memo

The Corporation of the City of North Vancouver
Engineering, Parks & Environment Department

To Directors' Team

From Douglas Pope, Manager, Environment and Parks

Re **Street Tree Master Plan – Financial Implications**

Date January 25, 2005

After considering the staff report on the Street Tree Master Plan at the December 6, 2004, regular Council meeting, the following resolution was carried:

> **THAT** due to the significant cost increases facing the City in 2005, the report from the Manager, Environment and Parks, dated November 26, 2004, entitled "Street Tree Master Plan" be referred to the Directors' Team to provide Council, early in 2005, with options prior to considering the endorsement of the Street Tree Master Plan, in principle.

In light of Council's decision, the purpose of this memo is to provide Director's Team with additional information on the financial implications of the Street Tree Master Plan, with specific emphasis on the recommended options in the original staff report for which Council has asked Director's Team advice. The items proposed for 2005 are presented in a prioritized list, as follows:

Table 1. New Operating Budget Items (proposed for 2005)	Priority	Cost per year
Additional Tree Worker	1.	$78,000
Watering and Tree Replacement Program	2.	$20,000
Community Stewardship coordinator (half time)	3.	$30,000
Education + Information program	4.	$10,000
	Total	**$138,000**

As these items are proposed as annual additions to the operating budget, a longer-term costs projection has been prepared to reflect the first 20 years of the Street Tree Master Plan (STMP) implementation. As shown in attachment 1, the $138,000 in additional cost per year would be constant for the first five years of the program. After that period the program can be reviewed, and changes made to balance the goals of the STMP with the financial priorities of the day.

The addition of the tree worker position was the highest priority identified in the original report, as it will result in improved street tree services with the ability to implement the recommended preventative maintenance and inspection program. After the first five years of the proposed program, the results will be reviewed to determine if additional maintenance resources are required.

The attached staff report describes the rationale for funding the 3 other new items listed in Table 1. While considered a lower priority then the Tree Worker position, there are clear benefits of implementing each item for at least an initial five-year

period. Following that time, the decision based on evaluation, could be made to scale back or eliminate items 2 and 3 from the operating budget.

As was noted during Council's deliberations, the costs described above, and provided in attachment 1, are lower than those originally described in the consultant's report (attachment 2). These differences reflect staff's recognition that full implementation of the consultant's plan may not be feasible given the many other City projects and program competing for capital and operating funding. The differences between the staff and consultant financial implications are described below.

Pruning and Inspection Program: As shown in attachment 1, the consultant has estimated a per tree cost of $85 based on averages from BC Hydro's tree maintenance contractors. With the predicted growth rate of the City's street tree inventory at 200 trees per year, the consultant's cost estimates increase with the application of the BC Hydro unit cost from $68,000 in 2005 to $114,000 in 2025. However, those estimates do not take into account the predicted increased in crew productivity as a result of adding a second tree worker. They also assume that every tree inspected will require some pruning.

Staff suggest that the increased operational efficiency of the additional tree worker will allow tree service requests to be effectively managed and will provide sufficient resources to enable the implementation of preventative maintenance and inspection program. The staff strategy also recognizes that as the overall condition of the City's street tree inventory improves with regular maintenance, there should be a corresponding decrease in service requests, thereby freeing additional time for routine maintenance and inspection. As a result, the consultant's cost estimate for Pruning and Inspection are not included in the staff report, and instead, maintenance and inspection is considered to be addressed with the additional tree worker position.

Watering and Replacement Program: The consultant's estimated costs for watering and tree replacement are calculated on a per tree basis and therefore increase over time based on the predicted annual increase in the City's tree inventory. For the first five year period, staff have rounded up the figure to $20,000 per year, with additional increases of $2000 for every subsequent five year block.

Plans are underway to ensure that automatic irrigation is mandatory, where feasible, for all new street tree planting. This will ensure the containment of watering program.

Stewardship Coordinator: The proposed costs for the part-time Community Stewardship Coordinator position ($30,000) are consistent between both reports for the initial five years. However, staff suggest that the effectiveness of that position be reviewed after that initial period, before extending it beyond 2009.

Education Program: The consultant has proposed an ongoing education program that would vary from $10,000 to $20,000 over the first five years, and eventually be reduced to $5000 after 10 years. Staff feel that a $10,000 annual budget for the first five years should be sufficient, and that after that period and based on an evaluation of the Stewardship and Education program there maybe enough opportunities for

promotion and education available though existing City communications programs (CityViews, website etc).

Additional Tree Worker: It should be noted that the $78,000 listed in Table 1 is $23,000 more than the tree worker cost included in the original consultant report. This amount reflects the added costs of benefits plus vehicle charge out rates for the operation of an existing City pick-up truck by the City Arborist, reflecting the fact that with the additional Tree Worker, the Arborist will be free to conduct inspection and assessment work on his own.

Relationship to the OCP: In addition to the numerous social, environmental, and economic benefits described in the November 26th staff report, the Street Tree Master Plan also directly supports the OCP and Strategic Plan vision by making the City a more "liveable" community. Appealing streetscapes encourage pedestrian use and decrease the use of vehicles, resulting in reduced greenhouse gas emissions and reduced traffic congestion.

Sincerely,

Douglas T. Pope, P.Eng.
Manager, Environment and Parks

Attachments:

1. Projected Operating Costs
2. Operating Budget Estimates
3. Street Tree Master Plan Staff Report (November 26, 2004)
4. Street Tree Master Plan – Consultant Report

Urban Forestry Master Plan Phase II

Street Tree Master Plan

November 30th, 2004

the city of north vancouver

LANARC CONSULTANTS LTD

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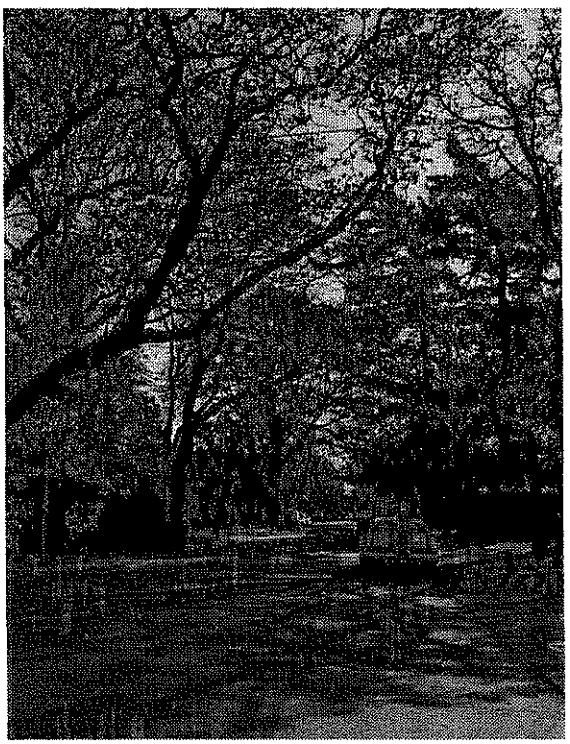

STREET TREE MASTER PLAN

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City of North Vancouver Urban Forest Plan

STREET TREE MASTER PLAN

1. Introduction

The City of North Vancouver (CNV) is an evolving leader in sustainable development, and the urban forest plays a key role in its sustainable future. The City's forested ravines and native conifers are a link to its natural environment, while its planted streets and green spaces help to define its character. All together, they function as the lungs of the City.

The urban forest can be defined as the total of all vegetation growing within an urban area. "The urban forest is a diverse patchwork of vegetation, a mosaic of green infrastructure from historic boulevards with exotic shade trees to natural areas that protect remnant Coastal Western Hemlock forest, streams and creeks" (CNV, 2003). The urban forest provides many benefits to the quality of life of communities.

The Department of Engineering, Parks and Environment is responsible for managing the City's urban forest, and is developing an Urban Forest Master Plan. Phase I, completed in 2001, created an inventory of street trees in the City. Phase II, this project, has a focus on the street tree component. Future Phases will extend the planning effort to parks and woodlands in the city.

This Street Tree Master Plan was developed by Lanarc Consultants Ltd., who was assisted by the Centre for Urban Forest Research (CUFR), a research arm of the US Forest Service.

1.1 Purpose of the Street Tree Master Plan

Street trees, as one component of the urban forest, are any trees growing naturally or planted within a municipally owned road allowance/right of way. Based on its existing inventory, the CNV has approximately 5415 street trees.

The purpose of this Plan is to provide a design and long-term planning framework for the planting, maintenance and funding of the CNV's street trees. The objectives of the Plan are to:

- **Integrate** with various existing City master plans and strategies.
- **Define Landscape Character Areas** and strategies to support them as the City redevelops, addressing heritage tree/landscape features.
- Provide detailed **street tree plans** for Lower and Central Lonsdale corridors to support redevelopment activity and urban design objectives.
- Provide **Street Tree Guidelines** and demonstrate their use through **Demonstration Projects** in residential areas.
- Provide an **Implementation Strategy** that sets out planting and maintenance targets, tree cover densities, community involvement measures, partnering opportunities, funding strategies and that builds on the current GIS street tree database.
- **Survey community attitudes** towards the urban forest and develop methods to **inform and educate the public** through the City's web resources and other media.

1.2 Methodology for Developing the Plan

Box 1 below outlines the main steps undertaken by the consulting team, in collaboration with CNV staff, to develop this Plan. Several interim products were generated:

- Street Tree Poster.
- Introductory PowerPoint slideshow.
- Street Tree Master Plan Backgrounder report (for a public audience).
- A Survey Response Form (online and paper versions) and Summary Report.

Box 1: Steps in developing the Street Tree Master Plan

1) Background Review

Collect and review existing GIS data and tree database.

Review and assess gaps in previous urban forestry initiatives.

Review existing Strategic Plans and record interfaces with UFMP.

Workshop A: Priorities and Team Roles

2) Landscape Character and Feature Study

Map draft landscape character areas.

Field review landscape character areas - create image record of views, refine boundaries.

Field review key urban design features-gateways, green necklace, heritage trees/corridors.

Summarize Landscape Character and Features/Opportunities in Map Form

3) Urban Forest Benefit:Cost Analysis

Adapt and run STRATUM program to calculate benefits:costs of existing urban forest.

Use STRATUM to analyze structure and weaknesses of the existing urban forest.

Summarize Benefit:Cost Analysis in written, graph, slide form.

4) Investigate Guiding Principles and UFMP Alternatives

Produce Draft Guiding Principles based on above research and analysis.

Create Alternative Approaches to meet the Guiding Principles, for discussion.

Run STRATUM Analysis of alternative approaches.

Prepare an outline of communication materials - web, posters, brochure, slides, response form.

Workshop B: Review Data, Analysis, Principles, Alternatives and Public Process

5) Finalize Communication Materials

Prepare digital visualizations of a residential and a commercial street tree application

Prepare poster display for mall, library, city hall, school use, web distribution

Prepare a web information site

Prepare both written and web response forms

Prepare a slide show for use by staff and volunteers

Prepare a press release and press kit.

Workshop C: Joint with PRAC, EPPC, HAC

First Council Presentation

6) Facilitate Public Process for Earth Week

Maintain the web site and on-line response form facility

Distribute slide and poster materials to interested schools

Support volunteers at key locations during Earth Week / Arbour Day

Collect and summarize response form results

7) Prepare Policy and Regulatory Recommendations

Finalize Guiding Principles, Goals and Objectives based on public input received.

Recommend a Policy and Regulatory Framework in a 20 Year Vision

Prepare Draft Street Tree Plans and Related Budgets

Prepare a Draft Implementation Strategy and 20 Year Budget Schedule

Workshop D: Staff Workshop re Draft Implementation Strategy

8) Draft and Final Reports

Produce Draft Report and submit for staff review.

Update poster, slide and web communication materials to final recommendations

Second Council Presentation

9) Submission of Final Products

1.3 Relationship to the Official Community Plan

Proactive planning and management of the City's Street trees addresses a broad range of community goals described in the Official Community Plan, in particular the broad vision of a sustainable community. To quote the 2002 OCP:

"COMMUNITY VISION: To be a vibrant, diverse and highly livable community that strives to balance the social,economic and environmental needs of our community locally."

"By addressing social, economic and environmental concerns as stated in this Vision, the City hopes to become a more "sustainable" community . . . a truly livable city with a distinct sense of place and visible links to the community's natural and cultural past. A city that is safe, welcoming, inspiring and inviting to all people."

"Our community has its origins in the natural environment.To achieve a sustainable community, it will be critical that we respect that environment and work with it, not against it. . . From the perspective of creating a sense of place, it is important that efforts be made to help people learn about our natural environment and relate to it. Although much of the City will be urban, opportunities to celebrate the natural environment should be explored. Our West Coast landscape origins should remain a distinctive part of our City's character. Connecting urban life with the natural environment is an important consideration."[1]

1.4 Relationship to the Corporate Strategic Plan

The Street Tree Master Plan also supports the City's Corporate Strategic Plan, specifically:

C2 We will protect and maintain new and existing public infrastructure and amenities and enhance the natural and built environment.

C3 We will enhance community safety.

C4 We will establish and maintain a customer service culture that is responsive to community needs.

C5 We will enhance communications with residents, businesses, and staff.

1.5 Other Related City Plans and Policies

Appendix 3 provides an overview of City of North Vancouver Plans and Policies that provide context or affect the Street Tree Master Plan.

The key relevant documents include:

Previous Urban Forestry Initiatives

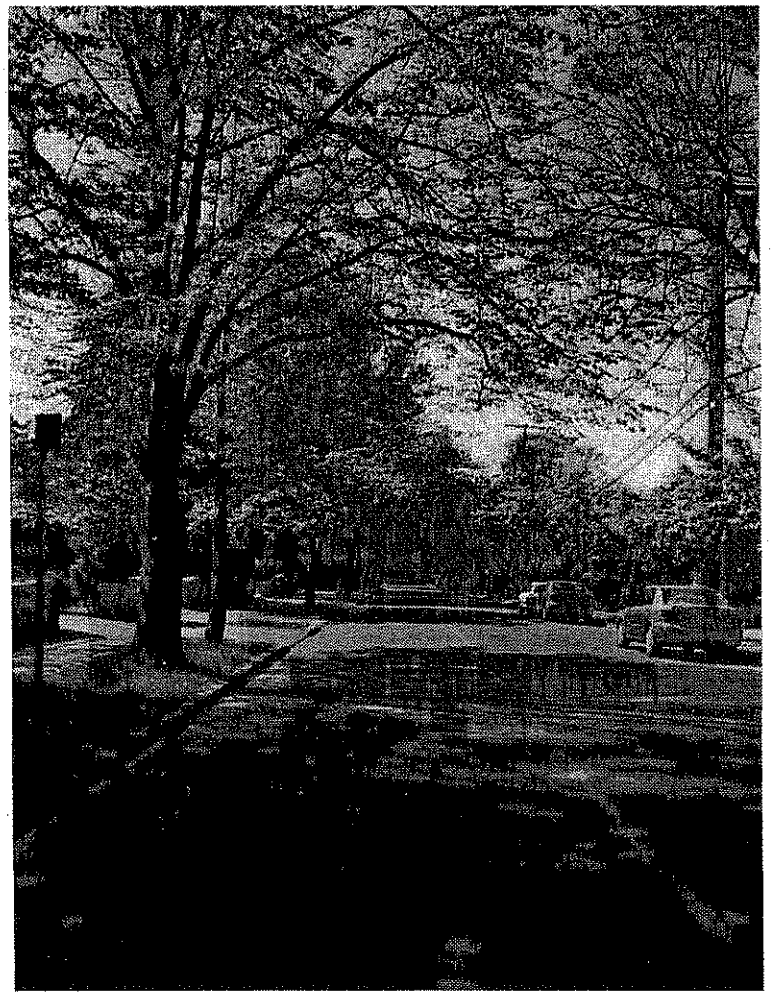
- 1983 Street Trees of North Vancouver
- 1987 Street Tree Plan: Phase 1
- 1992 Urban Forest Management Plan
- 1992 CNV Detailed Design Urban Forest Inventory
- 1993 Urban Forest Management Plan: Advanced Solutions
- 2001 Urban Forestry Master Plan Phase 1
- 2003 Assessment of Tree Conditions in Selected Parks within the City of North Vancouver

[1] City of North Vancouver, Official Community Plan, 2002

Current Strategic Plans and Policies

- 1994 CNV Heritage Inventory
- 1996 Bicycle Master Plan
- 2000 Lonsdale Corridor Master Plan
- 2001 Traffic Calming Program
- 2001 Lighting Master Strategy Phase 2
- 2001 Environmental Protection Program
- 2002 Official Community Plan
- 2002 Parks & Greenways Strategic Plan
- 2003 CNV Tree Policy
- 2003 CNV Senior Park and Open Space Study
- Integrated Stormwater Management Plans
- Partners for Climate Protection Program;

The Street Tree Master Plan is intended to complement, not conflict, with these prior plans and policies.



2. The Role of Street Trees

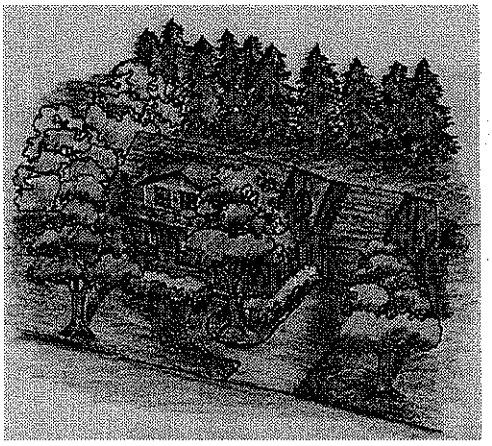
North Vancouver's setting location makes it ideal for high-density living, providing alternatives to continued suburban development that trigger automobile-based commuting and associated pollution. However, high-density development, when poorly designed, can lead to a proliferation of roof, pavement, and hard surface – hardscape. In North Vancouver, there are many opportunities to ameliorate the problems associated with hardscape through strategic tree planting and stewardship of existing trees. A well-designed street tree program can reduce stormwater runoff, conserve energy and water, sequester CO_2, attract wildlife, and provide other aesthetic, social, and economic benefits.

2.1 Component Benefits and Costs in the CNV

The Centre for Urban Forest Research (CUFR) customized a sophisticated computer program called STRATUM (Street Tree Resource Analysis Tool for Urban Forest Managers) to model the benefits and costs of the CNV's urban street tree populations. The methodology is described in Appendix 2 "STRATUM Application for the City of North Vancouver – Methodology and Procedures". While this approach has been carried out in many western U.S. cities, this was the first application of STRATUM in Canada.

STRATUM measured the following benefits/costs of the CNV's existing collection of street trees.

2.1.1 Energy Savings



Street trees modify the local microclimate and conserve building energy use through shading, transpiration (using solar energy that would otherwise heat the air to convert moisture to water vapour), and wind speed reduction. In so doing, street trees also reduce the "urban heat island effect" – the localized heating formed by concentrations of asphalt, concrete and other structures that absorb, rather than reflect, the sun's heat, causing local ambient temperatures to rise.

STRATUM estimated that the CNV's 5415 street trees:

- Saved 34.1 MWH annually.
- Saved 426.2 Mbtu of gas annually.
- This is equivalent to the energy use of approximately 12 homes in the CNV.
- This represents a savings of $6,514/year.

2.1.2 Greenhouse Gas (CO_2) Reductions

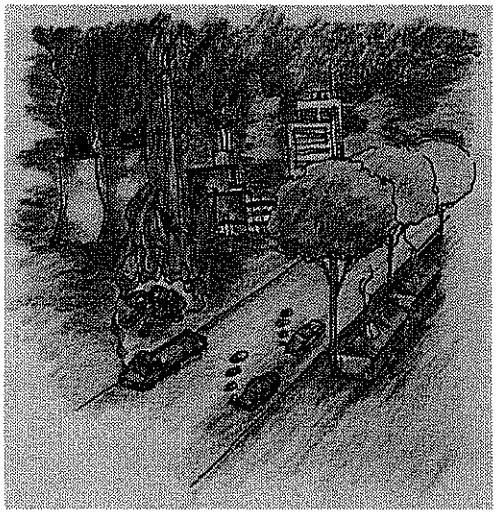
Trees capture carbon dioxide (CO_2) to build wood and foliage while they grow, though they also release CO_2 when they die. When they are near buildings, trees can reduce heating and air conditioning demands, thereby reducing CO_2 emissions from power generation.

STRATUM estimated that the CNV's 5415 street trees:

- Sequester 1,264,752 lbs (569,138 kg) of CO_2 per year.
- By reducing energy use, avoid the production of 4,560 lbs (2052 kg) of CO_2 per year.
- Release 334,379 lbs (150,471 kg) of CO_2 per year through decomposition and maintenance activities.
  - This results in a Net Reduction of 934,933 lbs (420,719 kg) of CO_2 per year.
  - This is the equivalent of CO_2 emitted by about 78 lightweight vehicles (12,000 lb/year/vehicle) in a year.
  - This represents a dollar value of $9,366 per year.

2.1.3 Air Quality Improvements

Trees absorb air pollutants like ozone and nitrogen oxides and intercept particulates like dust and smoke. They also release oxygen through photosynthesis and lower local air temperatures, which reduces the effect of ground-level ozone - a major contributor to smog. At the same time, though, trees can release biogenic volatile organic compounds (BVOCs), such as isoprenes and monoterpenes that can contribute to ozone formation. The BVOC generating potential of different tree species varies considerably.

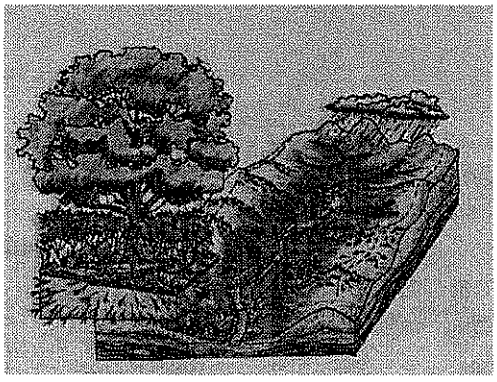


STRATUM estimated that the CNV's 5415 street trees:

- Remove 1013 lbs (460 kg) of ozone, nitrous oxide, particulate matter and sulphur dioxide.
- Avoid the production of 42.3 lbs (19 kg) of similar compounds by reducing energy use.
- Contribute about the same quantity (480 kg) of BVOCs.
- Overall, air quality benefits are likely neutral or better in the CNV's air shed, depending on tree species planted.

2.1.4 Stormwater Management

Trees intercept rainfall in significant amounts, thereby reducing stormwater runoff from roofs and pavement. A typical large street tree is estimated to reduce runoff by over 2000 liters (550 gallons) in places like Seattle and North Vancouver.

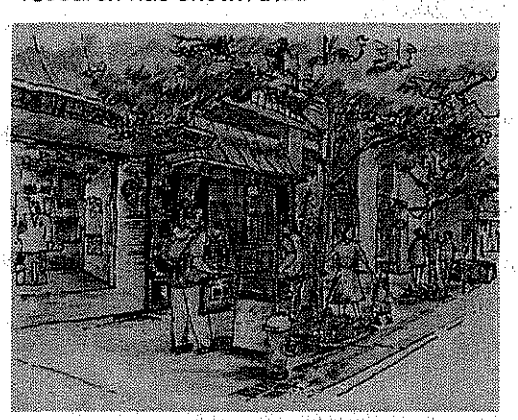


STRATUM estimated that the CNV's 5415 street trees:

- Intercept 521,948 US gallons (almost 2 million liters) of rainfall per year.
- This is enough water to fill 20 backyard swimming pools
- This represents a savings in stormwater management of $66,362 per year.
- Coniferous trees have the highest values for stormwater management.

2.1.5 Aesthetics & Other Benefits

Trees are beautiful (naturally), and while the benefits from their aesthetic appeal are difficult to quantify, research has shown that:



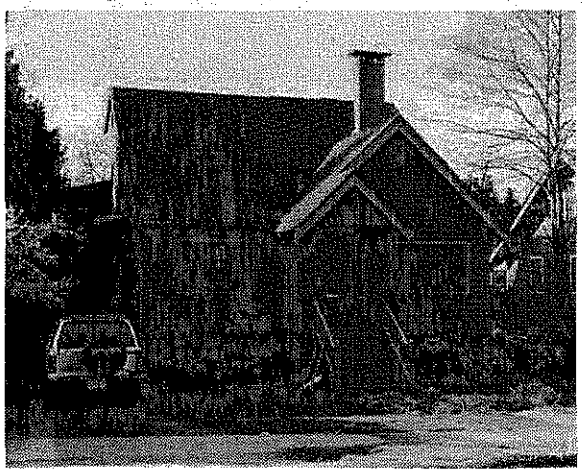
- Shoppers come more often, stay longer and pay more in commercial areas with trees than those without trees (Wolf, 1999).
- Office workers with a view of trees and nature report lower illness rates and greater satisfaction with their jobs.
- In public housing complexes, outdoor spaces with trees were used significantly more often than spaces without trees (Sullivan and Kuo, 1996).
- By facilitating interactions among residents, trees can contribute to reduced levels of domestic violence, as well as foster safer and more sociable neighborhood environments (Sullivan and Kuo, 1996).

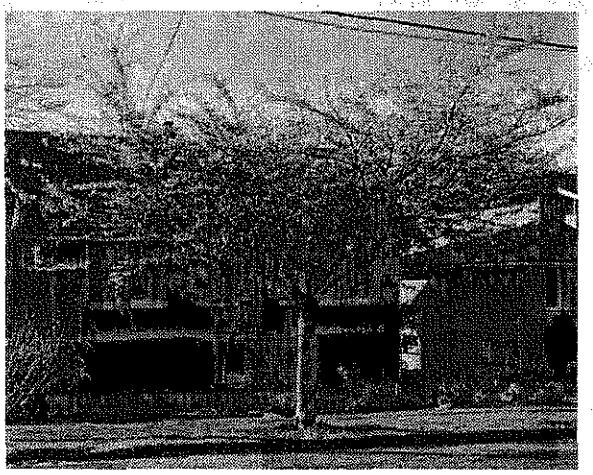
2.1.6 Property Values

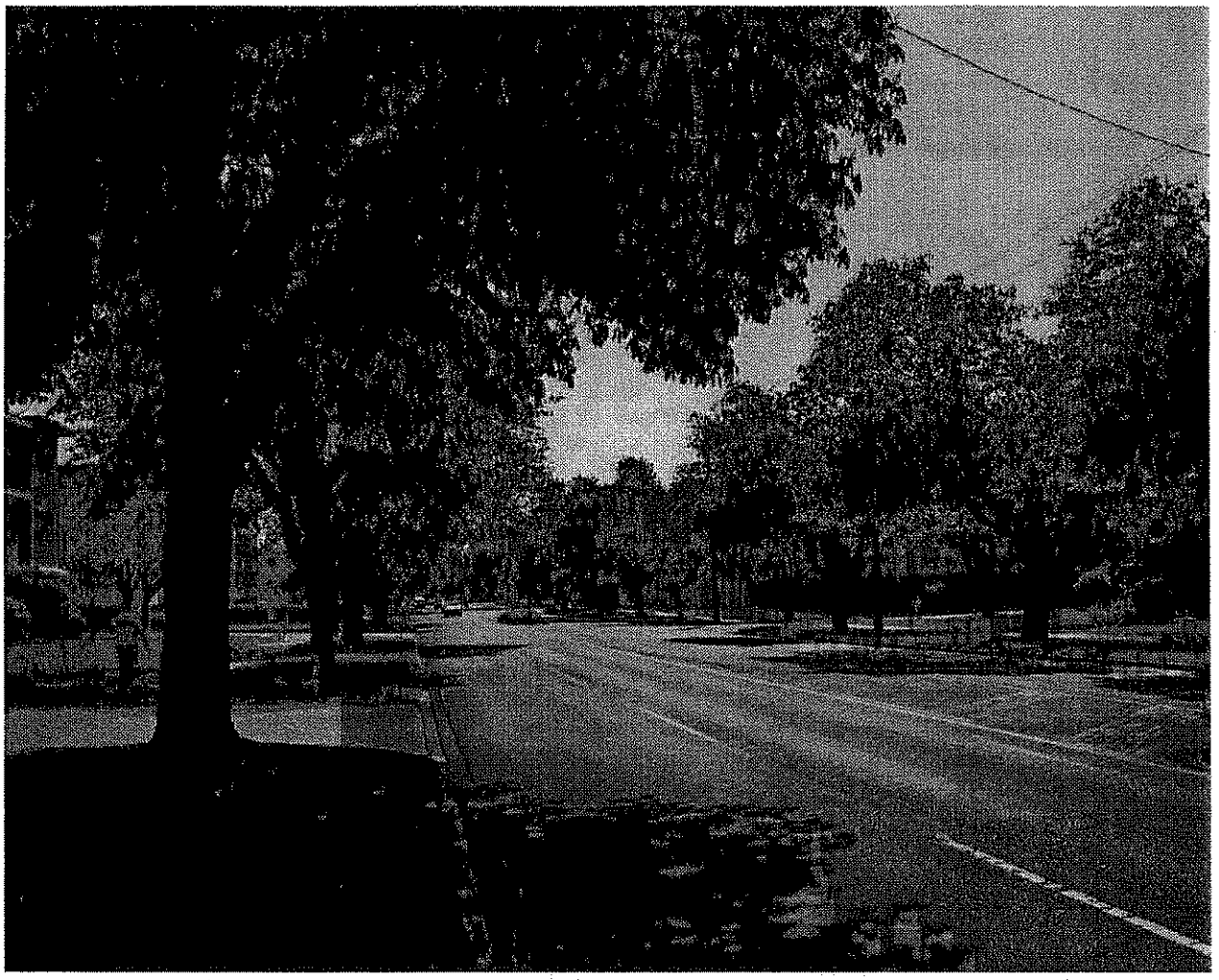
Well-maintained trees increase the 'curb appeal' of properties. Research shows that people are willing to pay 3-7% more for a property with trees than one without (assuming water views are not impacted).

STRATUM estimated that in the CNV's, street trees:

- Increase total property values by $419,728 per year.
- The increase per tree averages $78.44 per year.







2.2 Overall Benefit:Cost Ratio

Adding up all the above benefits and costs, the CNV's street trees are estimated to provide:

- Average annual benefits of $501,000 per year total or $94 per tree per year.
- Approximately $25 million in benefits over 50 years.
- With annual maintenance costs of $94,000 (based on costs in 2003 for managing street trees - pruning, tree and stump removal, watering, replacement planting), the existing street tree population in the CNV has a **benefit:cost ratio of greater than 5:1.**

The results of the STRATUM analysis and Lanarc's review also revealed the following features of the CNV's urban forest:

- Conifers with wide, high canopies (like Douglas Fir) have better energy and stormwater benefits than narrow conifers with needles to the ground (like Western Red Cedar).
- Care should be taken to avoid over-planting or concentration of common species (e.g. Japanese Flowering Cherry and Red Maple), to guard against the impacts of disease.
- There are many public streets in the City of North Vancouver that do not have street trees but could accommodate them.
- Overhead power lines in many locations are a constraint to planting of large trees.

2.3 Role of Street Trees in Urban Design

As well as environmental benefits, street trees are a key part of urban design. Along with building architecture, the placement and organization of street trees contributes the following to the City of North Vancouver:

Sense of Place: tree planting design can differentiate the City from more rural areas, and can provide an strong identity and civic pride.

Sense of History: the growth and aging of street trees provides a sense of time. Mature street trees provide a feeling of permanence and grace.

Connection to the Natural Environment: Street trees – and native conifers in particular – are a visual and ecological reminder of the rainforest environment.

Urban Fish and Wildlife: Linkages of street trees provide habitat and movement corridors for birds and small mammals between the forested ravines. Many people take comfort and enjoyment from watching this urban wildlife.

Spatial Definition and Unity: Strongly organized plantings of street trees can define spaces like urban plazas and corridors. Trees can unify a space.

Focal Points: Choosing trees which contrast their surroundings in shape or colour can provide a strong visual focal point, which can act as a landmark or attraction.

Human Scale: Trees at street level can create 'urban rooms' that are comfortable in scale for pedestrians. This is a particularly important design device in reducing the apparent scale of large or high buildings.

Softening of Urban Spaces: The dappled effect of light through street tree branches and leaves provides a pleasing, reassuring texture on hard urban surfaces like pavement and blank building walls.

Sense of Seasons: Street trees mark the seasons with changes in colour, flower, fruit and leafiness.

Visual Attraction and Comfort: Street trees make people feel more comfortable. Studies have shown this leads to people staying longer, and spending more, in retail shopping streets.

Opportunities for Amenity Lighting: The lighting of street trees, either by uplights or through use of LED 'fairy lights', is a key part of creating attractive urban spaces.

Traffic Calming: Street trees planted in traffic circles, and curb bulges, make these features more visible to motorists, and offer a visual narrowing of the street which promotes slower traffic. Tree locations at crossings need to carefully consider sight distance between motorists and pedestrians.

Separation of Pedestrians from Traffic: Street trees in boulevards or tree grates are effective at separating pedestrians from vehicular traffic.

Shade and Shelter: Street Trees provide amelioration of microclimate – offering shade and shelter from strong winds.

Buffering: Street trees can be designed to provide visual buffers to unsightly or conflicting areas.

The above Urban Design functions of street trees are calculated in the Benefit:Cost Analysis as increased property values. They are the largest single added value that street trees bring to the City.

2.4 Role of Street Tree Programs in Comparable Municipalities

The City of North Vancouver is joining a long list of leading Municipalities in formalizing its Street Tree Program.

Table 1a below shows how the City of North Vancouver compares with Street Tree Programs in Vancouver, Seattle and Portland.

Table 1a: Comparison of Street Tree Programs in Four Western Cities

Factor	Vancouver	Seattle	Portland	City of North Vancouver
# of Street Trees	124,000	139,000	200,000	5,415
Annual Budget	$3.1M operating	$2.3M US includes parks	$1.4M US	$0.1M operating
Pruning Cycle	7 yrs residential, 2 yrs commercial	Limited	7 years	No program
Population (persons)	560,000	540,000	550,000	44,303
Street Trees / population.	0.22	0.25	0.36	0.12
Street Tree Budget/ population.	$5.54 operating	$4.25 US includes parks	$2.55 US	$2.25 operating

The City of North Vancouver is less aggressive than all of these comparables in its planting, maintenance and funding of street trees.

Table 1b provides summarizes other aspects of the street tree programs of several comparable municipalities.

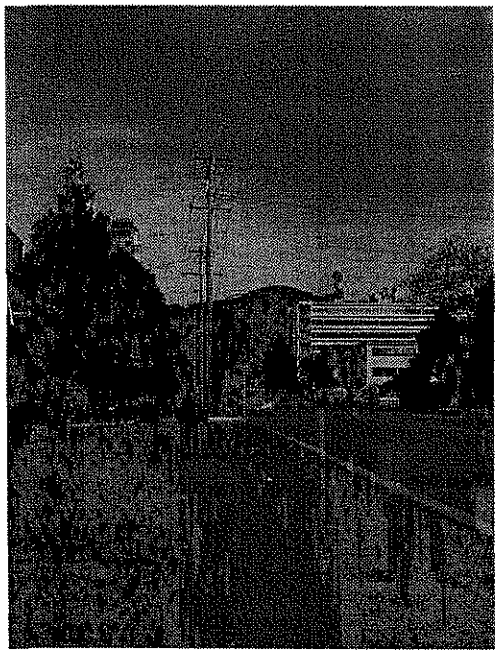


Table 1b City of North Vancouver – Street Tree Master Plan

URBAN FOREST MANAGEMENT – MUNICIPAL COMPARISON

	NORTH VANCOUVER CITY	CALGARY	EDMONTON	OTTAWA	PORTLAND	SEATTLE	VANCOUVER	WINNIPEG
DEMOGRAPHICS								
Population	44,303	905,000	666,104	774,072	550,000	540,000 (1998)	560,000	619,544
Area (ha)	1,195	72,173	67,000	277,964	89,600 acres = 36,260 ha	84 sq.miles = 21,756 ha	11,467	46,205
TREE RESOURCES								
Tree inventory	5415	335,000 in groomed parks and boulevards; many more in natural areas (separate stats for Birthplace forests)	115,000 boulevard trees 163,000 roadway buffer and park trees	>200,000 street trees	200,000 street trees	139,000 street trees 115,000 park trees in landscaped areas 250,000-400,000 on residential lots	124,000 street trees	185,000
Canopy Cover	Unknown					25% overall 15.5% in residential areas Goal: 40% overall		
Trees/ha	4.5	4.64	4.15		5.52	6.39 for street trees only 11.68 street and park trees	10.8	4.0
Species	See Stratum Report		Boulevards: - American elm 35% - Green ash 40% - Black ash 15% Natural areas: - aspen 30% - balsam poplar 35% - white spruce 15%			Street trees: - 300 species - 25% ornamental plums or cherries - 13.5% Sweetgum - 13% Norway maple Majority of City-owned trees in natural areas and parks, dominated by red alder and bigleaf maple.	Street trees: 600 species/ cultivars Most common: Japanese flowering cherry >19000 in boulevards	
Value	Unknown	$335 million	$850 million		$150 million for street trees	$635 million Estimated to increase assessed property valuation by up to $630 million. Estimated $42 million annual savings in air quality and stormwater management remediation	>$500 million	
MANAGEMENT FRAMEWORK								
Agency	Parks Division, Engineering, Parks and Environment Dept.	Urban Forest section, Parks Dept.	Edmonton Community Services Department	Forestry Services, Planning, Environment and Infrastructure Dept.	Urban Forestry, Dept. Parks & Recreation Urban Forestry Commission - 11 volunteer citizens; reviews plans and policies; advises on annual Urban Forestry budget request, sponsors Heritage Tree Program, educates community about urban forestry issues; resolves conflicts relating to trees by hearing citizen appeals.	Seattle Transportation (SeaTran) – street trees, ROWs Parks & Recreation Dept – City properties Urban Forest Coalition – include above + Seattle City Light, Public Utilities, Fleets & Facilities, Dept. Neighbourhoods, Seattle Center, Dept. Design, Construction & Land use, Office of Sustainability & Env. Seattle City Light	Vancouver Park Board	Forestry Branch, Parks and Open Space Division, Public Works Department
Staffing	1 Arborist, 1 field staff					SDOT – City Arborist, Admin'r, 3 Certified arborists, Tree Crew supervisor Parks & Rec - Senior Urban Forester, two 2-person tree	>50 arboriculture staff	

	NORTH VANCOUVER CITY	CALGARY	EDMONTON	OTTAWA	PORTLAND	SEATTLE	VANCOUVER	WINNIPEG
						crews and a part-time Urban Forester.		
UF Plan	2001 Urban Forest Inventory, current planning			Urban Forest Strategy proposed under Environmental Strategy, part of 20/20 vision.	Updated UF Management Plan in draft. Includes 8 recommendations and specific actions for each; address coordination, documentation, expansion of the urban forest, regulations, funding, development incentives and education. http://www.parks.ci.portland.or.us/Planning/PDFfiles/ufmp_publicreviewdraft_b.pdf	Seattle Urban Forest Assessment: Sustainability Matrix (2000) SDOT Street Tree Master Plan – 3-phase study (1992-99) recommends priorities for tree plantings in arterial streets, provides list of trees, and presents concepts for plantings to connect existing green spaces.	Street Tree Management Project see note 2	See note 1
Bylaw	Parks Bylaw, Tree Protection Policy	Applies to City/public land only. Requires permit and tree protection plan for any construction within 6 m of a tree in ROW.	Boulevard tree bylaw (7829)	Trees Bylaw addresses the protection, maintenance, and control of trees on highways and City property, sets out the responsibilities for persons carrying out work in the vicinity of a City owned tree.	Tree Cutting Ordinance regulates cutting of trees 12" diameter or greater on certain private properties; regulate the removal of any tree in public right-of-way.	Proposed Street Tree Ordinance Proposed PROPARKS levy Tree Protection Standards	Street Tree Bylaw no. 5985. Private Property Tree By-law (No. 7347) and Guidelines: requires all property owners to obtain a permit ($25) to remove a tree (as defined); allowed one removal per 12 months with exceptions. http://www.city.vancouver.bc.ca/commsvcs/BYLAWS/TREE/Tree.htm	
Management tools							TreeCare – street tree management program VanTree – computerized database tracks each tree's vital statistics, maintenance, enquiries; planting sites.	Computerized street tree inventory, low level helicopter aerial photography
MANAGEMENT ACTIVITIES								
Planting	No formal program, incidental to development and civic projects	*Community Tree Planting Program* – free trees for communities to plant on City land – see below.	5-10,000 trees & shrubs/yr planted by City and developers		Citizens can apply for free permit from Urban Forestry to plant trees on public ROW; Arborist will assess and provide advice on species and planting.		>3000 street trees/yr 4 programs: - capital - local improvement - greenways - replacement 8-ha nursery in Campbell R Valley Park holds 10,000 trees; harvest av. 2000 trees/year.	800/yr on boulevards and in parks
Maintenance & Pruning	No formal program		6 year cycle, except 40,000 elm pruned on 4 yr cycle for DED prevention		7 year cycle, interrupted by responses. Relies heavily on adjacent property owners. Citizens can apply for free permit to prune trees on public ROW; Arborist will assess and provide advice on pruning needs.	19-year cycle? SeaTran maintains street trees planted by the City only; all other street trees are responsibility of adjacent property owner. Street use permit required to prune or remove tree in ROW.	7-year cycle in neighbourhoods; prune 1/7 trees in each of 22 neighbourhoods each year. 1-2 year cycle in commercial areas. >17,500 trees/yr - When pruning, staff update info re. trunk diameter, height, condition. 3 million ladybugs released/yr to help control aphids. >5000 service calls/yr on street trees	12 year cycle 18,000 trees/yr

	NORTH VANCOUVER CITY	CALGARY	EDMONTON	OTTAWA	PORTLAND	SEATTLE	VANCOUVER	WINNIPEG
Removal/ loss	unknown		600-900/yr		Citizens can apply for free permit from Urban Forestry to remove and replant trees on public ROW; Arborist will assess and issue permit if warranted.		1200/year average	300-400 boulevard trees/yr – damage, age
Annual budget/ funding	$0.1 million		$2.6 million		(US) $1.4 million	(US) $2.3 million in neighbourhoods, parks and open spaces $3.6 million if include costs of powerline clearance (City Light) $4.25-$6.60 per capita (range for US cities: $1.13 - $18).	$3.1 million street tree operations; $1.1 million capital/tree planting	
Special concerns	Lack of maintenance program	Black knot fungus Elm scale and Ash psyllid	DED (Dutch elm disease)		DED		Species with perennial disease problems: Blireana plum, English hawthorn, Modesto ash, old cultivars of Flowering crab.	Dutch elm disease (DED)
Powerline mgmt	Done by BC Hydro					Seattle City Light - Power Line Clearance Program http://www.cityofseattle.net/light/neighborhoods/nh4_trlr.htm	Provides general information to residents; suggests contacting BC Hydro Vegetation management branch.	
PUBLIC PROGRAMS								
Education	No formal program	Information on website re. benefits of trees, tree pruning, tree protection bylaw.	Information on website re. benefits of trees, tree pruning, watering, "drought stressed trees", tree protection bylaw.	Information on website re. benefits of trees, tree pruning, watering, tree bylaw.	Extensive information online and as booklets on tree permits, planting, pruning, care, cutting, etc. http://www.parks.ci.portland.or.us/urbanforestry/UrbanForestry.htm#brochures Guided walks to showcase noteworthy tree species in Portland.	Extensive information online on tree planting, pruning, care, cutting, etc. Variety of workshops provided to train residents on pruning, etc.	Descriptions online of City's programs	
Planting programs	No formal program	*Planting Incentive Program* (PIP): planting on **residential properties**; community associations, neighbourhood groups or individuals apply to Calgary Parks for **50% funding.** Parks/urban forests staff review applications, meet with applicants, recommend species and site locations. Parks staff prepare hole and planting. Maintenance except pruning is responsibility of residents. *Forever Green Program* – partners: BP Canada, Golden Acre Garden Sentres, Calgary Health Region, CPR. Sponsors: *Community Tree Planting Program* – free trees to	*Arbor Day* – evergreen seedling given to all grade 1 students. 1 school awarded to host official ceremony and plant a tree on school's property. *Commemorative tree planting* - $800/tree. *Tree donation/transplanting* – specifies criteria to be met.	*Trees in Trust* - Street trees available by request. No charge - tree and planting provided by the City. Applies only to homes with space between property line and the roadway. Property owner must pledge to assist with the proper tree care for first 3 years; instructions provided. Minimum tree size of 50 mm diameter, or 2-3 meters in height. Limit 1 tree per single fronting household or 2 trees per corner lot. *Community Partnership Tree Planting Program* – provides grants up to $2000 (funds or trees) to groups with acceptable plan and showing commitment to maintain.	*Neighborhood Tree Liaison Program* is a 'learn and serve' volunteer program that provides 20 hr instruction in overall tree knowledge to certify you as a Neighborhood Tree Liaison, enabling you to work with Urban Forestry and your neighborhood to plan projects promoting trees in your community http://www.parks.ci.portland.or.us/Services/treeliaison.htm *Heritage Tree Program* – trees identified by location, species, etc.; can be nominated by public. *Arbor Day and Month events* – includes planting, free workshops, walks. http://www.parks.ci.portland.or	*Tree Fund, part of Neighbourhood Matching Fund, Dept. of Neighbourhoods* – provides 10-40 trees, neighbors (minimum 5 households on a block) share planting and caring of trees in planting strips on residential streets; participants must attend a training session and provide tools. Budget: $100,000/yr. *Urban Tree Replacement Program, City Lights* – sponsors neighbourhood plantings to replace inappropriate trees under power lines; plants 3 trees for every 1 removed. *Tree Steward Program, SeaTran* – encourages	*Commemorative tree program:* min. $500/tree, tax-deductible donation. *Arbor Week tree planting* *Street beautification projects* *Tree Trust Program* - community partnerships and projects between the City, residential communities, businesses and property developers throughout the city. Monetary and in-kind contributions provide support for existing and new community programs. Contributions recognized through Gold, Silver and Bronze Leaf partnership opportunities. http://www.city.vancouver.bc.c	*Reforestation programs* *Evergreen Project* *Take Pride Winnipeg*

	NORTH VANCOUVER CITY	CALGARY	EDMONTON	OTTAWA	PORTLAND	SEATTLE	VANCOUVER	WINNIPEG
		community associations to plant on City lands. Applicants must demonstrate commitment to maintain, hold planting event and supply adequate volunteers. *BP Birthplace Forest* – parents pay for(?) a tree to be planted in designated urban forest when baby is born; e.g., 7600 trees planted in Elliston Park to represent every baby born in 2001. *Arbor Day* – 1st Thursday in May, a seedling given to all grade 1 students to plant at home. 1 school awarded to host official ceremony and plant a tree on school's property. *Memorial Drive Project* – trees planted from 1922-28 to memorialize fallen soldiers; trees are now being regenerated and greater variety of species being replanted.		*Commemorative Tree Program* – citizens can have tree planted in park; $400.	.us/urbanforestry/UrbanForestry.htm#arbor%20month	residents to plant trees in planting/parking strips, provides sight-line rules, tree species guidelines (inc. prohibited trees), tree planting and watering advice; http://www.seattle.gov/transportation/outreach.htm *Adopt-a-park program*, participate in urban forest management *PlantAmnesty Heritage Tree Program* - 4 categories: specimen, landmark, historic, collection	a/commsvcs/planning/treebylaw/trust.htm	
Website	No formal program	http://content.calgary.ca/CCA/City+Hall/Business+Units/Parks/Urban+Forestry/Urban+Forestry.htm	http://www.edmonton.ca/portal/server.pt/gateway/PTARGS_0_2_271_213_0_43/http://CMSServer/COEWeb/environment+waste+and+recycling/beautification/UrbanForestry.htm	http://ottawa.ca/city_services/environment/forestry/index_en.shtml	http://www.parks.ci.portland.or.us/Services/UrbanForestry.htm	http://www.cityofseattle.net/environment/urban_forest.htm	http://www.city.vancouver.bc.ca/parks/trees/index.htm	http://www.city.winnipeg.mb.ca/PWDforestry/aboutus.htm
Contact	Parks and Environment Department	Parks Urban Forestry section at 216-5252 or email parks@calgary.ca.	(780) 496- 8733 E-mail: citytrees@edmonton.ca		pkweb@ci.portland.or.us 503-823-4489	(206) 684-7649, or e-mail Nolan Rundquist, City Arborist.	City of Vancouver *Tree Hotline*, 604.871.6378 e-mail: rick_scobie@city.vancouver.bc.ca	tel: 204.986.7623

1. Winnipeg UFP objectives:
   - environmental modification of urban climates and other stress effects including pollution.
   - to increase popular support and public involvement.
   - to recruit key organizations from the public, private and voluntary sectors.
   - to make full use of all available land.
   - to promote the best technical practice.
   - to secure long-term management of resources.
   - to assess and promote the benefits of urban forestry.
   - to provide a demonstration for other regions as there is considerable interest in the plan from other regions within Canada, and beyond, including interest from the internet community.

2. Goals of Vancouver Street Tree Management program:
   - to substantially increase the City's street stock;
   - to improve the pruning and care of Vancouver's street trees;
   - to effectively respond to the needs and expectations of City residents with regard to the City's street trees;
   - to improve the quality of our urban environment; and
   - to broaden species diversity.

3. Goal and Principles

3.1 Goal

The general goal of the CNV's Street Tree Program is *to maintain and increase the long-term sustainability of the City of North Vancouver's urban forest assets*, as a part of meeting the sustainability objectives of the Official Community Plan.

3.2 Guiding Principles

1. **Increase existing benefits of the urban forest, by planting more street trees on public land, with a target of a fully stocked condition within 50-60 years.**

The current (2003) tree population is 5415. A fully stocked condition is estimated at approximately 16,500 street trees. Neighbourhoods where tree stock levels are low should be given priority in reaching this target, to provide more equitable distribution of the benefits provided by trees.

2. **Be sensitive to planting large trees in locations where they would conflict with views from existing residences to the water or mountains.**

It is important to support the property benefits of trees while still being cognizant of view impacts.

3. **Increase environmental benefits by striving to plant more trees that grow to larger size in locations without conflicts with views or utilities.**

Urban forest research has shown that on average, large trees have higher benefits per tree than small trees in terms of stormwater management, greenhouse gas uptake, and energy savings. Priority should be given to sites that can accommodate large trees at maturity.

4. **Provide locations and methods to re-establish native trees so that the proportion of native to ornamental trees is at least as exists now, as reflecting in existing inventory of trees.**

Most of the CNV's native trees are conifers located in the ravine parks or isolated specimens in manicured parks like Grand Boulevard. There is also a scattering of conifers on municipal and private property throughout the city. These widely spaced conifers are important for both their environmental function, but also for the 'sense of place' that they provide the City. However, this sprinkling of native conifers is a resource that appears to be in decline as redevelopment occurs.

This principle promotes: a) the conservation of existing native trees on public property; b) where it is necessary to remove existing native trees, their replacement with similar species in sizes as large as possible; and c) locating vacant street sites of sufficient size and with no conflicts with views and utilities for the re-establishment of native trees.

5. **Reduce the risk of disease decimating the street tree population by aiming for a mix of species, with a target of no one species greater than 10% of the population.**

Determining an appropriate species mix means balancing between limiting the number of tree species for maintenance efficiency with maintaining a healthy species diversity. A rule of thumb commonly accepted in the urban forestry literature is that no one species should comprise more than 10% of the street tree population, and no single genus (such as *Prunus*) should make up more than 30% of the population.

6. **Plan for a mix of tree ages and gradual tree replacement, recognizing that living trees will eventually die.**

A general target for an urban forest population is an age mix of 20% "young"; 60% "mature" and 20% "over-mature" trees (age categories will be species-specific). A gradual planting program to create fully stocked streets over 50-60 years will create age diversity – with the City always having some old, medium and young aged trees. Once a fully-stocked condition is reached, the City will enter a replacement phase.

7. **In new plantings, focus on long-lived species that do well in the CNV environment, to maximize the benefits of available growing space.**

While some short-lived species may be "prettier", long-lived species provide the most benefits for the least cost in the long term. Also, species already planted that have maintained high percentages of trees in good condition are likely to provide greater benefits at less cost than planted species with more trees in fair and poor condition.

8. **As a priority, plant in areas that drain to sensitive watercourses rather than areas that drain to the sea.**

This principle acknowledges the high stormwater management benefits that trees can play in the CNV. Tree canopy cover in stream watersheds play a role in reducing instream erosion that impacts fish habitat.

9. **The City "Gateways" - Marine Drive, Westview, Lonsdale, Boulevard Crescent, Lynn Creek and Lower Lonsdale/Esplanade – should be given consideration and some priority in tree planting.**

This acknowledges the significant role that gateways play in creating an attractive city. The aesthetic benefits of trees must be balanced with the need to provide clear visibility (consideration of sight lines and shadows) and safe travel environments in these areas. Also, planting of gateways should not be at the expense of neighbourhood planting programs.

10. **Develop a scheduled and adequately supported maintenance program for tree pruning and disease control of street trees.**

Programmed pruning, under a reasonable timeline, can improve public safety by eliminating conflicts, reduce costs through program efficiency, and increase benefits by improving tree health and condition. Any short term dollar savings realized by deferring pruning only do so at a loss of tree value (Miller and Sylvester, 1981). A 3-6 year cycle in residential areas, and annual maintenance in commercial areas, is typically recommended (Miller 1997).

11. **Diversify sources of funding and resources for both planting and maintenance.**

Funding sources include:

- General property tax revenues – justified on the premises that: a) property values increase due to the presence of street trees; and b) many tree benefits accrue to the neighbouring property owners (e.g., stormwater capture, energy reduction).
- Fees based on a "user pay" principle – i.e., those who clear land, create impervious surface area and/or increase emissions compensate for impacts by funding trees.
- Funding programs of senior governments and private organizations – e.g.:
    - Targeted tree planting programs;
    - Federal green infrastructure funding (commonly expects a 30% improvement target);
    - Federal climate change funding;
    - GVRD Sustainability and Demand Management funds.
- A 'Tree Bank' to allow the holding of funds for replanting and/or maintenance in alternate locations.
- Encouraging active roles for volunteers, particularly in planting and maintenance (except pruning) of trees on their street. This may be facilitated by a City Stewardship Co-ordinator.
- Bequests and Donations – such as commemorative memorial trees.

12. **Promote knowledge and understanding among the citizens of the CNV about the benefits of the urban forest, and ways in which they can effectively support this valuable community asset.**

This principle forms the basis for developing a public education and involvement program that encompasses written and on-line information and staff resources to provide advice and coordination in a vibrant urban forest program.

4. Design and Management Guidelines

4.1 General Street Tree Guidelines

The priorities of the CNV Street Tree Plan are:

- ❑ planning for species diversity,
- ❑ planting large trees as conditions and budgets allow, for environmental benefits,
- ❑ re-establishing native trees, and
- ❑ avoiding or reducing conflicts with utilities, views and other urban constraints.

4.1.1 Species Diversity

- No one species should represent more than 10% of the total street tree population throughout the city.
- No one genus (e.g., Prunus) should represent more than 30% of the total street tree populations.
- No one species should be concentrated in a given neighbourhood – cluster species on a block-by-block basis.

4.1.2 Native Conifer Targets

- Conifers should be considered first where space allows. For every 40 deciduous trees, plant an average of 2 native conifers likely near mid-block or lanes.
- Total conifer target population would be about 820 trees -- 5% of 16,415 trees (target population) to be conifers.

4.1.3 Large vs. Small-sized Species

- Plant the largest tree species possible to maximize leaf canopy, respecting site limitations such as utility lines (overhead), root space (ground) and views (see section 5.2).
- Recognize that smaller specimens are typically less expensive, so in some cases, it may be more cost effective to plant/replant smaller specimens more densely than a few large trees.

4.1.4 Compatibility with an Urban Setting

- Avoid trees that are shallow rooted, predisposed to excessive amount of disease and insects, and tree species with fruit or growth habits that are unsuited in an urban location.

4.2 Street Tree Opportunities and Constraints

Map 1 attached summarizes the opportunities and constraints for street trees in the City of North Vancouver.

4.2.1 Opportunities

There are many boulevards along streets in the City which are not stocked with street trees. These present opportunities to expand the street tree population and its benefits.

Heritage trees and landscape features have also been identified in several parts of the City. See Map 4

4.2.2 Constraints

There are also constraints on many streets – with overhead utility lines being a prime example. Other constraints include narrow boulevards, paving of the entire right of way for traffic uses, and encroachment of private plantings onto city property.

4.2.3 Species Concentrations and Disease Risk

In reviewing the existing street tree collection, there are parts of the City where trees of a single species are concentrated. This provides risks for high impacts from disease outbreaks (such as Dutch Elm Disease or Mountain Pine Beetle), and should be avoided. Map 2a and 2b show concentrations of red maples and cherries in the City.

4.2.4 Native Conifers at Risk

Native conifers are a significant resource to the City, both for ties to natural heritage, and for their superior environmental values. Map 3 shows the rather random distribution of conifers on city streets.

4.2.5 Constraint Classes

A variety of planting conditions exist on the CNV's streets. To take this into consideration, the 5 following constraint classes have been identified:

- Constraint Class 1: No prominent constraints
- Constraint Class 2: Narrow boulevard
- Constraint Class 3: Overhead lines
- Constraint Class 4: Overhead lines + narrow boulevard
- Constraint Class 5: Planting in paving

The following pages illustrate each class through picture examples, and recommend appropriate tree types and species for each class.

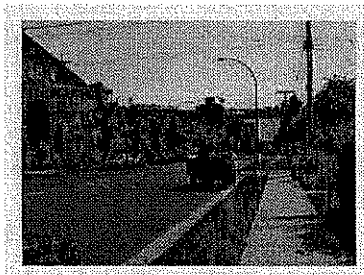
Refer to Section 4.6 for a detail listing of recommended street trees.

Constraint Class 1: No prominent constraints. Large trees with a height greater than 9 m such as *Acer rubrum* (Red Maple), *Quercus palustris* (Pin Oak) and *Zelkova serrata* (Japanese Zelkova) are suitable for this type of street.

27th at Mahon east

Chesterfield at 12th

Constraint Class 2: Narrow boulevard, less than 1.5 m width. Medium size trees that may have a height greater than 9m but with a slender tree shape (maximum spread of 8 m) are best suited due to limited space above and below ground. Tree roots are related to the canopy spread or drip line; usually tree roots extend two or three times beyond the drip line. Some examples of medium trees are *Ginkgo biloba* 'Princeton Sentry' (Princeton Sentry Ginkgo), *Oxydendron arboretum* (Sourwood), and *Acer platanoides* 'Columnar' (Columnar Norway Maple).



Chesterfield at 6th

3rd at St.David

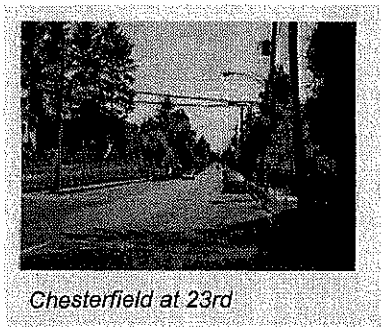
Constraint Class 3: Overhead lines. Small trees and shrubs are suggested under and near overhead lines. Directly under lines, vegetation with a maximum height of 6 m is suitable; near overlines (10 m from the pole), trees less than 12 m are preferred. *Acer griseum* (Paperbark Maple), *Cornus florida* (Flowering Dogwood) and *Acer circinatum* (Vine Maple) are appropriate near overhead utilities.

16th at St. Andrew

Chesterfield at 2nd

Constraint Class 4: Overhead lines + narrow boulevard. Small trees and shrubs are recommended; e.g., *Prunus serrulata* `Amanogawa' (Amanagawa Cherry), *Juniperus communis* (Common Juniper), and *Amelanchier alnifolia* (Saskatoon).

6th near Lonsdale

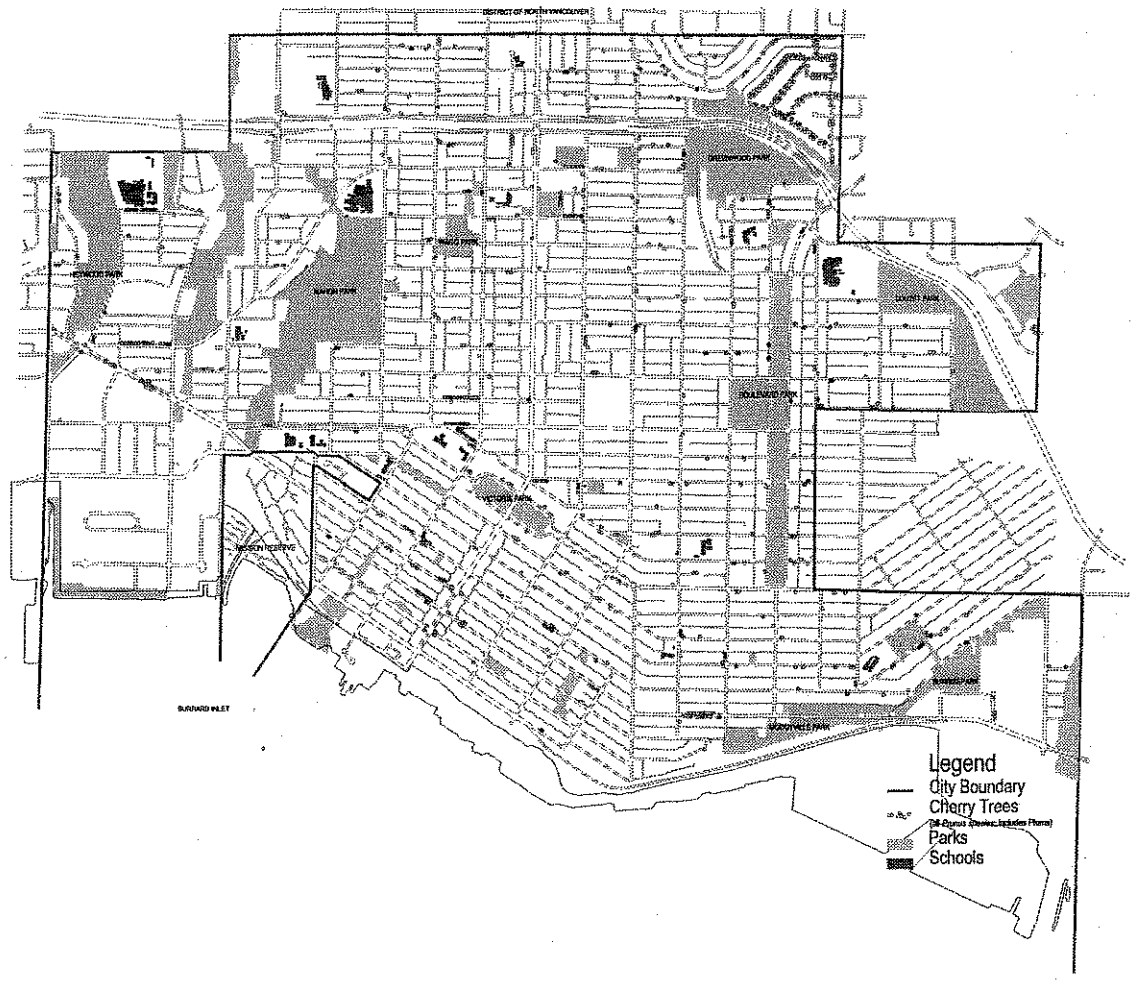


Chesterfield at 23rd

Constraint Class 5: Planting in paving. Avoid trees with large surface roots, dense canopies, and trees that can litter the pavement. *Tilia cordata* (Littleleaf Linden), *Cercidiphyllum japonicum* (Katsura Tree) and *Nyssa sylvatica* (Tupelo) are good trees to plant in pavement.

Esplanade W of Lonsdale

Marine near Bewick



Cherry Trees

City of North Vancouver

Scale nts

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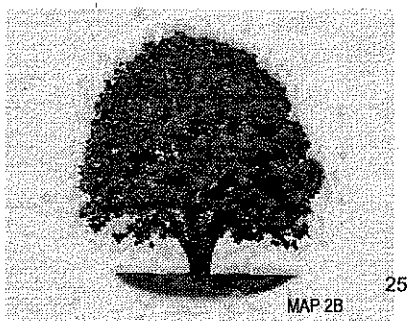
LANDSCAPE ARCHITECTURE
COMMUNITY PLANNING
ENVIRONMENTAL DESIGN
INFORMATION ARCHITECTURE



MAP 2B

Red Maples

City of North Vancouver

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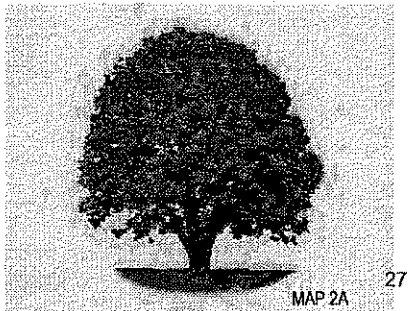
COMMUNITY PLANNING
ENVIRONMENTAL DESIGN
INFORMATION ARCHITECTURE



MAP 2A

Coniferous Trees

City of North Vancouver

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LANDSCAPE ARCHITECTURE
COMMUNITY PLANNING
ENVIRONMENTAL DESIGN
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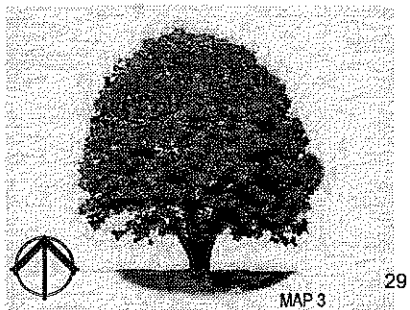
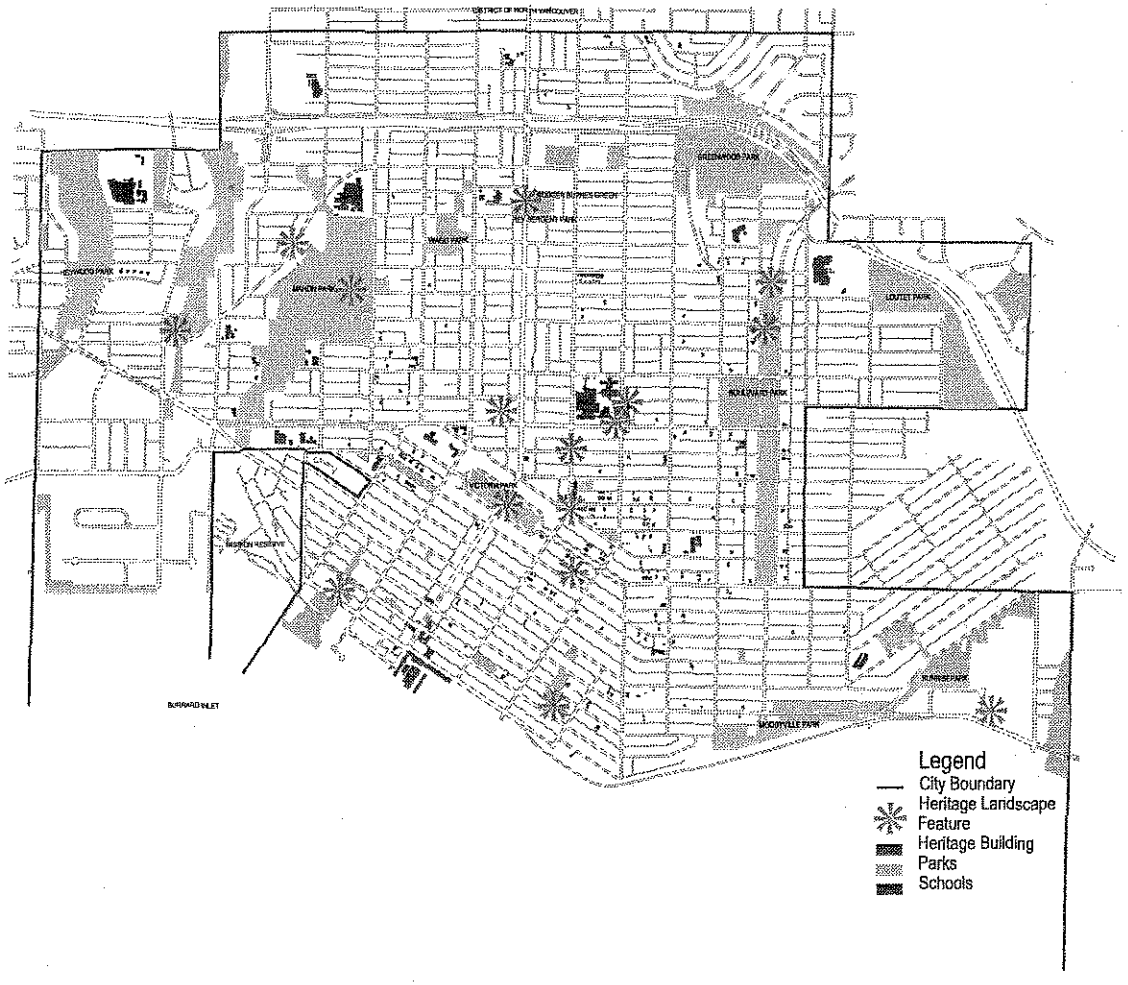
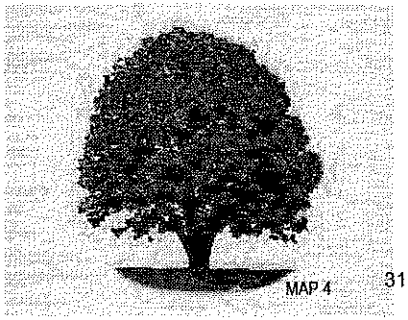




Heritage Landscape Features

City of North Vancouver

Scale NTS



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LANDSCAPE ARCHITECTURE
COMMUNITY PLANNING
ENVIRONMENTAL DESIGN
INFORMATION ARCHITECTURE

4.3 Landscape Character Areas and Street Tree Guidelines

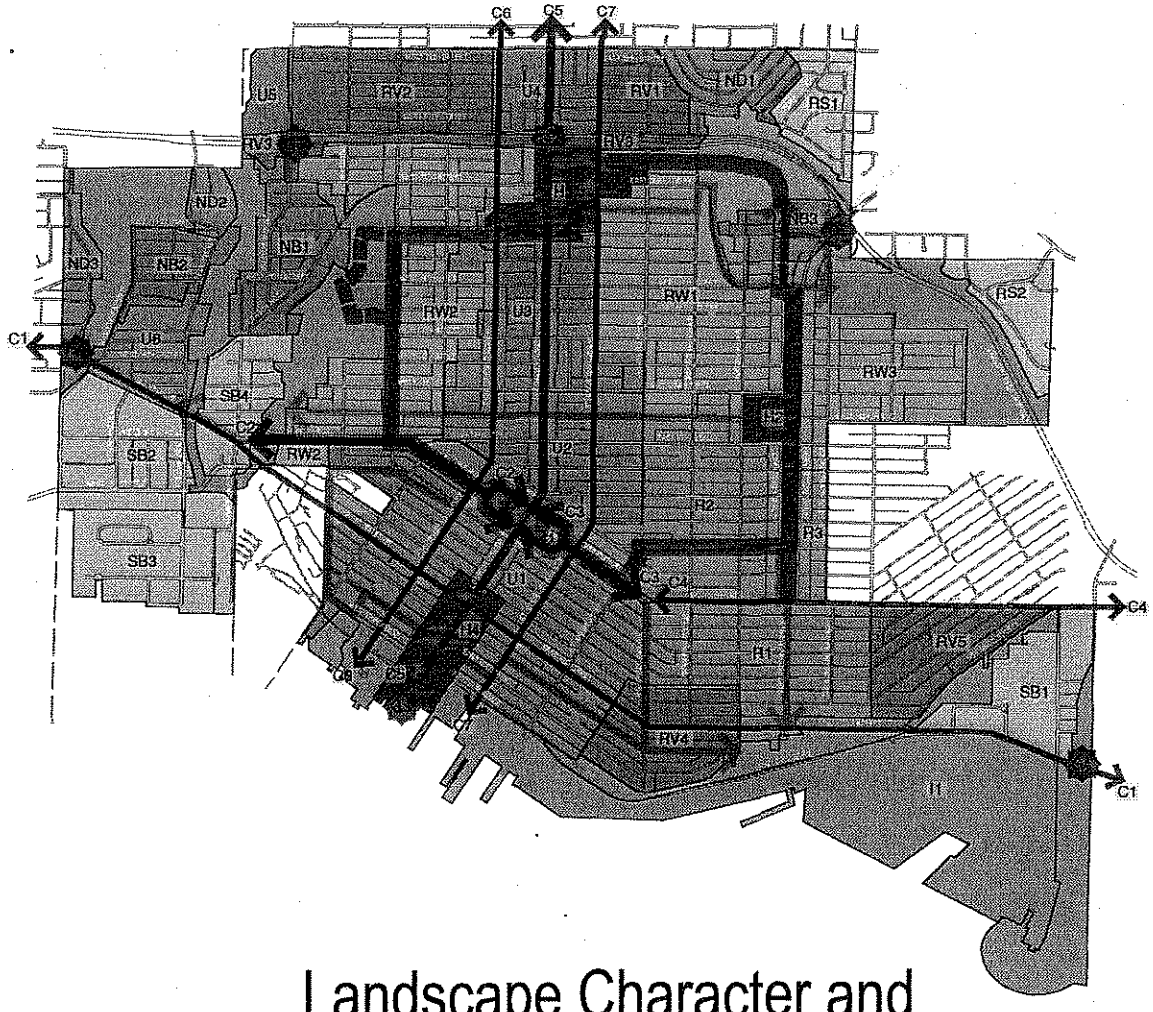
The City of North Vancouver has been divided into a set of Landscape Character Areas – see Map 5. The areas are identified for the purpose of defining street tree priorities and area-specific street tree design and management guidelines.

4.3.1 Mapping of Landscape Character and Street Tree Management Areas

Mapping of Landscape Character and Street Tree Management Areas on Map 5 is based on:

1. Watershed boundaries – separating areas which drain directly to Burrard Inlet from those areas that drain into salmon-bearing streams.
2. Density of existing vegetation, in particular native trees, as reflected in the Environmentally Sensitive Areas map. The presence of existing mature or heritage trees is also considered.
3. Relationships to existing parkland and publicly-managed woods. While parks and schoolgrounds are not included in the polygons, they influence the character of some polygons by providing a nearby backdrop of native trees that dominates the landscape.
4. Distribution of land use types. Higher density zoning, either residential or commercial / industrial, and resulting land development has a dramatic influence on the existing character and design guidelines for street trees.
5. Concentration of heritage resources, either in heritage trees or heritage architecture.
6. View potential from residential areas which may be affected by street tree planting. This is more relevant in sloping single family areas, where views from low buildings could be affected by tree planting. In higher density residential areas, it is the height of buildings that usually creates view barriers, rather than tree planting. However, the plan considers the view down street corridors between buildings to Burrard Inlet or Lions Gate, or up street corridors to North Shore Mountains.

The Landscape Character Map also shows gateways into the City at major road entrances, as well as important corridors through the City which merit special attention.



Landscape Character and Street Tree Management Areas

City of North Vancouver

N.T.S.

Legend

- City Boundary
- Park/School Area
- Heritage Character Area
  - H1 - Victoria Park
  - H2 - Grand Boulevard
  - H3 - Upper Lonsdale Civic Area
  - H4 - Lower Lonsdale Heritage
- Industrial
  - I1 - Low Level Port
- Native - Backdrop
  - NB1 - Larson
  - NB2 - Upper Hamilton
  - NB3 - Greenwood Heights
- Native - Dominant
  - ND1 - Temple Crescent
  - ND2 - Upper Fell
  - ND3 - Heywood
- Residential
  - R1 - Queensbury
  - R2 - Ridgeway
  - R3 - Sutherland
- Residential Stocked
  - RS1 - Tempe Heights
  - RS2 - Eastview
- Residential View Potential
  - RV1 - Upper Levels East
  - RV2 - Upper Levels West
  - RV3 - Upper Levels Greenway
  - RV4 - Moodyville Slopes
  - RV5 - Cloverly
- Residential Watershed
  - RW1 - Greenwood Bowl
  - RW2 - Mahon
  - RW3 - Boulevard East
- Suburban Business
  - SB1 - Park and Tilford
  - SB2 - Hamilton
  - SB3 - Harbourside
  - SB4 - Bewicke
- Urban
  - U1 - Lower Lonsdale
  - U2 - Civic Lonsdale
  - U3 - Central Lonsdale
  - U4 - Upper Lonsdale
  - U5 - Westview
  - U6 - Lower Fell
- Gateways
  - G1 - Marine Drive Gateway
  - G2 - Upper Lonsdale Gateway
  - G3 - Lower Lonsdale Gateway
  - G4 - Main Street Gateway
  - G5 - Boulevard Crescent Gateway
  - G6 - Westview Gateway
- Corridors
  - C1 - Marine Drive/3rd Street Corridor
  - C2 - Keith Road Median West Corridor
  - C3 - Keith Road Median East Corridor
  - C4 - Keith Road Non-Median Corridor
  - C5 - Lonsdale Corridor
  - C6 - Chesterfield Corridor
  - C7 - St. Georges Corridor
  - C8 - Green Necklace Corridor
  - C9 - Other Greenway Corridors

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4.3.2 Guidelines for Landscape Character and Street Tree Management Areas

The following describes each character area and provides design guidelines for street tree planting, both for the character type, and for specific areas of the City.

Recommended Planting Priority for each Landscape Character and Street Tree Management Area is provided with their description, and summarized below.

Table 2: Street Tree Planting Program – Planting Priorities by Street Tree Management Area

High Planting Priority	Moderate Planting Priority	Low Planting Priority
H1: Victoria Park	H2: Grand Boulevard	H3: Upper Lonsdale Civic Area
RW1: Greenwood Bowl	R1: Queensbury	H4: Lower Lonsdale Heritage
RW2: Mahon	R2: Ridgeway	I1: Low Level Port
RW3: Boulevard East	R3: Sutherland	NB1: Larson
U1: Lower Lonsdale Mixed Use	RV1: Upper Levels East	NB2: Upper Hamilton
U3: Central Lonsdale	RV2: Upper Levels West	NB3: Greenwood Heights
U4: Upper Lonsdale	RV3: Upper Levels Greenway	ND1: Tempe Crescent
C1: Marine / 3rd Street	U2: Civic Lonsdale	ND2: Upper Fell
C2: Keith Median West	C5: Lonsdale Corridor	RS1: Tempe Heights
C3: Keith Median East	G6: Westview Gateway	RS2: Eastview
C4: Keith Rd Non-Median		RV4: Moodyville Slopes
*C6: Chesterfield Corridor		RV5: Cloverly
*C7: St. George Corridor		SB1: Park & Tilford
C8: Green Necklace Corridor		SB2: Lower Hamilton
C9: Other Greenway Corridors		SB3: Harbourside
G2: Upper Lonsdale Gateway		SB4: Bewicke
G4: Main Street Gateway		U5: Westview
G5: Boulevard Crescent Gateway		U6: Lower Fell
		G3: Lower Lonsdale Gateway

*high planting priority if overhead lines are undergrounded

Detailed street tree plans for portions of these character areas are presented in sections 4.4 and 4.5.

Landscape Character
& Street Tree Management Area

HERITAGE

Description

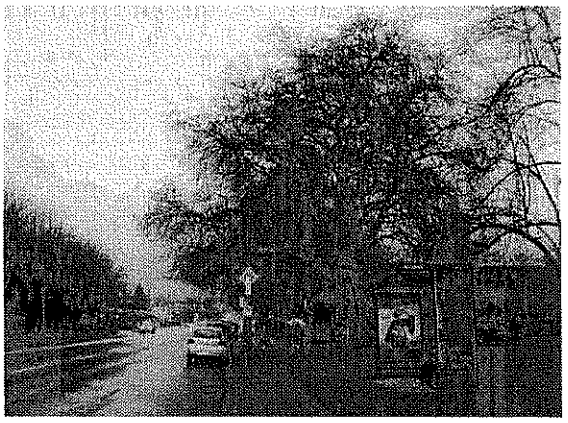
In areas of Heritage Landscape Character, street tree management should respect the significant heritage values of existing trees or architecture.

These include key treed open spaces from the 1905 Town Plan – Victoria Park and Grand Boulevard.

Stands of established heritage trees in the area of Rodger Burnes Green, Rey Sargent Park and Lonsdale Elementary combine with civic uses to create an evolving heritage area.

The areas of architectural heritage in Lower Lonsdale merit special attention as to how the existing and future street trees could complement this heritage.

Known individual or small groupings of heritage trees outside of these polygons are shown on Map 5.



General Guidelines

- Give priority to retention of existing established trees in the heritage character areas.
- Removal of existing established trees should be considered only if the trees are deemed hazard or diseased by a certified arborist.
- Plant new trees in these areas to provide age diversity, and to eventually replace the existing mature trees when they die.
- New street trees should be chosen to provide species diversity to the existing tree stock in the heritage space.
- Tree planting location and pattern should reflect heritage, classic forms.
- Tree planting should be designed to frame, but not block, the view of heritage architecture.

Related Policies & Reports

- Heritage Inventory, City of North Vancouver
- Parks and Greenways Plan
- Victoria Park Enhancement Plan and Current Design Initiatives
- Grand Boulevard Park Management Plan
- Lonsdale Corridor Master Plan

Area Specific Guidelines

H1 **Victoria Park** Includes the existing park both east and west of Lonsdale. **Planting Priority: High**	❑ Around Victoria Park, there are tulip trees, red oaks, plane trees, Japanese cherries and spruces (Liriodendron tulipifera, Quercus rubra, Platanus x acerifolia, Prunus serrulata, Picea omorika, and Picea abies). ❑ Maintain an open view from Lonsdale into the park lawns and to mature trees. ❑ Plant young trees on a gradual basis for age diversity. ❑ Tree planting at the park perimeter should be in rows on both sides of the adjacent streets – to provide a spatial definition to Victoria Park, as well as to unify the perimeter of the space.
H2 **Grand Boulevard** Includes the median between East and West Grand Boulevard **Planting Priority: Mod.**	❑ Tree Planting should follow the guidelines in the Grand Boulevard Park Management Plan. Since there is an excess of species diversity within the park, new tree plantings in the short term should be designed to provide structure and unity to the park collection, and should be located to define public spaces within the park. ❑ Existing native conifers in the Park should be given special protection, and replacement plantings.
H3 **Upper Lonsdale Civic Area** Includes the area fronting Lonsdale from 21st St. to the Upper Levels Highway, plus adjacent institutional and high density areas. **Planting Priority: Low**	❑ Give priority to protection of the row of horse chestnut, mature red oaks, and other mature trees in this area. ❑ Maintain recent plantings of the Lonsdale Gateway at the Upper Levels Highway, and the area fronting the Youth Park to make trees dominate this precinct . ❑ Add to tree plantings on side streets and fronting instituional buildings and grounds. ❑ Follow the guidelines in the Lonsdale Corridor Master Plan for the Recreational / Cultural / Educational Precinct.
H4 **Lower Lonsdale Heritage** Includes the Lonsdale corridor from 4th St. down to the water's edge. **Planting Priority: Low**	❑ Maintain the existing plantings of Red Maple that line both sides of this street section. ❑ When tree replacement is required, use trees with similar appearance to the red maples, but use a different species for disease control e.g. Sweetgum. ❑ Install structural soils of sufficient volume under the paving to support the trees full grown. ❑ Employ paving, grates and tree accessories in accordance with the Lonsdale Corridor Master Plan for the Lower Lonsdale Precinct.