Canada's Urban Forests

Bringing the Canopy to All

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Nature CANADA

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Executive Summary and Recommendations

Our map analyses in Vancouver, Abbotsford, Calgary, Toronto and Montreal reinforce previous findings that tree canopy tends to be much lower in low-income and racialized neighbourhoods. The interviews with experts highlight some of the reasons for this inequity, including:

- A lack of funding;
- Absence of an integrated planning process that values urban trees;
- Poor incentives for planting trees on private land;
- Weak public engagement with those communities that need trees the most.

Having explored these barriers to tree equity, we consider how cities are currently tackling the problem. The focus for expanding trees cover in most cities is largely quantitative. The majority of Canadian municipalities have published urban tree cover targets—for example, the City of Toronto has committed to achieving 40% urban forest canopy cover by 2050. While laudable, such city-wide targets do not address equity of access for different communities and neighborhoods.

A better approach is the 3-30-300 rule, which states that everyone should be able to see at least three trees from their home, that all neighbourhoods should have at least a 30% tree canopy, and that all residents should have a greenspace of at least one hectare within 300 metres of where they live. While this principle can help substantially in advancing tree equity, we need to go further. In this report, Nature Canada proposes that equitable access should be thought of in terms of three variables—proximity to urban trees and forests, urban forest quality and the governance of urban forests.

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Everyone should be able to see at least **3 trees** from their home

▼

Communities should ensure a **30% tree canopy** in all neighbourhoods

▼

All residents should have a greenspace of at least **one hectare within 300 metres** of where they're living

Based on our review of the problem, we offer recommendations to municipalities, governments and advocacy groups on how to achieve tree equity.

1. Recommendations to Municipalities

- Decolonize the urban forest and prioritize equity. Cities need to give voice and power to those in underserved and marginalized neighbourhoods. Early engagement and consultation are necessary for successful tree-planting programs across our cities. This is particularly important for Indigenous communities: by working with the original caretakers of the land, municipalities can acknowledge and implement Indigenous wisdom regarding relationships with nature.

- Build urban forest strategies into an integrated planning process. Trees cannot be an afterthought in laying out cities. They are a core part of city planning and need to be integrated into municipal land-use policies.
- Develop appropriate tree inventories across the city and set neighbourhood targets. Inventories give a clear picture of the location and extent of inequitable tree canopy cover across the city. They are an essential starting point for setting tree canopy targets by neighbourhood.

- Promote urban biodiversity. Trees anchor ecosystems, which are weakened when fragmented. Living things have difficulty moving safely; populations cannot intermingle. Municipalities should implement tree planting programs to reconnect fragmented landscapes and halt and reverse biodiversity loss.

- Incentivize tree planting on private land. Since a substantial part of the urban tree canopy is not found on public land, cities need to encourage private landowners to plant and maintain trees.

2. Recommendations to the Federal Government

Although municipalities are caretakers of their own green spaces, the federal government has an important role to play in achieving tree equity.

- The 2 Billion Tree Program (2BT) should prioritize tree planting in urban, peri-urban and agricultural landscapes in populous southern Canada, where landscapes are fragmented and under significant threat. For a full list of recommendations for 2BT, see here.
- As a corollary, the government needs to support the development of the supply of culturally, genetically and climate appropriate seedlings, since 2BT will put an unprecedented demand on tree nurseries as part of its commitment to the growth of additional and permanent forest cover.
- Funding to municipalities needs to be increased in order to expand the permanent urban forest canopy.
- Federal programs such as the Natural Infrastructure Fund should enhance equitable access to the urban forest while strengthening natural infrastructure. Poor tree canopy cover in marginalized and racialized communities makes these communities more vulnerable to extreme weather events such as floods.

- Federal departments need to follow a coordinated, whole-of-government approach to ensure progress towards the stated government goal of a more equitable, carbon-neutral and nature-positive future for all.

3. Recommendations for Nature and Community Organizers

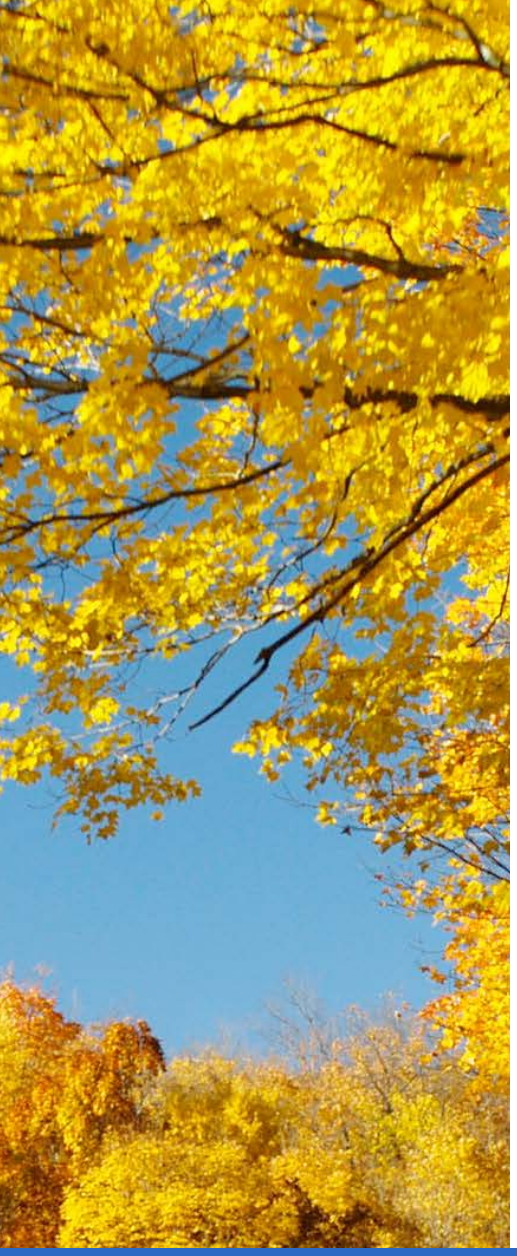
We conclude this report by providing recommendations to nature and community groups for achieving tree equity, including:

- Spread the word by writing op-eds, organizing events, and sharing this report on your social channels. Invite Nature Canada to speak at your event or meeting.
- Identify the social and climate justice groups, tenant and community associations, and tree groups in your city and connect with them.
- Get to know your city's Urban Forest Management Plan.
- Get to know the federal 2 Billion Tree program as it can support your city's tree planting efforts.
- Meet with your councillor to talk about tree equity. Research other councillors for the names of those who have advocated for similar issues.
- Ask a champion councillor to pass a motion that requests the city to leverage the federal 2 Billion Tree funding program to plant trees equitably.
- Start a petition to show your council that this is an important issue for the whole community.
- Take pictures of the tree-lush and tree-deficit neighbourhoods to send to your councillor. Post them on social media and tag relevant decision-makers.
- Start a letter writing campaign to have community members bring the issue forward to their own councillors.
- Sign up to speak at budget, infrastructure, and environment meetings on the importance of trees in all areas of our lives.
- Offer your knowledge and support for any policy changes required.

We salute all those advocates who are working hard to advance tree equity and invite them to contact Nature Canada for support and resources.

1

Introduction



The Issue and the Opportunity

Urban forests, defined as all natural and planted trees in or near an urban area, are increasingly recognized as important components of more liveable, healthy, and resilient cities. They sequester and store carbon, keep cities cool, (mitigating urban heat islands), serve as habitats for many species, and shield us from extreme weather like floods and landslides. Just as importantly, they support our mental and physical well-being. Through the COVID-19 pandemic in particular, Canadians have come to appreciate the immense value of urban trees and forests.

And yet evidence suggests that **not everybody gets to enjoy the benefits of the urban forest to the same degree**. People living in racialized and marginalized neighbourhoods have highly inequitable access to urban trees and forests compared to those in affluent neighborhoods. This "tree inequity" is part of a broader issue of environmental injustice and racism in Canada: low-income and often racialized minority communities tend to be located within lower quality natural environments, are disproportionately exposed to environmental burdens that threaten their health, and access fewer environmental amenities.[1]

WITH ABOUT 82% OF CANADIANS LIVING IN URBAN AREAS, DESIGNING CITIES TO BE MORE LIVABLE THROUGH MORE EQUITABLE ACCESS TO URBAN TREES FOR EVERY URBAN RESIDENT IS AN IMPORTANT PRIORITY.

In pursuing this goal, advocates for greater equity in the urban forest canopy know they are starting from a deficit. Forests in and near urban areas, like forests across Canada, have been badly decimated as part of urban, agricultural and industrial development patterns particularly in the last 150 years, though more broadly since colonization. Under the twin onslaughts of urban sprawl and deforestation, the treescape is continuing to decline, and governments are belatedly recognizing the need to act.

At the federal level, the Government of Canada has committed to planting **two billion trees over ten years**,

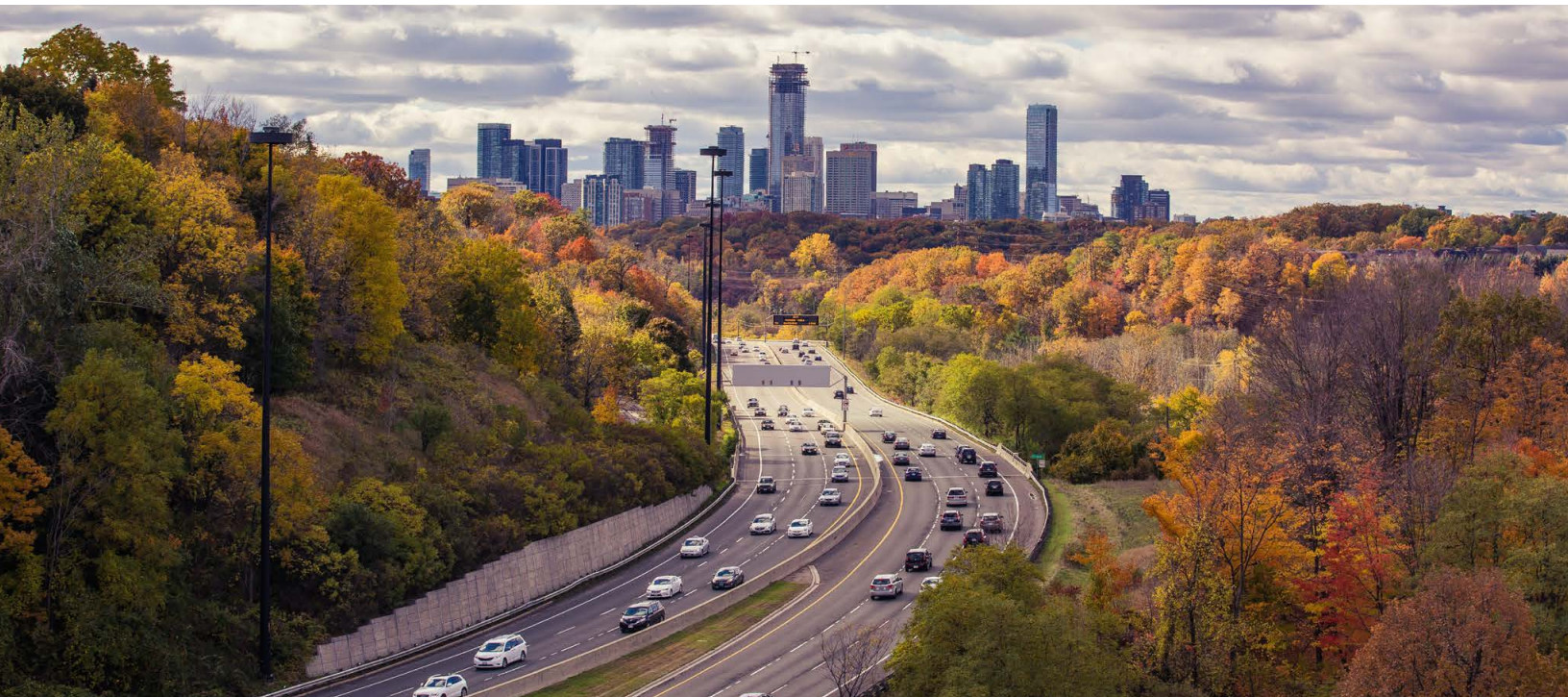
identifying it as an important part of Canada's efforts to achieve net-zero greenhouse gas emissions by 2050 while supporting biodiversity recovery and enhancing urban green space.[2] The Government has also announced its commitment to create a network of national urban parks[3] as part of the wider historic commitment to expand protected areas to 25% of land and ocean by 2025 and 30% by 2030. Other federal commitments include the creation of the Natural Infrastructure Fund, which seeks to connect Canadians to nature and increase access to green spaces while promoting recreational and social connection, particularly in urban areas.[4]Many Canadian municipalities are also implementing tree planting initiatives as part of a broader climate change adaptation plan and to improve the quality of life for urban residents.

These commitments to increase urban tree canopy offer significant potential to contribute to the government's overall goals to halt and reverse biodiversity loss by 2030 and to build a more equitable, carbon-neutral and nature-positive future. They also offer an opportunity to address a particular long-standing injustice described in this report: the inequitable distribution of urban forests and the resulting inequitable distribution of the health and environmental benefits they provide.

2 Billion trees over 10 years

0 Net greenhouse emmissions by 2050

30 Percent of land and oceans to be protected by 2030



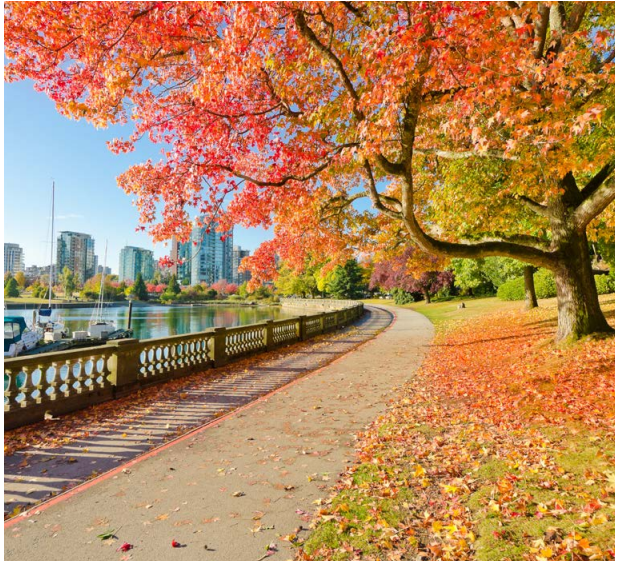
Purpose of this Report

Nature Canada sees advancing equity and anti-racism as an ethical imperative and as central to efforts to stop species loss, climate change and other environmental harms. Everyone should have access to the benefits of urban forests and green space—and thus be part of building a future for nature's full recovery.

This report provides an overview of who has (and doesn't have) access to urban tree canopies in selected Canadian cities , and how municipalities and governments can increase equity of access by drawing on lessons and analyses to date. Specifically, we offer recommendations on increasing access to urban trees for low-income communities and communities of Black, Indigenous and people of colour (BIPOC).

The report is based on research into the distribution of urban trees among various socio-demographic and socio-economic variables at the census block group level across selected Canadian municipalities. We also undertook interviews with individuals from a diverse array of municipalities and organizations actively engaging with the biophysical, social, and/or policy dimensions of trees in Canadian municipalities.

A central aim of this report is to support nature advocates in taking action to redress historic policies and programs that have created a landscape of inequitable access to neighborhood trees, forests,



and green spaces, along with the critical green-infrastructure/ecosystem services they provide. The report also aims to support municipalities in their efforts to build nature positive, equitable, and inclusive forest-related programs.

With the current rapid rate of urbanization, the value of urban forests will continue to increase across Canadian cities given the critical ecosystem services they provide to sustain human health and well being, support biodiversity and help cities adapt to and mitigate climate change.

What does equitable access to the urban forest mean?

The burgeoning interest in expanding urban forests is accompanied by a broad and international consensus that cities should strive for a minimum tree canopy target of 30% to maximize health benefit[5] Other studies suggest that tree cover needs to approach 40 per cent in order to achieve significant cooling benefits.[6]

However, such city-wide targets do not address the issue of equity of access for racialized and marginalized communities at a neighborhood scale. A target per neighbourhood offers a much better approach to pursuing equity on the ground.

Nature Canada supports the **3-30-300** rule recommended by Cecil Konijnendijk, a Professor of Urban Forestry at the University of British Columbia (UBC) and the Director of Nature-based Climate Institute in Spain, whereby:

- everyone should be able to see at least three trees from their home;
- communities should ensure a 30% tree canopy in all neighbourhoods; and
- all residents should have a greenspace of at least one hectare within 300 metres of where they're living.[7]

▼

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But a quantitative approach to assessing equity is not enough. In this report, we propose equitable access should be thought of in terms of three variables —proximity to urban trees and forests, urban forest quality, and the governance of urban forests.

Proximity to urban trees and forests:The World Health Organization recommends urban residents should live within 300 meters from the nearest public green space of 0.5-1 hectare or a safe 5-10 mins walk from their homes.[10] Where this is not possible, municipalities must work adequate and affordable transportation infrastructure to make urban parks more accessible for racialized and marginalized groups.

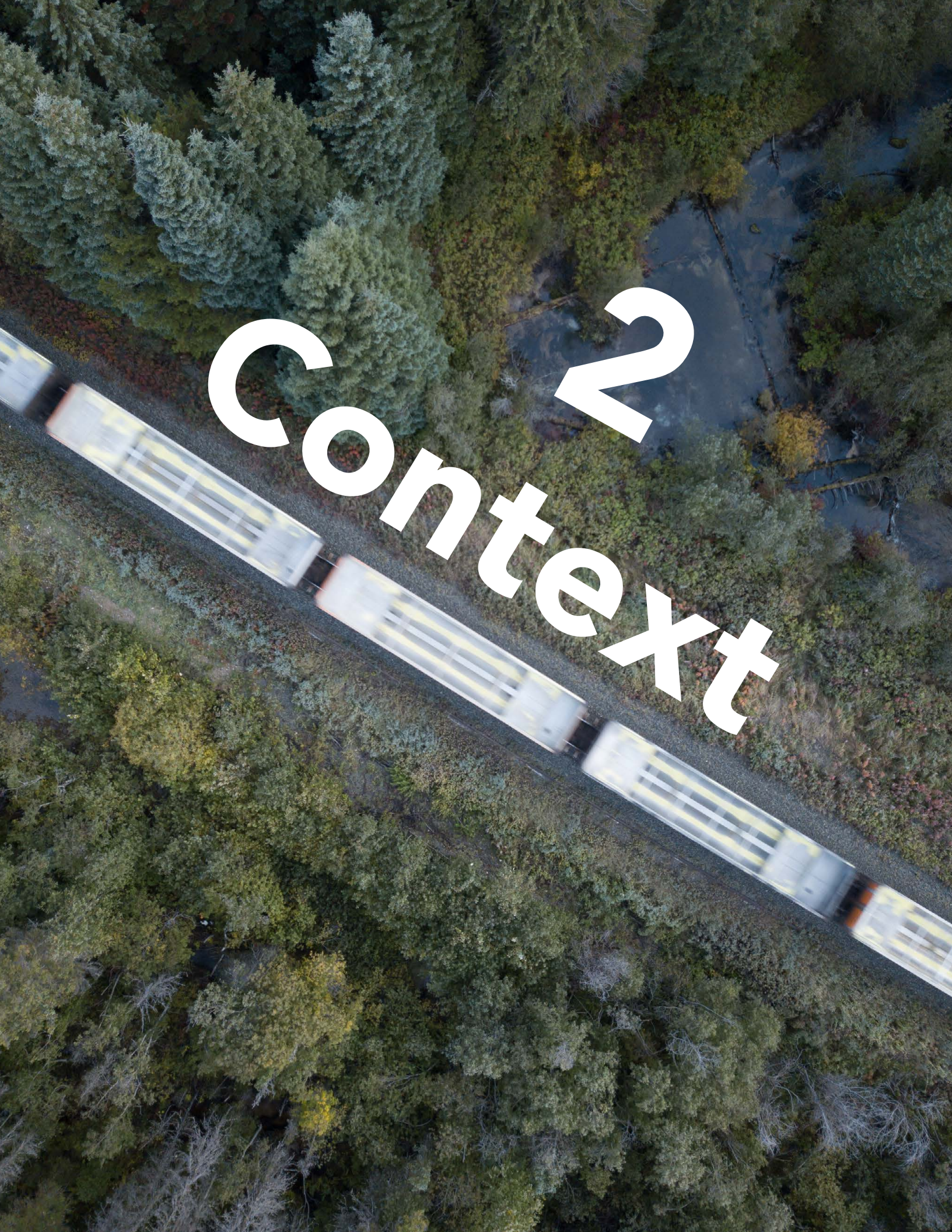
Urban forest quality: It's important people have access to good quality urban forest cover– in terms of its biodiversity and the cultural needs of urban park users. This includes specific attention to how increasing urban tree canopy cover can promote culturally relevant species for distinct urban Indigenous cultures, as well as better connecting patches of urban trees and forest to support wildlife and restore urban biodiversity. Another measure of forest quality is density, or green space/park acres per resident, which helps planners evaluate potential risks of park congestion. As noted, it is recommended that there should be at least 30% tree canopy cover in each neighbourhood.

Governance (voice and power): Ensuring that urban forests and park spaces are not only equitably located, and with high quality tree cover, but are also safe and welcoming for diverse communities means opening up the decision-making process to racialized and marginalized communities. This requires both access to planning, consultations, and decision-making in relation to urban forests and a willingness on the part of decision-makers to listen and act on the priorities of these communities.

Urban Forests Defined

Urban forests are defined as the trees and associated vegetation in both public and private urban areas, and include multiple "green" elements of urban socio-ecological systems, such as street trees, parks, backyard trees and gardens, and remnant woodlands.[8]

The quality and quantity of the urban forest is generally assessed using the urban tree canopy cover. The Canadian Society of Landscapes Architect (CSLA) defines the urban tree canopy cover as the layer of tree leaves, branches and stems from all publicly and privately owned deciduous and coniferous trees, forests and understory, including the location, condition and age of trees as well as the inequitable distribution of trees across socio-economic communities.[9] The urban tree canopy cover is therefore a quantifiable metric that is used to establish baselines and goals to increase and maintain the health of the urban forest and the benefits that it provides.



2 Context

The Concerning State of Canada's Forests

Canada contains approximately 30% of the world's boreal forests and 9% of global forests making the health of Canadian forest landscapes critical to the health of the planet as a whole.

It is estimated however that roughly within the last 45 years, about 3.3 million hectares of Canadian forests were converted to non-forest uses with the main drivers being agriculture (41%), resource extraction (37%), urban expansion and recreation (12%), forestry (8%) and hydroelectric development (1%).[11] The pattern is not only a historic one. Large intact forest landscapes across the country decreased by approximately 4.7% (~142,000 km2) in just over a decade between 2000 and 2013.[12] So the imperative for urban reforestation takes place in a larger context of forest loss and degradation across Canada.

Urban landscapes in Canada are often situated in areas of high species richness. At the same time, these landscapes have experienced extensive habitat fragmentation and conversion as a result of historic and continued urban development. Consequently, today's urban forests tend to be smaller, patchy and less diverse than their original state.

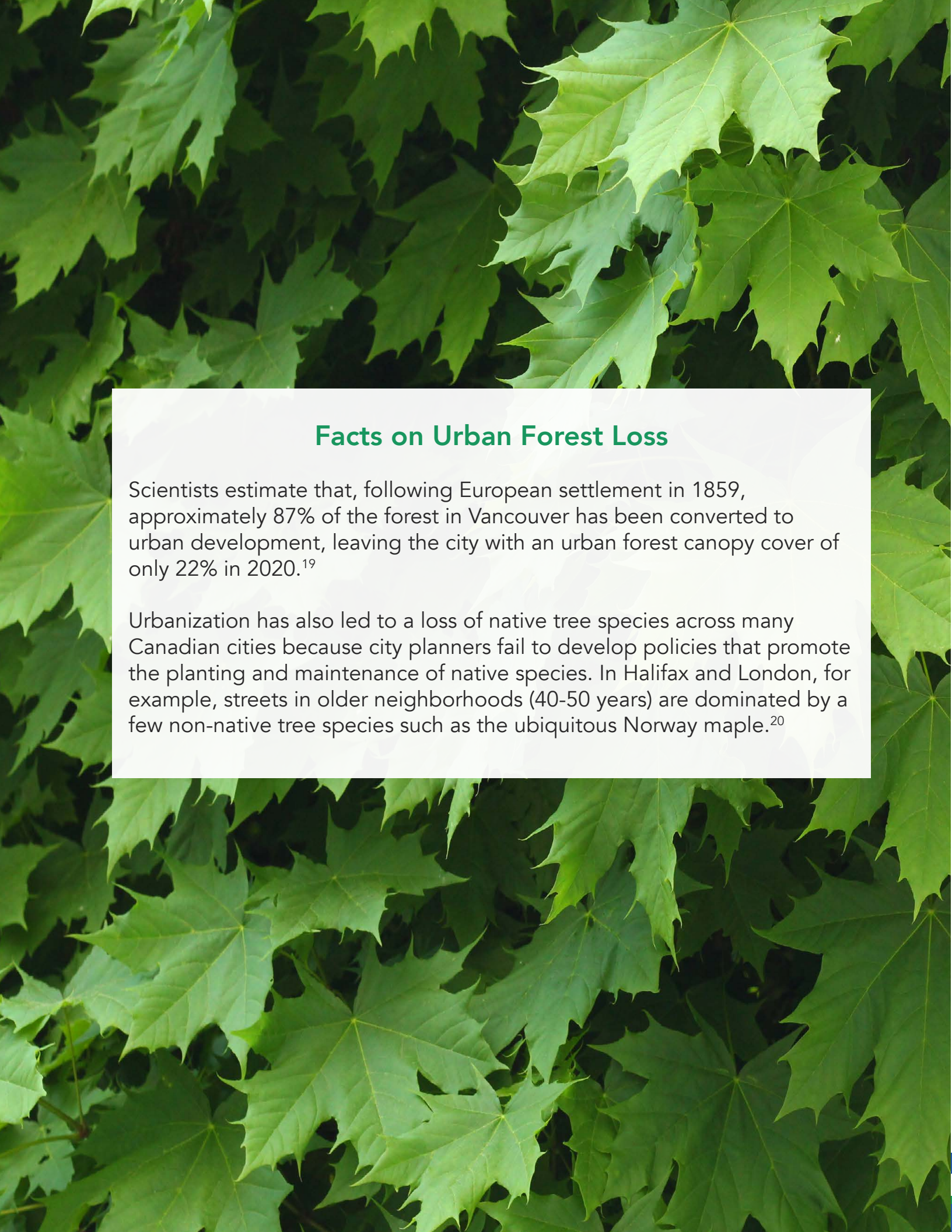
Cross-country Overview of Forest Loss

Human activity and settlement has greatly affected the biodiversity-rich forests of Southern Canada. It is estimated that following European settlement in 1859, approximately 87% of the forest in Vancouver has been converted to urban development.[13] Urbanization has also led to a loss of native tree species in many Canadian cities as city planners fail to develop policies that promote the planting and maintenance of native species. For example in Halifax and London, streets in older neighborhoods (40-50 years) are dominated by a few non-native tree species such as the ubiquitous Norway maple.[14]

CAROLINIAN FORESTS (located in South Western Ontario) have witnessed a significant decline in coverage accompanied by changes in forest composition and structure. The Carolinian forest zone, which serves as home to about 25% of Canadians, constitutes one of the most biodiverse ecological zones and supports many endangered species in Canada. Unfortunately, as documented by Carolinian Canada, no more than 11% of these forests remain across the landscape.[15]

IN ACADIAN FOREST landscapes (located in the Maritimes), forest inventories suggest less than 1-5% of forest cover across the Maritimes is older than 100 years.[16] Forest fragmentation, generally defined as a process whereby a large contiguous area of habitat is broken into smaller parcels of forest, has also increased with agricultural intensification along the St. Lawrence valley.[17]

CANADA'S BOREAL FOREST, where there are fewer urban centres, experiences a considerable legacy of compounded negative effects. The accumulation of past, present and previewed future impacts of extractive industries have caused dramatic reductions in environmental, social, economic and cultural values of forests in the landscape, with significant impact on First Nation and Metis communities whose livelihoods and culture are deeply connected with the land. Seismic lines are the most common human disturbances in the boreal forest, estimated at 1.5 to 1.8 million km in total length in Alberta alone.[18] These lines not only reduce tree cover, they cut up the connectivity of critical habitat.



Facts on Urban Forest Loss

Scientists estimate that, following European settlement in 1859, approximately 87% of the forest in Vancouver has been converted to urban development, leaving the city with an urban forest canopy cover of only 22% in 2020.[19]

Urbanization has also led to a loss of native tree species across many Canadian cities because city planners fail to develop policies that promote the planting and maintenance of native species. In Halifax and London, for example, streets in older neighborhoods (40-50 years) are dominated by a few non-native tree species such as the ubiquitous Norway maple.[20]

The Benefits of Trees and Urban Forests

Roughly four out of five people across Canada live in cities, making our urban forests an important way for people to connect with nature while also reaping its health, environmental, cultural, and economic benefits.

Urban forests are crucial for biodiversity, providing habitat and food for birds, invertebrates, mammals, and plants. When planted strategically, urban forests also provide protective cover for other plant life and corridors for animals to travel.[21] If trees are concentrated only in certain parts of a city, the result is fragmented tree cover and less habitat for the wildlife we share our cities with. The importance of biodiversity doesn't stop there. Variety amongst tree species helps to reduce the impact of species-specific pests and disease, such as the Emerald Ash Borer and Dutch Elm Disease. These pests have significant economic costs to manage and can leave streets bare and exposed.

Trees also play a critical role in regulating the climate by absorbing carbon dioxide (CO2) from the atmosphere through the process of photosynthesis, while also releasing life giving oxygen back into the air for our next breath.

In the context of climate change, communities across Canada are projected to experience an increase in the severity and frequency of floods, the number of days over 30°C, and exposure to pollution and smog.[22] Trees also help with this. Canopy cover helps prevent flooding by intercepting the rain, which allows up to 30% to evaporate without even touching the ground. The green space needed for a tree provides a permeable surface in urban areas which reduces run-off, and the tree roots help the water penetrate the earth even faster.[23]

Furthermore, tree canopies provide shade, making cities more comfortable and reducing the need for air conditioning. A well-treed neighbourhood can reduce the temperature on a hot summer's day by roughly 2.5 degrees Celsius compared to a neighbourhood without trees.[24] Trees also improve the quality of the air. Hot temperatures bake car exhaust, creating smog, but trees help filter particulates and thus reduce pollution.[25] Research on 86 Canadian cities found that the urban forest removed 16,500 tonnes of air pollution in 2010, translating into $227 million worth of human health benefits.[26]

The consequences of reduced tree canopy cover in certain neighbourhoods is significant. British Columbia's heat dome in the summer of 2021 saw temperatures reach nearly 50°C, causing close to 600 deaths.[27] Parts of Quebec also experienced record-breaking heat waves twice in the same month in 2021.[28] When

municipal tree planting is not distributed equitably, certain neighbourhoods are more exposed to heat-related illnesses than others.

Our urban forests also improve mental health challenges like depression, anxiety, stress and ADHD, while improving sleep, strengthening the immune system, and reducing the impacts of many other negative health conditions.[29]

The benefits listed here are of economic significance as well. A study of select Canadian cities showed that for every $1 spent on urban forestry, residents received between roughly $2 - $13 in benefits each year through storm management, erosion prevention, air quality, energy savings, and carbon sequestration.[30] From a city-wide perspective, the areas of greater Halifax, Montreal, and Vancouver are home to more than 100 million trees, worth an estimated $51 billion (Halifax: $11.5b; Montreal: $4.5b; Vancouver: $35b). [31]

$1 Spent on Urban Forestry

= $2 to $13

in Benefits

How are these benefits distributed?

There is growing evidence of a widespread lack of equity in urban forest cover and green space across Canada. Studies in multiple Canadian municipalities[32] all point to the inequitable distribution of urban forests in lower-income and racialized neighbourhoods, and the lack of engagement of these communities in urban forest governance.

Trees are found to be larger in size and abundance in wealthier neighbourhoods, in comparison to lower canopy cover, which is associated with lower levels of land ownership.[33] Additionally, wealthier areas are associated with a higher diversity of tree species and wildlife.[34] Communities with lower levels of tree canopy cover are also more likely to be impacted by border environmental challenges, resulting in these areas being at a higher risk of losing their current tree canopy.[35]

Poverty is highly racialized in Canada,[36] meaning neighborhoods with the least access to tree cover are also most often dominated by BIPOC communities. The relationship between race alone and urban tree canopy is less straightforward, since wealthy treed neighbourhoods also include racialized populations,[37] but still display other patterns of inequity. Racialized urban residents for example are less likely to engage in environmental stewardship activities, with most tree-planting groups and events being dominated by white communities.[38] The absence of racialized communities in community-based tree planting activities is accompanied by a similar absence of the same communities in decision-making roles. This results in racialized communities having less control over urban tree-planting practices in their own communities. These dynamics between urban forests and socio-economic factors are not unique to Canadian cities and have been tracked as a worldwide trend.[39]

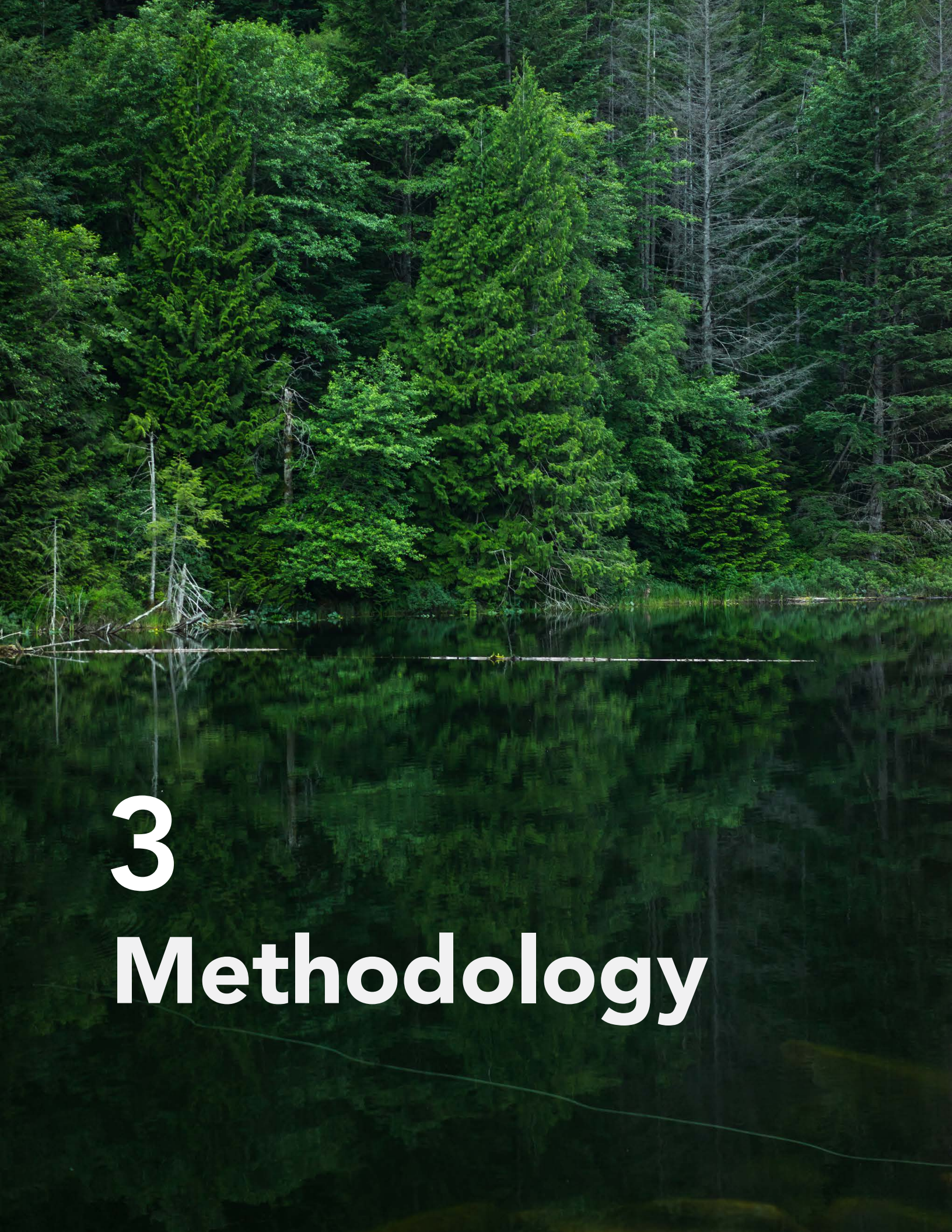
Tree inequity: Historical and Present Day Colonial Context

Urban forests continue to function under a settler colonial construct, characterized by an artificial division between people and nature.

An appreciation for trees and nature emerged through the City Beautiful movement, which swept across North America throughout the 1890s, rooted in European romantic sentiments for re-creating pristine and undisturbed spaces.[40] There was a felt need to 're-wild' urban spaces as temporary escapes from the detrimental effects of urbanization, but in a heavily controlled manner that regulated the 'untamed' characteristics of forests, creating manicured green spaces preserved for their aesthetic value.[41]

The introduction of urban forests in this way, while presented as "neutral" green spaces, meant parks were colonial tools of displacement that prevented Indigenous communities from engaging with their lands.[42] Parks were, and are, also often laced with pesticides to preserve certain trees and shrubs, while preventing Indigenous communities from engaging in their traditional practices of food and medicinal harvesting. In this way, even though parks and green spaces are considered public land, they are essentially colonial enterprises that reinforce existing settler colonial relations with the land.[43] This pattern of spatial inequality and injustice continues today, with the Indigenous Stewardship Land Circle recently calling for an immediate ban on the use of pesticides in High Park, Toronto.[44]

As the socio-economic benefits and importance of trees have become apparent, they are increasingly rooted in patterns of class and land ownership. Trees are viewed primarily as commodities or amenities within the city, rather than as an essential right.[45] This narrative is vastly different from that of Indigenous communities, where First Nation, Metis and Inuit knowledge and cultural practices are ultimately guided by the understanding that all communities are part of and connected to nature rather than separate from it. This world view has created concepts of reciprocity and kinship in daily ways of living, which can ensure all communities have access to urban forests.[46]



3 Methodology

In this report, we built on the noted previous research using two complementary approaches:

A Map Analysis

The first approach allowed us to get a sense of the scale of the problem in select Canadian cities, and create tools for engagement in these areas. We mapped out the relationship between tree cover and income on the one hand, and racialized populations on the other, using 2016 census data. Municipalities were initially selected for mapping based on the following criteria: status as a major urban centre; existing relationships with Nature Canada; whether or not they have committed to equitably expand their urban forests canopy; and considerations of data availability.

Twelve cities were mapped in this study including

Abbotsford
Brampton
Burnaby
Calgary
Kingston
Montreal
Ottawa
Quebec City
Richmond
Surrey
Toronto
Vancouver

Semi-Structured Interviews

The second approach using interviews gave us insiders' perspectives on how to tackle the issue.

We interviewed municipal staff, urban foresters, academics, and practitioners to better understand the relationship between urban tree canopy cover, race and socioeconomic variables and what are the barriers and solutions to improve outcomes for equity, biodiversity and the climate.

The municipal staff interviewed were drawn from Canadian cities that have made a commitment to increase access to urban forests for low-income and racialized communities and other cities with whom Nature Canada has active relationships. Municipal staff and urban foresters from six municipalities participated in our interviews—Toronto, Montreal, Vancouver, Ottawa, Winnipeg, and London.

Practitioners interviewed that were not municipal staff were based in major cities across Canada and reflected a range of expertise on urban nature, environmental justice and forests, including individuals who identify as BIPOC.

Please see Appendix 1 for further details regarding our research methodology.

4 Findings

SPATIAL ANALYSIS - Mapping the Urban Forest with Respect to Income and Race

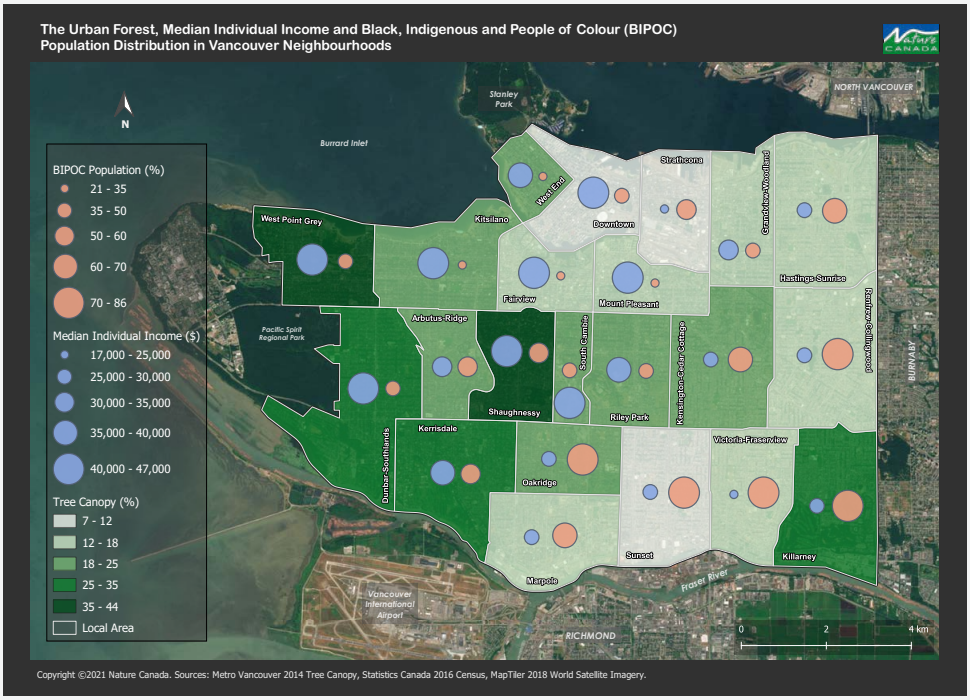
Our research and mapping confirm that there are significant inequities of access to the urban tree canopy in relation to race and income across Canada. All the cities mapped have higher tree canopy cover in higher income and/or predominantly white areas. Burnaby was a bit distinct, where tree canopy is lower for racialized populations, but this is not also correlated with income. Indeed lower-income communities in Burnaby have higher access to urban forests than wealthier communities. In this report we focus on providing more detailed findings from Vancouver, Toronto, Montreal, Abbotsford and Calgary because they are particularly illustrative of the problem. **(For maps of all municipalities investigated, please refer to Nature Canada's website).**

VANCOUVER

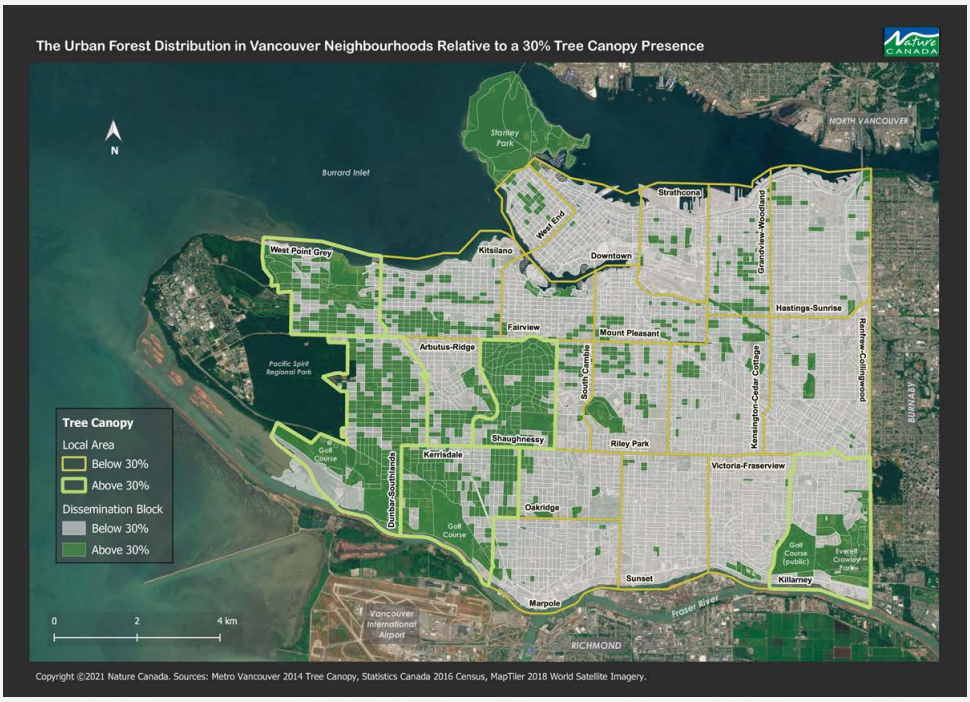
Vancouver, the traditional territories of the Musqueam, Squamish, and Tsleil-Waututh Nations is one of Canada's most highly populated and dense cities, but this has not stopped the city from pursuing tree planting. From 2013 to 2018 the city increased its tree canopy from 21% to 23%, prompting the city to increase its tree canopy cover goal from 22% to 30% city wide by 2050.[47]

As part of addressing equity issues, one of Vancouver's urban forest targets is to double street tree density in priority neighbourhoods by 2030.[48] The two neighbourhoods, Marpole and the Downtown Eastside, were selected as they are home to the majority of residents who are at risk to extreme heat.[49] Vancouver's Parks and Recreation Framework was also developed as a decision-making tool for improving equitable access to parks and green spaces.[50] This framework employs an equity lens identifying "Initiative Zones" as areas of priority for the delivery of park and recreation resources.[51]

As map 1 shows, trees are not currently equitably distributed across the city. Vancouver's urban forest cover increases from east to west. Exceptions include the city's downtown area which, like many downtown cores across the country, has a sparse tree canopy. It is notable that where BIPOC presence generally decreases (southeast to northwest), median income generally increases. The mapping confirms that areas of lower income and greater BIPOC diversity tend to have lower tree cove.



Map 2 takes a slightly different approach to mapping tree canopy cover across the city by showing which neighbourhoods meet the recommended minimum 30% canopy cover. Most of these areas are present in the western part of the city and have an evenly distributed canopy cover. In comparison, the only area in the eastern region with a canopy above 30% is Killarney, where much of the urban canopy is concentrated in the southern portion of the neighbourhood, which contains a golf course and park. These findings highlight the need for neighbourhood-level tree canopy cover goals to ensure all residents receive the multitude of benefits trees provide as opposed to merely having city-wide targets.



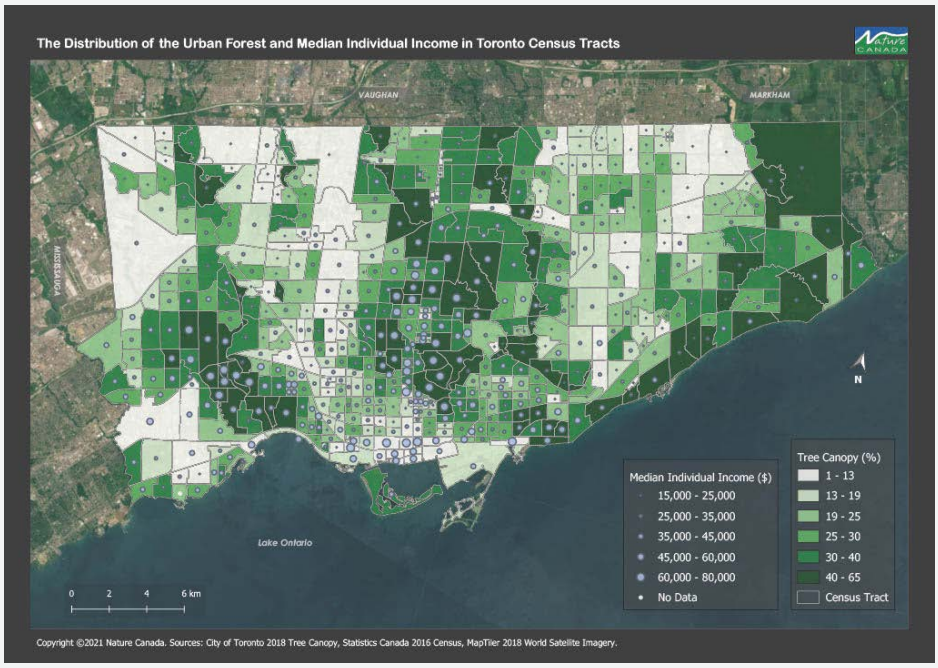
TORONTO

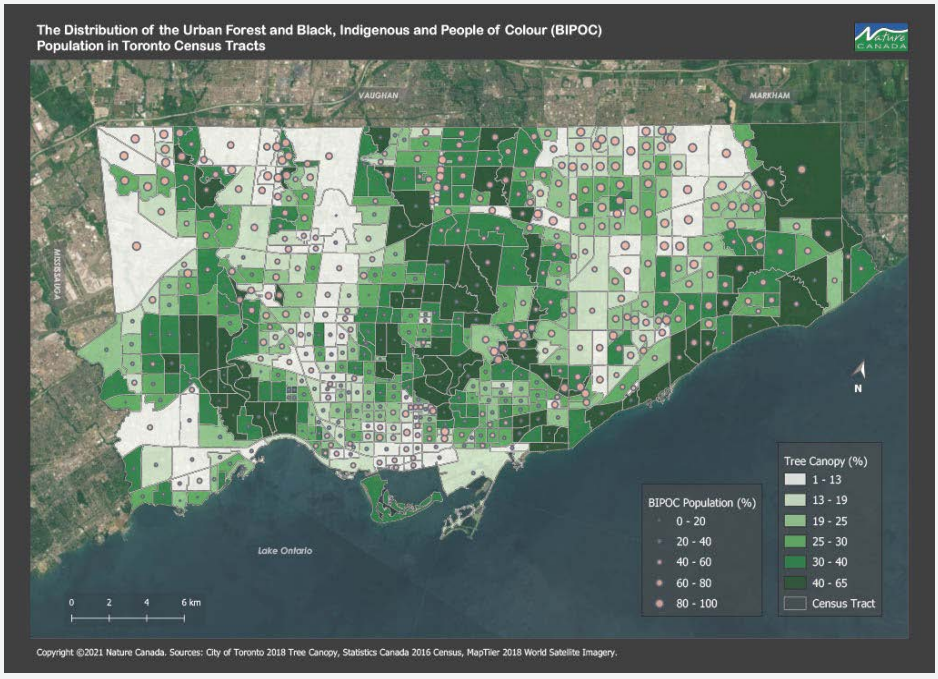
Toronto, traditional territory of many nations including the Mississaugas of the Credit, the Anishnabeg, the Chippewa, the Haudenosaunee and the Wendat peoples and is now also home to many diverse First Nations, Inuit and Métis, has about 3 million people and an estimated 11.5 million trees.[52] In roughly a decade, from 2008 to 2018, the city planted nearly 1 million trees, increasing its urban canopy cover by roughly 2% to 28.4%.[53] Toronto's urban forest is densest within the three major ravine systems that traverse the city. These include the Humber River in the west, the Don River in the city centre, and Rouge River in the east (map 3).

As noted by other studies, Toronto's trees are not planted equitably. Issues of access can be clearly seen, when comparing map 3 with 4 and 5. The more heavily treed areas of the central and southwest are areas of high income with low presence of BIPOC communities. Outside those areas, the tree canopy declines considerably as income decreases and BIPOC presence increases (maps 4 and 5).

This correlation is not consistent universally across the city. Most notably, the downtown area is a low canopy region characterized by both higher income and higher racial diversity. The east end where there is a higher presence of BIPOC and lower income levels also has a dense tree canopy. A significant portion of the northeast region contains Rouge National Urban Park, where people do not reside.

Achieving a more equitable distribution of urban trees was one of Toronto's strategic goals between 2012 and 2022.[54] Toronto remains focused on planting trees where they are most needed, which includes investing in canopy extension, specifically on private land.[55] More information on Toronto's plans to improve equity are reviewed in section 4.3 below.



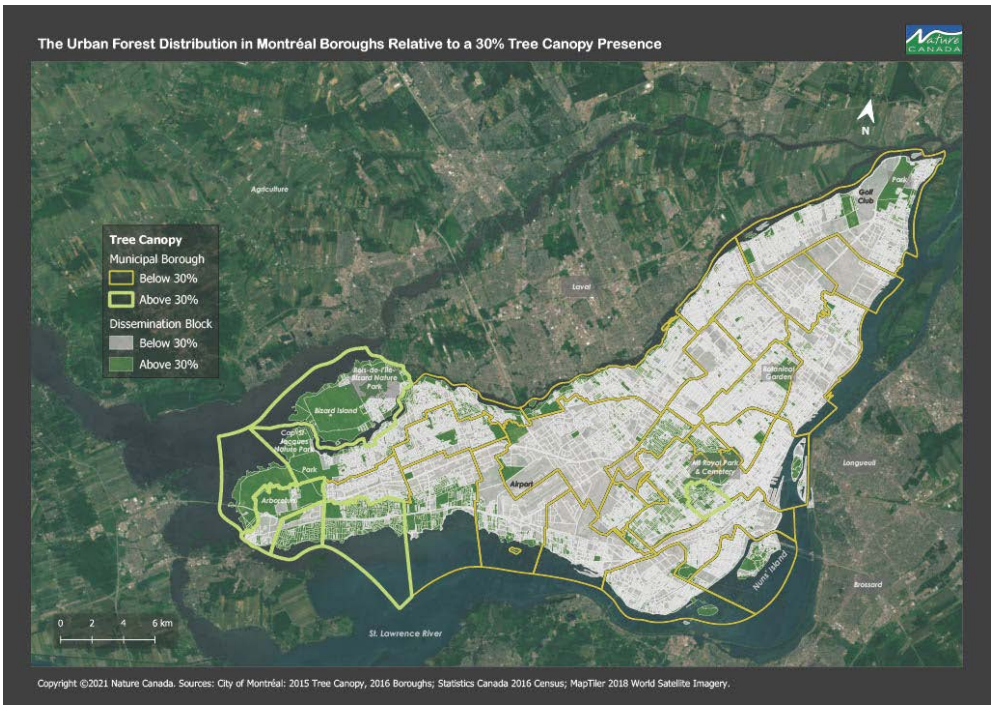


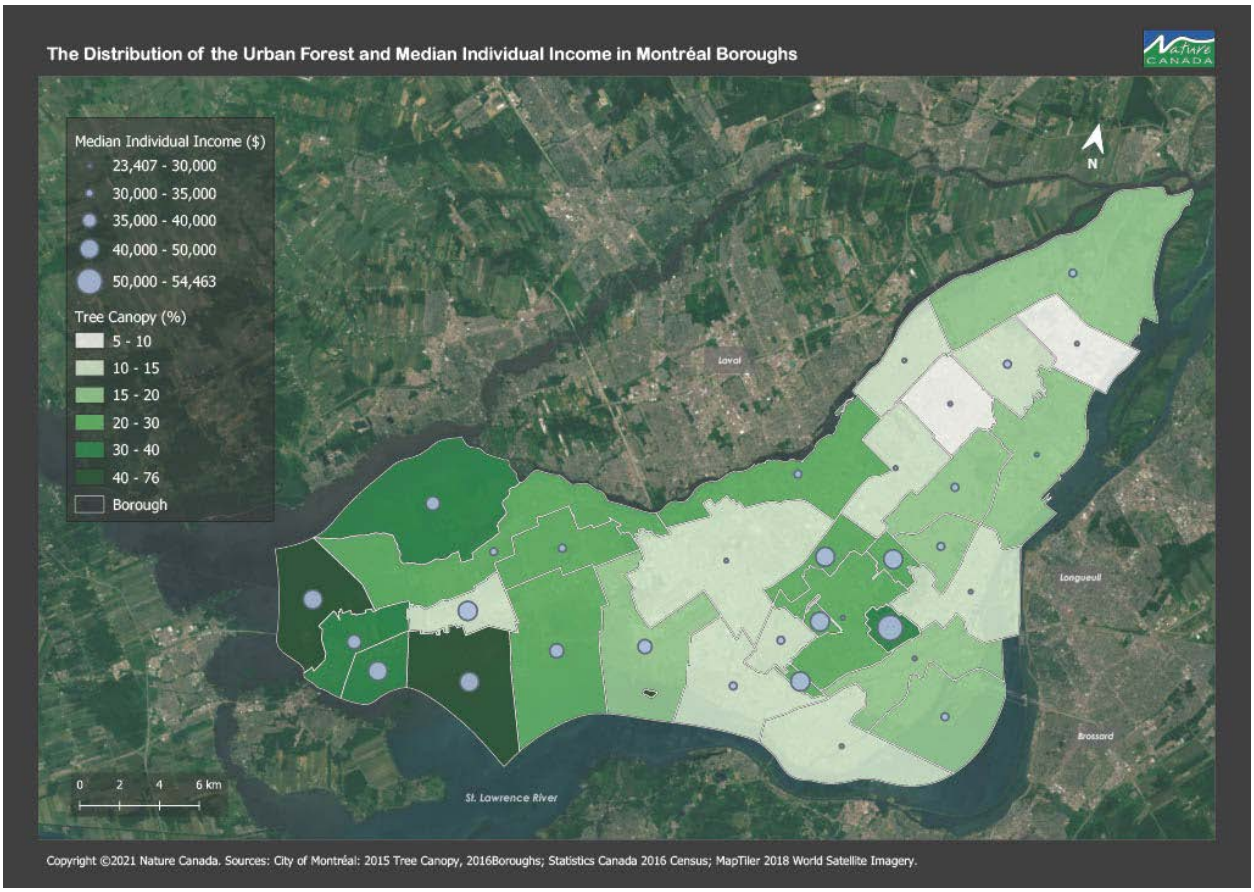
MONTREAL

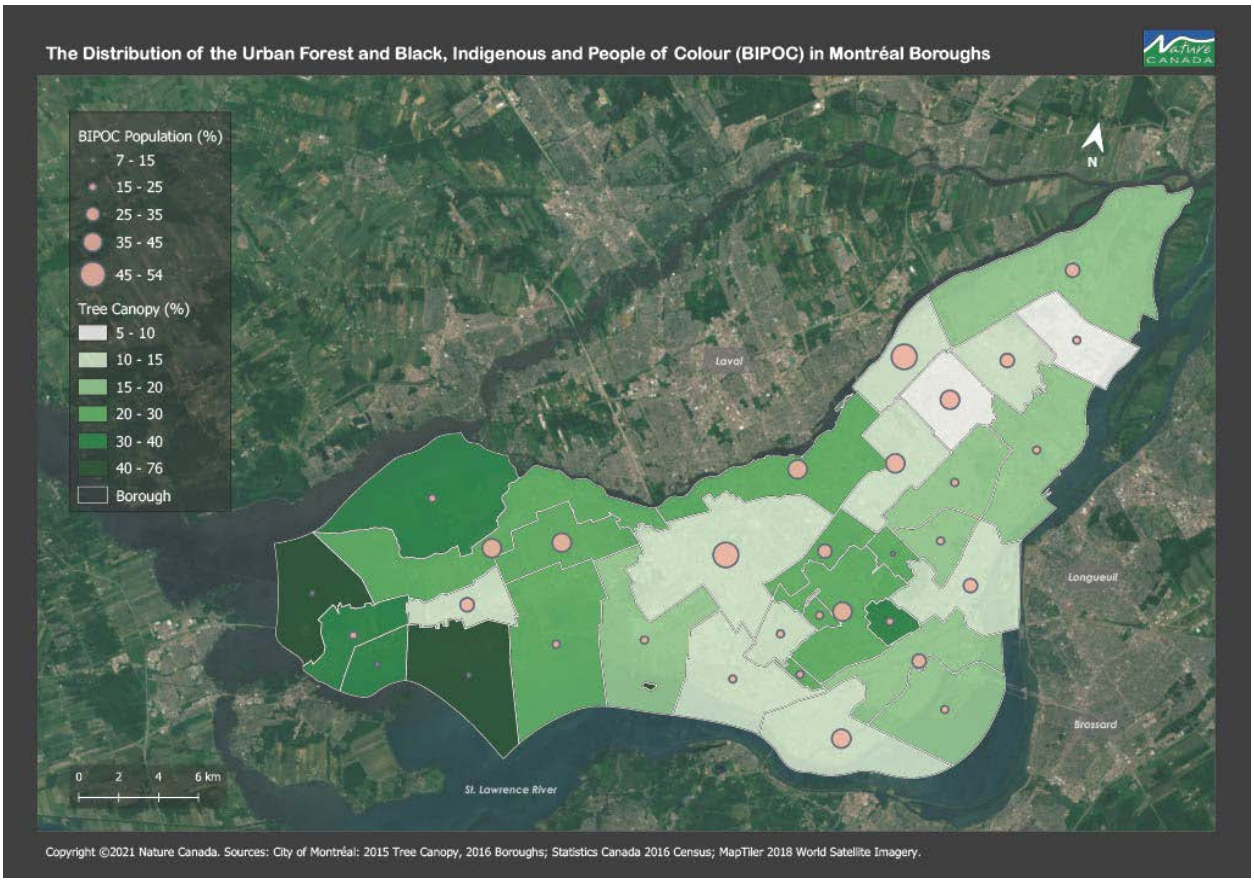
The Island of Montreal, traditional territory of the Kanien'kehà:ka Nation, is home to the country's second most populated city. Montreal is unique in its collaboration with non-profit organizations to coordinate planting on both public and private property. The city has an ambitious goal to increase tree canopy cover from 20% to 25% by 2025.[56]

The Office for Ecological Transition and Resilience and the Urban Planning and Mobility Department are collaborating to develop a map of territorial equity and indicators for Montreal. This work will contribute to existing maps on climatic hazards.[57] Additionally, a canopy index is being created every four years to map changes over time, with the latest index created in 2019. The canopy percentage is then calculated for each district, making it possible to identify underserved communities.[58]

Across the island there is a greater tree canopy in the city's west and central areas (map 6). It is notable that most of these boroughs, all of which enjoy a canopy cover above 20%, have a moderate-high median income level (map 7). On the other hand, a majority of low canopy boroughs outside of these high canopy regions—and predominantly in the city's east end—are of lower income. As for racial diversity, the BIPOC levels vary (i.e., low to high) in regions of low-moderate tree cover (map 8). However, in all boroughs of higher tree canopy presence, where canopy cover is greater than 30%, racial diversity levels are low. Therefore, it appears that in Montreal, areas of a high urban forest presence tend to be associated with a higher income and lower racial diversity. A recent study conducted in Montreal supports these findings, suggesting that spatial distribution of vegetation in Montreal disproportionately favours higher-income communities over lower income and visible minorities.[59]



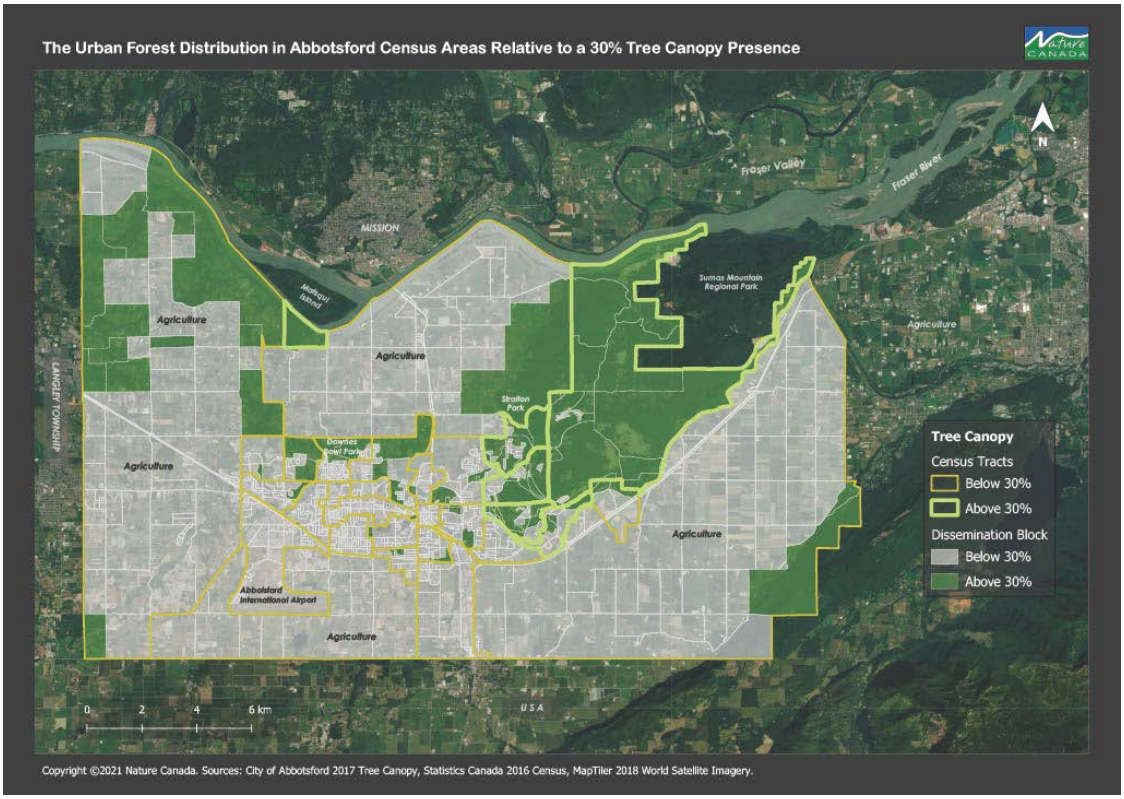

The Distribution of the Urban Forest and Median Individual Income in Montréal Boroughs
Median Individual Income ($)
23,407 - 30,000
30,000 - 35,000
35,000 - 40,000
40,000 - 50,000
50,000 - 54,463
Tree Canopy (%)
5 - 10
10 - 15
15 - 20
20 - 30
30 - 40
40 - 76
Borough
N
Laval
Longueuil
Brossard
St. Lawrence River
0 2 4 6 km
Copyright ©2021 Nature Canada. Sources: City of Montréal: 2015 Tree Canopy, 2016Boroughs; Statistics Canada 2016 Census; MapTiler 2018 World Satellite Imagery.

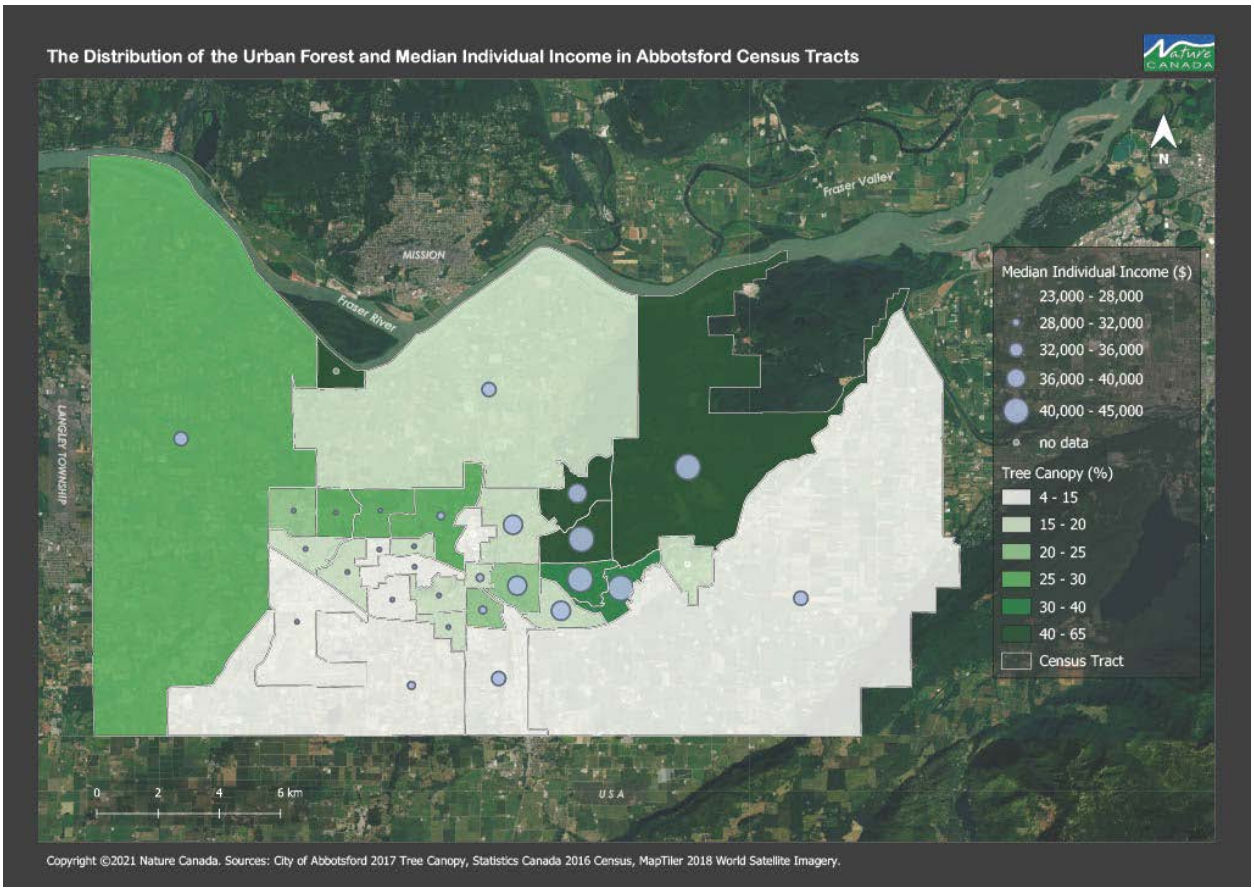

The Distribution of the Urban Forest and Black, Indigenous and People of Colour (BIPOC) in Montréal Boroughs
BIPOC Population (%)
7 - 15
15 - 25
25 - 35
35 - 45
45 - 54
Tree Canopy (%)
5 - 10
10 - 15
15 - 20
20 - 30
30 - 40
40 - 76
Borough
N
Laval
Longueuil
Brossard
St. Lawrence River
0 2 4 6 km
Copyright ©2021 Nature Canada. Sources: City of Montréal: 2015 Tree Canopy, 2016 Boroughs; Statistics Canada 2016 Census; MapTiler 2018 World Satellite Imagery.

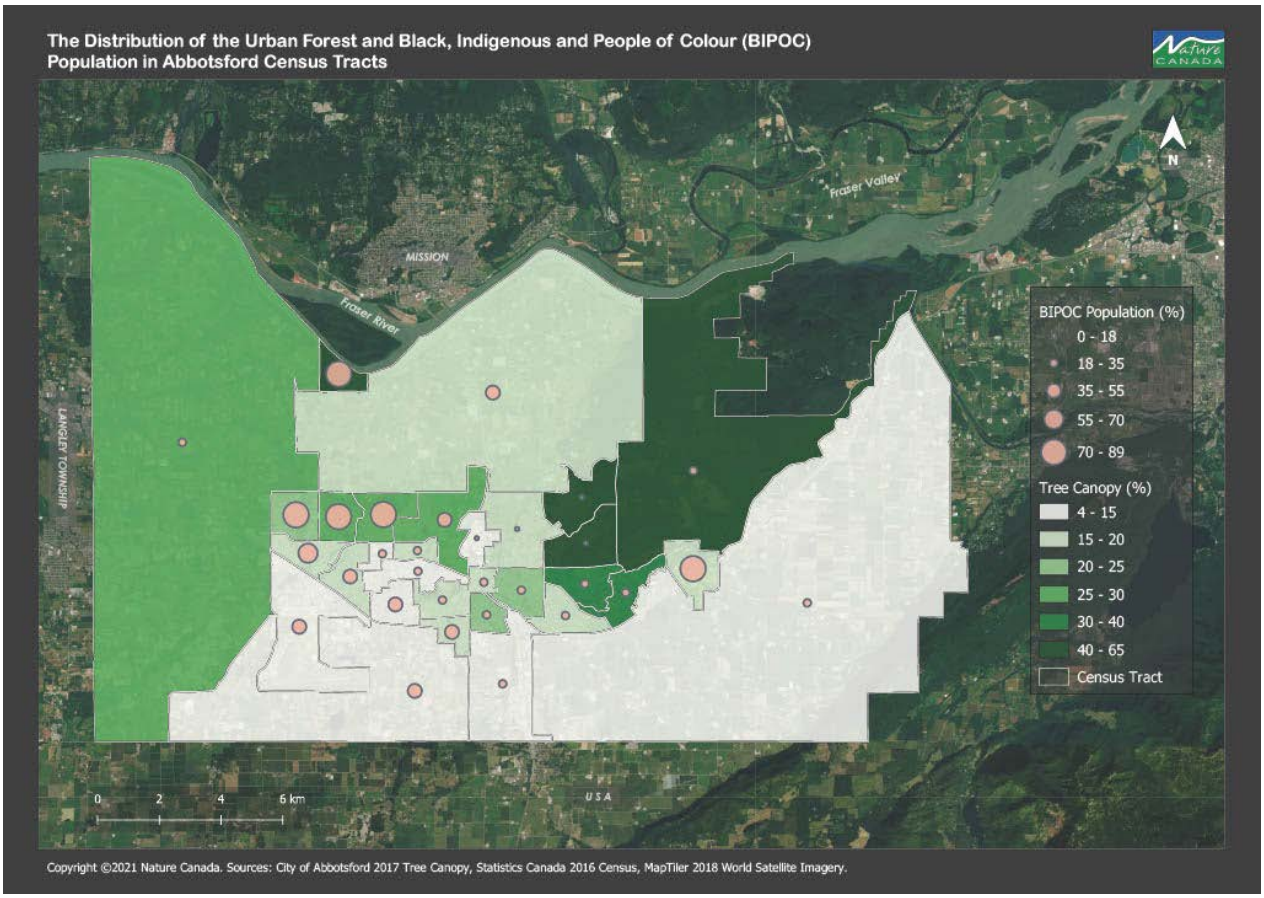
ABBOTSFORD

Located in the Fraser Valley east of Vancouver, Abbotsford is home to the Sumas First Nation and roughly 140,000 people, with nearly 34% identifying as BIPOC.[60] Comparatively, Abbotsford has a high canopy coverage at 40% excluding agricultural land in 2017, with 85% of it on private land. When agricultural lands are included the tree canopy cover sits at 22%. The city is currently determining a canopy target, however the proposed options are either a decrease in canopy cover or maintaining the existing 40%. The trend from 1994 – 2017 has been a 7% decrease in canopy cover (excluding agricultural lands) as a result of land development, forestry, mining, and agriculture.[61]

Despite a high canopy cover overall, the majority of Abbotsford's urban forest is concentrated in the central north-east areas of the city, with only six census tracts above 30% (map 9). These areas also contain the city's highest earners (map 10) and have a small BIPOC population (map 11). Outside of Abbotsford's agricultural areas, and in the more densely populated city center, most areas in the central and central-west region are of low income and a moderate-high BIPOC population. Furthermore, these areas also have low-moderate urban forest cover. In its proposed urban forest management plan, the City of Abbotsford recognizes the need to grow the urban forest equitably by planting in areas of low canopy cover and high population density.[62] It also categorizes past work along these lines as inadequate.



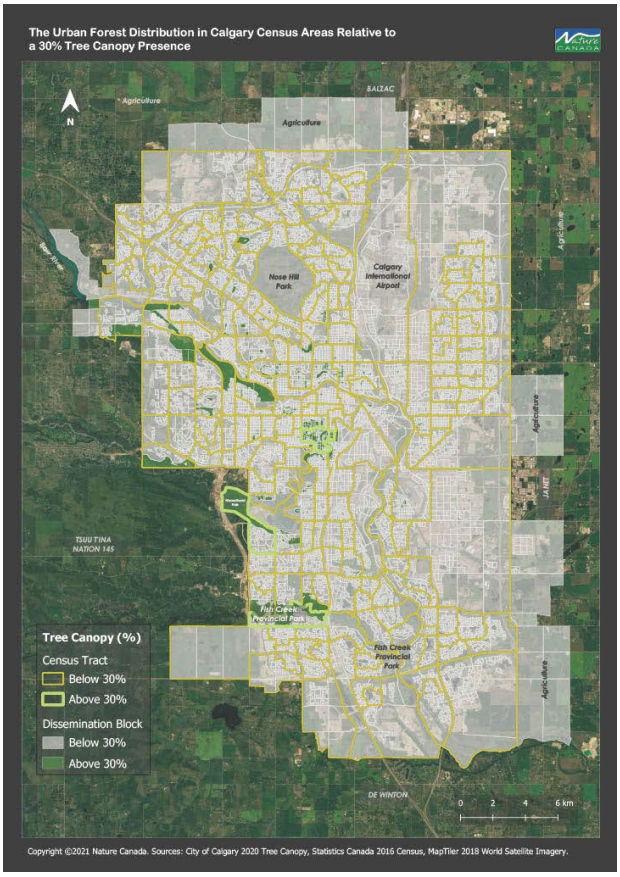

The Distribution of the Urban Forest and Median Individual Income in Abbotsford Census Tracts
Nature Canada
N
Fraser Valley
MISSION
Fraser River
LANGLEY TOWNSHIP
USA
0 2 4 6 km
Median Individual Income ($)
23,000 - 28,000
28,000 - 32,000
32,000 - 36,000
36,000 - 40,000
40,000 - 45,000
no data
Tree Canopy (%)
4 - 15
15 - 20
20 - 25
25 - 30
30 - 40
40 - 65
Census Tract
Copyright ©2021 Nature Canada. Sources: City of Abbotsford 2017 Tree Canopy, Statistics Canada 2016 Census, MapTiler 2018 World Satellite Imagery.

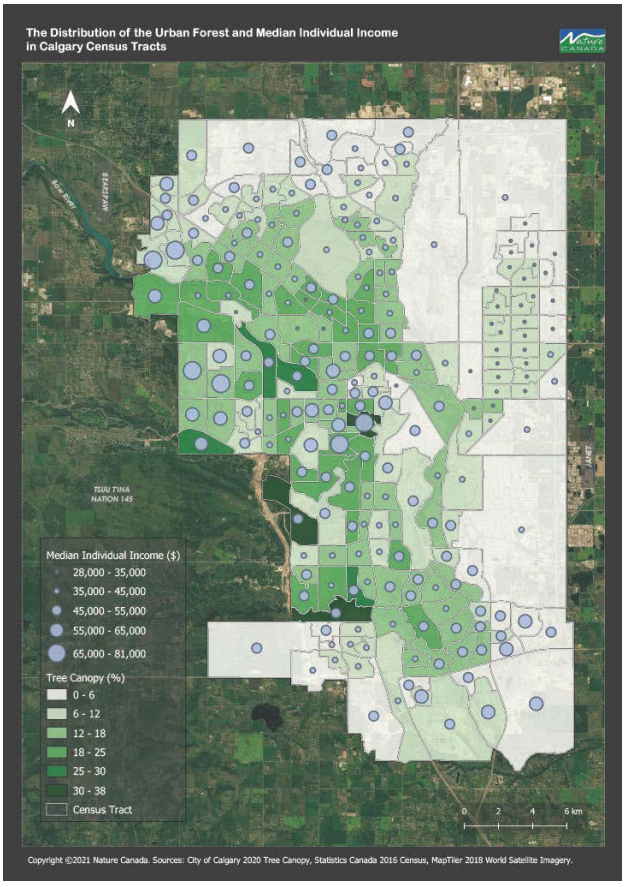

The Distribution of the Urban Forest and Black, Indigenous and People of Colour (BIPOC) Population in Abbotsford Census Tracts
Nature Canada
N
Fraser Valley
MISSION
Fraser River
LANGLEY TOWNSHIP
USA
0 2 4 6 km
BIPOC Population (%)
0 - 18
18 - 35
35 - 55
55 - 70
70 - 89
Tree Canopy (%)
4 - 15
15 - 20
20 - 25
25 - 30
30 - 40
40 - 65
Census Tract
Copyright ©2021 Nature Canada. Sources: City of Abbotsford 2017 Tree Canopy, Statistics Canada 2016 Census, MapTiler 2018 World Satellite Imagery.

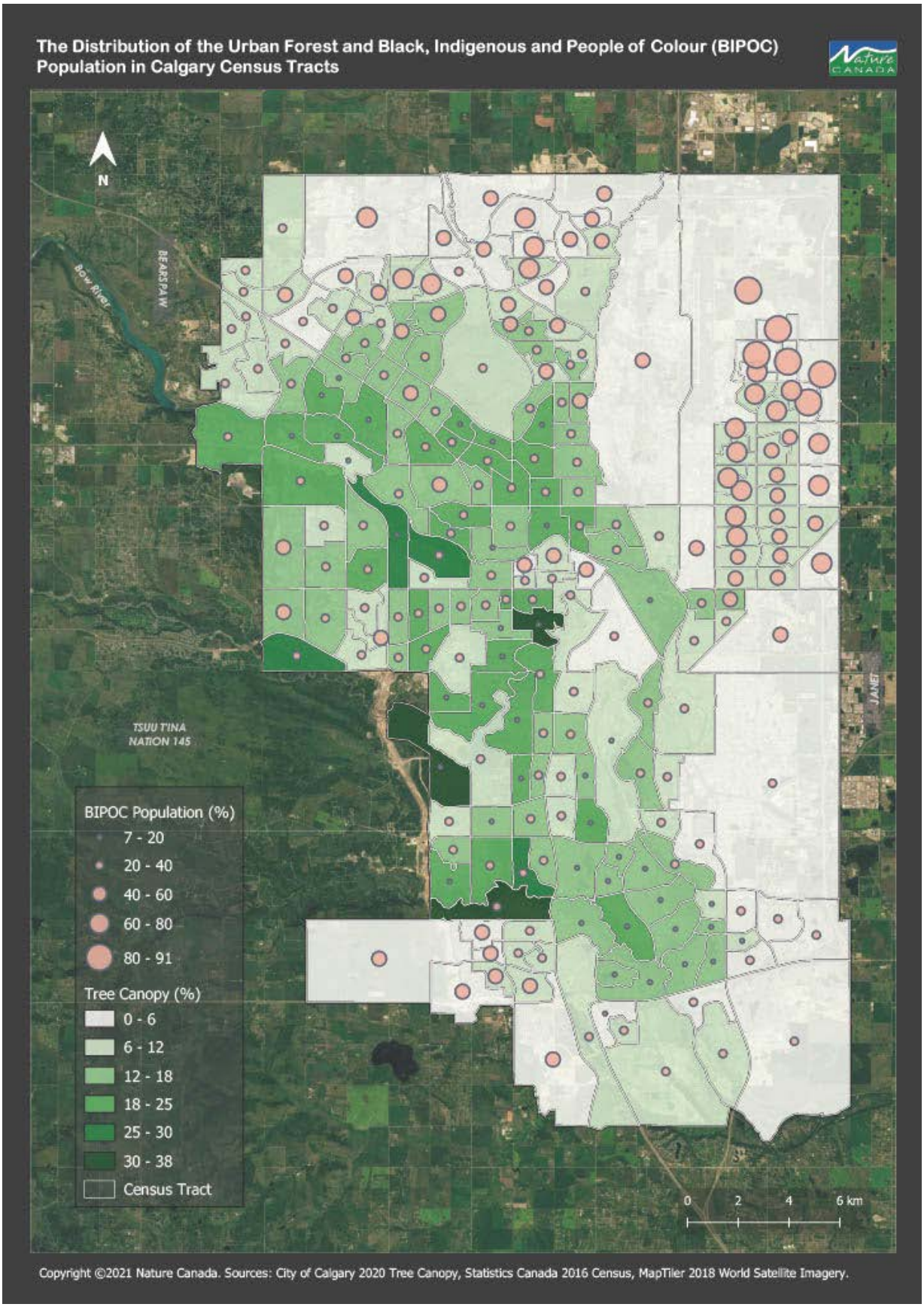
CALGARY

Calgary, the traditional territories of the Blackfoot Confederacy (Siksika, Kainai, Piikani), the Tsuut'ina, the Îyâxe Nakoda Nations, and the Métis Nation (Region 3), is uniquely positioned between a parkland natural region to the west and a grassland natural region to the east, with the latter being unsuitable for tree planting. Although climate change has impacted the region's hardiness zone resulting in a longer growing season, climate events have negatively affected the urban forest in recent years.[63] Calgary's tree canopy cover sits at just over 8%, one of the lowest in Canada, and the goal is to plant 7,500 trees per year in order to reach 16% by 2060.[64] The city is not on track to meet this goal, however, as it reports limited funding and a projected focus on maintaining the existing canopy.[65]

The tree canopy is above 30% in a few small pockets, mainly within the Bow River ravine and Fish Creek Provincial Park (map 12). It is notable that while income levels (map 13) are diverse throughout the city, there is a region of low-income census areas in the north-east end of Calgary. This region has a high BIPOC population (map 14) and low tree canopy covers of roughly 0-12%, as it is within the grassland region. However, in the western region of the city, where the tree canopy is more robust, BIPOC populations are comparatively lower than in the northern part of the city. Overall, the data confirms that census areas of higher racial diversity often have a relatively low urban forest coverage in Calgary.






The Distribution of the Urban Forest and Black, Indigenous and People of Colour (BIPOC) Population in Calgary Census Tracts
N
Bow River
BEARSPAW
TSUU T'INA NATION 145
JANET
BIPOC Population (%)
7 - 20
20 - 40
40 - 60
60 - 80
80 - 91
Tree Canopy (%)
0 - 6
6 - 12
12 - 18
18 - 25
25 - 30
30 - 38
Census Tract
0 2 4 6 km
Copyright ©2021 Nature Canada. Sources: City of Calgary 2020 Tree Canopy, Statistics Canada 2016 Census, MapTiler 2018 World Satellite Imagery.

Interview Findings: The Barriers Identified

As we have seen, the data shows a fairly pronounced problem across Canadian cities: tree canopy (and its attendant benefits) tend to be much lower in low-income and racialized neighbourhoods compared to white and affluent communities. Our interviews with experts—in urban forestry and those engaging with BIPOC communities—helped surface some of the issues and trends behind this data as well as perspectives on the barriers and solutions for increasing access.

Lack of Funding

Not surprisingly, almost every one of our interviewees identified funding as vital in addressing the historic and continued inequitable distribution of urban forests across cities. Funding shortfalls were mentioned in three distinct ways. First, there is no dedicated funding source for trees and the lack of funding is inhibiting the widespread implementation of urban forestry goals. Interviewees generally felt that only with reliable funding will cities be able to expand urban tree cover in marginalized and racialized neighborhoods. This point was raised by multiple interviewees who are directly engaged with operations and maintenance of municipal trees. This is consistent with previous reports from several municipalities showing the negative effects of decades of divestment and budget cuts.[66]

> *"At the moment our budget is just for replacement planting. We have lots of empty vacant planting sites, but those locations just sit on the list because we don't have the resources or funding to plant trees."*
>
> **- Municipal staff interviewee, Winnipeg**

It's worth noting that because many urban areas lack available spaces for expanding tree canopy due to the built infrastructure (e.g. utilities, concrete, roadways, etc.), the funding necessary to redesign roadways for accommodating trees can be cost-prohibitive.

> *"It's not just surface space but also underground space [that's needed for trees]. There are a lot of utilities, so there are a lot of setback requirements for underground and on the ground infrastructure. There is not much space left for trees."*
>
> **- Academic Expert Interviewee**

Second, the onus is largely upon the cities to make urban tree planting happen and obtaining funds for tree planting projects can be challenging due to restrictions on municipalities. Under the Public Sector Accounting Board (PSAB), trees are considered operating expenses (as opposed to capital assets).[67] Such an approach puts pressure on the private sector and philanthropy to step up to address the funding shortfall, which can be unpredictable and lead to delays in establishing trees and a regime for their care.

A third element of the funding theme relates to the lack of funds for the maintenance of planted trees. Participants in the study concurred that current funding programs are often too constrained to encompass the full range of maintenance and care facing urban forests.

For example, the long maintenance cycle for tree care by the city often means adjacent property owners need to take an active role in watering, pruning, and other maintenance. Yet these additional costs can further exacerbate existing inequities, specifically for low-income communities who may not be property owners and are already financially challenged. Areas with low-income and racialized communities are also those areas needing the most attention. In the absence of funds for tree maintenance, these areas will see fewer trees and likely higher levels of tree mortality. The lack of a long-term budget for tree maintenance presents a challenge for municipalities.

In short, planting trees requires significant investments as upfront cost as well as ongoing maintenance. Trees are often not recognized as infrastructure in public accounting systems, creating challenges in obtaining appropriate financing. In order to reverse the trend of inequitable access to urban trees and forests, there is a need to intentionally invest in expanding urban tree canopy cover and creating accounting frameworks that recognize trees and other natural capital assets. This makes the launch of the federal two billion tree program a particularly important opportunity for cities.

Absence of an integrated planning process that values urban trees

Preserving existing trees are often left out of the planning process –from the conceptual, and design, through to implementation and enforcement stages of urban development. Many municipal officials alluded to the secondary role of trees during the development of infrastructure. Urban development and the equitable expansion of urban forests continue to be seen as competing objectives rather than seeing urban forest growth as a cost-effective, resilient and sustainable approach to urban development. Once infrastructure is built, the lack of consideration for urban forests in the earlier design phase poses a barrier to forward tree-planting initiatives. Key interviewees mentioned a lack of open space being left to plant trees as well as a lack of space at the sub-surface level for tree roots to develop due to telephone lines and utilities.

The lack of an integrated planning process that includes urban forestry has led to competing priorities between municipalities and urban developers. Conflicting interests between utility providers and urban planners was a commonly mentioned challenge. Street trees are often considered a public hazard, as sidewalks are often heaved by tree roots. This leads to the removal of the tree for the purpose of preserving sidewalks. The lack of sub-surface space presents a safety concern for utility lines. There is often a lot of pushback on tree planting from utility providers and the urban planning community, who are aware of these safety concerns.

Conflicts also exist with the real estate development community. Developers generally view land as a revenue generator and tend to ignore the ecological benefits of trees. Two significant trends were noted by the interviewees. First, Canada's recent urban sprawl has considerably increased the value of properties around the city. The revenue generated from developing land far exceeds that generated from planting trees. Secondly, due to the high demand for affordable housing, tree planting initiatives are increasingly not being prioritized for spending.

> *"One big challenge for next year is going to be the value of properties in cities because it's going up so fast. So it will be difficult for companies to say 'I'm not going to construct on this land, I'm going to have a park', especially because the difference in income will be huge."*
>
> **-Practicing Urban Forester, NGO Interviewee**

Programs aimed at increasing urban tree cover equity across municipalities need to be created in tandem with associated land use policies.

Lack of incentives to support tree planting on private land

Several interviewees mentioned that across certain Canadian municipalities, the greatest amount of potential space for canopy growth exists on private land. However, the engagement of private landowners in tree planting initiatives is still very limited.

Interviewees often mentioned that the lack of engagement of private landowners is leading to a decline in tree canopy cover on private properties. For example, from 2008 - 2018, urban trees on private property in Toronto decreased from 60% to 55%.[68]

At the same time, due to the nature of development across North American cities, trees are perceived as an amenity that contributes to an increase in the value of land. Increasing property values from tree-planting is associated with green gentrification, causing the involuntary displacement of lower income residents to lower cost neighbourhoods. This creates a vicious cycle, whereby the planting of trees contributes to displacement of lower income and racialized communities from green spaces.

Interviewees recommended that privately owned land in the vicinity of high priority urban areas (areas with low access to trees for racialized and marginalized communities) be targeted for tree planting whenever possible, as well as parks and public green spaces. Urban managers and planners can also use this approach to implement programs to support the private sector to plant trees in places where they are needed but there is limited opportunity on public land (e.g., due to a lack of space). Municipalities can and should encourage voluntary tree planting on private land, for instance, by using direct incentives or partnering with local non-profit organizations that connect with the private sector to leverage resources.

Meaningful Public Engagement

Lack of adequate public engagement was identified as one of the main causes of inequitable access to urban trees. This lack of engagement prevents lower

income and racialized communities from being part of the decision-making about which trees and where trees are planted.

Proactive meaningful community engagement is essential to ensuring local buy-in and agency in the establishment of urban forests and parks. Urban Indigenous communities need to be separately engaged to identify and understand their specific needs given the history of urban planning processes and the establishment of parks in Canada. Meaningful community engagement entails:

- starting early in the project and creating multiple, iterative opportunities for engagement and dialogue;
- securing free, prior and informed consent when applicable;
- validating Indigenous knowledge regarding what makes for suitable urban green space in terms of species and programming;
- actively overcoming barriers like cost, lack of official documentation, and asymmetric information;
- and ensuring that all stakeholders' opinions are heard and appropriately incorporated into the plans.

Proactive engagement with lower income and marginalized communities ensures their specific needs and cultural preferences are incorporated into tree planting and urban reforestation initiatives. This could range for example, from preferences for feng shui-inspired landscapes, to interest for specific fruit or other food bearing trees linked to traditional cuisines.

"Newcomers understand the value of trees from a spiritual, religious, functional, environmental value. But moving to Canada, the types of trees and their uses are different. So newcomers don't relate to trees as much anymore and can start to take them for granted."

- Academic Expert Interviewee

In addition, interviewees underscored the lack of meaningful partnerships and relationship-building between municipalities and urban Indigenous communities. Although consultations with Indigenous communities are often conducted, Indigenous preferences are rarely taken into consideration in the design and implementation of tree-planting initiatives.

The notion of "the right trees in the right places" came up many times during several interviews. There has been insufficient species variety in the past, and current approaches must emphasize diversity and urban conditions. Some referenced the species of tree, including the importance of native versus non-native species, evergreen versus deciduous, flowering and non-flowering, etc. Others spoke at length about the importance of planting trees that are able to withstand the coming climate crisis.

"There is a lack of native plants and Indigenous gardens. In the city we plant so many non-native trees. There are seasonal plants that look stunning but aren't native. Why can't we have native plants? Why can't some of that money go towards seeing which native plants can thrive in the city? The city is the main spender, and city money perpetuates ecological colonialism"

- Academic Expert Interviewee

Designing an inclusive tree-planting program that integrates community perspectives into the design and implementation is imperative. For example, ensuring a high proportion of native species that are important for Indigenous cultures could ensure that tree plantings are coupled with other benefits for urban Indigenous residents.

In addition, development of more consistent and engagement oriented communications with communities on what are "the right trees in the right places" may help ensure better outcomes for urban forests and urban dwellers.

Approaches to the Problem

Given these barriers to achieving tree equity, how are cities addressing the problem?

The focus for expanding trees cover in most cities is largely quantitative. The majority of Canadian municipalities have published urban tree cover baselines and future targets (see **Table 1**).

Table 1: Current canopy baselines and future targets across selected Canadian municipalities

City	Current Canopy Cover	Canopy Target
Toronto	28.4-31%	40% by 2050
Vancouver	23%	30% by 2050
Montreal	23%	25% by 2025
Brampton	18%	1 million by 2040
Abbotsford	40%	Maintain 40% until 2045
Richmond	12%	30% by 2045 (public land only)
London	24%	34% by 2065
Calgary	8.25%	16% by 2060

Such city-wide targets, while laudable, do not address the issue of equity of access for different communities and neighborhoods in the city.[69] A target per neighbourhood would offer a much better approach - as recommended in, the 3-30-300 rule described earlier in section 1(See page 10).

While a number of Canadian municipalities have made explicit commitments to ensure equitable access to urban forests, concrete actions vary. Some cities have developed action plans that prioritize tree planting programs in BIPOC communities, while others are still at the conceptual stages of such plans. The city of Ottawa, for example, is currently re-thinking their approach to increase equitable access to urban trees for BIPOC communities.

In Toronto, the city's 2018 Tree Canopy Study highlighted the importance of addressing urban forest changes at a neighbourhood level.[70] This has led to Toronto calculating 'Tree Equity Scores' as a way of assessing equity in tree canopy cover across neighborhoods. This system, developed by American Forests, produces an equity score indicator per neighbourhood on a scale ranging from 0 to 100. Currently, when Toronto's ravine systems are excluded, seventeen neighbourhoods produced a low tree equity score of between 48 to 79.[71] This, along with Toronto's ambitious 40% tree canopy cover target, puts the city in a leadership position in Canada.

The City of Montreal is mapping areas where there is a high concentration of vulnerable communities (children, aged people, low-income and racialized communities) that are at risk of being exposed to the heat island effect, linked to canopy deficits across the city.[72] The intent is to identify priority planting locations to increase access to urban forests for vulnerable communities. Other municipalities such as the city of Vancouver are also adopting a similar approach.[73]

Interestingly, no municipality in our study mentioned that they explicitly plant trees to promote urban biodiversity. Rather, cities mentioned the need to plant appropriate native species that are capable of surviving future climate changes. Historically, Frank Santamour's 10-20-30[74] composition rule has had a positive influence on urban forest structure and diversity. The rule states that no tree species should make up more than 10% of a municipality's urban forest, no genus should have a share larger than 20%, and no single family should make up more than 30% of the urban forest. Several Canadian municipalities such as Richmond, Burlington and Mississauga have adopted the rule.

As governments across Canada take on the commitment to halt and reverse nature loss by 2030, it will be important to see more specific attention to growing the urban canopy in a way that supports people and nature.

Tree Equity Score

The Tree Equity Score system developed by American Forests[75] provides an indicator of whether a neighborhood has tree equity, defined as the right number of trees so all people experience the health, economic and other benefits that trees provide.

Neighborhood scores are calculated on factors such as existing tree cover, population density, income, employment, race, ethnicity, age and the urban heat island effect (as measured by surface temperatures).

A 0-to-100-point system makes it easy to understand how tree equity varies across neighbourhoods in a municipality. While there is no threshold to designate trees in a neighbourhood as equitably distributed, the goal is to encourage municipalities to ensure the tree equity score is very high in each neighbourhood. Municipalities such as Los Angeles, Houston, Phoenix, and Washington have adopted the tree equity score as an approach to address tree inequity.

In Canada, Toronto is the only municipality to have officially adopted the Tree Equity Score.[76]

5 Recommendations

Recommendations for

Increasing Equitable Access to Urban Tree Canopy Cover

Racialized and marginalized residents continue to have inequitable access to urban forests and are denied the attendant benefits. At the same time, these residents may have a conflicted relationship with urban nature because urban forests have not always been integrating, welcoming, and safe spaces for them, especially given colonial discourses and practices that define nature—and who enjoys it. As a result, nature groups need to urge municipal, provincial and federal governments to build green neighborhoods and create public green spaces that provide benefits and safe havens for Indigenous, racialized and marginalized residents.

Nature organizing work for increasing access to urban trees, connecting ecological corridors, or establishing urban parks can consist of creating welcoming, protective, reparative, and nurturing environments and neighborhoods while rebuilding underinvested urban communities. This mobilization needs to be rooted in memories, healing and resilience.

We offer three sets of recommendations—the first for municipalities, the second for provincial and federal governments, and the third for nature organizations and organizers across the country. Our recommendations take into account the three key dimensions of equity outlined in this report (proximity to urban forests, forest quality and governance).

Recommendations for Municipalities

1. Decolonize the urban forest

At the very foundation of municipal urban forestry plans are colonial constructs of control and management. This approach needs to shift to building a relationship with the urban forest that includes thinking not only of what we get from the trees, but what we give back. By working with the original caretakers of the land, i.e. Indigenous communities, cities can acknowledge, respect, and implement Indigenous wisdom regarding relationships with nature.

2. Define and prioritize equity

Urban forest management plans outline a city's strategy for both maintaining and improving its urban forest and setting out the priorities for decades at a time. These plans need to include equitable access to the urban forest as a strategic goal, where equity is conceptualized in terms of proximity, quality, and governance. Proximity describes the distance to trees in neighbourhoods. The 3-30-300 rule calls for every resident to be able to see at least three decent-sized trees from their home, and live in neighbourhoods with at least 30% tree canopy cover. As for quality, urban forests need to have locally appropriate tree species that support wildlife and cultural needs. This means thinking about how to increase urban tree canopy cover in order to promote species that support Indigenous cultures, as well as relate to the cultural needs of racialized populations, how to connect patches of urban trees and forests to promote urban biodiversity, as well as ensure adequate density per urban resident. Lastly, equitable governance means giving voice and power to those in underserved neighbourhoods. Early engagement and consultation are necessary for successful tree-planting programs across our cities.

3. Build urban forest strategies into an integrated planning process

An integrated planning process for urban trees should account for issues of equity and well being, biodiversity, and climate resilience in the forest canopy as a core part of city planning. Programs aimed at increasing urban tree cover equity across municipalities need to be created in tandem with associated municipal land use policies. Municipalities need to also ensure that racialized and marginalized communities live within 300m (a 5-10-minute walk) of "good quality" urban parks —or else provide adequate transport infrastructure for racialized and marginalized communities.

4. Develop appropriate tree inventories across the city and set neighbourhood targets

Addressing inequitable access to urban tree canopy requires the development of a credible tree inventory across the city at the neighbourhood level. An inventory is critical to integrated planning flagged above and improving equitable access to urban trees starts with mapping the problem. An urban tree canopy assessment provides a clear picture of the location and extent of inequitable

tree canopy cover across the city. A tree inventory provides information such as tree health, tree species, tree size, tree location and age-class distribution. Tree inventories need to be developed at the neighborhood scale. The inventories should then be used to set tree canopy targets by neighbourhood. It is imperative for municipalities to develop detailed tree inventories for the establishment and better management of urban forests.

5. Promote urban biodiversity

Municipalities should implement tree planting programs with the objective of protecting, restoring and connecting fragmented landscapes and halting and reversing biodiversity loss. The 10-20-30 composition rule has been used for several decades to ensure a positive influence on urban forest structure and diversity, as noted earlier.

6. Build meaningful relationships with racialized and marginalized communities and engage them fully in forest planning

Communities should be engaged early in the planning process, and ongoing relationships nurtured. Tenant and neighbourhood associations are excellent ways of reaching large groups of people. Stewardship programs in the priority neighbourhoods are another good method for building community ownership. Urban Indigenous communities need to be separately engaged to identify and understand their priorities, given the history of urban planning and establishing parks in Canada. This approach helps build momentum for community interest and commitment and allows for diverse perspectives to be considered. Municipalities need to integrate the uses, preferences, knowledge and needs of lower-income and marginalized communities and be willing to address legacies of trauma, violence and displacement both at the community and individual level. While limited urban forestry budgets constraints outreach efforts, building relationships with the people impacted by the program can lead to better program success.

Meaningful community engagement is essential to identify locally appropriate tree species that respond to community needs and are capable of surviving in a changing climate.

7. Incentivize tree planting on private land

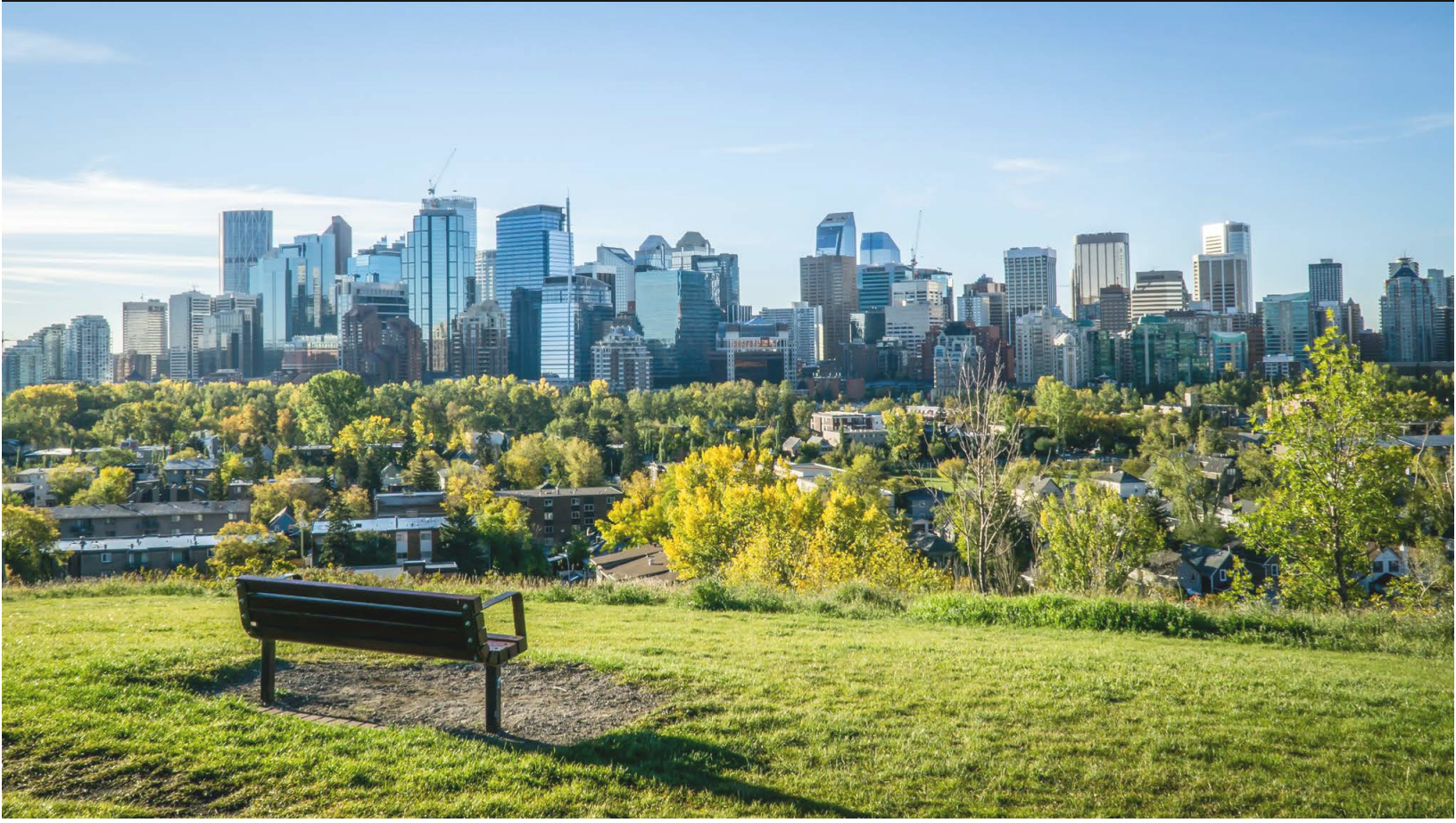
There is a large potential for tree planting on private land in the underserved communities. For example, in Toronto, only 45% of the urban tree canopy cover is found on public land. Cities therefore need to find ways of incentivizing private landowners and landlords to plant and maintain trees. The City of Montreal and SOVERDI, a local greening NGO, created the Alliance Forêt Urbaine, a coalition of NGOs dedicated to increasing Montreal's canopy cover on private land. This partnership allows for more focused outreach, increasing community and corporate participation. The City of Toronto offers subsidized grants and tree giveaways to landowners. Without proper incentives and frameworks, opportunities for increasing equitable access to urban trees could be missed.

Recommendations for the Federal Government

1. The 2 Billion Tree Program (2BT) should ensure trees planted under this program contribute to permanent new forest canopy including in Canadian municipalities. The program should identify priority areas to achieve positive biodiversity, climate and human well-being outcomes. Priorities should include tree planting in private and public urban, peri-urban and agricultural landscapes in populous southern Canada where ecosystems are fragmented, under-protected, and facing significant biodiversity and climate pressures. For a full list of recommendations for the 2BT see here.

2. The federal government needs to support the development of culturally and genetically appropriate seedlings that will survive the predicted future climate to meet planting demands. Tree species preferences should reflect the experiences, needs and values of urban park stakeholders. Species diversity and planting the right trees in the right places are important in achieving increased urban tree canopy cover, as these considerations enable the development of resilient urban forests. With the commitment to plant two billion trees, nurseries will be facing unprecedented demand, and governments could face challenges in finding the right native species. Achieving such an ambitious target requires sustained funding to build capacity for seed collection, nursery propagation and seed sorting and storage .

3. Federal funding programs that support natural infrastructure should enhance equitable access to the urban forest while strengthening natural infrastructure. Poor tree canopy cover in marginalized and racialized communities tends to increase the vulnerability of these communities to extreme weather events such as floods. The Natural Infrastructure Fund can improve critical infrastructure services while increasing access to urban trees and forests for communities with



lower access. Natural infrastructure helps strengthen communities' resilience by reducing urban heat stress, limiting damage from increased storms and supporting stormwater management.

4. Increase funding to municipalities to expand the permanent urban forest canopy, including through, but not limited to, the Natural Infrastructure Fund. We recommend the federal government enhance the funding available to municipalities for protection, maintenance and replacement of existing trees as well as for the equitable expansion of the urban tree canopy as a long term, renewable investment in the well being of communities, biodiversity, and climate resilience

5. Ensure a coordinated, whole-of-government approach for federal programs (2 Billion Trees, Parks Canada's urban parks network and the Natural iInfrastructure Fund) to ensure that they are implemented in ways that halt and reverse nature loss across Canada while increasing access to urban trees for racialized and marginalized communities. Parks Canada, NRCan and Infrastructure Canada should work together to ensure that the 2 Billion Trees program can be leveraged to support the restoration of urban parks or urban/peri-urban corridors. This includes supporting priority areas that will expand access by marginalized and racialized communities to quality urban forests and parks.

6 Transforming Research into Action

"Diversity is not just a strength. Anti-racism is not a burden. It's the only way we can address the root causes of the climate crisis. Anti-racism is how we win."

Janelle Lapointe
Afro-Indigenous climate justice and
Indigenous rights activist from Stellat'en First Nation

Suggestions for Organizations

Below are suggestions for local groups and organizers who want to ensure equitable access to urban forests in their communities. Nature Canada is very keen to hear what actions people are taking in their community. For individuals inspired to get involved, we recommend searching out a local group to join—a shared vision always lightens the load. Groups are invited to get in touch with Nature Canada for support and resources, such as the tree equity organizing toolkit (See contact box below).

Spread the word

Sharing the message is important for engaging your supporters and building knowledge around the issue of tree equity. An engaged constituency is crucial for mobilizing: the more people are aware of your campaign, the easier it will be to apply pressure on decision makers. To engage your community you could consider these actions:

- Share this report on your social channels, in your networks and with your supporters via your website or newsletter.
- Discuss this report with your group at your next meeting.
- Write an op-ed for your local paper.
- Organize an event in your community to discuss the findings.
- Invite Nature Canada to speak at your event or meeting.

Connect

Connecting with other groups in your community who already care about these issues is an important tool for building collective power to create change. It is also important to speak with groups who aren't talking about equity and urban forests to bring new people into the conversation. In order to build a strong network of advocates you could consider the following:

- Identify the social and climate justice groups, tenant and community associations, and tree groups in your city. Look for these groups on social media, check out local papers for events and offer them support while building relationships.
- Brainstorm about other organizations you could contact to build collective power, e.g. faith-based groups.
- Ask to meet with other groups to discuss working together. Remember that relationships are two-way streets. Many of the groups you'll be engaging have other urgent priorities and missions. Finding common ground and mutually beneficial ways to work

together. Do your research and think long-term—these issues can take years to address, so your partnerships need to be authentic and strong.

Advocate for Change

Local decision-makers have many priorities to juggle, but we know how trees benefit nearly every realm of our lives. It is our job to make sure they know that the urban forest is a priority. In order to advocate for equitable tree policies, you need to be clear on the realities of your current tree canopy. From an informed place, you can begin to advocate for change based on your city's needs.

- Get to know your city's Urban Forest Management Plan. Does it include any of the recommendations listed in this report? What is the current status of the tree canopy in your city?
- Get to know the federal 2 Billion Tree program as it can support your city's tree planting efforts.
- Meet with your councillor to talk about tree equity and why it's so important for their constituents.
- Research other councillors to see who has advocated for similar issues—it's always good to have aligned champions for your campaign.
- Ask a champion councillor to pass a motion that requests the city to leverage the federal 2 Billion Tree funding program to plant trees equitably.
- Start a petition to show your council that this is an important issue for the whole community.
- Take pictures of the tree-lush and tree-deficit neighbourhoods to send to your councillor. Post them on social media and tag relevant decision-makers.
- Start a letter writing campaign to have community members bring the issue forward to their own councillors.
- Sign up to speak at budget, infrastructure, and environment meetings on the importance of trees in all areas of our lives.
- Most important, offer your knowledge and support for any policy changes required. Assist in the drafting of relevant motions or planning documents to lighten the load for your councillor while making it a political win for them.

Nature Canada has a strong network of over 1000 nature based groups across the country, all working to protect their nearby nature. We are here to support you in these efforts. For more information, please contact **engage@naturecanada.ca** to obtain resources for your campaign and to tap into the shared community of the Nature Network.

7 Conclusion

Bringing the Treescape to All

At the heart of this report is the imperative to make a common good truly common. We have taken an in-depth look at inequitable access to urban forests and learned that equity needs to be defined in the most comprehensive way possible, incorporating proximity, quality and governance of urban forests. We have explored the particular barriers to inequity—lack of funding, absence of integrated planning, poor incentives for planting on private land, and weak public engagement. And we have learned that achieving equity requires recentering the priorities that will help undo centuries of colonial and highly inequitable construction of urban landscapes.

While municipalities have a lot to accomplish in ensuring green equity, we have also noted a convergence of circumstances that favours real progress. The Government of Canada has launched several programs that touch directly on urban forests, including the 2 Billion Tree Initiative, the urban parks network and the Natural Infrastructure Fund. Many Canadian municipalities are implementing tree planting initiatives to improve the quality of life for urban residents and as part of a broader climate change adaptation plan. And neighbourhood and municipal groups are springing up in many communities to take an interest in protecting and expanding their urban forest canopy.

Now is a critical time to help grow our urban tree canopies in ways that help nature, people and the climate. By bringing the treescape to all, we are sharing the wealth—and health—of livable cities. Through active engagement with community groups and development of political will, municipalities can transform the current distributional inequities of urban forests and address the related challenges that these inequities create.

We invite comments on this report from readers, and we salute all those advocates who are working hard to make access to a healthy forest canopy a reality and right for all.

You can reach us at **info@naturecanada.ca**

Appendix

Appendix 1 : Research Methods

Interviews

Interviews with municipal staff and urban foresters focused on how their municipalities define equity, the status quo of urban tree distribution across their municipalities, what strategies their municipalities were adopting to increase equitable access to urban forests for BIPOC communities and the challenges faced in increasing urban tree canopy cover in BIPOC communities. Interviews with practitioners focused on understanding holistic ways in defining inequitable access to urban trees for BIPOC communities and recommended approaches that municipalities should consider as they strive to increase urban tree canopy in an equitable way.

All interviews were audio recorded and transcribed for analysis based on the preference of our interviewees.

Spatial analysis

Municipal tree canopy maps were created for this study primarily using the most recent tree canopy data available for each mapped city, and socioeconomic metrics collected from Canada's 2016 national census – related to income and race. The maps were produced in a QGIS Desktop (v.3.20.3) open software environment. National and municipal data sources used are listed in Tables 2 and 3 below.

Socioeconomic Indicators

Socioeconomic indicators of interest to this study focus on income and race. In this study, race is investigated as BIPOC (Black, Indigenous, and People of Colour) presence (Table 2) – where BIPOC population presence is calculated by the sum of visible minority and indigenous populations, expressed as a percentage of the total sample population.

The Urban Forest

Tree canopies represent the spatial extent of tree foliage coverage visible from a 'top-down' aerial perspective. This includes the area covered by branches and their leaves, as captured within the growing season. Tree canopy data is commonly derived from satellite imagery and 3D (LiDAR) aerial data using spatial analysis techniques. Pre-existing tree canopy data was obtained via municipal open data portals or from municipal staff in their respective environmental departments (Table 3).

Maps representing tree canopy and socioeconomic variables

To create bivariate maps that show socioeconomic and tree canopy data, municipal census areas were first parsed at the census tract level. These geographical boundaries were then used for aggregating tree canopy data as well as for hosting related income and race census data.

Maps representing tree canopy with a 30% threshold

Similarly, to create tree canopy threshold maps, municipal census areas were parsed at the dissemination block area level and used for aggregating tree canopy data. Tree canopy threshold maps in this study show urban tree canopy cover at/above and below 30% coverage. This 30% threshold is in reference to the 3-30-300 rule, which specifies a goal of having 30% tree canopy coverage in every neighbourhood.

Table 2. National Scale Data Sources

Data	Metadata	Source
Census Tracts (.shp) Year: 2016	- Cartographic boundary file of Census Tracts (no coastal waters, inland) - Purpose: spatial polygon component necessary to host census data for mapped visualization	2016 Census Boundary files (statcan.gc.ca)
Income & Ethnocultural Statistics Year: 2016	-Census 2016 Census Tract Dataset that contains one large* file (.csv) for all provinces & territories. - Purpose: extract (1) median income; and (2) visible minority and aboriginal populations to calculate BIPOC population - Attributes of interest: ["Median Total Income"], ["Aboriginal identity"] (Indigenous population), ["Total visible minority population"], & ["Total - visible minority for the population in private households - 25% sample data"] (total sample population) - *As the file is too large for Excel compatibility, a third party spreadsheet software is necessary to pre-select & extract data of interest. In this case, Beyond 20/20 was used to pre-parse data as a precursor IVT file format, then converted into a CSV file format for streamline Excel organization, calculations and QGIS compatibility	Census 2016 Dataset

Table 3. Municipal Scale Data Sources

City (reference divisions)	Canopy (all trees)	Income private individual	Race BIPOC population
Vancouver, Metro Vancouver, BC	All trees, Census Dissemination Blocks Canopy (EcoHealth Indicators)*, and Local Areas 2021, Metro Vancouver Open Data *derived from the 2014 Land Cover Classificatio	Census Tracts Local Area Census 2016 Profiles	Census Tracts Local Area Census 2016 Profiles
Burnaby, Metro Vancouver, BC	All trees, Census Dissemination Blocks Canopy (EcoHealth Indicators), Metro Vancouver Open Data, 2014	Census Tracts	Census Tracts
Abbotsford, BC	All trees, polygon Acquired from municipality	Census Tracts	Census Tracts
Toronto, ON	All trees, polygon Tree Cover (Class 1 land type) extracted from Forest & Land Cover Data, 2018, Toronto Open Data	Census Tracts	Census Tracts
Calgary, AB	All trees, polygon Tree Canopy coverage map, Calgary Open Data, 2020	Census Tracts	Census Tracts
Montreal, QB	All trees, polygon Canopee, Open Data Montreal, 2015	Census Tracts	Census Tracts

Endnotes

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