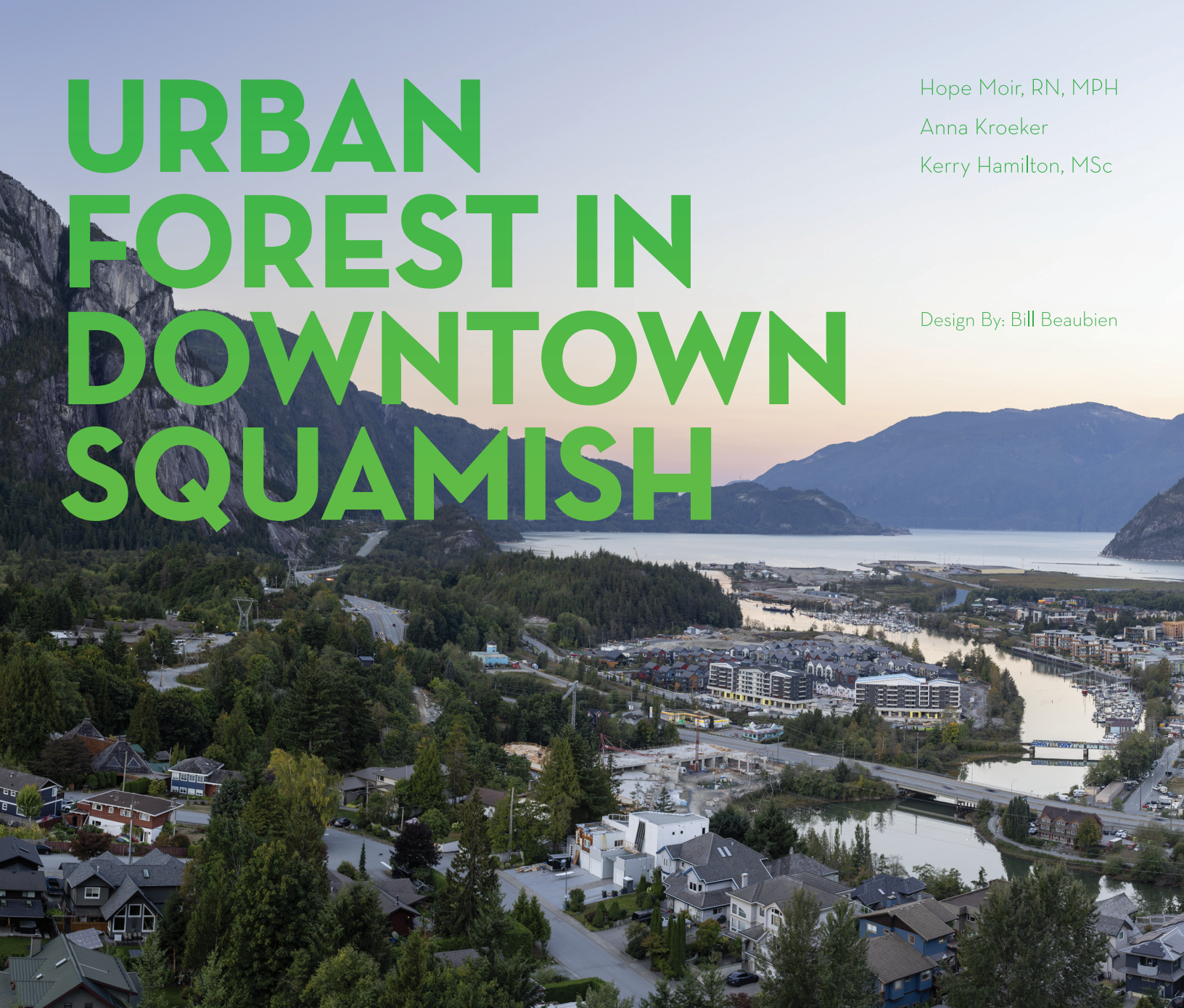




URBAN FOREST IN DOWNTOWN SQUAMISH

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Executive Summary

Urban forests hold deep importance in a community. Urban trees, and greenspaces, offer an array of benefits to the physical and mental health of those who live in the community, and the environment as a whole.¹

“Urban forestry is the sustained planning, planting, protection, maintenance, management and care of trees, forests, greenspace along with related resources in and around cities as well as communities for economic, environmental, social, and public health benefits for people. Urban forests are trees, forests, greenspace and related abiotic, biotic and cultural components in areas extending from the urban core to the urban-rural fringe.”²

It is vital that the importance of urban trees is understood to encourage preservation of existing trees and to add more trees where possible as a community continues to grow. While Squamish is surrounded by a diverse landscape of trees, urban trees still hold importance. Many studies show the extensive health benefits of urban trees, ranging from promotion of mental well-being and reduction of stress,³ to reducing incidences of obesity, asthma, and diabetes.⁴ Urban forests create safer communities with reported reduce crime rates and violence,^{5:6} and can increase road safety by slowing traffic.⁹ Urban forests provide beautification of urban centres,^{7:8} promoting social interaction and a sense of community, including stronger

ties to neighbours, a greater sense of safety, and more use of outdoor public spaces.^{10; 11}

District of Squamish urban tree canopy study findings have echoed this data, with 93% of survey takers, including residents of all areas of Squamish answering that they consider trees to be a primary contributor to their well-being. Findings of this survey, promoted through the District of Squamish Communications page, are used to analyse and assess the findings from our research in this paper.

Squamish is currently experiencing an extremely high rate of growth, and has been named one of Canada's ten fastest growing communities, with a 22% increase in population from 2016 to 2021.¹² This rapid growth in population has been mirrored by increased work and development in infrastructure, economy, and business. However, alongside this, there should also be clear policy and guidance to maintain and grow the urban tree canopy.

This report is a small step in Squamish's overall urban forest management planning. Focused on the downtown area, the report will provide a look at the current tree canopy, connections to socio-demographic data, community values of urban trees and provide subsequent policy recommendations for consideration. The report recommends creating a more comprehensive urban forest management strategy, and identifies several specific opportunities to enhance current bylaw and strategies. These policy recommendations are based on a health and equity lens, considering the unique context of Squamish.

This report is a small stepping stone in a greater process. As will be explored in more detail, the urban tree canopy should remain at the forefront of development through updated and effective policy and regulations.

“Urban forestry is the sustained planning, planting, protection, maintenance, management and care of trees, forests, greenspace along with related resources in and around cities as well as communities for economic, environmental, social, and public health benefits for people.”

Introduction

Squamish is a unique community with its close proximity to the natural environment. Nestled between mountains and ocean, the connection with nature makes it attractive for many to live and visit here. Those who do live here share strong values in protecting the environment.¹³ As Squamish grows, it is important to maintain the values that make people happy to live here. In a tree canopy survey, residents of Squamish answered overwhelmingly in favour of urban trees, with 93% of survey takers indicating tree coverage downtown is important to them. As population grows, Squamish is challenged with accommodating growth through increased development while protecting and preserving its urban forest. Understanding and evaluating the urban forest now can help put measures in place to help protect, preserve and grow what remains of Squamish's urban forest.

What is an urban forest?

The urban forest is a key aspect of infrastructure – a natural asset that includes anything from a single tree to a heavily canopied park.¹⁵ Trees on both private and public property contribute to the urban forest and they can be natural to the area and preserved, or planted after the fact. Many think of forests to be large natural areas of trees, but in an urban area, an urban forest can be thought of as the total collection of grouped or single trees dispersed across the urban city/town.

What are the benefits of an urban forest?

Urban trees are essential, as they are the most important green infrastructure offering several health benefits for

people and the environment.¹⁶ Some of the benefits are easier measured than others, but all act in harmony and each just as essential as the other.

The most obvious benefit of trees is their impact on the environment, particularly their impact on air quality. Trees improve air quality by pulling gasses and pollutants out of the environment, and putting oxygen back in.¹⁷ For instance, a study in London, England found that a 25% tree canopy in an area of 10 square kilometers reduced 90.4 tons of particulate matter from the air annually.¹⁸ In Vancouver, BC, a study found that the urban forest removed up to 1,740 tons of particulate matter from the air in one year.¹⁸ Poor air quality is harmful to health.¹⁵ Research has found lower prevalence of asthma and lung cancer in areas of higher street tree density.¹⁵

Similar to pulling pollutants from the air, urban trees can directly lower the urban heat island effect of a community.¹ Non-natural structures and infrastructure (buildings, pavement) absorb and re-emit the heat into the atmosphere, raising the temperature in densely urban areas by several degrees.¹⁹ Large urban forested areas means less structures

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that are able to contribute to the urban heat effect, however urban trees can be used within dense building and pavement areas to provide shade and reduce radiation intensity and subsequently reducing warming.²⁰

The urban heat island effect is only one contributor to hotter temperatures. Overall, the earth is warming and summer months have seen more intense heat events, such as the heat dome BC experienced in 2021 which resulted in 619 people losing their lives.²¹ As heat events and summer temperatures increase, the need for cooling becomes imperative. Trees, through a process of evapotranspiration, can pull heat out of the air.²⁰ Trees also provide shade for people and pets when outside, which have been found to be critical for health safety.¹⁵ Tree canopy reduces the risk of heatstroke and has been found to reduce heat-related ambulance calls during extreme heat events.¹⁵

Heavy rainfall and storm frequency is also predicted to increase with climate change.²² Trees reduce flow and volume of rainwater ending up in the stormwater systems.²² In fact, soil under tree canopies can absorb water between 69% and upwards of 354% more than if there was no tree.²² Larger tree canopies can also reduce the time between rain falling and when it reaches the surfaces below, with approximately 0.2mm of rainfall being held per square meter of leaf area.²² Reducing storm water lightens the load, and the cost, on municipalities making trees economically beneficial.

Trees do more for a community than just benefiting the environment. They affect community health in other ways. Crime, for instance, has been found to be reduced in areas with more urban trees.¹⁵ Traffic safety also improves as street trees slow driver speeds due to the perception of narrower streets and act as physical separation between vehicles and pedestrians.²³ Improved social connection is also found in greener areas.¹⁵ Studies have found higher levels of self-reported community connectedness in areas with more tree canopy.¹⁵

While connectedness brings a higher sense of well being, even just looking at trees can do the same. Being in nature has been found to reduce feelings of stress and the physiological processes of stress.¹⁵ Not only does the body benefit from lower stress, but those living in areas with more urban trees are more likely to spend time recreating outside.¹⁵ This not only improves well being but leads

to improved cardiovascular and respiratory health.¹⁵ Improved well being is associated with better mental health, and trees have been shown to reduce clinical incidences of mental illness.¹⁵

What part does equity play?

Even though the entire community is affected by trees, some members of the community are impacted at greater levels than others. Equity is “fair distribution of opportunities, power and resources to meet the needs of all people.”²⁴ Equity differs from equality as not everyone is given the same thing, but rather policies and programs are catered to meet different needs.²⁴ One’s health needs can often be highly influenced by factors outside of their control. Social Determinants of Health (SDOH) are a list of external factors that have been proven to impact health

status and are heavily responsible for health inequities within the population.²⁵ The SDOH include income and income distribution, education, unemployment and job security, employment and working conditions, early childhood development, food insecurity, housing, social exclusion, social safety net, health services, aboriginal status, gender, race and disability.²⁵

When thinking of the impacts of the tree canopy on health, it is important to consider the SDOH. For instance, the SDOH are linked to higher rates of chronic disease.²⁵ Those who are negatively affected by Social Determinants of Health can be put in a position where additional health factors can affect them in amplified ways. Impacts that minimal canopy can have on a community's health can create an exponential effect on more disadvantaged areas and their residents. For instance, lower income is often correlated to poorer living conditions, leaving people more susceptible to the risks with extreme weather events such as flooding or heat due to poor maintenance or ventilation.²⁶ Certain groups, such as young children and older adults, experience higher levels of morbidity and mortality from extreme heat events.²⁷

It is important that there is equitable distribution of urban forests across the community. Studies have shown that this is not always the case, and that marginalized areas have reduced access to urban forests or a lower quality urban forest.²⁸ Ensuring adequate and equitable access for all should be the leading priority when planning urban forests.

The Social Determinants of Health are a list of external factors which impact health status and are heavily responsible for inequities within the population. Factors include:

Income and income distribution	Social exclusion
Education	Social safety net
Unemployment and job security	Health services
Employment and working conditions	Aboriginal status
Early childhood development	Gender
Food insecurity	Race
Housing	Disability.

Study methods to understanding the urban forest of downtown Squamish

Research clearly shows that the urban forest is a key contributor to population health. By understanding and evaluating its urban forest now, the District of Squamish can begin to put measures in place that help protect, preserve and grow what remains of its urban forest. To that end, OurSquamish partnered with the District to initiate this tree canopy study in 2024 of the Downtown neighbourhood of Squamish.



Equality vs Equity

Using Light Detection and Ranging (LiDAR) data, this study assessed the current tree canopy of downtown Squamish. This data was collected via a drone flight over the designated area on May 20, 2024. OurSquamish worked with BCIT, a team led by Eric Saczuk of the Geomatics Department, to capture drone footage of Squamish. The raw data collected through the LiDAR imaging was compiled and reformatted to provide percentages of tree canopy (Figure 1).

In addition to LiDAR, an on-the-ground assessment of downtown trees was completed on October 7, 2024. This involved a walk-through of the downtown area to gather a broad assessment of tree types, tree health, and notable areas of high/low tree coverage. This provided further context on specific areas for better policy recommendations.

Finally, a community survey was conducted, running October and November 2024 to understand public opinions of the urban forest. This survey was hosted and shared through LetsTalk Squamish, the District of Squamish's community engagement site, as well as OurSquamish's networks. Promotional content for this survey was posted on community bulletin boards in town, promoted in the Squamish Chief newspaper, and shared through social media channels. The survey included both multiple choice and open-ended questions. The survey was available to all Squamish residents and not just those who resided downtown. Survey questions and results can be found in the following section of the report.

Community survey report and analysis

In October and November 2024, OurSquamish and the District of Squamish ran a survey assessing the views of Squamish residents on tree canopy in the Downtown neighbourhood area of Squamish. The survey received 105 responses, with one third of respondents being residents of Downtown and the rest residing in surrounding neighbourhoods. The survey assessed views of the tree canopy in Downtown Squamish through questions relating to shade, viewsapes, well being, parks, tree maintenance, etc.



Figure 1

The survey responses brought up many common themes. The main theme was the feeling of insufficient tree coverage Downtown. LiDAR imaging shows that Squamish has 14% tree canopy coverage Downtown, which is lower than many comparable municipalities, and far lower than the 30% tree canopy targets that many municipal urban forest plans are working towards, such as Kelowna and North Vancouver. These communities provide a good baseline because their existing tree canopy coverage is comparable to that of Squamish. Areas highlighted where more tree coverage would be beneficial centered around high pedestrian traffic areas, such as Cleveland Avenue, parks, or near concrete-heavy urban areas like parking lots. The two main reasons for more tree

“Squamish residents showed a strong sense of care for preserving mature trees, expressing frustration with developers for removing large, established trees, often replacing them with smaller, less effective plantings that fail to provide comparable shade or environmental benefits.”

coverage downtown were related to wanting more shade during hot summer months, and reducing the urban heat island effect. Therefore, support for planting large shade trees, and all-season coniferous trees was at the forefront of responses from survey respondents. In addition, there was some notable support for planting and maintaining native species that benefit biodiversity. Around 10% of respondents explicitly advocated for native species. Interestingly, some respondents mentioned concerns about small flowering trees not providing enough coverage. This trend further indicates a desire for shade producing trees, and reducing urban heat island effects, potentially at the expense of more “beautifying” factors like flowers. When asked about the benefits of trees in an urban setting, respondents associated a nature-connected urban setting with beautification, rather than the potentially more fabricated feeling of imported flowering trees.

The rapid rate of development was not overlooked by respondents of the survey. About 30% mentioned that losing existing trees to development was an issue that they would like a future plan to address. One respondent suggested integrating buildings into forests rather than clear-cutting land. This kind of specific urban design, such as rain swales between parking stalls, reflect creative approaches to urban greening, and a desire to look at the issue from different lenses as Squamish undergoes development from all sides. Responses reflected a frustration with developers for removing trees without adequate replacements or integrating green spaces into new developments.

Several respondents emphasized the importance of public education on the benefits of urban trees to combat potential resistance to tree planting efforts. Education on the feasibility of tree retention, planting, and the health benefits of tree coverage as laid out in this survey, could be a great public engagement initiative.

The survey results indicate that trees are essential to the wellness of Squamish residents. Respondents consistently highlighted trees as contributors to their well being, with many emphasizing shaded parks such as Junction Park as areas that encouraged their recreation and relaxation when living in or visiting the downtown area. Also mentioned as positive areas were the food truck plaza, and the Mamquam Blind Channel walkway, as well as the Estuary, and the downtown areas close to it.

There was also a theme of the importance of preserving mature trees. This is something that can be sometimes



overlooked in tree policy, and replaced with simply increasing the number of total trees. Squamish residents in this survey seemed to show a very strong sense of care and understanding for this issue, expressing frustration with developers for removing large, established trees, often replacing them with smaller, less effective plantings that fail to provide comparable shade or environmental benefits. Mature trees were recognized for their significant cooling effects, ability to anchor biodiversity, and role in creating a sense of place and identity in Squamish. Preserving these trees is seen as not simply maintaining greenery in Squamish, but also community heritage, identity, and long-term ecological stability.

The results of this survey show a strong and deep interest in the long-term maintenance of the tree canopy in Downtown Squamish. Residents understand the challenges facing urban greenery, but have overwhelmingly expressed a priority to protect and grow the urban forest, for reasons that encompass their health, connection to Downtown, and community.

Downtown geography and land use

Private and public (types) land make up Downtown Squamish. Any greenery/trees on public land is managed by the District of Squamish, where private land is managed by the land owner (household or strata). Downtown Squamish contains a variety of land uses, from single family homes to multi-story condominium buildings. The landscape has undergone changes over the last decade and continues to evolve as population grows and the area develops.

State of the urban forest

The overall tree canopy of Downtown Squamish currently sits at 14%. While low, Squamish is not an outlier and this simply provides a baseline to measure against. Kelowna and Fort St. John have reported similar levels of canopy with Kelowna's downtown core and all of Fort St. John having only 12% coverage.^{29; 30} However, there are many jurisdictions with higher canopy levels and this is considered low when compared to most suggested targets. As per a recent report from Nature Canada, a best practice target is 30%, with every person being able to see three trees from their home and that all residents should have green space within 300 hectares from their home.³¹ Certain areas may need to be less than 30%, however collectively Squamish may want to pursue similar targets in the upcoming Urban Forest Management Study as 30% is a common target amongst BC cities/municipalities, currently seen in strategies for Surrey, Kelowna, and North Vancouver.^{32; 29}

As seen in Figure 1, there are varying degrees of coverage in the downtown area. Given the urban area, it would not be expected for there to be extensive areas of high coverage, but there are certain areas of note. Overall, Downtown Squamish has higher levels of canopy coverage in park areas, particularly Stan Clarke Park and Junction Park and these trees provide good shade for park users. Additionally, there are several areas with high levels of street trees, with some providing over 50% canopy coverage, however most of these areas are concentrated in the undeveloped residential areas of Downtown Squamish that are closest to the Squamish River estuary.

What is evident from the LiDAR study is that the distribution of trees is not equal across downtown, and is particularly lacking in areas of high pedestrian traffic and gathering. Notably, Cleveland and Second Avenue have little to no tree canopy. This area is of particular interest given they are the core commercial high streets of Downtown and have seen increased redevelopment, increasing population use and needs of the area. Commercial high streets boast streetscape use and activation and are particularly areas where people are likely to sit outside on benches or on patios and pocket parks. Cleveland and Second Avenue both have a low tree canopy rating, meaning there is virtually no tree canopy shade in the highest used areas of Downtown Squamish.

Comparison to census data: Equity analysis

Table 1 demonstrates key metrics from the designated census areas seen in Figure 2. The below characteristics were chosen as they have direct links to poorer health outcomes due to the impacts of heat and air pollution, as well as higher incidences of chronic illness. Only ages 0-9 and over 65 are represented given the more significant equity considerations. This is not exhaustive and only a small snapshot for the purpose of this report.

To start, census area 1 has the highest proportion of the population over the age of 65. Fortunately, this coincides with an area of downtown with a greater tree canopy. Particularly, this census area includes two condominiums dedicated to residents over the age of 55, the Men's Shed and the 55 Activity Centre. Given the proportion of older adults, supporting tree canopy in this area is important, particularly to provide shade given the higher vulnerability of heat related illness. Census area 1 also has the highest proportion of young children. Similar to older



Figure 2

<i>Table 1</i>	Squamish	Census Area 1*	Census Area 2	Census Area 3*
Total	23,819	2,080	1,385	1,530
Age				
65+		350 (16.8)	120 (8.7)	155 (10.1)
0-9		240 (11.5)	135 (9.7)	140 (9.2)
Income				
Median Household		84,000	98,000	95,000
Single Parent Median		54,800	57,200	62,400
Immigration				
Immigrants		405 (19.5)	415 (30.0)	305 (19.9)
Immigrated in 2016-2021		100 (4.8)	70 (5.1)	105 (6.7)

adults, it is important for tree canopies to be maintained particularly in areas where children may be outside to provide opportunities for shade. Another positive aspect of Squamish's current tree canopy is there is no clear link between lower income and poorer canopy when comparing census areas to the tree canopy distribution. While there is no significant impact through census data, it is important to note that this is a small area in which specific street incomes are not obtained. During the community walkthrough, there was evidence of lower tree canopy and limited street trees in areas surrounding social support services and buildings, such as Under One Roof, Pearl Space and the local supervised consumption site.

Interestingly, there is a correlation between lower tree canopy and higher proportions of new immigrants to census area 3. While newcomers may have better health upon arrival to Canada, health status can deteriorate quickly.³³ A multitude of stressors causes this deterioration including but not limited to poverty, living conditions, and access to health and social services.³³ Particularly, recent immigrants are more likely to live in more crowded conditions, which decreases housing adequacy.³⁴ As adequacy decreases, impacts to ventilation become more likely, exposing the residents to more risk of poor health from heat and pollution.³⁵

While currently there are no obvious inequities, it is important to consider equity in the prioritization and preservation of existing large tree canopies and new tree plantings. Given the small area of this study, it is more likely for inequities to emerge as other neighbourhoods in Squamish are assessed. For instance, Downtown compared

to the Garibaldi Highlands neighborhood may show differences in overall tree canopy and household income. Priority areas should be determined based on areas where there are higher proportions of people vulnerable to heat illness. While tree canopy reviews on their own help to understand where more trees are needed, an equity lens can help determine what areas are needed most.

Examples in Squamish

A community walk-through highlighted certain tree canopy areas, features and considerations that cannot be captured by the LiDAR imaging. The below images show areas where there is evidence of both a strong canopy and where it is lacking.



This is an example of a large, shade producing tree within Stan Clarke Park surrounding an area of gathering and providing shade to the streetscape. Similar trees should be prioritized for preservation.



Pockets of green space and public parks help preserve large trees. Protection of watercourses and ditches can also support mature tree preservation, as shown in a recent redevelopment on Sixth Ave



This photo, shows a lot where tree clearing took place without tree cutting permits or approved development plans. Clearing lots before necessary has impacts on both carbon sequestering, tree canopy coverage, and overall beautification of the streetscape.



Tree canopies may begin small at planting but grow over time. It's important to plant large species trees in locations where they can grow, thrive and reach full tree canopy size. If not, trees can become hazards to adjacent buildings (wildfire), themselves and or humans (grow with leans).



As redevelopment moves away from large open parking lots (left) into denser urban forms(right), appropriate location of trees, street trees and preservations of existing mature trees downtown within redevelopment will become more important to achieve a healthy tree canopy.



These are examples of new trees within a new development. The image show how both streetscape boulevard area sizes and building canopy sizes can impact tree canopy growth. (left) Large boulevard areas away from building canopies will support these confers growth



over time. (right) Narrow boulevard spaces located close to a unusually large building canopy has already started to cause problem for this street tree canopy and will impact the overall tree canopy size overtime

Soil volume and irrigation play important roles in tree canopy health and growth. An example on Bailey Street shows how two identical tree species planted in the same year have performed overtime. Trees on the right are within the District streetscape, were not watered through irrigation and likely did not get planted with sufficient soil volumes, due to the street and sidewalk constraints. The trees on the left are irrigated by private strata property and were given ample soil volumes within large open planted areas.

This example shows how tree planting conditions and maintenance can play a large role in overall tree health.



This area of minimal tree coverage along streetscape and private property shows where redevelopment could benefit tree canopy coverage Downtown by adding street trees.



Overhead powerlines limit Downtown ability to grow large canopy trees. Overhead utilities are commonly disrupted by trees and thus tree canopies are routinely pruned, topped and trimmed by BC hydro to reduce potential hazards.



Supporting large tree canopies in urban areas requires undergrounding of utilities to allow for healthy tree canopy growth without limitations.



Squamish's proximity to urban forest also means proximity to its wildlife. Bears are common in Downtown Squamish and new trees should not be Wildlife attractant trees. Unfortunately, this means some large canopy native trees like Oaks are not supported.



This image depicts a new development, popular for gathering with a strong row of street trees. These trees have potential to produce shade as well as improve beautification.

A site visit revealed varying health levels for trees, showing weekend health and size for trees in tree grates vs trees planted within open planters.

Recommendations

The below recommendations were developed to be applied to all of Squamish based on the findings of the report, however those direct to Downtown are identified. The recommendations are focused on the creation of an urban forest management strategy and enhancing current bylaw and strategies.

Urban Forest Management Strategy

Complete a District of Squamish Urban Forest Management Strategy:

1. Set minimum tree canopy targets for all of Squamish and each neighbourhood following a complete current state tree canopy study with tree canopy goals to account for land use and equity.
 - a. When setting targets, particular attention is to be made to factors including, but not limited to, socioeconomic status, age, multi-family dwellings, racialized populations.²⁹ The health impacts of the urban forest may be most seen in certain groups. Research shows that blocks with 40% canopy cover have the greatest cooling effects, important for those vulnerable to heat related illness and death.³⁶
2. Create priority areas, such as those seen in the City of New Westminster's Street Tree Master plan.³⁷
3. Conduct thorough community engagement when developing the Urban Forest Management Strategy. Community engagement assists in understanding the community's current priorities of the urban forest.³⁸
4. Foster a sense of community value in protecting the urban forest.
 - a. Conduct regular community education sessions, dedicate a public website space about the urban forest, provide education and action items members of the public can take.
 - b. Consider an adopt-a tree-program, tree stewardship programs and/or community tree planting days to improve tree health and increase overall tree numbers.^{37; 39; 40} Promote programs such as the City of Vancouver's "Cool Kit" initiative, which promotes community engagement and protection/enhancement of tree canopy.⁴¹
5. Consider financial incentives for property owners in planting new trees.
6. Consider disincentives for property owners to remove healthy mature trees.

“These programs can actively engage the community in growing and protecting the urban forest through volunteer opportunity while subsequently reducing load on municipal staff for tree maintenance.”

Development Related Bylaws

1. Require all developers to include tree preservation plans on development applications.
 - a. Consider encouraging an equity analysis to ensure loss of canopy would not cause disadvantage to certain populations.
2. Increase requirements of contributions to the Environmental Reserve Fund for tree removal.
3. Ensure street trees are detailed on civil plans as required per F.1.1.b) of the current Subdivision and Development Control Bylaw. Subdivisions should require meeting tree canopy area growth targets through preservation first, then replanting.
4. Tree planting should be encouraged in areas of empty space such as right of ways and unused areas adjacent to parking, where assessed to have ability for adequate soil volume and drainage for tree health.
5. Incorporate tree planning into major neighbourhood planning processes (such as the Garibaldi Estates⁴³)
 - a. Include tree planning into community engagement efforts to determine tree priorities of residents.

Tree Management Bylaw

Enhance the current: Tree Management Bylaw.⁴⁴

1. Deny applications or increase required fees to Environmental Reserve Fund for tree removal for trees that meet the following criteria:
 - a. Supply shade in areas where people are at higher risk of heat illness
 - b. Supply shade in areas of community gathering
 - c. Where loss would impact public streetscapes along highways and collector routes unless concerns to safety
 - d. Located on school or playground property unless a risk to safety
 - e. Where removal would reduce pedestrian/non-motorized vehicle user separation from vehicle traffic, unless concerns to safety
 - f. Where loss would remove shade from transit stops
 - g. In areas of development, where construction has not begun
2. Include tree canopy targets to tree canopy and tree density targets to ensure there is no loss of canopy
 - a. Provide a list of tree species that reach the desired targets, taking into consideration shade trees, evergreen, and native species.

Active Transportation

Consider the urban forest in active transportation planning and construction efforts.

1. As per direction 4.B of the current Active Transportation Plan, include street trees to encourage active transportation.
 - a. Street trees must be adequate in providing a buffer from vehicle traffic
 - b. Consider tree type to maximize proper view of both users and vehicles as well as levels of possible debris
2. Ensure adequate tree maintenance and sweeping to promote user safety with consultation with Public Works
3. Active Transportation designs should attempt to maintain existing mature trees in new designs even if it requires delineations in the design and as long as it does not compromise safety.

Limitations

Given the scope of the project, there are several limitations in this report. The purpose of this report was to highlight the key considerations of the urban forest and provide the first snapshot of Squamish's tree canopy. This was the first report of its kind for Squamish, meaning there was no previous data to work from.

The other primary limitation is access to data. Because only a small section of Squamish was assessed, it is difficult to pull statistical significance from the data or have comparative areas. Additionally, because of the small areas, the data was not specific enough. Should a wider scale project be completed, it would be recommended to gather as much data that is available on the health and

equity considerations of each area. This may be easier should comparisons be with other areas of Squamish, rather than within a certain neighborhood.

Finally, there were limitations with the LiDAR data. Certain areas of tree canopy were not accurately captured which impacts the overall canopy percentage. The data was also challenging to segment when attempting further analysis such as trees on private vs. public lands, parks, etc. Should this work be repeated, it would be beneficial to understand the distribution of the tree canopy on land type, as well as remove areas of canopy associated with parks to better prioritize tree planting and preservation.

Conclusion

While small scale, there is a lot to learn and consider from this report. Squamish is developing fast, and the time to consider the urban forest is now. Without proper policy in place, it is more challenging to reverse actions to develop, rather than to plan for a future with a robust urban forest. As Downtown Squamish continues to evolve, there is imminent loss of trees. This report can act as a catalyst for future work by the District of Squamish.

As seen in this report, the impacts of climate change and tree canopy are significant and action is needed now. The longer there is without a strategy, the more challenging it will become to undo any actions already taken. With Squamish growing so quickly, there is further immediacy, especially when considering equity as the demographics of Squamish change. The urban forest is a key contributor to population health and without management, Squamish may lose existing assets that are deeply valued.

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