Urban Forest Management Strategy

Langley City
THE PLACE TO BE

Land Acknowledgement

The City of Langley as we know it today is located on the unceded traditional territories of the q̓ʷɑ:n̓ƛ̓ən̓ (Kwantlen), Máthxwi (Matsqui), q̓icə̓y̓ (Katzie) and e'mya'me (Semiahmoo) First Nations.

Project Acknowledgement

Diamond Head Consulting Ltd. (DHC) has prepared this Strategy for the City of Langley. DHC acknowledges the support and participation of City of Langley departments and staff in preparation of the document.

DIAMOND HEAD

Glossary

Biodiversity Biodiversity is a term used to describe the variety and variability of life on Earth. Biodiversity encompasses all living species and their relationships to each other. This includes the differences in genes, species, and ecosystems.

Canopy cover A measure of the extent of the urban forest based on the amount of ground covered by the foliage of trees when viewed from above.

Ecosystem services The benefits to humans provided by the natural environment and healthy ecosystems. Carbon sequestration, recreation, shade, water filtration, and pollination are all examples of ecosystem services associated with the urban forest.

Green infrastructure Natural and semi-natural areas with environmental and engineered features designed and managed to enhance nature's ability to deliver a wide range of ecosystem services[1].

Impervious surface A surface that does not permit the infiltration of water or air needed by tree roots. Asphalt and concrete are common impervious surfaces.

Invasive species A species that is not native or is outside of its natural range and is negatively impacting the environment.

LiDAR Acronym for 'light detection and ranging'. An active remote sensing technology that can measure vegetation height and elevation using laser scanning.

Natural asset Natural assets are the stock of natural resources or ecosystems that are relied upon, managed, or could be managed by a local government for the provision of one or more services to a community[2].

Tree equity When all people can access the benefits of the urban forest in proportion to their needs.

Urban forest program A set of activities performed by City staff and community partners to plan, manage, enhance, protect, and steward the urban forest, as well as all related policies, equipment, resources and knowledge used to work towards Langley City's urban forest vision.

Executive Summary

The City of Langley is home to a diverse urban forest anchored by the Nicomekl River corridor at its centre, and growing outwards through a network of natural areas, streets, parks, and private properties. This urban forest offers significant benefits to the community, including high levels of biodiversity, recreational opportunities, improved air quality, stormwater management, and enhanced neighbourhood aesthetics.

Langley City's Official Community Plan sets a goal to "expand and strengthen the existing tree canopy." In meeting this goal, the urban forest faces growing challenges from climate change and densification to accommodate a growing population. At the same time, redevelopment presents opportunities to increase canopy cover in under-served areas north of the Nicomekl River.

To respond to growing challenges and emerging opportunities, the City of Langley has developed an Urban Forest Management Strategy that establishes a long-term vision and guidance for urban forest growth and management in the decades to come.

In 2021, Langley City's tree canopy cover was estimated to be 17%. This Strategy provides a 30-year vision and supporting goals, strategies and actions to achieve a baseline canopy cover target of 20% by 2046 and an aspiration target of 31% by 2050. Implementing this Strategy will enhance the management of public tree assets to maximize tree benefits and minimize risks, and expand opportunities to protect and grow tree canopy on public and private land in partnership with the community.

VISION

Langley City's urban forest features a wealth of mature trees and a diversity of native and climate-adapted species that foster a healthy, connected community and ecosystems, delivering benefits to all residents.

GOALS

Protect and enhance trees, forests, and soils to grow a healthy, diverse, and resilient urban forest

Manage the urban forest more proactively to improve its health and resiliency

Support community **partnerships** for the stewardship of Langley City's urban forest

Monitor progress and adapt to changing conditions

A total of 33 actions are proposed to be implemented over the next 15 years, including some actions that will have the biggest impacts on the City's urban forest as well as some 'quick start' actions that allow quick initiation of the implementation:

MOST IMPACTFUL ACTIONS

UPDATING POLICIES AND REGULATIONS

To increase tree protection and ensure replacement and growth of the urban forest, the City will consider adopting a tree bylaw (action 1) and updating development requirements through the Zoning Bylaw or Form and Character Development Permit Areas (action 2) and the Subdivision and Development Servicing (action 3).

MOVING TO A MORE PROACTIVE MANAGEMENT PROGRAM

Transitioning to more proactive management of City tree assets to improve tree health and longevity, including exploring having an inventory of urban trees (actions 14-15), adjusting staffing and budget as the inventory grows (action 20), as well as considering defining service levels (actions 17-18).

PLANTING MORE TREES

Exploring opportunities to plant more trees across the City, with a focus on under-served areas (action 8), and support for voluntary planting on private land (action 13).

'QUICK START' ACTIONS

- Consider integrating the canopy cover target and supporting requirements into the OCP, Local Areas Plans, in landscaping requirements in the Zoning Bylaw, Design Criteria Manual, or Form and Character Development Permit Areas, and other strategic policies and initiatives to achieve consistent tree protection and planting and adequate soil volume.

- Consider updating the Subdivision and Development Servicing Bylaw to strengthen tree protection and maintenance and improve tree planting quality.

- Clarify responsibilities and workflows to improve inspection and tracking of developer-planted street trees from soil installation to the end of the maintenance period.

- Update the recommended tree species list in the Design Criteria Manual and other relevant policies with species information that accounts for future climate suitability to guide tree planting on public and private land and continue to require a diversity of species to reduce vulnerabilities.

- Consider a City tree policy to define the risk management program and the requirements to apply to City operations when removing or working around City trees to meet or exceed private land requirements defined in the tree bylaw.

- Consider urban forest stewardship programs on City land, for example by encouraging residents to water newly planted trees, and developing online educational resources for developers and property owners on topics such as tree benefits, tree protection, tree care, and tree permit requirements.

More detailed actions can be found in the The Implementation Plan in the appendix.

Contents

1

Introduction

The City of Langley's diverse urban forest is composed of forested ecosystems and urban trees growing along streets, parks, and on private properties. The urban forest beautifies the city, improves community well-being, and provides essential habitat for wildlife. However, the escalating impacts of climate change—including droughts, storms, and the prevalence of invasive species, pests and diseases — are impacting urban forest health. Additionally, urban densification makes it more challenging to retain and replant trees.

This is the City of Langley's first Urban Forest Management Strategy and it responds to current challenges and opportunities by establishing a vision to guide city-wide urban forest growth and management to 2050. Implementing the Urban Forest Management Strategy will ensure Langley has a healthy, diverse, and resilient urban forest in the next 30 years. The Urban Forest Management Strategy includes the following sections:

1. **Introduction**: Introduces the Urban Forest Management Strategy;

2. **Current State of Langley City's Urban Forest**: Describes the urban forest and its key components, a historical timeline of the urban forest, its current condition, and the key opportunities and challenges that the City faces to achieve its urban forest vision and goals;

3. **Community Values and Priorities**: Summarizes the feedback from the community through the public engagement process.

4. **Langley City's Urban Forest Management Strategy**: outlines the vision for the urban forest, and supported goals, strategies, and actions to achieve the vision over a 30-year timeframe.

5. **Conclusion and Recommendations**: Concludes the Strategy with recommendations on the implementation and monitoring of the Strategy.
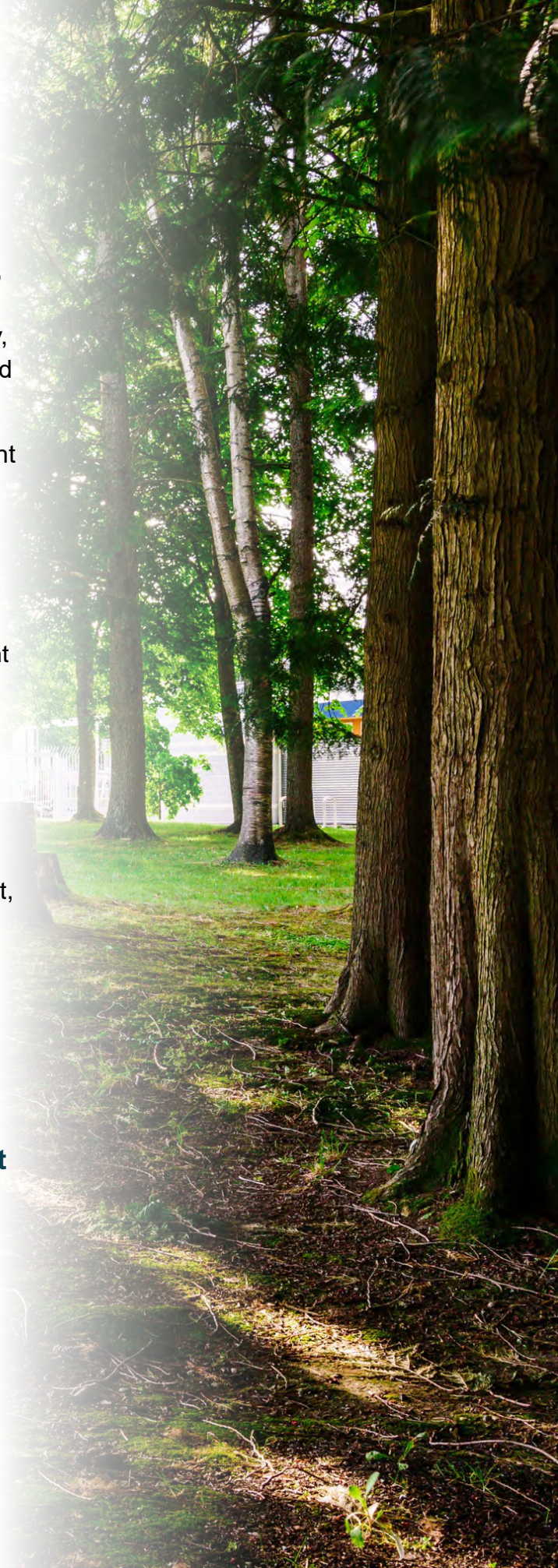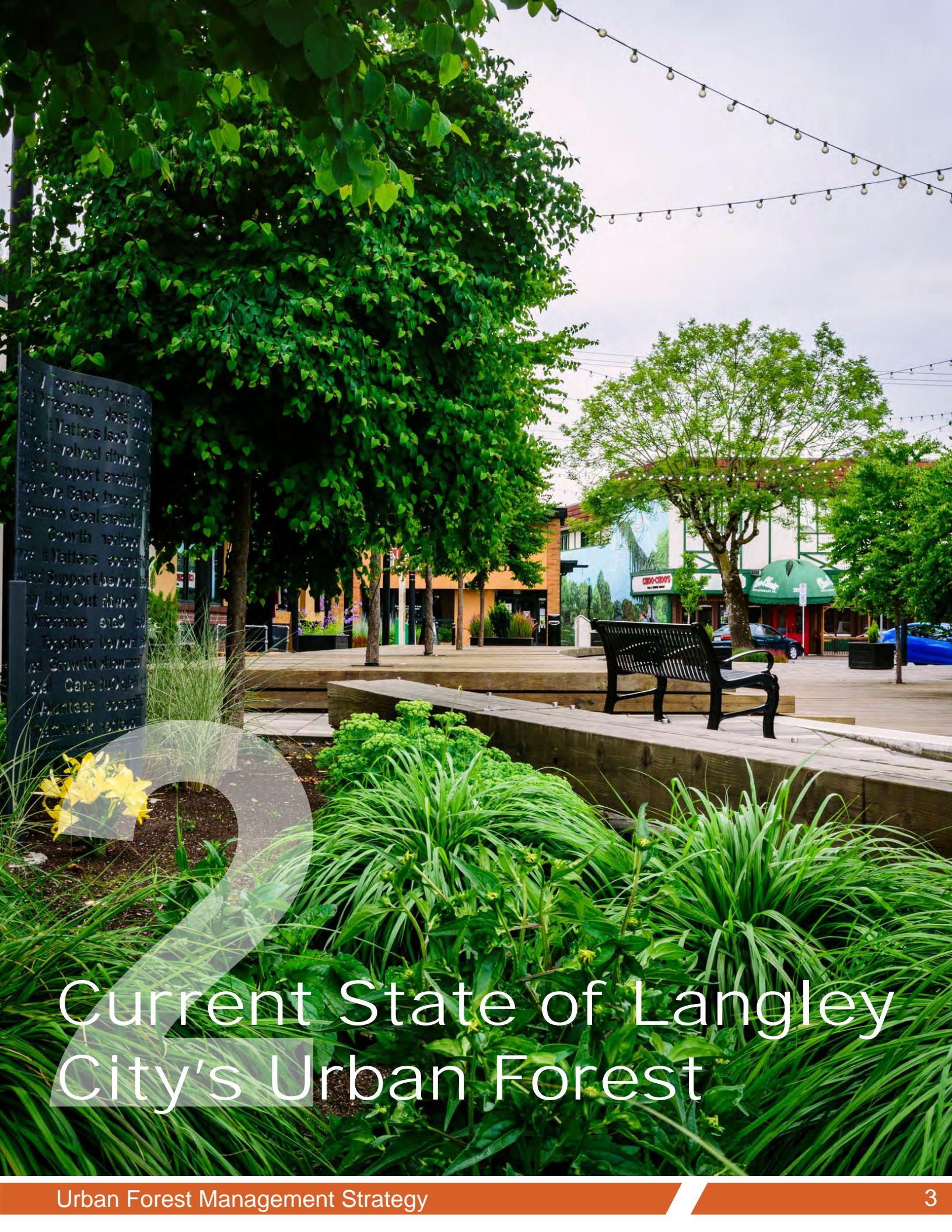
2 Current State of Langley City's Urban Forest

What is the Urban Forest?

Langley City's urban forest includes all trees and native forests in natural areas, parks, schools, streets, and private yards across the city (Figure 2). The City's urban forest contains diverse species of trees and understory vegetation and grows across public and private land, meaning that both the City and community members are responsible for its management. In fact, two-thirds of Langley City's estimated 49,000 trees grow on private lands.

Trees, much like other types of city assets, require regular maintenance to maximize the benefits they provide the community and ensure a long service life. Strategic care can prolong a tree's life, enhancing its ecological, social, and economic contributions. The City manages trees along road rights-of-way and in city parks, while private property owners care for those on private land. Management approaches differ based on where trees grow. Trees in natural areas are typically managed as stands, focusing on forest health (e.g., managing invasive species) and minimizing risks at forest edges and along trails. In contrast, urban trees, often planted individually, require more intensive care like pruning and watering due to their proximity to buildings and people. This approach ensures tailored management to diverse urban forest environments. More details on the management of Langley City's urban forest are provided in Appendix 1.

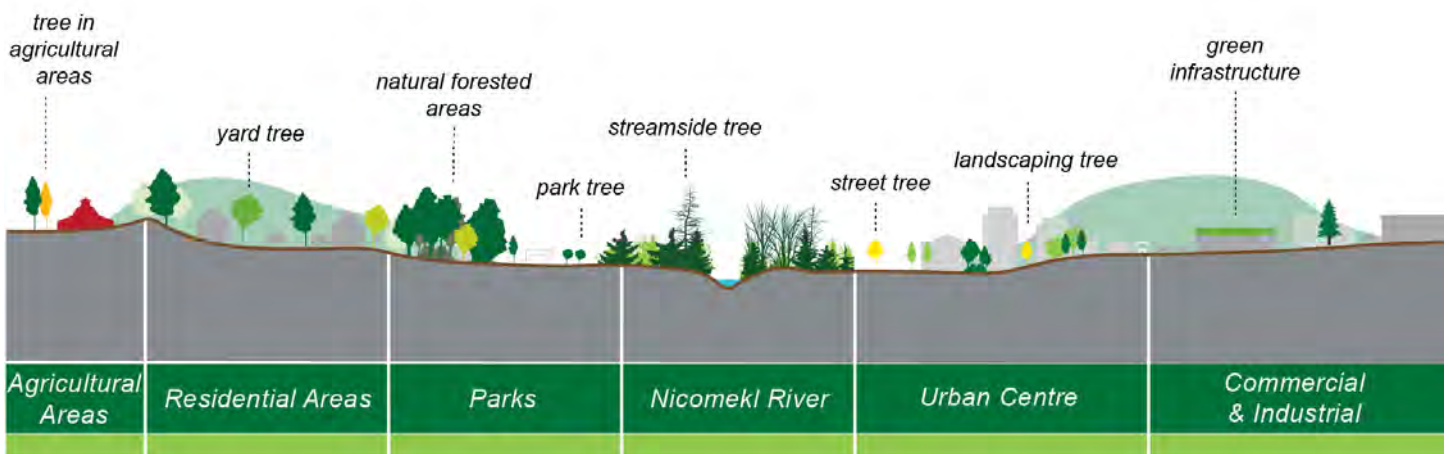> **Urban forests include all trees and their associated ecosystems.**

Figure 2 Langley City's urban forest

Why is the Urban Forest Important?

The urban forest, sometimes described as a 'natural asset', is a key contributor to a healthy and sustainable community. The urban forest supports urban cooling, stormwater management, biodiversity and wildlife habitat, slope stability and flood mitigation. These processes, and the broader array of community benefits that urban forests provide, are often called 'ecosystem services[3].'

In the City of Langley, the urban forest plays a vital role in maintaining a comfortable environment for urban residents and wildlife. Trees cool their surroundings by blocking sunlight and releasing water vapour, reducing the need for energy-intensive air conditioning in the summer[4]. Trees and soil play a key role in stormwater management, capturing and filtering contaminants. Reducing stormwater runoff is especially important during heavy rainfalls that can lead to flooding[5].

The City's forested areas support various plant and animal species, contributing to local biodiversity[6] and forming green corridors for wildlife movement, promoting genetic diversity and ecosystem resilience. Trees provide habitat, enhancing ecological diversity and offering food and shelter to many species of native flora and fauna that are essential for ecological balance, nutrient cycling, and pollination.

The urban forest also contributes significantly to social well-being and community resilience. It offers communal spaces for interaction, recreation, and relaxation. These green spaces enhance physical and mental health, beautify the city, attract visitors, and potentially boost commercial activity[7,8].
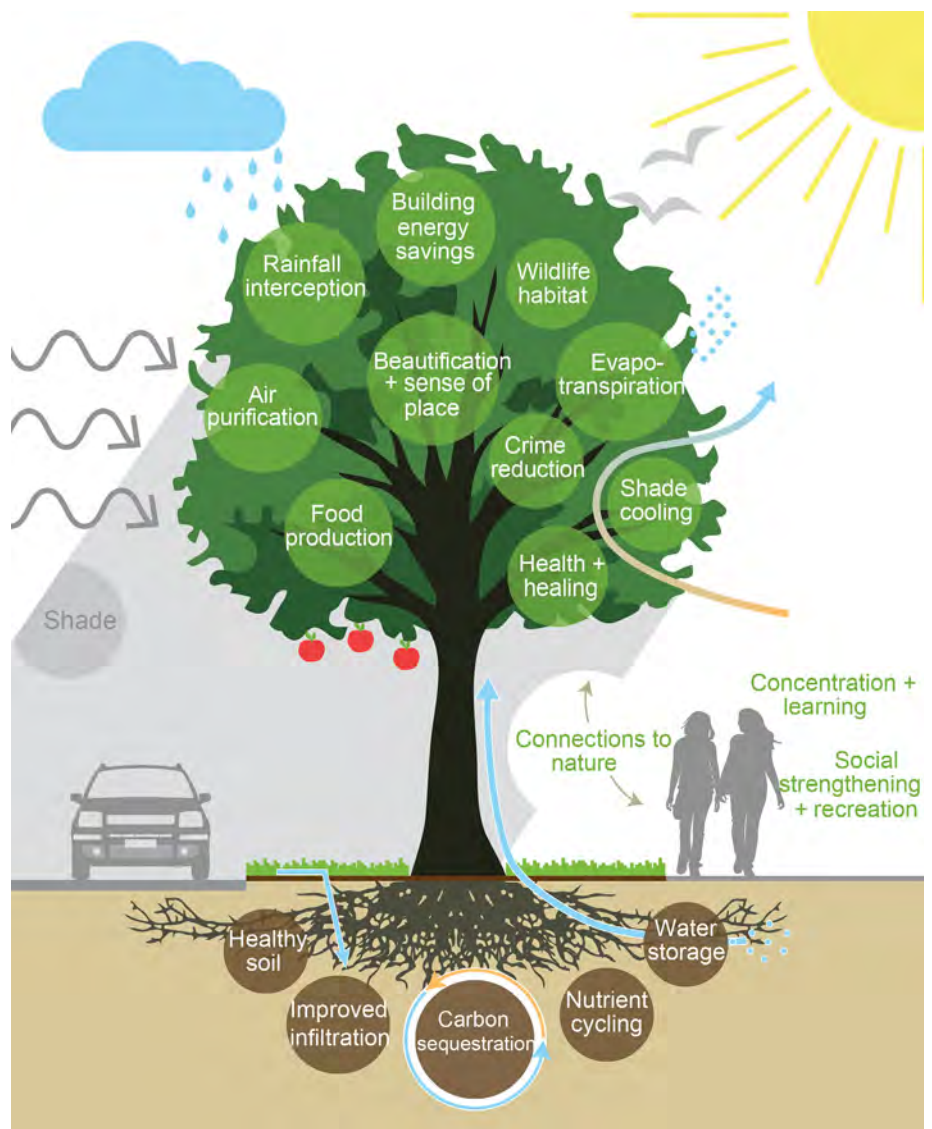

Figure 3 Illustration of urban forest benefits

Valuing Ecosystem Services

Software developed by the US Department of Agriculture's Forest Service allows us to quantify the value of a few of Langley's City's urban forest benefits. In 2021, the City's urban forest provided an estimated $3.7 million worth of benefits and services in carbon storage and sequestration, stormwater management, and pollutant removals (Table 1). The entire urban forest acts as a substantial carbon sink, storing over 13,000 tonnes of carbon or over 49,000 tonnes of carbon dioxide equivalent, an estimated value of $3.2 million. Each year, the urban forest sequesters 450 tonnes of carbon from the atmosphere (estimated at $107,300), intercepts or absorbs over 48 million litres of runoff (estimated at $147,600), and removes over 15 million grams of air pollutants (estimated at $227,000).

Did you know that Langley City's urban forest:

- Offsets emissions from 360 average passenger vehicles in a year
- Can prevent runoff equivalent to water that fills 19 Olympic swimming pools per year

Table 1 Results of i-Tree Canopy assessment

Ecosystem Service	Service Estimates	Dollar Value ($)
CARBON		
Carbon stored in trees (t)	13,399	$3,196,300
CO2 equiv. rate (t) stored in trees	49,129	$3,193,400
Carbon sequestered in trees (t/year)	450	$107,300
CO2 equiv. rate (t/year) sequestered annually in trees	1,649	$107,200
STORMWATER		
Avoided runoff annually (L/year)	48,563,059	$147,600
POLLUTION		
Removed air pollutants (g/ha/year)	**15,364,150**	**$227,000**
CO removed annually (g/year)	135,997	$300
NO2 removed annually (g/year)	1,372,173	$500
O3 removed annually (g/year)	9,711,566	$37,100
PM10 (g/year)	2,868,137	$25,500
PM2.5 (g/yr)	749,726	$163,500
SO2 removed annually (g/year)	526,552	$100
Total Annual Service Value		**$481,900**
Total Service Value		**$3,678,200**

A Brief History of the Urban Forest

The lands now known as the City of Langley have been inhabited and cared for by the Stó:lo First Nations, particularly q̓ʷɑ:n̓ƛ̓ən̓ (Kwantlen), since time immemorial. Prior to European settlement, the Langley's lowland floodplains and adjacent uplands hosted natural habitats including rivers, ponds, swamps, marshes, and forests. The arrival of settlers in the early 1800s profoundly changed the natural landscape as forests were cleared for agricultural and, eventually, urban land uses as the City became the downtown core for the surrounding area. Agriculture boomed in the fertile valley soils and native forests dominated by Douglas fir, western redcedar, western hemlock, and Sitka spruce were logged extensively. Although some natural areas remain, most of the forest ecosystems within the municipality are altered and fragmented compared to their historic state. However, the City still retains a variety of natural habitats, mostly concentrated around the Nickomekl River and its tributaries, in addition to parks, gardens, and other open space.

Today, the City of Langley is also home to a diverse mix of planted urban trees growing along streets, in parks, and on private lands. Many of these urban trees were planted relatively recently and will grow the City's urban tree canopy over the coming decades. In 1999, the City took a significant step in managing its urban forest by initiating a street tree program to preserve and enhance the street trees in the City. A preliminary tree inventory was carried out in the summer of 1999, marking one of the first efforts by the City to compile information for urban forest management. While the street tree inventory is no longer current, the implementation of this Urban Forest Management Strategy will result a renewed focus on both urban trees and trees growing in remnant forest ecosystems.

Figure 4   Aerial view looking north towards Langley City in 1973 (source: Langley Centennial Museum)

Urban Forest Management

Langley City's urban forest is managed by a dedicated team that cares for City-owned trees and is guided by a set of policies and regulations that inform the City's approach to tree protection and management.

Urban Forest Management Program

In the City of Langley, the Engineering and Parks Operations Department takes the lead in protecting and managing the urban forest. Out of the estimated 49,000 trees in the City, about one-third (estimated 16,500 trees) are found on public properties and mainly managed by the City. City-owned tree assets include about 6,000 street trees, 2,400 park trees, and 8,100 trees on other City properties. New trees are added to the City's asset portfolio in new parkland or on the street frontage of new developments after they are planted and maintained by developers.

The primary responsibilities of the Engineering and Parks Operations Department include tree planting, replacement, pruning, watering, and removal on City-owned properties, such as parks and roads. The dedicated team includes the Parks Manager, Parks Superintendent, a Head Arborist and an arborist crew. Additional staff support the core team during storm removals, fall pruning or planting practices. Temporary staff are sometimes hired to supplement these efforts when necessary. In recent years, the urban forestry team has been increasingly involved in the development permit review process to ensure appropriate site design considerations for tree retention and replacement. The City allocates an annual operational budget of $112,700 for tree pruning, $80,760 for hazardous tree removal, and $105,340 for planting. To sustain its urban forest, the City often allocates a capital budget for tree replacement, which was set at $40,000 in 2023.

Young trees are managed more actively, with staff doing structural pruning annually for the two to three years after planting. Young tree watering has been extended from two to eight years after planting to allow the trees to establish in the region's increasingly warm, dry climate. Maintenance of established trees is primarily reactive, meaning that staff visit the trees for pruning or risk inspections when they receive a request for service or by visiting areas where they have noticed issues. Between 2016 and 2023, the City received an average of 186 tree-related work orders per year. Although the numbers varied by year, over 80% of the work orders were about tree pruning and tree removals, with the remainder related to issues like pests and insects or requests for tree watering.

Policies and Regulations

Urban forest management in Langley City is guided by a set of plans, policies, and bylaws (Figure 5). These documents guide how trees, forests, and lands in the City are managed and protected. Langley City can make regulations about trees due to **enabling legislation** from the Province. **Guiding policies and plans** focus on the vision and big ideas for the City's trees and natural areas. **Bylaws, policies, and guidelines** help put these big ideas into action. **Other plans and policies** associated with themes such as climate change and transportation also influence the outcomes of urban forest management in Langley City.
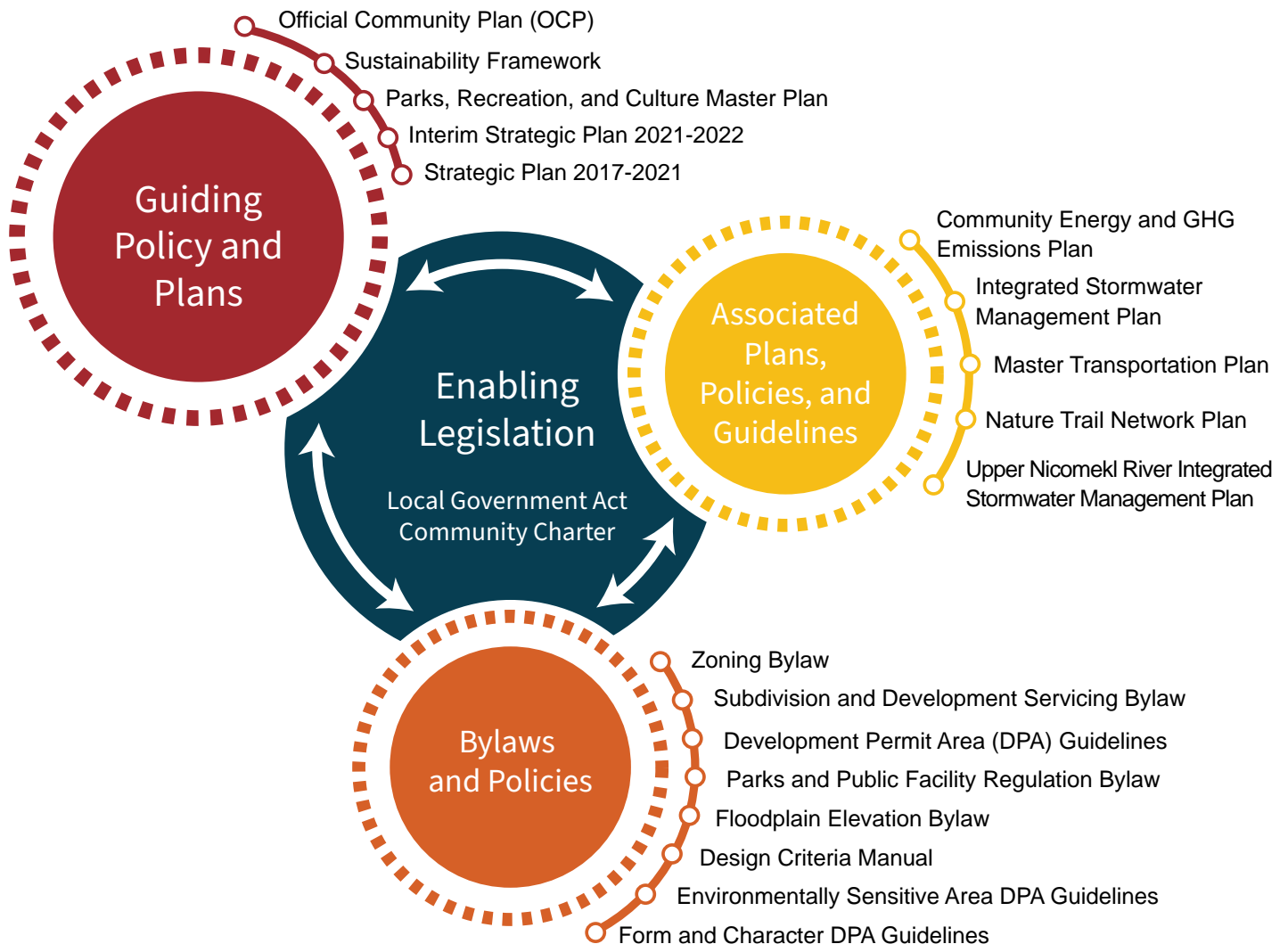
Guiding Policy and Plans
- Official Community Plan (OCP)
- Sustainability Framework
- Parks, Recreation, and Culture Master Plan
- Interim Strategic Plan 2021-2022
- Strategic Plan 2017-2021

Enabling Legislation
Local Government Act
Community Charter

Associated Plans, Policies, and Guidelines
- Community Energy and GHG Emissions Plan
- Integrated Stormwater Management Plan
- Master Transportation Plan
- Nature Trail Network Plan
- Upper Nicomekl River Integrated Stormwater Management Plan

Bylaws and Policies
- Zoning Bylaw
- Subdivision and Development Servicing Bylaw
- Development Permit Area (DPA) Guidelines
- Parks and Public Facility Regulation Bylaw
- Floodplain Elevation Bylaw
- Design Criteria Manual
- Environmentally Sensitive Area DPA Guidelines
- Form and Character DPA Guidelines

Figure 5 Langley City plans, policies, and bylaws of importance for the urban forest

The Subdivision and Development Servicing Bylaw and Design Criteria Manual sets requirements to tree planting on streets adjacent to developing properties, while the Development Permit Areas guide the protection of Environmentally Sensitive Areas (ESAs) and tree planting during development on private land. Appendix 2 provides a more detailed overview of policies and regulations that guide urban forest management in the City of Langley.
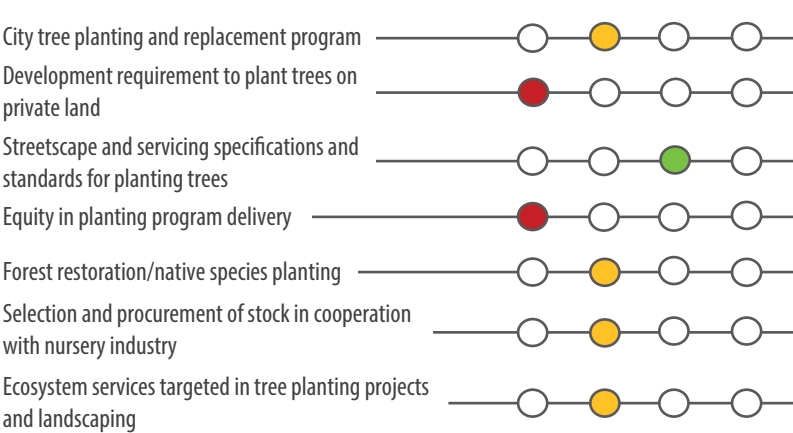
Report card

The report card provides a comprehensive assessment of the City's urban forest program against industry best practices to identify areas where the City is performing well and where the Urban Forest Management Strategy should guide efforts for further improvement. Langley City ranks 'fair' for its complete program. The report card below summarizes the assessment of each indicator in Langley City's current program against an optimal outcome.
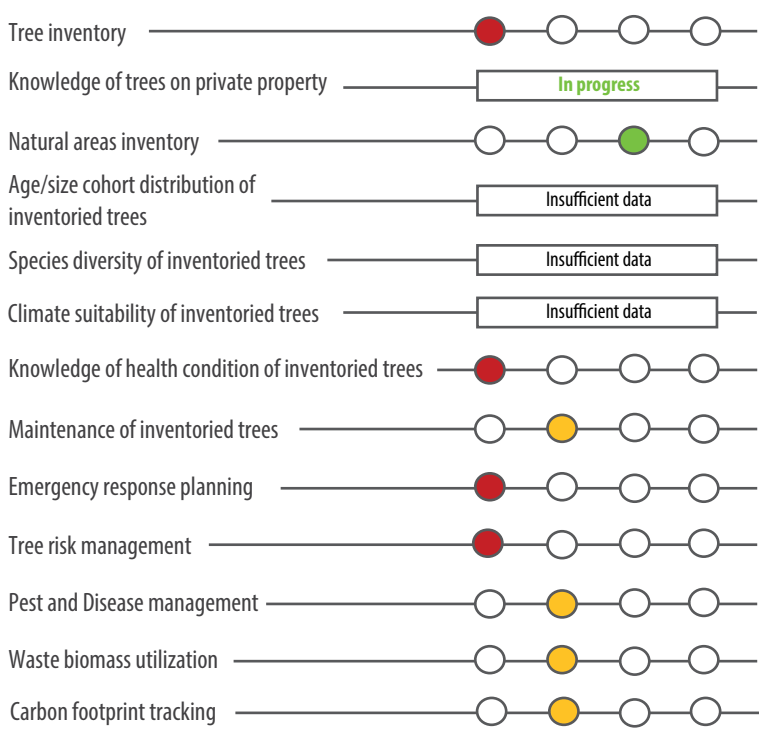
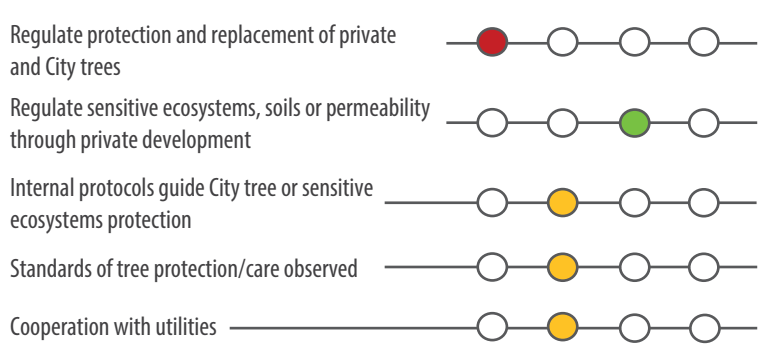**2023 URBAN FOREST REPORT CARD**

(Gauge: POOR — FAIR — GOOD — OPTIMAL; pointer at FAIR)

MANAGE

Indicator	Poor	Fair	Good	Optimal
Tree inventory	●			
Knowledge of trees on private property	In progress			
Natural areas inventory			●	
Age/size cohort distribution of inventoried trees	Insufficient data			
Species diversity of inventoried trees	Insufficient data			
Climate suitability of inventoried trees	Insufficient data			
Knowledge of health condition of inventoried trees	●			
Maintenance of inventoried trees		●		
Emergency response planning	●			
Tree risk management	●			
Pest and Disease management		●		
Waste biomass utilization		●		
Carbon footprint tracking		●		

PLAN AND ADAPT

Indicator	Poor	Fair	Good	Optimal
Awareness of the urban forest		●		
Interdepartmental and municipal agency cooperation			●	
Clear and defensible urban forest assessment and goals	In progress			
Relative tree canopy cover	Insufficient data			
Municipality-wide management plan	In progress			
Municipal infrastructure asset management		●		
Municipal-wide biodiversity or green network strategy			●	
Municipal urban forestry program capacity		●		
Funding to implement a strategy		●		

PROTECT

Indicator	Poor	Fair	Good	Optimal
Regulate protection and replacement of private and City trees	●			
Regulate sensitive ecosystems, soils or permeability through private development			●	
Internal protocols guide City tree or sensitive ecosystems protection		●		
Standards of tree protection/care observed		●		
Cooperation with utilities		●		

PLANT

Indicator	Poor	Fair	Good	Optimal
City tree planting and replacement program		●		
Development requirement to plant trees on private land	●			
Streetscape and servicing specifications and standards for planting trees			●	
Equity in planting program delivery	●			
Forest restoration/native species planting		●		
Selection and procurement of stock in cooperation with nursery industry		●		
Ecosystem services targeted in tree planting projects and landscaping		●		

PARTNER

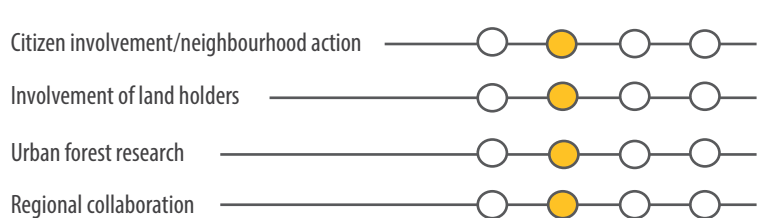| Indicator	Poor	Fair	Good	Optimal
Citizen involvement/neighbourhood action		●		
Involvement of land holders		●		
Urban forest research		●		
Regional collaboration		●		

Tree Canopy Cover

The following section provides a snapshot of Langley City's urban forest today using canopy cover as the main metric. Canopy cover measures the land area covered by tree branches and leaves when viewed from above (Figure 6). It is one of the most common metrics in urban forestry to assess and track the extent of the urban forest over time. Langley City's canopy cover was estimated using a combination of aerial imagery and remotely sensed Light Detection and Ranging (LiDAR) data collected in 2016 and 2021.
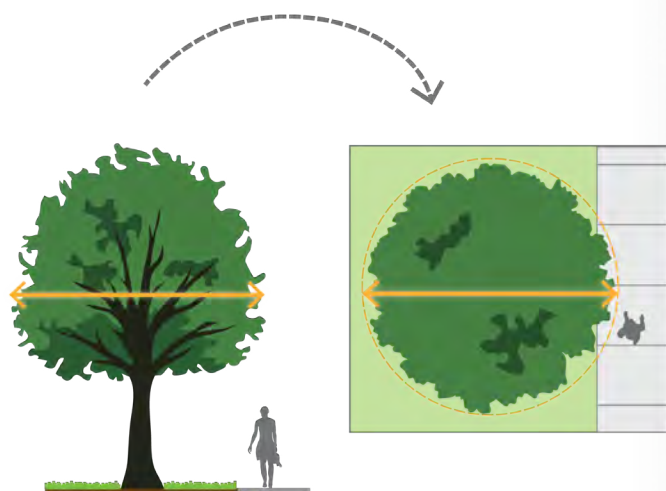
Figure 6 Illustration of tree canopy cover

For more details about the current state of the urban forest, including information about forest stands (e.g., forest structure and type), as well as the data used to generate the urban forest metrics discussed in this section, please refer to Appendix 3.

Citywide Canopy Cover

Langley City's 2021 canopy cover was estimated to be 17% citywide (174 hectares), with most of the canopy located south of the Nicomekl River (Figure 7). An estimated 49,000 trees distributed across public and private land provide the City's canopy cover. Langley City's urban forest is primarily deciduous, with deciduous trees providing 61% of the total canopy cover. Deciduous trees are located on private land, along streets, parks, and other public areas. Coniferous trees, on the other hand, are more commonly found on private properties, especially in the southern section of the City.
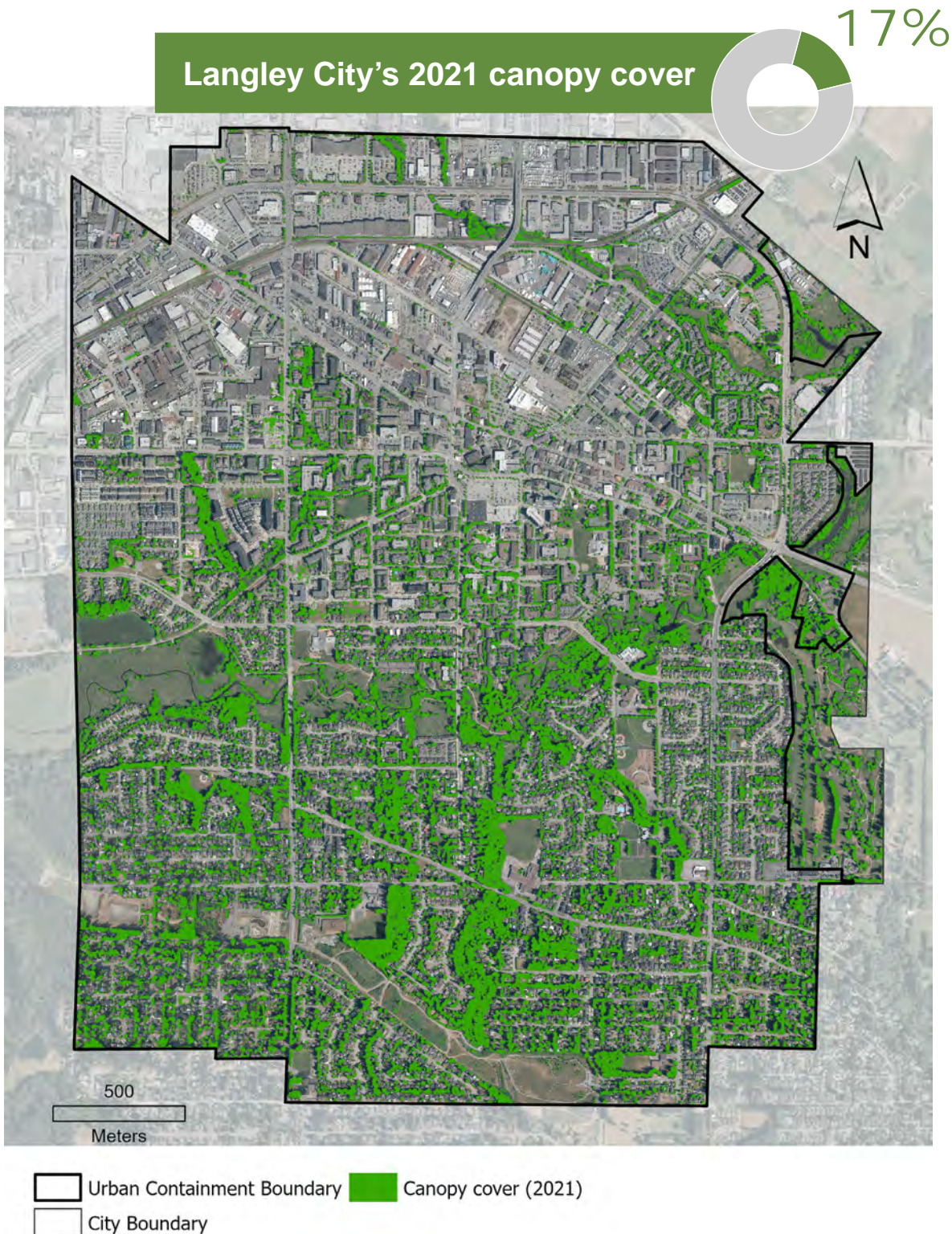
Figure 7 Canopy cover of Langley City in 2021

Who Owns the City's Tree Canopy?

Two-thirds of Langley City's land is privately owned and 64% of the tree canopy grows on private land (Figure 8). Public land accounts for one-third of the city's land area, and holds the remaining 36% of the tree canopy. The high proportion of tree canopy under private ownership means that successful implementation of the Strategy will require actions be taken on both City and privately managed land alike.
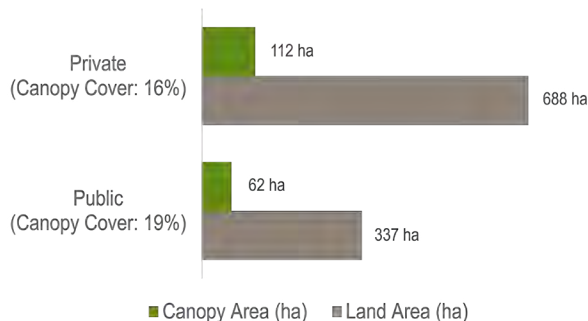
Figure 8 Canopy cover and land area of public and private lands

Figure 9 Public and private lands within Langley City

How does Langley City's canopy compare to other municipalities in the region?

Metro Vancouver's 2020 regional canopy cover study estimated the region's canopy cover at 31% within the Urban Containment Boundary (the area where urban development is concentrated to manage growth and restrict sprawl[17]). The regional data shows that Langley City has canopy cover comparable to municipalities like White Rock and Port Coquitlam, which support a similar population density (Figure 10). Metro Vancouver's report suggests that Langley could pursue a canopy cover target of 35% by 2050 to help achieve the region's 40% target. However, the regional data over-estimates Langley's current canopy cover[1], and work completed to prepare this Strategy does not support a 35% target being possible within the 2050 timeframe.

Figure 10 Canopy comparison (within UCB) across Metro Vancouver in 2020

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1 The regional study provides a coarser estimate of canopy cover compared to the dataset prepared for this strategy. As a result, the statistics from the regional study (21% canopy cover) and this report (17% canopy cover) are not directly comparable..

Canopy Cover Distribution

Canopy by Neighbourhood

The distribution of tree canopy across Langley City's neighbourhoods follows a strong north-south gradient (Figure 11). Neighbourhoods in the south part of the City, such as Simonds and Uplands enjoy the most abundant tree canopy at approximately 27%. In comparison, the Nicomekl and Douglas neighbourhoods north of the river have less than 15% canopy cover.

Tree Equity

American Forests developed the Tree Equity Score metric, which allows communities to assess how equitably their urban forest benefits are distributed (see Appendix 3 for more details). The metric combines data about the lack of canopy cover (canopy gap) with data about the highest need for trees to prioritize areas for tree planting.
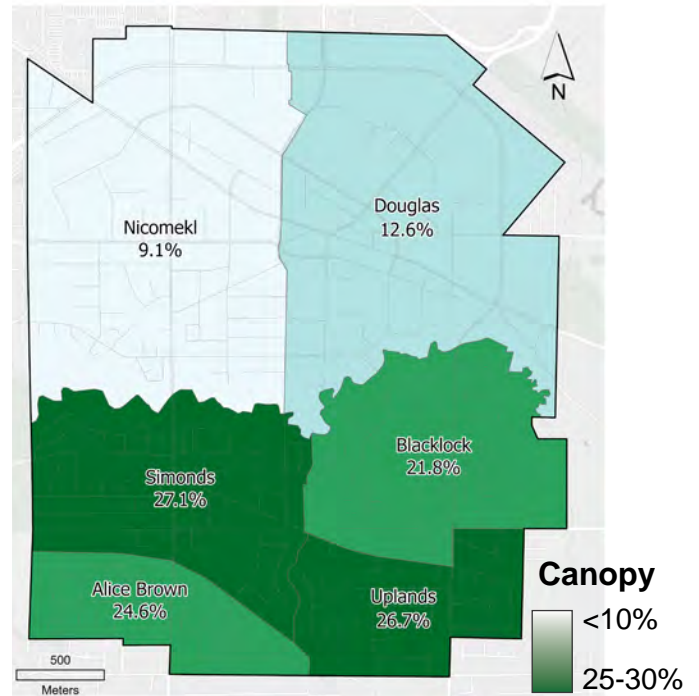
Figure 11 Canopy cover by neighbourhood in 2021

Figure 12 Tree Equity Score by census dissemination area

The areas with the highest need for trees have the hottest surface temperature and a high proportion of populations most vulnerable to heat impacts (seniors and children, unemployed, lower income, and minority groups). Figure 12 shows the Tree Equity Score for census dissemination areas across Langley City.

Areas with the lowest tree equity are in the northern part of the City and around the downtown area. The Tree Equity Score can help inform tree planting priority during the implementation of Langley City's strategy.

Canopy by land use

Langley City's Official Community Plan (OCP) defines future land use (Figure 13). Analyzing canopy cover based on these land use designations offers a perspective on potential tree impacts due to future development.

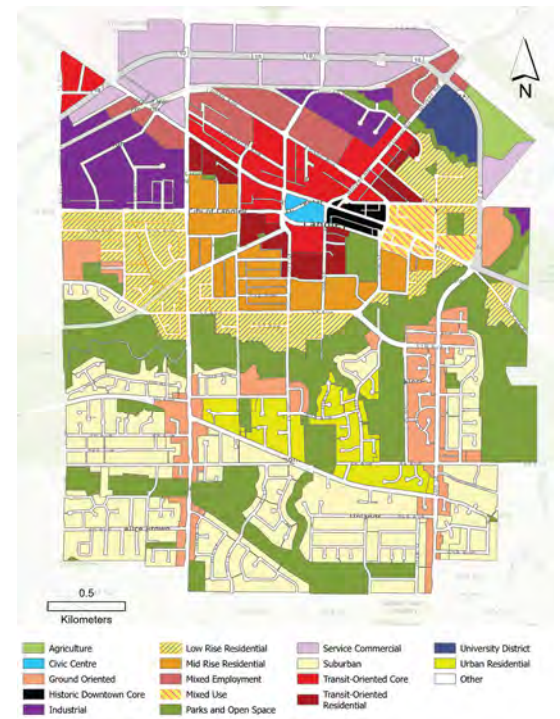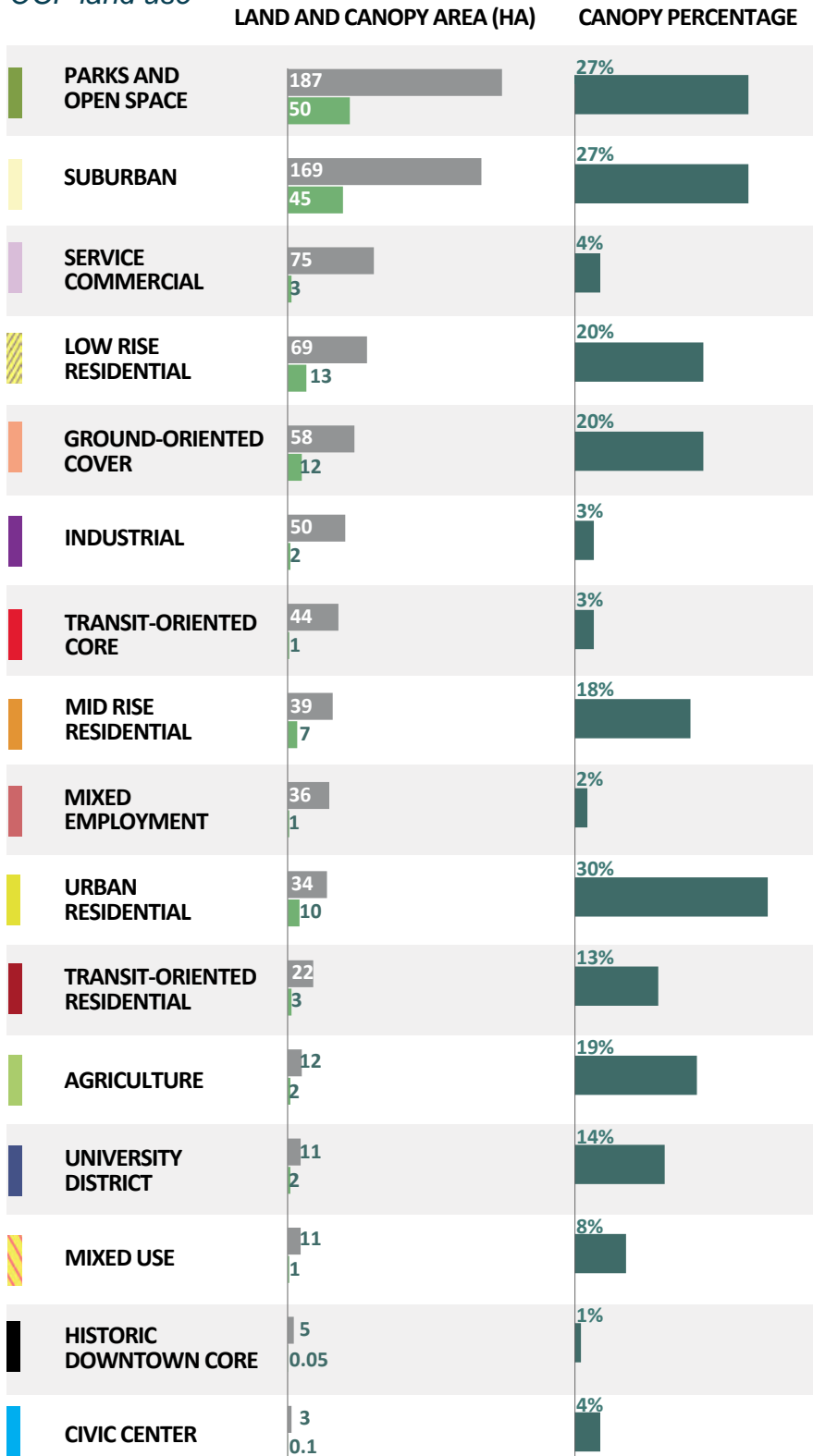*Figure 13 Land and canopy cover area and percentage for all OCP land use*

	LAND AND CANOPY AREA (HA)	CANOPY PERCENTAGE
PARKS AND OPEN SPACE	187 / 50	27%
SUBURBAN	169 / 45	27%
SERVICE COMMERCIAL	75 / 3	4%
LOW RISE RESIDENTIAL	69 / 13	20%
GROUND-ORIENTED COVER	58 / 12	20%
INDUSTRIAL	50 / 2	3%
TRANSIT-ORIENTED CORE	44 / 1	3%
MID RISE RESIDENTIAL	39 / 7	18%
MIXED EMPLOYMENT	36 / 1	2%
URBAN RESIDENTIAL	34 / 10	30%
TRANSIT-ORIENTED RESIDENTIAL	22 / 3	13%
AGRICULTURE	12 / 2	19%
UNIVERSITY DISTRICT	11 / 2	14%
MIXED USE	11 / 1	8%
HISTORIC DOWNTOWN CORE	5 / 0.05	1%
CIVIC CENTER	3 / 0.1	4%

Figure 14 Official Community Plan land use designations

Legend: Agriculture, Civic Centre, Ground-Oriented, Historic Downtown Core, Industrial, Low Rise Residential, Mid Rise Residential, Mixed Employment, Mixed Use, Parks and Open Space, Service Commercial, Suburban, Transit-Oriented Core, Transit-Oriented Residential, University District, Urban Residential, Other

The land uses with the highest canopy cover include parks and open spaces, suburban areas, and urban residential, which had at least 27% canopy cover in 2021. Parks and open space and suburban land uses also make up a large proportion of Langley City's total land area, meaning that any significant changes to canopy in these land uses would have significant impacts on the City's canopy cover.

Other land uses like mixed employment, transit-oriented core, or the historic downtown core have nearly no canopy cover. While those land uses face limitations for the space available to grow trees, opportunities may exist to increase tree canopy.

Canopy Cover Change

Canopy cover in Langley City decreased from 20% in 2010 to 17% in 2021. Detailed canopy data between 2016 and 2021 shows specific locations where canopy has grown or been removed in recent years (Figure 15).

The majority of the canopy loss was recorded within the suburban and low-rise residential OCP land uses, representing 40% and 31% of the total canopy change, respectively. The canopy loss in low-rise residential and possibly suburban parcels appears to be tied to increased redevelopment activities within these land uses. In contrast, parks and open spaces registered the highest canopy gain at 8%. Other land uses experienced minimal changes in their canopy cover. See Appendix 3 for more details (note that results differ from the 2020 Metro Vancouver analysis due to data resolution differences).

Example of canopy gain on older low rise and transit-oriented developments:

2016 → 2021

Example of canopy loss for the development on a low rise residential parcel:

2016 → 2021

Legend:
- Greater than 40% loss
- 20 - 40% loss
- 10 - 20% loss
- < 10% loss
- Indiscernible loss or gain
- < 3% gain
- 3 - 5% gain
- 5 - 10% gain
- 10 - 27% gain
- City Boundary

500 Meters
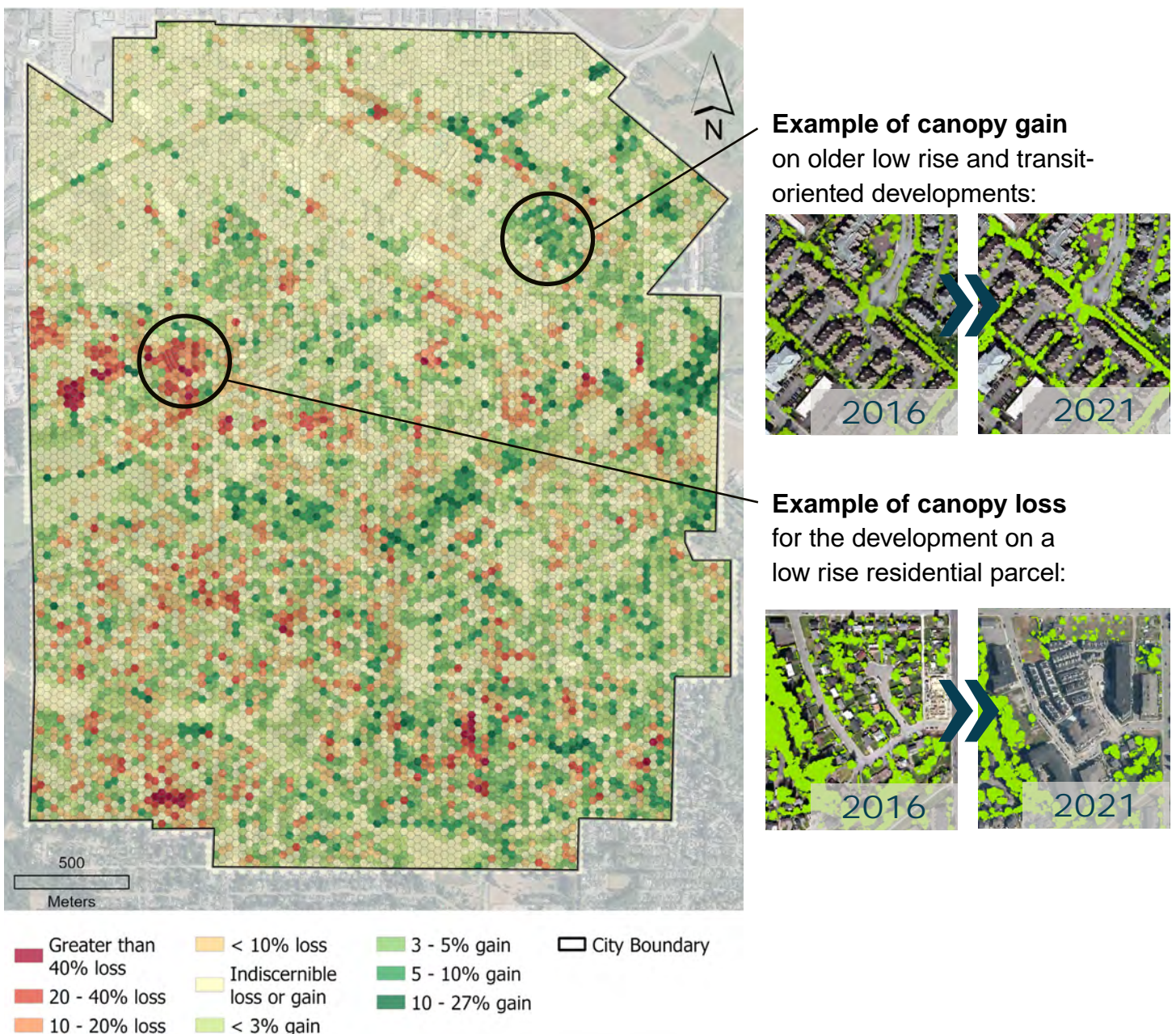
Figure 15 Map of canopy change from 2016 to 2021

Opportunities and Challenges

This section describes current opportunities and challenges that Langley City will need to address or leverage to achieve the Strategy's 2050 vision.

Climate change

Langley City's urban forest is already experiencing impacts from the more common and prolonged droughts recently experienced in the region. Native species, such as the western redcedar, are already showing signs of distress across the region due to more frequent droughts. In addition to drought, more frequent extreme weather and the emergence of new pests and diseases could further threaten the urban forest. Langley City will need to continue proactively preparing for and adapting to the impact of climate change with strategies such as increasing watering of young trees, providing sufficient soil volumes to give trees good access to water, and planting a diversity of climate-adapted species.

City tree management

There is no asset inventory of street and landscape park trees, making it difficult to evaluate the condition and diversity of trees actively managed by City staff. A tree inventory and defined service levels help define budgets and priorities for management. While good collaboration exists between departments, tree protection and planting outcomes could be improved with better-defined processes and communication tools between departments. The Strategy will build on innovative approaches already being trialled by City staff, such as using microbial inoculants to improve tree health.

Urban redevelopment

Redevelopment presents both opportunities and challenges for Langley City's urban forest. Recent trends in canopy cover show that the City has been losing canopy in part as a result of redevelopment, particularly in low-rise and suburban residential uses (see Figure 13 for OCP land use details), which have seen higher rates of development in recent years. New higher-density developments are also expected to have high site coverage that will limit tree planting opportunities on private parcels due to height restrictions from aeronautic regulations and limited opportunities for underground structures because of soil types and the depth aquifer.

Despite these challenges, development will also present many opportunities to increase tree canopy. The City expects to see the most significant increase in population density in neighbourhoods north of the Nicomekl River, particularly along the planned Skytrain line. Given that those neighbourhoods have high impervious cover and low tree canopy, development could bring opportunities for greening through on-site planting, improved streetscapes, and new parkland acquisition. Past canopy trends have already shown that some previously redeveloped low-rise properties now show canopy gains from trees planted along the street or on the properties maturing.

Private land stewardship and tree removals

Much of Langley City's canopy grows on private land. The City would benefit from adopting a tree bylaw to regulate the removal and replacement of trees on private land. A tree bylaw, combined with provisions for landscaping in zoning bylaws and/or development permit areas, could guide community expectations for tree retention and replacement on all properties and in the development context. Recent Provincial housing legislations, which promote increased housing density and streamlined development approvals, makes it essential to have clear guidance for tree protection and landscaping requirements with development.

Partnerships

Given that much of Langley City's urban forest grows on private land and that City resources are limited, stewardship will continue to be an essential part of ensuring a healthy urban forest. The City can continue supporting community members and organizations in their stewardship of the urban forest and seek opportunities to partner with property owners such as schools. The City has a history of successful partnerships with institutions like Kwantlen University that it can build on to seek more partnerships with post-secondary institutions to document and improve urban forestry practices.

Community Values and Priorities

Public engagement plays a pivotal role in shaping the effective implementation of the Urban Forest Management Strategy. Recognizing this, the City of Langley has embarked on a comprehensive two-phase process to capture diverse voices and views, ensuring that strategy design aligns with the community's needs, aspirations, and preferences. Phase 1, completed in July 2023, seeks to understand public values, vision, and priorities. The subsequent Phase 2 engagement will provide an opportunity to offer feedback on this draft strategy. The following section highlights the key engagement outcomes. Please refer to Appendix 4 for a complete summary.

Phase 1 Engagement Summary

Who We Heard From

More than 205 people participated in Phase 1 engagement, including 196 survey respondents, 10 Environmental Sustainability Committee members and people who visited the pop-up booth and used the mapping tool. Of the 196 survey respondents, the large majority are within the 35-64 age group and reside in the City of Langley. The most represented neighbourhoods are Nicomekl and Simonds.

A Vision for the Urban Forest

Participants were asked what they wanted Langley's urban forest to look like in 2050 (Figure 16). In general, participants envisioned an expanding and healthy urban forest composed of diverse and native species that are large and mature. Other ideas raised were:

- Providing shade and cooling
- Supporting wildlife habitat and biodiversity
- Enhancing walkability and access to greenspaces such as parks and walking trails

"A tall healthy forest, with a healthy understory of native berries and flowers. With lots of places for people to walk and spend time in, but also with restricted areas for ecological conservation and enhancement."

"Many trails with assorted tree sizes and species that attract wildlife such as bats and deer in park areas. Cultured trees in developed areas."

Figure 16 Word cloud showing the most common words used by respondents to describe their vision of the urban forest by 2050

Current Levels of Service

Residents expressed mixed satisfaction with the services currently provided by the City of Langley (Figure 17). While many appreciated the City's response to storm and debris cleanup, they were more neutral or dissatisfied with other service levels such as pest and disease control and dangerous tree removals. Respondents were the most dissatisfied with the service of public education opportunities (9% satisfied and 35% dissatisfied).
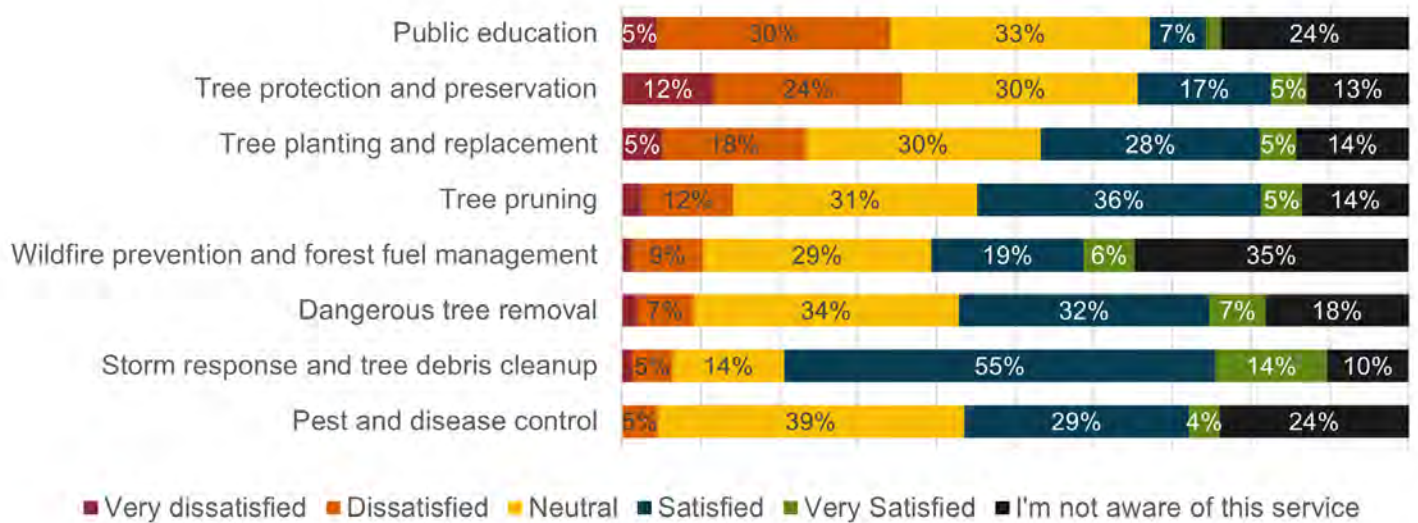

Figure 17 Satisfaction levels with current service levels for trees in parks and along streets (total respondents =155)

Langley City's Urban Forest Management Strategy

Vision and Goals for the Future

The vision that guides the implementation of Langley City's Urban Forest Management Strategy is that:

> **Langley City's urban forest features a wealth of mature trees and a diversity of native and climate-adapted species that foster a healthy, connected community and ecosystems, delivering benefits to all residents.**

The vision is supported by four goals:

GOAL 1: Protect and enhance
trees, forests, and soils to grow a healthy, diverse, and resilient urban forest

Strategy 1. Improve policies and regulations to achieve a better integration of the urban forest within the built environment

Strategy 2. Enhance ecosystems to support biodiversity and access to nature

Strategy 3. Grow the urban forest with a focus on tree resilience and equity across neighbourhoods

GOAL 2: Manage
the urban forest more proactively to improve its health and resiliency

Strategy 4. Acquire and integrate tree asset information to the City's asset management system

Strategy 5. Transition to a more proactive urban forest management program

Strategy 6. Evaluate and maintain sufficient staffing and budget resources to deliver defined urban forest service levels

GOAL 3: Partner
with the community for the stewardship of Langley City's urban forest

Strategy 7. Create opportunities to build relationships and work on reconciliation with local First Nations through urban forest management

Strategy 8. Support and expand initiatives to involve community members, landowners, and organizations in urban forest stewardship

GOAL 4: Monitor
progress and adapt to changing conditions

Strategy 9. Regularly monitor and report on urban forest change

Strategy 10. Continuously explore options to collect information and adapt practices to changing conditions

Canopy Target

Setting a canopy cover target is a common way for municipalities to monitor their success in implementing their urban forest management strategy. Leading organizations in the field of urban forestry, such as the US-based not-for-profit organization American Forests, recommend setting targets that are not only based on the region's ecosystems and climate but also reflective of what is achievable given the municipality's population density and land use constraints. Langley City's Urban Forest Management Strategy sets a baseline and an aspirational canopy cover target for 2046 and 2050, respectively:
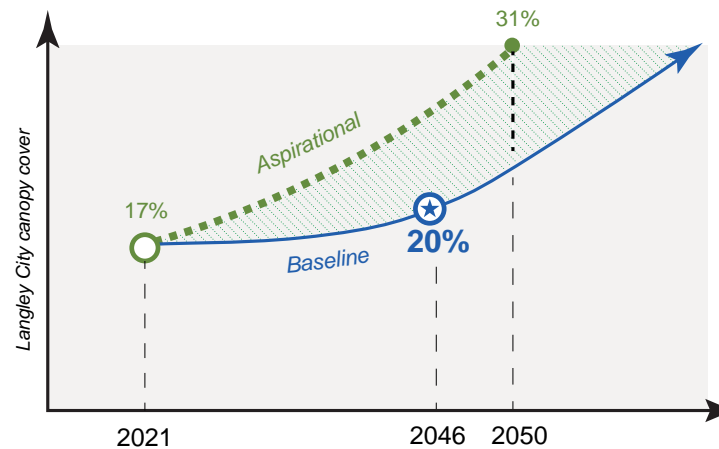
Figure 1 Langley City's baseline and aspirational canopy cover targets

Baseline target: Langley's baseline canopy cover target is to achieve 20% by 2046 with the implementation of the UFMS action plan. To achieve this target, Langley City will need approximately ~1,080 new trees annually across public and private land. This estimate is based on a forecast of development over the next two decades and may vary based on the actual pace of development. Trees planted during that timeframe will continue to grow and provide increased canopy cover beyond 2046.

The baseline target means that:

- Tree removed are being replaced
- Additional new trees are being planted each year:
    » ~250 trees planted in City parks and rights-of-way by the City or with new developments
    » ~260 trees planted on private land through voluntary plantings or development

Aspirational target: Metro Vancouver has established a 40% canopy target for the UCB by 2050 and recommends that Langley City increase its canopy cover from the current level to 35% by 2050 to help achieve this regional goal.[15] Langley City will work towards that aspirational target as resources permit, for example by seeking external funding to support more tree planting.

Urban Forest Strategies and Actions

The following section provides an overview of urban forest strategies and actions the City aims to implement to achieve its vision and goals. A detailed implementation plan is included in Appendix 4.

Goal 1 Protect and enhance trees, forests, and soils to connect ecosystems and deliver community benefits

Strategies and actions under Goal 1 focus on improving policies and regulations that protect existing trees and ensure new trees are planted across the City. The actions seek to improve tree protection and planting in urban areas (i.e., along streets and in yards) and within natural areas. The desired outcome is to protect existing trees and forests wherever possible and to increase planting efforts to replace any canopy loss and expand the urban forest in underserved areas.

Action 2 recommends updates to land use regulations that would support the retention of sufficient pervious landscape area to grow trees. On properties with limited space, regulations can be written to require both a minimum percentage of pervious area (property A below), and that it be consolidated to provide a landscape area sufficient to plant a tree (property B).
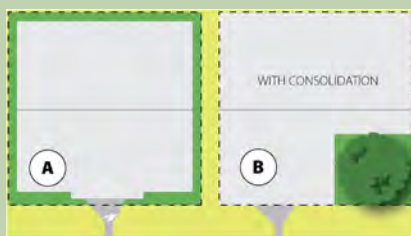
Figure 18 Properties A and B have the same amount of pervious area (shown in green); however, A has a narrow pervious edge surrounding the building that is too small for tree planting, and B shows the pervious area consolidated into a single location to support a tree. This illustrates how building setbacks and footprints can be adjusted to better accommodate tree planting.

Strategy 1. Improve policies and regulations to achieve a better integration of the urban forest within the built environment

1. Consider adopting a tree bylaw to improve protection of trees of importance to the community and require adequate replacements or cash-in-lieu when they must be removed.
2. Consider integrating the canopy cover target and supporting requirements into the OCP, Local Areas Plans, in landscaping requirements in the Zoning Bylaw, Design Criteria Manual, or Form and Character Development Permit Areas, and other strategic policies and initiatives to achieve consistent tree protection and planting and adequate soil volume.
3. Consider updating the Subdivision and Development Servicing Bylaw to strengthen tree protection and maintenance and improve tree planting quality.
4. Consider enabling the use of delegated minor variances to allow the retention of large and healthy trees during development by varying factors such as setbacks, building height or parking.
5. Clarify responsibilities and workflows to improve inspection and tracking of developer-planted street trees from soil installation to the end of the maintenance period.
6. Update the Environmental Development Permit Areas to integrate a green infrastructure network, specify arborist reporting requirements, and integrate guidelines to avoid impacts to tree within a functional distance.

Strategy 2. Enhance ecosystems to support biodiversity and access to nature

7. Consider developing a natural area management framework to manage and enhance natural areas, such as the Nicomekl floodplain, through restoration planting and management of invasive species.

Strategy 3. Grow the urban forest with a focus on tree resilience and equity across neighbourhoods

8. Maintain the City's current tree population and seek options to expand trees planted in under-served areas with low tree equity scores through annual programs, replacing every tree removed (1:1 replacement), and consider increasing species diversity.

9. Expand the tree network in the public realm and ensure design soil volumes meet industry standards on private property and for new street trees, as supported by actions 2, 3, and 6.

10. Update the recommended tree species list in the Design Criteria Manual and other relevant policies with species information that accounts for future climate suitability to guide tree planting on public and private land and continue to require a diversity of species to reduce vulnerabilities.

11. Consider updating the Design Criteria Manual for boulevard standards to increase soil volume for trees.

12. Continue to trial and monitor various innovative methods to improve tree health.

13. Consider Introducing incentive programs and educational materials to encourage planting and protection on private land, such as a subsidized tree sale or grants for the maintenance of significant trees, and consider a monitoring program to evaluate success.

Langley City's Environmentally Sensitive Areas Mapping Study (2016) describes a **green infrastructure network** as "interconnected network of natural areas and other open spaces that conserves natural ecosystem values and functions, sustains clean air and water, and provides a wide array of benefits to people and wildlife". The Study recommends that Langley City recognize its environmentally sensitive areas as integral to its green infrastructure network, supported by constructed green infrastructure like green roofs and walls, bioswales, or rain gardens.

Microbial inoculants can enhance tree health by introducing beneficial microorganisms that improve soil fertility and structure. These inoculants, such as mycorrhizal fungi and nitrogen-fixing bacteria, form symbiotic relationships with tree roots, increasing nutrient and water uptake while also protecting against soil-borne pathogens. Mycorrhizal fungi, for instance, extend the root system through their hyphal networks, allowing trees to access nutrients and water more efficiently, particularly in poor soils. In recent years, the City has started microbial inoculant trials for newly planted trees and larger stressed trees at selected sites.

Trees in the city often face many stressors which can create risks to infrastructure and communities. Urban forest management seeks to minimize tree risks while maximizing benefits to the community. The City of Langley currently manages approximately 16,500 trees on City properties. As Langley City seeks to expand its urban forest, responsibilities and demands to manage the urban forest will grow. Strategies and actions under this goal seek to transition the City towards a more proactive urban forest management program. The desired outcome is to maximize the lifetime of trees across Langley City to maximize urban forest benefits.

Strategy 4. Acquire and integrate tree asset information to the City's asset management system

14. Explore opportunities to inventory all street and planted park trees to include, at a minimum, the species, year planted (where possible), diameter, and condition to inform budgets and service levels. Update the inventory with the pruning cycle.

15. Inventory forest stands to include species composition, forest health concerns, mortality, invasive species detection, encroachment and other factors that can be used to assess the condition of forest stands and prioritize management responses. Update the inventory every five years.

16. Integrate the tree inventory to the City's asset management system.

Strategy 5. Transition to a more proactive urban forest management program

17. Define service levels for young tree maintenance, established tree pruning, and risk management that shift the urban forest maintenance program to proactive management of street and planted park trees.

18. Consider defining service levels for natural areas to help prioritize restoration and other management activities.

19. Consider a City tree policy to define the risk management program and requirements to apply to City operations when removing or working around City trees to meet or exceed private land requirements in the tree bylaw.

Strategy 6. Evaluate and maintain sufficient staffing and budget resources to deliver defined urban forest service levels

20. Review and adjust program staffing and budget annually to enable staff to meet service levels as the inventory grows.

21. Evaluate staffing requirements to effectively administer the tree bylaw upon adoption and develop clear operating procedures to delineate departmental responsibilities for the bylaw implementation and enforcement.

22. Explore grant funding opportunities to support tree planting and forest restoration initiatives, 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's Natural Infrastructure Fund.

Urban Forest Asset Management

Although more costly during their early and end stages, the benefits of the urban forest far exceed the management costs. Unlike constructed assets like a road or a park bench, trees appreciate in value as they grow and provide their maximum benefits once they reach maturity, usually a few decades after planting. Effective urban forest management ensures that trees reach and maintain healthy maturity, maximizing the return on investment and delaying the need for removal and replacement. Langley City's current management program already responds to this by prioritizing young tree watering and pruning to facilitate their establishment.

By further applying asset management principles to urban forest management, the City can acquire information about the number of assets it manages and their condition (action 15), establish service levels with performance indicators, implement a proactive lifecycle management strategy beyond young tree establishment (action 18), and develop a financial strategy to support these activities (action 21).

Magnitude of costs and benefits over the tree life cycle

Maximize time in this phase for best return on investment

COSTS

BENEFITS

energy reserves depleted

	NEWLY PLANTED	YOUNG	SEMI-MATURE	MATURE	OVER-MATURE OR STRESSED	DECLINING	DEAD
YEARS:	1-3	4 - 15	~ 15 - 40	40 - life expectancy			
Best practices program	Planting, watering, young tree pruning		Proactive inspection and pruning cycle		Tree health and risk management treatments		Removal
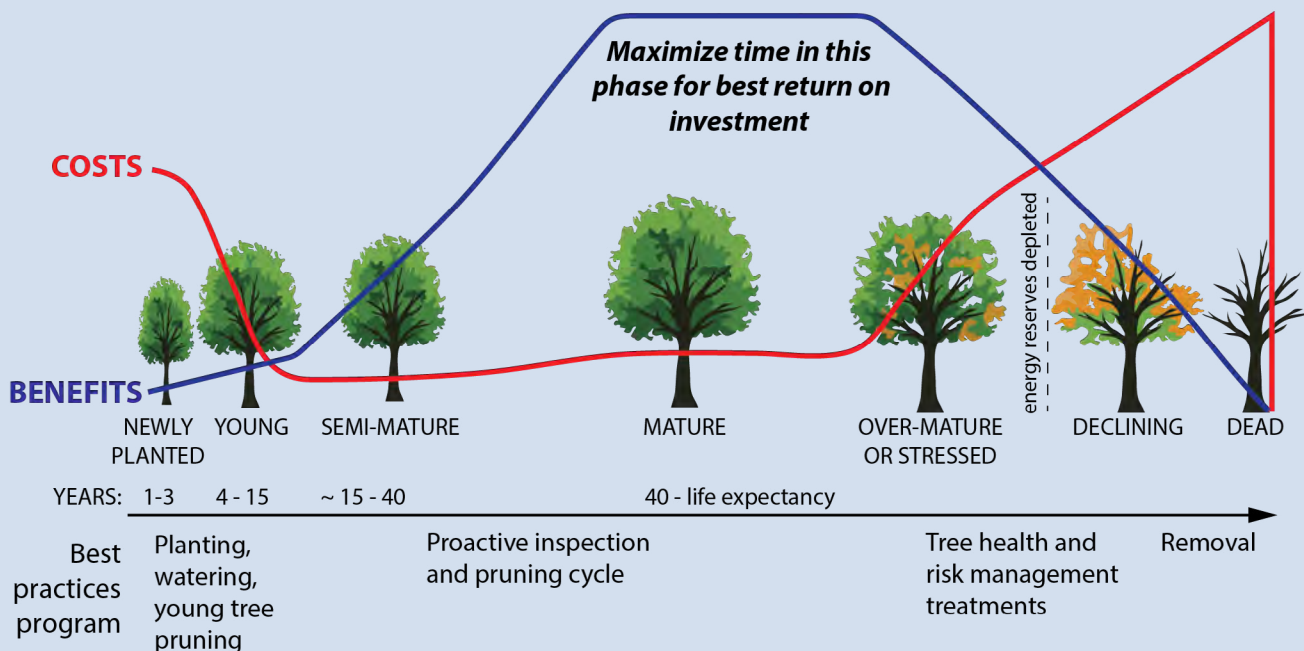
Goal 3 Partner with the community for the stewardship of Langley City's urban forest

With over 64% of canopy cover located on private land, collaborative efforts among the City, community members, stewardship organizations, and local First Nations will continue to play a vital role in protecting and enhancing Langley City's urban forest. Strategies and actions under this goal seek to recognize the importance of community members and organizations and support their urban forest stewardship.

Strategy 7. Explore opportunities to build relationships and work on reconciliation with local First Nations through urban forest management

23. Consider how urban forest initiatives can support the City's initiatives with local First Nations, and consider opportunities to coordinate with First Nations regarding the incorporation of traditional knowledge and practices related to native species, forest and natural areas.

Strategy 8. Support and expand initiatives to involve community members, landowners, and organizations in urban forest stewardship

24. Explore opportunities to collaborate with universities and research institutions to increase knowledge of urban forest within the city, for example to monitor the effectiveness of subsidized tree sales (action 13).

25. Explore partnership opportunities with school districts, not-for-profit organizations, and other institutional landowners to increase canopy coverage through tree planting programs.

26. Consider urban forest stewardship programs on City land, for example by encouraging residents to water newly planted trees, and developing online educational resources for developers and property owners on topics such as tree benefits, tree protection, tree care, and tree permit requirements.

27. Support or provide stewardship opportunities for residents which could include watering street trees during dry seasons, invasive species removal and restoration planting

28. Consider supporting public education and outreach initiatives about food forests and fruit trees planting, as part of efforts to improve food security and encourage urban forest stewardship.

Youth stewardship events (credit: Green Teams of Canada)

Goal 4 Monitor progress and adapt to urban forest changing circumstances

Given the dynamic nature of the urban forest and escalating uncertainties such as climate change, the ability to monitor and adapt to new information or changing conditions will be crucial for effective urban forest management. Strategies and actions under this goal seek to support adaptive management during the implementation of the Urban Forest Management Strategy.

Strategy 9. Regularly monitor and report on urban forest change

29. Reassess canopy cover every five years using LiDAR or other accurate technologies available.
30. Consider updating the urban forest report card annually and the action plan every five years.
31. Consider creating a monitoring plan to track the UFMS implementation progress, including KPIs for equity, climate resiliency, and stewardship.

Strategy 10. Continuously explore options to collect information and adapt practices to changing conditions

32. Trial new technologies to improve tree health and achieve co-benefits with other city initiatives such as stormwater management.
33. Review implementation progress and update the Implementation Plan after 10 years

Additional performance indicators to report back on Langley City's urban forest could include:
- Number of trees planted, removed, and replaced on public land
- Number of trees planted, removed, and replaced on private land
- Mortality rates for street trees, park trees, and trees in natural areas
- Number of trees planted in low-equity areas
- Hectare of natural area restored

See Appendix 4 for the detailed implementation plan, including detailed action, implementation timeframe, cost, and departmental responsibilities.

The Implementation Plan

The implementation plan outlines a set of initiatives aimed at helping the City of Langley accomplish its urban forest vision and goals. By detailing specific actions, involved departments, implementation timelines, and budgetary needs, the plan provides a comprehensive roadmap for managing the urban forest for the next 15 years.

Goal 1: Protect and enhance trees, forests, and soils	Timeframe Short: 1-5 years Med: 5-10 years Long: 10-15 years	Cost $: Already budgeted/using existing resources $$:$20,000-$100,000 $$$: >$100,000	Lead Department
Strategy 1. Improve policies and regulations to achieve a better integration of the urban forest within the built environment			
1. Consider adopting a tree bylaw to improve protection of trees of importance to the community and require adequate replacements or cash-in-lieu when they must be removed.	Med	$$$	Engineering & Parks
2. Consider integrating the canopy cover target and supporting requirements into the OCP, Local Areas Plans, in landscaping requirements in the Zoning Bylaw, Design Criteria Manual, or Form and Character Development Permit Areas, and other strategic policies and initiatives to achieve consistent tree protection and planting and adequate soil volume.	Med	$$	Planning, Development
3. Consider updating the Subdivision and Development Servicing Bylaw to strengthen tree protection and maintenance and improve tree planting quality.	Short	$	Engineering & Parks
4. Consider enabling the use of delegated minor variances to allow the retention of large and healthy trees during development by varying factors such as setbacks, building height or parking.	Short	$$	Development
5. Clarify responsibilities and workflows to improve inspection and tracking of developer-planted street trees from soil installation to the end of the maintenance period.	Short	$	Engineering & Parks, Planning
6. Update the Environmental Development Permit Areas to integrate a green infrastructure network, specify arborist reporting requirements, and integrate guidelines to avoid impacts to tree within a functional distance.	Med	$$	Development
Strategy 2. Enhance ecosystems to support biodiversity and access to nature			
7. Consider developing a natural area management framework to manage and enhance natural areas such as the Nicomekl floodplain, through restoration planting and management of invasive species etc.	Long	$$$	Engineering & Parks

Goal 1: Protect and enhance trees, forests, and soils	Timeframe Short: 1-5 years Med: 5-10 years Long: 10-15 years	Cost $: Already budgeted/using existing resources $$:$20,000-$100,000 $$$: >$100,000	Lead Department

Strategy 3. Grow the urban forest with a focus on tree resilience and equity across neighbourhood

	Timeframe	Cost	Lead Department
8. Maintain the City's current tree population and seek options to expand trees planted in under-served areas with low tree equity scores through annual programs, replacing every tree removed (1:1 replacement), and consider increasing species diversity	Short	$$$	Engineering & Parks
9. Expand the tree network in the public realm and ensure design soil volumes meet industry standards on private property and for new street trees, as supported by actions 2, 3, and 6.	Long	$$	Development
10. Update the recommended tree species list in the Design Criteria Manual and other relevant policies with species information that accounts for future climate suitability to guide tree planting on public and private land and continue to require a diversity of species to reduce vulnerabilities.	Short	$	Engineering & Parks
11. Consider updating the Design Criteria Manual for boulevard standards to increase soil volume for trees.	Short	$	Engineering & Parks
12. Continue to trial and monitor various innovative methods to improve tree health, such as microbial inoculant trials conducted by staff.	Med	$$	Engineering & Parks
13. Consider Introducing incentive programs and educational materials to encourage planting and protection on private land, such as a subsidized tree sale or grants for the maintenance of significant trees, and consider a monitoring program to evaluate success.	Short	$$	Engineering & Parks

Strategy 4. Acquire and integrate tree asset information to the City's asset management system

14. Explore opportunities to inventory all street and planted park trees to include, at a minimum, the species, year planted (where possible), diameter, and condition to inform budgets and service levels. Update the inventory with the pruning cycle (i.e., when visiting trees for scheduled pruning).	Med	$$$-$$$$	Engineering & Parks
15. Inventory forest stands to include species composition, forest health concerns, mortality, invasive species detection, encroachment and other factors that can be used to assess the condition of forest stands and prioritize management responses. Update the inventory every five years.	Med	$$$	Engineering & Parks
16. Integrate the tree inventory to the City's asset management system.	Med	$$	Engineering & Parks

Strategy 5. Transition to a more proactive urban forest management program

17. Define service levels for young tree maintenance, established tree pruning, and risk management that shift the urban forest maintenance program to proactive management of street and planted park trees.	Med	$$	Engineering & Parks
18. Consider defining service levels for natural areas to help prioritize restoration and other management activities.	Med	$$	Engineering & Parks
19. Consider a City tree policy to define the risk management program and the requirements to apply to City operations when removing or working around City trees to meet or exceed private land requirements defined in the tree bylaw.	Short	$$	Engineering & Parks

Strategy 6. Evaluate and maintain sufficient staffing and budget resources to deliver defined urban forest service levels

20. Review and adjust program staffing and budget annually to enable staff to meet service levels as the inventory grows.	Med	$$$-$$$$	Engineering & Parks
21. Evaluate staffing requirements to effectively administer the tree bylaw upon adoption and develop clear operating procedures to delineate departmental responsibilities for the bylaw implementation and enforcement.	Short	$$$	Engineering & Parks
22. Explore grant funding opportunities to support tree planting and forest restoration initiatives, 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's Natural Infrastructure Fund.	Med	$$	Engineering & Parks

Goal 3: Support community partnership	Timeframe Short: 1-5 years Med: 5-10 years Long: 10-15 years	Cost $: Already budgeted/using existing resources $$:$20,000-$100,000 $$$: >$100,000	Lead Department
Strategy 7. Create opportunities to build relationships and work on reconciliation with local First Nations through urban forest management			
23. Consider how urban forest initiatives can support the City's relationship building with local First Nations. and consider opportunities to coordinate with First Nations regarding the incorporation of traditional knowledge and practices related to native species, forest and natural areas.	Med	$$	Engineering & Parks
Strategy 8. Support and expand initiatives to involve community members, landowners, and organizations in urban forest stewardship			
24. Explore opportunities to collaborate with universities and research institutions to increase knowledge of urban forest within the city, for example to monitor the effectiveness of subsidized tree sales (action 13).	Med	$$	Engineering & Parks
25. Explore partnership opportunities with school districts, not-for-profit organizations, and other institutional landowners to increase canopy coverage through tree planting programs.	Med	$	Engineering & Parks
26. Consider urban forest stewardship programs on City land, for example by encouraging residents to water newly planted trees, and developing online educational resources for developers and property owners on topics such as tree benefits, tree protection, tree care, and tree permit requirements.	Med	$	Engineering & Parks
27. Support or provide stewardship opportunities for residents which could include watering street trees during dry seasons, invasive species removal and restoration planting.	Long	$	Engineering & Parks
28. Consider supporting public education and outreach initiatives about food forests and fruit trees planting, as part of efforts to improve food security and encourage urban forest stewardship.	Med	$$-$$$	Engineering & Parks

Goal 4: Monitor progress and adapt to changing circumstances	Timeframe Short: 1-5 years Med: 5-10 years Long: 10-15 years	Cost $: Already budgeted/using existing resources $$:$20,000-$100,000 $$$: >$100,000	Lead Department

Strategy 9. Regularly monitor and report on urban forest change

	Timeframe	Cost	Lead Department
29. Reassess canopy cover every five years using LiDAR or other accurate technologies available.	Med	$$	Engineering & Parks
30. Consider updating the urban forest report card annually and the action plan every five years.	Short	$$	Engineering & Parks
31. Consider creating a monitoring plan to track the UFMS implementation progress, including KPIs for equity, climate resiliency, and stewardship.	Short	$$	Engineering & Parks

Strategy 10. Continuously explore options to collect information and adapt practices to changing conditions

	Timeframe	Cost	Lead Department
32. Trial new technologies to improve tree health and achieve co-benefits with other city initiatives such as stormwater management.	Long	$$-$$$	Engineering & Parks
33. Review implementation progress and update the Implementation Plan after 10 years.	Long	$$	Engineering & Parks

Youth stewardship events (credit: Green Teams of Canada)

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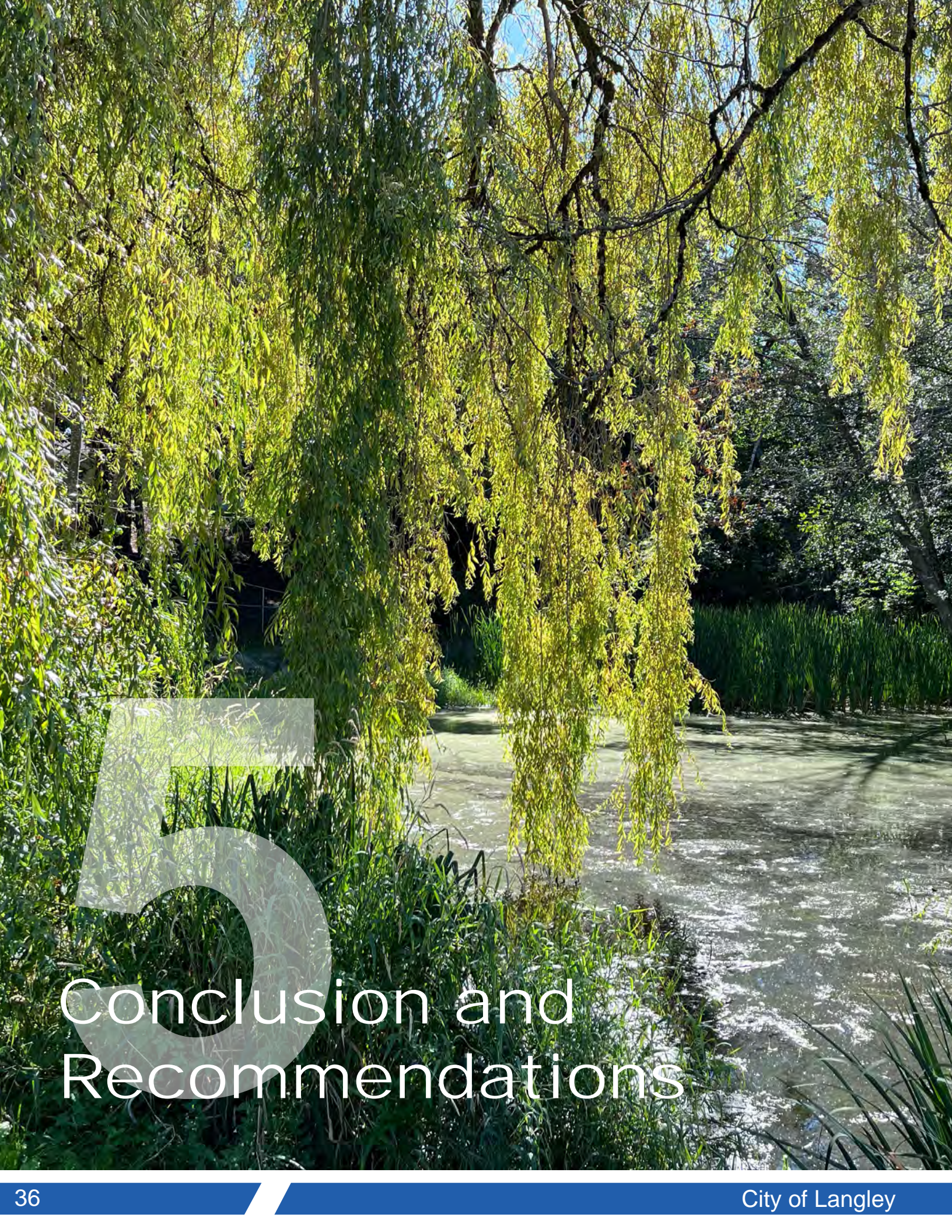
Conclusion and Recommendations

The City of Langley's Urban Forest Management Strategy marks a pivotal step towards a healthy, diverse, and climate-adapted urban forest in the next 30 years. With a comprehensive vision, a canopy target and supporting goals, this Strategy is a testament to the City's commitment to mitigating the challenges posed by climate change, urban densification, and evolving community needs.

The success of the Strategy hinges on effective implementation. The action plan provides a roadmap for tangible progress covering critical aspects of effective urban forest management, such as climate adaptation, City tree management, and community stewardship.

Implementing the Urban Forest Management Strategy is more than a static commitment; it is a dynamic process that will require ongoing monitoring, adaptation, and collaboration. The Strategy includes 10 strategies and 33 actions on implementation and monitoring to support the protection and growth of its urban forest as a thriving asset, contributing to the well-being and vibrancy of Langley City for generations to come.

A few 'quick start' actions have been identified to initiate implementation of the plan:

- Consider integrating the canopy cover target into the OCP, Local Area Plans, Zoning Bylaw, Design Criteria Manual, or Form and Character Development Permit Areas, and other strategic policies and initiatives.

- Consider updating the Subdivision and Development Servicing Bylaw to strengthen tree protection and maintenance and improve tree planting quality.

- Clarify responsibilities and workflows to improve inspection and tracking of developer-planted street trees from soil installation to the end of the maintenance period.

- Update the recommended tree species list in the Design Criteria Manual and other relevant policies with species information that accounts for future climate suitability to guide tree planting on public and private land and continue to require a diversity of species to reduce vulnerabilities.

- Consider a City tree policy to define the risk management program and the requirements to apply to City operations when removing or working around City trees to meet or exceed private land requirements defined in the tree bylaw.

- Consider urban forest stewardship programs on City land, for example by encouraging residents to water newly planted trees, and developing online educational resources for developers and property owners on topics such as tree benefits, tree protection, tree care, and tree permit requirements.

Actions that are anticipated to have some of the biggest impacts on Langley City's canopy, but may require more time and resources to be implemented, include:

- **Updating policies and regulations** to increase tree protection and ensure replacement and growth of the urban forest, including consideration for a tree bylaw (action 1) and updates to development requirements through the Zoning Bylaw or Form and Character Development Permit Areas (action 2) and the Subdivision and Development Servicing (action 3).

- Seeking opportunities to transition to a more **proactive management of City tree assets** to improve tree health and longevity, including exploring having an inventory of urban tree assets (actions 16-17), adjusting staffing and budget as the inventory grows (action 20), as well as considering defining service levels (actions 17-18).

- Exploring opportunities to **plant more trees** across the City, with a focus on under-served areas with a low tree equity score (action 8) and support voluntary planting on private land (action 13).

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Appendices

1. Urban Forest 101

Why Do We Manage the Urban Forest?

Management is essential to preserve the health and longevity of urban forests. Trees, much like other types of City assets, require regular maintenance to maximize the benefits they provide the community and ensure a long service life. Strategic care can prolong a tree's life, enhancing its ecological, social, and economic contributions. Large, mature trees provide more wildlife habitat, are more effective at cooling, and become beloved landmarks for the community. However, large trees in urban settings also carry potential risks, such as dead or broken branches or lifting sidewalks, that need to be managed for public safety. Proper planning and management can minimize risks, maximize benefits and extend a tree's life.

Who Manages the Urban Forest?

Urban forest stewardship in Langley City requires a collaborative effort, involving the City, public institutions, private entities, and the community. While the City oversees trees on streets, parks, and natural areas, a significant portion of the tree canopy lies on private property, making community involvement essential for comprehensive forest management. Urban forest management requires coordination with, or assistance from, a wide range of partners. A brief overview of some of these partners is provided below:

- **City of Langley** manages trees and forests along streets, in parks, in environmentally sensitive areas, and on other City properties. The City also regulates tree removals and replacement on private lands and in street rights-of-way.

- **Residents/landowners** plant, maintain, and remove trees on their properties. They also benefit from, advocate for, and participate in the stewardship of trees and forests on public lands through committees, community organizations, and as individuals.

- **First Nations groups**, particularly the ʷɑːṅƛ̓əṅ (Kwantlen), Máthxwi (Matsqui), q̓íc̓əy̓ (Katzie) and e'mya'me (Semiahmoo) First Nations, have a long-standing but disrupted relationship with the land and trees in their unceded territories. As part of the journey towards reconciliation, it is important for the City, local organizations, and residents to understand the historical and ongoing impacts of colonial settlement and their traditional knowledge and practices for more equitable, inclusive, and sustainable practices.

- **NGOs**, such as the Langley Environmental Partnership Society and Langley City Parks Foundation, offer educational and stewardship opportunities to local communities and individuals and support greening and ecological restoration in Langley City.

- **BC Hydro and Fortis** plant, prune, and remove trees near utility lines.

- **Private industry arborists and landscape companies** provide tree-related professional services such as tree planting, pruning and risk assessment, to improve tree health and minimize tree hazards.

- **Metro Vancouver** manages forests and vegetation in regional parks. It also provides regional-level urban forestry and green infrastructure resources and guidance for member jurisdictions, and identifies, protects, and manages lands with unique natural biodiversity.

- **Province of British Columbia** regulates watercourses and their riparian areas and the Agricultural Land Reserve. The Province also monitors forest health and is responsible for native forest climate change adaptation strategies.

- **Government of Canada** provides funding for climate adaptation and mitigation, and regulates invasive pests, plants and diseases.

2. Policies and regulations that guide urban forestry

Enabling legislation

The *Local Government Act* and the *Community Charter* give the City of Langley power to introduce regulations and protection requirements for the urban forest within its boundary.

Higher level strategies and plans

The **Official Community Plan (OCP)** includes a vision that acknowledges the importance of nature in tackling climate change issues, restoring ecological health, and making people-friendly streets and great public places that cater to all users. The urban forest is addressed in 19 policy statements, including promoting park dedication and acquisition for new development, retention of mature trees, enhancement of trail and green space connectivity, and integration of natural assets in the current asset management program. The OCP also establishes Development Permit Areas (DPAs) for enhanced protection of the Environmentally Sensitive Areas (ESAs) (e.g., restricting development in ESAs with moderate to high values), and regulated development activities within the DPAs (e.g., imposing stricter requirements on DP applications and stricter form and character requirements).

The **Sustainability Framework** is a guiding document that outlines the City's sustainability commitment and goals. The urban forest and trees are recognized in four focus areas and goals: 1) Arts, culture, and heritage, 2) Health, safety, and well-being, 3) Natural areas, parks, and recreation, and 4) Water.

The **Parks, Recreation, and Culture (PRC) Master Plan** (2022 draft) aims to strategically guide and manage the direction of parks, recreation, and culture for the next 10 years. The plan specifies park planning and management directions, such as land acquisition in developing areas to reach a minimum of 0.6 hectare park size and improve park access for residents.

The **Nature Trails Network Plan** is a long-term strategy for enhancing the City's trail system. It offers recommendations and guidelines supportive of retaining existing mature trees and vegetation, prioritizing native species in natural areas, and restoring disturbed areas.

Lastly, developing an Urban Forest Management Strategy was specified in City-level documents such as the **Interim Strategic Plan 2021-2022** and **Strategic Plan 2017-2021**.

Bylaws, policies, and guidelines

Langley City regulates its urban forest through several bylaws, policies, and guidelines. On private lands, the management of trees relies on a combination of Zoning Bylaw, Development Permit Area (DPA) Guidelines, and Floodplain Elevation Bylaw. The **Zoning Bylaw** specifies landscaping requirements, including the provision of buffers, screens, and amenity space in areas zoned for different uses. The **DPA Guidelines** define specific requirements for tree planting in designated areas, such as commercial parking spaces and plazas. In Environmentally Sensitive Areas (ESAs), the **ESA DPA Guidelines** and **Floodplain Elevation Bylaw** work together to protect trees by limiting development and enforcing protection and setback requirements.

Trees on City-owned land, such as parks and roads, are subject to the Subdivision and Development Servicing Bylaw, Parks and Public Facility Regulation Bylaw, and Design Criteria Manual. The **Subdivision and Development Servicing Bylaw** specifies requirements on street tree planting, park space conveyance and the warranty of developer-planted trees. The **Parks and Public Facility Regulation Bylaw** protects park trees from damage and unauthorized removal. For boulevard trees, the **Design Criteria Manual** provides detailed planting specifications, such as soil volume, species and spacing.

Regulations of trees in the City of Langley

KEY
Public | Private

Urban Forest Management Theme	Trees in forested and landscaped parks	City-owned street trees	Private yard trees	Private trees in riparian and other ESAs
Planting new trees	The **Subdivision and Development Servicing Bylaw** may require 5% parkland conveyance or cash-in-lieu for large subdivisions that create three or more new lots. No other formally adopted policy guides tree planting in forested landscaped parks.	The **Subdivision and Development Servicing Bylaw** requires boulevard tree planting for areas with **OCP** land use designations as a minimum service requirement. Boulevard planting should follow the City's **Design Criteria Manual**, which provides detailed requirements on soil volume, tree species and sizes, spacing, planting for boulevard tree and vegetation.	The **Zoning Bylaw** defines landscaping requirements to screen lots of different uses, increase pervious areas, provide outdoor greenspace or urban agricultural amenity areas. The **Form and Character DPA Guidelines** require tree planting in commercial parking lots, in plazas and squares, or in interior pathways. **Other DPA Guidelines** require or encourage tree planting for screening, traffic calming and decorative purposes.	No formally adopted policy guides tree planting in riparian and other ESAs.
Protecting and replacing trees	The **OCP** enables use of density bonusing to provide parks and open space. The **Parks and Public Facility Regulation Bylaw** forbids any action that damages, remove trees, including deposit any waste, offensive materials or other substance of any kind into or upon any trees. The park conveyance required by the **Subdivision and Development Servicing Bylaw** may need to be kept in a natural state and follow specific protection measures such as fencing.	The **Subdivision and Development Servicing Bylaw** requires an offsite tree protection plan for areas with OCP land use designations as a minimum service requirement. During construction, the **Subdivision and Development Servicing Bylaw** requires tree protection measures for offsite trees.	No formally adopted policy guides the protection and replacement of trees in private yards outside of the ESAs and protected riparian areas.	The **Environmentally Sensitive Area DPA Guidelines** introduces setback and information requirements to protect the ESAs and discourages development close to mature and large tree stands. The **Floodplain Elevation Bylaw** specifies setback requirements for development in floodplain of Nicomekl River and other watercourses.
Maintaining trees	No formally adopted policy guides tree planting in forested and landscaped parks.	The **Subdivision and Development Servicing Bylaw** requires developers to maintain newly planted City trees period of 1 year and specifies boulevard maintenance requirements (e.g., weed control and irrigation).	No formally adopted policy guides the maintenance of trees in private yards.	No formally adopted policy guides the maintenance of trees in riparian and other ESAs.

Measuring tree canopy

Light detection and ranging (LiDAR) is a remote sensing technology that uses laser light to measure distance and create a detailed, 3D representation of the Earth's surface and its features.

How LiDAR works: LiDAR data is usually acquired from a plane or drone that emits laser pulses vertically toward the ground. The technology measures distance to the ground based on the time required for the laser light to rebound on the surface to create a 3D point cloud of the ground, trees, and buildings. For this Strategy, the project team used aerial imagery in combination with LiDAR to create a high resolution tree canopy map, then used a technique called individual tree detection to isolate individual trees. This method provides information about tree heights and counts, allowing further analysis of forest structure and categorization.

Individual tree detection provides an coarse estimate of the count of overstory trees. Tree counts presented in the Strategy are very approximate and accuracy would be improved with a comprehensive tree inventory.
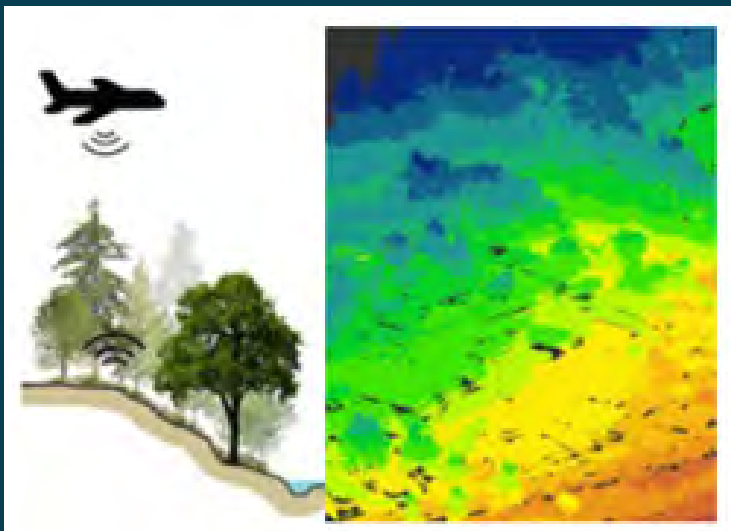
Canopy Cover Change

Canopy cover changes as trees grow, decline, or get removed due to natural causes or human activities. Tracking these shifts over time can shed light on the drivers of change that the Strategy can address. For example, identifying locations where the tree canopy is declining can inform actions to reverse trends. Conversely, increases in canopy cover can indicate successful management practices or the natural growth of the urban forest.

Langley City's canopy cover change was tracked for 2010, 2016 and 2021 using two types of datasets: combined LiDAR and aerial imagery, and a statistical tool called i-Tree Canopy[1]. The datasets provide an estimate of citywide canopy cover for each of the three years (Figure A1), and datasets from 2016 and 2021 allow fine-scale spatial comparisons of changes across the City (Figure A2).

Figure A1 reveals a decline in Langley City's canopy cover, dropping from 20% in 2010 to 17% in 2021. Detailed canopy mapping for 2016 and 2021 provides insights as to where and why those changes took place. It is important to note that although the mapping, which uses mixed datasets of LiDAR and aerial imageries, indicates a 1% canopy reduction from 2016 to 2021, seasonal differences in when the LiDAR was flown in each year mean that the decline may be overstated (see limitations below).

Even accounting for seasonal differences in the measurements, there are areas of notable canopy change. Pronounced canopy losses, illustrated in red in Figure A2, span the City but are more concentrated in its western and southwestern regions. Canopy growth in the City is attributed to the natural maturation and expansion of trees over time. Prominent areas with increased canopy cover are indicated by green circles in Figure A2.
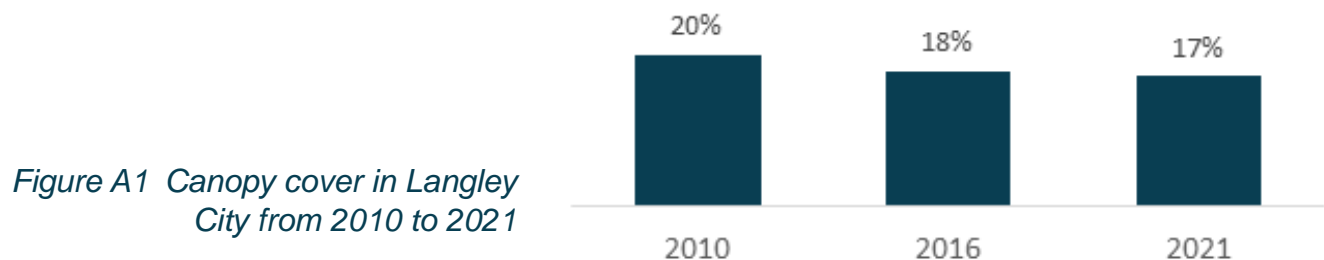
Figure A1 Canopy cover in Langley City from 2010 to 2021

Data Limitations

Tracking changes in canopy cover requires datasets to be comparable to avoid capturing trends that are due to data limitations rather than real change. One common issue with comparing canopy data extracted from LiDAR and aerial imagery is seasonality; when data is captured while deciduous trees don't have leaves, the data tends to underestimate the extent of canopy they provide because finer branches at the edge of canopy might not be captured by the data. In Langley City, the 2021 canopy data combines leaf-off LiDAR data with leaf-on aerial imagery to minimize the underestimate. The seasonality of the data means that 2021 canopy cover might underestimate slightly the growth of deciduous trees as compared to the 2016 data. The 2010 data uses a tool based on aerial imagery that provides a good citywide comparison, but unlike the data extracted from combined LiDAR and imagery data, does not allow us to identify specific areas of loss and gain within the city.

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1   i-Tree Canopy is a tool developed by the USDA Forest Service that helps users estimate land cover, including tree canopy cover using aerial imagery.
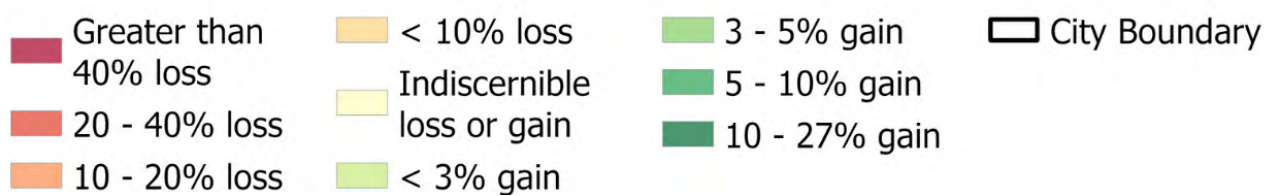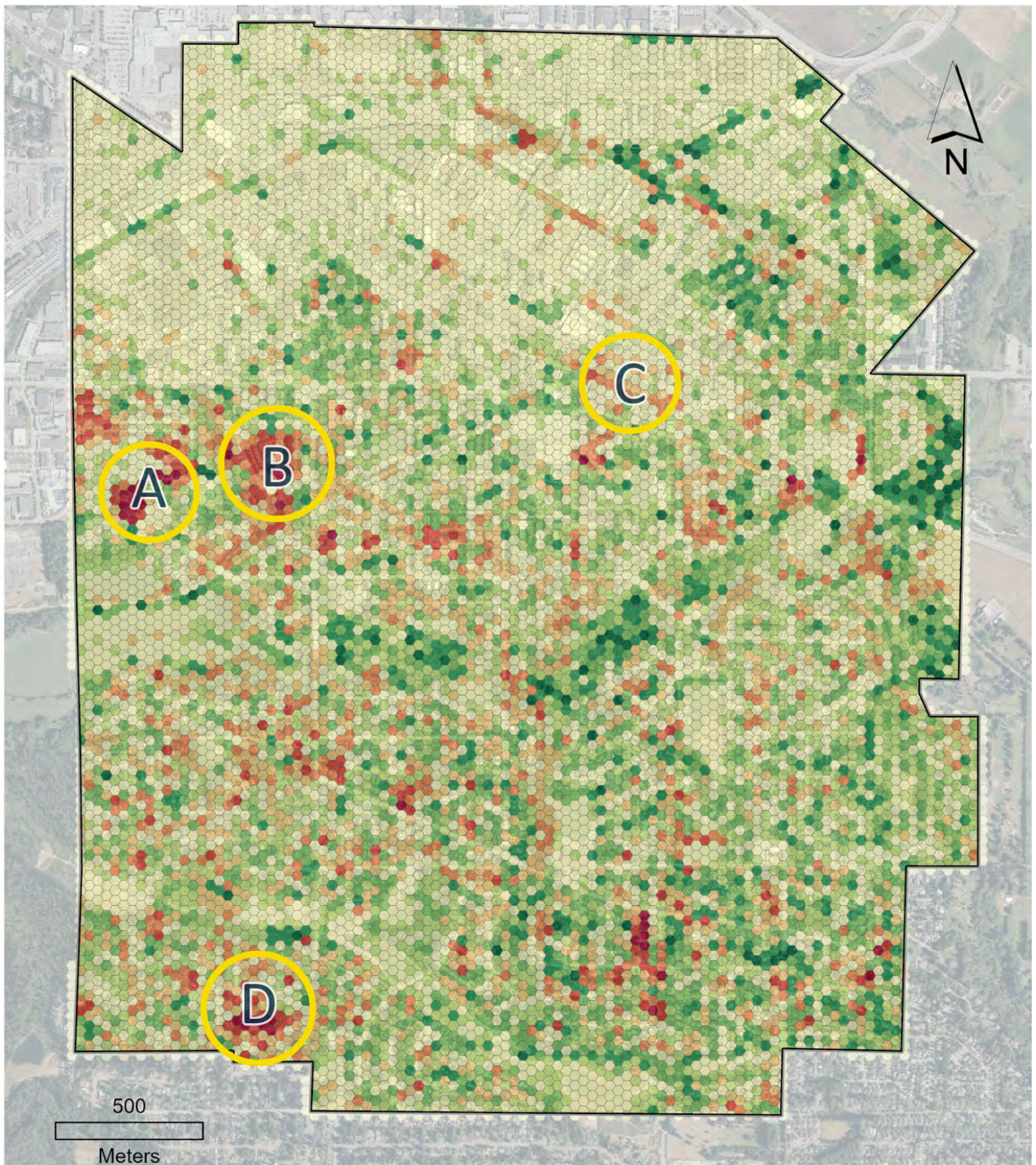
Figure A2 Map of canopy change from 2016 to 2021 (see examples A-D of canopy change on the following pages)

Legend:
- Greater than 40% loss
- 20 - 40% loss
- 10 - 20% loss
- < 10% loss
- Indiscernible loss or gain
- < 3% gain
- 3 - 5% gain
- 5 - 10% gain
- 10 - 27% gain
- City Boundary

A **Example of tree loss in Brydon Park for the construction of open park spaces and additional development:**

B **Example of tree loss for the development of low rise residential building at 55a Ave and Brydon Crescent:**

C **Example of street tree loss in the historic downtown core:**

2016

2021

D **Example of tree loss in Hunter Park for construction of open park spaces:**

2016

2021
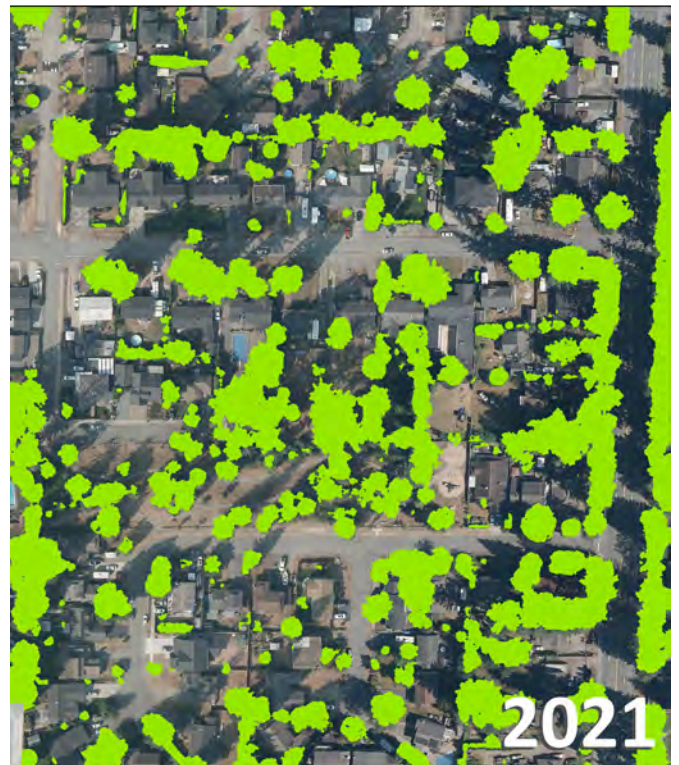
By land use

The majority of the canopy loss was recorded in areas for suburban and low-rise residential OCP land uses, representing 40% and 31% of the total canopy change, respectively (Figure A3). The pronounced loss in low-rise residential and possibly suburban regions can be attributed to increased redevelopment activities within these areas. In contrast, parks and open spaces defied this trend, registering the highest canopy gain at 8%. Other land uses experienced minimal changes in their canopy cover.
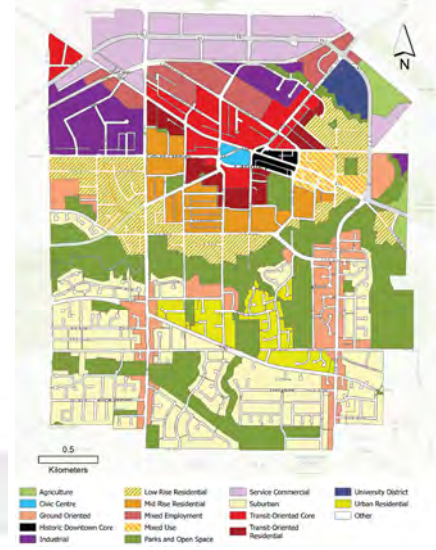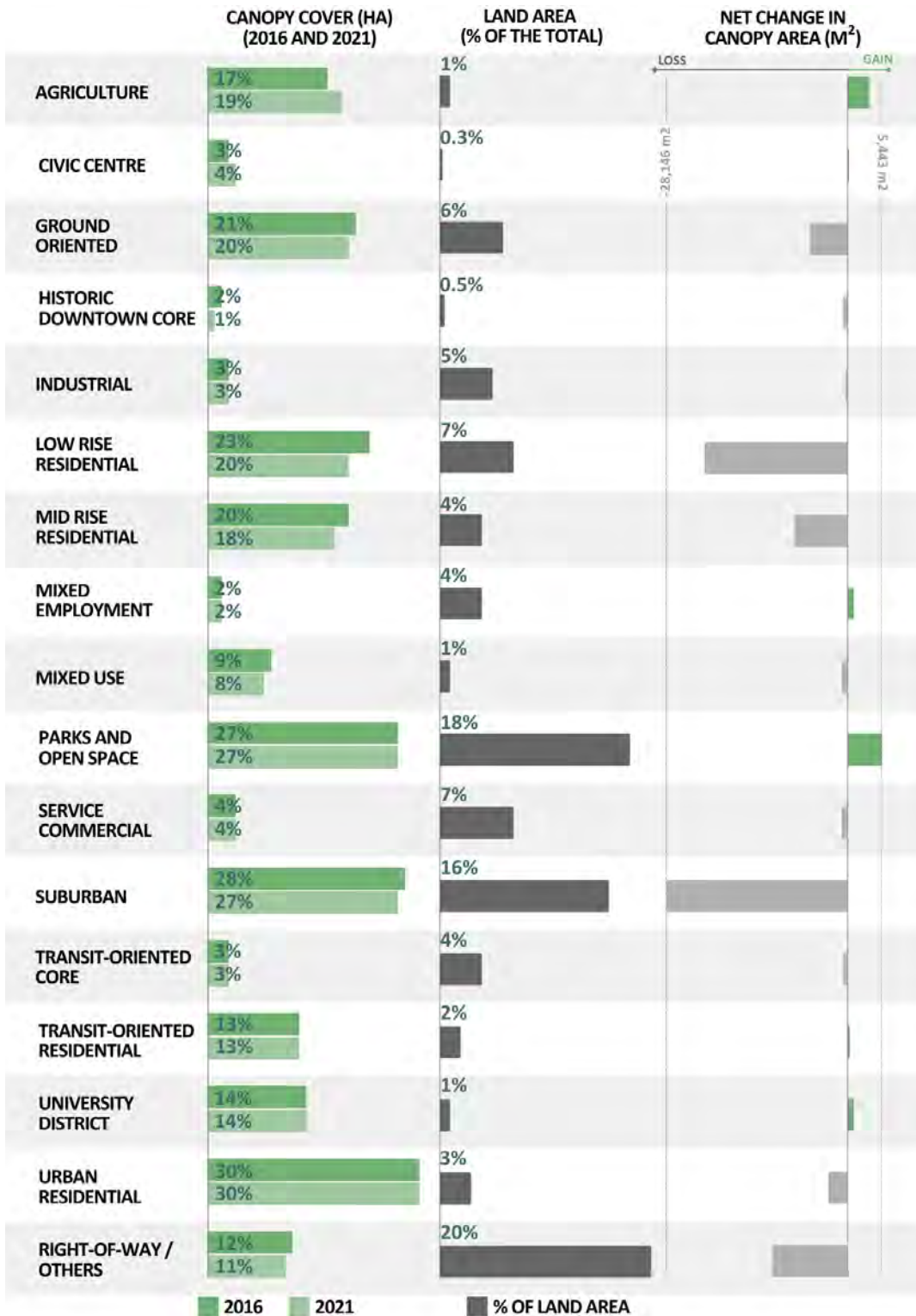
Figure A4 Official Community Plan land use designations

Figure A3 Canopy cover, land area and canopy change from 2016 to 2021 summarized by land use

Impermeability and tree planting

Cities tend to become increasingly impermeable as urbanization leads to soil being covered by paved surfaces like asphalt or cement and buildings. Areas with a high impervious surface cover see more surface water runoff when water can no longer infiltrate the ground, leading to higher flooding risks and declining water quality and soil moisture. Impervious surfaces also emit more heat and create what is known as the urban heat island effect (see page 53).

Highly impermeable areas in Langley City are concentrated north of the Nicomekl River and correspond to areas with some of the lowest tree canopy cover in the City (Figure A5). The high prevalence of impermeable surfaces makes tree planting more challenging because there are usually fewer opportunities for trees to access sufficient soil volume and water. Retrofitting space for trees to grow in highly impermeable areas is possible but more costly than where opportunities to plant trees in existing soil are available.

An example of a very impervious surface

An example of a very pervious surface

Pervious

Impervious

Figure A5 Map of pervious and impervious areas in the City

Urban heat and the urban forest

Cities are warmer than surrounding rural areas. This is a phenomenon known as the urban heat island effect[9]. One of the main causes of the urban heat island effect is urbanization. Buildings, roads, and paved surfaces in urban areas absorb solar radiation during the day and slowly release it in the evening. Hard surfaces holding heat leads to higher temperatures in the City, both day and night. Hard surfaces also reduce space for trees and vegetation that would help cool the surroundings through shade and evapotranspiration[10,11]. Urban heat islands are made more dangerous by the increasing frequency of extreme heat events that raise temperatures to levels that threaten human health[12,13].

Extreme heat can cause heat exhaustion and heat stroke, especially for vulnerable groups like the elderly and individuals with pre-existing health conditions[14]. A real-world example that underscores the severe human health impacts of extreme heat is the 2021 heat dome event in British Columbia, Canada. This unprecedented event led to temperatures soaring well above the average, reaching records of up to 49.6°C. The intense, sustained heat resulted in a catastrophic increase in sudden deaths, with the provincial Coroners Service reporting nearly 600 more deaths than the five-year average for the same time period[15]. Figure A6 shows the land surface temperature in the City of Langley on June 30, 2021, during the heat dome. The temperature varied by over 10°C, with the hottest spot concentrated in the most impervious areas while the coolest spots were found in areas that have a high pervious and tree canopy cover.
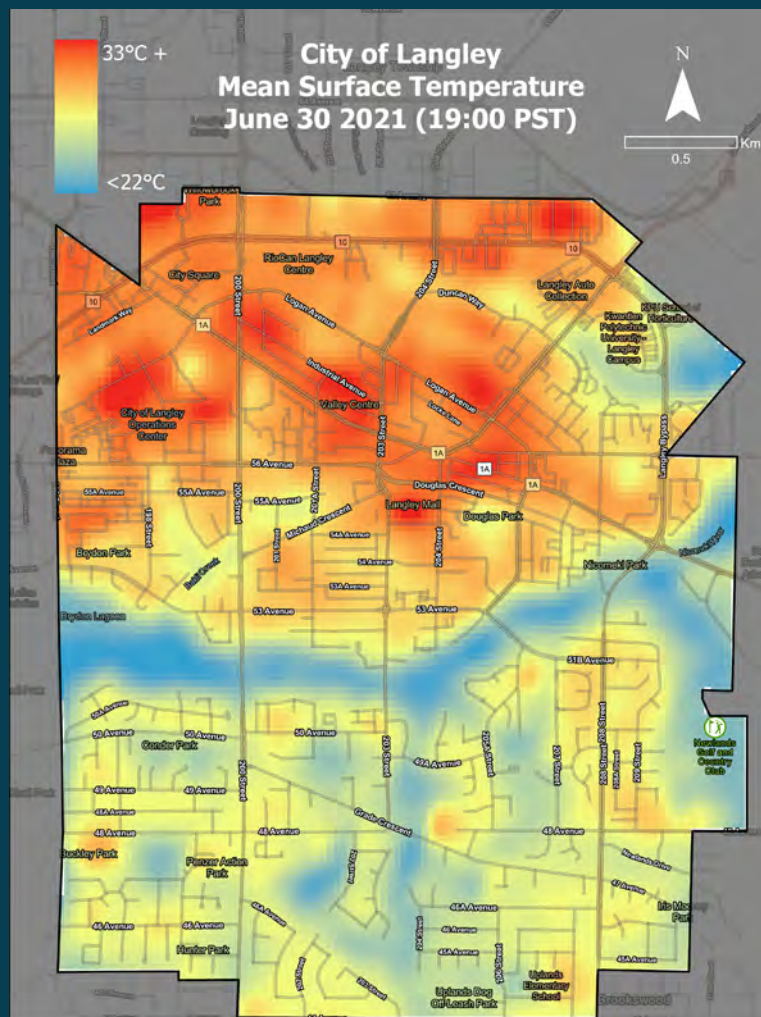
Figure A6 Land surface temperature derived from satellite image taken on June 30, 2021

Urban Forest Structure

Within Langley City's urban forest, trees grow in a variety of contexts. These contexts contribute to the structure of the urban forest, which can be thought of as the size, species, age, and arrangement of trees and how it varies. While trees of different sizes and ages have their role in a healthy urban forest ecosystem, large mature trees provide the greatest benefits to the community and the environment. For this reason, urban forest management should strive to create the conditions for large trees to thrive wherever possible.

The analysis of Langley City's tree canopy involved a cutting-edge single tree detection technique that provides tree count, height and type (coniferous vs. deciduous) information of every individually segmented tree canopy (each means one tree). The information allows a better understanding of the structure of the urban forest.

Most trees in Langley City (79%) are under 20 meters in height, suggesting a relatively young urban forest in the City. These trees collectively contribute to 55% of the overall canopy in the City. In contrast, taller and more mature trees account for a small proportion of the urban forest population, with trees over 30 meters tall representing only 7%. Nevertheless, these mature trees contribute to 16% of the total tree canopy cover.
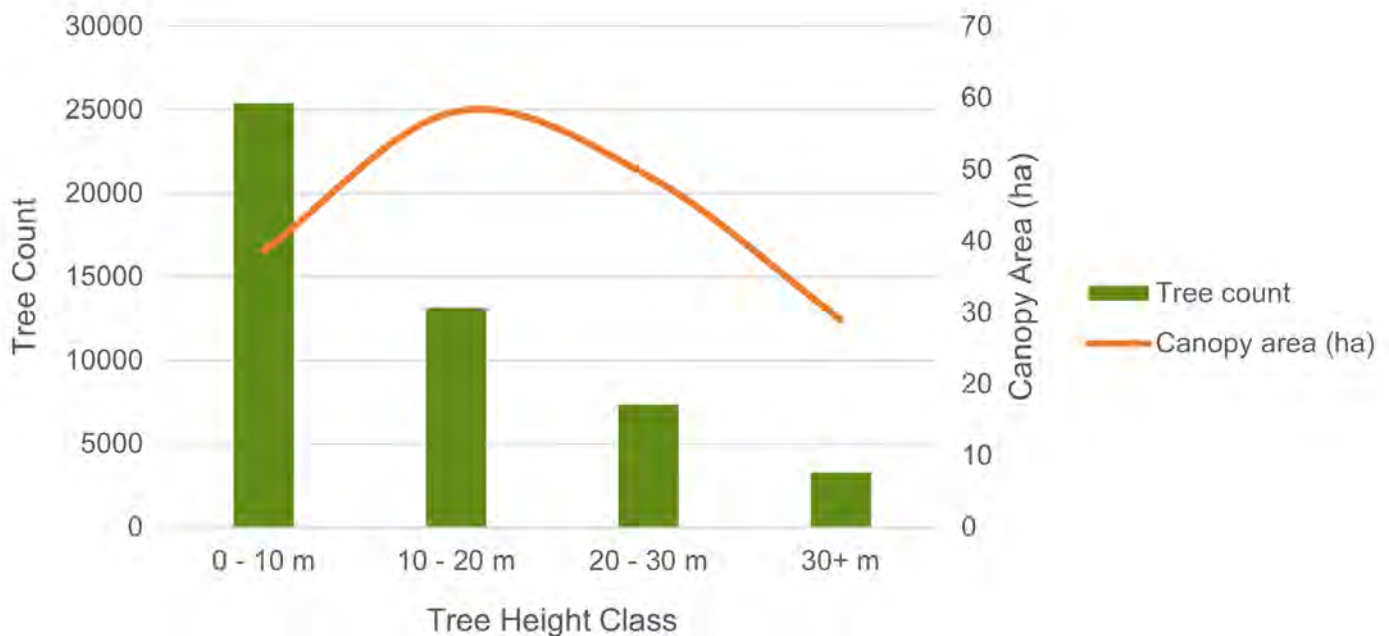
Figure A7 City-wide tree count and canopy area by height class

To gain a better understanding of which areas rely on small or young trees for their canopy cover and which areas have a higher number of large and mature trees, it is helpful to explore the relationships among tree count, canopy area, and tree height in different parts of the City. Figure A8 shows the urban forest structure information in environmentally sensitive areas (ESAs, including forested natural areas on both public and private lands) and the urban areas (i.e., areas outside of the ESAs).

In urban areas, trees tend to be smaller and younger, with 56% of trees being under 10 meters tall. Among all height classes, trees of 10-20 meters tall provide the most canopy cover, representing 36% of the total canopy cover in urban areas. Langley City's natural areas have a very different structure (Figure A8). Within mapped ESAs, there is a more even distribution of small to large trees. Trees taller than 30 metres, likely the oldest in the population, contribute most significantly to the canopy in natural areas, at 20%.
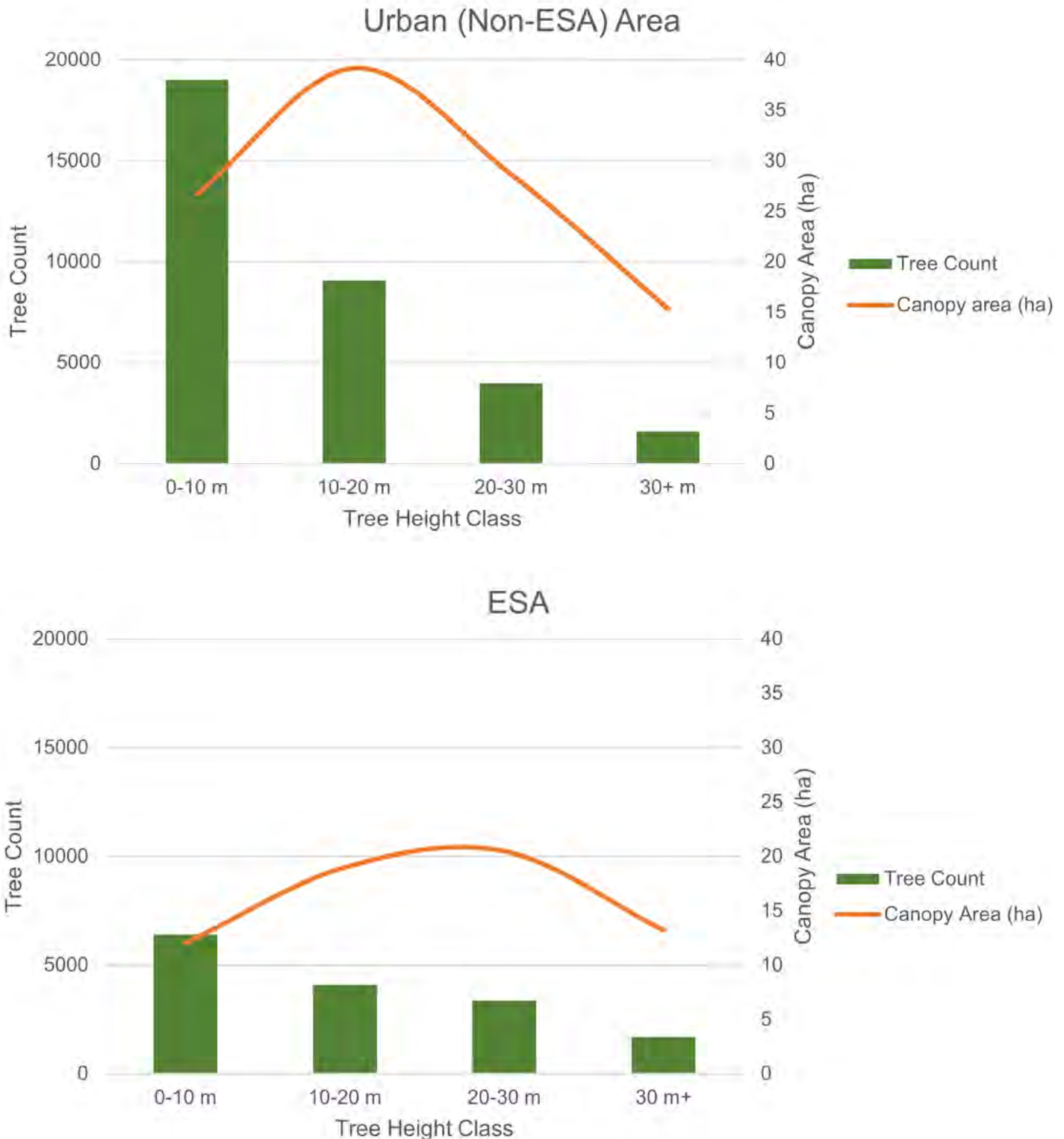
Figure A8 Tree count and canopy area by height class in urban areas (non-ESA area; top) and ESA area (bottom)

Tree type

The majority of Langley City's urban forest is deciduous, making up 61% of the total canopy cover (Figure A9). Among these deciduous trees, 57% are located on private land, while the remaining 43% are distributed along streets, in parks, and other publicly managed areas. Coniferous trees, on the other hand, are more commonly found on private properties (especially in the southern section of the City), accounting for 79% of the citywide coniferous tree canopy cover.

Figure A9 Distribution of deciduous and coniferous trees in Langley City, based on 2021 canopy data

City of Langley
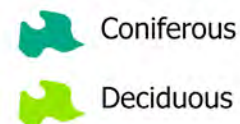
Tallest trees

Although the most common native trees in Langley City can reach heights of well over 30 metres, only 7% of trees reach exceed this threshold, with 1% of trees being over 40 meters tall. Most tall trees are found in forested natural areas, primarily in upland and riparian forests where conifers dominate. The tallest tree, standing at 53 meters in 2021, is a grand fir on the banks of the Nicomekl River, as illustrated in Figure A10.
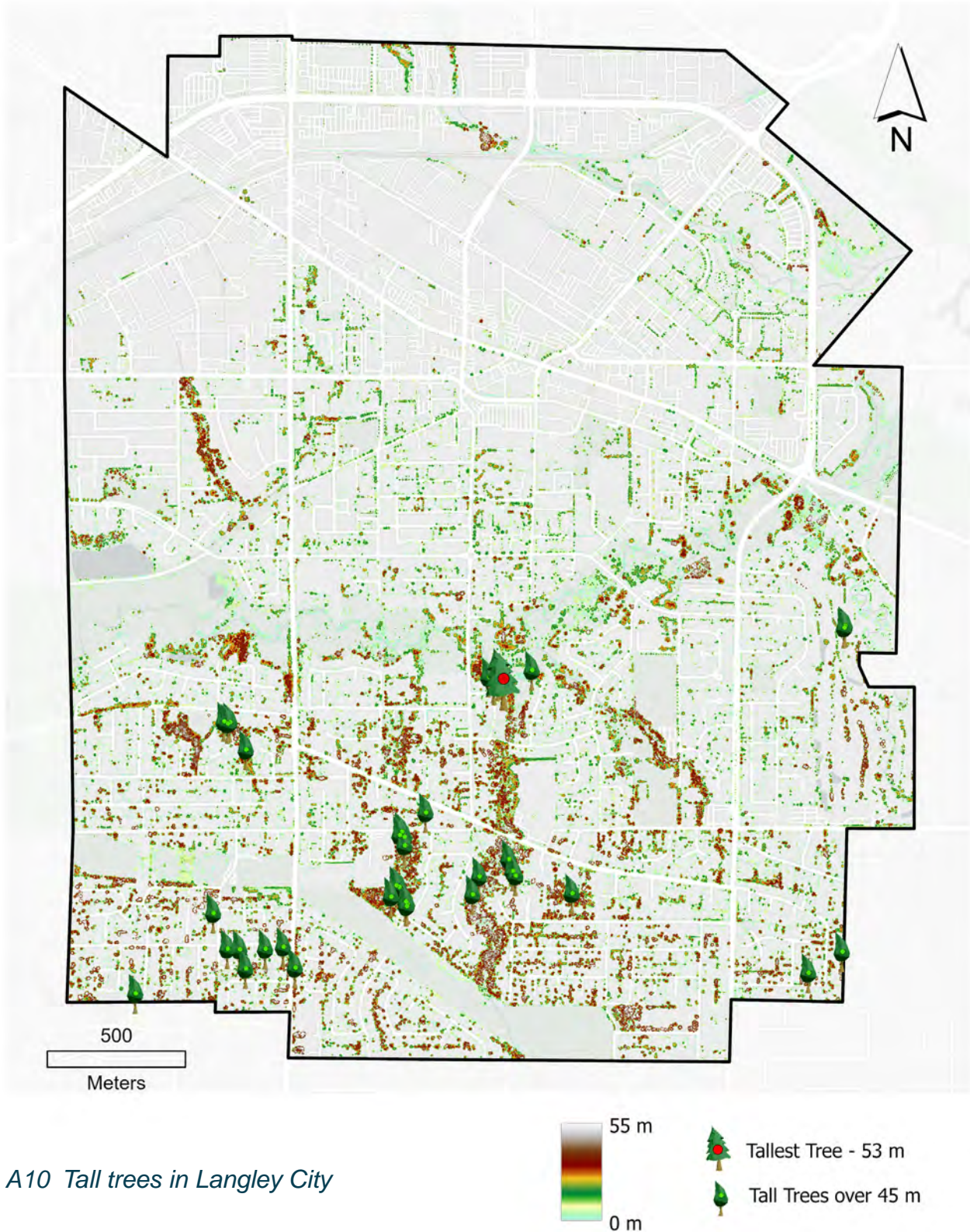
Figure A10 Tall trees in Langley City

Forested Natural Areas

About 30% of Langley City's trees grow in forested natural areas. While most of the trees in natural areas are native species, many natural areas contain non-native tree species as well, some of which may be naturalizing or invasive. Natural areas in Langley City are fragmented by urban development, which makes them more vulnerable to disturbance and ecological change.

Forested natural areas in Langley City can be placed in three main groups: upland forests, lowland forests, and riparian/ravine forests. Consulting staff conducted field assessments to determine the characteristics of the City's forested natural areas. See Figure A11 for the locations of field assessments.
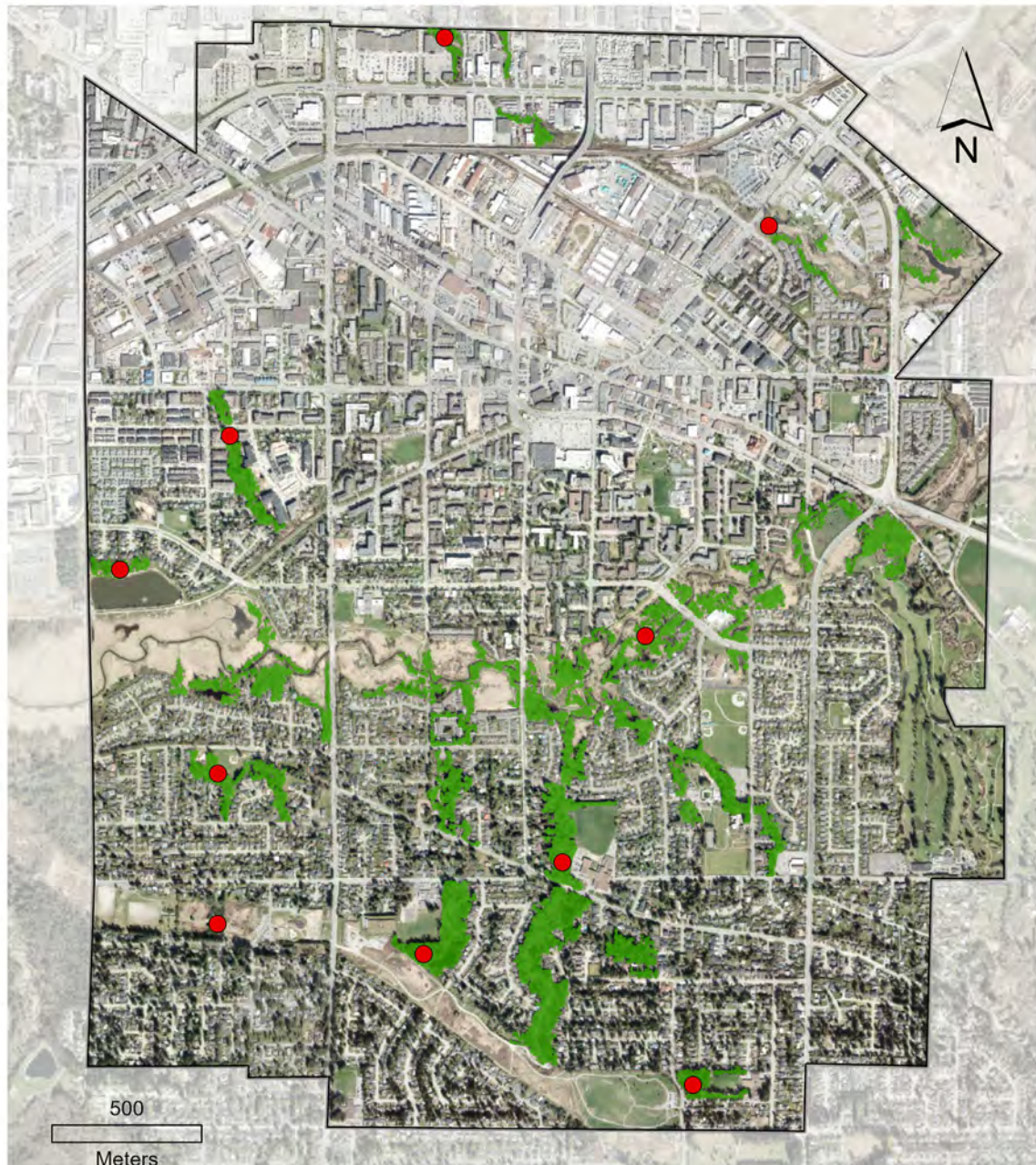
Figure A11 Locations of field assessments in the summer of 2023

Upland forests

Upland forests are often composed of coniferous tree species like Douglas-fir and western redcedar, with other species like western hemlock and grand fir seen occasionally. These forests are the legacy of logging and land clearing that occurred in the Fraser Valley between 1858 and the mid-1950s, as well as early fires that were often set for land clearing purposes. When approaching maturity, these forests are often dense and dark enough to exclude regenerating young trees. However, both younger and older upland forests can have vibrant communities of understorey shrubs and plants like salal, Oregon-grape, red huckleberry, sword fern, and regenerating trees. Increasing drought is an important threat to these forests, which can have deep water tables during the summer months. Western hemlock and western redcedar are particularly vulnerable to drier soils. When disturbed, such as so-called old-field sites, uplands also support forests of short-lived deciduous species like red alder and black cottonwood.

Lowland forests

Lowland forests are mainly composed of fast-growing deciduous species today, although in the past they would have included more coniferous trees. Forests that grow in the floodplain of the Nicomekl River must tolerate frequent flooding and waterlogged soil. Red alder and black cottonwood are common tree species, sometimes forming closed canopy forests that sit just above the water table. The lowest and wettest sites are often occupied by shrub communities with scattered willow trees. Conifers tolerant of wet soils are found in these forests, like Sitka spruce, grand fir, and western redcedar, while shore pine is sometimes found in association with peat soils or small bogs. These forests can be particularly vulnerable to invasion by invasive plant species, which are often transported by water, animals, and humans along the corridor. Illegal dumping and water pollution are other important issues. Short-lived deciduous trees are often associated with elevated hazards to trails and park infrastructure because of their rapid decay profile.

Riparian/ravine forests

Riparian forests occupy the many ravines that flow from uplands towards the Nicomekl River in Langley City. They often contain mixtures of deciduous and coniferous species, and because of their unique terrain can contain trees both tolerant and intolerant of flooding. Any of Langley City's native tree species can occur here. Forest canopies in riparian areas are often patchy, with occasional gaps between large trees, which allows rich understorey plant communities to develop. Because riparian areas were often spared from land clearing fires or logging, many of Langley City's oldest, largest trees are found in them. Riparian areas are important connections for wildlife between upland and lowland areas, and provide important recreation and greenspace in Langley City's residential areas. They can be impacted by invasive species issues, illegal dumping and camping, erosion from inadequate or broken water control structures, and soil compaction from unauthorized trails.

Significant Stands

There are over 51 ha of forest stands in the City of Langley, contributing to 30% of its citywide canopy cover (Figure A12). These forests support ecosystems for a diverse range of wildlife, with 80% of the forests offering moderately high to high environmentally sensitive area value, a value to measure the significance of ESAs according to the City's Environmentally Sensitive Areas Mapping Study in 2015 (Figure A13).

Figure A12 Forest stands of different levels of ESA value
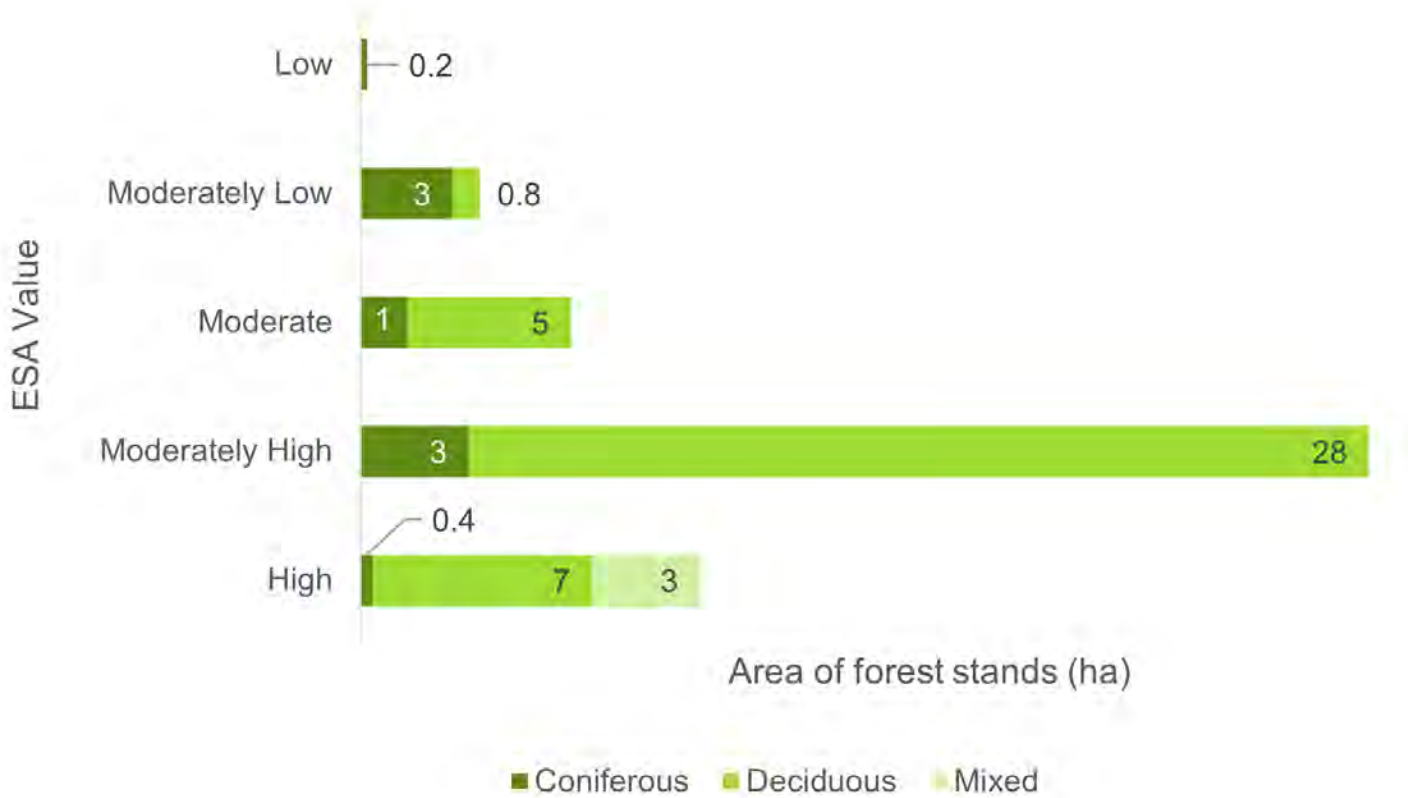
City of Langley

Figure A13 ESA values of different forest stands in Langley City

Environmentally Sensitive Area Mapping Study (2016)

The City of Langley initiated an Environmentally Sensitive Area (ESA) Mapping Study in 2015, an update from the earlier planning based on data from 1997 and 2002. This project, guided by the Official Community Plan (2005) and Sustainability Framework (2010), emphasizes the protection of ESAs and the creation of an ecological network for biodiversity and recreation. The study identified various natural features such as riparian areas, forest patches, and ecological corridors (Figure A14), assessed their ecological value (Figure A15), and provided 38 prioritized management recommendations. These recommendations span planning, conservation of species, addressing climate change, and community involvement. The project also established a monitoring framework to track ecological health and management performance over time, ensuring Langley's continued commitment to environmental preservation and a livable community.
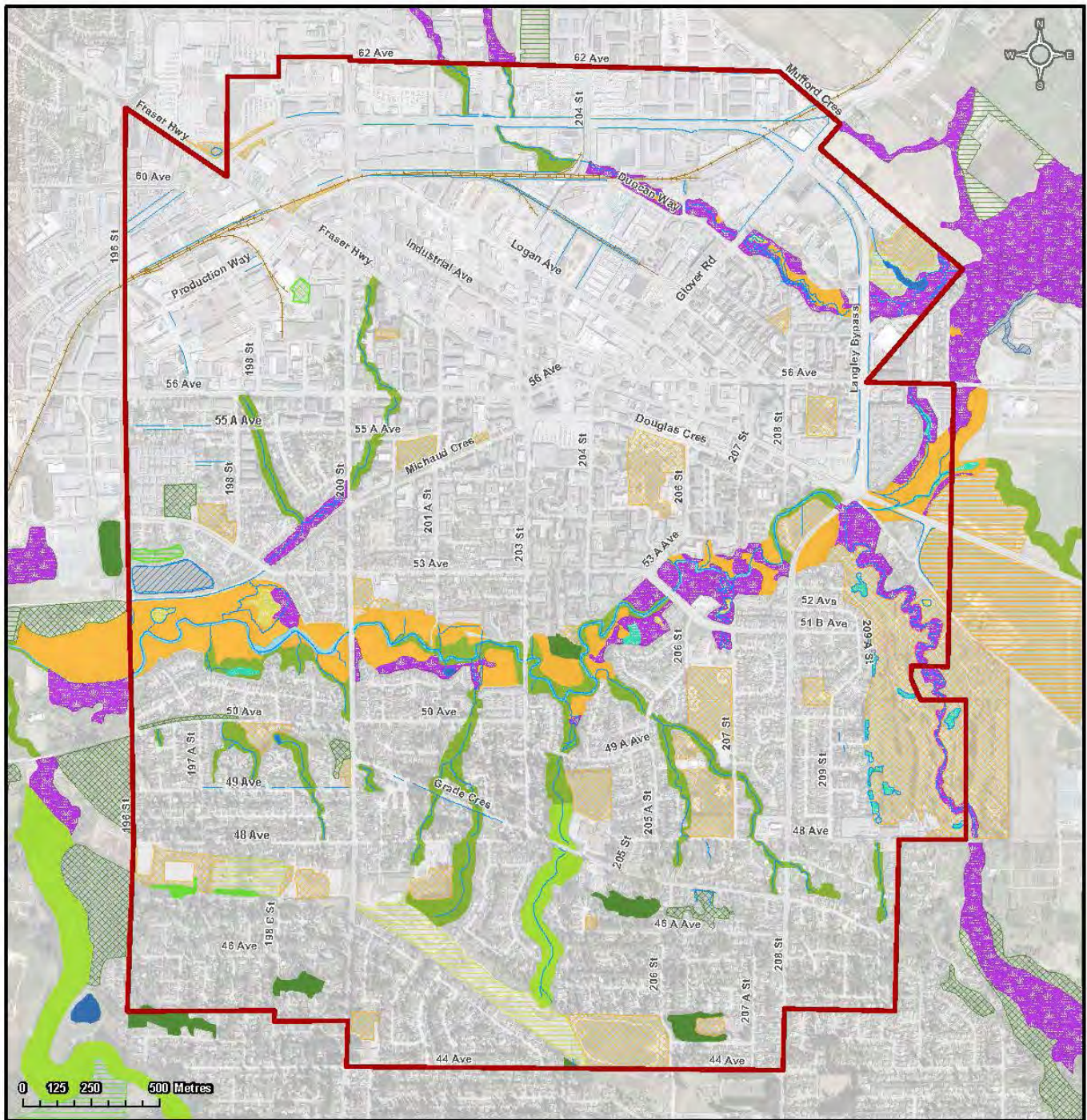
Legend

City of Langley Boundary	Modified Ecosystem (agriculture)	Wetland (marsh)
Watercourses	Old field	Wetland (swamp)
Railway	Mature Forest (coniferous)	Wetland (shallow water)
Freshwater (pond)	Mature Forest (mixed)	Young Forest (broadleaf)
Freshwater (reservoir)	Riparian (fringe)	Young Forest (coniferous)
Modified Ecosystem (reed canary)	Riparian (gully)	Young Forest (mixed)
Modified Ecosystem (turf)	Riparian (river)	

Sensitive Ecosystem Inventory

Project:
Langley ESA Mapping Study

Client:
City of Langley

Drawn By: D. Lishman and C. Lefrancois

Date: Oct. 29, 2015   Ortho Year: 2014

DIAMOND HEAD

Figure A14 Identified natural areas and features from the ESA Mapping Study 2016

Figure A15 ESA value map based on four aspects: ecosystem rarity, species of conservation concern, floodplain mapping, and watercourse and riparian

Tree Equity

A critical aspect of urban forest planning and management is equity, specifically regarding how people access and enjoy the benefits provided by the urban forest. It is noteworthy that Langley City's urban forest is not equitably distributed across the City. To gain a more thorough understanding of the urban forest distribution and whether it is situated where it is most needed, a quantitative method known as the Tree Equity Score (TES) developed by American Forests was used[16]. The TES gauges the equitable distribution of a city's urban forest, considering a combination of factors such as climate, income, and employment (Table A1). The scores serve as a tool for cities to discern areas that should be prioritized for improvement in tree equity. A lower TES suggests a more pronounced gap in tree canopy coverage in priority areas, thereby indicating a higher priority for increasing tree canopy.

Table A1 Priority index indicators used in calculating TES by census dissemination area

| Indicator	Metric	Description
Climate	Temperature	Average land surface temperature, as measured from remote sensing data
Income	People in poverty	Percentage of people living on income 200% below the federally-designated poverty line (<$40,000 per year)
Age	Dependency ratio	Ratio of seniors (age 65+) and children (0-14 years old) to working age adults (15-64)
Race	People of colour	Percentage of people belong to visible minority group as defined by the Employment Equity Act and, if so, the visible minority group to which the person belongs to.
Employment	Unemployment Rate	Percentage of people who do not have a job, but are available and looking for one
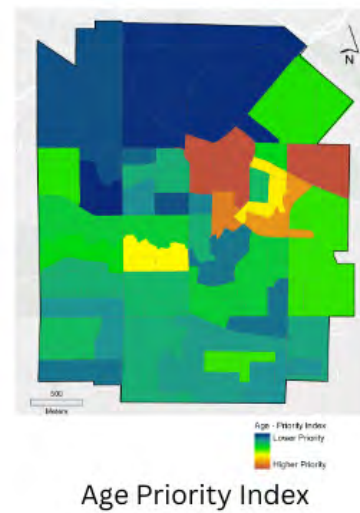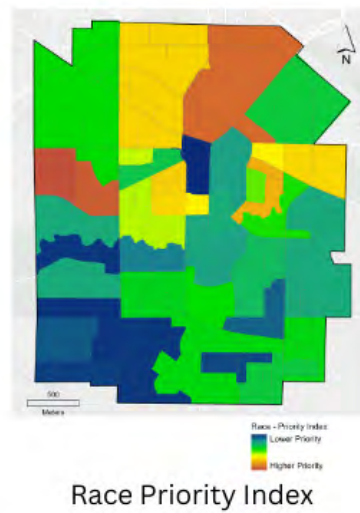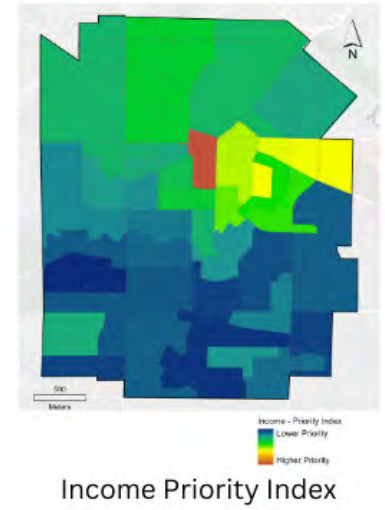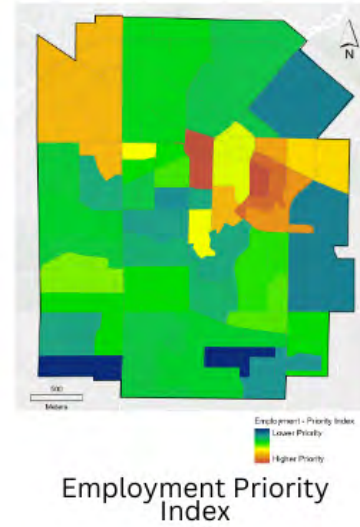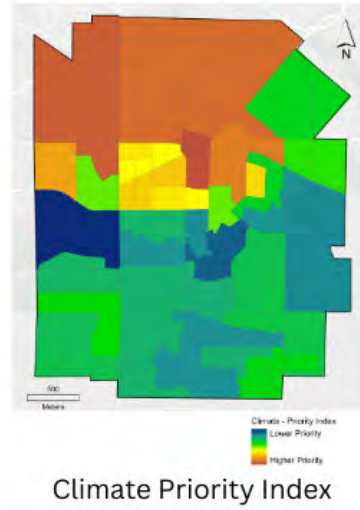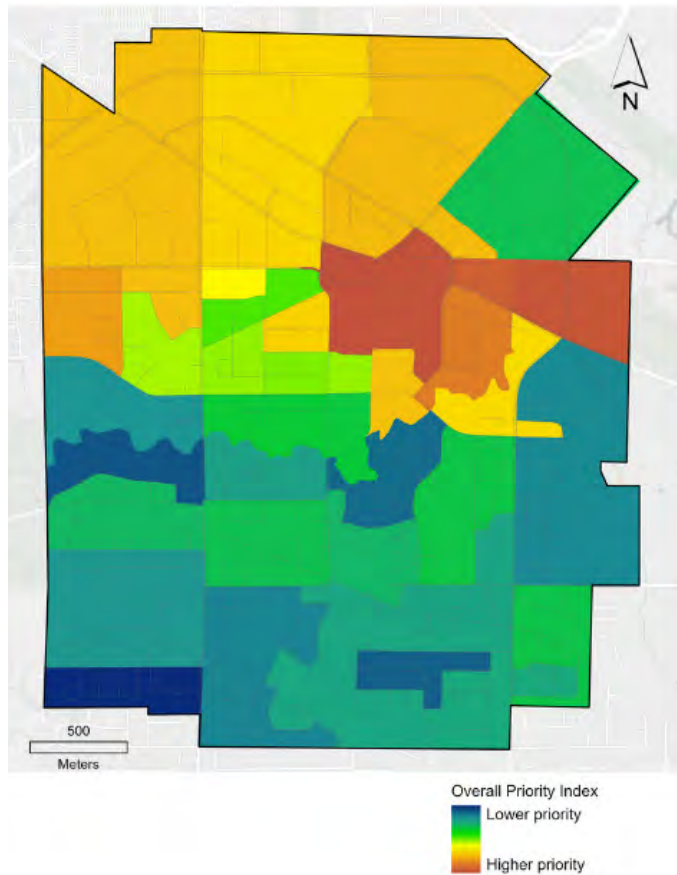
Figure A16 Priority index map based on climate, income, race, age, and employment factors

As illustrated in Figure A17, while some areas have the highest possible TES (100 out of 100), many areas, especially in the northern part of the City and around the downtown area, have relatively low TES (lowest at 54). These findings suggest that the urban forest in these areas may not be adequately serving its residents and might require targeted planning interventions to promote equitable distribution.
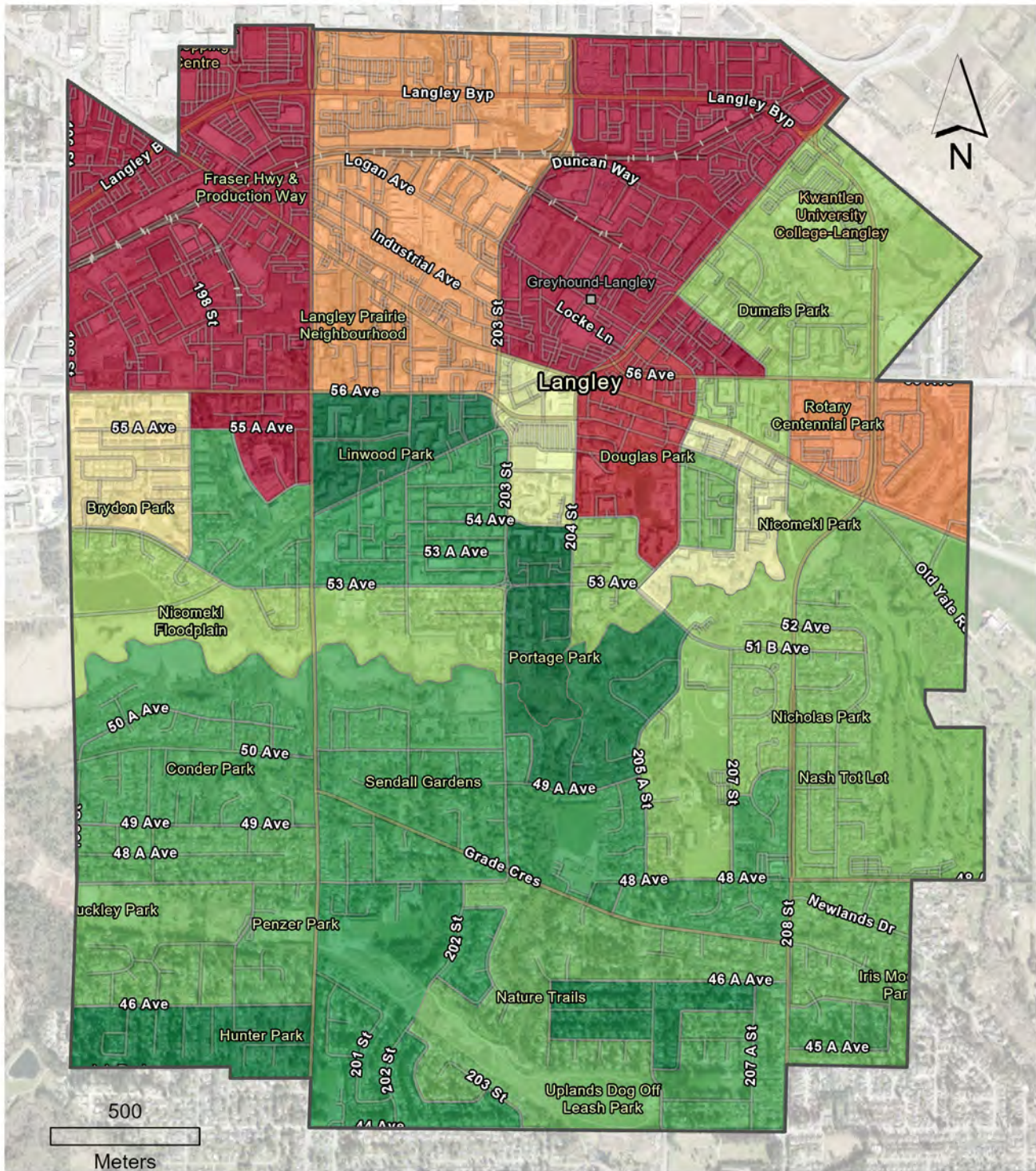
Figure A17 Tree equity score by census dissemination area

4. Engagement Summaries

City of Langley Urban Forest Management Strategy

Phase 1 Engagement Summary

September 2023

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1.0   Scope of the Engagement

The City of Langley is developing an Urban Forest Management Strategy (UFMS) to manage and grow the urban forest over the next 30 years (to 2050). Langley's urban forest faces complex challenges from increasing development and climate change impacts. The UFMS will establish a community-supported vision and goals, as well as supporting implementation recommendations, to effectively address the current challenges confronting Langley's urban forest and to sustain a healthy and resilient urban forest.

Two phases of public engagement are planned to inform the UFMS. The initial phase of public engagement occurred in June and July 2023. The engagement aimed to gather community's inputs on a long-term strategic urban forestry vision and supporting goals to guide the protection and management of the urban forest. The second phase of engagement is planned for the fall of 2023 and will seek opinions on the draft strategy.

1.1   Objectives for public engagement

Objectives for public engagement are:
- To inform the public about
  - The status of our urban forest
  - The role of our urban forest in the community, including the unique environmental, economic, and social value of Langley's urban forest
  - The opportunities and challenges for urban forest management, particularly due to ongoing development and climate change
- To consult the community to:
  - Identify and acknowledge their concerns and aspirations for the City's urban forest
  - Develop a long-term vision and goals for the strategy that capture the community's perspective on the City's urban forest
- To obtain feedback on the draft UFMS
- To build community awareness, support, and advocacy for our urban forest and the updated UFMS

1.2   Engagement activities

The public was invited to provide input through a 20-minute online survey[1], a mapping tool hosted on the project page, and a pop-up booth at the Community Day Festival in June 2023. An online open house scheduled for June 27, 2023, was cancelled due to lack of attendance. The project team presented to the Environmental Sustainability Committee in July 2023 and sought input from committee members. Details on engagement opportunities for Phase 1 are outlined in Table 1.

Table 1. Summary of engagement opportunities in Phase 1 Engagement

Date	Engagement Activity	Participants
June 10, 2023	*Booth at Community Day Festival*	Approx. 30 visitors
June 8 to July 19, 2023	*Survey*	196 respondents
June 8 to July 19, 2023	*Mapping tool: Share locations that you value or want to improve*	58 submissions
July 13, 2023	*Presentation to the City's Environmental Sustainability Committee*	10 committee members

Urban Forest Management Strategy booth at the Community Day Festival

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[1] Paper copies of the survey were made available upon request

1.3   Communication tactics used

Information on engagement opportunities was communicated via several available online platforms to reach as many people as possible. Promotional materials used are in the appendix. The platforms used included:

- Dedicated UFMS project page, news and event items, and homepage slider on the City's website.
- City of Langley social media accounts: Facebook, Instagram, Twitter.
- Events to links added in the City's eNewsletter

2.0   Who we heard from

We have engaged more than 205 people in Phase 1 Engagement, including 196 survey respondents, 10 Environmental Sustainability Committee members and people who visited the pop-up booth and/or who used the mapping tool.

2.1   Survey demographics

Of the 196 survey respondents:

➢ 77% reside in the City of Langley
➢ 75% are homeowners, 16% renters
➢ Most respondents live in Nicomekl (24%) and Simonds (19%) (**Figure 1**)
➢ 62% are 35-64 years old (**Figure 2**)
➢ 52% found out about this survey through social media, and 19% through the City's newsletter
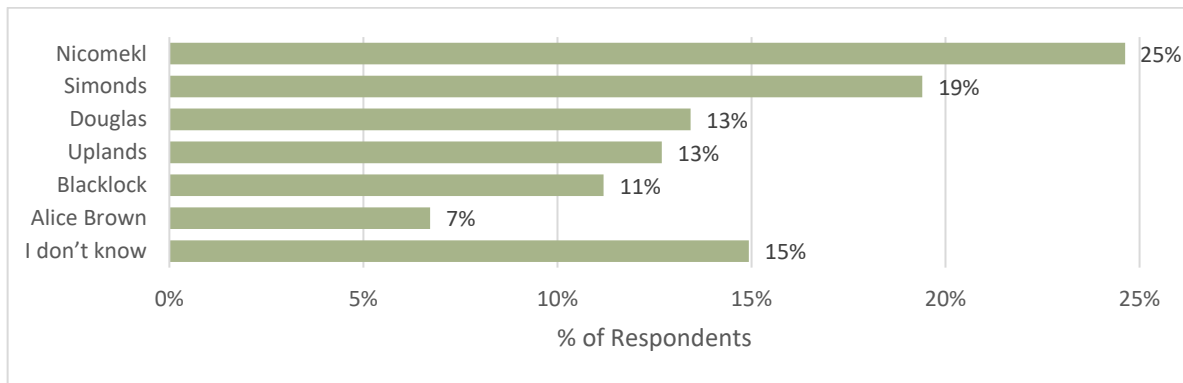

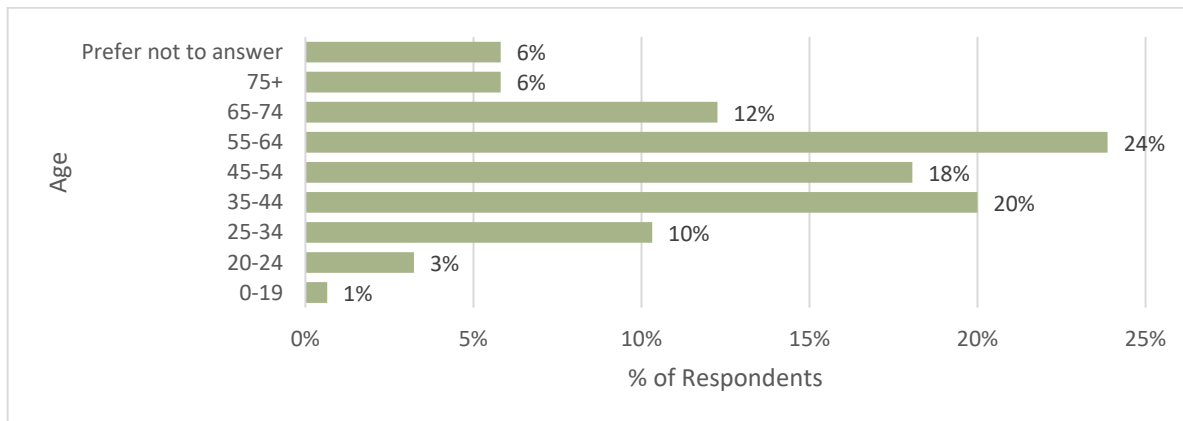**Figure 1. Where survey respondents reside (total respondents =134)**

Figure 2. Age of survey respondents (total respondents = 155)

3.0   What We Heard

Results from the first phase of public engagement are summarized in this section and structured around the following engagement topics:

- Understanding how the urban forest is valued and vision for 2050
- Important urban forest places
- Preference for street trees (size and distribution)
- Priorities for urban forest management on City-owned land and private land
- Satisfaction with and preferred urban forest service levels
- Community stewardship of the urban forest

3.1   Understanding how the urban forest is valued and the vision for 2050

Survey respondents were asked to rank the benefits they valued in an urban forest (**Figure 3**). Respondents ranked **ecological** (e.g., providing habitat and food for native plants and animals), **environmental services** (e.g., rainwater management, air purification, wind protection) and **climate change resilience** (e.g., shading streets and buildings, carbon storage) as the most important urban forest benefits to them and their community. Survey respondents ranked **cultural, economic, and health and social benefits** as lower importance.
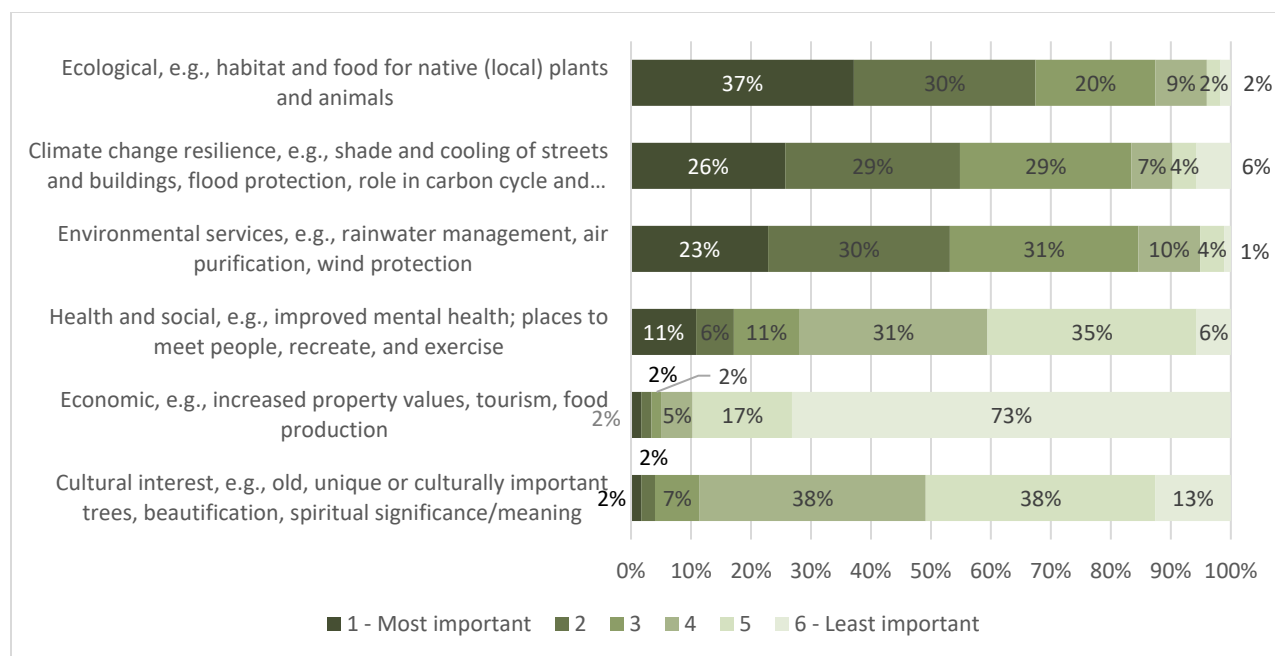

Figure 3. Respondents ranking of urban forest benefits (total respondents = 175)

Members of the Environmental Sustainability Committee (the Committee for short hereafter) were invited to share their current impressions of Langley City's urban forest. They used words such as "**natural**", "**protecting**", "**well-being**", and "**heritage**" to describe the current values they appreciate

about the urban forest. However, there were also expressions of concern. Terms like "**lacking**", "**lost**", and "**too many trees clear cut**" suggest that Committee members would like Langley City to strengthen its urban forest protection measures.

Figure 4. Presentation participants' description of Langley City's urban forest from 5 Committee members

Survey respondents were asked to imagine what they would like Langley's urban forest to look like in 2050. All respondents wanted more trees in the city. Their responses were analyzed by counting the frequency of specific key terms (**Figure 5**). The terms "**tree**" (107 mentions), "**green**" (39 mentions), "**forest**" (27 mentions), "**park**" (35 mentions), and "**canopy**" (12 mentions) were most used to describe respondents' desire for more green space and "**large**[r]" (31 mentions) trees and tree canopy. In particular, people wanted more green spaces for "**shade**" and "**cool**[ing]" (33 mentions) for "**walk**[ing]" (10 mentions), "**biodiversity**" and "**wildlife**" habitat (12 mentions). Participants described their ideal urban forests "**health**[y]" (22 mentions), diverse tree species (16 mentions of "**mix**"/ "**diverse**"/ "**balanced**") "**native**" (14 mentions), and "**lush**" (12 mentions).

Figure 5. Word cloud showing the most common words used by respondents to describe their vision of the urban forest by 2050 (total respondents = 131)

3.2 Important urban forest places

Community members used the mapping tool, through the online platform or in-person during the Community Day festival, to identify important urban forest places that they value or need improvement. A total of 60 locations were identified, including 16 (27%) places of value and 44 (73%) places needing improvements. Most locations were submitted for areas in and around downtown Langley City (43%, 26 locations), primarily for places needing improvements and with only one place of value.

Places of value

Across the entire City, 75% of valued places were in parks or along trails (12 locations) and were mostly found along the Nicomekl River District and trails leading there. The other 4 submissions were in unprotected greenspace or natural areas, streetscapes, and private yards. Value locations are summarized in **Figure 6**. The most common reasons respondents valued locations were strong ties to a specific park, greenspace, or otherwise large trees. Several people indicated that they valued overall greenness or canopy cover rather than a single, specific tree. Other reasons places were valued included seeing/supporting wildlife, opportunities for recreation, and general beauty and aesthetic value.
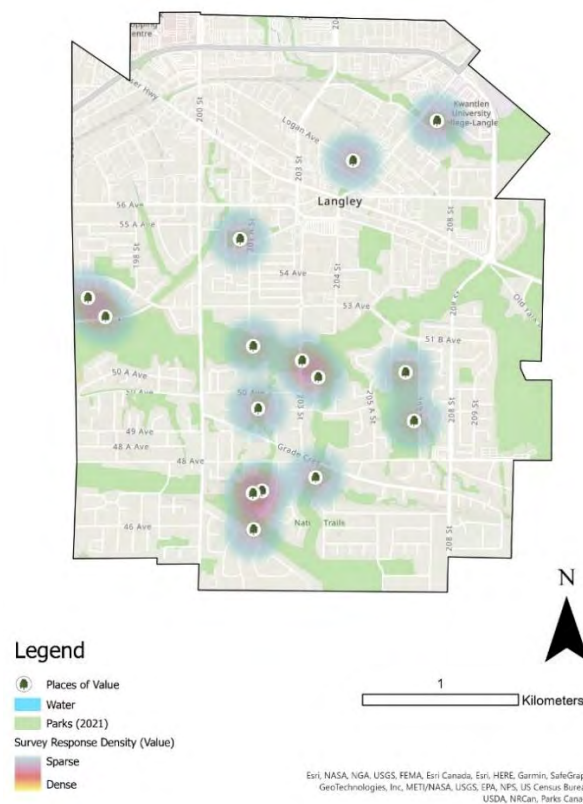
Figure 6. Places of value identified in urban forest using the online mapping tool between June – July 2023 (16 submissions)

"This is a true beauty in Langley that deserves to be preserved & possibly made bigger."
                                        - Respondent on valuing the point in between Grade Crescent and 50 Avenue.

Places needing improvement

Urban forest places needing improvement are summarized in **Figure 7**. Out of the total 44 submissions, most submitted places were in and around Downtown Langley (25 location; 57% of submissions). People suggested more tree planting along residential streets and major roads such as where the Fraser highway crosses Downtown Langley and along Douglas Crescent, 203 Street, and 204 Street (30 locations, 68% of submissions). Other places submitted for improvement were found in the parks (25%; 11 locations) that are mostly lawn, i.e., Portage Park, Portage Playground, and Conder Park. Participants recommended adding more trees to those locations, having a greater diversity of plants and trees, expanding the trail systems and greenways, protecting wildlife habitats, and having better dog recreation amenities.
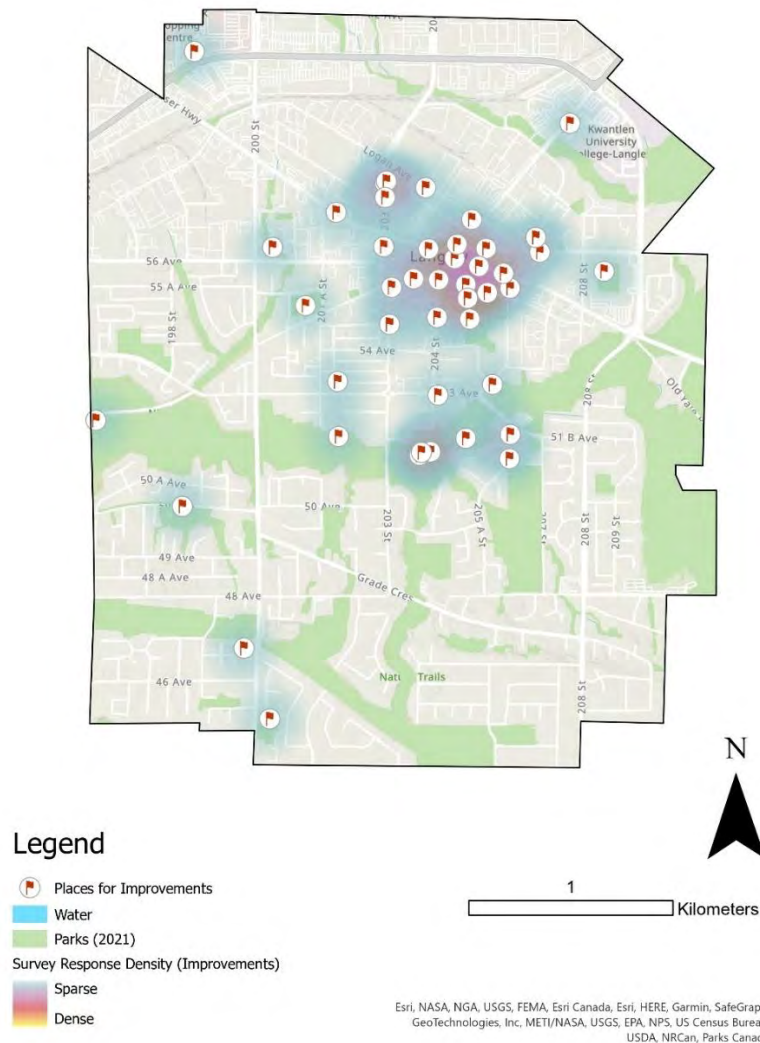
Figure 7. Place needing improvement identified in urban forest using the online mapping tool in June – July 2023 (44 submissions)

3.3   The urban forest on your street

Survey respondents were asked to identify the photo that most resembled their street and a preference for what they would like their street to resemble (Figure 8). Most respondents currently live on a street resembling **Option D – mixed spacing and species, medium-sized trees** (25%), **Option A – Few or no trees** (18%), and **Option F – Mixed spacing and species, large trees** (16%). Only 26% of respondents live on a street with large trees present (option E or F): 16% of respondents live on a street with **mixed spacing and species, large trees** (Option F) and 10% of respondents live on a street with **regularly spaced, large trees** (Option E).

When asked which street they would prefer to live on, 60% of respondents indicated a preference to live on a street with **large trees** (options E or F). Only 2% of respondents would like to live on a street with **regularly spaced small trees** (Option B), and no respondents want to live by a street with **few or no trees** (Option A).

A. Few or no trees

B. Regularly spaced small trees

C. Regularly spaced, medium-sized trees

D. Mixed spacing and species (different types of trees), medium sized trees

E. Regularly spaced, large trees

F. Mixed spacing and species (different types of trees), large trees

Figure 8. Types of street tree planting presented to survey respondents (total respondents = 168)

3.4   Priorities for urban forest management

Survey respondents were asked to rank areas for tree planting (**Figure 9**). The top ranked locations are local residential streets, and major arterials (e.g., 200 St and Glover Rd). Private land (e.g., residential areas) and natural areas (e.g., Portage or Nicomekl Park) were ranked the lowest in tree planting priority. Some respondents suggested additional priority planting areas, including industrial areas (3 respondents), downtown Langley (2 respondents), streams (1 respondent), walking and biking paths (1 respondent), floodplains (1 respondent), and playgrounds (1 respondent).
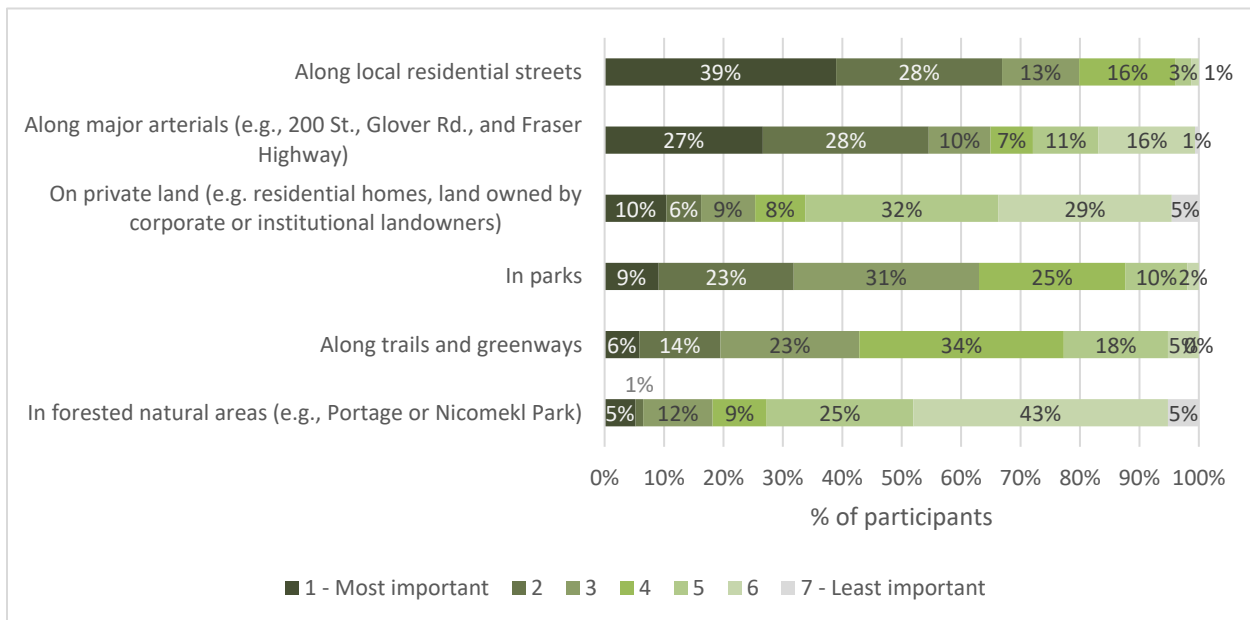
Figure 9. Areas where trees are missing (total respondents =154)

Concerns with tree loss in the City

Respondents and the Committee members expressed concerns with tree loss. Respondents shared their concerns in **Figure 10.** Respondents were most concerned about loss of trees due to development. Fifty two percent (52%) of participants were most concerned about mature tree loss during private development and 15% were most worried about losing public trees to make space for adjacent development. The loss of City-owned trees for capital constructions was not as much of a concern to survey respondents; only 2% of participants ranked it as the biggest concern for tree loss. The loss of tree to extreme weather and forest health issues is considered the lowest concern with 51% of participants ranking it the last or second last.
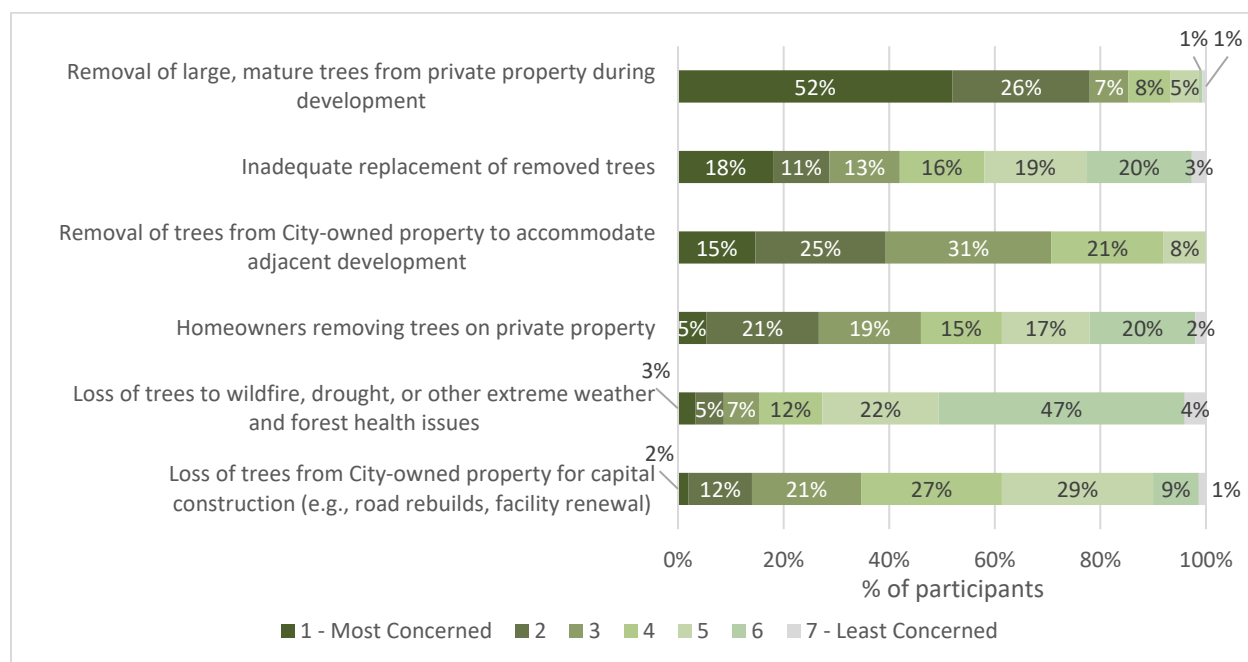
Figure 10. Respondents concerns with respect to tree loss in the City (total respondents = 152)

Nineteen respondents provided additional responses to elaborate on their concerns. These comments centred around inadequate planning and species selection for the longevity of trees (by 8 respondents), inadequate tree management such as insufficient watering and excessive heat (by 4), and adverse impacts of housing development on trees and natural areas such as clearing forests to accommodate development (by 5).

Street tree preferences

To address the loss of trees and to increase canopy over the next 30 years, Committee members supported planting more trees in the city. In terms of desired tree characteristics, survey respondents prioritized trees that maximize environmental benefits, resist pests and diseases, and attract birds and pollinators with 47%, 42%, and 37% of respondents respectively ranking these as their top 2 choices. Conversely, food production and aesthetic value were less important with 52% and 50% of respondents ranking them as their bottom 2 choices.

Priority actions on City-Owned Land

A total of 130 respondents shared their level of support to seven urban forestry actions on City-owned lands (Figure 11). The highest priority action identified was tree planting as part of capital projects, with 82% of respondents considering it a high priority. The other actions that were considered as a high priority by over half of respondents included improving guidelines for tree species selection (67%), strengthening policies to protect City-owned trees (66%), and planting more trees along streets and parks (66%), and expanding tree irrigation system (57%). Increasing public spending on caring for existing trees was ranked as a medium priority by 50% of respondents.
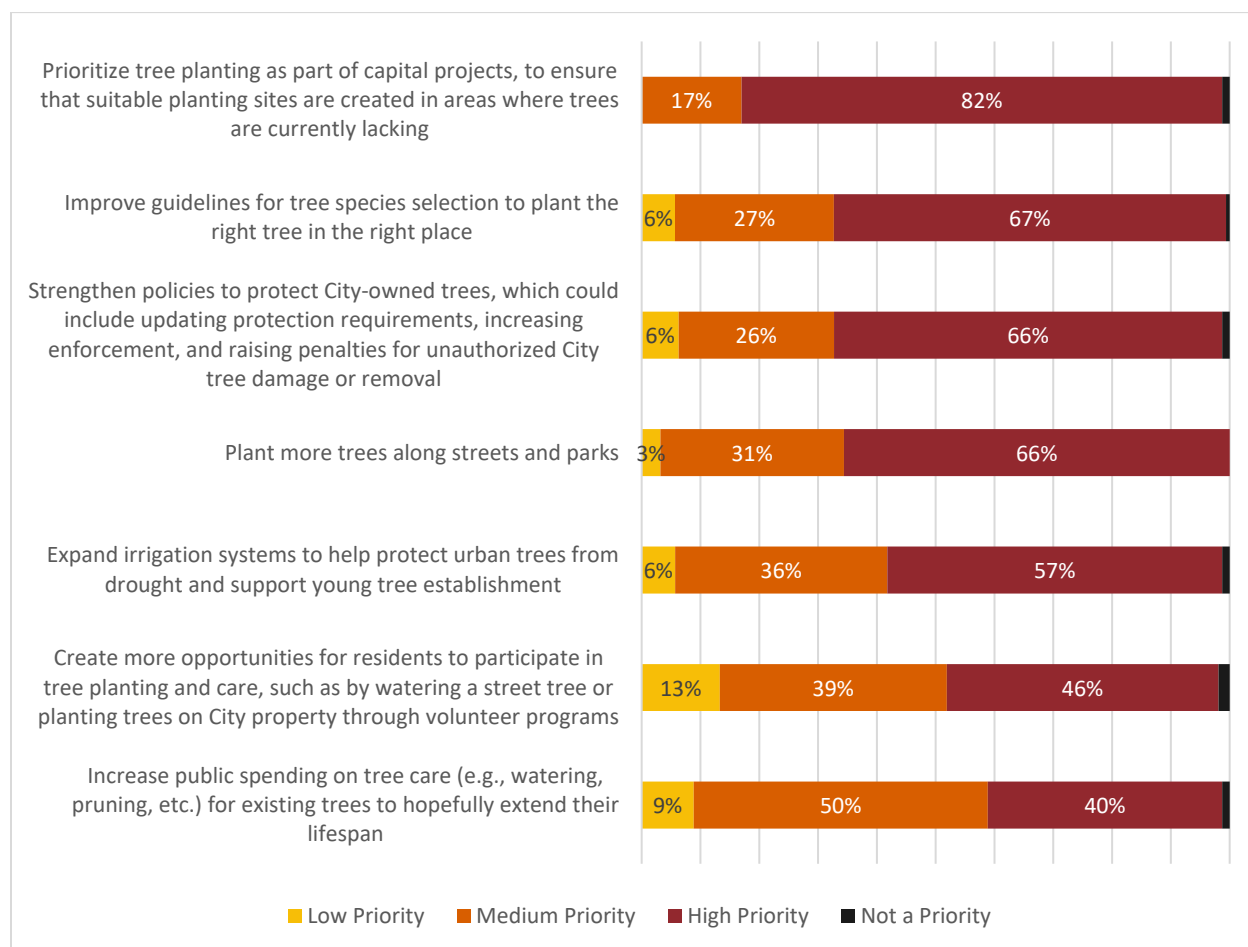
Figure 11. Respondent priority rankings for seven urban forest actions on City-owned land (total respondents = 159)

Twenty-seven survey respondents provided additional open-ended comments about actions they would like to see on City-owned land, such as preserving current large trees and habitats around waterbodies (5 respondents), enhancing tree maintenance practices including the implementation of regular watering and inspecting schedules all trees in the City (4 respondents), and considering planting other plants aside from where the space is not suitable for tree planting (1 respondent).

Priority actions on Private Property

Survey respondents showed a high level of support for the proposed urban forestry actions on private properties (Figure 12). Among the 158 respondents who answered this question, developing incentives for trees planting and increasing the planting requirements for development were the most supported actions, both ranked by 82% of respondents as a high priority action. Most respondents also considered improving guidelines for tree species (71%) and enforcement measures (i.e., security deposits) for proper planting and replacement (69%) as high priority actions. Moderate level of support was shown toward actions to provide more education about tree planting and offer partnership programs with residents.
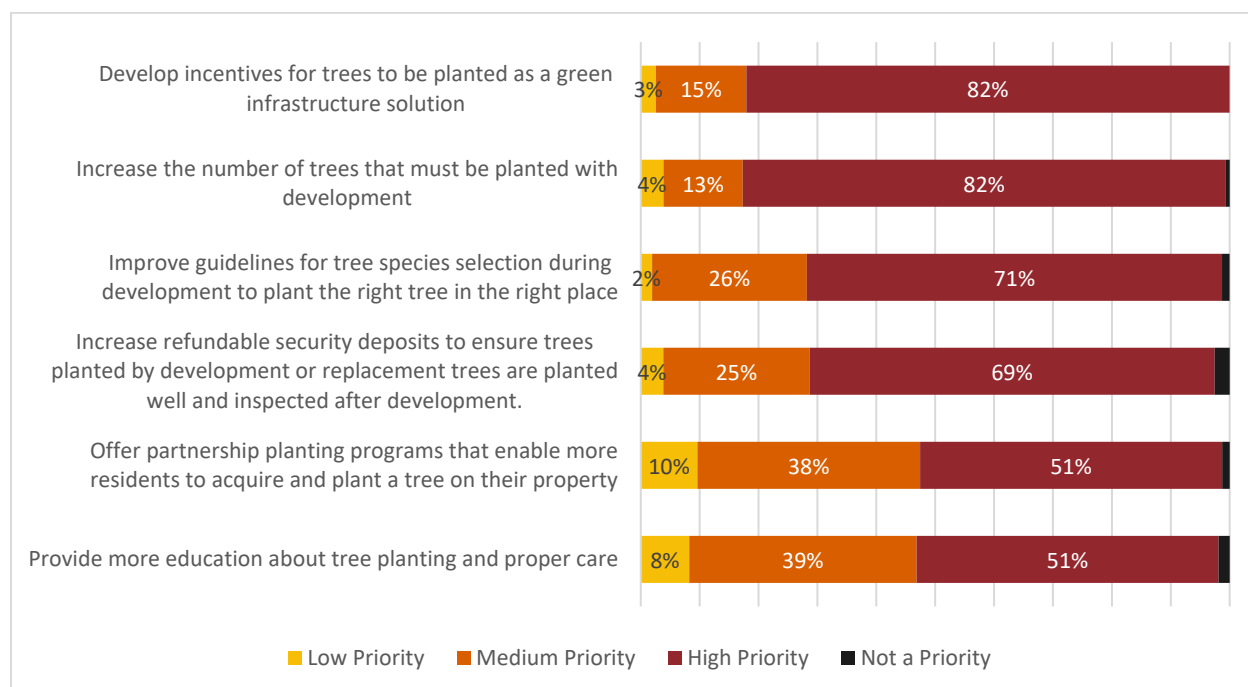
Figure 12. Respondent levels of support for six urban forest actions on private property (total respondents =158)

Twelve survey respondents provided additional open-ended comments about actions they would like to see on private property, including tree maintenance protocols that ensure regular tree inspections (3 respondents). Other comments reiterated the survey options on Figure 12.

Regulating private tree removals

Respondents were surveyed about the extent to which the City should be involved in the removal of trees on private properties (Figure 13). Forty one percent (41%) of respondents were in favour of the City having some degree of influence over tree removal, 35% supported the City having a substantial role (35%, 56 respondents), and 16% preferred a limited level of City influence. Eight percent (8%) of respondents wished for no City involvement.
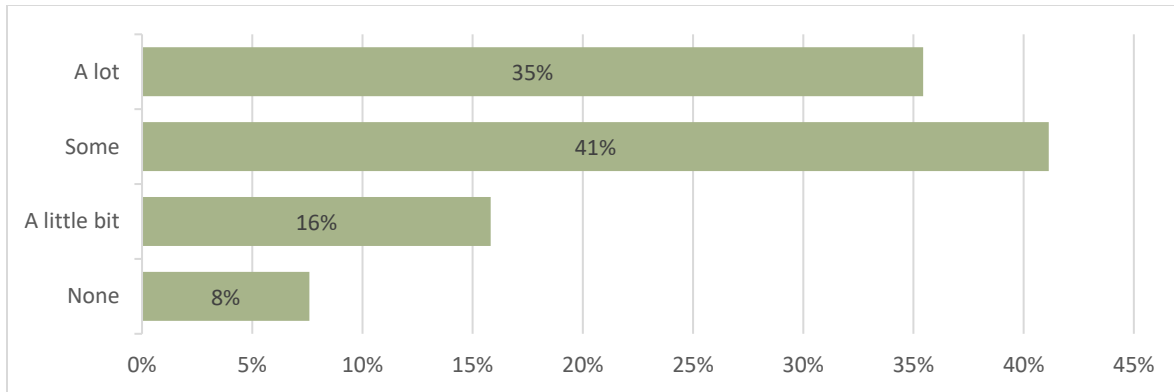
Figure 13. Respondents' stance on how much say the City should have in tree removal on private properties (total respondents =158)

Tree regulations on private property

When asked about potential private tree regulations on private property (Figure 14), most participants leaned towards either regulations that require property owners to keep most trees on their land (37% of respondents) or regulations requiring property owners to retain certain trees to uphold the community's character (37%). A smaller group of respondents (18%) supported the approach where property owners could remove trees but would need to replace the larger trees they removed, and 7% of respondents favored complete freedom without constraints on tree cutting and management decisions.
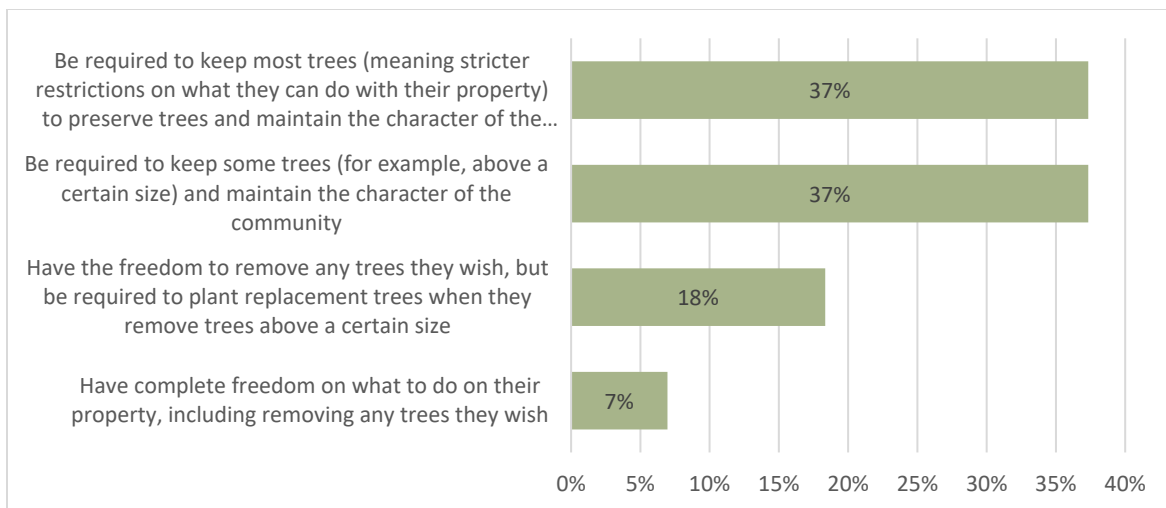

Figure 14. Respondents' preferences for tree management regulations on private property for property owners (total respondents =158)

Tree regulations on private property undergoing development

For private properties undergoing development (Figure 15), most respondents supported tree preservation; 52% of respondents wanted to require property owners to maintain most trees and 37% wanted them to retain some trees to maintain the community's character. Ten percent supported to

have the freedom to remove trees on the condition that they replace tree above a certain size. Only 1% preferred complete freedom with an unrestricted authority over tree removal on their land.
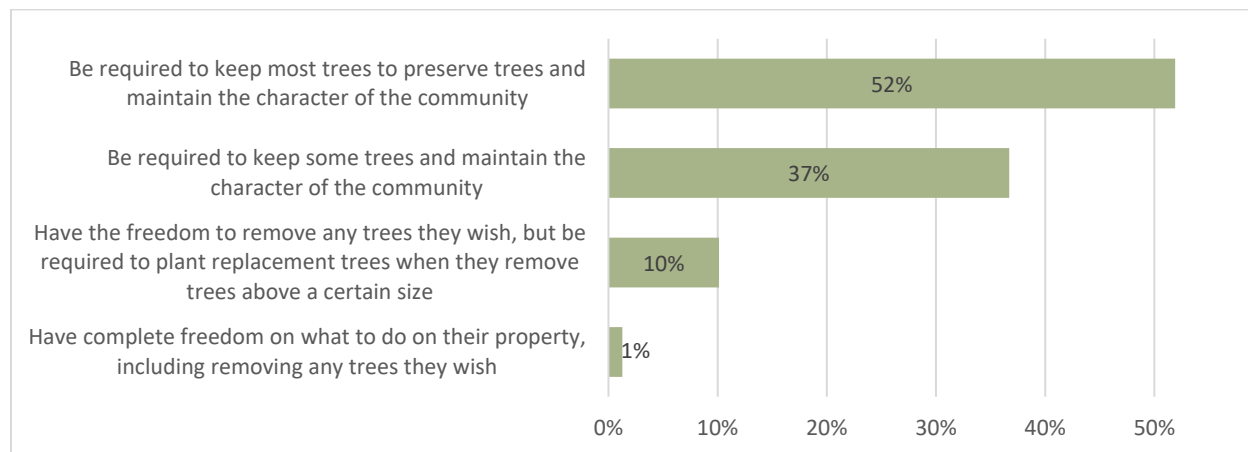

Figure 15. Respondents' preferences for property owner undertake of tree management regulations on private property undergoing subdivision or development (total respondents = 158)

3.5   Urban forest service levels

Service levels describe how the City of Langley maintains City-owned tree assets. Survey respondents were asked to rank satisfaction levels with current service levels for trees in parks and along streets. Overall, respondents had mixed levels of satisfaction with the urban forest services provided by the City (Figure 16). While most respondents were satisfied with storm response and tree debris cleanup (69% satisfied versus 6% dissatisfied), they were more neutral about the rest of service levels, such as pest and disease control (39% neutral), and dangerous tree removal (34% neutral). Respondents were most dissatisfied with public education opportunities on urban forestry (9% satisfied versus 35% dissatisfied) and tree protection and preservation (21% satisfied versus 36% dissatisfied). These results are in line with respondents' major concerns discussed in the previous section. Many respondents were not aware of all the services that the City provides, especially the services for wildfire preservation and forest fuel management (35% unaware), pest and disease control (24%) and public education (24%).

Many Committee members also expressed concerns with the lack of tree protection and interest in more tree regulations to improve protection.

	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied	I'm not aware of this service
Public education		5%	30%	33%	7%	24%
Tree protection and preservation	12%	24%	30%	17%	5%	13%
Tree planting and replacement	5%	18%	30%	28%	5%	14%
Tree pruning		12%	31%	36%	5%	14%
Wildfire prevention and forest fuel management		9%	29%	19%	6%	35%
Dangerous tree removal		7%	34%	32%	7%	18%
Storm response and tree debris cleanup		5% 14%		55%	14%	10%
Pest and disease control		5%	39%	29%	4%	24%
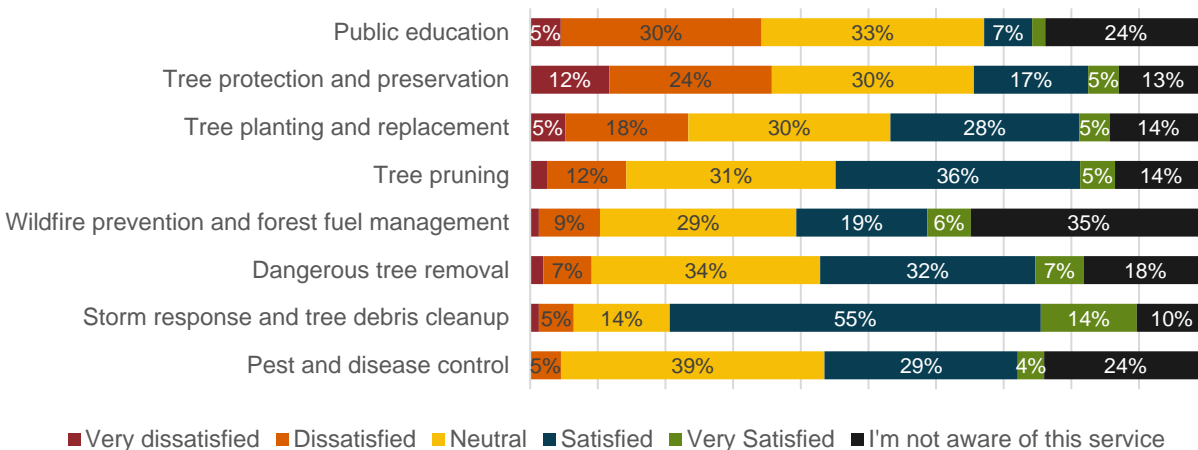
Figure 16. Satisfaction levels with current service levels for trees in parks and along streets (total respondents =155)

Forty-five respondents provided additional comments to emphasize general disappointment with the City's tree maintenance and planting (18 respondents), particularly in young tree watering and tree hazard management. Other respondents suggested solutions to improve, including:

- Offer the community more tree planting, maintenance (8 respondents)
- Establish partnerships with local schools and colleges (e.g., Kwantlen Polytechnic University) on community-based urban forest planning (2 respondents)
- Improve planting infrastructure to support growing canopies in development areas (1 respondent)
- Allocating resources more strategically (e.g., budgeting financial resources proportional to the expansion of the City; 2 respondents)
- Address safety concerns relating to the urban forest, such as wildfire risks and homelessness along trails (2 respondents)

Most respondents were willing to contribute financially to support the City to improve the delivery of services on public land (Figure 17). Over 80% of respondents were willing to contribute $10 to $100 per household to support the delivery of satisfactory service levels on public land, while 10% of respondents preferred not contributing anything.
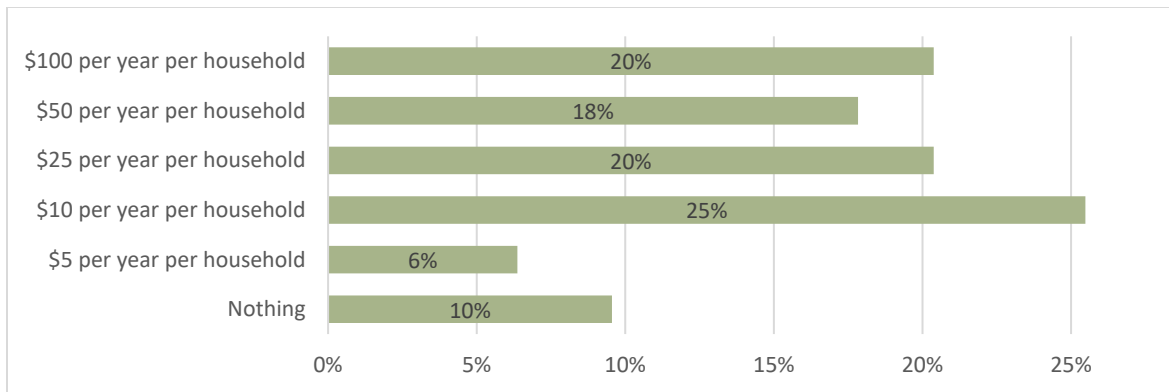
Figure 17. Respondents' willingness to pay for the City to deliver service levels on public land to satisfaction (total respondents = 157)

3.6   Community stewardship

Community stewardship refers to activities that the community participates in to care for or contribute to urban forestry on public and private land. Seventy-nine percent of respondents had participated in at least one urban forest stewardship activity (Figure 18). The top attended stewardship activities were maintaining trees on personal property (79%), planting trees on personal property (48%), assisting others with tree needs (36%), and removing hazardous or sick tree on personal property (36%). Other activities that respondents have participated in include educating friends and family about local plants to foster a connection with nature, inquiring about the City's tree policy, getting an arborist assessment of trees, and regularly cleaning up ravines, advocating for more City-planted trees in parks and streets, donating a tree to City Park, and removing invasive species.
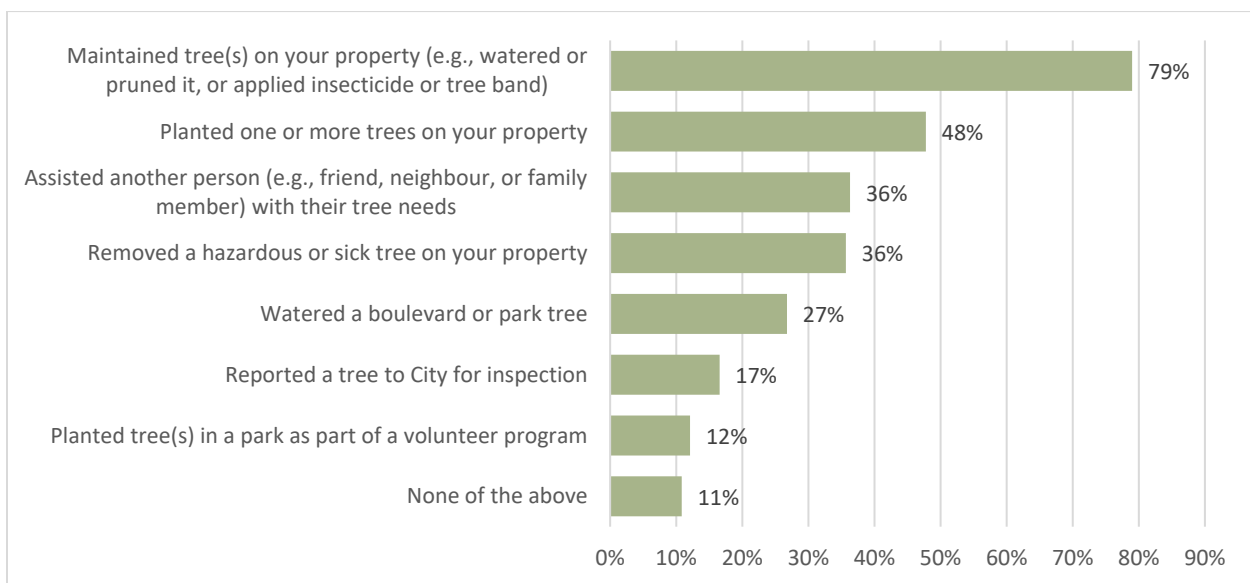

Figure 18. Stewardship activities that respondents have participated in the past 5 years (total respondents = 157)

Barriers to participating in stewardship activities

Respondents cited various factors that restrict their involvement in stewardship activities (Figure 19). The top barriers cited by respondents included a lack of information about stewardship activities (43% respondents), needing permission from a strata or landlord (27%), space constraints (24%), and already having enough trees on their property (24%). None of the respondents wanted no trees on their property. In addition, 6 respondents mentioned in their open-ended comments that they did not participate in stewardship activities because they had a strata management company that maintains trees for them.
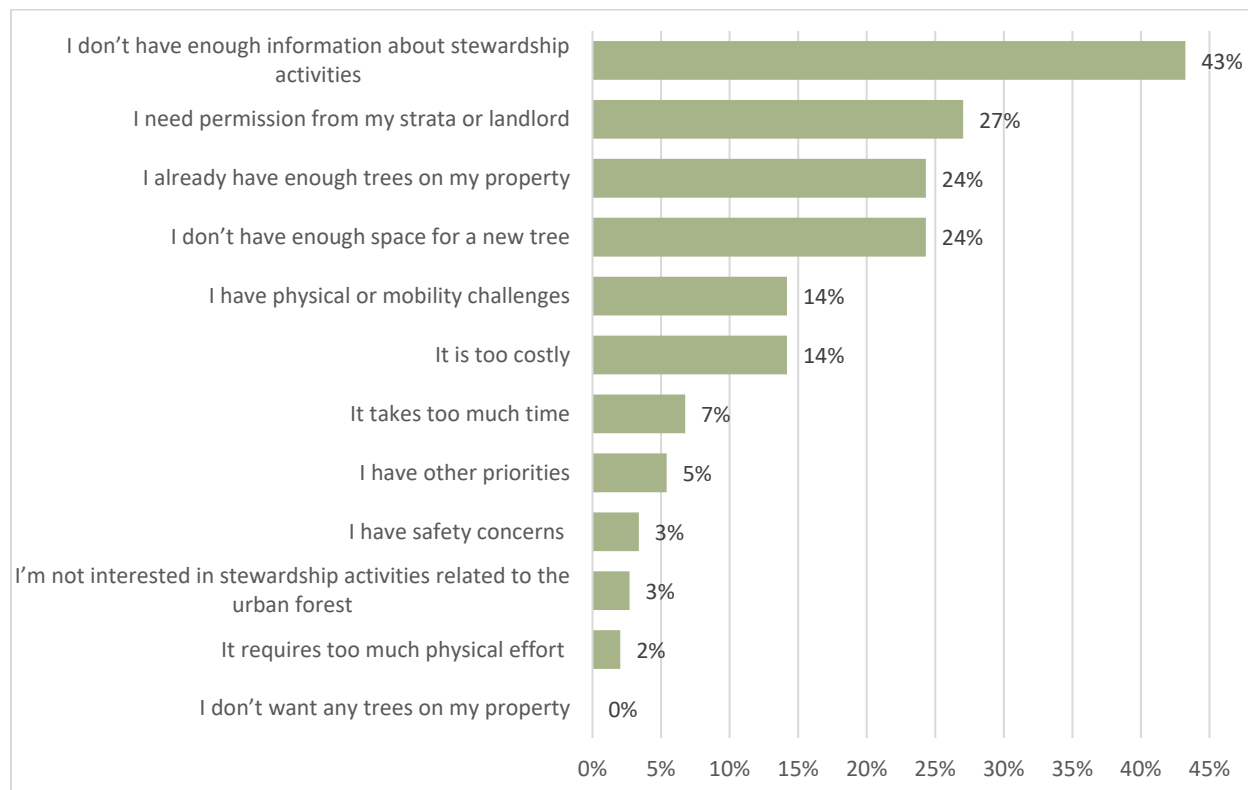

Figure 19. Barriers preventing respondents from participating in stewardship activities (total respondents = 148)

Encouraging factors for planting more trees on private property

To encourage residents to plant more trees on private property (Figure 20), having adequate space for planting and appropriate knowledge of species selection were important, as suggested by 41% and 39% of respondents respectively. Other approaches suggested by participants included providing a subsidy reduce planting cost (31%), offering education opportunities on tree planting and maintenance (including guidance on where to plant; 31%), getting support from strata or landlords (30%) and information on where to buy trees (30%). Only 5% of respondents were not interested in planting tree on their property at all.
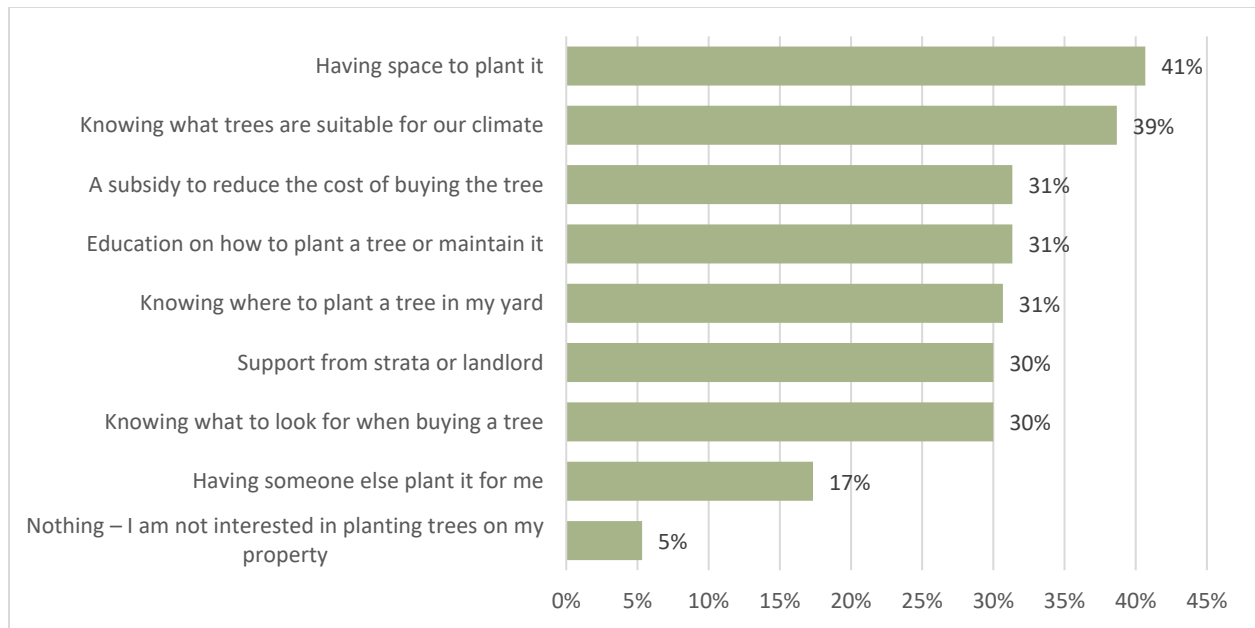
Figure 20. Encouraging factors for planting more trees on private property (total responses = 150)

Thirty respondents further provided additional comments on how to encourage tree planting on properties. Many responses reiterated results in Figure 20. Nine respondents suggested ensuring the proper maintenance like removing sick and dangerous trees posing threats and also having the City assure the integrity of infrastructure like private driveways or sidewalks to make them accessible for people with disability, wanting the autonomy to design their gardens by planting trees of their choice without influences (tree size, or species), prioritizing provisioning fruit trees, building a community or neighbourhood hub to support one another with planting.

4.0   Synthesis of Feedback

The feedback received from the survey, mapping tool, and Committee presentation has been synthesized into key statements in the tables below. Each key statement ("What we heard") is followed by a statement on how the feedback will be considered in relation to the ongoing development of the UFMS for the following urban forest themes:

- Planning and vision
- Protecting
- Managing
- Growing
- Stewarding

Summary of feedback for the urban forest planning and long-term vision

What we Heard	How it will be considered
• Survey respondents highly valued ecological, environmental, and climate change-related benefits provided by the urban forest. • The Committee valued health and cultural benefits of the urban forest. • Respondents envisioned the City of Langley's 2050 urban forest as expanding, with healthy trees of diverse native species that are climate suitable. • People want to see lusher and larger tree-lined streets, pathways, and trails connecting different parts of the city.	The project team will incorporate this input when drafting the UFMS vision and goals to emphasize the benefits most valued by the community.

Key themes for protecting the urban forest

What we Heard	How it will be considered
More respondents were dissatisfied than satisfied by current urban forest service levels for tree protection and preservation.	The draft UFMS will consider strategies aimed at enhancing tree protection and preservation.
Concerns with respect to tree loss in the city are strongly associated with the removal of large mature trees in developing areas, whether on private or City-owned land, to accommodate for the City's growth.	The draft UFMP will consider strategies aimed at preserving existing mature trees during development and, when that is not possible, adequately replacing or compensating for the loss of trees.
Many respondents expressed a desire for some forms of regulation of tree removal on private property by the City	The draft UFMP will make recommendations about updates to existing regulations or new regulations that could improve tree protection, along with public awareness and incentive approaches to encourage tree retention on private property

Key themes for <u>managing</u> the urban forest

What we Heard	How it will be considered
Respondents had mixed levels of satisfaction for current urban forest service levels: • Respondents were satisfied with storm and debris cleanup and tree pruning. • Respondents expressed dissatisfaction for public education, tree protection, and wildfire prevention. • Respondents were mostly neutral about dangerous tree removal, pest and disease management, and tree planting.	The draft UFMS will share information about services provided by the City and consider recommendations to improve services with the greatest dissatisfaction.
Respondents notice that newly planted trees have a high mortality, possibly due to insufficient watering and excessive heat.	The draft UFMP will provide information about and may recommend updates to tree management practices to improve young tree establishment.

Summary of feedback for <u>growing</u> the urban forest

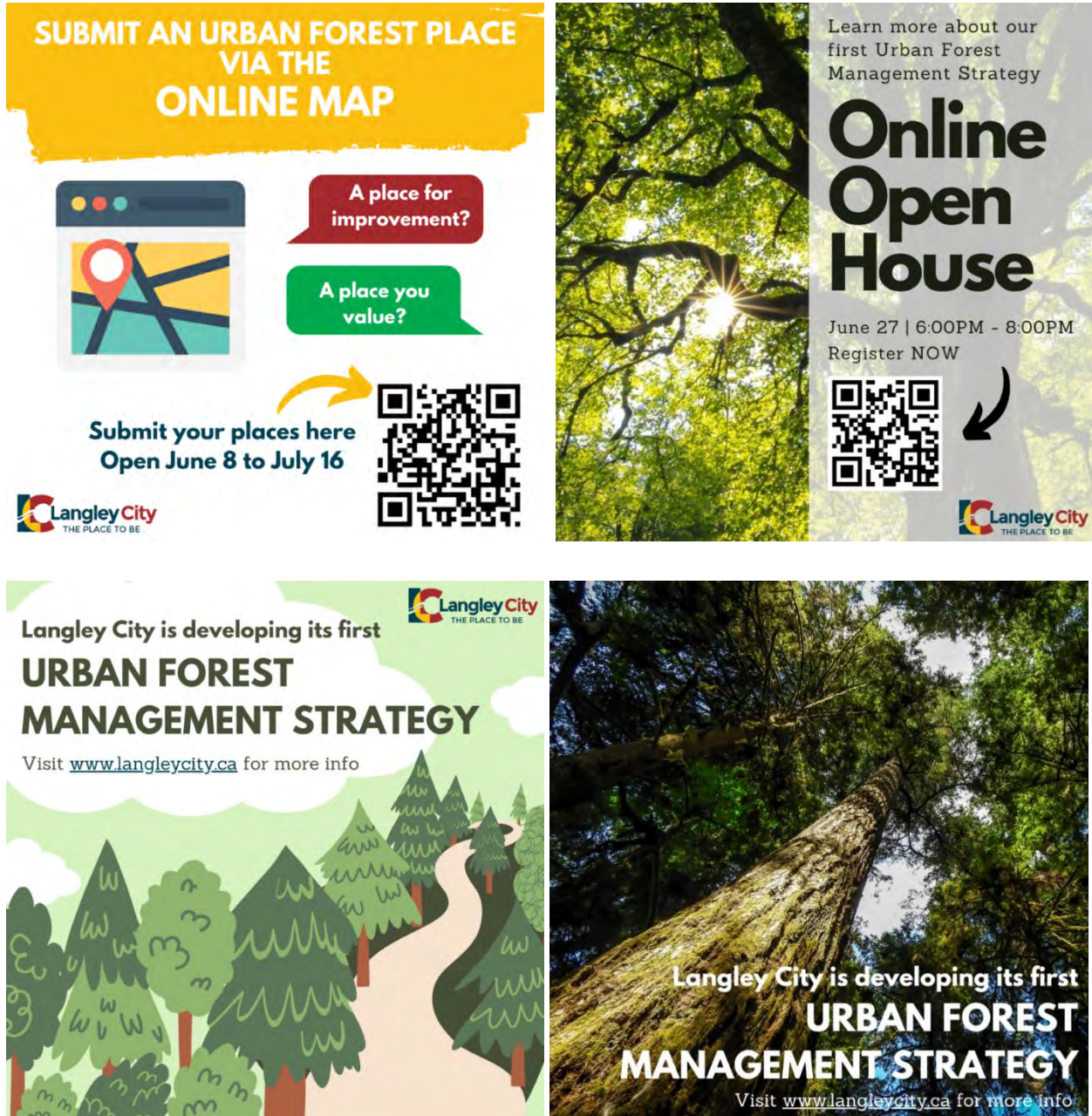| What we Heard	How it will be considered
• Survey respondents had a strong preference for streets with mixed spacing, and either mixed or large tree sizes. • Survey respondents and mapping tool users would like to see tree planting prioritized in residential streets, along major arterials, parks, and along trails and greenways.	The draft UFMP will make recommendations about tree planting to respond to those value and preferences.
• On public properties, survey respondents suggested to improve planting as part of capital projects and ensure adequate planting space is created in tree-deficient areas. Respondents also would like to see a guideline for species selection following "right tree, right place" principle • On private properties, survey respondents see a tree planting incentive program and a higher tree planting requirements with development as high priority actions.	The draft UFMS will provide recommendations to guide tree planting that addresses planting space improvements and capital work projects as well as opportunities to support tree planting on private land.

Key themes from the public engagement about <u>stewardship</u> the urban forest

What we Heard	How it will be considered
• Up to 124 respondents have maintained trees on private property and 19 respondents had planted at least one tree on their property in the past five years. • The largest barriers to planting trees on property were requiring permission from strata, space limitation, and already having trees. The main incentives would be having the space to plant trees, knowing which species are suitable for the climate.	The draft UFMS will consider ways for the City to encourage urban forest stewardship, including education on tree planting and tree care and incentives.

5.0   Next Steps

The findings from the first phase of community engagement will inform the development of the draft UFMS, including a long-term vision and priorities for implementation. Phase 2 of public engagement is expected to occur in the fall of 2023 to gather feedback on the draft UFMS.

Appendix 1   Sample Communication and Promotion Materials