

ACKNOWLEDGEMENTS

The City of Fort Saskatchewan is located on Treaty 6 territory and Métis Nation of Alberta District 11; the ancestral and traditional territory of the Nehiyawak, Dene, Blackfoot, Saulteaux, Nakota Sioux, and Métis. We acknowledge that our forests have been protected and cared for by Indigenous Peoples for millennia, and we extend our gratitude to those who have shared their knowledge of the natural environment with us as we've worked on the Urban Forest Protection and Enhancement Plan. As we share the findings of this report, we endeavour to embody a spirit of respect and appreciation for the urban forest and the community it supports.

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Acknowledgement is also given to the project team in the City of Fort Saskatchewan Public Works Department, Diamond Head Consulting Ltd., Modus Planning + Design, pipikwan pêhtâkwan, and Kathryn G. Lennon for their work and dedication to the development of the Plan, as well as all of City Council, Administration, stakeholders, and the many residents that contributed their insights to the Urban Forest Plan.









EXECUTIVE SUMMARY

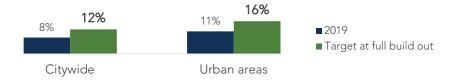
Fort Saskatchewan's Urban Forest Protection and Enhancement Plan (the Urban Forest Plan) will guide the City's management of the urban forest. The urban forest, made up of planted and naturally occurring trees, vegetation, and soils, is an important community asset, from forests growing along the river valley to street and yard trees.

The urban forest plan builds on extensive work already underway in the municipality and seeks to leverage opportunities to improve tree protection, planting, and stewardship while addressing challenges such as managing pests and diseases and improving growing conditions for urban trees. The plan takes an additional step towards etuaptmumk (Two-Eyed Seeing), the gift of integrating Indigenous ways of knowing with Western ways of knowing.

A FEW FACTS ABOUT FORT SASKATCHEWAN'S URBAN FOREST:

- Fort Saskatchewan and the surrounding area was known by the nehiyawak (Cree) people as waskwayâhtikispatinaw (birch hills) due to the many birch trees that were present in the land prior to colonization
- As of 2019:
 - 8% of the City and 11% of the urban area was covered by tree canopy
 - much of Fort Saskatchewan's natural areas are short young forests dominated by deciduous trees
 - the City manages over 15,000 urban trees planted along its streets and in its parks.

CANOPY TARGETS:





VISION:

Fort Saskatchewan's resilient and expansive urban forest supports community well-being, enhances biodiversity, and seamlessly weaves nature into every neighbourhood. Our community plants, nurtures, and grows the urban forest with guidance from the seven sacred teachings of wisdom, courage, respect, honesty, truth, humility, and love from the nehiyawak and other Indigenous cultures.

"A seed is an idea, and an idea is a seed."

– Elder Roy Bear, Chief of the Siksika Nation, sharing wisdom about the potential for the Urban Forest Plan to support not only tree planting but also to nurture and grow the urban forest with the community.

- **GOAL 1.** Protect and grow urban trees for an equitable access to lush, tree-lined neighbourhoods
- **GOAL 2.** Protect and restore natural areas to protect their cultural and historical importance, enhance their ecological value, and provide community access to the City's valued green spaces
- **GOAL 3.** Manage the City's urban forest in accordance with best practices
- **GOAL 4.** Partner with community members and organizations for urban forest management
- **GOAL 5.** Monitor performance and adapt to changing circumstances.

ACTIONS:

The plan includes **43 actions** to achieve the urban forest vision. The following are highlighted as 'big moves' towards achieving the plan's vision:

- Develop a planting plan to guide City tree planting (action 3F) and prioritize City tree planting in areas with lower tree equity and vacant planting sites (action 3A)
- Explore ways to improve food security with parks landscaping in partnership with schools, food banks, or other interested community organizations (action 8B)
- Develop education materials about urban forestry to enhance community's knowledge about and support stewardship of Fort Saskatchewan's urban forest (action 9A)
- Develop an urban forest stewardship program that integrates community and school events, programs like adopt-a-tree, and activities to familiarize the community with the urban forest (action 9B).

The plan also supports many actions that are already in progress or have been initiated by the City, such as improvements to soil inspection in new subdivisions (action 2B), maintenance of the City's street and park trees (actions 3B, 6A, 6D), tree species trials to adapt to the changing climate, the historical impact assessment for Turner Park (action 4B), or pursuit of grant funding for urban forest initiative (action 7A).



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SECTION 1.0

INTRODUCTION

Fort Saskatchewan's urban forest and green spaces are an important community feature. Residents highly value the urban forest, from the extensive forest and green space along the river valley to tree-lined streets in the city's older neighbourhoods. The urban forest provides important benefits to connect with nature, recreate and make neighbourhoods more livable.

Fort Saskatchewan's Urban Forest Protection and Enhancement Plan (the Urban Forest Plan) recognises the importance of the city's urban forest, benchmarks its current conditions, and identify the challenges it faces, and community values it needs to respond to. The plan sets a vision, target, goals, and implementation plan to guide urban forest management for the coming years.

The Urban Forest Plan contains the following sections:

Introduction – describes the purpose of the plan.

What is the urban forest – defines the urban forest, why it matters, and who manages it.

The urban forest through time – provides the historical context rooted in Indigenous knowledge and connection with the land and the recent history of the City's urban forest program.

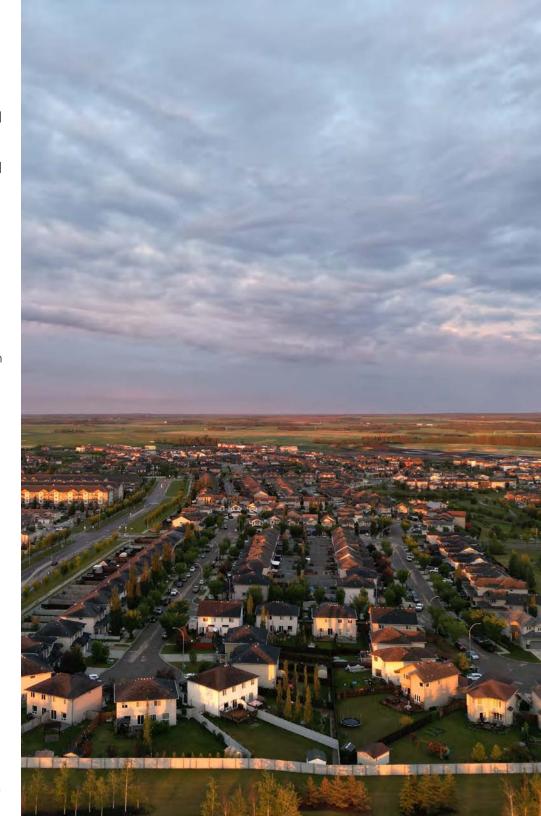
The urban forest today – benchmarking of the current state of the urban forest in Fort Saskatchewan and the City's urban forest program.

The urban forest of the future – a description of the major urban forest challenges, vision for the urban forest of the future, and a supporting canopy cover target.

Community values – describes key community values gathered through community and Indigenous engagement for this project.

The urban forest of the future – the plan's vision for Fort Saskatchewan's future urban forest, the goals set out to achieve it and the challenges and opportunities they respond to, and a supporting canopy cover target to monitor implementation success.

The action plan – a detailed implementation that builds on the goal to provide strategies and actions and their respective priorities, costs, and responsibilities for implementation.



Etuaptmumk, or Two-Eyed Seeing is a concept developed by Mi'kmaw Elder Albert Marshall to describe the gift of seeing and integrating multiple perspectives¹. It refers to the gift of seeing the Indigenous ways of knowing with one eye and the Western ways of knowing with the other eye and integrating them to achieve beneficial outcomes.

As part of the engagement conducted to inform the development of this plan, Indigenous engagement was led by pipikwan pêhtâkwan to identify important Indigenous history and cultural significant areas; learn what Indigenous experts identify as high value in an urban forest plan; learn the vision Indigenous community members have for the urban forest; collect traditional knowledge to inform the Plan; and build relationships with Indigenous participants.

In an effort to practice etuaptmumk, traditional knowledge gathered through the Indigenous engagement and summarized in full in pipikwan pêhtâkwan's "'A Seed is an Idea, and an Idea is a Seed' – Traditional Indigenous Knowledge" report is integrated throughout this plan. The content is marked in green and with a braiding icon for easy reference.

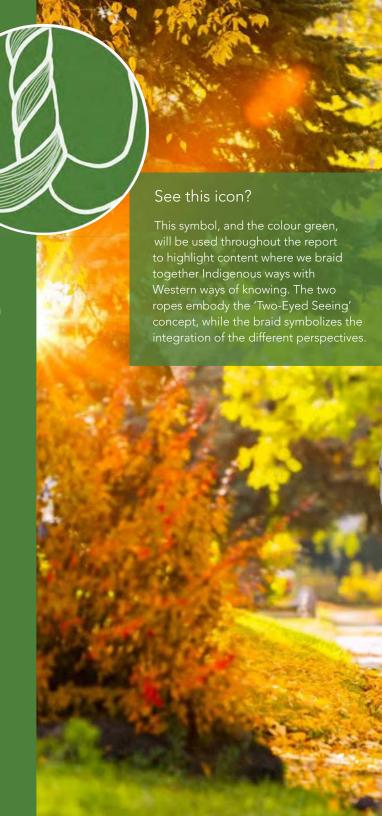
The power of action¹

Elder Roy Bear, Chief of Siksika Nation, said that the Plan in Fort Saskatchewan has so much potential because "a seed is an idea, and an idea is a seed". The work that will go into this plan needs to be more than planting new trees, it must be nurtured and grow with the community.

ani to pisi, in siksikaitsipowahsin (Blackfoot language) is a phrase that teaches us about the spiderweb; our traditional knowledge of the original instructions on how we work together. There are similar nehiyawak (Cree) words that have similar teachings. To follow those instructions, we must recognize that every action we take has the power to vibrate through the web and talk to all other societies. No changes in the Plan will ever happen in isolation, everything is connected.

¹ Content taken from pipikwan pêhtâkwan (2023): "'A Seed is an Idea, and an Idea is a Seed' – Traditional Indigenous Knowledge" report.





SECTION 2.0

WHAT IS THE URBAN FOREST



This section provides a brief overview of what we describe as the urban forest, how its various components are managed, and its value.

2.1 URBAN FOREST DEFINITION

The urban forest is comprised of planted and naturally occurring trees, vegetation, and soil located on public and private lands along roads, in parks, open spaces, private yards, and natural areas, including the river valley (**Figure 1**).

Urban forests encompass the places where people reside, work, recreate, travel, make purchases, and socialize. The urban forest serves as the intersection between local ecosystems and urban landscapes. Native trees and plants in the city's natural areas provide an important community asset and essential habitat for our fauna and flora. Urban trees create wildlife corridors linking

pockets of natural habitat across the city's urban areas and provide important benefits to residents and visitors. While an individual tree may provide shade for a family outing, an entire urban forest has the capacity to mitigate the urban heat island effect, offering cooling benefits to numerous residences or businesses during summer heatwayes.

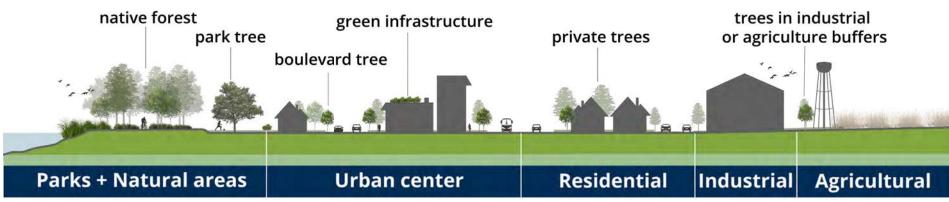


Figure 1. Component of Fort Saskatchewan's urban forest.

2.2 SEVEN SACRED TEACHINGS IN THE NEHIYAWAK AND OTHER

INDIGENOUS CULTURES²



There are seven sacred teachings in the nehiyawak culture, and other Indigenous cultures. The seven layers of a food forest are directly aligned with the seven sacred teachings. The trees, or standing people as referred in nehiyawak culture, share knowledge with humans and impart this guidance on us. The teachings from the seven layers of food forest offer a different perspective on how to describe the urban forest and our relationship to it.

The Canopy of Wisdom

The oldest layer of a canopy are the biggest standing people and they protect all the other plants and animals: The walnut, the chestnut, the beech nut, and the maple trees. We learn wisdom from them. The walnut is shaped like the human brain. Western knowledge is coming to know what Indigenous knowledge always has: walnuts are great nutrition for the mind.

The Canopy of Courage

The next tallest layer of the standing people are the fruit trees: Cherry, apple, plum, saskatoons. Fruit trees are challenged by harsh winters, drought, or even storms. Although they may be fragile, they share their fruits which shows courage to us. We learn to not hide our gifts, even when the environment may be scary.

Figure 2. Seven layers of food forest in the nehiyawak culture and other Indigenous cultures (graphic credit: pipikwan pêhtâkwan).

² Content adapted from pipikwan pêhtâkwan (2023): "'A Seed is an Idea, and an Idea is a Seed' – Traditional Indigenous Knowledge" report.

The Canopy of Respect

The next layer in the food forest is the berry layer, or bushes: Blueberry, raspberry, haskap, and gooseberries. Berry bushes are self-fertilizing and self-propagating. They grow together amongst each other. They come in different shapes, colours, tastes and yet they grow in harmony together. We learn to respect and how we can co-exist with one another, and the other societies from this layer.

The Canopy of Honesty

The next layer is the food that grows right above the ground: Squash, pumpkins, lettuce, and cucumbers. There is honesty about these foods, they are trusted and nutritious. They show when they are ready to be eaten and there is an honesty about that willingness to be shared.

The Canopy of Truth

The next layer is found on the surface of the ground. These are our medicines: fungi, sweetgrass, sage and the strawberry. While the strawberry is a fruit, it is a sacred berry for Indigenous people, referred to as the heart berry. The strawberry represents the earth. Unlike any other fruit, the strawberry seeds are on the surface of the fruit, just as humans occupy the surface of the earth.

The Canopy of Humility

The canopy that grows just under the surface are important vegetables: potatoes, carrots, and turnips. They are not evident from the surface as much as the other layers. We often have to dig them up, on our hands and knees. This layer teaches us humility. Many of the foods that grow in this layer grow best in companionship with others; they may not be successful just anywhere.

The Canopy of Love

The last layer is the vines and creepers. They explore the forest areas and embrace other plants. They are an important layer that often provides access for animals from the ground to higher areas for safety. From this layer we learn love.



2.3 MANAGEMENT OF THE URBAN FOREST

The City of Fort Saskatchewan oversees the management of trees in city parks and along streets, while property owners or land managers are responsible for tree management on private land. The City uses different management approaches for the following two types of tree assets: urban trees and trees in natural areas.

Figure 3 provides an overview of how management differs for these two types of trees when it comes to planting, maintenance, protection and stewardship activities. The Urban Forest Plan addresses the issues and management strategies associated with these urban forest assets.

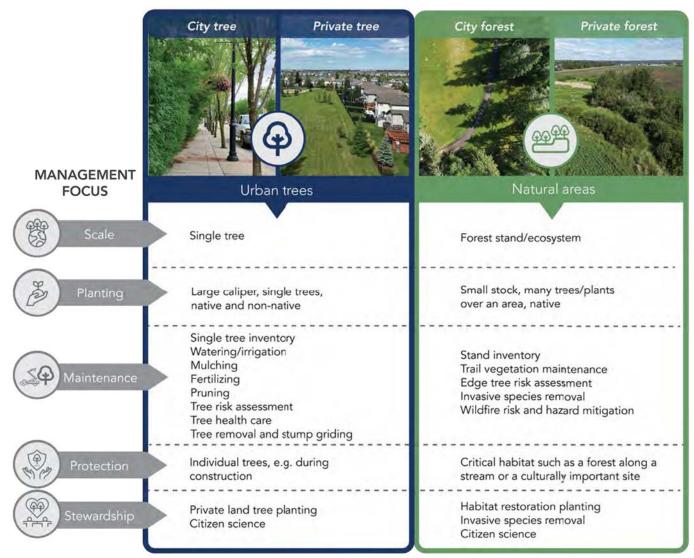


Figure 3. Urban forest asset types in Fort Saskatchewan.

2.3.1 TREES IN NATURAL AREAS

Trees in natural areas are generally managed as a stand rather than individually. Trees either self-seed or regenerate themselves. Maintenance is usually limited to dealing with risk and clearance along trails and forest edges, or the management of forest health concerns such as pests and invasive species or restoration of native plants and trees.

2.3.2 TREES IN URBAN AREAS

Trees in urban areas are often planted individually to showcase their attributes like size, colours, texture and form. These trees are generally managed as individual assets that, like other human-built City infrastructure, provide services and require management. Trees in urban areas often require more management efforts compared to those in natural areas. They are planted individually

because of space limitations and their proximity to buildings and structures, which restrict their access to soil and water. Due to the harsher growing conditions, urban trees are not always native species, tend to be planted at a larger size than in natural areas to facilitate their establishment, and usually require some watering and pruning.

Unlike traditional engineered assets, trees appreciate in value as they mature so long as proper care is given in the early establishment years of a tree. **Figure 4** provides an overview of the costs and benefits of urban trees from the time of planting. Costs are higher in early years, while they provide most benefits once they reach maturity. To maximize its return on investment, Fort Saskatchewan needs to ensure that the right trees are planted in adequate growing environments and provide sufficient watering and pruning to allow their establishment and growth to a mature size.

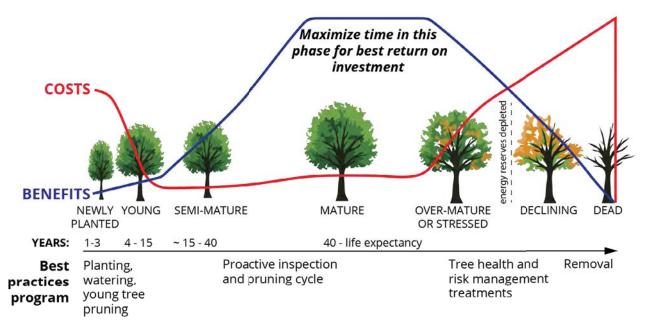


Figure 4. Magnitude of management costs and tree benefits over the urban tree life cycle in urban settings.

2.4 VALUE OF THE URBAN FOREST

Fort Saskatchewan's urban forest is highly valued by the community, particularly for providing clean air and water, providing shade, and beautifying the city. The benefits provided by the urban forest can be categorized into four ecosystem service types²:

Provisioning services: the tangible goods produced by trees and forests, including medicines, fruits, mushrooms, clean water, timber, and plant fibers.

Supporting services: the natural processes that yield indirect benefits by establishing conditions for other services to take place. Photosynthesis is a prime example of a supporting ecosystem service in the urban forest, whereby trees convert light

into energy to sustain themselves. Trees provide oxygen through photosynthesis to support other life forms.

Regulating services: offer immediate benefits through moderation or regulation of ecosystem processes. For example, trees cool air temperatures in the summer by providing shade and through evapotranspiration. Trees also absorb and store carbon from the air to help reduce greenhouse gas emissions.

Cultural services: how we appreciate the urban forest, which includes providing aesthetic value, fostering a sense of place, promoting mental and physical well-being, fostering spirituality, facilitating recreation, and boosting tourism.

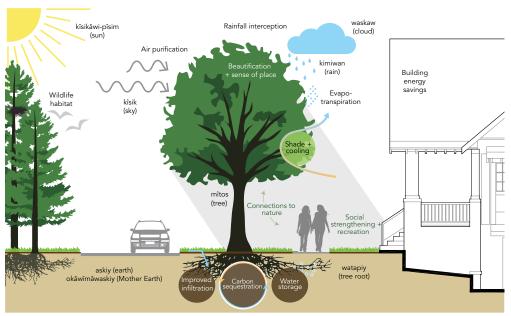


Figure 5. Benefits of individual urban trees, with Plains Cree language translation.

Indigenous oral knowledge tells us that the standing people (trees) "never grew alone", but rather in clusters of at least three. While space might be insufficient to grow trees together in the narrower street boulevards, opportunities will be sought to learn from this knowledge in implementing this plan.





Traditional knowledge shared during this project indicates that humans have been exchanging information with trees and that trees have many lessons to share with us. See section 2.2 and section 3 to learn more about the seven sacred teachings and our shared history with the standing people.

The urban forest provides benefits across various scales, ranging from individual trees to entire woodland communities. Typically, larger and healthier trees contribute a more significant share of benefits, offering greater shade, cooling over more extensive areas, purifying more pollutants from air and water, and enhancing habitat for native fauna. The following section will summarize several common benefits associated with urban forests.

Health and community well-being

Trees are pivotal in enhancing physical and mental well-being, providing spaces for exercise and peaceful contemplation. Spending time in green spaces has been proven to reduce stress levels, improve work performance, and expedite recovery times in hospital settings^{3,4,5}. The proximity of parks or natural areas has been correlated with an increased likelihood of people achieving recommended physical activity levels⁶.

A sense of place

Urban forests add layers of meaning to individuals and communities, fostering cultural benefits such as a strong civic identity and pride⁷.

Habitat and biodiversity

Urban forests serve as biodiversity hotspots, offering habitat for numerous plants, animals, fungi, and microbes during both their life and after their death⁸. Intact forests with diverse habitats support an even greater variety of life. The animals residing in urban forests also benefit from essential ecosystem services like clean water and forest foods⁹.

Climate resilience

Urban forests play a role in carbon sequestration, aiding the global effort to mitigate climate change 10,11. At a local level, the

shade provided by trees and the process of evapotranspiration cools the surrounding air and surfaces¹². Areas with substantial canopy cover experience lower temperatures than those with minimal vegetation, providing a protective cover against extreme heat. Moreover, urban forests help mitigate the impact of storms and floods by intercepting and slowing rainfall with their canopy, stems, and roots¹³. They also prevent bank erosion by binding soil together through tree root systems.

Financial value

Urban trees contribute to the local economy by supporting the success of local businesses. In urban settings, trees encourage longer customer stays and increased spending, improving local shops' performance¹⁴. Research from various locations, including Finland and Florida, indicates that a high density of trees positively influences neighbourhood property values^{15,16}.

Clean air and water

Trees in urban areas serve as natural filters, capturing rain and removing pollutants from both air and water^{17,18}. This process contributes to the cleaning of the air by absorbing pollutants like carbon monoxide, road particulates, and nitrogen dioxide while releasing oxygen¹⁹.

Resources

While urban forests are primarily managed for their intangible services, many cities repurpose removed trees for products such as wood chips and mulches. Fruit trees in community gardens or orchards contribute to fresh, locally grown food availability. Additionally, some trees offer medicinal resources, providing ingredients for traditional medicines and natural remedies.

Indigenous knowledge holders shared the importance of medicinal and sacred plants like fungi, sweetgrass, sage, and strawberries that hold special significance in the nehiyawak and other Indigenous cultures.



Example of urban forest tree valuation - City of Calgary



The City of Calgary hosts an online map of the City's public street and park trees. Each public tree has an associated assessment value based on the International Society of Arboriculture's Guide for Plant Appraisal (9th edition). The tree values are calculated by combining tree species, size, and health. The main motivation behind placing a monetary value on public trees is to encourage

the retention of large and unique trees across the city. It's important to note that such a monetary valuation cannot account for all the benefits provided by trees, particularly more intangible ones such as their role in shaping the community character and improving public health and well-being.

SECTION 3.0

THE URBAN FOREST THROUGH TIME

This section provides an overview of the history of the urban forest from Creation, before Treaty 6, and after the incorporation of the City of Fort Saskatchewan. Content about the history before the Treaty and near colonization is taken or paraphrased from the "A Seed is an Idea and an Idea is a Seed" Traditional Indigenous Knowledge report about the urban forest from before the Treaty.

3.1 BEFORE TREATY 63

3.1.1 FROM CREATION

Traditional Indigenous knowledge gathered during engagement for the development of this plan, tells us that the land is sacred. The land is more than a representation of Mother Earth, it is our Mother. Many nehiyawak (Cree) Elders shared parts of the Creation story during visits held in 2023, where it was learned that trees are known as the standing people. They shared that humans are one of the youngest siblings of all societies and that trees were here long before us. There are shorter and longer versions of the Creation story, but each shares an important lesson about how the land came to be. The standing people gave parts of themselves to help humans learn to grow strong bones. When we recognize the collaboration and collective efforts that were needed to grow the earth we inhabit, we learn to uphold those original agreements.

nehiyawak Elders shared that humans and trees can speak to one another. The trees have shared many important messages with us throughout history. Many parts of the tree provide different knowledge, for example: the leaves, fruits, the trunk, root systems etc. The more we connect with the trees in a relational way, the healthier our forests can become.



³ Content taken from pipikwan pêhtâkwan (2023): "'A Seed is an Idea, and an Idea is a Seed'

⁻ Traditional Indigenous Knowledge" report.

nehiyawak knowledge shares with us that there are four main layers in the earth. Deities and spiritual energy live originally in one of the layers of the earth. These living beings are then reflected into the sky as Northern Lights. The land is living, just as the things that grow out of it. We depend on the energy in those layers for human survival.



3.1.2 BIRCH HISTORY

It was shared that Fort Saskatchewan and the surrounding area was known by the nehiyawak (Cree) people as waskwayâhtikispatinaw (birch hills) due to the many birch trees that were present in the land prior to colonization. Birch bark was not only important for the building of canoes along kisiskâciwansîpî (the North Saskatchewan River), it was also a material used to create birch-bark scroll with nehiyawak syllabics inscribed in them.

Birch trees are excellent protectors against wind and snow due to their strong root systems and dense foliage year round. Birch trees are a significant source of food for many animals societies, such as: foxes, birds, moose, deer, beavers and more. The birch tree produces a flower cluster known as catkins, and those flowers produce small fruits called samaras. The birch tree was a gift from Creator to connect animals and human societies. It is likely that due to colonization and development the land is no longer suited for sustaining birch.

Peter T. Ream, Fort Saskatchewan's most prominent historian, confirms in his book, The Fort on the Saskatchewan, that the area was known as Birch Hills due to clusters of birch trees surrounding the mouth of the Sturgeon River²⁰. Although the mouth of the Sturgeon River does not fall within present-day City limits, the presence of birch trees made the area important as a gathering place for Indigenous peoples

3.2 HISTORY NEAR COLONIZATION⁴

The area known as Turner Park has been identified as a homestead for the Métis, specifically Joseph Turner. Yet, it was not known by participants how the land belonging to Mr. Turner had left his familial ownership and became public property. There was no evidence discussed of script being given and taken for these plots, although research from the Fort Heritage Precinct suggests that the property they lived in was just north of 109a Street. The area was also highlighted as a traveling land for many nehiyawak (Cree) people from Saddle Lake First Nation and Cold Lake First Nation.

The land closest to kisiskâciwan-sîpî (North Saskatchewan River) was prominent during trade and Elders believe it is likely to have significant artifacts such as tools, artisan crafts, and scrolls.

Turner Park was identified as a priority area for conservation due to the known Métis and Indigenous history. Elders shared about the deep knowledge found in the land.

⁴ Content taken from pipikwan pêhtâkwan (2023): "'A Seed is an Idea, and an Idea is a Seed' – Traditional Indigenous Knowledge" report.

3.3 RECENT HISTORY

After being incorporated as a Village in 1899 and a Town in 1904, Fort Saskatchewan became a City in 1985. The urban forest management program developed as the City grew to plant and maintain trees along the streets and in parks.

In the early 2000s the City of Fort Saskatchewan hired an expert urban forester to carry out the City's first inventory of city trees. Each tree was recorded and catalogued based on tree species and size with metal tags placed on each tree. Around 2010 the City began migrating to a digital inventory system called HisTree. This digital tracking system allowed City arborists to update tree information about existing trees, new plantings, and tree removals all directly in the field. This City's current management program is described in Section 4.2.



Figure 6. Examples of HisTree tags that were used for the City's tree inventories.



SECTION 4.0

THE URBAN FOREST TODAY

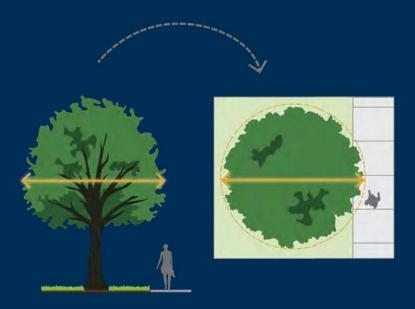
This section provides a summary of the current state of Fort Saskatchewan's urban forest and the City's management program.

4.1 STATE OF THE URBAN FOREST

The description of Fort Saskatchewan's urban forest provides information about its current state that will be used as a baseline during the implementation of the plan. It describes the citywide urban forest and provides relevant details about natural areas and urban tree assets.

Canopy cover: A common urban forest metric

Tree canopy cover refers to the area of land covered by tree leaves and branches when looking from above. It is often expressed as a percentage of the land area.



Canopy cover is a common urban forest metric because it is easy to compare across different areas and assess the extent of an urban forest over time. It is used throughout this section to describe Fort Saskatchewan's urban forest.

4.1.1 CITY-WIDE

In 2019, the City of Fort Saskatchewan estimated its citywide tree canopy cover to be 8%, or 475 hectares of tree canopy. Within Fort Saskatchewan's developed urban area (which excludes industrial and agricultural lands), canopy cover reaches 11% (281 hectares of canopy). For comparison, canopy cover in comparable cities ranges from 7% in Lethbridge to 13% in Edmonton (**Figure 7**).

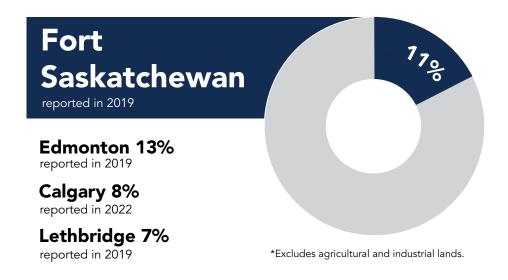


Figure 7. Canopy cover comparison between Fort Saskatchewan and neighboring cities.

Fort Saskatchewan's canopy cover is not equally distributed across the city (**Figure 8**). Areas with some of the highest canopy cover include natural areas along the North Saskatchewan River, downtown, and the surrounding established neighbourhoods.

Compared to those areas, industrial lands to the north, undeveloped areas, and some of the most recently built residential neighbourhoods have lower canopy cover.





Surface temperature and canopy cover

The urban heat island effect has been well documented and describes the relationship between impervious surfaces (buildings, roads) and higher temperatures. **Figure 9** shows the land surface temperature across Fort Saskatchewan on June 27th, 2021, during the 2021 heat dome event. Across the city, parks and natural

areas with high canopy cover, as well as agricultural fields, are cooler than surrounding built-up neighbourhoods and industrial areas. This is visible in the inset map of **Figure 9**, where the cooler interpretive forest in the southwest of Fort Saskatchewan meets the hotter adjacent residential neighbourhood.

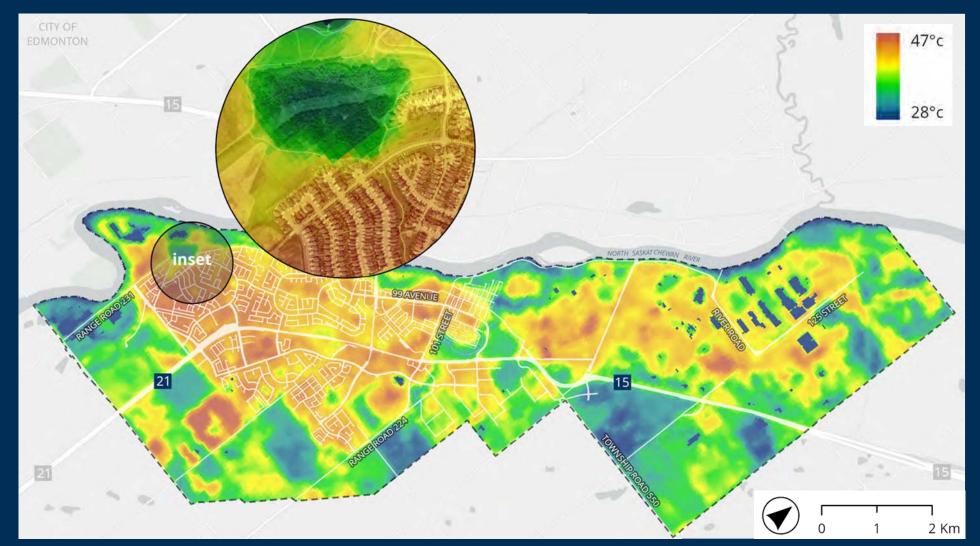


Figure 9. Land surface temperature in Fort Saskatchewan.

4.1.1.1 CANOPY BY NEIGHBOURHOODS

Canopy cover is also unevenly distributed across neighbourhoods in Fort Saskatchewan, with canopy cover ranging from <1% to 42% (**Table 1**). The average canopy cover across all neighbourhoods is 10%, while the average canopy cover for residential neighborhoods is slightly higher at 11%. The neighbourhoods with the highest canopy cover are Old Fort (42%) and Ross Creek Park (26%) near downtown and surrounding neighbourhoods

like Chamberlain (22%) and Pineview (21%) (**Figure 10**). The neighbourhoods with least canopy cover are the light and medium industrial neighbourhoods of Alsten Lands (<1%) and Bussee's Lands (<1%) as well as Sienna (<1%) and Southpointe (<1%).

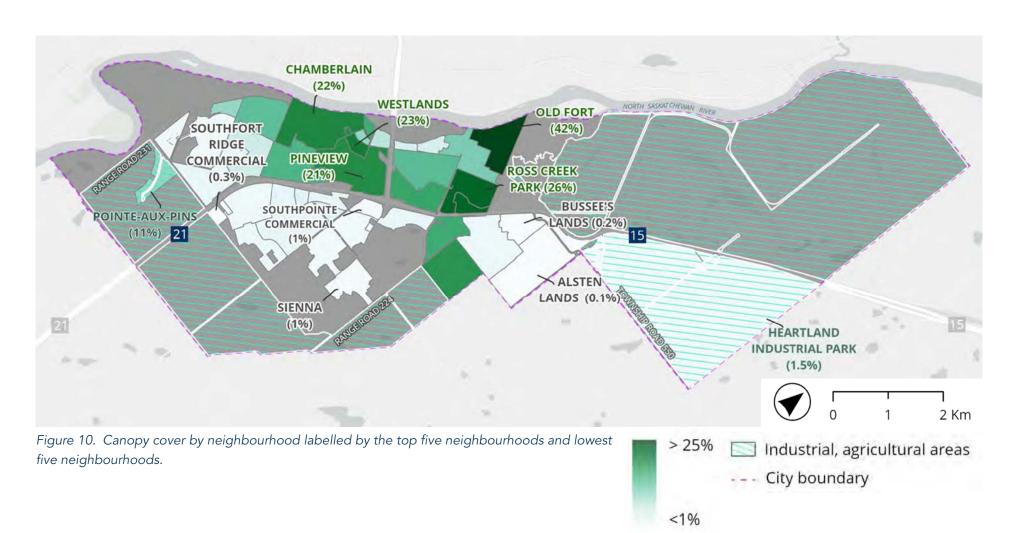


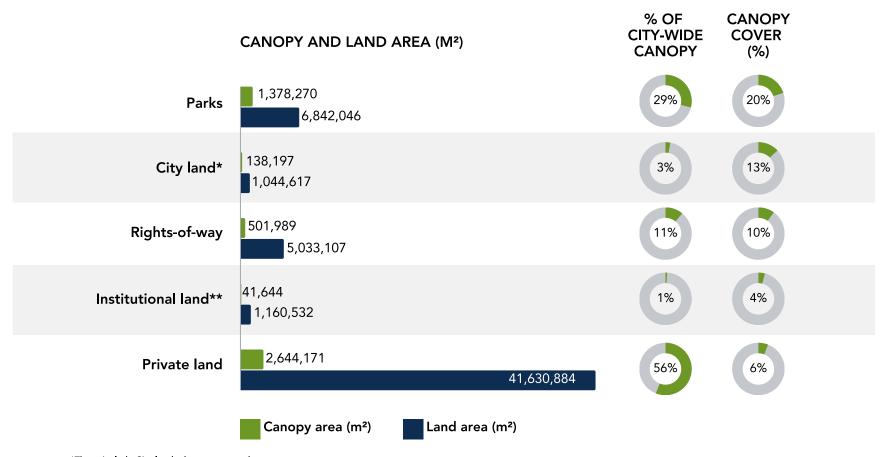
Table 1. Neighbourhoods by total land area, canopy area, and canopy cover.

NEIGHBOURHOODS	AREA (M²) Canopy area Total area	CANOPY COVER	NEIGHBOURHOODS	AREA (M²) Canopy area Total area	CANOPY COVER	NEIGHBOURHOODS	AREA (M²) Canopy area Total area	CANOPY COVER
ALSTEN LANDS	1,692 1,165,755	0.1%	PINEVIEW	187,352 874,703	21%	SOUTHFORT RIDGE	9,275 533,599	2%
BRIDGEVIEW	3,365 60,917	6%	POINTE-AUX-PINS	30,992 274,736	11%	SOUTHFORT RIDGE COMMERCIAL	258 95,398	0.3%
BUSSEE'S LANDS	608 336,383	0.2%	RIVER GLEN	8,768 48,198	18%	SOUTHFORT VILLAGE	3,226 71,147	5%
CHAMBERLAIN	206,040 934,955	22%	RIVERPOINTE	8,225 97,139	9%	SOUTHPOINTE	10,516 733,395	1%
CLOVER PARK	134,102 646,564	21%	ROSS CREEK CROSSING	65 ,178 358,043	18%	SOUTHPOINTE COMMERCIAL	1,325 135,600	1%
CORNERSTONE	6,847 262,936	3%	ROSS CREEK PARK	146,747 569,552	26%	VALLEY POINTE ESTATES	13,760 125,156	11%
COUNTRYSIDE	5,058 44,294	11%	SHERRIDON	94, 854 612,448	16%	WESTLANDS	23,179 100,724	23%
DOWNTOWN	61,710 479,297	13%	SHERRIDON EXTENSION	80,142 424,654	19%	WESTPARK ESTATES	81,415 539,451	15%
EASTGATE BUSINESS PARK	16,379 791,651	2%	SIENNA	3,648 381,893	1%	WESTWOOD TRAILS	34,978 520,631	7%
FOREST RIDGE	10,834 579,545	2%	SOUTHFORT BEND	4,232 145,387	3%	WINDSOR	17,063 603,265	3%
FORT CENTRE	6,902 118,339	6%	SOUTHFORT ESTATES	29,403 915,674	3%	WINDSOR POINTE	17,063 603,265	2%
MCNICOL	108,035 647,149	17%	SOUTHFORT HEIGHTS	4,827 99,158	5%			
OLD FORT	216,715 523,188	41%	SOUTHFORT MEADOWS	6,973 326,174	2%			
HEARTLAND INDUSTRIAL PARK	91 ,304 5,932,790							2%

4.1.1.2 CANOPY BY OWNERSHIP

Approximately 77% of Fort Saskatchewan's land base is privately owned or institutional land, with the remaining 23% being comprised of City-owned parks (12%), rights-of-way (i.e., streets; 9%), and City lands, i.e., City properties that are not parks or roads

(2%; **Figure 11**). Over half of the total canopy in the city lies within private lands, despite private lands having only 6% canopy cover. Parks provide almost a third of the entire canopy in the city and have 20% canopy cover.



^{*}These include City lands that are not parks.

Figure 11. Fort Saskatchewan land ownership by canopy area, land area, percent of citywide canopy, and canopy cover.

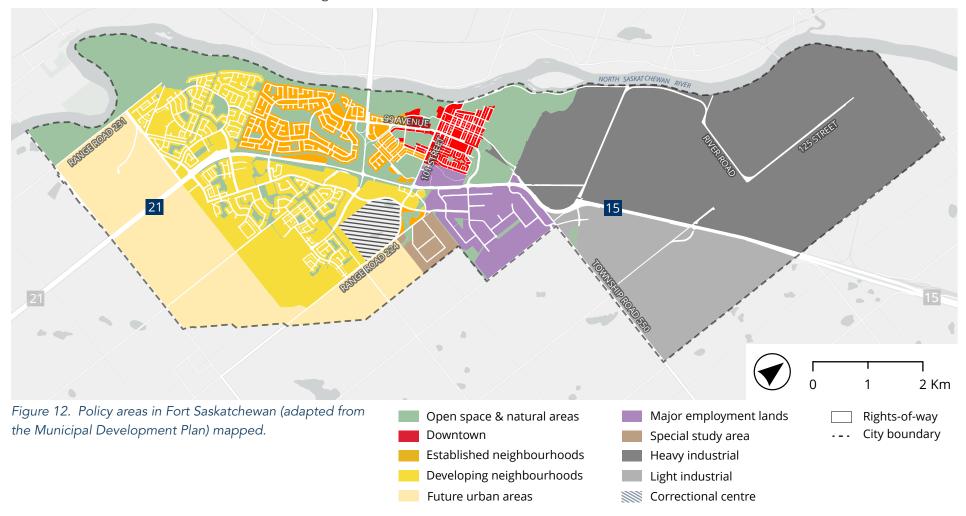
^{**}These lands include the Fort Saskatchewan Correctional Centre, the Fort Pentecostal Assembly and other institutional parcels.

4.1.1.3 CANOPY BY POLICY AREAS

Fort Saskatchewan's Municipal Development Plan is structured around distinct policy areas to tailor the City's planning approach to the unique needs of each of those communities. Those policy areas were adapted to report on tree canopy in distinct areas for light and heavy industrial and road rights-of-way (**Figure 12**).

The policy areas with the highest canopy cover are the study area in Clover Park (20%), followed by open spaces and natural areas (20%), downtown (17%), and established neighbourhoods south

of downtown (14%; **Figure 13**). Fort Saskatchewan's rights-of-way (i.e., streets) have 10% canopy cover. The two largest policy areas by total area all have canopy cover below 10%. Heavy industrial lands make up the largest policy area in Fort Saskatchewan, covering 1,773 hectares of land and 8% canopy cover. Future urban areas and major employment lands have a canopy cover of 5% and 4%, respectively. Light industrial areas have the lowest canopy cover of all policy areas at 2%.



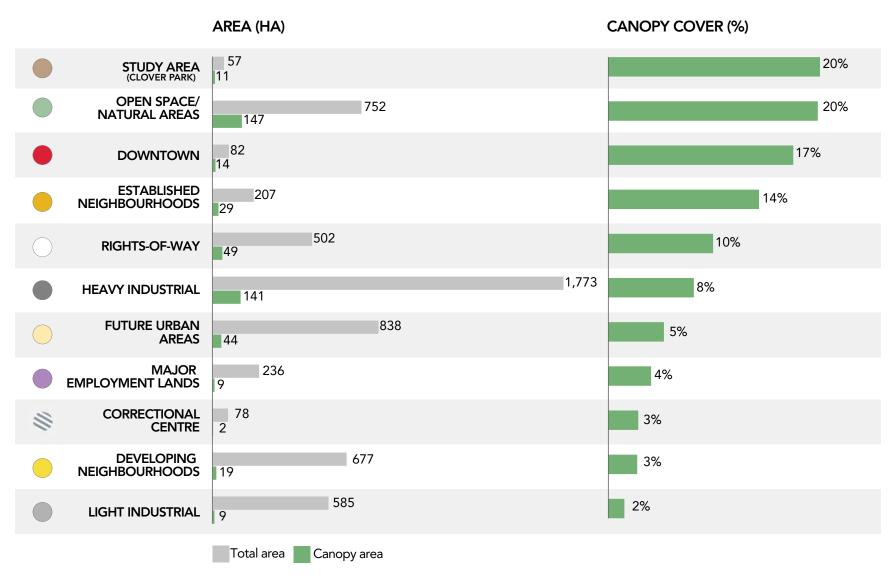


Figure 13. Policy areas in Fort Saskatchewan by land area (ha), canopy area (ha), and canopy percentages (%).

Urban forest initiatives on heavy industrial land

Heavy industrial land makes up 31% of the city's land base and has an 8% canopy cover. While tree planting is not feasible for all heavy industrial uses, many of the heavy industry landowners have been protecting and restoring existing natural areas or reforesting parts of their properties. For example, Sherritt and Dow both carry out restoration planning and plantings in existing natural areas on their properties and collect data about species biodiversity of these areas.

Nutrien has been conducting a reforestation project to restore historical ponds and former stacking sites for phosphogypsum, a gypsum byproduct of manufacturing fertilizers. The company has partnered with the University of Alberta, the Canadian Forest Service, Project Forest and Trees for Life to reclaim phosphogypsum stacks with tree planting rather than grass sowing, which is sometimes used for site restoration. Since 2016, they have planted approximately 70,000 trees on over 37 hectares of land and have found that trees grow faster than they would on typical soil due to the phosphogypsum nutrients. The tree plantations are aesthetically pleasing and bring environmental benefits including new wildlife habitat, a stronger local ecosystem, and carbon sequestration.

Despite limited tree planting opportunities in industrial areas, heavy industrial landowners have managed to maintain 8% canopy cover and retain important wildlife habitat thanks to their protection, restoration, and reclamation programs.

2015 2022 2022





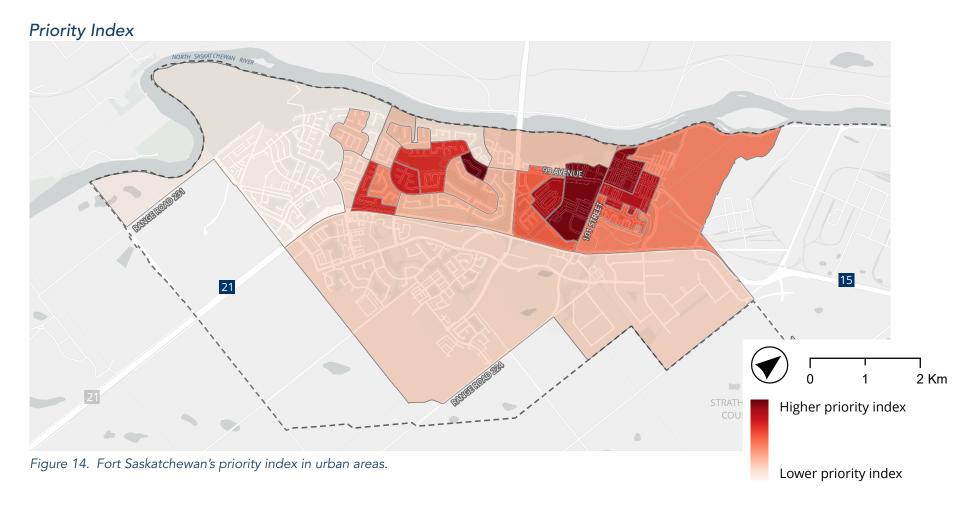


4.1.1.4 EQUITY AND ACCESS

Residents of some neighbourhoods of Fort Saskatchewan have a much better access to tree canopy and its benefits than others. Moreover, because some people are more vulnerable to issues like urban heat, not everyone experiences the same impacts from urban forest benefits on their wellbeing. The not-for-profit American Forests developed a metric called the Tree Equity Score that combines data about the lack of canopy cover with data about the highest need for trees to prioritize tree planting.

Need is identified with a priority index that combines social factors related to heat vulnerability (i.e., high concentration of seniors and children, unemployed, lower income, and minority groups) with urban heat to identify areas with the greatest needs for the cooling benefits of canopy cover (**Figure 14**).

The Tree Equity Score combines the priority index with a canopy gap (i.e., difference between current canopy and a target for the relevant policy area). A lower score indicates a higher priority to increase canopy cover.



Tree Equity Score

A Tree Equity Score was calculated for each census dissemination area within Fort Saskatchewan's urban area. A high Tree Equity Score score implies that tree equity has been achieved based on existing canopy, goals for canopy coverage, and sociodemographic factors. In contrast, lower scores reflect relative tree inequity. In Fort Saskatchewan, the lowest scores are concentrated in the more urbanized areas of the City, specifically in the Sherridon neighbourhood and the south-west portion of the McNicol (**Figure 15**).



The 3-30-300 metric

Another urban forest metric that can inform equity and access to the urban forest is the 3-30-300 guideline (**Figure 16**). The Nature Based Solutions Institute has introduced the guideline recommending that each home has a view of 3 trees, every neighbourhood maintains a 30 percent tree canopy cover, and each home be within 300 meters of the nearest public park or green space. This guidance is grounded in research demonstrating the health benefits of trees and green spaces near homes and workplaces. While seeking to achieve 30% canopy cover target in each neighbourhood provides an easy-

to-remember guideline worldwide, it may not be realistic to achieve in grassland ecosystems such as Fort Saskatchewan. In fact, the not-for-profit American Forests recommends a baseline canopy cover target of 20% for grassland cities²⁸. Similarly, while the guideline recommends each home having access to a park within 300 metres, Fort Saskatchewan's Municipal Development Plan already identifies a target for every dwelling to be within 400 metres of a park. As such, the guideline assessed for Fort Saskatchewan on the next page has been adjusted to 3:20:400.



Figure 16. The 3-30-300 metric³⁰.

How are we doing?

Many of Fort Saskatchewan's policy are close to achieving the 3:20:400 metric (modified from the original metric to match the 20% grassland canopy cover target and Municipal Development Plan's 400 metres from a park target). The Clover Park study area is the only policy area to achieve 100% of parcels with at least three trees within 25 m (**Figure 17**). All policy areas but Clover Park have less than 20% canopy cover. The developing neighbourhoods rank lowest in the 3:20:400 metric, having the highest number

of parcels with less than three trees within 25 m (269 parcels) and highest number of parcels further than 400 m away from a greenspace (241 parcels). Only parcels which were developed at the time of the canopy LiDAR analysis (2019) and trees that were planted by 2019 were considered in this analysis. The downtown and established neighbourhoods areas already provide a public greenspace within 400 m of all parcels.

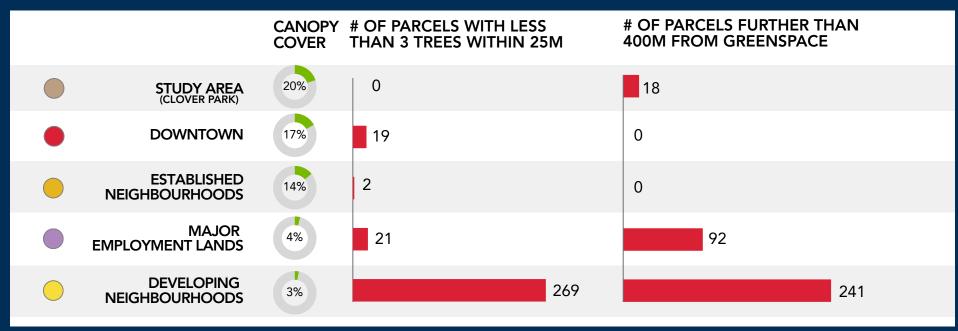


Figure 17. Fort Saskatchewan's 3-20-400 metric.

NATURAL AREAS

Trees in natural areas play many important roles in Fort Saskatchewan's urban forest. Forested natural areas are rich with native plants and animals, protect our community from floods and erosion, offer places to recreate and connect with nature, and connect us with the history of our landscape and many Indigenous teachings. Forested natural areas come in many shapes and sizes, following patterns in stone, soils, waters, and winds that have etched the river valley of kisiskâciwansîpî (the North Saskatchewan River). They reflect our climate, featuring species and ecosystems developed over thousands of years. Forested natural areas are also closely connected to the history of Indigenous nehiyawak (Cree) and Métis people, who sustainably harvested their wood fibres like birch bark and medicines. Today, while many forested natural areas remain in Fort Saskatchewan that are highly valued by the community, they are also highly impacted by invasive plants or animals, erosion, and fragmentation by urban and industrial development.

4.1.1.5 EXTENT OF FORESTED NATURAL AREAS

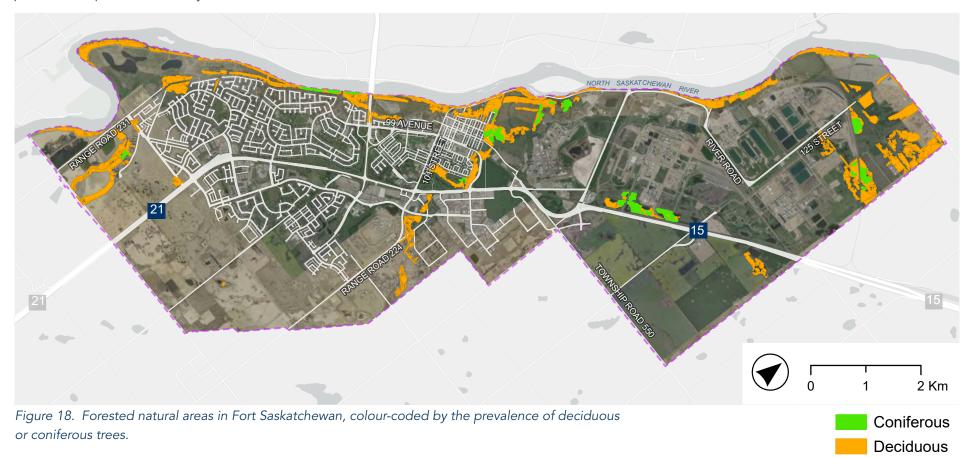
Despite many of the impacts listed above, forested natural areas provide most of Fort Saskatchewan's urban forest canopy. Within city boundaries, forested natural areas provide over 295 hectares, or 62%, of the city's total urban forest canopy. Although the Urban Forest Plan focuses on trees and forest ecosystems, Fort Saskatchewan's natural areas include other important ecosystems like streams and wetlands, open riverbanks, and restored prairies. Forests and non-forested ecosystems complement each other, playing unique roles in the broader landscape of the "parkland" natural region²¹.



4.1.1.6 FOREST TYPES

The data used to map Fort Saskatchewan's canopy (Light Detection and Ranging data, or LiDAR) can also be used to distinguish coniferous from deciduous trees to help us identify where each type is more common in the city's natural forests. Coniferous, deciduous, and mixed forests have different species compositions, lifecycles, habitat attributes, and other

features. In Fort Saskatchewan's natural areas, deciduous trees outnumber coniferous trees ten-to-one. Only 27 hectares of forested natural areas are predominantly coniferous, while 267 hectares are predominantly deciduous. **Figure 18** shows the extent of coniferous and deciduous forested natural areas in Fort Saskatchewan.



Common tree species in Fort Saskatchewan's natural areas

nehiyawak Elders who shared knowledge during the development of this plan explain that trees and humans speak to one another and have exchanged important messages throughout history. They recommended the creation of educational materials to help people greet trees as they walk in the forest. The following content aims to support that recommendation by providing information on common native tree species.





Lodgepole pine



Black spruce

Common native conifers

White spruce (*Picea glauca*) is the most common coniferous tree in forested natural areas and around Fort Saskatchewan. White spruce stands out for its pyramid shape of deep blue-green foliage. Look for sharp-tipped needles that are squarish in profile and branches that carry 4-5 cm long brown, papery cones. In some places, white spruces line the upper banks of the North Saskatchewan River, but the tree is also found on the slopes of the river valley and in patches near water sources on the prairie.

Less common native conifers are **jack and lodgepole pines** (*Pinus banksiana* and *Pinus contorta* var. *latifolia*), black spruce (*Picea mariana*), and tamarack (*Larix laricina*). Fort Saskatchewan is in the zone where jack and lodgepole pine ranges meet. These two trees hybridize with each other and can have similar appearances. Lodgepole pine is usually a tall, slender tree with a conical crown of tufted, emerald-green needles held in groups of two. It ranges west through the foothills and into British Columbia. Jack pine is the boreal cousin of lodgepole, and its shorter, denser stature reflects its northern, often snow-bound origin. Pines gave their name to Pointe-aux-Pins Creek. The City has planted thousands of pine trees in recent years to reforest nearby areas.

Black spruce and **tamarack** are species adapted to wet, cold, poorly drained ground like muskeg. Black spruce has short, bristly, dark green needles and grows to become a thin, spindly tree with a distinctive "club top" resembling the head of a matchstick. Tamarack is a member of the larch family, a group of deciduous conifers. It carries its soft, light green needles on stubby whorls of 15-20 needles each. In autumn, its foliage turns bright yellow before dropping.



Aspen



Balsam poplar

Common deciduous trees



Deciduous trees are much more numerous in Fort Saskatchewan's natural areas. Indigenous species in the area include **paper birch** (*Betula papyrifera*), from which the area's nehiyawak name waskwayâhtikispatinaw (birch hills) derives. Cree elders observed for the Urban Forest Plan that birch has been lost from the landscape over time, likely due to the impacts of colonization and development. Birches are still found in some of the community's natural areas. Superficially, birch can look like aspen – having whitish bark marked with dark callouses and light green foliage. However, paper birch's prize bark comes in various colours, from white to cinnamon brown or light pink, and naturally peels back from the trunk in fine sheets. Its leaves have serrated edges, compared with aspen's smooth, heart-shaped foliage.

Aspen (*Populus tremuloides*) is the most common tree in Fort Saskatchewan. The parkland natural region is where great aspen forests meet the prairie, creating a complex environment of forest glades and open meadows. Aspen is a clonal species: the trees above the ground can be the third, fourth, fifth, or hundredth generation produced by a single underground network of roots. An aspen clone in Utah named 'Pando' is the largest-known living organism, having an estimated weight of 6,000 tonnes and an age of 80,000 years. In Fort Saskatchewan, aspen is readily found in parks, natural areas, residential yards, and patches in farmland.

A close relative of aspen, **balsam poplar** (*Populus balsamifera*) is commonly seen in the river valley and around creeks and draws. Tolerant of flooding, poplars can achieve great heights along Alberta's rivers, where their furrowed, grey bark and shiny arrowshaped leaves are often seen. Poplar is a medicine tree – it produces compounds that are natural relievers of pain and inflammation. Its sweetly scented but sticky buds are the aroma of spring in Fort Saskatchewan's riparian areas.



American elm boulevard planting

Introduced species in natural areas

Colonization and trade have brought several more tree species to Fort Saskatchewan, some of which are now established in forested natural areas. The most prevalent of these are **box elder**, **also called Manitoba maple** (*Acer negundo*), and **American elm** (*Ulmus americana*), both of which originate from further south and east in North America. These tree species arrived in Fort Saskatchewan several decades ago, with box elder being planted in the Edmonton area since the 1870s. Box elder is now well established in forested natural areas, displacing indigenous species like birch and spruce. American elm is slower-growing and less threatening to native ecosystem structure. Often planted as a shade tree by early twentieth century farmers, an American elm over 1 metre in diameter found during field work for the Urban Forest Plan was the largest tree (by circumference) observed in Fort Saskatchewan.



4.1.1.7 FOREST STRUCTURE

Regardless of their species composition forests in Fort Saskatchewan are generally younger than 75 years. During field work, a tool called an increment borer was used to collect a cross-section of tree rings to count the tree's approximate age. Of sampled trees, no tree older than 50 was found, although since not all natural areas were sampled the possibility of older forests remains in Fort Saskatchewan. Aspen clones could be substantially older than the ring count on individual trees (or "sprouts") from a shared root system (read more about aspen clones in the feature above).

Forest structure changes as trees age. In forests of western Canada, natural disturbances, like wildfire, flooding, or wind and icestorms, are usually responsible for allowing a new forest to germinate. Following severe natural disturbance, most forests start as dense, rapidly growing thickets. Eventually, trees grow to the point where they compete for light, water, or other resources, initiating a process called stem exclusion, where the death of smaller, weaker trees thins the forest. This allows the surviving trees to continue growth. Tree species with adaptations for living in shade or making the best of limited resources can grow in the understorey of the developing forest even as stem exclusion occurs among the fastest-growing species.

As time passes, forests may develop several distinct layers, creating a complex structure of living and dead trees that offers the widest variety of forest habitats. Even young forests with simpler structures can provide critical habitats for specific wildlife. Although competition between trees helps create forest ecosystem structure, trees can also share resources with the ecosystem via complex underground networks of fungi called mycorrhizae. These forces of competition and cooperation help generate and sustain the forest's ecosystem value.

The LiDAR analysis allows us to estimate the height and size distribution of trees in forested natural areas to categorize simple forest structures, called "successional stages". Since field sampling did not reveal significant forests of old trees, only two stages are found in the city's forested natural areas:

- Sapling forests are young forests, not yet closed-in, so no significant mortality has occurred within a cohort, or "generation", of trees.
- Young forests follow the sapling stage and represent the beginning of mortality within a generation.

Young forests gradually transition to become mature and old forests, neither of which were found in Fort Saskatchewan. Young forests have been split with LiDAR canopy mapping into "short" and "tall" subtypes, reflecting the average height of the canopy trees and helping identify taller stands where forests are likely to be more highly developed in structure.

Sapling forests comprise 4.5 hectares of the city's forested natural areas, while tall young forests provide 34 hectares of canopy. Most of Fort Saskatchewan's forests are short young forests, or forests where some mortality has begun, but trees remain less than 12-15 m in height. 255 hectares of our forested natural areas belong to this type, shown in **Figure 19**. The most complex forests are scattered throughout the city, including forest patches in the southwest, downtown, and northeast/industrial areas.



4.1.1.8 FORESTED NATURAL AREAS MANAGEMENT

Forested natural areas occur across the city on private and public property. Of all the forested natural areas in the city, 162 hectares (55%) are on private property, mainly in industrial and agricultural areas (**Figure 20**). Almost 131 hectares (45%) are City-managed, primarily occurring in parks (39%) with small areas on other City property (2%) or in the portion of road rights-of-way passing

through natural areas (3%). Less than 1% of forested natural areas occur on institutional property, such as land owned by the school district. Almost all forested natural areas within the urban area occur on City-managed property, giving the City considerable responsibility for stewarding this component of the urban forest.



Figure 20. Forested natural areas categorized by management responsibility.



4.1.1.9 FOREST CONDITION

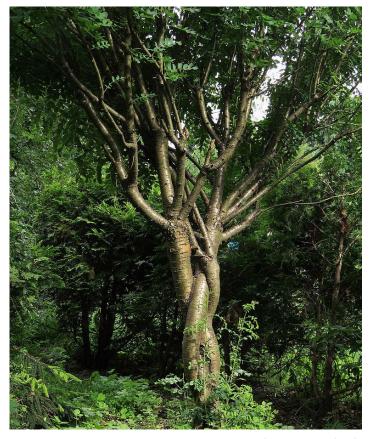
A few key forest health issues were identified during field visits conducted in the development of this plan:

Ground disturbance: Ground disturbance of some forests in the city was assessed during field work for the Urban Forest Plan. Only three sites – two in the Interpretive Forest and one in upper Ross Creek – were found to have substantially "natural" soil structure and understorey species composition. All other sites visited in forested natural areas showed some unnatural disturbance, such as erosion from trails (whether unauthorized or official) or cover of non-native or invasive species. Most sites were classified as "semi-disturbed" and showed a mixture of intact native ecosystem structure and composition with disturbed areas. Just two sites visited were mostly disturbed. Areas of high ground disturbance include the lower Ross Creek drainage, where unsanctioned trails have caused erosion in the riparian area. Unauthorized uses of forested natural areas include trail building and dumping of household waste. The nature of unauthorized uses makes reporting on and enforcing environmental protection difficult.

Invasive species and other forest health concerns: Invasive species are non-native species that, when introduced to an ecosystem, rapidly take over resources in the environment. The result of species invasion is often a loss of ecosystem structure or function, including a loss of native biodiversity. In Fort Saskatchewan's forested natural areas, introduced species can include established tree species like box elder (Acer negundo), which have colonized many sites with erosion and several riparian areas. Box elder forms a dense thicket, with heavy shade reducing the presence of native understorey plants, including many members of the nehiyawak seven sacred canopy layers like wild strawberry, hazelnut, sweetgrass, and twining honeysuckle. Other plants like Siberian peashrub and Russian olive show recent invasive potential, particularly in transitional environments at the edge of forests and meadows, along disturbed agricultural lines, and in areas of poor site quality. These and many other plants listed by the Invasive Species Council of Alberta are potential threats to the parkland region's prairies and forested natural areas.



Box elder, or Manitoba maple



Siberian peashrub

Invasive species also include new insects, fungi, or other life forms with similar potential to disrupt ecosystem structure. Changes in climate and ecosystem structure brought about by humans also allow native species to become disruptive if they are well-positioned to take advantage of environmental disturbance or human management of forests. Black knot disease, first described in Pennsylvania in the 19th century, is now a common disease in Fort Saskatchewan and the region's natural areas, causing a dark-coloured and swollen canker to form on stems and branches. Infections were found during field work in several areas, including West River's Edge Park. Damage from the disease is usually cosmetic, although it can cause tree dieback or regeneration failure in severe infection centres.

Yellow-headed spruce sawfly, a defoliating insect of native and ornamental spruce, targets young trees. It is responsible for the scraggly and moth-eaten appearance of some white spruce in the city's parks and gardens. Repeated feeding by the sawfly can kill the young trees, leaving "growing space" open for other, sometimes non-native, species to occupy.



Black knot disease



Russian olive



Yellow-headed spruce sawfly

4.1.2 CITY-OWNED URBAN TREES

As of March 2023, Fort Saskatchewan's Parks Department maintained an inventory of 15,220 street and planted park trees (**Figure 21**). The inventory includes information about each tree's

species, genus, and diameter at breast height (DBH). New trees are added to the inventory annually, and the data about existing trees is updated when staff visit the trees for regular pruning.



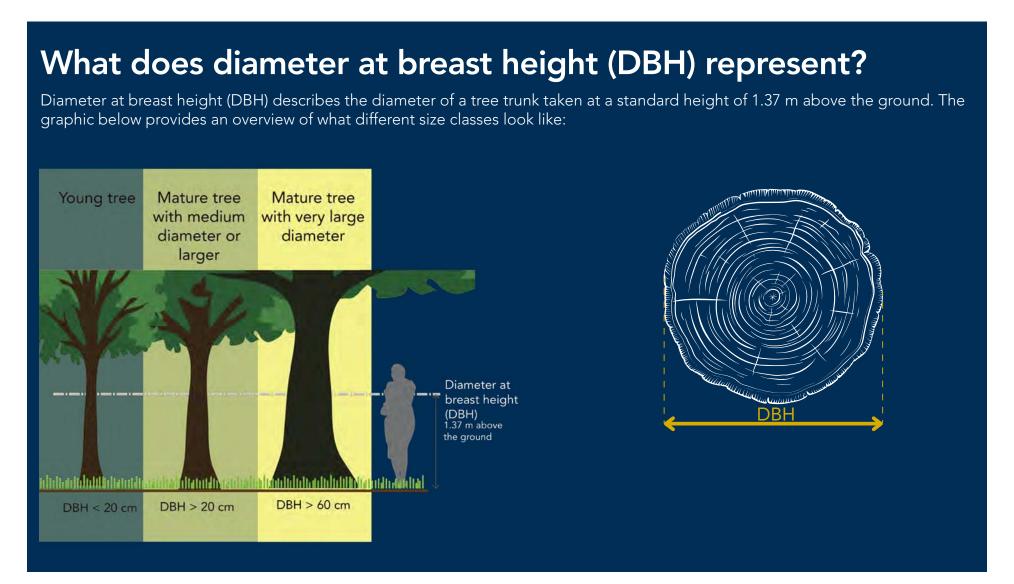


Although the inventory provides good data about urban trees managed by the City, the data has some limitations. The inventory doesn't include some of the more recently planted trees in newly developed areas (approx. the last 3 years) or some planted park landscape trees. There are 1,131 trees (7.5% of the inventory) without DBH information and 1,622 (11% of the inventory) park and boulevard trees that were inventoried using inaccurate DBH measurements. These 2,753 trees have been excluded from the analysis in the sections below.

4.1.2.1 SIZE DIVERSITY

The inventory's diameter at breast height (DBH) allows us to assess size diversity across the city and can give us a general idea of age diversity (larger trees tend to be older, although this varies by species and growing conditions). As shown in **Figure 21**, tree size varies geographically across the city. Newer developments are populated with young trees (**Figure 21**, inset A), while size

diversity increases in the older downtown neighbourhoods, which also have the highest proportion of older trees (**Figure 21**, inset B). About 53% of trees in the inventory are less than 20 cm in diameter, with an almost negligible number of trees larger than 60 cm in diameter (0.3%).



Research suggests that the ideal age distribution in tree inventories is 40% of trees with a DBH of less than 20 cm, 30% between 20-40 cm, 20% between 40-60 cm, and 10% greater than 60 cm²². This stepped distribution ensures a healthy and stable tree population as young trees replace older dying trees. **Figure 22** shows that Fort Saskatchewan's inventory does not currently meet this distribution, with 53% of trees below 20 cm, 37% between 20 and 40 cm, 10% between 40 and 60 cm and 0.3% above 60 cm. Fort Saskatchewan's tree inventory is mostly made up of trees less than 20 cm in diameter, indicating a growing and maturing population of public trees into the future.

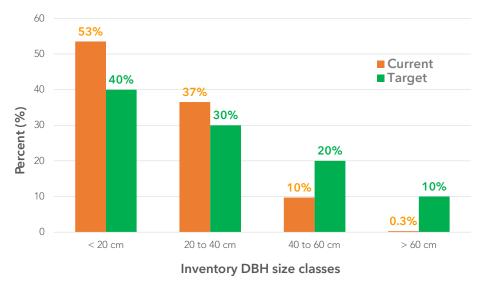


Figure 22. Current tree inventory DBH size distribution and target percent size distribution.

4.1.2.2 SPECIES DIVERSITY

Tree species diversity is integral to urban forest resilience to pests and diseases. The Edmonton Metropolitan Region's Guide to Urban Forest Management in a Changing Climate proposes a genus diversity target adapted from the literature of no more than 20% of any genus in a City's tree inventory²³. In the City's current inventory, 74% of the tree population is dominated by three genera: ash (39%), elm (24%), and spruce (11%), two of which are higher than the recommended 20%. At the species level, green ash (*Fraxinus pennsylvatica*, 39%) is the most widespread tree species present in the tree inventory, followed by American elm (*Ulmus americana*, 22%), and white spruce (*Picea glauca*, 5%) (**Figure 23**).

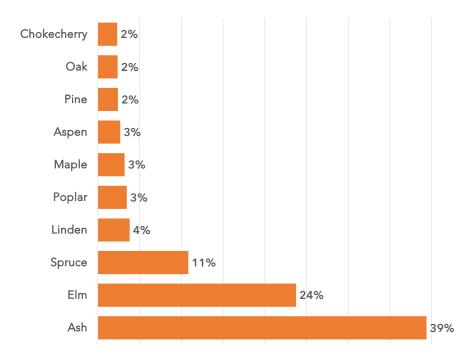


Figure 23. Dominant genera present in the tree inventory in Fort Saskatchewan.

4.1.2.3 TREE REMOVALS

City trees can require removal for a variety of reasons. In Fort Saskatchewan, some of the common reasons for tree removal include fungal diseases such as black knot, poor site and soil conditions, storm and salt damage, extended periods of summer drought, and damage. Green ash, black ash, linden trees, and

Schubert chokecherry are the City trees that have been removed the most in the past decade. The number of City tree removals in the past decade has ranged from 20 to 80 trees a year, depending on the year (**Figure 24**). Tree removal data from 2017-2020 was not available for analysis.

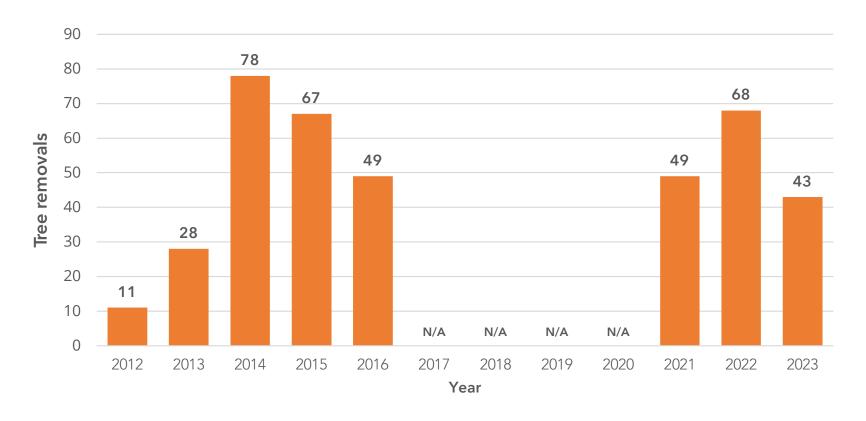


Figure 24. City tree removals (2012 - 2023) in Fort Saskatchewan.

4.2 CITY URBAN FORESTRY PROGRAM

The City of Fort Saskatchewan manages the urban forest with policies and bylaws that guide the planting, protection, and maintenance of public and private urban trees and natural areas. The City dedicates a team and budget to planting and managing

City trees. This section summarizes the program and policies in place and provides a report card that compares the City's program and policies with urban forestry best practices.

4.2.1 RESOURCING

Fort Saskatchewan's Tree and Shrub Maintenance and Horticulture team manages the City's urban forest. This program is nestled under the Public Works Department. The Tree and Shrub Maintenance and Horticulture team comprises in-house staff and contracted crews. Staff in the planning and engineering departments are also involved in subdivision and development

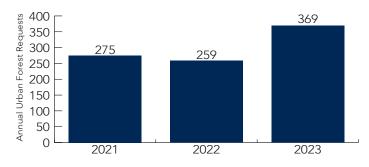
applications review and inspection, including the review of yard and street tree planting requirements. The Tree and Shrub Maintenance and Horticulture team's efforts are primarily focused on urban trees in streets and landscaped parks. Their team, resources, and responsibilities are outlined below.

Public Works Department: urban forest resources

2024 Staffing	Parks Services has a total staffing allocation of 33 FTEs. The Tree and Shrub Maintenance and Horticulture program has 6 FTE allocated, which includes: • 0.7 FTE allocation for Management, coordination, administrative support, project planning and management	
	 5.3 FTEs for field staff including foreman, arborists and labours who maintain City street trees, landscaped park trees, trees along trails, shrub beds and general horticulture 	
2024 Annual	2024 Tree and Shrub Maintenance and Horticulture program budget is a net of \$610,000 of which:	
Operating Budget	• ≈\$490,000 is spent on staff salaries and wages	
	• ≈\$60,000 is spent on horticulture	
	• ≈\$30,000 is spent on tree planting	
	• ≈\$25,000 is spent on watering	
	• ≈\$21,000 is spent on tree pruning	
	• \approx \$20,000 is spent on contracted tree pruning	
	The program has a revenue allocation of \$36,000 that offsets some of these costs. The net cost of the program is \$610,000.	
Core services	New tree planting + establishment	
	Established tree maintenance	
	Tree inspection + removal	
	Integrated pests and disease management	
	Horticulture	

Public Works Department: urban forest resources

Service requests (calls from community members) Service requests for the urban forest team have primarily been for tree removals, black knot management, tree pruning for sightline issues, or tree inspections for potential hazards. In recent years, the urban forest team has handled the following volume of service requests:



Tree pruning is generally on a 7-year cycle. With the growth of the community and the large amount of young trees (< 20 cm) coming up for maintenance, as shown in **Figure 21**, there will be a need to

adjust resources or service levels to meet demands of community growth and additional tree planting activities.

4.2.2 POLICIES

Urban forest management in Fort Saskatchewan is enabled and guided by provincial, regional, and municipal bylaws and policies, including:

- Enabling provincial legislation: the Municipal Government Act and the Alberta Land Stewardship Act set the rules for municipal governance and the framework for land use and development.
- Guiding policies: the Edmonton Metropolitan Region's Growth Plan and Municipal Development Plan (Our Fort. Our Future.) set the high-level vision and guide the approach to urban forest management.
- Bylaws and policies: many bylaws and City policies frame how the City regulates publicly owned trees are protected and managed and tree planting or protection requirements during subdivision or development.
- Other plans: documents such as the Community Sustainability Plan influence how the urban forest is managed through their relevant goals and actions.

The following page provides more details on how the Municipal Development Plan, bylaws, and policies regulate trees on City land and on private land during subdivision and development.



4.2.3 REPORT CARD

Fort Saskatchewan's urban forest report card assesses the City's urban forest management program, including relevant policies, procedures, and partnerships, against a set of criteria developed for sustainable urban forests customized to suit the local context and needs. The criteria and indicators used are based on the framework for sustainable urban forest management prepared by Leffe (2016)²⁴, as well as other additional references such as relevant academic research and guidelines^{25,26,27,28}.

The report card below summarizes the assessment of each indicator in Fort Saskatchewan's current program against an optimal outcome. The criteria are associated with the core urban forest services: planning, planting, management, protection, and partnership. It provides a comprehensive assessment of areas where the City is performing well and where the Urban Forest Plan should guide efforts for further improvement.

Criteria	Rating
Plan	
General awareness in the community and across City departments of the value of the urban forest	Fair
Interdepartmental and Municipal agency cooperation on urban forest strategy implementation	Good
Clear and defensible urban forest canopy assessment and goals	In Progress
Tree canopy cover relative to established canopy targets	Pending Assessment
Municipality-wide urban forest management plan	In Progress
Municipal green infrastructure asset management	Fair
Municipal-wide biodiversity or greenspace network strategy	Fair
Municipal urban forest management program capacity	Fair
Urban forest funding to implement a strategy	Fair

Fort Saskatchewan's urban forest program in 2023 rates fair, approaching good, using this criteria and indicators approach. The Urban Forest Plan includes an action plan which is tied to the evaluation found in this report card. The implementation of the action plan is intended to progress the City's urban forest towards a good to optimal ranking.



Criteria	Rating
Protect	
Regulating the protection and replacement of public trees	Poor
Regulating the conservation of sensitive ecosystems, soils or permeability	Poor
Internal protocols guiding tree protection or sensitive ecosystem protection	Poor
Standards of tree protection and tree care observed during development	Fair
Cooperation with utilities on protection of public trees	Poor

Criteria	Rating
Plant/Grow	
City tree planting program and planting targets	Fair
Development requirements to plant trees on private land	Good
Streetscape specifications and standards for planting trees	Good
Equity in planting program delivery	Poor
Forest restoration and native vegetation planting	Fair
Stock selection and procurement in cooperation with nurseries	Fair
Ecosystem services targeted in tree planting projects and landscaping	Fair
Manage	
Tree inventory	Good
Knowledge of trees on private property	Good
Natural areas inventory	Poor
Age diversity in the inventory (size class distribution)	Good
Species diversity (public tree inventory)	Poor
Species suitability for local area	Good
Publicly owned tree condition	Fair
Maintenance of public, high-visibility trees	Good
Extreme weather response planning	Poor
Tree risk management	Good
Pest and disease management	Good
Waste biomass utilization	Fair
Partner	
Citizen involvement and neighbourhood action	Fair
Involvement of large private and institutional landholders	Good
Urban forest research	Poor
Regional collaboration	Fair



SECTION 5.0

COMMUNITY VALUES

Engagement for this Plan was carried out through two processes: a public engagement component and an Indigenous engagement component. It began in a Pipe Ceremony on June 15, 2023, with Pipe Carriers, Elder Jesse Morin and Lloyd Cardinal.

5.1 PUBLIC ENGAGEMENT

Public engagement was held between May and late July 2023 to develop the plan's vision, principles, and goals. The engagement was also aimed at understanding community support relating to the planting, protecting, managing and stewarding of the urban forest in Fort Saskatchewan. It included an online survey and mapping tool, booths at community events and pop-ups at community centres, two community open house workshops, and two targeted workshops with members of the local industries, environmental, and Indigenous groups.

5.1.1 LONG-TERM VISION

The long-term vision for Fort Saskatchewan's urban forest was centered around growing the city's tree canopy in an equitable manner across neighbourhoods. Respondents expressed a desire for Fort Saskatchewan to be known as a city with the most trees per capita in Alberta and Canada. Respondents' vision included an urban forest that offers recreational opportunities within natural areas, being mindful not to contribute to environmental degradation of the urban forest. Respondents also highlighted the importance of protecting large, healthy trees and making the urban forest more resilient to climate change. Finally, respondents favoured a proactive approach to tree management, turf naturalization into native prairies, and opportunities for education on the urban forest.

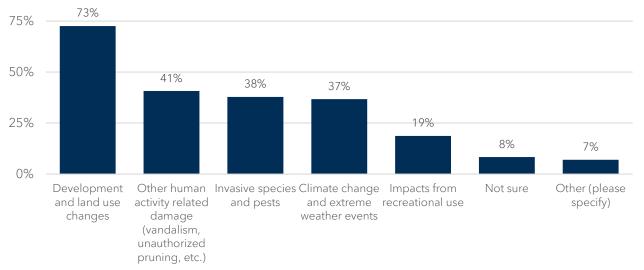
5.1.2 PROTECTING

When it comes to protecting the urban forest, most respondents agreed the City should focus on protecting parks and natural areas. Respondents felt strongly that the City should play an important role in protecting Ross Creek and Turner Park, including plants such as sage and sweetgrass, which are important to Indigenous community members. Respondents also agreed that the City should protect trees on publicly owned lands and streets. There was less consensus on the City's role in protecting trees on private property. Finally, respondents raised concerns regarding tree losses due to new developments and that developers should be required to protect or maintain existing trees (**Figure 25**).



Community open house (June 20, 2023)

In your opinion, what are the most pressing challenges facing urban trees and forests in Fort Saskatchewan?



WELCC

WELCC

Community open house (June 21, 2023)

Figure 25. Survey responses on the challenges facing urban trees and forests.

5.1.3 PLANTING

Respondents expressed interest in the City planting more trees and larger caliper trees along boulevards. The "3-30-300" metric was highlighted as an aspirational goal for Fort Saskatchewan. On private property, the public was broadly in favor of incentives for residents to plant trees on their property and regulations requiring

new developments to plant a tree for every residential unit built. Planting more edible and fruit trees and more food forests was also of interest to the community. Respondents prioritized planting hardy tree species resistant to black knot and expressed the need to enhance biodiversity in the city.

5.1.4 MANAGING

When asked about their satisfaction with the City's urban forest services, respondents were most satisfied with storm response, tree debris cleanup, tree pruning, and tree planting and replacement (**Figure 26**). Respondents were unaware the City provided services around public education, dangerous tree removal and pest and disease control. The services with the most dissatisfaction were pest and disease control (specifically surrounding Black Knot) and public education. The City moving to a more proactive approach to risk management of urban forest was expressed as desirable by respondents.

How satisfied are you with the current levels of service provided by the City for city-owned trees?

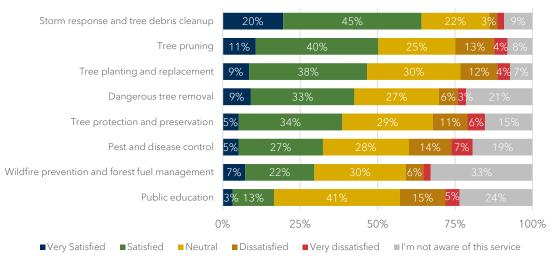


Figure 26. Survey responses on the satisfaction with urban forest services provided by the City.

5.1.5 STEWARDING AND PARTNERING

Respondents expressed a desire for more public education about the urban forest and more readily available information on the services provided by the City. Respondents were eager to learn more about native tree species selection for planting, how to prune and water trees, and pest and disease control (**Figure 27**). Additionally, respondents welcomed more partnerships with industry, community groups, schools, and a youth educational program.

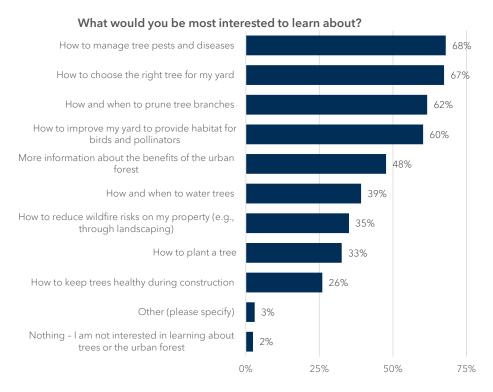


Figure 27. Survey responses on topics respondents would like to learn more about.



5.2 INDIGENOUS ENGAGEMENT

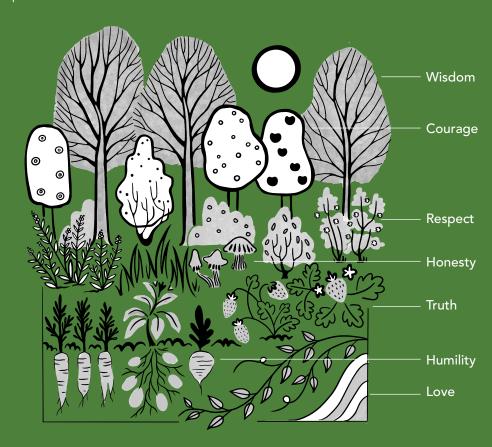


Indigenous engagement occurred parallel to public engagement between June 2023 and August 2023. The method for engagement with Indigenous community members of Fort Saskatchewan was keeoukaywin: The Visiting Way, an Indigenous research methodology grounded in Cree and Métis ways of knowing and being. Using keeoykaywin in practice means that all activities are grounded in reciprocity, co-lead dialogue, and prioritize protocol.

The keeoukaywin resulted in 14 recommendations to integrate Indigenous knowledge within the Western process of creating the Urban Forest Plan. These fourteen recommendations were developed in close relation to the seven layers of the food forest that are also aligned with the seven sacred teachings in the nehiyawak culture and other Indigenous cultures (Section 2.2). The 14 recommendations from the Indigenous engagement are listed below.

The recommendations listed below come from pipikwan pêhtâkwan's "Indigenous Engagement – Interim Report" and "'A Seed is an Idea, and an Idea is a Seed' – Traditional Indigenous Knowledge" reports:

- **#1** Identify and outline a scope of practice for when a land breaking Ceremony would be held in the Municipality. These Ceremonies gain consent from Mother Earth, as well as tell our intentions to the other societies, specifically where we seek to remove the standing people.
- **#2** Create education materials that help people walking through the urban forest areas and be able to identify different trees. They can use that knowledge to greet trees as they walk past.
- **#3** Protection in the plan should include the protection of the layers of the earth, such as a topsoil protection strategy. The traditional oral knowledge in these stories aligns with What We Heard from Indigenous engagement on the Plan.
- **#4** Include birch trees in the Plan to ensure that native plants and animals are able to thrive in their intended habitat. This action allows the land to be reacclimated and to return to a more holistic urban forest.
- **#5** (In relation to the Canopy of Wisdom) We must monitor this layer with great effort and ensure that these standing people have a strong protection plan against invasive species or being removed for development.



#6 (In relation to the Canopy of Courage) We must have a strong fruit bearing layer if the Plan is to be courageous and step outside the box. Fruit trees may be more expensive to maintain, but have a large value to the mental, physical, emotional and spiritual health of a community.

#7 (In relation to the Canopy of Respect) Special importance for a dynamic berry layer should be considered. Where possible, planting many berries side by side, can bring the value of respect into the plan and will also provide access to a dynamic food forest for community members.

#8 (*In relation to the Canopy of Honesty*) The Plan should include community access to more spaces where people grow and nurture types of food like squash, pumpkins, lettuce, and cucumbers.

#9 (*In relation to the Canopy of Truth*) Sacred space to grow medicines like fungi, sweetgrass, sage, and strawberry would benefit many community members, but would hold a special place for Indigenous community members who may struggle to find these medicines growing naturally in Fort Saskatchewan any longer.

#10 (In relation to the Canopy of Humility) Education that supports growing and harvesting from this root vegetable layer (e.g., potatoes and carrots) is important to community understanding. Ensuring that policies are structured to empower individuals to explore this canopy layer, not shy away from it. For example, possible restrictions on where this layer can be grown should be evaluated.

#11 (In relation to the Canopy of Love) The Plan should include guidance on maintenance for this layer. Often vines and creepers have a lot of love and spread themselves quickly. They also can become the home for many invasive species and a protection plan for this layer would benefit the forest throughout all areas.

#12 To advance the efforts of reconciliation in Fort Saskatchewan, we recommend further investigation into Indigenous Peoples history in Fort Saskatchewan, prior to any changes in the current Turner Park area. Including an environmental scan completed by an Indigenous environmental scientist or agency.

A people history review should include:

- Identifying the exact homestead location for Mr. Turner,
- Discover any potential timber rights that have previous existed,
- Identify areas that are likely to have Indigenous artifacts,
- Identify traditional plants and medicines that could be lost.

#13 Rather than planting boulevard trees individually, at a set interval apart, a successful Plan will plant trees together in clusters so they can support one another.

#14 To create a collective of community members and partners who can inform the planting goals annually. A planting plan designed to be longer term will ensure Mother Earth can heal and support all other plants in what they need to thrive.



SECTION 6.0

THE URBAN FOREST OF THE FUTURE

This section provides an overview of the vision, goals, and canopy cover target that the implementation of this plan should achieve.

6.1 VISION

Fort Saskatchewan's urban forest vision was developed with input from everyone who participated in the public and Indigenous engagement, Council, and City staff. The long-term vision describes how the urban guides the implementation of the action plan by describing the outcome it seeks to achieve.

VISION:

Fort Saskatchewan's resilient and expansive urban forest supports community well-being, enhances biodiversity, and seamlessly weaves nature into every neighbourhood. Our community plants, nurtures, and grows the urban forest with guidance from the seven sacred teachings of wisdom, courage, respect, honesty, truth, humility, and love from the nehiyawak and other Indigenous cultures.

"A seed is an idea, and an idea is a seed."



 Elder Roy Bear, Chief of the Siksika Nation, sharing wisdom about the potential for the Urban Forest Plan to support not only tree planting but also to nurture and grow the urban forest with the community.

6.2 GOALS

The vision is supported by five goals that provide the framework for the Urban Forest Plan's action plan:

- **GOAL 1.** Protect and grow urban trees for an equitable access to lush, tree-lined neighbourhoods
- **GOAL 2.** Protect and restore natural areas to protect their cultural and historical importance, enhance their ecological value, and provide community access to the City's valued green spaces
- **GOAL 3.** Manage the City's urban forest in accordance with best practices
- **GOAL 4.** Partner with community members and organizations for urban forest management
- **GOAL 5.** Monitor performance and adapt to changing circumstances

The following pages provide more details about what the plan intends to achieve with each goal and the specific opportunities and challenges it addresses.



6.2.1 GOAL 1: PROTECT AND GROW URBAN TREES FOR AN EQUITABLE ACCESS TO LUSH, TREE-LINED NEIGHBOURHOODS

The plan seeks to protect existing urban trees and plant more, particularly in areas with low tree equity and high proportions of vulnerable community members. Urban trees provide important benefits to residents and visitors and help connect natural areas

across the built environment. Soils are an important component in achieving better urban tree cover across the city, including protecting existing topsoils and ensuring urban trees have access to sufficient soil volume to be healthy and mature.

6.2.1.1 OPPORTUNITIES

Soil protection and management: The region is blessed with rich topsoils that can be lost through erosion or during new subdivisions if not protected adequately, as pointed out by Indigenous participants. The Regional Agriculture Master Plan highlights that soil should be recognized as a limited, non-renewable resource and managed accordingly. It emphasizes that soil management, including its reuse and recycling, should be considered as part of an area structure plan for greenfield areas. Implementing this plan can support the protection of the city's topsoil to help provide adequate growing conditions for urban trees, many of which currently struggle to survive in new street boulevards, likely because of inadequate soil.

Tree planting with new subdivision: The City already has many regulations in place to require the planting of yard and street trees in new subdivisions. The action plan proposes approaches to enhance tree planting requirements.

6.2.1.2 CHALLENGES

Challenging growing conditions: Trees in cities face various adversities associated with difficult urban growing conditions. In Fort Saskatchewan, tree mortality is exacerbated by soils with a high abundance of clay, a lack of nutrients in soils previously used for agricultural purposes, salt from roads, and poor monitoring of soils used subsequently to a new development. These challenges, together with climate change impacts like droughts and more frequent and severe extreme weather events, reduce the functional lifespan of trees, decrease the ecosystem services trees provide, and create a financial burden on the municipality. Furthermore, the cold and harsh winters in Fort Saskatchewan constrain the list of tree species that can thrive here.

Example of soil erosion along informal trails.



Invasive species, pests, and disease management: Invasive species, pests, and diseases all pose ongoing threats to Fort Saskatchewan's urban forest. While the City is already proactively managing or monitoring many pests and diseases, more have been detected by City staff in recent years. Climate change is anticipated to increase the number of invasive species, pests, and diseases that can survive in Fort Saskatchewan.

Protecting trees on construction sites: Working near trees can damage their trunk, canopy, or roots, which can compromise their health and survival. Yet, replacing the benefits provided by a mature tree takes a decade. Where possible, tree protection barriers or supervision from an arborist can minimize impacts on trees and maximize their chance of survival.

Planting in new developments: Fort Saskatchewan's population has more than doubled in the last 20 years, from 13,824 residents in 2003 to 28,624 in 2023. Integrating trees on lots and street boulevards in new subdivisions is more challenging due to narrow lot sizes, smaller building setbacks, and competition for space in boulevards with driveways, utilities, and street furniture that often leave insufficient space for trees. The action plan seeks ways to maximize space for tree planting in new subdivisions.

6.2.1.3 STRATEGIES TO ACHIEVE THE GOAL:

- **Strategy 1.** Improve policies, regulations, and processes for yard and street tree protection and planting
- Strategy 2. Improve soil quality and topsoil protection
- **Strategy 3.** Grow the urban forest to improve access and equity

Example of tree roots exposed during a construction project.



6.2.2 GOAL 2: PROTECT AND RESTORE NATURAL AREAS TO PROTECT THEIR CULTURAL AND HISTORICAL IMPORTANCE, ENHANCE THEIR ECOLOGICAL VALUE, AND PROVIDE COMMUNITY ACCESS TO THE CITY'S VALUED GREEN SPACES

Community members highly value natural areas as places to connect with nature and recreate. They are also very important to the Indigenous community members who provided input for this plan, either specific places with important history, or important species and medicines. The world is also facing an unprecedented biodiversity crisis that results from significant habitat loss and is compounded by the climate crisis. The plan seeks to improve the protection and support of the restoration of natural areas throughout the city and to balance the protection of ecosystems and culturally significant sites with community access for recreation and connecting with nature.

6.2.2.1 OPPORTUNITIES



Wealth of natural areas: Fort Saskatchewan has an expensive network of natural areas found along the kisiskâciwan-sîpî (North Saskatchewan River) and throughout the city. Those natural areas provide important habitat for the native fauna and flora.

Community and Indigenous knowledge: Many community members, Indigenous participants, and organizations hold important knowledge about Fort Saskatchewan's natural areas. Collaboration with those knowledge holders could improve the City's knowledge of its natural areas and support protection and restoration work.

Elders shared about the deep knowledge found in the land. Indigenous people who participated in the engagement on this plan felt that an Indigenous environmental scan of the area would result in significantly different outcomes than an environmental assessment done by non-Indigenous people. Bringing these two worlds together would offer a good opportunity to practice etuptamumk – two-eyed seeing.

6.2.2.2 CHALLENGES

Changing climate and invasive species, pests, and disease management: Climate change is changing ecosystems' growing conditions. Events such as more common and longer summer droughts are already impacting forests and many of their tree species. Invasive species, pests, and diseases all pose ongoing threats to Fort Saskatchewan's urban forest, which is also expected to be exacerbated by climate change. Ash trees have been stressed by ash leaf cone rollers (*Calaptilia fraxinella*) and Western ash bark beetle (*Hylesinus californicus*). While many invasive species are known to grow in the city's natural areas, few resources are available to monitor and manage them.

Erosion and damage from recreation: While recreational trails in Fort Saskatchewan's natural areas are an important community amenity, unauthorized trail development has led to erosion problems, and loss of understory vegetation in many places along the river valley and Ross Creek. The action plan seeks to support a better balance between providing access and protecting the city's natural areas.

Protection of natural areas in new subdivisions: Although the City has a few regulatory tools to protect forests along creeks or to acquire environmentally sensitive land in new subdivisions, those tools are often insufficient to protect natural areas. The ability of the City to require the protection of environmentally sensitive lands is limited by the powers granted to municipalities by the province. Still, the action plan explores options to improve the protection of natural areas in new subdivisions.

Saving black ash trees in Fort Saskatchewan

Black ash (*Fraxinus nigra*) was historically a common boulevard tree throughout the prairie provinces, selected and praised for its size, shape and fall color. Properly cared for, these trees are extremely beautiful and very long lived (up to 200 years). Black ash trees in Fort Saskatchewan have dwindled in numbers as environmental stressors increase their susceptibility to insect damage mainly from the Western ash bark beetle (*Hylesinus californicus*).

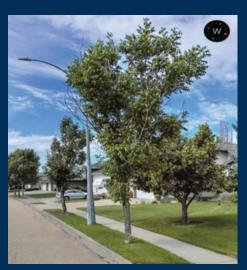
Beginning in the spring of 2021, a cultural control program was undertaken by the Horticulture Team to save the approximately 100 black ash trees left in Fort Saskatchewan. The program involved banding the trees with a sticky insect tape. The sticky tape prevents adult beetles from reaching the smaller upper branches of the tree to deposit their eggs, preventing branch dieback and reducing stress on the tree. The condition of the black ash trees has improved dramatically since 2021 as the number of beetles has been decreasing over previous seasons.







Summer 2023



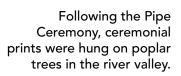
Summer 2021



Summer 2023

6.2.2.3 STRATEGIES TO ACHIEVE THE GOAL:

- **Strategy 4.** Identify, protect and enhance sites of cultural, historical, and ecological significance to support ecosystems and community use
- **Strategy 5.** Improve policies, regulations, and processes for parks and natural areas tree protection and planting





6.2.3 GOAL 3: MANAGE THE CITY'S URBAN FOREST IN ACCORDANCE WITH BEST PRACTICES

Aligning urban forest management with best practices is the best way for the City to maximize its return on investment and allow trees to grow into healthy and mature trees. This goal supports the City's existing urban forest program to maximize urban forest benefits and minimize risks. It involves supporting the City's proactive urban tree management program through a review and alignment of resources with the assets managed and defined service levels.

6.2.3.1 OPPORTUNITIES

Tree inventory: The City has maintained an inventory of its urban tree assets since the early 2000s. The tree inventory offers a great tool to track the number of assets managed and identify risks related to the size or species distribution.

City policy and proactive management program: Fort Saskatchewan already has a City Policy in place to define its urban forest levels of service, including a proactive young tree establishment and established tree seven-year pruning program that is aligned with best practices.

6.2.3.2 CHALLENGES

Growing the tree inventory: Despite having maintained a tree inventory for several decades, staff often lack the capacity to add new assets to the inventory following the transfer of new boulevard trees into City maintenance. The software used to manage the inventory also does not allow easy edits to the data while staff are visiting the trees in the field.

Proactive maintenance and resourcing: Current best practices dictate a 7-year pruning cycle for optimal tree health. Service requests, storm events, and increased construction in established neighbourhoods demand more staff's time and require additional resources, which makes the 7-year pruning cycle difficult to

maintain. Newer developments have many young trees (<20 cm) (**Figure 21**) that will need to be pruned for the first time in the coming years, which also impacts the 7-year pruning cycle. Climate change and extended summer droughts have already been increasing the need for and number of watering years required to establish trees, further challenging current allocated resources. To ensure a more proactive urban forest management program, the City must consider increasing resource allocation to effectively address the growing demand and respond to emerging challenges.

Invasive species, pests, and disease management: Invasive species, pests, and diseases pose ongoing threats to Fort Saskatchewan's urban forest. City staff regularly manage elm scale, aphids, bark beetles, and black knot and monitor Dutch Elm Disease in the urban tree population. Climate change is anticipated to increase the threat of invasive species, pests, and diseases and, therefore, also the resources required for their management.

Risk management: Tree inspections for urban trees are carried out informally during pruning cycle visits or in response to a call for service. In contrast, natural area trees are only monitored informally along a few of the City's most popular trails. Risk management policies and procedures are not currently defined in the City's Policy.

6.2.3.3 STRATEGIES TO ACHIEVE THE GOAL:

- **Strategy 6.** Leverage the tree inventory to support efficient asset management
- **Strategy 7.** Improve resourcing and standards to deliver target urban forest service levels

6.2.4 GOAL 4: PARTNER WITH COMMUNITY MEMBERS AND ORGANIZATIONS FOR URBAN FOREST MANAGEMENT

This goal is focused on supporting partnerships and organizations that contribute to urban forest stewardship. Many community members and organizations are already involved in caring for Fort Saskatchewan's urban forest on their properties or in city parks and natural areas. Many of the Indigenous community members engaged in developing this plan are either already involved or have shown interest in contributing their knowledge for land stewardship.

6.2.4.1 OPPORTUNITIES

Engaged community: Many community organizations are already involved and interested in Fort Saskatchewan's natural areas for environmental stewardship and recreation. Large industrial landowners have also been supporting urban forest stewardship initiatives on City land. To be successful, plan implementation should rely on and collaborate with the community towards achieving the plan's vision.

Knowledge holders: Community members, Indigenous peoples, and organizations hold profound knowledge about the land, forest, and our relationship to it. The action plan intends for the City to seek out that knowledge and use it to support implementation.

6.2.4.2 CHALLENGES

Increasing involvement and knowledge: The plan will be more successful if as many community members as possible are informed about how to care for and participate in the stewardship of the urban forest on their property or through stewardship programs in parks. Educational materials and information sharing will be important to implementing this plan.

6.2.4.3 STRATEGIES TO ACHIEVE THE GOAL:

- **Strategy 8.** Support and develop community partnerships to implement the plan
- **Strategy 9.** Foster connections between people and the urban forest

6.2.5 GOAL 5: MONITOR PERFORMANCE AND ADAPT TO CHANGING CIRCUMSTANCES

This goal is focused on guiding how the City can monitor its progress in implementing the plan. Monitoring is important to monitor success and identify areas of improvement but also needs to use available and manageable metrics.

6.2.5.1 OPPORTUNITIES

Tree inventory: The City already has a fairly comprehensive inventory of its urban trees that, with continued maintenance, can provide information about the growth of assets managed by the urban forest team.

Advance measurement technologies: LiDAR data was used to benchmark Fort Saskatchewan's urban forest during the development of this plan and will enable precise monitoring of changes in extent and structure.

6.2.5.2 CHALLENGES

Resources for data maintenance: Monitoring and reporting on urban forest changes may be challenging due to limited staff resources. Adequate resourcing and the use of software and tools that make it easy to update, maintain, and summarize data will be important to allow monitoring during the plan's implementation.

6.2.5.3 STRATEGIES TO ACHIEVE THE GOAL:

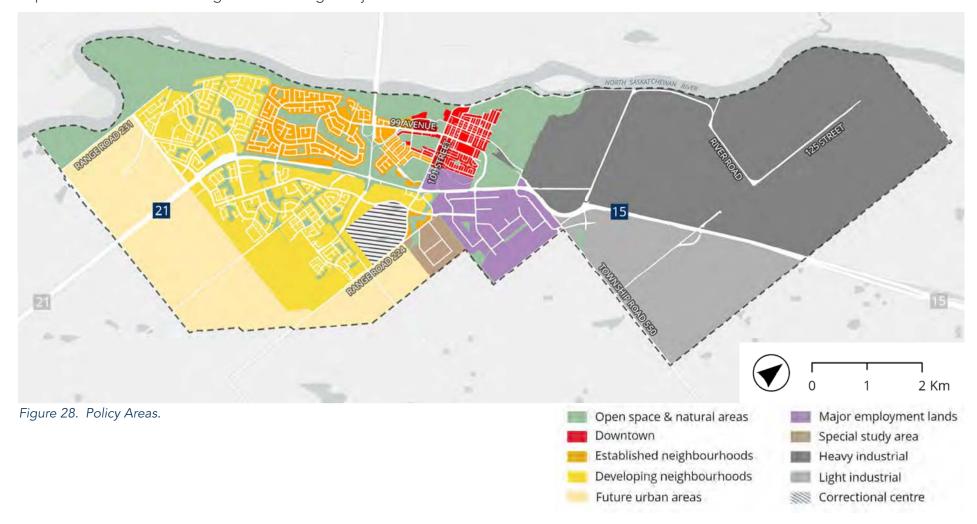
Strategy 10. Keep the plan up-to-date



6.3 CANOPY COVER TARGET

Municipalities often set a canopy cover target as the leading indicator to monitor their success in implementing their urban forest goals. Best practices in urban forestry suggest that the selection of a canopy cover target should be based on every community's current canopy cover, local climate, population, and development density and land use²⁹. In grassland ecosystems like Fort Saskatchewan, the US-based American Forests not-for-profit recommends aiming for a 20% target adjusted based

on population density. The City's Municipal Development Plan includes a target to raise urban tree canopy by 10% (i.e., tree canopy increase from 11% to 12.1% in the urban area). It uses policy areas to guide plans for the future of Fort Saskatchewan. Those same policy areas were adapted to serve in the modelling of the city's canopy cover target citywide and within the urban area.



Canopy cover target: 16% within the urban area and 12% citywide

With the 10% increase in canopy target in the Municipal Development Plan in mind, the Urban Forest Plan sets a target to increase canopy from 11% to 16% in the urban area and from 8% to 12% citywide by full build out. To achieve this target, Fort Saskatchewan will require approximately 206 hectares of new tree canopy (approx. 66,040 new trees) over approximately the next 40 years (or by full build out) to grow its urban forest and make up for canopy loss anticipated to result from a combination of natural tree mortality and impacts from new subdivisions.

The project team used a forecasting model to estimate canopy growth and loss due to new subdivisions and a 2.5% natural mortality across the urban forest by full build out. Canopy loss due to new subdivision by full build out was estimated at 10% of developing neighbourhood's existing tree canopy, 30% of canopy in future urban areas, and 50% of canopy in light industrial areas. The model indicates that achieving the canopy cover target while offsetting canopy loss would require planting approximately 1,650

trees annually (assuming a constant rate of subdivision until full build out), as detailed in **Table 2** and **Figure 29**.

Table 2. Percentage of total new tree plantings

Future Urban Areas	47%
Light Industrial	21%
Developing Neighbourhoods	20%
Open Space & Natural Areas	9%
Established Neighbourhoods	2%
Downtown	1%

Monitoring will be needed over time to verify the model's assumptions and ensure that planting rates are sufficient to achieve the canopy cover target.



^{*}On industrial properties, we assume yard plantings of one tree per 3 metre of frontage and 1 tree per 5 metres of side yard on one side of the property.

Figure 29. Annual tree planting pursuant to a 12% citywide and 16% urban area canopy cover target by full build out.

SECTION 7.0

ACTION PLAN

The action plan provides strategic steps and initiatives aligning the urban forest to its vision and goals.

GOAL 1. Protect and grow urban trees for an equitable access to lush, tree-lined neighbourhoods

- **Strategy 1.** Improve policies, regulations, and processes for yard and street tree protection and planting
- **Strategy 2.** Improve soil quality and topsoil protection
- **Strategy 3.** Grow the urban forest to improve access and equity

GOAL 2. Protect and restore natural areas to protect their cultural and historical importance, enhance their ecological value, and provide community access to the City's valued green spaces

- **Strategy 4.** Identify, protect and enhance sites of cultural, historical, and ecological significance to support ecosystems and community use
- **Strategy 5.** Improve policies, regulations, and processes for parks and natural areas tree protection and planting

GOAL 3. Manage the City's urban forest in accordance with best practices

- **Strategy 6.** Leverage the tree inventory to support efficient asset management
- **Strategy 7.** Improve resourcing and standards to deliver target urban forest service levels

GOAL 4. Partner with community members and organizations for urban forest management

- **Strategy 8.** Support and develop community partnerships to implement the plan
- **Strategy 9.** Foster connections between people and the urban forest

GOAL 5. Monitor performance and adapt to changing circumstances

Strategy 10. Keep the plan up-to-date

The action plan tables provide a roadmap to achieve the urban forest vision and canopy cover target set out in this plan. The actions listed on the following pages are embedded under the goals and strategies with an assigned implementation timeframe, cost, and departmental responsibility.

Stra	tegies and actions	Timeframe Ongoing	Opinion on probable cost	Responsibility Department
1	PROTECT AND GROW URBAN TREES	Short: 1-5 yrs \$: Already budgeted \$\		
Strat	egy 1. Improve policies, regulations, and processes for yard and street tree protection and p	lanting		
1A	 Update the Land Use Bylaw to improve tree planting requirements, specifically Add a tree planting requirement such as: 	Short	\$	Planning & Development
	 Up to 2 trees per lot for lower density residential per parcel up to 400 m² and an additional tree for every additional 100 m² of parcel area, to be planted in any yard A target number of trees per parking stall in commercial and light industrial areas, and a buffer planting requirement such as 1 tree per 5 m of side yard for one side of light industrial properties. Include minimum soil volume requirements in accordance with the table provided and topsoil depth requirements (minimum 600 mm to 1,000 mm depth). 			
	• In situations where mature trees are retained in development, the City could consider a 5% increase in building coverage and explore other trade-offs for retaining mature trees.			
	Add tree and vegetation requirements around storm ponds.			
	See Action 5A for other recommended updates to the Land Use Bylaw focused on natural areas.			
1B	Continue to improve requirements and review processes to ensure that adequate planting space is retained on-site to fit the required trees on new developments.	Med	\$	Public Works
1C	Consider creating or sharing public education materials on the value of tree protection and planting for property owners for property value or other benefits. See also Action 3D (recommending the creation of a subsidised tree program).	Short	\$	Public Works/ Corporate Communications

Action 1A: Minimum recommended soil volume per tree³¹

Tree Size	Minimum soil volume (m³)	Shared or irrigated soil volume (m³)
Small tree canopy spread is up to 6m	8	6
Medium tree canopy spread is up to 10m	20	15
Large tree canopy spread is greater than 10 m	35	30

Soil volume shall be calculated as:

- Soil: Surface area (Length x Width x Depth)
- Soil cells: Volume of soil cell installation (Length x Width x Depth) x .92

Strat	PROTECT AND GROW URBAN TREES	Timeframe Ongoing Short: 1-5 yrs Med: 5-10 yrs Long: 10-15 yrs	Opinion on probable cost \$: Already budgeted \$\$: \$10,000-20,000 \$\$\$: \$20,000 - \$150,000 \$\$\$: > \$150,000	Responsibility Department
1D	 Update the Parkland Bylaw to: Modernize it, specifically: Clarify actions that constitute damage, such as affixing things to trees or blocking streams Increase the fine amounts and create new collection mechanisms such as collecting as tax arrears Create an exemption for cultural harvesting in accordance with the new City Policy detailed in Action 5B. Protect all City-owned trees (including street trees) Specify reasons why the City will allow removal of its trees Designate heritage trees in accordance with Tree Installation & Maintenance Policy criteria Clarify requirements for tree protection during construction such as fencing Define adequate compensation for tree removed or damage (such as the replacement cost and amenity value of the lost or damaged tree, per ISA's Guide for Plant Appraisal). 	Short	\$\$\$\$	Public Works
1E	Seek adoption of the Tree Installation & Maintenance Policy across all City departments to guide practices for tree protection during construction and compensation for tree loss or damage.	Short	\$\$	Public Works
Strat	egy 2. Improve soil quality and topsoil protection			
2A	 Update the Engineering and Servicing Standards to: Include minimum soil volume requirements and acceptable alternatives for structural soil, soil cells, bridged sidewalks, or soil trenches Reduce soil compaction in boulevards to a maximum of 70 to 80% Standard Procter Density Clarify the acceptance criteria for the City to accept new trees as assets Consider opportunities to move parking and shallow utilities to back alleys to increase the space available for trees and soil in the boulevards Ensure that, when required trees cannot be provided, the cash-in-lieu provided for the City to plant those trees elsewhere is adequate to cover the cost of planting and early maintenance and is deposited into a fund that also allow its use for tree maintenance, soil amendments, or funding subsidized trees for private land. 	Short	\$\$	Fleet, Facilities & Engineering/ Public Works
2B	Continue improving development inspection processes to ensure soil is installed as per the Engineering and Servicing Standard specifications for new boulevards, such as third-party monitoring mid-development.	Ongoing	\$\$\$	Public Works

Stra	tegies and actions	Timeframe	Opinion on probable cost	Responsibility
Goal 1	PROTECT AND GROW URBAN TREES	Ongoing Short: 1-5 yrs Med: 5-10 yrs Long: 10-15 yrs	5: Already budgeted \$\$: \$10,000-20,000 \$\$\$: \$20,000 - \$150,000 \$\$\$: > \$150,000	Department
2C	Continue to protect topsoil by ensuring topsoil stockpiling and reuse requirements from the Engineering and Servicing Standards are being implemented, in line with policies from the Edmonton Metropolitan Regional Board's Regional Agriculture Master Plan.	Med	\$\$	Engineering
Stra	tegy 3. Grow the urban forest to improve access and equity			
3A	Prioritize City tree planting in neighbourhoods and streets with lower tree equity and vacant planting spaces.	Medium	\$\$	Public Works
3B	Maintain an inventory of street boulevards or park locations with repeated tree failure to prioritize soil quality improvements.	Ongoing	\$	Public Works
3C	Continue to trial new tree species to diversify the urban forest with species suitable to the current and anticipated future climate conditions using the Edmonton Metropolitan Region Guide to Urban Forest Management in a Changing Climate species list.	Ongoing	\$	Public Works
3D	Consider creating a subsidized tree program for residents to purchase affordable trees for planting in their yards.	Medium	\$\$	Public Works
3E	Work with Indigenous knowledge holders to identify sacred spaces for Indigenous community members to grow medicines such as fungi, sweetgrass, sage, and strawberry.	Short	\$\$	Public Works/ Culture & Recreation Services
3F	 Prioritizes tree planting in clusters where suitable so they can support one another Prioritizes planting of birch trees where conditions allow it to honour Fort Saskatchewan's nehiyawak name (waskwayâhtikispatinaw, birch hills) and support a holistic urban forest where native plants and animals thrive Prioritizes planting in low equity areas or other priority areas identified by the community such as planting along ski trails. 	Ongoing	\$\$\$\$	Public Works

Stra	tegies and actions PROTECT AND RESTORE NATURAL AREAS	Timeframe Ongoing Short: 1-5 yrs Med: 5-10 yrs Long: 10-15 yrs	Opinion on probable cost \$: Already budgeted \$\$: \$10,000-20,000 \$\$\$: \$20,000 - \$150,000 \$\$\$: > \$150,000	Responsibility Department
Strat	egy 4. Identify, protect and enhance sites of cultural, historical, and ecological significance to	support ecosys	stems and community	use
4A	Consider detailing the Municipal Development Plan's environmentally sensitive areas map to include more information about ecosystem types and condition and to integrate information from an Indigenous environmental scan. Use the map to help prioritize land dedicated for Environmental Reserve or for restoration projects on city property.	Medium	\$\$	Planning & Development
4B	Prepare a Historical Resource Impact Assessment (HRIA) for the Turner Park Development as part of the campground's phase 2 expansion.	Ongoing	\$\$\$	Planning & Development
4C	Consider creating or sharing public education materials on the value of tree protection and planting for property owners for property value or other benefits. See also action 3D (recommending the creation of a subsidised tree program)	Medium	\$\$\$	Public Works
4D	Consider developing an Invasive Species Management Plan to identify current and potential threats, map problem areas, define responses and prioritize treatment.	Medium	\$\$	Public Works
4E	In city parks, seek opportunities to restore and educate the community about: Grassland ecosystems Traditional medicines such as rat root, sweetgrass, sage, or cedar Tree museum displays (clusters of diverse trees with interpretive signage).	Medium	\$\$\$	Public Works/ Culture & Recreation Services
4F	Continue to work with community groups to share information about natural surface trail construction and maintenance standards, remove unauthorized structures, and conduct regular cleanup events to maintain high quality trails and natural areas with a particular focus on minimizing erosion and protecting the fauna and flora.	Short	\$\$	Public Works/ Culture & Recreation Services

Goal 2	PROTECT AND RESTORE NATURAL AREAS	Timeframe Ongoing Short: 1-5 yrs Med: 5-10 yrs Long: 10-15 yrs	Opinion on probable cost \$: Already budgeted \$\$: \$10,000-20,000 \$\$\$: \$20,000 - \$150,000 \$\$\$: > \$150,000	Responsibility Department
4G	Maintain a map of sanctioned trails and identify non-sanctioned trails to be decommissioned and areas that will require restoration.	Short	\$\$	Public Works/ Culture & Recreation Services
Strat	egy 5. Improve policies, regulations, and processes for parks and natural areas tree protectio	n and planting		
5A	Update the Land Use Bylaw to improve protection of streams by requiring that reduction of the top of bank setbacks be proposed by a qualified environmental professional with input from a geotechnical engineer. See also Action 1A for other recommended updates to the Land Use Bylaw focused on street and yard trees.	Short	\$	Planning & Development
5B	 Consider developing a City Policy to: Determine when and how notifications to Indigenous communities and organizations is conducted and a land breaking Ceremony should be held prior to breaking ground or tree removals Use information from the Indigenous environmental scan described in Action 4.A. to identify plants with important medicinal or traditional uses and the process for their protection or transplantation when work takes place in or near a natural area Define bylaw exemptions to enable cultural harvesting in accordance with the Parkland Bylaw (see Action 1D). 	Medium	\$\$	Public Works/ Culture & Recreation Services
5C	 Develop a Parkland Acquisition Strategy that: Uses the detailed inventory of environmentally sensitive areas and low tree equity mapping to prioritize land for acquisition Explores opportunities to enable interested private partners to contribute to a land acquisition fund. 	Medium	\$\$\$	Planning & Development

Action 5C Parkland Aquisition Strategy: There are strategies available for municipalities beyond the use of cash provided in-lieu of parkland dedication to acquire new parkland. Many communities in Ontario, such as <u>Hamilton</u>, use a Natural Areas Acquisition Fund to leverage funds from grants and partner agencies such as non-governmental organizations. Cities like <u>Calgary</u> have a Parks Foundation that creates parks through donations and partnerships.

Stra	tegies and actions MANAGE THE CITY'S URBAN FOREST	Ongoing Short: 1-5 yrs Med: 5-10 yrs Long: 10-15 yrs	Opinion on probable cost \$: Already budgeted \$\$: \$10,000-20,000 \$\$\$: \$20,000 - \$150,000 \$\$\$\$: > \$150,000	Responsibility Department
Stra	tegy 6. Leverage the tree inventory to support efficient asset management			
6A	Continue the migration of the City's tree inventory to a software that allows on-site data collection or update and that will support integration into City asset management systems.	Ongoing	\$	Public Works/ Information Technology
6B	Update tree inventory data during pruning and start collecting tree condition information to facilitate tracking of poorly performing areas, trees that require removal, and vacant planting sites.	Ongoing	\$	Public Works
6C	Update the Engineering Standards so "as-built drawings" include the coordinates for trees planted on public properties.	Short	\$	Fleet, Facilities & Engineering
6D	 Use the tree inventory to drive tree planting and maintenance budgets, specifically: Adjust operational and capital budget requests based on the addition of new tree assets and identify thresholds beyond which additional maintenance budget will be required Adjust funding budget requests based on the forecasted number of trees that require replacement annually using tree condition and vacant planting site data. 	Ongoing	\$\$\$	Public Works

Action 6D Pruning cycle: The City's target 7-year pruning cycle is aligned with best practices for the proactive management of urban forest assets²⁷. Communities such as St. Albert, Beaumont, and Drumheller Valley all identified proactive pruning as an important component of their urban forest plans to improve tree structure and health. Having already implemented a proactive pruning cycle, Fort Saskatchewan has already shown leadership in its urban forest management. Adjusting management budgets to the size of the tree inventory will help achieve the City's 7-year pruning cycle.

Stra Goal 4	tegies and actions MANAGE THE CITY'S URBAN FOREST	Timeframe Ongoing Short: 1-5 yrs Med: 5-10 yrs Long: 10-15 yrs	Opinion on probable cost \$: Already budgeted \$\$: \$10,000-20,000 \$\$\$: \$20,000 - \$150,000 \$\$\$: > \$150,000	Responsibility Department
Strat	egy 7. Improve resourcing and standards to deliver target urban forest service levels			
7A	Continue to pursue funding for urban forest initiatives from sources such as the Government of Canada's 2 Billion Trees Program, the Green Municipal Fund – Growing Canada's Community Canopies, the Tree Canada Granting Programs, or Infrastructure Canada Programs (natural infrastructure fund).	Ongoing	\$	Public Works
7B	Define levels of service for forested areas and trail inspections and document risk management procedures.	Medium	\$	Public Works
7C	Revise and adjust resourcing to align with the number of assets managed and to ensure adopted service levels, such as the frequency of pruning defined in the City Tree Installation & Maintenance Policy, are being met.	Short	\$\$\$\$	Public Works
7D	Develop an extreme weather response policy that documents call-out procedures, responsibilities, and a prioritization criterion for hazard and debris removal.	Medium	\$	Public Works
7E	Continue to inform community members about common or threatening pests and diseases as well as how to manage and prevent their spread.	Ongoing	\$	Public Works/ Corporate Communications
7F	Continue to produce mulch for use in parks and look for opportunities to up-cycle good quality timber from removed trees.	Ongoing	\$	Public Works

Stra Goal 4	tegies and actions PARTNER WITH COMMUNITY MEMBERS AND ORGANIZATIONS	Timeframe Ongoing Short: 1-5 yrs Med: 5-10 yrs Long: 10-15 yrs	Opinion on probable cost \$: Already budgeted \$\$: \$10,000-20,000 \$\$\$: \$20,000 - \$150,000 \$\$\$: > \$150,000	Responsibility Department
Stra	tegy 8. Support and develop community partnerships to implement the plan			
8A	Continue to develop partnerships with communities and organizations to support initiatives that contribute to reconciliation, for example to support connections between the City's urban forest program and cultural resource use and protection.	Ongoing	\$	Public Works/ Culture & Recreation Services
8B	Explore ways to improve food security with parks landscaping that includes fruit or nut trees, edible plants, and community gardens in partnership with schools, food banks, or other interested community organizations.	Medium	\$	Public Works
8C	Develop research partnerships with academic institutions, NGOs, or Indigenous community members and organizations to monitor the health of the urban forest.	Medium	\$\$	Public Works
8D	Set up regular meetings with industry partners to continue to discuss synergies and opportunities for them to support City projects and objectives such as: • Providing funding for trees or land for City or school tree planting • Helping coordinate volunteer events (e.g., tree planting, noxious weed removals).	Ongoing	\$	Public Works
Stra	tegy 9. Foster connections between people and the urban forest			
9A	 Develop educational materials about urban forestry on topics such as: Indigenous history on and knowledge of the land Medicinal plants in terms of what they are, why people should not remove them like weeds and how to harvest them Tree identification to allow people to greet trees as they walk through the forest Common and rare fauna, flora, and fungi growing in Fort Saskatchewan forests and their importance How to plant and maintain trees on your property: native species, how to prune and water trees, and how to handle common tree diseases The City's urban forest program (responsibilities, regularly scheduled activities and service levels). 	Short	\$\$	Public Works/ Corporate Communications

Stra Goal 4	PARTNER WITH COMMUNITY MEMBERS AND ORGANIZATIONS	Timeframe Ongoing Short: 1-5 yrs Med: 5-10 yrs Long: 10-15 yrs	Opinion on probable cost \$: Already budgeted \$\$: \$10,000-20,000 \$\$\$: \$20,000 - \$150,000 \$\$\$: > \$150,000	Responsibility Department
9B	 Develop an urban forest stewardship program that integrates: Events such as invasive species removal, tree planting, community gardens, etc. Grade one seedling program Adopt-a-tree program where people can donate their time to help with tree planting and establishment tasks like watering Activities to familiarize the community with its urban forest such as scavenger hunts or other ludic activities and the use of QR codes or reusing of HisTREE tags to share educational materials. 	Medium	\$\$	Public Works

Strat Goal 5	MONITOR PERFORMANCE AND ADAPT	Timeframe Ongoing Short: 1-5 yrs Med: 5-10 yrs Long: 10-15 yrs	Opinion on probable cost \$: Already budgeted \$\$: \$10,000-20,000 \$\$\$: \$20,000 - \$150,000 \$\$\$\$: > \$150,000	Responsibility Department
Strat	egy 10. Keep the plan up-to-date			
10A	Reassess canopy cover every five years using LiDAR or other accurate technologies available.	Medium	\$\$	Information Technology
10B	Review implementation process and update the action plan after five years.	Medium	\$\$\$	Public Works
10C	Update the Urban Forest Protection and Enhancement Plan every 10 years to align it to changing circumstances and evolving best practices.	Long	\$\$\$\$	Public Works

SECTION 8.0

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APPENDIX 1.0

PLANTING PLAN

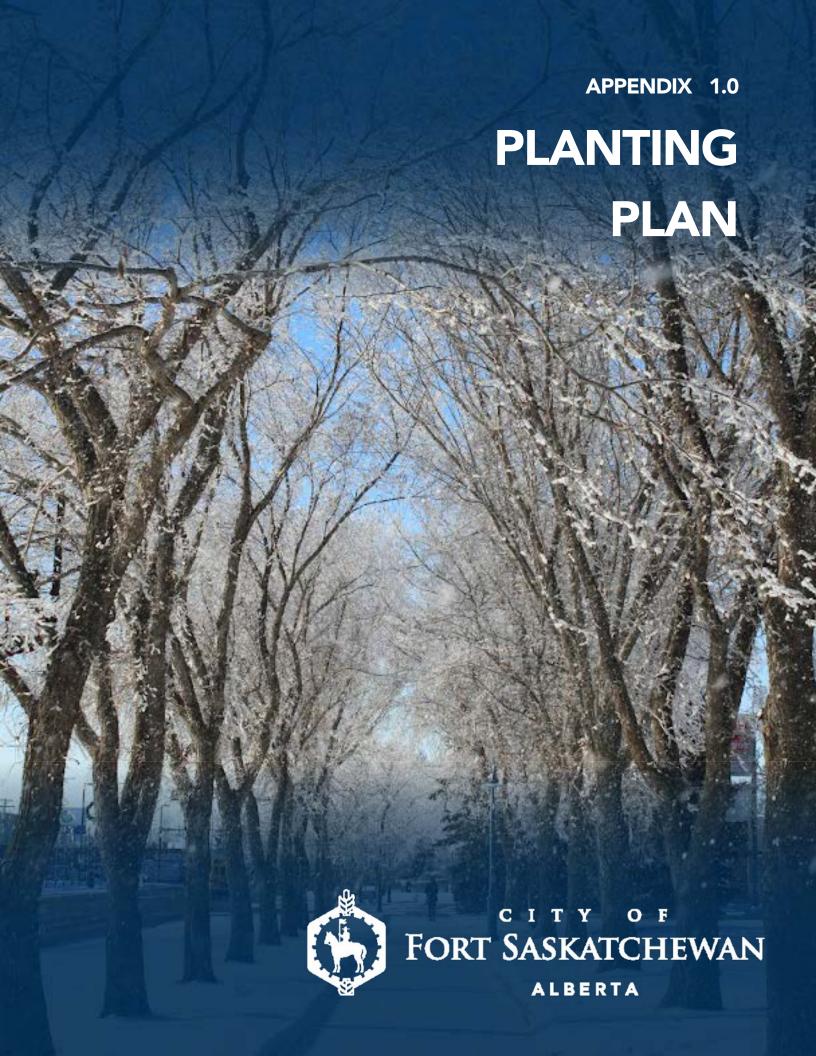


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1 INTRODUCTION

The City of Fort Saskatchewan's Urban Forest Protection and Enhancement Plan (the Urban Forest Plan) sets a vision, target, goals, and implementation plan to guide urban forest management for the coming years. The Plan's canopy cover target is to achieve 16% canopy cover within urban areas and 12% citywide by full build out. To achieve the target, the city will require approximately 206 hectares of new tree canopy to grow its urban forest and make up for canopy loss anticipated to result from a combination of natural tree mortality and impacts from new subdivisions.

Many of the Plan's actions will support the achievement of Fort Saskatchewan's canopy cover target. The scope of this planting plan is to guide the planting of urban trees on City lands, particularly along streets, in landscaped parks, and on other City properties. It represents the implementation of Action 3F under Goal 1 to protect and grow urban trees, which provides an overview of components to be considered in a planting plan that will guide the City's tree planting program on City lands. The Planting Plan:

- Provides an overview of the planting program and principles that will guide tree planting
- Identifies planting opportunities and prioritizes them
- Provides a 10-year planting plan identifying where trees are anticipated to be planted with guidance on the species and character sought out across planting sites and cost estimates and anticipated canopy gains for the planting program

UFP Action 3F: Develop a planting plan that:

- Prioritizes tree planting in clusters where suitable so they can support one another
- Prioritizes planting of birch trees where conditions allow it to honour Fort
 Saskatchewan's nehiyawak name (waskwayâhtikispatinaw, birch hills) and support a
 holistic urban forest where native plants and animals thrive
- Prioritizes planting in low equity areas or other priority areas identified by the community such as planting along ski trails

Indigenous engagement recommendation #14: To create a collective of community members and partners who can inform the planting goals annually. A planting plan designed to be longer term will ensure Mother Earth can heal and support all other plants in what they need to thrive.

1.1 Policy Areas

The planting plan refers to policy areas that were adapted from Fort Saskatchewan's Municipal Development Plan. Those policy areas were also used in the Urban Forest Plan to establish the city's canopy cover target and are also referred to throughout the planting plan (Figure 1).

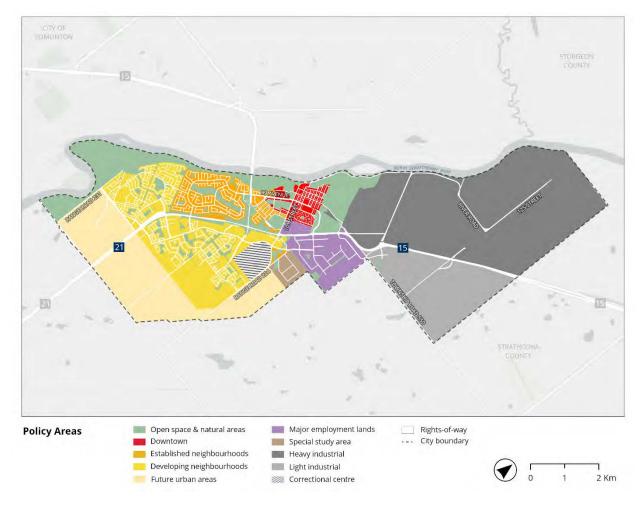


Figure 1. Policy areas.

2 PLANTING PROGRAM

The City of Fort Saskatchewan recognizes the critical role that trees in the public realm play in improving the environmental quality and the beauty of our city. The planting program is intended to provide "aesthetically pleasing parks, boulevards and open spaces", per the City's Tree Installation & Maintenance Policy GEN-044-A. Tree planting also supports the implementation of the Municipal Development Plan's policies related to natural systems, green infrastructure, recreation, walkability, placemaking and much more.

As of 2024, the City's Park Services has a team of six full-time equivalent staff working to manage, coordinate, plan, maintain, remove, and plant trees in Fort Saskatchewan. Of the City's \$610,000 annual Tree and Shrub Maintenance and Horticulture budget, approximately \$30,000 is allocated to tree planting. Fort Saskatchewan's Planting Plan is intended to support the City's tree planting program toward achieving the Urban Forest Plan's vision and canopy cover target.

2.1 Guiding Principles from Traditional Ecological Knowledge

The following guiding principles are based on Traditional Ecological Knowledge received from Indigenous Elders and participants. The principles will guide decisions on what, when, and where to plant trees in parks and along streets:

- Integrate Oral Indigenous Knowledge received for this project into tree planting practices.
 - Indigenous Elders and participants who shared knowledge and teachings for the development of the Urban Forest Plan recommended many practices to improve tree planting, young tree care, and soil protection that are referenced throughout the planting plan.
- Encourage relational connections with the urban forest.
 Indigenous Elders and participants shared teachings about humans' relation to tree, known as standing people in the creation story. Tree plantings should support our relationship with trees through educational materials that allow people to recognize and greet trees as well as learn from them.
- Collaborate with community members and organizations.
 Seek community participation to support tree planting and young tree maintenance.

2.2 General Guiding Principles

The following guiding principles will guide decisions on what, when, and where to plant trees in parks and along streets:

• Preserve existing trees and topsoil.

Existing trees and topsoil will be preserved wherever possible. Where trees are removed, they will be replaced.

• Enhance community character and aesthetics.

Tree planting will continue to help beautify the city and to create a distinctive look and feel across neighbourhoods and enhance pedestrian comfort.

• Distribute tree canopy and its associated benefits equitably across the city.

Priority will be given to planting new trees in areas that have lower tree canopy and a high priority for planting, as identified in this plan.

Select the right tree for the right place.

Balance tree planting and species selection with competing requirements such as presence of above or below ground utilities.

• Mitigate and adapt to climate change.

Increase urban forest resilience through planting site improvements and species selection and leveraging its capacity to intercept stormwater, sequester carbon, and cool urban areas.

• Plant more edible trees and plants.

In suitable locations, increase the availability of fruit and nut trees, berries, and food forests.

• Support local biodiversity and connectivity.

Tree planting will support native wildlife with native trees and plants and flowering species to expand and connect habitat across the city.

• Apply best management practices and innovation.

Continue to promote practices and guidelines that adhere to professional best practice standards.

3 PLANTING PRIORITIZATION

The Planting Plan provides guidance on where tree planting should be prioritized based on factors related to equity and access to trees and greenspace that were described in the Urban Forest Plan. The prioritization is focused on existing neighbourhoods. This section provides an overview of the factors used to identify priority planting streets and parks, including:

- Along streets and rights-of-way, the highest planting priorities are identified based on adjacent city blocks having a combination of:
 - Lowest street tree density
 - o Lowest tree equity, determined at the city block scale find the following data:
 - Highest population density
 - Highest surface temperature
 - Lowest access, based on ranking on the City's adaptation of the 3-30-300 metric, identifying city blocks with the least access to:
 - At least three trees visible from their parcel
 - 20% canopy cover in their neighbourhood
 - A green space within 400 metres of their parcel
 - o Highway corridor, a major community thoroughfare
- In parks and other City properties, the highest planting priorities are identified based on having a combination of:
 - o Highest-use parks
 - Linear corridors and other priority locations along trails, to provide shade and windbreaks for users
 - o Lowest tree canopy, determine as a combination of:
 - Lowest tree canopy cover
 - Lowest tree density, to account for recently planted trees not yet contributing significant canopy cover

Sites with the greatest priority are combined with available planting sites to determine where tree planting can occur in the short term. Locations that have a high priority but few planting sites available may be considered for planting in the longer term as they would require site upgrades to create adequate space for tree planting.

3.1 Streets and Rights-of-Way Prioritization

Tree planting along streets and rights-of-way provide the closest access to tree canopy where community members live, work, and travel. The factors for prioritization focus on providing a more equitable access to tree canopy and its benefits across Fort Saskatchewan. The following pages include a description of the prioritization factors, followed by Figure 2 which shows high priority areas for each factor individually.

3.1.1 Street tree density

City blocks with the lowest street tree density are a higher priority for planting because they are underserved. In Fort Saskatchewan, city blocks with the lowest street tree density are primarily found in the developing neighbourhoods and major employment land, as shown on Figure 2.

3.1.2 Lowest Tree Equity

The Tree Equity Score included in the Urban Forest Plan identifies high-priority areas at the census dissemination area scale to grow tree canopy based on a lack of access and the presence of populations more vulnerable to heat. To provide more location-specific information to inform street tree planting, the Planting Plan uses two of the Tree Equity Score's input datasets available at the block scale: highest population density and surface temperature. Highest population density is found in developing neighbourhoods, particularly around the Windsor, Forest Ridge, Southpointe, Sienna neighbourhoods (Figure 2). Highest surface temperatures were also recorded in those neighbourhoods, as well as Southfort Ridge, Downtown, and Cornerstone (Figure 2).

3.1.3 Lowest Access

The Urban Forest Plan provided information about how Fort Saskatchewan's neighbourhoods rank on an adaptation of the 3-30-300 metric. In Fort Saskatchewan, the City aims to provide access for every parcel to:

- See at least three trees from their parcel
- Have at least 20% canopy in their neighbourhood
- Have access to a green space within 400 metres of their parcel

Figure 2 shows highest priority areas for each of those factors. When it comes to the ability to see three trees from every parcel, highest priority areas are found in residential neighbourhoods of Windsor and Windsor Pointe, Southfort Ridge, and Major Employment Lands along 88 Avenue, Eastgate Business Park, and Alsten Lands. For lack of canopy cover, there is a higher priority across developing neighbourhoods, Chamberlain, Major Employment Lands, and Clover Park. For access to green space from every parcel, highest priority areas are found on Major Employment Lands and southeasternmost developing neighbourhoods.

3.1.4 Highway Corridor

The Highway 15 and 21 corridors are a major community thoroughfare that provide the first outlook onto Fort Saskatchewan for most visitors. It is also considered a high priority for tree planting.

3.1.5 Locations Identified During Engagement

During community engagement on the Urban Forest Plan in the summer of 2023, participants identified many locations where they hoped to see improvements to the urban forest. Those locations are considered as community priorities for tree planting.

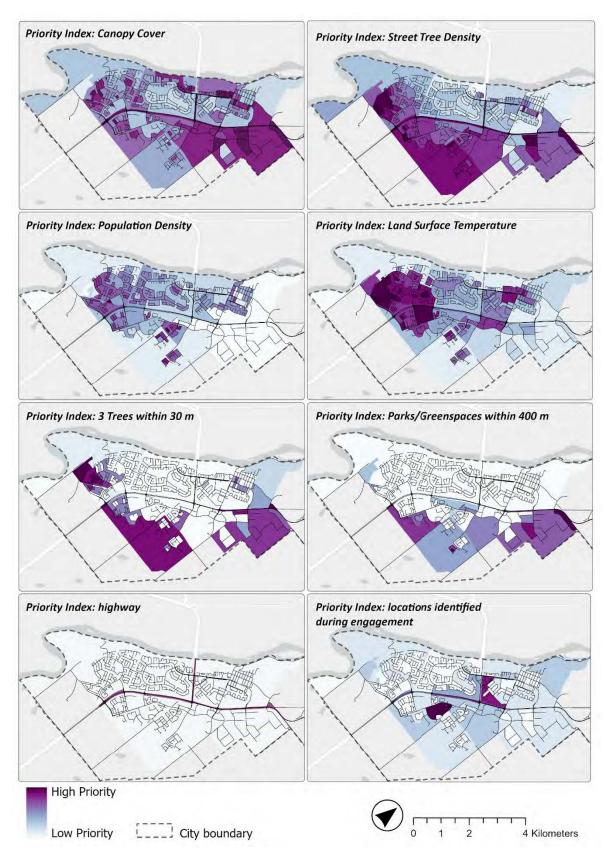


Figure 2. Prioritization factors for streets and rights-of-way

3.1.6 Summary of Streets and Rights-of-Way Prioritization

Figure 3 shows the overall street and rights-of-way planting priorities for every city block after compiling all prioritization factors for existing neighbourhoods. The prioritization will be applied to the nearest streets, where planting character recommendations will be made with guidance from the next section of this plan.

Future neighbourhoods are highlighted independently as tree planting will occur in phases with development. Planting trees in new neighbourhoods is a high priority that will continue to occur as new infrastructure is constructed.

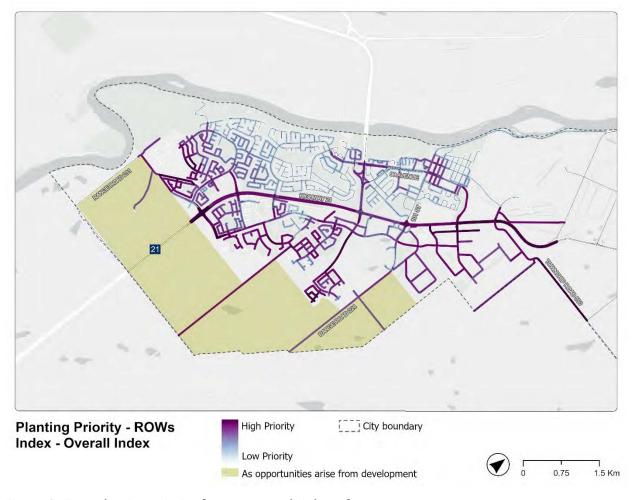


Figure 3. Tree planting priority for streets and rights-of-way

3.2 Parks Prioritization

Tree planting in parks can provide an improved recreational experience in city parks, whether to provide shade or windbreak along trails and active use areas like playground and sports fields or opportunities to interact with the urban forest through edible plantings or educational opportunities. The factors for prioritization focus on providing more tree canopy in highest use parks, high interest areas along trail corridors, and in parks with lower tree canopy. The following pages include a description of the prioritization factors, followed by Figure 4 which shows high priority areas for each factor individually.

3.2.1 Highest-Use Parks

While the City doesn't have a formal classification of its parks, the following parks were identified as having the highest use: Legacy Park, Turner Park, Pryce Alderson Park, West River's Edge, and Fort Centre Park (see Figure 4).

3.2.2 Locations Identified During Engagement

During community engagement on the Urban Forest Plan in the summer of 2023, participants identified many locations where they hoped to see improvements to the urban forest. For example, many participants mentioned the importance of tree planting to improve trail use by providing shade and windbreaks. Ski trail users, in particular, noted the importance of trees to prevent snow drift on the trails. High-interest areas highlight important locations for tree planting to provide shade along trails and to improve cross-country skiing conditions. Those locations are considered community priorities for tree planting, as shown in Figure 4.

3.2.3 Lowest Tree Canopy

Parks with the lowest tree canopy also present an opportunity to improve access to tree canopy across Fort Saskatchewan. The lowest tree canopy is determined by a combination of low tree canopy and low tree density to account for recently planted trees not yet contributing significant canopy cover, as shown in Figure 4.

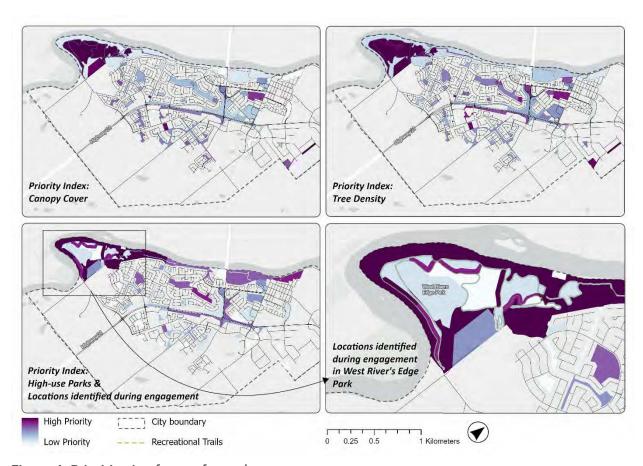


Figure 4. Prioritization factors for parks

3.2.4 Summary of Parks Prioritization

Figure 5 shows the overall parks planting priorities for every park or park area in the city. Planting character recommendations will be made for parks in the next section of this plan.

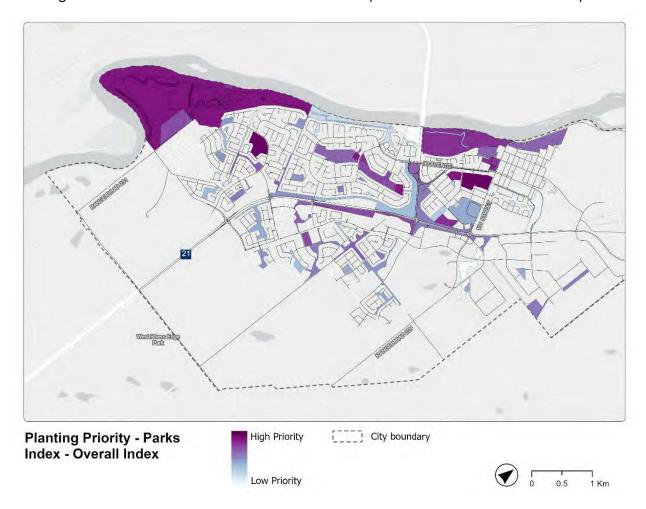


Figure 5. Tree planting priority for parks

4 PLANTING GUIDANCE

This section provides guidance on how tree planting should be completed. More specifically, it outlines the planting objectives and character for distinct types of planting environments along city streets and rights-of-way and in parks. The section also provides technical guidance about tree selection, planting site preparation, and planting.

4.1 Planting Character

The planting character section provides guidance on the objectives and character sought out for different types of planting environments along streets and rights-of-way and in parks, including:

- Streets and rights-of-way:
 - o Highway corridors
 - o Neighbourhood collectors
 - Local streets
 - Downtown commercial streets
- Parks:
 - o Linear planting along trails
 - o Indigenous medicine gardens
 - o Food forests and educational plantings
 - o Planting in open park space

4.1.1 Streets and Rights-of-Way

The planting plan recommends distinct planting character for four types of streets and rights-of-way: highway corridors, neighbourhood collectors, local streets, and downtown commercial streets (Figure 6).



Highway corridors

Large multi-lane road corridors with wide permeable areas that support tree planting and multi-use trails



Local streets

Boulevard planting strips between the street and homes



Neighbourhood collectors

Wider gateway streets into neighbourhoods with planting boulevard and medians



Downtown commercial

Commercial street with hardscape planting strips



Figure 6. Streets and rights-of-way planting character

4.1.1.1 Highway Corridors

Description: Multi-lane roads that carry traffic between communities and do not have a direct interface with the neighbourhood beyond the entranceways. The highway rights-of-way include a wide permeable corridor on either side of the highway that already accommodates some tree planting and multi-use trails. There is ample soil volume to support rows or cluster tree planting to shield residential neighbourhoods and trails from the highway.

Examples of current tree planting along highway corridors:

Highway 21 corridor:



Highway 15 corridor:



Highway 21 plantings:



Highway 15 plantings:



Objectives:

- Plant trees to soften fencing and screen adjacent land uses and to give a more human scale to these broad multi-lane roads.
- Plant a mix of deciduous and coniferous trees and shrubs to create year-round screening and character.

Planting character for highway rights-of-way:

- In locations with no pedestrian access that are fenced and/or have broad grass shoulders, plant row or mass plantings of evergreens or deciduous trees with or without understory landscaping to screen fences and adjacent land uses.
 - o Avoid food producing trees and plants where it may attract wildlife along the highway corridor.
- In locations with multi-use pathways and/or medians, plant with rows of large canopy trees of the same species to create a coherent avenue planting.
- Plant trees together in clusters of at least three so they can support one another.

Indigenous Elders and participants who shared knowledge during development of the Urban Forest Plan shared that trees traditionally grow in clusters of at least three so they can support one another. Planting trees closer together allows them to connect their root systems and provide strength to one another.

Precedents – examples of what we will aim for:

Mixed tree plantings along highway (Whitemud Drive, Edmonton):

Cluster plantings of mixed coniferous, deciduous, and shrubs (Groat Road, AB):





Credit: Kurayba

Credit: Kurayba

4.1.1.2 Neighbourhood Collectors

Description: Collector streets are typically wide streets that convey traffic to multiple destinations within the community. Boulevard planting strips are often quite wide. Centre medians are common in many collector streets. Neighbourhood collectors are the gateways into the city's neighbourhoods and offer an opportunity to create distinct character across communities.

Examples of current tree planting along neighbourhood connectors:







99 Avenue median planting



Westpark Drive boulevard planting



Objectives:

- Plant unique combination of tree species to give the city's neighbourhood different character with variations in seasonal colours and form.
- Plant trees in regularly spaced rows to give a more human scale to these broad streets and create a comfortable pedestrian space.
- When planting adjacent to parks with eclectic planting and arrangement of trees extend that character in the public right-of-way.

Planting character for neighbourhood connector streets:

When planting streetscapes within boulevards with separate sidewalks or public rights-of-way adjacent to private property with enough space to create rows of trees:

- Plant trees in regularly spaced rows to create a coherent streetscape that defines the pedestrian space and connects street-blocks through the community.
- Plant trees close enough together that they will form a continuous, canopy ceiling and allow their root systems to connect.
 - Where soil volume and space allow, plant trees in clusters of at least three to allow root systems to connect and trees to provide strength to one another.
- Plant staggered double rows of trees where planting space allows.
- Plant the same species (or species of similar scale, form, and texture) for one to two blocks at a time to create homogeneity in texture, pattern, light, and shade.
- Plant trees curbside where possible to extend the canopy over the street.
- Select large trees for planting along sidewalks that will cover and contain the
 pedestrian space rather than small trees that interrupt and fragment the pedestrian
 space, except where screening is needed or there are constraints like high-voltage
 power lines.

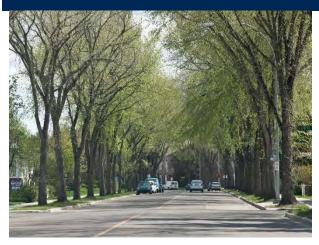
When planting adjacent to parks or private landscapes with eclectic planting and arrangement of trees:

- Extend that character in the public rights-of-way and select a diversity of trees that will provide year-round interest with flower, foliage and bark colour. Plant conifers along northwest boundaries to provide a wind break.
- Plant trees curbside where possible to extend the canopy over the street and create separation between vehicles and pedestrians.
- Tree selection should focus on native trees or desirable insects- and bird-attracting trees where possible, particularly when there is an opportunity to create a canopy corridor between greenspaces.

Precedents – examples of what we will aim for:

Treed boulevard in Edmonton

Treed boulevard in Edmonton with fall colors





Credit: Dave Sutherland

Credit: Mack Male

4.1.1.3 Local Streets

Description: Local streets typically have boulevard planting strips between the road and the sidewalk that are either continuous or fragmented by driveways. Where there are no sidewalks, boulevards are adjacent to front yards fragmented by driveways.

Range of current tree planting along local streets:

Curbside boulevard planting (without driveways)









Curbside boulevard planting (with driveways)



Planting adjacent to private property





Objectives:

• Where possible, plant trees in regularly spaced rows to create a coherent streetscape that defines the pedestrian space and connects street-blocks through the community.

- When planting adjacent to parks or private landscapes with eclectic planting and arrangement of trees, extend that character in the public rights-of-way.
- Where suitable, plant trees that support biodiversity by providing food or habitat for beneficial insects, reptiles, birds or small mammals. Encourage residents and schools to contribute to the provision and maintenance of biodiversity or edible plantings on their properties.

Planting character for local streets:

When planting streetscapes within boulevards with separate sidewalks or public rights-of-way adjacent to private property with enough space to create rows of trees:

- Plant trees in regularly spaced rows to create a coherent streetscape that defines the pedestrian space and connects street-blocks through the community
- Plant trees close enough together that they will form a continuous, canopy ceiling and allow their root systems to connect
- Plant staggered double rows of trees where planting space allows
- Create homogeneity in texture, pattern, light and shade by planting the same species (or species of similar scale, form and texture) for one to two blocks at a time
- Plant trees curbside where possible to extend the canopy over the street
- Select large trees for planting along sidewalks that will cover and contain the
 pedestrian space rather than small trees that interrupt and fragment the pedestrian
 space, except where screening is needed or there are constraints like high-voltage
 power lines

When planting adjacent to parks or private landscapes with eclectic planting and arrangement of trees:

- Extend that character in the public rights-of-way
- Plant trees curbside where possible to extend the canopy over the street

Precedents – examples of what we will aim for:

Row of large canopy trees along local street (Winnipeg, MB)

Fall color along local street (Calgary, AB)



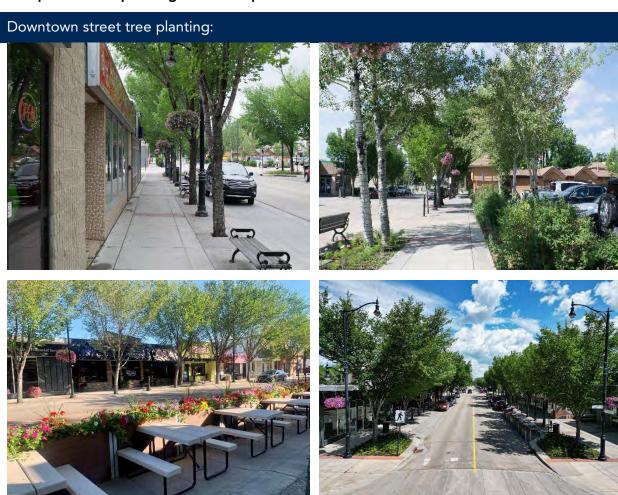


Credit: Flickr Credit: Nataliia Kvitovska

4.1.1.4 Downtown Commercial

Description: In commercial locations, trees are typically planted in pits to maximize the area of hardscape to support higher volumes of pedestrian traffic, as well as signage and street furniture.

Examples of tree planting in hardscape:



Objectives:

- Plant trees to shade the street and sidewalks and create a comfortable pedestrian environment.
- Plant trees with large canopies that will grow above commercial awnings.

Planting character for downtown commercial street tree planting:

- Plant trees in regularly spaced rows to create a coherent streetscape that defines the pedestrian space and connects the commercial sector.
- Plant trees close enough together that they will form a continuous, canopy ceiling.
- Where planting sites allow for multiple trees to grow in a connected trench, plant the same species close enough together so their roots will connect.

- Select large trees for planting along sidewalks that will cover and contain the pedestrian space and grow above commercial awnings rather than small trees that interrupt and fragment the pedestrian space and hide storefronts.
- Install structural soil or soil cells to increase soil volume in tree pits

Precedents – examples of what we could aim for:

Treed boulevard with planted medians along a commercial street (Rice Howard Way East, Edmonton):



Credit: Kurayba

4.1.2 Parks

The planting plan recommends distinct planting characters for parks. While character styles such as planting along trails have a proposed geographical location shown on the map below, many of the other styles will require further work with staff, community members, and organizations to identify preferred locations.



Linear planting along trails

Planting to provide shade and wind sheltering to trail users



Food forests and educational plantings

Food or educationoriented plantings proposed to take place in highest-use parks or as determined through further engagement



[2]

Indigenous medicine gardens

Dedicated areas to re-grow traditional Indigenous medicines (locations to be determined)



Other parks

Open space planting

Planting in open park space and near features such as sports fields or playgrounds



Highest-use parks (labelled)

Figure 7. Parks planting character locations

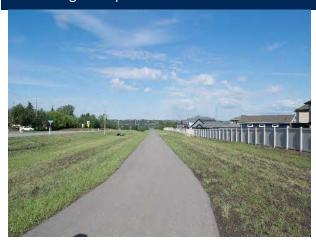
City trails

4.1.2.1 Linear Planting Along Trails

Description: The city's numerous trails connect neighbourhoods and amenities. Outside of the trails running through natural areas and forests, many trails run across landscaped parks and green spaces where trees grow in open areas with ample soil volume.

Examples of tree planting along trails:





Trail in Turner Park:



Trail in West River's Edge Park:



Ski trails in West River's Edge Park:



Objectives:

- Plant trees in linear corridors along trails to provide shade and windbreaks for trail users
- Plant trees that support biodiversity by providing food or habitat for beneficial insects, reptiles, birds or small mammals
- Prioritize the planting of multiple layers of canopy, including understory plantings where appropriate

Planting character:

- Plant trees in clusters of at least three trees to allow their roots to connect
- Create special plantings in locations where they will add visual interest and become landmark features, such as a trail entrance or intersection.
- Where trails come out of natural areas, select native tree species that extend the character along the trail.
- Prioritize planting of a mix of coniferous trees (spruce and pine) with some deciduous trees and shrubs to shelter trail users from dominant winds and reduce snowdrift on ski trails in West River's Edge Park (see the parks prioritization map on locations identified during engagement in section 3.2 for more details).

Precedents - examples of what we will aim for:

Linear corridor with fall colour:

Linear corridor with mixed plantings (Rio Park, Edmonton):





Credit: Pickpik

Credit: Kurayba

4.1.2.2 Indigenous Medicine Garden

Description: Indigenous participants to the engagement on the Urban Forest Plan expressed strong interest in re-growing traditional medicines that have been lost in recent decades.

Objectives:

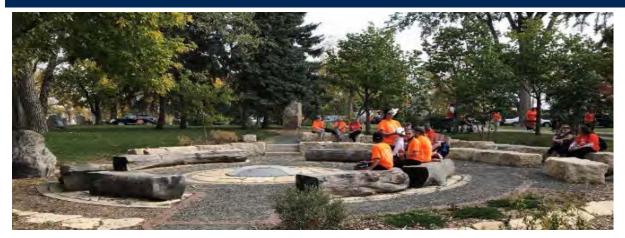
- Work with Indigenous community members to restore traditional medicines along the kisiskâciwan-sîpî (North Saskatchewan River) in accordance with Traditional Ecological Knowledge.
- Restore green space to grow medicinal plants of importance to Indigenous communities.
- Protect those sensitive trees and plants.

Planting character:

- Assign areas dedicated to a medicine garden.
- Seek out planting and restoration of traditional medicines such as fungi, sweetgrass, rat root, sage, and strawberry with guidance from Indigenous Elders and community members.
- Integrate educational information about the importance to prevent use of pesticide to avoid contaminating the native plants and to protect plants from trampling and erosion due to recreational use.
- Seek out opportunities to expend the restoration into natural areas, including the protection of existing plants and trees from pesticides and recreational users and restoration plantings in accordance with Traditional Ecological Knowledge.

Precedents – examples of what we will aim for:

The Kapabamayak Achaak Healing Forest was named by an Anishnaabe Elder* in Winnipeg (MB):



*The park's goal is to 'help people reflect, heal and learn from the past'. It does not provide an example of what an Indigenous medicine garden would look like in Fort Saskatchewan but can provide inspiration for what types of projects have been achieved elsewhere.

4.1.2.3 Food Forests and Educational Plantings

Description: Park open space can be designated for special planting of food forests and to create educational opportunities for community members to learn about Fort Saskatchewan's urban forest. Those types of plantings may be considered for highest-use park or as determined through further community engagement.

Examples of park space where special plantings could occur:

Fort Centre Park:



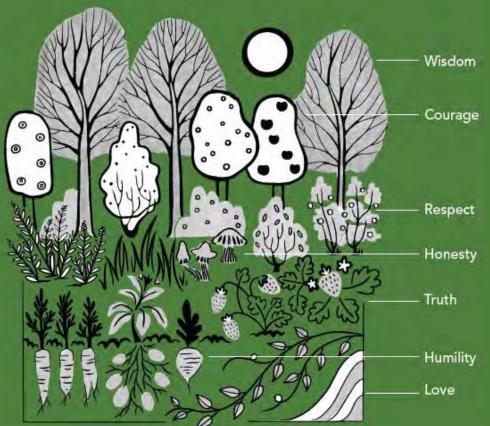


Objectives:

- Create community landmarks using tree and landscape plantings. Plantings should stand out to assist with wayfinding, education, and provide surprising, seasonal delight with flowers, fruit, bark or colour changes. For example, birch trees are an important species and part of the Cree namesake for the area surrounding Fort Saskatchewan.
- Create food forests, orchards, and gardens that expand community gardens with layers of canopy provide a diversity of food options. Encourage residents, local organizations, and schools to participate in the planting, maintenance and harvesting.
- Create 'tree museums' that provide opportunities to educate community members about the urban forest and allow them to recognize and greet trees.
- Integrate opportunities for community members to connect with trees in a more relational way in accordance with knowledge shared by Indigenous Elders that humans and trees can communicate with one another and that forests become healthier when we connect with trees in a more relational way.
- Engage further with Indigenous Peoples about planting in parks along the river valley and particularly in the areas known as Turner Park and West River's Edge, which are significant due to their historical use and are likely to have significant artifacts such as tools, artisan crafts, and scrolls.

Planting character:

- Create singular or small group plantings of unique trees (i.e. large size, unusual form, unusual specimen, trunk patterns) to create sculptural outcomes.
- Plant trees in clusters of at least three trees to allow them to support one another and integrate educational signage about the types of trees growing across the city.
- Where planting sites are suitable, plant birch tree and educational materials about its importance to nehiyawak (Cree) people.
- Work with community members and organizations to plant and maintain food forests that integrate the seven layers of food forests¹ aligned with the seven sacred teachings in the nehiyawak and other Indigenous cultures:
 - o **Wisdom**: largest trees that offer protection, like walnut, chestnut, beech, or maple trees.
 - Courage: fruit trees that provide important mental, physical, emotional, and spiritual health, like cherry, apple, plum, or saskatoons.
 - o **Respect**: berries that grow in harmony together and teach us about respect, like blueberry, raspberry, haskap, and gooseberries.
 - o **Honesty**: food-producing plants that grow right above the ground and teach us about honesty and willingness to share with nutritious and



trusted food, like squash, pumpkins, lettuce, and cucumbers.

- Truth: traditional Indigenous medicines like fungi, sweetgrass, rat root, and sage, and the sacred strawberry which represents the earth.
- This layer requires protection against pesticides and recreational use.
- o **Humility**: vegetables that grow under the surface and in companionship and require us to dig them up, like potatoes, carrots, and turnips.
- o **Love**: plants that explore the forest, embrace other plants, and provide access to animals from the ground to higher areas for safety, like vines and creepers
- This layer requires protection against invasive species.

Layers of food forests and seven sacred teachings from the nehiyawak culture (graphic credit: pipikwan pêhtâkwan).

 $^{^{-1}}$ See section 2.2 of the Urban Forest Plan for more information about the seven layers of food forests.

Precedents – examples of what we will aim for:

Recently planted birch trees in Fort Centre Park (Fort Saskatchewan):

Planting out of MacKinnon Food Forest (Edmonton):





4.1.2.4 Planting in Open Park Space

Description: Open space areas in parks range from areas that border sports fields and playgrounds to grassy areas. Tree planting is sometimes situated to provide shade or create delineation along or is scattered across parks.

Examples of tree planting in open park spaces:









Objectives:

- Plant layers of canopy that support biodiversity by providing food or habitat for beneficial insects, reptiles, birds or small mammals.
- Plant trees to create shade and wind breaks near active park uses like sport fields or playgrounds.

Planting character:

 Plant trees together in clusters of at least three so they can support one another, with understory landscaping like shrubs, vines and creepers where desirable.

- Extend that character in the public rights-of-way and select a diversity of trees that will provide year-round interest with flower, foliage and bark colour.
- Identify areas for the mass plantings of evergreens and deciduous trees with or without understory layers of canopy.
- When planting near a natural area, select trees and plants to extend that character into parks, particularly where there is an opportunity to create canopy corridors between greenspaces.
- Where planting sites are suitable, plant birch tree to provide wind and snow protection, food for animal societies and traditional uses for Indigenous community members.

Precedents – examples of what we will aim for:

Mixed forest plantings at Lake Rundle Park (Edmonton, AB):

Mixed forest near a playground at Hawrelak Park (Edmonton, AB):





Credit: Winterforce Media



Credit: IQRemix

4.2 Planting Installation Guidance

Tree installation and maintenance in the City of Fort Saskatchewan is guided by the Tree Installation and Maintenance Policy GEN-044-A. Landscaping Design Standards are provided in Schedule C of the Engineering and Serving Standards. The information in this section is a supplement to the City Tree Installation and Maintenance Policy and Schedule C of the Engineering and Servicing Standards.

4.2.1 Species and Site Considerations

Species considerations shall conform to the Plant Source and Hardiness Guidelines in Section 6.6 Plant Material, of the Landscaping Design Standards. The considerations below are supplemental to the City standards.

• Species Selection: Objectives

Planting objectives should guide stock selection. This requires identifying specific objectives, such as reducing summer heat where vulnerable people live or enhancing habitat, in alignment with broader community goals for urban forest planning, sustainability, biodiversity, and climate action. A recommended species palette is provided at the end of this document. As a rule, select the largest tree suitable for the site to maximize the benefits produced.

• Species Selection: Suitability

Site considerations are to include location, exposure to elements (sun and wind exposure), slope and drainage, proximity to water bodies, soil type and condition. Choose species suitable for the local environment and planting site. Consider water use, shade tolerance and wind tolerance, physical limitations, and all proposed plant material must be hardy to minimum Zone 3b **Plant Hardiness Zone.**

• Species Selection: Criteria

- Trees that provide adequate, year-round sightlines maintained for pedestrian and vehicular safety
- Minimum 1.8m branching height for all trees adjacent to roadways and walkways
- Trees with a single and sturdy vertical trunk with a well-balanced crown and fully developed leader, unless uncharacteristic for that species
- o Trees with a single and prominent central leader and balanced branching habit.
- No fruit bearing trees or oak trees to be placed near any sidewalk or trail near streets or boulevards but will be considered along trails in open space

• Species Selection: Diversity

Aim for diversity to reduce risks, such as pests and disease outbreaks, from monocultures. Aim for no more than 20% of any genus in the City's tree inventory. Alternating patterns of trees along streetscapes to avoid a monoculture of trees in a particular area. Shrubs (smaller, multi-stemmed, woody plants) should be considered as part of restoration or habitat planting projects, edible planting projects, or in areas where tree planting is not viable.

• Species Selection: Native vs. Invasive

Prefer native species for natural areas and where site conditions permit to support native habitat and biodiversity. In urban settings, exotic species better adapted to urban conditions may be preferred, but it is crucial to avoid invasive species due to detrimental impacts they may have on local ecosystems and biodiversity.

• Species Selection: Aesthetics and Maintenance

Consider the species' appearance and maintenance needs, including potential nuisances. Trees grow in a variety of forms and colours which can beautify landscapes. Factors such as fall color, flowers/fruit, and growth form should be considered in species selection.

4.2.2 Stock Selection Considerations

Stock selection considerations shall conform to the Plant Source and Hardiness Guidelines in Section 6.6 Plant Material, of the Engineering and Servicing Standards. The considerations below are supplemental to the City standards.

- Stock Selection: Nursery Stock Types: Nursery stock comes in various ages, sizes, and types, including seedlings, bare-root, container-grown, and ball and burlap trees. Stock quality should meet the Canadian Nursery Stock Standard⁶. See the Appendix 1 for a more detailed description of each type of tree stock. In general, seedlings, bare-root trees and container grown tree stock are suitable for high volume plantings where some losses may be expected in parks and along highways. Ball and burlap or wire basket trees are more commonly used for street tree planting because their larger size means they are less vulnerable to physical damage. However, staff may consider it acceptable to use smaller, container-grown stock in residential streets where trees are less likely to be damaged and, ideally, where the adjacent residents are willing to support supplemental watering.
- **Stock Selection: Stock Size** refer to Section 6.6 Plant Material, of the Engineering and Servicing Standards.
- Stock Selection: Stock Acceptance and Storage
 - Plan the logistics of accepting, transporting, and storing the nursery stock. Make all necessary arrangements with the contractor or the nursery to ensure a successful transfer and storage of trees and a timely tree planting operation.
- Stock Selection: Inspection and Assessment Always assess nursery stock before acceptance to ensure trees are high quality and likely to establish and grow after planting. Inspect young trees at the nursery or ensure contractors do so according to the Canadian Landscape Standard, current edition. Upon delivery, verify stock quality based on standards. Check trees for buried root flares, circling roots, and damaged branches. Nursery stock should be inspected prior to acceptance to ensure trees are:
 - Free from disease and insect pests, eggs or larvae, rodent damage, sunscald, frost cracks and other abrasions or scars to the bark
 - Structurally sound, healthy and vigorous, well branched and densely foliated when in leaf
 - Free of girdling roots
 - Free of co-dominant leading stems (single leader present)
 - Free of crowding branches
 - Presence of trunk taper

4.2.2.1 Inspecting: Container Grown Trees

Issues to Inspect For	Corrective Actions
Root flare can be buried in potting medium.	If you cannot see the first lateral supporting root, excavate the top of the soil in the container with your fingers or a small garden claw tool to identify the depth of the first lateral feeder root and to expose the root flare. Most container grown trees are planted too deep so do not assume that a container-grown tree can be planted "as is".
Circling roots may be hidden in the soil.	Reject the stock.
When you lift a tree out of the container, the soil falls away from the roots.	Reject the stock or, if not possible, plant as a bare root tree (create a mound of soil in the middle of the bottom of the hole to spread roots across, backfill soil as usual, water and stake the tree).
Broken branches	If the main leader is broken, or if more than 15% of the crown is broken, reject the stock. Otherwise, prune off broken branches and maintain a well-balanced appearance.

4.2.2.2 Inspecting: Ball and Burlap or Wire Basket Field Grown Trees

Issues to Inspect For	Corrective Actions
Root flare can be buried in root ball.	If you cannot see the first lateral supporting root, excavate the top of the soil in the container with your fingers or a small garden claw tool to identify the depth of the first lateral feeder root and to expose the root flare.
Broken branches	If the main leader is broken, or if more than 15% of the crown is broken, reject the stock. Otherwise, prune off broken branches and maintain a well-balanced appearance.

4.2.3 Planting Site Preparation

 Maximize soil volume: The following are recommended minimum soil volumes per tree:

Tree size	Minimum soil volume (m³)	Shared or irrigated soil volume (m³)
Small tree canopy spread is up to 6 m	8	6
Medium tree canopy spread is up to 10 m	20	15
Large tree canopy spread is greater than 10 m	35	30

- Retain soils in-situ when possible: Whenever possible, retain and protect the existing soil and soil structure unless it cannot support healthy tree growth or is infested with noxious weeds. Backfilling with the existing soil will prevent changes in soil texture that create interfaces that can disrupt water flow. The existing soil will also have structure and microbial activity that commercial soil mixes lack and avoids the cost of purchasing soil. Protect soil in-situ from construction impacts by:
 - o Fencing off planting areas or laying down materials like mulch or matting where machine access is needed during construction; and,
 - o If grading is required, stockpile the soil drawn from the O and A horizons (see inset below) on the development site and cover the soil to prevent wind and water erosion.
 - o If excavating a planting hole in the existing soil (i.e., not on a graded site), backfill the planting hole with the soil that was excavated in approximately the order it was removed to match the soil layers. Backfill soil mix in 150 mm lifts and tramp to prevent air pockets.
 - o If excavating a planting hole into a graded site, rip the subsoil if compacted or scarify the bottom of the hole and mix in some of the stockpiled soil so that it blends with the surrounding soil. Backfill the planting hole with the stockpiled soil.
 - Indigenous engagement participants highlighted the importance of topsoil protection and recommend its protection from sun during storage to avoid loss of nutrients.

Soil Horizons

The O horizon refers to the uppermost layer of soil which contains organic materials such as plant residues at various levels of decomposition. It is usually only a few centimeters in depth, but its high concentration of organic material stores nutrients and provides habitat for beneficial soil organisms which support the growth of trees. It also increases soil's water retention capacity and helps maintain optimal soil temperatures and aeration.

The A horizon refers to the layer of soil immediately below the O horizon (i.e. the topsoil). It is enriched in organic materials relative to the B horizon below it, giving it a darker color. Its greater depth supports healthy tree rooting and contributes to the storage of water and nutrients.

- **Rehabilitate soils when needed:** In compacted areas or locations where trees have repeatedly failed, rebuild soil profiles before planting¹. Minimize soil texture interfaces that disrupt water flow.
- **Reduce water loss and minimize competition:** Apply mulch to the root zone of trees to reduce water loss in the soil through evaporation.
- **Maximize permeable surfaces:** Maximize the area of permeable surface surrounding trees with larger tree pits or permeable paving solutions.
- Seek opportunities for passive water harvesting: Plant trees in areas that naturally receive runoff but are not waterlogged. Integrate absorbent landscapes such as bioswales, berms, raingardens, French drains, bioretention tree pits, permeable hardscapes, and infiltration trenches in street designs to redirect stormwater runoff.

4.2.4 Tree Planting and Maintenance for Newly Installed Trees

Tree planting considerations shall conform to the Plant Source and Hardiness Guidelines in Section 6.6 Plant Material, of the Engineering and Servicing Standards and the **Tree**Installation and Maintenance Policy. The considerations below are supplemental to the City standards.

- **Tree planting:** refer to Section 6.6 Plant Material, of the Engineering and Servicing Standards.
- **Spacing and setbacks:** refer to Section 6.6 Plant Material, of the Engineering and Servicing Standards.
- Service and Maintenance for Newly Installed Trees:
 - o Refer to the Tree Installation and Maintenance Policy for procedures related to:
 - Staking
 - Mulching
 - Watering
 - Fertilizing
 - Regular maintenance
 - Structural pruning
- **Minimize salt build-up:** Where road speed is 60 kph and de-icing salt is used, consider washing planting sites with freshwater in the spring.

5 10-YEAR PLANTING PLAN

This section builds on the previous ones to inform tree planting over the next 10 years. It connects the planting prioritization with data about the availability of planting sites to identify short-, medium-, and long-term planting locations along streets and in city parks. It recommends on tree species and a cost estimate to support tree planting and young tree establishment.

5.1 Planting Timeframes

To establish planting timeframes for streets, rights-of-way and parks, this section combines the planting priorities from section 3 with data that identifies potential tree planting opportunities.

5.1.1 Planting Opportunities

Planting opportunities are potentially vacant planting sites that were identified through geospatial analysis of streets, rights-of-way, and parks. The methodology used to identify opportunities varies for existing and future neighbourhoods.

5.1.1.1 Existing Neighbourhoods

In existing neighbourhoods, vacant planting sites were identified using land cover data to identify all permeable areas on City land. To be considered a potential planting site, we excluded pervious areas that were already covered by tree canopy, within storm ponds, sports fields, rinks, and toboggan hills, and within 2 metres of utility lines or on a city trail.

5.1.1.2 Future Neighbourhoods

In future neighbourhoods, planting sites were estimated based on assumptions consistent with those used to create the Urban Forest Plan's canopy cover target (section 6.3 of the plan). Planting opportunities for new street and park trees assumed 1 street tree for every new parcel and 75 trees per hectare on new parkland.

5.1.2 Timeframe

The planting plan map shows streets and rights-of-way and park areas shown for short-, medium- and long-term planting based on a combination of their priority (as presented in section 3) and the availability of planting opportunities. Figure 7 shows the proposed timeframe for tree planting along streets and rights-of-way and Figure 8 for parks. This planting plan is intended to guide tree planting for the next 10 years, with the long-term planting expected to extend beyond that time.



Figure 8. Proposed timing for tree planting on streets and rights-of-way

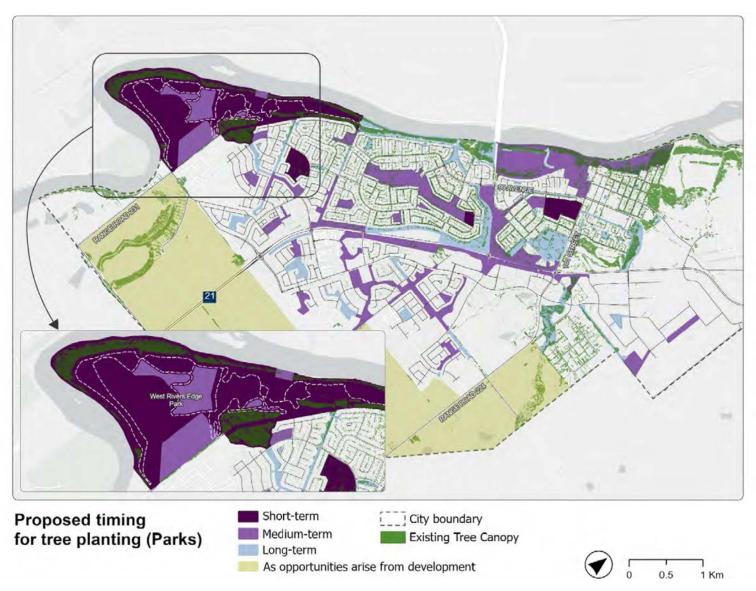


Figure 9. Proposed timing for tree planting in parks

The planting plan does not assign specific timeframes to short-, medium- and long-term planting because planting rates are expected to vary based on available funding. Nonetheless, in streets and rights-of-way, planting opportunities data was used to ensure at least ~300 trees could be planted annually based on estimated planting opportunities.

Parks generally have more planting opportunities due to fewer constraints. To avoid limiting planting to a few parks where planting opportunities would be maxed out over the short- and medium-term, we include a larger spectrum of parks in the medium-term timeframe where staff can distribute planting based on available funds.

5.2 Species Recommendations

A proposed species list is included in Schedule 2. The species selected are either suited to Fort Saskatchewan's current climate or trial species from Calgary and Minnesota, based on work carried out for the All One Sky Foundation². Drought and cold tolerance are the main limiting factors. Some of the trial species proposed are likely to be only somewhat suitable or marginal but might be supported with irrigation or suitable to future microclimate. The species list is intended to be updated over time to reflect staff's ongoing species trials.

5.3 Resourcing

Trees in future neighbourhoods will be planted by developers and are therefore not included in the cost estimates presented in this section. The rate of annual planting in streets, rights-of-way, and parks is expected to vary based on available budget, including grant funding sought out by the City to support tree planting.

When planting trees, the City incurs costs to purchase the trees from a nursery (supply), to plant them (installation), and to water them over 2 years to allow their establishment (maintenance). Costs for 2024 are provided in Table 1 (see schedule for descriptions of types of tree stock).

Table 1. Estimated 2024 cost of planting, including supply, installation, and	2-vear maintenance.
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Type of tree stock	Cost of supply, installation, and 2-year maintenance
Conifer seedlings	\$45
Ball and burlap conifer tree (2.5-3 m height)	\$825
Ball and burlap deciduous tree (60-70 mm caliper)	\$750

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² Diamond Head Consulting. (2019). Edmonton Metropolitan Region Guide to Urban Forest Management in a Changing Climate. Consultant Report prepared for All One Sky, Calgary, AB.

Table 2 provides an estimate for the probable annual planting budget based on the 2024 costs. The estimate is based on an average planting rate that aligns with the Urban Forest Plan's canopy cover target of ~300 trees planted annually.

Table 2. Probable annual costs based on an average annual planting rate for streets, rights-of-way, and parks.

Planting character	Recommended tree stock	Average number of trees for annual planting	Average annual cost (planting and maintenance)			
Streets and rights-of-way (all)	Deciduous trees (60- 70 mm caliper)	100	\$75,000			
Highway corridors	Conifer seedlings	50	\$2,250			
Parks	Conifer seedlings	100	\$4,500			
	Conifer (2.5-3 m height)	25	\$20,625			
	Deciduous (60-70 mm caliper)	25	\$18,750			
TOTAL		300	\$121,125			

Exact costs will be determined by the types of stocks the City plants and changes to current costs of purchasing and maintenance. The City will consider alternatives to the stock sizes recommended in the above tables such as container-grown trees or bare root trees to reduce costs and improve outcomes where appropriate (see Schedule 1 for descriptions of types of tree stock). As planting occurs, the City will continue to monitor tree mortality and replace trees as needed. Particular care will need to be given to adequately protect and maintain seedlings, which are known to have a higher mortality rate when not watered during establishment or protected from trampling, deer browsing, and mowing.

Finally, Fort Saskatchewan will be seeking funding to support tree planting from sources such as Government of Canada's 2 Billion Trees Program, the Green Municipal Fund – Growing Canada's Community Canopies, the Tree Canada Granting Programs, or Infrastructure Canada Programs (natural infrastructure fund) in accordance with Action 7A of the Urban Forest Plan.

Schedule 1 Types of Tree Stock

Seedlings are very young trees, easy to plant in large numbers, cheap, and easy to transport. Seedlings are most appropriate for natural planting or large-scale planting (e.g. replanting a forest). They are inappropriate for street tree planting, or planting in high traffic areas, as they are easily damaged.

Bare-root Trees are transplanted without soil on the roots. Bare-root trees, when removed from the soil for purchase, need to have their roots protected, as roots can dry out and damage the tree. Bare-root trees are light due to the absence of soil but may be more susceptible to root damage and need to be kept moist if not immediately planted. Bare root trees also need to be planted when the tree is dormant, which reduces the planting timing window.

Container Grown Trees and Shrubs are often grown in artificial soil, in a variety of different sizes. They are easier to handle and transport, but roots can girdle and be restricted by the container size. Also, winter conditions can damage container grown trees, if grown above ground, as they are less protected from cold temperatures although trees are more easily moved inside before planting if needed.

Ball and Burlap Trees are commonly larger trees, grown in the soil at the nursery and then removed with roots covered by burlap sack. The root ball protects the roots during transport, but Ball and Burlap trees are heavy and more difficult to transport. The larger size makes Ball and Burlap trees more resistant to damage and more appropriate for planting in high traffic areas.

Note: Tree cultivars (cultivated varieties) are trees selected and grown by humans for different features that do not display when found in their native growing condition. Tree Varieties are naturally growing trees within the same species, that display different features and are selected for growth by nurseries.

Schedule 2 Species Palette

Species			erance	;			Species	Charac	teristics	Placement	Climate Suitability
Botanical Name	Common Name	Salt 1	Shade ²	Drought²	Water- logging²	Branch breakage potential³	Size Class ⁴ (height)	Deciduous	Shade density in leaf³	Suitable as Street Tree	USDA lower hardiness zone³
Abies balsamea	Fir, Balsam	L	Н	L	L		L	No	Н	No	2
Acer tataricum*	Maple, Amur	L	М	М	L	М	S	Yes	М	Yes	3
Acer negundo	Maple, Manitoba	М	М	М	Tolerant	Н	М	Yes	Н	No	2
Acer saccharinum	Maple, Silver	L	Н	М	Tolerant	Н	L	Yes	М	Yes	3
Acer x freemanii	Maple, Red "Freeman"		М	М		Н	L	Yes	М	No	4
Aesculus glabra	Ohio Buckeye		М	М	L		М	Yes	Н	Yes	3
Alnus hirsuta	Alder, Manchurian		L	М	Tolerant		М	Yes	Н	No	3

¹ Data primarily from Wentz (2001), L = low, M = Medium, H = High

 $^{^2}$ Data primarily from Niinements and Valladares (2006) or UFEI Selectree https://selectree.calpoly.edu/L = low, M = Medium, H = High, Blanks = Unknown.

³ Data primarily from UFEI Selectree https://selectree.calpoly.edu/ L = low, M = Medium, H = High, Blanks = Unknown

 $^{^4}$ Tree height and recommended soil volume: S = Small (<8 m; 15–30 m3 soil per tree), M = Medium (8-12 m; 20–70 m3 soil per tree), H = High (>12 m; 45–150 m3 soil per tree)

^{*}Invasive potential – capable of self-seeding therefore avoid planting in locations where seeds can disperse and germinate into natural areas.

Species		Tole	erance	;			Species	: Charac	teristics	Placement	Climate Suitability
Botanical Name	Common Name	Salt ¹	Shade ²	$Drought^2$	Water- logging²	Branch breakage potential ³	Size Class ⁴ (height)	Deciduous	Shade density in leaf ³	Suitable as Street Tree	USDA lower hardiness zone³
Alnus incana	Alder, speckled	L	L	L	Tolerant		М	Yes	Н	No	2
Amelanchier alnifolia	Saskatoon, Tree Form		М	М	L		S	Yes	М	No	4
Betula nigra	Birch, River	L	L	L	Tolerant	М	М	Yes	М	No	4
Betula papyrifera*	Birch, Paper	L	L	L	L	Н	L	Yes	М	No	3
Betula pendula*	Birch, Weeping	L	L	L	L	М	L	Yes	L	No	2
Celtis occidentalis* 'Prairie Sentinel'	Hackberry		М	Н	Tolerant	М	М	Yes	Н	No	3
Crataegus crus-galli var inermis	Hawthorn, Thornless	М	L	Н			М	Yes	М	Yes	4
Crataegus x mordenensis	Hawthorn, Morden	М	М	Н		L	М	Yes	М	Yes	4
Eleagnus angustifolia	Russian Olive	Н		Н			S	Yes	Н	Yes	2
Fraxinus americana	Ash, White	L	L	L	Tolerant	М	М	Yes	М	Yes	4
Fraxinus mandshurica	Ash, Manchurian		М	L	Tolerant		М	Yes	Н	Yes	2
Fraxinus pennsylvanica*	Ash, Green	М	М	Н	Tolerant	Н	L	Yes	Н	Yes	2
Gleditsia triacanthos	Honeylocust		L	Н	Tolerant	М	М	Yes	L	No	3

Species		Tole	erance	9			Species	Charac	teristics	Placement	Climate Suitability
Botanical Name	Common Name	Salt 1	Shade ²	Drought²	Water- logging²	Branch breakage potential³	Size Class ⁴ (height)	Deciduous	Shade density in leaf³	Suitable as Street Tree	USDA lower hardiness zone³
Juglans cinerea	Butternut		L	L	L	L	М	Yes	М	No	2
Juniperus occidentalis	Juniper, Western		L	Н	L		М	No	Н	No	4
Juniperus sabina	Juniper, Arcadia		L	Н	L		S	No	Н	No	3
Juniperus scopulorum	Juniper, Rocky Mountain		L	Н	L		М	No	Н	No	4
Larix laricina	Larch, American		L	L	Tolerant		L	Yes	М	No	2
Larix occidentalis	Larch, Western		L	L	L		L	Yes	М	No	2
Larix sibirica	Larch, Siberian		L	L	L		L	Yes	М	No	2
Maackia amurensis	Maackia, Amur		L	Н		М	S	Yes	Н	Yes	3
Malus baccata*	Crabapple, Siberian	М	М	М			М	Yes	Н	Yes	3
Phellodendron amurense*	Cork Tree, Amur	М	L	Н	L	М	М	Yes	Н	Yes	3
Picea abies*	Spruce, Norway	L	Н	L	L	М	L	No	Н	No	2
Picea glauca	Spruce, White	М	Н	М	L	М	L	No	Н	No	3
Picea mariana	Spruce, Black		Н	L	L		М	No	Н	No	3
Picea pungens	Spruce, Blue/Colorado	L	Н	М	L	М	L	No	Н	No	3
Pinus albicaulis	Pine, Whitebark		Н		L		М	No	М	No	4

Species			erance	•			Species	Charact	teristics	Placement	Climate Suitability
Botanical Name	Common Name	Salt ¹	Shade ²	$Drought^2$	Water- logging²	Branch breakage potential³	Size Class ⁴ (height)	Deciduous	Shade density in leaf ³	Suitable as Street Tree	USDA lower hardiness zone³
Pinus aristata	Pine, Bristlecone	•	L	Н	L	•	S	No	М	No	4
Pinus banksiana	Pine, Jack		L	Н	L	М	М	No	Н	No	2
Pinus cembra	Pine, Swiss Stone		М	М	L		М	No	Н	No	4
Pinus contorta latifolia	Pine, Lodgepole		L	Н	Tolerant		L	No	М	No	3
Pinus flexilis	Pine, Limber		L	Н	L	М	L	No	М	No	4
Pinus monticola	Pine, Western White		М	L	L	М	L	No	М	No	4
Pinus mugo	Pine, Mugo	М	L	Н	L		S	No	Н	No	2
Pinus nigra	Pine, Austrian		L	Н	L	М	L	No	Н	No	4
Pinus ponderosa	Pine, Ponderosa	М	L	Н	L	L	L	No	Н	No	3
Pinus strobiformis	Pine, Eastern White	L	М	L	L	Н	L	No	М	No	3
Pinus strobus*	Pine, Eastern White	L	М	L	L	Н	L	No	М	No	3
Pinus sylvestris*	Pine, Scots		L	Н	Tolerant	М	L	No	Н	No	2
Pinus uncinata	Pine, Mountain		L	Н	L		L	No	М	No	2
Populus alba*	Poplar, Silver		L	М	L	Н	L	Yes	М	No	3
Populus balsamifera	Poplar, Balsam	М	L	L	Tolerant	Н	L	Yes	М	No	2

Species		Tole	erance	•			Species	Charac	teristics	Placement	Climate Suitability
Botanical Name	Common Name	Salt 1	Shade ²	Drought²	Water- logging²	Branch breakage potential³	Size Class ⁴ (height)	Deciduous	Shade density in leaf ³	Suitable as Street Tree	USDA lower hardiness zone³
Populus deltoides	Poplar, Cottonwood	L	L	L	Tolerant		L	Yes	Н	No	3
Populus tremuloides	Aspen, Trembling	М	L	L	L	Н	М	Yes	М	No	1
Populus x canescens	Poplar, Grey	М	М	L			L	Yes	М	Yes	2
Populus x jackii	Poplar, Northwest	М					L	Yes	M	Yes	
Prunus cerasifera*	Plum, Cherry		L	М	L	М	S	Yes	Н	No	4
Prunus cerasus*	Cherry, Sour		М	М	L		М	Yes	М	No	4
Prunus maackii	Cherry, Amur		L	L	L		S	Yes	М	No	3
Prunus mahaleb	Cherry, Mahaleb		L	Н	L		S	Yes	L	No	4
Prunus padus commutata	Plum, Mayday	М	М	L			S	Yes	М	Yes	3
Prunus salicina x	Plum, hybrid		L	М			S	Yes	М	No	3
Prunus virginiana*	Chokecherry	L	М	М	L	М	S	Yes	М	Yes	3
Pseudotsuga menziesii	Douglas-fir	L	М	М	L	L	L	No	М	No	3
Pyrus ussuriensis	Pear, Ussurian		L	М	L		М	Yes	М	No	3
Quercus macrocarpa	Oak, Bur	М	М	Н	L	L	L	Yes	Н	Yes	3

Species			erance	•			Species	: Charac	teristics	Placement	Climate Suitability
Botanical Name	Common Name	Salt 1	Shade ²	Drought ²	Water- logging²	Branch breakage potential³	Size Class ⁴ (height)	Deciduous	Shade density in leaf³	Suitable as Street Tree	USDA lower hardiness zone³
Quercus mongolica	Oak, Mongolian			Н			М	Yes	Н	Yes	3
Salix alba	Willow, Golden		L	L	Tolerant		L	Yes	Н	No	2
Salix babylonica	Willow, Weeping		L	L	Tolerant	Н	L	Yes	Н	No	
Salix pentandra	Willow, Laurel Leaf	М	L	L	Tolerant		L	Yes	Н	Yes	3
Sorbus americana	Mountain Ash, American	М	М	L	L		М	Yes	Н	Yes	3
Sorbus aria	Beam, White		М	Н	L		М	Yes	Н	No	4
Sorbus aucuparia*	Mountain Ash, European		М	L	L	М	М	Yes	Н	No	4
Sorbus decora	Mountain Ash, Showy			М			М	Yes	Н	Yes	2
Sorbus x hybrida	Mountain Ash, Oakleaf			М			S	Yes	Н	Yes	
Syringa pekinesis	Lilac, Peking	М		М			S	Yes	М	Yes	4
Syringa reticulata	Lilac, Japanese Tree	М	L	L	L	М	S	Yes	М	Yes	3
Tilia americana	Linden, American	L	Н	М	L	М	L	Yes	Н	Yes	3
Tilia cordata	Linden, Littleleaf	L	Н	М	L	М	М	Yes	Н	No	4

Species		Tolerance					Species Characteristics			Placement	Climate Suitability
Botanical Name	Common Name	Salt 1	Shade ²	$Drought^2$	Water- logging²	Branch breakage potential³	Size Class ⁴ (height)	Deciduous	Shade density in leaf ³	Suitable as Street Tree	USDA lower hardiness zone³
Tilia x flavescens	Linden, Dropmore			М			М	Yes	Н	Yes	
Ulmus americana*	Elm, American	М	М	М	L	Н	L	Yes	Н	Yes	2
Ulmus pumila*	Elm, Siberian	М	М	М	L	Н	L	Yes	М	Yes	3