

Appendix A

Environmental Overview



Gallagher Park Concept Plan Environmental Overview

Prepared for:

IBI Consulting Group

Attention: Mark Nolan
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25 June 2019

Mark Nolan
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Dear Mr. Nolan

Re: Gallagher Park Master Plan Environmental Overview

Please find attached the Baseline Environmental Assessment report completed for the Gallagher Park Master Plan. Further study will be conducted in regard to baseline conditions in the upcoming field season, particularly for rare plants and weed presence. This baseline report will inform the master planning process for the park and will serve as the basis for the environmental impact assessment of preferred development options and improvements.

We trust this information will be helpful in next steps of identifying potential options for the park. Should you have any questions, please do not hesitate to contact me.

Sincerely,
Solstice Canada Corp.




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TABLE OF CONTENTS

Table of Contents	ii
List of Figures.....	ii
1. Introduction	1
2. Property Description	2
2.1. Study Area	2
2.2. Zoning.....	2
2.3. Land Ownership	2
2.4. Existing and Historical Land Use	2
2.5. Relevant Federal, Provincial, and Municipal Legislation.....	3
3. Methods	4
3.1. Literature Review.....	4
3.2. Wildlife Connectivity Mapping.....	4
4. Environmental Context – Baseline Conditions	6
4.1. Surface Water.....	6
4.2. Groundwater	6
4.3. Surficial Composition and Geology.....	6
4.4. Geomorphology	6
4.5. Soils.....	7
4.6. Vegetation	7
4.7. Wildlife	7
4.1. Fish Habitat	10
4.2. Historic Resources.....	11
5. Conclusions and Recommendations.....	11
6. References.....	12

LIST OF FIGURES

Figure 1: Black-capped chickadee habitat connectivity in the summer.	8
Figure 2: Coyote habitat connectivity in the summer.....	9
Figure 3: Coyote habitat connectivity in the winter.....	9

1. INTRODUCTION

The City of Edmonton has approved the creation of a Gallagher Park Master Plan, to identify potential improvements to programming and services. The Master Plan will establish a new vision for Gallagher Park, building on its location within the river valley park system, and various recreational and cultural uses promoted through the Folk Music Festival, the Edmonton Ski Club, the Muttart Conservatory, and the Cloverdale Community League. Due to the multiple parties involved and the importance of the connectivity of the river parks system, a 20-year Concept Plan was approved to guide the development, preservation, and appreciation of Gallagher Park. The Concept Plan will also incorporate public feedback and suggestions gained through multiple engagement opportunities. As part of the later stage of the planning process, an environmental assessment will be done on proposed development scenarios carried forward within the Master Plan. Baseline information collected about potential sensitivities was required early in the process, in an environmental overview that meets City planning requirements. The environmental overview identifies environmental sensitivities and potential development concerns within the Gallagher Park Concept Plan area, to help inform early stage planning options, and develop a shared understanding of those sensitivities with City planners, public stakeholders and planning team members.

Solstice Canada Corp. (Solstice) was retained by IBI Group to prepare this Environmental Overview to meet help guide the Concept Plan. As noted above, the overview forms the basis of planning, as well as the later stage of environmental impact assessment, and selection of valued ecosystem components on which the assessment would focus. Following the City of Edmonton's environmental assessment policy (required under Bylaw 7188), the overview was to address the following environmental aspects:

- Groundwater
- Surface water
- Fish and fish habitat
- Geology
- Geomorphology
- Soils
- Vegetation
- Wildlife
- Historical resources

2. PROPERTY DESCRIPTION

2.1. STUDY AREA

The Gallagher Park Master Plan study area encompasses all of Gallagher Park and much of the treed area of Strathearn Park. Adjacent lands were also considered within this report, including the North Saskatchewan River and its associated valley. Mill Creek park lies to the southwest of the study area, and was not part of the focal study area, since any modifications considered in the Concept Plan would be contained wholly within Gallagher Park. We did include the lower reach of Mill Creek in the description of the broader regional study area, to capture ecological interactions with this landscape feature (e.g., for wildlife movement).

The study area is located near downtown Edmonton, just south of the Cloverdale neighbourhood. Gallagher Park is bordered by 98th Ave to the west, Connors Road to the south, and Cloverdale Hill Road to the east. The neighborhood of Cloverdale lies on the northern edge of the park. Part of Strathearn Park has been included in the study area, specifically a section of the treed, northwesterly facing slope that forms a natural study boundary on the east side of Gallagher Park. Although Strathearn Park and Gallagher Park are bisected by Cloverdale Hill Road, there is ecological connectivity, and recreational potential in this part of Strathearn Park due to its proximity to Gallagher Park. The part of Strathearn Park located within the study area is bordered by Cloverdale Hill Road to the west, Strathearn Drive to the south, 98 Ave NW to the north, and by the further extent of Strathearn Park to the east.

The following municipal facilities lie within the local study area:

- The Muttart Conservatory – 9626 96a St NW,
- Gallagher Park – 9505 96 Ave NW, and
- Strathearn Park – 9300 87 St NW.

The LSDs that are captured partially within this area include 6 to 11-33-52-24 W4M and 12 and 13-34-52-24 W4M (and Plan 1522550 Blk 7 Lot 1, Plan 4497R Blk OT, Plan 3053HW Lot P, Plan EDMONTO Lot 21, and Plan 8922564 Lot A). The study area totals 31.3 ha in area.

2.2. ZONING

The study area is comprised of three different types of land use zones. The majority of the study area is “A” or Metropolitan Recreation Zone. The areas included under this designated zoning include much of Gallagher Park and all of Strathearn Park that lies within the study area. Gallagher Park also falls within two other zones, “AP”, a Public Parks Zone and “AN”, a River Valley Activity Node Zone. The Public Parks Zone, located within Plan Lot 21, is the lot in which the Cloverdale Community League resides.

2.3. LAND OWNERSHIP

The study area is entirely owned by the City of Edmonton; portions of the study area are leased for use by external organizations. These organizations are the Edmonton Ski Club, which leases 7.45 ha of central Gallagher Park, predominately on the north facing slope of Gallagher Hill. A second area is licensed by the Cloverdale Community League and is 0.9 ha in size. This licensed area is located at 9411 97 Ave NW, in the northeast corner of Gallagher Park.

2.4. EXISTING AND HISTORICAL LAND USE

Prior to colonization, the area was an important travel corridor for First Nations who resided and traded in the area and later the river would serve as an important corridor for travel during the Fur Trade for traders and trappers headed to Fort Edmonton. Later during early European settlement, the study area supported agricultural ventures due to the fertile soils on the riparian terraces along the North Saskatchewan River. The area eventually became a center for industry, including businesses such as brick yards, coal mines, and lumber yards. During the Great Depression, the Mill Creek Incinerator was erected where the Muttart Conservatory stands today. The incinerator operated from the 1930s to 1971. The surrounding area, encompassing much of Gallagher Park, was used to store refuse that was to be incinerated. The eastern extent of the study area shows physical evidence of past industrial activities. The “Camel Humps”, hilly terrain within the eastern treed extent of the study area are thought to be remnant clay and sand piles of a once prosperous brick yard.

The park, previously called Grassy Hill, was renamed to honour Mayor Gallagher of Edmonton after the incinerator and dump were closed, forming Gallagher Park. The Edmonton Ski Club, formed in 1911, continued operation on Connors Hill within Gallagher Park, until the lease for the buildings associated with the club was terminated in 2017.

The closure of the dump and incinerator allowed for conversion to recreation land use in the area. Following the closures and cleanup of the incinerator infrastructure, the Muttart Conservatory was erected in 1976, roughly on the same location where the incinerator stood. Later, the Edmonton Folk Music Festival would begin hosting their annual music event within Gallagher Park in 1981. Both the music festival and Conservatory continue to operate within Gallagher Park.

2.5. RELEVANT FEDERAL, PROVINCIAL, AND MUNICIPAL LEGISLATION

Gallagher Park, and the activities that are permitted within the area are guided by a number of policies. These policies include the City of Edmonton's Urban Parks Management Plan, the North Saskatchewan River Valley Redevelopment Plan (Bylaw 7188), the Cloverdale Area Redevelopment Plan, and the City of Edmonton's Municipal Development Plan.

- The Urban Parks Management Plan classifies existing green spaces to guide development. Gallagher Park is classified as a River Valley and Ravine Park. The goal of this policy is to ensure the integrity of classified green space is preserved.
- The North Saskatchewan River Valley Area Redevelopment Plan (Bylaw 7188) was created to protect the river valley and to guide future plans and programs for development within the river valley parks system. An environmental impact assessment of proposed development within the river valley is required under this policy.
- The Cloverdale Area Redevelopment Plan outlines land use planning for existing City-level public facilities, such as the Muttart Conservatory, the Edmonton Ski Club, and the Edmonton Folk Music Festival. The plan's objectives include the maintenance of recreation opportunities/facilities for the future, including increasing capacity, while also minimizing any negative outcomes from such facilities.
- The City's Municipal Development Plan laid out principles to guide future development across the City, and set a goal of increasing parkland and access. The plan also discusses the alteration of use or operation of park areas to meet recreational, social, educational, or environmental needs.

In addition to the above City policies, and based on this site's characteristics, the following Provincial and Federal regulatory requirements could also apply to the project:

- Federal Fisheries Act
- Federal Migratory Birds Convention Act
- Federal Species at Risk Act (SARA)
- Alberta Environmental Protection and Enhancement Act (EPEA)
- Alberta Historical Resources Act
- Alberta Soil Conservation Act
- Alberta Water Act and associated policies
- Alberta Wildlife Act

These policies will inform future planning decisions, and will set the legislative framework for the environmental impact assessment to be done on proposed conceptual planning options, under Edmonton Bylaw 7188.

3. METHODS

3.1. LITERATURE REVIEW

Descriptions of baseline conditions were completed using existing environmental assessments, which was compiled and delivered by the City of Edmonton for review by Solstice, as well as other existing resources such as provincial monitoring databases. All of the materials delivered by the City of Edmonton were reviewed for relevant information; however, only the applicable information was utilized in this Environmental Overview. Additional information and resources were referenced when gaps in reporting were noted or to update environmental information. These additional resources included Government of Alberta databases and web tools.

Specifically, the environmental overview on current conditions within the study area was based on previous reporting conducted within the study area. In particular, the following reports were referenced:

- Valley Line-Stage 1 LRT Project Environmental Impact Screening Assessment,
- Tier 2 Risk Assessment: Muttart Conservatory/Gallagher Park,
- Alberta Fish and Wildlife Management Information System (FWMIS), and
- the Alberta Conservation Information Management System.

Other materials that were reviewed and found not to be applicable for the study area, mainly due to their focus on upstream sections of Mill Creek and Mill Creek park. Those reports included the following:

- Site Location Study for the Reconstruction and Rehabilitation of Pedestrian Bridges in Mill Creek Ravine Park, Spencer Environmental Management Services for ISL Engineering and Land Services Ltd.
- Mill Creek Erosion Study, Associated Engineering
- Mill Creek Geomorphic Assessment: Argyll Road to Mill Creek Tunnel Inlet, Stantec
- Environmental Screening Report: Mill Creek Pedestrian Bridge B234, Tetra Tech
- Mill Creek Water Quality Scoping Study, Associated Engineering
- Daylighting the Downstream Reach of Mill Creek: Project Overview, ISL Engineering and Spencer Environmental Management Services Ltd.
- Alberta CreekWatch: A Report Card on Urban Creek Water Quality 2016, RiverWatch Institute of Alberta

3.2. WILDLIFE CONNECTIVITY MAPPING

Wildlife connectivity mapping was updated from an analysis of City-wide wildlife connectivity, which was part of the City of Edmonton Environmental Sensitivities mapping project (Solstice 2017). The connectivity mapping was created using predictive modeling based in the open-source software CircuitScape, using two indicator species, black-capped chickadee and coyote, to represent arboreal and terrestrial routes of movement.

CircuitScape uses principles based in electrical-circuit flow theory, using circuit and resistor analysis to map out movement corridors (similar to an electrical circuit), identify pinch points and locate potential restoration areas. It can also identify core areas by comprehensively mapping the ecological network of an area. This software has additional advantages in that it can be applied to single or multiple species of management concern, and does not require confirmation through independent, field-confirmed data (Koen et al., 2014), although predictions are improved with locally-relevant habitat use data (LaPoint et al., 2013). With fine-resolution vegetation mapping, across natural areas and the developed landscape of the City, and locally relevant understanding of animal behavior in such landscapes, we can identify key corridors useful to various wildlife species.

CircuitScape uses a raster-based analysis that is based on assignment of habitat permeability scores to vegetated areas, barriers and smaller connective features (e.g., culverts) relevant to a given wildlife species. The resulting output describes landscape permeability for a study species (or suite of species) by scoring useful habitat, linkages, matrix lands and barriers. Assignment of permeability is the key to a reliable analysis using the software, and particularly when data will be used for fine-scale planning decisions. Although generalized approaches for a suite of

species have been done (Koen et al., 2014), ideally the analysis reflects locally relevant information about target wildlife species (Spear et al., 2010; Beier et al., 2011; Zeller et al., 2012, LaPointe et al., 2013). In some cases, barriers are obvious (e.g., highways and arterial roads, housing footprints and very steep terrain). Other landscape features may have reduced permeability and must be evaluated relative to other habitat choices; weightings are more realistic with data relevant to a given species and local context (LaPointe et al., 2013). Although landscape level planning can proceed with coarse-resolution inputs (Beier and Brost, 2010), for fine-scale planning activities, high resolution habitat and barrier data are also required (LaPointe et al., 2013). Because fine-scale data were available for this analysis, the results of this analysis were hoped to be sufficient for land use planning at the City level.

As noted above, the Environmental Sensitivities mapping project used two indicator species representative of Edmonton's wildlife community, the coyote (*Canis latrans*) and the black-capped chickadee (*Poecile atricapillus*). Both have locally relevant information on habitat use that can be modelled at a fine scale with relative confidence, particularly with the fine-resolution vegetation and urban infrastructure mapping available for this project. Further, because both are relatively common in Edmonton, and are known to move through native and non-native habitats, they can serve as good indicators of the connectivity now provided by the vegetated areas of the City, to help evaluate the role of such sites in Edmonton's ecological connectivity.

We updated the connectivity model mapping for these two species within Gallagher Park, specifically adding in the new LRT infrastructure, which was only just underway at the time of the previous Environmental Sensitivities mapping project. The study area for connectivity analyses was narrowed to the study area laid out for the Gallagher Park Master Plan. Connectivity mapping was then updated with new or confirmed barriers and passageways within the area, namely the Valley Line-Stage 1 LRT and the wildlife corridor culvert at the top of Connors Hill. The final habitat connectivity models were created by reworking these features into the analyses, for chickadee (representing arboreal movement), and coyote (for winter and summer terrestrial movements).

4. ENVIRONMENTAL CONTEXT – BASELINE CONDITIONS

4.1. SURFACE WATER

The study area does not have any notable surface water present within the boundary. However, the North Saskatchewan River lies within 250 m of the northern study area boundary. The study area is also near the old creek channel of Mill Creek, which was isolated when 98th Avenue and the associated bridges were constructed and the section of the creek channel within the study area was infilled. The isolated channel of Mill Creek is approximately 100 m north of the study area boundary, in Henrietta Muir Edwards Park (HME Park). It appears to provide stormwater management in the form of storage and drainage (Spencer Environmental 2013). The Alberta Government's Flood Hazard online tool (GoA 2019) delineates the northern part of the study area as a flood fringe area. The north bank of the North Saskatchewan River creates a less extensive floodplain in comparison to the banks on the southern side, which are susceptible to flooding according to the online tool.

4.2. GROUNDWATER

Within the study area, two groundwater regimes were identified by Thurber Engineering (2012): a perched water table and a deeper water table within the bedrock below. Below Connors Hill, depths of the water table were found to vary between 3.9 and 14.4 mBGS. Further groundwater information was present within the Risk Management Plan (RMP) created for the area by AECOM (2017). This report found groundwater depths to be between 4.8 and 13.3 mBGS. The shallow groundwater levels were thought to be contiguous with the river water level (i.e., for groundwater not trapped in bedrock). Groundwater was found to flow predominately north with a northeast counterpart. The northern direction of groundwater flows appeared to follow the filled in course of Mill Creek on the west side of Gallagher Park.

Both the Valley LRT Report (Spencer Environmental 2013) and the RMP (AECOM 2017) identified groundwater contamination within the park. Both reports stated exceedances for PAHs, various metals, and salts. The RMP reported chloride concentrations varying from 6 to 1530 mg/L, but due to de-icer use on the surrounding pavement, chloride was not assumed to be a reliable indicator of contamination. Metals, such as boron, mercury, copper, uranium, and zinc were found to be present, and above Tier 1 Guidelines. Polycyclic aromatic hydrocarbons (PAHs) were identified in wells that were drilled through fill materials. Debris, such as glass, brick, wood chips, and concrete were encountered when establishing these wells and these debris materials were thought to be the contributing factor to PAH presence within groundwater. The PAHs found in groundwater were in exceedance of the Freshwater Protection of Aquatic Life Guidelines. These exceedances are of concern due to the likelihood of groundwater discharge into surface waterbodies, such as Mill Creek and the North Saskatchewan River.

4.3. SURFICIAL COMPOSITION AND GEOLOGY

The study area is in a region that consists of the Horseshoe Canyon Formation, comprised of sandstone, siltstone, and containing coal seams, ironstone beds, and bentonite beds (Andriashak 1988). The formation is Cretaceous-aged (Andriashak 1988). Investigations within the localized stratigraphy found topsoil comprised of gravel, sand, clay, and silt, fill (clay) between 1.8 to 13.9 mBGS, and bedrock comprised of clay shale or sandstone, both with and without coal seams, from 9.2 to 16.8 mBGS (AECOM 2017). Bedrock was shallow near the top slope of Connor's Hill, where surficial deposits were also thin. Here bedrock was within 0.5 to 2.0 m of surface (Spencer Environmental 2013).

4.4. GEOMORPHOLOGY

The study area lies in the North Saskatchewan floodplain, which is comprised of lower-lying ground with deposits of river sediments deposited from intermittent flooding. This part of the river valley has steep valley walls delineating the floodplain extent, achieving a terraced formation created by past deposition and erosion events (Spencer Environmental 2013). Generally, the study area has steep slopes to the south and east with level ground near the base of the steep slopes that slopes gradually down nearer the river. The study area, and Gallagher Park in particular, has been subject to large scale surface disturbances and filling events, altering the natural landforms of the area. Buried waste associated with the former incinerator site located near the current Muttart Conservatory lies under parts of this slope (AECOM 2017). The "Camel Humps", a landform anomaly on the eastern extent of the study area is hilly terrain created from abandoned stockpiles of sand and other debris within a historic brick yard. The wooded slopes south of Connor's Road were thought to be at risk of slope failure and a retaining wall was installed as part of the Valley Line LRT project (Spencer Environmental 2013). Ground water seepage has also been evident

within the slopes of Gallagher Park, in particular on the southeast side (Spencer Environmental 2013).

4.5. SOILS

Gallagher Park is highly disturbed and previous environmental reporting has recorded contamination within the study boundary. Soil investigations have found buried wastes, ash, and coal (AECOM 2017). Deeper contamination was found on the steeper hillsides adjacent to Connor's Road and was believed to be linked to significant surface disturbance. Other areas within Gallagher Park were found to have more surficial contamination, suggesting less disturbance. Metal exceedances located near the Muttart Conservatory, and PAHs, located near the old incinerator site, were the main parameters of concern within the soil of Gallagher Park (Spencer Environmental 2013, AECOM 2017). Remediation and risk assessments recommended capping these contaminated areas with a impermeable clay layer, and avoiding future ground disturbance to minimize risk of human exposure.

4.6. VEGETATION

The study area was dominated by manicured lawns but also contained various wooded stands, including aspen, aspen/balsam poplar, aspen/white spruce/other deciduous, balsam poplar/aspen/birch and Manitoba maple. Aspen stands bordered Connor's Road and had high proportions of native species. These stands supported a shrub understory of native species (e.g., buffaloberry, beaked hazelnut, western blue clematis, high bush cranberry, twining honeysuckle, choke cherry, and prickly rose) and native forbs (e.g., wild vetch and wild sarsaparilla). Weeds, such as smooth brome and quack grass, were also present in many areas.

Three S3 ranked rare species were also detected within the aspen forest areas: tall anemone (*Anemone riparia*), yellow lady's slipper (*Cypripedium parviflorum*), and high-bush cranberry (*Viburnum opulus*). Of these species, the lady's slipper was found in one of the larger aspen stands bordering the ski runs in Gallagher Park. The others were found on the south side of Connor's Road, but could potentially be present in other areas of the park (Spencer Environmental 2013).

A search of the Alberta Conservation Information Management System (ACIMS) found three results within 33-052-24-W4M. The three observations were primarily to the north of the study area. These species included one invertebrate, creeping ancyliid (*Ferrissia rivularis*), and one plant, smooth sweet cicely (*Osmorhiza longistylis*). Creeping ancyliid was last observed in 2001 and smooth sweet cicely was last observed in 2013, and previously in 1946. None of the species listed within ACIMS were recorded within the study area during the assessment carried out by Spencer Environmental (2013). However, Spencer Environmental did record the smooth sweet cicely within Henrietta Muir Edwards Park in 2013. Smooth sweet cicely prefers moist forests in Parkland and Grassland natural regions and may find suitable conditions within the forested stands within the Gallagher Park area.

4.7. WILDLIFE

Bird species noted during transect surveys conducted within or near Gallagher Park as part of the LRT environmental assessment (Spencer Environmental 2013) found only urban species, tolerant of human disturbance. A FWMIS search found past observations of short-eared owls within 1 km of Gallagher Park. Although no suitable breeding habitat for amphibian species was located within the area, Canadian toad was noted in the provincial FWMIS database. Red-sided garter snakes and plains garter snake may also utilize the area, though no hibernacula were reported in the FWMIS database. Based on habitat conditions and past FWMIS observations, species at risk that may reside within the Gallagher Park part of the LRT study area included: Peregrine falcon, long-tailed weasel, northern bat, and Canadian toad (Mill Creek Ravine and north of the River).

Due to Gallagher Park's connection to the adjacent river valley, wildlife movement, especially of avian and large mammalian species, was thought possible prior to development of the LRT. Deer and coyote (large bodied mammals) were noted to periodically traverse Connor's Road from the Mill Creek Ravine area to Gallagher Park (Spencer Environmental 2013). Movement was potentially possible either throughout the park or in adjacent forested lands (Spencer Environmental 2013). Permeability was especially notable in the northeast area of Gallagher Park, and as a mitigation for construction of the LRT, a wildlife passage was to be installed in this area (near the top of Connor's Road).

Wildlife connectivity analyses completed by the City of Edmonton for the Environmental Sensitivities mapping project (Solstice 2017) included an assessment of general landscape permeability and an analysis of terrestrial and arboreal connectivity. This analysis differed from previous analyses in that it considered all vegetation in the city, in private yards as well as on public lands. As with previous studies, this mapping found connective links in Gallagher Park

through the wooded areas of the park. An updated landscape permeability assessment was conducted as part of this report. Not unexpectedly, the updated assessment found increased resistance due to the inclusion of the Valley Line LRT currently being constructed through the area. LRT-updated connectivity analyses for chickadee and coyote demonstrated changes to movement abilities for both species.

Chickadee connectivity was most notably affected by the reduction in connectivity for animals moving from the Mill Creek area into Gallagher Park, and for animals moving along the south shore of the North Saskatchewan River (Figure 1). The cumulative effects of both Connors Road and its associated traffic and the addition of the LRT as part of this movement barrier were evident in the reduced connectivity values along this transportation corridor. Coyote connectivity was modeled differently for summer versus winter, as it is assumed coyotes could have minimal movement across the North Saskatchewan River when the surface is frozen. Accordingly, there were more noticeable reductions in summer connectivity for coyotes (Figure 2) than for winter connectivity (Figure 3), again both tied to the addition of the LRT transportation corridor. Although the general connectivity of the area was reduced for coyote by the LRT placement, the strategically placed movement culvert atop Connors Hill will likely mitigate some of the barrier effects associated with the LRT for coyotes (and other ground-based species). This is evident in both the summer and winter predictive models. Further analyses of these models will be carried out to incorporate the proposed concepts for Gallagher Park and area, as part of the environmental assessment for the Master Plan. These concepts could introduce new barriers or may create a more permeable landscape for small or large species.



Figure 1: Black-capped chickadee habitat connectivity in the summer.

**Gallagher Park and Area
Wildlife Connectivity:
Preliminary Results
Summer Coyote**

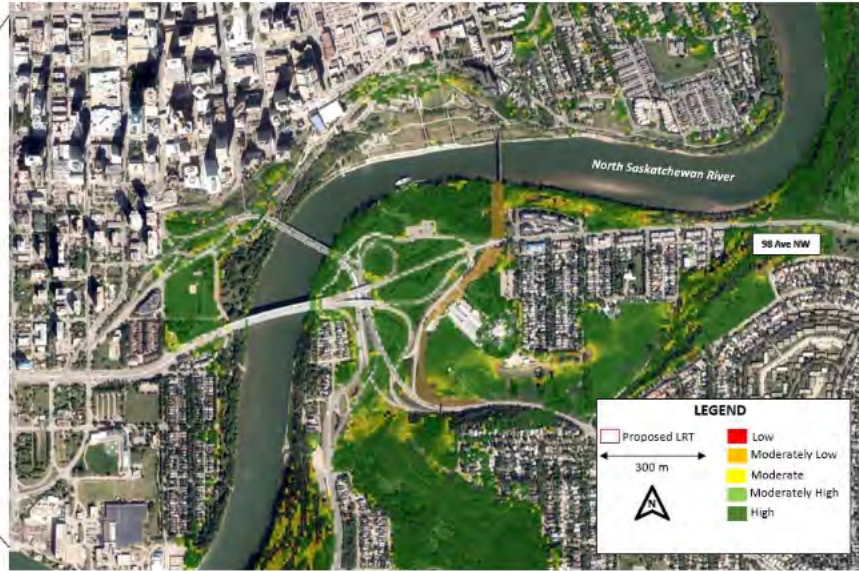


Figure 2: Coyote habitat connectivity in the summer.

**Gallagher Park and Area
Wildlife Connectivity:
Preliminary Results
Winter Coyote**



Figure 3: Coyote habitat connectivity in the winter.

4.1. FISH HABITAT

Although the North Saskatchewan River lies just north of the Park, and is technically beyond the study limits of the project, it is possible for development activities to have secondary impact on the aquatic habitat conditions of the river. For that reason, we considered past studies conducted on this part of the river.

As part of the Valley Line LRT Environmental Impact Screening report (Spencer Environmental 2013), a fish and fish habitat assessment was carried out by Pisces Environmental Consulting Services Ltd (Pisces). The study area encompassed a total of 2.5 km of the North Saskatchewan River, 2.0 km downstream and 0.5 km upstream of the Cloverdale Bridge. The area was found to have primarily moderate depth, with slow, run habitat, with areas of deep-water habitat and shallow shoals. Substrate within the channel varied from fine materials (low velocity areas) to coarse materials (high velocity areas). In-stream refuge consisted of boulders (from riprap) and varying water depths. Much of the instream study area was found to be less than two meters in depth, except in an area immediately upstream of the then existing bridge structure, where depths exceeded four meters. This section of the North Saskatchewan River was mostly Class C habitat under the Water Act Code of Practice, with a small area of Class A habitat (where water depth was greater). This latter small habitat area is considered highly sensitive.

The expanse of the North Saskatchewan River adjacent to Gallagher Park is classified as Class C habitat. Other adjacent fish habitat, such as Mill Creek, is limited due to the redirection and isolation of the existing channel. The historic section of Mill Creek that connects to the North Saskatchewan River northwest of Gallagher Park may support fish species in times of high-water levels.

Fish species listed from a FWMIS search included brook stickleback, burbot, emerald shiner, fathead minnow, finescale dace, flathead chub, goldeye, lake sturgeon, longnose dace, longnose sucker, mooneye, mountain whitefish, northern pike, quillback, river shiner, sauger, shorthead redhorse, silver redhorse, spoonhead sculpin, spottail shiner, sucker species, trout-perch, walleye, and white sucker. All of these species would be expected to occur in the river, immediately north of the study area.

4.2. HISTORIC RESOURCES

Overview assessments of the LRT study area indicated a historical impact assessment was required only in the remnant Mill Creek gully, near the river in Henrietta Muir Edwards Park, outside of the Gallagher Park Master Plan area (Spencer Environmental 2013). Other areas were considered too disturbed by past activity. Paleontological work was also required along the slope south of Connor's Road, since the area was designated as HRV5 (high value for paleontological resources).

Paleontological resources were anticipated within the Horseshoe Canyon bedrock layers. HRIA work reported in Spencer Environmental (2013) did not indicate whether paleontological resources were discovered, but did highlight areas where potential was higher. These were areas of shallow bedrock detected during geotechnical work, including the mid-slopes of Connor's Road. The river terrace at the base of the ski hill area has alluvial deposits of 5 – 10 m thick, but near the top slope of the hill, surficial deposits are thin, and bedrock is within 0.5 to 2 m of surface. Dinosaur fossils have been found within Mill Creek ravine (Spencer Environmental 2013). Therefore, fossil resources have a high potential to be disturbed if bedrock disturbance occurs.

5. CONCLUSIONS AND RECOMMENDATIONS

The most environmentally sensitive aspect of the park study area identified in the assessment work conducted so far are the known areas of contamination associated with the previous incinerator operations. Both soil and groundwater contamination have been identified in past studies, and the City has completed risk management studies and implemented the recommended actions to prevent mobilization, release or exposure to those contaminants.

In addition, local residents have noted the impact of shallow groundwater on a low area just east of the Cloverdale Community League building. This area becomes very wet after rainfall events, and after the Folk Fest activities conclude. The groundwater flows through this area can be very shallow, and any depression area could become saturated from existing flow. Activities or development should incorporate both sensitivities into planning.

The timing of this study during the winter prevented any substantial field work being completed. During the summer months of 2019, we will complete a habitat assessment and a rare plant and weed survey of the forested part of Strathearn Park within the study area, as well as other naturally vegetated areas within Gallagher Park. This will add to the previous Spencer Environmental (2013) study, which focused on the proposed LRT alignment, along the west side of Gallagher Park. Information for Strathearn Park is a particular gap for this current study, as it has not been previously surveyed for wildlife use or rare plants.

Once concept plans have been developed, the next step for this study will be to complete an environmental assessment of the proposed development concepts. We have discussed the scope of the assessment in general terms with City Planning staff, and will confirm assessment scope again, once concepts have been completed.

6. REFERENCES

- AECOM. 2017. *Tier 2 Risk Assessment: Muttart Conservatory/Gallagher Park*.
- Andriashek, L.D., 1988 *Quaternary Stratigraphy of the Edmonton Map Area NTS 83H*. Alberta Research Council. Open File Report #198804
- Beier P, Brost B. 2010. *Use of land facets to plan for climate change: conserving the arenas, not the actors*. *Cons Biol*. 24(3): 701-10. (doi: 10.1111/j.1523-1739.2009.01422.x).
- [FWMIS] Fisheries and Wildlife Management Information System. 2018. Fish and Wildlife Internet Mapping Tool - Public. Edmonton (AB): Alberta Environment and Parks. Available at: https://maps.alberta.ca/FWIMT_Pub/Viewer/?TermsOfUseRequired=true&Viewer=FWIMT_Pub [Accessed 24 April 2019].
- [GoA] Government of Alberta. *Flood Hazard Map Application*. 2019. Edmonton (AB): Alberta Environment and Parks. Available at: <http://maps.srd.alberta.ca/floodhazard/> [Accessed 24 April 2019].
- Koen E L, Bowman J Sadowski C, Walpole AA. 2014. *Landscape connectivity for wildlife: development and validation of multispecies linkage maps*. *Methods in Ecology and Evolution*, 5, 626-633.
- LaPoint S, Gallery P, Wikelski M, Kays R. 2013. *Animal behavior, cost-based corridor models and real corridors*. *Landscape Ecol*. 28: 1615-1630.
- Solstice Canada Corp. 2017. *City of Edmonton Environmental Sensitivities Project Mapping and Analysis Methodology*.
- Spear S F, Balkenhol N, Fortin J-J McRae BH, Scribner K. 2010. *Use of resistance surfaces for landscape generic studies: considerations for parameterization and analysis*. *Mol Ecol*. 19: 3576-3591.
- Spencer Environmental Management Services Ltd. 2013. *Valley Line-Stage 1 LRT Project Environmental Impact Screening Assessment*.
- Thurber Engineering. 2012. *Edmonton Southeast LRT Extension: Quarters to Connors Road: an Overall Appraisal of Geotechnical Conditions Along the LRT Alignment*.
- Zeller KA, McGarigal K, Whiteley AR. 2012. *Estimating landscape resistance to movement: a review*. *Landscape Ecol*. 27: 777-797.

Appendix B

Phase I Environmental Impact Assessment



GALLAGHER PARK CONCEPT PLAN ENVIRONMENTAL IMPACT ASSESSMENT

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EXECUTIVE SUMMARY

The City of Edmonton has approved the creation of a Gallagher Park Concept Plan, to identify potential improvements to programming and services encompassing a 31.3 ha area which includes all of Gallagher Park and much of the treed area of Strathearn Park. Due to the multiple parties involved and the importance of the connectivity of the river parks system, a 20-year Concept Plan was approved to guide the development, preservation, and appreciation of Gallagher Park. The Concept Plan for Gallagher Park was an iterative approach that took into consideration summer and winter use of the site, stakeholder objectives and site opportunities, constraints, as well as public input compiled from several open house and on-line public engagement events. Based on public and stakeholder feedback, these various enhancement options were combined into a preferred Concept Plan design that involves minimal changes to the existing conditions that are present at Gallagher Park. The focus of the preferred Concept Plan design is on enhancing pedestrian access (e.g., trails and sidewalks), site amenities (e.g., washroom facilities, lighting, wayfinding, and seating areas) and use of the park, while enhancing the ecological nature of the park through the addition of new naturalized areas.

As Gallagher Park falls within the North Saskatchewan River Valley Area Redevelopment Plan, it is subject to Bylaw 7188, which requires that an Environmental Impact Assessment (EIA) be completed for any development project within these boundaries. A combination of a literature review, field surveys, and wildlife connectivity mapping was done to compile the information necessary to complete this requirement. From this, baseline conditions within the Gallagher Park Concept Plan study area were determined for surface water, groundwater, geology, geomorphology, soils, vegetation, wildlife, fish habitat, and historic resources to evaluate potential environmental receptors, sensitivities, and issues.

Based on our understanding of the preferred Concept Plan and the baseline environmental context, the following valued ecosystem components (VECs) were selected for impact assessment: surface water, groundwater and geomorphology, soils and landform, vegetation, and wildlife. Potential direct and indirect impacts to these VECs were identified by overlaying the preferred Concept Plan design drawings on the mapped VECs and considered all project activities. An assessment of the direction (i.e. positive or negative), nature (i.e. direct or indirect), geographical extent (i.e. local or regional), magnitude (i.e. negligible to high), duration and frequency (i.e. temporary, seasonal, or permanent), and likelihood (i.e. likely or unlikely) of the potential impacts to each VEC. Mitigation measures were suggested for each impact and the residual impacts to each VEC were reassessed.

As the preferred Concept Plan design only provides a high-level overview of the proposed enhancements to Gallagher Park, no specific information on preliminary or detailed design was provided. In that regard, specific information concerning detailed design drawings or specifications and construction measures were not included as part of this assessment. However, a conservative approach was taken in developing recommended mitigation measures that address any potential negative environmental impacts in a proactive manner that can be implemented as part of planning processes and controls during future construction of the preferred Concept Plan design. Based on the review of potential impacts anticipated to occur from the implementation of the preferred Concept Plan design, it is expected that all potential negative residual impacts will be reduced to negligible with the application of the recommended mitigation measures. In that regard, the preferred Concept Plan design is expected to have a minimal effect on environmental resources and is expected to result in a net positive impact to both vegetation and wildlife components through the establishment of new naturalized areas that will increase both local biodiversity and wildlife habitat.

Although no monitoring requirements are mandated by regulatory approvals or permits, specific monitoring requirements will be developed and refined as part of planning processes and controls during future construction of the preferred Concept Plan design. These include confirming compliance with specific plan requirements, such as a site-specific ECO Plan or other project plans, as well as confirming that all recommended mitigation measures have been implemented and are performing as intended.

TABLE OF CONTENTS

Signatures	i
Disclaimer	i
Executive Summary	ii
1. Introduction.....	1
2. Property Description.....	1
2.1. Study Area.....	1
2.2. Zoning	2
2.3. Land Ownership	2
2.4. Existing and Historical Land Use	2
2.5. Relevant Federal, Provincial, and Municipal Legislation	4
3. Environmental Assessment Methods.....	7
3.1. Literature Review	7
3.2. Field Surveys.....	7
3.3. Wildlife Connectivity Mapping	8
4. Environmental Baseline Conditions	9
4.1. Surface Water	9
4.2. Groundwater.....	9
4.3. Surface Composition and Geology (landform).....	10
4.4. Geomorphology.....	10
4.5. Soils.....	10
4.6. Vegetation	10
4.7. Wildlife.....	12
4.8. Fish Habitat	15
4.9. Historic Resources	15
5. Project Concept Plan	16
5.1. Concept Plan Overview.....	16
5.2. General Project Phasing and Consideration of Environmental Sensitivities	18
6. Project Impacts and Mitigation Measures	20
6.1. Environmental Impact Assessment Methods.....	20
6.1.1. Impact Identification and Analysis.....	20
6.1.2. Impact Assessment Criteria and Evaluation	20
6.2. Assessment of Project Environmental Impacts and Associated Mitigation	21
6.2.1. Surface Water	21
6.2.2. Groundwater and Geomorphology.....	22
6.2.3. Soils and Landform	22

6.2.4.	Vegetation	25
6.2.5.	Wildlife	29
6.2.6.	Unanticipated Discoveries Associated with Archaeological or Cultural/Historical Resources	31
6.3.	Assessment of Cumulative Environmental Impacts	31
6.3.1.	Methods	31
6.3.2.	Results	32
7.	Environmental Monitoring	34
8.	Public Consultation	34
9.	Conclusions	35
9.1.	Summary of Environmental Impacts and Sensitivities	35
9.2.	Assessment Limitations and Key Mitigation Measures	36
10.	References	37

LIST OF TABLES

TABLE 1.	Summary of Applicable Legislation and Bylaws	4
TABLE 2.	Historic Resource Listings by Legal Subdivision	15
TABLE 3.	Project Interaction Table	19
TABLE 4.	Assessment Criteria for Environmental Impact Assessment	20

LIST OF FIGURES

FIGURE 1.	Study Area Location	3
FIGURE 2.	Dominant Vegetation Communities and Rare Plant Locations	11
FIGURE 3.	Black-Capped Chickadee Habitat Connectivity in the Summer	13
FIGURE 4.	Coyote Habitat Connectivity in the Summer	14
FIGURE 5.	Coyote Habitat Connectivity in the Winter	14
FIGURE 6.	Preferred Gallagher Park Concept Plan (excerpt from Gallagher Park Concept Plan Design Report 2020 Draft)	17
FIGURE 7.	Overlay of the Preferred Concept Plant Design on the Existing Environment	26
FIGURE 8.	Coyote Habitat Connectivity in the Summer Considering the Proposed Concept of Gallagher Park and Area	32
FIGURE 9.	Coyote Habitat Connectivity in the Winter Considering the Proposed Concept of Gallagher Park and Area	33
FIGURE 10.	Black-Capped Chickadee Habitat Connectivity in the Summer Considering the Proposed Concept of Gallagher Park and Area	33

LIST OF APPENDICES

APPENDIX A. Plant Species Lists Collected During Vegetation and Rare Plant Field Surveys

APPENDIX B. Representative Site Photographs

1. INTRODUCTION

The City of Edmonton has approved the creation of a Gallagher Park Concept Plan, to identify potential improvements to programming and services. The Concept Plan establishes a new vision for Gallagher Park, building on its location within the river valley park system, and various recreational and cultural uses promoted through the Folk Music Festival, the Edmonton Ski Club, the Muttart Conservatory, and the Cloverdale Community League. Due to the multiple parties involved and the importance of the connectivity of the river parks system, a 20-year Concept Plan was approved to guide the development, preservation, and appreciation of Gallagher Park. As part of the process of developing the preferred Concept Plan multiple public engagement opportunities were initiated to solicit public feedback and suggestions, which were incorporated into the final Concept Plan. The public consultation process resulted in the development of preferred Concept Plan for Gallagher Park that focused in improving park amenities (i.e., improving trails and access points, signage, lighting and washroom facilities) with minimal change to the surrounding landscape and current uses of the park.

As Gallagher Park falls within the North Saskatchewan River Valley Area Redevelopment Plan it is subject to Bylaw 7188, which requires that an Environmental Impact Assessment (EIA) be completed for any development project within these boundaries. As such, Solstice Canada Corp. (Solstice) was retained by IBI Group to prepare this EIA to meet the requirements outlined in Bylaw 7188. An initial Environmental Overview (Solstice 2019) was completed to identify environmental sensitivities and potential development concerns within the Gallagher Park Concept Plan area to help inform early stage planning options, and develop a shared understanding of those sensitivities with City planners, public stakeholders and planning team members. At this point, selection of Valued Ecosystem Components (VECs) were identified, which were carried forward to the EIA. The selected VECs included:

- Groundwater,
- Surface water,
- Fish and fish habitat,
- Geology,
- Geomorphology,
- Soils,
- Vegetation,
- Wildlife, and
- Historical resources.

As part of the EIA process, potential environmental impacts associated with various project components related to the preferred Concept Plan design carried forward within the Gallagher Park Concept Plan were assessed relative to the selected VECs. The EIA content and format follows the Terms of Reference outlined in Appendix C of the RFP document (932491 NRFP Pkg_Gallagher Park Master Plan).

2. PROPERTY DESCRIPTION

2.1. STUDY AREA

The Gallagher Park Concept Plan study area encompasses all of Gallagher Park and much of the treed area of Strathearn Park. Adjacent lands were also considered, including the North Saskatchewan River and its associated valley. Mill Creek park lies to the southwest of the study area, and was not part of the focal study area, since any modifications considered in the Concept Plan would be contained wholly within Gallagher Park. The study area includes the lower reach of Mill Creek in the description of the broader regional study area, to capture ecological interactions with this landscape feature (e.g., wildlife movement).

The study area is located near downtown Edmonton, just south of the Cloverdale neighbourhood. Gallagher Park is bordered by 98th Avenue to the north, Connors Road to the south, and Cloverdale Hill Road to the east (Figure 1). The neighborhood of Cloverdale lies on the northern edge of the park. Part of Strathearn Park has been included in the study area, specifically a section of the treed, northwesterly facing slope that forms a natural study boundary on the east side of Gallagher Park. Although Strathearn Park and Gallagher Park are bisected by Cloverdale Hill Road, there is ecological connectivity, and recreational potential in this part of Strathearn Park due to its proximity to Gallagher Park. The part of Strathearn Park located within the study area is bordered by Cloverdale Hill Road to the west, Strathearn Drive to the south, 98 Avenue NW to the north, and by the further extent of Strathearn Park to the east.

The following municipal facilities lie within the local study area:

- The Muttart Conservatory – 9626 96a Street NW,
- Gallagher Park – 9505 96 Avenue NW, and
- Strathearn Park – 9300 87 Street NW.

The Legal Subdivisions that are captured partially within this area include 6 to 11-33-52-24 W4M and 12 and 13-34-52-24 W4M (and Plan 1522550 Blk 7 Lot 1, Plan 4497R Blk OT, Plan 3053HW Lot P, Plan EDMONTO Lot 21, and Plan 8922564 Lot A). The study area totals 31.3 ha in area.

2.2. ZONING

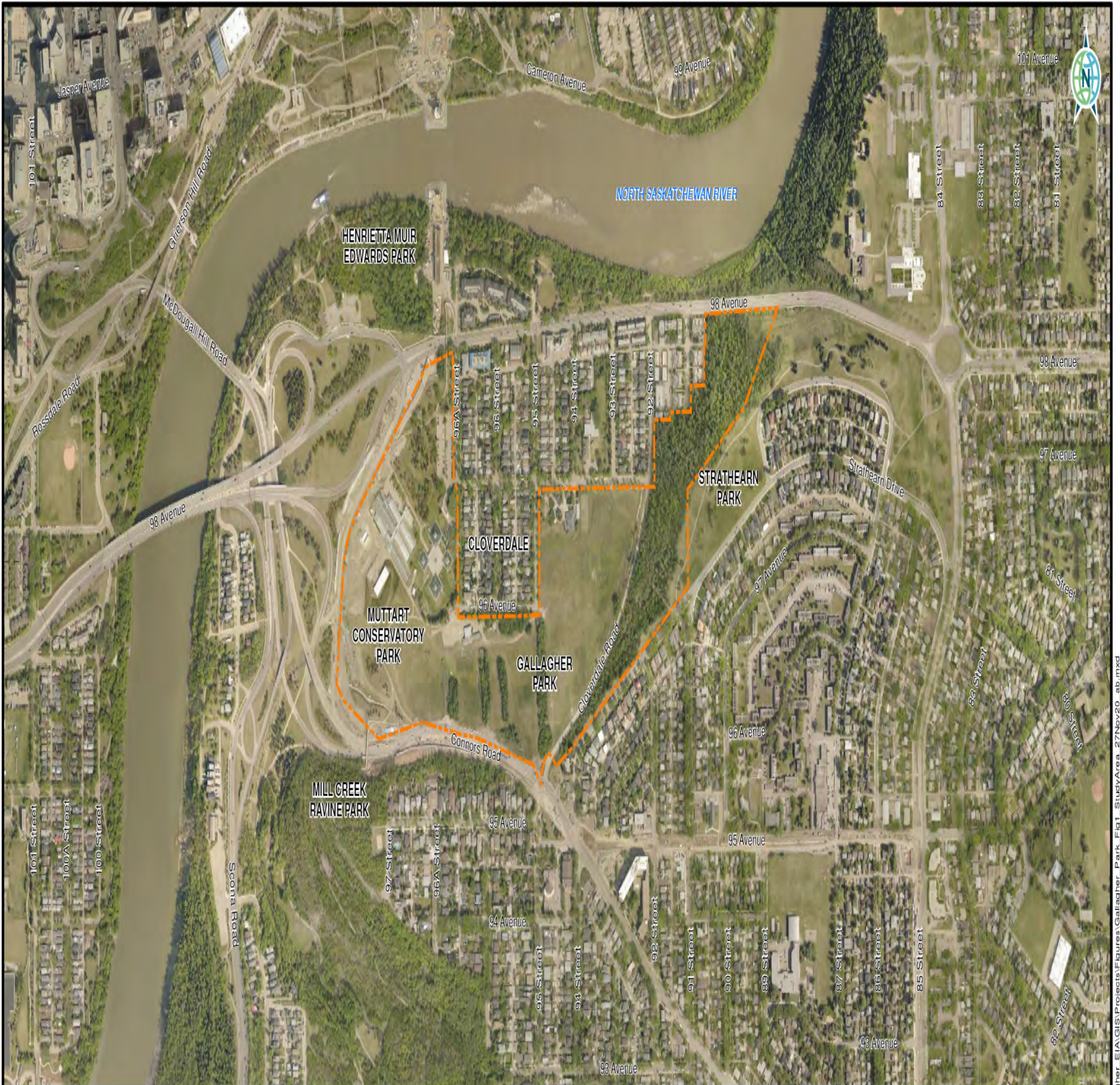
The study area is comprised of three different types of land use zones. Most of the study area is "A", or Metropolitan Recreation Zone. The areas included under this designated zoning include much of Gallagher Park and all Strathearn Park that lies within the study area. Gallagher Park also falls within two other zones, "AP", a Public Parks Zone and "AN", a River Valley Activity Node Zone. The Public Parks Zone, located within Plan Lot 21, is the lot in which the Cloverdale Community League resides.

2.3. LAND OWNERSHIP

The study area is entirely owned by the City of Edmonton. However, portions of the study area are licensed for use by external organizations including the Edmonton Ski Club and Cloverdale Community League. The Edmonton Ski Club has a license for 7.45 ha of central Gallagher Park, predominantly on the north facing slope of Gallagher Hill. A second area located at 9411 97 Avenue NW, in the northeast corner of Gallagher Park, is licensed by the Cloverdale Community League and is 0.9 ha in size.

2.4. EXISTING AND HISTORICAL LAND USE

Prior to colonization, the area was an important travel corridor for First Nations who resided and traded in the area and later the river would serve as an important corridor for travel during the Fur Trade for traders and trappers headed to Fort Edmonton. Later, during early European settlement, the study area supported agricultural ventures due to the fertile soils on the riparian terraces along the North Saskatchewan River. The area eventually became a center for industry, including businesses such as brick yards, coal mines, and lumber yards. During the Great Depression, the Mill Creek Incinerator was erected where the Muttart Conservatory stands today. The incinerator operated from the 1930s to 1971. The surrounding area, encompassing much of Gallagher Park, was used to store refuse that was to be incinerated. The eastern extent of the study area shows physical evidence of past industrial activities. The "Camel Humps", hilly terrain within the eastern treed extent of the study area is thought to be remnant clay and sand piles of a once prosperous brick yard.



LEGEND

Concept Plan Study Area (31.3 ha)



**CITY OF EDMONTON
GALLAGHER HILL EIA
STUDY AREA LOCATION**

DATE: NOVEMBER 27, 2020	PROJECTION: 3TM 114	CARTUM: NAD83
----------------------------	------------------------	------------------

PROJECT CODE:
18-4131-25

SCALE:
1:7,500

FIGURE 1



SOURCES:
ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AERGRID, IGN, AND THE GIS USER COMMUNITY.

Z:\City of Edmonton\4131_Gallagher Hill EIA\GIS\Projects\Figures\Gallagher_Park\Fig_1_StudyArea_27Nov20_ab.mxd

The park, previously called Grassy Hill, was renamed to honour Mayor Gallagher of Edmonton after the incinerator and dump were closed, forming Gallagher Park. The Edmonton Ski Club, formed in 1911, continues operation on Connors Hill within Gallagher Park. The closure of the dump and incinerator allowed for conversion to recreation land use in the area. Following the closures and cleanup of the incinerator infrastructure, the Muttart Conservatory was erected in 1976, roughly on the same location where the incinerator stood. Later, the Edmonton Folk Music Festival would begin hosting their annual music event within Gallagher Park in 1981. Both the music festival and Conservatory continue to operate within Gallagher Park.

2.5. RELEVANT FEDERAL, PROVINCIAL, AND MUNICIPAL LEGISLATION

Gallagher Park, and the activities that are permitted within the area, are guided by several policies. These policies include the City of Edmonton's Open Space Policy, the North Saskatchewan River Valley Redevelopment Plan, the Cloverdale Area Redevelopment Plan, and the City of Edmonton's Municipal Development Plan. The municipal policies and bylaws taken into consideration as part of the EIA are listed in Table 1. These policies and bylaws will inform future planning decisions and will set the legislative framework for this environmental impact assessment for proposed conceptual planning options, under Edmonton Bylaw 7188.

In addition to the above City policies and bylaws, a number of Provincial and Federal regulatory requirements were also taken into consideration as part of the assessment process (Table 1).

TABLE 1. Summary of Applicable Legislation and Bylaws

Legislation, Policy, or Bylaw	Responsible Authority	Purpose or Intent	Anticipated Regulatory Requirement
Federal			
Fisheries Act	Fisheries and Oceans Canada	To prevent the harmful alternation, degradation or destruction of fish or fish habitat, including release of deleterious substances to fish habitat.	None. Proximity to Mill Creek and North Saskatchewan River requires implementation of appropriate mitigation measures to avoid potential release of deleterious substances.
Migratory Birds Convention Act	Environment Canada	The protection and conservation of migratory bird individuals and populations, their nests, and habitats.	Respect clearing restrictions during the breeding season, which for the Edmonton area falls within the B4 nesting zone that has breeding bird period of April 14 th to August 28 th . If construction is to occur during the breeding season period, a nest sweep should be conducted by a qualified wildlife biologist to confirm if nests are present and establish required setbacks, if needed.

Legislation, Policy, or Bylaw	Responsible Authority	Purpose or Intent	Anticipated Regulatory Requirement
<i>Species at Risk Act</i>	Environment Canada	To prevent the extirpation or extinction of wildlife species, as well as to provide for the recovery of species currently at risk due to human activity, and to prevent species of special concern from becoming at risk. Protection of individuals or their critical habitat from disturbance or damage during construction may result in Penalties.	None. No Schedule 1 species are anticipated to be impacted by site activities.
Provincial			
<i>Water Act</i>	Alberta Environment and Parks	To promote the conservation and management of water in Alberta, including wetlands.	None. Site activities will avoid all watercourse/waterbodies including seepage/wetland area.
<i>Alberta Wetland Policy</i>	Alberta Environment and Parks	To conserve, protect, and restore Alberta's wetlands to sustain the ecosystem services and benefits associated.	None. Site activities will avoid all watercourse/waterbodies including seepage/wetland area.
<i>Soil Conservation Act</i>	Alberta Environment and Parks	Requirement to prevent soil loss or deterioration from taking place or to stop loss or deterioration from continuing	None. Not applicable to location and proposed works.
<i>Environmental Protection and Enhancement Act</i>	Alberta Environment and Parks	To support and promote the protection, enhancement and use of the environment	None. However, compliance during construction activities is required to prevent release of contaminants to land, water, or air and to reclaim and revegetate any disturbances to equivalent land capability or condition.
<i>Public Lands Act</i>	Alberta Environment and Parks	To manage and protect Crown owned land for sustainable use, including the bed and shores of all waterbodies	None. Not applicable to location and proposed works.
<i>Wildlife Act</i>	Alberta Environment and Parks	Protection of plants and wildlife species in the province, including harvest or hunting, and management of species at risk	None. However, compliance is required during construction to prevent harm to listed wildlife or plant species. Vegetation clearing should aim to avoid the breeding bird nesting period for this area (April 14 th to August 28 th), as well as the owl nesting period from February 15 th to April 20 th .
<i>Historic Resources Act</i>	Alberta Culture, Multiculturalism, and Status of Women	Provides for the use, designation and protection of moveable and immoveable historic resources	Potentially. Potential requirement for approval as portions of Gallagher Park contain Historic Resource listings.

Legislation, Policy, or Bylaw	Responsible Authority	Purpose or Intent	Anticipated Regulatory Requirement
Municipal			
<i>North Saskatchewan River Valley Area Redevelopment Plan (Bylaw 7188)</i>	City of Edmonton	To protect the North Saskatchewan River Valley and Ravine System as part of Edmonton's valuable open space heritage and to establish the principles for future implementation plans and programs	EIA and SLS required and must be approved by City Council.
<i>Open Space Policy (C594)</i>	City of Edmonton	Inform the planning, design and management of Edmonton's open space to achieve the outcomes and realize the vision of an integrated, sustainable, vibrant and multifunctional green network.	Compliance and unanimity with the Policy is required.
<i>Cloverdale Area Redevelopment Plan (Bylaw 7972)</i>	City of Edmonton	Outlines land use planning for existing City-level public facilities, such as the Muttart Conservatory, the Edmonton Ski Club, and the Edmonton Folk Music Festival. The plan's objectives include the maintenance of recreation opportunities/facilities for the future, including increasing capacity, while also minimizing any negative outcomes from such facilities.	Compliance and unanimity with the Policy is required.
<i>City of Edmonton Municipal Development Plan (Bylaw 15100)</i>	City of Edmonton	Guide future development across the City and set a goal of increasing parkland and access. The plan also discusses the alteration of use or operation of park areas to meet recreational, social, educational, or environmental needs.	Compliance and unanimity with the Policy is required.
<i>Corporate Tree Management Policy (C456)</i>	City of Edmonton	The purpose of this policy is to ensure growth, sustainability, acquisition, stewardship, tree maintenance, protection and preservation of the City of Edmonton Urban Forest	None. However, there is a requirement for adherence to the Policy, including development and implementation of a Tree Protection Plan. Compensation for loss of canopy and ornamental trees must be addressed in agreement with the City.

3. ENVIRONMENTAL ASSESSMENT METHODS

3.1. LITERATURE REVIEW

Descriptions of baseline conditions were completed using existing environmental assessments, which was compiled and delivered by the City of Edmonton for review by Solstice, as well as other existing resources such as provincial monitoring databases. All the materials delivered by the City of Edmonton were reviewed for relevant information; however, only the applicable information was utilized. Additional information and resources were referenced when gaps in reporting were noted or to update environmental information. These additional resources included Government of Alberta databases and web tools.

Specifically, a review of current environmental conditions within the study area was based on previous reporting conducted within the study area. In particular, the following reports and databases were referenced:

- Valley Line-Stage 1 LRT Project Environmental Impact Screening Assessment (Spencer Environmental 2013),
- Tier 2 Risk Assessment: Muttart Conservatory/Gallagher Park (AECOM 2017),
- Alberta Fish and Wildlife Management Information System (FWMIS c2020), and
- Alberta Conservation Information Management System (ACIMS c2019).

Other materials that were reviewed and found not to be applicable for the study area, mainly due to their focus on upstream sections of Mill Creek and Mill Creek park. Those reports included the following:

- Site Location Study for the Reconstruction and Rehabilitation of Pedestrian Bridges in Mill Creek Ravine Park, Spencer Environmental Management Services Ltd. for ISL Engineering and Land Services Ltd.
- Mill Creek Erosion Study, Associated Engineering.
- Mill Creek Geomorphic Assessment: Argyll Road to Mill Creek Tunnel Inlet, Stantec.
- Environmental Screening Report: Mill Creek Pedestrian Bridge B234, Tetra Tech.
- Mill Creek Water Quality Scoping Study, Associated Engineering.
- Daylighting the Downstream Reach of Mill Creek: Project Overview, ISL Engineering and Spencer Environmental Management Services Ltd.
- Alberta CreekWatch: A Report Card on Urban Creek Water Quality 2016, RiverWatch Institute of Alberta.

3.2. FIELD SURVEYS

A rare plant survey was completed by Solstice on July 18, 2019 to confirm the presence of rare or listed plant species within undisturbed portions of the study area, focusing on the wooded area east of Cloverdale Hill Road and 91 Street. Prior to completing the rare plant survey, existing records of rare plants in the area were obtained through a search of the ACIMS database, the Valley Line-Stage 1 LRT Project Environmental Impact Screening Assessment (Spencer Environmental 2013), and conversations with other professionals with experience conducting rare plant surveys in the Edmonton River Valley. Rarity was defined using the most recent ACIMS subnational rankings (S-ranks). Previous rare plant survey methodologies for the area were followed, which consider S1, S2, and S3 species to be species of interest. The rare plant survey was conducted by an experienced rare plant specialist using methods recommended by the Alberta Native Plant Council (ANPC 2012). The study area was traversed with meandering transects to confirm the presence of previously identified rare plant species and document any other rare plant species that may be present.

In addition, Solstice completed a site visit on September 3, 2020 to characterize and describe the dominant vegetation in the study area and to collect incidental wildlife observations. The vegetation

survey focused on collecting general vegetation data for mapped vegetation communities identified through the Urban Primary Land and Vegetation Inventory (UPLVI) (City of Edmonton 2014). Qualified personnel recorded vegetation species within 1x1 meter plots for ground cover and 10x10 meter plots for shrub and tree cover. Additional sampling points were completed to capture vegetation communities not listed within the UPLVI. Vegetation species were recorded by survey point and later referenced against community description within the UPLVI and any incidental wildlife observations were also recorded, along with representative site photographs. Plant species identified during the two field surveys completed by Solstice are presented in Appendix A and representative photographs of each mapped vegetation community are presented in Appendix B.

3.3. WILDLIFE CONNECTIVITY MAPPING

Wildlife connectivity mapping was updated from an analysis of City-wide wildlife connectivity, which was part of the City of Edmonton Environmental Sensitivities mapping project (Solstice 2017). The connectivity mapping was created using predictive modeling based in the open-source software CircuitScape, using two indicator species, black-capped chickadee and coyote, to represent arboreal and terrestrial routes of movement.

CircuitScape uses principles based in electrical-circuit flow theory, using circuit and resistor analysis to map out movement corridors (like an electrical circuit), identify pinch points and locate potential restoration areas. It can also identify core areas by comprehensively mapping the ecological network of an area. This software has additional advantages in that it can be applied to single or multiple species of management concern, and does not require confirmation through independent, field-confirmed data (Koen et al., 2014), although predictions are improved with locally relevant habitat use data (LaPoint et al. 2013). With fine-resolution vegetation mapping, across natural areas and the developed landscape of the City, and locally relevant understanding of animal behavior in such landscapes, we can identify key corridors useful to various wildlife species.

CircuitScape uses a raster-based analysis that is based on assignment of habitat permeability scores to vegetated areas, barriers, and smaller connective features (e.g., culverts) relevant to a given wildlife species. The resulting output describes landscape permeability for a study species (or suite of species) by scoring useful habitat, linkages, matrix lands and barriers. Assignment of permeability is the key to a reliable analysis using the software, and particularly when data will be used for fine-scale planning decisions. Although generalized approaches for a suite of species have been done (Koen et al. 2014), ideally the analysis reflects locally relevant information about target wildlife species (Spear et al. 2010; Beier et al. 2011; Zeller et al. 2012, LaPointe et al. 2013). In some cases, barriers are obvious (e.g., highways and arterial roads, housing footprints and very steep terrain). Other landscape features may have reduced permeability and must be evaluated relative to other habitat choices; weightings are more realistic with data relevant to a given species and local context (LaPoint et al. 2013). Although landscape level planning can proceed with coarse-resolution inputs (Beier and Brost 2010), for fine-scale planning activities, high resolution habitat and barrier data are also required (LaPoint et al. 2013). Because fine-scale data were available for this analysis, the results of this analysis were hoped to be sufficient for land use planning at the City level.

As noted above, the Environmental Sensitivities mapping project used two indicator species representative of Edmonton's wildlife community, the coyote (*Canis latrans*) and the black-capped chickadee (*Poecile atricapillus*). Both have locally relevant information on habitat use that can be modelled at a fine scale with relative confidence, particularly with the fine-resolution vegetation and urban infrastructure mapping available for this project. Further, because both are relatively common in Edmonton, and are known to move through native and non-native habitats, they can serve as good indicators of the connectivity now provided by the vegetated areas of the City, to help evaluate the role of such sites in Edmonton's ecological connectivity.

We updated the connectivity model mapping for these two species within Gallagher Park, specifically adding in the new LRT infrastructure, which was only just underway at the time of the previous Environmental Sensitivities mapping project. The study area for connectivity analyses was narrowed to the study area laid out for the Gallagher Park Concept Plan. Connectivity mapping was then updated with new or confirmed barriers and passageways within the area, namely the Valley Line-Stage 1 LRT and the wildlife corridor culvert at the top of Connors Hill. The final habitat connectivity models were created by reworking these features into the analyses, for chickadee (representing arboreal movement), and coyote (for winter and summer terrestrial movements).

4. ENVIRONMENTAL BASELINE CONDITIONS

4.1. SURFACE WATER

The study area does not have any notable surface water present within the boundary. However, a potential groundwater seepage area is present on the lower slopes of the eastern extent of Gallagher Park, which has resulted in the formation of a small wet area. Although this wet area is present within the manicured part of the slope it contains sufficient hydrological and vegetation characteristics to be classified as a temporary graminoid marsh under the Alberta Wetland Classification System (AEP 2015). Soils are saturated in this area and vegetation is dominated by sedge species (*Carex spp.*), small-flowered buttercup (*Ranunculus abortivus*), and common cattail (*Typha latifolia*).

Additionally, the North Saskatchewan River lies within 250 m of the northern study area boundary. The study area is also near the old creek channel of Mill Creek, which was isolated when 98th Avenue and the associated bridges were constructed and the section of the creek channel within the study area was infilled. The isolated channel of Mill Creek is approximately 100 m north of the study area boundary, in Henrietta Muir Edwards Park (HME Park). It appears to provide stormwater management in the form of storage and drainage (Spencer Environmental 2013). The Alberta Government's Flood Hazard online tool (AEP c2020) delineates the northern part of the study area as a flood fringe area. The north bank of the North Saskatchewan River creates a less extensive floodplain in comparison to the banks on the southern side, which are susceptible to flooding according to the online tool.

4.2. GROUNDWATER

Within the study area, two groundwater regimes were identified by Thurber Engineering (2012): a perched water table and a deeper water table within the bedrock below. Below Connors Hill, depths of the water table were found to vary between 3.9 and 14.4 m below ground surface (bgs). Further groundwater information was present within the Risk Management Plan (RMP) created for the area by AECOM Canada Ltd. (AECOM 2017). This report found groundwater depths to be between 4.8 and 13.3 m bgs. The shallow groundwater levels were thought to be contiguous with the river water level (i.e., for groundwater not trapped in bedrock). Groundwater was found to flow predominately north with a northeast counterpart. The northern direction of groundwater flows appeared to follow the filled in course of Mill Creek on the west side of Gallagher Park.

Both the Valley LRT Report (Spencer Environmental 2013) and the RMP (AECOM 2017) identified groundwater contamination within the park. Both reports stated exceedances for PAHs, various metals, and salts. The RMP reported chloride concentrations varying from 6 to 1,530 mg/L, but due to de-icer use on the surrounding pavement, chloride was not assumed to be a reliable indicator of contamination. Metals, such as boron, mercury, copper, uranium, and zinc were found to be present, and above Tier 1 Guidelines. Polycyclic aromatic hydrocarbons (PAHs) were identified in wells that were drilled through fill materials. Debris, such as glass, brick, wood chips, and concrete were encountered when establishing these wells and these debris materials were thought to be the contributing factor to PAH presence within groundwater. The PAHs found in groundwater were in exceedance of the Freshwater Protection of Aquatic Life Guidelines. These exceedances are of concern due to the likelihood of groundwater

discharge into surface waterbodies, such as Mill Creek and the North Saskatchewan River.

4.3. SURFACE COMPOSITION AND GEOLOGY (LANDFORM)

The study area is in a region that consists of the Horseshoe Canyon Formation, comprised of sandstone, siltstone, and containing coal seams, ironstone beds, and bentonite beds (Andriashek 1988). The formation is Cretaceous-aged (Andriashek 1988). Investigations within the localized stratigraphy found topsoil comprised of gravel, sand, clay, and silt, fill (clay) between 1.8 to 13.9 m bgs, and bedrock comprised of clay shale or sandstone, both with and without coal seams, from 9.2 to 16.8 m bgs (AECOM 2017). Bedrock was shallow near the top slope of Connor's Hill, where surficial deposits were also thin. Here bedrock was within 0.5 to 2.0 m of surface (Spencer Environmental 2013).

4.4. GEOMORPHOLOGY

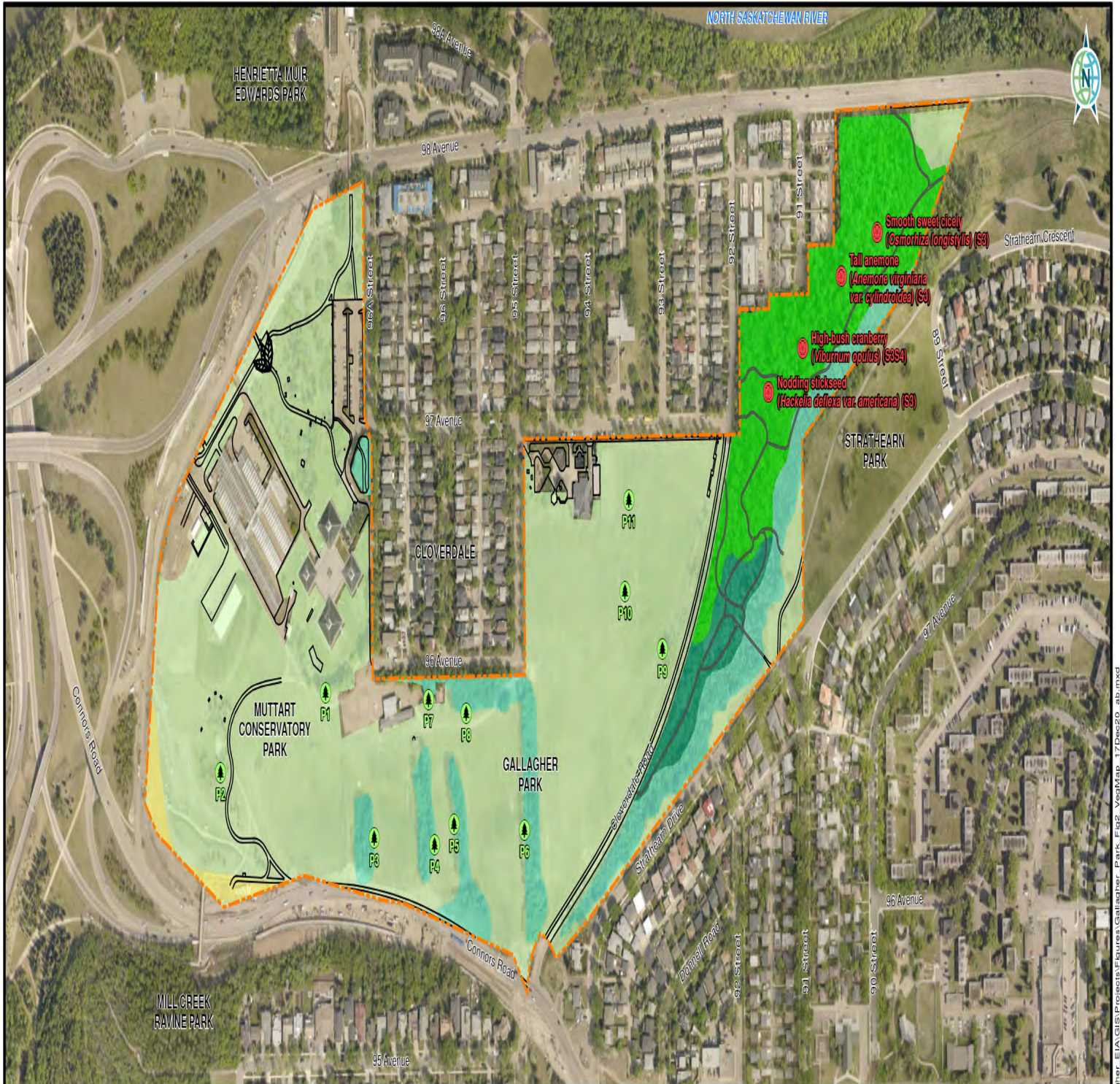
The study area lies in the North Saskatchewan floodplain, which is comprised of lower-lying ground with deposits of river sediments deposited from intermittent flooding. This part of the river valley has steep valley walls delineating the floodplain extent, achieving a terraced formation created by past deposition and erosion events (Spencer Environmental 2013). Generally, the study area has steep slopes to the south and east with level ground near the base of the steep slopes that slopes gradually down nearer the river. The study area, and Gallagher Park in particular, has been subject to large scale surface disturbances and filling events, altering the natural landforms of the area. Buried waste associated with the former incinerator site located near the current Muttart Conservatory lies under parts of this slope (AECOM 2017). The "Camel Humps", a landform anomaly on the eastern extent of the study area is hilly terrain created from abandoned stockpiles of sand and other debris within a historic brick yard. The wooded slopes south of Connor's Road were thought to be at risk of slope failure and a retaining wall was installed as part of the Valley Line LRT project (Spencer Environmental 2013). Ground water seepage has also been evident within the slopes of Gallagher Park, in particular on the southeast side (Spencer Environmental 2013), which has led to the formation of a small wetland area as described in Section 4.1.

4.5. SOILS

Gallagher Park is highly disturbed and previous environmental reporting has recorded contamination within the study area boundary. Soil investigations have found buried wastes, ash, and coal (AECOM 2017). Deeper contamination was found on the steeper hillsides adjacent to Connor's Road and was believed to be linked to significant surface disturbance. Other areas within Gallagher Park were found to have more surficial contamination, suggesting less disturbance. Metal exceedances located near the Muttart Conservatory, and PAHs, located near the old incinerator site, were the main parameters of concern within the soil of Gallagher Park (Spencer Environmental 2013; AECOM 2017). Remediation and risk assessments recommended capping these contaminated areas with an impermeable clay layer and avoiding future ground disturbance to minimize risk of human exposure.

4.6. VEGETATION

The study area is predominantly characterized by a large tract of maintained grass along the slope, with occasional pockets of planted and natural treed stands (Figure 2). Appendix A provides a summary of the plant species noted within each UPLVI vegetation community. White spruce and tamarack were typically associated with planted areas, while native forested stands were dominated by aspen or a mix of aspen, balsam poplar, and Manitoba maple. Relatively undisturbed native forested stands of aspen and balsam poplar are present in Strathearn park and border Connor's Road. These stands support a shrub understory of native species (e.g., buffaloberry, beaked hazelnut, western blue clematis, high bush cranberry, twining honeysuckle, choke cherry, and prickly rose) and native forbs (e.g., wild vetch and wild sarsaparilla). Only one noxious weed, Canada thistle, was observed with low abundance. However, the Maintained Grass vegetation community is predominantly comprised of a number of invasive non-native plant species including smooth brome, quack grass, tufted vetch and dandelion.



LEGEND

- Rare Plant Location
- Vegetation Survey Location
- Disturbed Class**
- Existing Paved Trails/Roads
- Existing Trails in Camel Humps
- Concept Plan Study Area (31.3 ha)
- Vegetation Class**
- Forested (Trembling Aspen)
- Forested (Balsam Poplar)
- Forested (Balsam Poplar, Trembling Aspen)
- Maintained Grass
- Transplant Trees

SOURCES:
 DISTURBANCE FEATURES FROM THE IBI 113178-X-BASE.DXF LS-SURF AND LS-SURF-NAT LAYERS.
 VEGETATION DATA FROM THE CITY OF EDMONTON PRIMARY LAND AND VEGETATION INVENTORY FOR URBAN ENVIRONMENTS (URBAN PLVI) DATASET (CITY OF EDMONTON 2015).
 ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGIRD, IGN, AND THE GIS USER COMMUNITY.



**CITY OF EDMONTON
 GALLAGHER HILL EIA
 DOMINANT VEGETATION COMMUNITIES
 AND RARE PLANT LOCATIONS**

DATE: DECEMBER 17, 2020	PROJECTION: 3TM 114	DATUM: NAD83
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PROJECT CODE:
18-4131-25

SCALE:
1:4,000

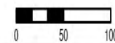


FIGURE 2

A search of the ACIMS database returned two results of listed species within 33-052-24-W4M, which were primarily to the north of the study area. These species included one invertebrate: creeping ancyliid (*Ferrissia rivularis*), and one plant: smooth sweet cicely (*Osmorhiza longistylis*). Creeping ancyliid was last observed in 2001 and smooth sweet cicely was last observed in 2013, and previously in 1946. None of the species listed within ACIMS were recorded within the study area during the assessment carried out by Spencer Environmental Management Services Ltd. (Spencer Environmental) (2013). However, Spencer Environmental did record the smooth sweet cicely within Henrietta Muir Edwards Park in 2013. Smooth sweet cicely prefers moist forests in Parkland and Grassland natural regions and may find suitable conditions within the forested stands within the Gallagher Park area. Populations of three S3 ranked rare species were also identified by Spencer Environmental (2013) within the aspen forest areas, including tall anemone (*Anemone riparia*), yellow lady's slipper (*Cypripedium parviflorum*), and high-bush cranberry (*Viburnum opulus*). Species designated as S3 are generally known to occur in 21-100 locations in Alberta. Of these species, lady's slipper was documented as occurring in one of the larger aspen stands bordering the ski runs in Gallagher Park. The other species were found on the south side of Connor's Road, but could potentially be present in other areas of the park (Spencer Environmental 2013).

Results from the rare plant survey completed by Solstice on July 18, 2019 documented the occurrence of three S3 ranked listed plant species, including tall anemone (*Anemone virginiana* var. *cylindroidea*), nodding stickseed (*Hackelia deflexa* var. *americana*), and smooth sweet cicely (*Osmorhiza longistylis*), as well as one S3S4 ranked plant species, high-bush cranberry (*Viburnum opulus*). Species designated as S3S4 have uncertainty regarding the status and may fall within the S3 rank which have populations known to occur in 21-100 locations in Alberta or the S4 rank, which are populations that are uncommon, but not rare and apparently secure. All four listed plant species were documented as occurring in the northeast portion of Strathearn Park just east of Cloverdale Hill and 91 Street.

4.7. WILDLIFE

Bird species noted during transect surveys conducted within or near Gallagher Park as part of the LRT environmental assessment (Spencer Environmental 2013) found only urban species, tolerant of human disturbance. Similar findings were noted by Solstice during the September 3, 2020 vegetation survey, where incidental wildlife species observations included black-capped chickadee (*Poecile atricapillus*), red squirrel (*Tamiasciurus hudsonicus*), American robin (*Turdus migratorius*), American crow (*Corvus brachyrhynchos*), pine siskin (*Spinus pinus*), hairy woodpecker (*Dryobates villosus*), and an unknown Gull spp.

A FWMIS search found past observations of short-eared owls within 1 km of Gallagher Park. Although no suitable breeding habitat for amphibian species was located within the area, Canadian toad were noted in the provincial FWMIS database. Red-sided garter snakes and plains garter snake may also utilize the area, though no hibernacula were reported in the FWMIS database. Based on habitat conditions and past FWMIS observations, species at risk that may reside within the Gallagher Park part of the LRT study area include: Peregrine falcon, long-tailed weasel, northern bat, and Canadian toad (Mill Creek Ravine and north of the River).

Due to Gallagher Park's connection to the adjacent river valley, wildlife movement, especially of avian and large mammalian species, was thought possible prior to development of the LRT. Deer and coyote (large-bodied mammals) were noted to periodically traverse Connor's Road from the Mill Creek Ravine area to Gallagher Park (Spencer Environmental 2013). Movement was potentially possible either throughout the park or in adjacent forested lands (Spencer Environmental 2013). Permeability was especially notable in the northeast area of Gallagher Park, and as a mitigation for construction of the LRT, a wildlife passage was to be installed in this area (near the top of Connor's Road).

Wildlife connectivity analyses completed by the City of Edmonton for the Environmental Sensitivities mapping project (Solstice 2017) included an assessment of general landscape permeability and an analysis of terrestrial and arboreal connectivity. This analysis differed from previous analyses in that it

considered all vegetation in the city, in private yards as well as on public lands. As with previous studies, this mapping found connective links in Gallagher Park through the wooded areas of the park. An updated landscape permeability assessment was conducted as part of this report. Not unexpectedly, the updated assessment found increased resistance due to the inclusion of the Valley Line LRT currently being constructed through the area. LRT-updated connectivity analyses for chickadee and coyote demonstrated changes to movement abilities for both species.

Chickadee connectivity was most notably affected by the reduction in connectivity for animals moving from the Mill Creek area into Gallagher Park, and for animals moving along the south shore of the North Saskatchewan River (Figure 3). The cumulative effects of both Connors Road and its associated traffic, and the addition of the LRT as part of this movement barrier, were evident in the reduced connectivity values along this transportation corridor. Coyote connectivity was modeled differently for summer versus winter, as it is assumed coyotes could have minimal movement across the North Saskatchewan River when the surface is frozen. Accordingly, there were more noticeable reductions in summer connectivity for coyotes (Figure 4) than for winter connectivity (Figure 5), both tied again to the addition of the LRT transportation corridor. Although the general connectivity of the area was reduced for coyote by the LRT placement, the strategically placed movement culvert atop Connors Hill will likely mitigate some of the barrier effects associated with the LRT for coyotes (and other ground-based species). This is evident in both the summer and winter predictive models.



FIGURE 3. Black-Capped Chickadee Habitat Connectivity in the Summer



FIGURE 4. Coyote Habitat Connectivity in the Summer

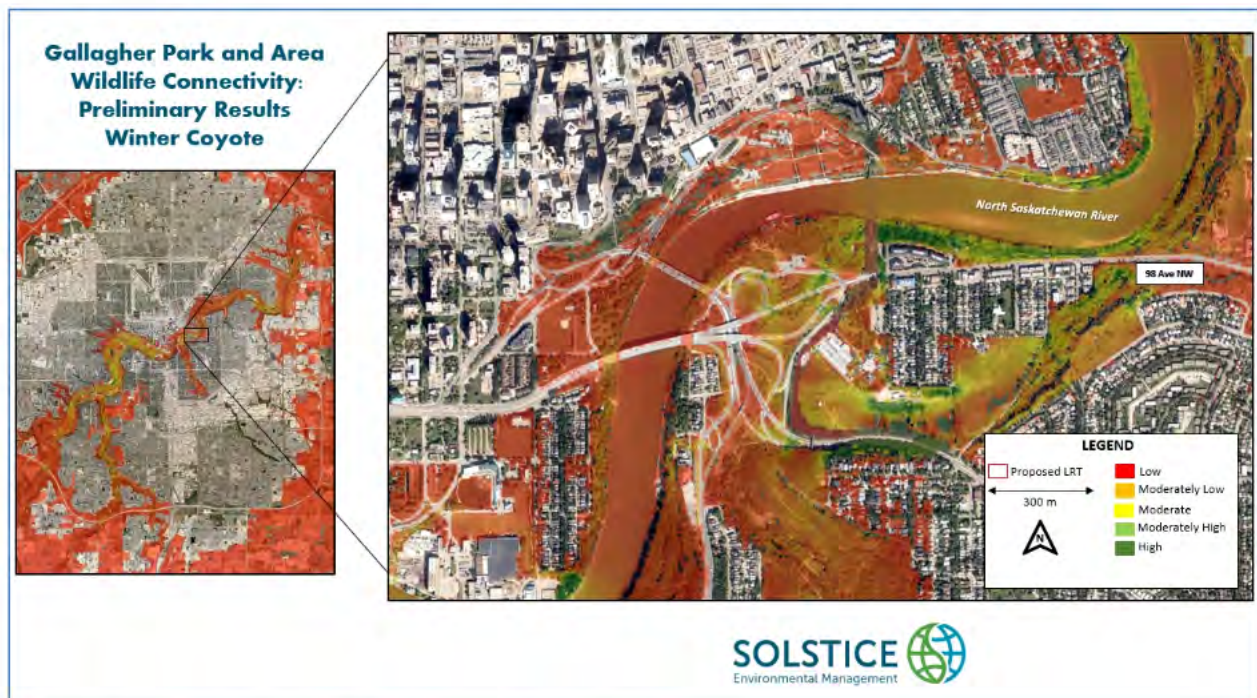


FIGURE 5. Coyote Habitat Connectivity in the Winter

4.8. FISH HABITAT

Although the North Saskatchewan River lies just north of the Park and is technically beyond the study limits of the project, it is possible for development activities to have indirect impacts on the aquatic habitat conditions of the river. For that reason, we considered past studies conducted on this part of the river.

As part of the Valley Line LRT Environmental Impact Screening report (Spencer Environmental 2013), a fish and fish habitat assessment was carried out by Pisces Environmental Consulting Services Ltd (Pisces). The study area encompassed a total of 2.5 km of the North Saskatchewan River, 2.0 km downstream and 0.5 km upstream of the Cloverdale Bridge. The area was found to have primarily moderate depth, with slow, run habitat, with areas of deep-water habitat and shallow shoals. Substrate within the channel varied from fine materials (low velocity areas) to coarse materials (high velocity areas). In-stream refuge consisted of boulders (from riprap) and varying water depths. Much of the instream study area was found to be less than two meters in depth, except in an area immediately upstream of the then existing bridge structure, where depths exceeded four meters. This section of the North Saskatchewan River was mostly Class C habitat under the *Water Act* Code of Practice, with a small area of Class A habitat (where water depth was greater). This latter small habitat area is considered highly sensitive.

The expanse of the North Saskatchewan River adjacent to Gallagher Park is classified as Class C habitat. Other adjacent fish habitat, such as Mill Creek, is limited due to the redirection and isolation of the existing channel. The historic section of Mill Creek that connects to the North Saskatchewan River northwest of Gallagher Park may support fish species in times of high-water levels.

Fish species listed from a FWMIS search included brook stickleback, burbot, emerald shiner, fathead minnow, finescale dace, flathead chub, goldeye, lake sturgeon, longnose dace, longnose sucker, mooneye, mountain whitefish, northern pike, quillback, river shiner, sauger, shorthead redhorse, silver redhorse, spoonhead sculpin, spottail shiner, sucker species, trout-perch, walleye, and white sucker. All these species would be expected to occur in the river, immediately north of the study area.

4.9. HISTORIC RESOURCES

The study area falls within Legal Subdivisions 6-11, 33-52-24 W4M and 12,13, 3-52-24 W4M, which have been identified as locations that contain Historic Resource listings according to the most recent update (Fall 2020) as noted in Table 3.

TABLE 2. Historic Resource Listings by Legal Subdivision.

Legal Subdivision	Resource Listing*
6-33-52-24 W4M	HRV 4 (a), HRV 5 (a,p)
7-33-52-24 W4M	HRV 5 (a,p), HRV 1 (h), HRV 4 (p)
8-33-52-24 W4M	HRV 5 (a,p)
9-33-52-24 W4M	HRV 4 (a), HRV 5 (p)
10-33-52-24 W4M	HRV 5 (a,p)
11-33-52-24 W4M	HRV 5 (a,p)
12-34-52-24 W4M	HRV 5 (a,p)
13-34-52-24 W4M	HRV 5 (a,p)

*HRV 1 designated under HRA as a Provincial Historic Resource, HRV 4 contains a historic resource that may require avoidance, HRV 5 has a high potential to contain a historic resource, 'a' is archaeological, 'h' is historic period, and 'p' is paleontological.

However, overview assessments of the LRT study area indicated a historical impact assessment was required only in the remnant Mill Creek gully, near the river in Henrietta Muir Edwards Park, outside of the Gallagher Park Concept Plan area (Spencer Environmental 2013). Other areas were considered too

disturbed by past activity. Paleontological work was also required along the slope south of Connor's Road, since the area was designated as HRV 5 (high value for paleontological resources).

Paleontological resources were anticipated within the Horseshoe Canyon bedrock layers. HRIA work reported in Spencer Environmental (2013) did not indicate whether paleontological resources were discovered but did highlight areas where potential was higher. These were areas of shallow bedrock detected during geotechnical work, including the mid-slopes of Connor's Road. The river terrace at the base of the ski hill area has alluvial deposits of 5-10 m thick, but near the top slope of the hill, surficial deposits are thin, and bedrock is within 0.5 to 2 m of surface. Dinosaur fossils have been found within Mill Creek ravine (Spencer Environmental 2013); therefore, fossil resources have a high potential to be disturbed if bedrock disturbance occurs.

5. PROJECT CONCEPT PLAN

5.1. CONCEPT PLAN OVERVIEW

The Gallagher Park Concept Plan considered the history and existing inventory and use of the study area, the goals of all partners invested in the site, the priorities identified by the public, applicable standards and regulations, and strategic goals of the City (City of Edmonton 2020). The intent of the 20-year Concept Plan is to guide the development, preservation, and appreciation of Gallagher Park through facilitating enhanced access to the park by providing facilities and infrastructure to support existing recreation, while enhancing the ecological values of the park (City of Edmonton 2020).

The Concept Plan for Gallagher Park was an iterative approach that took into consideration summer and winter use of the site, stakeholder objectives and site opportunities and constraints, as well as public input compiled from several public engagement events. As part of the project concept plan development, several different enhancement scenarios were considered including:

1. Enhancement Option 1: Landscaping enhancements – ornamental plantings vs naturalized landscape.
2. Enhancement Option 2: Pathways – sidewalk versus shared use pathway.
3. Enhancement Option 3: Amenities - skiing upgrades versus staircase and sledding area.
4. Enhancement Option 4: Vehicle access – access from 96A Street versus from the west (98 Ave).

Based on public and stakeholder feedback these various enhancement options were combined into a preferred Concept Plan design that involves minimal changes to the existing conditions that are present at Gallagher Park. An overview of the preferred Concept Plan design illustrating the proposed enhancements to Gallagher Park is presented in Figure 6. The focus of the preferred Concept Plan design is on enhancing pedestrian access, site amenities (e.g., washroom facilities, lighting, wayfinding, seating areas) and use of the park through the following components:

1. Proposed construction of a permanent, stand-alone washroom facility that would be located just off 95 Street near the existing play area.
2. Upgrades to road access to the Edmonton Ski Club parking area from 98 Ave. This will require upgrading and widening the existing Muttart access road and extending the access road to the Edmonton Ski Club parking area. No new additional parking will be constructed and access control to 95 Street and 96A Avenue will be retained through the existing park access gate.

FIGURE 6. Preferred Concept Plan (excerpt from Gallagher Park Concept Plan Design Report 2020 Draft)



SOURCE: City of Edmonton, Figure 10 - Preferred Concept Plan, Gallagher Park Concept Plan - Draft Concept Design Report, September 02, 2020.

3. Proposed construction of several permanent paved shared use trails and sidewalks including:
 - A new paved shared use path along the access road to the Edmonton Ski Club parking area from 98 Ave, which will connect into existing pathways.
 - A new paved shared use path between 96 A Street and 95 Street located just south of the Edmonton Ski Club buildings (for non-winter use only).
 - Upgrading the current grass track between 97 Avenue and the intersection of Cloverdale Hill Road and Connors Road to a paved shared use pathway.
 - A new 1.5 metre sidewalk along the south side of 96 Ave.
 - New sidewalk/bicycle lane and shared use path along the west side of 96A Street.
 - A 1.8 metre sidewalk along the east side of 95 Street.
4. Proposed construction of new permanent structures, including:
 - Several viewpoints along Connors Road and Cloverdale Hill Road with enhanced seating (e.g., benches), interpretive signage and plantings.
 - Additional lighting along major pathways and upgrades to street lighting.
 - Installation of traffic barriers along 95 Street and 97 Ave to restrict vehicular access into the park.
5. Proposed upgrades to existing trails in the Camel Humps area in Strathearn Park including:
 - Resurfacing the main trail that connects the existing staircase from Strathearn Drive to 97 Avenue to a gravel base that meets minimum City trail guidelines.
 - Widening and resurfacing of the connecting trail south to the proposed lookout adjoining Cloverdale Hill Road to a gravel base that meets minimum City trail guidelines.
6. Warming Hut (movable structure that will only be used in winter).
7. New naturalized plantings, which will be primarily be established to the west of the existing shared use path.

5.2. GENERAL PROJECT PHASING AND CONSIDERATION OF ENVIRONMENTAL SENSITIVITIES

As the proposed Concept Plan only provides a high-level overview of proposed enhancements to Gallagher Park, no specific information on preliminary or detailed design was provided. Thus, project phasing is based on a general understanding of the associated activities that may be undertaken for each project component considered as part of the preferred Concept Plan design as indicated in Table 3. Although the proposed Concept Plan acknowledges that not all project components will necessarily be implemented at the same time as they will likely be phased in on a priority basis depending on funding, the EIA considers all project components as being implemented at the same time for the purpose of this assessment.

Consideration of environmental sensitivities was an integral component of the concept design process. Early in the planning process, an initial Environmental Overview (Solstice 2019) was completed to identify environmental sensitivities and potential development concerns within the Gallagher Park Concept Plan area. This information was used to help inform early-stage planning options, and develop a shared understanding of those sensitivities with City planners, public stakeholders and planning team members. Site disturbances, including permanent features, such as multi-use pathways and viewpoints, were situated to avoid sensitive areas including an area of contaminated soils south of the Muttart Conservatory and a groundwater seepage area near the base of the southeast side of Gallagher Hill. As a result of these planning processes, the preferred Concept Plan design not only minimizes any impacts to the natural environment, but also has incorporated enhancements through naturalized plantings that will have a net positive impact on the natural landscape and ecosystem function within Gallagher Park.

TABLE 3. Project Interaction Table

Project Components	General Project Phasing and Associated Activities
New permanent paved shared use trails and sidewalks	<p>Site Preparation – vegetation clearing and/or removal of sod.</p> <p>Construction – minor soil excavation for pathway/sidewalk construction, cut and fill along portions of slope on the west side to create pathway grade and establishment of gravel base and paved top on all new permanent trails.</p> <p>Landscaping/Reclamation – re-sod and/or reseed disturbed areas along new pathways as per concept plan design and will be finalized during the preliminary and detailed design phases, and will take into consideration recommendations outlined in Section 6 of the EIA.</p>
New permanent structures (viewpoints, barriers and light posts)	<p>Site Preparation – vegetation clearing and/or removal of sod.</p> <p>Construction – soil excavation, minor soil excavation and/or grading for viewpoint and light post installations.</p> <p>Landscaping/Reclamation – re-sod and/or reseed disturbed areas along viewpoints and light posts; naturalized plantings in select areas as per concept plan design and will be finalized during the preliminary and detailed design phases, and will take into consideration recommendations outlined in Section 6 of the EIA.</p>
New permanent washroom facility	<p>Site Preparation – removal of sod at building site.</p> <p>Construction – building site and utility excavation, construction of washroom facility.</p> <p>Landscaping/Reclamation – re-sod and/or reseed disturbed areas adjacent to building footprint as per concept plan design and will be finalized during the preliminary and detailed design phases, and will take into consideration recommendations outlined in Section 6 of the EIA.</p>
Upgrades to existing trails in Camel Humps area in Strathearn Park (resurfacing and widening)	<p>Site Preparation – some minor vegetation clearing may be required for the portion of the trail that will be widened.</p> <p>Construction – limited to minor trail widening and augmentation of gravel base to meet minimum City standards for gravel trails.</p> <p>Landscaping/Reclamation – natural regeneration as minimal disturbance.</p>
Upgrades to road access to the Edmonton Ski Club parking area from 98 Ave	<p>Site Preparation – removal of sod in areas where access road needs to be widened and extended.</p> <p>Construction – soil excavation and construction of paved access road.</p> <p>Landscaping/Reclamation – revegetation of disturbed areas including planting trees and re-sodding/reseeding grassy areas along road as per concept plan design and will be finalized during the preliminary and detailed design phases, and will take into consideration recommendations outlined in Section 6 of the EIA.</p>
Warming Hut (movable structure that will only be used in winter)	<p>Temporary removable structure– does not require any site construction or disturbance to natural features.</p>
New naturalized plantings	<p>Landscaping/Reclamation – requires minor site preparation for naturalized plantings in select areas; planting locations will be in accordance with concept plan design and will be finalized during the preliminary and detailed design phases, and will take into consideration recommendations outlined in Section 6 of the EIA.</p>

6. PROJECT IMPACTS AND MITIGATION MEASURES

6.1. ENVIRONMENTAL IMPACT ASSESSMENT METHODS

6.1.1. Impact Identification and Analysis

Based on our understanding of the project and the existing environmental context, the following VECs were selected for impact assessment:

- Surface water;
- Groundwater and Geomorphology;
- Soils and Landform;
- Vegetation; and
- Wildlife.

Fish habitat was not carried forward to the impact assessment stage as the nearest watercourses with fish bearing habitat are greater than 100 m away and will not be directly impacted by any of the proposed works associated with the preferred Concept Plan design. Any indirect effects (e.g., release of deleterious materials, including sediments) that could potentially affect fish or fish habitat area captured under the surface water component. Historical resources were also not carried forward to the impact assessment stage as proposed works associated with the preferred Concept Plan design generally involve minimal disturbance to soil in areas that have already been historically disturbed and are outside areas that were identified as requiring a historical impact assessment. However, provisions for unanticipated discoveries have been included as part of the impact assessment process.

6.1.2. Impact Assessment Criteria and Evaluation

Potential direct and indirect impacts to selected VECs were identified by overlaying the preferred Concept Plan design drawings on the mapped VECs and considered all project activities. Construction works and ancillary buildings or structures required for the Project (e.g., washroom facilities, lighting, wayfinding, seating areas, paved pathways, sidewalks) were assessed for their potential interactions with the surrounding environment, based on existing environmental conditions. It is assumed that work will be completed in a manner that addresses safety and the environment, using current Best Management Practices (BMP) and will follow the requirements set out in the City of Edmonton's Environmental Management System (ENVISO), including the development of a site-specific Environmental Construction Operation (ECO) Plan.

Table 4 provides a summary of the assessment criteria for determining potential environmental impacts on each VEC. Potential environmental impacts were initially assessed without the application of additional mitigation measures. Any negative impacts that remained after additional recommended mitigation measures were applied were termed residual impacts and were characterized according to the guidance provided in the EIA Terms of Reference.

TABLE 4. Assessment Criteria for Environmental Impact Assessment

Criteria	Characteristics
Direction of Effect	
Negative (Adverse)	Loss to the resource.
Positive	Benefit to the resource.
Nature of Effect	
Direct	Direct loss/reduction of resource.
Indirect	Off-site impacts to adjacent resources outside of Project area (i.e., sedimentation in adjacent watercourse or river).

Criteria	Characteristics
Geographical Extent of Effect	
Local	Project footprint and adjacent land within the local study area.
Regional	Beyond the local study area boundary.
Magnitude of Effect	
Negligible	Slight change to the indicator, but in the range of natural variation.
Low	Impact will be noticeable, but recovery is possible within short-term. Or disturbance will permanently affect only a small portion of the resource relative to its availability (e.g., population, extent) or relative to regulatory standards (e.g., CCME guidelines).
Moderate	Impact will affect a moderate portion of the resource, beyond its capacity to recover (e.g., regional population, adjacent water sources). Or disturbance will permanently affect a moderate portion of the resource relative to its availability (e.g., local population) or relative to regulatory standards (e.g., CCME guidelines).
High	Impact will affect a large portion of the resource, beyond its capacity to recover. Or disturbance will permanently affect a significant portion of the resource relative to its availability (e.g., regional population) or relative to regulatory standards (e.g., CCME guidelines).
Duration and Frequency	
Temporary	Expected to return to baseline conditions within one year.
Seasonal	Expected to return to baseline conditions within one to two years.
Permanent	Never expected to return to baseline conditions naturally (irreversible effect).
Likelihood of Occurrence	
Likely	Impact has a high probability of occurring.
Unlikely	Impact has a low probability of occurring.

6.2. ASSESSMENT OF PROJECT ENVIRONMENTAL IMPACTS AND ASSOCIATED MITIGATION

6.2.1. Surface Water

6.2.1.1. Potential Impacts

There are no natural watercourses within the study area and both Mill Creek Ravine and the North Saskatchewan River are greater than 100 m from the study area. However, spills and releases, including sediments have potential to migrate or drain downslope into one of several catch basins that discharge into the storm system and eventually into the North Saskatchewan River, which is a fish bearing watercourse. As such, potential impacts to surface water arising from Project activities are limited to indirect effects on water quality from accidental release of sediments or deleterious substances into the storm sewer system. Should a release occur the potential environmental impact is expected to have a negligible, negative effect that is indirect, localized and temporary in duration.

6.2.1.2. Mitigation and Residual Impacts

Erosion and Sedimentation

Sediment release due to erosion from pathway, trail and sidewalk construction activities, or from temporary storage of soils can be mitigated through temporary erosion and sedimentation control (ESC) measures. Revegetation and seeding/sodding of exposed soils should be implemented as soon as possible after project works are completed to minimize erosion risk. Temporary ESC measures, such as silt fences, straw wattle or geotextile fabrics will be required around areas of exposed soils to prevent erosion and sedimentation release. In addition, ESC measures such as catch basin inlet barriers should

be placed around storm drains and catch basins along adjacent roadways to prevent sediments from entering catch basins. All ESC measures will be implemented in accordance with the City of Edmonton Erosion and Sedimentation Guidelines and associated Field Manual (City of Edmonton 2005a, b). With the implementation of such measures, residual impacts to surface water will be negligible.

Release of Deleterious Substances

Release of deleterious substances into the storm sewer system may occur as a result of spills or improper storage and handling of various materials. By implementing the following mitigation measures residual impacts will be reduced to a negligible effect:

- Implementation of a spill prevention and emergency response plan that complies with City of Edmonton and provincial spill reporting requirements.
- Secure storage of fuels, oils and lubricants, with appropriately sized spill kits in close proximity.
- Implementation of proper handling techniques including refueling and maintaining equipment in designated areas, a minimum of 100m away from waterbodies or watercourses and not within a drainage path leading to a waterbody or watercourse.
- Preventive maintenance and regular inspection of all equipment to avoid accidental leaks.
- The use of vegetable-based hydraulic fluids for equipment working in or near water, to minimize the risk of harm should an accidental release occur.

6.2.2. Groundwater and Geomorphology

6.2.2.1. Potential Impacts

Water table depths within the study area were noted to vary between 3.9 and 14.4 mbgs, with shallower groundwater depths located in the floodplain region adjacent to the North Saskatchewan River. Based on the identified water table depths, it is anticipated that there will be no direct or indirect impacts to groundwater associated with the implementation of the preferred Concept Plan design, as no project components should require excavation beyond approximately one- or two-meters depth.

However, a groundwater seepage, which has formed a temporary wetland in the southeast part of the study area has been noted as an environmentally sensitive area, though it is not clear if this is a naturally occurring wetland feature or a result of historic modifications to the site. No direct impacts to this feature are anticipated as the multi-use pathway identified in the preferred Concept Plan design has been aligned to avoid this feature. Nonetheless, if this area is determined to be a naturally occurring wetland feature and is impacted by construction activities, a provincial *Water Act* approval application and a Wetland Assessment and Impact Report, including a wetland mitigation and replacement plan will be required to meet Alberta Wetland Policy requirements. Provided that the wetland area is avoided, any potential indirect impacts to this temporary wetland feature will be avoided through the implementation of the following mitigation measures:

- Establishment of a minimum setback around the wetland feature, including marking the boundary in the field using lath and flagging or fencing, as required.
Establishment of temporary ESC measures, such as silt fences around this wetland feature to prevent any potential release of sediments or other deleterious substances into this feature.

6.2.3. Soils and Landform

Potential impacts to soils and landform associated with implementation of the preferred Concept Plan design include the following;

- Loss or alteration to soil substrate.
- Disturbance of known historically contaminated soils.
- Contamination due to accidental spills and releases.
- Slope stability.

6.2.3.1. Potential Impacts

Loss or Alteration to Soil Substrate

Although the preferred Concept Plan design minimizes impacts to soil substrate, some direct or indirect impacts to soils will occur as result of project works associated with the construction of site amenities (e.g., washroom facility, lighting, access road upgrades, pedestrian access and seating areas). It is anticipated that only minor grading, and cut and fill will be required for some segments of the multi-use pathway system and permanent soil disturbances will be limited to the specific locations where permanent features will be installed. Temporary impacts to soil substrate may occur due to wind or water erosion of exposed soil, as well as through admixing of topsoil and subsoil during earthworks.

Site preparation and construction activities associated with the construction of site amenities will result in the removal of vegetation and exposure of bare soil surfaces, in small areas and possibly for extended periods of time. Construction activities on exposed soils can result in erosion and loss of topsoil and subsoil, degradation of topsoil quality, and weakened slope stability. In areas where existing vegetation cover is cleared, exposed soils are susceptible to water erosion in wet conditions and wind erosion in dry conditions. In this situation, sedimentation from eroded soils can accumulate downslope and potentially migrate off-site.

Soil compaction and rutting may also occur during site clearing and construction activities, especially when soils are wet. Compaction and rutting disrupt soil structure, impede root penetration, and reduce infiltration of water and nutrients. These disruptions to drainage patterns can affect vegetation growth and may prevent full revegetation and soil stabilization after construction. Degradation of topsoil quality by compaction, rutting, loss of organic matter, and admixing can be mitigated through proper soil handling and conservation practices.

If mitigation measures (BMP's, controls and clean-up measures) are not put into practice, the impact to soil substrate is anticipated to be negative, direct and indirect, of low magnitude, temporary, local and likely.

Disturbance of Known Historically Contaminated Soils

Although the preferred Concept Plan design has been developed to avoid impacting known areas of historically contaminated surficial soils, wherever possible, there is potential for project works associated with the construction of site amenities to disturb contaminated soils. A Tier 2 Risk Assessment has been completed the Muttart Conservatory and Gallagher Park (AECOM 2017), which has identified metal exceedances in the area immediately south of the Muttart Conservatory and PAHs, located near the old incinerator site. Disruption of these contaminated soils could result in impacts to surrounding vegetation and surface water and groundwater receptors, if not managed appropriately.

The potential impact to known contaminated soils is anticipated to be negative, direct and indirect, with a low to moderate magnitude, that is permanent, and localized in extent. The likelihood of encountering contaminated soils is unknown outside of known areas that have been documented.

Contamination Due to Accidental Spills and Releases

Potential impacts to soil from contamination can occur through refueling spills, poor storage and handling of materials, equipment repairs, and leaks due to insufficient equipment maintenance. Typical contaminants include oil, fuel, lubricants, and other hazardous substances used in conjunction with construction activities. Release of these contaminants to surrounding soils can have various negative on- and off-site impacts to the environment and human health. Incidents would typically be small in scale, particularly are construction sites, but could become more serious if not quickly controlled. If appropriate plans and practices are not put into place, the impact of a hazardous or deleterious substance spill could be negative, direct, negligible to low, temporary, local and likely.

Slope Stability

Most project components of the preferred Concept Plan design will be constructed along the base of Gallagher Hill, or in areas where slope gradients are low. However, some project components, specifically the construction of a trail and viewpoints along Cloverdale Hill Road will take place at the top of the slope, though these will be established on mostly level terrain. As all project works are anticipated to be off-set from any major slope-breaks it is anticipated that any potential impacts to slope stability will be a negative, negligible to low, direct, local and temporary impact.

6.2.3.2. Mitigation and Residual Impacts

Loss or Alteration to Soil Substrate

Any loss or alteration to soil substrate associated with soil erosion and sedimentation, admixing or compaction will be mitigated through the following measures:

- Temporary erosion and sedimentation controls (ESCs) should be designed, implemented, and maintained until the site is sufficiently reclaimed and the soils stabilized. These can include such measures as silt fences, straw wattle or geotextile fabrics around areas of exposed soils and catch basin inlet barriers around storm drains and catch basins along adjacent roadways.
- All ESC measures will be implemented in accordance with the City of Edmonton Erosion and Sedimentation Guidelines and associated Field Manual (City of Edmonton 2005a, b) and will include a plan that specifies monitoring protocols, including frequency of monitoring.
- Revegetation and seeding/sodding exposed soils as soon as possible after project works are completed to minimize erosion risk.
- Minimize or avoid construction activities during wet periods (e.g., during spring thaw and during periods of heavy rain) to reduce compaction and rutting of soils.
- If soil salvage and storage is required, the salvage and storage of topsoil and subsoils soils should be separated to reduce the likelihood of admixing.

Provided that best management practices and appropriate mitigation measures are implemented and maintained, the residual impacts of loss or alteration to soil substrate from soil erosion and sedimentation, admixing or compaction will be reduced to negligible

Contamination due to Accidental Spills and Releases

Implementation of BMPs to minimize and avoid the risk of soil contamination due to accidental spills and releases are a key measure in reducing contamination risks and include designating areas for refueling and storing of oil and other lubricants that are away from water and protected against spills (i.e., use of double-walled fuel tanks or stored in areas with spill containment). It is anticipated that the Proponent will be required to provide a spill prevention and emergency response plan, and a hazardous waste management plan as part of the site-specific ECO Plan to meet the City of Edmonton's ENVISO requirements. Those plans will include specific measures related to securely protecting all roadway catch basins in the project area and will outline monitoring protocols and frequency. With these measures in place the residual impact of spills should be negligible. Small spills may still occur as a result of equipment malfunctions, but they would be containable and thoroughly cleaned up with no residual impact.

Disturbance of Known Historically Contaminated Soils

Should the implementation of the preferred Concept Plan design require construction adjacent to or directly within known historically contaminated surficial soils, where there is a risk of soil disturbance, a site-specific risk management plan will be developed. Based on the recommendations from the Tier 2 Risk Assessment completed by AECOM (2017) the risk management plan should at a minimum address the following:

- Capping contaminated areas with an impermeable clay layer and avoiding future ground disturbance to minimize risk of human exposure by establishing landscaping and park maintenance measures that maintain the integrity of the cap.
- Soil management plans and protocols, including handling and disposal of contaminated soils, as well as any required monitoring and site controls to reduce the risk for off-site migration of contaminated soils and any risks to worker health and safety.
- Recommendations for additional groundwater monitoring points between the plume and the North Saskatchewan River and for future groundwater monitoring requirements.
- Implementing management and control measures restricting the use and access to groundwater resources.

It is anticipated that the implementation of a risk management plan to address site activities that take place adjacent to, or within, known historical areas of soil contamination will reduce any potential residual impacts to negligible.

Slope Stability

The risk to slope stability during and post-construction can be reduced to a negligible residual effect through the implantation of the following measures:

- Cut-and-fill areas created during clearing and construction should be contoured to incorporate stable side-slopes to reduce erosion potential and instability.
- If it is determined that there is a risk to slope stability from any project component, appropriate stabilization measures will be developed and implemented using methods acceptable to the City of Edmonton.

6.2.4. Vegetation

Potential impacts to vegetation associated with implementation of the preferred Concept Plan design include the following;

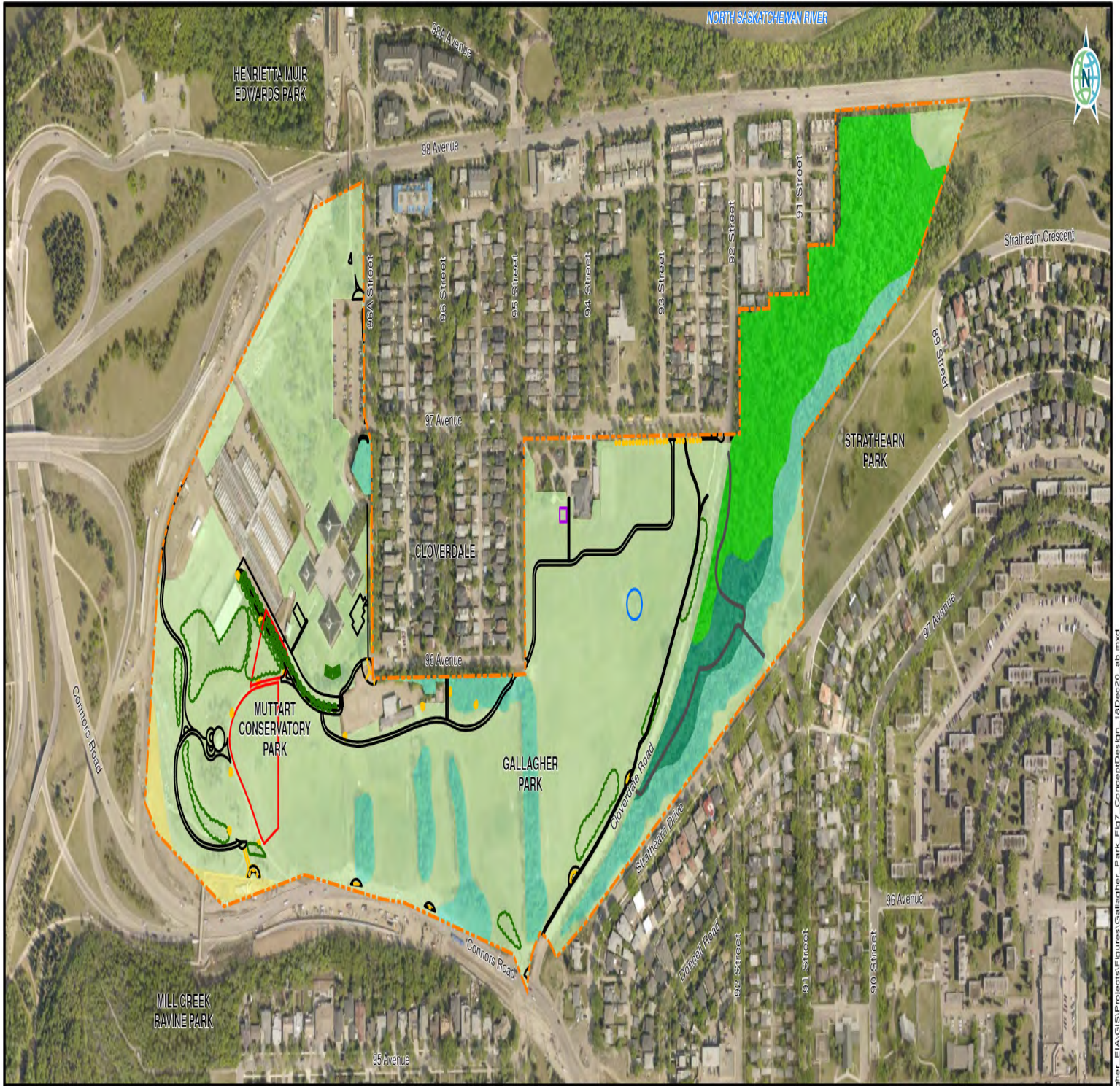
- Loss or alteration of native plant communities and rare plants.
- Introduction and establishment of weed species.
- Incidental damage to native or ornamental trees.

6.2.4.1. Potential Impacts

Loss or alteration of native plant communities and rare plants

Although the preferred Concept Plan design minimizes impacts to native plant communities, some direct loss of vegetation, both permanent and temporary will occur as result of project works associated with the construction of site amenities (e.g., washroom facility, lighting, access road upgrades, pedestrian access and seating areas) as indicated in Figure 7. Most loss or alteration of plant communities will occur in the Maintained Grass vegetation type, with permanent multi-use pathway features primarily situated in areas that are already highly disturbed by current park use.

Additionally, minor tree clearing associated with the Forested (Trembling Aspen) vegetation type will be required, which will result in the permanent loss of the western most stand of trees just south of 96 Avenue and east of Ski Club buildings to accommodate sidewalk and pathway construction. This stand of trees has been assessed by the City of Edmonton Natural Areas Coordinator and was determined to be unsustainable as the stand is primarily comprised of non-native species and not in good health (Courtney Teliske Pers.Com). It is also anticipated that should trail widening and upgrades to the connector trail south to the proposed lookout adjoining Cloverdale Hill Road in the Camel Humps (Strathearn Park) be completed, minor vegetation clearing, including select removal of trees, within the Forested (Balsam Poplar) vegetation type will be required. This will result in permanent loss of a very small portion of this vegetation type, as trail widening will be aligned to minimize removal of trees.



LEGEND

Preferred Concept Design Overlay

- Existing - Wetland Seepage Feature
- Existing - Soil Contamination
- New Permanent Paved Shared Use Trails and Sidewalks

- Trail Upgrades
- New Permanent Structures (Washroom)
- New Permanent Structures
- New Naturalized Planting Areas

- Concept Plan Study Area (31.3 ha)
- Existing Vegetation Class**
- Forested (Trembling Aspen)
- Forested (Balsam Poplar)

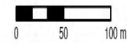
- Forested (Balsam Poplar, Trembling Aspen)
- Maintained Grass
- Transplant Trees

SOURCES:
 PREFERRED CONCEPT DESIGN VEGETATION CLASSES FROM IBI 113178-CONCEPT.DXF PROPOSED, LS-EXST-CONTAMINATION, LS-EXST-DRAINAGE LOW, AND LS-EXST-PLNT LAYERS.
 VEGETATION DATA FROM THE CITY OF EDMONTON PRIMARY LAND AND VEGETATION INVENTORY FOR URBAN ENVIRONMENTS (URBAN PLVI) DATASET (CITY OF EDMONTON 2015).
 ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRIID, IGIN, AND THE GIS USER COMMUNITY.



**CITY OF EDMONTON
 GALLAGHER HILL EIA
 OVERLAY OF PREFERRED CONCEPT
 DESIGN ON THE EXISTING ENVIRONMENT**

DATE: DECEMBER 18, 2020	PROJECTION: 3TM 114	DATUM: NAD83
PROJECT CODE: 18-4131-25		
SCALE: 1:4,000		
FIGURE 7		



Thus, the potential impact associated with permanent loss of native plant communities is expected to have a low, negative effect that is permanent, localized, and likely to occur. However, any potential negative impacts will be offset by the establishment of naturalized plantings throughout Gallagher Park, which will result in a net increase in native vegetation within the study area. Naturalized plantings are anticipated to be established throughout the western area of Gallagher Park and along the upper slopes of Cloverdale Hill Road as noted in Figure 7. As a result, the overall impact of the preferred Concept Plan design will result in a direct, positive effect to vegetation that is low to moderate in magnitude, local, and permanent.

No direct or indirect impacts to rare plant species are expected with the implementation of the preferred Concept Plan design. Although rare plant species have been recorded in the study area, these plant species were noted to occur along the slopes in the northeast portion of Strathearn Park in the Camel Humps area just east of Cloverdale Hill and 91 Street and also in one of the larger aspen stands bordering the ski runs in Gallagher Park. No proposed project works will be taking place in any areas where rare plants were noted to occur, and as such no additional surveys or mitigation measures are required. However, as these plant species are designated with an S3 status, their geographic distribution in the province is considered limited, so as part of due diligence all known populations should be protected in order to sustain existing populations in this area.

Introduction and establishment of invasive weed species

Only one noxious weed, Canada thistle, was observed with low abundance in the study area and no prohibited noxious weeds were identified. However, populations of non-regulated invasive plant species, such as smooth brome, tufted vetch and quack grass were present throughout the study area. Given that the study area is primarily comprised of Maintained Grass within an urban environment, there is the potential that other noxious and prohibited noxious weeds from surrounding urban areas can spread and become established in disturbed areas. Disturbance and exposure of soil during site clearing and construction phases of the project have the potential to create ideal conditions for the establishment of populations of various noxious and prohibited noxious weeds commonly found in Edmonton. In this regard, preventing the ingress and establishment of weed species is the most cost-effective approach to weed management. Without appropriate mitigation in place, the establishment and spread of invasive or weedy species within revegetated and reclaimed areas is expected, and the impact will be negative, direct, low to moderate, local and likely.

Incidental tree damage

Implementation of the preferred Concept Plan design will require some clearing of vegetation, including removal of sod within the Maintained Grass portions of the study area that contain planted vegetation, including trees. Through construction activities will be situated to avoid direct impacts to planted vegetation, there is potential for adjacent trees to be exposed to limb, trunk or root damage as a result of indirect activities. The potential for additional incidental tree damage or loss is rated as a negative, indirect, low, permanent, local and likely impact.

6.2.4.2. Mitigation and Residual Impacts

Loss or alteration of native vegetation communities and rare plants

Any permanent and temporary loss of native vegetation communities will be mitigated through the following measures:

- Any areas within the Maintained Grass vegetation type that requires removal of sod associated with temporary working areas will be reclaimed and re-sodded or reseeded to meet City of Edmonton specifications.
- All project works will be developed and implemented to ensure compliance with the City of Edmonton Corporate Tree Management Policy and will comply with specific tree removal and protection specifications.

- Any permanent loss of native vegetation associated with the loss of the western part of the treed stand just south of 96 Avenue and east of Ski Club buildings will be directly addressed through the establishment of new trees in this area, as per the preferred Concept Plan design.
- Establishment of new naturalized planting areas as shown on the preferred Concept Plan design will be implemented using only native plant species. This will result in a net gain in native vegetation cover and will enhance the overall biodiversity and connectivity of Gallagher Park.
- Detailed naturalization or reclamation plans will be developed as part of the detailed design phase of the Gallagher Park Concept Plan by a qualified professional. These plans will include more detailed information on plan objectives and requirements, plant species selection and specifications, and planting bed design. All plans will be developed in consultation with project stakeholders, including City of Edmonton representatives.
- All naturalization or reclamation plans are to be reviewed by the City of Edmonton, or a City of Edmonton representative.
- Although no rare plants are expected to be disturbed by the implementation of the preferred Concept Plan design, in the unlikely event that a rare plant species is identified in the vicinity of where proposed works are to take place, the plant species should be verified and appropriate mitigation measures, such as establishing setbacks around the identified population, be implemented.

With the implementation of the above measures, it is expected that loss of native vegetation communities will be fully mitigated over time, as there will be a net positive gain in woody, naturally vegetated areas. Thus, with successful revegetation and reclamation, the anticipated residual impact of loss or alteration of native vegetation communities and rare plants is expected to be negligible.

Introduction and establishment of weed species

The risk of weed establishment during and post-construction will be reduced through the following measures:

- Cleaning of all equipment before entering the construction area. All equipment will arrive on-site in a clean condition
- Prompt re-sodding or reseeded of all areas of exposed soils in the Maintained Grass vegetation type following reclamation of temporary site disturbance associated with construction.
- Implementation of weed management plan, including weed control measures for any identified noxious or prohibited noxious weed, which will be outlined in the site-specific project ECO plan. Prompt weed control and diligent weed monitoring will be required during all phases of implementing the preferred Concept Plan design, including construction and reclamation/revegetation.
- Limit soil disturbances, including any soil stockpiles, as much as practical.

It is anticipated that there will be a need for the City of Edmonton to undertake weed control in the years following construction of project components. Assuming diligent implementation of these mitigation measures, the residual impact related to the introduction and establishment of weed species will be reduced to negligible.

Incidental tree damage

Incidental tree damage can be minimized through implementing the following measures:

- A Tree Protection Plan will be prepared and implemented prior to construction. The Tree Protection Plan which will include measures to physically protect native treed stands and planted trees that are present in areas where proposed project components such as shared use pathways and viewpoints will be established.
- Tree protection efficacy will be monitored throughout the period of construction and any incidental damage will be documented and reported to the City of Edmonton.

With the implementation of these mitigation measures, the residual impact associated with potential for incidental tree damage will be reduced to negligible.

6.2.5. Wildlife

6.2.5.1. Potential Impacts

Direct and Indirect Impacts to Wildlife Habitat

Direct impacts to wildlife habitat from vegetation clearing has the potential to result in the loss of wildlife habitat. It is expected that the majority of works associated with the preferred Concept Plan design will be completed in the Maintained Grass vegetation type, which has little to no habitat wildlife habitat value for most wildlife species that utilize the study area. Minimal clearing of native vegetation will be required and will be limited to the western most stand of trees just south of 96 Avenue and east of Ski Club buildings and potentially along the margins of the connector trail south to the proposed lookout adjoining Cloverdale Hill Road in the Camel Humps area of Strathearn Park. As such, direct loss of wildlife habitat will be minimal and is characterized as a negative, negligible, temporary, local, and likely effect. However, wildlife habitat will ultimately be enhanced through establishment of new naturalized areas, which will result in a net positive gain of wildlife habitat in the long-term.

In addition to direct loss of wildlife habitat, indirect impacts to wildlife habitat from constructions activities and increased use of the Gallagher Park may affect wildlife use of the area and reduce habitat effectiveness of the surrounding native vegetation. It is anticipated that wildlife habitat effectiveness may be disrupted during construction periods due to increased noise and activity on site. This impact is expected to be negative, direct, negligible to low, temporary, local in scale, and likely to occur. As the overall use of Gallagher Park does not change from baseline conditions with the implementation of the preferred Concept Plan design, impacts to wildlife use or reduced habitat effectiveness from increased human use are expected to be negligible. Most wildlife species that frequent the Gallagher Park area are adapted to some level of human disturbance and none of the project components associated with the preferred Concept Plan design are significant enough to act as a barrier to wildlife movement. Wildlife habitat connectivity will be maintained through the features such as the wildlife underpass that will be constructed as part of the Valley Line LRT and new naturalized areas that will be established in Gallagher Park.

Overall, direct and indirect impacts to wildlife habitat, taking into consideration proposed naturalization activities, will result in a direct, net positive effect that is low to moderate in magnitude, local and regional in area, and permanent.

Mortality or Disturbance to Protected Wildlife and Migratory Breeding Birds

Mortality or disturbance to migratory breeding birds is prohibited under the *Migratory Birds Convention Act* and the *Alberta Wildlife Act*. The *Alberta Wildlife Act* also prohibits disturbing and causing mortality to other wildlife species found in Alberta. Direct impacts to breeding birds may occur if bird species are nesting in or adjacent to areas require vegetation clearing or within the proposed project work area during the spring and summer breeding season. This applies to all vegetated areas including native treed stands, ornamental and planted trees and maintained grass, as many migratory songbirds use these areas for nesting, breeding or foraging habitat. Mortality may occur directly (i.e., birds killed through the construction process) or from nest failure or abandonment. Adults, fledglings, and eggs may be at risk if they are unwilling or unable to leave the nest. Current best management practices outlined by Environment Canada recommends avoiding vegetation clearing during the period when there is a high probability of nesting activity, which for the Edmonton area is between April 15 and August 31 (GoC c2018). In the absence of the adherence to this standard or implementation of additional mitigation measures the potential for nest disturbance is high.

Additionally, early season nesting owls that occur in Edmonton are protected under the *Wildlife Act*. As such, vegetation clearing of mature trees during the owl nesting season from February 15th to April 20th should be avoided to minimize any potential impacts or mortality to breeding owls. Northern flying squirrels are another species that is protected under the *Wildlife Act* that has the potential to be present in the study area. As northern flying squirrels nest in tree cavities, activities associated with vegetation clearing and/or other construction have the potential to result in the direct mortality or disturbance of breeding habitat of this species.

In the absence of adherence to vegetation clearing best management practices, impacts resulting in the mortality or disturbance of migratory bird species or other wildlife species are expected to have a direct, negative, low to moderate, permanent effect that is local and likely to occur.

6.2.5.2. Mitigation and Residual Impacts

Direct and Indirect Impacts to Wildlife Habitat and Connectivity

No negative residual impacts are expected to wildlife habitat as wildlife habitat will ultimately be enhanced through establishment of new naturalized areas, which will result in a net positive gain of wildlife habitat.

Indirect impacts to wildlife habitat use and connectivity can be reduced through implementation of the following mitigation measures:

- Although unlikely to occur, night shift work (if required) will be minimized to allow wildlife passage through work areas.
- Whenever possible, limit work activities during the evening and early morning hours.
- Storage of materials and equipment will be situated in previously disturbed or hardscaped areas (e.g., parking lots) wherever possible to avoid unnecessary disturbance or restriction of wildlife movement.

With the implementation of these mitigation measures, the residual impact associated with Indirect impacts to wildlife habitat use and connectivity will be reduced to negligible.

Mortality or Disturbance to Protected Wildlife and Migratory Breeding Birds

In areas where vegetation and tree clearing are required, the recommended Environment Canada guidelines for reducing impacts to migratory birds, and the *Migratory Birds Convention Act*, will be followed as outlined below:

- All tree and brush clearing activities will avoid the high-risk period for migratory bird breeding season between April 15th and August 31st, wherever possible. Activities include the clearing of ornamental trees, as well as and grassy areas as many common bird species may also nest in these areas.
- If vegetation clearing must proceed during this time, a qualified biologist should be consulted to provide an opinion regarding the feasibility of an effective sweep, based on the areal extent and vegetation type present, prior to completing a nest sweep. The nest sweep should be conducted within seven days of tree and brush clearing and should follow widely accepted protocols. Nests found during the sweep should be protected until the young have fledged using a species-appropriate buffer from construction activities.
- If vegetation clearing proceeds between February 15th to April 20th, a qualified biologist should be consulted to assess the risk to owls, and provide recommendations.
- If soil stockpiles are present, they should be contoured with angles less than 70 degrees to create unsuitable nesting/den conditions for burrowing birds or other wildlife.

With the implementation of these mitigation measures, the residual impact associated with mortality or disturbance to protected wildlife and migratory breeding birds will be reduced to negligible.

6.2.6. Unanticipated Discoveries Associated with Archaeological or Cultural/Historical Resources

6.2.6.1. Potential Impacts

Although, unlikely given the high degree of historic disturbance in the study area, there is a potential for the discovery of archaeological resources, paleontological resources, historic period sites, and Aboriginal traditional use sites during construction. It is important to preserve and protect the historic resources of Alberta and inadvertent losses could occur if construction crews are not aware of this risk.

6.2.6.2. Mitigation and Residual Impacts

In the event that contractors uncover/discover unanticipated archaeological resources, paleontological resources, historic period sites, and Aboriginal traditional use sites during construction, the notification/stop work process for unanticipated discoveries requirements would be applied and Heritage Division of Alberta Culture, Multiculturalism and Status of Women would be notified.

6.3. ASSESSMENT OF CUMULATIVE ENVIRONMENTAL IMPACTS

6.3.1. Methods

Cumulative effects associated with the interaction of past, present, future (proposed) projects were considered for entire study area. As noted previously, past projects initiated within Gallagher Park include historic uses as an incinerator site, as well as the current summer and winter uses associated with the Muttart Conservatory, Edmonton Ski Club, Edmonton Folk Fest and Cloverdale Community League. The only project that is presently being constructed is the Valley Line-Stage 1 LRT, which is scheduled to be completed by 2021. The preferred Concept Plan design is considered a future project at this stage, as the implementation of all components of the preferred Concept Plan is likely three to five or more years out, depending on funding. No other future (proposed) projects are anticipated to occur in the next five years.

Wildlife habitat connectivity modelling was carried forward to the cumulative environmental impacts stage to assess how past, present and future projects, including the implementation of the preferred Concept Plan design may impact wildlife movement through Gallagher Park, in relation to potential barriers as well as enhancements to wildlife habitat from new naturalized areas. No other VEC's were identified as being cumulatively impacted by the interactions of the preferred Concept Plan design in conjunction with any other past, present future (proposed) projects.

The base wildlife connectivity modelling using CircuitScape was updated to include proposed project components from the preferred Concept Plan design and were categorized in the resistance layer as vegetated or hard surfaces. With these updated changes to the existing landscape, cumulative effects of past, present and future projects, including the implementation of the preferred Concept Plan design on the habitat connectivity analysis for chickadee (representing arboreal movement), and coyote (for winter and summer terrestrial movements) were assessed.

6.3.2. Results

The results of the cumulative effects analysis on wildlife habitat connectivity for summer and winter coyote models are presented in Figures 8 and 9, and the chickadee model is presented in Figure 10. Given the scale and scope of the preferred Concept Plan design relative to the other current present uses and projects (i.e., Valley Line-Stage 1 LRT) there is a negligible change to wildlife habitat connectivity from the baseline conditions described previously. Strong connective links are still present throughout the wooded and maintained grass areas of Gallagher Park, with the cumulative effects of both Connors Road and its associated traffic, and the addition of the LRT forming a movement barrier to coyote in both summer and winter, as indicated by the reduced connectivity values along this transportation corridor (Figures 8 and 9). However, the movement culvert atop Connors Hill will likely mitigate some of the barrier effects associated with the LRT for coyotes (and other ground-based species), which is evident in both the summer and winter predictive models. Chickadee connectivity is also reduced in western portions of Gallagher Park, particularly along Connors Road where the LRT is being constructed (Figure 10).

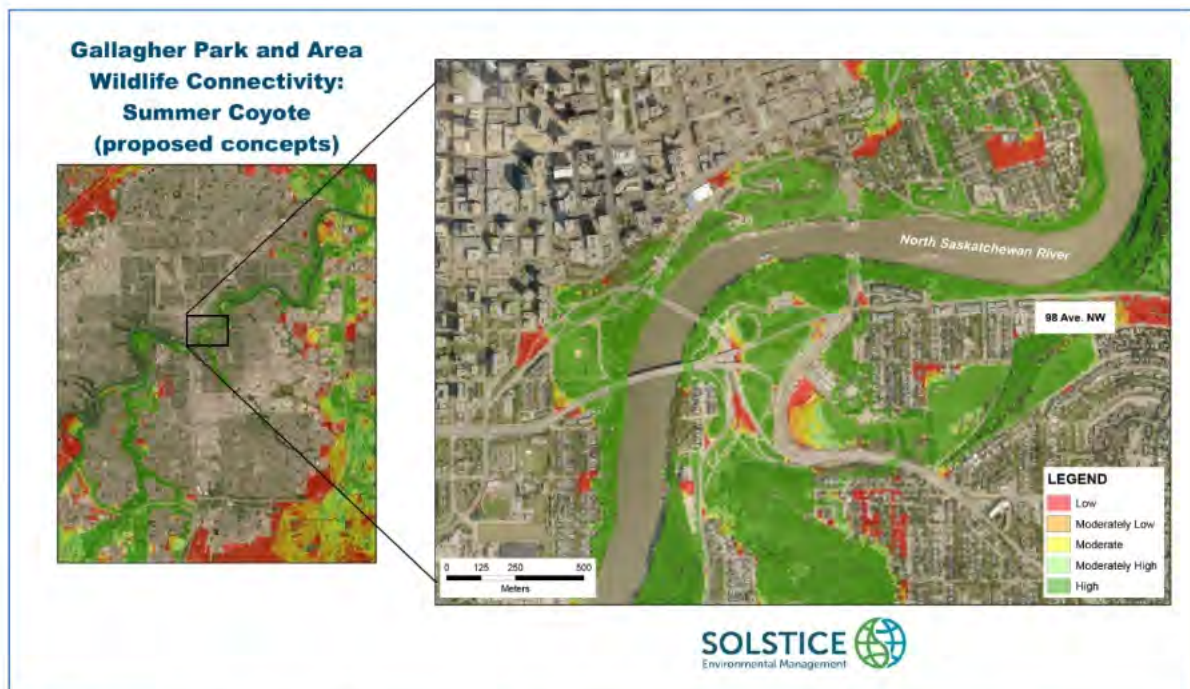


FIGURE 8. Coyote Habitat Connectivity in the Summer Considering the Proposed Concept of Gallagher Park and Area

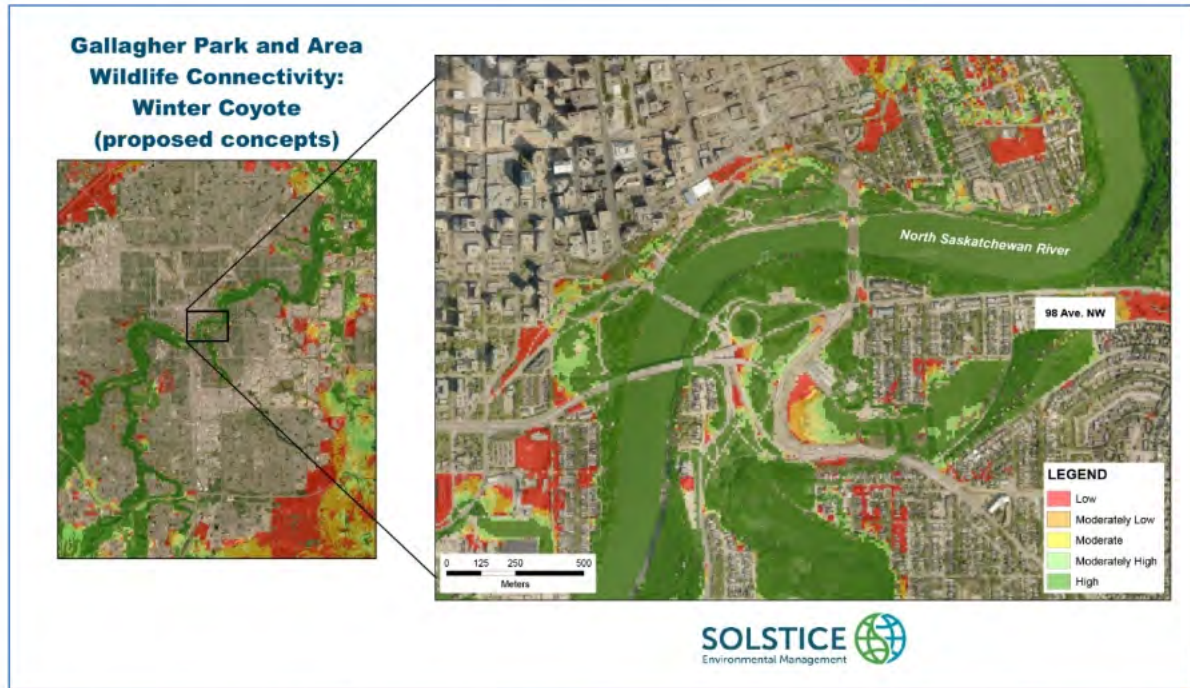


FIGURE 9. Coyote Habitat Connectivity in the Winter Considering the Proposed Concept of Gallagher Park and Area

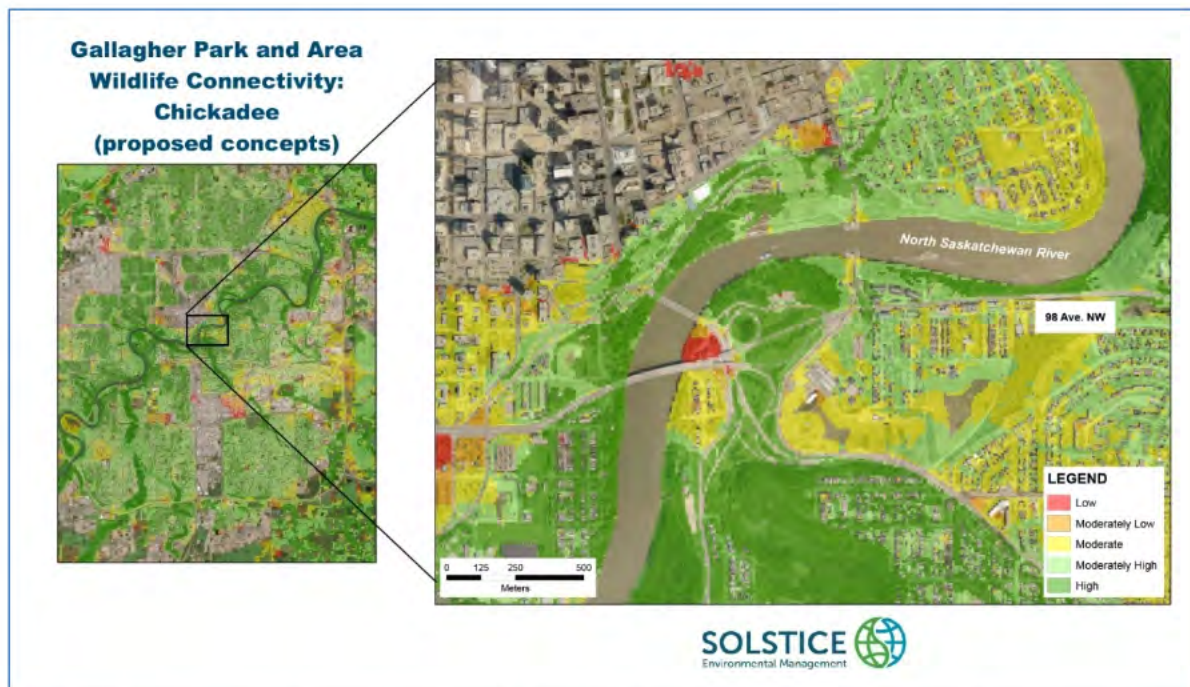


FIGURE 10. Black-Capped Chickadee Habitat Connectivity in the Summer Considering the Proposed Concept of Gallagher Park and Area

7. ENVIRONMENTAL MONITORING

Through the review of project impacts it was determined that there are no monitoring requirements mandated by regulatory approvals or permits for the implementation of the preferred Concept Plan design. However, through the analysis of impacts and the recommendation of mitigation measures and Best Management Practices (BMPs), several monitoring recommendations were identified. These monitoring recommendations would require the Proponent to self-monitor during future stages of project implementation, in particular construction and post-construction periods. The intent of such monitoring is to confirm compliance with specific plan requirements, such as the site-specific ECO Plan and other project plans, as well as confirming that all recommended mitigation measures have been implemented and are performing as intended.

It is anticipated that specific monitoring requirements, including the ones listed here, will be developed and refined as part of planning processes and controls during future construction of the preferred Concept Plan design. In that regard, key monitoring requirements that should be considered during construction include:

- Contaminated Soils
 - Monitor site and soil management and control measures to ensure compliance with the site-specific risk management plan developed based on the recommendations from the Tier 2 Risk Assessment completed by AECOM (2017).
- Soils and Surface Water
 - Monitor the performance of temporary erosion and sediment controls, particularly in relation to off-site migration of sediment that may enter catch basins or adjacent watercourses/ waterbodies.
 - Monitor the setback around the groundwater seepage, which has formed a temporary wetland to ensure no encroachment takes place.
 - Monitor the margins of the disturbance area to ensure no deleterious substances migrate off-site.
- Vegetation
 - Monitor the performance of the Tree Protection Plan in relation to the Corporate Tree Management Policy.
 - Monitor the project area for the introduction of weeds or exotic species following disturbance.
 - Monitor the reclamation/revegetation of disturbed areas and newly established naturalized areas.
- Wildlife
 - Monitor the clearing of vegetation if conducted within the breeding bird period through nest sweep surveys to reduce potential impacts. If nests are encountered establish a monitoring plan, including buffers to reduce impacts.

8. PUBLIC CONSULTATION

Public consultation was an integral part of the conceptualization of the Gallagher Park Concept Plan and multiple public and stakeholder engagement opportunities were initiated to solicit feedback and suggestions as part of the process of developing the preferred Concept Plan design. The input of key stakeholders including site partners such as the Cloverdale Community League, Edmonton Folk Music Festival, Edmonton Ski Club, and the Muttart Conservatory, as well as the public were used to inform decisions about the direction and content of the plan, and to build a collaborative relationship among all stakeholders to support future decisions.

Public engagement initiatives were completed over three phases as follows:

- Phase 1 – Vision Statement and Guiding Principles and Idea Gathering, which was facilitated through open houses and online questionnaires.
- Phase 2 – Concept plan Development, which was facilitated through open houses and online questionnaires.
- Phase 3 – Draft Preferred Concept Plan, which could only be completed through online engagement due to the Covid-19 pandemic.

Stakeholders were involved in the first phase of the project in 2016 - 2017 with the planning of the Project Charter and Project Team Terms of Reference for the direction and success of this Concept Plan. During the summer of 2017, Indigenous Engagement took place for Gallagher Park in conjunction with the Dawson and Oleskiw Park Master Plan projects. Public consultation associated with the third phase of the project took place in 2020.

9. CONCLUSIONS

9.1. SUMMARY OF ENVIRONMENTAL IMPACTS AND SENSITIVITIES

As a result of planning processes, the preferred Concept Plan design not only minimizes any impacts to the natural environment, but also has incorporated enhancements through naturalized plantings that will have a net positive impact on the natural landscape and ecosystem function within Gallagher Park. Thus, based on the review of potential impacts anticipated to occur from the implementation of the preferred Concept Plan design, it is expected that all potential negative residual impacts will be reduced to negligible with the application of the recommended mitigation measures.

Of the VEC's that were identified, key environmental sensitivities that required further consideration included:

- Soil management, specifically soil erosion and sedimentation risk and management of historically contaminated soils.
- Groundwater seepage and temporary wetland area. Unclear if this is a naturally occurring wetland feature.
- Native vegetation communities.
- Wildlife habitat and use.

Soil management, specifically management of historically contaminated soils will need to be addressed at future stages of the project and will require the development and implementation of a site-specific risk management plan. All other environmental sensitivities related to soil, native vegetation communities and wildlife can be effectively addressed through various project controls and mitigation measures that will be implemented as the project proceeds to the next phases. If the seepage and wetland area is determined to be a naturally occurring wetland feature and is impacted by construction activities, a provincial *Water Act* approval application and a Wetland Assessment and Impact Report, including a wetland mitigation and replacement plan will be required to meet Alberta Wetland Policy requirements.

Overall, the preferred Concept Plan design is expected to have a minimal effect on environmental resources and is expected to result in a net positive impact to both vegetation and wildlife components through the establishment of new naturalized areas that will increase both local biodiversity and wildlife habitat. In that regard, we are of the opinion that the proposed preferred Concept Plan design can proceed as planned.

9.2. ASSESSMENT LIMITATIONS AND KEY MITIGATION MEASURES

As the preferred Concept Plan design only provides a high-level overview of the proposed enhancements to Gallagher Park, no specific information on preliminary or detailed design was provided. In that regard, specific information concerning detailed design drawings or specifications and construction measures were not included as part of this assessment. However, a conservative approach was taken in developing recommended mitigation measures that address any potential negative environmental impacts in a proactive manner that can be implemented as part of planning processes and controls during future construction of the preferred Concept Plan design.

In that regard, key mitigation measures that the City of Edmonton should consider mandating as action items to be included as part of the implementation of the preferred Concept Plan design are as follows:

- Temporary erosion and sediment control measures should be utilized to prevent soil erosion and the off-site release of sediments.
- A site-specific risk management plan developed based on the recommendations from the Tier 2 Risk Assessment completed by AECOM (2017) is required if project works disturb soils within the vicinity of the area of known historical contamination.
- Ensure compliance with all mitigation measures outlined in Section 6.2.4 that address vegetation clearing and the Corporate Tree Management Policy, including:
 - ♦ Prepare detailed naturalization or reclamation plans as part of the detailed design phase of the Gallagher Park Concept Plan.
 - ♦ Prepare and implement a Tree Protection Plan.
 - ♦ Prepare and implement a weed management plan, including weed control measures for any identified noxious or prohibited noxious weeds.
 - ♦ Initiate prompt revegetation of cleared areas.
- Ensure compliance with all federal and provincial requirements pertaining to wildlife including:
 - Avoid vegetation clearing during the breeding bird season (April 15th to August 31st).
 - If soil stockpiles are present, they should be contoured with angles less than 70 degrees to create unsuitable nesting/den conditions for burrowing birds or other wildlife.
 - If important habitats or species (protected under government legislation) are discovered, work should be postponed until a wildlife biologist can recommend a species appropriate buffer zone.
- Ensure compliance with ECO plan and other environmental regulations required under ENVISIO including but not limited to:
 - Development and implementation of site-specific temporary ESC measures;
 - Development and implementation of a spill mitigation and control plan and emergency response plan; and
 - Development and implementation of a hazardous waste management plan.

10. REFERENCES

- [AECOM] AECOM Canada Ltd. 2017. Tier 2 Risk Assessment: Muttart Conservatory/Gallagher Park. Edmonton (AB): AECOM Canada Ltd.
- [ACIMS] Alberta Conservation Information Management System. c2019. Alberta Conservation Information Management System (ACIMS). Edmonton (AB): Alberta Parks; [accessed 2019 Apr 24]. <https://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-acims/>.
- [AEP] Alberta Environment and Parks. c2020. Alberta Floods – Flood Hazard Maps. Edmonton (AB): Alberta Environment and Parks; [accessed 2019 Apr 24]. <https://floods.alberta.ca/>.
- [AEP] Alberta Environment and Parks. 2015. Alberta Wetland Classification System. Edmonton (AB): Alberta Environment and Parks, Water Policy Branch; [accessed 2020 Dec 17]. 66 p. <https://open.alberta.ca/dataset/92fbfbf5-62e1-49c7-aa13-8970a099f97d/resource/1e4372ca-b99c-4990-b4f5-dbac23424e3a/download/2015-Alberta-Wetland-Classification-System-June-01-2015.pdf>.
- Andriashek LD. 1988. Quaternary Stratigraphy of the Edmonton Map Area NTS 83H. Edmonton (AB): Terrain Sciences Department, Natural Resources Division, Alberta Research Council. Open File Report #198804.
- [ANPC] Alberta Native Plant Council. 2012. Alberta Native Plant Council (ANPC) Guidelines for Rare Vascular Plant Surveys in Alberta, 2012 Update. Edmonton (AB): Alberta Native Plant Council; [accessed 2020 Dec 17]. 25 p. <https://anpc.ab.ca/wp-content/uploads/2015/01/Guidelines-For-Rare-Plant-Surveys-in-AB-2012-Update.pdf>.
- Beier P, Brost B. 2010. Use of land facets to plan for climate change: conserving the arenas, not the actors. *Conservation Biology*. 24(3):701-10.
- City of Edmonton. 2020. Gallagher Park Concept Plan Design Report. September 2020 Draft.
- City of Edmonton. 2014. Urban primary land and vegetation inventory (uPLVI) interpretation manual. Greenlink Forestry Inc. 4th ed. Edmonton (AB): City of Edmonton; [accessed 2020 Dec 17]. 60 p. <https://data.edmonton.ca/Environmental-Services/uPLVI-Interpretation-Manual-October-2014/skyj-by77>.
- City of Edmonton. 2005a. Erosion and Sedimentation Guidelines.
- City of Edmonton. 2005b. Erosion and Sedimentation Field Manual.
- [FWMIS] Fisheries and Wildlife Management Information System. c2020. Fish and Wildlife Internet Mapping Tool - Public. Edmonton (AB): Alberta Environment and Parks; [accessed 2019 Apr 24]. https://maps.alberta.ca/FWIMT_Pub/Viewer/?TermsOfUseRequired=true&Viewer=FWIMT_Pub.
- [GoC] Government of Canada. c2018. General Nesting Periods of Migratory Birds. Ottawa (ON): Government of Canada, Environment and Natural Resources; [accessed 2020 Dec 11]. https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods.html#_04.
- Koen EL, Bowman J, Sadowski C, Walpole AA. 2014. Landscape connectivity for wildlife: development and validation of multispecies linkage maps. *Methods in Ecology and Evolution*. 5:626-633.
- LaPoint S, Gallery P, Wikelski M, Kays R. 2013. Animal behavior, cost-based corridor models and real corridors. *Landscape Ecology*. 28:1615-1630.

[Solstice] Solstice Canada Corp. 2019. Gallagher Park concept plan environmental overview. Edmonton (AB): Solstice Canada Corp.

[Solstice] Solstice Canada Corp. 2017. City of Edmonton Environmental Sensitivities Project Mapping and Analysis Methodology. Edmonton (AB): Solstice Canada Corp.

Spear SF, Balkenhol N, Fortin M-J, McRae BH, Scribner K. 2010. Use of resistance surfaces for landscape generic studies: considerations for parameterization and analysis. *Molecular Ecology*. 19:3576-3591.

[Spencer Environmental] Spencer Environmental Management Services Ltd. 2013. Valley Line-Stage 1 LRT Project Environmental Impact Screening Assessment. Edmonton (AB): Spencer Environmental Management Services Ltd., prepared for LRT D and C Transportation Services, City of Edmonton.

Thurber Engineering. 2012. Edmonton Southeast LRT Extension: Quarters to Connors Road: an Overall Appraisal of Geotechnical Conditions Along the LRT Alignment. Edmonton (AB): Thurber Engineering.

Zeller KA, McGarigal K, Whiteley AR. 2012. Estimating landscape resistance to movement: a review. *Landscape Ecology*. 27:777-797.

APPENDIX A. PLANT SPECIES LISTS COLLECTED DURING VEGETATION AND RARE PLANT FIELD SURVEYS

Table A1 Vegetation Sampling Plot Species List

Plot	Dominant Vegetation Community from PLUVI	Dominant Plant Species Present
P1	Maintained Grass (contains planted trees)	White Spruce (<i>Picea glauca</i>), Tamarack (<i>Larix spp</i>), Kentucky Bluegrass (<i>Poa pratensis</i>), Smooth Brome (<i>Bromus inermis</i>), Thickspike Wheatgrass (<i>Elymus lanceolatus</i>), Black Medick (<i>Medicago lupulina</i>), White Sweet-Clover (<i>Melilotus alba</i>), Tufted Vetch (<i>Vicia cracca</i>), Common Fireweed (<i>Chamerion angustifolium</i>), Common Dandelion (<i>Taraxacum officinale</i>), Alsike Clover (<i>Trifolium hybridum</i>), and Manitoba Maple (<i>Acer negundo</i>)
P2	Maintained Grass (contains planted trees)	White Spruce (<i>Picea glauca</i>), Tamarack (<i>Larix laricina</i>), Manitoba Maple (<i>Acer negundo</i>), Choke Cherry (<i>Prunus virginiana</i>) and High-bush Cranberry (<i>Viburnum opulus</i>)
P3	Forested– Trembling Aspen (Native)	Balsam Poplar (<i>Populus balsamifera</i>), Prickly Rose (<i>Rosa acicularis</i>), Red- Osier Dogwood (<i>Cornus stolonifera</i>), Beaked Hazelnut (<i>Corylus cornuta</i>), and Common Fireweed (<i>Chamerion angustifolium</i>)
P4	Forested– Trembling Aspen (Native)	Aspen (<i>Populus tremuloides</i>), Balsam Poplar (<i>Populus balsamifera</i>), Red-Osier Dogwood (<i>Cornus stolonifera</i>), Prickly Rose (<i>Rosa acicularis</i>), Common Fireweed (<i>Chamerion angustifolium</i>), and Lindley's Aster (<i>Symphyotrichum ciliolatum</i>)
P5	Forested– Trembling Aspen (Native)	Burr Oak (<i>Quercus macrocarpa</i>), Balsam Poplar (<i>Populus balsamifera</i>), Aspen (<i>Populus tremuloides</i>), Red-Osier Dogwood (<i>Cornus stolonifera</i>), Prickly Rose (<i>Rosa acicularis</i>), Snowberry (<i>Symphoricarpos albus</i>), Tufted Vetch (<i>Vicia cracca</i>), Northern Bedstraw (<i>Galium boreale</i>), Veiny Meadow Rue (<i>Thalictrum venulosum</i>), Common Fireweed (<i>Chamerion angustifolium</i>), Beaked Hazelnut (<i>Corylus cornuta</i>), and Lindley's Aster (<i>Symphyotrichum ciliolatum</i>)
P6	Forested– Trembling Aspen (Native)	Aspen (<i>Populus tremuloides</i>), White Birch (<i>Betula papyrifera</i>), Balsam Poplar (<i>Populus balsamifera</i>), Prickly Rose (<i>Rosa acicularis</i>), Beaked Hazelnut (<i>Corylus cornuta</i>), Wild Black Currant (<i>Ribes americanum</i>), Snowberry (<i>Symphoricarpos albus</i>), Northern Bedstraw (<i>Galium boreale</i>), Tufted Vetch (<i>Vicia cracca</i>), Kentucky Bluegrass (<i>Poa pratensis</i>), and Lindley's Aster (<i>Symphyotrichum ciliolatum</i>)
P7	Forested– Trembling Aspen (Native)	Balsam Poplar (<i>Populus balsamifera</i>), Manitoba Maple (<i>Acer negundo</i>), Prickly Rose (<i>Rosa acicularis</i>), Red-osier Dogwood (<i>Cornus stolonifera</i>), Creeping Thistle (<i>Cirsium arvense</i>), and Star-Flowered Solomon's-Seal (<i>Maianthemum stellatum</i>)
P8	Forested– Trembling Aspen (Native)	Trembling Aspen (<i>Populus tremuloides</i>), Balsam Poplar (<i>Populus balsamifera</i>), and Manitoba Maple (<i>Acer negundo</i>), Star-Flowered Solomon's-Seal (<i>Maianthemum stellatum</i>), Kentucky Bluegrass (<i>Poa pratensis</i>), and a Cherry spp.
P9	Maintained Grass (contains planted trees)	Balsam Poplar (<i>Populus balsamifera</i>), Kentucky Bluegrass (<i>Poa pratensis ssp. pratensis</i>), Common Horsetail (<i>Equisetum arvense</i>), and Tufted Vetch (<i>Vicia cracca</i>)
P10	Maintained Grass (Seepage/wetland area)	Common Plantain (<i>Plantago major</i>), Black Medick (<i>Medicago lupulina</i>), Common Cattail (<i>Typha latifolia</i>), Grass spp., Sedge spp. (<i>Carex spp.</i>), Small-Flowered Buttercup (<i>Ranunculus abortivus</i>), Celery-Leaved Buttercup (<i>Ranunculus sceleratus</i>)
P11	Maintained Grass	Manicured grass and common dandelion (<i>Taraxacum officinale</i>)

Table A2: List of Plant Species Found During Gallagher Park Concept Plan Environmental Overview

Type	Latin Name	Common Name	Origin	Status (ACIMS/Weed Act)
Forb	<i>Actaea rubra</i>	red and white baneberry	native	S5
Forb	<i>Anemone virginiana</i> var. <i>cylindroidea</i>	tall anemone	native	S3
Forb	<i>Aralia nudicaulis</i>	wild sarsaparilla	native	S5
Forb	<i>Arctium tomentosum</i>	woolly burdock	exotic	noxious
Forb	<i>Campanula rotundifolia</i>	bluebell	native	S5
Forb	<i>Chamerion angustifolium</i>	Fireweed	native	S5
Forb	<i>Circaea alpina</i>	small enchanter's nightshade	native	S4
Forb	<i>Cirsium arvense</i>	Canada thistle	exotic	noxious
Forb	<i>Galeopsis tetrahit</i>	Hemp nettle	exotic	SNA
Forb	<i>Galium boreale</i>	northern bedstraw	native	S5
Forb	<i>Galium triflorum</i>	sweet-scented bedstraw	native	S5
Forb	<i>Hackelia deflexa</i> var. <i>americana</i>	nodding stickseed	native	S3
Forb	<i>Heracleum maximum</i>	cow parsnip	native	S5
Forb	<i>Impatiens capensis</i>	spotted touch-me-not	native	S4
Forb	<i>Maianthemum stellatum</i>	star-flowered Solomon's-seal	native	S5
Forb	<i>Medicago sativa</i>	alfalfa	exotic	SNA
Forb	<i>Mertensia paniculata</i>	tall lungwort	native	SNA
Forb	<i>Mellilotus alba</i>	white sweet-clover	exotic	SNA
Forb	<i>Mellilotus officinalis</i>	yellow sweet-clover	exotic	SNA
Forb	<i>Osmorhiza longistylis</i>	smooth sweet cicely	native	S3
Forb	<i>Plantago major</i>	common plantain	exotic	SNA
Forb	<i>Prosartes trachycarpa</i>	fairybells	native	S5
Forb	<i>Rubus pubescens</i>	dewberry	native	S5
Forb	<i>Sanicula marilandica</i>	snakeroot	native	S4S5
Forb	<i>Sonchus</i> sp.	sowthistle	exotic	SNA
Forb	<i>Taraxacum officinale</i>	common dandelion	exotic	SNA
Forb	<i>Thalictrum venulosum</i>	veiny meadow rue	native	S5
Forb	<i>Trifolium hybridum</i>	alsike clover	exotic	SNA
Forb	<i>Urtica dioica</i>	stinging nettle	native	S5
Forb	<i>Vicia cracca</i>	tufted vetch	exotic	SNA
Forb	<i>Viola canadensis</i> var. <i>rugulosa</i>	western Canada violet	native	S5
grass	<i>Bromus inermis</i>	smooth brome	exotic	SNA
grass	<i>Poa pratensis</i>	Kentucky bluegrass	native	S5
pteridophyte	<i>Equisetum arvense</i>	common horsetail	native	S5
pteridophyte	<i>Gymnocarpium dryopteris</i>	oak fern	native	S5
shrub	<i>Amelanchier alnifolia</i>	Saskatoon	native	S5
shrub	<i>Caragana arborescens</i>	common caragana	exotic	SNA
shrub	<i>Cornus stolonifera</i>	red osier dogwood	native	S5
shrub	<i>Corylus cornuta</i>	beaked hazelnut	native	S5
shrub	<i>Cotoneaster lucidus</i>	Peking cotoneaster	exotic	SNA
shrub	<i>Prunus virginiana</i>	chokecherry	native	S5
shrub	<i>Ribes americanum</i>	wild black currant	native	S4
shrub	<i>Rosa acicularis</i>	prickly rose	native	S5
shrub	<i>Rubus idaeus</i>	wild red raspberry	native	S5
shrub	<i>Sambucus racemosa</i>	elderberry	native	S4
shrub	<i>Shepherdia canadensis</i>	Canada buffaloberry	native	S5
shrub	<i>Symphoricarpos albus</i>	snowberry	native	S5
shrub	<i>Symphoricarpos occidentalis</i>	buckbrush	native	S5
shrub	<i>Viburnum edule</i>	low-bush cranberry	native	S5
shrub	<i>Viburnum opulus</i>	high-bush cranberry	native	S3S4
tree	<i>Acer negundo</i>	Manitoba maple	native	SU
tree	<i>Betula papyrifera</i>	white birch	native	S5?
tree	<i>Picea glauca</i>	white spruce	native	S5
tree	<i>Pinus banksiana</i>	Jack pine	native	S5
tree	<i>Populus balsamifera</i>	balsam poplar	native	S5
tree	<i>Quercus macrocarpa</i>	burr oak	unknown/ undetermined	SNA
tree	<i>Sorbus aucuparia</i>	European mountain-ash	exotic	SNA
tree	<i>Ulmus americana</i>	American elm	exotic	SNA

Note: Plants meeting the requirements of rarity (ACIMS subnational ranking of S1, S2, or S3) are highlighted bold font

APPENDIX B. REPRESENTATIVE SITE PHOTOGRAPHS



Photo 1: View of planted trees within the Maintained Grass vegetation community (Plot 1).



Photo 2: View of the remnant Forested– Trembling Aspen (Native) stand along Gallagher Hill near the Edmonton Ski Club (Plot 3).



Photo 3: View of the remnant Forested– Trembling Aspen (Native) stand along Gallagher Hill near the Edmonton Ski Club (Plot 4).



Photo 4: View of the remnant Forested– Trembling Aspen (Native) stand along Gallagher Hill near the Edmonton Ski Club (Plot 5).



Photo 5: View of the remnant Forested– Trembling Aspen (Native) stand along Gallagher Hill near the Edmonton Ski Club (Plot 6).



Photo 6: View of the western segment of the remnant Forested– Trembling Aspen (Native) stand along 96 Ave that is to be removed (Plot 7).



Photo 7: View of the eastern segment of the remnant Forested– Trembling Aspen (Native) stand along 96 Ave that is to be retained (Plot 8)



Photo 8: View of the Temporary wetland feature formed in the seepage area within the Maintained Grass vegetation community (Plot 10)



Photo 9: View of the highly manicured Maintained Grass vegetation community (Plot 11).

Appendix C

Site Location Study



GALLAGHER PARK CONCEPT PLAN SITE LOCATION STUDY

Prepared for:

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SIGNATURES

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TABLE OF CONTENTS

Signatures	i
Disclaimer.....	i
1. Introduction.....	1
1.1. Background and Scope.....	1
1.2. Site Description	1
1.3. Project Description (Concept Plan).....	3
1.4. Concept Plan Alternatives.....	3
2. Opportunities and Constraints Analysis	4
3. Conclusions.....	5

LIST OF TABLES

TABLE 1. Opportunities and Constraints Analysis – Gallagher Park Concept Plan Alternatives.....	6
--	---

LIST OF FIGURES

FIGURE 1. Study Area Location	2
--	---

1. INTRODUCTION

1.1. BACKGROUND AND SCOPE

Solstice Canada Corp. (Solstice) was retained by IBI Group to prepare a Site Location Study (SLS) for the Gallagher Park Concept Plan.

The City of Edmonton has approved the creation of a Gallagher Park Concept Plan to identify potential improvements to infrastructure, site servicing, landscape and programming. The Concept Plan establishes a new vision for Gallagher Park, building on its location within the river valley park system, and various recreational and cultural uses promoted through the Folk Music Festival, the Edmonton Ski Club, the Muttart Conservatory, and the Cloverdale Community League. Due to the multiple parties involved and the importance of the connectivity of the river parks system, a 20-year Concept Plan was approved to guide the development, preservation, and appreciation of Gallagher Park.

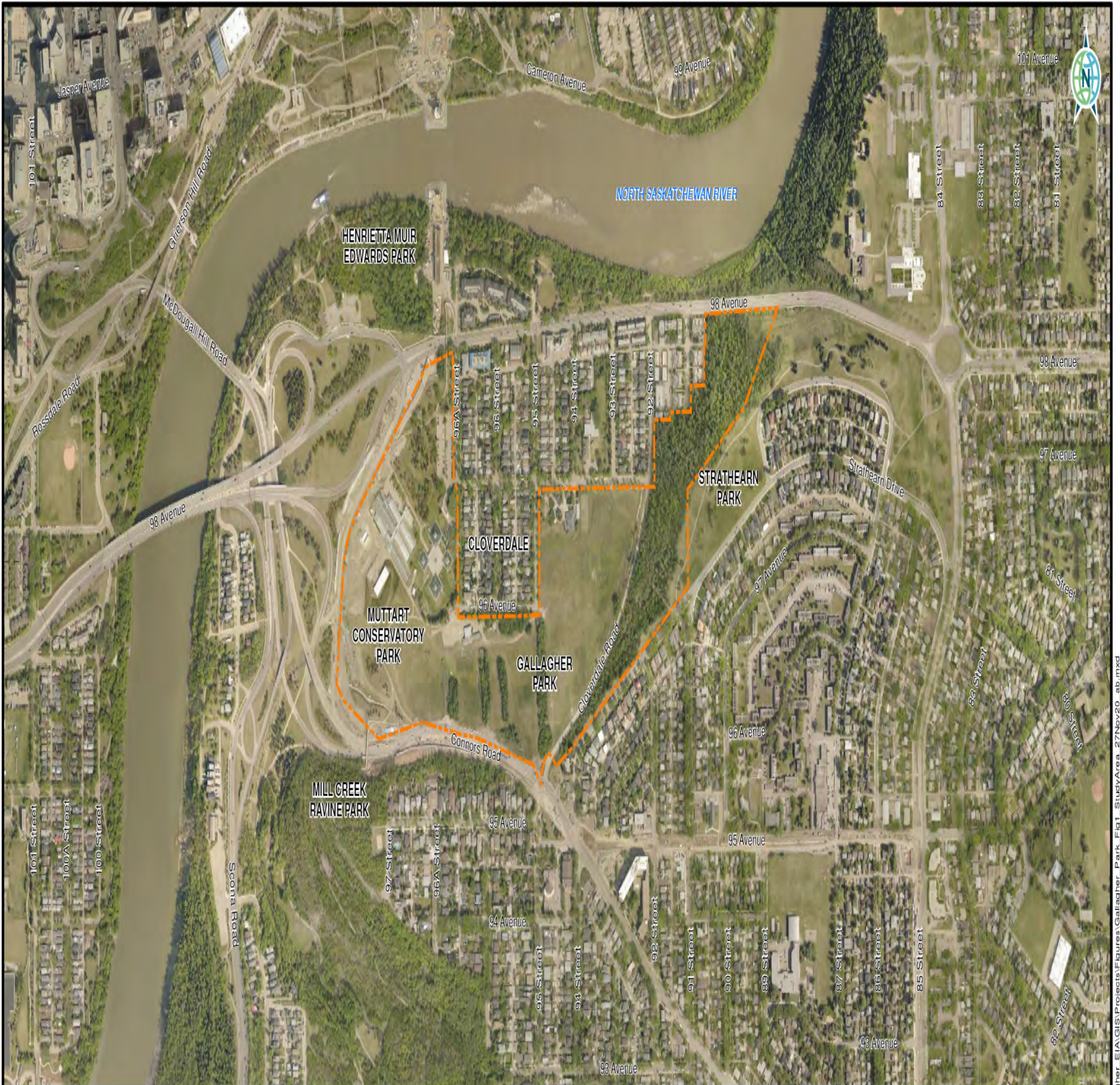
As Gallagher Park falls within the North Saskatchewan River Valley Area Redevelopment Plan (NSRV ARP) it is subject to Bylaw 7188. As such, the City of Edmonton has requested that an SLS and an Environmental Impact Assessment (EIA) be completed for the Gallagher Park Concept Plan. The scope of the SLS includes an assessment of financial, social, environmental and institutional constraints and opportunities to provide justification and rationale for any projects being undertaken in the NSRV ARP and considerations for alternative locations, if applicable. This report presents the results of the SLS, which has been developed in conjunction with the Gallagher Park Concept Plan EIA that was prepared by Solstice and has been submitted under a separate cover. Additional design details and alternatives associated with the Gallagher Park Concept Plan are discussed in the accompanying EIA and Concept Plan documents.

1.2. SITE DESCRIPTION

The Gallagher Park Concept Plan study area encompasses all of Gallagher Park and much of the treed area of Strathearn Park. Gallagher Park is located near downtown Edmonton, just south of the Cloverdale neighbourhood and is bordered by 98th Avenue to the north, Connors Road to the south, and Cloverdale Hill Road to the east (Figure 1). Gallagher Park is owned by the City of Edmonton and functions as a City level park.

It has for decades provided for recreational and cultural activities that are managed by the Edmonton Folk Music Festival, the Edmonton Ski Club, the Muttart Conservatory, and the Cloverdale Community League. Folk Festival and Ski Club activities are linked to the site due to its landform and landscape, particularly the steep north facing grassed slopes that are ideal for skiing and outdoor concerts. The Muttart Conservatory is a City managed facility that attracts visitors from the region. The Cloverdale Community League provides recreation and community-focused activities for the local neighbourhood.

Gallagher Park's landscape encompasses a large open tract of maintained grass along its southern slopes, with occasional pockets of planted and natural tree stands. The largest tract of undisturbed native tree stands is located in Strathearn Park, along the northwesterly facing slope that forms a natural study boundary on the east side of Gallagher Park. Given the proximity to the North Saskatchewan River and Mill Creek Ravine and presence of undisturbed treed stands, wildlife use and movement through the Gallagher Park area is considered high. Several environmental studies have been completed in the Gallagher Park area over the past number of years which have characterized the ecological conditions of this area and this information is described in detail in the accompanying EIA.



LEGEND

 Concept Plan Study Area (31.3 ha)



**CITY OF EDMONTON
GALLAGHER HILL EIA
STUDY AREA LOCATION**

DATE: NOVEMBER 27, 2020 PROJECTION: 3TM 114 DATUM: NAD83

PROJECT CODE: 18-4131-25

SCALE: 1:7,500

FIGURE 1



SOURCES:
ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AERGRID, IGN, AND THE GIS USER COMMUNITY.

1.3. PROJECT DESCRIPTION (CONCEPT PLAN)

The intent of the 20-year Concept Plan is to guide the development, preservation, and appreciation of Gallagher Park through facilitating enhanced access to the park by providing facilities and infrastructure to support existing recreation, while enhancing the ecological values of the park. As such, the proposed Concept Plan design is dependent on the river valley and must occur within the NSRV ARP in order to meet the objectives of the plan.

The preparation of the Concept Plan for Gallagher Park was an iterative approach that took into consideration summer and winter use of the site, stakeholder objectives and site opportunities and constraints, as well as public input compiled from several open house and on-line public engagement events. Based on public and stakeholder feedback, these various enhancement options were combined into a preferred Concept Plan design that involves minimal changes to the existing conditions that are present at Gallagher Park. The focus of the preferred Concept Plan design is on enhancing pedestrian access (e.g., trails and sidewalks), site amenities (e.g., washroom facilities, lighting, wayfinding, and seating areas) and use of the park, while enhancing the ecological nature of the park through the addition of new naturalized landscape areas.

The unique setting and landform of Gallagher Park, particularly the steep north facing grassed slopes are an integral feature that forms the backdrop for many recreational activities including active and passive recreation (e.g. picnicking, hiking, biking), as well as skiing and outdoor concerts. Upgrades to the park are required partially due to the imminent opening of an LRT station adjoining the park. This will be the only location in the river valley that has access by LRT, and this is expected to increase visitation to the park and will specifically require improved infrastructure for pedestrian circulation throughout the park.

The proposed Concept Plan only provides a high-level overview of proposed enhancements to Gallagher Park, thus no specific information on preliminary or detailed design was provided. Potential environmental impacts associated with various project components related to the preferred Concept Plan design carried forward within the Gallagher Park Concept Plan are assessed in the EIA. A summary of recommended mitigation measures that address any potential negative environmental impacts that can be implemented as part of planning processes and controls during future construction of the preferred Concept Plan design are also included in the accompanying EIA.

1.4. CONCEPT PLAN ALTERNATIVES

As part of the project concept plan development, several different enhancement scenarios were considered including:

1. Enhancement Option 1: Landscaping enhancements – ornamental plantings vs naturalized landscape. Landscaping options included either a primarily naturalized or primarily ornamental landscape for the park.
2. Enhancement Option 2: Pathways – sidewalk versus shared use pathway. Options for pathways through the park included either a sidewalk along the east side of 95 street or a shared use pathway through the park.
3. Enhancement Option 3: Amenities - skiing upgrades versus staircase and sledding area. Options for winter use of the east side of the park included a reduced sledding area and an expanded downhill skiing area or a staircase and a larger sledding area
4. Enhancement Option 4: Vehicle access – access from 96A Street versus from the west (98 Ave). Options for vehicle access to the existing ski club parking area included maintaining access from 96 A street or providing a new access from the LRT crossing from the West.

2. OPPORTUNITIES AND CONSTRAINTS ANALYSIS

Table 1 summarized the financial, social, environmental and institutional opportunities and constraints of the proposed Gallagher Park Concept Plan design and alternatives that were considered. The table is structured to allow for comparisons between the options associated with each type of proposed enhancement activity. Though financial opportunities and constraints were a consideration in the preferred Concept Plan design, the primary drivers were social and environmental constraints. City of Edmonton institutional policies and bylaws that regulate and guide development activities North Saskatchewan River Valley system, which have been instituted to protect Edmonton's natural features from increasing development pressures, were also a key consideration. These are discussed in detail in both the accompanying EIA and Concept Plan documents.

Although various enhancement options were considered, the preferred Concept Plan design opted for the following options:

- **Naturalized landscape** – has the highest ecological and social benefits, with the lowest financial costs and adheres to the City of Edmonton institutional policies and bylaws that regulate and guide development activities North Saskatchewan River Valley system.
- **Sidewalk and Shared Use Pathway** – both options enhance accessibility to the site. Both adhere to the City of Edmonton institutional policies and bylaws that regulate and guide development activities within the North Saskatchewan River Valley system and other overarching policy documents. The SUP has higher social benefit in terms of providing access through the park, with some financial and environmental constraints. The implementation of the SUP is constrained by the current groundwater seepage in that area of the park and therefore cannot be implemented until the seepage is resolved. Due to this, implementation of the sidewalk as part of Phase 1 improvements and implementation of the SUP as part of later improvements is the best solution to improving access in the short term.
- **Staircase and larger sledding area** – has the least environmental impact as it does not require clearing of native treed stands or regrading of the site. However, it will require capital funding from the City of Edmonton, but unlike the ski hill improvements is not depended on external funding. Will improve pedestrian access and adheres to City of Edmonton institutional policies and bylaws that regulate and guide development activities North Saskatchewan River Valley system, along with accessibility and recreation objectives. The constraint to implementing the staircase and larger sledding area is that they are within the current license area of the Ski Club, and thus cannot be implemented without an amendment to the license area. In the short term, this area may need to remain unchanged until plans for the Ski Club license area are revisited.
- **Upgraded vehicle access from the west (98 Ave)** – has a moderate capital cost as requires constructing new road, which will result in some environmental impacts. However, alternative access will reduce vehicle movement through Cloverdale neighbourhood and also provide an alternate means of emergency exit from the site. Adheres to City of Edmonton institutional policies and bylaws that regulate and guide development activities North Saskatchewan River Valley system, along with accessibility objectives.

3. CONCLUSIONS

This SLS was conducted pursuant to the NSRV ARP (Bylaw 7188) to evaluate the proposed enhancements to improvements to infrastructure, site servicing, landscape and programming outlined in the Gallagher Park Concept Plan. As the Concept Plan was primarily driven through public and stakeholder engagement, feedback on these various enhancement options from engagement sessions were combined into a preferred Concept Plan design that involves minimal changes to the existing conditions that are present at Gallagher Park. Thus, the end result is a preferred Concept Plan design that is focused on enhancing pedestrian access, site amenities (e.g., washroom facilities, lighting, wayfinding, seating areas) and use of the park, with minimal disturbance to the existing environment. As such, the preferred Concept Plan design is expected to have a minimal effect on environmental resources and is expected to result in a net positive impact to both vegetation and wildlife components through the establishment of new naturalized areas that will increase both local biodiversity and wildlife habitat. In that regard, the recommendation of this SLS is that the proposed preferred Concept Plan design proceed as planned.

TABLE 1. Opportunities and Constraints Analysis – Gallagher Park Concept Plan Alternatives

Enhancement Option 1: Landscaping		
	1a: Ornamental plantings	1b: Naturalized Landscape
Financial	Requires moderate capital and maintenance costs for construction and upkeep of ornamental plants.	Requires low capital and maintenance costs (native plants require less long-term maintenance).
Social	Provides aesthetic benefits (e.g., showy flowering plants).	Provides nature appreciation benefits. Opportunity to showcase natural landscapes and highlight importance of maintaining natural ecosystems in terms of biodiversity; wildlife habitat and other ecosystem services. Opportunity for educational engagement on City's environmental programs.
Environmental	Plantings would be located in maintained grass areas and require minimal disturbance, so no impacts to native vegetation anticipated. Fewer environmental benefits in terms of local biodiversity. Provides lower wildlife habitat value.	Plantings would be located in maintained grass areas and requires minimal disturbance, so no impacts to native vegetation anticipated. Increases local biodiversity, including providing microhabitats for pollinators such as native bees and butterflies and other insects. Increases wildlife habitat and connectivity through the North Saskatchewan River Valley and ravine system. However, with increased wildlife use there is potential to create a mortality sink at Conner's Road, though this risk will in part be alleviated through the wildlife crossing being constructed as part of the Valley Line LRT. The recommendation for naturalization is to consider grassland or low shrubland along the top of slope near Connors Road to minimize risk of encouraging wildlife crossing of the road.
Institutional	Satisfies City objectives for tree canopy coverage.	Satisfies City objectives for tree canopy coverage and increase in habitat for wildlife.

Enhancement Option 2: Pathways		
2a: Sidewalk along the east side of 95 street		2b: Shared use pathway through the park
Financial	Requires moderate capital costs.	Requires moderate capital costs.
Social	Provides access along edge of park to play area.	Provides access through the park to community league building and east side of park.
Environmental	<p>Minimal environmental impact is anticipated, with minimal to no impacts to most Valued Ecosystem Components.</p> <p>Sidewalk is in areas that is in an area that is already highly disturbed by current park use.</p> <p>Minimal impacts to wildlife habitat are anticipated, as no clearing of native vegetation required.</p>	<p>Minimal environmental impact is anticipated, with minimal to no impacts to most Valued Ecosystem Components.</p> <p>Minor grading, and cut and fill will be required for some segments of the multi-use pathway system, which will result in permanent soil disturbance. Temporary impacts to soil substrate may occur due to wind or water erosion of exposed soil, as well as through admixing of topsoil and subsoil during earthworks.</p> <p>Multi-use pathway is primarily situated in areas that are already highly disturbed by current park use.</p> <p>Portion of proposed multi-use pathway may be affected by groundwater seepage area. While proposed location of multi-use pathway location avoids the wetland area, if this area is determined to be a naturally occurring wetland feature and is impacted by construction activities, a provincial <i>Water Act</i> approval application and a Wetland Assessment and Impact Report, including a wetland mitigation and replacement plan will be required to meet Alberta Wetland Policy requirements.</p> <p>Minimal impacts to wildlife habitat are anticipated, as minimal to no clearing of native vegetation required.</p>
Institutional	Satisfies City accessibility objectives.	Satisfies City accessibility objectives.

Enhancement Option 3: Amenities		
	3a: Skiing infrastructure upgrades	3b: Staircase and larger sledding area
Financial	Requires capital funding dependant on Ski Club.	Requires capital funding by City.
Social	Provides a better recreation facility for skiers.	Provides a better recreation facility for sledding and better pedestrian access up and down the hill.
Environmental	<p>Moderate environmental impact anticipated as upgrades would require removal of a native aspen stand along the slope and regrading. Thus, loss of native vegetation and wildlife habitat would result in a low to moderate impact to these Valued Ecosystem Components.</p> <p>Potential to impact rare plants as populations of yellow lady slipper (<i>Cypripedium parviflorum</i>) were identified in some of these remnant aspen stands.</p> <p>Site regrading would result in low to moderate impacts to soils, with an increased risk of soil erosion and sedimentation due to construction works taking place along the slope face.</p>	<p>Minimal environmental impact as location is currently grassed. Staircase would be located in maintained grass areas, thus negligible impacts to native vegetation or wildlife habitat anticipated. However, staircase cannot be built in current proposed location unless ski club license area is modified.</p> <p>Impacts to soils are expected to be low and are primarily associated with erosion and sedimentation risk.</p>
Institutional	Satisfies City recreation objectives.	Satisfies City accessibility and recreation objectives.

Enhancement Option 4: Vehicle access		
	4a: Existing vehicle access from 96A Street	4b: Upgraded vehicle access from the west (98 Ave)
Financial	Requires low capital costs as much of the road access infrastructure is existing.	Requires moderate capital costs as a new portion of road would need to be constructed.
Social	No changes anticipated.	Provides an alternative access to the west side of the park, specifically access to the ski club. Opportunity to potentially reduce vehicle movement through Cloverdale neighbourhood.
Environmental	No impact to the environment anticipated as road infrastructure already exists.	Low to Moderate environmental impact. Requires new construction and some disturbance to the existing landscape including areas along the edge of the contaminated area. Disruption of these contaminated soils could result in impacts to surrounding vegetation and surface water and groundwater receptors, if not managed appropriately. As such, there is a low to moderate environmental impact if contaminated soils are disturbed. All loss or alteration of plant communities will occur in the Maintained Grass vegetation type, with permanent multi-use pathway features primarily situated in areas that are already highly disturbed by current park use. Minimal impacts to wildlife habitat are anticipated, as no clearing of native vegetation required.
Institutional	No changes anticipated; meets all current applicable City of Edmonton policies and bylaws.	Satisfies City accessibility objectives.

Appendix D

Public Engagement Results/ Summary



GALLAGHER PARK CONCEPT PLAN WHAT WE HEARD REPORT

PHASE 3: DRAFT PREFERRED
CONCEPT PLAN

DECEMBER 2020

Photo Credit: Mack Male, mastermaq.ca

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Table of Contents

Project Overview and Purpose	1
Project Engagement Plan	3
Phase 1 – What We Heard and Observed.....	4
Phase 2 – What We Heard and Observed.....	6
Phase 3 Engagement - Draft Preferred Concept Plan.....	8
Going Forward.....	15

Project Overview and Purpose

Gallagher Park has always been a cherished and well-used space in Edmonton. This location was traditionally used as a gathering spot and place of commerce by indigenous people and new settlers.



It now provides walking, cycling and commuter access to river valley and ravine trails, as well as the downtown core. As a River Valley Park, its environmental assets are protected and with careful planning, enhanced for the enjoyment of both Edmontonians and visitors. Spectacular views from the park are some of the best the city has to offer.



The purpose of the Gallagher Park Concept Plan project is to ensure a long-term strategic approach for the development and use of Gallagher Park, that takes into account its site partners' attractions and programming, through the development of a 20-year plan. We want to improve the experience for those who visit and enjoy the park. As we build the 20-year concept plan, we will take into consideration existing plans and policies, opportunities and constraints and the preferences of Edmontonians.

Site History

Gallagher Park is at the centre of Edmonton's history:

- Indigenous settlements were common along the North Saskatchewan River.
- The Cloverdale Community League was established in 1920.
- The park has been home to the Edmonton Ski Club since 1922.
- The Muttart Conservatory opened in Gallagher Park in 1976.
- The internationally renowned Edmonton Folk Music Festival has entertained crowds in Gallagher Park since 1981.

Gallagher Park will see another milestone in 2021 when the first LRT station in the river valley opens adjacent to the park, allowing more Edmontonians access to the river valley park system.



Project Engagement Plan

Preparation of the Concept Plan was composed of three phases of investigation and public engagement.

The role of the public in the first two phases of engagement was to work with the City to **Refine** – involving the public to adapt and adjust the approach to the Concept Plan and the resulting services to be provided.

The role of the public in Phase 3 was to work with the City to **Advise** on the further refinement of the draft preferred Concept Plan as we moved towards a final draft Concept Plan.

PHASE 1

Idea Gathering, Vision and Guiding Principles.

OBJECTIVES

To gather ideas on the breadth of public uses, stakeholder objectives, site opportunities and constraints and to gather feedback on the proposed vision and guiding principles for development to a proposed vision and guiding principles for development of the Concept Plan.

PHASE 2

Concept Plan Development.

OBJECTIVES

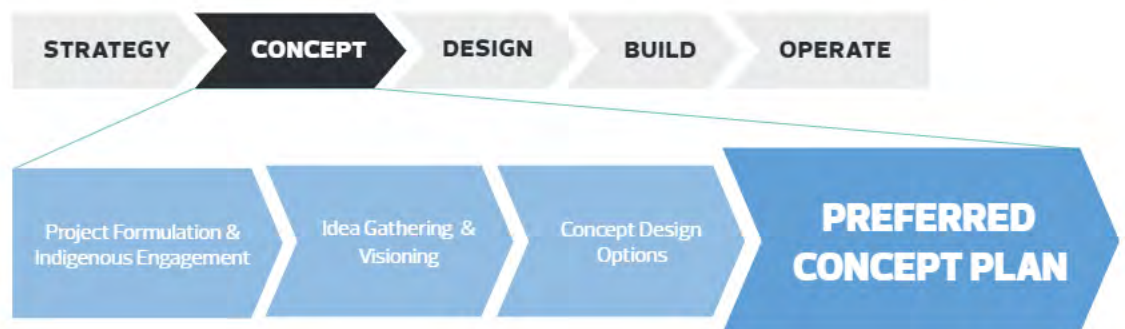
To develop Concept Plan options for consideration, including summer and winter overlays, and recommendations for all-season programming and site improvements.

PHASE 3

Draft Preferred Concept Plan.

OBJECTIVES To present a draft Concept Plan for public review and feedback.

The image below identifies the phase of this project that this report addresses.



Phase 1 – What We Heard and Observed

Phase 1 Engagement: Gathering Ideas and Development of a Vision Statement and Guiding Principles

To engage with citizens in the first phase of development of this concept plan, the City of Edmonton hosted an engagement event on March 6, 2019 at the Cloverdale Community Hall.

The focus of this event was to gather input from the public on the proposed draft vision and guiding principles for the project and hear additional ideas that would assist in the development of draft concept plan alternatives.

Input was obtained from site partners including Cloverdale Community League, Edmonton Folk Music Festival, Edmonton Ski Club, Muttart Conservatory and other external stakeholders such as the Bennett Centre, as well as from the public and stakeholders as summarized in the What We Heard Report from Phase 1 of the project.

Vision Statement and Guiding Principles

OUR VISION

Gallagher Park, the only river valley park that will be accessible by LRT, is a hub for distinctive year round recreational experiences and is integrated into the thriving city core and river valley system.

The **Guiding Principles** are to:

- Facilitate enhanced access to both active and passive recreational activities.
- Enhance the ecological values of the park.
- Provide facilities and infrastructure that support and enhance existing recreation and complimentary uses.
- Encourage LRT and active transportation access to the park and its activities.

Participants and respondents in the Phase 1 Engagement were very supportive of the proposed vision and guiding principles and in agreement with the various components. There was strong support for access by LRT, encouraging active transportation modes, access for persons with disabilities and support for enhancing the ecological values of the park.

Major Themes from Phase 1

In addition to support for the proposed guiding principles, participants in Phase 1 engagement also identified the following as important considerations in the development of the concept plan alternatives for Gallagher Park:

- Amenities (e.g. washrooms, seating).
- Safety and security (e.g. park lighting, control of vehicle access).
- Access and accessibility (e.g. pathways, enhanced pedestrian entrances).
- Recreational activities (e.g. walkways, picnicking).
- Environment and heritage (e.g. planting).

The image below shows how these five major themes related to the three categories of Ecology, Wellness and Celebration as outlined in the City's open space strategy – Breathe.



Phase 2 – What We Heard and Observed

Phase 2 Engagement: Concept Plan Development

To engage citizens in the second phase of development of this Concept Plan, the City of Edmonton hosted an engagement event on September 18, 2019 at the Cloverdale Community Hall from 4:30–7:30 PM.

The focus of this event was to gather input from the public on a series of proposed enhancements to the park addressing access, amenities, safety, activities, environment and partner opportunities and some optional enhancements in relation to landscaping, pathways, vehicle access and winter sports.

Input was obtained from site partners including Cloverdale Community League, Edmonton Folk Music Festival, Edmonton Ski Club, Muttart Conservatory and other external stakeholders such as the Bennett Centre, as well as from the public as summarized in the What We Heard Report from Phase 2 of the project.

A total of 686 participants attended the event in-person and/or completed the online survey. Almost 90% of participants had previously visited the park and identified that visiting the Muttart Conservatory was the most common reason they visited the park.

A series of enhancements were proposed for summer and winter uses. These included both enhancements that the City could fund and others that could be funded by the site partners. Overall, the proposed enhancements that received the greatest average rating with high support were:

- **Public washrooms.**
- **Additional park lighting.**
- **More pathways for walking, running and cycling.**
- **Better access and signage for walking trails.**
- **Enhanced entrances to the park with seating, bike racks and lighting.**
- **Vehicle barriers and vehicle access controls.**

Design options were presented to gather feedback on public preference for four enhancements related to:

- Landscaping.
- Pathway alignment near the community league area.
- Vehicle access.
- Ski hill upgrades versus a larger sledding area and staircase.

The participants preferred:

- Naturalized landscaping.
- A shared-use pathway through the park.
- A staircase and larger sledding area.
- Vehicle access from the west through the park.

Although the shared-use path was the preferred option, this is constrained by current drainage problems that need to be addressed before the path can be constructed. The staircase and larger sledding area was also preferred; however, this is constrained by the Ski Club's lease area and cannot currently be accommodated. There was equal support to retain the existing vehicular access point through the community and support for the proposed west access: the latter was only stronger by 1%.

Phase 3 Engagement – Draft Preferred Concept Plan

The goal for this phase of the project was to present the draft preferred concept plan for review.

What We Did

To engage citizens in the third phase of the draft preferred Concept Plan, the City of Edmonton hosted an online engagement event from August 17, 2020 to September 15, 2020 through engaged.edmonton.ca.

The focus of this event was to secure final input from the public on the draft preferred Concept Plan. The public engagement plan originally intended this event to be an in-person public open house in April 2020, similar to the event held in Phase 2. Due to the COVID-19 pandemic and the guidelines around physical distancing, the City postponed all in-person events. As a result, Phase 3 Engagement for Gallagher Park was completed online using the engaged.edmonton platform and the following information was provided:

- Background information for the project and the project stages, including public engagement progress through to Phase 3.
- A pre-recorded presentation included: background information, current project status, draft Concept Plan, downloadable presentation slides and transcript.
- The draft preferred Concept Plan, zoom-in key features the recommended historical signage plan, and previous engagement materials and feedback from Phases 1 and 2.

Participants who visited the webpage were invited to review the materials listed above and share their feedback through a comment box.

Participants were notified of the online engagement event via postcards delivered to Cloverdale community residents, onsite signage and e-invites to the City of Edmonton's Insight Community.

The engagement event was initially scheduled to close on September 7, 2020; but was extended by one week to September 15, 2020 due to the amount of feedback received. Postcards were delivered to Cloverdale community residents advising them of the extension.

Participation

The following is a summary of the number of participants who viewed the online engagement event as reported by engaged.edmonton.ca. There were a total of 494 page views as described below:

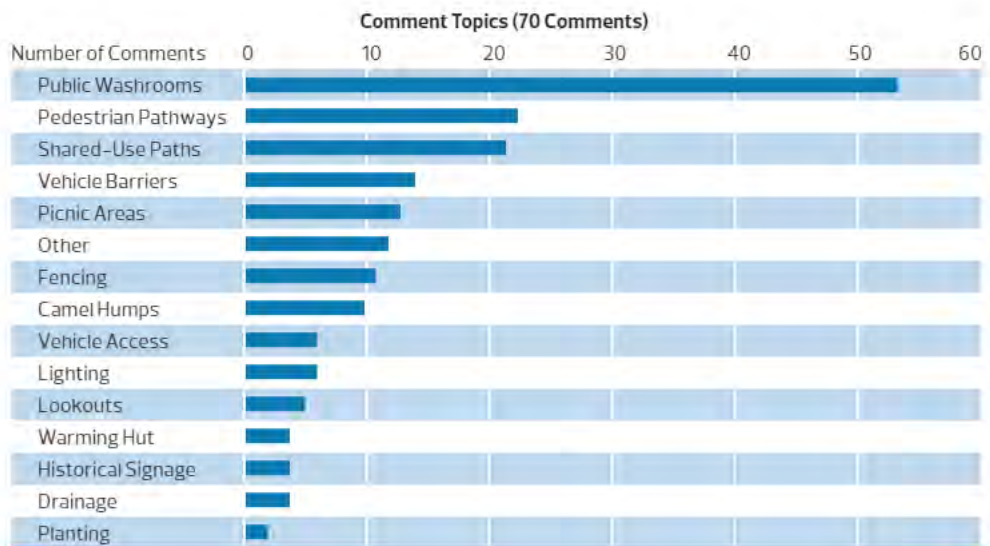
- 223 navigated the page including viewing a video, downloading a document, visiting the FAQ page or posting a comment (this includes 63 viewers who left at least one comment).
- 271 participants chose to view the page only without reviewing the attachments or commenting.
- Feedback was collected through comments; therefore, the opinions of those who viewed the page but did not leave a comment, is unknown.

A total of 70 comments were received.

The Overall Draft Concept was the most downloaded at 123 downloads, followed by the Presentation Slides at 43 and Presentation Script at 18.

Feedback

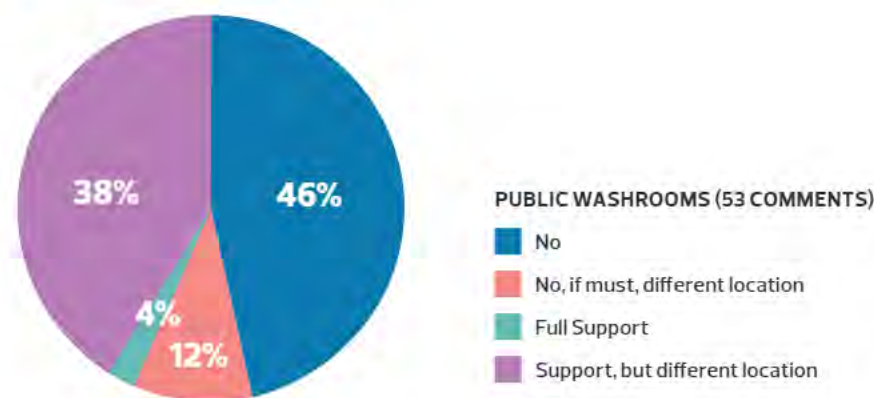
The 70 comments covered approximately 15 topics, with nine comments generally supportive of the plan. The 15 topics covered in the comments are shown in the chart below:



Most comments received were about the proposed public washrooms and their location. Of the 53 comments on the public washrooms:

- 46% (or 24 comments) were completely opposed to them.
- 38% (or 20 comments) were supportive of the idea, but suggested other locations.
- 12% (six comments) preferred no washrooms at all, but acknowledged that, if they are required, other locations in the park were preferred.
- 4% (two comments) fully supported the public washrooms in their proposed location.

Public Washrooms



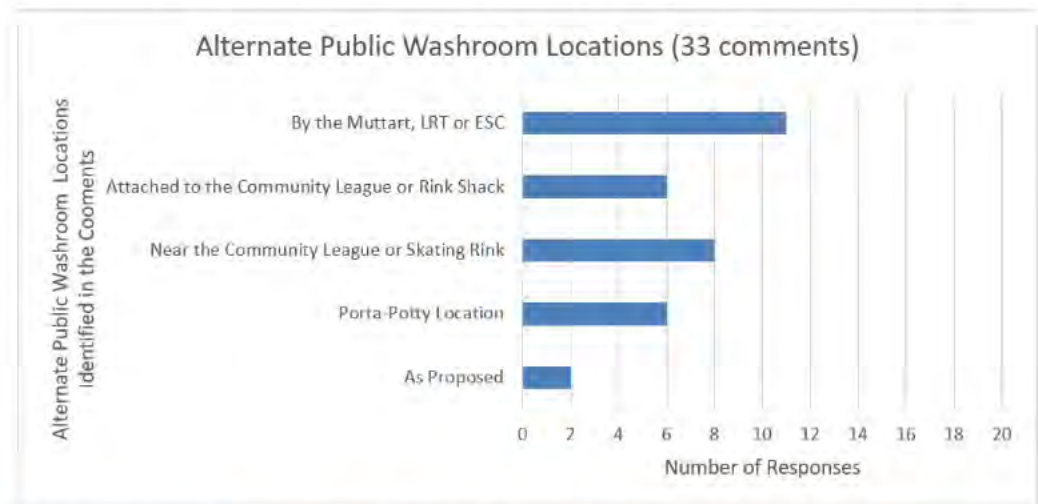
The majority of responses did not support the proposed location of the public washrooms along 95 Street as it would affect the views of residents who live on 95 Street. These comments came from people identifying as Cloverdale residents, residents of 95 Street or non-residents of Cloverdale.

There was concern that the public washrooms would attract more crime, vandalism or illicit activities to the park. A couple of notable comments suggested:

1. It was not the lack of public washrooms available in the area, but the lack of access to public washrooms. There are washroom facilities in the Bennett Centre, the Cloverdale Community League building, the rink shack, the Muttart Conservatory and likely to be in the future LRT Station, once open. The respondent suggested working together with these facilities to enable public access to the washroom facilities.
2. They were not opposed to public washrooms in theory, the concern is how the level of maintenance and security of them will be enforced.

Out of the 53 comments on the proposed public washrooms, 33 suggested alternate locations. The alternate locations proposed by the respondents included:

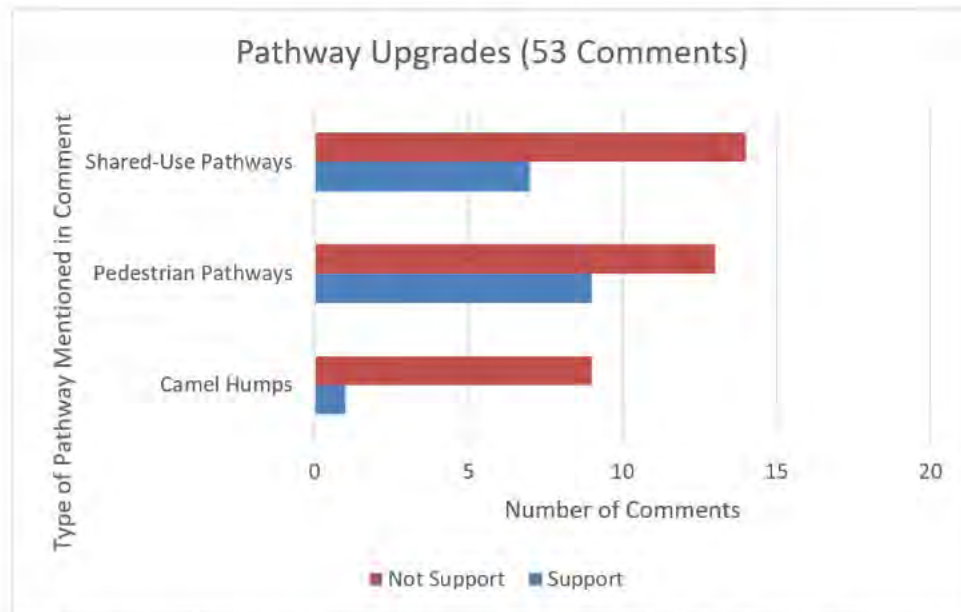
1. In the west area of the park, closer to the Edmonton Ski Club (ESC), Muttart Conservatory, and the LRT.
2. Attaching them to the Cloverdale Community League building or the rink shack.
3. Locating the public washroom building nearer to the community league building or the skating rink.
4. Where the porta-potties are currently located (which is similar to the above location, north of the community league building and near the rink shack).



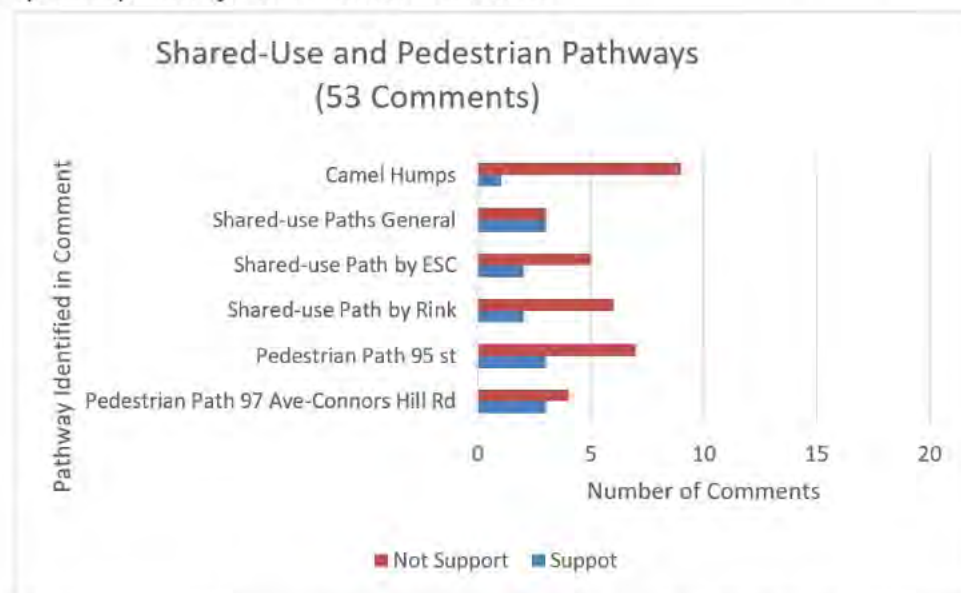
Pedestrian Pathways, Shared-Use Pathways and the Camel Humps

The next most common comments were related to the proposed pedestrian pathways (22 comments) and shared-use pathways (21 comments), including 10 comments specific to the Camel Humps, totalling 53 comments on this topic. Those who commented on the pathways did not support the upgrades saying the existing pathways were sufficient and paved pathways through the park would cause obstruction to cyclists, skiers or tobogganers coming down the hill at speed. There was notable commentary on the Camel Humps pathway upgrades. Respondents did not want a pathway paved or the wildlife disturbed, even though the pathways were not proposed to be paved.

Respondents in support of the proposed pedestrian and shared-use pathways acknowledged these connections would make the park more accessible to those with reduced mobility and families with strollers. Supporters of upgrades to the Camel Humps pathway agreed that it could be difficult to traverse at times.



The general commentary on the shared-use and pedestrian pathways was captured in the above summary and graph. The graph below identifies which specific pathways were most referred to.



Ten comments focused on the pedestrian path on 95 Street, which is covered in detail in the following section.

A total of seven comments referred to the proposed pedestrian pathway connecting 97 Avenue and Connors Hill Road, with three in support and four opposed. The supportive comments acknowledge the park would be more accessible for people with reduced mobility with upgraded pathways, while those opposed felt paved pathways were not necessary, not worth the cost and over-developing the park.

There were six comments referring to "the shared-use paths" without identifying one specifically. Three comments were in favour and three were not.

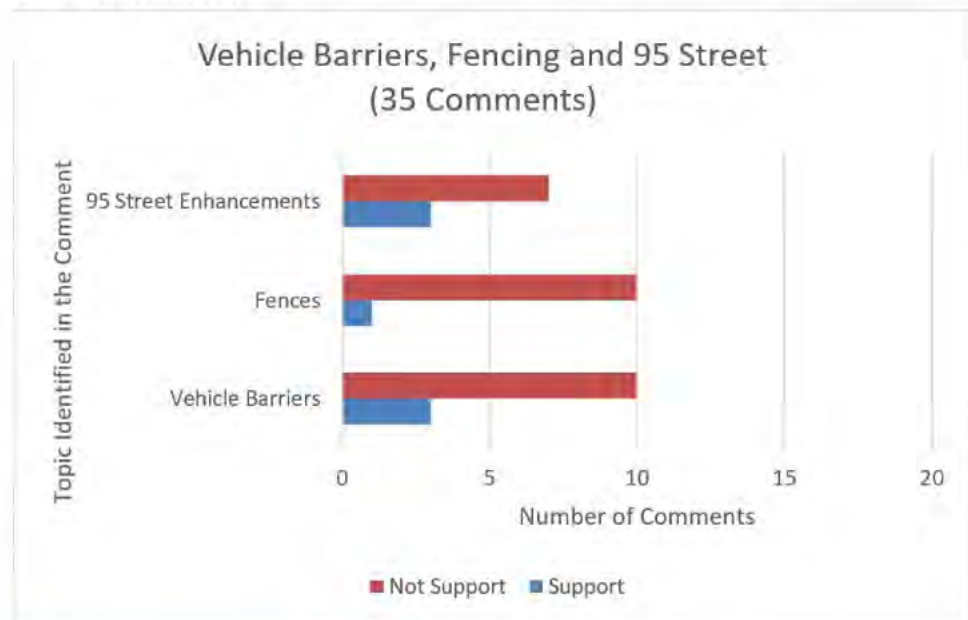
Seven comments specifically referred to the shared-use path by the ESC, two in support and five opposed.

Eight comments on the shared-use path by the rink, two in support and six opposed to it.

Vehicle Barriers, Fencing and 95 Street Proposed Enhancements

Comments on the proposed vehicle barriers (14 comments) asserted that they were not necessary. A similar sentiment was expressed on fencing (11 comments). As one resident claimed the fence would cut off the Cloverdale Community from the park, when referring to the fencing and vehicle barriers on 95 Street (10 comments).

Comments did not support the proposed sidewalk, fence and vehicle barriers proposed on 95 Street mostly claiming it was an unnecessary expense to enhance this area.

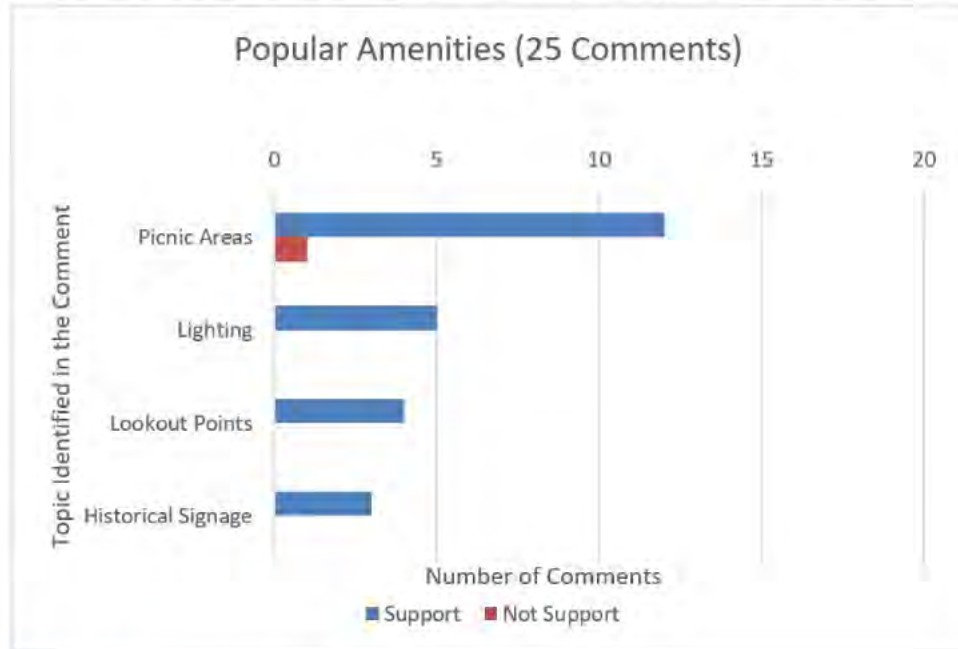


Popular Amenities

Key features that received almost total positive feedback included:

- Picnic areas (13 comments).
- Pathway lighting (5 comments).
- Lookout points (4 comments).
- Historical signage (3 comments).

One comment on the picnic area noted they were proposed to be located within a tree stand and that they preferred to save the trees than locate a picnic area there. Another respondent cautioned that the pathway lighting brightness be controlled so not to affect the nearby homes in Cloverdale.



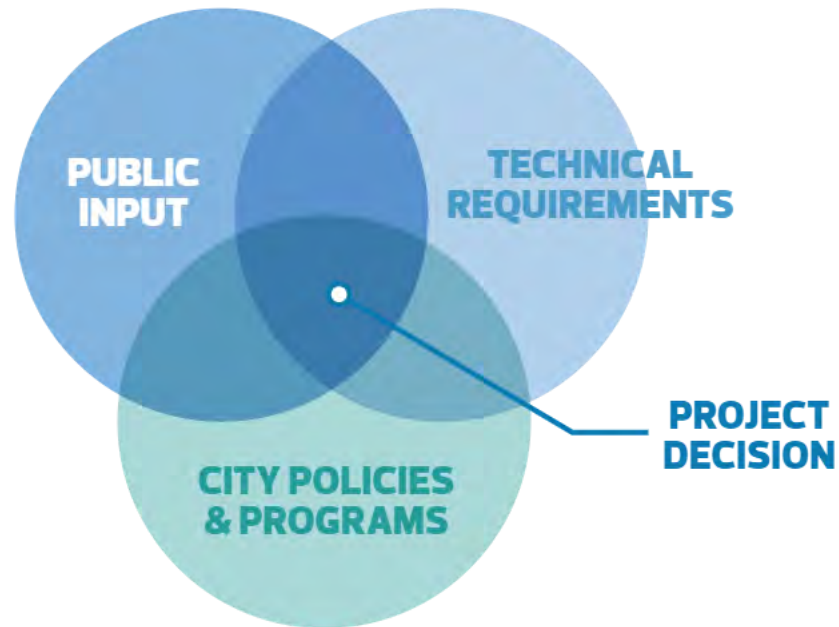
Other Comments

The less common topics in the comments included:

- Drainage**
 There were three comments that focused on the drainage issues within the park and asserted that this issue should be a priority. This topic was also followed by general comments of drainage issues within the community during snow melt and a question related to the age and capacity of the sewer system.
- Vehicle Access**
 Five comments addressed the proposed vehicle access to the ESC with four supporting the enhancement, and one not.
- Planting/Landscaping**
 Two comments were in favour of the naturalized planting but one wondered if it would add any value to the experience of the park.
- Warming Hut**
 Of the two comments addressing the proposed warming hut, one was in favour in theory but was concerned about the monitoring, maintenance and security of it; and one suggested it would be a magnet for vandalism or transient people seeking shelter.
- General Comments**
 There were a total of 12 other comments that fell outside of the engagement or project scope.

Going Forward

Phase 3 Engagement concludes the public engagement for this project. The feedback gathered during Phase 3 will be further considered alongside feedback from other stakeholders, technical analysis and City policies as the Concept Plan is finalized.



Once the concept plan is finalized, the concept plan and supporting documents will be approved by the City of Edmonton project team for implementation. This will require securing funding. Currently, funding is not available for implementation of the concept plan. Should funding become available through partnerships or future City capital budgets, the concept plan will guide development of the park.

Please visit the Gallagher Park Concept Plan project website for future updates on the project: https://www.edmonton.ca/projects_plans/parks_recreation/gallagher-park-master-plan.aspx

Appendix E

Winter Recreation Study



INTRODUCTION

This report analyzes the winter sport opportunities and market of the Edmonton region. The analysis looks at the broader region with a lens towards Gallagher Park and Edmonton Ski Club and the existing operations and future opportunities there.

The information in this report is intended to provide perspective on the potential for Gallagher Park as a viable winter recreation area. The data and findings will assist decision makers and stakeholders in making decisions regarding the future of Gallagher Park and the Edmonton Ski Club. This report is part of a larger Gallagher Park Master Plan.

Sources of information for this analysis include reports from the Canadian Ski Council, Statistics Canada, Alberta Culture and Tourism, Nichols Applied Management, City of Edmonton, and Edmonton Ski Club. Secondary research was conducted on activities and attractions in the region around Edmonton.

KEY OBSERVATIONS AND OPPORTUNITIES

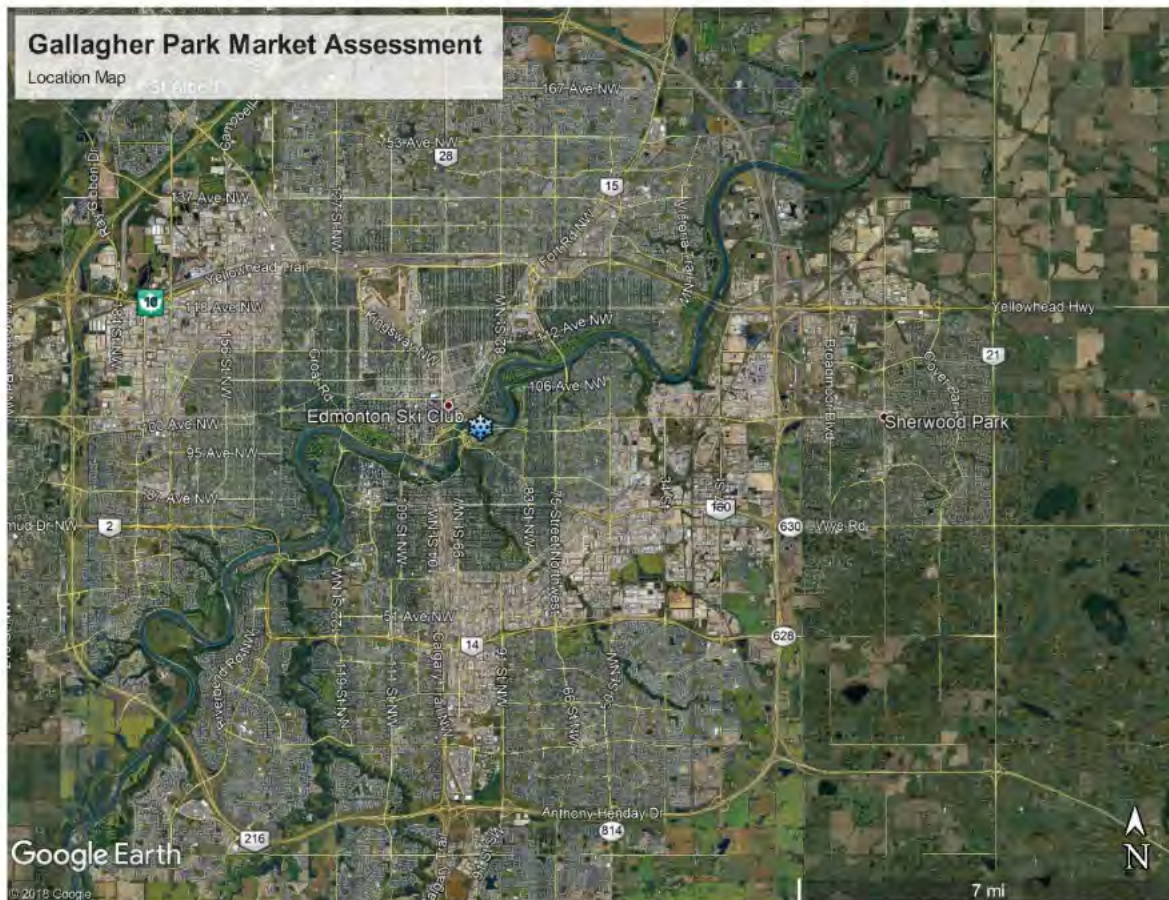
This section presents a brief overview of some of the findings of the Winter Sport Regional Analysis. Please see the body of the report for more detail on these and other topics.

- The City of Edmonton's population has grown rapidly in recent years and is expected to continue along that trend.
- While the country's population is aging, downhill skiing and snowboarding are most popular amongst younger age groups. Cross country skiing is relatively popular amongst older and younger populations.
- Total Canadian skier visits have declined very slightly in recent years, and participation rates have seen a greater decline. Visits and participation rates in Alberta have also followed that trend. In Edmonton specifically, participation rates are lower than across the province or in other Alberta cities. Most Edmonton residents are infrequent skiers (i.e., once a month)
- Alberta residents are showing little interest in trying downhill skiing and snowboarding. They have expressed more interest in trying cross country skiing.
- Edmonton residents have found costs and proximity to be major barriers to participate in recreational activities and are interested in more trails and machine groomed cross country skiing trails.
- Edmonton Ski Club is located very close to downtown Edmonton but sees few annual skier visits compared to nearby ski areas. It does not have an aerial chairlift and offers fewer programs and activities.

- With its terrain, Edmonton Ski Club could provide a ski product on par with that of nearby ski areas. It must match the nearby ski areas in programs and activities and differentiate itself to attract skier visits.
- Snow Valley Ski Club offers discounts for season passholders to Alberta and British Columbia ski resorts, including Rabbit Hill and Sunridge.
- Sunridge offers the only snowtubing in the metropolitan area and the activity is very busy and frequently sold out.
- The City of Edmonton markets itself as “Winter City” and there are many events, festivals, and opportunities for winter recreation (and warming up), in the river valley.
- Skating, fat biking, and cross country skiing are popular, free activities for Albertans. Programs and clubs exist for those looking to learn or compete.

LOCATION

Gallagher Park is located in the city of Edmonton, AB. It is surrounded by residential neighborhoods but very close to downtown. The park is approximately 600 metres south of the North Saskatchewan River, opposite downtown. A Light Rail station, at Muttart Conservatory, is currently under construction and will provide transit access from points across the city to the park.



REGIONAL POPULATION

CURRENT POPULATION (2016)

- Edmonton: 932,546
- Edmonton Metropolitan Area: 1,321,426
- Alberta: 4,067,175¹

POPULATION GROWTH

Since 2011, the population of Edmonton has grown significantly. The metropolitan area and Alberta grew as well, although at a slightly lower rate.

Population Change, 2011-2016

Geography	2011	2016	Overall Rate of Change	Annualized Rate of Change
Edmonton	812,201	932,546	+14.8%	+3.0%
Edmonton MA	1,159,869	1,321,426	+13.9%	+2.8%
Alberta	3,645,257	4,067,175	+11.6%	+2.3%

The population growth of Edmonton is expected to continue, but at a slower rate. By 2030, it is anticipated that Edmonton will have between 1,166,900 residents and 1,243,000 residents. ²

DEMOGRAPHICS

The population of Alberta is aging, which has implications for the province's ski industry and particularly the smaller, learn to ski hills. In 2017, children 14 and under were about 19% of the province's population. The youth population is in decline, from 30% of the province's population in 1972. The Alberta Office of Statistics and Information predicts that the youth population will decline slightly, to 17%, by 2046. The over 65 population has grown significantly in recent years, from under 7% in 1972 to 14% in 2017. By 2046, the over 65 population is expected to exceed 20% of the population. ³

REGIONAL ANALYSIS

The following section looks at opportunities, participation, and trends around winter recreation in the region.

WINTER RECREATION PARTICIPATION

Canada

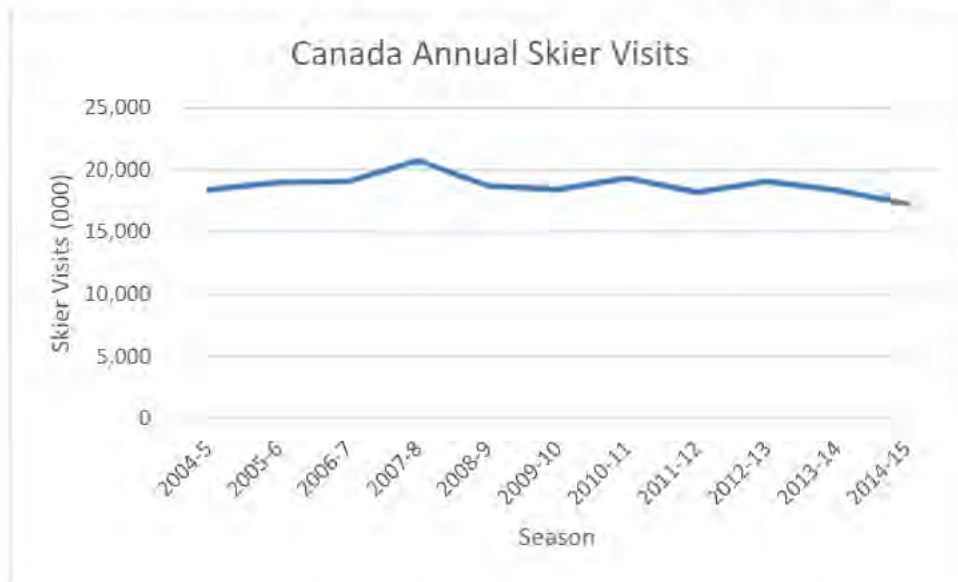
Canadian ski areas saw an average of 18.8 million skier visits annually between the 2004/05 season and the 2016/7 season. In recent years, skier visits have declined slightly. From the 2007/08 season,

¹ Statistics Canada, 2016 Census Profile

² Nichols Applied Management, Inc., City of Edmonton Growth Study 2018

³ Statistics Canada, 2016 Census Profile

where skiers visits surpassed 20,000,000, annual skier visits declined by 3.6% to the 2012/13 season and 6.1% to the 2014/15 season. Ski visits did rebound to the 2016/17 season, back to 18.8 million.⁴



Source: Canadian Ski Council Facts and Stats Ski and Snowboard Industry 2014-2015

Canadian participation rates in alpine skiing, snowboarding, and cross country skiing have remained constant or increased slightly in recent years. Participation in alpine skiing has increased to 9.0% of the population in 2017, up from 7.4% in 2011 and 2013. Snowboarding participation has stayed constant at 5% since 2011. In 2017, 7.0% of Canadians participated in cross country skiing, up from 4.1% in 2015. Snowboarders are most likely to live in urban areas, while alpine skiers are least likely.⁵

The aging population could have ramifications for skier visits and participation rates. Across Canada, only 1.7% of the population over 65 skis and 0.02% of the population over 65 snowboards. Comparatively, of the population between 12 and 17, 14.2% skis and 8.5% snowboards. No other segment of the population participates in skiing or snowboarding at a rate above 10%.⁶

The older population participates in cross country skiing at a slightly higher rate, with 2.3% of those over 65 participating. Participation is highest amongst those 55-64 (5.8%) and 12-17 (5.6%).⁷

Alberta

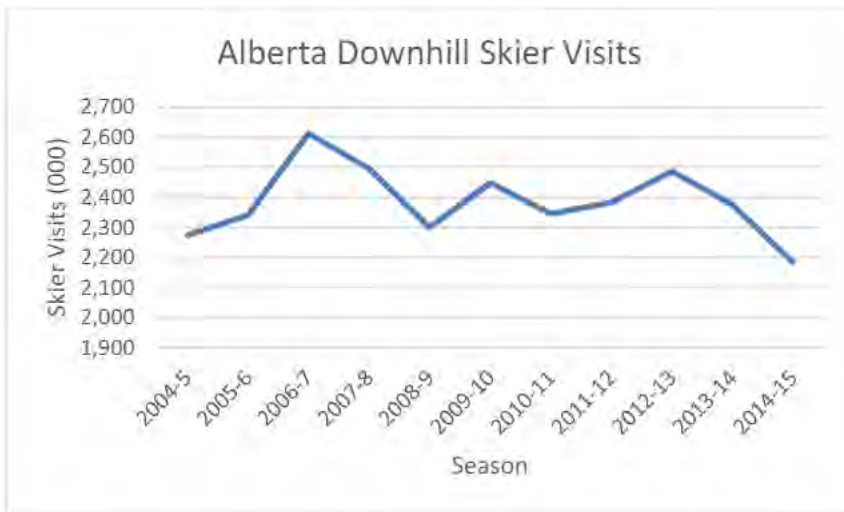
In line with the national trend, skier visits in Alberta have declined in recent years according to the Canadian Ski Council's 2015 report. Downhill skier visits peaked during the 2006/07 season at 2.6 million, but declined, to 2.1 million by the 2014/15 season. Cross country ski visits had shown growth up to the 2010/11 season but declined and then plateaued at approximately 75,000 annual visits.

⁴ Canadian Ski Council Facts and Stats 2016-2017

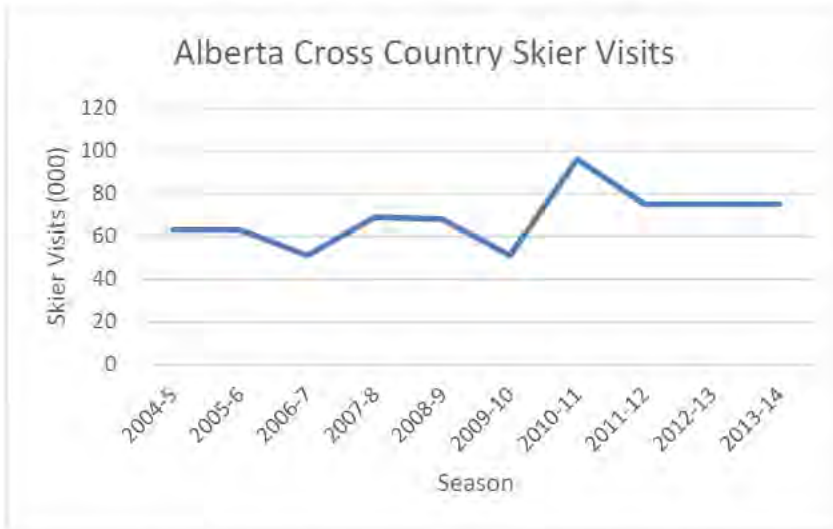
⁵ Canadian Ski Council Facts and Stats Ski and Snowboard Industry 2014-2015

⁶ Canadian Ski Council Facts and Stats Ski and Snowboard Industry 2014-2015; Statistics Canada, 2016 Census Profile. These participation rates are based on estimates from the Canadian Ski Council. Note the Canadian Ski Council only tabulates skier visits from those 12 and over.

⁷ Ibid.



Source: Canadian Ski Council Facts and Stats Ski and Snowboard Industry 2014-2015



Source: Canadian Ski Council Facts and Stats Ski and Snowboard Industry 2014-2015

In this period, the Albertan participation rates in downhill skiing, cross country skiing, and snowboarding all declined further than the national rates. In 2015, 7.0% of Albertans downhill skied, down from 9.7% in 2011. Over those years, Albertan snowboarding participation rates fell from 7.2% to 5.8%. Cross country skiing was down as well, from 5.7% in 2012 to 4.4% in 2015. Despite the decline, in 2015, Albertans participated in snowboarding at rates above the national average and downhill skiing and cross country skiing right around the national average.

The Province of Alberta's quadrennial recreation survey also provides recent data on skiing participation trends in the province. Although the participation rates are not in line with those collected by the Canadian Ski Council, comparisons to previous surveys illustrate trends in Alberta winter recreation. According to the 2017 survey, 15% of Albertans participate in downhill skiing and 4.3% participate in snowboarding. Comparatively, the 2013 survey reported that 17.5% of Albertans downhill ski, while 3.6% snowboard, showing a decline in downhill skiing participation but increase in

snowboarding. Participation in cross country skiing fell as well, with 8.7% of Albertans participating in 2017, down from 12.4% in 2013. For the most part, these rates and trends are in line with the Canadian Ski Council's data. However, the Alberta survey showed snowboarding participation rates increasing, while Canadian Ski Council reported they were declining.

In the survey, few Albertans expressed interest in trying skiing. In a ranking of the 13 activities Albertans most wanted to try, downhill skiing and snowboarding did not make the list. Cross country skiing did, with 2% of those looking to try a new activity expressing interest in cross country skiing.⁸

Edmonton

Edmonton residents participate in recreation, in general and in winter sports, at slightly lower rates than the Alberta provincial average. Among Edmonton residents, 91% participate in some form of active living (i.e., walking, biking, sports, etc.), compared to 95% of Albertans. For snowsports, defined as snowshoeing, cross country skiing, and snowmobiling, 13% of Edmontonians participate, compared to 17% of Albertans. The 2017 Albertan Recreation Survey categorized alpine skiing and snowboarding under outdoor facility-based activities (with golf, softball/baseball, and shooting). Similarly, Edmontonians participated at a lower rate, 38%, compared to 43% of Albertans. Across all these categories, Edmontonians' participation rates are lower than Calgary's and those of all the urban areas in the province.⁹

The Live Active Survey conducted by the City of Edmonton in 2015 identified challenges and barriers and interests around active recreation and sport in the city. Residents listed time, cost, and facility location as the top three barriers to participation. Respondents expressed the strongest interest in more and better maintained trails, with machine groomed cross country trails as a priority. Respondents also expressed interest in more activity offerings with better access and closer to home.¹⁰

The City of Edmonton last gathered skiing participation rates in 2010 and 2008. These surveys found a slight decline in skiing (downhill, cross country and snowboarding) participation, from 12% in 2008 to 11% in 2010.¹¹ Participation rates were highest with residents between 18 and 24 and 25 to 34. Of those under 18 years of age, a target market for the small learning hills and racing programs in and around Edmonton, 10% participated in skiing in 2010, a slight decline from 11% in 2008.¹² The 2008 report recorded the frequency with which Edmontonian skiers participate: 52% participated less than once a month, 25% participated 2-3 times a month, 18% participated 1-2 times/week, and 3% participated 3 or more times per week.¹³ For the most part, Edmontonian skiers participate on a limited basis (i.e., one ski outing per month to the mountains rather than frequent night skiing after work).

⁸ 2017 Albertan Recreation Survey; 2013 Alberta Recreation Survey

⁹ 2017 Albertan Recreation Survey

¹⁰ Live Active: A Collaborative Strategy for Active Living, Active Recreation, and Sport in Edmonton, 2016.

¹¹ Edmonton Active Recreation & Sport Policy Current State Assessment Snapshot Report, 2013

¹² The State of Alpine Skiing in Edmonton, 2013

¹³ 2013 State of Alpine Skiing in Edmonton

WINTER RECREATION OPPORTUNITIES

Downhill Skiing

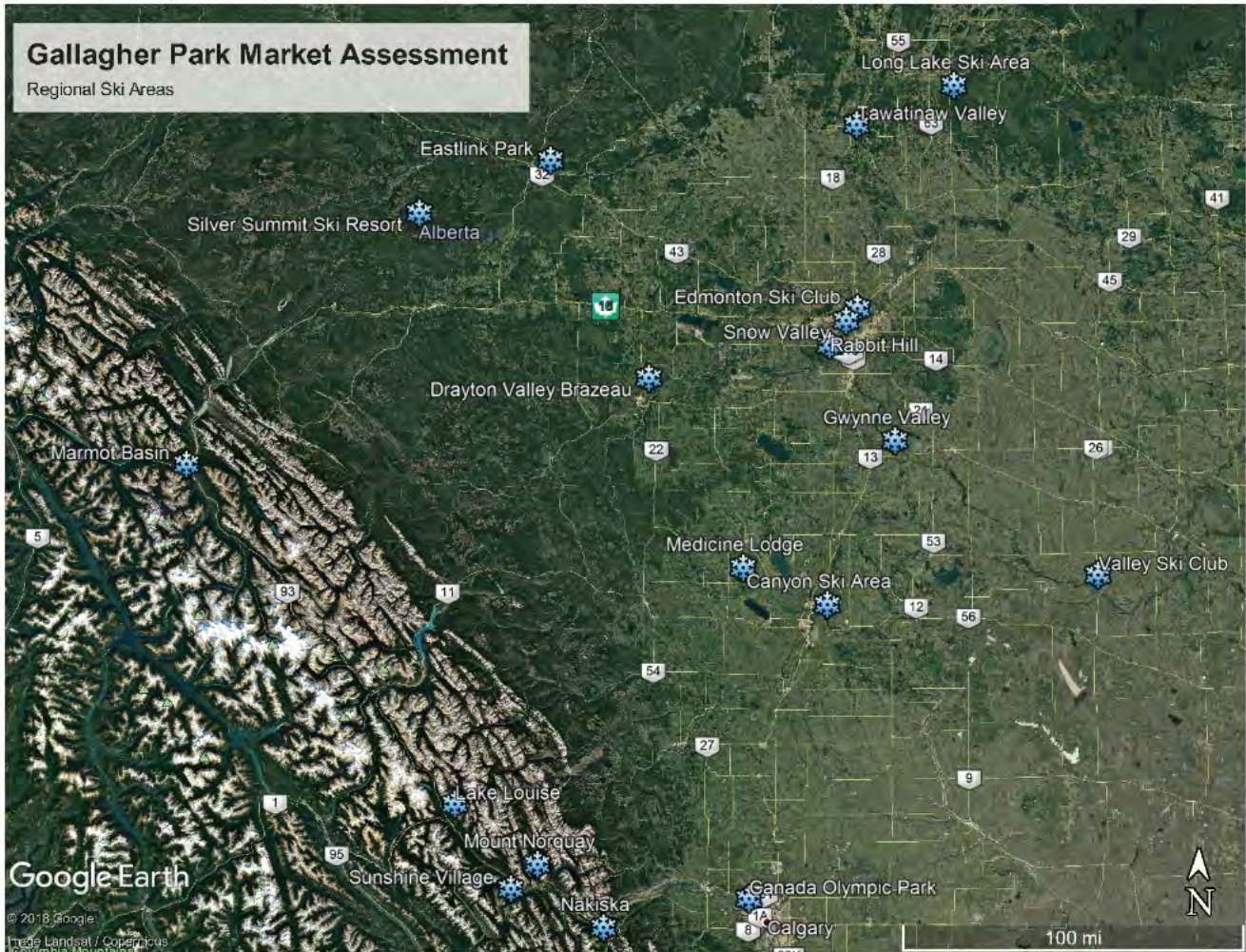
There are four small ski areas located in and around the City of Edmonton: Edmonton Ski Club, Rainbow Hill Snow Resort, Snow Valley Ski Club, and Sunridge Ski Area. These ski areas are very convenient for city residents and suited for short trips, learning to ski, riding terrain parks, and race training. This assessment will explore Edmonton Ski Club's place in that marketplace.

Beyond the Edmonton metropolitan area, there are many small ski hills within an hour or two drive of the city: Gwynne Valley, Drayton Valley Brazeau, Eastlink Park, Medicine Lodge, and Long Lake Ski Area. These hills primarily serve their local community. Their size and offerings are limited and comparable, if not lesser than, to the Edmonton ski areas. Therefore, few Edmonton residents would make the drive to ski these resorts. They are not considered further in this analysis.

Canyon Ski Area and Tawatinaw Valley are located within an hour and a half of Edmonton. Although both fairly small resorts, their offering and proximity may attract Edmonton skiers to visit. Their offering is described in more detail later in this report.

For large ski areas, Edmonton residents are forced to travel about four hours to Marmot Basin or the resorts in Banff National Park, closer to Calgary. These are destination resorts, where people travel for a weekend or weeklong ski trip. Given the distance from Edmonton and the type of skiing offered, those resorts do not operate in the same marketplace as the Edmonton Ski Club, which attracts people for a day, afternoon, or evening of skiing. The large resorts do present opportunities for partnerships, as Edmonton residents may learn to ski or warm up at the city ski hills, before venturing to the larger resorts.

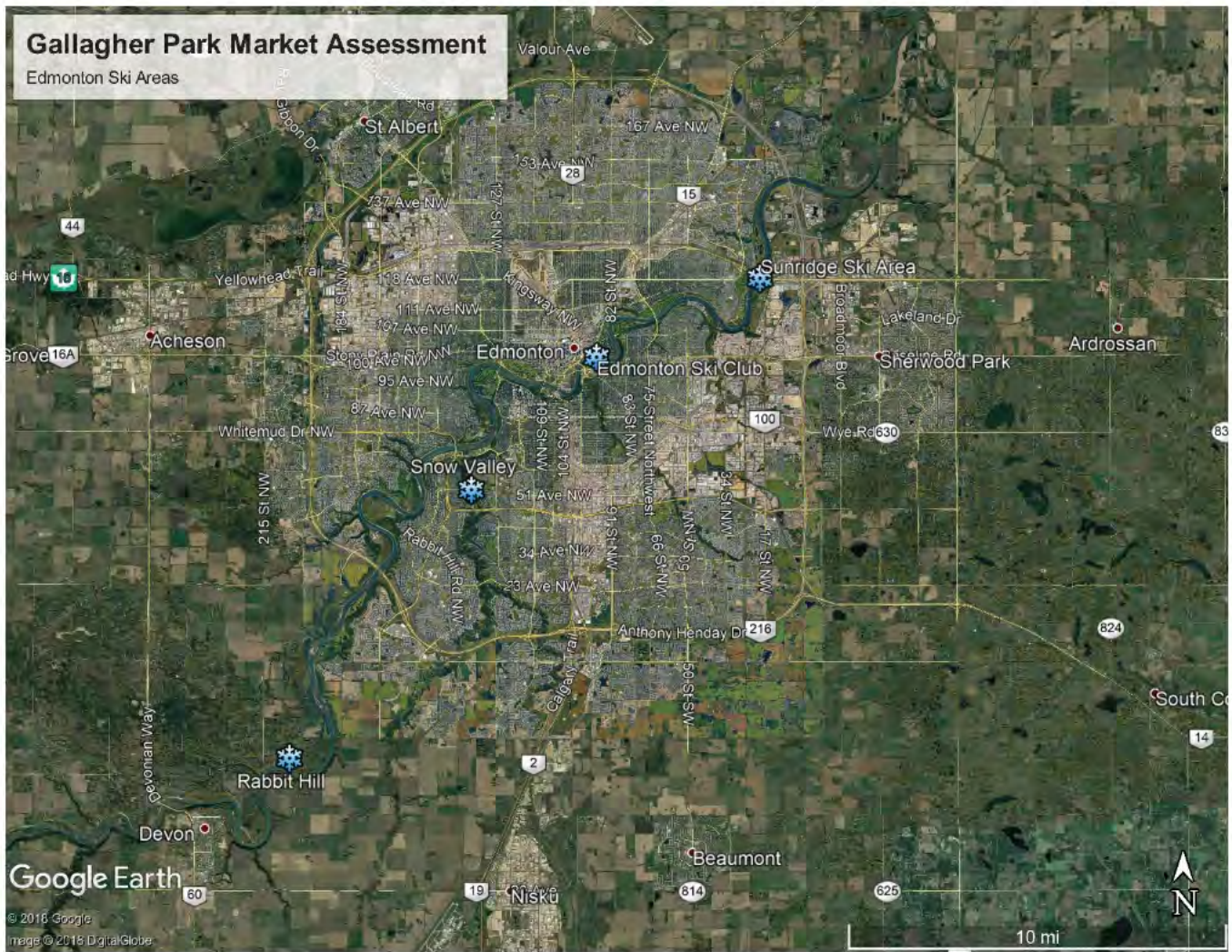
The figure below is a map of the Alberta ski areas close to Edmonton.



Ski Area Comparison Table

The table below lists the ski areas comparable to Edmonton Ski Club and provides their basic statistics for distance to downtown Edmonton, skiable acres, number of trails, vertical drop, terrain difficulty distribution, lift infrastructure, snowmaking capability, night skiing, other features and offerings, and price point. This data indicates that Edmonton Ski Club could be fairly competitive when compared to other areas in the ski product (skiable area, vertical drop, etc.). Therefore, Edmonton would need to develop programs and other offerings to both match the surrounding ski areas and differentiate itself.

Resort	Quick Look	Driving Distance to Downtown Edmonton	Market	Skiable Acres	# of Trails	Vertical Drop	Terrain	Lifts	% Snow-making Coverage	Night Skiing	Features and Offerings	Price point
Edmonton Ski Club	The Edmonton Ski Club (ESC) has been a hub for ski instruction and athlete training since 1911. Open to the public, the ESC offers five ski runs for all levels, a challenging terrain park, ski and snowboard lessons for children and adults, kids snow day camps, school programming, and group rental opportunities for the community. Concessions are available within the lodge.	2.9 km	Day	25	5	61 m	Beginner: 17% Intermediate: 66% Advanced: 17% Expert: 0%	1 rope tow 1 tbar 2 pomas	100%	Yes	Terrain parks, after school program, lessons, holiday camps, field trips, Edmonton Alpine Ski Racing Society (youth program)	Adult lift ticket: \$10-\$30 Junior lift ticket: \$10-\$25 Adult season pass: \$199 Lessons: \$80/hour
Snow Valley Ski Club	Snow Valley is located southwest of downtown – right off the Whitemud Freeway. It is easily accessible and popular with people learning to ski, riding in the terrain parks, and participating in its many programs.	12 km	Day	20	10	40 m	Beginner: 40% Intermediate: 50% Advanced: 10% Expert: 0%	1 quad lift 1 triple lift 2 carpets	100%	Yes	Terrain parks (2), masters racing program, lessons, youth programs, hill rentals, corporate night, ladies night, freestyle program	Adult lift ticket: \$15-\$39 Junior lift ticket: \$15-\$32 Adult season pass: \$377 Lessons: \$80-\$100/hour
Rabbit Hill Snow Resort	Rabbit Hill is located 15 minutes southwest of Edmonton. Rabbit Hill offers over 40 acres of ski and snowboard trails as well as one of the best terrain parks in Western Canada.	32 km	Day	40	9	91 m	Beginner: 56% Intermediate: 33% Advanced: 11% Expert: 0%	1 triple lift 3 rope tows 2 carpets 2 T-bars	80%	Yes	Terrain parks (3), adaptive snowsports, lessons, freestyle program, hill rentals, Rabbit Hill Ski Club (masters program), Parkland Racers Ski Club (youth program), Tuesday Night Special	Adult lift ticket: \$20-\$43 Junior lift ticket: \$10-\$25 Adult season pass: \$394 Lessons: \$74-\$99/hour
Sunridge Ski Area	Sunridge was named 2018 Canadian Ski Racing Resort of the Year. It offers skiing, snowboarding, terrain parks, snowtubing, and skier cross. It recently added a quad chairlift and a new magic carpet.	13 km	Day	72	12	58 m	Beginner: 50% Intermediate: 17% Advanced: 33% Expert: 0%	1 quad lift 1 triple lift 2 carpet lifts 1 rope tow	90%	Yes	Terrains parks (2), Ski/SB Cross, snowtubing, freestyle club, skier cross racing program, Sunridge Alpine Ski Team (youth program), Edmonton Freestyle Ski Club, field trips, hill rentals, lessons, freestyle competitions	Adult lift ticket: \$35-\$42 Junior lift ticket: \$27-\$34 Adult season pass: \$399 Lessons: \$90/hour
Canyon Ski Resort	Canyon Ski Resort is Alberta's largest non-mountain ski area. The resort, located near Red Deer, offers a terrain park, super pipe, snow tube park, rustic lodge, cafeteria, and a cozy lodge. The resort has a vast snowmaking system that ensures great conditions through the winter.	164 km	Day	70	23	164 m	Beginner: 26% Intermediate: 35% Advanced: 39% Expert: 0%	1 triple lift 1 double lift 1 carpet 2 T-bars 1 rope tow	95%	Yes	Terrain park, snow tube park, adaptive skiing, holiday camps, lessons, XtREME Snowboard Club, school programs	Adult lift ticket: \$24-\$45 Junior lift ticket: \$20-\$35 Adult season pass: \$490 Lessons: \$50/hour
Tawatnaw Valley	Tawatnaw Valley is a recently reopened community ski area north of Edmonton. The ski area has both downhill and cross country ski trails and a tubing hill. The downhill skiing area is significantly larger, by acreage than the Edmonton ski areas.	98 km	Day	140	24	76 m	Beginner: 33% Intermediate: 46% Advanced: 21% Expert: 0%	3 T-bars 1 rope tow	0%	No	Cross Country skiing trail system (23.4 km), snow tubing, reciprocal pass program, terrain park, school programs	Adult lift ticket: \$30 Junior lift ticket: \$25 Adult season pass: \$325 Lessons: \$60/hour



Edmonton Area Ski Hills

The four ski hills in and around Edmonton are fairly similar in terms of size, offering, and costs. All the ski areas have a youth downhill racing program, although their competitive programs beyond that vary. All hills also have a terrain park. Further descriptions of each ski area are below and see the chart on page 9 for statistics about each ski area.

Edmonton Ski Club: Edmonton Ski Club is located immediately across the river from downtown and will soon be accessible by light rail. Of the city ski hills, it is the only one without an aerial chairlift and its lift tickets are slightly cheaper. However, it only has five total trails, with only one trail intended for beginners.

Snow Valley: Snow Valley is the smallest of the ski areas by both vertical feet and acreage. It is considered to have the best snow in Edmonton.¹⁴ It is highly visible and accessible, located right off the Whitemud Freeway, and draws many schools and groups to ski. In 2013, over half of the skier visits were from schools and groups.¹⁵ Snow Valley has a Community Initiatives Program to bring

¹⁴ “Alberta’s Best Snow Resorts: Skiing and Snowboarding in Wild Rose Country.” *Across and Abroad*. October 19, 2010.

¹⁵ State of Alpine Skiing in Edmonton, 2013

disadvantaged youth and new Canadians to try skiing and snowboarding at Snow Valley. The ski area lodge was completed in 2006 and is a center of activity with food and rentals available. At 17,800 square feet, it hosts private functions and community events over the summer.

Snow Valley also partners with ski shops, hotels, and other resorts to offer discounts for season passholders. Season passholders are eligible to receive discounts on lift tickets at the following resorts: Apex Mountain Resort, Big White Ski Resort, Canyon Ski Resort, Castle Mountain, Fernie Alpine Resort, Hidden Valley, Hudson Bay Mountain Resort, Kicking Horse Mountain Resort, Kimberley Alpine Resort, Kinsoo Ridge Snow Resort, Lake Louise, Manning Park Resort, Marmot Basin, Misery Mountain Ski Area, Mt. Seymour, Mount Washington Alpine Resort, Nakiska, Nitehawk, Ski Norquay, Panorama Mountain Village, Pine Valley Resort, Pass Powderkeg, Powder King, Rabbit Hill Snow Resort, Revelstoke Mountain Resort, Sasquatch Mountain Resort, Sun Peaks Resort, Sunridge, Sunshine Village, Tawatinaw Valley, Valley Ski Club, Wapiti Valley, and Whitewater. Notably, Snow Valley season passholders receive discounts at Sunridge Ski Area and Rabbit Hill.

Sunridge Ski Area: Sunridge ski area has the most terrain and largest programmatic offering of the city ski areas. The ski area, located northeast of downtown, offers a permanent skicross course, a freestyle skiing program, and snow tubing. The snow tubing is extremely popular and the only tubing in the metropolitan area. The ski area has recently completed many capital improvement projects to enhance the skiing experience and draw additional visitors to Sunridge. It added a new quad chairlift and magic carpet for the 2017/18 season. The ski area’s chalet is a large, cedar-paneled building with a cafeteria and rental shop, and hosts weddings and other events in the summer.

Sunridge was named the 2018 Canadian Ski Racing Resort of the Year by Alpine Canada. The award goes to a resort that has “demonstrated an exceptional commitment to Canadian ski racing, through support of local, provincial, or national ski racing programs, including training, competition, and related activities.”¹⁶

Rabbit Hill: Rabbit Hill has the most vertical drop (91 m) of the hills around Edmonton and the terrain park has one of the largest half pipes in northern Alberta. Rabbit Hill complements that offering with a robust learn to ski program. Rabbit Hill also offers the only adaptive skiing program in the Edmonton area, through the Canadian Association for Disabled Skiing. Rabbit Hill is located outside the city proper and offers a bus on weekends from a few points on the western edge of Edmonton. The ski area day lodge has a full service food and beverage area.

Skier Visits

The table below displays the most recent skier visit data available.

Facility	2009/10	2010/11	2011/12	2012/13
Snow Valley Ski Club	187,443	188,085	185,593	190,647
Rabbit Hill Snow Resort	175,000	164,000	173,000	194,000

¹⁶ Awards Guide, Alpine Canada.

Edmonton Ski Club	24,938	37,750	21,230	27,960
Sunridge Ski Area	Data not provided			

Source: State of Alpine Skiing in Edmonton, 2013

The 2009/10 to 2012/13 data suggests that skier visits at each area are largely independent of each other. Although there is some correlation between an increase in Rabbit Hill skier visits and a decline at Edmonton Ski Club, and vice versa, the ski areas are relatively far apart and likely draw from different areas of the city. While no data was provided for Sunridge, the managers noted that skier visits had increased over this period as well. 2013, when the ski areas received the most visits, was a great snow year in Edmonton – the city received 186.7 cm of snow, compared to 88.6 cm in 2010.

Edmonton Ski Club’s annual skier visits are significantly lower and fluctuated more than those of Snow Valley and Rabbit Hill. However, Edmonton Ski Club’s size and terrain, or potential ski product, is on par with the other, more popular resorts (see Ski Area Comparison Table). Therefore, by bringing its infrastructure and offering to the level of the other ski areas, the Edmonton Ski Club should be able to attract more visitors.

Edmonton Ski Club must match the ski experience provided by the other resorts, while also differentiating itself so Edmontonians choose to visit Edmonton Ski Club. To differentiate itself, Edmonton Ski Club should look to its proximity to downtown, a unique aspect of the club. The convenience of Edmonton Ski Club would be very attractive to skiers looking to ski a few runs after work or school.

A 2013 State of Alpine Skiing in Edmonton report showed that only 5% of Snow Valley’s annual visitors were season pass holders. Comparatively, in the United States, 43% of annual skier visits are season passholders. While drawing schools and groups is key for these ski areas, they should work to increase season passholders. More season passholders would create loyalty, bring in money upfront, and incentivize visitation.

Regional Ski Areas

Tawatinaw Valley and Canyon Ski Resort are located close to Edmonton and offer a unique experience that attracts some Edmonton residents for a day of skiing.

Tawatinaw Valley offers alpine skiing, cross country skiing, and tubing about an hour and fifteen minutes north of Edmonton. The diversity of activities appeals to families looking to alpine ski, cross country ski, tube, or a mix of the three. Tawatinaw Valley nearly closed in the fall 2018 before a non-profit, Friends of Tawatinaw Valley, raised the funds to purchase the ski area from the county and convert it into a year-round facility. This effort was led by local community members and Tawatinaw Valley is primarily a community resource, with some visitors from the Edmonton metropolitan area. Although previous visitation data is unavailable, the ski area is hoping to have 8,000 skier visits over the 2018/19 season.

Tawatinaw Valley has a robust reciprocal pass program where Tawatinaw Valley season passholders receive discounts to the following ski areas: Baldy, Big White, Canyon, Cypress, Eastlink, Hidden Valley, Lake Louise, Marmot Basin, Misery Mountain, Powder King, Rabbit Hill, Revelstoke, Mt.

Seymour, Mt. Sima, Snow Valley, Sunridge, Sun Peaks, Valley Ski Club, Mt. Washington, and Winsport/Canada Olympic Park. The reciprocal pass program encourages local residents to purchase a pass to Tawatinaw Valley and visit other ski areas in the region as well.

Canyon Ski Resort markets itself as the “largest non-mountain ski resort in Alberta.” The resort is similar in acreage to Sunridge but offers significantly more meters of vertical drop (164 meters compared to 58 at Sunridge and 91 at Rabbit Hill). The resort also has snow tubing and will be hosting the 2019 Canada Winter Games. It attracts over 50,000 guests per year, well below the visit totals of the busier Edmonton ski hills. Its offering, while not dramatically better than what can be found in and around Edmonton, may be appealing to Edmontonians looking for more vertical and something different.

Neither Tawatinaw Valley nor Canyon Ski Resort should be seen as direct competition to Edmonton Ski Club. Rather, they are potential partners and models for Edmonton Ski Club in crafting a unique experience.

Local Ski Clubs

Two local ski clubs, Snow Valley and Edmonton Ski Club, operate ski areas in the City of Edmonton. Other city clubs offer trips to destination ski resorts. Such clubs include: Edmonton Sport & Social Club, University of Alberta Ski and Snowboard Club and Rocky Mountain Seniors Ski Club.

Other Winter Recreation Opportunities

The City of Edmonton prides itself on being “Winter City,” a place where residents and tourists embrace winter and participate in many different winter activities. Much of this activity is concentrated in the North Saskatchewan River Valley, a network of urban parks running through the center of Edmonton. The river valley through Edmonton is 48 km long, with 20+ parks and over 10,000 acres of parkland, the longest continuous urban parkland in Canada and a prime destination for winter recreation.

Each year, the city publishes a Winter Excitement Guide about the activities and events happening during the winter in Edmonton. According to the report, Edmontonians are actively participating in winter festivals. In 2017, over 352,000 people attended outdoor winter festivals and events and 36% of the population is attending more festivals and events than they did five years ago. These efforts have led city residents to appreciate winter: 44% of city residents agreed that their perception of winter in Edmonton has become more positive recently.

Ice Skating

There are many opportunities for indoor and outdoor ice skating in Edmonton.

There are 23 indoor ice arenas around the city, seven of which are within five kilometers of Gallagher Park. All arenas have public skating hours when admission is free and reserved times for hockey, figure skating, and member skating. However, given the popularity of hockey and skating in Edmonton, the arenas can be crowded and ice time is in high demand.

When Donnan Arena, near Gallagher Park, was undergoing renovations in 2016, there was significant competition for ice time around the city. At the time, the Executive Director of Hockey Edmonton commented that the city has a “desperate need for more arenas.”¹⁷

The City of Edmonton maintains eight outdoor skating rinks through the winter that are free and open to the public. Community leagues manage an additional 100+ outdoor rinks throughout the area as well. The community league rinks are typically for community league members, but many are open to the general public. They typically have few facilities and are used primarily by the local neighborhood.

The city rinks are larger and many are attached to warming pavilions with washrooms. Only the Hawlerak Park rink offers rentals. In recent years, the city has developed and maintained two IceWay Skating Trails at city parks. The Victoria Park IceWay Skating Trail, the first one in the city, is an ice path through the forest with rainbow lighting. The Rundle Park IceWay Skating Trail, added in 2017 after the popularity of the Victoria Park trail, connects small rinks and ponds, warming huts, and picnic pavilions in the park.

Winter Chalet Network

The City of Edmonton has developed and promoted a Winter Chalet Network along the North Saskatchewan River. The network encourages people to explore the river valley in the winter. The network map shows winter activity areas, attractions and recreation centers, warm up areas, and washrooms. When people toboggan, skate, cross country ski, or snowshoe along the river, the map directs them towards locations to pause and warm up. Currently, the Muttart Conservatory is listed as an attraction on the map and Gallagher Park is not included.

Tobogganing

The City of Edmonton maintains six toboggan hills. A city-maintained hill has a safe run-out, safety signage, and reduced hazards. A few of the toboggan hills are at the city’s Winter Chalets. Most of the city hills lack washrooms and other amenities and toboggan rentals are not available anywhere. Gallagher Park is a designated toboggan hill. Children will also toboggan on many other hills and the City estimated there are approximately 35 toboggan hills throughout.¹⁸

Snow Tubing

In the immediate Edmonton area, snow tubing is only available at Sunridge Ski Area. Sunridge has a magic carpet dedicated to tubing and three groomed tubing chutes. The tubing park is very popular and sells out frequently.

Tubing is also available well outside the city at Tawatinaw Valley and Canyon Resort (see Downhill skiing section for more about those areas).

Cross Country Skiing

Edmonton has a robust network of groomed cross country skiing trails. Groomed trails are located throughout the city but most of the network is concentrated along the river valley park system. Trails are groomed by the Edmonton Nordic Ski Club and the city. The city grooms trails at Victoria Golf Course, Hawlerak Park, Riverside Golf Course, and Kinsmen Park. The Nordic Ski Club grooms the trails at

¹⁷ “Hockey Headaches Expected when Donnan Arena Closes for Repairs.” *Global News*. March 20, 2016.

¹⁸ Edmonton Active Recreation & Sport Policy Current State Assessment Snapshot Report, 2013

Gold Bar, Gold Stick, and Capilano parks – three connected parks on the eastern side of the city. The club recently added a snowmaking system at Gold Bar Park and lights for night skiing are available at Kinsmen Park and the Edmonton Nordic Ski Club-groomed trails. There is no user fee but the ski club does charge membership fees for those wishing to participate in its programs, lessons, and many events.

The Edmonton Nordic Ski Club is one of the largest cross country skiing clubs in the country. In recent years, membership has been stagnant at about 650 members. The club offers lessons, youth and adult racing programs, biathlon programs, and development and training groups. A separate Biathlon Center is located at Strathcona Science Park. In the 2015 Edmonton Live Active Survey, residents requested additional groomed cross country skiing trails.

People also cross country ski on other parks and trails in Edmonton when there is ample snow. There are a few larger, scenic cross country ski trail systems within an hour of Edmonton as well. The Canadian Birkebeiner, Western Canada's premier cross country skiing event, takes place 50 km east of Edmonton.

Fat biking

Fat biking or Winter Cycling is growing in popularity in Edmonton. Their primary use is as a commuting tool – many Edmonton residents ride fat bikes through the winter to commute to work. Residents and tourists also ride fat bikes recreationally along the River Valley and a few bike shops and outdoor adventure outfitters rent fat bikes as well. In previous years, local bike shops and the city have sponsored races, although none are occurring this year. Downhill fat biking is not available in the region.

Snowshoeing

Many people snowshoe in Edmonton. There are a few recommended areas, but in general, the city encourages residents to walk through untracked areas in its parks for the best experience. Snowshoe tours and rentals are offered by the River Valley Adventure Company.

Winter Segways

River Valley Adventure also offers winter segway tours through Fort Edmonton and the River Valley.

Snowmobiling

Those interested in snowmobiling near Alberta must head outside city. Snowmobile tours are available in Sylvan Lake, an hour and forty-five minutes outside of the city. Ministik is a large trail system open to snowmobilers, near South Cooking Lake.

Sleigh Rides

Sleigh rides are offered by Dick Laurin's Hay & Sleigh Rides about 45 minutes outside the City of Edmonton. In the winter, the interactive sleigh rides end at a warming bonfire. They also offer horse drawn wagon tours of the Candy Cane Lane attraction and will bring the horses and sleighs to the city for private events.

Ice Castles

The Ice Castles are a popular winter attraction in Hawlerak Park. The castle is constructed each winter and draws large crowds to the river valley. It is made up of about 25 million pounds of ice and has ice-carved tunnels, fountains, and slides.

Additional Winter Recreation Activities Not Available in Edmonton

Ice climbing

For those interested in ice climbing, there are classroom courses in Edmonton with an excursion to the mountains.

Ski Jumping

Despite Edmonton Ski Club's history with ski jumping, there are no ski jump hills in the city. The nearest ski jump hill is in Calgary at the Olympic Park.



Appendix F

CPTED Assessment





EDMONTON POLICE SERVICE

CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN

CPTED ASSESSMENT



Date: 19OCTOBER23	Assessment Conducted By: Reg# 3698 Cst. Graham HANNAH
Site Name: Edmonton Ski Club	
Location: 9613 96 AVE	
Contact: Geoff FRISBY	Phone #: 7809152681

INTRODUCTION

This security assessment is based on the principles of Crime Prevention Through Environmental Design (CPTED). CPTED, pronounced 'SEPTED', is based on the premise that "the proper design and effective use of the built environment can lead to a reduction in the incidence and fear of crime and an improvement in the quality of life."

The four main concepts of CPTED are: *Natural Surveillance, Natural Access Control, Territorial Reinforcement and Maintenance.*

NATURAL SURVEILLANCE is a design concept that is directed primarily at keeping intruders under observation through the normal and routine use of the environment.

NATURAL ACCESS CONTROL is a strategy used to inhibit access to a location that is not under natural surveillance, which should create a perception of risk to offenders.

TERRITORIAL REINFORCEMENT is a method of claiming and establishing ownership of one's own property. This is accomplished by defining changes from public space to semi-private to private space.

MAINTENANCE is the regular care and upkeep of your property. A consistent maintenance plan shows pride of ownership and is necessary for CPTED to be effective at your property.

Lighting is one of the most important preventative measures that can be taken at any site and in any application. There is a dramatic difference between the function, placement and type of light that is used for aesthetic lighting as opposed to security lighting.

In general terms, aesthetic lighting compliments and accentuates design and architectural features of a site or building. While it can increase the overall look, feel and perception of safety in an area, its primary role may not be safety or security.

Security lighting acts as a deterrent for illegal and nuisance activity, is used for identification purposes, provides way finding and directly compliments other security devices, especially security surveillance cameras.

Proper lighting types and placement is vital for complimenting mechanical surveillance (security cameras), as well as increasing natural and passive surveillance opportunities.

Many theories of criminal behavior have focused on the fact that the “criminal” wants to conduct their “criminal activity” without being noticed so they naturally tend to go to secluded, isolated or hidden places. CPTED tries to eliminate such places through the use of the four CPTED concepts.

The enclosed CPTED security audit and its recommendations are not intended to make the facility “burglar-proof”, “robbery-proof”, “theft-proof”, etc. They will assist in reducing the probability of losses and for illegal and illegitimate incidences from occurring if properly applied and maintained.

Crime prevention, like all management responsibilities, will require constant upgrading. You will need to keep abreast of the changing operational needs of security.

Implementation of the enclosed recommendations *should not* be fragmented if possible. Many times the incorporation of one recommendation depends upon the implementation of other security recommendations. Failure to utilize the systems approach can breach some or all elements of the entire security system.



CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN ASSESSMENT



AREA OVERVIEW



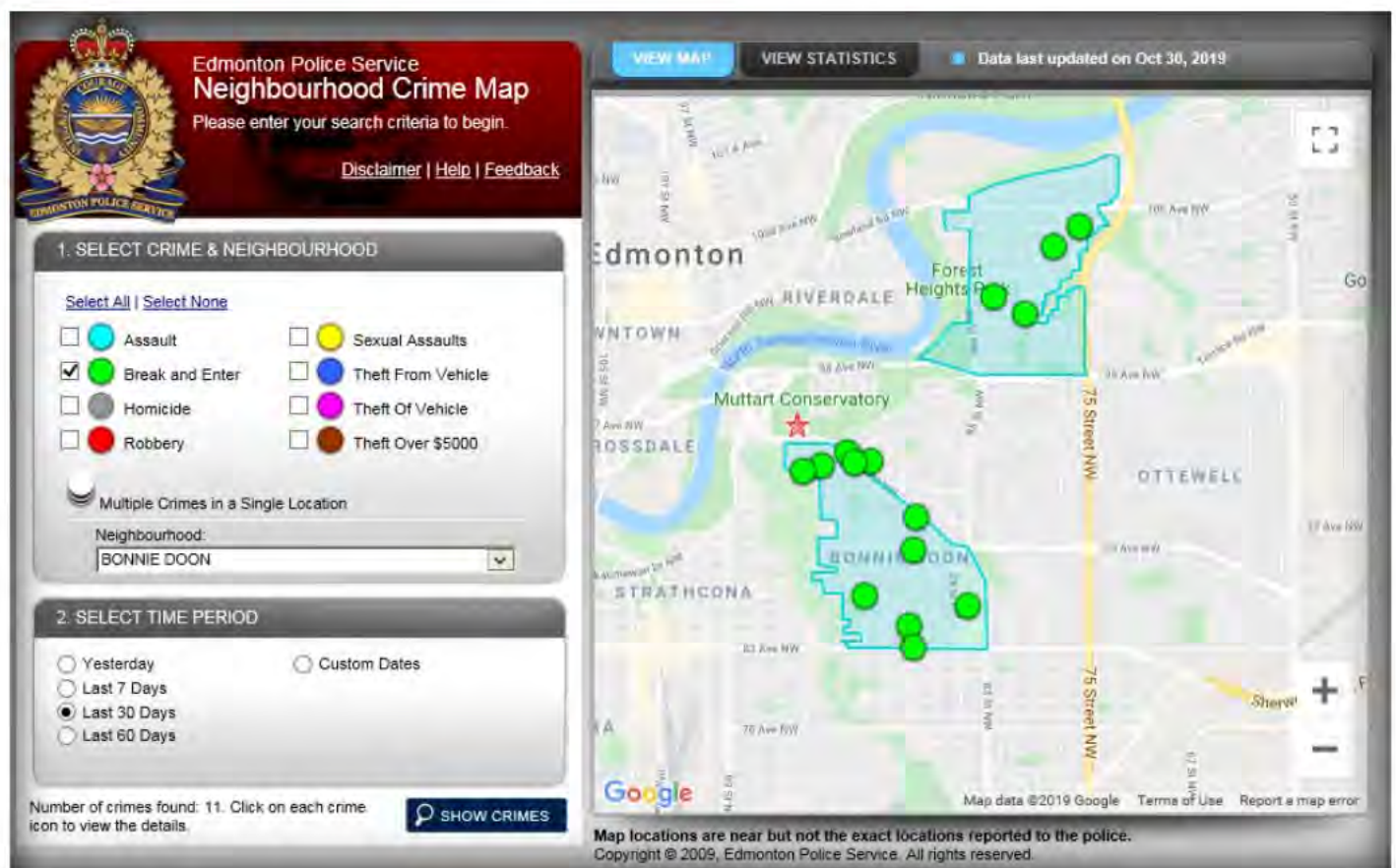
The Edmonton Ski Club (ESC) is a 25 acre ski area located in central Edmonton. The ESC generally operates between November and April each year, though the main office is used by staff all year round. In addition to recreational skiing, ESC offers competitive skiing and snowboarding for all age groups. The ESC is located in the Cloverdale neighborhood, between Gallagher Park and the Muttart Conservatory. The ESC is intended to be used by paying customers who can purchase day passes or yearly memberships.

The ESC is also located near the Edmonton River Valley and is between Downtown Division and the Bonnie Doon Neighbourhood. The forested areas of the river valley are often home to homeless populations and it is not uncommon to find camps located near the Edmonton Ski Club. The homeless population is very

transient, often walking from Downtown to Bonnie Doon and the ESC is located in the middle of this corridor. The location of the ESC is also naturally secluded as it is at the bottom of a valley with only a few residential properties that can see it.

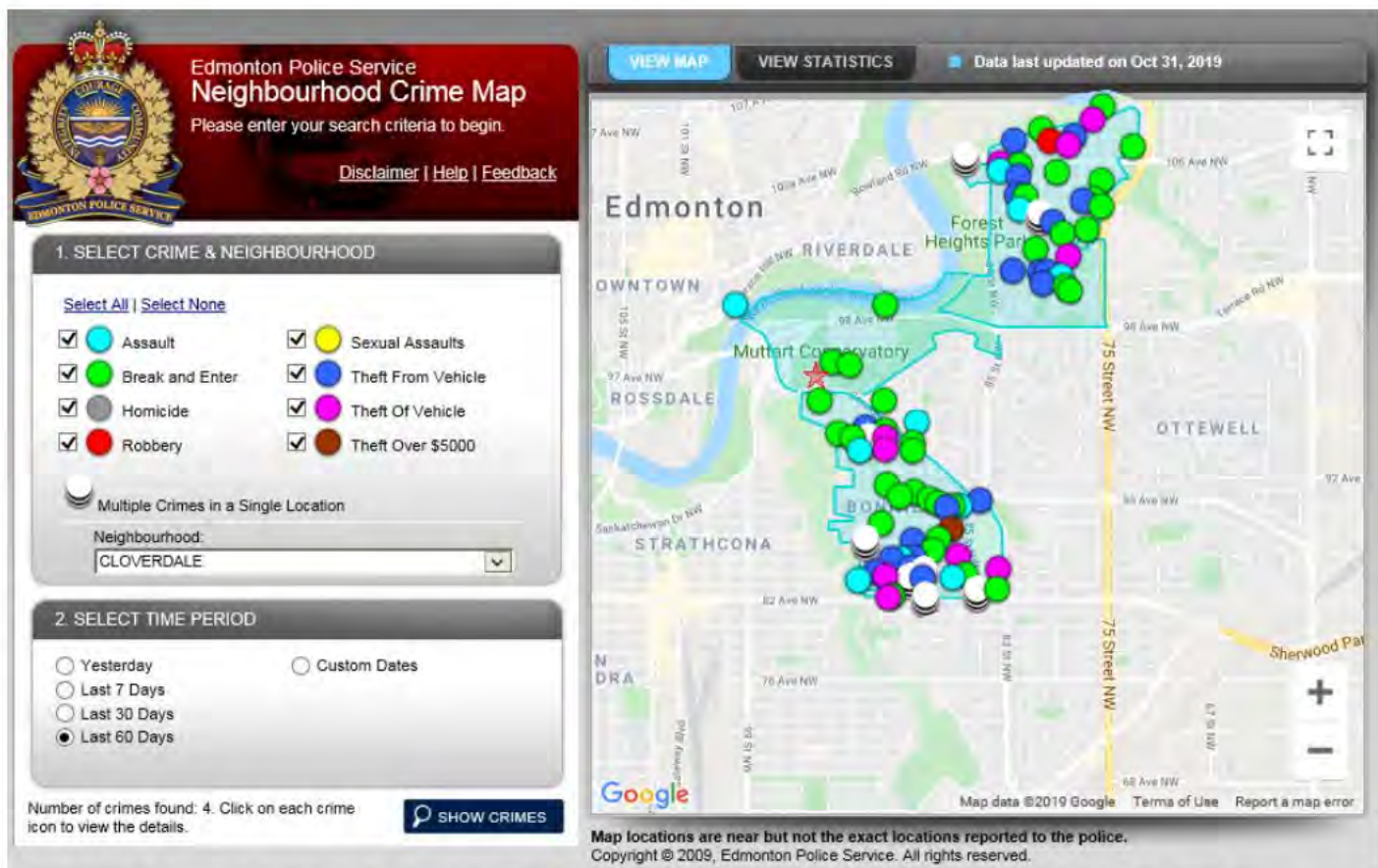
This CPTED audit is being done at the request of the management group of ESC after they experienced a rash of copper theft and graffiti over the spring and summer of 2019. Several of their trailers had been vandalized with graffiti and there had been several break and enters at the site, both reported and unreported. In addition to these occurrences, the surrounding communities, especially Bonnie Doon, Strathearn, and Forest Heights, have a high rate of property related crime including break and enters. Between August and October of 2019 there have been 37 break and enter occurrence in Bonnie Doon, 3 in Cloverdale, and 23 in Forrest Heights for a total of 63 reported events. Staff at the ESC have made some steps to try to reduce these occurrences such as having Mural's painted on their trailers to combat Graffiti. The ESC is open to feed back about how best to protect themselves for future issues.

Reported Break and Enters between the dates of October 2 and October 31 2019.



NOTE: This above map only shows crime for the last 30 days (As of October 31, 2019) and only shows Break and enter indicators and does not include other crime and disorder reported in the area.

Reported Crime Indicators between in last 60 Days as of October 31, 2019



Cloverdale, Bonnie Doon, and Forrest Heights for last 60 days as of October 31, 2019.

9613 96 AVE falls into Southeast Division, District 1. Statistical data and recent crime maps can be obtained by visiting <http://crimemapping.edmontonpolice.ca> and selecting "Cloverdale" in the "Neighborhood" drop down menu.

Each division in the city has a Community Liaison Sergeant (CLS) assigned to it. For any location specific problems, long-term community initiatives, presentations or problem solving initiatives requiring police assistance or participation, contact the CLS, Sgt. Dehid at 7808681003.



PERIMETER

OVERVIEW:

The ESC is a ski facility situated in Central Edmonton at 9613 96 AV. Given its intended use, it covers a huge open area of 25 acres. The vast majority of the area is empty space used for skiing and snowboarding in the winter and it is also home to the Edmonton Street Performers Festival in August. The north end of the property is where the main office, maintenance buildings, and chalet are located. There are 4 buildings on the property, all of which are located on the north side.

The main entrance to ESC is located off of 96 AV and 96A ST, on the north side of the property. This is the only means of entering the ESC grounds by vehicle and is also where the parking lot is located. From 96A ST, west to 95 ST, the north perimeter is lined by tall trees and shrubs. From 96A ST west, there is a walking and biking path that leads west before looping south and then back east along the south side of the property. There is not any physical barrier separating the walking path from the ESC property. Much of the south side of the path is under construction due to the expanding LRT tracks. The east side of the property is lined by a thick tree line which separates ESC from Gallagher Park.



Path leading west from 96A ST



South perimeter looking west



North perimeter on 96 AV.



East perimeter looking south from 96 AV.

EXISTING CPTED STRATEGIES:

Existing CPTED strategies that support Natural Surveillance include: site lines once you enter the property are generally good as most of the property from east to west and north to south is visible.

Existing CPTED strategies that support territoriality include: Signage on the front gate and near the main office which identify the property as ESC. There is a private property sign on the front gate however it is currently covered by advertisements. The traffic circle at the main door is also a good way to calm traffic in a high pedestrian area.

Existing maintenance strategies include: professionally painted murals on the buildings to deter unwanted graffiti. The grass and landscaping of the skiing area is well taken care of.

The following are the identified concerns and recommended mitigating strategies.

1. CONCERNS AND/OR ISSUES:

The only sign that marks ESC as private property is covered by a banner. There are a few no parking signs in select locations but no signs that designate where the parking stalls are located. Signage on the property and in the parking lot would go a long way to showing ownership of the property and will clearly mark where public property ends and private property begins.



RECOMMENDATIONS:

- Consider moving the Season Passes sign to uncover the Private Property sign.
- Consider placing additional Private Property or No Trespassing signs along 96 AV, along the walking path on the west side, and on the south and east borders of the property this will reinforce the fact that anyone entering the site is now entering private property.
- Consider placing parking and no parking signs in the parking lot and surrounding property, as applicable, so that it is clearly marked where customers are to park.
- A private property guideline document will be provided along with this report intended to assist with the property placement and correct wording of signs to make them enforceable under the Edmonton Bylaw.



2. CONCERNS AND/OR ISSUES:

The perimeter of 96 AV between 96A ST at 95 ST has thick trees and brush which makes it nearly impossible to see into the property of ESC from the street or residences.



RECOMMENDATIONS:

It is strongly recommended that tree canopies are trimmed up at least 6 feet from the ground and shrubs are no higher than 3 feet. This landscaping will eliminate hiding spots and open sightlines. Remember a maintenance plan is critical when it comes to landscaping.

Also consider planting hostile vegetation along the 96 AV border. If it is well maintained, this vegetation can be aesthetically pleasing and it would dissuade pedestrians from walking through the tree line to enter the property.

Another option would be anti-climb fencing the north perimeter.



Barberry Bush



Anti-Climb Fencing

3. CONCERNS AND/OR ISSUES:

Potential vehicle access to the north east corner of the property. Currently there is a gate on the east end of 96 AV, however, it can easily be driven around and then a vehicle can have full access to the ESC property.

Additionally, police have done checks at night and have found that the access gates on both ends of the property were left open.



RECOMMENDATIONS:

- a) Consider adding a fence or gate to prevent unwanted vehicle traffic from entering or exiting at this location. Concrete barriers can easily be defeated by anyone who is motivated to do so.
- b) Implement a system of responsibility where it is the role of one or more employees to conduct a perimeter check at the end of each night to ensure that all gates are secure.

4. CONCERNS AND/OR ISSUES:

There is very little lighting on the property. During the night checks, the only lighting is around the main office building. The rest of the facility was in total darkness. The low light conditions combined with the dense trees along 96 AV would make it nearly impossible for anyone to be seen from outside of ESC.



Consider adding lighting to the perimeter of the property, particularly on the north east border where the office and maintenance buildings are located. Ideally, there should be sufficient light to be able to identify a person's face from 10-20 meters away. LED lighting is recommended. LED lighting is energy efficient and reduces electrical costs. It can also be equipped with motion sensors that allow lights to dim when there is no activity and turn up the brightness when activated. From a would-be offender's point of view, lighting up an area they are entering makes them feel more exposed and at a greater risk of being observed and caught.

EXTERIOR

OVERVIEW:

The ESC has 4 buildings located on the property all of which are located on the north side of the property. The main office building and chalet is the largest of the 4 buildings and is located just east of the parking lot and has a west facing main entrance. There is also a south exit onto a patio and north exit which it used for staff members only.

North east of the main office building is newly installed trailer with two south facing exits.

Just east of the new trailer is a garage where ATV's and other machinery are stored. This building has a south facing overhead door, an east facing overhead door, and an east facing pedestrian door. East of the garage is a fuel storage container which recently had fuel stolen.

Lastly there is a fourth building which is located south of the main office building. This building is designated for staff use only and has a north facing exit.

Most of the windows on the property are protected by metal cages, though there was a reported incident where a suspect cut through the cage to gain entry to the building. There is not any lighting on any of the buildings beside the main office building. As such, the property is very dark at night.



Front Entrance of main office.



New trailer east of the office building.



Garage located east of the new trailer.



Southern most building, staff only.

EXISTING CPTED STRATEGIES:

Existing CPTED strategies that Support Natural Surveillance include: large windows on the west side of the main office which overlook the parking lot and entrance. The main office building is also well lit around its exterior at night.

Existing CPTED strategies that Support Territoriality include: The main entrance is clearly marked and there are two large signs for the Edmonton Ski Club near the front doors.

Existing CPTED strategies that Support Access Control include: The main entrance is clearly defined and is obvious when you first enter the property and are in the parking lot.

The following are the identified concerns and its recommended mitigating strategies.

1. CONCERNS AND/OR ISSUES:

As mentioned, there is no lighting around any of the buildings except for the main office building. These unlit areas provide anonymity for anyone who is at the facility after hours providing the opportunity to engage in criminal and disorderly activities.



RECOMMENDATIONS:

Consider installing LED lights on the exterior of the buildings and trailers as well as in the parking lot and walking areas. Ideally, there should be sufficient light to be able to identify a person's face from 10-20 meters away. Solar powered, motion sensitive lights would also be a cost effective option for some of the less travelled areas.



2. CONCERNS AND/OR ISSUES:

There are no security cameras on the property and most of the reported crimes have occurred at night when there is no staff present. As such there have been no witnesses or video evidence. The property is also very secluded and there is not much opportunity for member of the public to provide natural surveillance of the property.

RECOMMENDATIONS:

- a) Consider installing a CCTV security system to help identify suspects if there are future incidences of mischief or break and enter. If a security system is purchased, consider the lighting conditions ensuring it is adequate to support CCTV and inquire about which cameras would provide the best resolution given their placement.
- b) Consider installing signage which indicates that the property is under video surveillance.



- c) Another type of surveillance equipment is a stand-alone mobile unit. These units can be overt or covert and can be placed in the middle of an area you wish to cover. The units are powered by diesel, ethanol and solar power or a combination of these fuel sources.

These units are typically outfitted with a telescopic mast that can be 30 feet or higher equipped with different cameras of your choice. Cameras such as pan tilt zoom, night vision, infrared (body heat) or standard fixed cameras can be mounted on these units. Other options that are available are flashing strobes, spot lights and a public announcement system (PA) capable of broadcasting messages.

Another interesting feature is perimeter detection devices that are activated when movement is detected in the area being monitored, this works well in secluded areas. Cameras can be set to focus on the movement, record and send out alerts to whoever is chosen to monitor them. This can be controlled and accessed through such things as smart phones and tablets. This equipment can be costly starting at about \$60,000 CAD however, because this equipment is portable, it can be used at different location when needed.



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FEATURES

- Methanol Fuel Cell Technology
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- PTZ Cameras for Auto Tracking
- Integrated Video Recorder



3. CONCERNS AND/OR ISSUES:

Currently the only barrier between the vehicles in the parking lot and the front doors of the office is a narrow sidewalk that is only a few inches in height. A vehicle could easily mount the sidewalk and drive through the front windows of the office.

RECOMMENDATIONS:

Concrete or metal planters could be used as a safety measure to mitigate this issue. Strategically placed planters could also be used to guide pedestrians and vehicles through the property.



INTERIOR

OVERVIEW:

The interior of the buildings are currently being configured for the 2019 season. Given that the main problem areas are the perimeter of the property and the exterior of the buildings no recommendations will be made at this time. If modifications are made to the interior of the buildings, keep natural surveillance in mind. Try to arrange seating and workstation areas in a way that offer visibility to people inside and out allowing people to be aware of what is going on around them.

CONCLUSION

The staff of the ESC are very engaged and open to suggestions when it comes to making the ESC a safer and more secure facility. Given the size and open nature of the property there are some security issues that will be difficult to address as securing the entire perimeter is not an option. However, implementing features such as additional signage, lighting, and cameras should improve the overall security of the facility.

One of the main objectives should be to make the property less appealing for those who are not there to use it for the intended purpose. This means making the property visible and ensuring there is continual maintenance which shows ownership and pride in the facility.

DISCLAIMER

This CPTED assessment was conducted to address the concerns of safety and security. None of our recommendations are compulsory under law, but this document can be made public under an application under the FOIPP Act or as otherwise required by law. This report does not address issues of responsibility concerning a civil litigation action. You should consult a lawyer familiar in this area for advice.

We acknowledge some of these suggestions are costly and may have to be taken in consideration for future budgets. We also understand that you want to create a warm open environment for your guests, customers and tenants but security precautions must be kept in mind.

This CPTED report was submitted to the Edmonton Police Service Collaborative Policing Unit and reviewed prior to releasing the report to the person or group who requested the audit. The report was checked for thoroughness and adherence to current CPTED practices.

Crime Prevention Unit member reviewing report: Cst. John Beatson
Date: November 21, 2019

Edmonton Police Service
9620 – 103A Avenue
Edmonton, AB T5H 0H7

APPROVAL BY COLLABORATIVE POLICING UNIT

Reg. #: 3356 Name: John Beatson Signature: 