



BASELINE REPORT

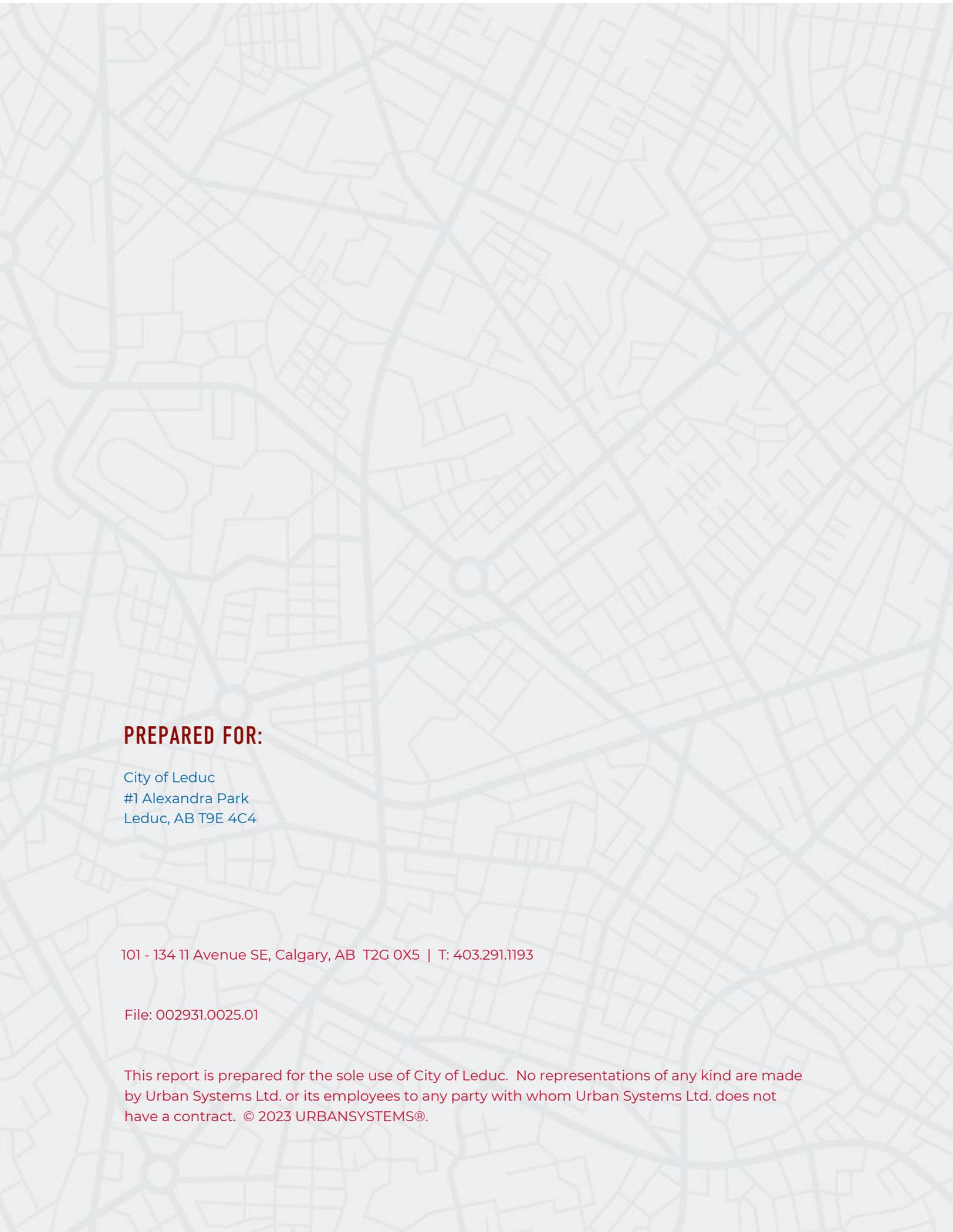
ENVIRONMENTAL PLAN UPDATE

September 22, 2023

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LIST OF ABBREVIATIONS			
AQHI	Air Quality Health Index	LRC	Leduc Recreation Centre
ACRWC	Alberta Capital Region Wastewater Commission	LUF	Land-Use Framework
ARMA	Alberta Recycling Management Authority	LULUCF	Land Use, Land-Use Change and Forestry
ASP	Area Structure Plan	MEM	Municipal Energy Manager
AVPA	Airport Vicinity Protection Area	MF	Multifamily
BAU	Business-as-usual	MDP	Municipal Development Plan
BoD	Biological Oxygen Demand	ML	Megalitres
CEIP	Clean Energy Improvement Program	NBCS	Nature-Based Climate Solutions
CEPA	Canadian Environmental Protection Act	NEF	Noise Exposure Forecast
dBA	Decibels A	NO2	Nitrogen Dioxide
DW	Drinking Water	NSR	North Saskatchewan River
EMP	Environmental Master Plan	NSRP	North Saskatchewan Regional Plan
EMRB	Edmonton Metropolitan Region Board	NSWA	North Saskatchewan Watershed Alliance
EPR	Extended Producer Responsibility	O3	Ozone
ESA	Environmentally Significant Areas	PM	Particulate Matter
GHG	Greenhouse Gas	RFP	Request for Proposal
ICI	Industrial Commercial Institutional	SO2	Sulphur Dioxide
ICLEI	International Council for Local Environmental Initiatives	SUPPR	Single-use Plastics Prohibition Regulations
IPCC	Intergovernmental Panel on Climate Change	SW	Surface Water
IPM	Integrated Pest Management	TOR	Terms-of-Reference
LEAB	Leduc Environmental Advisory Board	WCRP	Weather and Climate Readiness Plan
LED	Light Emitting Diodes	WW	Wastewater

EXECUTIVE SUMMARY

The City of Leduc's mission is "**People. Building. Community**". In order to better achieve this mission, the City of Leduc has developed the Environmental Plan – Phase 2, as a follow-up to the Environmental Plan – Phase 1 developed in 2012. The updated Plan will build on the targets and goals of the previous Plan while also setting new goals for the next ten (10) years, allowing Leduc to continue to thrive as a community and foster continued environmental stewardship. To support the development of the updated Environmental Plan, an Environmental Baseline Report has been prepared to determine Leduc's current state of the environment. The baseline report allows for the new Plan to be better tailored to Leduc's current environment while also celebrating the significant achievements of the previous Plan. The Environmental Baseline Report is focused on the following priority issues as identified by the City of Leduc:

- Summarizing the past work of the City
- The current state of the environment
- Achievements on the key focus areas of the initial plan
- Impacts of environmental issues on vulnerable populations.
- Opportunities for alignment with regional best practices
- Summaries of Provincial and Federal targets

Of the forty-five (45) action items in the original Plan, 80% of the action items have been completed, with another 15% in progress. Major accomplishments include implementing a curbside organic collection program, encouraging waste reduction, undertaking stormwater management initiatives, and developing an extensive multiuse trail network. Leduc also increased transit ridership through marketing and improved services, implemented urban forestry initiatives, and developed greenhouse gas reduction targets for the corporation and community, among other initiatives.

Since the previous Plan, Leduc's population has increased significantly from roughly twenty-six thousand (26,676) residents in 2012 to roughly thirty-five thousand (35,398) residents by 2022 and as such the environment has been changed as well, highlighting the importance of developing a new Plan and updated baseline conditions. Environmental aspects of Leduc which have been evaluated in this report include the regional watershed, land use changes, impacts of climate change, and natural assets such as wildlife, waterbodies, and soils. The environmental aspects mentioned above were considered based on their ecological significance, level of conservation concern, and their overall importance to the City of Leduc.

To help ensure that the City continues to align regional, Provincial, and Federal targets and best practices, existing legislation and initiatives have also been reviewed to identify other leaders in their respective areas.

This Baseline Report and subsequent updated Environmental Plan will support Leduc's vision to protect the unique context of the community. Furthermore, the updated Plan will help to enhance the quality of life of all who live in the City through effective, innovative, and responsible leadership that prioritizes the needs of community members as well as the natural environment.

Treaty 6 Territorial Acknowledgement

The City of Leduc acknowledges that the land we now know as Canada is the traditional territory of many First Nations, Inuit and Métis. Leduc is located on Treaty 6 land, the traditional territory to the Cree, Dene, Blackfoot, Saulteaux, and Nakota Sioux. We recognize and pay homage to these and all Indigenous peoples - past, present and future - that continue to support, educate and contribute to the strength of our region and country. As a Council, we are committed to listening and building our understanding of the sovereignty, lands, histories, languages, knowledge systems, and cultures of First Nations, Métis and Inuit nations.

1.0 INTRODUCTION

This Environmental Plan Update builds off The City of Leduc’s (Leduc, the City) original Environmental Plan, which was developed in 2012 as a living document to guide Leduc’s sustainability goals over a ten-year (10) period. The mission of the Plan was “to protect the unique environment of our area and enhance the quality of life in our community through effective, innovative, responsible leadership and consultation.” The Plan was based on extensive community engagement and emphasized the importance of capacity building through educational outreach programs, leadership opportunities, and local environmental initiatives.

The original Plan focused on the following six (6) key areas: (1 Waste, (2 Water, (3 Energy and Climate Change, (4 Air, (5 Light and Noise, and (6 Land. Within each of the key areas, the Plan identified targets, action items, and timelines to help Leduc achieve their environmental goals. Leduc’s progress on these action items was tracked and celebrated annually in Environmental Progress Reports.

Remarkably, Leduc completed 80% of the forty-five (45) action items in the original Environmental Plan, and another 15% of the actions are currently in progress. Major accomplishments include implementing a curbside organic collection program, encouraging waste reduction, undertaking stormwater management initiatives, and developing an extensive multiuse trail network. Leduc also increased transit ridership through marketing and improved services, implemented urban forestry initiatives, and developed greenhouse gas reduction targets for the corporation and community, among other initiatives.

Since the original Plan was developed, Leduc has experienced significant growth. In 2012, Leduc had a population of 26,676 residents. By 2022, Leduc’s population had grown to 35,398 residents, which represents an increase of 32% in ten (10) years (Figure 1). This rapid growth presents environmental challenges for Leduc, which will be considered and addressed as part of the updated Environmental Plan. As the original Environmental Plan was intended to be a 10-year living document, Leduc has retained Urban Systems to complete this Environmental Plan Update.

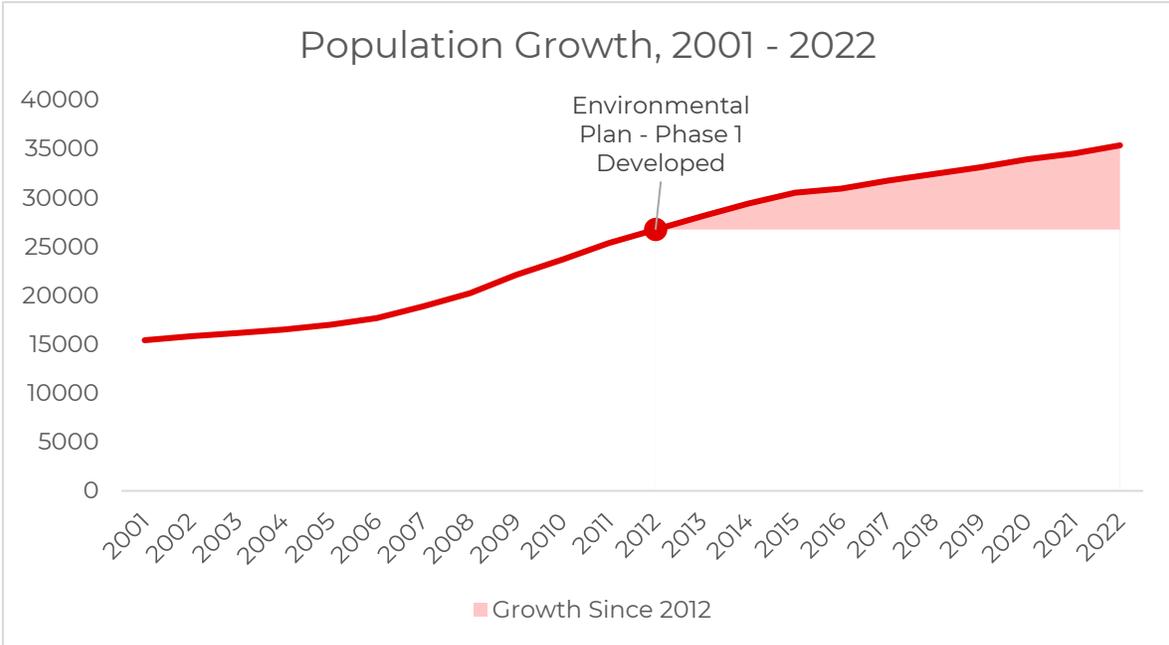


Figure 1: Population Growth, 2001 – 2022

2.0 BACKGROUND DOCUMENT REVIEW

A comprehensive review of background documentation was completed at the outset of this baseline report, to ensure a thorough understanding of the progress, initiatives, challenges, and opportunities specific to the City of Leduc over the prior decade. Below is a summary of each of the relevant City of Leduc reports with an environmental sustainability focus.

City of Leduc – Environmental Plan 2012

Leduc's Environmental Plan – Phase 1, functions as a living document outlining preliminary guiding principles, frameworks, strategies, and action items needed to fulfil its environmental sustainability mission along a 10-year (10) timeline. Leduc highlights six (6) key areas with supporting policy frameworks and programs to help reach key sustainability objectives and targets needed to achieve the City's 10-year vision for Leduc.

City of Leduc – Weather and Climate Readiness Plan (WCRP) 2014

The WCRP stresses the importance of employing an iterative risk management process to identify priority weather & climate risks for Leduc's corporate services and considers changing weather and climate risks to the 2050s. Twenty-one (21) weather-related risks to corporate services were identified, eight (8) of which were deemed "moderate" or "high-risk" events, thereby warranting immediate action, and acting as the focus of the WCRP. The WCRP acts as the preliminary document informing the development of a functional Climate Change Readiness Plan for Leduc.

City of Leduc – Integrated Pest Management Report (IPM) 2018

The 2017 IPM Report identifies five (5) key priority IPM areas to strengthen, mainstream, and refine within Leduc's existing IPM management and monitoring practices. The intent of this document aims to address Leduc's specific policies and procedures needed to fit the local Leduc context and primary IPM areas of concern, while remaining on par with industry best practices utilized across regional municipal equivalents.

City of Leduc – Environmentally Significant Areas (ESA) Study 2018

The primary objective of this study was to inventory natural areas in Leduc to identify a portfolio of ESAs by using an objective, standardized, and scientifically replicable framework. In total, eighty-six (86) natural areas were identified, with the top ten (10) highest-scoring natural areas formally designated as ESAs. It is recommended that Leduc pursue an assessment of existing legislation, policies, and guidelines present throughout the planning and development process to better leverage natural area acquisition tools needed to increase the potential of integrating environmental values in land-use planning and decision-making. Additionally, the study identified how Leduc could develop new environmental policies and tools to further support this endeavor. Items identified were to implement management policies such as monitoring plans, legislation, and/or guidelines outside of the Community Standards Bylaw, and increase the scope of public engagement and strategic partnerships to promote and improve conservation outcomes.

City of Leduc – Greenhouse Gas (GHG) Reduction Action Plan 2018

Leduc's GHG Reduction Action Plan provides a prioritized roadmap for municipal, community, and residents' GHG reduction actions over the next decade. As such, Leduc has chosen an overall target of reducing GHG emissions to 3% below business-as-usual (BAU) projections by 2030. Additionally, Leduc has set a corporate emissions reduction target of reducing emissions by 20% BAU by 2030 or an 8% reduction below 2015 levels, along with a community target of a 3% reduction from BAU by 2030 or for emissions at 6% above 2015 levels. The plan assigns departmental responsibilities, estimated cost profiles,

and timelines to ensure accountability and help Leduc meet these GHG reduction targets. Along with developing a GHG inventory to quantify which sectors were generating emissions, Leduc identified six (6) of its own action/sector areas that could reduce GHG emissions through action items within Leduc's control. Under each respective action/sector area, action items were organized by their capacity to produce a three (3)-, five (5)-, and nine (9) percent GHG reduction, and therefore created the three (3) different scenarios known as low-, medium-, and high-reduction scenarios, respectively. Leduc has also considered the tax implications and relative benefits that each scenario would bear on Leduc's social, economic, and environmental possible futures, and as such, has plans to implement specific monitoring programs for each key action area to assess levels of progress, with the intention of reporting this progress on an annual basis.

City of Leduc – Parks and Open Spaces and Trails (POST) Master Plan 2020

This is an update to the previous 2012 Parks, Open Space and Trails (POST) Master Plan and reflects updated community engagement, future Area Structure Plans (ASP), development of the Crystal Creek site and current Leduc strategies, and policies. The objective of this updated Master Plan is to ensure that parks in Leduc are well-managed fiscally, and ecologically sustainable, safe, accessible, natural, and to enrich the overall quality of life for everyone in the community.

The update has the following important changes from the 2012 version:

- References to recent policies such as the revised Municipal Development Plan, Transportation Master Plan, Environmental Policy and Plans,
- Changes to Open Space categories and sub-categories,
- Snapshot of current recreational trends,
- Update of volunteer opportunities,
- Summary of the Municipal Reserves and Environmental Reserves inventory.

This document is intended to direct POST planning over the next decade and based within seven (7) strategies:

- Access and connectivity,
- Nature and Environment,
- Facilities,
- Amenities,
- Safety,
- Management and Maintenance, and
- Programming.

The POST Master Plan 2020 identifies five (5) management areas for Leduc and includes an updated version of the Minimum Landscape Design and Construction Standards.

City of Leduc – Municipal Development Plan (Bylaw 1057) 2020

The Municipal Development Plan (MDP) is a high-level, long-range planning document used by City Administration to guide land use, identify, and direct community service priorities and infrastructure investment.

This document was last reviewed in 2012 and reflects many of the changes brought about by Leduc's exponential growth since that time. This MDP aims to influence how residents interact with Leduc's built and natural environments and includes the transportation network, amenities, and residences.

The MDP contains general policies for various sectors, which are grouped under nine (9) general categories, with various subsectors. These are:

- Complete communities: policies ranging from land development, growth, commercial development, and urban design to natural areas and developmental constraints,
- Environmental sustainability: climate adaptation, greenhouse gas reduction, solid waste, and hazardous materials management,
- Economy and local jobs: local and regional economic development, tourism,
- Infrastructure and utilities: general and communication infrastructure, water, stormwater and wastewater,
- Transport and Mobility: transportation, transit, and accessibility,
- Recreation and Parks,
- Arts, Culture, and Heritage,
- Community Services, and
- Agriculture

Furthermore, the MDP also identifies four (4) policy areas which concern all development conducted in Leduc and is categorized geographically by: urban centre, central redevelopment areas, residential areas, and employment areas. Finally, the MDP identifies additional policies that cover regional and intermunicipal relationships, public engagement, and implementation.

City of Leduc – Strategic Plan 2023-2026

This planning document highlights the overarching strategic direction desired for the City of Leduc and considers the City should develop its other plans, policies, and programs. Additionally, the Plan highlights the value Leduc's Council maintains in balancing growth and development with the intent to replenish what we've borrowed from our natural environment. Council is committed to protecting and enhancing both the natural and built environments by leveraging best practices and exploring new and innovative ways to improve our capacity to steward the environment and reduce our footprint throughout the Strategic Plan. This approach will help Leduc continuously safeguard the integrity of its environmental, social, and economic assets, helping to balance growth with environmental conservation for years to come.

The Strategic Plan, along with several master planning documents, influences the direction of its annual corporate and business plans once they're developed. Progress on the implementation of the Council's Strategic Plan is monitored on a regular basis, with updates and findings annually reported to the public.

Additionally, the Plan identifies nine (9) guiding values focus on, which include, citizens, excellence and prosperity, financial balance, transparency and accountability, a committed city team, environmental sustainability, social justice, working in partnership for success, and a regional focus.

It also lists goals for Leduc and identifies various strategies to achieve those four (4) goals which are:

- Making Leduc a city where people want to live,
- Ensuring that Leduc has the capacity to meet the current and future needs of its residents,
- Economic prosperity,
- Making Leduc a collaborative community-builder and regional partner.

3.0 CURRENT STATE OF THE ENVIRONMENT

The current state of the environment has been evaluated based on available desktop information and previous environmental reporting completed by Leduc, as outlined in the section above. This overview supports determining Leduc’s environmental footprint and helps to identify areas that can be improved upon in the updated environmental plan moving forward.

3.1 REGIONAL ENVIRONMENTAL SETTING

Leduc is located within the Central Parkland Subregion (Parkland Region), which is both the most densely-populated subregion in Alberta, as well as the most productive agricultural region [1]. Due to extensive agricultural activities and primary land uses dedicated to serving the population, native vegetation is rare, with approximately 5% of native vegetation remaining in the subregion [1]. This subregion shares climate conditions of both the cold, snowy forests to the north and the warm, dry prairies to the south [1]. The presence of wetlands within the subregion is minimal, accounting for approximately 10% of land cover, with numerous small streams and ponds scattered throughout the area [1]. The region has a long growing season, with warm summers, fertile soils, and the most rainfall in the region contributing to the agricultural fertility of the area. Conventional oil and gas exploration is also widespread throughout the region, which has played a large role in the establishment of Leduc [2].

As shown in Figure 2, Leduc is within the North Saskatchewan Watershed and the Strawberry Sub-watershed, part of the Headwaters Alliance (HA) stewardship group [3].

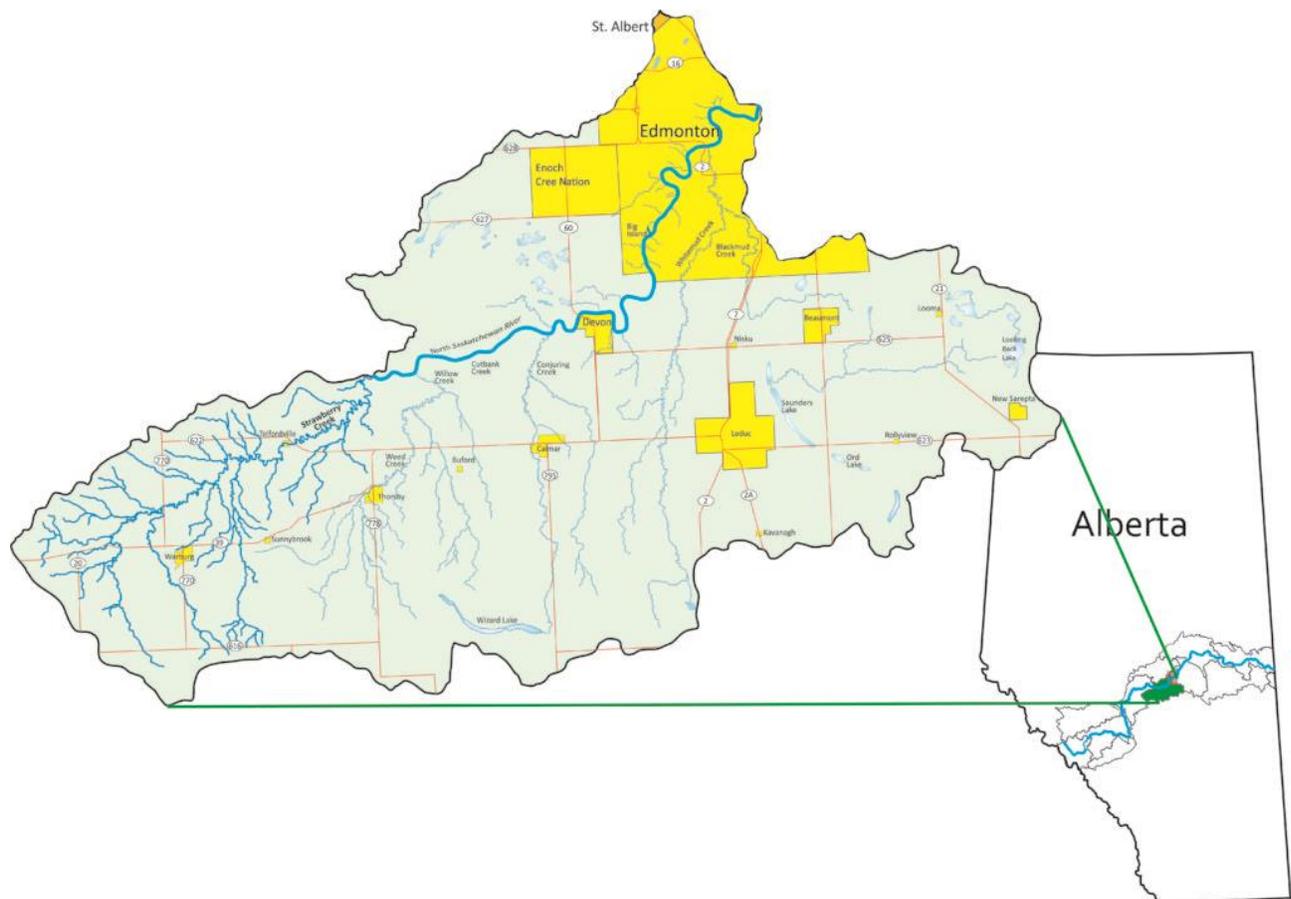


Figure 2: Strawberry Subwatershed within the North Saskatchewan Watershed [4]

3.2 SUBREGIONAL WATERSHED REVIEW

According to the State of The Watershed Report, Edmonton and its surrounding areas have the largest impact on the North Saskatchewan Rivers water quality, primarily due to wastewater inputs and stormwater runoff [5]. Surface water from Leduc predominately drains west to Whitemud Creek and east to Blackmud Creek [6]. Typical inputs of concern associated with stormwater, wastewater and agricultural runoff include increased Biological Oxygen Demand (BoD), fecal micro-organisms, total suspended solids, and nutrients such as total nitrogen and phosphorous. Increased concentrations of nutrients can impact water quality in multiple ways, such as causing increased frequency and severity of algae blooms. These impacts can result in insufficient amounts of dissolved oxygen available for fish and other aquatic species in addition to having a negative impact on recreation.

High sediment loads and suspended solids can also degrade the aquatic environment by accumulating on the bottom of the receiving waterbody and preventing the establishment of aquatic vegetation. High sediment loads also impair and suffocate fish and their spawning grounds. While numerous riparian inventories and studies have been conducted on the Strawberry Sub-watershed, information is lacking regarding the overall water quality of the region and further studies are needed [7]. As a densely populated and agriculturally productive area, it is important for all municipalities and communities within the watershed to play an active role in maintaining a healthy riparian environment, through both responsible stormwater/wastewater management and water conservation initiatives.

Based on the 2017 Blackmud/Whitemud Creek Surface Water Management Study, flooding risk has been determined to be relatively minor when considering 1:100-year events and accounting for future growth and development. However, the same report has also identified that significant erosion and runoff are projected as development increases within the water basins [8]. Increased erosion and runoff further contribute to increased sediment loads, and nutrient inputs, subsequently degrading water quality.

Invasive species were also identified as major problems in all areas assessed during the 2005 riparian health assessment within the sub watershed [5]. The presence of noxious weeds such as creeping thistle (*Cirsium arvense*), common tansy (*Tanacetum vulgare spp.*), and scentless chamomile (*Tripleurospermum inodorum*) are problematic in riparian zones. Noxious weeds and invasive species can have negative ecological impacts by competing with native species, causing an overall decline in biodiversity, in addition to economic and social implications such as increased parks maintenance costs and a decline in park aesthetics. Overgrown weedy vegetation can also create safety hazards if line of sight is disrupted, and may present an increased fire risk if not appropriately managed. Likely aggravated by long-term agricultural activities and anthropogenic disturbances, invasive species are a concern throughout the region, with remaining areas of native vegetation typically dominated by invasive species [1].

3.3 TEMPERATURE AND PRECIPITATION REVIEW

As per Leduc's Greenhouse Gas Reduction Action Plan, the City can expect to see an increase in annual mean temperature. These projections are backed up by regional reports such as a detailed climate projections study undertaken by Edmonton [9]. This report is referenced as Edmonton is within a suitable proximity to Leduc, to reasonably adopt certain climate projections for the purposes of this baseline report.

In line with regional projections, Leduc can expect average temperatures to increase in the future across all seasons, with winter season being impacted the most. Leduc's mean annual temperature has increased by 2.7°C over the past thirty (30) years , and Leduc can expect a further increase of 2°C by the

2050s [10]. This also implies that Leduc can expect maximum temperatures that are higher than previously recorded.

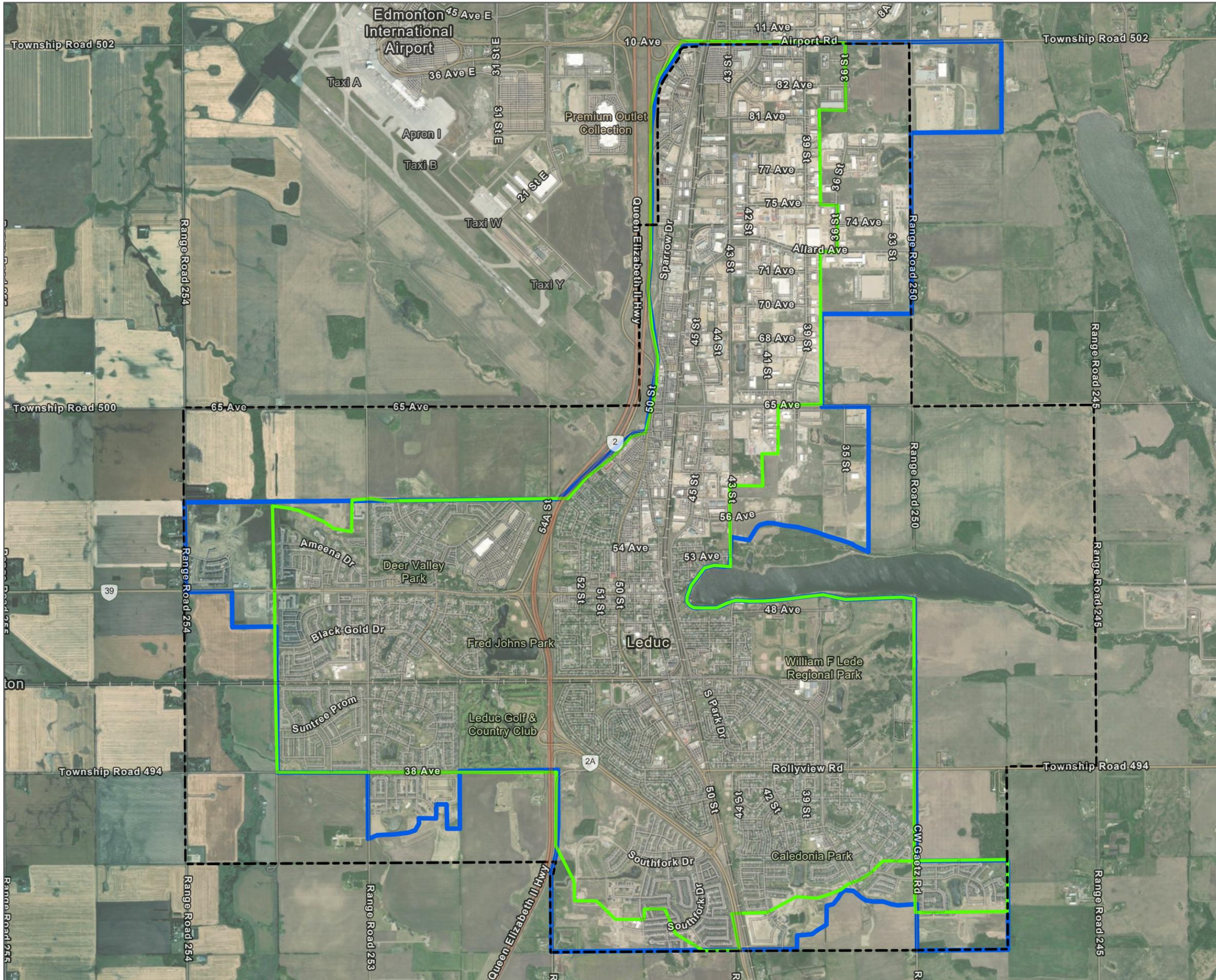
Due to increasing temperatures, there will be more energy in the atmosphere, which is likely to support more frequent and intense extreme weather events including lightning, tornados, hail, and high winds. Increasing temperature in the region is also expected to influence drought conditions since annual accumulated moisture is expected to decrease during the summer months, making drought more likely.

Precipitation patterns are also anticipated to change as annual precipitation is expected to increase by the 2050s, with spring season experiencing the largest increase. While there is an overall increase in precipitation, summer precipitation is expected to decrease. Leduc can expect extreme rainfall events of increasing magnitude and frequency, which are likely to lead to an increase in urban flooding events. Edmonton projections estimate that the likelihood of urban flooding will almost double by the 2050s. Overall, Leduc should be prepared for wetter winters, drier summers, and more extreme rainfall events.

The impacts of climate change and extremes of weather and climate events have the potential to affect every aspect of life in Leduc, including municipal infrastructure and services, private property, the local economy, the natural environment and the health, safety, and wellbeing of Leduc citizens.

3.4 LAND USE (2012-2022)

As Leduc continues to grow and accommodate a variety of land uses, primarily residential, ICI, and agricultural, how land is used will become increasingly important. Over the past decade, the developed area within Leduc's municipal boundary has increased by approximately 28% from 2012-2022 (Figure 3). Based on the current municipal boundary, as of 2022, approximately 1,423 ha, or 33%, remains undeveloped. From 2012-2022, land use has transitioned from agricultural to predominately residential in the south and ICI in the northeast, where the greatest expansion has occurred. The remaining undeveloped areas are nearly all agricultural lands, excluding the natural areas to the north, east, and south of Telford Lake.



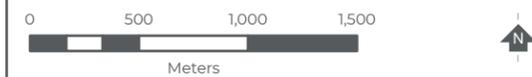
City of Leduc
 Environmental Plan
 Baseline Report
 Land Cover Changes
 (2012 - 2022)

Legend

- Municipal Boundary
- 2012
- 2022



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 (When plotted at 11"x17")

Data Sources:

- Data provided by Alberta Government
- ESRI Imagery (June 2022)

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FIGURE 3

The Edmonton Metropolitan Region Growth Plan put out by the Edmonton Metropolitan Region Board (EMRB) is a thirty (30) year growth plan with a fifty (50) year vision to create a contiguous and diverse thrivingly competitive metropolitan region [11]. The Plan includes a vision, guiding principles, and a framework for responsible growth & six (6) overarching strategies, a Metropolitan Regional Structure breakdown, and six (6) policy areas with objectives and policies. The regional structure of EMRB is characterized under three (3) distinct policy tier areas as follows: rural area, metropolitan area, and the metropolitan core.



Figure 4: Distinct Policy Tier Areas making up the Edmonton Metropolitan Region for the EMRB

Each policy tier area represented above in Figure 4 contains its own unique set of community characteristics and as such, will require a context-specific interpretation of each of the six (6) policy areas listed below:

1. Economic competitiveness & employment
2. Natural living systems
3. Communities & housing
4. Integration of land-use & infrastructure
5. Transportation systems
6. Agriculture

A toolkit was created by the EMRB to help member municipalities navigate and understand the Regional Evaluation Framework, along with additional aids to support municipalities in their interpretation of the policy directives to create community-specific policies that reflect the growth projections of each respective policy tier, whilst contributing towards the contiguous growth outcomes for the Edmonton Metropolitan Region at large [12].

Of critical importance to enabling growth for the City of Leduc, are the new updates to the Airport Vicinity Protection Area (AVPA). As of May 2022, three (3) key changes to the AVPA established new Noise Exposure Forecast (NEF) contours, which have lifted restrictions on commercial and industrial development, and have relaxed residential development restrictions across many City areas. Now that 80% of the City is not covered under restrictive NEF contours, Leduc's growth and development across ICI, and residential asset classes, will likely necessitate updates or amendments to the Municipal Development Plan (MDP), the Land-Use Bylaw, and various Area Structure Plans (ASP's). Through tactful consideration, iterative community engagements, and stakeholder consultation, Leduc will be well positioned to update its MDP, Bylaw and ASPs to balance Leduc's desired growth with environmental concerns, thereby tangibly producing material co-benefits across various environmental and economic areas of concern [13].

3.5 NATURAL ASSETS

Natural assets can be defined as “the stocks of natural resources and/or ecosystems that contribute to the provision of one [1] or more services required for health, well-being, and long-term sustainability of a community and its residents” [14]. While the purpose of this report is not to evaluate and apply a monetary value to Leduc’s natural assets, it is important to highlight the ecological value of Leduc’s environment, and to subsequently identify areas of conservation concern, as well as those with environmental, social, and economic community value. Based on available information and professional knowledge of the area and its Environmentally Significant Areas (ESAs), the following have been identified as key areas of environmental, social, and economic value.

3.5.1 ENVIRONMENTALLY SIGNIFICANT AREAS

In the 2018 Environmentally Significant Areas (ESA) Study conducted by Fiera Biological Consulting, 8% of Leduc’s land cover was identified as ESAs [15]. These areas were assessed for significance based on the ecological, social, and economic context specific to Leduc. The top ten (10) areas identified as ESA include wetlands, streams, and tree stands, with Telford Lake being the most highly-ranked area (Figure 5) [15].

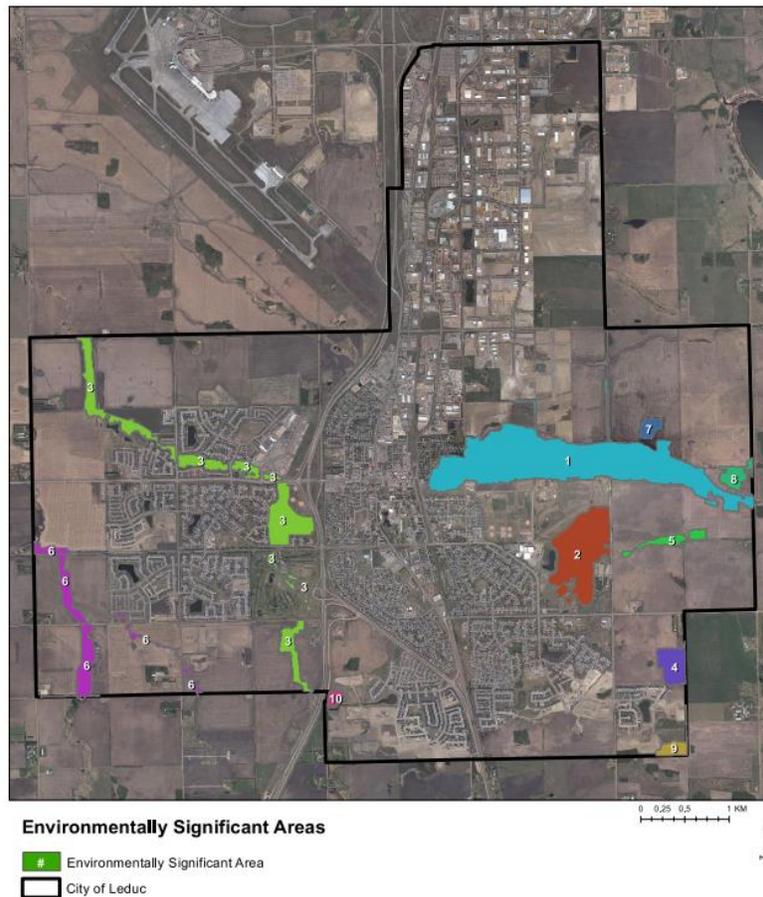


Figure 5: Top 10 ESA's Identified within Leduc [15]

3.5.2 WETLANDS, LAKES, AND WATERCOURSES

Leduc is home to a range of valued waterbodies that include temporary, seasonal, or permanent wetlands, lakes, streams, and creeks, all of which provide quality habitat, climate resilience, and social value to the community.

Wetlands are extremely dynamic and diverse ecosystems identified through many different characteristics including vegetation, hydric soils, topography, and the presence of temporary to permanent surface water. The Alberta Wetland Policy defines wetlands as “*land saturated long enough to promote the formation of water altered soils, growth of water tolerant vegetation, and various kinds of biological activity that are adapted to the wet environment*” [16].

Wetlands are an incredibly valuable ecological resource, helping to protect water quality by naturally filtering contaminants, aiding in flood mitigation through water storage and groundwater recharge, while also providing habitat for a wide range of species. It has been estimated that wetlands can contain upwards of four hundred (400) different plant species, further speaking to the vast biodiversity and ecological value they provide [16].

Despite their immense value, natural wetlands are declining in Alberta as land is converted for development, with an estimated loss of 60-70% in settled areas [17]. This dramatic decline emphasizes the importance for Leduc to conserve and restore the natural wetlands within Leduc’s municipal boundary. Leduc has already taken a ‘step in the right direction’ through the previous restoration of two (2) wetlands to the north and south of Telford Lake in collaboration with Alberta Environment and Protected Areas. Following the completion of vegetation plantings in 2022, the wetlands will be monitored for four (4) years to help increase the chance of successful restoration.

An important step in restoring and preserving wetlands and watercourses is to address and establish a setback from the ecological boundary of the waterbody. Adaptive management techniques should be implemented where needed to adjust and adapt to challenges during establishment and restoration, helping to ensure that a healthy riparian zone can be established.

Telford Lake is a beautiful ecological community amenity, providing the same valuable ecological benefits as a wetland but to a greater extent due to its depth and size, and the ability to support a wide span of terrestrial and aquatic wildlife life stages. In addition to providing flood mitigation and helping to protect the overall water quality of the watershed, Telford Lake supports a large range of wildlife and biodiversity while also offering habitat connectivity downstream to Sanders Lake. As the crown jewel of the community, Telford Lake also exists as a great amenity for passive and active recreation, which include the boat launch and boardwalk.

Telford Lake currently experiences numerous stressors which, if not proactively managed, may negatively impact its ecological, social, and economic value. Stressors on the system include nutrient and sediment inputs from the surrounding lands and stormwater runoff, recreational pressure associated with the boat launch, and a reduction in catchment area as the surrounding lands are developed. If these impacts are not sufficiently managed, the Lake may be at further risk of increased erosion, declining water quality, sedimentation, algae blooms, reduced fish populations, and subsequently, an overall decline in ecosystem function, with social, environmental, and economic implications.

Given the value of Telford Lake, it is important to ensure this resource is responsibly managed. Options to support Telford Lake include:

- establishing and maintaining setbacks,
- restoration of riparian and highly-eroded areas around the lake,

- ensuring the catchment area of the lake in surrounding lands is sufficient to maintain water levels post-development, and
- Limiting stormwater inputs.

Numerous unnamed streams, particularly throughout agricultural lands within Leduc's boundary, also contribute to the overall ecological function of the community and of Telford Lake, with connectivity to major watercourses outside of the Leduc's municipal boundary.

For Leduc to preserve these valuable assets, early recognition at the high-level planning stage is key. By focusing on avoidance, minimization, and restoration and by building on provincial and federal policy, Leduc has the potential to improve upon existing regulations while also aligning with the communities' goals and visions, to support a thriving community for generations to come.

3.5.3 WILDLIFE

As Leduc is surrounded by agricultural lands, a major city centre to the north, and an airport to the northwest, it is important to consider how wildlife interacts and moves around and through Leduc, and what can be done to support and maintain urban wildlife.

The approach to land management and conservation will help to foster and integrate wildlife in an urban setting. Leduc provides habitat for a wide diversity of wildlife species and their various lifecycles from forested areas creating shade and shelter, to open water and riparian areas providing habitat for breeding birds and aquatic species.

Leduc provides a crucial wildlife corridor, creating habitat connectivity to downstream lands through Telford Lake, as shown in the Leduc Wildlife Corridor Study conducted in 2018 [18]. While the west, north, and south sides of Leduc are highly developed, fragmented habitat exists throughout Leduc in the form of parks and public spaces, providing steppingstones for wildlife to access the more preferred, high-quality habitat of Telford Lake.

Residents of Leduc are already embracing and interested in their natural environment, as evidenced through the Cornell Lab of Ornithology "hotspots" located within Leduc. The Cornell Lab of Ornithology utilizes citizen science to inventory bird species found within an area, where a high diversity of observations results in "hotspots" of activity. Two (2) hotspots exist within Leduc [19], one at the Leduc Reservoir and one at Telford Lake. Over 140 different species have been identified at the Telford Lake hotspot, 25 of which are federally, and/or provincially listed species of conservation concern. Such a high diversity of species observed speaks both to the biodiversity that Telford Lake provides, but also to the communities' interest in their natural environment. Fostering this relationship and ensuring Leduc's wildlife can continue to thrive for years to come provides an invaluable community amenity.

A diverse bird population also helps to support a healthy ecosystem and encourages biodiversity, as birds aid in plant distribution through the spreading of seeds. Furthermore, because birds are sensitive to environmental changes such as habitat loss, declining water quality, and climate change, they can be used as an indicator species to evaluate and monitor overall ecosystem health. Small fish species, such as brook stickleback and fathead minnow, have also been recorded within Telford Lake [20], providing a food source for resident wildlife, and contributing to the overall lifecycle of the aquatic and terrestrial environment.

By allowing for wildlife to thrive and integrate within an urban center, Leduc can enhance residents' relationship with nature and reap the social and health benefits that come along with having a strong connection to the natural world.

3.5.4 SOILS

Surrounded by vast, highly-productive agricultural land both within Leduc and beyond, the subregion's most common land-use has the potential to provide numerous ecological benefits while also supporting the regions economy.

All of earth's soils store carbon to varying degrees. Through the process of photosynthesis, vegetation removes carbon dioxide from the atmosphere and stores the carbon within its plant tissue. As the vegetation decomposes, the carbon is then stored in the soil as organic matter. This natural phenomenon results in large amounts of carbon being removed from the atmosphere through the process known as carbon sequestration. The extent to which agricultural lands can store carbon depends on how the agricultural resource is managed, with sustainable farming practices playing a large role in the soil's ability to mitigate climate change. Healthy agricultural lands, and in turn healthy soils, also contribute to overall ecosystem health through nutrient cycling and help to manage runoff by providing a permeable surface.

Overall, the agricultural lands within and surrounding Leduc offer a very valuable environmental and economic resource and are important to consider in land management decisions as the Leduc continues to expand.

4.0 BASELINE ASSESSMENT

4.1 PRIORITY ISSUES AND WHERE WE ARE NOW

Leduc's 2012 Environmental Plan committed to several actions listed under its six (6) key areas: Waste, Water, Energy and Climate Change, Air Quality, Light & Noise, and Land. We have highlighted the status of each area as completed, in progress, or ongoing, as well as the incomplete statuses of each action item/commitment in **(Table 1)**. Additionally, and where appropriate, we have documented recommendations to increase the reach and impact of specific areas to leverage the 80% completion rate that Leduc has achieved.

We have noted that actions and commitments listed in the "Air Quality" action area were commitments whose successful completion status was contingent upon factors outside of Leduc's control, as air quality is primarily controlled through the province. Given this, we have made note of potential avenues for Leduc to investigate if they possess the appetite and financial resources to support the Province's measures to control air quality through municipal initiatives.

Progressive action across the Water action area includes the restoration of 0.4 ha of wetland north of Telford Lake and 0.37 ha of wetland south of Telford Lake, as well as consistently hosting environmental bulk purchase programs for water-wise home tools such as rain barrels, and the ongoing development of a Stormwater Master Plan.

The "Energy and Climate Change" action area made significant strides as renewable energy projects were completed and contributed towards a revolving energy financing fund that helped other environmental initiatives. Solar energy was found to be the most viable option for Leduc and has been installed on a number of City-owned buildings. A corporate energy efficiency and greenhouse gas plan addressing both corporate and community emissions was developed in 2019 with progress being made towards achieving the action items contained within this Environmental Plan. As part of the Municipal Energy Manager (MEM) Program, the City of Leduc hired a Municipal Energy Project Manager in 2021. Responsibilities include benchmarking municipal facilities, identifying energy savings opportunities, applying for energy and environment-related grants, and implementing greenhouse gas emission reduction projects. Leduc was the fourth municipality in Alberta to develop a Clean Energy Improvement Program (CEIP) showcasing its commitment to innovative municipal climate governance & leadership. Further action on initiatives for the 2019 plan is expected to continue over the next few years as more resources become available.

"Light and Noise" action areas were not as robust, since they included actions that were already part of many of Leduc's departmental processes. Leduc has, however, completed the development of local noise guidelines and has informal guidelines for noise control, as retrofitting buildings, and new developments, and Leduc's Transportation Master Plan also accounts for sound monitoring. Streetlights throughout Leduc have been converted to LED and further recommendations by LEAB are forthcoming for dark sky initiatives. A concerted marketing effort being undertaken to encourage the use of public transit is showing progress with "on-demand" transit resulting in a significant increase in ridership.

Regarding "Waste" action items, Leduc has an award-winning, Eco-Station waste drop-off accepting a wide range of waste from residents across the City of Leduc, Leduc County, and Beaumont, encouraging the landfill diversion rates. Leduc also implemented a curbside organics collection program and has implemented waste audits and green bin inspections regularly to monitor diversion progress and report results to the public. Waste reduction plans for corporations, businesses, and residents are in progress with a multi-unit waste diversion program, and the ICI sector are expected to follow.

“Land” has also seen progress as a key priority in certain action areas. A natural habitat inventory was completed in 2017. An initiative to provide residents with information on existing pesticide practices and educate them on alternatives to pesticides is planned for 2024, and the Integrated Pest Management plan was updated in 2018. The Urban Forestry Plan is also in the process of being implemented, and a Tree Protection Policy and Bylaw are expected to be forthcoming in the future. Leduc has also expanded its multiway system with 84 km of multi-use trails as of 2022. In the spirit of maintaining an exemplary leadership role stewarding the environment in the face of new challenges over the next ten (10) years, Leduc remains committed to fostering productive, collaborative relationships with key Capital Region organizations to enhance alignment with broader regional initiatives. These include but are not limited to increasing collaboration with initiatives such as the EMRB Climate Risk and Vulnerability Assessment & Solid Waste Collaborative, Alberta Capital Airshed, Edmonton Energy Transition Learning Network, and the Edmonton Region Waste Advisory Committee.

Table 1: Priority Issue and Progress

PRIORITY ISSUES AND PROGRESS	
Waste	<p>What has been achieved?</p> <ul style="list-style-type: none"> • Implementation of a curbside organics collection program. • Development of a corporate waste reduction plan that encourages Leduc employees to reduce waste. • Development of waste reduction plan for multi-family units in progress • Regular waste audits to track progress and report to the public. • Use of internal communication methods to reduce waste through accessing sorting stations in civic buildings for city staff. • School Waste Diversion pilot program. • Award winning Eco-Station offers Leduc, Leduc County, Beaumont and Calmar, the opportunity to drop off waste encouraging the diversion of a range of materials from the landfill. • New drop-off location at the City of Leduc & District Waste Management Facility now accommodating vehicle access. • Partnered with GFL & Telus to implement Artificial Intelligence (AI) technology to identify contamination in green bins during collection and notify residents from where contamination was detected. • Development of a waste reduction plan, and associated Waste bylaw update for Multi-Family units.
Water	<p>What has been achieved?</p> <ul style="list-style-type: none"> • Support of ongoing water conservation monitoring and developed water conservation & efficiency reports. • Continued to offer water conservation resources to homeowners. • Ensured infrastructure maintenance is undertaken regularly on catch basins. • Restored 0.4 ha of wetland north of Telford Lake and 0.37 ha of wetland south of Telford Lake through receiving funding support from the Alberta Environment and Parks Wetland Replacement program. • Developing a new Stormwater Master Plan - Ongoing • Consistently host environmental bulk purchase programs including, the Green Gold events held annually for composter and rain barrel sales in partnership with Rona - Ongoing

PRIORITY ISSUES AND PROGRESS

	<p>What barriers were identified?</p> <ul style="list-style-type: none"> • Joining the North Saskatchewan Watershed Alliance (NSWA) was deemed cost prohibitive, reconsider joining and evaluate costs as of 2023.
<p>Energy and Climate Change</p>	<p>What has been achieved?</p> <ul style="list-style-type: none"> • Successfully completed a feasibility study for renewable energy project at the Leduc Recreation centre (LRC) where a solar system project was completed. • Developed a corporate and community energy efficiency and greenhouse gas plan in 2019. • Reporting on energy efficiency and GHG emissions are consistently addressed in the annual Environmental Progress Reports. • Offset credits generated from the solar systems at LRC and Operations buildings. • City Council agreed that the development of a revolving energy financing fund can be achieved using offset credits towards environmental initiatives. • Encouraging the use of public transit has been consistently marketed. • Increased use of on-demand transit ridership, and the successful implementation of an E-scooter Pilot Project. • Evaluations of the Backyard Hens and Bees Pilot Program will be evaluated in 2023 to encourage a deeper understanding and appreciation of where food comes from. • LEAB hosts annual community tree planting and pollinator garden events with increases to the number of trees planted each year. • 2021 Leduc joined the 2 Billion Trees Program initiative. • Multiple programs undertaken and implemented with the Municipal Climate Change Action Centre (MCCAC), including, Municipal Energy Manger Program, Electric Vehicles for Municipalities program to obtain a fleet of EV's, and Recreation Energy Conservation Program. • Solar carport is fully operational solar t in 2022. • Level 2 & 3 electric vehicle chargers installed. • Solar Installation at the LRC and Operations Building, Eco Station, Protective Services building allows the City to sell the offsets through Rewatt for \$37,000/year. • Developed a Clean Energy Improvement Program (CEIP) and was the fourth municipality in Alberta to do so. <p>What barriers were identified?</p> <ul style="list-style-type: none"> • No specific reporting standards employed. • Potential to increase transparency around financial impact and opportunity presented by offset credits for environmental initiatives.
<p>Air Quality</p>	<p>What has been achieved?</p> <ul style="list-style-type: none"> • Providing the public with air quality monitoring information is accessible online through AQHI website or app, and through Alberta Capital Airshed and Alberta Environment websites. <p>What barriers were identified?</p>

PRIORITY ISSUES AND PROGRESS

	<ul style="list-style-type: none"> Increasing the reach and exposure of these resources through targeted marketing campaigns for vulnerable populations disproportionately affected by climate change-induced weather events (people experiencing houselessness, low-income residents, racialized minorities, elderly population, and other marginalized communities, etc.) could enhance the health of these populations residing in Leduc [21]. The development of a local air quality plan was not pursued because these responsibilities fall under provincial and federal jurisdiction. The Alberta Capital Airshed has identified the City as a priority area for a permanent air monitoring station however identifying funding sources has been challenging.
<p>Light and Noise</p>	<p>What has been achieved?</p> <ul style="list-style-type: none"> All streetlights in Leduc have been changed to LED lights and Leduc is working with LEAB to integrate further recommendations to reduce light trespass and provide public information and resources on reducing light pollution. Leduc maintains noise (DB) standards in the Engineering Guidelines for new developments, along with sound monitoring requirements as part of the Transportation Master Plan. <hr/> <p>What barriers were identified?</p> <ul style="list-style-type: none"> Consider what new standards have evolved with the use of independent building sustainability rating systems.
<p>Land</p>	<p>What has been achieved?</p> <ul style="list-style-type: none"> Planning Department commissioned the ESA Study completed in 2017, which contains a natural habitat inventory. As of spring 2022, Leduc now has 84 km of multiway trails, thereby continually enhancing their multiway system. <hr/> <p>What barriers were identified?</p> <ul style="list-style-type: none"> Development of a brownfield strategy is pending partnership with industry partners; City-owned contaminated sites have been prioritized and are currently being assessed, reclaimed (e.g., Drawdown wells) and/or risk managed as required.

4.2 VULNERABLE POPULATIONS/COMMUNITIES

As the effects of climate change become more prevalent throughout our environment, it will also be important to consider the implications on vulnerable populations. Vulnerable populations, in the context of climate impacts, are defined as “populations that are at higher risk of being harmed by the impacts of climate change.” The effects of climate change to vulnerable populations range from health impacts to higher food costs and infrastructure liabilities. It is important to ensure that climate adaptation initiatives be viewed through a holistic, equitable lens to ensure that the most susceptible members of our community be protected from the impacts of a changing climate. This begins with an understanding of people who are at increased risk from climate change.

Health Canada lists a variety of populations that may be at higher risk by being harmed by the impacts of climate change [22]. These include:

- seniors,
- youth and children,
- Indigenous Peoples,
- racialized populations,
- people with disabilities,
- women who are pregnant,
- frontline emergency responders,
- residents of northern and remote communities,
- individuals who are socially and economically disadvantaged, and
- people who are immunocompromised and those living with pre-existing illness.

It is possible that Leduc may be able to reduce potential demands on their health care services if due consideration and proactive measures are adopted for vulnerable populations, since these may aid in diminishing the physical and mental health impacts of climate change. This holistic, equitable approach, coupled with planning ahead regarding climate change's impacts on vulnerable populations may also have positive effects on other municipal aspects such as food security and service delivery¹ [23].

Leduc has already taken some important steps in incorporating equity into their Environmental Plan by conducting youth engagement and can build on this foundation by adopting other measures that consider the increased sensitivity of vulnerable populations to climate change.

5.0 TARGETS AND BEST PRACTICES

The purpose of this section is to understand the direction that each of the key focus action areas is headed towards and the relevant strategies, plans, policies, programs, and best practices that apply on a municipal, provincial, and national scale.

5.1 OPPORTUNITIES FOR REGIONAL ALIGNMENT OF BEST PRACTICES

Existing environmental policy, initiatives, and best practices of Calgary, St. Albert, Strathcona County, Spruce Grove, and Okotoks were reviewed to understand what leading innovation and best practices have emerged in neighboring communities since the initial Environmental Plan was developed. Each community below highlights a minimum of one of the key areas that is a priority for the City and provides a brief description of the program, policy, or initiative.

The City of Calgary

The City of Calgary requires multi-family residential developments to provide a three (3) stream diversion system of their own in alignment with the City's residential diversion targets [24]. The multi-family developments are required to arrange for municipal collection services or contractors of their choosing. Since 2016, businesses and organizations have been required to manage recycled materials including specific materials related to commercial waste, such as scrap metal and unprocessed wood.

The City of St. Albert

¹ Climate change: 7 steps to save the world's most vulnerable | World Economic Forum (weforum.org)

The City of St. Albert's Municipal Development Plan, known as *Flourish* focuses on responsible land use and urban design practices [25]. Balancing conflicting land uses with economic development and environmental conservation requires a holistic growth strategy that reimagines how the City of St. Albert can plan the City to accommodate a rising population of one hundred thousand (100,000), and up to 13,000 new jobs over the coming decades. The approach taken by the City of St. Albert for its MDP organizes policies and bylaws according to broader policy areas that St. Albert recognizes as valuable to its environmental, economic, and socio-cultural health. *Flourish* considers how to identify priority land-related challenges, while still working within the requirements of, the EMRB, and the North Saskatchewan Regional Plan currently under development, to achieve its desired community outcomes. Contending with how to balance growth and environmental sustainability over the coming years, *Flourish* clearly identifies the City of St. Albert's main challenges and how, if left without intervention, they will evolve to threaten the viability of achieving its growth and livability visions.

Approved in 2008 and then updated in 2018, the City of St. Albert has an Idel-Free Bylaw [26] to help prevent the idling of vehicles parked for longer than three (3) minutes and subsequently help to reduce air pollution. In an effort to enhance available data and resources on urban air pollution, St. Albert has also installed an Air Quality Monitoring Station [27] to measure particulate matter (PM2.5), nitrogen dioxide (NO₂), and ground-level ozone (O₃), all of which are components of smog and are harmful to human health. The data is used by the Alberta Government and Environment Canada to monitor and report on air quality.

Strathcona County

In 2008, the Beaver Hills Dark Sky Preserve invited Strathcona County (the County) to join the Preserve [28]. As part of the County's dedication to the importance of dark skies, a Light Efficient Community Policy was approved by the County's Council in 2010, in accordance with the International Dark-Sky Association. The policy provides guidance on appropriate lighting in rural and urban settings and outlines the roles and responsibilities of different stakeholders, including internal departments to retrofit fixtures and adjust policy documents such as the Municipal Development Plan.

The City of Spruce Grove

The City Spruce Grove's Climate Change Action Plan, accepted by the Council on May 9th, 2022, helps to clarify how Spruce Grove can prepare the community for the anticipated effects of climate change. By highlighting how both the City and the community can reduce GHG emissions, the Plan has identified ninety-nine (99) practical actions that residents and City staff can take immediately and over the next twelve (12) years to stay within their evidence-based carbon budget, helping to keep warming below 1.5°C. The Plan organized action types capable of achieving the plan's outcomes by characterizing actions as either Governance, Ventures, or Outreach types. Action sub-types were then developed under each action to clarify a pathway for implementation. For example, the subtypes for a Governance action such as "developing climate resilience design standards for city buildings and infrastructure", is categorized as a Policy subtype (rather than an assessment, or plan subtype option). Specific departments have been identified to work on actions and action sub-types, with monitoring, evaluation and progress reviews scheduled to occur every four (4) years to ensure alignment with the City of Spruce Groves carbon budget.

The Town of Okotoks

The town of Okotoks is pushing the boundaries of water conservation out of necessity as their water license has for many years been seen as a limiting factor to the community's future growth, and they have successfully continued to expand. The Town has taken steps to support community members to

partake in water conservation behaviors such as low-flow fixture rebates, and initiatives. The Town has begun to shift its focus to the businesses and institutions of the community to reduce their water use [29]. The Town has put out a Water Smart Business Grant of up to \$10,000 per applicant to support businesses and institutions to reduce their water consumption through indoor low-flow upgrades, irrigation upgrades, water reuse structures, and water-wise landscaping. Projects are awarded based largely on the description of the project and the estimated water savings.

5.2 PROVINCIAL TARGETS

Waste

For many years, the recycling community in Alberta has discussed moving towards a different model for addressing recycling, known as extended producer responsibility (EPR), which is currently in place in most provinces across Canada. EPR shifts the costs and physical burden of collection, sorting, and processing recycling materials to the producers of the product and away from municipalities. This EPR regulation is currently geared towards residential waste streams, while the ICI streams will be considered at a later phase. One of the main intentions of an EPR framework is to encourage producers of a product to take responsibility for the end-of-life disposal of the products they produce, instead of shifting that responsibility to consumers who have little choice in the matter. Through an EPR framework, new economies are developed for each stream of waste, to ensure there is an end use, as moving to a circular economy becomes more tangible.

In November 2022, the **Extended Producer Responsibility (EPR) regulation** came into effect in Alberta with two (2) EPR systems, the first being single-use products, packaging, and paper products, while the second is for hazardous and special products [38].

This regulation is still new, and the development of bylaws are underway through the designated oversight authority, the Alberta Recycling Management Authority (ARMA). Leduc will notice the largest shift as producers become responsible for the curbside collection of single-use products, packaging, and paper products starting April 1, 2025. Single stream sorting of these products will not be requested through the EPR program, to encourage continued momentum of recycling behaviors. The largest disruption that residents are likely to notice is a shifting schedule of collection, as currently the regulation only requires bi-weekly collection through established curbside collection programs.

In terms of hazardous and special products, the Leduc Eco Station will likely continue to be a collection point, and the items collected will increase for residential scale volumes of these products. Similarly, to the single stream products, the collection of these materials will be the responsibility of producers and the costs of the facility will be undertaken as well.

Water

The **Water for Life** strategy is the tool used by the Government of Alberta to safeguard water resources [39]. The three (3) overarching goals of the strategy, which have been at the core of all work by the Alberta Water Council, include:

1. Safe, secure drinking water supply
2. Healthy aquatic ecosystems
3. Reliable, quality water supplies for a sustainable economy

To implement this plan, Water for Life Action Plans have been developed to support the implementation of short-, mid-, and long-term steps. The most recent Action Plan “*Our Water, Our Future,*” developed in

2014, includes the following action items focused on Healthy Lakes, Hydraulic Fracturing and Water, Drinking Water and Wastewater, and Water Management [40]. Action items relevant to Leduc include:

- Enhance lake governance systems to clarify roles and responsibilities.
- Fill information gaps to improve lake monitoring, evaluation, and reporting.
- Enhance public awareness about lake management to further support Albertans in keeping lakes clean and healthy.
- Continuing to promote information about Alberta's drinking water and wastewater systems.
- Work with municipalities to identify opportunities for enhancing the sustainability of municipal water systems.
- Develop a common approach for establishing source water protection plans to be used in all watersheds.
- Advance an outcome-based approach to the management of drinking water systems.
- Conduct analysis on conjunctive water use to inform future policy development.
- Advance a provincial lake policy that supports an integrated approach to healthy lakes in support of economic, environmental, and social interests.

While Leduc has already succeeded in implementing several of the action items shown above, the continuous improvement and evolution of initiatives and goals is important to help ensure continued growth. In order help achieve the objectives of the Water for Life strategies, the Alberta Water Council was developed a tool to help advance the objectives on a provincial level [41], with the North Saskatchewan Watershed Alliance advancing the objectives on a regional level [42]. Both non-profit organizations are multi-stakeholder groups comprised of members from government, industry, and non-government organizations, with the common goal of helping achieve the Water for Life outcomes.

Leduc can align with provincial water targets and actions by continuing to promote public awareness on the importance of conserving water, as well as through the development of lake policies and overall management of Telford Lake as an environmental, social, and economic resource for Leduc.

The **Alberta Wetland Policy**, implemented in 2013, provides the strategic direction and tools required to minimize the loss and degradation of wetlands within the province, while also supporting growth and development [16]. The Wetland Policy has also been developed with the core principles of the Water for Life strategy in mind. With an overarching goal to “conserve, restore, protect, and manage” Alberta's wetlands, the policy focuses on the protection and conservation of high-value wetlands, wetland conservation and restoration, and management through minimization/avoidance when possible. The strategic direction of the Wetland Policy includes flexible wetland management, and the building of knowledge, tools, and capacity, in addition to encouraging the conservation of wetlands through active stewardship.

By protecting and restoring wetlands within Leduc's city boundary and aiming to avoid and/or minimize wetland loss through responsible land-use planning, Leduc can align with provincial objectives of conserving wetlands from a regional perspective.

Land

Alberta's Land-Use Framework (herein referred to as LUF), formally put into force as of 2008, was created to usher in a new land-use planning system capable of effectively managing the mounting and competing land-use demand pressures associated with increased development. The regional land-use plans are the province's institutional arrangements for addressing integrated resource management, cumulative effects, and adaptive management. The LUF established regional planning regions that reflect the boundaries of Alberta's major watersheds, of which there are seven (7) that embed smaller

interconnected socio-ecological systems and city-regions. The LUF seeks to achieve three (3) desired outcomes:

1. A healthy economy supported by our land and natural resources.
2. Healthy ecosystems and environment
3. People-friendly communities with ample recreational and cultural opportunities

The LUF ultimately intends to integrate land-use policies that ensure the sustainability of the land for current and future generations to use, however, the regional alignment of land-use policies remains a challenge across the province under the LUF. Part of this challenge revolves around the fact that the Regional Land-Use policy for the North Saskatchewan Land-use area is incomplete and still being developed. Given that most of the land-use priorities needed for Leduc to develop their own land-use plan are contingent upon the currently incomplete Regional Land-use Plan for the North Saskatchewan land-use area, Leduc can only surmise what key land-use policy areas to develop based on a limited number of documents released by the Regional Advisory Council.

The Regional Advisory Council are responsible for overseeing that the development of the **North Saskatchewan Regional Plan** (NSRP) remains in alignment with Alberta's strategic priorities, as these strategic priorities will ultimately have influence over how land is used in Alberta. The key strategic priorities for Alberta include the Water for Life strategy, the Provincial Energy Strategy, Plan for Parks, and the Climate Change Strategy, and therefore filter, to a degree, which priority areas Leduc should remain focused on in developing the City's land-use plans, policies, and bylaws.

The completion of the Terms-of-Reference (TOR) needed to develop the NSRP was finalized in May of 2014 [43], and is one such document from which Leduc can draw upon to further define how to develop regionally-appropriate land-use plans, policies, zoning ordinances and bylaws. The TOR lays out the process through which the regional plan will be developed and provides guidance from Cabinet on specific economic, environmental, and social factors that must be considered within the North Saskatchewan land-use region. The TOR for the NSRP outlines recommendations for their "Healthy Ecosystem and the Environment" focus area, to be supported by more targeted and specific land-use policies and bylaws. These include:

- Identifying priority areas for wetland conservation and restoration to support the implementation of the Alberta Wetland Policy.
- Incentivizing the use of voluntary tools on private lands for conservation and stewardship and identifying potential new conservation areas through known voluntary and mandatory existing means of land tenure transfer for conservation purposes.
- Iterative improvements to the way working landscapes are managed to maintain ecosystem function and biodiversity.

Another document available for reference to Leduc when considering how best to define its regionally-appropriate land-use plans, policies, and bylaws is the **Profile of the North Saskatchewan Region** (2014) (herein referred to as the Profile) regional profile document [44]. The Profile similarly provides an overview of key social, economic, and environmental factors that are salient to the region and would therefore need to be reflected in the development of both the NSRP and municipally-iterated plans, policies, and bylaws. Within the Profile's "Ecosystems and the Environment" key focus area, the following valued components and their associated recommendations on how best to develop supportive policies and bylaws for the NSRP's context have been considered below:

- **Natural Regions and Subregions** – Identification of at-risk sub-regions within Municipal boundaries and the creation of a policy mandating that a certain percent of said sub-region

retain its native land cover to protect the productivity and ecological services provided by said agriculturally valuable subregion.

- **Biodiversity** – Measuring the decreased levels of biodiversity caused to a natural habitat by accessing the percentage (%) of converted parkland and natural landscapes to cropland, and/or the number of fragmented landscapes caused by the incursion of oil and gas projects, and integrating these findings into future land-use planning by determining a desired quantitative target representing a level of biodiversity for Leduc to maintain in its land-use plans, policies and bylaws. Tracking the number of wetlands and other natural landscapes that have been fragmented and converted to other land-uses, and setting a limit on the amount of conversion possible within City limits within a timeframe to manage development and competing land-use pressures.
- **Species at Risk** – understand the inventory of species at risk and critical habitat present within Leduc’s boundaries and develop species specific Recovery Plan’s to align with NSRP requirements.
- **Air and Emissions** – no specific mention on how to comply with policies, zoning ordinances or bylaws designations are mentioned in this document, however, Leduc may investigate fortifying certain construction and manufacturing air control requirements in new residential and/or commercial and/or industrial developments including: dust control, enclosure requirements when dealing with toxic chemicals, and enhancing ventilation provisions in new builds.
- **Water** – management programs with detailed requirements for development standards that are specifically tailored to meet the needs of the North Saskatchewan River Basin.
- **Climate Variability** - consider developing a climate change conscious municipal asset management framework to protect natural and infrastructure assets utilizing an appropriate risk management framework (ex. ISO frameworks).

Given that the TOR and the Profile focus heavily on proactive environmental management and climate change resilience, priorities for land-use policies, zoning ordinances, and bylaw development and/or amendments for Leduc could be guided by the following considerations:

- Riparian area management.
- Prairie grassland protection.
- Increasing development setbacks from wetlands and other wetland protection requirements for developments.
- Species at Risk Inventory and development of species-specific Recovery Plans.
- Air Management programs focused on new build developments across different asset classes.
- North Saskatchewan River (NSR) Management Plan as developed by the North Saskatchewan Watershed Alliance (NSWA) [45].
- Municipal Asset Management Plan that integrates climate change priorities informed by the recommendations above [46].

Energy and Climate Change

In April 2023, the Government of Alberta released the **Alberta Emissions Reduction and Energy Development Plan** (the Plan). The Plan aligns with the federal government’s target of achieving net-zero greenhouse gas emissions by 2050. The Plan emphasizes the importance of investing in carbon capture and storage technologies to achieve carbon neutrality. While much of the province’s Plan focuses on reducing and capturing emissions from industry, the Plan does acknowledge the importance of working with municipalities to reduce greenhouse gas emissions and adapt to climate change. Specifically, the Plan commits to continued funding for the Municipal Climate Change Action Centre, which provides municipalities with funding, technical assistance, and support to reduce greenhouse gas

emissions. The province does not have a plan or strategy specifically focused on climate change adaptation.

Light and Noise

While there are several areas where the government of Alberta has worked towards reducing light pollution, such as through the designation of five (5) Dark Sky Preserves, there are no provincial requirements to address light pollution or light trespassing in Alberta [47]. The purpose of Dark Sky Preserves is to preserve these areas from artificial light, to support the habitat of nocturnal species and promote recreational stargazing [48]. As a result of these preservation efforts, economic opportunities for the tourism industry have arisen. Regulations are typically seen from select communities whose residents have identified it as a priority.

Traffic noise is defined as the sounds produced by vehicles operating on the highway and include engine and exhaust noises [49]. If a road is being widened and it is cost-effective, the responsibility for development of noise mitigation measures such as noise walls and or berms falls to Alberta Transportation, or the responsibility can fall to the residential subdivision if it is built adjacent to an existing roadway.

5.3 NATIONAL TARGETS

Waste

While jurisdiction over waste management primarily falls onto provincial and municipal governments, the federal government is committed to supporting waste reduction goals. The waste sector is responsible for approximately 3% of the country's greenhouse gas emissions, with roughly 70% of these emissions coming from landfills [50]. In 2018, Canadian Council of Ministers for the Environment (which includes environmental ministers from the federal and provincial governments) adopted aspirational waste reduction goals for the country. The goals included decreasing waste by 30% by 2030 and by 50% by 2040. The ministers also set an aspirational goal of achieving zero plastic waste by 2030 [51].

While provincial and municipal governments are largely responsible for managing solid waste, the federal government likely has the authority to regulate and prohibit the use of certain items in order to reduce waste. In 2022, the Government of Canada released the **Single-use Plastics Prohibition Regulations** (SUPPR), which prohibits Canadian businesses from manufacturing, importing, or selling six types of single-use plastic items. These six (6) types include: checkout bags, cutlery, foodservice ware (e.g., containers for food delivery), ring carriers for beverage containers, stir sticks, and straws. The regulations are being implemented on a staggered timeline between 2022 and 2025 [52]. However, the federal government's authority to implement these regulations is currently being challenged in court, with rulings not expected for several months [53].

Water

The governance of water in Canada is complex. Under the **Constitution Act**, the provinces are the "owners" of water resources and are responsible for most areas of water management and protection within their boundaries. This includes water allocation and use, source water protection, drinking water services, wastewater services, and hydroelectric power development. Provinces typically delegate the responsibility to manage drinking water and wastewater to municipalities.

However, the federal government does have certain responsibilities related to water, including regulating navigable waters, fisheries, and boundary waters. The protection of water resources is regulated federally through several pieces of legislation, including the **Canada Water Act**, the **Canadian**

Environmental Protection Act, the **Fisheries Act**, **Canadian Navigable Waters Act**, the **Arctic Waters Pollution Prevention Act**, and the **Canada Shipping Act**.

Energy and Climate Change

The **Paris Agreement under the United Nations Framework Convention on Climate Change** (also known as the Paris Agreement or Paris Accords) is an international treaty adopted by 196 parties in 2015 [54]. The goal of the Paris Agreement is to limit warming to well below 2 degrees Celsius. The Government of Canada initially committed to reducing the country's greenhouse gas emissions to 30 percent below 2005 levels by 2030. In 2021, the Government updated its nationally-determined contribution to reduce emissions by 40 to 45 percent below 2005 levels by 2030. The Government also committed to achieving net-zero emissions by 2050 [55].

In 2022, the federal government released Canada's 2030 **Emissions Reduction Plan**, which is the first plan released under the Canadian **Net-Zero Emissions Accountability Act**. The plan outlines an emissions reduction plan and emissions pathway to meet Canada's most recent commitments under the Paris Agreement. The Emissions Reduction Plan includes actions related to carbon pricing, clean fuels, buildings, electricity, transportation, waste, nature-based solutions, agriculture, heavy industry, oil and gas, clean technology, sustainable finance, and sustainable jobs. The Plan emphasizes the importance of municipal leadership and collaborations between the federal and municipal governments, particularly related to buildings, transportation, water, waste, land-use, natural infrastructure, and community energy generation [56].

To support this work, the Government of Canada has provided several funding sources for municipalities to invest in sustainable practices. One notable example is the **Green Municipal Fund**, which is a \$1.6 billion program funded by the federal government and administered through the Federation of Canadian Municipalities.

Following this, in 2023, the federal government released the **National Adaptation Strategy** (the Strategy). While the Emissions Reduction Plan focuses on climate change mitigation, the Adaptation Strategy aims to prepare the country for projected climate impacts. The Strategy acknowledges that "warming temperatures and changing precipitation are contributing to more frequent and devastating events like heatwaves, floods, droughts, and wildfires" across the country. The Strategy also notes that climate change will impact infrastructure within cities and emphasizes the importance of new climate-informed standards and guidance for communities. While the federal government does not have jurisdiction directly over municipalities, the Strategy does aim to ensure climate change is considered in all municipal planning and decision-making processes. To this end, the Strategy includes a target of having 80% of public and municipal organizations factoring climate change adaptation into their decision-making processes by 2030.

Air

In 2012, the Canadian Council of Ministers for the Environment (which includes environmental ministers from the federal and provincial governments) introduced the national **Air Quality Management System** (the System) to reduce air pollution across the country. The System consists of several components including the Canadian Ambient Air Quality Standards, which are non-regulatory health and environmental ambient air quality objectives. These standards have been developed for nitrogen dioxide (NO₂), sulphur dioxide (SO₂), fine particulate matter (PM_{2.5}) and ozone (O₃). The Air Quality Management System also includes air zones and air shed. Alberta is located in the Prairie airshed, and Leduc is located with the Alberta – North Saskatchewan air zone [57].

The federal government also supports air quality improvements through the Canadian Environmental Protection Act (CEPA), which was introduced in 1999. CEPA regulates emissions from motor vehicles and off-road engines. The goal of these regulations is to reduce air pollution from vehicle engines. Businesses are not allowed to import, transport, or sell vehicles or engines that do not meet these requirements. The federal government also regulates emissions from railways, marine vessels, and off-road engines in other Acts [58].

Light and Noise

Light pollution is typically regulated at the municipal level and there are currently no federal regulations or targets focused on light pollution abatement in Canada. Environmental noises are regulated by different levels of government. The federal government regulates aircraft noise through Transport Canada, rail noise through the Canadian Transportation Agency, and occupational noises through Employment and Social Development Canada [59].

Land

In Canada, provincial and municipal governments are responsible for regulating land-use planning. However, the federal government can influence land-use planning through targeted financial support and programs for municipal and provincial governments. The Government of Canada recently committed to investing in nature-based solutions to address both biodiversity loss and climate change. These commitments include setting a target to protect 25% of the country's lands and oceans by 2025, and 30% of the country's lands and oceans by 2030 [60].

6.0 NEXT STEPS

Some of the preliminary ideas and areas for strategic improvement as highlighted by the environmental baseline assessment, could include but are not limited to:

- Telford Lake catchment analysis (inputs/outputs),
- Update the Telford Lake master plan from an environmental lens,
- Improved stormwater management plan and mitigation for Telford Lake inputs,
- Annual monitoring program to further water conservation efforts,
- Detailed framework/guideline for environmental impact assessment requirements on land development proposals,
- Conduct a natural asset inventory to assign an economic value to ecosystem services,
- Riparian enhancement and setbacks guidelines and policy, and
- Invasive weed management and educational signage on noxious/invasive species.

Specific and detailed recommendations and action items will be provided within the Final Environmental Plan and will also include suggestions on ways to improve or expand on the targets and goals of the previous environmental plan.

To ensure the Plan is an accurate reflection of the progress made from the initial 2012 plan and focused on maintaining that momentum, engagement with the public is critical. Through sharing the accomplishments of the previous plan with the community, residents can take pride in their City and consider what they hope the community achieves over the next ten (10) years. Engagement opportunities will aim to understand the perspectives of youth, residents, vulnerable populations, businesses, and City Council, as shown in **Appendix A**. Through approachable engagement techniques, the project will aim to minimize barriers to engagement and make it simple to participate.

Following a breadth of engagement initiatives, an updated plan will be developed to reflect the outcomes of engagement, community priorities, and best environmental practices, continuing to steward the City of Leduc towards environmental excellence and leadership in sustainability for the coming decade.

7.0 CORPORATE AUTHORIZATION

This document, entitled *Baseline Report* is prepared by Urban Systems Ltd. for the City of Leduc. The material in this report reflects the best judgment of Urban Systems based on the information available at the time of preparation. Any use, which a third party makes of this report, or reliance on or decisions made based on it, is the responsibilities of the third party. Urban Systems Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this report.

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APPENDIX A:

Engagement Strategy:

City of Leduc Environmental Plan Update

1.0 PROJECT OVERVIEW

The City of Leduc (the City) is updating its Environmental Plan (the Plan) developed in 2012 to reflect advances in the field of climate change and current national and provincial sustainability initiatives. The new Plan will guide the next 10 years of Leduc's efforts around environmental sustainability.

Engagement will be an important element of the Plan update and will be used to develop an understanding from the community around which environmental issues are their top priorities and why. Engagement comments collected will be used to inform the development of the Plan to ensure that the Plan aligns with the community's interests.

1.1 Objectives

The engagement objectives that will underpin and apply to the project are:

1. To provide stakeholders with opportunities to strengthen their understanding of environmental resiliency and sustainability.
2. To ensure that the identified stakeholders have meaningful opportunities to influence and shape the development of the project outcomes.

2.0 APPROACH

2.1 Principles of Engagement

As outlined in the City of Leduc's Public Engagement Framework, engagement activities will align with the following principles:

- 1. Impactful and meaningful:** The public is involved in decisions that directly impact them and input is considered by the City as part of the decision-making process.
- 2. Inclusive and accessible:** Opportunities to participate in public engagement are accessible and welcome diverse ideas, perspectives, and input.
- 3. Transparent:** Public engagement opportunities are communicated clearly, openly, and in a timely way.
- 4. Well-planned and intentional:** Public engagement opportunities reflect careful planning and preparation that supports the engagement purpose(s).

5. Accountable: Public engagement is reported on and evaluated to support continuous improvement.

2.2 Spectrum and Levels of Engagement

The International Association of Public Participation’s (IAP2) Spectrum of Public Participation was designed to assist in selecting the level of engagement a stakeholder may have within any public participation process. The IAP2 Spectrum outlines differing levels of participation. The level assigned to a stakeholder depends on the goals, timeframes, resources, and anticipated levels of concern in the decision to be made. The five levels of public participation – as defined by IAP2 – are identified in Figure 1.

The levels of engagement selected for this project will largely from *Inform* to *Involve*.

IAP2 Spectrum of Public Participation



IAP2’s Spectrum of Public Participation was designed to assist with the selection of the level of participation that defines the public’s role in any public participation process. The Spectrum is used internationally, and it is found in public participation plans around the world.

INCREASING IMPACT ON THE DECISION					
	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public.
PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.

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2.3 Engagement Mapping

There are three (3) stakeholder groups that we will engage with in this project. Each stakeholder group will have opportunities to provide their feedback throughout the project. We will provide thoughtful, and tailored engagement opportunities for each stakeholder group.

Stakeholder Group	Stakeholders	Level of Engagement
Key Stakeholders	Leduc Environmental Advisory Board (LEAB)	Involve
	City Administration	
	City Council	
Community Stakeholders	Residents of Leduc <ul style="list-style-type: none"> • Trail users • Eco Station users 	
	Youth <ul style="list-style-type: none"> • Leduc Youth Council • Boys and Girls Club of Leduc • Summer Camps <ul style="list-style-type: none"> ○ PARKS Program ○ Outdoor Day Camps • Leduc Public Library Youth Programs <ul style="list-style-type: none"> ○ Summer Learning Challenge ○ Summer Reading Challenge 	
	Local businesses <ul style="list-style-type: none"> • Leduc Downtown Business Association • Leduc, Nisku & Wetaskiwin Regional Chamber of Commerce 	
	School boards <ul style="list-style-type: none"> • Black Gold School Division • St. Thomas Aquinas Roman Catholic 	
	Vulnerable persons service providers <ul style="list-style-type: none"> • Leduc Regional Housing Foundation • Leduc & District Food Bank 	
	Local organizations <ul style="list-style-type: none"> • Leduc Communities in Bloom • Leduc Wildlife Conservation Society (LWCS) Action for Healthy Communities (Newcomer services) 	

3.0 ENGAGEMENT TACTICS

3.1 Key Stakeholder Focus Groups

Up to three (3) focus groups with targeted key stakeholders including the Leduc Environmental Advisory Board (LEAB), City administration, and council. A list of contact information will be developed to identify individuals who may have an interest in contributing. A preliminary email will be submitted to determine availability to schedule an in-person or virtual meeting. Focus groups will consist of five (5) key stakeholders and will participate in a facilitated discussion.

City Council will be engaged through a Committee of the Whole in September 2023.

Purpose: To gain an understanding of barriers the initial Plan faced, and to identify issues and priorities for the next 10 years.

Timing: July to September 2023

Targeted Stakeholders: Key Stakeholders

Organization	Responsibility
The City of Leduc:	<ul style="list-style-type: none"> • Provide direct contact information for LEAB members, key members of administration, and City Council. • Provide meeting place for in-person meetings (when applicable). • Review list of potential interview questions. • Attend sessions as required.
Urban Systems:	<ul style="list-style-type: none"> • Email Key Stakeholder to invite them to participate in the sessions. • Prepare list of potential interview questions. • Record interview notes and prepare for distribution with interviewees for finalization. • Provide one (1) staff to facilitate meetings with up to five (5) key stakeholders. • Prepare materials and facilitation sessions.

3.2 Be Bold, Inviting, and Ask Questions

Several engagement opportunities will be made available for information sharing and feedback collection through online surveys and in-person installations at key sites within the City of Leduc. Tactics will be used to introduce the project to the greater community to receive preliminary feedback on environmental priorities within the community.

Purpose: To provide low-barrier opportunities to gather engagement feedback.

Timing: July - August 2023

Targeted Stakeholders: Public - Residents of Leduc

3.2.1 Project Webpage Update

An update will be made to the existing [project page](#) to reflect the upcoming changes to the plan. While this is not an engagement tactic, this page will act as a launch pad for the community to know how to get involved with the Plan. The project page will outline key dates throughout the project, opportunities to engage including an online survey, and will provide resources related to the Environmental Plan like a What We Heard Report.

Organization	Responsibility
The City of Leduc:	<ul style="list-style-type: none"> Review all web content and provide direction on edits. Provide any images or graphics to align content with internal branding guidelines. Post and update content as the Plan develops.
Urban Systems:	<ul style="list-style-type: none"> Draft website content and make any required edits.

3.2.2 Free Standing Survey Signage

Signage will be used to share information about the project and provide a QR code to direct individuals to an online survey. The survey will contain a maximum of eight (8) qualitative questions and two (2) open-ended questions. Laminated posters will be positioned for one (1) month near popular walking trails, outdoor recreation areas (i.e., golf courses, sports courts), and near the Eco Station.

Organization	Responsibility
The City of Leduc:	<ul style="list-style-type: none"> Review signage and provide direction on edits. Review survey and provide direction on edits. Cost and installation of signage. Monitor the status of the signage and adjust as needed. Remove signage following the closure of the survey.
Urban Systems:	<ul style="list-style-type: none"> Design signage including content and graphic design. Create online survey draft and make any required edits. Publish and host survey for three (3) weeks, monitor, and close survey.

3.2.3 Online Engagement - Social Media

Online engagement tools will be used to collect preliminary engagement comments on the Plan early in the engagement process to introduce the project and to gain a better understanding of the public’s understanding and support of the past and future of the Plan. Tactics will include social media posts, polls, and quizzes. The questions used on social media will be similar, if not the same to some of the questions used in tactic 3.2.2 above. Social media posts will be shared through the City’s platforms including the City’s website and social media channels.

Organization	Responsibility
The City of Leduc:	<ul style="list-style-type: none"> Review all social media posts and provide direction on edits. Post social media posts according to the drafted schedule. Send Urban Systems the summaries of polls and quizzes before they close.
Urban Systems:	<ul style="list-style-type: none"> Prepare schedule and draft social media copy, graphic design, polls, and quizzes. Monitor the progress of polls and quizzes. Analyze and report on all online engagement.

3.2.4 Infographic Boards

Stationary signage will be designed to include project information and engagement feedback opportunities such as, but not limited to dotmocracies. Signage will be positioned at key indoor community areas within the City of Leduc like the Public Library or the Leduc Recreation Centre for a period of one (1) month.

Organization	Responsibility
The City of Leduc:	<ul style="list-style-type: none"> Review infographic boards and provide direction on edits. Obtain permissions for installation of infographic boards. Cover printing and installation costs. Work with the Library or Recreation Centre to monitor the boards and distribute engagement tools (stickers) as needed. Periodically collect engagement inputs and send send them to Urban Systems. Print and install infographic boards.
Urban Systems:	<ul style="list-style-type: none"> Draft content and graphic design for infographic boards. Create guiding document on monitoring process. Summarize engagement input.

3.3 Youth Engagement

Engagement will be designed to connect LEAB members and Administration with youth to facilitate age-appropriate activities centred around environmental topics as they relate to the Plan. Engagement will target summer camps, library programs, and summer activity providers as community partners to assist in facilitating engagement activities.

Purpose: Provide youth with educational opportunity to learn about the environment, Green House Gas’s (GHG’s), and sustainability, and collect engagement feedback on elements of Plan.

Timing: August - October 2023

Targeted Stakeholders: Youth

3.3.1 Youth Summer Programming

Summer camp activities will be designed around environmental topics and will be tailored to the age ranges being engaged. Camp opportunities could be incorporated into the Boys and Girls Club program, PARKS Program (for kids and their parents), or Outdoor Day Camps.

Programming could also be integrated into library programming like the Summer Learning Challenge or the Summer Reading Challenge.

Organization	Responsibility
The City of Leduc:	<ul style="list-style-type: none"> Review activity design and materials and provide direction on edits. Leverage connections with youth camp organizations to enable LEAB and members of Administration to facilitate activities in the camps. Provide up to two (2) staff to attend and facilitate each session. Assist in the recording of engagement feedback for reporting.
Urban Systems:	<ul style="list-style-type: none"> Design activity, supporting materials, and facilitation guide for review two (2) weeks before scheduled engagement. Review how to conduct the activity with the LEAB and Administration ahead of going into the camps
LEAB	<ul style="list-style-type: none"> Provide up to two (2) members to attend and facilitate activities. Assist in the recording of engagement feedback for reporting.

3.4 Go to the People

Engagement will focus on a go-to-the-people approach designed to reduce barriers to participation by implementing pop-up style booths at community events like VolunteerFest or the Fall Festival. Supporting engagement content will be developed to be clear and quick for community members to review and engage with. Feedback collection will be straightforward and engaging with a low time commitment to make the engagement an accessible and easy experience for community members.

Option to include a prize draw to encourage participation.

Purpose: To share the purpose and function of the Environmental Plan with the broader community and provide a low-barrier opportunity to provide engagement feedback.

Timing: July - November 2023

Targeted Stakeholders: Public - Residents of Leduc

Engagement pop-ups could align with one of the following community events below.

- Summer in the City - July 29th, 2023
- VolunteerFest - September 10th, 2023
- Leduc Pro Show N' Shine - September 15th & 16th, 2023
- Fall Festival - October (Date TBD)

Organization	Responsibility
The City of Leduc:	<ul style="list-style-type: none"> • Review engagement materials and provide direction on edits. • Provide one (1) staff to attend the event. • Costs for space rentals and materials. • Work with local event organizers to secure a venue for the engagement station
Urban Systems:	<ul style="list-style-type: none"> • Design engagement materials and facilitation guide for review two (2) weeks before community event date. • Provide two (2) staff to attend the event. • Summarize engagement input.

3.5 Meet with Community Stakeholders

Virtual focus groups will be held with key community stakeholders like local businesses/commerce groups, school boards, and vulnerable persons service providers to understand their experience with the previous Environmental Plan. Focus groups will be conducted virtually with the intention to respect the time of stakeholder's, and streamline the engagement process. A series of questions will be developed to guide the focus groups and collect engagement input. Up to three (3) one-hour focus groups will be conducted with community stakeholders.

Purpose: To perform targeted conversations with key community stakeholders to identify gaps, recognize stakeholder priorities, and understand opportunities to build on the initial Environmental Plan.

Timing: August - November 2023

Targeted Stakeholders: Community Stakeholders

Organization	Responsibility
The City of Leduc:	<ul style="list-style-type: none">• Review invitation, agenda, questions and provide direction on edits.• Provide one (1) staff member to attend interviews.
Urban Systems:	<ul style="list-style-type: none">• Reach out to community stakeholders via email and schedule focus groups.• Prepare email invitations for the City to review• Create meeting agenda including guiding questions.• Provide two (2) staff to attend/conduct interviews.

4.0 REPORTING BACK

A concise “What We Heard” Report will be produced with written and visual components to share quantitative and qualitative results from engagement tactics. The “What We Heard” Report will be written in plain language and shared on the Project Website. Elements of the “What We Heard” Summary Report may include a review of previous engagement initiatives, descriptions of tactics employed during the current engagement process, and key themes that emerged from the engagement activities.

Purpose: To share with all stakeholders how their input was captured and how it will inform the project.

Timing: Two (2) weeks after the completion of all engagement activities (November 2023)

Targeted Stakeholders: All Stakeholders

Organization	Responsibility
The City of Leduc:	<ul style="list-style-type: none"> Review, approve, and post the final copy of the report in an appropriate location (project page on City website).
Urban Systems:	<ul style="list-style-type: none"> To prepare a concise report, ensuring that the themes that were identified in the engagement activities are captured.

5.0 EVALUATION

1. To provide stakeholders with opportunities to strengthen their understanding of environmental resiliency and sustainability.

Indicators of Success:

Stakeholders indicate that the information provided in the tactic provided sufficient information to understand the project.

Method of Success:

Asking questions to participants about their comfort in understanding the materials.

2. To ensure that the identified stakeholders have meaningful opportunities to influence and shape the development of the project outcomes.

Indicators of Success:

Stakeholders report that they had multiple opportunities to be heard through the engagement tactics.

Method of Success:

Number of stakeholders that participate in the engagement opportunities and provide feedback.