

Urban Forest Management Strategy

January 2023



City of Surrey

13450 104 Avenue
Surrey, BC, Canada
V3T 1V8

Urban Systems

1090 Homer Street #550
Vancouver, BC, Canada
V6B 2W9

Cover: R.A. Nicholson Park. Inside cover: Hi-Knoll Park



Table of Contents

Executive Summary **i**

1 Introduction **1**

- 1.1 Background 1
- 1.2 International Context 2
- 1.3 Regional Context 4
- 1.4 Surrey's Strategic Plans 7

2 Importance of the Urban Forest **9**

- 2.1 Benefits 9
- 2.2 Values 13

3 Surrey's Urban Forest **17**

- 3.1 Urban Forest Context 17
- 3.2 Current Tree Management 23
- 3.3 Tree Canopy Cover 29
- 3.4 Urban Forest Characteristics and Health 47

4 What We Heard **55**

- 4.1 Engagement Process 55
- 4.2 Community Survey 56
- 4.3 Workshops 58
- 4.4 Open House 59

5 Goals, Objectives and Actions **61**

Appendices

A Sample Site Analysis **70**

B Community Survey Results **74**

C Glossary **80**

D Bibliography **84**



Territorial Acknowledgement

Surrey is situated on the unceded traditional territories of the Semiahmoo, Katzie, Kwikwetlem, Kwantlen, Musqueam, Qayqayt, Tsleil Waututh and Tsawwassen First Nations. City residents benefit from the opportunity to live on these lands and walk among the trees.

Community Acknowledgement

We appreciate the input to this strategy provided by many residents and stakeholders. The project team was inspired by their interest, insights, and passion for the city's urban forest.



Executive Summary

Surrey has many plans and policies that help guide the management of the urban forest. On private property, the *Zoning Bylaw* regulates land use and development, and the *Tree Protection Bylaw* governs tree removals, protection and replacement. The *Natural Areas Management Plan* and *Shade Tree Management Plan* provide guidance for managing the urban forest on City property.

In March 2018, City Council directed staff to prepare a citywide *Urban Forest Management Strategy* (the Strategy) to support the City's vision of a thriving, green, inclusive city. Building on existing policies and plans, the Strategy identifies both the extent of the urban forest and its benefits, and provides guidance for planning, protecting and managing it through 2038.

Over the past 20 years, the City has completed multiple tree canopy cover studies, which have identified that the canopy cover has declined from 33% to 29% during this time. If current development trends continue, it is anticipated that the canopy cover will further decline to 26% by 2050. Analysis completed during the preparation of the Strategy identified that the value of the ecosystem services provided by Surrey's urban forest is greater than \$90 million.



The community provided input into the Strategy's development through multiple engagement opportunities. Participants indicated appreciation for the urban forest's benefits, concern about potential negative impacts to it, and support for management strategies to protect and enhance Surrey's urban forest.

The Strategy will strengthen Surrey's efforts in protecting and enhancing the urban forest now and into the future. The Strategy is guided by three broad goals that inform more focused objectives and management actions. The actions are intended to halt the citywide decline in tree canopy cover and to support the achievement of a 30% canopy cover target by 2038.

The Strategy's goals and objectives:



Goal A

A DIVERSE AND RESILIENT URBAN FOREST

1. Plan for the retention and growth of the urban forest.
2. Incorporate biodiversity targets and green infrastructure considerations into urban forest planning and management.



Goal B

STRONG POLICIES AND PRACTICES TO PROTECT AND CARE FOR TREES

1. Review and update policies and operational procedures related to tree retention, planting and maintenance.
2. Ensure sufficient resource allocation for urban forest management.



Goal C

AN INFORMED AND INSPIRED COMMUNITY OF CHAMPIONS

1. Increase public awareness of the urban forest and its values.
2. Provide opportunities for the public to engage in urban forest stewardship activities.
3. Strengthen internal communication.
4. Strengthen relationships with other levels of government and external organizations.

1

Introduction

1.1 Background

The Semiahmoo, Katzie, Kwikwetlem, Kwantlen, Musqueam, Qayqayt, Tsleil Waututh and Tsawwassen First Nations have resided on this land since time immemorial. Douglas-fir, western hemlock, western redcedar and many other trees formed Surrey's historic forests and played important roles in Indigenous cultures and in the lives of settlers after their arrival.

Today, Surrey is one of the fastest growing and most populous cities in Canada. Despite the pressures of population growth and urban development, Surrey's urban areas still support many forested natural areas, as well as an extensive network of shade trees in parks and along streets.

Surrey has the largest area of urban forest within Metro Vancouver.¹⁷ This could change as development to support population growth continues. A decline in the extent of the urban forest would reduce biodiversity, the benefits provided by the trees, and resilience to climate change. Protecting and enhancing the urban forest is essential to Surrey's future environmental, social and economic health.

WHAT IS THE URBAN FOREST?

The urban forest is made up of all trees within a city – on public and private land – and the associated vegetation, soils and wildlife. It includes trees in parks and natural forests; along roads; and on residential, commercial, institutional and industrial properties.

The "urban forest" is different from "a forest" which is a complex ecological system in which trees are the dominant life form. For example, street trees are part of the "urban forest", but they are not "a forest".

Surrey was an early leader in urban forest management, with one of the first tree bylaws and urban forestry programs in the province. More recently, tree canopy cover studies were completed in 2011 and 2014, and a biodiversity conversation strategy was developed in 2014.

In March 2018, City Council directed staff to prepare a citywide urban forest management strategy to support the City's vision of a thriving, green, inclusive city. Building on existing policies and plans, the Strategy assesses both the extent of the urban forest and its benefits; and provides guidance for planning, protecting and managing it until 2038.

1.2 International Context

Cities worldwide are recognizing the value of trees and their importance in mitigating the effects of climate change⁴. Prompted by the biodiversity crisis facing the world, a Global Tree Assessment was conducted from 2015 to 2020 by a network of more than 60 institutional partners and 500 experts⁵. This assessment identified that over the past 300 years, the global forest area had decreased by about 40 per cent and almost 30 per cent of the world's tree species were considered threatened. The final report notes that most of this loss is from human-caused land use change. Climate change is also emerging as a significant threat to individual tree species, with effects on all forest ecosystems.

"Trees are one of the most familiar forms of life for all humans and represent the largest part of earth biomass."

"A huge number of other species (epiphytic plants, fungi, birds, mammals, invertebrates, amphibians, reptiles, etc.) depend on their [trees'] presence. Their protection leads to enormous benefits to humans and wildlife alike."

State of the World's Trees,
September, 2021



Redwood Park

“I think trees help with people’s mental health and visually there is nothing better. I think we are so lucky to live where we do and enjoy all the animals that come to live in the trees.”

Community survey participant



Douglas Squirrel



Newton Park

1.3 Regional Context

Metro Vancouver provides regional guidance related to population growth and urban forest management.

Metro 2050 is an update of the existing regional growth strategy, *Metro Vancouver 2040: Shaping our Future*. This strategy outlines a 25-year vision for accommodating anticipated future growth in the region. To achieve compact communities, the plan defines an Urban Containment Boundary (UCB) where growth should occur. *Metro 2050* proposes increasing the total tree canopy cover within Metro Vancouver’s UCB to 40 from 32 per cent by 2050. With this updated plan, Metro municipalities will be required to adopt Regional Context Statements that identify local tree canopy cover targets, and to demonstrate how their tree canopies will contribute to achieving regional targets.

Over the next 20 to 30 years, population growth in Metro Vancouver is expected to result in a regional reduction in tree canopy cover as lands are developed at higher densities. Building larger residential homes on single-family lots will also impact tree retention in the region. According to the *Regional Tree Canopy Cover and Impervious Surfaces* report, tree canopy cover in the UCB is projected to decrease to 28 from 32 per cent, if current development practices continue.¹⁷

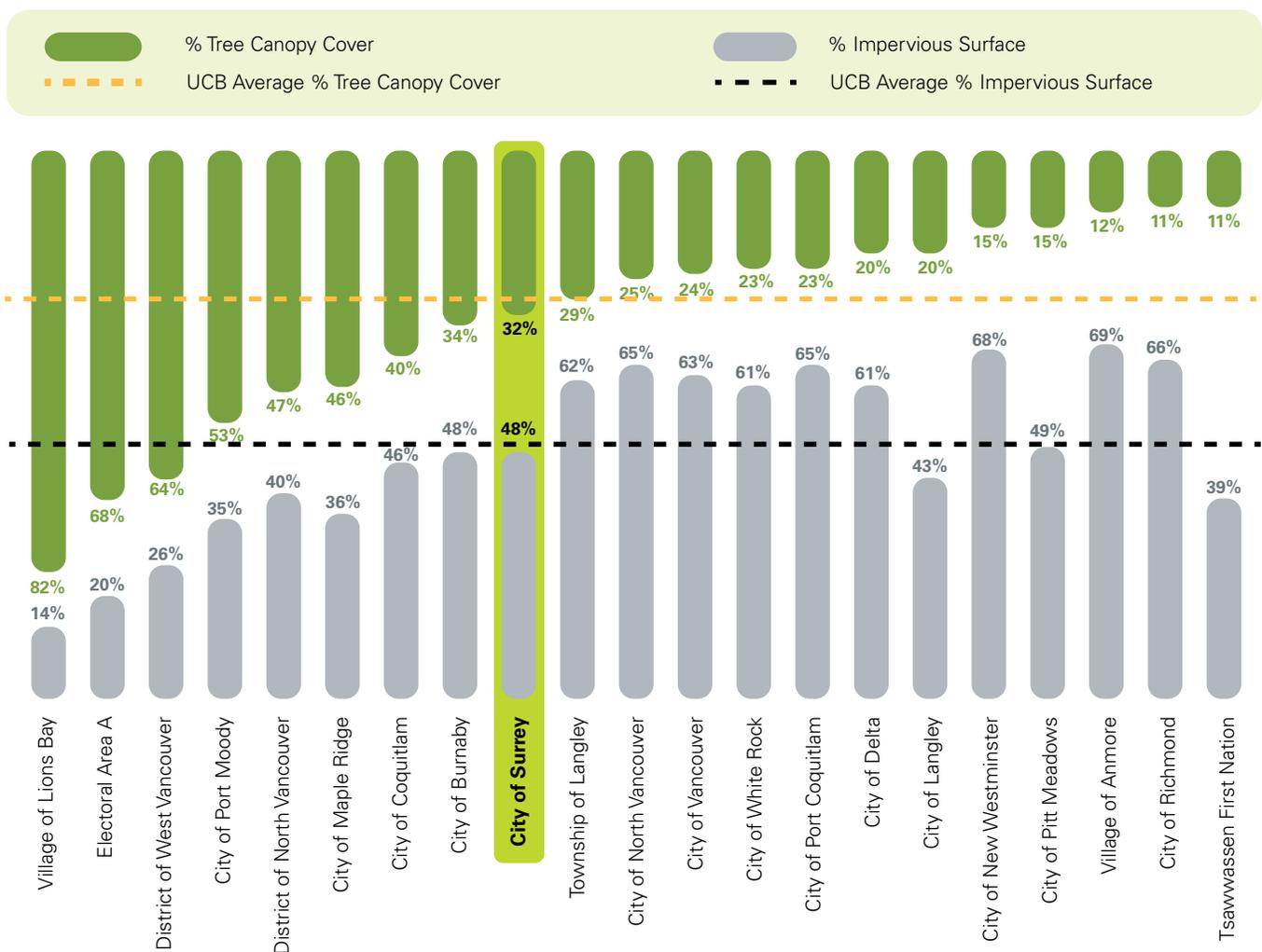
One of the main objectives of this report was to use a consistent method to compare tree canopy cover among Metro Vancouver municipalities. Using data from 2014, this analysis identified that Surrey’s tree canopy cover was 32 per cent. This represents 24 per cent of the region’s tree canopy cover in the UCB. Surrey’s land area in the UCB is also responsible for 24 per cent of Metro Vancouver’s UCB.

Impervious surfaces such as buildings, paved parking lots and roads affect watershed health and limit opportunities for retaining or planting trees. As impervious surface cover increases, there is generally a reduction in tree canopy cover (Figure 1). The area covered by impervious surfaces in Metro Vancouver member jurisdictions ranged from 14 to 69 per cent in 2014, with Surrey's measured at 48 per cent. At that time, Surrey contributed 23 per cent of impervious surfaces within Metro Vancouver's UCB.

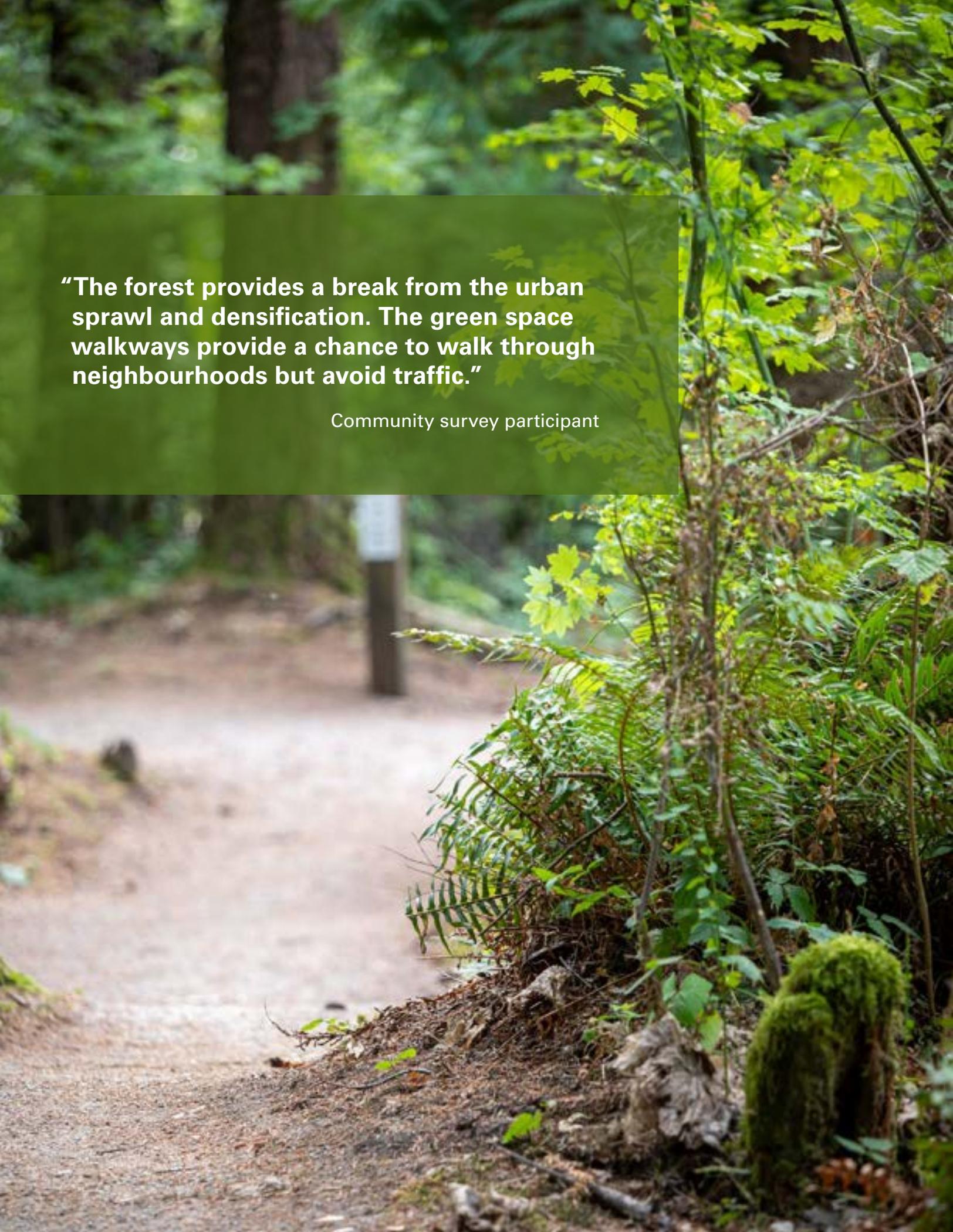
WHAT ARE IMPERVIOUS SURFACES?

Impervious surfaces are built structures, such as pavements (e.g., roads, sidewalks, driveways and parking lots) that are covered by water-resistant materials such as asphalt, concrete, brick, stone and rooftops.

FIGURE 1: % OF TREE CANOPY COVER AND IMPERVIOUS SURFACE WITHIN THE UCB OF METRO VANCOUVER MEMBER JURISDICTIONS¹⁷



Metro Vancouver also provides guidance on climate adaptation and regulations related to urban forest management in the region. These resources offer information on tree selection, planting, policies and development regulations that can help municipalities manage their urban forests for the future.^{16, 18}

A photograph of a dirt path in a forest. The path is made of brown soil and leads into the distance. On the right side of the path, there is a dense thicket of green plants, including ferns and a small tree with bright green leaves. In the foreground, there is a mossy tree stump. The background is filled with more trees and foliage, creating a lush green environment.

“The forest provides a break from the urban sprawl and densification. The green space walkways provide a chance to walk through neighbourhoods but avoid traffic.”

Community survey participant

1.4 Surrey's Strategic Plans

The City of Surrey has several high-level plans and strategies that provide direction for the management of the urban forest.

Official Community Plan, 2014

PlanSurrey 2013: Official Community Plan (OCP) is a comprehensive, overarching document that guides growth, development and environmental protection over a 30-year period. Its vision, goals and policies address land uses, densities, growth, the future form of development and infrastructure, ecosystems, economy and culture. A Regional Context Statement within the OCP synchronizes it with the regional growth strategy.

Sustainability Charter 2.0, 2016

The Sustainability Charter 2.0 is the City of Surrey's high-level policy for envisioning and implementing a more sustainable community. Trees are referenced in three of the themes: Built Environment and Neighbourhoods, Ecosystems, and Health and Wellness. Across these themes, desired outcomes include planning to better integrate and grow the urban forest into Surrey's landscape, and engaging the public to form deeper relationships between residents and the urban forest. This charter recommends a tree canopy cover target of 30 per cent.

Biodiversity Conservation Strategy, 2014

The Biodiversity Conservation Strategy (BCS) recognizes Surrey's biodiversity as a key foundation of a healthy, livable and sustainable city. The goal of the strategy is to preserve Surrey's biodiversity over the long term.

Maintaining large, contiguous natural areas is important to maintain biodiversity, as is preserving a variety of habitats that support different species of plants, wildlife and other organisms. However, not all land can be protected, particularly in urban areas where there are many demands on limited space. Therefore, a focused approach is necessary to ensure land is optimized for biodiversity conservation. A Green Infrastructure Network was identified and forms the framework of the BCS. The BCS provides policy recommendations on sensitive timing for tree removal, greener parking lot design, enhanced tree protection, and an increased tree canopy cover on private property.

A **Green Infrastructure Network** is an interconnected network of protected open space and natural areas that conserves ecosystem values and functions and provides benefits to people and wildlife (Benedict and McMahon, 2006).

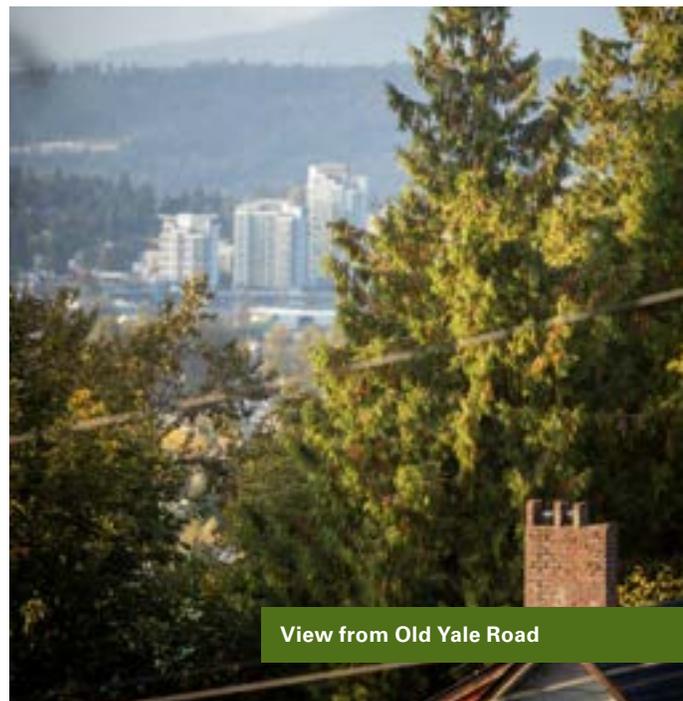
Climate Change Action Strategy, in Progress

In 2019, Surrey City Council declared a climate emergency, joining a growing wave of cities and countries worldwide. In 2020, Council approved bold new targets to reduce carbon pollution and reach net zero community-wide greenhouse gas (GHG) emissions and absolute zero corporate GHG emissions before 2050.

The City is developing a Climate Change Action Strategy to reach Surrey's ambitious 2050 emissions reduction targets and to improve the community's resilience to climate change impacts. One of six key components in this strategy is "climate-positive resilient ecosystems". This component envisions healthy and connected ecosystems playing a leading role in reducing the severity of climate impacts, and helping to reduce carbon pollution.

Parks, Recreation & Culture Strategic Plan, 2018–2027

This 10-year strategic plan provides a blueprint for determining parks, recreation and culture facility and service priorities. The plan's five themes have significant relationships to the urban forest. Under the theme Leaders in Environmental Stewardship, the number of trees planted is proposed as a measure of the City's commitment to the environment and the protection of overall tree canopy cover. The plan recommends the preparation of an Urban Forest Management Plan.



View from Old Yale Road



Surrey Nature Centre

2

Importance of the Urban Forest

2.1 Benefits

The environmental, social and economic benefits provided by the urban forest are well documented. Urban forests contribute to a healthy environment and help mitigate the effects of climate change. They improve the quality of life for residents by providing shade, cleaner air and access to nature.

The world's forested areas contain about 50 per cent of the world's terrestrial carbon stocks, and over 75 per cent of the world's accessible freshwater.²⁰



Environmental Benefits

Urban forests are essential components of healthy cities. They support biodiversity and help reduce habitat loss caused by growing cities.¹⁰ Urban forests absorb and filter stormwater runoff and help stabilize slopes in sensitive areas. Shade created by trees helps to reduce urban temperatures and mitigates the urban heat island effect (where materials, impervious surfaces and buildings trap heat in cities).²⁵ Urban forests also reduce air pollution and produce oxygen.

Surrey's urban forest plays a pivotal role in the City's climate change mitigation efforts. It absorbs and stores carbon dioxide and provides a natural solution to help reduce the impacts of heat waves and flooding.^{8, 26} The equitable distribution of the urban forest better protects those who are most susceptible to extreme heat and storm events.²³

- > Provide habitat and support biodiversity
- > Reduce urban heat island effects
- > Lower pollution levels
- > Manage rainwater
- > Stabilize slopes



Social Benefits

Regular access to trees and natural areas can improve mental health by reducing stress and promoting mental clarity and well-being.²⁴ Trees contribute to spaces where people can explore and recreate in nature, promoting a more physically healthy lifestyle. Forests also provide spaces where people can find spiritual revitalization.

The social benefits of the urban forest go beyond the individual by promoting social interactions within communities, creating a greater sense of place and identity.¹⁹ Urban forests also provide invaluable educational experiences for visitors and promote opportunities for environmental stewardship.

- > Improve mental and physical wellbeing
- > Provide sense of place and identity
- > Connect people with nature
- > Create more comfortable and attractive settings
- > Protection from UV rays



Economic Benefits

Because of the economic benefits provided to residents, businesses and municipalities, preserving its urban forest is one of the best investments a city can make. Mature trees in neighbourhoods are linked to higher property values. For businesses, a well-managed urban forest can attract more visitors, and views of trees can improve employees' productivity.²⁸

The urban forest can also increase the attractiveness of a city and bolster tourism.² Without a healthy urban forest, cities would have to spend millions more in infrastructure spending to generate the benefits it provides, such as clean air and water, and stormwater management.^{10, 1}

- > Attract more people to retail areas
- > Enhance tourism values
- > Reduce energy needs and costs
- > Save costs in stormwater management
- > Increase property value



2.2 Values

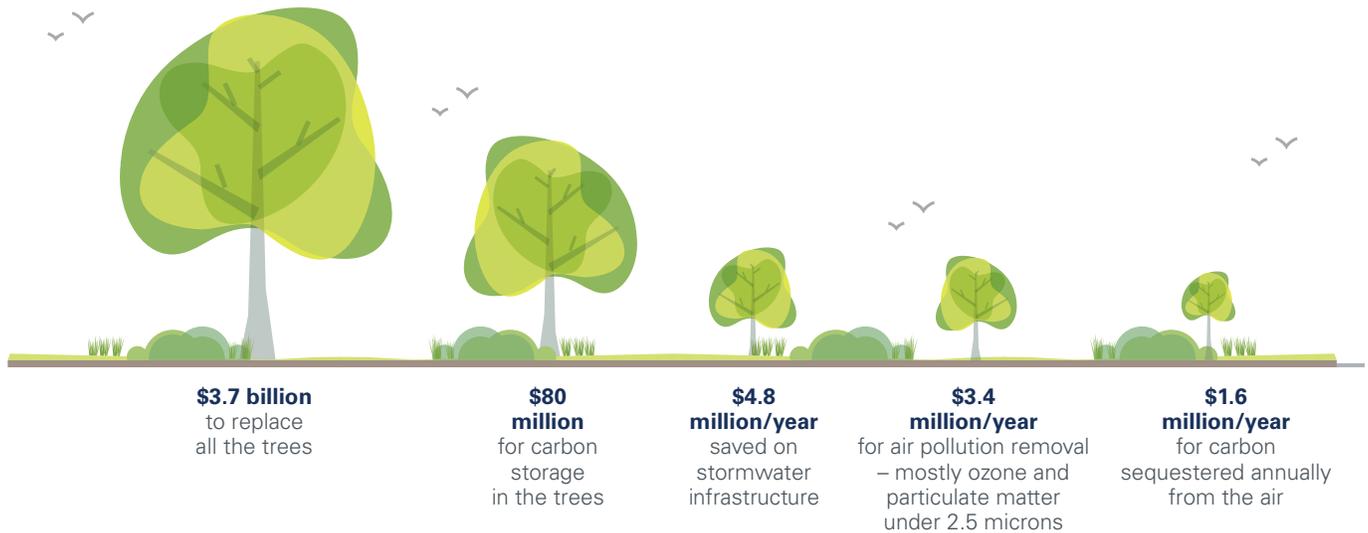
Trees offer many ecosystem services that may not be obvious to everyone. Even less obvious may be the money to be saved from the presence of trees. Calculating the benefits of the urban forest in monetary terms can help to build support for the importance of trees and for policies that protect and enhance the urban forest.

Monetary values can extend far beyond the trees themselves. For example, the removal of air pollution by trees results in reduced health care costs related to respiratory illness.¹² These values are complex and difficult to calculate and are therefore not typically factored into municipal decision-making. The values of ecosystem services provided by Surrey's urban forest (Figure 2) are based on an assessment using iTree Eco.

Ecosystem services are the benefits people obtain from ecosystems. They include temperature regulation through shading and cooling (helping to mitigate the urban heat island effect), carbon storage, stormwater management, clean air, mental well-being, food production and pollination.



FIGURE 2: VALUES OF ECOSYSTEM SERVICES PROVIDED BY SURREY'S URBAN FOREST



22,000 metric tons/year
oxygen production



The amount of carbon currently stored in Surrey's urban forest is equivalent to the carbon emitted from **543,000 gas-powered cars** or from **223,000 gas-heated detached homes** in one year.



Fleetwood Park



Magee Park

An aerial photograph of a suburban neighborhood with a green semi-transparent overlay on the left side. The overlay contains a quote and the name of a community survey participant. The background shows a dense residential area with many houses, some with autumn-colored trees, and a large park area with a playground and a paved path.

“Trees make such a difference in our lives in every season. I love walking or cycling around this neighbourhood at all times of the year, especially in the spring when the blossoms are out.”

Community survey participant

Magee Park



3

Surrey's Urban Forest

3.1 Urban Forest Context

Prior to European settlement, the land now known as Surrey was dominated by temperate rainforests interspersed with areas of grasslands, wetlands, riparian areas and shorelines. Indigenous Peoples actively managed forests through selective tree removal and controlled burning to maintain open meadow areas. The open areas provided suitable growing conditions for desirable food plants, and forage crops that would attract deer and other animals used for food.

Since the arrival of Europeans, drastic changes to the landscape have occurred over a relatively short period. Forests have been cleared, wetlands have been drained, and floodplains dyked for settlement and agriculture. This has resulted in a loss of forested areas, fragmentation of wildlife habitat, and a significant reduction in biodiversity. Many species of plants and wildlife are now endangered or threatened, and some have been lost.

Biodiversity in Surrey's forested areas has also been affected by invasive plant species and climate change. Invasive plants such as English ivy and Himalayan blackberry can overtake native vegetation. Hot dry summers and more severe winter storms caused by climate change have affected the health of many tree species.

As Surrey has urbanized, the last remnants of wilderness are found in natural area parkland. Approximately 60 per cent (1,650 hectares) of Surrey's existing parkland is natural area; however, the native vegetation is under considerable pressure from urban influences. Several city parks contain significant areas of second growth forests.

SUNNYSIDE ACRES URBAN FOREST PARK

After it was logged in the early 1900s, the forest was left to regenerate on its own, resulting in a diverse community of trees, plants and animals. A local group (Save our Sunnyside) recognized its unique ecological characteristics, recreational opportunities, and educational importance. With overwhelming support from the community, Sunnyside Acres Urban Forest Park was dedicated as an urban forest park in perpetuity in 1988. Save our Sunnyside became the Sunnyside Acres Heritage Society, which now works closely with Surrey Parks to protect and enhance this urban forest.





“Sunnyside Acres Urban Forest Park is special because it’s dedicated in perpetuity to remain in a natural state. Park visitors who are long-time Surrey residents can remember walking through the park as children. It’s an important natural area for preservation but also for the education of children and adults.”

Ron Meadley, President, Sunnyside Acres Heritage Society



GREEN TIMBERS URBAN FOREST PARK

Green Timbers is known as the “birthplace of reforestation” in B.C. After the last old growth trees were logged in 1930, the area was replanted, marking a first in B.C.’s history. It was dedicated as an urban forest park in 1988, largely in response to the efforts of the Green Timbers Heritage Society and other organized groups that recognized its unique history, ecological characteristics and recreational opportunities. Community involvement in the park continues to this day through the Green Timbers Heritage Society. In partnership with the City, the society educates the local community and is involved in the park’s protection.

“I walked in Green Timbers a couple of days ago and the smell of the trees in the air was wonderful.”

Community survey participant

Biodiversity Preserve Parks

Biodiversity preserve parks protect ecologically sensitive ecosystems and large areas of wildlife habitat. Public access in these parks is limited to trails, boardwalks and viewing platforms in less sensitive areas. Management activities and decisions are guided by site-specific management plans. These parks often include natural features such as wetlands, creeks and old-field meadows.

GODWIN FARM BIODIVERSITY PRESERVE

This park in Fleetwood was acquired in 2015 as a donation through Canada’s Ecological Gifts Program. The site features many large trees, including rare varieties and a 53-metre-tall heritage Douglas-fir tree. Looping trails provide access to old-field habitat, a fruit tree orchard, pond and sensitive riparian areas.

FERGUS WATERSHED BIODIVERSITY PRESERVE

This site in South Surrey was acquired in 2009 to protect the Fergus Creek headwaters and to provide opportunities for residents to enjoy nature. Bridges and trails will protect habitat and support nature appreciation.

CAMPBELL HEIGHTS BIODIVERSITY PRESERVE

This new park in South Surrey is adjacent to the Campbell Heights neighbourhood. At 82 hectares, this park includes forest, creeks, wetlands and fields. It will be managed for the primary purpose of habitat conservation.



“Green Timbers Park is important from an environmental perspective, a community involvement perspective, an urban forestry perspective, and a heritage perspective. The park demonstrates how a community shapes land use based on the values it sees in the land.”

Don Schuetze, President, Green Timbers Heritage Society

Surrey's parks have many notable trees, forests and other natural areas contributing to the diversity of the city's urban forest.

Fleetwood Park is home to Surrey's third designated urban forest, protecting 35 hectares of diverse second-growth forest as well as Fleetwood Creek and its tributaries.



Redwood Park's historic arboretum features over 50 species of trees from around the world, as well as one of the largest stands of redwood trees north of California.



Port Kells Park is home to a beech tree planted in 1898 (the oldest known planted tree in a Surrey park), and a stately row of heritage English oak and common beech trees.



Invergarry Park protects over 37.5 hectares of riparian creek habitat and natural forest, and is also home to one of the region's largest downhill mountain bike parks.



Blackie Spit Park's tidal marsh, sandy spit, shrubland and forest provide important habitat for hundreds of species of migratory and wintering birds.



Newton Pond Park, a green oasis of ponds, wetlands and forest within a densely populated neighbourhood, has been the focus of habitat restoration efforts by local youth.



HERITAGE TREES

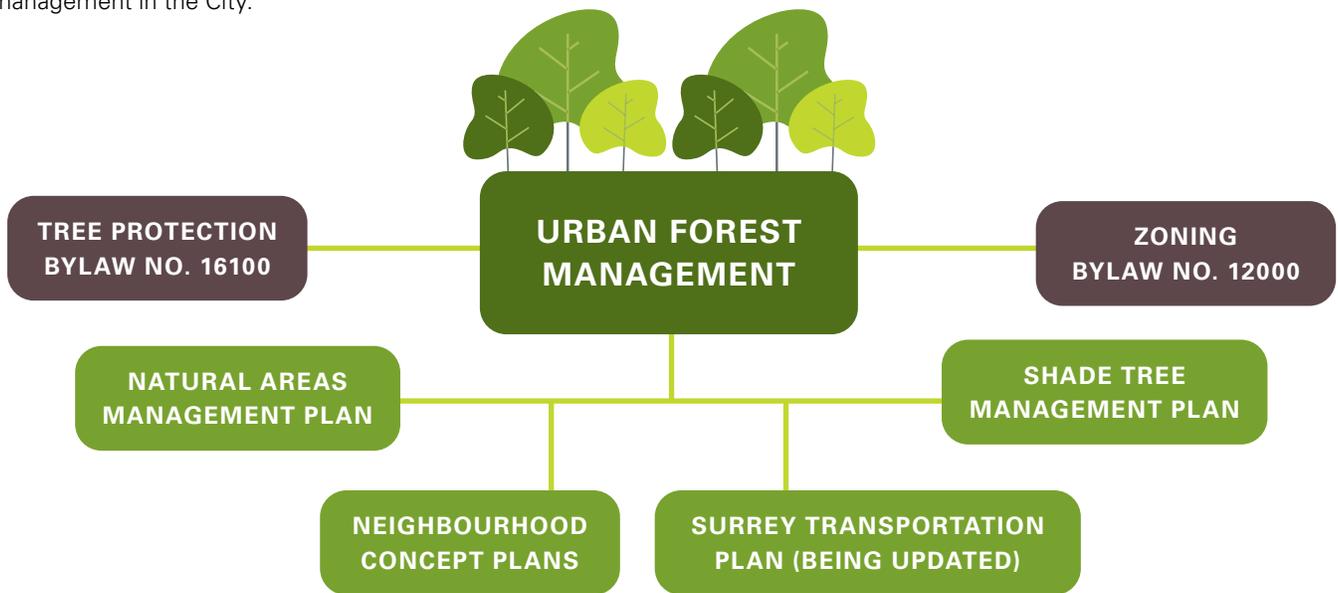
There are more than 200 trees with heritage status in Surrey, of which the oldest are approximately 180 years old. Heritage trees are nominated by residents and then reviewed by City arborists and Surrey's Heritage Advisory Commission. Heritage trees have tremendous value as legacies of the past and as icons in the landscape.



3.2 Current Tree Management

Bylaws and Plans

A number of plans, bylaws and policies influence urban forest management in the City.



TREE PROTECTION BYLAW NO. 16100

The Tree Protection Bylaw regulates tree cutting, tree removal and damage to trees. The bylaw governs trees on private and public land, including those affected by development. It also sets fees for tree cutting permits and requirements for planting replacement trees.

ZONING BYLAW 12000

The Zoning Bylaw regulates land use and development. The area allowed to be developed on each property and densities permitted in each zone affect the potential space available for planting trees.

NATURAL AREAS MANAGEMENT PLAN

Provides direction on managing wildlife habitat, tree risk, fire, public access and more in Surrey’s natural area parkland.

Supports biodiversity and forest health in the city’s natural areas.

NEIGHBOURHOOD CONCEPT PLANS

Concept plans, land use plans and local area plans guide design and development of Surrey’s neighbourhoods.

Can address tree retention through land use designations, areas of special study, and tree canopy cover targets.

SURREY TRANSPORTATION PLAN (BEING UPDATED)

Includes greening guidelines for landscaping and tree planting in transportation corridors.

Guide for prioritizing walking, cycling and safe mobility.

SHADE TREE MANAGEMENT PLAN

Provides guidance for tree species selection, planting and growing conditions, maintenance standards, risk management and more for shade trees on public property, including streets and parks.

Supports the growth of trees in urban areas of the city.

Other Guidelines and Policies

- > Biodiversity Design Guidelines
- > Engineering Design Criteria Manual
- > Park Standard Construction Documents
- > Sensitive Ecosystem Development Permit Areas
- > Supplementary Master Municipal Construction Documents
- > Surrey Parks, Recreation and Cultural Facilities Regulation Bylaw No. 13480 (1998)
- > Tree Cutting on City Land and Boulevards Bylaw No. 5835 (1979)

Urban Forest Management Responsibilities

Management of the urban forest involves collaboration among multiple levels of government, utility providers, residents and business owners. The Parks Division is primarily responsible for managing trees on City-owned land, including parkland and road rights-of-way. Roles also include fostering community engagement and delivering environmental messaging related to the urban forest. Property owners are responsible for managing trees on their property, often hiring landscapers and arborists to manage and maintain these trees. The Building Division administers the Tree Protection Bylaw and provides guidance to property owners to ensure that their tree work is in compliance.

	TREES ON CITY LAND	TREES ON PRIVATE LAND
Who leads this?	Parks Division	Building Division
Key role	Plants and maintains trees on City property – includes watering, pruning, managing insects and disease	Implements the Tree Protection Bylaw for tree removal, replacement and protection on private land

A close-up photograph of a rose bush. The image shows several green, serrated leaves with small yellow spots, likely from a disease. Two bright red rose hips are prominently featured in the center, hanging from a stem. The background is a soft-focus green, suggesting more foliage.

**“I think the City has done a great job
planting trees. I’d like to see more fruit
bearing trees residents could enjoy.”**

Community survey participant

Trees on Private Land

58 per cent of Surrey's tree canopy cover is on private land



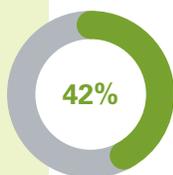
The City's Tree Protection Bylaw regulates the removal, replacement and protection of trees on private land. This includes setting requirements for planting replacement trees after permitted removals. The bylaw also sets requirements for trees during development, including the collection of securities to ensure trees are protected. Approximately 9,000 trees are replanted annually as compensation for tree removal.

The City hosts annual tree sales that provide residents the opportunity to purchase fruit and shade trees to plant on their property.



Trees on Public Land

42 per cent of Surrey's tree canopy cover is on public land



The Parks Division manages natural area parkland, and shade trees on streets and in parks. Natural areas provide valuable ecosystem services related to stormwater management, biodiversity and wildlife habitat. Surrey's natural area parkland plays an important role in the city's Green Infrastructure Network. The management of natural area parks includes tree risk assessments, hazard tree removals, trail maintenance, natural area restoration and wildlife habitat management.

Shade trees also provide valuable wildlife habitat and ecosystem services. Between 2006 and 2021, the City planted more than 275,000 trees on public land. The City's 108,260 shade trees along streets and in parks contribute almost six per cent of Surrey's tree canopy cover (as of 2021).

Including tree sales and compensation planting on private land, approximately 30,000 trees are planted annually through City programs.



Heritage Oak Trees on King George Boulevard



Green Timbers Urban Forest Park

Environmental Stewardship

Surrey has long recognized environmental stewardship and education as a core part of its service delivery, with a dedicated staff team focused on urban forest stewardship in place for more than 20 years. Annual public awareness campaigns encourage residents to take an active role in protecting and maintaining City trees, including helping to water street trees. Diverse programs and events engage schools, youth, volunteers and the public in learning about and caring for the urban forest.

Highlights include:

- > **Environmental Extravaganza** – series of 100+ environmental programs for all ages from April to June, hosted with community partners (since 1997)
- > **Releaf Tree Planting Events** – opportunities for residents, schools and community groups to plant trees in parks (since 1991)
- > **Surrey's Natural Area Partnership (SNAP)** – partnership between the City and three local non-profits, employing youth to carry out habitat restoration, tree care and community outreach activities (since 2001)
- > **Surrey's Youth Stewardship Squad (SYSS)** – environmental volunteer opportunities for high school-aged youth (since 2006)

Surrey Nature Centre

The Surrey Nature Centre at Green Timbers opened in 2008 to foster community appreciation for nature and the urban forest. The Surrey Nature Centre delivers a wide range of programming for children and adults, and has welcomed over 44,000 visitors to date.

Programs include:

- > **School Programs** – curriculum-based, outdoor programs introducing students to the urban forest through place-based, hands-on learning
- > **Nature Preschool** – year-long licensed preschool program to foster children's familiarity and connection with the natural world
- > **Guided Nature Walks** – opportunities for visitors to learn more about Green Timbers Urban Forest, both in-person and virtually
- > **Nature Day Camps** – spring break, summer and Pro-D day camps for children aged 6-12, providing opportunities to learn about nature and build outdoor skills



Releaf Tree Planting Event

3.3 Tree Canopy Cover

Tree canopy cover is commonly used to evaluate the urban forest; it is relatively easy to measure and is a good indicator of the urban forest's distribution. It enables a municipality to track how its urban forest changes over time, and also how it compares to other communities. Tree canopy cover does not address ecosystem services or forest characteristics, such as health or species distribution. These need to be evaluated with other methods.

Metro Vancouver conducted a study to track tree canopy cover in the region. In comparison with four other municipalities with available historic data, Surrey has a relatively high tree canopy cover, but it has also experienced a significant decline since 1995.

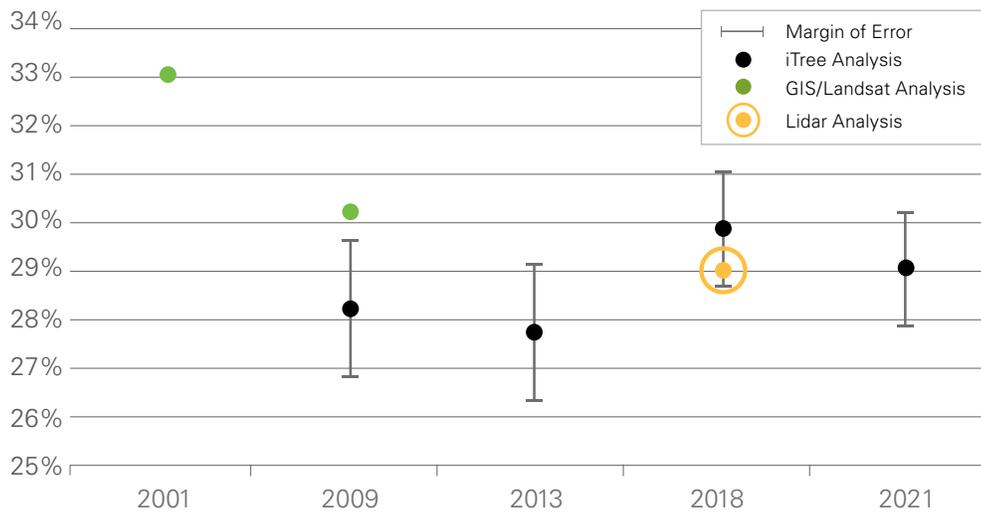


Surrey's Tree Canopy Cover Studies

The City has completed multiple tree canopy cover studies over the past 20 years. Lands in the Agricultural Land Reserve (ALR) were excluded from these studies. Lands managed by other levels government, including Semiahmoo First Nation, Metro Vancouver, and the provincial and federal governments, were included.

Over the past 20 years, the city's tree canopy cover has declined; however, in recent years the rate of decline has slowed. The most accurate analysis was completed in 2021 using LiDAR data from 2018. This analysis identified a tree canopy cover of 29 per cent. An iTree Canopy analysis using a 2021 air photo also identified a 29 per cent tree canopy cover.

FIGURE 3: TREE CANOPY COVER ANALYSIS



Surrey has 17 parks fully or partially within the ALR that were not included in the tree canopy cover studies. Covering 424 hectares, and with a tree canopy cover of 42 per cent, inclusion of these parks would increase the city's tree canopy cover from 29 to 29.2 per cent.

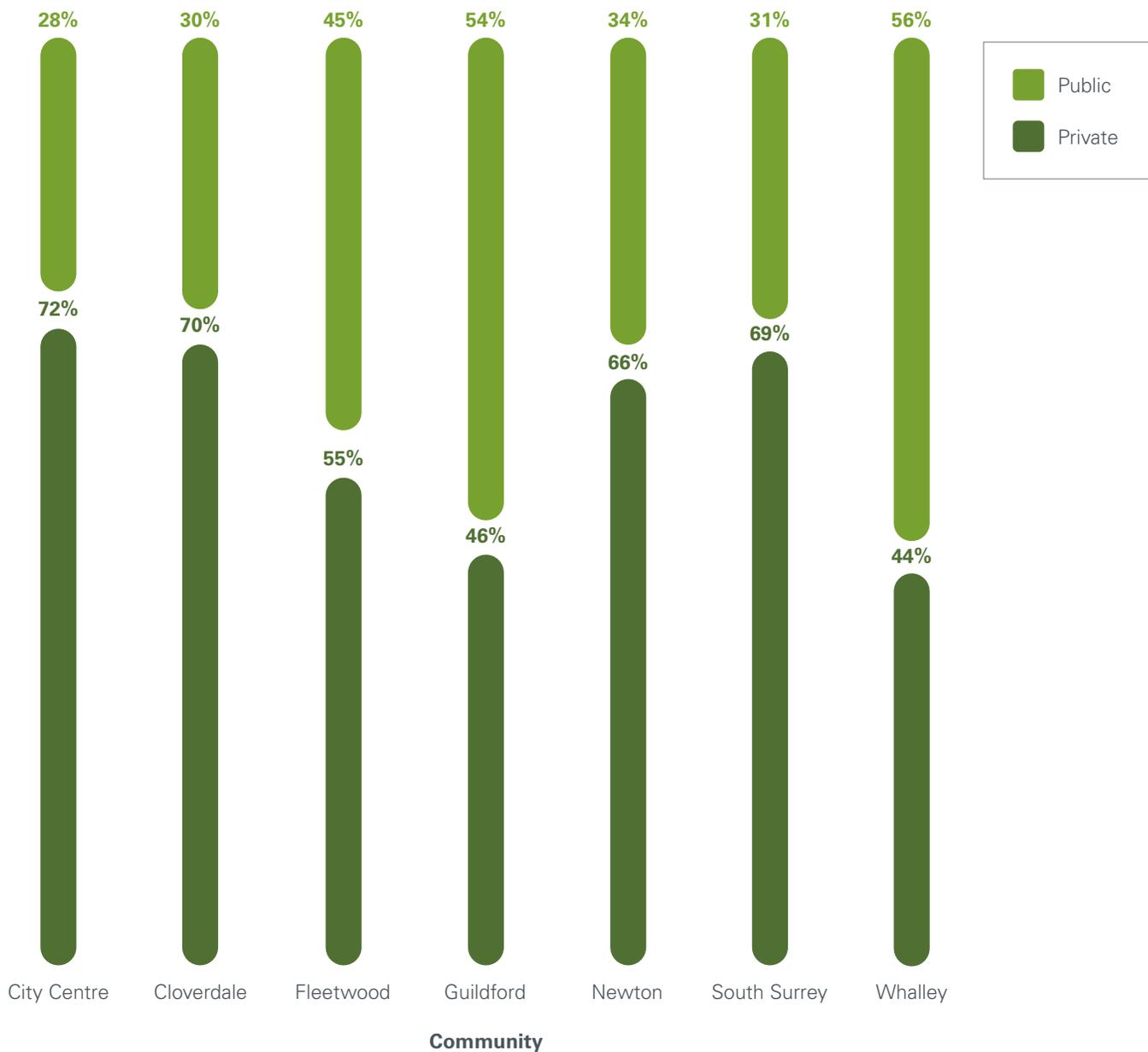
	ITREE ANALYSIS	GIS/LANDSAT ANALYSIS	LIDAR ANALYSIS
Description	Online software that randomly selects points identified by the operator as "tree" or "non-tree", and other selected features if desired, e.g., "shrub"	Fieldwork and digitizing of sample sites to identify tree canopy cover, satellite imagery to map forests, zoning to apply canopy to land uses	Digital analysis of data gathered by 3D aerial laser scanning
Advantages	Easy to use and repeat	Best method available for detailed analysis in 2011 Allows for comparison with other map information, e.g., land use	Accurately identifies tree canopy cover and tree heights Current best practice Allows for comparison with other map info., e.g., land use
Disadvantages	Margin of error depends on number of points sampled Does not allow for comparison with other map information, e.g., land use Cannot control air photo source without the use of GIS software	Time consuming	Expensive data to collect Complicated to analyze

Source: United States Department of Agriculture

Tree Canopy Cover on Public and Private Lands

The location of the tree canopy cover affects potential actions to increase and manage the urban forest. Most of Surrey's tree canopy cover is on private land, so guidance on land development and programs to encourage tree planting are important tools. The City manages the tree canopy cover in parks and natural areas, and strives to plant and manage trees while also providing sports fields and other recreation amenities. Surrey also plants trees along road corridors, within the limitations posed by transportation infrastructure and utilities.

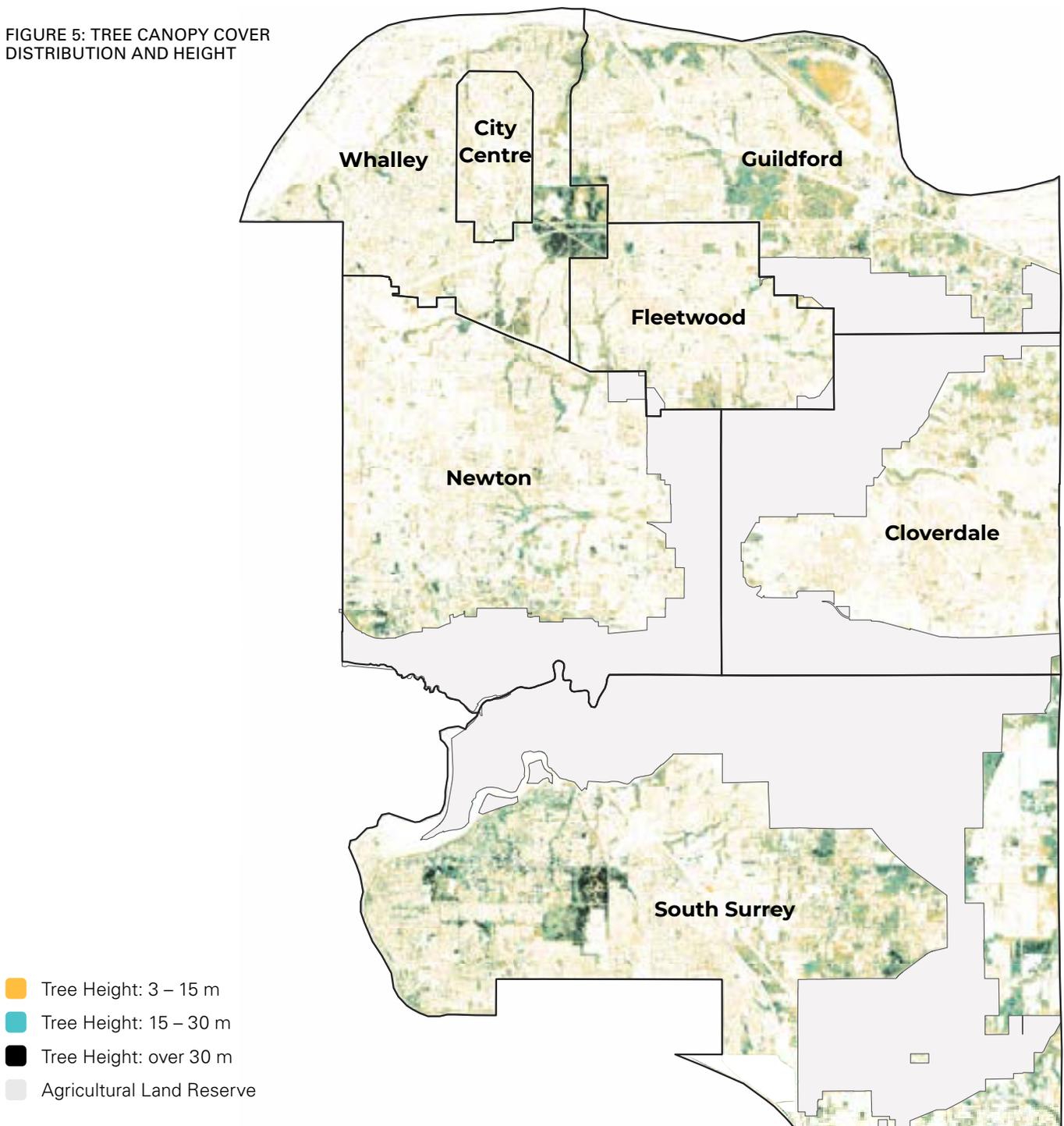
FIGURE 4: PUBLIC AND PRIVATE TREE CANOPY COVER



Tree Height Distribution

Tree heights are shown in three classes to illustrate the variation within the tree canopy cover. Trees under 15 metres are both young trees as well as small trees selected to fit within urban settings. Trees between 15 and 30 metres in height are mostly mature trees that provide substantial shade and other ecosystem services. Trees over 30 metres provide the greatest environmental and social benefits. On average, a large tree provides 16 times more value to the community over its lifetime than a small tree.¹⁵

FIGURE 5: TREE CANOPY COVER DISTRIBUTION AND HEIGHT



Tree Canopy Cover by Community

For each of Surrey’s six communities the tree canopy cover was analyzed to better understand how the urban forest is distributed across the City and by different land uses. For this analysis, the following land uses were consolidated from the Zoning Bylaw.

LAND USE TYPE	DEFINITION
Agriculture	Agricultural lands that are not in the ALR
Cemetery	Public and private cemeteries
Commercial	Land uses that supply goods and services for profit
Comprehensive Development	Mixed land uses on one lot based on a comprehensive plan
Golf Course	Public and private golf courses
Industrial	Manufacturing, processing, assembling, servicing or repairing of goods
Industrial – Business Park	Industrial business parks based on a comprehensive design
Parks and Natural Areas	Public parks and natural areas
Public Assembly	Assembly and institutional uses such as hospitals and colleges
Residential – Estate Lots	Minimum one acre lot and larger acreage residential
Residential – Multi Family	Duplex, multiple, semi-detached, manufactured home and special care housing
Residential – Single Family	Cluster, half acre and single family residential
Road Rights-of-Way	Public rights-of-way around roads

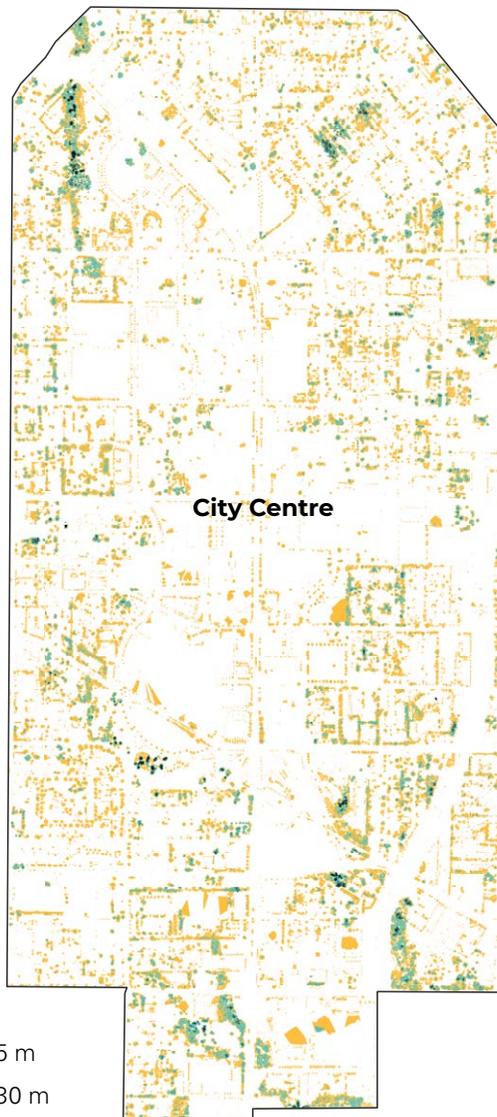


City Centre

The land uses in City Centre are mostly high-density residential and commercial. There are some areas of single-family housing around the periphery.

The tree canopy cover is primarily composed of small and medium trees throughout the developed areas. There are larger trees in and riparian corridors.

TREE CANOPY COVER



- Tree Height: 3 – 15 m
- Tree Height: 15 – 30 m
- Tree Height: over 30 m
- Agricultural Land Reserve

TREE CANOPY COVER DISTRIBUTION



TREE CANOPY COVER BY LAND USE

Commercial	11.5%
Comprehensive Development	12.6%
Parks and Natural Areas	26.6%
Public Assembly	16.6%
Residential - Multi Family	27.7%
Residential - Single Family	25.4%
Road Rights-of-Way	16.2%

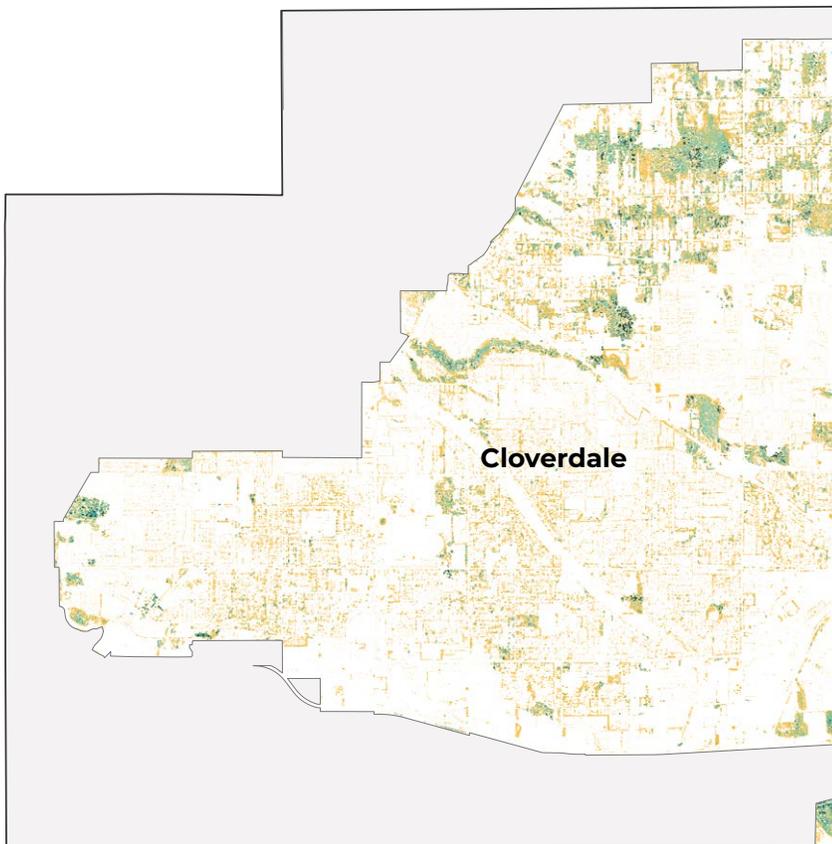


Cloverdale

Cloverdale includes agricultural land bounded by large residential estate lots in the north, transitioning to commercial and multi-family in the centre, and mostly industrial lands in the south.

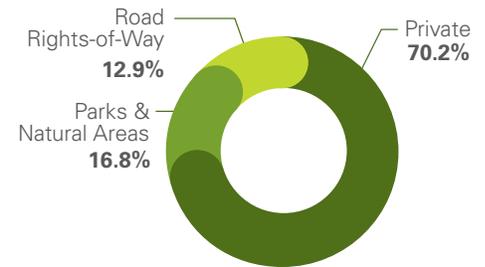
The tree canopy cover in the south and centre of the community is made up of mainly small and medium trees. In the north of the community, there are large areas of forested land in estate lots, along riparian corridors and in parks.

TREE CANOPY COVER



- Tree Height: 3 – 15 m
- Tree Height: 15 – 30 m
- Tree Height: over 30 m
- Agricultural Land Reserve

TREE CANOPY COVER DISTRIBUTION



TREE CANOPY COVER BY LAND USE

Agriculture	31.4%
Commercial	6.6%
Comprehensive Development	11.7%
Golf Course	28.8%
Industrial	8.0%
Industrial - Business Park	10.9%
Parks and Natural Areas	40.9%
Public Assembly	12.1%
Residential - Estate Lots	39.8%
Residential - Multi Family	15.4%
Residential - Single Family	16.2%
Road Rights-of-Way	15.2%

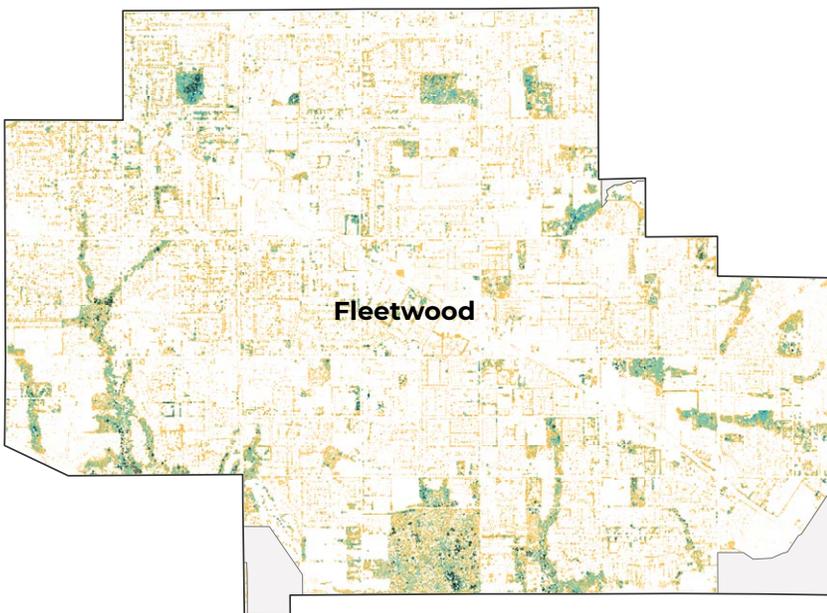


Fleetwood

Fleetwood has a corridor of commercial and higher-density residential uses along Fraser Highway. Newer developments are located in the northeast of the community, and the remainder is single family and parkland, including Fleetwood Park.

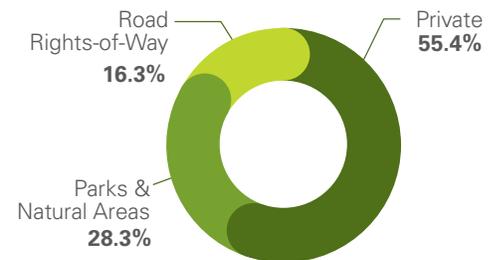
The tree canopy cover in the south is mostly small and medium trees throughout the developed areas, with some significant areas of forested land and larger trees along riparian corridors and in parks.

TREE CANOPY COVER



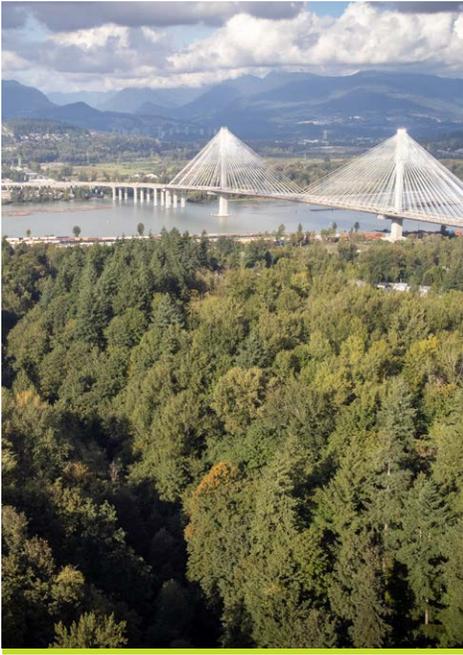
- Tree Height: 3 – 15 m
- Tree Height: 15 – 30 m
- Tree Height: over 30 m
- Agricultural Land Reserve

TREE CANOPY COVER DISTRIBUTION



TREE CANOPY COVER BY LAND USE

Agriculture	45.6%
Commercial	9.1%
Comprehensive Development	13.1%
Golf Course	19.8%
Industrial	36.8%
Parks and Natural Areas	60.5%
Public Assembly	20.5%
Residential - Estate Lots	38.8%
Residential - Multi Family	17.5%
Residential - Single Family	17.8%
Road Rights-of-Way	18.9%

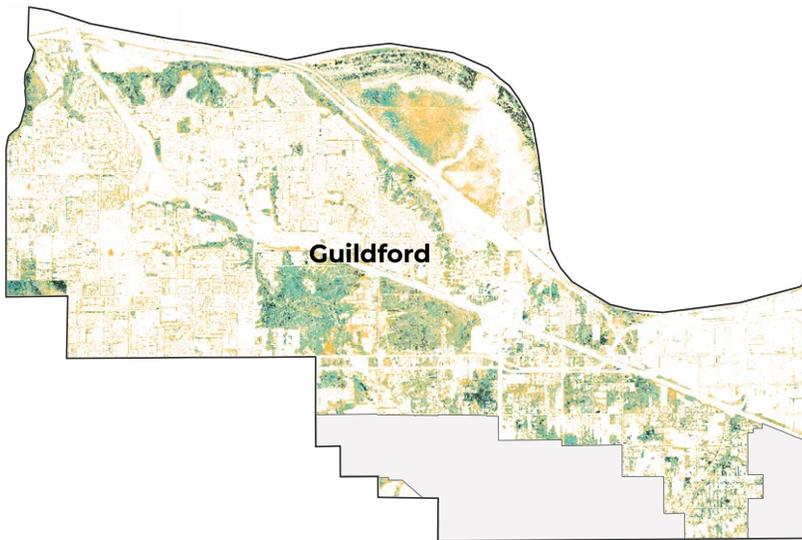


Guildford

Industrial lands are adjacent to the Fraser River and Canadian National Railway in the northern section of the community. Two large Metro Vancouver Parks, Surrey Bend and Tynehead, are major features in this area. There is a high-density commercial and residential core in the west; agriculture and estate lots dominate the east. Single-family housing surrounds the commercial residential core.

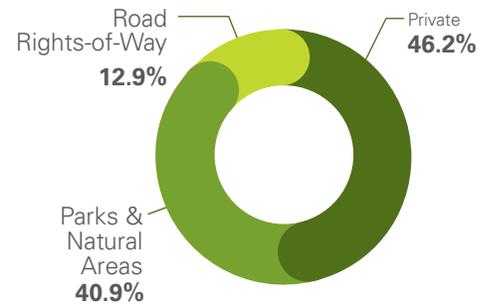
There are significant forested areas and large trees located in parks and estate lots, and along riparian corridors. Primarily small and medium trees are distributed throughout the developed areas, with minimal tree canopy cover in the industrial areas.

TREE CANOPY COVER



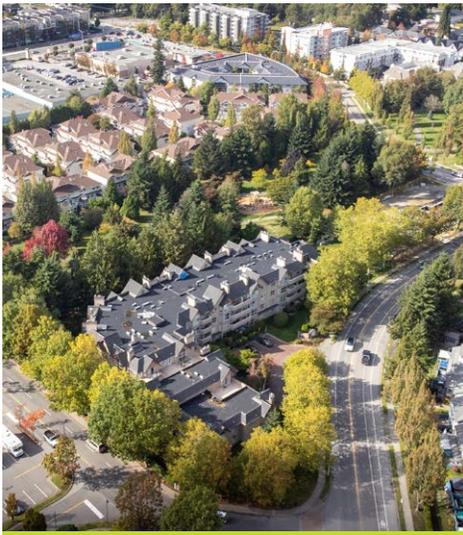
- Tree Height: 3 – 15 m
- Tree Height: 15 – 30 m
- Tree Height: over 30 m
- Agricultural Land Reserve

TREE CANOPY COVER DISTRIBUTION



TREE CANOPY COVER BY LAND USE

Agriculture	46.9%
Commercial	15.4%
Comprehensive Development	14.0%
Industrial	13.3%
Parks and Natural Areas	63.8%
Public Assembly	17.9%
Residential - Estate Lots	49.1%
Residential - Multi Family	25.2%
Residential - Single Family	19.9%
Road Rights-of-Way	22.2%

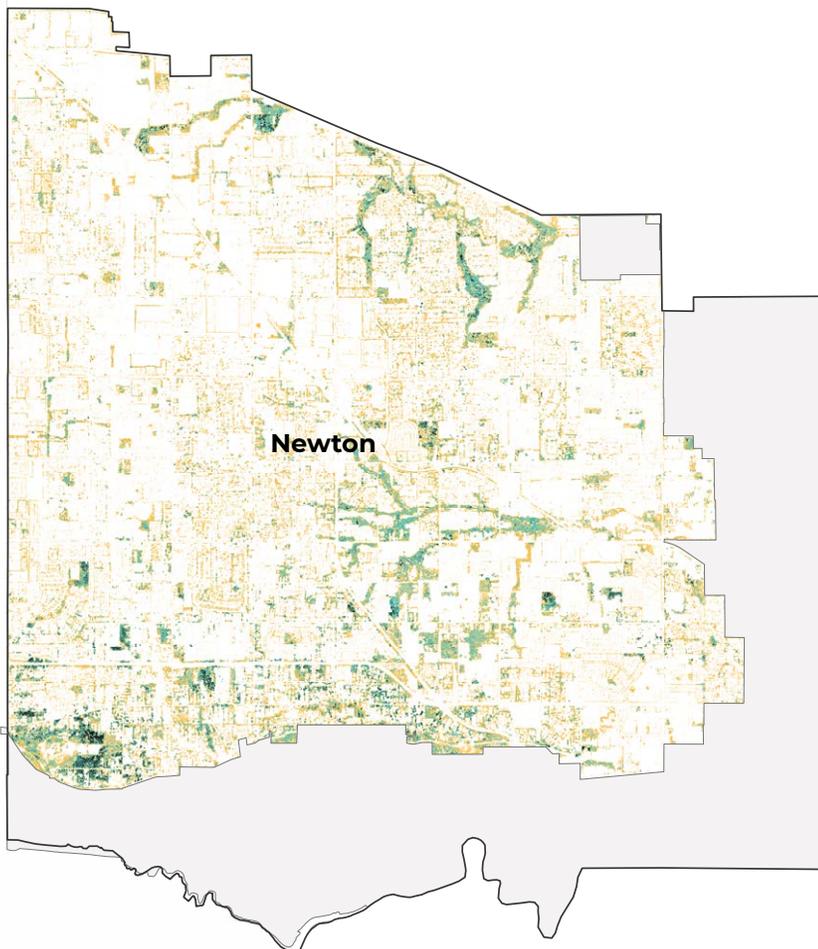


Newton

Newton has significant commercial areas along King George Boulevard, and industrial development is located near the Southern Railway of B.C. Clusters of multi-family development are close to King George Boulevard and Scott Road. Large areas of single-family homes are found away from these corridors.

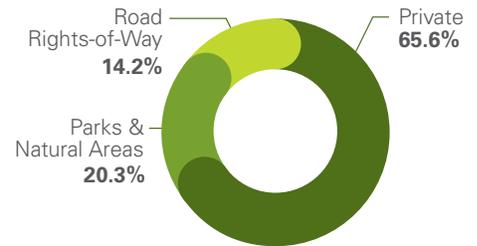
The tree canopy cover includes small and medium trees throughout the single-family areas. Riparian corridors, mostly on the east side of Newton, have larger trees with more substantial forested areas south of 58 Avenue.

TREE CANOPY COVER



- Tree Height: 3 – 15 m
- Tree Height: 15 – 30 m
- Tree Height: over 30 m
- Agricultural Land Reserve

TREE CANOPY COVER DISTRIBUTION



TREE CANOPY COVER BY LAND USE

Agriculture	24.4%
Cemetery	19.4%
Commercial	11.7%
Comprehensive Development	13.1%
Industrial	11.1%
Industrial - Business Park	11%
Parks and Natural Areas	50.9%
Public Assembly	17.1%
Residential - Estate Lots	36.7%
Residential - Multi Family	22.8%
Residential - Single Family	21%
Road Rights-of-Way	17%

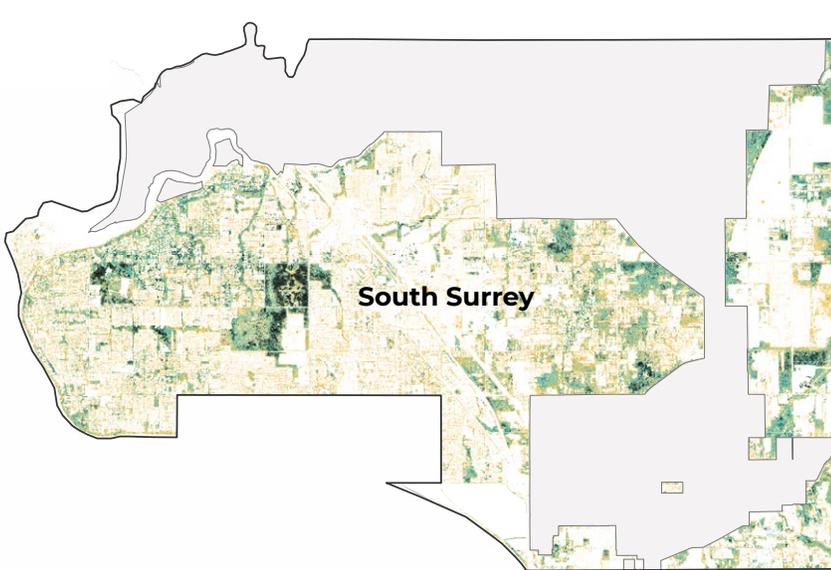


South Surrey

South Surrey is a large community bisected by the ALR. There are high-density commercial and residential areas along Highway 99 and King George Boulevard, large areas of estate lots with single-family housing west of the highway, and both agricultural and industrial land east of the ALR. Large parks such as Sunnyside Acres Urban Forest Park and Crescent Park are key features.

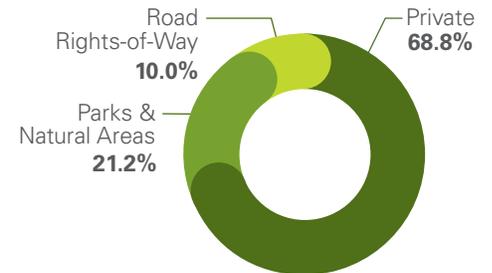
There are significant forested areas with large trees in parks and areas with estate lots. There is minimal tree canopy cover in the industrial areas, and mostly small and medium trees in the other developed areas.

TREE CANOPY COVER



- Tree Height: 3 – 15 m
- Tree Height: 15 – 30 m
- Tree Height: over 30 m
- Agricultural Land Reserve

TREE CANOPY COVER DISTRIBUTION



TREE CANOPY COVER BY LAND USE

Agriculture	41.6%
Cemetery	27.0%
Commercial	17.5%
Comprehensive Development	17.7%
Golf Course	27.4%
Industrial	13.4%
Industrial - Business Park	11.9%
Parks and Natural Areas	69.2%
Public Assembly	33.6%
Residential - Estate Lots	53.5%
Residential - Multi Family	20.4%
Residential - Single Family	27.5%
Road Rights-of-Way	21.4%

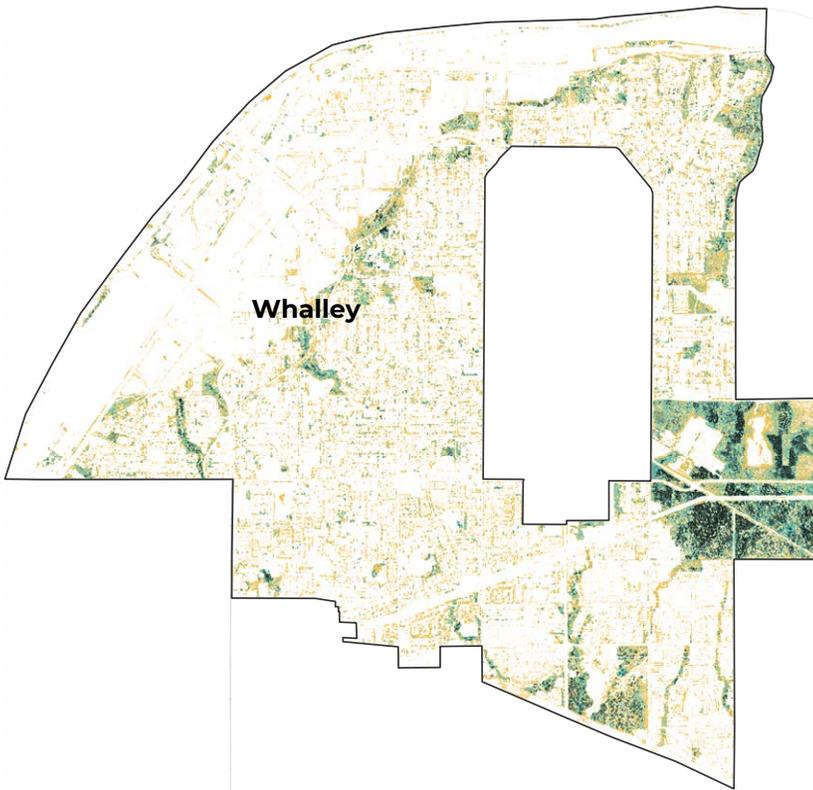


Whalley

Whalley has a large industrial area along the Fraser River in the north. Extensive areas of single-family housing are located elsewhere, with occasional pockets of higher density housing. The community includes Green Timbers Urban Forest Park and Bear Creek Park.

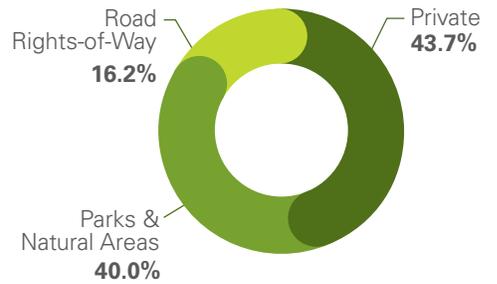
The tree canopy cover includes small and medium trees throughout the single-family areas. The major parks, bluffs above the industrial area and riparian corridors have larger trees.

TREE CANOPY COVER



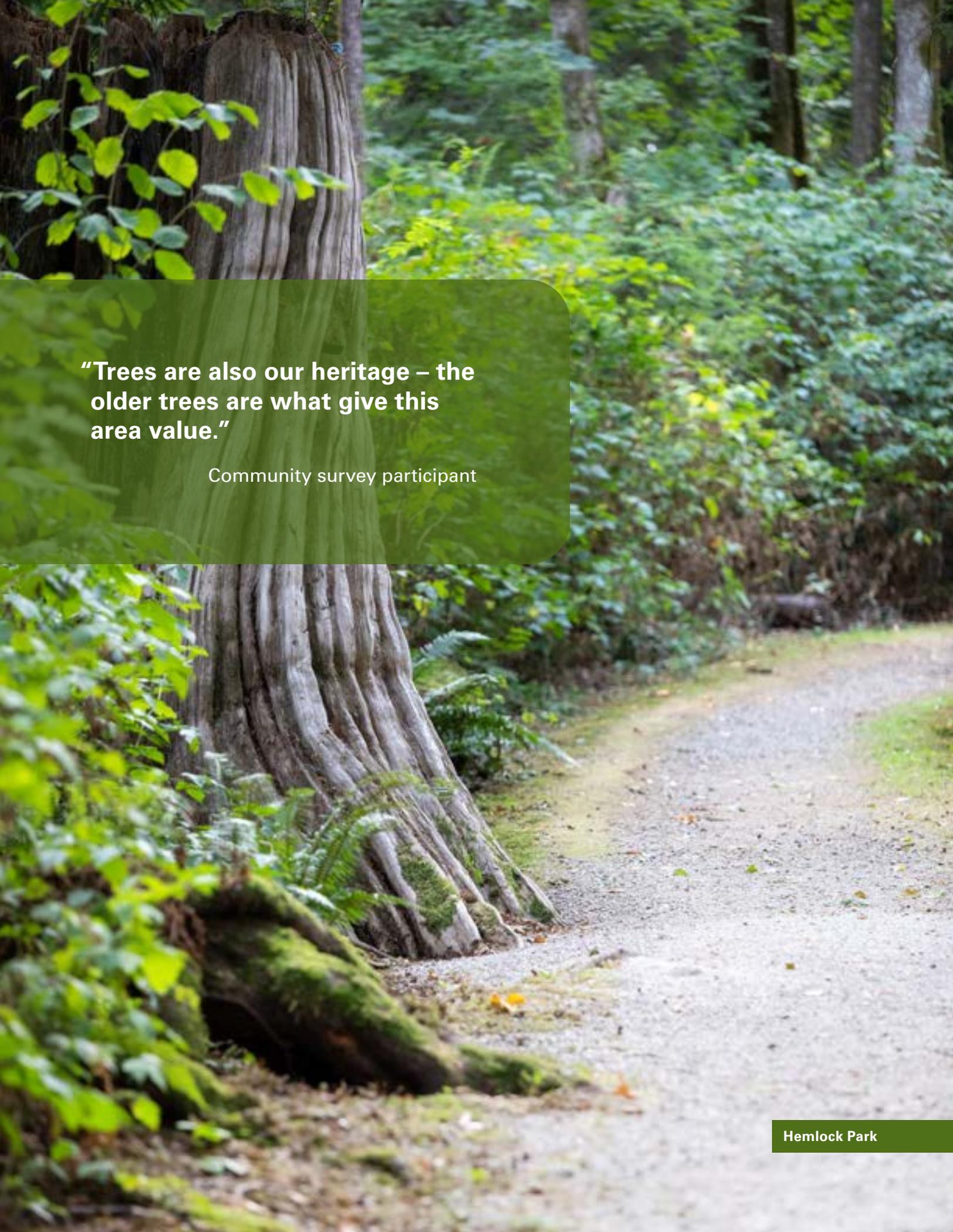
- Tree Height: 3 – 15 m
- Tree Height: 15 – 30 m
- Tree Height: over 30 m
- Agricultural Land Reserve

TREE CANOPY COVER DISTRIBUTION



TREE CANOPY COVER BY LAND USE

Agriculture	23.3%
Commercial	12.2%
Comprehensive Development	17.2%
Industrial	6.6%
Industrial - Business Park	16.0%
Parks and Natural Areas	69.0%
Public Assembly	19.5%
Residential – Estate Lots	37.6%
Residential – Multi Family	23.9%
Residential – Single Family	21.4%
Road Rights-of-Way	18.6%



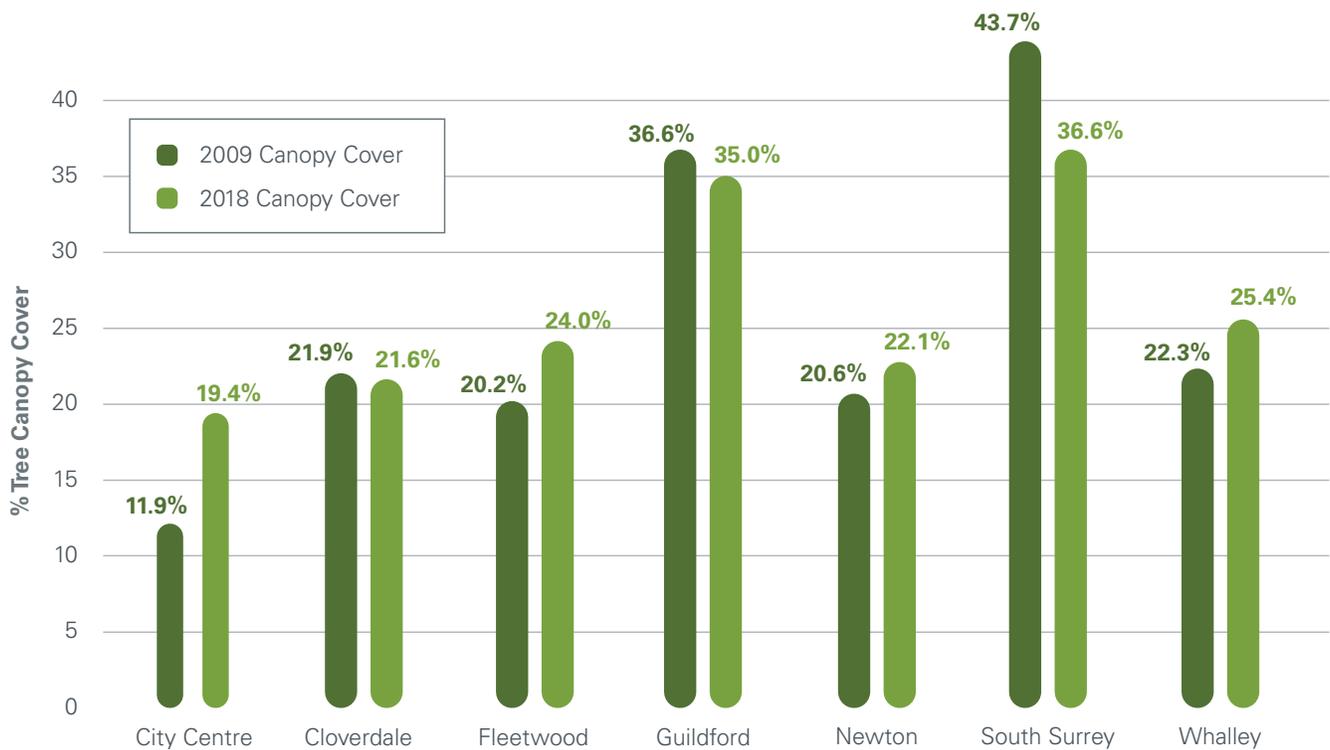
“Trees are also our heritage – the older trees are what give this area value.”

Community survey participant

Tree Canopy Cover Change

The tree canopy cover in Surrey's communities has changed over the past decade. Most of these changes were relatively small, as the loss of canopy cover from new development was in some cases offset by increases related to the growth of recently planted trees. The South Surrey community saw the greatest decline due to new development and the construction of large houses on estate and larger single-family lots. City Centre's tree canopy cover increased the most as trees planted over the past decade continued to grow.

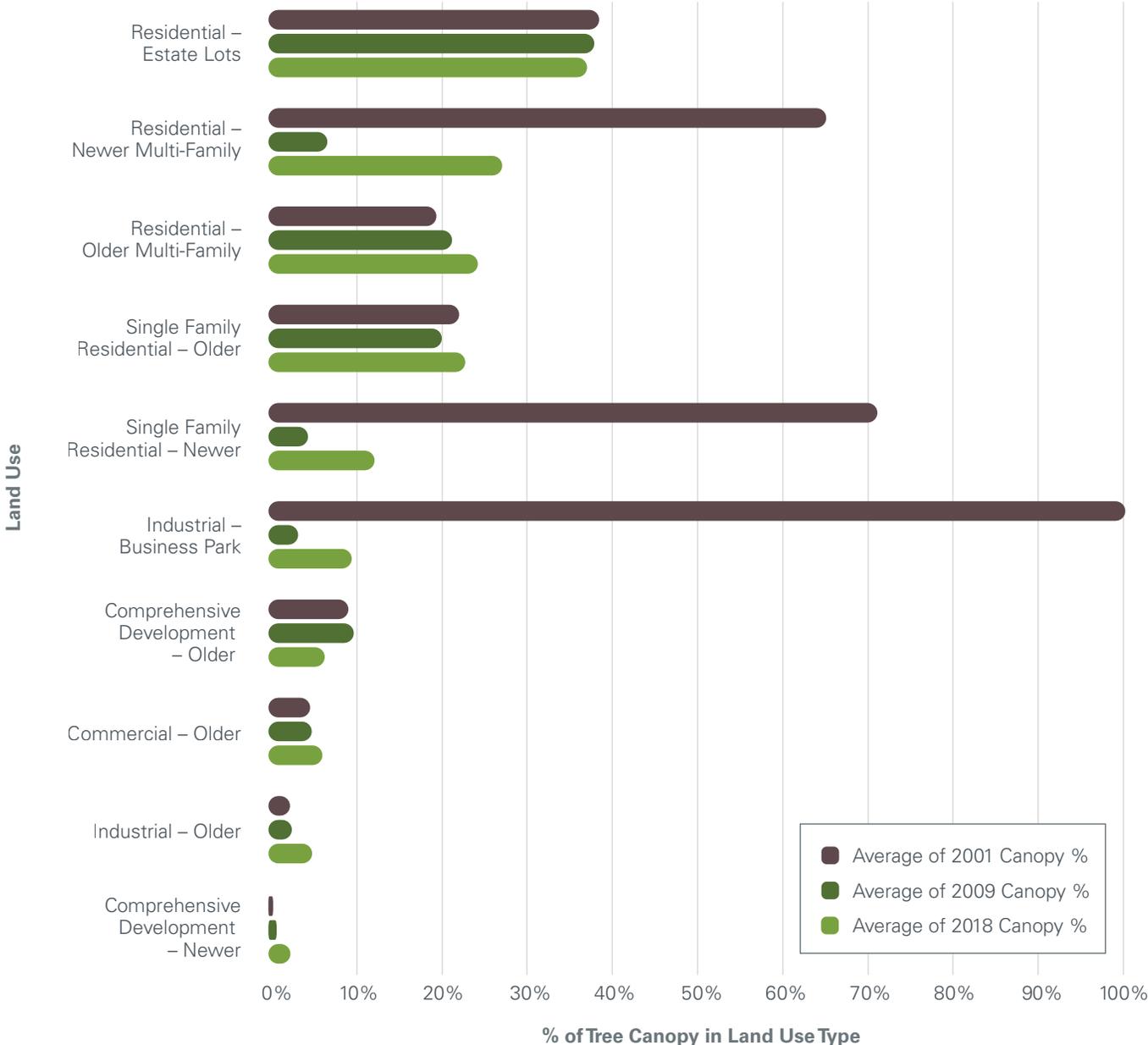
FIGURE 6: TREE CANOPY COVER BY COMMUNITY (2009 – 2018)



In a 2011 tree canopy cover study, 25 sample sites were selected to represent a variety of land uses and ages of development³. An analysis of these sites with data from 2001, 2009 and 2018 provides an understanding of the patterns of change that have occurred to the city’s tree canopy cover over this time (see Appendix A for sample sites).

A summary of the data illustrates how the tree canopy cover has changed on these sample sites. For example, several of the new residential and industrial sites had been undeveloped in 2001. This resulted in a significant decrease in canopy cover by 2009 when the properties had been developed, followed by moderate increases by 2018 as planted trees grew. Residential estate lots and some of the older residential neighbourhoods saw gradual canopy cover decreases as trees were removed for building larger houses or infill development. There were tree canopy cover increases in some of the older developments as planted trees grew larger.

FIGURE 7: TREE CANOPY COVER BY LAND USE FOR SAMPLE SITES 2001 – 2018



Equity Analysis

An equity analysis was carried out to determine tree canopy cover in areas where populations are facing socio-economic challenges. This analysis can help ensure that the social, environmental and economic benefits provided by the urban forest are accessible to all residents.

Within census tracts, the relative concentrations of residents with lower incomes, youth, seniors, Indigenous Peoples and new immigrants were combined to create an overall measure of equity need. These were divided into three levels – high, moderate and low –and the tree canopy cover was then calculated for each of the equity need areas.

A **census tract** is a small geographic region defined for the purpose of taking a census: in Canada a census tract typically has a population between 2,500 and 8,000 persons.

FIGURE 8: EQUITY NEED

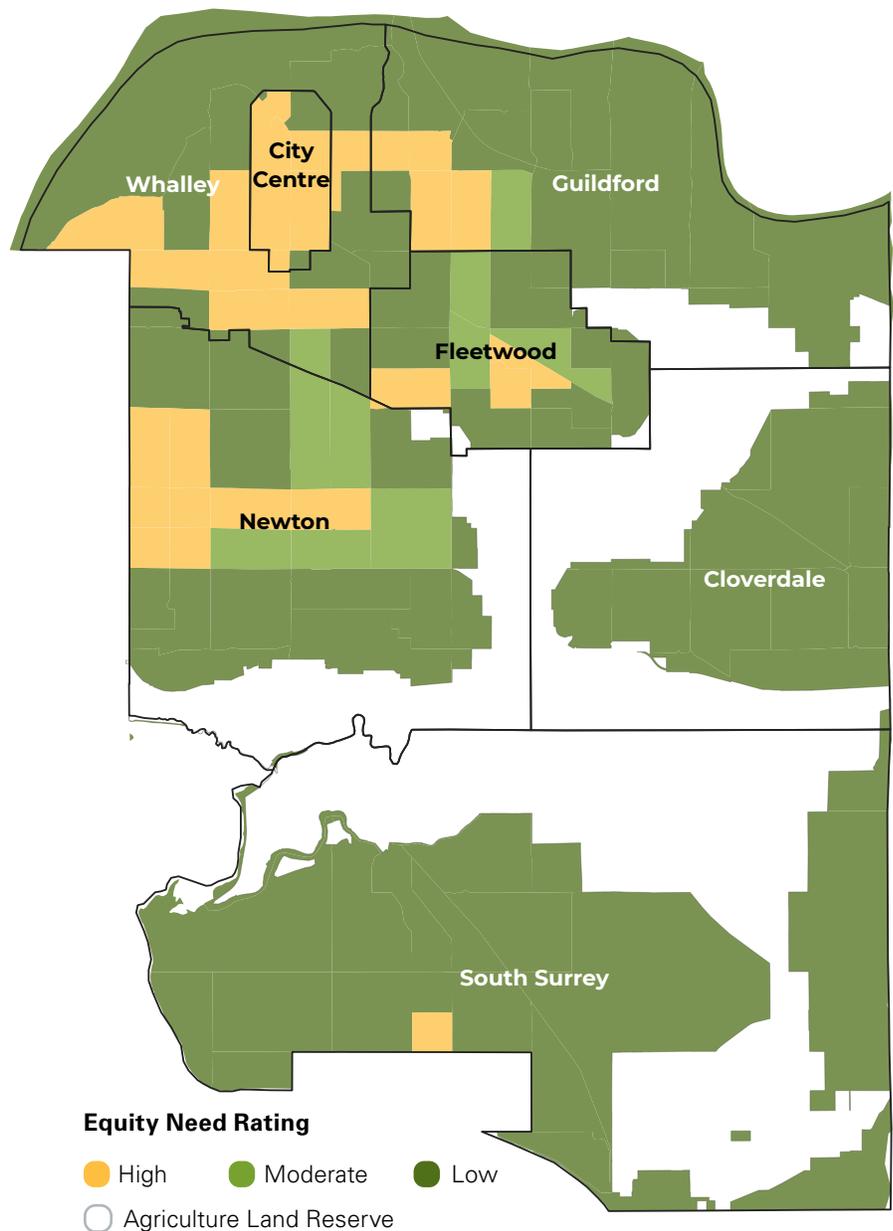
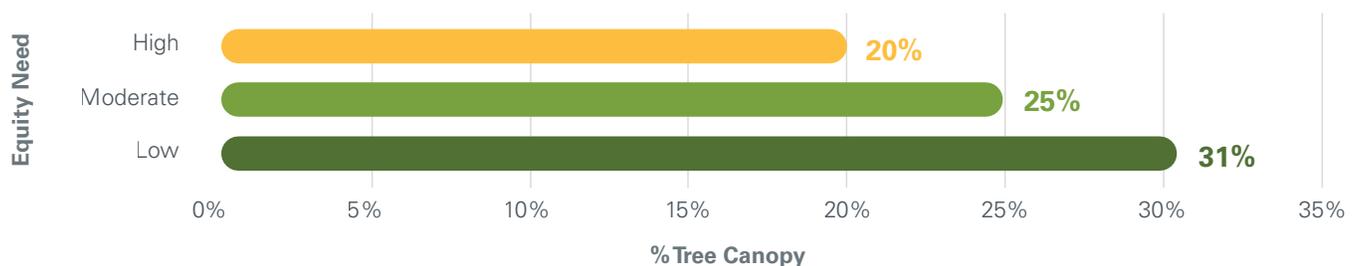


FIGURE 9: TREE CANOPY COVER IN EQUITY NEED AREAS



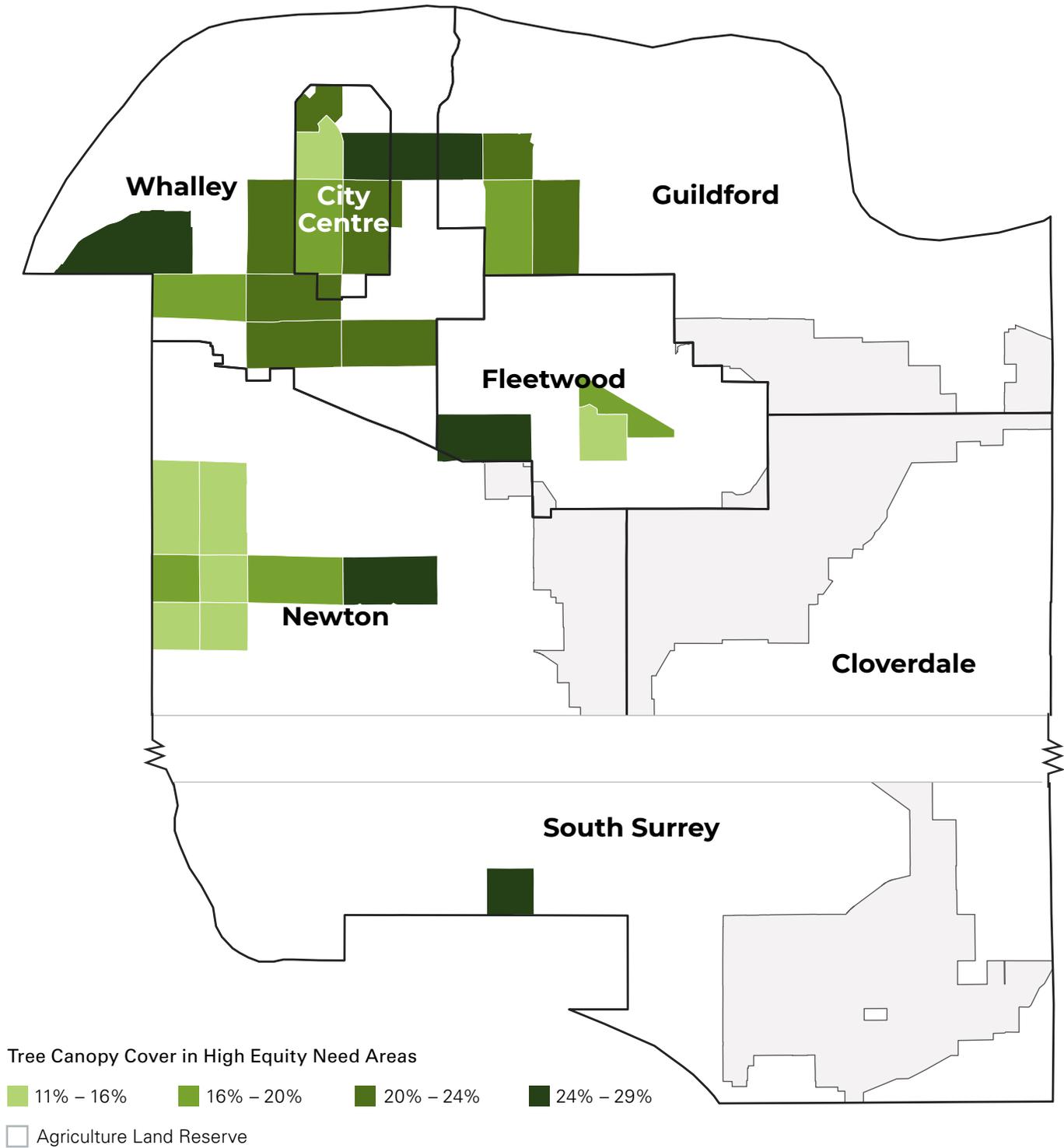
As is common throughout North America, Surrey's higher equity need areas have lower than average tree canopy cover.¹⁴ This is typically due to higher population densities resulting in less space available for the urban forest.

The high and moderate equity need areas combined represent around 19 per cent of the city's area. The relatively small size of these areas will make it easier to focus planting efforts.



The map below illustrates the tree canopy cover in high equity need areas. The areas with the lowest tree canopy cover on this map are priorities for tree planting to improve equity.

FIGURE 9: TREE CANOPY COVER IN HIGH EQUITY NEED AREAS



3.4 Urban Forest Characteristics and Health

Recent iTree Eco and GIS analyses estimate that Surrey has between 1.4 and 1.9 million trees. Surrey's urban forest includes a variety of tree and forest types, distributed across natural areas, parks, streets and private land.

The following are the typical urban forest characteristics in Surrey, including trees in natural and developed areas.

MATURE SECOND-GROWTH FOREST

Older forested areas in Surrey, found on public and private land, are dominated by large western redcedar, Douglas-fir and western hemlock. These forests have a mostly closed tree canopy cover, with relatively dark and cool conditions below, with multiple tree ages and sizes. The understory vegetation is shade-tolerant, with native ferns, shrubs and some young trees. Many of the forest edges, particularly along roads, have red alder, bigleaf maple and black cottonwood.

Key benefits – high biodiversity, major carbon sequestration

YOUNG SECOND-GROWTH FOREST

Younger forests are often dominated by fast-growing, shade-intolerant Douglas-fir, red alder and black cottonwood. These are found on private and public land, including unopened road allowances. Tree spacing is relatively close, and the crowns of the trees growing towards the light are quite narrow. Most trees are of similar ages, having established at the same time after land clearing. At this stage where tree spacing is close, understory is minimal.

Key benefits – habitat for birds and small mammals, soil building, carbon sequestration, community contribution

PARK TREES

Found in parks with open lawn and amenities such as play areas, sports fields and courts, these trees are valuable assets, particularly for their shade in summer. Surrey's park trees represent diverse species, ages and sizes.

Key benefits – habitat values, shade, park character improvement, botanical collections

STREET TREES

Street trees are planted on boulevards and medians; there are also non-inventoried native, remnant and/or homeowner planted trees located on City road allowances. In the past, one tree species was usually planted along a street, which would create a monoculture; to enhance diversity, more recent plantings have used a mix of species.

Key benefits – habitat for birds, small mammals and pollinators, shade, stormwater management, improve street character, traffic calming

TREES ON PRIVATE LAND – OLDER DEVELOPMENTS

There is a wide range of trees within older private developments. Large, native trees on residential sites were most likely retained when the land was initially developed. Many non-native trees have been planted to beautify properties or to provide shade and screening.

Key benefits – habitat for birds, small mammals and pollinators, shade, stormwater management, improve neighbourhood character, sense of place

TREES ON PRIVATE LAND – NEW DEVELOPMENTS

The trend in new developments is towards smaller single-family lots and higher density multi-family projects. Building footprints occupy more space, leaving less room available to plant trees. Retained trees are often left with inadequate space to grow (both above and below ground), altered site hydrology and shade from buildings.

Key benefits – habitat values, shade, stormwater management, improve neighbourhood character

RIPARIAN AREAS

Federal, provincial and municipal regulations protect riparian areas and support the growth of trees. Riparian areas are often sheltered by slopes, and their damp, cool microclimate results in unique plant communities that are relatively rich in biodiversity. Coarse woody debris and fallen trees are often required to be retained in riparian areas, offering cavities and crevices that support wildlife.

Key benefits – high biodiversity, rich soil, major carbon sequestration, urban cooling, flood mitigation

Species and Metrics

The following characteristics of Surrey’s urban forest are based on data collected from 198 sample points in August 2021 and analyzed with the iTree Eco tool.¹³



Tree size can be used to determine the age class distribution of an urban forest. An urban forest with a wide range of tree ages is often more resilient. In general, Surrey’s urban forest has a disproportionately large number of trees in the semi-mature category and fewer trees in the young category.

The 40:30:20:10 guideline, illustrated in Figure 10, suggests a preferred distribution for achieving a diverse and stable urban forest.²¹

FIGURE 10: TREE AGE DIVERSITY GUIDELINE

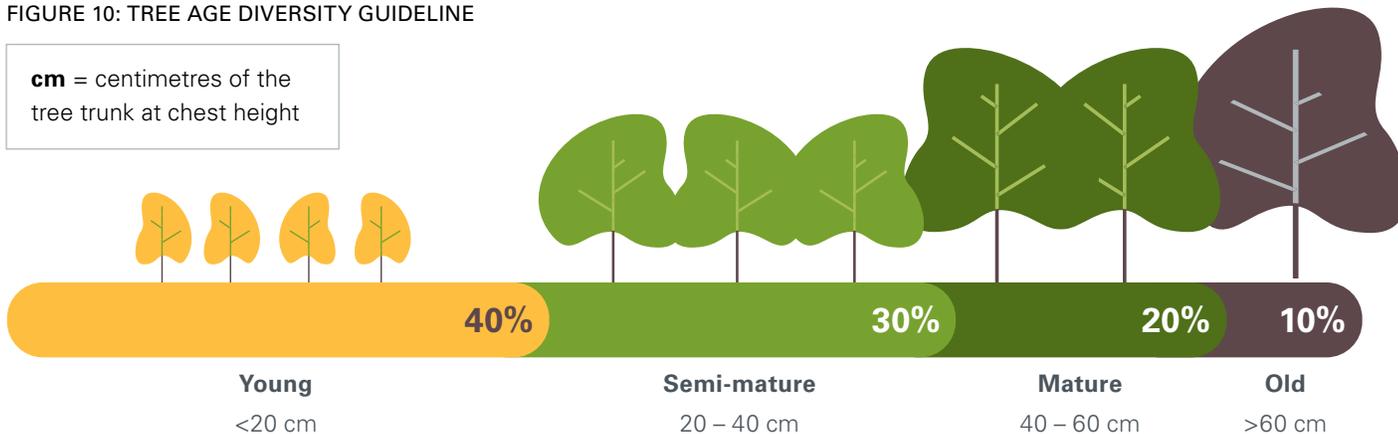
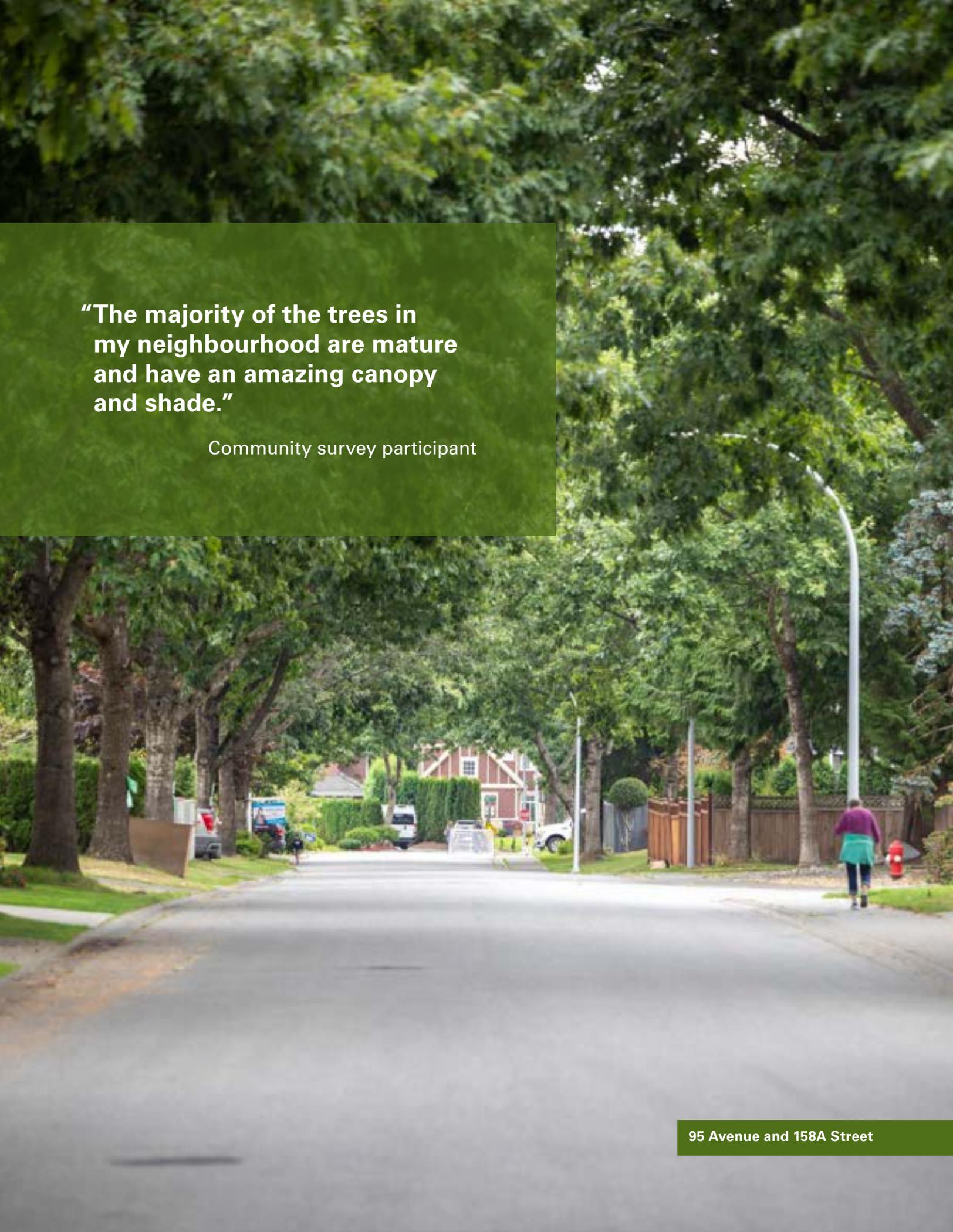


FIGURE 11: TREE SIZES IN SURREY*



*based on iTree eco

Source: Shannon, P.D.; Swanston, C.W.; Janowiak, M.K.; Handler, S.D.; Schmitt, K.M.; Brandt, L.A.; Butler-Leopold, P.R.; Ontl, T.A. (in review). Adaptation Strategies and Approaches for Forested Watersheds. Ecological Applications. Retrieved from fs.usda.gov/ccrc/approach/enhance-species-age-classes-and-structural-diversity-forests.



“The majority of the trees in my neighbourhood are mature and have an amazing canopy and shade.”

Community survey participant

TREE HEALTH

The iTree Eco sample size was too small to provide reliable data on the health of all tree species; however, the ratings of the abundant native species provide valuable information. The most common tree species in Surrey are western redcedar, red alder, and Douglas-fir.

In general, drought stress was observed in trees along streets, in parks and on private property. Tree loss will likely occur with climate change and an increase in the frequency of weather events similar to the heat dome in 2021. As is often the case, trees located in mowed grass seemed to be suffering more than trees within planting beds or forests, often with visible mower damage to the roots and lower stems.

Western redcedar trees have been experiencing fairly uniform crown thinning in larger trees in relatively open conditions. Documented throughout the region and the Pacific Northwest, this underlying drought stress has been evident for over ten years and appears to be a progressive effect due to climate change.⁹



Red alder trees are the primary pioneer species growing in cleared or disturbed ground. Red alders are found in early second growth forests, and due to their age many stands are near the end of their life cycle. More than half of the red alder trees sampled were showing signs of health issues, including sensitivity to hydrological changes and recent exposure to newly cleared edges. Healthy red alders were recorded in wetter locations and large young forest stands, where the trees have ideal soil and water conditions and greater protection.



Douglas-fir trees were found in relatively young, second growth stands, where increased competition between trees was causing reduced growth. This process is part of natural thinning that is typical for this species.



An aerial photograph of a dense forest with several winding, light-colored paths. The trees are mostly green, with some showing yellowing, suggesting autumn. The paths are dark and narrow, curving through the trees.

“With the oncoming climate change, we need all the trees we can manage.”

Community survey participant

Surrey's Public Shade Trees

Surrey's public shade trees are a subset of the urban forest. As of 2021, Surrey had 108,692 shade trees in public parks and road corridors. The majority are imported rather than native species, chosen for their suitability for the urban environment.

FIGURE 12: TOP 20 PUBLIC SHADE TREES IN SURREY

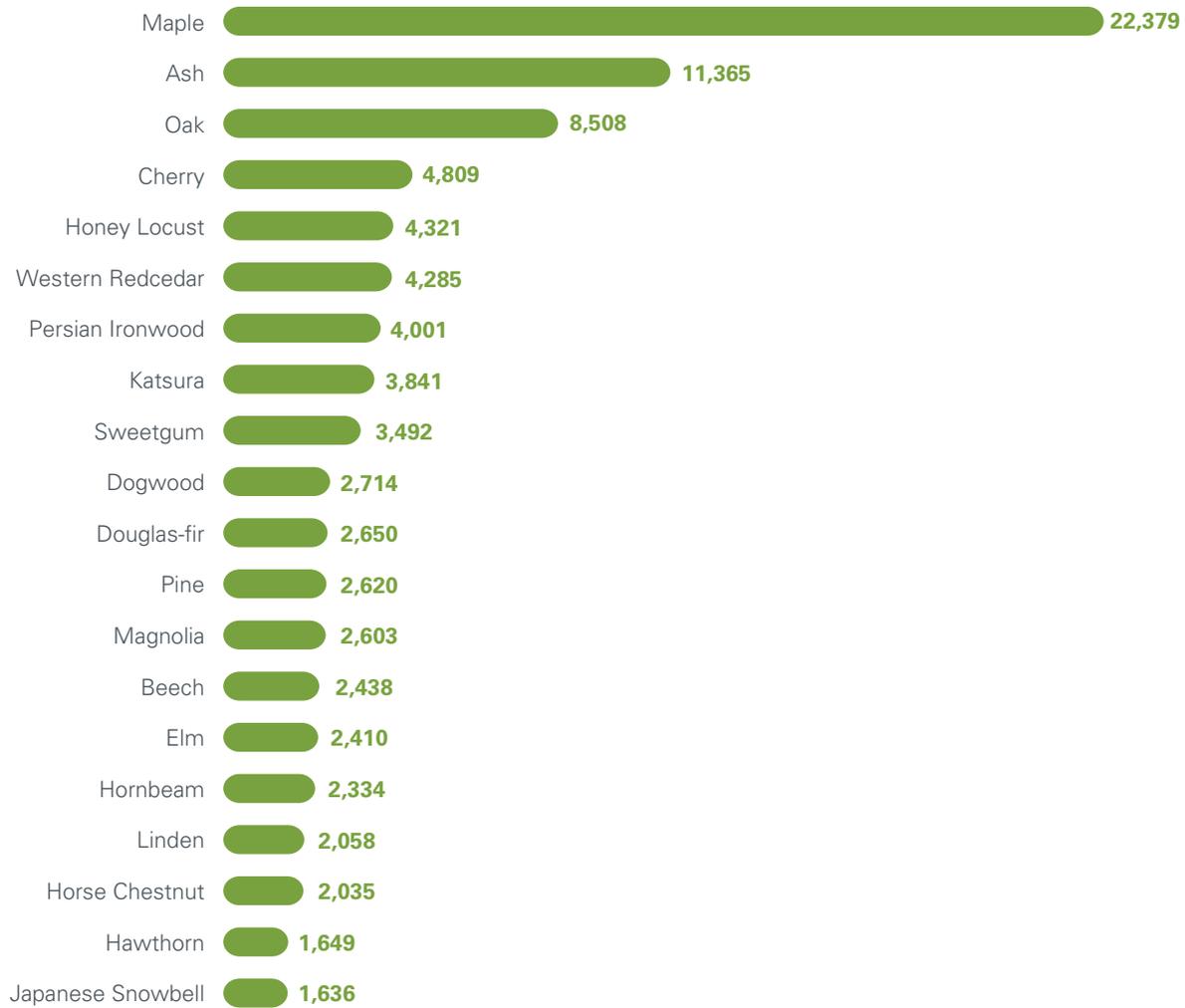
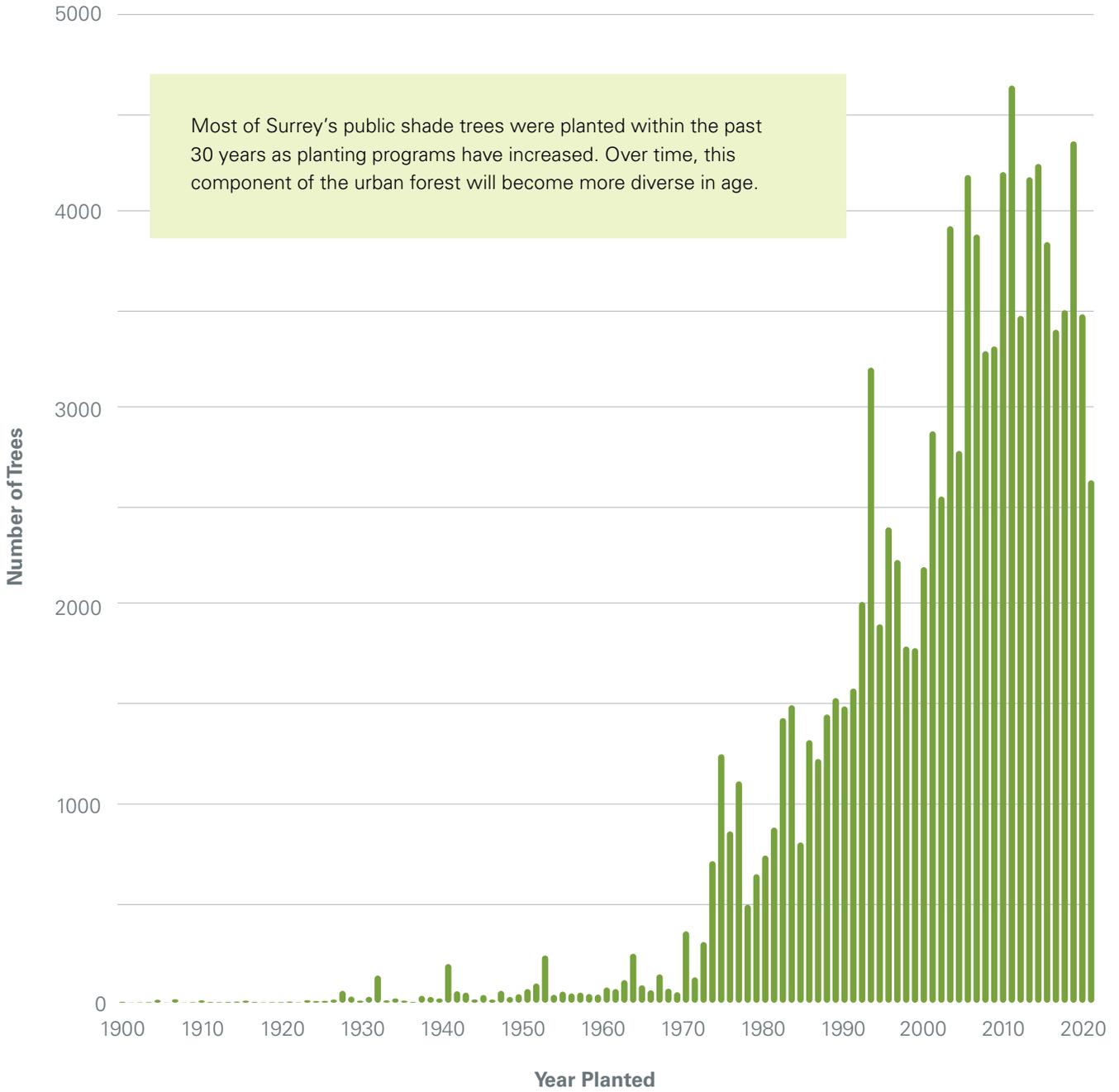


FIGURE 13: AGE DISTRIBUTION OF SURREY'S PUBLIC SHADE TREES



4

What We Heard

4.1 Engagement Process

A broad communications and engagement process was carried out to inform and involve stakeholders and the community in the preparation of the Strategy. The engagement process was guided by the City's Public Engagement Strategy and Toolkit.

Public Engagement

MAY – JUNE 2021

Shared information, built awareness, and obtained perspectives on the urban forest from a broad range of Surrey voices.

- > **Community survey** 2,053 participants



SEPTEMBER – OCTOBER 2021

Shared information on community survey input, urban forest analysis, and draft strategies; obtained input on draft strategies from internal and external stakeholders.

- > **Internal workshops** with staff from multiple departments
- > **Stakeholder workshops** with youth, tree care industry, environmental groups
- > **Virtual open house** 62 participants





4.2 Community Survey

With over 2,000 responses, the community survey provided important insight into many Surrey residents' perspectives. Most of the survey respondents expressed appreciation for the benefits of the urban forest, concern about potential negative impacts, and support for management strategies related to the protection and enhancement of Surrey's urban forest (Appendix B).

Respondents were also asked which benefits of the urban forest were most important to them. The highest rated benefits were improvements to air quality, habitat for birds and other wildlife, health benefits, and access to nature within the City. Benefits related to soil erosion, water resources, shading/cooling and aesthetics were also noted by respondents as important.

Survey participants were asked about their concerns related to potential negative impacts to the urban forest. The top concerns were private property development, public property development, City infrastructure (e.g., roads), climate change and invasive species.

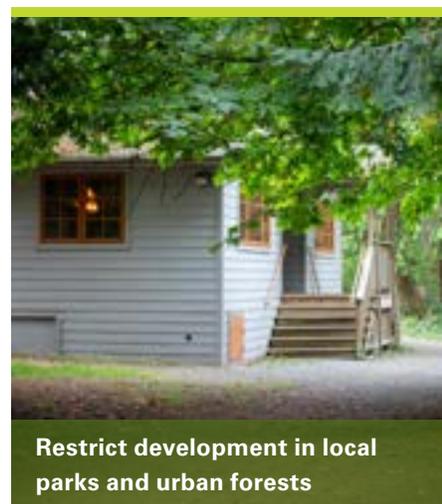
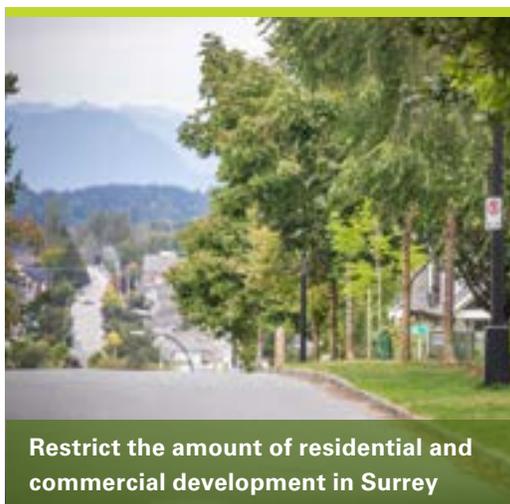
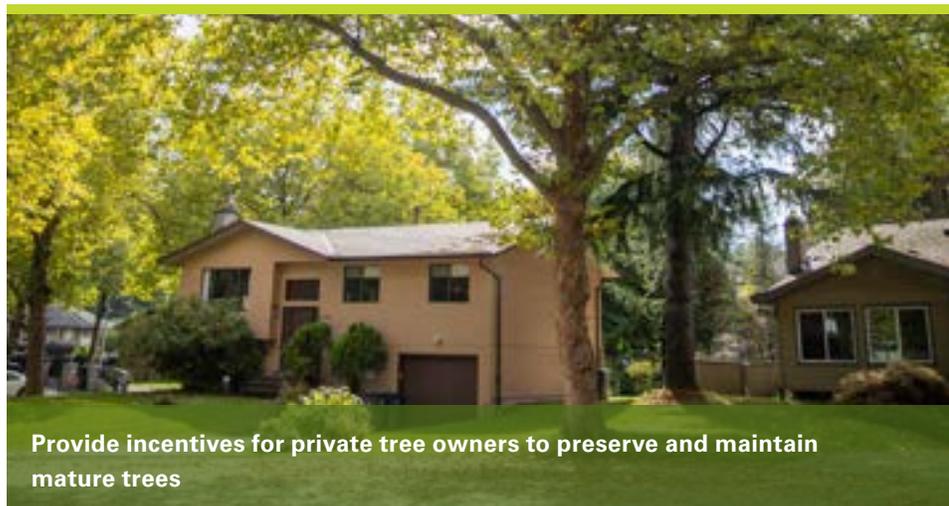
The majority of survey participants felt that it is important to have healthy trees throughout the City. The most important locations identified were in natural areas, parks (playgrounds and open spaces), multi-unit residential properties, private single-family lots and along roads.

Survey participants were supportive of the City managing the urban forest by retaining more trees on sites to be developed, improving the success and health of trees on new development projects, and planting more trees in parks. Respondents also felt that providing information about the urban forest, incentives for tree retention on private land, and stewardship opportunities for the public were important.

Additional findings included:

- > Almost all respondents indicated that it is important for the City to measure and track Surrey's tree canopy cover.
- > The top concerns related to trees in the respondents' neighbourhoods were roots cracking sidewalks or roads, and having to clean up leaves and branches.
- > Concerns related to neighbourhood trees were forest fire risk, damage from falling branches or trees, and reduced space for building.
- > Respondents expressed interest in the tree voucher and tree sale programs.
- > The greatest barrier to planting trees on their own property was lack of space.

Some other common suggestions from the community survey for managing the urban forest in Surrey included:



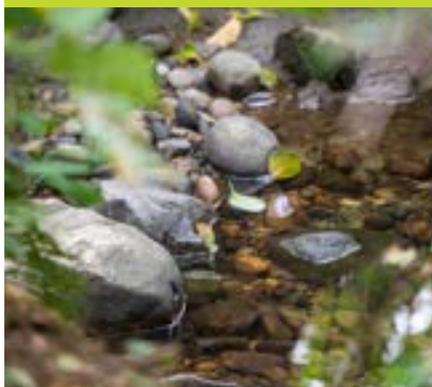
4.3 Workshops

Interactive workshops were held with four groups. At each workshop, the initial findings of the urban forest analysis and community survey were presented, along with draft goals and strategies. The key themes of participant input were:



Tree Care Industry

- > Strengthen requirements and standards for tree planting and retention.
- > Create incentives for developers to retain larger, high-quality trees.
- > Increase bylaw enforcement for replacement tree requirements.
- > Provide more information on trees to other City departments, homeowners and developers.



Environmental Groups

- > Increase rainwater infiltration in development projects, and direct stormwater to trees.
- > Plant trees that will improve biodiversity and ecosystem health.
- > Use incentives and penalties to achieve more creative development solutions.
- > Strengthen bylaws and internal City collaboration.



Youth

- > Continue to offer access to nature for all children.
- > Increase awareness among youth and children about the importance of the urban forest.
- > Provide more information about the urban forest to adults.

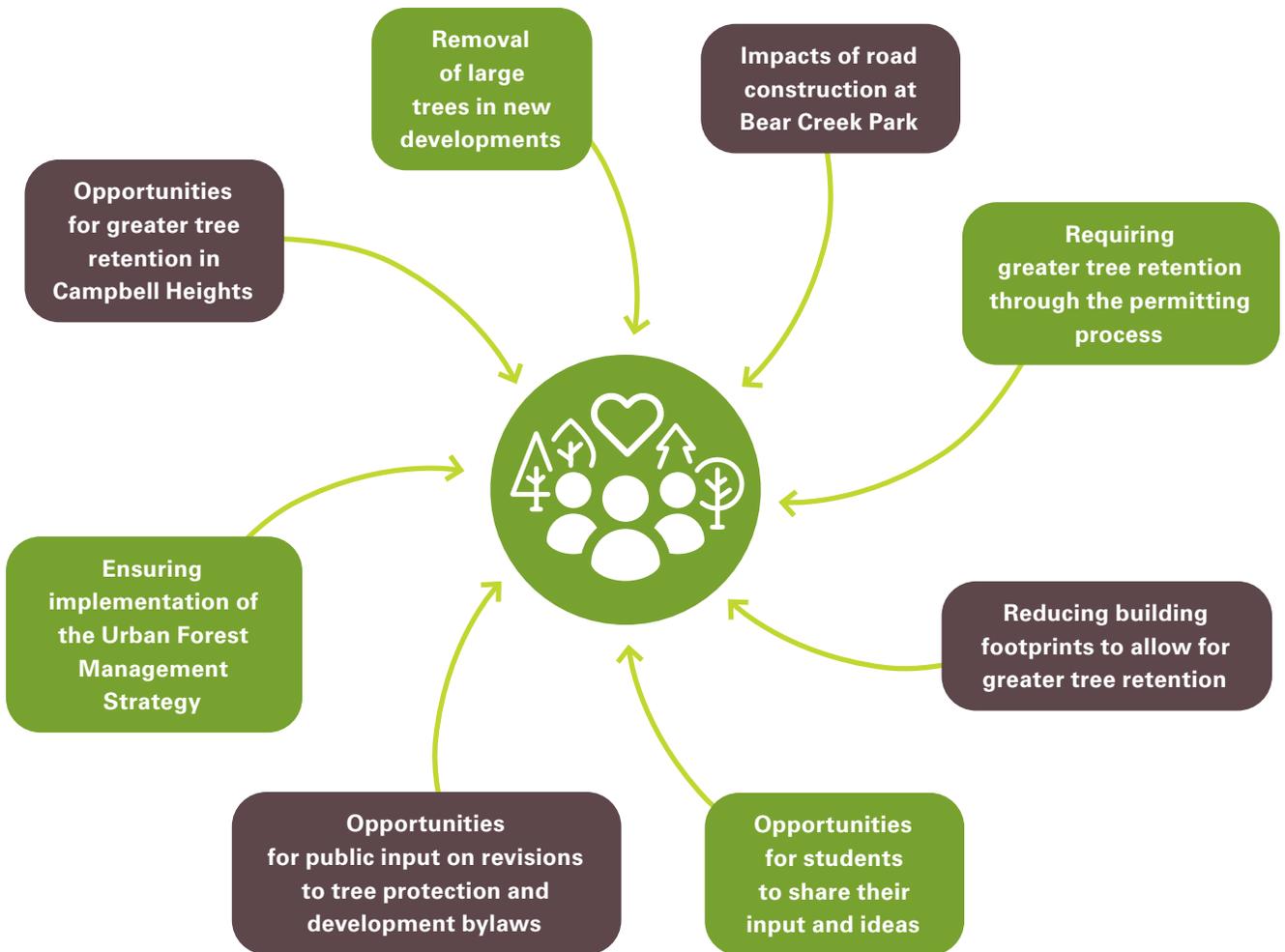


City Staff

- > Set realistic targets for the tree canopy cover.
- > Link urban forestry with climate change action, biodiversity and stormwater management.
- > Strengthen bylaws, policies, standards and enforcement, and establish incentives for tree protection.
- > Prioritize collaboration, equity and accessibility.

4.4 Open House

The format of the open house allowed participants to provide input, ask questions, and vote for questions to be answered. The most common comments and questions were related to:



“Education is key to inspiring interest, concern, and respect for and stewardship of our forests and local trees.”

Community survey participant



Releaf Tree Planting Event

5

Goals, Objectives and Actions

A healthy and diverse urban forest is an essential component of a thriving, green, inclusive city and will help to achieve Surrey’s climate commitments.⁷ Surrey’s tree canopy cover declined from 33% in 2001 to 29% in 2018. If current development trends continue, it is anticipated that the tree canopy cover will further decline to 26% by 2050.

The Strategy will strengthen Surrey’s efforts to protect and enhance the urban forest now and into the future. The Strategy is guided by broad goals, focused objectives and targeted actions, all of which are designed to halt the citywide decline in tree canopy cover, and to achieve a 30% tree canopy cover target by 2038.



Goal A

A DIVERSE AND RESILIENT URBAN FOREST

1. Plan for the retention and growth of the urban forest.
2. Incorporate biodiversity targets and green infrastructure considerations into urban forest planning and management.



Goal B

STRONG POLICIES AND PRACTICES TO PROTECT AND CARE FOR TREES

1. Review and update policies and operational procedures related to tree retention, planting and maintenance.
2. Ensure sufficient resource allocation for urban forest management.



Goal C

AN INFORMED AND INSPIRED COMMUNITY OF CHAMPIONS

1. Increase public awareness of the urban forest and its values.
2. Provide opportunities for the public to engage in urban forest stewardship activities.
3. Strengthen internal communication.
4. Strengthen relationships with other levels of government and external organizations.



“We need education expressing the importance that trees play in our lives and the importance of improving the numbers to assist in the battle against climate change.”

Community survey participant

Releaf Tree Planting Event

TIMEFRAME FOR IMPLEMENTATION OF ACTIONS

 **Short term**
(1-3 years)
  **Medium term**
(4-8 years)
  **Long term**
(9-15 years)
  **Continuous**



Goal A: A diverse and resilient urban forest

An urban forest with high connectivity and with high diversity of species and age classes will be more resilient to climate change.

Objective 1: Plan for the retention and growth of the urban forest.

Timeframe	Actions	Section Lead	Co-lead
	1.1 Develop canopy cover targets for each land use type to support an equitable distribution of the urban forest.	Parks Planning	Trees & Landscape
	1.2 Consider developing policies for soil volume and permeability targets, to support medium to large trees on private property during development.	Trees & Landscape	
	1.3 Review and update the zoning bylaw to support retention of trees and permeable surfaces for future tree planting on private land.	Community Planning	Trees & Landscape
	1.4 Complete a detailed analysis of actions required to enhance canopy cover beyond a 30% target (excluding ALR).	Urban Forestry	Trees & Landscape
	1.5 Integrate the Strategy’s goals and objectives into the decision-making process for parkland acquisition.	Parks Planning	
	1.6 Provide sufficient space and soil volume to support medium to large trees along active walking and cycling transportation routes within each community.	Urban Forestry	Engineering Transportation
	1.7 Incorporate canopy cover targets when developing and updating NCPs, with policies requiring sufficient area and soil volume to support future tree growth.	Community Planning	Parks Planning

Objective 2: Incorporate biodiversity targets and green infrastructure considerations into urban forest planning and management.

Timeframe	Actions	Section Lead	Co-lead
	2.1 Update the Natural Areas Management Plan to better reflect current best practices, including a focus on mitigating climate change and protecting biodiversity.	Urban Forestry	
	2.2 Implement the Biodiversity Design Guidelines to enhance the urban forest in parks and on private property.	Urban Forestry	Area Planning
	2.3 Complete an ecosystem services analysis every five years to quantify the value of our natural assets.	Urban Forestry	



Goal B: Strong policies and practices to protect and care for trees

Implementing and enforcing policies and practices will result in a healthy tree canopy cover on public and private land.

Objective 3: Review and update policies and operational procedures related to tree retention, planting and maintenance.

Timeframe	Actions	Section Lead	Co-lead
	3.1 Identify and implement tree planting targets for public land that support a 30% canopy cover target.	Urban Forestry	
	3.2 Prioritize tree planting in high equity need neighbourhoods with less than 25% canopy cover.	Urban Forestry	
	3.3 Develop a standardized process to determine compensation for loss of trees on public land.	Urban Forestry	Parks Development Services
	3.4 Update the Parks Construction Standards document to reflect best management practices for tree protection and planting, including the review and updating of tree species selection guidelines for public land.	Parks Planning	
	3.5 Review appropriate bylaws to identify opportunities to plant more trees during single family building permit processes.	Trees & Landscape	
	3.6 Complete annual reviews of standard operating procedures, terms of reference and public bulletins related to implementation of the Tree Protection Bylaw.	Trees & Landscape	
	3.7 Review and update the Tree Protection Bylaw and Tree Cutting on City Land and Boulevards Bylaw at least every five years to strengthen tree replacement, protection and compensation requirements.	Trees & Landscape	Urban Forestry
	3.8 Ensure City operations follow established tree protection and replacement practices.	Urban Forestry	All
	3.9 Work with the Engineering Department to prioritize tree retention and planting when updating the Supplementary Master Municipal Construction Documents and Design Criteria Manual.	Urban Forestry	Engineering
	3.10 Continue to require arborist supervision for construction work that may impact trees on public and private land.	Urban Forestry	Trees & Landscape
	3.11 Continue to require replacement tree plans to be submitted, with tree species and location, for tree removals on private land.	Trees & Landscape	

●	3.12 Continue to map the location and monitor the status of replacement trees on private land.	Trees & Landscape	
●	3.13 Ensure tree species selection guidelines consider new information on climate change impacts and species health, to support the City's goals for climate action (e.g., carbon sequestration), stormwater management and biodiversity.	Urban Forestry	Trees & Landscape

Objective 4: Ensure sufficient resource allocation for urban forest management.

Timeframe	Actions	Section Lead	Co-lead
●	4.1 Assess the health of forested natural areas on public land to identify opportunities for restoration and tree planting.	Urban Forestry	
●	4.2 Establish a dedicated team focused on bylaw enforcement for violations related to permeable surfaces, encroachments, and the Tree Protection Bylaw.	Bylaws	Urban Forestry/ Trees & Landscape
●	4.3 Increase enforcement of the Tree Protection Bylaw to ensure replacement trees are planted as required.	Trees & Landscape	
●	4.4 Collect tree removal and retention data related to development, to better inform future decision making.	Trees & Landscape	Urban Forestry
●	4.5 Schedule annual canopy cover analysis using iTree Canopy orLiDAR data when available.	Urban Forestry	





Goal C: An informed and inspired community of champions

A commitment to communication and collaboration, both internal and external, will help to build unified support for the urban forest.

Objective 5: Increase public awareness of the urban forest and its values.

Timeframe	Actions	Section Lead	Co-lead
	5.1 Develop an "ask an arborist" program for private property owners to access general tree maintenance information from qualified staff.	Trees & Landscape	
	5.2 Develop and distribute new educational materials on best management practices related to the planting and management of trees on private land.	Trees & Landscape	Urban Forestry
	5.3 Develop and implement communication plans to promote awareness of the values and current management of the urban forest.	Urban Forestry	Trees & Landscape
	5.4 Continue to support schools and community organizations in safely accessing the urban forest as a learning environment, while minimizing their environmental impact.	Urban Forestry	
	5.5 Regularly share the status of the urban forest with the public.	Urban Forestry	

Objective 6: Provide opportunities for the public to engage in urban forest stewardship activities.

Timeframe	Actions	Section Lead	Co-lead
	6.1 Develop an Urban Forest Stewardship and Engagement Plan to guide the future development of programs and initiatives to educate and involve the community in caring for the urban forest.	Urban Forestry	
	6.2 Identify and review opportunities to develop a program encouraging residents to retain and plant trees on private land.	Trees & Landscape	
	6.3 Identify and review opportunities to develop an incentive program that encourages tree retention and planting on private land during development.	Trees & Landscape	
	6.4 Increase stewardship opportunities that support the health and growth of the urban forest, e.g., shade tree and natural area planting, invasive species removal and citizen science projects.	Urban Forestry	
	6.5 Continue to host events that celebrate the urban forest, e.g., National Tree Day, Arbor Day and Releaf tree planting events.	Urban Forestry	
	6.6 Continue to support tree planting on residential property with the tree sale program and by reinstating the tree voucher program.	Urban Forestry	Trees & Landscape

Objective 7: Strengthen internal communication.

Timeframe	Actions	Section Lead	Co-lead
	7.1 Establish an inter-departmental staff working group to communicate and implement procedures related to the urban forest.	Urban Forestry	

Objective 8: Strengthen relationships with other levels of government and external organizations.

Timeframe	Actions	Section Lead	Co-lead
	8.1 Develop a new sponsorship program, and continue to seek grant funding, to support tree planting and habitat restoration projects on public land.	Urban Forestry	
	8.2 Explore opportunities to support tree planting on school properties.	Urban Forestry	
	8.3 Strengthen relationships with the land-based First Nations and urban Indigenous community in Surrey to better integrate traditional knowledge and practice in forest management.	Urban Forestry	Parks Planning
	8.4 Strengthen existing relationships with local and regional governments to share information and improve management practices.	Trees & Landscape	Urban Forestry
	8.5 Continue to work with BC Hydro and FortisBC to refine strategies for tree pruning and vegetation maintenance in utility corridors.	Urban Forestry	
	8.6 Work with local tree nurseries to ensure availability of appropriate planting stock.	Urban Forestry	
	8.7 Continue to partner with post-secondary institutions to provide project learning sites, share professional knowledge, and promote further research on the urban forest.	Trees & Landscape	Urban Forestry
	8.8 Continue to partner with local community groups, and support the development of new groups, to encourage their involvement in urban forest stewardship.	Urban Forestry	

This page is left intentionally blank



Appendix A

Sample Site Analysis

Sample Site Analysis

SITE NO.	PLAN YEAR	NEIGHBOURHOOD	LAND USE TYPE
21	2003	South Surrey	Residential – Newer Multi-Family



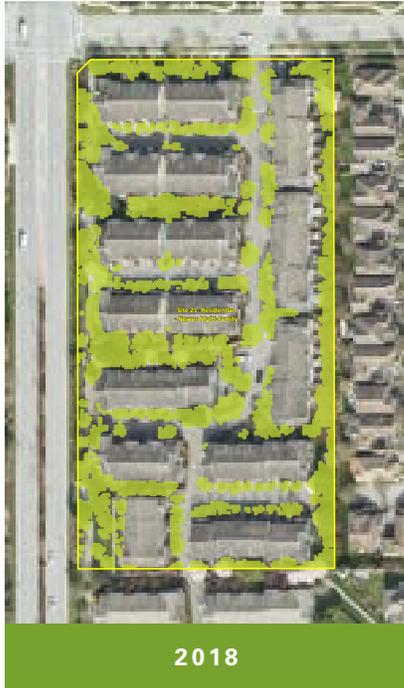
2001

Canopy Cover 39.2%



2009

Canopy Cover 10.3%



2018

Canopy Cover 32.2%

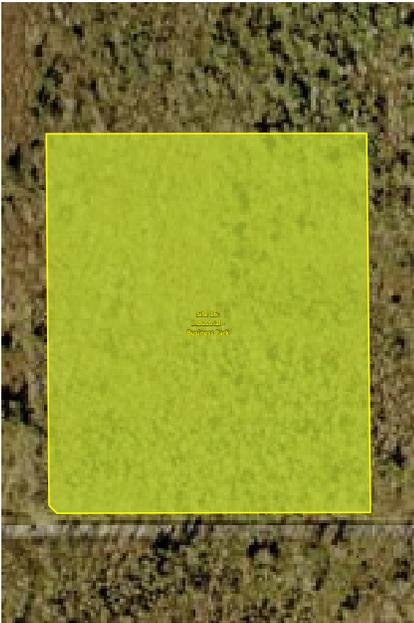


Photo taken in 2011



Photo taken in 2021

SITE NO.	PLAN YEAR	NEIGHBOURHOOD	LAND USE TYPE
16	2004	South Surrey	Industrial – Business Park



2001

Canopy Cover 100.0%



2009

Canopy Cover 2.7%



2018

Canopy Cover 9.0%



Photo taken in 2011



Photo taken in 2021

SITE NO.	PLAN YEAR	NEIGHBOURHOOD	LAND USE TYPE
----------	-----------	---------------	---------------

8

1992

Guildford

Industrial – Older



Canopy Cover 1.9%

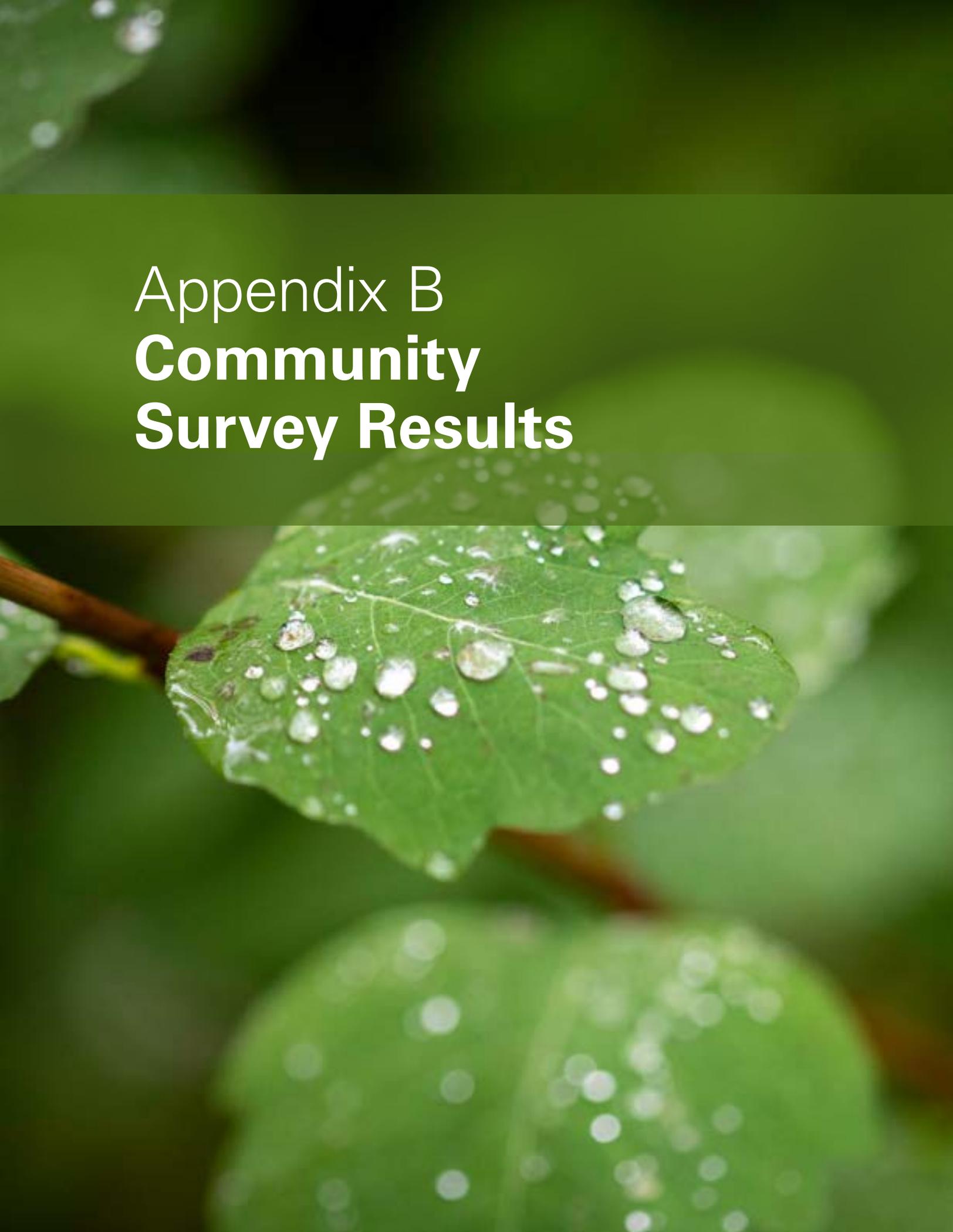


Canopy Cover 2.4%



Canopy Cover 4.5%



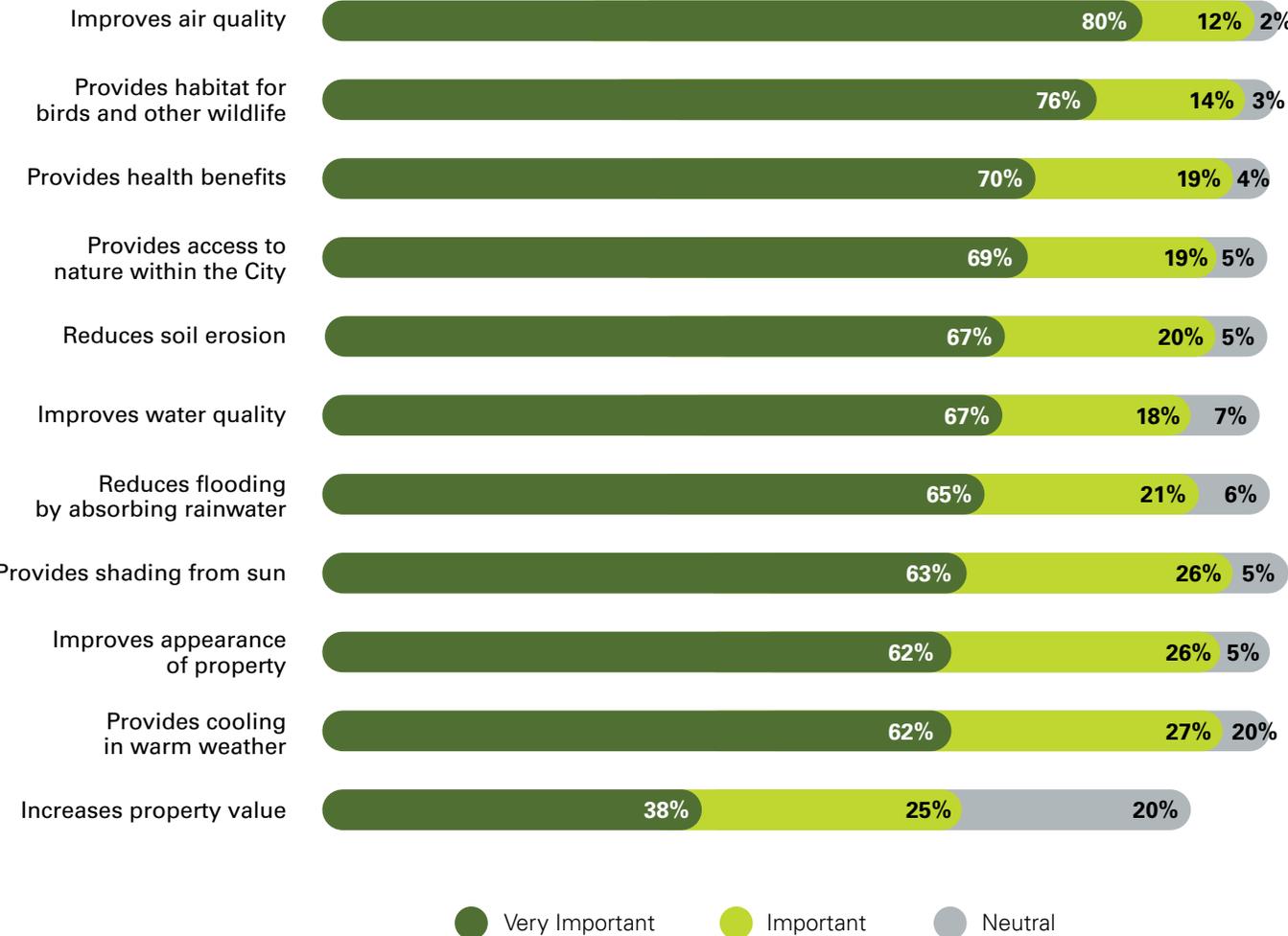


Appendix B
**Community
Survey Results**

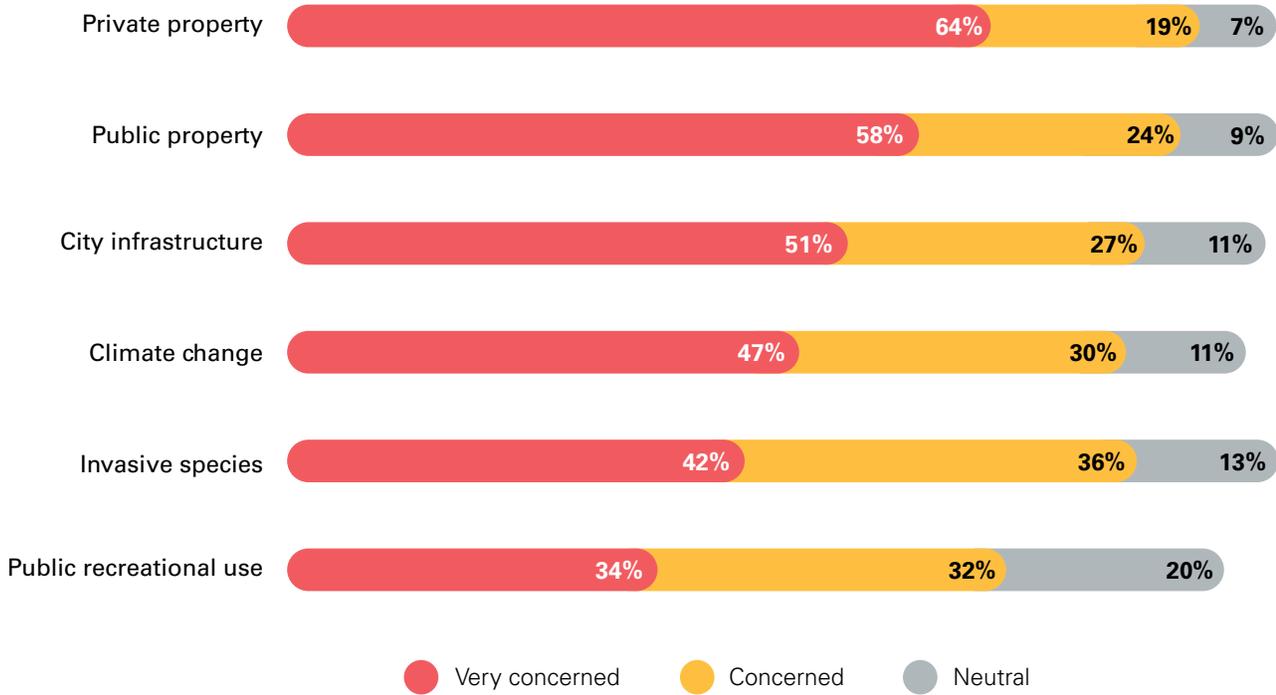
Community Survey Results

The following tables show responses to key questions from the community survey:

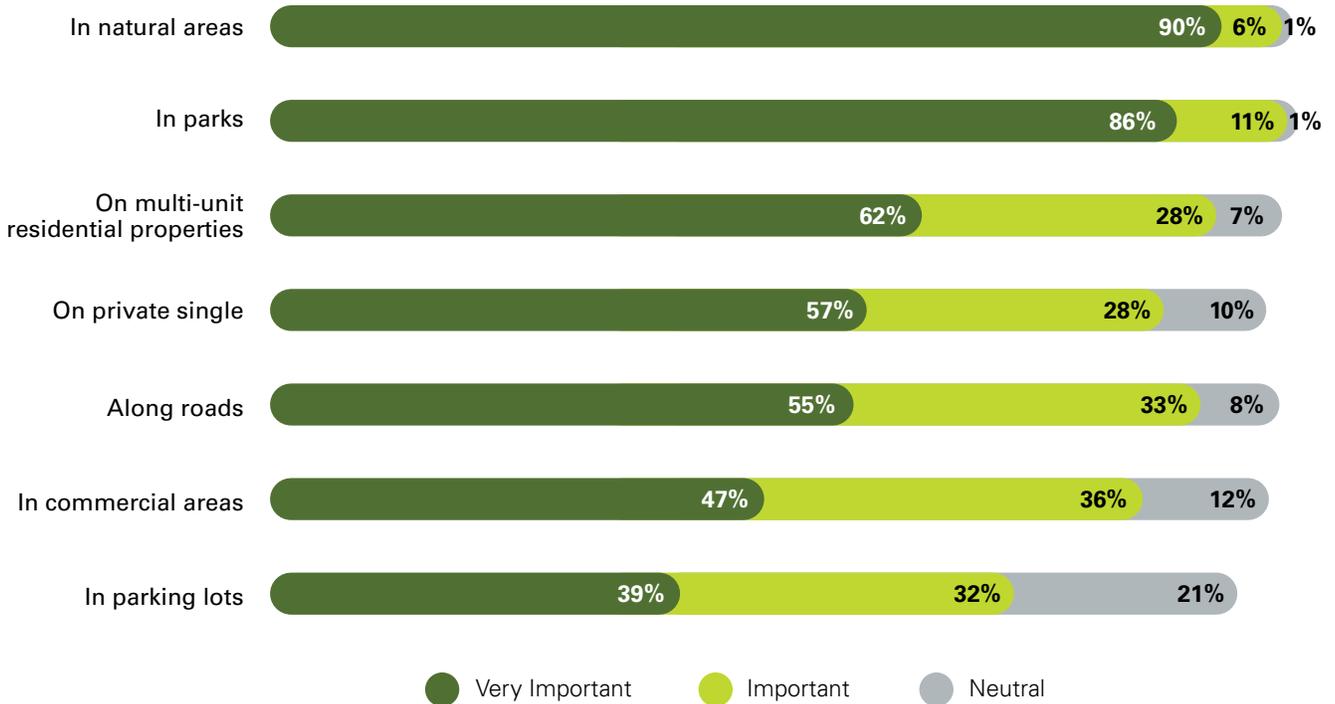
IMPORTANCE OF BENEFITS PROVIDED BY THE URBAN FOREST



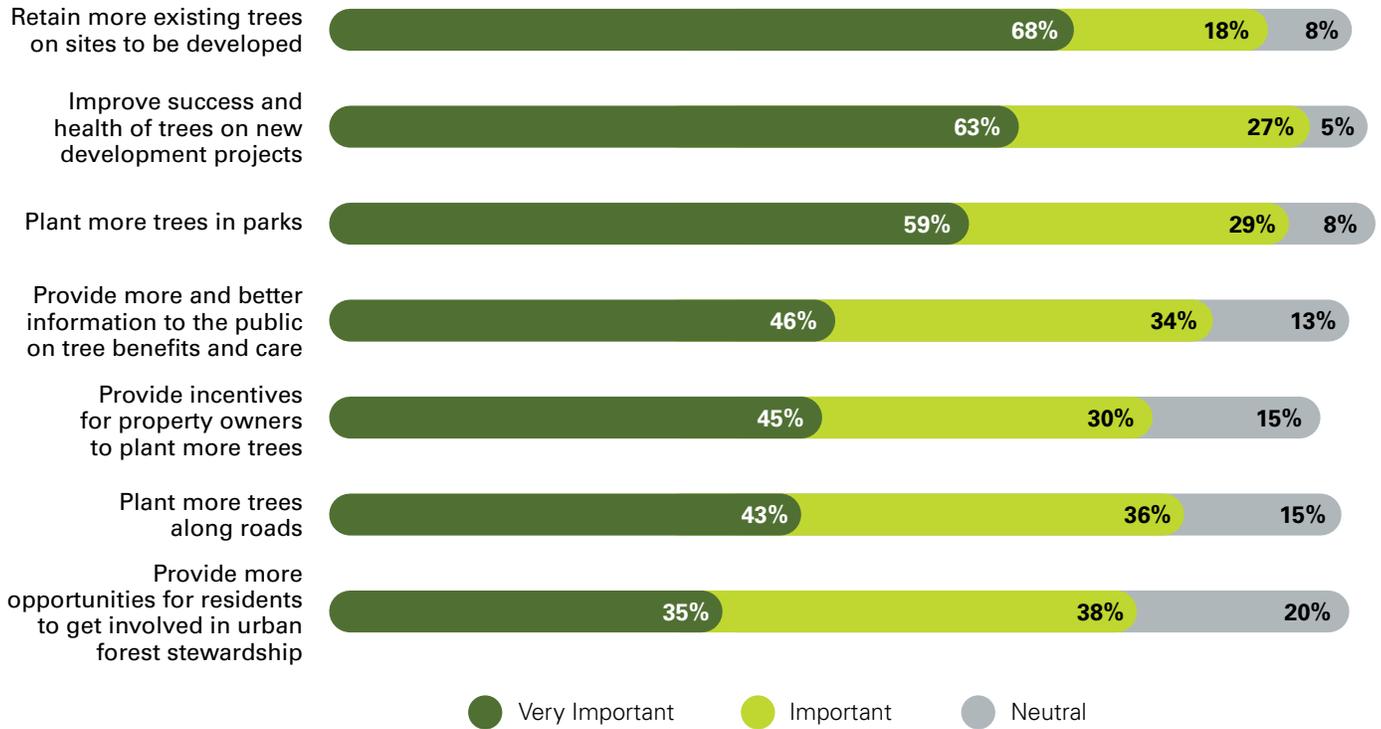
LEVEL OF CONCERN ABOUT THE POTENTIAL NEGATIVE IMPACTS TO THE URBAN FOREST



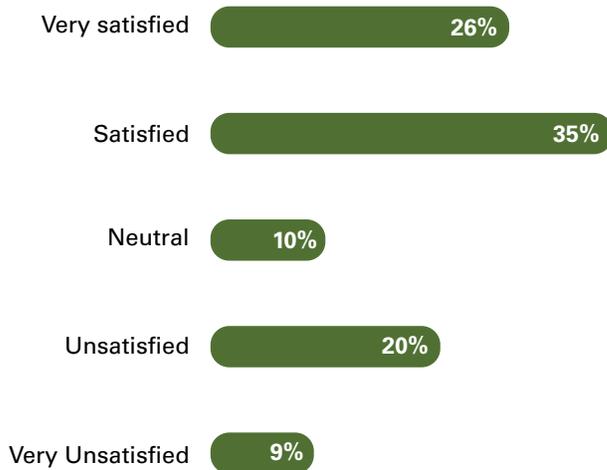
IMPORTANCE OF HAVING HEALTHY TREES



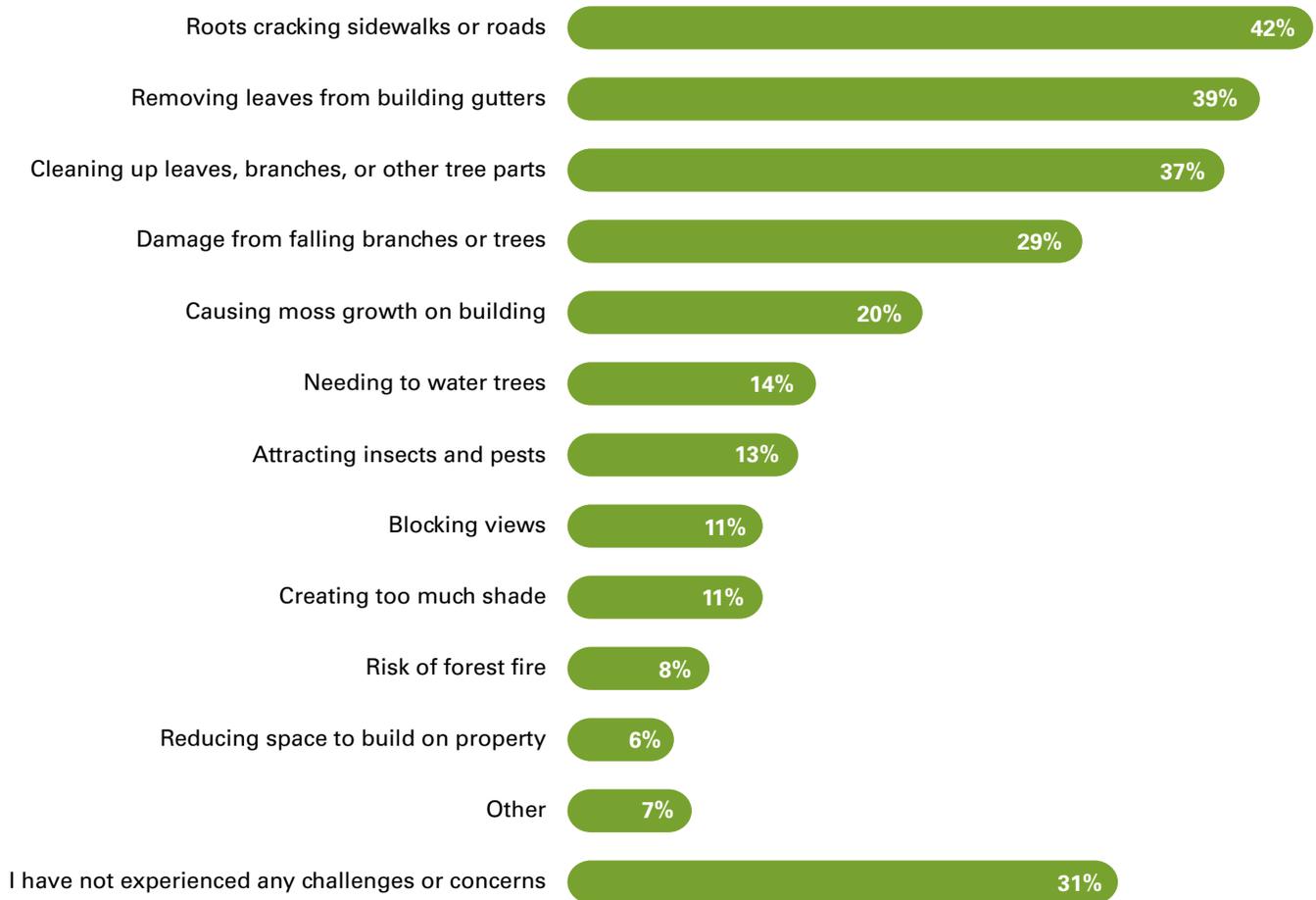
THE FOLLOWING ARE SOME ADDITIONAL WAYS THE CITY COULD MANAGE THE URBAN FOREST. PLEASE RATE THE IMPORTANCE OF EACH TO YOU:



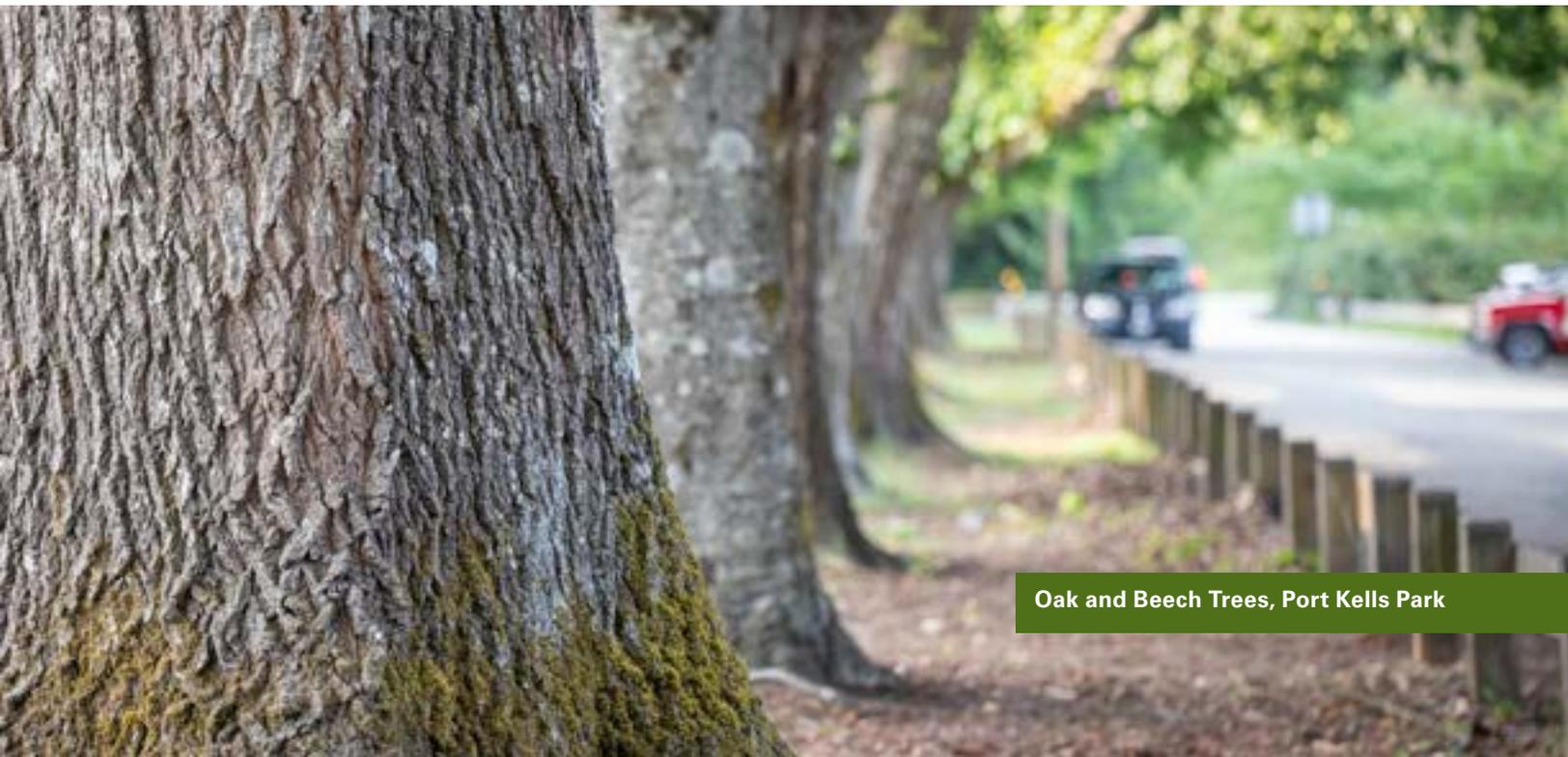
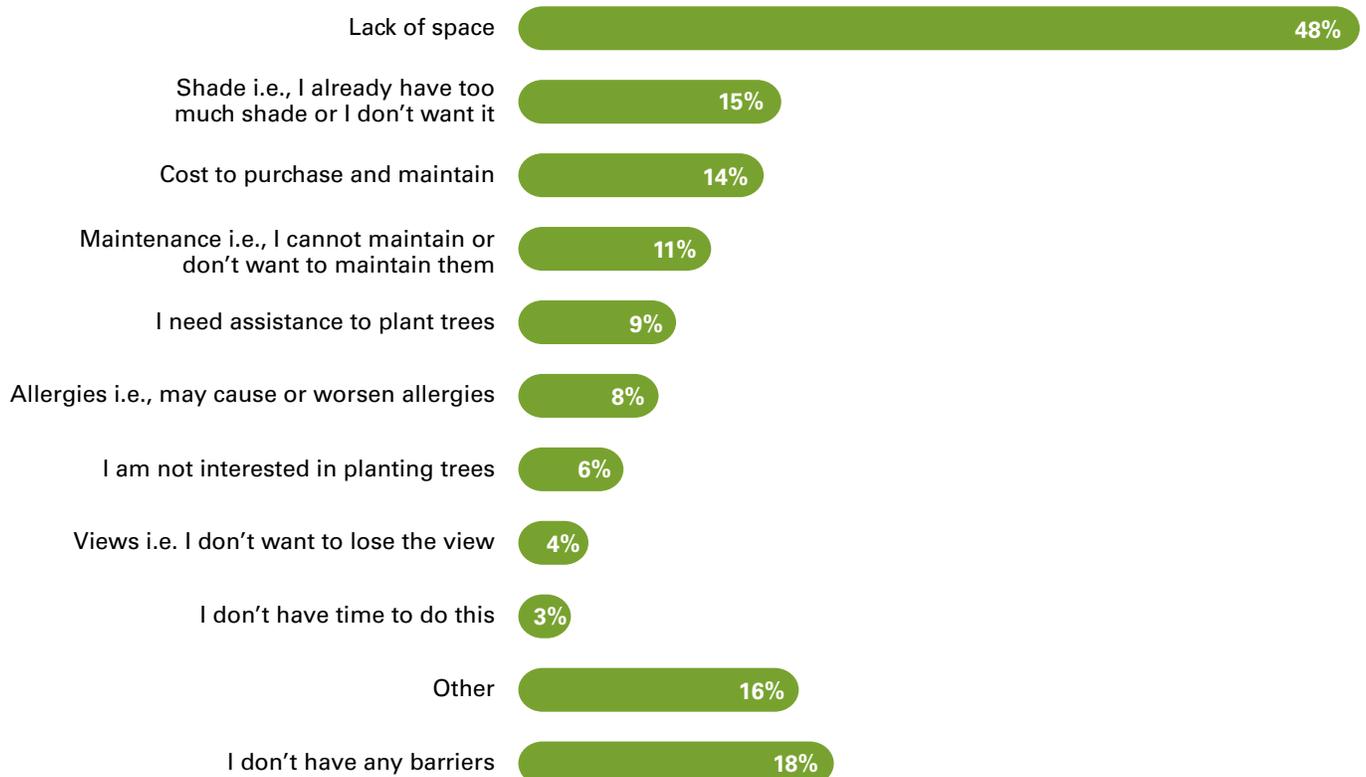
SATISFACTION WITH NUMBER OF TREES IN NEIGHBOURHOOD



CHALLENGES/CONCERNS EXPERIENCED DUES TO NEIGHBOURHOOD TREES



BARRIERS TO PLANTING TREES ON PROPERTY



Oak and Beech Trees, Port Kells Park

A close-up photograph of green moss or fern fronds, showing the intricate, overlapping structure of the leaves. The moss is a vibrant green color and appears to be growing on a dark, textured surface. The background is blurred, emphasizing the detail of the moss.

Appendix C

Glossary

Glossary

Arborist

A specialist in the care and maintenance of trees

Biodiversity

The variety of species and ecosystems on earth and the ecological processes of which they are a part – including natural ecosystems, living species and other components that provide genetic diversity

Carbon sequestration

The process of capturing and storing atmospheric carbon dioxide; a process through which trees help to reduce the amount of carbon dioxide in the atmosphere

Carbon storage

The long-term storage of carbon in plants, soils, geologic formations and the ocean that can help to mitigate or defer global warming

Climate adaptation

Planning for and taking appropriate action to anticipate the adverse effects of climate change and prevent or reduce those impacts

Climate change

Changes to long-term weather patterns considered to be a result of human activity that causes greenhouse gas emissions; global warming

Density

Refers to population density; the number of people living in each unit of area (such as a square kilometre)

Ecosystem

A community of living organisms in conjunction with the nonliving components of their environment, such as air, water and mineral soil, interacting as a system through nutrient cycles and energy flows

Ecosystem services

The benefits people obtain from ecosystems including temperature regulation through shading and cooling (helping to mitigate the “urban heat island” effect), carbon storage, stormwater management, clean air, mental well-being, food production and pollination

Environmental stewardship

The responsible use and protection of the environment; an example of responsible use is limiting the harvest of natural resources and an example of protection is the creation of parkland

Greenhouse gas (GHG)

Atmospheric gases, such as carbon dioxide, methane, nitrous oxide and water vapour, that absorb infrared radiation produced by solar warming of the earth’s surface

Geographic information system (GIS)

A system that enables collection, management, analysis and display of information, integrating spatial (location) data with descriptive information

Green infrastructure

Natural and constructed features in the urban environment that support biodiversity and can provide community services such as stormwater management, climate adaptation and flood protection

Green infrastructure network (GIN), green infrastructure network corridor

An interconnected network of protected open space and natural areas that conserves ecosystem values and functions, and provides benefits to people and wildlife

Heat stress

The rise in temperature beyond a threshold level for a time period sufficient to cause irreversible damage to plant growth and development

Habitat

The place or environment where a plant or animal naturally or normally lives and grows

Infill development

The process of developing vacant or under-used parcels within existing urban areas that are already largely developed

LiDAR (Light Detection and Ranging)

A form of a laser technology used to measure distances to the earth that can be used to generate precise, three-dimensional information about the shape of the earth and its surface characteristics

Natural areas

Areas that are relatively undisturbed, contain a high percentage of native plant species, and provide significant ecological value

Neighbourhood concept plan (NCP)

A conceptual framework for proposed development of a neighbourhood that identifies a pattern of land uses, densities, services and infrastructure

Pollination

Occurs when pollen is moved within flowers or carried from flower to flower by pollinating animals such as birds, bees, bats, butterflies, moths beetles, or by the wind; the transfer of pollen can lead to fertilization and successful seed and fruit production for plants

Riparian area

Linking water to land, riparian areas border streams, lakes, and wetlands; the blend of streambed, water, trees, shrubs and grasses in a riparian area provides fish habitat, and directly influences it

Shade trees

Individual trees growing in parks, along streets and on private property, in contrast to trees growing together in a forest setting

Stormwater management

The effort to reduce runoff of rainwater or melted snow into streets, stormwater pipes and watercourses in order to increase infiltration, reduce erosion and improve habitat and water quality

Sustainability

Meeting the needs of the present generation in terms of socio-cultural systems, the economy and the environment while promoting a high quality of life, but without compromising the ability of future generations to meet their own needs

Tree canopy cover

The area covered by the branches, stems and leaves of trees when viewed from above

Urban containment boundary (UCB)

The stable, long-term footprint for urban development where there is sufficient capacity to accommodate all of Metro Vancouver's projected residential growth to 2041; the UCB reinforces the protection of agricultural, conservation and rural lands, and provides predictability for locating urban uses, major regional transportation and infrastructure investment

Urban heat island

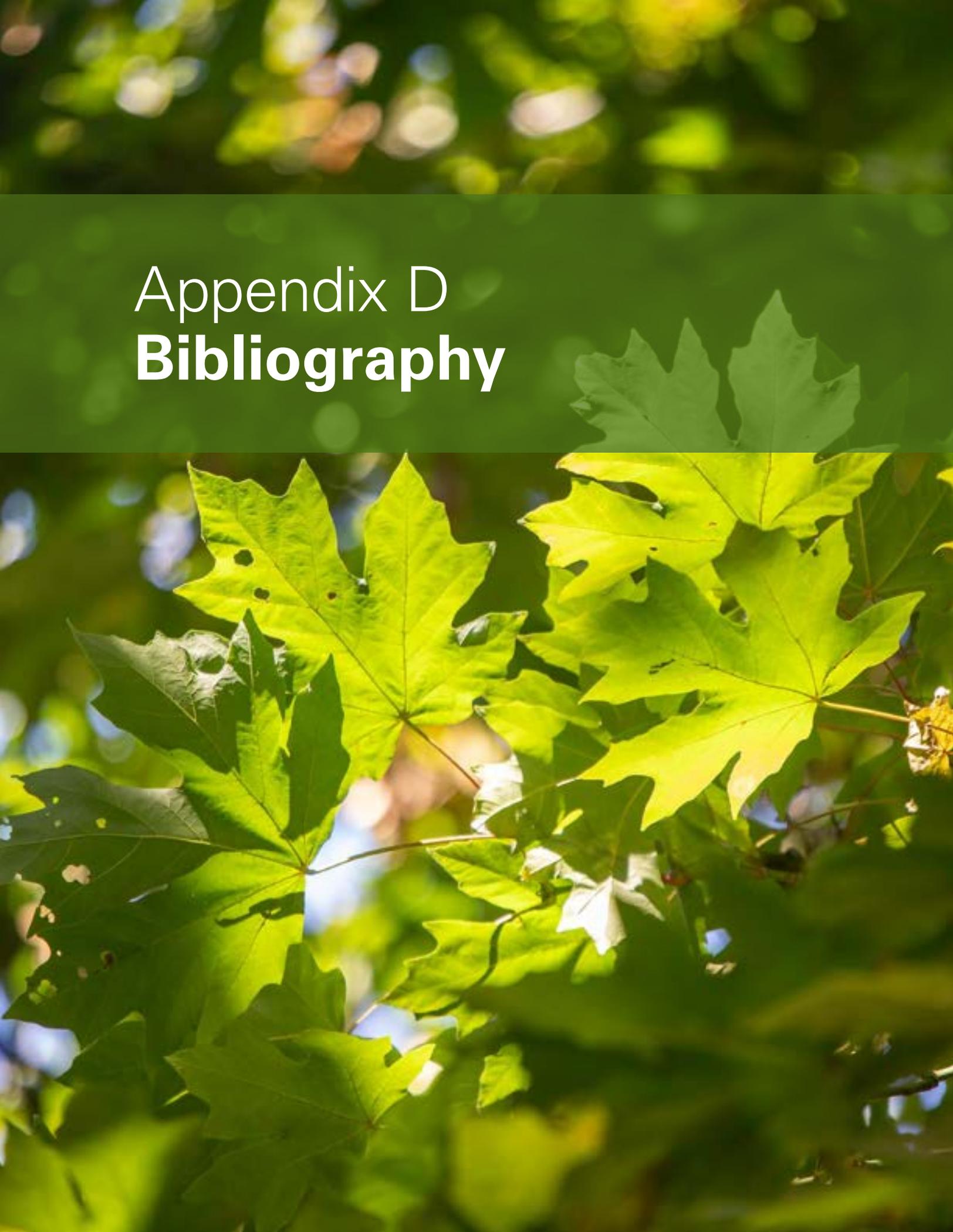
An urban area that is significantly warmer than surrounding rural areas due to concentrations of pavement, buildings and other surfaces that absorb and retain heat

Urban forest

All trees within a city – on public and private land – and the associated vegetation, soils and wildlife, including trees in parks and natural forests; along roads; and on residential, commercial, institutional and industrial properties

Zoning bylaw

Regulates how land, buildings and other structures may be used, including regulations for tree retention, removal and planting



Appendix D
Bibliography

Bibliography

1. Alexander, C., and C. McDonald. *Urban Forests: The Value of Trees in the City of Toronto*. Special Report: TD Economics, 2014. <https://td.com/document/PDF/economics/special/UrbanForests.pdf>
2. Andrada, R., and J. Deng. 2010. *Enjoying green cities: Assessing visitors' attitudes and preferences for urban forests in Washington, D.C. Proceedings of the 2010 Northeastern Recreation Research Symposium*. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station: pp. 168–174. <https://nrs.fs.fed.us/pubs/gtr/gtr-p-94papers/25andrada-p94.pdf>
3. Bastin, Jean-Francois, et al. 2019. "The global tree restoration potential." *Science* 365,6448 (July 2019): 76–79. doi.org/10.1126/science.aax0848
4. Botanic Gardens Conservation International. *State of the World's Trees*. Surrey: BGCI, 2021. <https://www.bgci.org/wp/wp-content/uploads/2021/08/FINAL-GTARReportMedRes-1.pdf>
5. City of Surrey. *Balancing Growth of Today with Trees for Tomorrow: City of Surrey Tree Canopy Analysis*. Surrey: Catherine Berris Associates Inc., July 2011.
6. City of Surrey. Surrey Urban Indigenous Strategy. Retrieved from <http://www.surrey.ca/about-surrey/social-planning/surrey-urban-indigenous-strategy>.
7. City of Surrey. Climate Action Now. Retrieved from <http://www.engage.surrey.ca/climate-action-now>.
8. City of Surrey. History of Surrey, BC. Retrieved from <http://www.surrey.ca/about-surrey/history-of-surrey>
9. Climate Atlas of Canada. *Urban Heat Island Effect*. University of Winnipeg: Prairie Climate Centre, 2022. <https://climateatlas.ca/urban-heat-island-effect>
10. Metro Vancouver. *Urban Forest Climate Adaptation Framework for Metro Vancouver: Tree Species, Selection, Planting and Management*. Vancouver: Diamond Head Consulting, May 2017. <http://www.metrovancouver.org/services/regional-planning/PlanningPublications/UrbanForestClimateAdaptationFrameworkTreeSpeciesSelection.pdf>
11. Food and Agriculture Organization of the United Nations. *Ecosystem Services & Biodiversity*. Rome: FAO, 2022. fao.org/ecosystem-services-biodiversity/en
12. Food and Agriculture Association of the United Nations. *Rethinking the Future of Cities*. Rome: FAO, 2018. fao.org/faostories/article/en/c/1106849
13. Hawkin, Paul (ed.) *Drawdown: The Most Comprehensive Plan Ever Proposed to Reverse Global Warming*. Penguin Books. New York, 2017.
14. Hotte, Ngaio, et al. *The Social and Economic Values of Canada's Urban Forests: A National Synthesis*. Vancouver: UBC Faculty of Forestry, 2015. <https://urbanforestry.sites.olt.ubc.ca/files/2016/09/The-Social-and-Economic-Values-of-Canada%E2%80%99s-Urban-Forests-A-National-Synthesis-2015.pdf>
15. iTree Ecosystem Analysis is a model developed by the U.S. Forest Service, Northern Research Station.

16. Locke, Dexter H., et al. "Residential housing segregation and urban tree canopy in 37 US cities." *npj Urban Sustain* 1,15 (January 2021). <https://doi.org/10.1038/s42949-021-00022-0>
17. McPherson, E.G.; J.R. Simpson; P.J. Peper; Q. Xiao; S.E. Maco; P. J. Hoefler. 2003. *Northern Mountain and Prairie Community Tree Guide: Benefits, Costs and Strategic Planting*. https://www.itreetools.org/streets/resources/Streets_CTG/CUFR_258_North_CTG.pdf
18. Metro Vancouver (2016). Urban Forest Climate Adaptation Framework. <http://www.metrovancouver.org/services/regional-planning/PlanningPublications/UrbanForestClimateAdaptationFrameworkTreeSpeciesSelection.pdf>
19. Metro Vancouver (2021). Metro Vancouver Tree Regulations Toolkit. http://www.metrovancouver.org/services/regional-planning/PlanningPublications/MV_TreeRegulationsToolkit.pdf
20. Nesbitt, N. H. L., Cowan, S. B. J., Cheng, Z. C., Pi, S. S., & Neuvonen, J. (2015). The Social and Economic Values of Canada's Urban Forests: A National Synthesis. UBC Faculty of Forestry.
21. Newton, Adrian C. *Ecosystem Collapse and Recovery, (1st edition)*. Cambridge University Press. 2021. <https://doi.org/10.1017/9781108561105>
22. Nicoletti, Leonardo, and Josephine Clark. *Regional Tree Canopy Cover and Impervious Surfaces*. Vancouver: Metro Vancouver, 2019. <https://metrovancover.org/services/regional-planning/PlanningPublications/EcologicalHealth-TreeCanopyCoverImperviousSurfaces.pdf>
23. Richards, N.A. 1983. Diversity and stability in street tree populations. *Urban Ecology*. 7:159–171.
24. Shannon, P.D., et al. (in review). Adaptation Strategies and Approaches for Forested Watersheds. Ecological Applications. USDA Climate Change Resource Center. <https://fs.usda.gov/ccrc/approach/enhance-species-age-classes-and-structural-diversity-forests>
25. Sisson, Patrick. "Can Planting Trees Make a City More Equitable?" *City Lab* (August 2020). <https://bloomberg.com/news/articles/2020-08-28/planting-city-trees-with-a-new-focus-on-equity>
26. Sutte, Jill. "Why Trees Can Make You Happier." *Greater Good Magazine* (April 2019). Retrieved from greatergood.berkeley.edu/article/item/why_trees_can_make_you_happier
27. The Associated Press. "How cities are coping with 'urban heat islands.'" *CBC News* (July 2018). <https://cbc.ca/news/science/cities-urban-heat-islands-1.4762510>
28. TreeCanada. (n.d.). *Stormwater Management and Urban Forests*. <https://treecanada.ca/resources/canadian-urban-forest-compendium/17-stormwater-management-and-urban-forests>.
29. Vibrant Cities Lab. (n.d.). Property Values Impact. <https://vibrantcitieslab.com/research/economic-development-property-values-impact>
30. Vibrant Cities Lab. (n.d.). Business Impact. <https://vibrantcitieslab.com/research/economic-development-business-impact>



 CITY OF
SURREY
the future lives here.