

Urban Forest Management Strategy



NEW WESTMINSTER

Parks, Culture & Recreation
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Acknowledgements

The Strategy benefited greatly from input by community stakeholders, the public and staff from the City of New Westminster. Specifically, the following groups and departments provided input, feedback and support for the Strategy and consultation process:

- Mayor and Council (2015)
- Environmental Advisory Committee (2014)
- Parks and Recreation Committee (2014)
- Development Services
- Engineering
- Engineering Operations
- Electrical Operations
- Parks, Culture and Recreation
- Parks Operations and Horticulture
- Bylaw Enforcement
- Everyone who attended workshops in October and December 2014
- Everyone who participated in the on-line surveys

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1. Executive Summary

CONTEXT OF NEW WESTMINSTER

New Westminster was the first incorporated City west of the Great Lakes and the first capital city of the united colony of British Columbia. The City has the proud distinction of being named by Queen Victoria, herself, hence the name "The Royal City." It is situated in the centre of Metro Vancouver overlooking the Fraser River. Bounded by the municipalities of Burnaby, Coquitlam, Surrey, Delta and Richmond, New Westminster is easily accessible by road, SkyTrain, water and rail. The City has an illustrious history and has grown to become a vital part of the Region. Today, New Westminster faces a complex array of challenges and opportunities which, if successfully managed, will improve the City as a place to live, work and play.

COMMUNITY URBAN FOREST VISION STATEMENT 2035

> New Westminster's urban forest is a beautiful and beloved public resource, providing refuge, education and recreation within the City. Urban trees are carefully planted, protected and maintained to enhance habitat, clean the air, capture carbon, manage stormwater and maximize benefits to our City's environmental health and quality of life.
>
> Great planning and management supports an urban experience of diverse, colourful and comfortable, well-treed streets and boulevards that connect with neighbourhood parks, natural areas and the waterfront.
>
> The City's management policies include measurable objectives, priority actions and regulatory mechanisms, ensuring strategic, efficient and effective coordination between public and private partners.
>
> Homeowners and developers play an increasingly significant role in urban forest enhancement with protection and planting on private lands. Community members of all walks of life care for the urban forest as a shared priority and defining feature of what makes New Westminster such a great place to live.



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THE PLAN

A collaborative process served to co-create a vision and establish priorities to protect and enhance the urban forest on public and private land. The community-supported vision for the urban forest will be achieved by implementing the Urban Forest Strategy ("the Strategy") over a **20 year timeframe**. Goals and objectives provide direction for the development of priority actions to achieve New Westminster's urban forest vision:

PROTECT New Westminster's urban forest and its benefits to our community by:

- Increasing canopy cover to 27% city-wide.
- Introducing a tree bylaw to protect existing canopy cover.
- Adapting the urban forest population, and the City, to a changing climate.

ENHANCE all aspects of the urban forest and its management within New Westminster by:

- Updating policy, guidelines and best management practices to support urban forest enhancement.
- Enhancing the tree care program by increasing resourcing and information management system capability.
- Improving urban forest diversity by planting no more than 10% of any species, 20% of any genus and 30% of any family.
- Improving environmental health by establishing goals for Environmentally Sensitive Areas and complementary naturescaping guidelines for adjacent lands.

ENGAGE all community stakeholders involving issues related to urban forest management by:

- Developing an urban forest stewardship program to build community ownership of the urban forest, and;
- Working with departments internally to improve integration of trees and green infrastructure into integrated stormwater management, greenhouse gas and air quality management, and to improve long-term tree health outcomes.

THE CHALLENGES

The strategy was developed in recognition of the urban forest as a valued public resource, in light of significant challenges to its long-term health:

- **Canopy decline:** New Westminster's urban forest canopy area has been declining at a rate of approximately 1.5% per year over the last decade.
- **Urban growth and densification:** The Regional Growth Strategy anticipates a near-doubling of New Westminster's population between the years 2010-2041.
- **Urban trees in competition with other infrastructure and services:** Tree assets are not currently integrated into planning for other infrastructure assets and services, which can cause conflicts resulting in damage either to trees or other infrastructure.
- **Changing climate and extreme weather events:** Warmer and drier summers, wetter winters, and an increasing frequency of extreme weather events will present challenges for both the urban forest and the people of New Westminster.
- **Managing stormwater:** Loss of urban forest canopy associated with increased densification (and impervious coverage) will compound challenges related to stormwater management within the City.
- **Managing natural areas and biodiversity:** Isolated natural areas within the City are more susceptible to further degradation and loss of habitat. New Westminster's ecological inventory defines the range and location of ecosystems within the City.

If New Westminster's existing canopy cover is to be maintained, then actions prescribed in this strategy require implementation. In the last decade, canopy cover has been declining at a rate of approximately 1.5% per year (based on the trend measured from 2004 to 2013). The decline has occurred almost entirely on private land and is largely due to the absence of tree protection or replacement requirements. If this trend continues, then the City's canopy cover could consist only of what exists on public land and drop to as low as 7%. This would represent a substantial loss to the community in terms of amenity, air quality, shade, urban ecology and numerous other benefits. Tree protection and a program of new planting are essential to maintain and enhance the future tree canopy.

THE OPPORTUNITIES

New Westminster's urban forest is highly valued for its environmental quality, its beauty and naturalness, and the social and recreational opportunities it provides. These values contribute significantly to the quality of life of New Westminster. Implementation of the Strategy will contribute towards key Council priorities of:

1. **Health and well being:** Trees clean the air by capturing particulates and through absorption and adsorption of other pollutants. Research also supports that trees and greenspaces provide a broad range of benefits including reduced stress, improved attention span, faster recovery from surgery, higher levels of physical activity and community connectivity.

2. **Environmental health:** The urban forest provides habitat and contributes to urban biodiversity. Trees and vegetation intercept and clean stormwater before it reaches natural waterways.

3. **Energy savings:** Trees, and green infrastructure, when strategically placed can provide savings on heating and cooling costs for buildings.

4. **Comfort/shade/microclimate:** Trees provide comfort by moderating the climate at street level. Trees provide shade and evapo-transpirative cooling that gives people relief on hot summer days.



2. Background & Context

2.1 What is the urban forest?

An urban forest includes all of the publicly and privately-owned trees and supporting vegetation in an urban area[i]. This includes individual trees and groups of trees located in natural areas, parks, backyards, on streets, and in commercial and industrial zones. Other elements such as plants, water, soil, micro-organisms, and wildlife are also part of this forest community. Each of these elements, in addition to people and the built environment, have an influence on the health of the urban forest.

By definition, the urban forest occurs in areas with higher densities of people and more artificial surface (buildings, roads, etc.). This is where the urban population is concentrated and where the majority of future development will occur over the 20 year timeframe of this plan.

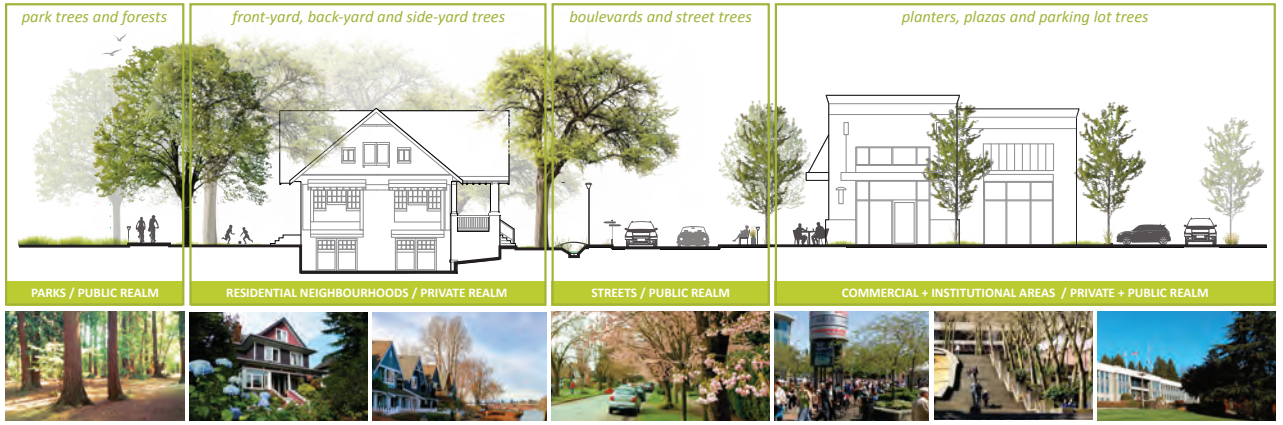


Figure 1. Conceptual cross-section illustrating different realms of an urban forest.

2.2 Glossary of Key Terms

ANSI A300 Standards: The generally accepted industry standards for tree care practices. They are voluntary industry consensus standards developed by Tree Care Industry Association and written by a committee called the Accredited Standards Committee (ASC) A300, whose mission is to develop consensus performance standards based on current research and sound practice for writing specifications to manage trees, shrubs, and other woody plants.

Biodiversity: The variety of life on Earth. It is the variety within and between all species of plants, animals and micro-organisms and the ecosystems within which they live and interact. It is inclusive of species, genetic and ecosystem diversity.

Canopy Cover: The area of leaves and branches measured, when viewed from above, as a proportion of the total land area.

Ecosystem Services: The benefits people obtain from ecosystems. These include provisioning services such as food and water, regulating services such as flood and disease control, cultural services such as spiritual, recreational, and cultural benefits, and supporting services such as nutrient cycling that maintain the conditions for life on Earth.

i-Tree Eco: The I-Tree Eco model uses field data and GIS analysis to calculate ecosystem services provided by trees within a defined area. This tool quantifies the urban forest and can be used for making effective resource management decisions or developing policy. This system was developed by USDA Forest Service.

i-Tree Canopy: The I-Tree Canopy tool estimates tree cover and tree benefits for a given area by randomly locating points over an air photo. The user classifies each point as tree canopy or other defined land use to estimate the percentage cover of each type within a defined area.

Stewardship: An ethic that embodies the responsible planning and management of resources. The concepts of stewardship can be applied to the environment, economics, health, property, information, theology, etc.

Tree Care: A general term referring to the operational management of trees in urban landscapes.

Urban Heat Island: This phenomenon describes urban and suburban temperatures that are 1° to 6°C warmer than nearby rural areas.

Useful Life Expectancy: The ULE is an estimate of how long a tree is likely to be viable in the landscape based on health, amenity, environmental services contribution and risk to the community.

2.3 Understanding the Value of Urban Forests

Take a moment to consider how many benefits are provided by the urban forest. From cherry blossoms and fall colour... to summer shade and fresh air... to flood protection and carbon storage... trees are a remarkably singular and simple solution for many challenges associated with the sustainable management of our cities and neighbourhoods. The following section details many benefits provided by the urban forest across a range of spaces found throughout New Westminster.



Figure 2. Trees provide a broad range of social, economic, environmental and cultural benefits to people living in cities (graphic made with Piktochart).

More than half of the world's population now lives in urban areas and population trends indicate an increase of 2 billion people by 2050[iii]. The area of urban land worldwide is expected to triple between 2000 and 2030[iv]. This rate of growth has major implications for global land use change, energy consumption and emissions, which highlights the importance of urban forests in providing good quality 'human habitat' and essential ecosystem services for people who live in cities.

An increase of 343 trees per square kilometre was associated with a 29% lower early childhood prevalence of asthma in New York City[v].

The World Health Organization reports that one in eight global deaths annually are caused by air pollution exposure, confirming that air pollution is now the world's largest single environmental health risk[vi].







Health and Well Being

Urban forests are increasingly being recognized for the important economic, social, and environmental benefits and ecosystem services[1] they provide. Urban forests support people's health and well-being by enhancing psychological health, physical health and social cohesiveness[2].

Trees clean the air by capturing particulates and through absorption[3] and adsorption[4] of other pollutants. Fine particulate matter (particles less than 2.5 micrometre diameter) is the primary air pollutant of concern in BC because of its highly toxic nature[ii].

Studies have shown that diesel PM is the most important pollutant in the airshed from a human health perspective, accounting for an estimated 67% of the lifetime cancer risk from exposure to air pollution. In one year, a mature city tree can capture up to 1.4 kg of particulate matter[vii].
The importance of urban forests will only increase in the future. Climate change is predicted to result in a higher frequency of extreme weather events: heat waves, drought, flood, wildfire, and heavy rainfall events[viii].

These events are expected to place more pressure on public infrastructure and the healthcare system. Increasingly, research and case studies support that trees and green infrastructure[5] are cost effective ways to mitigate climate change impacts and build resilient cities[ix].

1 Ecosystem Services: The benefits people obtain from ecosystems such as clean air and water, recreation and cultural benefits.
2 The Green Cities: Good Health website collects and summarizes research about the benefits of nature in cities and towns- http://depts.washington.edu/hhwb/Top_Introduction.html
3 Absorption: the transfer of a gaseous pollutant from the air into a contacting liquid, such as water.
4 Adsorption: The gas molecules or particulates are absorbed—attracted to and held—on the surface of a solid.
5 Green Infrastructure: A strategically planned and managed network of natural lands, working landscapes, and other open spaces that conserves ecosystem values and functions and provides associated benefits to human populations.

Green Infrastructure and Environmental Health

Within New Westminster, several ecologically important natural areas anchor the City's urban forest resource. The Ecological Inventory[x] prepared for the City of New Westminster identified four distinct natural areas spanning City and other ownership lands:

- Fraser River foreshore and islands;
- Brunette River corridor;
- Glenbrook ravine; and
- Large treed parks.

These natural areas are large in size and are considered the most important in terms of their ecological significance. Each has unique attributes that contribute to overall biodiversity and ecological function in New Westminster, and in some cases, regionally. The Fraser, Brunette, and Glenbrook natural areas are significant linear 'corridors', while the large treed parks (the most prominent of these are Queens Park, Moody Park and Friendship Gardens/Tipperary Park) represent the City's most prominent green 'patches'. Beyond the sum-total value of individual trees, these areas form a substantial component of the City's green infrastructure: the network of natural areas and open space that conserves natural ecosystem values and processes, while providing benefits to both people and wildlife[xi].

Ecosystem Services and Energy Savings

Trees, when strategically placed in relation to a building can provide savings on heating costs due to wind interception and savings in air conditioning due to shading and cooling. The USDA reports that trees properly placed around buildings can reduce air conditioning needs by 30% and can save 20-50% of the energy used for heating homes. Where tree planting is not possible, green walls and roofs can provide similar benefits.

An i-Tree Canopy and i-Tree Eco analysis for the City of New Westminster indicated that the urban forest is providing the following:

- 18% canopy cover
- 35,600 cubic meters of avoided runoff/year
- 20 metric tonnes of pollution removed per year
- 2,700 tonnes of carbon sequestered annually and 80,000 tonnes stored

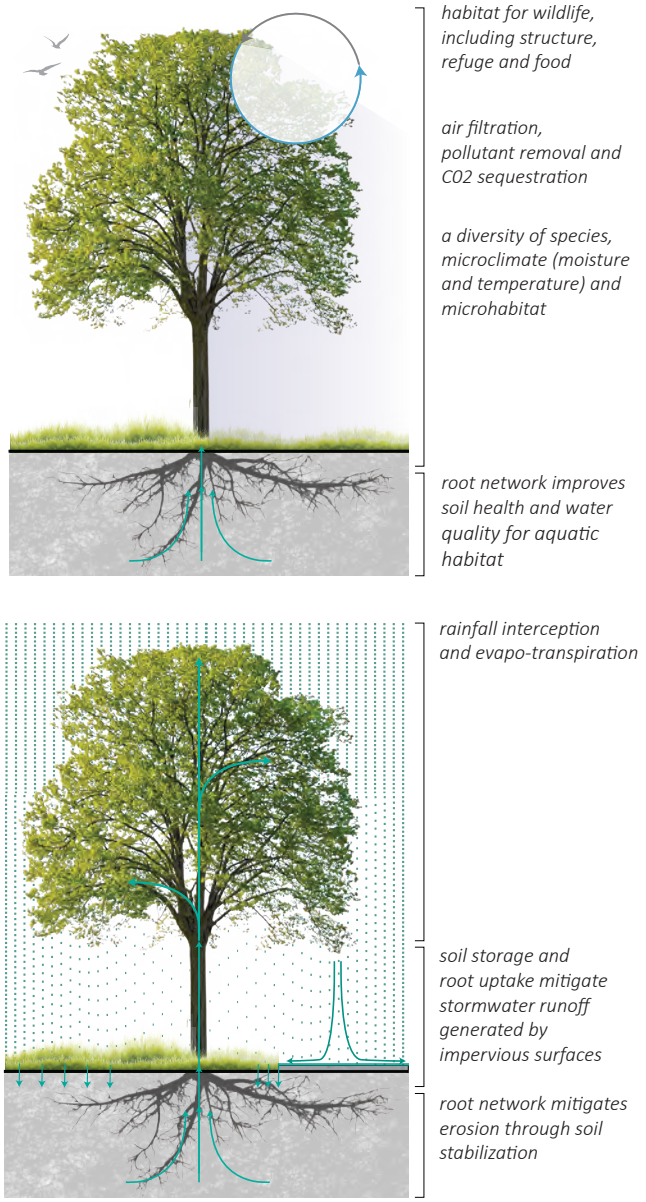


Figure 3. The above diagrams represent some of the green infrastructure and ecosystem services provided by trees and the urban forest.

Comfort/shade/microclimate

Trees provide shade and evapo-transpirative cooling that gives people relief on hot summer days. Extreme heat events place stress on people living in cities and towns and, when occurring for extended periods, can result in heat related illness and even mortality.

Trees can reduce the urban heat island effect[6] (Figure 4) by shading hard surfaces and cooling air temperature through evapo-transpiration. Generally, only 10-30% of the sun's energy reaches the area below a tree during summer months[xii]. In terms of cooling, studies have found that suburban areas with mature trees are 2-3°C cooler than suburbs without tree. In summer, the urban heat island effect can increase heat related illness and mortality, drive up energy demand, and increase air pollution and greenhouse gas emissions.

The July 2009 heat wave in the lower mainland is estimated to have contributed to an additional 122 deaths[xiii] among vulnerable members of the population including children, seniors and people with chronic health conditions.

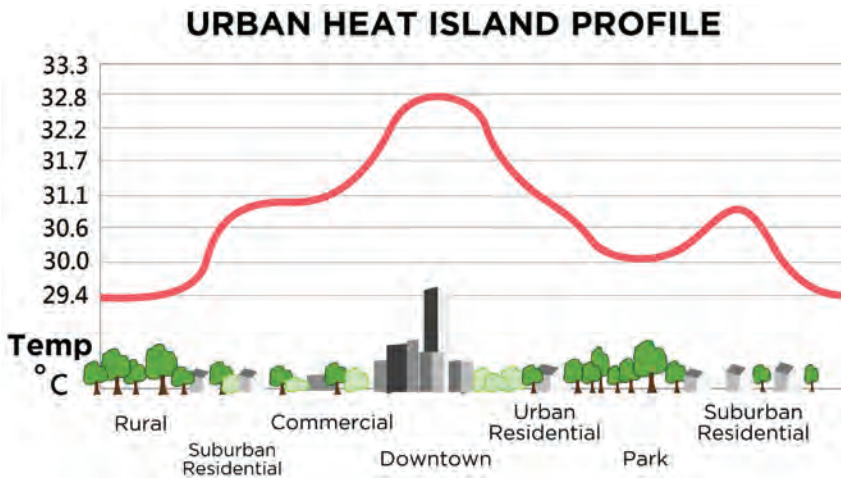


Figure 4. Representation of the urban heat island effect that results in built up areas being hotter than surrounding rural areas.

2.4 What is an Urban Forest Management Strategy?

An urban forest management strategy is: "a programmatic approach of the development and maintenance of the urban forest, including all elements of green infrastructure within the community, in an effort to optimize the resulting benefits in social, environmental, public health, economic, and aesthetic terms, especially when resulting from a community visioning and goal-setting process." [xiv]

New Westminster's Urban Forest Management Strategy ("the Strategy") outlines the community vision for the urban forest and provides objectives and actions to achieve that vision. The plan will be implemented over a 20 year timeframe (2015- 2035) through prioritized actions that are based on consultation with municipal staff, stakeholders and the community, inventory data and a review of policy and best management practices for urban forestry.



Figure 5. A collaborative approach to building the Urban Forest Management Strategy.

6 Urban Heat Island Effect: describes densely developed areas that are hotter than nearby rural areas. As urban areas develop, vegetation and permeable surfaces are replaced with buildings and hard impermeable surfaces. These hard surfaces heat up during the day and gradually release heat throughout the night.

3 Inventory and Analysis



3.1 Regional Context

New Westminster has a population of 67,545 people (2011 Census – BC Stats). The City's resident population is expected to increase by almost 33,000 people by 2041 as the City accommodates growth, with the majority of population increase occurring in the 50-54 age group[xv]. These trends and projected environmental changes mean that urban forests will have an increasingly valuable role in maintaining and improving quality of life of the residents of New Westminster.

3.2 A Brief History of New Westminster's Urban Forest

Prior to European settlement, much of what is now New Westminster was covered by the towering tree canopy that typifies our West Coast temperate forests. By the 1800s, increasing settlement, agriculture, forestry and other development marked significant change in the natural environment.

New Westminster's landscapes have undergone dramatic decline and recovery over the years:
from clear-cutting of the coastal forest and the Great Fire of 1898, the urban forest was largely destroyed... but has rebounded, grown and matured with the City. Today, the landscape of New Westminster – while retaining much of its defining character related to the riverfront – is highly urbanized. Its forest canopy stands at only 18% coverage, as compared with the North American average of 27%.

Accordingly, we recognize a different kind of decline of New Westminster's urban forest: in contrast to the massive clearing and disasters of the past, today we face a slow and subtle loss in urban canopy associated with urban densification, highlighting a growing need to pro-actively manage this resource.

As the City of New Westminster considers its long-term goals for growth management, appreciation of the natural environment – and long-term protection and enhancement of environmental values – is central to New Westminster's vision for a sustainable community.

As the City undertakes several planning initiatives to support sustainable growth and development, a City-wide strategy to guide best management of trees and its community's urban forest is desired.



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3.3 Measuring the Urban Forest: Canopy Cover

One way to measure the extent of the urban forest is through quantifying the urban tree canopy which includes the layer of leaves, branches and tree stems when viewed from above.

Canopy cover, expressed as a percentage of total land area, within the City of New Westminster was assessed using ***i-Tree Canopy***, which enables measurement of randomly chosen sample points over aerial imagery; sampling error varies according to sample size. Within the City of New Westminster's municipal boundary, canopy cover was measured at 18.1% with an error of +/- 2.4%. (Analysis techniques and sampling error of case study examples, as illustrated at right, is unknown.)

Compared to neighbouring municipalities, New Westminster's urban forest is relatively intact: its relative forest cover is comparable to Vancouver and Victoria (18%), but lower than that of Duncan (26%) and Nanaimo (28%), both on par with the North American average of 27% urban forest canopy. As compared to the recommended "best practice" (Pacific Northwest benchamark as advocated for by American Forests and commonly referenced within urban forest management literature), New Westminster has room for improvement.

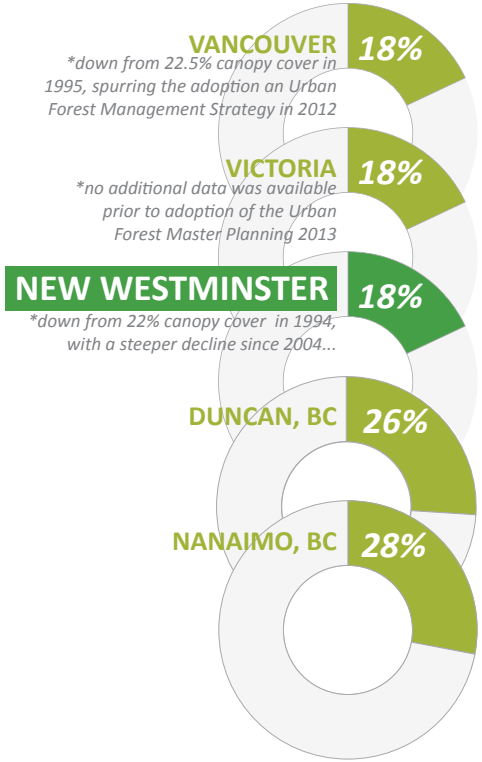




Figure 6. A comparison of relative canopy cover as illustrated by Google "street view."

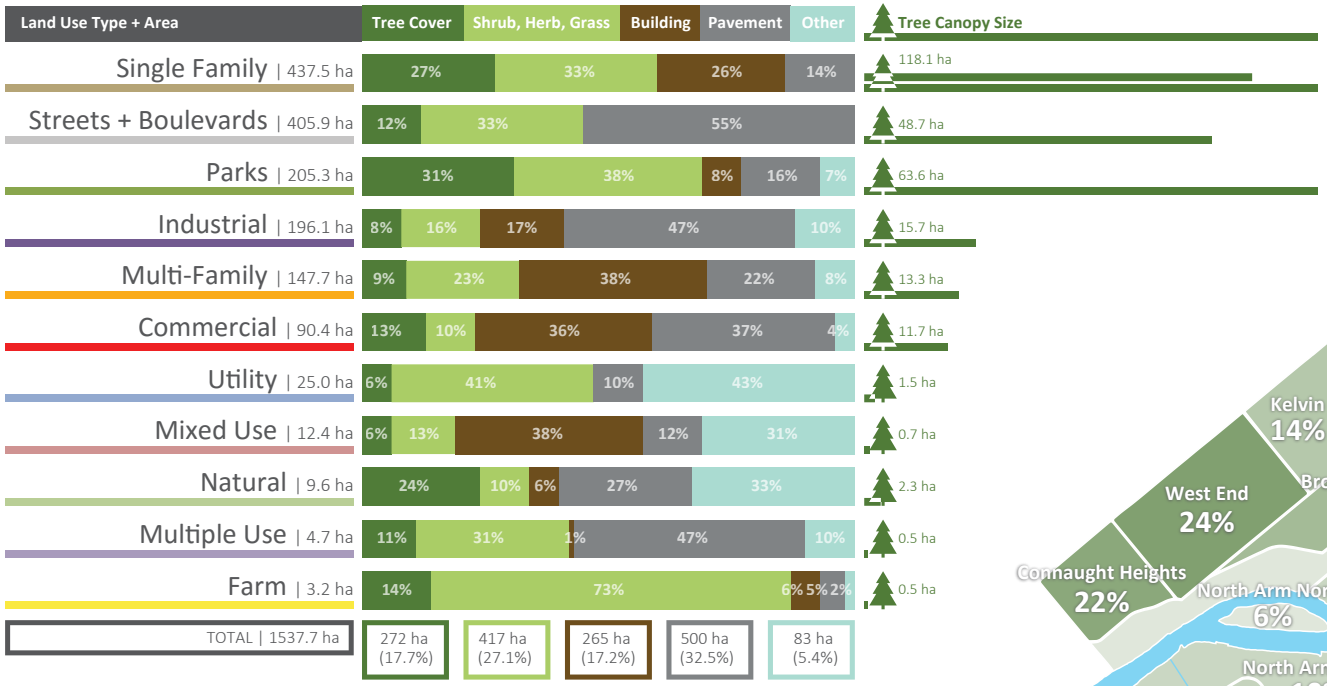


Figure 7. Analysis of the Urban Forest- brokwn down into land use types- reveals varying degrees of tree canopy coverage and highlights the total (absolute) area of urban forest found within single family residential neighbourhoods, streets, boulevards, and parks.

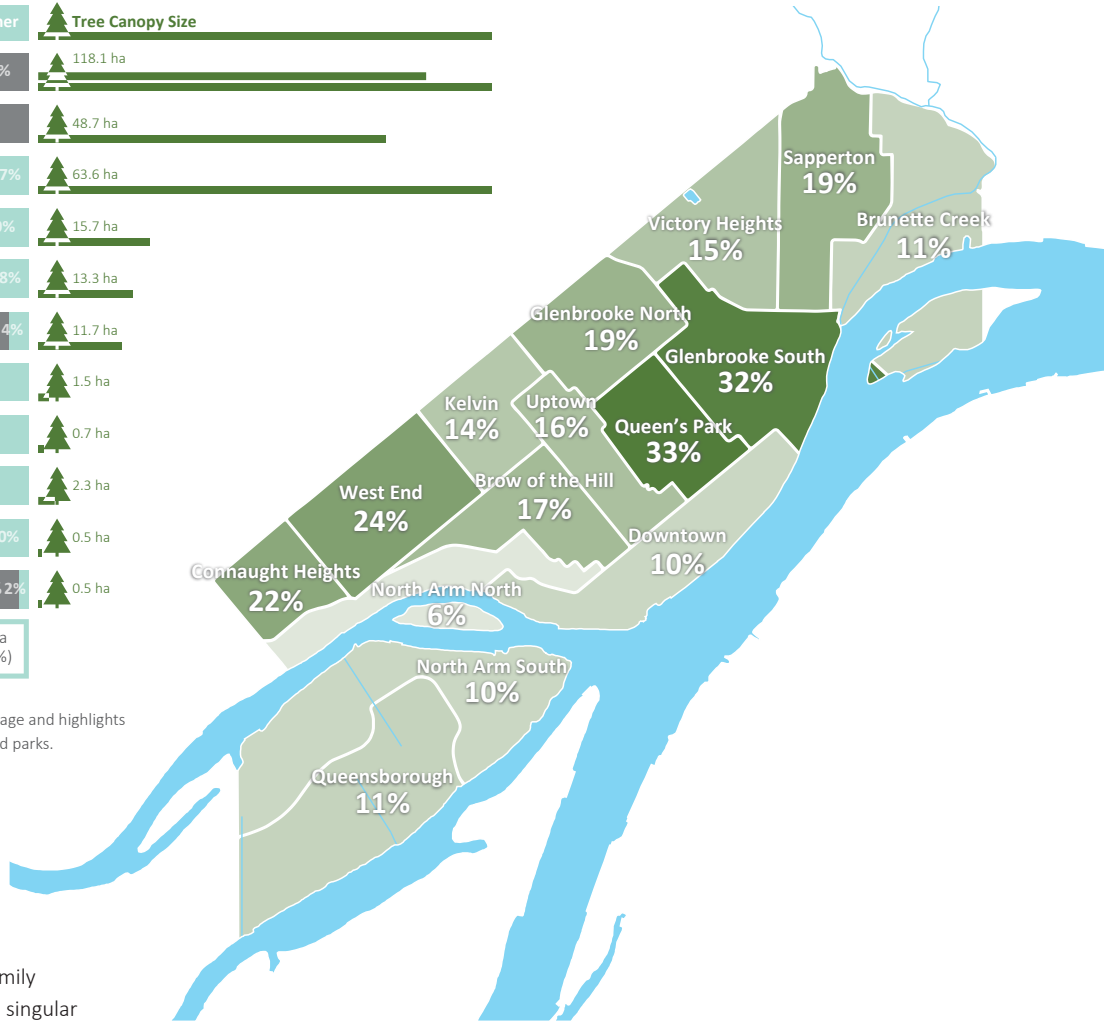


Figure 8. Analysis of the urban forest- broken down by neighbourhood- highlights differences in canopy distribution across the City.

3.4 Land Use and Neighbourhood Context

A majority of New Westminster's urban forest is located within parks, streets and single family residential areas. Interestingly, the proportion of the urban forest canopy found within the singular land use category of "single family residential" is very similar to the proportion of canopy found in the entire public realm, including streets and boulevards and parks. That being said, the City's overall 18% canopy cover is composed of 11% canopy from within the private realm and 7% canopy from within the public realm.

Across the City's neighbourhoods, the greatest canopy cover is found in the City's oldest neighbourhoods of Queen's Park and Glenbrooke South. The lowest canopy cover is found in the Downtown, Brunette Creek and Queensborough neighbourhoods.



3.5 Policy Context

Several plans, policies and regulations are relevant to the management of New Westminster's trees and urban forest. The relationship between the Strategy, provincial and other New Westminster policy documents and plans is illustrated in Figure 9.

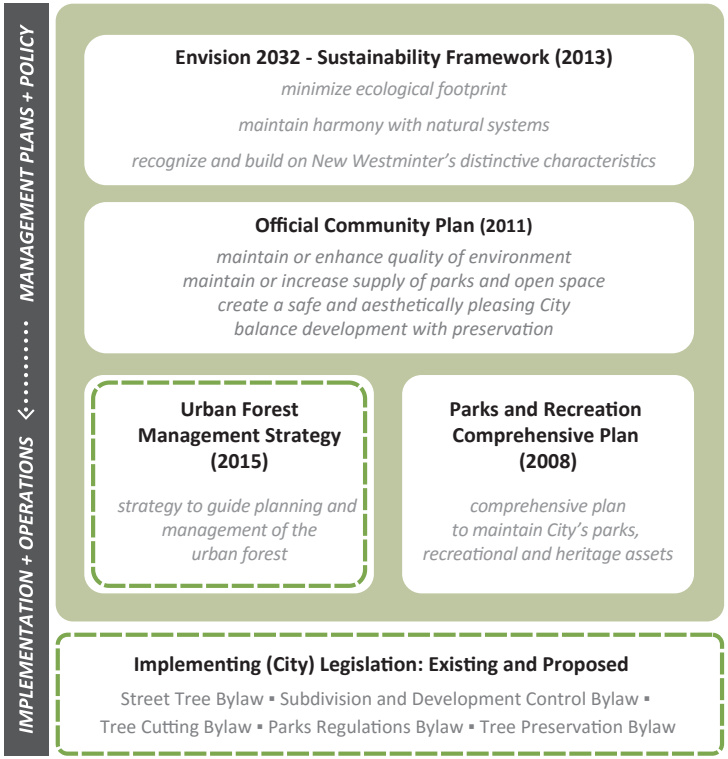


Figure 9. Relationship between the Urban Forest Management Strategy, provincial and New Westminster policy documents, plans and implementation deliverables.

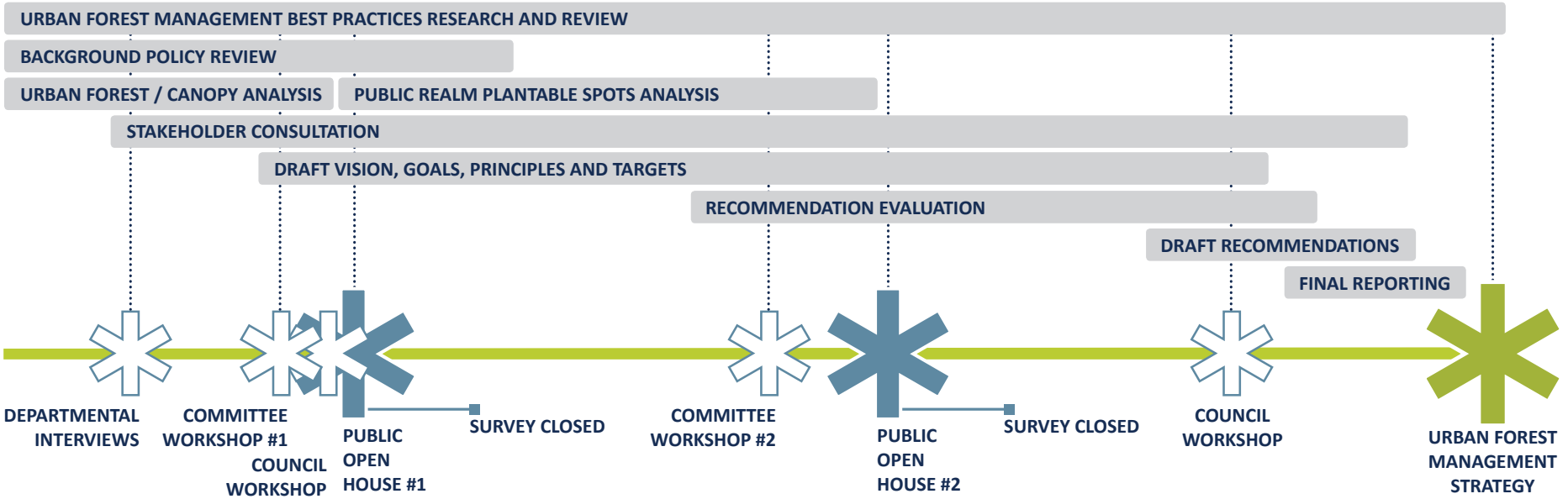
Influencing Provincial Policies

- Develop with Care 2014
- BC Climate Action Plan
- BC Climate Action Tool kit
- Adapting to Urban Heat: A Tool Kit for Local governments
- Urban Forests: Climate Adaptation Guide

Influencing City Policies

- Downtown Community Plan
- Lower 12th Street Plan
- Queensborough Community Plan
- Queen's Park Neighbourhood Heritage Study
- Waterfront Vision
- Industrial Land Strategy
- Sustainability Report Card

4 Planning Process and Stakeholder Consultation



4.1 Planning Process

A three-stage collaborative process served to co-create a vision and establish priorities to protect and enhance the urban forest.

1. ***Understanding our Current Condition*** – the initial phase of work involved completing an assessment of New Westminster's urban forest. This inventory captured the current level of canopy coverage and baseline data used to develop the Urban Forest Management Strategy. The collection of urban forest data is ongoing and will be an important link in implementing the Strategy and in building community ownership of the urban forest;

2. ***Defining Priorities*** – the phase of work involved stakeholder consultation with the Environment Advisory Committee (EAC), Parks and Recreation Committee (PRC), Council and members of the public as a means to confirm preliminary understanding, develop a shared vision and identify priorities for the Strategy; and,

3. ***Developing the Strategy*** – the final phase of work involved drafting and refinement of the Strategy with City of New Westminster staff, with particular attention given to specific activities related to implementation.

4.2 Stakeholder Consultation

In order to customize best practices in urban forest management to the specific context of New Westminster, the Strategy was developed in consultation with the public and community stakeholders, including the EAC and PRC, and Council. Two open houses and an online survey were used as opportunities for engagement and involved approximately 200 members of the community.

Input from community stakeholders played a critical role in developing and refining the draft urban forest management vision statement and objectives, as well as management targets and priorities.

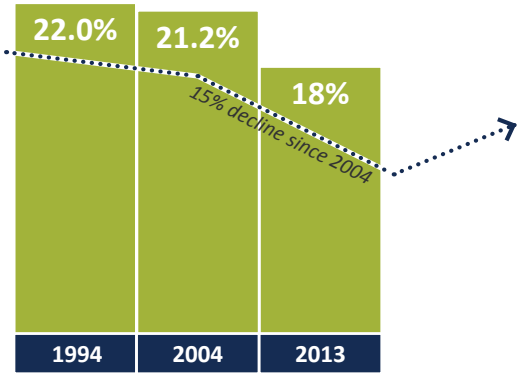
Generally speaking, residents of New Westminster rated biodiversity, naturalness and environmental quality objectives as most important for urban forest management, followed by more human-centric qualities of aesthetics and well-being.

The Strategy considers all urban forest values and provides a framework within which management efforts and implementation can be tailored to emphasize these community priorities. Refer to Appendix A for a complete community consultation summary including Public Open House materials and feedback.

5 Issues & Opportunities for urban forest management

5.1 Canopy decline and urban densification

Canopy cover in New Westminster has been declining, due in large part to clearing of existing forest for development. Satellite imagery between 2004 and 2013 demonstrates that substantial canopy loss has occurred in New Westminster's urban area. While population growth between 2004 and 2012 slowed to ~17% (compared to ~33% population growth between 1994 and 2004), the rate of canopy loss by decade has increased from 4% between 1994 and 2004 to 15% between 2004 and 2013. If the trend in loss of canopy in the private realm continues, then the City's canopy cover could decline to as low as 7% by 2025.



The City can retain and plant more trees while still supporting development and building high quality neighbourhoods. An aspirational canopy cover goal of 40%, which was the preferred target, may eventually be achievable in New Westminster by protecting and creating space for large canopy trees as the City develops; however, within the current 20 year time frame this plan will target an increase in tree canopy to the North American average of 27% by 2035.

Figure 10. Recent-historical canopy decline within the City of New Westminster

5.2 Urban trees in competition with other infrastructure and services

Trees in urban environments compete for space and funding with a variety of infrastructure and services. When poorly planned, tree planting and/or maintenance can result in mature trees in conflict with other infrastructure assets and services. Similarly, other infrastructure and services can conflict with trees if they are not considered in planning and appropriate tree protection is not in place. Collaboration in planning and design are essential to having an urban forest that maximizes benefits to the community and functions in harmony with other infrastructure and services (Figure 11). Several tree management issues relevant to New Westminster are described in the following sections.

Below ground infrastructure: Trees need adequate soil volume to ensure they grow, stay healthy, and have a long lifespan. Some areas of the City (e.g. downtown), have limited soil available for trees. Conflict with below ground infrastructure (e.g. sewer and stormwater pipes) can occur when trees are planted in shared space. For example, the roots of the large locust trees on Columbia and McKenzie have grown quite large and will likely be clogging nearby drains.

By designing with adequate soil volume and passive water infiltration to support the growth of a large canopy tree, future conflicts can be minimized while still providing an attractive streetscape and retail environment. Strategies for minimizing conflicts between tree root and below ground infrastructure are presented in the "Technical Appendices to the Urban Forest Management Strategy", hereafter referred to as the Technical Appendix.

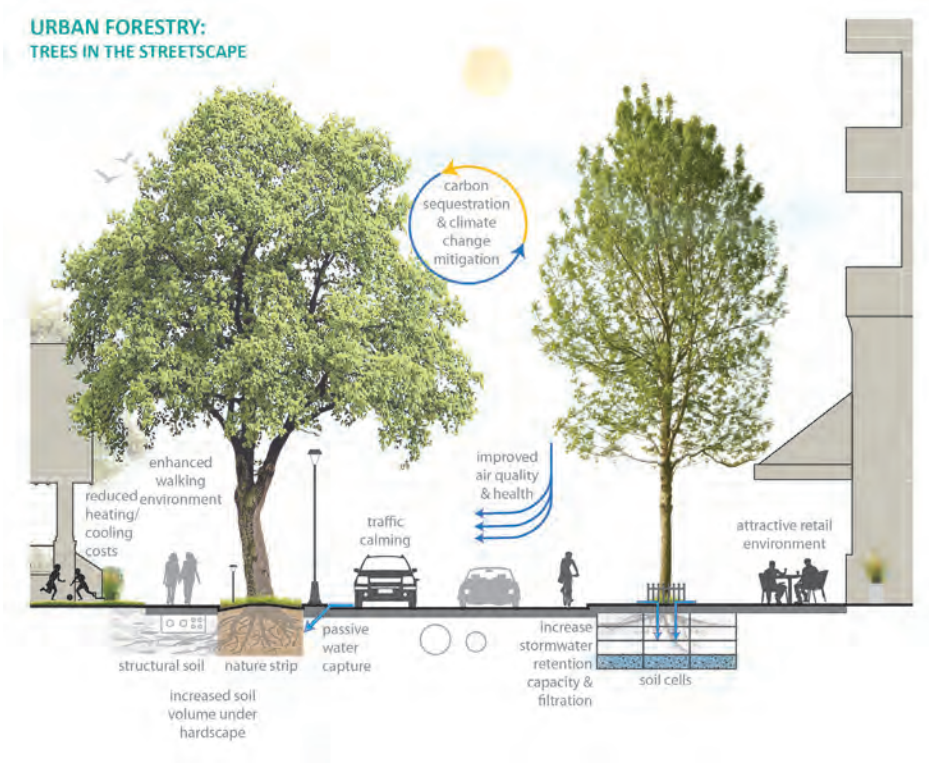


Figure 11. Providing opportunities to increase soil volume and minimise conflicts with infrastructure.

Utility clearance and brushing: Brushing and mowing, and utility clearance are common maintenance activities along roadsides and laneways in New Westminster. Public trees are sometimes damaged during these activities, which can result in injuries that reduce the amenity value of trees and often reduce their longevity.

Applying best practices and improving integration in managing clearance pruning can improve efficiencies in service and costs for both utilities and urban trees. Planting planning can incorporate guidance on tree selection and placement to minimize tree growth into the limits of approach for power lines or other utility clearance limits.

Public tree care and maintenance: Public trees in New Westminster are currently maintained on a block pruning system. There are eight blocks. While the number of public trees that require more intensive management (e.g. regular pruning) is relatively low, the current budget is not sufficient to ensure a healthy, beneficial and aesthetically pleasing tree population in the long term. Increasing the budget allocated to public tree care and maintenance will support maintaining New Westminster's urban forest to industry standards.

The presence of larger trees in yards and as street trees can add from 3% to 15% to home values throughout neighbourhoods[v].

Construction and development: When undertaking construction for development or renewal projects, trees can easily be damaged or killed unless proper tree protection management is in place.

Protection is required for both the above ground portions of the tree and the roots below ground, and protecting healthy existing trees is worth the investment. A single well-placed large tree delivers up to sixteen times the benefit of a small tree, including air quality improvement, stormwater interception, carbon sequestration and building energy cost savings. Medium to large street trees need to live for 40 to 50 years before making returns on their investment. Retaining existing large trees in the landscape is often better than trying to re-establish canopy cover with new trees; because the existing tree is already providing benefits and the costs associated with establishing that large stature tree have already been expended.

The Large Tree Argument

When it comes to trees, size does matter. Large-stature trees are worth the price to plant and care for. Research from the USDA published in 2003[xvi] assessed the average benefits for small, medium and large trees (see the table below). ***On average, a large tree provides 16 times more value to the community over its lifetime than a small tree.***

	Small Tree (< 8 m tall)	Medium Tree (9-11 m tall)	Large Tree (>12 m tall)
Total benefits/year	$23	$33	$55
Total costs/year	$14	$17	$18
Net benefits/year	$9	$16	$37
Life expectancy	30 years	60 years	120 years
Lifetime benefits	$690	$1,980	$6,600
Lifetime costs	$420	$1,020	$2,160
Value to community	$270	$960	$4,440

This research factored in the costs of planting, maintenance, street sweeping, sidewalk repair and legal liability. Planting the right tree in the right place, and creating good planting sites prevents infrastructure conflict. Strategies to minimize potential conflicts between tree roots and infrastructure are discussed in the Technical Appendix.

Based on research into the minimum soil volume needed to grow healthy trees, the following guidelines are provided:

- 0.3-1 m^3 of soil per 1 square metre of canopy projection
- 25-60 m^3 of soil for a medium to large tree

For New Westminster, it is recommended minimum soil volume requirements are provided in the Technical Appendix.

5.3 Changing climate and extreme weather events

Climate change is expected to result in warmer, drier summers and wetter winters for the Greater Vancouver Region (Table 1).

SUMMARY OF CLIMATE CHANGE FOR GREATER VANCOUVER IN THE 2080s			
Climate Variable	**Season**	**Projected Change from 1961-1990 Baseline**	
		Ensemble Median	**Range (10th to 90th percentile)**
Mean Temperature (°C)	Annual	+2.7 °C	+1.5 °C TO +4.1 °C
Percentage (%)	Annual	+8%	+15 to +18%
	Summer	-14%	-37% to-3%
	Winter	+9%	+1% to +23%
Snowfall (%)	Winter	-52%	-74% to-26%
	Spring	-75%	-88% to-21%

Table 1. Summary of Climate Change for Greater Vancouver in the 2080s[xvii]

In addition, extreme weather events are expected to increase in frequency as the climate continues to change[xviii]. Sea level rise coupled with more frequent high intensity rainfall events will increase the risk of flooding in low lying areas.

Modeling for Metro Vancouver indicates that rainfall events that previously occurred every 25 years would instead occur every four years by 2050, and one in 25 year hot day events would instead occur every eight years.

Careful planning, good management and species selection, will produce healthy tree assets that are more robust to the impacts of climate change. The urban forest (and green infrastructure) offers opportunities to help communities adapt to climate change, for instance, by mitigating urban heat island, high rainfall and flood impacts, and by providing shade and cooling.

5.4 Managing water

In a natural forest, rainwater is intercepted by the canopy, then runs down the branches and stem onto the forest floor where it infiltrates into the ground. Surface runoff usually represents 10% or less of the rainfall volume. When land is developed, the extent of impermeable surfaces is increased (i.e., roofs, streets, sidewalks, parking lots and other hard surfaces). Runoff volume increases in direct proportion to impervious area.

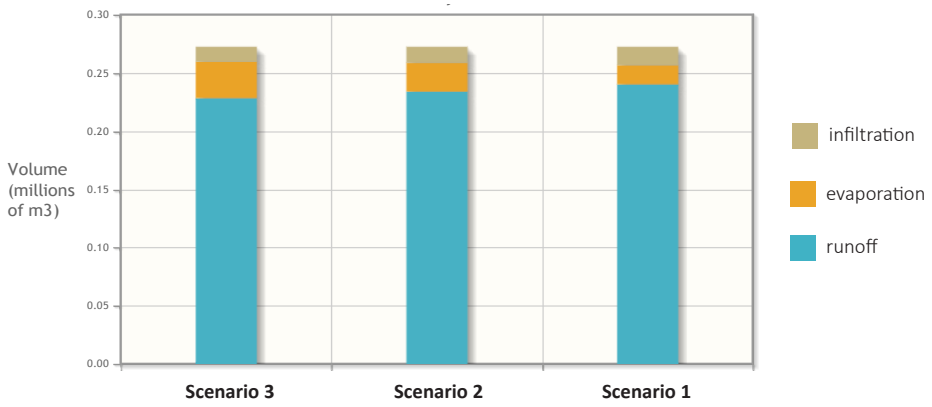
Reducing, slowing and cleaning stormwater discharges naturally improves both ecological and economic outcomes when compared to using only catch basins and pipes for controlling and managing the discharges. The urban forest canopy can be part of an integrated stormwater solution that utilizes both traditional and green drainage infrastructure. Best practices site based stormwater management[xix] reduces the volume of runoff by minimizing impervious area, increasing infiltration to the ground and encouraging evapotranspiration via vegetation and/or long-term storage.



Stormwater Utility Fees

Cities in Canada and abroad are beginning to use stormwater utility fees and credit programs as a means of incenting property owners to manage their rainwater on site. The Minnesota Pollution Control Agency's (USA) Minimum Impact Design Standards (MIDS) provide credit calculations[xx] for tree trenches and tree boxes. Volume credits are given for rainwater infiltration into the soil, interception from the tree canopy and water taken up and evapotranspired by trees. A tool with similar potential in BC is the BC Water Balance Model (***www.waterbalance.ca***). To provide an example of the impact of tree canopy on rainwater discharge, an arterial road typical of New Westminster was modelled in the BC Water Balance Model based on a 0.5 ha catchment area. Total losses represent evaporation and total discharge represents run-off.

Climate Data: Kwantlen Park, Surrey (nearest), Climate change applied to 2080s time slice.



Scenario 1 | Base Case
150 m long, gently sloping (0.2 m/m) street with a 30 m width (consisting of an arterial road, sidewalk each side, grass shoulder).

Scenario 2 | Base Case + Current 12% Canopy Large maples were planted up to 12% canopy cover, with 50% of each canopy over impervious surface.

Scenario 3 | Base Case + 40% Canopy
Large maples were planted up to 40% canopy cover, with 50% of each canopy over impervious surface.

RESULT: *Adding trees alone reduced run-off by 5%* (evapotranspiration is not included in this model). If tree canopy were coupled with surface treatments, such as raingardens or swales, discharge into stormwater would be further reduced. Recommended minimum soil volume requirements are provided in the Technical Appendix.

5.5 Managing natural areas & biodiversity

The City of New Westminster developed on the banks of the Fraser River. Over time, development, industrial activities and population growth have significantly altered the natural landscape. Today, the original old growth forests that once characterized this region are gone. Although the City still retains some natural areas and features, they generally exist in a fragmented, altered state. Despite their altered condition, remaining natural areas are of enormous value to the City, its inhabitants and wildlife.

In 2014, the City completed an ecological inventory of natural, semi-natural and aquatic ecosystems. The inventory found that 15% of the City's land area is natural forest, natural shrub/herb or semi-natural (i.e., gardens, managed grass, urban trees) terrestrial ecosystems.

The largest and most ecologically significant natural areas were identified as the Fraser River foreshore and islands in the Fraser River, the Brunette River corridor, the Glenbrook Ravine and large treed parks. Taken as a whole, these areas form a substantial component of the City's green infrastructure. Focusing management efforts on enhancing and connecting natural areas, streets and greenways, rooftops and pocket greenspaces will improve overall ecological integrity, optimize resources and provide substantially more benefits for both wildlife and the community over the long-term. Enhancement of the urban forest, particularly within the developed urban matrix, can improve connections between natural areas in terms of the canopy layer, surface permeability and, in some areas, understory structure.

Physical features influence social contact among neighbours, and nature plays an important role in creating vital neighbourhood spaces.

6 The Urban Forest Management Strategy

6.1 Community Vision Statement 2035

New Westminster's urban forest is a beautiful and beloved public resource, providing refuge, education and recreation within the City.

Urban trees are carefully planted, protected and maintained to enhance habitat, clean the air, capture carbon, manage stormwater and maximize benefits to our City's environmental health and quality of life.

Great planning and management supports an urban experience of diverse, colourful and comfortable, well-treed streets and boulevards that connect with neighbourhood parks and natural areas.

The City's management policies include measurable objectives, priority actions and regulatory mechanisms, ensuring strategic, efficient and effective coordination between public and private partners.

Homeowners and developers play an increasingly significant role in urban forest enhancement with protection and planting on private lands.

Community members of all walks of life care for the urban forest as a shared priority and defining feature of what makes New Westminster such a great place to live.

The vision[xxi] for the Urban Forest Management Strategy is a statement of reflective agency, developed in collaboration with City staff, Environmental Advisory Committee, Parks and Recreation Committee and members and the Public. The vision is value-based, guides decision-making and promotes intervention towards a preferred outcome.

6.2 Principles and Priorities

The following principles for Urban Forest Management Strategy were consolidated from the aspirational goals of the New Westminster's Official Community Plan (Bylaw 7435, 2011- Section 1.6):

- **Uniqueness** (history, location, character and identity);
- **Livability, Health and Safety** (aesthetic values and quality of life);
- **Smart (Good) Growth** (balanced and sustainable, towards a complete community);
- **Effectiveness and Efficiency** (well-managed systems and governance);
- **Diversity and Accessibility** (socio-economic opportunity and community-driven); and,
- **Quality** (neighbourhoods, civic amenities and natural environment).

The above principles are reflected in the guiding vision for urban forest management in New Westminster and inform the development of goals, objectives and management actions, as well as the assessment criteria used to measure progress over time. Priorities for urban forest management in New Westminster—established based on public consultation outcomes and review of background policies and best management practices—focus on tree protection, maintenance, tree planting, and education and engagement to maintain and enhance urban forest values related to environmental quality, naturalness and biodiversity, social and recreation opportunities and aesthetics.



6.3 Goals and Objectives of the Strategy

Three overarching goals and nine key objectives emerged as part of the Strategy's development[xxii] and these form the driving the future implementation of this plan. Broad in scope and scale, the goals of the Strategy are further detailed within more specific objectives to guide priority actions towards measurable targets.

1. **PROTECT** New Westminster's urban forest and its benefits to our community by:
   - Increasing canopy cover to 27% city-wide.
   - Introducing a tree bylaw to protect existing canopy cover.
   - Adapting the urban forest population, and the City, to a changing climate.

2. **ENHANCE** all aspects of the urban forest and its management within New Westminster by:
   - Updating policy, guidelines and best management practices to support urban forest enhancement.
   - Enhancing the tree care program by increasing resourcing and information management system capability.
   - Improving urban forest diversity by planting no more than 10% of any species, 20% of any genus and 30% of any family.
   - Improving environmental health by establishing goals for Environmentally Sensitive Areas and complementary naturescaping guidelines for adjacent lands.

3. **ENGAGE** all community stakeholders involving issues related to urban forest management by:
   - Developing an urban forest stewardship program to build community ownership of the urban forest, and;
   - Working with departments internally to improve integration of trees and green infrastructure into integrated stormwater management, greenhouse gas and air quality management, and to improve long-term tree health outcomes.



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6.4 Measureable Actions and Priority Recommendations

Urban Forest management objectives are measured against the indicator table shown below. Individual indicators are developed as relative measures of success in accordance with best practices in urban forest management.

The summary "dashboard" (at right) illustrates the baseline condition of New Westminster's urban forest management capacity at the time of this report. Priority actions (detailed in Section 6.5) highlight the means by which to improve performance as measured against overall management objectives and performance indicators.

Management Objectives and Measures of Success	Low	Moderate	Good	Optimal
A. INCREASE CANOPY COVER TO 27% CITYWIDE BY 2035				
Relative canopy cover performance	○	●	○	○
Tree establishment planning and implementation	○	●	○	○
Tree standards for development and streetscape outcomes	○	●	○	○
Planting the largest tree suitable for the site	○	●	○	○
B. PROTECT EXISTING CANOPY COVER				
Tree protection, policy development and enforcement	●	○	○	○
Canopy cover inventory	○	○	●	○
Public agency (internal & external) cooperation	○	○	●	○
Recognition of green infrastructure asset value	○	●	○	○
C. ADAPT THE URBAN FOREST POPULATION TO A CHANGING CLIMATE				
Species suitability	○	○	●	○
Storm response	●	○	○	○
Pest and Disease Management	○	○	●	○
D. ENHANCE THE TREE CARE PROGRAM				
Tree inventory	○	●	○	○
GIS asset management system integration	●	○	○	○
Tree risk management	○	●	○	○
Maintenance of publicly-owned trees	○	○	●	○
E. IMPROVE URBAN FOREST DIVERSITY				
Species distribution	○	●	○	○
Useful life expectancy distribution	○	○	●	○
Native vegetation	○	●	○	○
F. STRENGTHEN ECOLOGICAL HEALTH AND BIODIVERSITY WITHIN THE MUNICIPALITY				
Publicly-owned natural areas planning	○	●	○	○
Publicly owned natural areas inventory	○	○	○	●
Invasive species	○	●	○	○
G. MANAGE THE URBAN FOREST TO REDUCE GREENHOUSE GAS AND IMPROVE AIR QUALITY				
Building energy efficiency and air quality improvement	●	○	○	○
Waste biomass utilization	○	○	○	●
Corporate emissions and carbon neutrality	○	●	○	○
H. INTEGRATE THE URBAN FOREST INTO WATERSHED, STORMWATER AND FLOOD MANAGEMENT				
Permeability of surfaces for water infiltration	○	●	○	○
Passive and active water capture for vegetation	●	○	○	○
Green infrastructure for stormwater management	●	○	○	○
I. FOSTER LOCAL PARTNERSHIPS TO BUILD COMMUNITY OWNERSHIP OF THE URBAN FOREST MANAGEMENT PLAN				
Community action	○	●	○	○
Involvement of large private land and institutional land holders	●	○	○	○
Development community cooperation	●	○	○	○
Municipality-business interaction	●	○	○	○
General awareness of trees as a community resource	○	●	○	○

6.5 Objectives, Targets and Performance Indicators

OBJECTIVES A: INCREASE CANOPY COVER TO 27% BY 2035

TARGET: Plant 8500 new trees on public land and 3300 new trees on private land to increase canopy cover City-wide to 27% by 2035.

ACTIONS 1 - 5 YEARS

Action 1. To achieve a canopy cover target of 27% by 2035:

- Plant approximately 2200 new trees on City-owned park and civic lands to achieve a canopy cover of 45% by 2035.
- Plant approximately 6300 new trees in roads and boulevards to achieve a canopy cover of 32% by 2035.
- Work with residents to plant approximately 3300 new trees on private land to achieve a canopy cover of 22% by 2035.

Action 2. Establish canopy/planting targets for each park type and develop neighbourhood planting strategies to address succession, planting constraints and opportunities.

Action 3. Develop street tree guidelines for internal use that define planting standards, soil volume standards and tree protection for capital projects. It is recommended that a minimum soil volume requirement of 30 m^3 for medium to large trees be adopted with a target of providing 0.3 m^3 to 1 m^3 of soil per square metre of expected canopy projection. When trees are sharing soil volume, 20 m^3 per medium-large tree is acceptable.

Action 4. Identify and prioritize public realm opportunities to build new or retrofit green infrastructure develop green infrastructure (i.e. raingardens) standards for streetscapes.

Action 5. Establish programs to support tree planting, including: a 'Neighbourwoods' program to subsidize appropriate trees for residents to plant on private property; and encourage an 'Adopt a Tree' program for public property.

Action 6. Follow best management practices for tree planting based on International Society of Arboriculture's (ISA's) Best Management Practices Series – Tree Planting.

ACTIONS 6 - 7 YEARS

Action 7. Create opportunities to establish more trees in the urban environment and improve plantable space as part of the infrastructure renewal process.

PERFORMANCE INDICATORS (2015 STATUS HIGHLIGHTED IN BOLD):

	Low	Moderate	Good	Optimal
Relative canopy cover performance	Existing canopy cover equals 0%-50% of the target.	**Existing canopy cover equals 51%-70% of the target.**	Existing canopy cover equals 71%-90% of the target.	Existing canopy cover equals 91%-100% of the target (if no net canopy loss is target chosen)
Tree establishment planning and implementation	Tree establishment is ad hoc.	**Tree establishment occurs on an annual basis.**	Tree establishment is directed by needs derived from a tree inventory and opportunities assessment.	Tree establishment is directed by needs derived from a tree inventory and opportunities assessment and is sufficient to meet canopy cover objectives.
Tree standards for development and streetscape outcomes	No tree related guidelines, specifications and standards.	**Guidelines, specifications and standards not adequate to meet canopy cover goals or exist but are not adhered to.**	Guidelines, specifications and standards adequate to meet canopy cover goals and often adhered to in plans and projects.	Guidelines, specifications and standards adequate to meet canopy cover goals and always adhered to for plans and projects.
Planting the largest tree suitable for the site	Trees planted without consideration of the site conditions.	**Tree species are considered in planting site selection.**	Community-wide guidelines are in place for the improvement of planting sites and the selection of suitable species.	The largest trees suitable for the sites are planted. All trees planted in sites with adequate soil quality and quantity, and growing space to achieve their genetic potential.

OBJECTIVE B: INCREASE CANOPY COVER TO 27% BY 2035

TARGET: A tree protection and replacement bylaw is in place to protect trees on public and private land, including heritage/significant trees.

ACTIONS 1 - 5 YEARS

Action 8 Finalize, adopt and enforce bylaws to protect the trees on private land, including Tree Protection, Replacement and Removal and Soil Preservation.

Action 9 Reinforce canopy cover targets within OCP policy and Development Permit Area guidelines.

Action 10 Update the Development Permit Area guidelines and Zoning bylaw to include policy and best management practices to support protection of the urban forest including:

- Update the zoning bylaw to require permeability targets by zoning.
- Develop strategic tree selection and replacement criteria to increase building energy efficiency and improve air quality. Amend Development Permit Area Guidelines to include these criteria.
- Update Development Permit Area guidelines to include considerations for passive and active water capture from hard surfaces for the maintenance of vegetated landscapes.
- Update Development Permit Guidelines to include soil volume guidelines to meet canopy cover targets. Require conceptual landscape plans to indicate soil volume on site. Plans should be reviewed to ensure that resulting soil conditions will support tree growth where planting is indicated. It is recommended that a minimum soil volume requirement of 30 m^3 for medium to large trees be adopted with a target of providing 0.3 m^3 to 1 m^3 of soil per square metre of expected canopy projection. When trees are sharing soil volume, 20 m^3 per tree is acceptable.

Action 11 Work with Engineering to establish 'Green Infrastructure' policy as a means to:

- Develop green infrastructure guidelines;
- Provide technical expertise for the integration of trees and green infrastructure into City programs, facilities, streetscapes and infrastructure, and;
- Provide technical expertise for the integration of passive and active water capture for the maintenance of vegetated landscapes (parks and streetscapes).

ACTIONS 6 - 10 YEARS

Action 12 Update canopy cover inventory every five years.

Action 13. Add canopy cover and green infrastructure spatial data into the corporate asset management system and, when possible, quantify the value of services they deliver, the cost of maintenance and their appreciating value over time using available tools (e.g., iTree Eco).

PERFORMANCE INDICATORS (2015 STATUS HIGHLIGHTED IN BOLD):

	Low	Moderate	Good	Optimal
Tree protection, policy development and enforcement	No or very limited tree protection policy.	Policies in place to protect public and private trees without enforcement.	Policies in place to protect public and private trees with enforcement.	Integrated municipal-wide policies that ensure the protection of trees on public and private land are consistently enforced and supported by significant deterrents.
Canopy cover inventory	No inventory.	**Visual assessment.**	**Sampling of tree cover using aerial photographs or satellite imagery.**	Capture of tree cover by polygons in GIS using aerial photographs or satellite imagery.
Public agency (internal & external) cooperation	Conflicting goals among departments and/or agencies.	**Common goals but limited cooperation among departments and/or agencies.**	**Informal teams among departments and/or agencies are functioning and implementing common goals on a project-specific basis.**	Municipal tree protection policy implemented by formal interdepartmental/ interagency working agreements on all municipal projects.
Recognition of green infrastructure asset value	No recognition of value of natural forms and functions within local government.	**Local government recognizes the value of natural forms and functions but does not have adequate information to protect or enhance green infrastructure.**	Local government recognizes the value of natural forms and functions and has inventoried green infrastructure within an asset management system.	Local government recognizes and accounts for the value of natural forms and functions within an asset management system, and invests in green infrastructure protection and enhancement.

OBJECTIVE C: ADAPT THE URBAN FOREST POPULATION, AND THE CITY, TO A CHANGING CLIMATE

TARGET: By 2035, 100% of managed (park and street) tree species are suitable for local climate and site water conditions.

ACTIONS 6 - 10 YEARS

Action 14. Develop a storm response plan to define the process for emergency tree risk assessment and tree removal associated with storm events.

Action 15. Continue to mine tree removal data to identify any patterns that indicate repetitive site or species performance issues and correct them.

Action 16. Develop and IPM plan and liaise with CFIA to identify emerging forest pests of concern. Map locations at 'high risk' for emerging forest pests of concern based on species composition and age. Incorporate best management practices based on the ISA's Best Management Practices Series – Integrated Pest Management.



PERFORMANCE INDICATORS (2015 STATUS HIGHLIGHTED IN BOLD):

	Low	Moderate	Good	Optimal
Species suitability	Less than 50% of trees are of species considered suitable for the site and broader area.	50% to 75% of trees are of species considered suitable for the site and broader area.	**More than 75% of trees are of species considered suitable for the site and broader area.**	All trees are of species considered suitable for the site and broader area.
Storm response	**Response plan is based on visual assessment and call-out requests.**	A call-out procedure, roles and responsibilities, and criteria for prioritizing tree hazards and removing debris is in place.	A comprehensive action plan for responding to storm damage in the urban forest is in place.	A comprehensive action plan for responding to storm damage in the urban forest is in place and a response drill occurs periodically.
Pest and Disease Management	No integrated pest management (IPM) plan and no pest management.	No IPM plan and reactive pest management.	**No IPM plan but IPM is practiced and the City liaises with the CFIA to manage emerging threats.**	An IPM plan is in place and implemented, and the City liaises with the CFIA to manage emerging threats.

OBJECTIVE D: ENHANCE THE TREE CARE PROGRAM

TARGET: Park and street trees are incorporated into the City's spatial asset management system and trees are maintained according to best management practices.

ACTIONS 1 - 5 YEARS

Action 17. Implement a zoned tree maintenance program consisting of:

- Structural pruning of young trees 2, 4 and 7 years after planting.
- A pruning cycle of 7 years for all street trees, and park trees with constant target occupancy.
- A pruning cycle of 12 years for park trees with frequent or occasional target occupancy.

Action 18. Develop and implement a legally approved tree risk management policy based on Urban Tree Risk Management: A Community Guide to Program Design and Implementation[xxiii].

Action 19. Incorporate ISA best practices (inventory, pruning, risk assessment, planting) into contract language for tree work performed on public trees.

Action 20. Procure GIS-based mobile data collection technology that will enable continuous update (concurrent with the maintenance cycle) and improvement of the urban forest inventory within the corporate asset management system and, when possible, quantify the value of services they deliver, the cost of maintenance and their appreciating value over time.

Action 21. Implement a summer municipal tree watering program to water trees weekly in the first two years following planting, and to provide supplemental water to trees showing signs of drought stress.

Action 22. Follow best management practices for tree care based on ISA's Best Management Practices Series for tree inventories, tree pruning and tree risk assessment and strive to achieve ANSI A300 industry standards.

PERFORMANCE INDICATORS (2015 STATUS HIGHLIGHTED IN BOLD):

	Low	Moderate	Good	Optimal
Tree inventory	No inventory.	**Partial inventory of publicly-owned trees in GIS.**	Complete inventory of street trees and intensively managed park trees in GIS.	Complete inventory of publicly-owned trees including natural areas (polygons) and significant private trees (if protected) in GIS.
GIS asset management system integration	**No or limited integration.**	Street trees and intensively managed park trees in citywide asset management system.	Street trees and intensively managed park trees in citywide asset management system with values and costs accounted for.	Green infrastructure in citywide asset management system with values and costs accounted for.
Tree risk management	Request based/ reactive system. No formal risk management policy. The condition of the urban forest is largely unknown.	**Areas within the city are prioritized for assessment. No formal risk management policy.**	Formal risk management policy is in place and risk management program partially implemented.	Formal risk management policy in place and risk management program fully implemented.
Maintenance of publicly-owned, intensively managed trees	Publicly-owned trees are maintained on a request/ reactive basis. No systematic (block) pruning.	Publicly-owned trees are maintained on a request/reactive basis. No systematic (block) pruning. All immature trees are structurally pruned.	**All publicly-owned trees are systematically maintained on a cycle determined by workload and resource limitations. All immature trees are structurally pruned.**	All mature publicly-owned trees are maintained on an optimal pruning cycle. All immature trees are structurally pruned.

OBJECTIVE E: IMPROVE URBAN FOREST DIVERSITY

TARGET: The street and park tree population (excluding areas managed as native forest) is managed to meet optimal diversity measures.

ACTIONS 1 - 5 YEARS

Action 23. Ensure that new plantings in streets and parks (excluding areas managed as native forest) target no more than 10% of any species, 20% of any genus and 30% of any family at both the Citywide and neighbourhood levels.

Action 24. Spatially define the areas across the City where the use of native vegetation is to be prioritized and promote naturescaping.

Action 25. Assess the street trees that are within the zoned maintenance program for Useful Life Expectancy (see the Technical Appendix) to help manage age distribution and successional planting.



PERFORMANCE INDICATORS (2015 STATUS HIGHLIGHTED IN BOLD):

	Low	Moderate	Good	Optimal
Species distribution excluding areas managed as native forest	Fewer than five species dominate the entire planted tree population citywide.	**No species represents more than 20% of the entire planted tree population citywide.**	No more than 10% of any species, 20% of any genus and 30% of any family within the entire planted tree population Citywide.	No more than 10% of any species, 20% of any genus and 30% of any family in the planted tree population at both the Citywide and neighbourhood levels.
Useful life expectancy[7] (ULE) distribution of street and intensively managed park trees in the community	Any ULE class deviates more than 30% from optimal.	Any ULE class deviates more than 20% from optimal.	**Any ULE class deviates more than 10% from optimal.**	60 % with a ULE of > 30 years, 30% with a ULE of 10- 30 years, and 10% with a ULE of < 10 years.
Native vegetation	Voluntary use of native species on publicly and privately-owned lands.	**The use of native species is encouraged on a project-appropriate basis in public intensively and extensively managed areas.**	The use of native species is required on a project-appropriate basis in public intensively and extensively managed areas.	The use of native species is required on a project-appropriate basis in both public and private intensively and extensively managed areas.

[7] The ULE is an estimate of how long a tree is likely to be viable in the landscape based on health, amenity, environmental services contribution and risk to the community. The methodology is provided the technical appendix to the Urban Forest Management Strategy.

OBJECTIVE F: STRENGTHEN ECOLOGICAL HEALTH AND BIODIVERSITY WITHIN THE MUNICIPALITY

***TARGET**: The urban forest is developed within the context of a strategically planned green infrastructure network to support local and regional biodiversity.*

ACTIONS 1 - 5 YEARS

Action 26. Establish management goals for ESAs (Environmentally Sensitive Areas) by land status.

Action 27. Within areas defined as a priority for planting native vegetation plan and fund naturescaping on public lands to support and enhance biodiversity, and to demonstrate best practices for naturescaping to private landowners.

Action 28. Develop a native tree and plant list for use within areas defined as a priority for planting native vegetation and to serve as a resource for private landowners, and include guidance for landscaping when planting close to structures.



PERFORMANCE INDICATORS (2015 STATUS HIGHLIGHTED IN BOLD):

	Low	Moderate	Good	Optimal
Publicly-owned natural areas management planning and implementation	No biodiversity strategy or implementation is in effect.	**Reactionary stewardship in effect to facilitate public use (e.g. hazard abatement, invasive species management, trail maintenance).**	Area specific management plans in effect focused on management, protection and restoration each ecosystem type or feature.	Biodiversity strategy, or similar vehicle, in effect to manage, restore and protect an existing and future green infrastructure network throughout the municipality.
Publicly owned natural areas inventory (trees managed extensive; e.g. woodlands, ravine lands, etc.)	No or little information about publicly owned natural areas.	Publicly owned natural areas identified with defined ownership and/or management responsibility.	Publicly owned natural areas identified and mapped in GIS with defined ownership and/or management responsibility.	**Publicly owned natural areas and green infrastructure are captured within a GIS based 'Ecological Inventory' that classifies ecosystem types, habitat features, ownership and/or management responsibility is defined.**
Invasive species	No information and no management plan.	**Invasive species are recognized and controlled on an ad hoc basis.**	An invasive species management plan is in place.	An invasive species management plan is in place and fully implemented.

OBJECTIVE G: MANAGE THE URBAN FOREST TO REDUCE GREENHOUSE GAS EMISSIONS AND IMPROVE AIR QUALITY

TARGET: Strategic tree selection and placement criteria are incorporated into Development Permit Area Guidelines to increase building energy efficiency and to improve air quality.

ACTIONS 1 - 5 YEARS

Action 29. Continue to compost and mulch, up-cycling, or re-use of woody debris generated during urban forest management activities.

ACTIONS 11 - 20 YEARS

Action 30. Consider climate adaptations strategies when prioritizing land acquisitions. For example, consider the purchase or retention of pervious land for storm buffers, flood mitigation, air quality improvement, urban heat island mitigation etc. Encourage the Province and the Union of BC Municipalities to embrace carbon stewardship and to provide options for local governments to officially tally the purchase of treed ecosystems towards their carbon neutral Climate Action Charter commitments.



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PERFORMANCE INDICATORS (2015 STATUS HIGHLIGHTED IN BOLD):

	Low	Moderate	Good	Optimal
Building energy efficiency and air quality improvement	**Landscapes planted without consideration of the location for building energy efficiency and air quality improvement.**	Energy Conservation Development Permit Area Guidelines or equivalent incorporate tree and landscape considerations for building energy efficiency and air quality improvement.	Energy Conservation DPA Guidelines or equivalent incorporating tree and landscape considerations are implemented and value is quantified.	Energy Conservation DPA Guidelines or equivalent incorporating tree and landscape considerations are implemented and design outcomes are 3rd party certified.
Waste biomass utilization.	Waste from the urban forest is not utilized.	Waste from the urban forest is measured and tracked over time.	Business case made to Council for utilization of woody waste.	**Waste wood from the urban forest is utilized to meet existing demand.**
Corporate emissions and carbon neutrality	Carbon storage and GHG emissions reductions by city trees not measured and tracked over time.	**Carbon storage and GHG emissions reductions by city trees is measured and tracked over time but is not reported on in community climate initiatives[8].**	Carbon storage and GHG emissions reductions by city trees is measured and tracked over time and reported on in community climate initiatives.	Carbon storage and GHG emissions reductions by city trees is measured and tracked over time and reported on in community climate initiatives, and is recognized as contributing to Climate Action Charter commitments.

8 Community climate initiatives refer to examples such as reporting on the Corporate Energy and Greenhouse Gas Emissions Reduction Plan, and on carbon neutrality.

OBJECTIVE H: INTEGRATE THE URBAN FOREST INTO WATERSHED, STORMWATER AND FLOOD MANAGEMENT

Target: Urban forest canopy and green infrastructure are incorporated into new developments to meet DFO/MOE Stormwater Criteria and meet effective impervious area targets.

ACTIONS 1 - 5 YEARS

Action 31. Work with Engineering to:

- Ensure Integrated Stormwater Management Plan (ISMP) pilot project design options to maximize tree canopy, including considerations of below ground soil volume to support mature, healthy trees and enhance stormwater mitigation.
- Incorporate the effect of tree canopy and other green infrastructure interventions into ISMP stormwater interception and flooding analysis, and compare costs associated with traditional stormwater systems to manage that same volume.



PERFORMANCE INDICATORS (2015 STATUS HIGHLIGHTED IN BOLD):

	Low	Moderate	Good	Optimal
Permeability of surfaces for water infiltration	Permeability of surfaces is not factored into watershed, stormwater and flood management planning initiatives.	**Extent of impermeable surface is known and the benefit of increasing permeability is recognized in local government planning documents.**	Extent of impermeable surface is known, DPA Guidelines incorporate permeability considerations; cost/benefit are quantified in an asset management system.	Permeability targets are established in the Zoning Bylaw and Official Community Plan respectively, and cost/benefit is quantified in an asset management system.
Passive and active water capture for vegetation	**Passive and active water capture are not intentionally designed into vegetated landscapes.**	DPA Guidelines incorporate passive and active water capture considerations for vegetated landscapes.	DPA Guidelines incorporate passive and active water capture considerations for vegetated landscapes, and the value of avoided wastewater treatment and irrigation costs is quantified in an asset management system.	DPA Guidelines incorporate passive and active water capture considerations for vegetated landscapes, assets are captured in the asset management system, and design outcomes are certified by a nationally recognized certification program.
Green infrastructure, including tree canopy, designed for stormwater management	**Tree canopy and/or green infrastructure is not managed or accounted for as wastewater management assets.**	DPA Guidelines incorporate considerations for tree canopy and/or green infrastructure stormwater management.	DPA Guidelines incorporate considerations for tree canopy and/or green infrastructure stormwater management; value of avoided cost is quantified w/in asset management system.	DPA Guidelines incorporate considerations for tree canopy and/or green infrastructure stormwater management; assets are captured in an asset management system; outcomes are 3rd party certified.

OBJECTIVES I: FOSTER LOCAL PARTNERSHIPS TO BUILD COMMUNITY OWNERSHIP OF THE URBAN FOREST MANAGEMENT STRATEGY

Target: The City has an urban forest stewardship program that provides education and partnership opportunities to a broad range of stakeholders and fosters ownership of the urban forest.

ACTIONS 1 - 5 YEARS

Action 32. Establish common goals to implement tree protection policy and urban forest strategy interdepartmentally.

Action 33. Use co-op and work experience partnerships to expand field data and update the baseline inventory using both secondary as well as post-secondary education institutes.

Action 34. Develop and fund an Urban Forest Stewardship Program, coordinated through a City staff position, that:

- Defines partners and their role (e.g., Fraser River Estuary Management Program, Downtown BIA) and links to partner contact information.
- Coordinates a 'Neighbourwoods' program to supply appropriate trees to private and institutional landowners through local nurseries and supports an 'Adopt a Tree' program where individuals or businesses can provide funds for the planting and maintenance of a City tree.
- Identifies and establishes strategic partnerships with community groups, private enterprise, and local government to co-fund and resource urban forestry projects.
- Explores partnership opportunities with School District No 40 and other institutional land owners to increase canopy coverage through tree planting programs.
- Develops an online profile for the urban forest through the City's website and social media to provide links to urban forest benefit calculators, share city urban forest data, provide regular updates about City and partner urban forest activities and opportunities for participation.
- Posts public signage, and sends out educational materials related to urban forest benefits in areas where tree vandalism is occurring.
- Develops and sends out information about trees and associated benefits to residents when a new tree is planted in front of their house.
- Coordinates a Significant/Heritage Tree Register with partners (refer to the Technical Appendix).
- Develops a 'Citizen Urban Forester' program for the community to participate in urban forest management, with support from partners. For example, Citizen Urban Foresters could be trained in proper tree planting and formative pruning to lead volunteers in annual projects for parks and ESA or native vegetation planting, and potentially to support young tree maintenance.
- Develops a 'Neighbourhood Urban Forest Watch' pilot program for the community to identify and participate in cleanup of yard waste dumping in urban greenbelts.

Action 35. Make the urban forest inventory available to the public online in a format that displays ecosystem service benefits, enables people to add trees to the inventory, and permits people to submit information about trees in the City.

ACTIONS 6 - 10 YEARS

Action 36. Work with BIAs to obtain grants (e.g., TD Green Streets Innovative Community Forestry Projects), plan and construct urban forestry projects within the BIA.

Action 37. Consider starting an annual or semi-annual "bioblitz"[9] event as a platform to raise awareness around ecosystem services, carbon stewardship and biodiversity.

PERFORMANCE INDICATORS (2015 STATUS HIGHLIGHTED IN BOLD):

	Low	Moderate	Good	Optimal
Community action	No organized community action.	Isolated or limited number of active groups and locations with intermittent activities.	Community group's partner in urban forest management but involvement is ad hoc.	Community groups partner in urban forest management and formal agreements are in place.
Involvement of large private land and institutional land holders	Low or no understanding of issues	Educational materials and advice available to landholders.	Clear goals for tree resource by landholders. Incentives for preservation of private trees.	Landholders develop vegetation resource management plans (including funding).
Development community cooperation	Limited understanding or support for city-wide goals and objectives.	Understanding of city-wide goals/ objectives with limited appreciation of the role/value of the urban forest and GI.	Some sectors of the development community supporting goals of the UFMS; value added by GI is often reflected in built outcomes.	The development community supports the goals of the UFMS; value added by green infrastructure is always reflected in design and built outcomes.
Municipality-business interaction	Limited understanding or support for city-wide goals and objectives.	Understanding of city-wide goals/ objectives with limited appreciation of the role/value of the urban forest and GI.	BIAs understand and support urban forest management in their neighbourhoods.	BIAs partner in urban forest management to fund urban forest projects at the neighbourhood level.
General awareness of trees as a community resource	Trees seen as important to the community but a drain on budgets.	Trees acknowledged as providing environmental, social, and economic services.	The general public understands the role of the urban forest.	The general public understands the role of the urban forest and advocates for protecting and enhancing the value it provides to the City.

9 Bioblitz: an intense period of biological surveying in an attempt to record all the living species within a designated area.

7 Implementation framework

7.1 Priority actions

Tree Planting and Maintenance

1. To achieve a canopy cover target of 27% by 2035:
   a. Plant 425 trees per year on City-owned park, boulevards and civic land until 2035.
   b. Work with residents to plant 165 trees per year on private land until 2035.

2. Establish programs to support tree planting, including:
   a 'Neighbourwoods' program to subsidize appropriate trees for residents to plant on private property; and encourage an 'Adopt a Tree' program for public property.

3. Develop and implement a legally approved tree risk management policy based on Urban Tree Risk Management: A Community Guide to Program Design and Implementation[xxiii].

4. Implement a summer young tree watering program and a zoned tree maintenance program consisting of:
   a. Structural pruning of young trees 2, 4 and 7 years after planting.
   b. A pruning cycle of 7 years for all street trees, and park trees with constant target occupancy.
   c. A pruning cycle of 12 years for park trees with frequent or occasional target occupancy.

Tree Protection, Policy and Best Management Practices

5. Reinforce canopy cover targets within OCP policy and development permit guidelines.

6. Work with Engineering to integrate the goals of the Strategy within the city-wide Integrated Stormwater Management Plan (ISMP) :
   a. Ensure pilot project design options: maximize tree canopy; consider below-ground soil volume to support mature, healthy trees; and enhance stormwater mitigation.
   b. Incorporate the effect of tree canopy and other green infrastructure interventions into ISMP stormwater interception and flooding analysis, and compare costs associated with traditional stormwater systems to manage that same volume.

7. Update the Development Permit Area guidelines and Zoning bylaw to include policy and best management practices to support protection of the urban forest including:
   a. Update the zoning bylaw to require permeability targets by zoning.
   b. Develop strategic tree selection and replacement criteria to increase building energy efficiency and improve air quality. Amend Development Permit Area Guidelines to include these criteria.
   c. Update Development Permit Area guidelines to include considerations for passive and active water capture from hard surfaces for the maintenance of vegetated landscapes.
   d. Update Development Permit Area guidelines to include soil volume guidelines to support tree growth to meet canopy cover targets. Require conceptual landscape plans to indicate soil volume on site. Plans should be reviewed to ensure that resulting soil conditions will support tree growth where planting is indicated. It is recommended that a minimum soil volume requirement of 30 m^3 for medium to large trees be adopted with a target of providing 0.3 m^3 to 1 m^3 of soil per square metre of expected canopy projection. When trees are sharing soil volume, 20 m^3 per tree is acceptable.

8. Develop companion policy including:
   a. Establish common goals to implement tree protection policy and urban forest strategy interdepartmentally;
   b. develop street tree guidelines for internal use that define planting standards, soil volume standards and tree protection for capital projects;
   c. Identify and prioritize public realm opportunities to build new or retrofit green infrastructure develop green infrastructure (i.e. raingardens) standards for streetscapes;
   d. Create opportunities to establish more trees in the urban environment and improve plantable space as part of the infrastructure renewal process;
   e. Establish management goals for ESAs (Environmentally Sensitive Areas) by land status;
   f. Spatially define the areas across the City where the use of native vegetation is to be prioritized and promote naturescaping; and,
   g. Establish canopy/planting targets for each park type and develop neighbourhood planting strategies to address succession, planting constraints and opportunities.

9. Finalize, adopt and enforce bylaws to protect the urban forest, including Tree Protection, Replacement and Removal and Soil Preservation.

Staff Capacity, Defined Roles and Integrated Mandate

10. Work with Engineering to establish 'Green Infrastructure' policy as a means to:
    a. Develop green infrastructure guidelines;
    b. Provide technical expertise for the integration of trees and green infrastructure into City programs, facilities, streetscapes and infrastructure; and,
    c. Provide technical expertise for the integration of passive and active water capture for the maintenance of vegetated landscapes (parks and streetscapes).

Information and Management Systems

11. Update and/or develop information systems within a corporate asset management framework to measure urban forest management targets every five years, including inventory of location, quantity or extent, useful life expectancy and, when possible, costs and value of trees and green infrastructure (e.g., constructed wetlands, green roofs, green walls, and raingardens).

Communications and Awareness

12. Develop and fund an Urban Forest Stewardship Program.

7.2 Monitoring and review

Progress over time should be measured against the performance indicators, and ultimately the targets established for each objective. In general, it is recommended that progress against the performance indicators be assessed at 5 year intervals and that the management actions resulting from the Strategy be reviewed and modified to improve assumptions and achieve targets (e.g., increase or decrease number for planting program based on actual canopy area changes observed). This 5-yearly review should be recorded as a brief 'interim update' attachment to the Strategy to summarise any revisions to actions.

Four quantitative metrics will require periodic data collection in order to assess performance indicators:

1) Percent canopy cover (update in 2020, 2025, 2030, 2035)
2) Number of trees planted per year (assess annually)
3) Percent in each species, genus and family (update in 2020, 2025, 2030, 2035)
4) Percent in each ULE class (measure in 2035)

ADAPTIVE MANAGEMENT RECOMMENDATION:

Action 38. Measure urban forest progress against performance indicators and prepare an 'interim update' to the Strategy at 5 year intervals to reflect progress and changes to management actions.



7.3 Funding and resourcing 2015-2020

Two main funding sources are proposed for consideration to cover implementation of the plan. These funding sources consist of:

1. 20 year **Urban Forest Parcel Tax** estimated at approximately $10 per year (assuming 20,000 parcels) increasing at approximately 6% per year to allow for ongoing maintenance (excluding inflation). Beyond 20 years, maintenance and replacement costs would be ongoing but the rate of new planting would be substantially lower thus reducing annual program costs.

2. Development contributions paid into the General Amenity Fund and tracked for urban forest spending, or a dedicated **'Green Fund'**. Contributions would be driven through the bylaw and triggered:

    - Where public trees are approved for removal for the purposes of development, the Development Permit Applicant to pay for the replacement costs for public trees removed for development, including an amenity value as assessed by the Council of Tree and Landscape Appraisers (CTLA) method or alternative approved by Council.
    - If approved landscape plan proposes fewer replacement trees than required, then funds in-lieu of replacements should be provided at $350 per tree.

Consideration of additional funding sources to supplement the program should include:

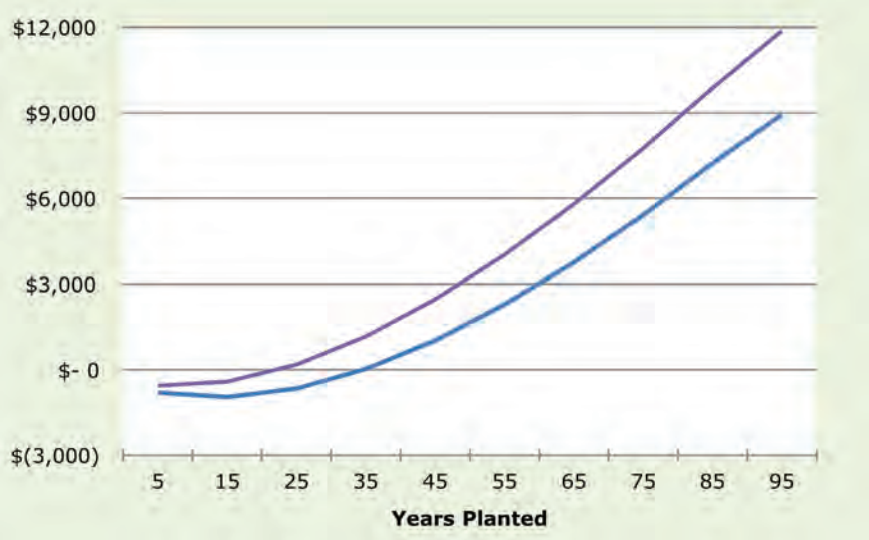
1. **'Adopt a Tree'** donations to sponsor the urban forest.

2. **Grants**: TD Green Streets available to BIAs and municipalities. Partner with BIA to obtain grant for innovative urban forestry projects in streets.

The anticipated in-house resourcing requirements to implement the plan were reviewed with each department based on the recommendations provided in this report. It was determined that two new full-time positions would be needed to assist the arboriculture crew and that all remaining tasks could be implemented in-house. In the longer-term, there may be work load implications for other departments that would need to be addressed such as increased leaf-fall work for street sweeping.

Hypothetical cost benefit: Using i-Tree Design, a Scarlet Oak street tree planted on the south side of 7th Avenue near 8th Street is modelled to return approximately:
- $3.90- $4.60 in benefits for every $1 spent if it remains in the landscape for 100 years.
- $3.60- $3.80 in benefits for every $1 spent if it remains in the landscape for 70 years.
- Break even if it remains in the landscape for approximately 25-35 years.

Return on Investment – Large Tree



The costs included are planting, establishment and maintenance (at two annual rates). This estimate only includes benefits for stormwater, air quality, carbon dioxide sequestration and building energy savings in winter and summer. Estimated benefits do not include the potential economic benefits related to real estate value increases and increased commercial spending, and the many intangible benefits related to the health and well-being of New Westminster residents. It is assumed that adequate soil volume is provided to enable healthy tree growth and avoid below ground infrastructure conflicts.

Endnotes

[i] Nowak, D.J.; Noble, M.H.; Sisinni, S.M.; Dwyer, J.F. 2001. Assessing the U.S. urban forest resource. Journal of Forestry. 99(3): 37-42.

[ii] Coccola, C. 2012. 2011 Inventory of Air Quality Bylaws in British Columbia: Vehicle Idling, Open Burning, and Wood Burning Appliances. BC Ministry of Environment. Accessed October 20 Online: http://www.bcairquality.ca/reports/pdfs/bylaws-2011.pdf

[iii] United Nations. 2014. The World Population Situation in 2014: A Concise Report. Population Studies, No. 354. United Nations, Department of Economic and Social Affairs.

[iv] Seto, K.C.; Güneralp, B.; Hutyra, L.R. 2012. Global forecasts of urban expansion to 2030 and direct impacts on biodiversity and carbon pools. Proc. Natl. Acad. Sci., 109, 16083–16088.

[v] Wolf, K.L. 2010. Community Economics - A Literature Review. In: Green Cities: Good Health (www.greenhealth.washington.edu). College of the Environment, University of Washington.

[vi] World Health Organisation. 2014. 7 Million Premature Deaths Annually Linked to Air Pollution [Media Release]. Accessed October 20 online: http://www.who.int/mediacentre/news/releases/2014/air-pollution/en/

[vii] Hiemstra, J.A.; Schoenmaker – van der Bijl, E.; Tonneijck, A.E.G. 2008. Trees: Relief for the City. Accessed October 20 online: http://edepot.wur.nl/20634

[viii] Warren, F.J.; Lemmen, D.S. (editors). 2014. Canada in a Changing Climate: Sector Perspectives on Impacts and Adaptation. Government of Canada, Ottawa, ON, 286p

[ix] Cirillo, C; Podolsky, L. 2012. Health, Prosperity and Sustainabiity: The Case for Green Infrastructure in Ontario. Green Infrastructure Ontario Coalition and Ecojustice. Accessed October 20 Online: http://www.greeninfrastructureontario.org/report

[x] Diamond Head Consulting. 2015. City of New Westminster Ecological Inventory. Consultant report prepared for City of New Westminster.

[xi] Benedict, M. and McMahon E. Green Infrastructure: linking landscapes and communities. 2006. The Conservation Fund. Island Press.

[xii] US EPA. 2012. Reducing Urban Heat Islands: Compendium of Strategies. http://www.epa.gov/heatislands/resources/pdf/TreesandVegCompendium.pdf

[xiii] Kosatsky, T.; Henderson, S.; Pollock, S. 2012. Shifts in Mortality During a Hot Weather Event in Vancouver, British Columbia: Rapid Assessment With Case-Only Analysis. American Journal of Public Health: December 2012, Vol. 102, No. 12, pp. 2367-2371.

[xiv] Schwab, James C. Planning the Urban Forest. Ecology, Economy and Communtiy Development. APA Planning Advisory Service, 2009. Pg 2.

[xv] BC Stats. 2014b. Sub-Provincial Population Projections - P.E.O.P.L.E. 2014. BC Stats, Ministry of Technology, Innovation and Citizens' Services. Accessed March 10, 2015 Online: http://www.bcstats.gov.bc.ca/StatisticsBySubject/Demography/PopulationProjections.aspx

[xvi] McPherson, E.G.; J.R. Simpson; P.J. Peper; Q. Xiao; S.E. Maco; P. J. Hoefer. 2003. Northern Mountain and Prairie Community Tree Guide: Benefits, Costs and Strategic Planting. https://www.itreetools.org/streets/resources/Streets_CTG/CUFR_258_North_CTG.pdf

[xvii] Pacific Climate Impacts Consortium. Plan2adapt. Accessed October 27 Online: http://www.pacificclimate.org/analysis-tools/plan2adapt

[xviii] Intergovernmental Panel on Climate Change. 2012. Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. Cambridge University Press, New York, NY, USA. Accessed October 27 Online: http://www.ipcc-wg2.gov/SREX/images/uploads/SREX-All_FINAL.pdf

[xix] Department of Fisheries and Oceans; BC Ministry of Environment. Land Development Guidelines [Pending Publication]. Accessed October 27 Online: http://www.rainwatermanagement.ca/wp-content/uploads/2014/04/Draft-BC-Land-Development-Guidelines-Section-4.pdf

[xx] Minnesota Pollution Control Agency. Calculating credits for tree trenches and tree boxes. Accessed October 27 Online: http://stormwater.pca.state.mn.us/index.php/Calculating_credits_for_tree_trenches_and_tree_boxes

[xxi] International Institute for Sustainable Development. Appreciative Inquiry and Community development – From problems to strengths. Accessed October 27 Online: http://www.iisd.org/ai/

[xxii] Diamond Head Consulting. 2015. New Westminster Urban Forest Management Strategy Background Report and Consultation report submitted to City of New Westminster.

[xxiii] USDA Forest Service Northeastern Area. 2003. Urban Tree Risk Management: A Community Guide to Program Design and Implementation. Accessed October 27 Online: http://www.na.fs.fed.us/spfo/pubs/uf/utrmm/

8. Consultation Summary

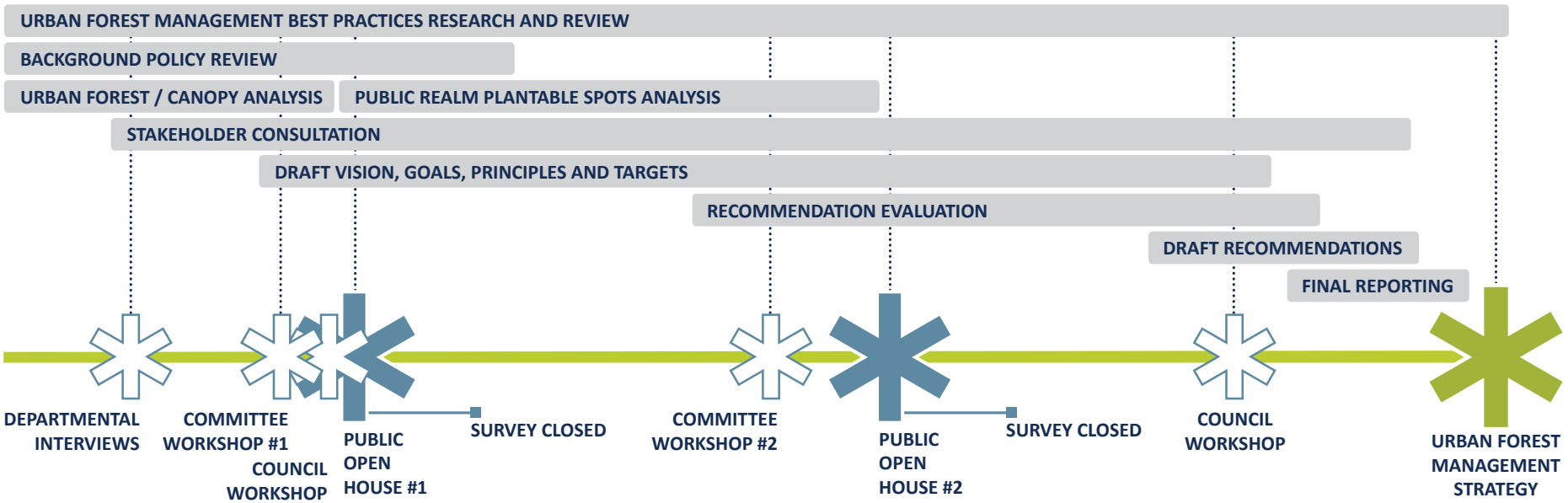
8.1 Introduction

All of the community's trees, vegetation and soil contribute to the urban forest, and this provides a wealth of social, economic and environmental benefits to people who live in urban communities. We want to make sure these important assets are valued appropriately relative to other forms of civic infrastructure and to keep these natural assets thriving in an urban setting through ongoing planning, maintenance and monitoring.

A key aspect of planning for the Urban Forest Management Plan (UFMP) is engaging with the community and stakeholders to:

- understand the key issues that affect New Westminster's urban forest today;
- establish community-supported targets for future canopy cover; and
- develop strategies for best management of the urban forest as a public resource.

This report summarizes the community and stakeholder consultation process, including: departmental interviews with City of New Westminster staff; technical working sessions with Committees and Council; and input from two Public Open Houses.



8.2 Community Stakeholder Consultation Summary

8.2.1 Departmental Interviews

Five staff workshops were held in September 2015 with members from seven City departments: Development Services; Engineering; Engineering Operations; Electrical Operations; Parks, Culture and Recreation; Parks Operations and Horticulture; and Bylaw Enforcement. Each workshop consisted of two facilitated discussions, focusing on two topics:

What do the Trees do for Me? A brainstorming session intended to map benefits/values, and challenges associated with trees; and **Developing a Whole System Strategy:** A discussion and exploration of specific departmental challenges and strategies related to urban forest management.

The meetings demonstrated a general understanding of the values that trees provide, from environmental quality and aesthetics to biodiversity habitat and personal wellness. More importantly, consensus emerged among departments regarding the important environmental, social and economic benefits provided by the urban forest. Each session noted that the "public good" (benefits) provided by trees outweighs any associated negative attributes, including risk and maintenance. Key messages from individual sessions are summarized the table beside.

Session	Key Themes
1	• Strategic management of the tree canopy, including plant selection and suitability, soil volume guidelines, and specific identification of "plantable areas"; and, • Needed protocol for inter-departmental coordination/cooperation with respect to the management of the urban forest;
2	• The importance of the planning process, political leadership and public support required to implement any strategy/plan related to urban forest management; • The need to develop transparent, measureable, equitable and balanced management guidelines with specific attention to offsets/improvements related to implementation (e.g. the "tree-cost-charge," green fund, and canopy goals related to biodiversity targets); and, • Public education and strategic communication required to address perception of "penalty for doing the right thing" (i.e. added regulation of individuals who have protected the urban forest) and focused communication acknowledging the protection of the public good.
3	• Differing opportunities presented by spatial constraints related to "historical patterns" of infrastructure servicing (e.g. shallow/deep services and underground/overhead utilities) throughout the city (street/lane cross section); and, • Reiteration of the need for coordinated inter-departmental standards and guidelines for managing the urban forest resource.
4	• Identification of "trees within the design process" of regulation within the City and its ongoing efforts to improve planning and operational effectiveness and efficiency; • Opportunities to formalize requirements/expectations for management of the urban forest on private lands within a tree bylaw; and, • Reiteration of integrating key stakeholders within the planning and decision-making process as a means to ensure success (from policy development to implementation/operation).
5	• Need to consider "cultural preferences" as related to trees on private property (and impacts to the urban forest as public resource); • Importance of accounting for all hard/soft costs for long-term tree care related to the goals for the urban forest management strategy (acknowledging the long-term operational burden of aggressive canopy targets); and, • Acknowledgement of "economies of scale" as related to the development/management of the urban forest (e.g. irrigation systems on large parcels, etc.); • Reiteration of politics and education as playing a critical role in public "buy in."

Minor differences of opinion regarding tree management are generally attributed to departmental focus and the types of management tasks related to trees. The importance of trees is reflected in various policies and plans that advocate for preservation of the existing tree stock, increased tree planting, creating a rich tree canopy and use of sustainable design principles. Issues that were identified indicate a clear need for funding and staff to meet tree management goals relating to City policy resulting in increased planting and maintenance levels. This includes the transfer of information about the care, maintenance and management of trees from a central source to other City departments and the public on a regular basis. In addition, the lack of any regulation of tree removal or protection on private land within the municipality has led to a significant decline in the tree canopy cover in the City.

A copy of visual notes from the individual interview sessions (1-5) is included in Appendix A.

8.2.2 Working Sessions with the Environmental Review Committee

A ***first working session*** with the Environmental Review Committee (ERC) was held on October 1st at New Westminster City Hall. The ERC was updated on work completed to date, including the urban forest inventory and analysis. Key themes that emerged from the departmental interviews were also shared. Beyond the review of technical findings, the ERC provided preliminary feedback on draft materials being prepared for the first open house. Specifically, the ERC provided valuable input regarding how the information was to be presented so that it could be easily communicated to the public.

A ***second and final working session*** with the Environmental Review Committee (ERC) was held on November 26th at the Century House. In addition to a review of draft content for the second public open house, the working session served to develop the draft vision for the Urban Forest Management Strategy. A "world café" roundtable exercise solicited input from Committee members with respect to the themes of: Appreciation (What qualities of the urban forest do you like?); Intention (What qualities do you seek?); and Action (How do we get there?). The draft vision statement was presented for feedback during the second public open house.

8.2.3 Public Open Houses and Surveys

The ***first public open house*** was held on October 8th, at the New Westminster Century House. Approximately 25 members of the New Westminster community attended the event. Poster boards were created to share important information with attendees, including benefits of trees and issues and opportunities facing New Westminster as it embarks on implementing an urban forest plan. Individuals were encouraged to share their thoughts on the urban forest and its management. Specific public engagement exercises included:

- Identifying your neighbourhood on a map and consider how measured tree canopy cover corresponds with your personal experience;
- Listing your top three priorities (naturalness/biodiversity; personal well-being, aesthetics, social values, environmental quality, other) for guiding the urban forest management strategy;
- List priorities, concerns/causes, strategies and measures of success for urban forest management;

A ***follow-up survey*** – available during the public open house and accessible on the City's website for 2 weeks following the event – was completed by 22 respondents and included questions related to:

- Ranking of importance regarding urban forest management issues as specifically related to street trees, parks, natural areas and private land;
- Ranking importance regarding services provided by the urban forest;
- Evaluation of the City's urban forest management efforts (present/future); and,
- City priorities regarding management strategies related to urban forest management targets (canopy increase), tree planting standards and tree protection on private property, and partnerships.

Feedback from the first open house indicated strong support for introducing policy to protect trees on private property in New Westminster. When asked, "Should the City aim to increase overall tree canopy cover on private lands" 84% of respondents agreed, 8% were neutral and 8% disagreed. When asked, "Should the City introduce policy to protect trees on private property and keep record of what trees are removed" 96% of respondents agreed and 4% disagreed. While there was a high degree of support for private property tree protection reported by those surveyed, these results are not based upon a statistically representative sample of the City's population. Staff did receive contrary comment back from a small minority of open house participants. The primary reason cited for concern/lack of support for private property tree protection included lack of opportunity (including education and awareness) for the community to provide comment on the implications of the by-law.

The ***second and final public open house*** was held on December 9th, at the New Westminster Century House. Approximately 21 members of the New Westminster community attended the event. Display materials were created to illustrate feedback received from the first public open house, and present draft content of the urban forest management strategy for consideration. Specific public engagement exercises included:

A ***follow-up survey*** – available during the public open house and accessible on the City's website for 2 weeks following the event – was completed by 21 respondents and included questions related to:

- Feedback on draft urban forest management goals;
- Feedback on the draft vision statement (developed in consultation with the ERC); and
- Indication of level support for a city-wide canopy target of 27% and strategies to achieve that target, including:
    - Public private partnerships;
    - Tree planting targets on public property; and,
    - Tree planting targets on private property (single family lots).

Feedback from the second open house reflected strong support for the draft urban forest management vision and canopy targets. A small minority of contrary responses stressed the need to: expand the strategy to more fully address other land uses (including commercial and industrial lands); and to more clearly communicate the % targets and the physical implications of the strategy (eg. "You will not get my support for policies until you make it much clearer what you are asking us to support."). Similar to Open House #1, while there was a high degree of support for the preliminary draft components of the urban forest management plan – including vision, objectives and the proposal of policy for the protection of trees on private property – the results are not based upon a statistically representative sample of the City's population.

A copy of public open house materials and surveys are included in Appendix B.

8.2.4 Working Session #1 with Council

A working session with Council members and City Staff was held on January 20th 2015. The following is summarized from meeting notes prepared by Erika Mashig (Parks and Open Space Planner):

Mayor Cote

1. Would like to see plantable spots map on public property for the entire city.
2. Needs more specifics on the implementation of a tree by-law:
    a) What is the staff time required to implement the by-law
    b) How long will it take to implement a City-wide tree planting plan? 5-10-15 or 20 years? Look at shorter goals (i.e. 21% in 8 years) and hold people accountable for that target.
    c) Present Council with options on how much it is going to cost the City on annual basis to implement tree planting plan and a by-law?
3. Create a report to Council with specifics on recommendations and options for a shorter and longer time frame for a by-law. Council can make a decision in an open meeting. Targets and measures are important to know if we are successful over time, however, implementation strategy is most important.
4. Tie tree canopy targets to options and show us how we get to each target;
5. Add examples for each option within Metro Vancouver; and,
6. Talk about challenges and successes in the UFMS report to Council.

Councilor Harper

1. Maintenance of trees= budgetary piece. We need to think about the tax implications of the UFMS.

Councilor Johnstone

1. What are other municipalities doing? How do we compare?
2. How do we phase each step, leading up to a by-law? We should demonstrate public leadership first. Education has the biggest impact.

Councilor McEvoy

1. Are there examples of places that have achieved their target (i.e. 27%)?
2. Understand range or degree of by-laws and associated costs and benefits for the City.

Dean Gibson

1. We will come back to Council with three pieces:
    a) Confirm canopy targets
    b) Period of time needed to reach targets
    c) Aspirational targets vs. more immediate targets (5-8 yrs)
    d) Tools to get us to those targets

8.2.5 Working Session #2 with Mayor and Council

A second working session with Mayor and Council (ERC) was held on January 20th at Municipal Hall. The purpose of the meeting was to confirm the process and feedback to date, answer any questions regarding next steps and receive any further input in advance of developing the first draft Urban Forest Management Plan. Specific topics included:

- acknowledged value of up-to-date inventory/analysis and mapping of public urban forest resources;
- discussion of current canopy goals (27% city-wide canopy) and cost-benefit discussion of regulation/management options;
- discussion of neighbouring Municipalities and “best practices”;
- discussion of the merits of more aspirational canopy goals;
- discussion of potential incentives to homeowners (for tree planting and heritage designation); and,
- general discussion of overall phasing and implementation of the UFMS.

8.2.6 Meeting with Directors

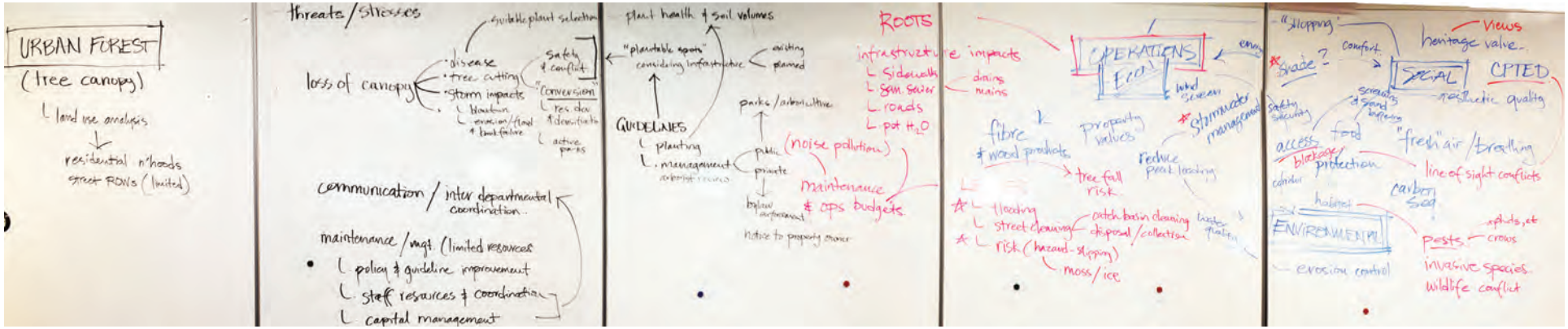
A final working session with the Directors was held on June 3 at the Anvil Centre. The purpose of the meeting was to review the process to date, the recommendations and financial implications of the plan and to answer any questions regarding next steps and receive any further input in advance of meeting with the Mayor and Council. Specific topics included:

- acknowledged value of up-to-date inventory/analysis and mapping of public urban forest resources;
- discussion of current canopy goals (27% city-wide canopy) and cost-benefit discussion of regulation/management options; and,
- general discussion of overall phasing and implementation of the UFMS.

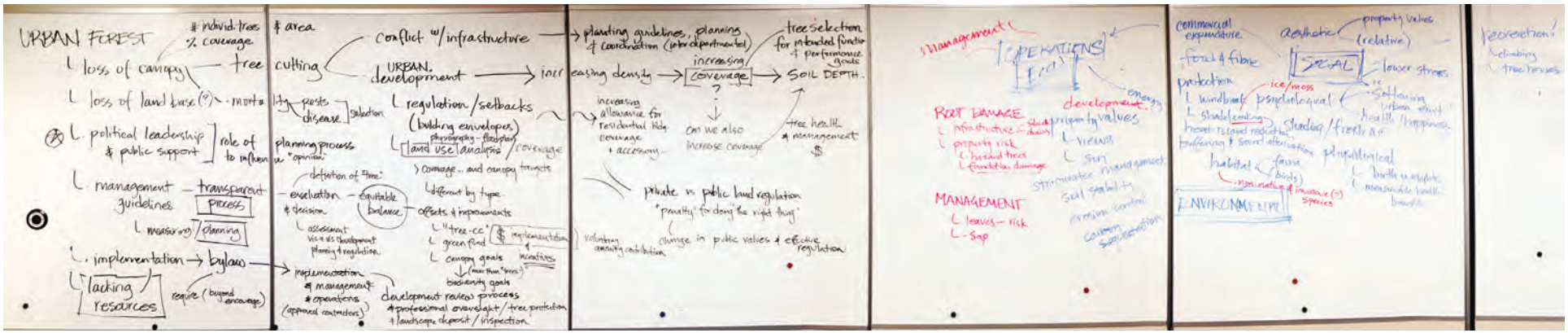
A selection of presentation materials is included in Appendix C.

8.3 Appendix A – Consultation Materials

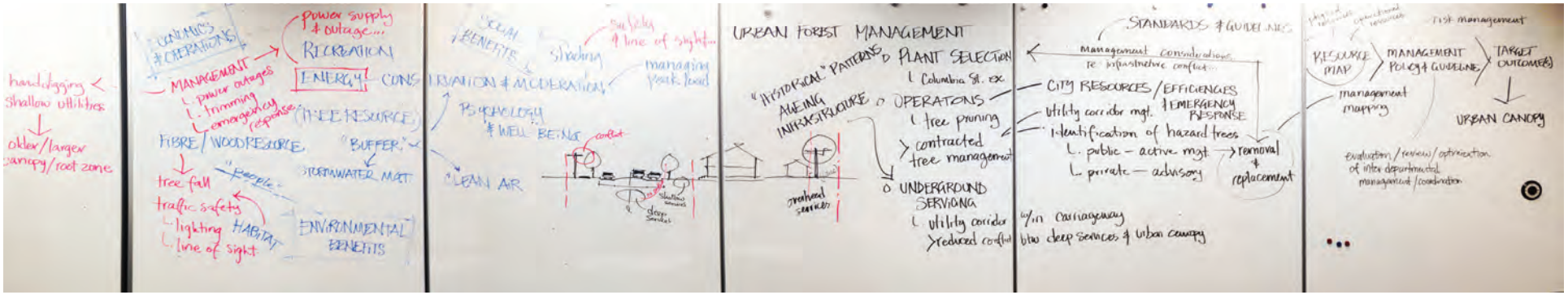
City of New Westminster | UFMS Departmental Interviews | Session 1



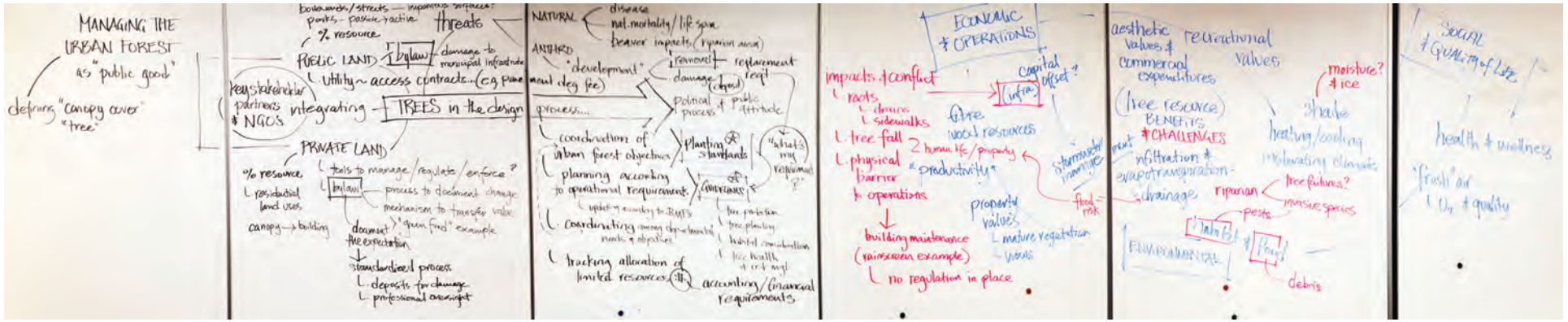
City of New Westminster | UFMS Departmental Interviews | Session 2



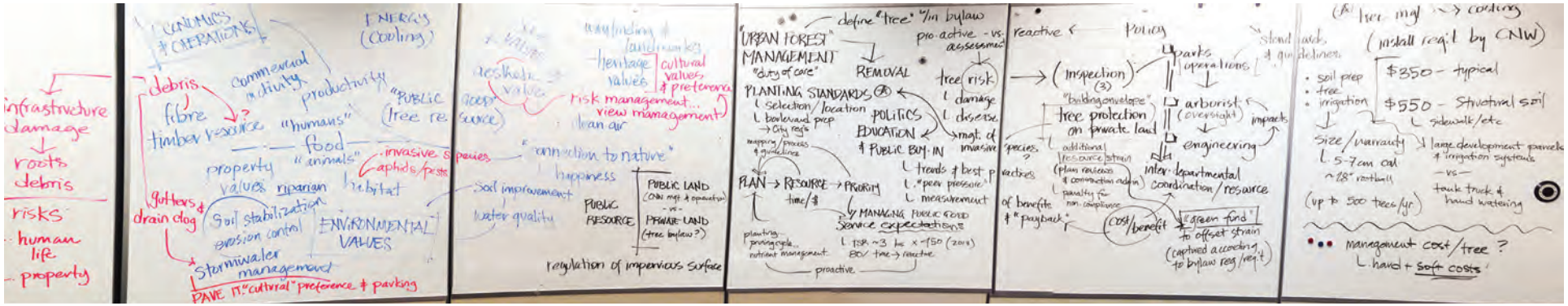
City of New Westminster | UFMS Departmental Interviews | Session 3



City of New Westminster | UFMS Departmental Interviews | Session 4

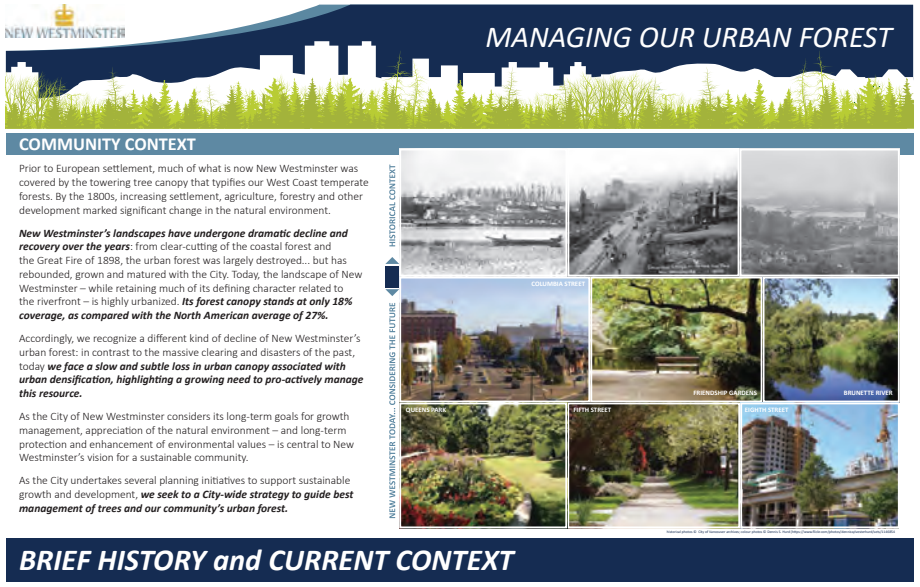


City of New Westminster | UFMS Departmental Interviews | Session 5

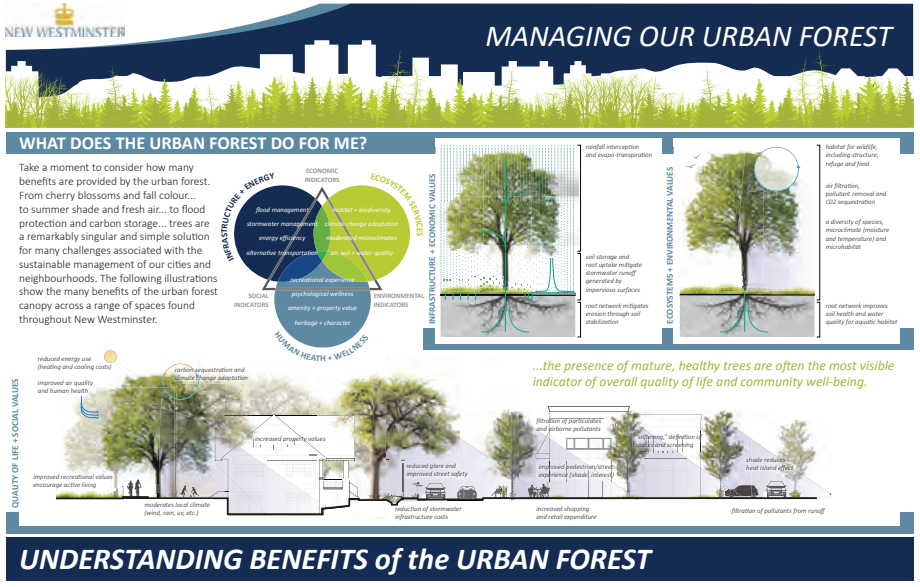


8.4 Appendix B – Open House Materials, Surveys and Results









NEW WESTMINSTER

MANAGING OUR URBAN FOREST

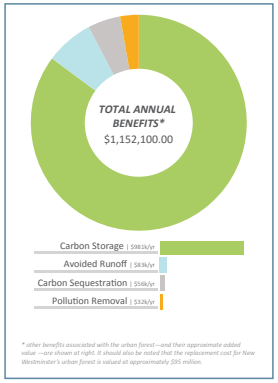
WHAT DOES THE URBAN FOREST DO FOR ME?

Given a moment to reflect, we all recognize the many benefits provided by our urban forest: from the intuitive values of habitat for wildlife and clean air... to emerging evidence of increased spending in well-treed commercial spaces and decreased stress associated with recreation in treed areas.

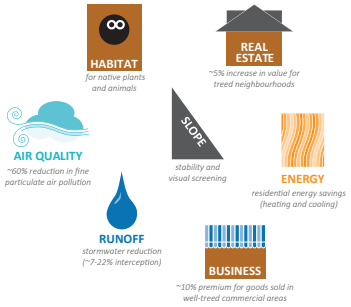
The deeper we investigate benefits of the urban forest, the more we recognize that the value of what it provides far outweighs the resources and coordination required to maintain this resource. As an example, the City of Vancouver calculated the cost/benefit ratio for services provided by the urban forest to be almost 4.6 to 1.

In more specific terms, we can assess the direct costs and associated values* of carbon sequestration and storage, avoided runoff, and pollution removal in calculating a simplified estimate of the value of the urban forest. The dollar value shown at the centre of the circle is reflective of specific services provided by New Westminster's urban forest.

It should be noted that these numbers represent only a fraction of what we know to be the added values associated with many other attributes, more generally illustrated with the icons to the right.



***ACTIVITY:** Help us understand how YOU most value the urban forest: place a dot on the area you consider highest priority. Add in any other aspects you think should also be represented in our management plan.*



QUANTIFYING BENEFITS of the URBAN FOREST

NEW WESTMINSTER

MANAGING OUR URBAN FOREST

NEIGHBOURS and LEADERS IN URBAN FOREST MANAGEMENT





Compared to our neighbours- at a local scale- New Westminster's urban forest is relatively intact. Relative to the North American average (27% forest canopy) and the recommended "best practice" (40% forest canopy), New Westminster has room for improvement.

Perhaps more importantly, New Westminster's urban forest canopy has been declining over the past two decades, highlighting the need to better manage the urban forest... and protect the valuable functions it provides.

Interestingly, while population growth between 2004 and 2012 slowed to ~17% (relative to ~33% population growth between 1994 and 2004), canopy loss has increased from ~4% between 1994 and 2004... to ~15% between 2004 and 2013. Our Strategy will look at how to best address this trend, implement best practices and measure success.

New Westminster's Urban Forest Management Strategy seeks to prevent further loss and increase urban forest canopy ...and the associated benefits it provides to everyone.

CASE STUDIES: examples of urban forest management

NEW WESTMINSTER

MANAGING OUR URBAN FOREST

MORE THAN THE SUM OF THE PARTS

Beyond the inventory and analysis of New Westminster's urban forest—including the assessment of land use coverage and more refined composition of the urban forest using representative plots—our Management Plan will be guided by an understanding of local and international "best practices," with particular attention to the efficient use of limited Municipal resources.

Most important, however, is the central vision that will guide the Urban Forest Management Strategy. It is this statement of intent that will guide the consideration of priorities, the development of specific strategies and the ultimate allocation of resources.



The following example of a vision statement guides the City of Nanaimo's Urban Forest Management Plan:

> *"Nanaimo is a community that strives to balance human, natural and economic priorities in maintaining and enhancing its urban forest. The urban forest is seen as a fundamental utility which provides wildlife habitat, clean air and water, economic prosperity and a physically attractive setting for the City's residents and visitors."*

Consider how this statement reflects the community's values as it relates to the management of the urban forest resource.

***ACTIVITY:** Our Urban Forest Management Strategy will be informed by the community's central guiding vision. From the following categories, which best represent your top three priorities for guiding our strategy?*



DRAFTING OUR COMMUNITY's VISION for the URBAN FOREST

NEW WESTMINSTER

MANAGING OUR URBAN FOREST

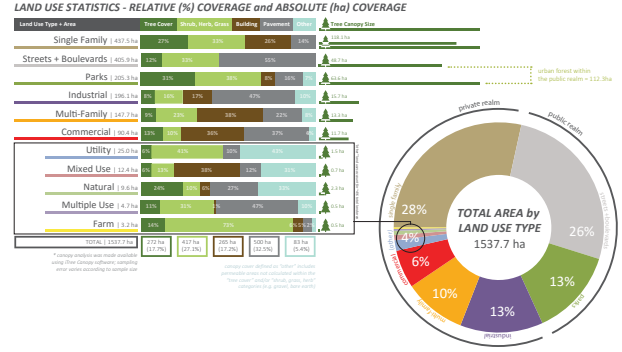
BY THE NUMBERS

Understanding the urban forest canopy — and changes and trends in urban forest health over time — can be challenging. These graphs illustrate interesting measures of New Westminster's urban forest... as a means to better develop and implement strategies for more effective resource management.

As evidenced in the numbers* at right, a majority of the urban forest is located within parks, streets and residential areas.

Interestingly, the entire public realm—including streets and boulevards and parks—accounts for almost an equal amount of the urban forest found within residential land uses. The remainder of the private realm—including industrial, multi-family, and commercial uses—accounts for less than 15% of urban forest (with "other uses" representing less than 2%).

Take a moment to consider the different types of land uses occurring within our City... and the opportunities each may present towards the long-term management and enhancement of our urban forest and its benefits.



URBAN FOREST INVENTORY: understanding our current condition

NEW WESTMINSTER

MANAGING OUR URBAN FOREST

EXPLORING THE TREND

Visual representation of urban forest analysis reveals several interesting questions related to current trends and change in New Westminster's land use... as well as potential opportunities for better management and enhancement of the urban forest resource.

Taking a city-wide perspective, other interesting trends emerge:

The decrease of urban forest canopy since 2004 correlates strongly with an increase in building coverage (with only slight increases in paved surfaces and lawn/shrub coverage), typical of urbanized - and densifying - municipalities like New Westminster; and,

A further analysis of canopy cover change since 2004 shows a slight increase in tree planting along streets with the vast majority of loss occurring within the private realm (outside the public realm of streets, boulevards and parks).*

Consideration of several opportunities are also revealed:

Compatible "open space" may be suitable for tree planting as a means to increase urban forest canopy cover;

Impervious areas (including paved surfaces and buildings) may be transitioned to "greener" functions through the use of Low Impact Design guidelines and/or greenroof technologies; and,

Incentives for private land tree protection may be explored.

CANOPY CHANGE 2004-2013



Take a moment to consider these trends... are these important to you?

Imagine other ways in which the benefits of the urban forest may be better managed and/or incorporated in the City...

...and include your ideas in the open house survey and ***ACTIVITY*** boards.

URBAN FOREST INVENTORY: understanding our current condition

NEW WESTMINSTER

MANAGING OUR URBAN FOREST

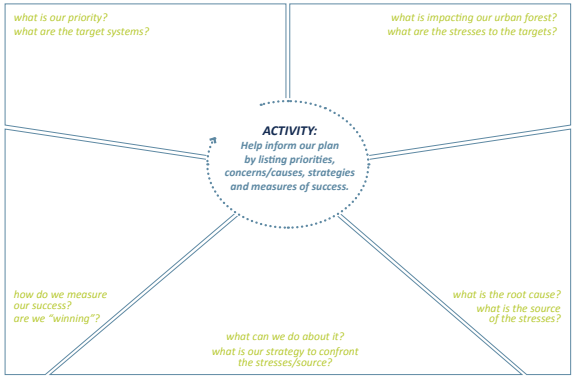
A FRAMEWORK FOR SUCCESS

New Westminster's Urban Forest Management Strategy will identify a range of best practices for managing the urban forest within the context of the City's overall goals, objectives and resources.

Ultimately, the City's Management Strategy seeks to achieve our community vision for the urban forest, to maintain its health, and to sustainably manage its economic, social and environmental services and resources for future generations.

The visioning process also serves a deeper strategic purpose in exploring key questions central to the understanding and management of the urban forest, its values and our priorities.

We want your input! *Please take a few minutes to consider the questions to the right. Write your answers and comments on a sticky note and place them near the question you are answering. Your input will help inform the Urban Forest Management Strategy by listing priorities, concerns/causes, strategies and measures of success.*



DRAFTING OUR COMMUNITY'S VISION for the URBAN FOREST

NEW WESTMINSTER

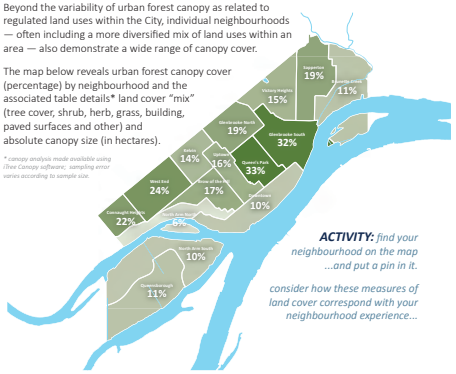
MANAGING OUR URBAN FOREST

COMMUNITY CONTEXT

Beyond the variability of urban forest canopy as related to regulated land uses within the City, individual neighbourhoods — often including a more diversified mix of land uses within an area — also demonstrate a wide range of canopy cover.

The map below reveals urban forest canopy cover (percentage) by neighbourhood and the associated table details* land cover "mix" (tree cover, shrub, herb, grass, building, paved surfaces and other) and absolute canopy size (in hectares).

* canopy analysis made available using iTree Canopy software; sampling error varies according to sample size.



ACTIVITY: *find your neighbourhood on the map ...and put a pin in it.*

consider how these measures of land cover correspond with your neighbourhood experience...

NEIGHBOURHOOD STATISTICS - RELATIVE (%) COVERAGE and ABSOLUTE (ha) COVERAGE

Neighbourhood	Tree Cover	Shrub, Herb, Grass	Building	Pavement	Other	Tree Canopy Size
Brow of the Hill | 77.8 ha	17%	29%	24%	30%		13.1 ha
Brunette Creek | 118.8 ha	11%	5%	14%	60%	10%	13.1 ha
Connaught Heights | 52.5 ha	22%	30%	19%	27%	2%	11.5 ha
Downtown | 116.0 ha	10%	11%	26%	38%	15%	11.6 ha
Glenbrooke North | 88.4 ha	19%	26%	23%	32%		16.8 ha
Glenbrooke South | 126.7 ha	32%	22%	11%	22%	2%	40.7 ha
Kelvin | 65.7 ha	14%	21%	25%	32%	8%	9.2 ha
North Arm North | 67.6 ha	5%	16%	21%	41%	16%	3.3 ha
North Arm South | 170.1 ha	10%	20%	16%	49%	5%	16.9 ha
Queensborough | 74.2 ha	11%	37%	22%	26%	4%	8.4 ha
Queen's Park | 163.8 ha	33%	28%	16%	24%		53.3 ha
Sapperton | 120.3 ha	19%	38%	15%	28%		22.8 ha
Uptown | 65.5 ha	16%	16%	33%	35%		10.5 ha
Victory Heights | 108.3 ha	15%	36%	25%	24%		16.2 ha
West End | 111.9 ha	24%	17%	19%	36%	4%	26.8 ha
TOTAL | 1537.7 ha	272 ha (17.7%)	427 ha (27.1%)	265 ha (17.2%)	500 ha (32.5%)	83 ha (5.4%)	

note: some neighbourhoods with a higher *relative* canopy cover do not necessarily contribute more in terms of *absolute* canopy.

URBAN CANOPY ANALYSIS: neighbourhoods by the numbers

NEW WESTMINSTER

MANAGING OUR URBAN FOREST

SEEING THE FOREST FROM THE TREES

As City staff continually work to capture community goals and objectives within regulatory plans and guidelines for sustainable growth, a significant challenge remains:

How do we translate our aspirations into tangible, measurable actions?

A Background Summary Report of current City policy reveals opportunities to develop the urban forest management strategies within the city's larger regulatory structure. In simpler terms, the Plan's recommendations are designed to "fit," appropriate to scale and place, and be more efficient and effective.



CURRENT POLICIES

The City of New Westminster uses a comprehensive set of policy documents to articulate and implement the goals and objectives of the community.

POLICY OPPORTUNITIES

Specific management policies - guided by an overarching Urban Forest Management Strategy - can ensure trees are considered thoughout all stages of the regulatory process.

regional-level policy

regional vision, strategy + policy	REGIONAL GROWTH STRATEGY				
community vision, guidelines + policy	ENVISION 2032	OFFICIAL COMMUNITY PLAN			
thematic plans, strategies + policy	SUSTAINABILITY REPORT CARD	PARKS + RECREATION	TRAIL + GREENWAY	INDUSTRIAL LAND	URBAN FOREST MANAGEMENT STRATEGY
neighbourhood plans, guidelines + policy	DOWNTOWN	LOWER TWELFTH ST	QUEENSBOROUGH	NEIGHBOURHOOD CANOPY COVER + TARGETS?	
detailed plans (waterfront, parks, etc.)	QUEEN'S PARK	WATERFRONT VISION	ENHANCEMENT PLANS?	PLANTING PLANS?	
development permit area guidelines + policy	CPTED	SIDEWALK CAFE	ENVIRONMENTAL DPA GUIDELINES?		
regulatory measures + bylaws	STREET TREE	PARKS	HERITAGE	ADDITIONAL?	

local-level policy

POLICY FRAMEWORK: from vision to implementation

NEW WESTMINSTER

MANAGING OUR URBAN FOREST

WHERE DO WE GO FROM HERE?

Thank you for attending the first open house and contributing your input. All materials presented at Open House #1 will remain available on the Parks, Culture and Recreation website. In addition, the survey will be available online for two weeks, closing on Thursday, October 23rd.

Please visit our website at: www.newwestpcr.ca and encourage oithers to get involved. The input collected will help in the next stages of strategy development, to:

- *Create a community vision for the future of New Westminster's urban forest;*
- *Identify goals, objectives and priorities for protecting, enhancing and expanding New Westminster's urban forest; and*
- *Develop a management and implementation strategy that maximizes the environmental, social and economic benefits provided by the urban forest.*

between now and the next open house...

The development of the Urban Forest Management Strategy will involve considerable stakeholder input including technical workshops, public open houses, online surveys and ongoing consultation with City staff.

The second open and final house (late 2014) will feature: summary analysis of the feedback collected from the first open house; a draft community vision; and management recommendations from Diamond Head Consulting based on current best management practices in urban forestry.

A second opportunity for the public to provide comments and suggestions on the community vision statement, recommendations and strategies will be available during Open House #2, to be scheduled in late 2014.

ACTIVITY: ***Please don't stop here..! Help us draft our community vision for the Urban Forest Management Strategy by completing the survey: your input is invaluable to this process and we appreciate your contribution!***



PLANNING PROCESS and PROJECT TIMELINE

INVENTORY + ANALYSIS — *understanding our current condition*
stakeholder interviews, policy review, tree canopy assessment, gap analysis

TECHNICAL WORKSHOP #1
October 1, 2014

PLANNING + DESIGN — *defining our priorities and critical path*
technical working sessions, vision, principles, goals + targets

WE ARE HERE

OPEN HOUSE #1
October 8, 2014

MANAGEMENT — *implementing a strategic plan*
management plan recommendations

TECHNICAL WORKSHOP #2
date tbd

OPEN HOUSE #2
date tbd

FIELD OPS
organizational framework, monitoring framework, implementation

URBAN FOREST MANAGEMENT STRATEGY

NEXT STEPS in DEVELOPING the MANAGEMENT STRATEGY

NEW WESTMINSTER

New Westminster Urban Forest Management Strategy

The City of New Westminster is developing an Urban Forest Management Strategy (UFMS). The plan will provide direction for key activities including canopy cover growth targets, new tree planting, tree health and maintenance, tree protection and budgeting within city limits. Diamond Head Consulting Ltd., a Vancouver-based company specializing in forest and ecosystem management, is working with the City to develop the strategy.

A key aspect of the planning process is engaging with community members and stakeholders to understand the inventory and analysis of New Westminster's urban forest today and to develop community supported targets for future tree canopy cover and any proposed tree management practices. The survey and material presented at the October 8th open house are available on the City's website: **www.newwestpcr.ca**

The survey information received at the open house and online will be used to help develop a community vision and direction for future management of trees and natural areas within the City.

The results of this survey will be made available at the second public open house scheduled for late 2014.

Definitions

Urban Forest: An urban forest includes all of a community's trees, shrubs, herbaceous low-growing perennial vegetation and soil. The urban forest is found on both **public** and **private** lands including parks, street trees, open spaces, commercial property, residential and industrial lands.

Canopy Cover: One way to measure the extent of the urban forest is through quantifying the urban tree canopy; envision the layer of leaves, branches and tree stems when viewed from above.

If you have any questions or would like further information, please contact:

Erika Mashig, Parks and Open Space Planner
Parks, Culture and Recreation Department, City of New Westminster: 604-527-4567
(emashig@newwestcity.ca)

Begin survey

NEW WESTMINSTER

New Westminster Urban Forest Survey

1. Which neighbourhood do you live in? _____

2. How important is it for the City to manage the aspects of the urban forest listed below? *Tick only one box in each row.*

	Least important 1	2	3	4	Most important 5
A Street trees	☐	☐	☐	☐	☐
B Trees in parks and landscaped areas	☐	☐	☐	☐	☐
C Trees in natural areas	☐	☐	☐	☐	☐
D Trees on private land	☐	☐	☐	☐	☐

3. The urban forest is a community asset that provides numerous environmental, social and economic impacts. How important are the following for the urban forest to provide in New Westminster? *Tick only one box in each row.*

	Least important 1	2	3	4	Most important 5
A Providing shade	☐	☐	☐	☐	☐
B Habitat for native plants and animals	☐	☐	☐	☐	☐
C Reducing storm water run-off	☐	☐	☐	☐	☐
D Providing shade	☐	☐	☐	☐	☐
E Reducing air pollution	☐	☐	☐	☐	☐
F Producing food	☐	☐	☐	☐	☐
G Beautifying the City	☐	☐	☐	☐	☐
H Cooling streets and buildings	☐	☐	☐	☐	☐
I Providing spaces for people to interact	☐	☐	☐	☐	☐
J Contributing to history/culture of the City	☐	☐	☐	☐	☐
K Increasing property values	☐	☐	☐	☐	☐
L Making New Westminster more welcoming	☐	☐	☐	☐	☐
M Providing spaces for people to play sports or participate in other recreational activities	☐	☐	☐	☐	☐
N Capturing and storing carbon	☐	☐	☐	☐	☐
O Stabilizing slopes	☐	☐	☐	☐	☐

www.newwestpcr.ca October 8, 2014

NEW WESTMINSTER

New Westminster Urban Forest Survey

4. Please indicate degree to which you agree with each of the following statements.
Tick only one box in each row.

	Strongly Disagree 1	2	Neutral 3	4	Strongly Agree 5
A Public street trees are well managed by the City	☐	☐	☐	☐	☐
B Trees in parks are well managed by the City	☐	☐	☐	☐	☐
C Natural areas are well managed by the City	☐	☐	☐	☐	☐
D The City should do more to protect trees on private land	☐	☐	☐	☐	☐

5. How do you feel about the following statements on the future management of the urban forest? *Please indicate the degree to which you agree with each of the following statements.*

	Strongly Disagree 1	2	Neutral 3	4	Strongly Agree 5
A The City should aim to increase overall tree canopy cover.	☐	☐	☐	☐	☐
The City should aim to increase tree canopy cover on:					
A1. Public Streets	☐	☐	☐	☐	☐
A2. Parks and Natural Areas	☐	☐	☐	☐	☐
A3. Private Lands	☐	☐	☐	☐	☐
B The City should introduce policy to protect trees on private property and keep record of what trees are removed.	☐	☐	☐	☐	☐
C The City should require minimum canopy cover targets for new multi-family developments.	☐	☐	☐	☐	☐
D The City should partner with organizations that develop educational programs and volunteer initiatives for tree planting and maintenance.	☐	☐	☐	☐	☐
E The City should set minimum soil volumes (below ground space required tree root growth) for trees on new development sites to ensure that newly planted trees have the best potential to reach their mature size and maintain health.	☐	☐	☐	☐	☐

NEW WESTMINSTER

New Westminster Urban Forest Survey

6. What are three things you value most about New Westminster's urban forest?

A. _____

B. _____

C. _____

7. What are three things that could be improved about New Westminster's urban forest?

A. _____

B. _____

C. _____

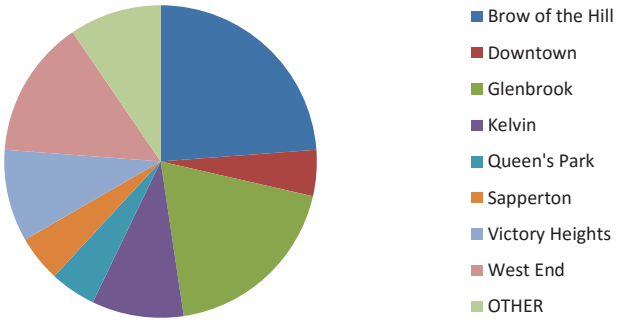
8. Please describe New Westminster's urban forest as you would ideally imagine it 50 years from today, in **2065**.

9. Please share any other comments you may have regarding the Urban Forest Management Strategy:

www.newwestpcr.ca October 8, 2014

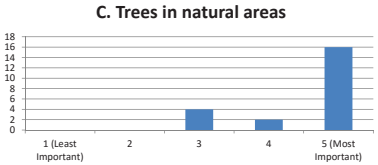
PUBLIC OPEN HOUSE #1 - COMPILED SURVEY RESULTS

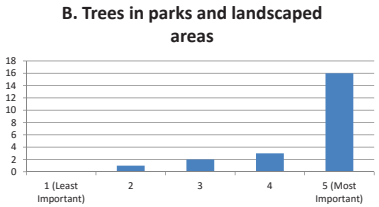
Q1: What neighbourhood do you live in?

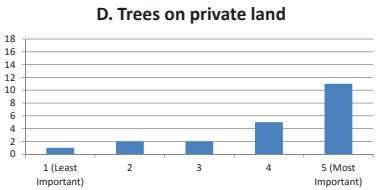


Q2: How important is it for the City to manage the aspects of the urban forest listed below?



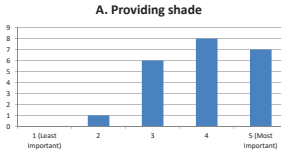


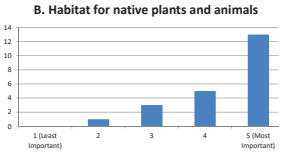


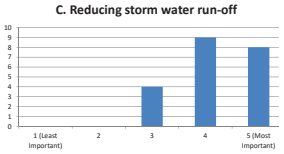


PUBLIC OPEN HOUSE #1 - COMPILED SURVEY RESULTS

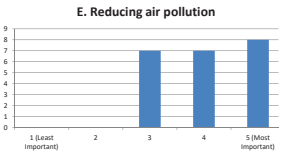
Q3: The urban forest is a community asset that provides numerous environmental, social and economic impacts. How important are the following for the urban forest to provide in New Westminster?

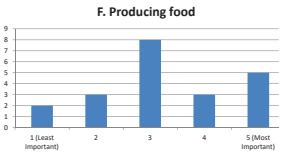


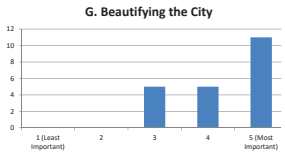


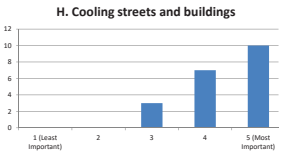


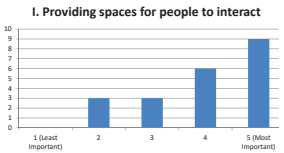
"D" was a duplicate of "A. Providing shade" and duplicate results were not recorded.

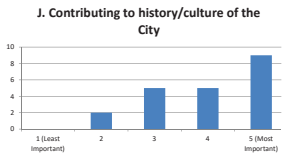


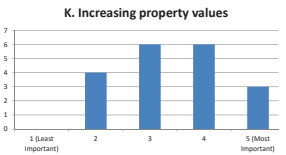


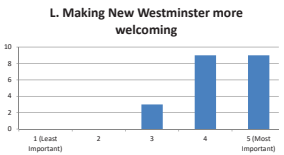


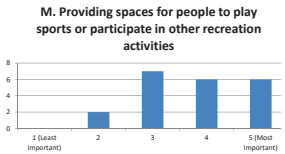


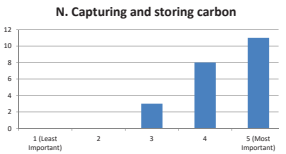


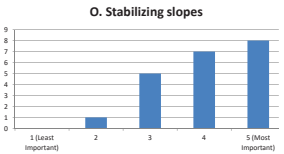








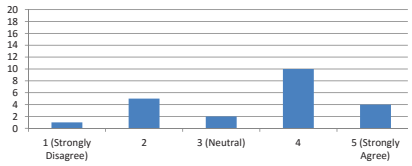




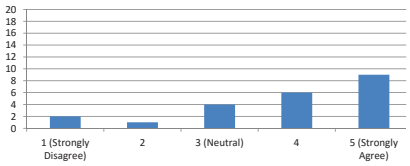
PUBLIC OPEN HOUSE #1 - COMPILED SURVEY RESULTS

Q4: Please indicate the degree to which you agree with each of the following statements.

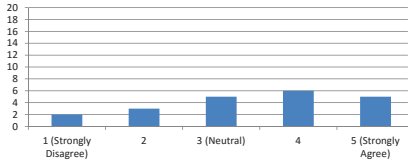
A. Public street trees are well managed by the City



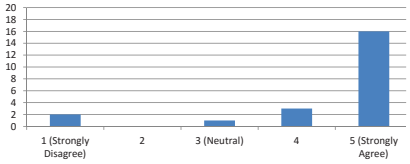
B. Trees in parks are well managed by the City



C. Natural areas are well managed by the City



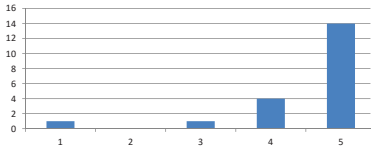
D. The City should do more to protect trees on private land



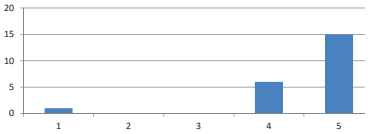
PUBLIC OPEN HOUSE #1 - COMPILED SURVEY RESULTS

Q5: How do you feel about the following statements on the future management of the urban forest?

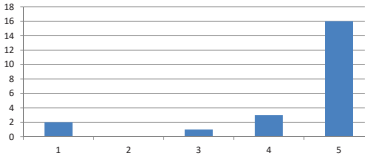
A. The City should aim to increase overall tree canopy cover.



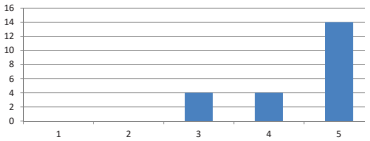
B. The City should introduce policy to protect trees on private property and keep record of what trees are removed.



C. The City should require minimum canopy cover targets for new multi-family developments.

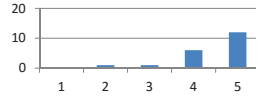


D. The City should partner with organizations that develop educational programs and volunteer initiatives for tree planting and maintenance.

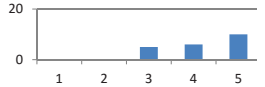


The City should aim to increase tree canopy cover on:

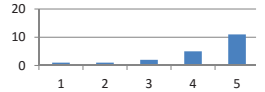
A1. Public Streets



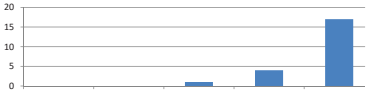
A2. Parks and Natural Areas



A3. Private Lands



E. The City should set minimum soil volumes (below ground space required tree root growth) for trees on new development sites to ensure that newly planted trees have the best potential to reach their mature size and maintain health.



PUBLIC OPEN HOUSE #1 - COMPILED SURVEY RESULTS

Q6: What are three things you value most about New Westminster's urban forest?

1 Beauty and encouragement of healthy activity such as walking and cycling.
Shade and privacy
A sense of history, evidenced by mature trees much older than myself
2 Reducing air polution
Habitat for plants & animals
Providing spaces for people to interact
3 The diversity of tree types
The cooling shade - very noticeable moving from Queen's Park to Uptown. So much warmer Uptown!
The birds which frequent our urban forest
4 The aesthetic value of trees, at any time of the year
Shade trees
Diversity - different shapes, colours
5 Health benefits
6 Unique older specimen tree rare in the lower mainland
Diversity in street tree planting
Well maintained street trees
7 Heritage value
Increase in air quality
Reduction of noise pollution
8 The variety
9 Capturing & storing carbon, water
Providing shade & public space
Stabilizing slopes
10 Creates comforting surroundings
Creates beauty
Provides valuable habitat for wildlife
11 It makes our city more livable & comfortable
It makes our city more beautiful
It makes our city more valued
12 City has variety of large trees in our parks
Trees habitat birds & wildlife
Trees provide us oxygen & shade - necessary for all of us
13 Shade
Visual impact
Home for beasts
14 Habitat for birds
Food supply for birds & bees
Shade, water conservation
15 Age of some splendid mature specimens
Great small tree selection under O/H lines
Red-tailed hawk nests in Glenbrook Ravine
16 The diversity of species
The diversity of age of trees, public & private
The high number of trees in Queen's Park
17 Native plantings of all kinds
Wildlife that is supported by these native plantings
Clean air!
18 Variation and variety of trees
Locations and placement of park trees and blvd trees
Wildlife that coexists within urban forest
19 Variety of trees
Maintaining unique trees
Amount of large old trees
20 Habitat for birds
Beautiful city & a "legacy" for grandchildren
Healthy - air, cool

PUBLIC OPEN HOUSE #1 - COMPILED SURVEY RESULTS

Q7: What are three things that could be improved about New Westminster's urban forest?

The city desperately needs more street trees, especially in areas such as Brow of the Hill and
1 Downtown. Considering the time to mature planting should be expedited.

Don't be afraid to plant trees that will become large. We can handle some sidewalk repaving.
I support a reasonable tree bylaw that allows for trees to be removed in some situations but
reenforces retention of tree cover
2 More protection for private trees when threatened by adjacent development.
Plant more Rose of Sharon! I love them.
Public education about value of trees.
3 Increase the public appreciation for the urban forest
Lead tree-identification walks in the city
More education re the value of urban trees
4 Street tree canopy downtown North arm areas
Private property, canopy coverage, retention enforcement
Soil volumn increased for new developments
5 Private tree protection - stronger than Vancouver
Ecological focus (remnant forest reserves/invasives management)
Heritage tree program
6 Go for larger trees - douglas fir, cedar, hemlock
Stop with the dwarf varities
Bring back more boulevard trees
7 Could we register grand trees on a heritage designation registry similar to the Heritage Homes etc
Tighten up new build zoning
8 Enact a tree bylaw to protect trees on private residences

9 Better pruning of street trees (branches too low over sidewalks)
Better protection for trees on private land
10 Better protection for trees on private land
More fruit trees
11 Stop new homeowners from destroying/cutting trees, make by laws to prevent this

Bring back green space in neighbourhoods - far too large homes now make an uncomfortable life

Private person should be able to plant tree in parks etc.
Stop subsidiary original lots
12 Somehow promote the growing of private land trees
More boulevard & street trees
Registration of heritage or even large
13 Appropriate tree types
Increased education
Incentive for home owners
14 Lack of structural pruning has created a legacy of trees becoming hazardous
Good young tree training needs to be addressed
More community-based tree events
15 Frequency of pruning of street and park trees
Use of newer planting technologies (silva cells)
16 Fewer seasonal/exotic/annual plantings
More native plantings on ground and in planters
Thus freeing parks dept to educate us more
17 More resources dedicated to improving the urban forest
More public awareness of urban forest plans
More media attention to public for tree issues - pruning - importance - watering
18 Protecting large existing trees (Douglas Firs)
Planting open spaces
Educating children/community
Stop letting them cut down all trees when a new build is happening. I'm tired of seeing all the trees
19 leveled - and no new 'big' trees planted!
Have residents "sponsor" planting trees (give certificate and GPS of location)

PUBLIC OPEN HOUSE #1 - COMPILED SURVEY RESULTS

Q8: Please describe New Westminster's urban forest as you would ideally imagine it 50 years from today, in 2065.

1 Nearly all streets have boulevards with 45+ year old mature trees (ie. all boulevards have trees planted within 5 years). Neighborhoods such as Brow of the Hill and Queensborough have the same or better tree cover as Queens Park does today. Moody Park has more vegetation than it does now, including community gardens.
2 More trees required on private land in those areas now lacking it. Shade, shade, shade - we will need it due to global warming
3 More trees, less high rises downtown
4 High canopies of diverse trees covering most of the city. Other than roof top gardens, sports fields, and emergency route roadways. Aerial photos of the city should show only trees.
More douglas fir, cedar, hemlock in parks
Large oaks on boulevards
Terry Hughes Park Ringed by large trees
5 Public is encouraged to plant trees on their private property
6 I hope that green space would be intersperced with residential & rooftop gardens would be the norm.
7 That a certain percentage of each land parcel should have tree canopy
For my neighbour the way it's being rebuild I visualize a concrete jungle of large houses & no trees or green space!
8 Personal opinion - bring comformity in our neighbourhoods. Educate the value of trees to newcomers. Please stop concrete front yards & backyards.
9 Lush, cool
10 Parks and natural areas less manicured & organized (compare Queen Elizabeth Park as it is now and how it was 60 years ago)
11 The city's urban forest contains a wide diversity of species, with most trees being healthy and free of defects and hazards. The community treasures their trees and work tirelessly as partners with the city to restore, maintain and enhance the urban forest
12 All available planting sides on streets planted; high level of species and age-class diversity; designated heritage tree inventory (public & private lands); intact Urban Forest Plan w/ metrics for maintenance & rejuvenation of urban forest; canopy cover of 30% city-wide

13 Real forest areas, not just groves in parks or parts of parks. Attracting & keeping our wildlife, insects, birds, etc.
Street calmed to pedestrian only access
Park areas dev in many new areas coexisting with new & old developments
14 Much more blvd tree planing

15 An urban forest with a community that has been educated and is aware of the importance and value that it has.
16 Lovely older trees - a variety well managed supported by residents and city. New builds - respect trees and build around. Trees managed so healthy trees cannot be cut down.

PUBLIC OPEN HOUSE #1 - COMPILED SURVEY RESULTS

Q9: Please share any other comments you may have regarding the Urban Forest Management Strategy

I'm glad this is happening! Don't be afraid to hire (temporary?) help to expedite street tree planting efforts. I understand that there is 1+ year backlog of requests at the moment. Street trees should be on all boulevards
1 within a few years time. It is well worth the expense to do this now as trees take a long time to grow.
Perhaps on educational presentation at various elementary, middle and high schools - similar to salmon
2 enhancement.
This process is the most important first step towards a sustainable urban ecology. It must be implementable!
3 *Surrey is the role model
Plant bigger native speciies. They require less maintenance.
4 Give trees to the public to plant on their respective property
5 I worry about how new homes are built at the expense of green space - like to see more boulevard trees
6 Thank you for taking a step in the right direction to protect trees
7 I appreciate neighbours who are using our boulevards for gardening, shrubery or special trees
8 It's good that the urban forest is being analyzed. Hopefully a constructive program will be developed.

9 Need to include intensive education program for residents, business developers, city should lead by example

The foundation of any management plan is a comprehensive inventory that reflects the condition of the trees,
10 and describes any particular requirements for restoration, removal or routine/maintenance.
We have a great urban forest; let's make it even better! New West needs a tree removal permit bylaw for
11 private lands (see City of Surrey as an example)
12 Trhank you so much for doing this work (survey & outreach to public)
More long term planning
More resources dedicated to urban forestry
13 Heritage tree inventory and public walk of interest
14 More staff
When can you start? I would like some strategy to prevent trees being cut down before and bylaw regarding
15 management could be made

NEW WESTMINSTER

MANAGING OUR URBAN FOREST

WELCOME and WHY WE'RE HERE

PURPOSE

The City of New Westminster is developing an Urban Forest Management Strategy for the City.

Work with us to co-create the vision, goals, objectives and urban forest "target" for New Westminster; help guide the management of the City's urban forest.

OBJECTIVE

Tonight's second Public Open House provides a review of what we've heard thus far, and presents: a draft vision for urban forest management; management scenarios and targets... and a framework for action.

Please fill out a survey before you go... and thank you for your contribution!

PLANNING PROCESS and PROJECT TIMELINE

- **INVENTORY + ANALYSIS** — *understanding our current condition*; stakeholder interviews, policy review, tree canopy assessment, gap analysis
- **TECHNICAL WORKSHOP #1** — *October 1, 2014*
- **PLANNING + DESIGN** — *defining our priorities and critical path*; technical working sessions, vision, principles, goals + targets
- **OPEN HOUSE #1** — *October 8, 2014*
- **MANAGEMENT** — *implementing a strategic plan*; management plan recommendations
- **TECHNICAL WORKSHOP #2** — *November 26, 2014*
- **OPEN HOUSE #2** — *December 9, 2014* — WE ARE HERE
- **FIELD OPS**; organizational framework, monitoring framework, implementation
- **URBAN FOREST MANAGEMENT STRATEGY**

INTRODUCTION and ORIENTATION

NEW WESTMINSTER

MANAGING OUR URBAN FOREST

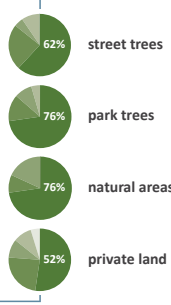
FEEDBACK: RESULTS FROM THE FIRST PUBLIC OPEN HOUSE and ONLINE SURVEY

WHAT'S IMPORTANT?

Asked about ***how important it is for the City to manage certain aspects of the urban forest***, participants responded as follows:

most important — *least important*

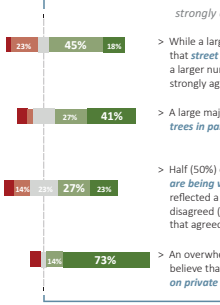
- > A large majority of respondents (62%) believe ***managing street trees as part of the urban forest is most important***;
- > An overwhelming majority of respondents (76%) believe ***managing park trees as part of the urban forest is most important***;
- > A overwhelming majority of respondents (76%) believe ***managing natural areas as part of the urban forest is most important***; and,
- > A majority of respondents (52%) believe very ***managing trees on private lands as part of the urban forest is most important***.



HOW ARE WE DOING?

Asked about ***how well the City is managing the Urban Forest***, it is interesting to note how the responses—and their relative emphasis—compare with the evaluation of management priorities (at left):

strongly disagree — *strongly agree*



- > While a large majority (63%) of respondents believe that ***street trees are being well-managed by the City***, a larger number of individuals disagreed (23%) than strongly agreed (18%) with this statement;
- > A large majority (68%) of respondents believe that ***trees in parks are being well-managed by the City***;
- > Half (50%) of respondents believe that ***natural areas are being well-managed by the City*** as responses reflected a relatively small margin between those that disagreed (14%), those that were neutral (23%), those that agreed (27%) and strongly agreed (23%); and,
- > An overwhelming majority (87%) of respondents believe that ***the City should do more to protect trees on private property***.

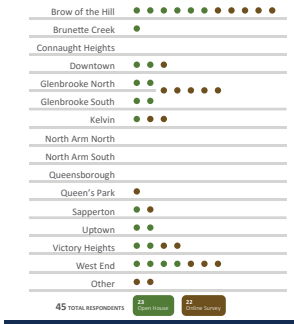
UNDERSTANDING OUR COMMUNITY PRIORITIES

NEW WESTMINSTER

MANAGING OUR URBAN FOREST

FEEDBACK: RESULTS FROM THE FIRST PUBLIC OPEN HOUSE and ONLINE SURVEY

Input from the first Public Open House and online survey will assist in tailoring the draft urban forest management strategy to the priorities of New Westminster. Participants and survey respondents included the following neighbourhoods:

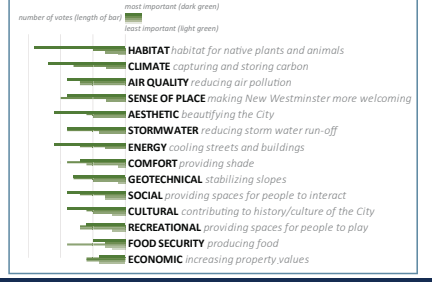




WHAT MATTERS MOST?

The following themes and "ecosystem services" provided by the urban forest were evaluated according to their relative* importance to survey respondents.

Biodiversity, naturalness and environmental quality objectives were rated as most important, followed by more human-centric qualities of aesthetics and well-being.



UNDERSTANDING OUR COMMUNITY PRIORITIES

NEW WESTMINSTER

MANAGING OUR URBAN FOREST

MORE THAN THE SUM OF THE PARTS

Beyond the inventory and analysis of forest attributes and a technical understanding of best management practices, *the Urban Forest Management Strategy will be guided by a community vision.*

The following draft vision was developed from feedback provided at the first Public Open House, results of the online survey, and collaboration with municipal staff and Council's Environment Advisory and Parks and Recreation Committees. Additional information boards are provided to demonstrate how this vision guides the Urban Forest Management Strategy's goals, objectives and priority actions.



>>> OUR DRAFT VISION <<<

New Westminster's urban forest is a beautiful and beloved public resource, providing refuge, education and recreation within the City.

Urban trees have been carefully planted, protected and maintained to clean the air, enhance habitat, capture carbon, manage stormwater and maximise benefits to our City's environmental health and quality of life.

Great planning and management has created a renowned urban experience of diverse, colourful and comfortable, well-treed streets and boulevards that connect with neighbourhood parks and natural areas.

The City's management policies include measurable objectives, priority actions and regulatory mechanisms, ensuring strategic, efficient and effective coordination between public and private partners.

Homeowners and developers play an increasingly significant role in urban forest enhancement with protection and planting on private lands.

Community members of all walks of life care for the urban forest as a shared priority and defining feature of what makes New Westminster such a great place to live.

>>> DRAFT GOALS of the UFMS <<<

PROTECT *New Westminster's urban forest and its benefits to our community*

ENHANCE *all aspects of urban forest management within New Westminster*

ENGAGE *all community stakeholders with respect to issues of urban forest management*



visioning workshop input

A VISION for our URBAN FOREST MANAGEMENT STRATEGY

NEW WESTMINSTER

MANAGING OUR URBAN FOREST

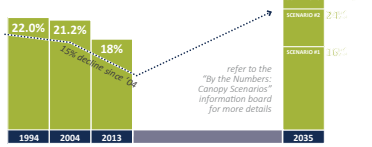
LEADING THE REGION IN URBAN FOREST MANAGEMENT

Recognizing the past decades' decline in New Westminster's urban forest canopy the Urban Forest Management Strategy proposes an aspirational canopy target to bring the City in line with the North American average (27%).

Achieving this goal—with a twenty-year time horizon—requires shared vision and coordinated effort between public and private interests.

In the simplest of terms, the expansion of the urban forest is about planting trees... And as a first step, the identification of "plantable spots" across the diverse matrix of urban land uses, identifies existing opportunities to enhance "shrub, herbs and grass" to include urban canopy.

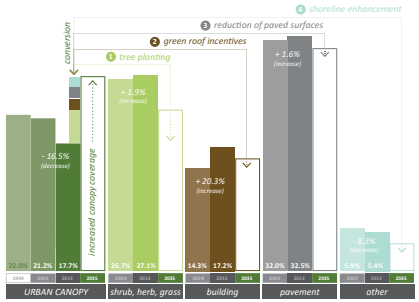
Additional conversion strategies—beyond the planting of trees—are illustrated at right. As New Westminster continues to grow and densify, these strategies will play an increasingly central role in achieving the targets and stated goals of the Urban Forest Management Strategy.



refer to the "By the Numbers: Canopy Scenarios" information board for more details

FOUR CONVERSION STRATEGIES (EXAMPLES) ---> 27% CANOPY TARGET





Strategies beyond tree planting reflect the direct connections between urban forest management and City-wide priorities related to planning and urban design.

SETTING A TARGET: a goal for urban forest management

NEW WESTMINSTER

MANAGING OUR URBAN FOREST

BY THE NUMBERS: LAND USE and PLANTABLE SPOTS

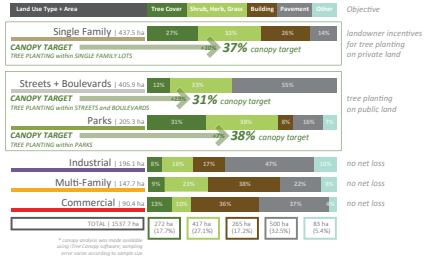
Understanding the anticipated impact and effectiveness of individual forest management strategies plays an important role in determining the most efficient and effective course of action.

As shown in the graph at right, the UFMS explores a strategic focus on specific land use designations given their relative significance according to land area, existing canopy resource and jurisdiction (with respect to public lands).

Public lands - including ***street rights of ways, boulevards, and parks*** - form a central focus of the strategy: the targets illustrated at right are calculated based on an inventory of ***existing "plantable spots"*** available within public lands.

Single family residential neighbourhoods also play a critical role given their relative size within the City: with tree planting on public lands maximised according to the preliminary plantable spots inventory, incentives for tree planting on private lands will prove a key strategy for urban forest management within New Westminster.

27% ***With an overall canopy target of 27% (based on the average canopy cover for urban forests in North America) individual canopy targets* are shown in the graph below.***



* *canopy analysis was made available using iTree Canopy software; sampling error varies according to sample size*

*Canopy targets are illustrated relative to current land use and associated coverage.



By identifying "plantable spots" within public lands, the Urban Forest Management Strategy defines a measurable action plan... while highlighting how strategies to enhance the urban forest must be coordinated among all stakeholder groups.

MANAGEMENT and CONTEXT: understanding our strategy

NEW WESTMINSTER

MANAGING OUR URBAN FOREST

BY THE NUMBERS: CANOPY SCENARIOS

Four potential scenarios represent urban forest management approaches ranging from: ***status quo***, representing a continued decline in City-wide canopy; to ***structural change***, reflecting a more comprehensive consideration of urban forest goals and objectives within the City's planning and urban design strategies.

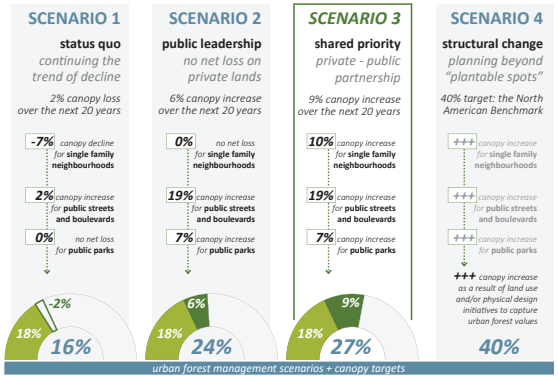
Ultimately, the City's Urban Forest Management Plan seeks a canopy target that is at once aspirational and achievable.

TRANSLATING THE MATH

The scenarios at right illustrate **land-use-specific canopy changes/targets** (*refer to information board titled "land use and plantable spots" for additional detail and rationale*) and demonstrate the extent to which collaboration between public and private stakeholders is key to success.

City-wide canopy change is summarized below in the pie charts, with:

- % existing canopy coverage (18%) in light green
- % overall canopy change in dark green
- % resulting/target coverage in bold blue



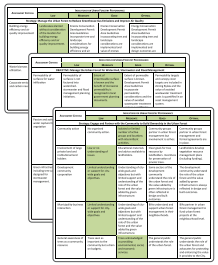
SETTING A TARGET: a goal for urban forest management

NEW WESTMINSTER

MANAGING OUR URBAN FOREST

MEASURING WHAT MATTERS

Inspired by the UFMS Vision, GOALS and OBJECTIVES will be addressed via specific strategies developed within the Urban Forest Management Strategy... and progress measured using individual "Report Cards."



"Report Cards" (example above) track progress towards measurable objectives associated with UFMS goals to PROTECT, ENHANCE and ENGAGE.

DRAFT PRIORITIES
(to be further developed within the UFMS)

GOAL | PROTECT *New Westminster's urban forest and its benefits to our community*

OBJECTIVES
- Increase canopy cover to the Pacific Northwest Benchmark
- Protect existing canopy cover
- Adapt the urban forest population to a changing climate

enhance street tree replacement program; include UFMS objectives within relevant City plans/policies and Local Area Plans; develop a Tree Risk Management Program;

GOAL | ENHANCE *all aspects of the urban forest and its management within New Westminster*

OBJECTIVES
- Enhance the tree care program
- Improve urban forest diversity
- Strengthen ecological health and biodiversity within the Municipality

create a comprehensive database of the City's urban forest; establish a Municipal Forestry Plan for the Parks Division; develop a biodiversity conservation strategy;

GOAL | ENGAGE *all community stakeholders involving issues related to urban forest management*

OBJECTIVES
- Manage the urban forest to reduce greenhouse gas and improve air quality
- Integrate the urban forest into watershed, stormwater and flood management
- Foster local partnerships to build community ownership of the urban forest

provide homeowner incentives to 'host' public trees in private yards; evaluate services provided by the urban forest; encourage connectivity and enhancement;

THE REPORT CARD: tracking progress toward the vision



WHERE DO WE GO FROM HERE?

Thank you for attending the second and final open house. All materials presented at Open House #2 will remain available on the Parks, Culture and Recreation website for two weeks from today.

Please visit our website at: www.newwestpcr.ca and encourage others to get involved. Additional input collected will help in the next stages of strategy development, to:

- Finalize a community vision for the Urban Forest Management Strategy;
- Tailor the goals, objectives, targets and priorities of the UFMS as a means to better protect and enhance New Westminster's urban forest; and
- Develop a management and implementation strategy that maximizes the environmental, social and economic benefits provided by the urban forest.

ACTIVITY: *Please don't stop here..! Help us draft our Urban Forest Management Strategy by completing the survey: your input is invaluable to this process and we appreciate your contribution!*



...after Open House #2...

The development of the draft Urban Forest Management Strategy will incorporate feedback from tonight's Open House with particular consideration given to the Plan's vision, targets goals and objectives.

Ongoing consultation with City staff and a Council working session in early 2015 will serve to guide the development of the draft Urban Forest Management Strategy.

The final draft Urban Forestry Management Strategy is scheduled for submission to Council for consideration in Spring 2015.

PLANNING PROCESS and PROJECT TIMELINE



NEXT STEPS in DEVELOPING the MANAGEMENT STRATEGY

NEW WESTMINSTER

New Westminster Urban Forest Management Strategy

The City of New Westminster is developing an Urban Forest Management Strategy (UFMS). The plan will provide direction for key activities including canopy cover growth targets, new tree planting, tree health and maintenance, tree protection and budgeting within city limits. Diamond Head Consulting Ltd., a Vancouver-based company specializing in forest and ecosystem management, is working with the City to develop the strategy.

A key aspect of the planning process is engaging with community members and stakeholders to understand the inventory and analysis of New Westminster's urban forest today and to develop community supported targets for future tree canopy cover and any proposed tree management practices. **The survey and material presented at the October 8th and December 9th open houses are available on the City's website: www.newwestpcr.ca**

The results from the survey first open house are included in the Open House #2 presentation panels.

If you choose to fill this survey out at home, you can either go to the Parks, Culture and Recreation website (the survey will remain open for two weeks from today) or mail your survey to the Parks, Culture and Recreation office. The survey information received at the open house and online will be used to help finalize the community vision and direction for future management of trees and natural areas within the City.

Definitions

Urban Forest: An urban forest includes all of a community's trees, shrubs, herbaceous low-growing perennial vegetation and soil. The urban forest is found on both **public** and **private** lands including parks, street trees, open spaces, commercial property, residential and industrial lands.

Canopy Cover: One way to measure the extent of the urban forest is through quantifying the urban tree canopy; envision the layer of leaves, branches and tree stems when viewed from above.

If you have any questions or would like further information, please contact:

Erika Mashig, Parks and Open Space Planner
Parks, Culture and Recreation Department, 600 Eighth Street
New Westminster, BC V3M 3S2
(P) 604-527-4567 (E) emashig@newwestcity.ca

NEW WESTMINSTER

New Westminster Urban Forest Survey

1. In which neighbourhood do you live? _____

2. The draft goals of the Urban Forest Management Strategy (UFMS) were developed from feedback provided at Open House #1 and results from the online survey. Please indicate degree to which you agree with each of the following three goals of the UFMS.
Tick only one box in each row.

GOAL	Strongly Disagree 1	2	Neutral 3	4	Strongly Agree 5
A. **PROTECT New Westminster's urban forest and its benefits to our community.**	☐	☐	☐	☐	☐
B. **ENHANCE all aspects of urban forest management within New Westminster.**	☐	☐	☐	☐	☐
C. **ENGAGE all community stakeholders with respect to issues of urban forest management.**	☐	☐	☐	☐	☐

Suggested revisions or comments.

_____

_____

_____

3. The draft community vision statement below was developed from feedback provided at the first Public Open House, results of the online survey, and collaboration with staff and Council's Environment Advisory and Parks & Recreation Committees. Please indicate the degree to which you feel the following seven sections of the draft vision, labeled A-G, reflect our community values.

VISION	Strongly Disagree 1	2	Neutral 3	4	Strongly Agree 5
A. **New Westminster's urban forest is a beautiful and beloved public resource, providing refuge, education and recreation within the City.**	☐	☐	☐	☐	☐

Suggested revisions or comments.

_____

_____

_____

www.newwestpcr.ca December 9, 2014

NEW WESTMINSTER

New Westminster Urban Forest Survey

VISION	Strongly Disagree 1	2	Neutral 3	4	Strongly Agree 5
B. Urban trees have been carefully planted, protected and maintained to clean the air, enhance habitat, capture carbon, manage stormwater and maximise benefits to our City's environmental health and quality of life.	☐	☐	☐	☐	☐

Suggested revisions or comments.

VISION	Strongly Disagree 1	2	Neutral 3	4	Strongly Agree 5
C. Great planning and management has created a renowned urban experience of diverse, colourful and comfortable, well-treed streets and boulevards that connect with neighbourhood parks and natural areas.	☐	☐	☐	☐	☐

Suggested revisions or comments.

VISION	Strongly Disagree 1	2	Neutral 3	4	Strongly Agree 5
D. The City's management policies include measurable objectives, priority actions and regulatory mechanisms, ensuring strategic, efficient and effective coordination between public and private partners.	☐	☐	☐	☐	☐

Suggested revisions or comments.

NEW WESTMINSTER

New Westminster Urban Forest Survey

VISION	Strongly Disagree 1	2	Neutral 3	4	Strongly Agree 5
E. Homeowners and developers play an increasingingly significant role in urban forest enhancement with protection and planting on private lands.	☐	☐	☐	☐	☐

Suggested revisions or comments.

VISION	Strongly Disagree 1	2	Neutral 3	4	Strongly Agree 5
F. Community members of all walks of life care for the urban forest as a shared priority and defining feature of what makes New Westminster such a great place to live.	☐	☐	☐	☐	☐

Suggested revisions or comments.

VISION	Strongly Disagree 1	2	Neutral 3	4	Strongly Agree 5
G. Urban trees have been carefully planted, protected and maintained to clean the air, enhance habitat, capture carbon, manage stormwater and maximise benefits to our City's environmental health and quality of life.	☐	☐	☐	☐	☐

Suggested revisions or comments.

www.newwestpcr.ca December 9, 2014

NEW WESTMINSTER
New Westminster Urban Forest Survey

4. The forest canopy in the City of New Westminster stands at 18% coverage. The average canopy cover for North American cities is 27% and the recommended "best practice" is 40% canopy cover. The proposed Strategy seeks a canopy target of 27% (a 9% increase over the next 20 years) through a private-public partnership. *Please indicate the degree to which you agree with a 27% canopy target (i.e. do you think our target should be higher or lower?) and if a private- public partnership is the best way to achieve this target.*

	Strongly Disagree 1	2	Neutral 3	4	Strongly Agree 5
A. Proposed canopy target of 27%.	☐	☐	☐	☐	☐

Please tell us why or why not.

B. Achieved through a private- public partnership.	☐	☐	☐	☐	☐

Please tell us why or why not.

5. Building on the question above, the strategy proposes to focus on increasing canopy cover on both public (streets, boulevards and parks) and private lands (single family lots) to achieve a 27% canopy target. *Please indicate the degree to which you agree with the proposed increases on both public and private land (i.e. should we being doing more or less on either public or private property?)*

	Strongly Disagree 1	2	Neutral 3	4	Strongly Agree 5
A1. PUBLIC LANDS - Tree planting within streets and boulevards (increase by 19%)	☐	☐	☐	☐	☐
A2. PUBLIC LANDS - Tree planting within parks (increase by 7%)	☐	☐	☐	☐	☐
B1. PRIVATE LANDS - Tree planting within single family lots (increase by 10%)	☐	☐	☐	☐	☐

Suggested revisions or comments.

NEW WESTMINSTER
New Westminster Urban Forest Survey

6. The goals of the UFMS are to protect and enhance our urban forest and engage stakeholders, the community, and management practices in these undertakings. To what extent do you feel the following objectives contribute to the stated goals? *Tick only one box in each row.*

PROTECT	Strongly Does Not Support 1	2	Neutral 3	4	Strongly Support 5
A1. Increase canopy cover to the Pacific Northwest Benchmark.	☐	☐	☐	☐	☐
A2. Protect Existing canopy cover.	☐	☐	☐	☐	☐
A3. Adapt the urban forest population to a changing climate.	☐	☐	☐	☐	☐
ENHANCE	**Strongly Does Not Support 1**	**2**	**Neutral 3**	**4**	**Strongly Support 5**
B1. Enhance the tree care program.	☐	☐	☐	☐	☐
B2. Improve urban forest diversity.	☐	☐	☐	☐	☐
B3. Strengthen ecological health and biodiversity within the municipality.	☐	☐	☐	☐	☐
ENGAGE	**Strongly Does Not Support 1**	**2**	**Neutral 3**	**4**	**Strongly Support 5**
C1. Manage the urban forest to reduce greenhouse gases and improve air quality.	☐	☐	☐	☐	☐
C2. Integrate the urban forest into watershed, stormwater and flood management.	☐	☐	☐	☐	☐
C3. Foster local partnerships to build community ownership of the urban forest.	☐	☐	☐	☐	☐

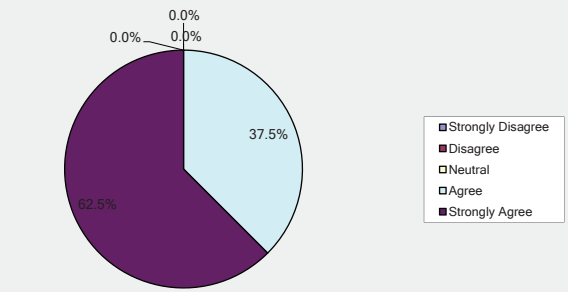
7. Please share any other comments you may have regarding the Urban Forest Management Strategy:

www.newwestpcr.ca December 9, 2014

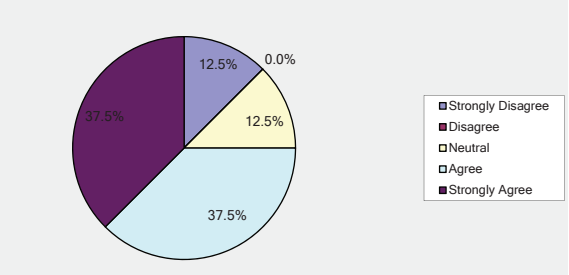
PUBLIC OPEN HOUSE #2 - COMPILED SURVEY RESULTS

Q3: The draft community vision statement below was developed from feedback provided at the first Public Open House, results of the online survey, and collaboration with staff and Council's Environment Advisory and Parks & Recreation Committees. Please indicate the degree to which you feel the following seven sections of the draft vision, labeled A-G, reflect our community values.

VISION A - New Westminster's urban forest is a beautiful and beloved public resource providing refuge, education and recreation within the City.

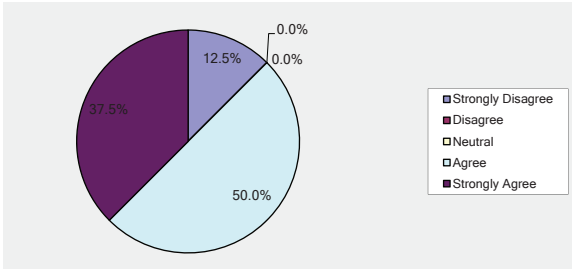


VISION B - Urban trees have been carefully planted, protected and maintained to clean the air, enhance habitat,capture carbon, manage storm-water and maximize benefits to our City's environmental health and quality of life.

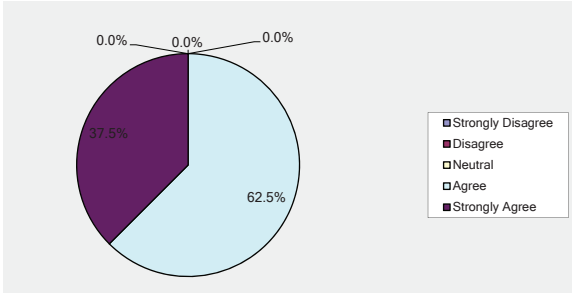


PUBLIC OPEN HOUSE #2 - COMPILED SURVEY RESULTS

VISION C - Great planning and management has created a renowned urban experience of diverse, colourful and comfortable, well-treed streets and boulevards that connect with neighbourhood parks and natural areas.

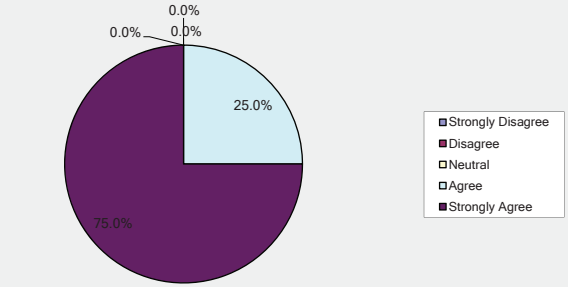


VISION D - The City's management policies include measurable objectives, priority actions and regulatory mechanisms, ensuring strategic, efficient and effective coordination between public and private partners.

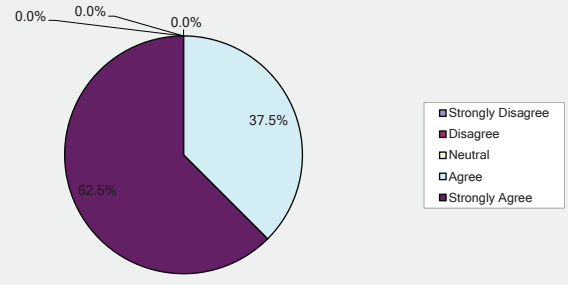


PUBLIC OPEN HOUSE #2 - COMPILED SURVEY RESULTS

VISION E - Homeowners and developers play an increasingly significant role in urban forest enhancement with protection and planting on private lands.

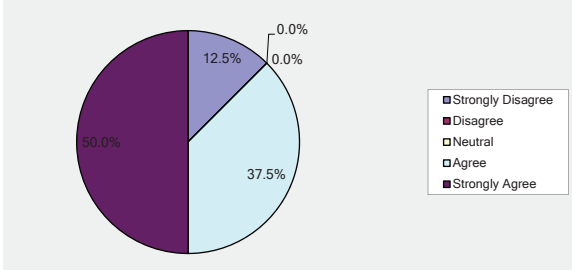


VISION F - Community members of all walks of life care for the urban forest as a shared priority and defining feature of what makes New Westminster such a great place to live.



PUBLIC OPEN HOUSE #2 - COMPILED SURVEY RESULTS

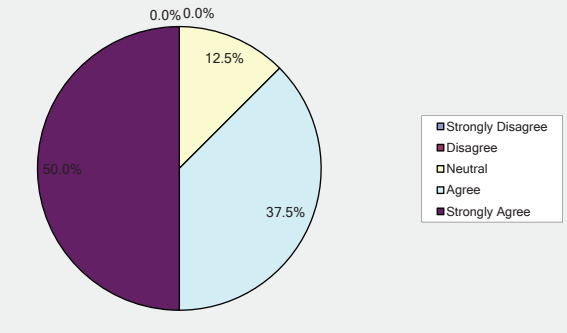
VISION G - Urban trees have been carefully planted, protected and maintained to clean the air, enhance habitat, capture carbon, manage stormwater and maximize benefits to our City's environmental health and quality of life.



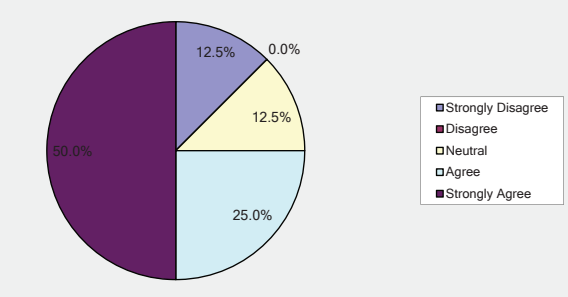
PUBLIC OPEN HOUSE #2 - COMPILED SURVEY RESULTS

Q4: The forest canopy in the City of New Westminster stands at 18% coverage. The average canopy cover for North American cities is 27% and the recommended "best practice" is 40% canopy cover. The proposed Strategy seeks a canopy target of 27% (a 9% increase over the next 20 years) through a private-public partnership. Please indicate the degree to which you agree with a 27% canopy target (i.e. do you think our target should be higher or lower?) and if a private- public partnership is the best way to achieve this target.

Please indicate your support for a 27% canopy target.



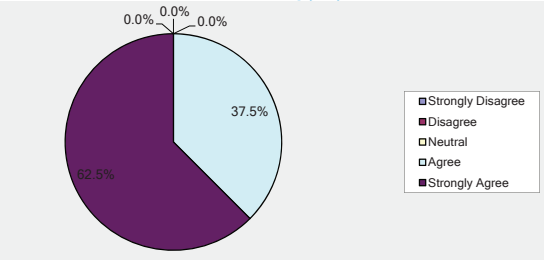
Do you support achieving our canopy goal through a Public-Private Partnership?



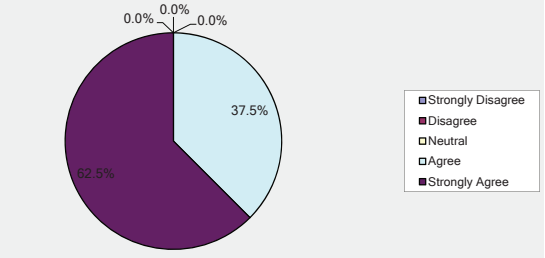
PUBLIC OPEN HOUSE #2 - COMPILED SURVEY RESULTS

Q5: Please indicate the degree to which you agree with the proposed increases on both public and private land (i.e. should we being doing more or less on either public or private property?)

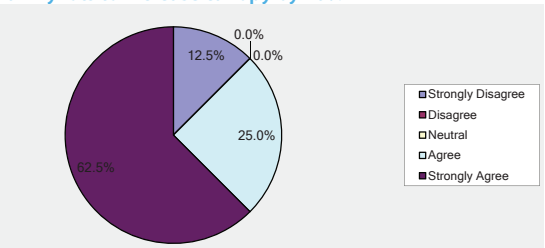
PUBLIC PROPERTY - Increase tree planting on City streets and boulevards to increase canopy by 19%



PUBLIC PROPERTY - Increase tree planting on parkland to increase canopy by 7%



Q14: PRIVATE LANDS - Increase tree planting on single family lots to increase canopy by 10%



PUBLIC OPEN HOUSE #2 - COMPILED SURVEY RESULTS

suggested revision or comments regarding canopy targets

You haven't mentioned increased tree planting on commercial and industrial lands and these need to be included. Large parking lots are a significant in affecting climate conditions. Large parking lots could incorporate small park like settings for employees to have their lunches outside with tree canopies for shade - e.g. Safeway, Queensborough Landing, Lowes, etc.

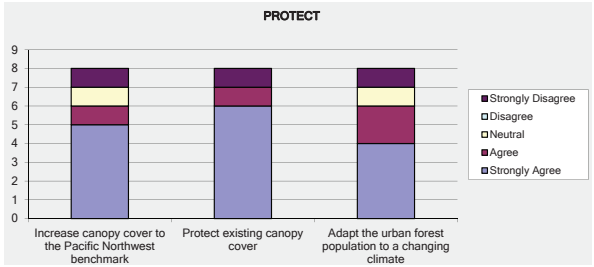
There are nine layers to an edible and resource rich forest garden, and it starts with the slowest growing elements which are the trees. The canopy (tall tree), sub-canopy (dwarf tree/tall shrub), shrubs, herbaceous plants, ground cover (creepers), underground, vertical (climber), mycelial (fungal), and aquatic wetlands all offer natural foods and services in an interactive web that can, with the right design, be interwoven into helping meet the needs of all within the living system, humans and human society included. The sooner we start planting the trees the better.

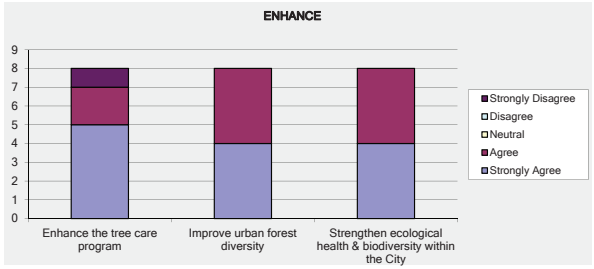
We would need to develop a marketing/promotional program to encourage private owners, developers and commercial enterprises to participate.
It is not appropriate that "single family lots" bear the burden of this extra canopy cover. Per your slides, single family lots are already at the 27% target. WE ARE THERE! Make the rest of the city do their share to increase the canopy target. Please do not create some plan that forces some of us to live is a dark and dreary neighbourhood simply because you want to meet some arbitrary average target. MULTI family properties need most of the increased cover. AND LESS PAVEMENT (streets, parking lots etc).

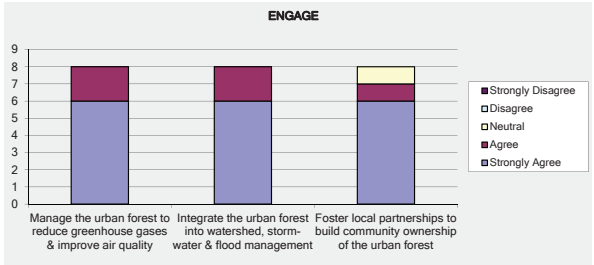
This city needs a Tree Bylaw for private property. A Bylaw that pays for itself modelled on best practices already in place in the Lower Mainland.

PUBLIC OPEN HOUSE #2 - COMPILED SURVEY RESULTS

Q6:The goals of the UFMS are to protect and enhance our urban forest and engage stakeholders, the community, and management practices in these undertakings. To what extent do you feel the following objectives contribute to the stated goals?







PUBLIC OPEN HOUSE #2 - COMPILED SURVEY RESULTS

other comments regarding the Urban Forest Management Strategy

Our trees are a multi-million dollar resource and having an inventory is essential to developing a master plan to include identifying and prioritizing species and planting schedules to promote the long term health of our forest, maximize the benefits, prioritize maintenance, facilitate long-term budgeting, and avoiding costly mistakes. Perhaps an annual rotating inventory by neighbourhood.

Queens Park and Moody Park offer an opportunity to engage and educate local people and businesses. They could become examples of successfully integrating living systems with human systems. They could demonstrate how to connect edible wetland landscape with public pools to create self-cleaning living pools. They could show home owners how to grow edible fences, how to design attractive year-round edible gardens, how to connect to community landscape care and food harvesting groups and business, how to include ducks or small animals that provide natural services to help grow and protect permaculture systems and, at the end of a productive work life can become sources of food themselves. There are so many ways that these parks could help us get together, learn together, work together, grow things together, and live well together. Thank you for asking for feedback.

What is the Pacific Northwest benchmark"? We cannot agree to something when we do not know what it is. Again, I cannot agree AT ALL with any blanket statement like "Protect the cover" You could use agreement to support a bylaw prohibiting the removal of any trees, which would be a very inappropriate bylaw. You will not get my support for policies until you make it much clearer wht you are asking us to support. Do you really think that climate change will affect the existing trees that much? Where was the case made for this? What science do you have to support it. Will the trees have a problem with a 2 or 3 degree rise? I doubt it. What is the "Tree Care Program"? Again I cannot support something without knowing what it is.

It would be most helpful if your information and survey were clearer and easier to understand.Given my responses you may not think that I support the city's initiative to improve our urban forest, but I do. I just think that so for the proposal is not clear enough to support. Remember 27% of the land with 100% coverage and nothing elsewhere is not acceptable. The "forest" must be spread out.
Responsibilty for this should be under one City department not spread over several in order to increase accountability and oversight.

8.5 Appendix C – Directors Presentation – Select Materials





	% current canopy coverage (by land use category)	# of potential Plantable Spots	# of Trees to be Planted (over 20 year time horizon)	% Contribution to overall Target
PUBLIC REALM	18.5%	8,500	8,500	6.14%
PRIVATE REALM	17.7%	unknown	3,300	2.86%
			11,800 (trees planted over 20 years)	**9% change** (18% → 27%)

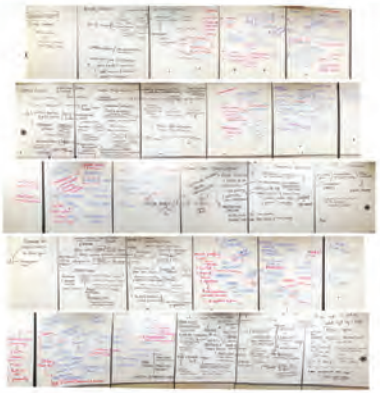
The Challenge in 27%: Public- and Private-Sector Targets



1. ***Tree Protection & Best Management Practices***
2. ***Tree Planting & Maintenance***
3. ***Staff Capacity, Defined Roles & Integrated Mandate***
4. ***Information & Management Systems***
5. ***Communications & Awareness***

Priority Actions for Urban Froest Management





> *inter-departmental (operational and financial)* **COORDINATION AND COOPERATION**

> *improved regulation, procedures and guidelines based on* **BEST MANAGEMENT PRACTICES**

> *a strategy to address* **SPECIFIC LOCAL CHALLENGES** *(limited resources, historical/cultural patterns/trends)*

> *the importance of public leadership and private partnerships in* **SUCCESSFUL IMPLEMENTATION**

Needs Assessment: Key Themes from Departmental Interviews





Priority Actions: Understanding Roles + Mapping Capacity



COUNCIL PRIORITIES

1 **Health + Well Being** *(quality of life)*

2 **Environmental Health** *(habitat + wildlife)*

3 **Energy Savings** *(fiscal responsibility)*

4 **Comfort / Shade / Microclimate** *(quality of life)*





NEW WESTMINSTER

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