



*Strategic Urban Forest Management Plan*

**NEIGHBORHOOD  
BUSINESS DISTRICT**



**NEIGHBORHOOD BUSINESS DISTRICT COMMITTEE**

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 Jori Adkins – Dome  
 Tom Ehnat – Fern Hill  
 Eric Crittendon – Hilltop  
 Leslie Young – Lincoln  
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## INTRODUCTION

In 2010, the Washington Department of Natural Resources (WDNR) Community Forestry Program provided grant funding to assist the City of Tacoma to begin a street tree inventory of 15 NBDs designated by city staff. The City of Tacoma hired Community Forestry Consultants, Inc. (CFC) to collect inventory data in each NBD and develop a SUFMP - NBD using inventory data, stakeholder meetings, city document reviews, and other resources.

### Vision Statement

The vision statement describes how the community wants its landscapes to look and function in the future. It supplies an action goal that facilitates open space objectives of conservation, restoration, and stewardship of the City's invaluable habitat areas and enhancement of habitat functions city-wide. This brief statement describes similar goals for the NBDs. It includes sentiments about the environmental, social, economic, and ecological importance of trees and natural resources to the business districts in terms of function, education, and sustainability.

### Tacoma Urban Forestry Vision Statement

The City of Tacoma takes the lead in establishing a citywide tree canopy cover of 30 per cent by the year 2030 ("30-by-30") through effective education, extensive outreach, innovative partnerships, and pragmatic implementation strategies.

### Tree Benefits

Few elements of the grey infrastructure of urban places can be said to boost property values, support retail activity, improve municipal health, protect water quality, reduce stormwater runoff, counter climate change, and ensure roadway safety—all at once. Communities looking for these benefits may be surprised to find a solution right in their own backyards, along their streets, and in their parks. The green infrastructure of trees, along with parks and open space, provide a wealth of benefits to Tacoma.

Trees have held a prominent role in discussions regarding environmental change, and more directly there have been a growing number of scientific studies in recent years specifically geared toward the role of trees in urban environments. Trees and urban forests provide environmental, ecological, economic, and social benefits to people living in urban and suburban areas. Environmental, economic, and social urban forest services and values are well documented in scientific and technical journals. A summary of key values and benefits, and some supporting sources, is provided below.

**Water Quality & Stormwater Retention.** Urban forests absorb rainfall, control surface water run-off, filter ground water and assist in ground water recharge. According to one study, 37,500 tons of sediment per square mile per year comes off of developing and developed landscapes, and urban trees could reduce this value by 95% (Coder 1996). Water quality and quantity are huge issues in the regional watershed. The success or failure of the push to clean up the watershed in many ways will be determined by the amount of tree canopy associated with the city and region.



Urban tree canopy reduces stormwater runoff by intercepting and storing rainfall and increasing infiltration into the soil through improved soil structure. The US Environmental Protection Agency issued a report, *Using Smart Growth Techniques as Stormwater Best Management Practices*, which identified urban tree canopy as an innovative and sustainable means to dramatically reduce stormwater runoff and the costs associated with stormwater management. Trees contribute to water quality and quantity improvement through storm water control, attenuation of peak flows, maintenance of base flow, erosion control, and rainfall interception (Bernatzky 1983; Xiao et al 1998; Floyd 2002; American Forests 2007). Trees are a critical component in the management of the watershed and maintenance of water quality.

**Air Quality Improvements.** Trees absorb gaseous pollutants such as ozone, nitrogen oxides, and sulfur dioxide; and they filter particulate matter such as dust, ash, pollen, and smoke. Reductions in these pollutants results in improved public health and reduces the severity of ozone-induced asthmatic responses and other respiratory illnesses. Urban trees absorb carbon dioxide, a major greenhouse gas, at an approximate rate of 230-lbs per year per tree. According to the U.S. Department of Agriculture, “one acre of forest absorbs six tons of carbon dioxide and puts out four tons of oxygen. This is enough to meet the annual needs of 18 people.”

Trees improve air quality by producing oxygen, absorbing pollutants, and sequestering carbon (Rowntree and Nowak 1991; Nowak 1992; McPherson et al 1999; American Forests 2007). A regional ecosystem analysis specific to Tacoma using tree inventory data can estimate the monetary value of pollution removal services provided by the urban forest.

**The Economics of Aesthetics.** Improving aesthetics of Tacoma and the business districts has tangible economic benefits. Aside from the potential price effect on residential property sales, trees in retail settings increase shoppers’ willingness to pay for goods and services by 12%. Shoppers also indicate that they are willing to drive farther and stay longer if a retail district is well-landscaped with trees. Also, respondents consistently reported greater willingness-to-pay for goods and services in the landscaped mall at an overall rate of 8.8%. Urban forests create an appealing consumer environment in business districts (e.g., Wolf 2003, 2005).

Increases in land values or sale prices as a result of quality landscaping and the presence or retention of trees offers a secondary benefit to the local jurisdiction. The adjustments directly relate to additional revenue from sources such as real estate transfer taxes and property tax assessments (Behe et. al. 2005; Wolf, 2007).

**Health & Well-Being.** Public spaces with trees receive more visitors, increasing the frequency of casual social interactions and strengthening the sense of community. Trees along transportation corridors narrow a driver’s field of vision, reducing traffic speeds, and increasing pedestrian safety by providing a natural, physical barrier. Studies have found that urban highways lined with trees decrease driver stress, resulting in fewer incidents of road rage. Trees foster safer, more sociable neighborhood environments and have been shown to reduce levels of crime, including domestic violence. Views of nature reduce the stress response of both body and mind when stressors of urban conditions are present. Hospital patients with window views of trees recover significantly faster and with fewer complications than comparable patients without access to such views.

Overall, the service value of individual urban trees can be quantified as shown in the graphic below. For every dollar spent on tree planting and establishment, a 250% return on investment is provided back to the business districts in terms of total services provided at tree maturity. There are over 900 planting spaces available for new trees in the business districts.

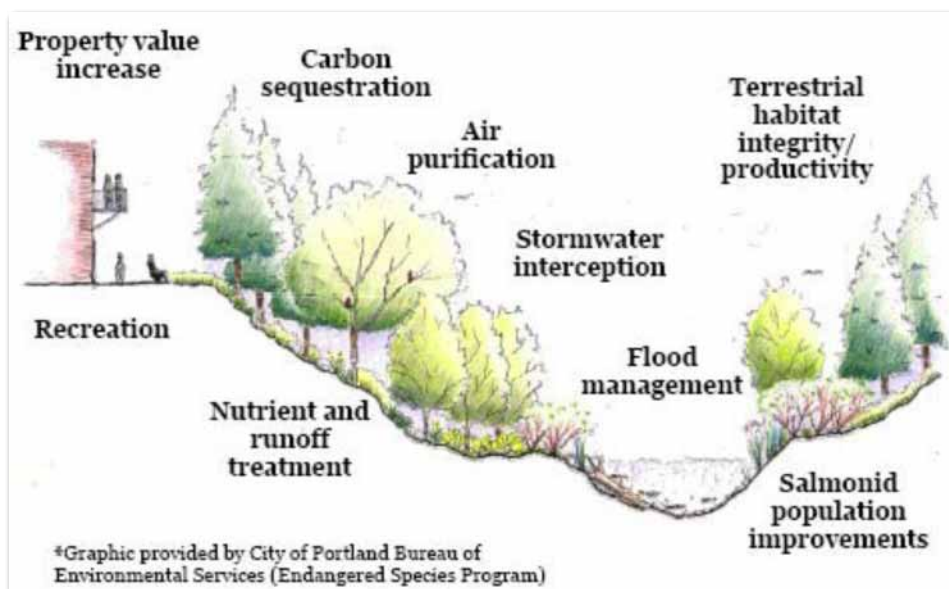
#### Average annual net benefits values per tree by size

Small	Medium	Large
\$1 - \$8	\$19 - \$25	\$48 - \$53

Source: *Society of American Foresters: Western Forester, January 2007*

The ideal shade tree has a dense, round crown with limbs broad enough to maximize shade on paving, parked vehicles, and other grey infrastructure. Large trees provide more shade and more benefits than smaller trees. Planting programs should require large tree planting in wide planting strips rather than planting several small ornamental trees

The graphic below illustrates the various benefits of and the integrated functions provided by business district trees.



While real costs must be borne by the City of Tacoma and its residents because of the urban forest (e.g., storm damage, removals, planting, maintenance, leaf removal, infrastructure impacts, etc.), the protection and expansion of street trees in the business districts will yield increased environmental, economic, and social benefits. This plan specifies a number of actions the city can take to maximize these benefits.

**Appraised Value.** Trees in urban areas are valued differently than their rural counterparts. Fire trucks have a monetary value (the cost of buying a new one) in addition to their immeasurable value when protecting citizens in the community. Trees, too, have an actual monetary value that is recognized by tree professionals, real estate experts, the judicial system, and the Internal Revenue Service.



Four factors are the basis for determining the appraised value of landscape plant material such as street trees. The four factors are species, size, condition, and location.

Species is one of the primary factors that determine the value of trees. Species ratings are based upon an evaluation of characteristics and observations by regional arborists. Each species is given a percentage rating based on several factors such as genetic characteristics, ornamental features, and adaptability of the tree.

Size is trunk diameter measured at diameter breast height (DBH is 54 inches above soil grade level) to the nearest inch. The trunk diameter measurement is used in the formula to determine value.

Condition is evaluated considering the health, vigor, life expectancy, structural integrity, and growth rate. The condition rating of trees varies from 0% to 100% and is evaluated on two factors: structural integrity and plant health. The structural integrity condition rating is determined by an assessment of the scaffold branches, trunk, and roots. The presence of trunk splits, trunk or crown decay, previous failures, co-dominant stems, cavities and dead tissues are all indicators of structural compromises. Plant health in terms of general vigor, annual twig growth, canopy density, leaf size, and color are assessed.

The location rating is composed of three components: the site of the property, the plant's functional and aesthetic contribution, and the placement of the plant in the landscape.

The site of the property considers the quality and general appearance of the structures, landscape surrounding the trees, and the maintenance intensity. It is expressed by its relative value within the area in which the site is located.

The contribution component of the location rating is determined by the environmental, engineering, functional, and aesthetic benefits provided by the tree including its historic or unique character.

The placement component of the location rating reflects the position of the tree to how effective the tree is in providing the identified benefits.

Each of the location factors is evaluated on a scale of 0 to 100%. The average of the three factors represents the tree's location rating.

Trees are a capital investment. Plant the right tree properly in the right place, maintain it, and it is an asset that will increase in value throughout its life. Trees in towns are like fire trucks and buildings. If no one cares for them, they lose value. If you don't change the oil in an engine, you save money, but eventually the truck quits running. If you don't maintain trees, you save money, but the trees decline and die, and along the way may become a risk to people and property. Deferring maintenance may save NBDs and business owners' money in the short run, but cost much more in the long run. In contrast, the elements of the gray infrastructure (fire trucks) look and function best when they are new. They decline in function and value as they get older.

NBD's tree population is an important financial asset of each district and has significant monetary value. Approximately 1,200 street trees were inventoried in the NBD tree inventory project. The appraised value for those trees is over \$1.6 million. The appraised value of trees inventoried to date is lower due to the large number of removals, poor condition of the trees, and deferred maintenance. The appraised value for trees inventoried to date should be 25 to 30% higher or approximately \$2.1 million.

Trees are of vital importance to NBD's environmental, social, and economic well-being. The business district trees provide numerous benefits that are both tangible and intangible. Trees are the only asset in the NBDs that increase in value as they age but only if they receive proper maintenance.

### **Public Process**

A crucial element of developing the SUFMP - NBD was soliciting information from members of the NBDs and the district council, city staff, key stakeholders, and citizens of Tacoma. Stakeholder input was used to assist CFC in identifying opportunities, issues, elements, actions, and goals for the SUFMP - NBD. Public meetings were used to gather information, opinions, and comments about trees in NBDs. Comments and opinions from members of the business districts shaped the direction of objectives and strategy for the SUFMP - NBD. The minutes from the public meetings are included in Appendix B.

### **Relationship to Other Planning Documents**

To supplement the public participation conducted in the development of this plan, the following community-based documents were reviewed for policy direction and goals as they pertain to the protection and management of the urban forest. Trees and urban forestry offer solutions for every objective defined in these plans.

**Urban Forestry Policy Element, adopted in 2010:** The UFP provides policies to retain a high quality of life by focusing on actions to increase the benefits and values of trees, and to improve on the response management of Tacoma's urban forest. The urban forest includes trees and vegetation throughout the City, including in planting strips, neighborhood parks, NBDs, open spaces, and on private property. The UFP addresses trees and vegetation under the full range of ownership, including trees on city-owned property, rights-of-way and private property. The UFPE establishes a framework for differing management approaches to each land use that strikes an equitable balance between public benefit and the responsibilities of land owners and other parties. As a component of the Tacoma Comprehensive Plan, the UFP effort is being conducted in coordination with other policy initiatives pertaining to the environment and quality of life for our City. In conjunction with the SUFMP-NBD, the UFP creates a framework for the proactive management of street trees in the business districts. The policy initiatives in Section III of the UFP and the SUFMP-NBD guide a range of actions to develop and enhance the street trees in the city and particularly in the business districts.

**Tacoma Mixed Use Centers: Complete Streets Design Guidelines, adopted in 2009:** "Complete streets" is a term used to describe streets designed to enable safe, attractive, and comfortable access for all users. The City of Tacoma defines "green streets" as a subset of complete streets where implementation of green infrastructure practices such as reducing road widths is integrated in the design. Within green streets, LID techniques and vegetation planting will be prioritized.

Complete Streets contribute to NBDs by providing public open space that integrates amenities including street trees and landscaping, street and sidewalk lighting, transit facilities, street furniture, water features, and public art work. The policies also promote the planting of street trees and other vegetation, the construction and maintenance of non-motorized transportation facilities, general support for transit, and streetscape improvements. Section 2.4.3 of the complete streets design guidelines supports tree planting and tree maintenance and provides additional information supporting the goals and objectives of the SUFMP - NBD.



**Tacoma Open Space Habitat and Recreation Element (OSHRP), adopted in 2008:** The OSHRP clearly states an objective of city support for maintaining and planting trees to support habitat development and retention in the natural and built environment of the City of Tacoma.

The OSHRP calls for restoring and enhancing environmental functions throughout the City through planting and maintaining trees and landscaping, and reducing impacts from stormwater and environmental pollution. Enhanced vegetation along streets and freeways, as well as on private land, can help create habitat connections that support and expand the habitat areas.

Public streets and sidewalks constitute a large percentage of the City's impervious surface, generating runoff and pollutants. Reducing the amount of impervious surface, implementing low-impact development (LID) stormwater techniques and increasing vegetation planting within City rights-of-way can assist in creating greener neighborhood business districts in Tacoma. Techniques to accomplish this include reducing the amount of pavement, utilizing pervious pavement, installing rain gardens, and installing traffic circles and medians which can be planted with vegetation. These techniques can also help to achieve traffic calming goals and a better balance between vehicles, pedestrians and bicycles, and are part of a "complete streets" approach.

**Green Ribbon Climate Action Task Force (GRFT), adopted in 2007:** The task force introduced more than 80 strategies to reduce the carbon footprint of the community. Trees in part are the solution to many of the strategies offered in the GRFT report. Trees provide enhanced, livable neighborhoods; reduce building energy costs; reduce greenhouse gas emissions; and augments green building programs. Tree planting is a primary strategy mentioned specifically in the GRFT Category 3, Enhanced Compact/Livable Neighborhoods. The GRFT recommends planting 20,000 trees annually which is a direct connection to the 906 available planting spaces in the business districts.

Developed in 2002 and amended annually, the Comprehensive Plan directs land use planning and development policies for the city. It also establishes specific policies related to housing, transportation, water quality, public facilities and services, economic resources, and includes the recent addition the Urban Forestry Policy Element. The SUFMP - NBD and the establishment of an urban forestry program have a direct bearing on the Tacoma Comprehensive Plan. The SUFMP - NBD should be mentioned, if not incorporated as a component of the Comprehensive Plan for the community. Trees impact all components discussed in the Tacoma Comprehensive Plan and are an important component to the successful implementation of the Tacoma Comprehensive Plan.

The SUFMP - NBD specifically establishes the goal of a comprehensive management plan for business district street trees. The SUFMP - NBD will act as a stand-alone management tool for the NBDs within the Urban Forestry Program. Upon review and adoption by the City Council, this plan will guide the protection, expansion, and management of the street trees in the NBDs, while also complementing the guidelines of the other city plans and policies.

The SUFMP - NBD provides enabling solutions for every component of existing city documents governing sustainable urban forestry management and is consistent with other policy and plan initiatives impacting trees. Trees are connected to city habitat and complete streets design and implementation of the SUFMP - NBD will complement objectives, goals, and recommendations described in these plans.

## EXECUTIVE SUMMARY

A Strategic Urban Forestry Management Plan for the Neighborhood Business Districts (SUFMP- NBD) is intended to provide a framework for ensuring that the trees and forests of our city are appropriately cared for according to our community goals. It is a guide for City staff, Neighborhood Business Districts (NBD) and councils, elected officials, board members, landowners, utility companies, developers, and residents to follow when making decisions about community trees in the NBDs.

Tacoma's SUFMP - NBD was initiated by the Urban Forestry section of the City of Tacoma Public Works Department to facilitate the city's ongoing commitment to maintain, enhance, and preserve Tacoma's tree canopy. Project funds were provided from a grant obtained from the USDA Forest Service Urban and Community Forestry Program administered by Washington State Department of Natural Resources Urban and Community Forestry Program.

An inventory of existing street trees and potential planting sites in NBDs designated by city staff was conducted in February, March, and May 2011. Comments and opinions from NBD members, residents, and City staff shaped the direction of the overall plan, its objectives, and the implementation strategy.

The primary methods of community outreach used were:

- » Interviews and group discussions with NBD stakeholders
- » Review of associated documents impacting urban forestry policy

The objectives of the strategic plan support the primary vision and mission of improving Tacoma's community through proper management of the city's most valuable asset – trees. The SUFMP- NBD follows the program vision stated in the Urban Forestry Policy Element (UFP). The UFP provides policies to retain a high quality of life by focusing on actions to increase the benefits and values of trees, and to improve on the responsible management of Tacoma's urban forest. City administrators, elected officials, City staff, NBD members, and citizens must have this vision for the future of the Tacoma's urban forest:



### Tacoma Urban Forestry Vision Statement

The City of Tacoma takes the lead in establishing a citywide tree canopy cover of 30 per cent by the year 2030 ("30-by-30") through effective education, extensive outreach, innovative partnerships, and pragmatic implementation strategies.

The primary goal is to assure that safe, healthy urban trees reach maturity, continue to thrive, and not create future problems or conflicts with other infrastructure. The SUFMP - NBD supports these concepts. The objectives were developed to address the challenges and issues that confront the trees in the NBDs and their stewardship. The objectives are dependent on one another and build upon the success of their implementation. Removing, pruning, planting, and preserving trees; educating stakeholders; and improving coordination and communication among citizens, stakeholders, city staff, and elected officials must be comprehensive for the SUFMP - NBD to succeed.



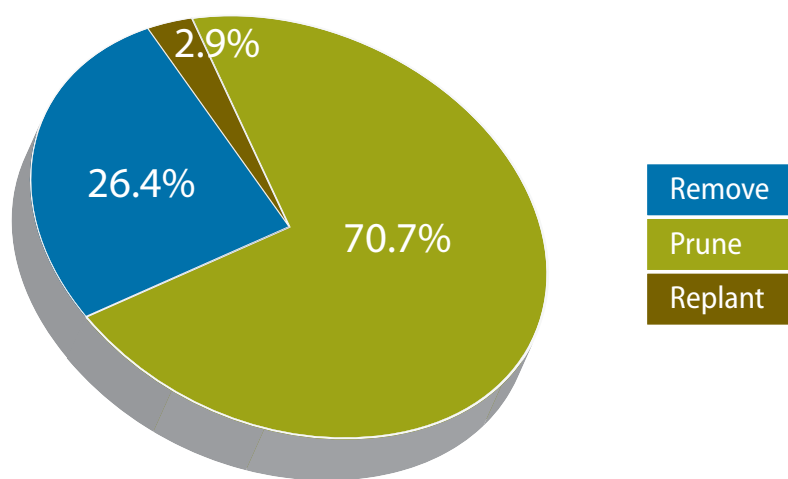
The SUFMP - NBD guidelines promote considering NBD trees as major and important urban infrastructure. It outlines best practices to incorporate trees into the NBD management framework. The SUFMP - NBD provides for progressive management of trees in the NBDs.

Acknowledging trees’ major contribution to business districts, the goal of this strategic plan is to provide objectives and recommendations to sustaining trees in the NBDs. Increasing knowledge of the measurable benefits of urban trees, combined with greater annual urbanization, and a greater number of people spending more time in NBDs, forces the NBDs to have a responsibility to care for the street trees. The SUFMP - NBD is a tool to be used for guiding NBD tree care and garnering support, cooperation, and funding for the tree programs in the NBDs.

NBD TREE INVENTORY SUMMARY

Data results

- » Trees inventoried: 1,221
- » Appraised value of trees inventoried: \$1,640,000.00
- » Appraised value of trees inventoried in better condition: \$2,180,000.00
- » Trees requiring maintenance: 794
- » Trees requiring removal: 327
- » Maintenance cost: \$158,800.00 (Average historical tree pruning cost: \$200.00/tree)
- » Removal cost: \$179,850.00 (Average historical removal cost: \$550.00/tree)
- » Sidewalk damage sites: 18 (Sidewalks lifted greater than 1 inch)
- » Available planting spaces: 906 (190 large tree spaces; 367 medium planting spaces; 349 small planting spaces)
- » Tree planting cost: \$1,000.00 (Average historical cost per tree to purchase, ship, and plant 2 – inch caliper). Does not include additional costs for tree grates or removal of asphalt or concrete from planting strips, etc.)



MAINTENANCE REQUIREMENT DETAILS	
Task	Tree Count
Removal	327 (26.4%)
Prune	794 (70.7%)
Replant	24 (2%)
Brace	1 (0.9%)
Total	1 146 (100%)

## Major Issues

- » Tree topping
- » Tree maintenance for existing trees
- » Tree planting
- » Species diversity
- » Education

## NBD MANAGEMENT GOALS

While each NBD is unique, there are many more common characteristics validated in the inventory data collection among all the NBDs that allow for universal objectives and recommendations. The SUFMP - NBD establishes these management goals for the NBDs of the City of Tacoma.

- » Adopt and implement the SUFMP – NBD in context with associated urban forestry policy documents.
- » Implement a district wide anti-tree topping education campaign.
- » Implement a comprehensive district-wide cyclic pruning program for young and mature trees.
- » Remove high-risk trees.
- » Create a tree planting plan; promote proper planting of new trees and diversification of species. Plant only what can be maintained properly.
- » Enhance and diversify tree planting designs in the NBDs.
- » Provide education and public awareness of the importance of the trees to the business districts; educate property owners, tree contractors, and the business community on proper tree care; and encourage greater participation in tree steward activities.

The recommendations made in this plan are intended to be considered and implemented over a period of five years.

Trees are long-lived organisms. Maintaining existing trees is critical and of primary concern in the business districts. Planting trees today will provide benefits for future generations of citizens if they are maintained and thrive. However, a systematic tree maintenance program must be in place, and adequate funding, staffing, regulations, and public education resources today, to ensure the future NBD tree population will thrive, expand, and be sustainable.

These goals may change over time, both through completion of specific projects and through the changing nature and composition of the business districts and tree populations over the years.

## NBD MANAGEMENT RECOMMENDATIONS

These recommendations are based on NBD management goals and are preliminary steps to enhancing street tree management in the business districts of Tacoma. The following table provides a brief summary of key issues throughout the NBDs found during the tree inventory data collection and recommendations for resolving the issues.

TYPE	RECOMMENDATION	DESCRIPTION	PAGE
<b>Action Plan</b>			101
Program Objectives	Program Goals	Program objectives, goals, and recommendations for NBDs.	101
	Education	Develop and implement an anti-topping education program.	101
Maintenance	Tree maintenance	Establish tree maintenance program.	102
Tree Resource Expansion	Tree planting	Establish annual planting program.	1034
	Diversification	Install many varieties of trees. No single genera should account for more than 10% of the population.	104
	Diameter distribution	Create a program that strives to increase the population of large stature trees.	105
NBD Tree Planting	Tree planting and design	Recommendation for tree planting and design options for NBDs.	107
Appendix A	Maintenance requirements	Maintenance requirements and operational functions for the urban forest.	115

The SUFMP - NBD initiates an effort by the Urban Forestry Program to form systematic management strategies for management of the business district tree population of Tacoma. Objectives and recommendations are addressed in detail in the SUFMP - NBD and listed below.

## NBD PROGRAM ACTIONS

There are NBD management elements that must be addressed on a proactive, regular basis: Proper Tree Maintenance, Tree Planting, Risk Tree Management, and Education. Although each of these objectives is essential to the maintenance of the NBD street trees, a unified tree maintenance program addressing the tree care needs of all the NBDs together should be established to determine how budget dollars will be spent across a district-wide maintenance program. The SUFMP - NBD recommendations have established responsible management of existing trees as the highest priority, and tree planting as secondary throughout the business districts.

The recommendations and actions will help business district tree resources thrive and sustain the tree canopy for future generations. Although this commitment will come with costs, the long-term benefits are significantly greater and will result in a sustainable asset for the citizens of Tacoma today and tomorrow.

## INVENTORY METHODOLOGY AND ANALYSIS

Tree inventories provide accurate and current information about the urban forest to evaluate the resource both economically and ecologically. An inventory process identifies species and analyzes their characteristics to target and prioritize current and future maintenance requirements, removal and planting efforts, and provides realistic budget and funding estimates.

By analyzing the results of the NBD inventories the agency can begin to develop goals and objectives, risk management policies, maintenance regimens, education programs, and action plans to meet goals and objectives.

An inventory and assessment of existing trees and potential planting spaces in 15 NBDs identified by Tacoma staff was conducted by Community Forestry Consultants, Inc. The inventory data collection occurred in February, March, and April 2011.

The NBDs are distributed across the city and NBD boundaries are designated by the City of Tacoma. Within each NBD the main arterial was the core area selected for inventory data collection. Occasionally side streets off the arterial were included in the data collection.

Data was collected using TreeWorks™, an ArcGIS tree management software. TreeWorks was configured to collect the following data.

- » Unique tree ID number
- » GPS coordinates
- » Tree genus and species
- » Diameter breast height (DBH)
- » Tree height and crown diameter
- » Tree condition (Excellent, Good, Fair, Poor, Very Poor, and Dead)
- » Tree defects (structural, cultural, and/or insect/disease)
- » Maintenance tasks and maintenance priority
- » Tree planting locations, planting area width, and potential tree size recommendation
- » Location information
- » Site conflicts and site disturbance
- » Utility conflicts

An inventory summary for each NBD that includes species distribution, maintenance requirements, diameter distribution, potential planting sites, infrastructure conflicts, and appraised tree values follows.





## 6TH AVENUE

The inventory area spanned 6th Avenue from South Alder to South Sprague. Sixth Avenue NBD is dominated by commercial business storefronts, integral curb and sidewalk adjoining buildings, building overhangs, and sidewalks congested with other infrastructure. There are a small number of apartment buildings mixed with the commercial businesses.

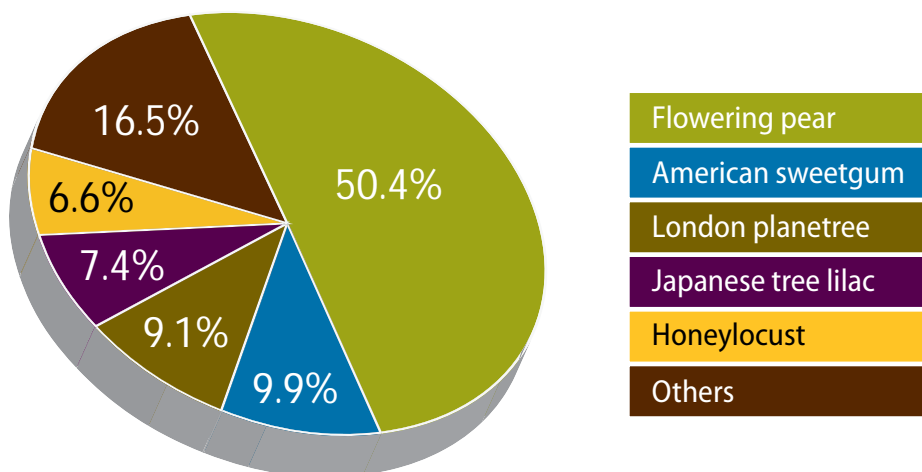


- Existing tree
- Planting potential
- Stump



Representative commercial building storefront along 6th Avenue with flowering pear trees in tree grate planting sites.

**Species Distribution.** The 2011 inventory of 6th Avenue street trees included 121 trees representing more than 10 species. This appears to be a diverse population but species distribution figures indicate the population is dominated by a few species and often poor quality species. Over 50 percent of the trees are represented by one species. The species is flowering pear. Species diversity in the 6th Avenue NBD is limited. Industry standards prefer less than 20% in any one genus in the tree population.



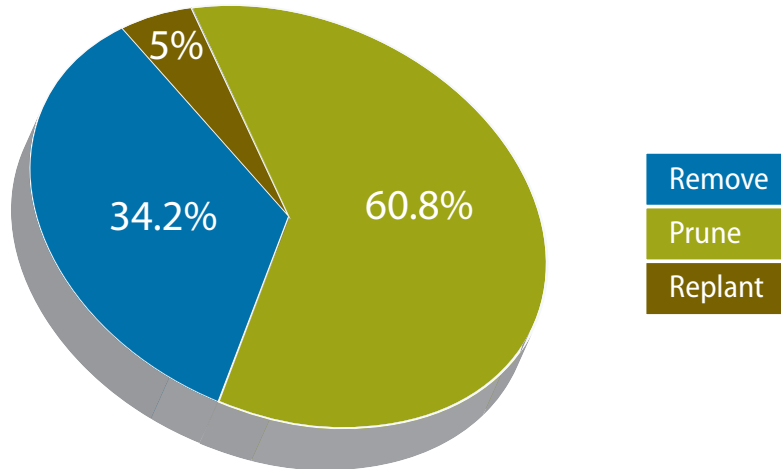
Species	Count	Percent
Flowering pear	61	50.4%
American sweetgum	12	9.9%
London planetree	11	9.1%
Japanese tree lilac	9	7.4%
Honeylocust	8	6.6%
Red maple	4	3.3%
Red oak	3	2.5%
Plum/Cherry	3	2.5%
Others	10	8.2%
<b>Total</b>	<b>121</b>	<b>100%</b>

**Maintenance Requirements.** The graphics below represent primary maintenance required for existing trees in the 6th Avenue NBD.

**Removals:** There are 41 trees (> 30%) of the 121 inventoried that require removal. Typical inventory results for tree removal in many cities are less than 3% of the population. Removals are primarily due to previous maintenance damage caused by topping.

**Prune:** There are 73 trees that require some type of pruning treatment. The most common defect is co-dominant stems which can be corrected by subordination pruning treatments.

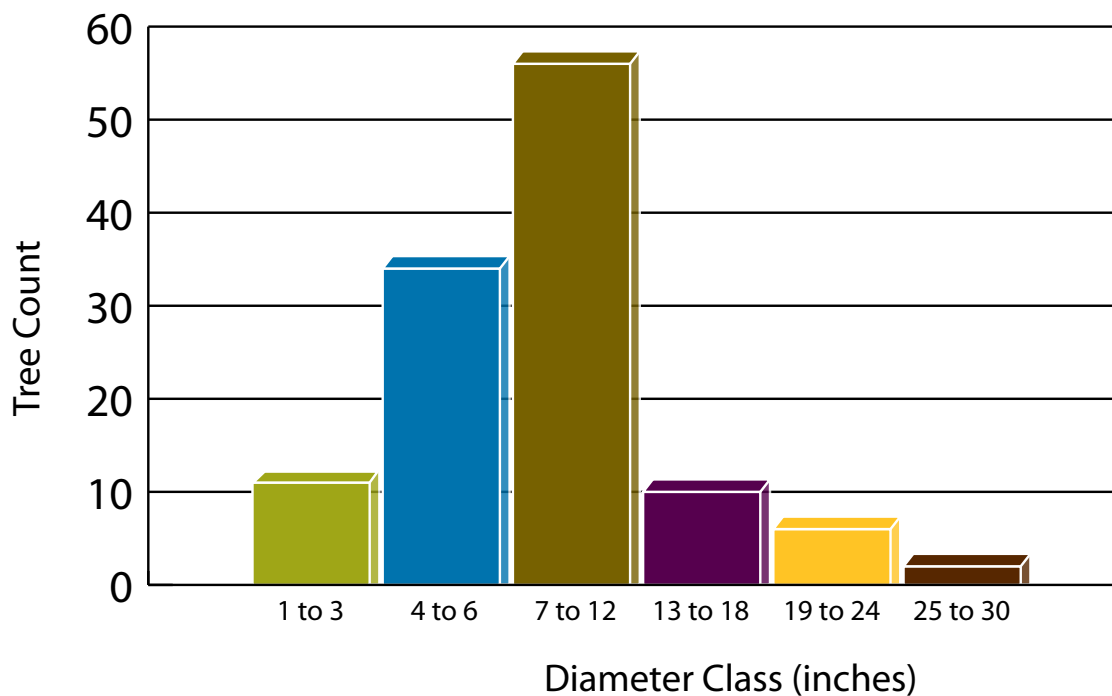
Replant: There are 6 trees that require replanting due to improper installation (planted too deeply).



6TH AVENUE MAINTENANCE REQUIREMENT DETAILS	
Task	Tree Count
Remove	41
Replant	6
Prune – Crown clean	11
Prune – Subordinate	62
Prune – Clearance	11



**Diameter Distribution.** The diameter distribution in the 6th NBD is composed of small trees planted 5 to 10 years ago that have not reached maturity. There are very few medium and large trees due to limited space and infrastructure conflicts.



Diameter Class	Percent	Count
1 to 3	9.9%	12
4 to 6	28.9%	35
7 to 12	47.1%	57
13 to 18	8.3%	10
19 to 24	5.0%	6
25 to 30	0.8%	1
Total	100%	121



Many trees along Sixth Avenue were topped and should be removed.

**Planting Spaces.** Planting spaces were determined by evaluating site characteristics such as building entries and signage, sidewalk width, adjoining utilities, planting strip width, view conflicts, and mature tree sizes. Each space was designated as a large, medium, or small planting space. Large spaces accommodate trees greater than 50 feet in height, medium spaces for trees 25 to 50 feet in height, and small spaces for trees 25 feet or less in height.

Potential planting spaces are new tree sites. They are not associated with the removal of existing trees. The removal of existing trees in the district may provide more planting spaces in addition to the new potential planting sites.

The space for planting sites is limited by congested sidewalks and infrastructure conflicts. There are 61 vacant planting sites in the 6th Avenue NBD. Of the 61 planting sites, 31 are potential small tree sites, 20 are medium tree sites, and 10 are large tree sites. The majority of these potential planting sites are in existing sidewalk cutouts or can be developed from new sidewalk cutouts.

6TH AVENUE PLANTING SPACES	
Tree Size	Tree Count
Large (> 50 feet)	10
Medium (25 – 50 feet)	20
Small (< 25 feet)	31

**Urban Infrastructure Conflicts.** Overhead utilities are a common infrastructure sharing public space with trees in the 6th Avenue NBD. Of the 121 existing trees, 58 have overhead utility conflicts.

**Appraised Value.** Trees in urban areas are valued differently than their rural counterparts. Fire trucks have a monetary value (the cost of buying a new one) in addition to their immeasurable value when protecting citizens in the community. Trees, too, have an actual monetary value that is recognized by tree professionals, real estate experts, the judicial system, and the Internal Revenue Service.

Tacoma’s tree population is an important financial asset of the community and has significant monetary value. There were 121 street trees inventoried in the 6th Avenue NBD of the tree inventory project. The appraised value for those trees is described below. Trees are a capital investment. Plant the right tree properly in the right place, maintain it, and it is an asset that will increase in value throughout its life.

6th Avenue Appraised Value	
Total Number of Trees in Report:	121
Total Appraised Value:	\$179,680
Total Mean Appraised Value:	\$1,485
Median Appraised Value:	\$870
Minimum Appraised Value:	\$80
Maximum Appraised Value:	\$15,500

## DOME

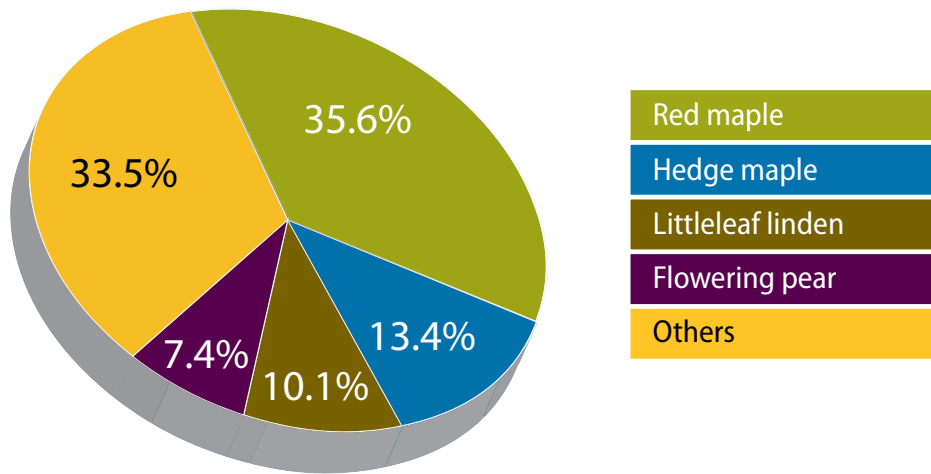
The Dome NBD is characterized by businesses, municipal buildings, and industrial facilities. It is predominantly paved surfaces throughout the district. The main arterial defining the district is East 25th Street. The inventory area included East 25th Street, extending from East G Street on the east, A Street on the west, East 27th Street on the south, and East 23rd Street on the north.



- Existing tree
- Planting potential
- Stump



**Species Distribution.** There are 149 existing trees in the Dome NBD. There are over 20 species in the Dome NBD tree population. While there are a substantial number of species represented, over 50% of these trees are in the maple genus. Industry standards prefer less than 20% in any one genus in the tree population.

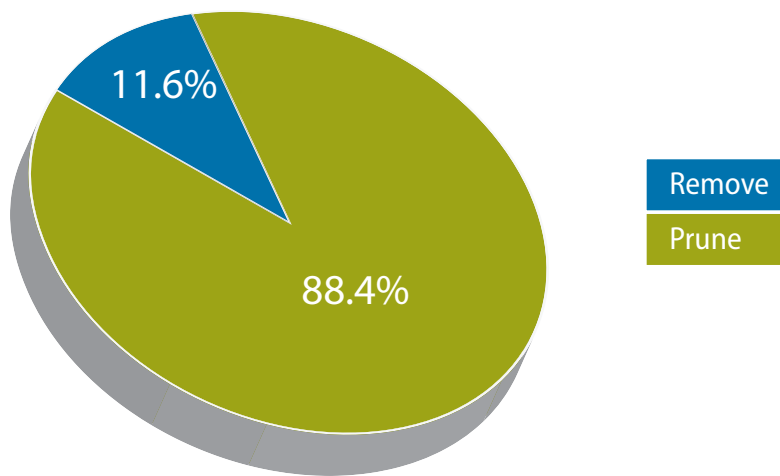


Species	Count	Percent
Red maple	53	35.6%
Hedge maple	20	13.4%
Littleleaf linden	15	10.1%
Flowering pear	11	7.4%
Others	46	33.5%
Total	145	100%

**Maintenance Requirements.** The chart below represents the tree maintenance needs in the Dome NBD.

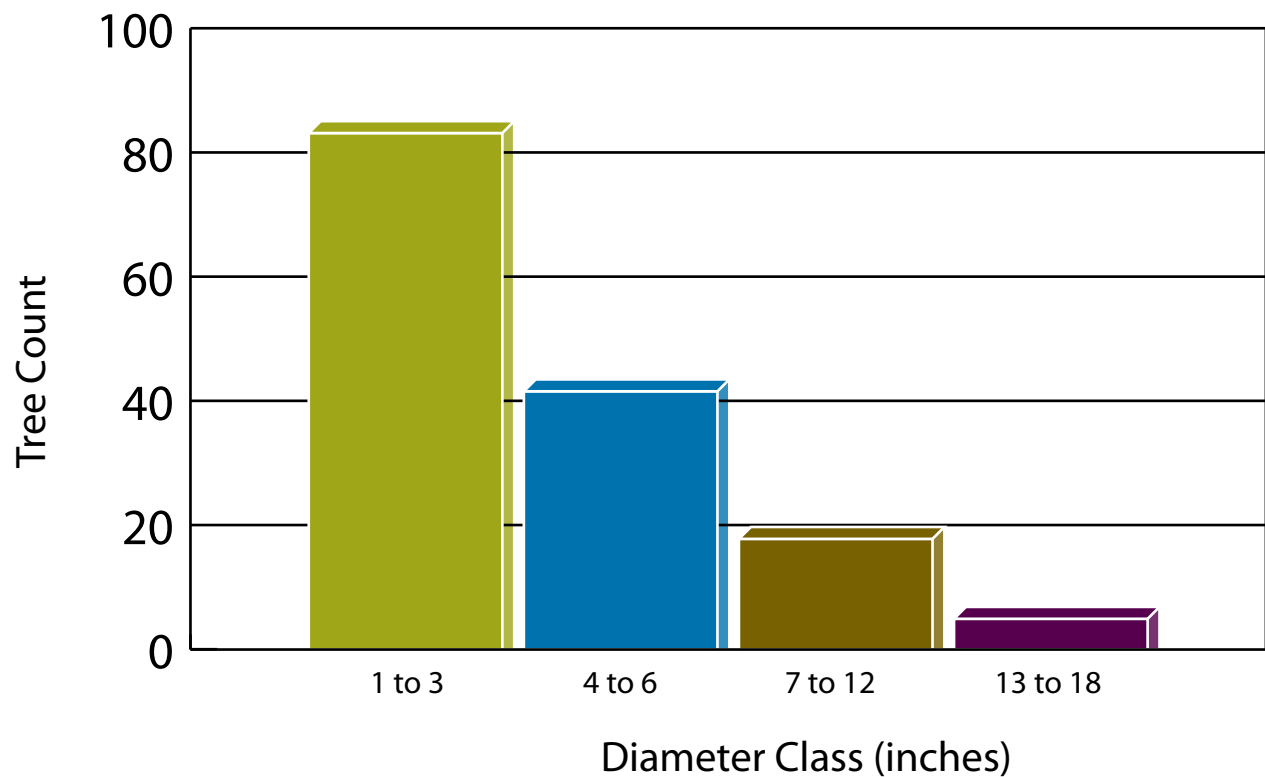
Removal: There are 16 trees representing 11% of the inventoried population that should be removed. Typical inventory results for tree removal in many cities are less than 3% of the population.

Prune: Over 120 of the existing trees need some type of pruning treatment. The majority of the pruning is subordination of co-dominant stems on the trees planted recently.



DOME MAINTENANCE REQUIREMENT DETAILS	
Task	Tree Count
Remove	16
Prune – Crown clean	2
Prune – Subordinate	117
Prune – Clearance	2
Prune – Restoration	1

**Diameter Distribution.** Many of the trees in the Dome NBD were planted in the last five years. It is a very young population that mimics the ideal population if you are trying to perpetuate these species. There are no large, old diameter trees in the Dome NBD.



Diameter Class	Percent	Count
1 to 3	56.4%	84
4 to 6	28.2%	42
7 to 12	12.1%	18
13 to 18	3.4%	5
Total	100%	149

**Planting Spaces.** Planting spaces were determined by evaluating site characteristics such as building entries and signage, sidewalk width, adjoining utilities, planting strip width, view conflicts, and mature tree sizes. Each space was designated as a large, medium, or small planting space. Large spaces accommodate trees greater than 50 feet in height, medium spaces for trees 25 to 50 feet in height, and small spaces for trees 25 feet or less in height.

Potential planting spaces are new tree sites. They are not associated with the removal of existing trees. The removal of existing trees in the district may provide more planting spaces in addition to the new potential planting sites.

The planting sites are limited due to paved surfaces throughout the Dome NBD and other infrastructure conflicts. There are 74 vacant planting sites in the Dome NBD. Of the 74 planting sites, 45 are potential small tree sites, 26 are medium tree sites, and 3 are large tree sites. The majority of these potential planting sites will have to be created from new sidewalk cutouts or other creative means such as bump outs.

DOME PLANTING SPACES	
Tree Size	Tree Count
Large (> 50 feet)	3
Medium (25 – 50 feet)	26
Small (< 25 feet)	45



Paved surfaces are the primary infrastructure conflict in the Dome NBD.

**Urban Infrastructure Conflicts.** Overhead utilities are a common infrastructure sharing public space with trees in the Dome NBD. Over 40% of the existing trees and potential planting spaces have overhead utility or streetlight conflicts.

**Appraised Value.** Trees in urban areas are valued differently than their rural counterparts. Fire trucks have a monetary value (the cost of buying a new one) in addition to their immeasurable value when protecting citizens in the community. Trees, too, have an actual monetary value that is recognized by tree professionals, real estate experts, the judicial system, and the Internal Revenue Service.



Tacoma's tree population is an important financial asset of the community and has significant monetary value. There were 149 street trees inventoried in the Dome NBD of the tree inventory project. The appraised value for those trees is described below. The majority of the trees in the Dome NBD are recent plantings and small diameter. The appraised value for the trees reflects this characteristic. Trees are a capital investment. Plant the right tree properly in the right place, maintain it, and it is an asset that will increase in value throughout its life.

Dome Appraised Value	
Total Number of Trees in Report:	<b>149</b>
Total Appraised Value:	<b>\$71,260</b>
Total Mean Appraised Value:	<b>\$480</b>
Median Appraised Value:	<b>\$180</b>
Minimum Appraised Value:	<b>\$0</b>
Maximum Appraised Value:	<b>\$4,350</b>

## FERN HILL

Fern Hill is in the southern part of Tacoma. It is defined by South 83rd Street on the north, South 84th Street on the south, Yakima Avenue on the west, and South G Street on the east. It is the smallest of the 15 neighborhood business districts. There are very few existing street trees in the district.



- Existing tree
- Planting potential
- Stump

**Species Distribution.** There are two existing street trees in the Fern Hill NBD. Both are small ornamental trees planted on South Park Avenue. Industry standards prefer less than 20% in any one genus in the tree population.



South Park Avenue in the Fern Hill NBD. Potential planting sites are limited by infrastructure conflicts.

**Maintenance Requirements.** Minor pruning to address co-dominant structure in the two trees is required.

**Diameter Distribution.** The two trees are a one inch Japanese maple and a two inch diameter flowering dogwood.

**Planting Spaces.** Planting spaces were determined by evaluating site characteristics such as building entries and signage, sidewalk width, adjoining utilities, planting strip width, view conflicts, and mature tree sizes. Each space was designated as a large, medium, or small planting space. Large spaces accommodate trees greater than 50 feet in height, medium spaces for trees 25 to 50 feet in height, and small spaces for trees 25 feet or less in height.

Potential planting spaces are new tree sites. They are not associated with the removal of existing trees. The removal of existing trees in the district may provide more planting spaces in addition to the new potential planting sites.

The space for planting sites is limited by paved surfaces, infrastructure conflicts, murals, and business frontage. There are 21 potential planting spaces in the Fern Hill NBD. There are 10 potential small planting sites, 11 potential medium planting sites, and 0 potential large tree planting sites. As in other business districts many of the potential planting sites are often used for parking by the adjoining landowner.

FERN HILL PLANTING SPACES	
Tree Size	Tree Count
Large (> 50 feet)	0
Medium (25 – 50 feet)	11
Small (< 25 feet)	10



South G Street in the Fern Hill NBD. Many potential planting strips are used for parking.

**Appraised Value.** Trees in urban areas are valued differently than their rural counterparts. Fire trucks have a monetary value (the cost of buying a new one) in addition to their immeasurable value when protecting citizens in the community. Trees, too, have an actual monetary value that is recognized by tree professionals, real estate experts, the judicial system, and the Internal Revenue Service.

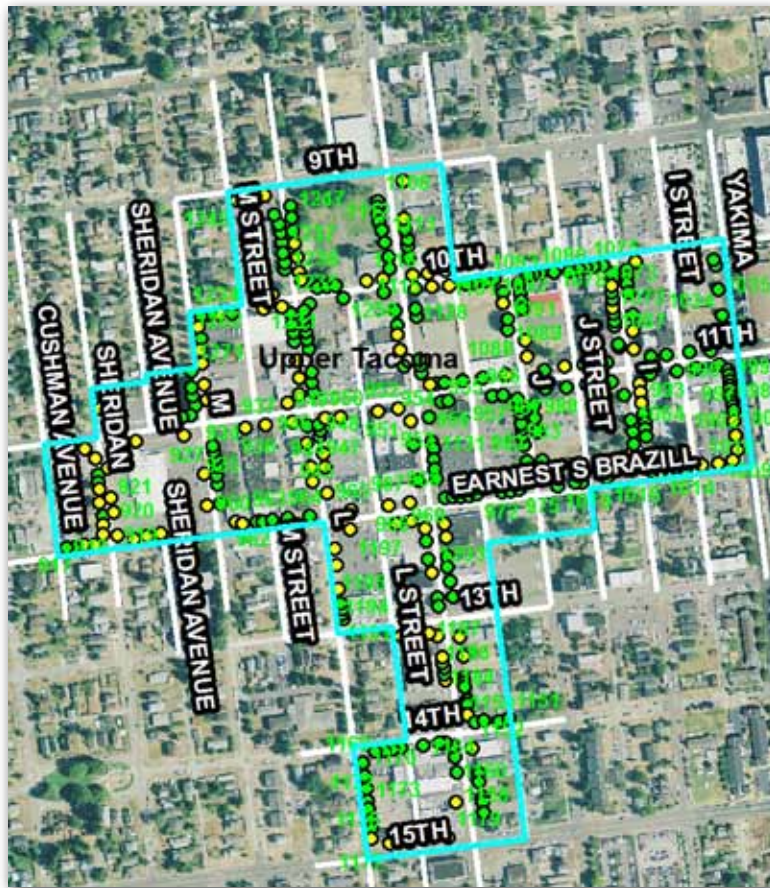
Tacoma's tree population is an important financial asset of the community and has significant monetary value. There are two existing street trees inventoried in the Fern Hill NBD of the tree inventory project. The appraised value for those trees is \$160.00.





## HILLTOP

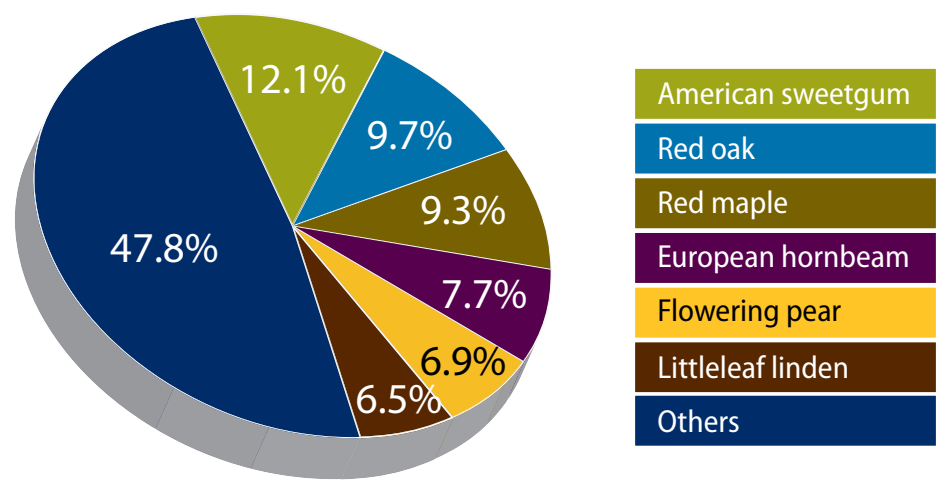
Hilltop inventory area is defined by Martin Luther King Jr. Way and South 11th Street arterials. South 9th Street on the north, South 15th Street on the south Yakima Avenue on the east, and South Sheridan Avenue on the west. The predominant land use in Hilltop NBD is business but the district has the most variety of land uses compared to other business districts. Churches, municipal property, apartments, and residences are other land uses present in the district.



- Existing tree
- Planting potential
- Stump



**Species Distribution.** There are more than 240 existing trees in the Hilltop NBD. There is better species diversity in the district compared to the other NBDs. The tree population is not dominated by one species as in the other districts. There are more than 20 species represented in the population. While there are a substantial number of species represented, only a small number of each species make up the district’s tree population. Industry standards prefer less than 20% in any one genus in the tree population.



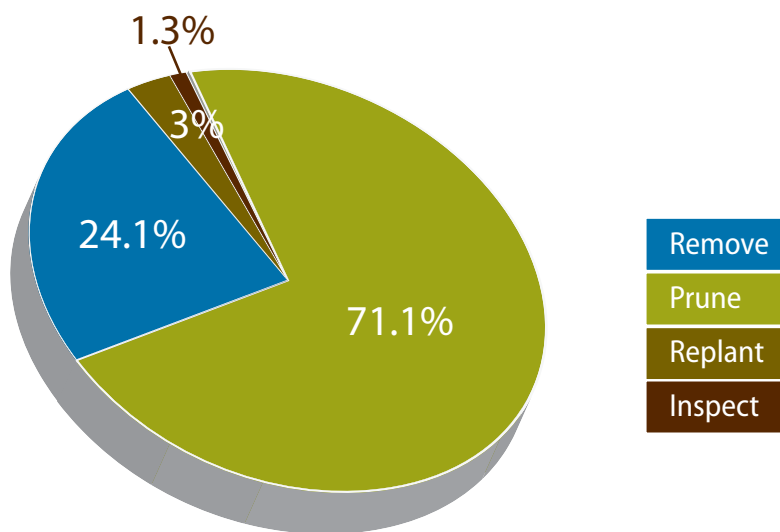
Species	Count	Percent
American sweetgum	30	12.1%
Red oak	24	9.7%
Red maple	23	9.3%
European hornbeam	19	7.7%
Flowering pear	17	6.9%
Littleleaf linden	16	6.5%
Others	118	47.8%
Total	247	100%

**Maintenance Requirements.** The chart below represents the tree maintenance needs in the Hilltop NBD.

Removal: There is more than 24% of the existing trees that require removal. Typical inventory results for tree removal in many cities are less than 3% of the population. Topping is the primary cultural defect and cause for some of the removals in the district.

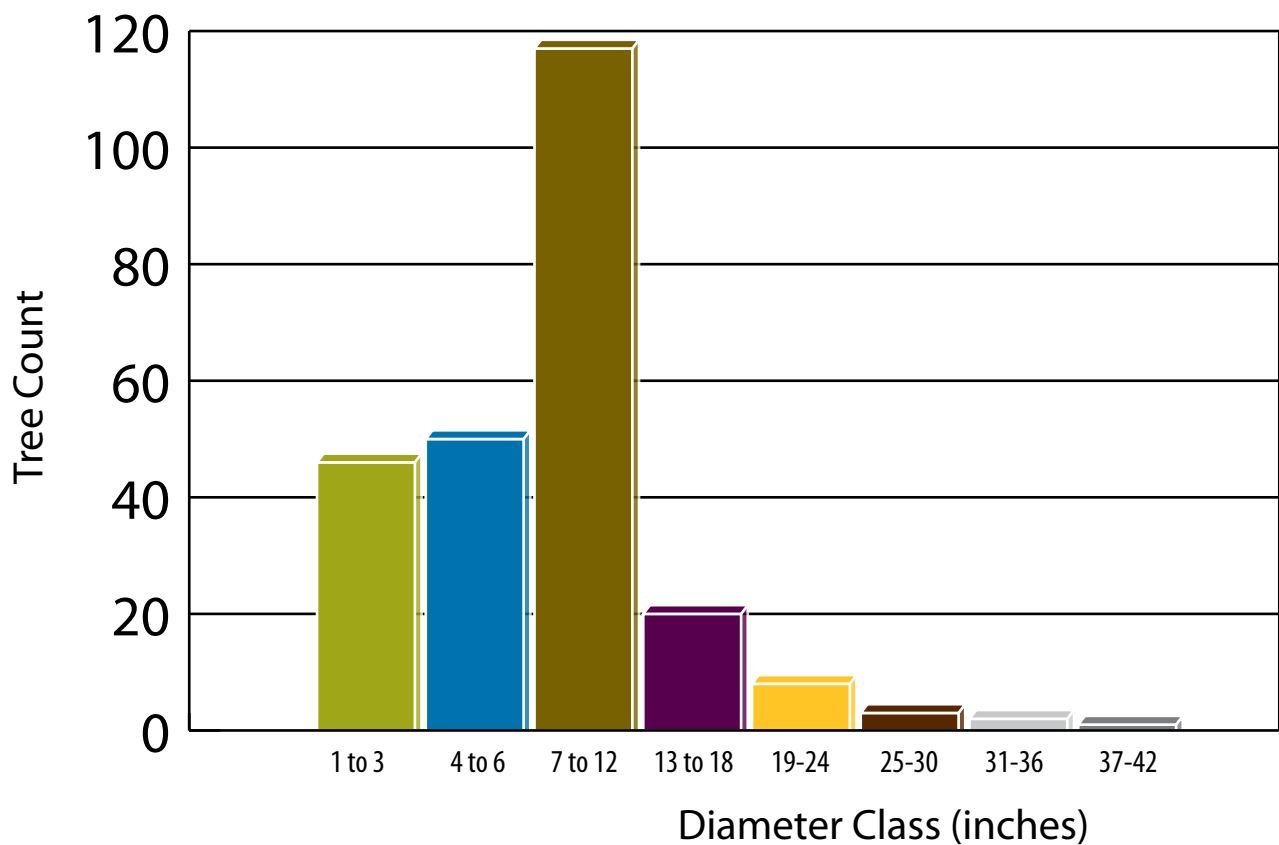
Prune: There are more than 70% of the existing trees that require some form of pruning treatment. The most common structural defect is co-dominant stems. Pruning can correct many of the trees with this defect.

Replant: There are 7 trees that require replanting due to improper installation (planted too deeply).



HILLTOP MAINTENANCE REQUIREMENT DETAILS	
Task	Trees
Remove	57
Replant	7
Prune – Subordinate	131
Prune – Clearance	24
Prune – Crown clean	8
Prune – Crown thin	6
Prune – Restoration	1

**Diameter Distribution.** The following graph depicts diameter distribution for the existing tree population of Hilltop NBD. The graph indicates an emphasis on planting trees in the last 10 years. Fortunately the species planted has varied and improved the species diversity. Unfortunately many of these recent plantings will be removed due to excessive topping or branch tear outs from co-dominant stems.



Diameter Class	Percent	Count
1 to 3	18.6%	46
4 to 6	20.2%	50
7 to 12	47.4%	117
13 to 18	8.1%	20
19 to 24	3.2%	8
25 to 30	1.2%	3
31 to 36	0.8%	2
37 to 42	0.4%	1
Total	100%	247

**Planting Spaces.** Planting spaces were determined by evaluating site characteristics such as building entries and signage, sidewalk width adjoining utilities, planting strip width, view conflicts, and mature tree sizes. Each space was designated as a large, medium, or small planting space. Large spaces accommodate trees greater than 50 feet in height, medium spaces for trees 25 to 50 feet in height, and small spaces for trees 25 feet or less in height.

Potential planting spaces are new tree sites. They are not associated with the removal of existing trees. The removal of existing trees in the district may provide more planting spaces in addition to the new potential planting sites.

There are 129 potential planting sites in the Hilltop NBD. There are 43 potential planting sites for small trees, 41 potential planting sites for medium trees, and 45 potential planting sites for large trees. There are some wider sidewalks in the district that will allow for larger cutouts for medium and large trees.

HILLTOP PLANTING SPACES	
Tree Size	Tree Count
Large (> 50 feet)	45
Medium (25 – 50 feet)	41
Small (< 25 feet)	43



Co-dominant stems is a common structural defect in Hilltop NBD street trees.

**Urban Infrastructure Conflicts.** About 30% of the existing trees and potential planting sites have overhead utilities and ornamental street light conflicts. The potential for planting medium and large trees is better in this district because of wider sidewalks and less utility conflicts.

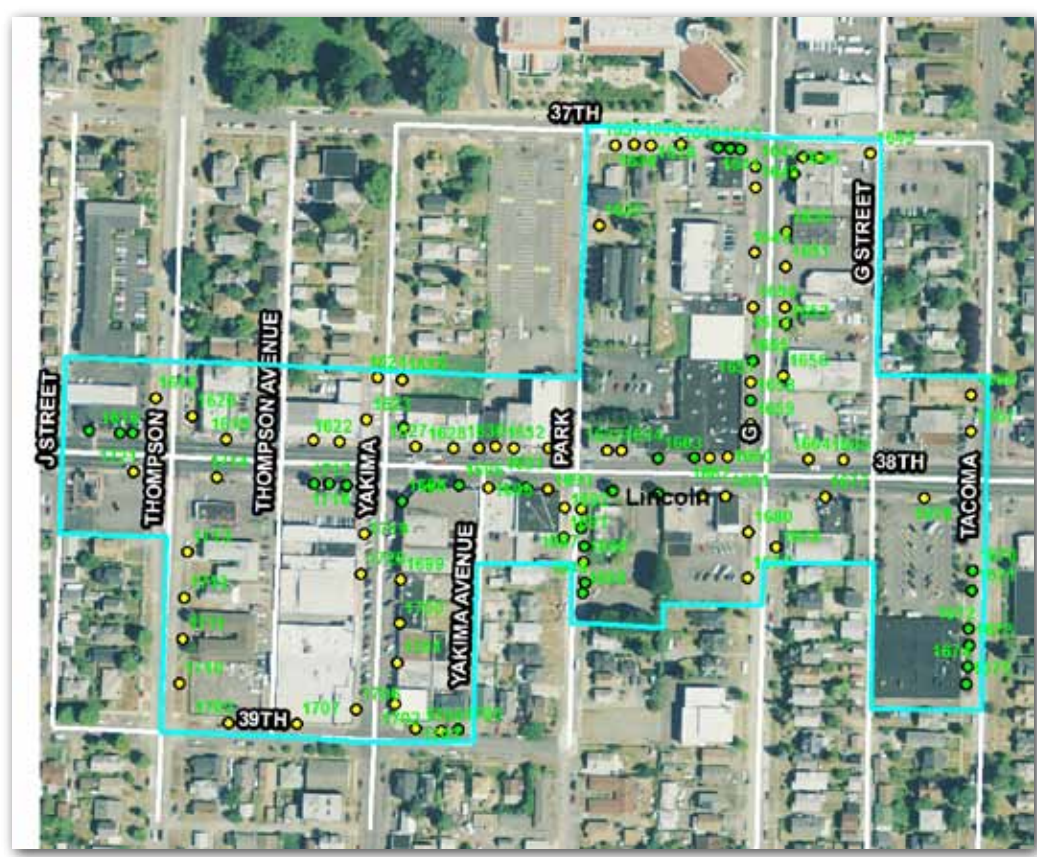
**Appraised Value.** Trees in urban areas are valued differently than their rural counterparts. Fire trucks have a monetary value (the cost of buying a new one) in addition to their immeasurable value when protecting citizens in the community. Trees, too, have an actual monetary value that is recognized by tree professionals, real estate experts, the judicial system, and the Internal Revenue Service.

Tacoma's tree population is an important financial asset of the community and has significant monetary value. There were 247 street trees inventoried in the Hilltop NBD of the tree inventory project. Many are small trees so the appraised value is lower despite a large number of trees in the district.

Hilltop Appraised Value	
Total Number of Trees in Report:	<b>247</b>
Total Appraised Value:	<b>\$328,000</b>
Total Mean Appraised Value:	<b>\$1,330</b>
Median Appraised Value:	<b>\$180</b>
Minimum Appraised Value:	<b>\$0</b>
Maximum Appraised Value:	<b>\$24,300</b>

LINCOLN INTERNATIONAL

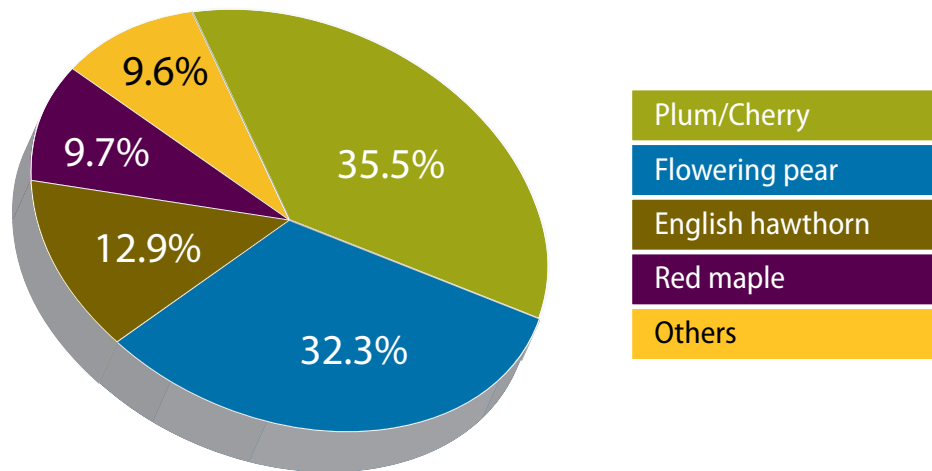
Lincoln International NBD tree inventory area is comprised of the main arterial South 38th Street between Tacoma Avenue on the east and South J Street on the west, South 37th Street on the north and South 39th Street on the south. Over 80% of the land use is business. Apartments and residences are the other land uses in the district.



- Existing tree
- Planting potential
- Stump



**Species Distribution.** There are 31 existing trees in the Lincoln International NBD inventory area. This is a small population dominated by two species—plum and flowering pear. The two species account for over 65% of the tree population in the district. Industry standards prefer less than 20% in any one genus in the tree population. Species diversity is limited. Plum and flowering pear are not the best choice of trees for city streets and the population in Lincoln International NBD is in poor condition.



Species	Count	Percent
Plum/Cherry	11	35.5%
Flowering pear	10	32.3%
English hawthorn	4	12.9%
Red maple	3	9.7%
Others	3	9.6%
Total	31	100%

**Maintenance Requirements.** The chart below represents the tree maintenance needs in the Lincoln International NBD.

Removal: About 57% of the existing trees in the Lincoln International NBD require removal due to topping, branch tear outs, or trunk decay. Typical inventory results for tree removal in many cities are less than 3% of the population.

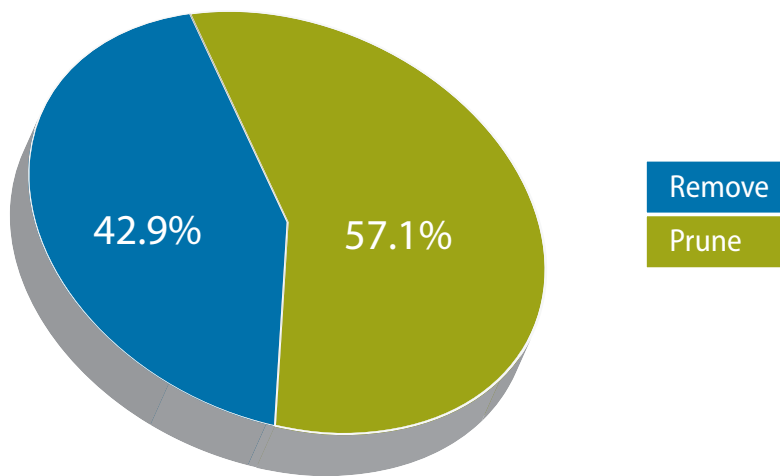
Prune: The remaining trees in the population require pruning to correct co-dominant stems, a structural defect, and address clearance issues.



Topped trees are very common in the Lincoln International NBD. The plum tree is topped and should be removed.

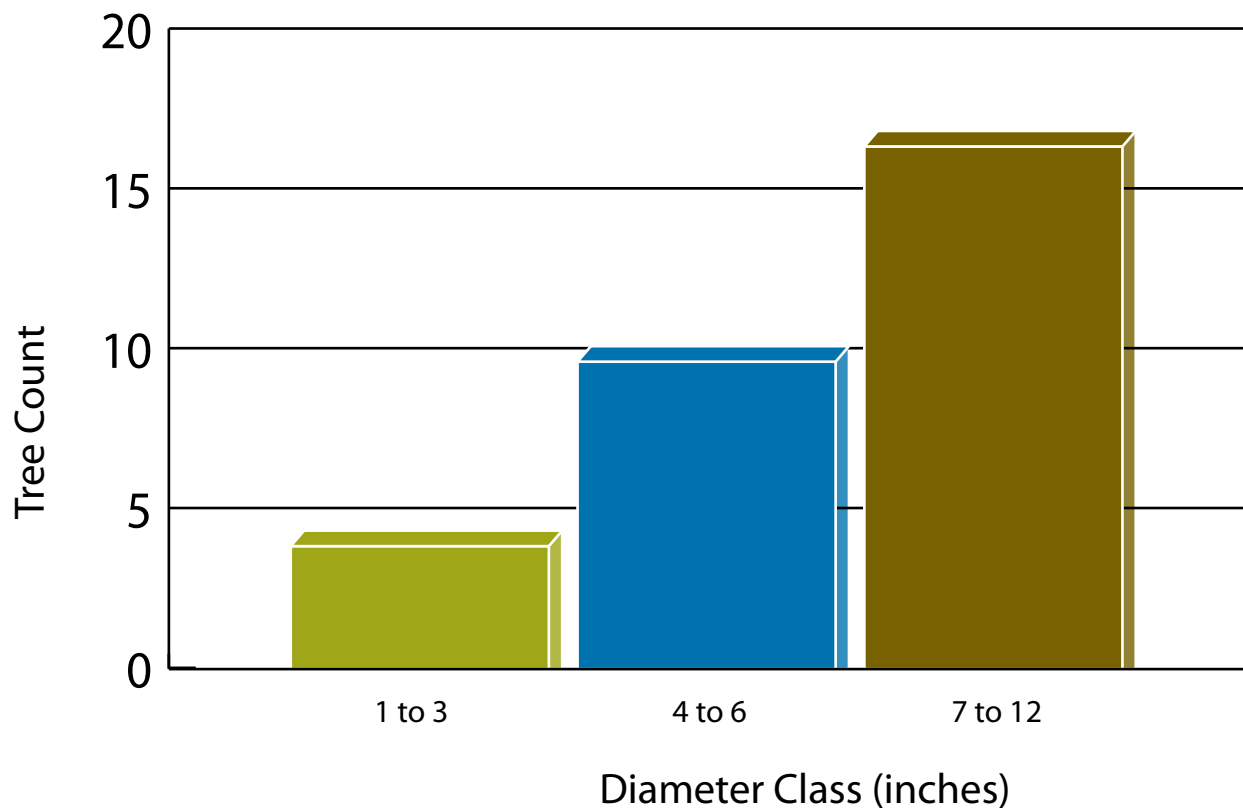


Branch tear-out from a co-dominant stem. Many trees in the Lincoln International NBD have branch failures caused by co-dominant stems.



LINCOLN INTERNATIONAL MAINTENANCE REQUIREMENT DETAILS	
Task	Tree Count
Remove	15
Prune – Subordinate	14
Prune – Clearance	6

**Diameter Distribution.** The diameter distribution for the Lincoln International NBD tree population is depicted in the graph below. The trend indicates tree planting occurred about 5 years ago and since has slowed. This correlates with the large number of potential planting spaces found in the district. All the trees in the district are young and recently planted.



Diameter Class	Percent	Count
1 to 3	12.9%	4
4 to 6	32.3%	10
7 to 12	54.8%	17
Total	100%	31

**Planting Spaces.** Planting spaces were determined by evaluating site characteristics such as building entries and signage, sidewalk width, adjoining utilities, planting strip width, view conflicts, and mature tree sizes. Each space was designated as a large, medium, or small planting space. Large spaces accommodate trees greater than 50 feet in height, medium spaces for trees 25 to 50 feet in height, and small spaces for trees 25 feet or less in height.

Potential planting spaces are new tree sites. They are not associated with the removal of existing trees. The removal of existing trees in the district may provide more planting spaces in addition to the new potential planting sites.

There are 77 potential planting sites in the Lincoln International NBD. There are 37 potential planting sites for small trees, 30 potential planting sites for medium trees, and 10 potential planting sites for large trees. Most of these potential planting sites are in vacant sidewalk cutouts or can be developed from new sidewalk cutouts.

Lincoln International Planting Spaces	
Tree Size	Tree Count
Large (> 50 feet)	10
Medium (25 – 50 feet)	30
Small (< 25 feet)	37

**Urban Infrastructure Conflicts.** Overhead utilities, street lights, and pavement are a common infrastructure sharing public space with trees in the Lincoln International NBD. Approximately half of the existing trees and potential planting spaces have conflicts with overhead utilities or streetlights. Business signs, business entrances, and building canopies are other primary infrastructure conflicts.

**Appraised Value.** Trees in urban areas are valued differently than their rural counterparts. Fire trucks have a monetary value (the cost of buying a new one) in addition to their immeasurable value when protecting citizens in the community. Trees, too, have an actual monetary value that is recognized by tree professionals, real estate experts, the judicial system, and the Internal Revenue Service.

Tacoma's tree population is an important financial asset of the community and has significant monetary value. There were 31 street trees inventoried in the Lincoln International NBD of the tree inventory project. Since most were small trees or topped trees in poor condition the appraised value is very low.

Lincoln International Appraised Value	
Total Number of Trees in Report:	<b>31</b>
Total Appraised Value:	<b>\$23,700</b>
Total Mean Appraised Value:	<b>\$765</b>
Median Appraised Value:	<b>\$530</b>
Minimum Appraised Value:	<b>\$70</b>
Maximum Appraised Value:	<b>\$1,920</b>

## MCKINLEY HILL

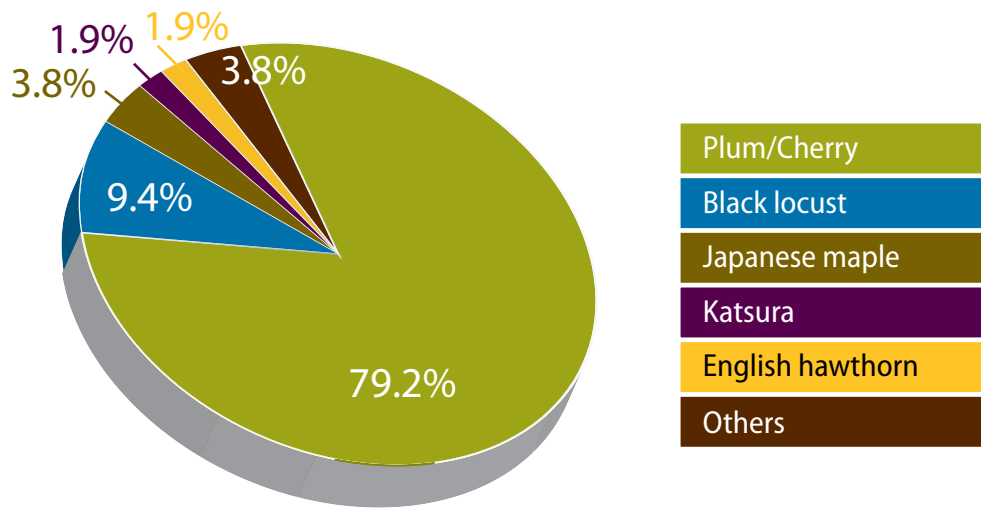
McKinley Hill NBD is a small district. McKinley Street is the main arterial anchoring the district. The inventory area included McKinley Street from East Wright Avenue on the north to East Division Lane on the south. Over 70% of the land use is business. Others properties include churches and residences.



- Existing tree
- Planting potential
- Stump



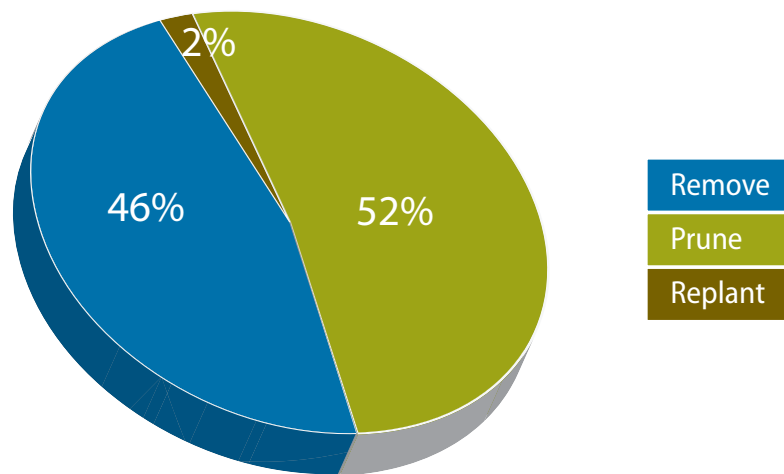
**Species Distribution.** There are 53 existing trees in the McKinley Hill NBD. Over 75% are cherry plums which are commonly referred to as purple leaf plums. Industry standards prefer less than 20% in any one genus in the tree population. Species diversity is limited to a species usually not recommended in urban forestry planting programs.



Species	Count	Percent
Plum/Cherry	42	79.2%
Black locust	5	9.4%
Japanese maple	2	3.8%
Katsura	1	1.9%
English hawthorn	1	1.9%
Others	2	3.8%
Total	53	100%

**Maintenance Requirements.** The chart below represents the tree maintenance needs in the McKinley NBD.

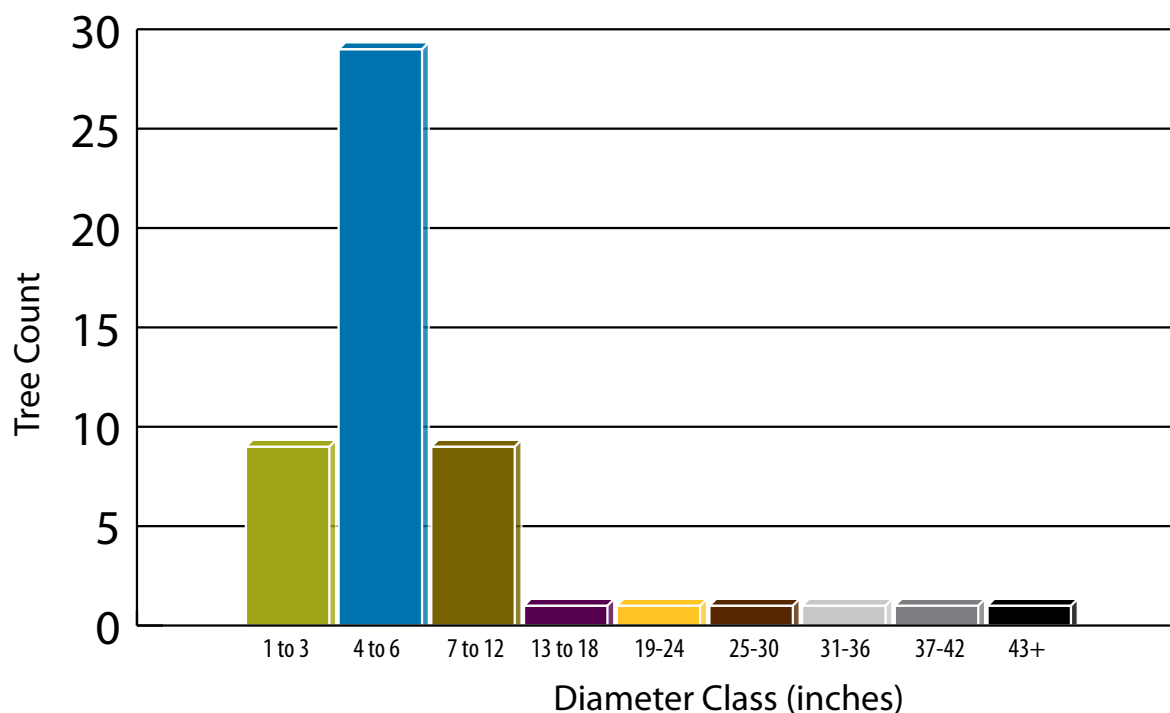
- Removal: Many of the McKinley Hill NBD trees are in poor or very poor condition and require removal. Topping of the cherry plums in conjunction with co-dominant stems containing included bark warrants removal. Over 40% of the trees in the district should be removed. Typical inventory results for tree removal in many cities are less than 3% of the population. There are large black locusts that require immediate removal due to trunk splits and decay.
- Prune: There are 26 trees that require pruning in the McKinley NBD. Some of the structural issues can be corrected with pruning treatments.
- Replant: There is one tree that requires replanting due to improper installation (planted too deeply).



Many of the cherry plums along McKinley Avenue have been topped severely and should be removed.

MCKINLEY HILL MAINTENANCE REQUIREMENT DETAILS	
Task	Tree Count
Remove	23
Replant	1
Prune – Subordinate	26

**Diameter Distribution.** The graph below depicts the diameter distribution of the tree population in the McKinley Hill NBD. The population peaks in the smallest diameter class and decreases significantly as diameters increase. The small diameter trees are cherry plums. Most of these will be removed. The large diameter trees are black locusts with major structural defects that warrant removal.



Diameter Class	Percent	Count
1 to 3	17.0%	9
4 to 6	54.7%	29
7 to 12	17.0%	9
13 to 18	1.9%	1
19 to 24	1.9%	1
25 to 30	1.9%	1
31 to 36	1.9%	1
37 to 42	1.9%	1
43 +	1.9%	1
Total	100%	53

**Planting Spaces.** Planting spaces were determined by evaluating site characteristics such as building entries and signage, sidewalk width, adjoining utilities, planting strip width, view conflicts, and mature tree sizes. Each space was designated as a large, medium, or small planting space. Large spaces accommodate trees greater than 50 feet in height, medium spaces for trees 25 to 50 feet in height, and small spaces for trees 25 feet or less in height.

Potential planting spaces are new tree sites. They are not associated with the removal of existing trees. The removal of existing trees in the district may provide more planting spaces in addition to the new potential planting sites.

There are 22 potential planting sites in the McKinley Hill NBD. There are 6 potential planting sites for small trees, 8 potential planting sites for medium trees, and 8 potential planting sites for large trees. Most of these potential planting sites are in vacant sidewalk cutouts or can be developed from new sidewalk cutouts. There is an opportunity to plant many new trees and better species in conjunction with the removals.

MCKINLEY PLANTING SPACES	
Tree Size	Tree Count
Large (> 50 feet)	8
Medium (25 – 50 feet)	8
Small (< 25 feet)	6

**Urban Infrastructure Conflicts.** Overhead utilities and ornamental street lights are a common infrastructure sharing public space with trees in the McKinley Hill NBD. Over 55% of the existing trees and potential planting spaces have conflicts with overhead utilities or streetlights. Business signs, business entrances, and building canopies are other primary infrastructure conflicts.

**Appraised Value.** Trees in urban areas are valued differently than their rural counterparts. Fire trucks have a monetary value (the cost of buying a new one) in addition to their immeasurable value when protecting citizens in the community. Trees, too, have an actual monetary value that is recognized by tree professionals, real estate experts, the judicial system, and the Internal Revenue Service.

Tacoma’s tree population is an important financial asset of the community and has significant monetary value. There were 53 street trees inventoried in the McKinley Hill NBD of the tree inventory project. Since most were small trees or topped trees in poor condition the appraised value is low.

McKinley Hill Appraised Value	
Total Number of Trees in Report:	53
Total Appraised Value:	\$71,970
Total Mean Appraised Value:	\$1,360
Median Appraised Value:	\$440
Minimum Appraised Value:	\$100
Maximum Appraised Value:	\$21,600



## OAKLAND/MADRONA

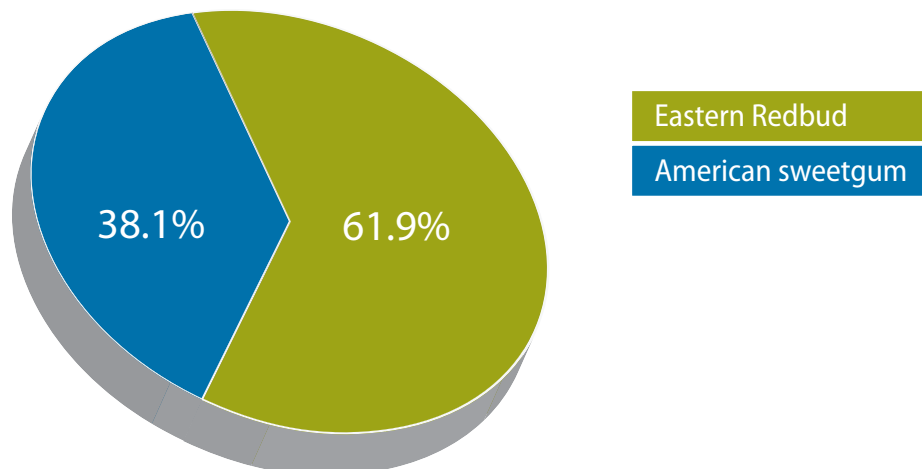
Oakland/Madrona NBD is one of the smallest districts. It runs along Center Street between South Tyler Street on the west and South Union Street on the east. The primary land use in the district is business.



- Existing tree
- Planting potential
- Stump

**Species Distribution.** There are very few trees in the Oakland/Madrona NBD. The tree population is made up of two species: Eastern redbud and American sweetgum. Industry standards prefer less than 20% in any one genus in the tree population.

Species diversity is limited. Redbud is not an appropriate species for street tree use. It does not tolerate heat and the low branching habit presents clearance issues for vehicles and pedestrians.



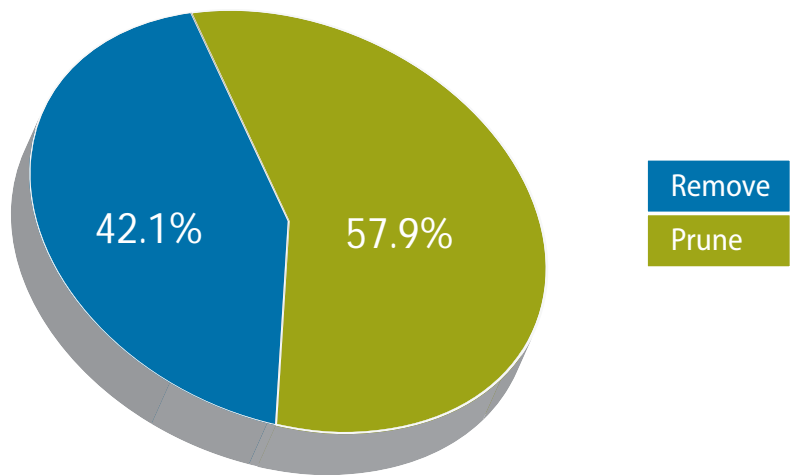
Species	Count	Percent
Eastern redbud	13	61.9%
American sweetgum	8	38.1%
Total	21	100%



Maintenance Requirements. The chart below represents the tree maintenance needs in the McKinley NBD. Every tree in the Oakland/Madrona NBD requires arboriculture treatments.

Removal: There are many eastern redbud trees with vandalism and branch tear-outs of co-dominant stems with included bark. There are 8 trees that should be removed. Typical inventory results for tree removal in many cities are less than 3% of the population.

Prune: There are 11 trees that require pruning. Co-dominants stems on the American sweetgums are common but can be pruned easily.

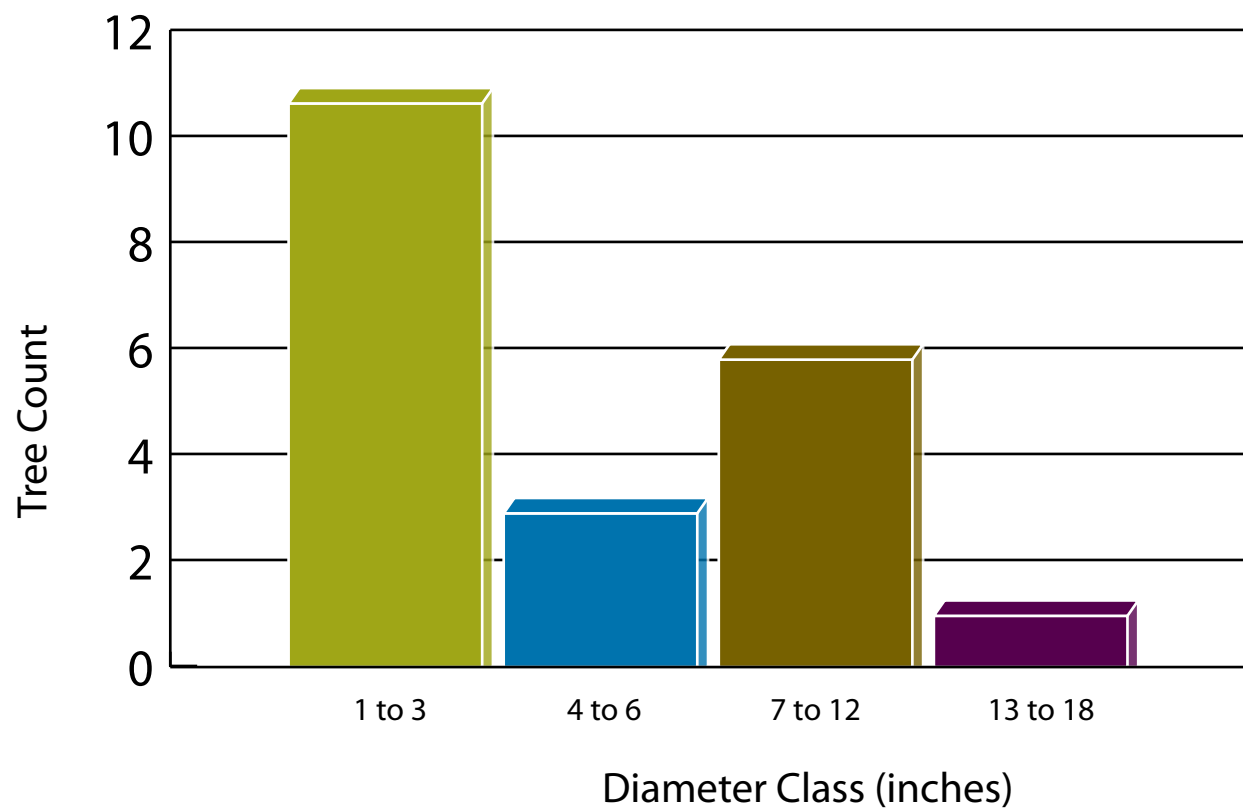


OAKLAND/MADRONA MAINTENANCE REQUIREMENT DETAILS	
Task	Tree Count
Remove	8
Prune – Subordinate	1
Prune – Clearance	6
Prune – Crown clean	4



Eastern redbud showing a split located at the co-dominant stem.

**Diameter Distribution.** The graph depicts diameter distribution for the Oakland/Madrona NBD. The eastern redbuds account for all the trees in the two smallest diameter classes. Many of these trees were planted in the last five years.



Diameter Class	Percent	Count
1 to 3	52.4%	11
4 to 6	14.3%	3
7 to 12	28.6%	6
13 to 18	4.8%	1
Total	100%	21

**Planting Spaces.** Planting spaces were determined by evaluating site characteristics such as building entries and signage; sidewalk width; adjoining utilities; planting strip width; view conflicts; and mature tree sizes. Each space was designated as a large, medium, or small planting space. Large spaces accommodate trees greater than 50 feet in height, medium spaces for trees 25 to 50 feet in height, and small spaces for trees 25 feet or less in height.

There are 27 potential planting sites in the Oakland/Madrona NBD. There are 19 potential planting sites for small trees, 6 potential planting sites for medium trees, and 2 potential planting sites for large trees. Most of these potential planting sites are in vacant sidewalk cutouts or can be developed from new sidewalk cutouts.

OAKLAND/MADRONA PLANTING SPACES	
Tree Size	Tree Count
Large (> 50 feet)	2
Medium (25 – 50 feet)	6
Small (< 25 feet)	19

**Urban Infrastructure Conflicts.** Overhead utilities and street lights are a common infrastructure sharing public space with trees in the Oakland/Madrona NBD. About half of the existing trees and potential planting spaces have conflicts with overhead utilities or streetlights. Business signs, business entrances, and building canopies are other primary infrastructure conflicts.

**Appraised Value.** Trees in urban areas are valued differently than their rural counterparts. Fire trucks have a monetary value (the cost of buying a new one) in addition to their immeasurable value when protecting citizens in the community. Trees, too, have an actual monetary value that is recognized by tree professionals, real estate experts, the judicial system, and the Internal Revenue Service.

Tacoma's tree population is an important financial asset of the community and has significant monetary value. There were 21 street trees inventoried in the Oakland/Madrona NBD of the tree inventory project. Since most were small trees or topped trees in poor condition the appraised value is low.

Oakland/Madrona Appraised Value	
Total Number of Trees in Report:	<b>21</b>
Total Appraised Value:	<b>\$19,810</b>
Total Mean Appraised Value:	<b>\$940</b>
Median Appraised Value:	<b>\$160</b>
Minimum Appraised Value:	<b>\$70</b>
Maximum Appraised Value:	<b>\$4,260</b>



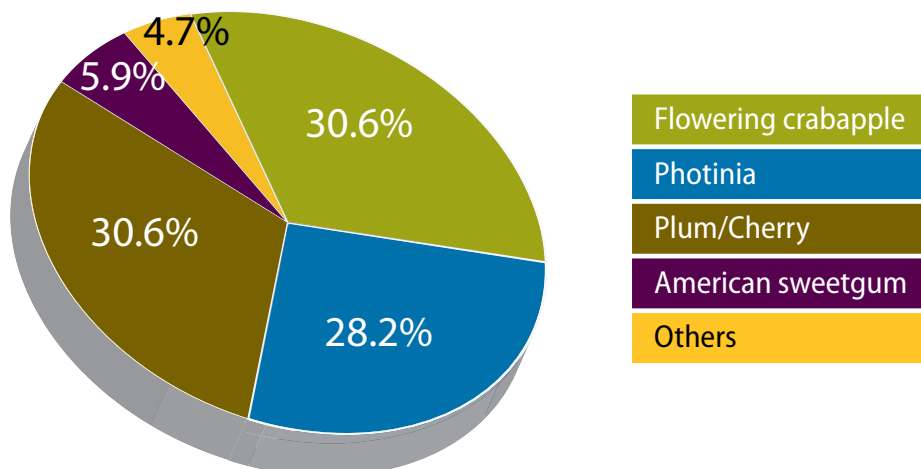
## OLD TOWN

Old Town is dominated by businesses and apartment buildings. The inventory area included North 30th street, part of North 31st street, and sections of the side streets between North 30th and North 31st streets.



- Existing tree
- Planting potential
- Stump

**Species Distribution.** There are four species that dominate the Old Town NBD tree population. They are flowering crabapple, photinia, flowering cherry, and American sweetgum. Industry standards prefer less than 20% in any one genus in the tree population. Species diversity is very limited. Photinia is the second most common species and not considered a desirable street tree. Crabapples and flowering cherries are small ornamentals that do not provide the benefits produced by medium and large street trees.





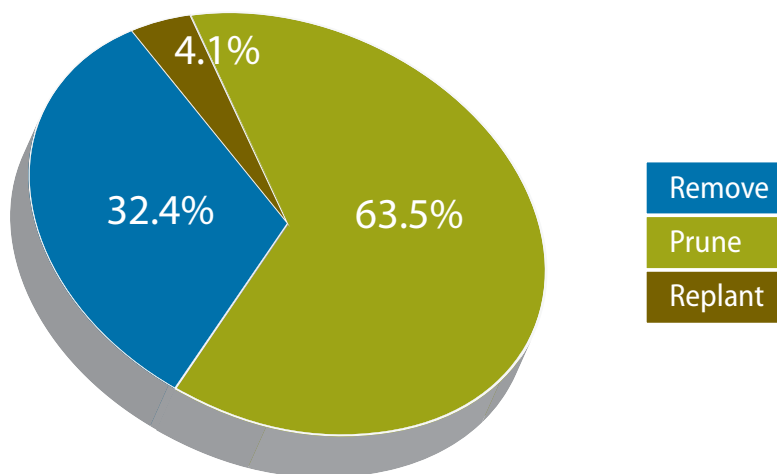
Species	Count	Percent
Flowering crabapple	26	30.6%
Photinia	24	28.2%
Plum/Cherry	26	30.6%
American sweetgum	5	5.9%
Others	4	4.7%
Total	85	100%

**Maintenance Requirements.** The chart below represents the tree maintenance needs in the Old Town NBD.

**Removal:** The tree defects found in the inventory of Old Town NBD are topping of photinia trees and co-dominant stems in the flowering crabapples and other young trees. The photinia have been severely topped annually and are not desirable street trees. They should be removed and replaced. Over 30% of the trees in the district should be removed. Typical inventory results for tree removal in many cities are less than 3% of the population.

**Prune:** Flowering crabapple trees offer outstanding ornamental features but little of the benefits offered by shade trees. Many of the crabapples have structural problems and are planted too deeply. The crabapples should be viewed as a short-term planting with the idea to replace them with medium and large trees as prescribed. In the interim all need subordination pruning to correct co-dominant stems.

**Replant:** There are 6 trees that require replanting due to improper installation (planted too deeply).



OLD TOWN MAINTENANCE REQUIREMENT DETAILS	
Task	Tree Count
Remove	24
Replant	6
Prune – Subordinate	41
Prune – Clearance	2

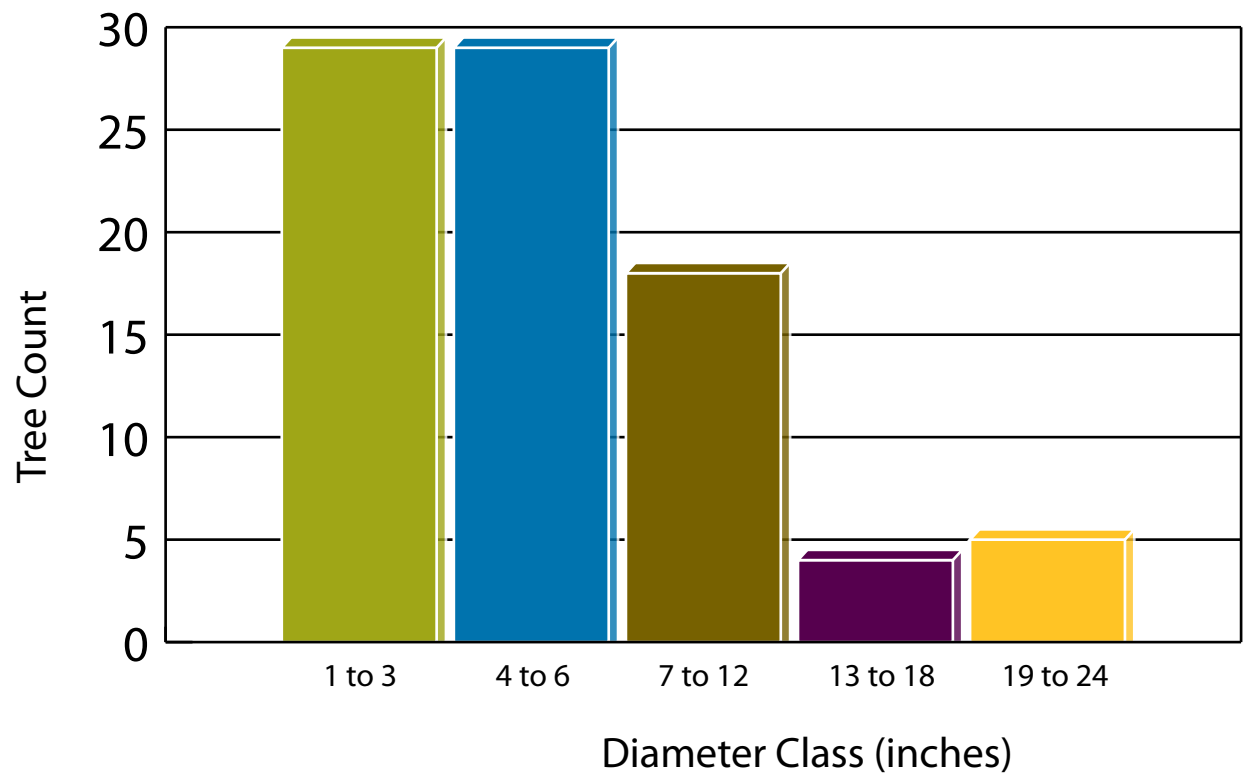


Photinia trees in the Old Town NBD have been severely topped and should be removed.



Small ornamental trees were planted where larger trees could have been planted.

**Diameter Distribution.** The trees found in Old Town NBD are mostly recent plantings of flowering crabapples. These trees are very small – usually two inch trunk diameter and ten feet in height. The photinia are older trees, approximately ten to fifteen feet in height, due to annual topping. The population of trees peaks in the smallest diameter class and gradually decreases as diameters increase. This represents a population that will perpetuate itself for some time in the future, since there is an abundance of trees in the lower diameter classes to replace the trees that are over mature. This distribution is ideal if it is a species the city is wants to retain and promote in the tree population. Flowering crabapples and photinias are not long-lived large trees that can sustain a city tree population over several generations.



Diameter Class	Percent	Count
1 to 3	34.1%	29
4 to 6	34.1%	29
7 to 12	21.2%	18
13 to 18	4.7%	4
19 to 24	5.9%	5
Total	100%	85

**Planting Spaces.** Planting spaces were determined by evaluating site characteristics such as building entries and signage, sidewalk width, adjoining utilities, planting strip width, view conflicts, and mature tree sizes. Each space was designated as a large, medium, or small planting space. Large spaces accommodate trees greater than 50 feet in height, medium spaces for trees 25 to 50 feet in height, and small spaces for trees 25 feet or less in height.

Potential planting spaces are new tree sites. They are not associated with the removal of existing trees. The removal of existing trees in the district may provide more planting spaces in addition to the new potential planting sites.

There are 37 potential planting sites in the Old Town NBD. There are 6 potential planting sites for small trees, 19 potential planting sites for medium trees, and 12 potential planting sites for large trees. Most of these potential planting sites are in existing sidewalk cutouts or can be developed from new sidewalk cutouts. Many of the sites that are planted with crabapples currently could be re-planted with larger trees.

OLD TOWN PLANTING SPACES	
Tree Size	Tree Count
Large (> 50 feet)	12
Medium (25 – 50 feet)	19
Small (< 25 feet)	6

**Urban Infrastructure Conflicts.** Overhead utilities, ornamental street lights, and view issues are a common infrastructure issues sharing public space with trees in the Old Town NBD.

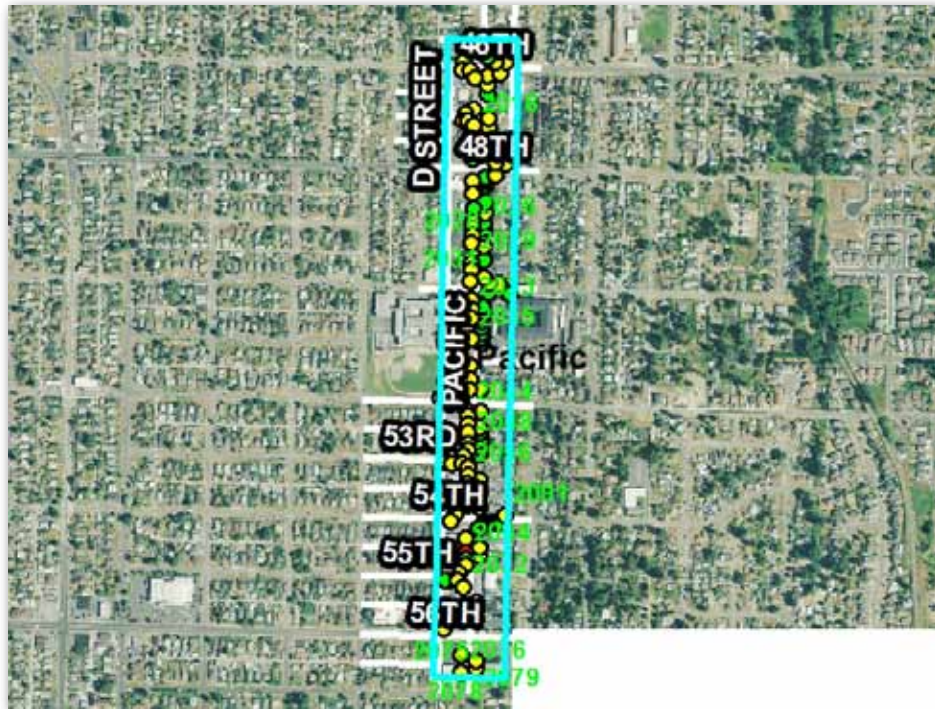
**Appraised Value.** Trees in urban areas are valued differently than their rural counterparts. Fire trucks have a monetary value (the cost of buying a new one) in addition to their immeasurable value when protecting citizens in the community. Trees, too, have an actual monetary value that is recognized by tree professionals, real estate experts, the judicial system, and the Internal Revenue Service.

Tacoma's tree population is an important financial asset of the community and has significant monetary value. There were 85 street trees inventoried in the Old Town NBD of the tree inventory project. Since most were small trees or topped trees in poor condition the appraised value is lower.

Old Town Appraised Value	
Total Number of Trees in Report:	<b>85</b>
Total Appraised Value:	<b>\$100,270</b>
Total Mean Appraised Value:	<b>\$1,180</b>
Median Appraised Value:	<b>\$470</b>
Minimum Appraised Value:	<b>\$0</b>
Maximum Appraised Value:	<b>\$10,700</b>

## PACIFIC AVENUE

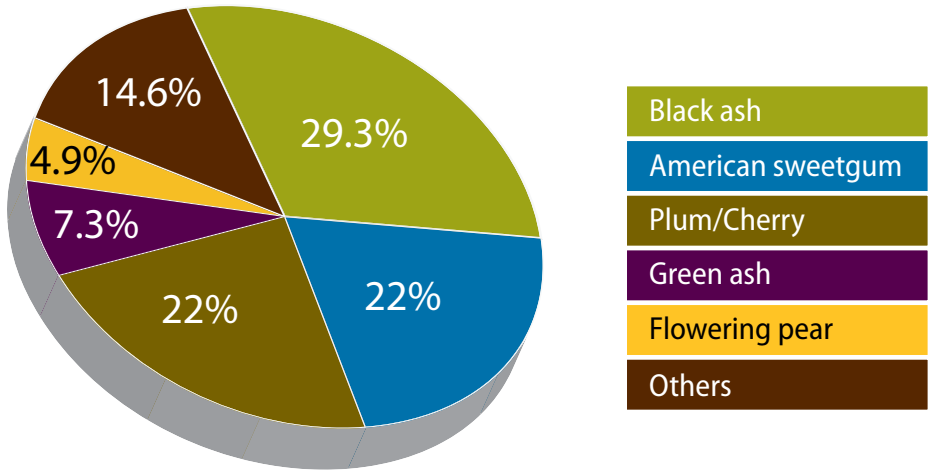
Pacific Avenue NBD is anchored by Pacific Avenue. The inventory area is Pacific Avenue between South 46th Street on the north and South 57th Street on the south. The land use is primarily business although apartments, residences, and school property account for more than 35% of the land use.



- Existing tree
- Planting potential
- Stump



**Species Distribution.** There are 41 existing street trees in the Pacific Avenue NBD. Over 70% of the tree population is represented by three species. Industry standards prefer less than 20% in any one genus in the tree population. Species diversity is limited.

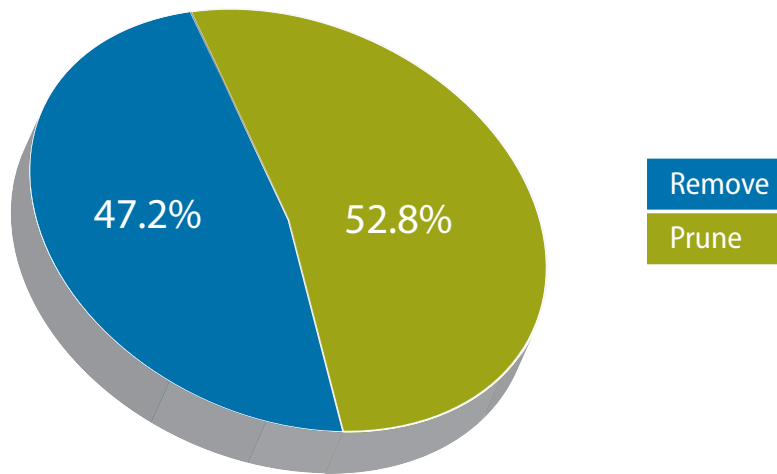


Species	Count	Percent
Black ash	12	29.3%
American sweetgum	9	22.0%
Plum/Cherry	9	22.0%
Green ash	3	7.3%
Flowering pear	2	4.9%
Others	6	14.6%
Total	41	100%

**Maintenance Requirements.** The chart below represents the tree maintenance needs in the Pacific Avenue NBD.

Removal: As in many of the other NBDs, the tree population in the Pacific Avenue NBD has a high number of removals due to poor maintenance practices. There are 17 of the existing 41 trees that require removal because of topping and structural issues. Over 40% of the existing tree population should be removed. Typical inventory results for tree removal in many cities are less than 3% of the population.

Prune: Nineteen of the remaining trees in the population require some type of pruning maintenance.



PACIFIC AVENUE MAINTENANCE REQUIREMENT DETAILS	
Task	Tree Count
Remove	17
Pruning – Restoration	1
Prune – Subordinate	12
Prune – Clearance	3
Prune – Crown clean	3



Many trees in the Pacific Avenue NBD have been topped or pruned improperly. Many of these trees will need to be removed.

**Planting Spaces.** Planting spaces were determined by evaluating site characteristics such as building entries and signage, sidewalk width, adjoining utilities, planting strip width, view conflicts, and mature tree sizes. Each space was designated as a large, medium, or small planting space. Large spaces accommodate trees greater than 50 feet in height, medium spaces for trees 25 to 50 feet in height, and small spaces for trees 25 feet or less in height.

Potential planting spaces are new tree sites. They are not associated with the removal of existing trees. The removal of existing trees in the district may provide more planting spaces in addition to the new potential planting sites.

There are 89 potential planting sites in the Pacific Avenue NBD. There are 51 potential planting sites for small trees, 38 potential planting sites for medium trees, and 0 potential planting sites for large trees. Most of these potential planting sites are in existing sidewalk cutouts or can be developed from new sidewalk cutouts.

PACIFIC AVENUE PLANTING SPACES	
Tree Size	Tree Count
Large (> 50 feet)	0
Medium (25 – 50 feet)	38
Small (< 25 feet)	51



Many planting strips are paved. Removing pavement may create more space for existing trees and new planting sites.

**Urban Infrastructure Conflicts.** Overhead utilities, street lights, and paved surfaces are common infrastructure conflicts sharing public space with trees in the Pacific Avenue NBD.

**Appraised Value.** Trees in urban areas are valued differently than their rural counterparts. Fire trucks have a monetary value (the cost of buying a new one) in addition to their immeasurable value when protecting citizens in the community. Trees, too, have an actual monetary value that is recognized by tree professionals, real estate experts, the judicial system, and the Internal Revenue Service.

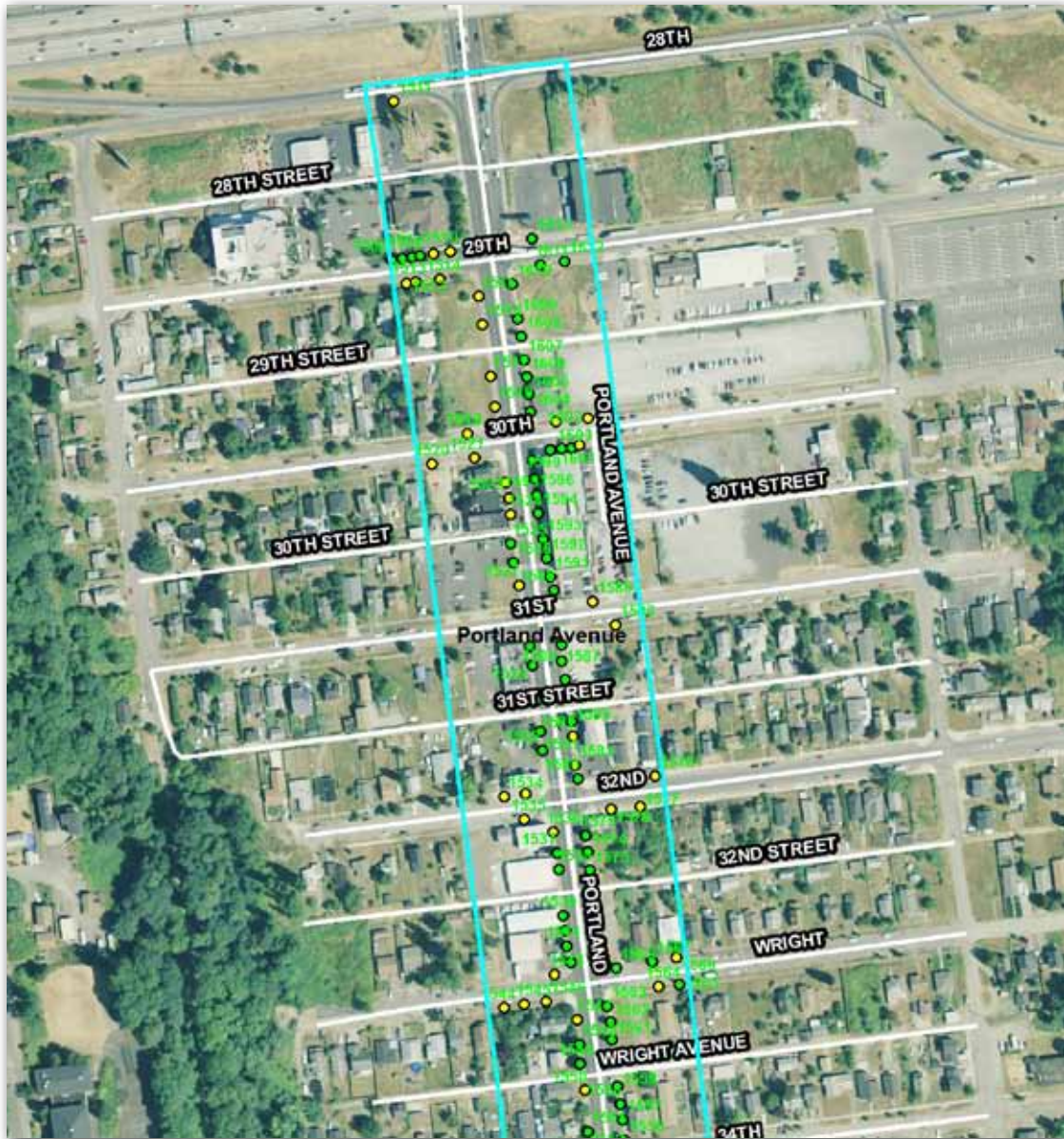
Tacoma’s tree population is an important financial asset of the community and has significant monetary value. There were 41 street trees inventoried in the Pacific Avenue NBD of the tree inventory project. Since most were small trees or trees in poor condition the appraised value is lower.

Pacific Avenue Appraised Value	
Total Number of Trees in Report:	41
Total Appraised Value:	\$19,860
Total Mean Appraised Value:	\$480
Median Appraised Value:	\$0
Minimum Appraised Value:	\$0
Maximum Appraised Value:	\$3,250



## PORTLAND AVENUE

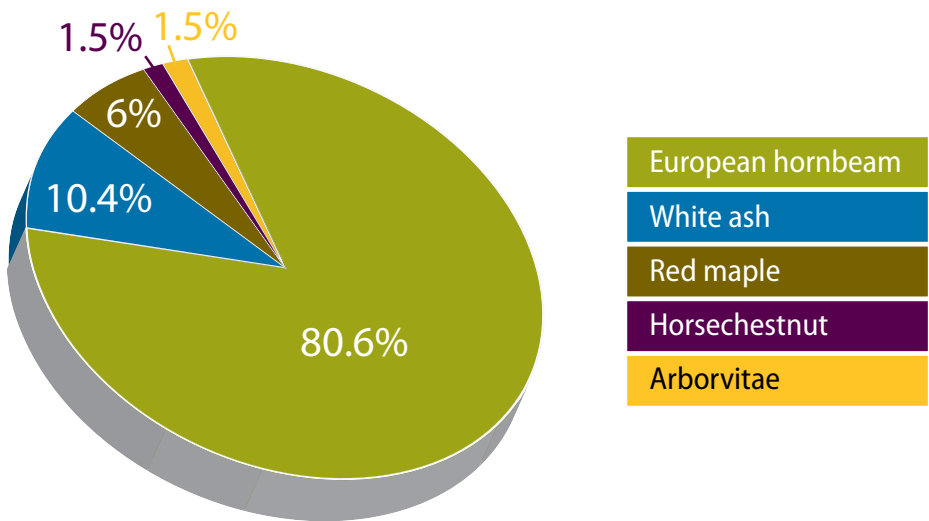
Portland Avenue NBD is located just south of Interstate 5 running south along East Portland Avenue between East 28th Street on the north and East 34th Street on the south. Medians were included in the inventory data collection. The land use is a mix of business and residential properties.



- Existing tree
- Planting potential
- Stump



**Species Distribution.** There are 67 existing trees in the Portland Avenue NBD. Most are European Hornbeams. Industry standards prefer less than 20% in any one genus in the tree population. There is very limited species diversity in the district.

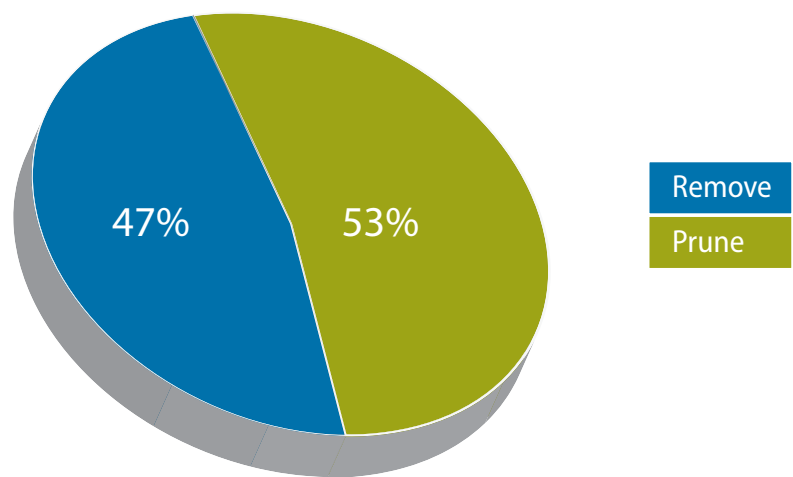


Species	Count	Percent
European hornbeam	54	80.6%
White ash	7	10.4%
Red maple	4	6.0%
Horsechestnut	1	1.5%
Arborvitae	1	1.5%
Total	67	100%

**Maintenance Requirements.** The chart below represents the tree maintenance needs in the Portland Avenue NBD.

**Removal:** There are many topped trees in the Portland Avenue NBD. Many of the topped trees also have co-dominant stems with included bark and trunk damage. Most are not salvageable and require removal. Over 45% of the tree population should be removed. Typical inventory results for tree removal in many cities are less than 3% of the population.

**Prune:** Thirty-five trees need some form of pruning treatment.

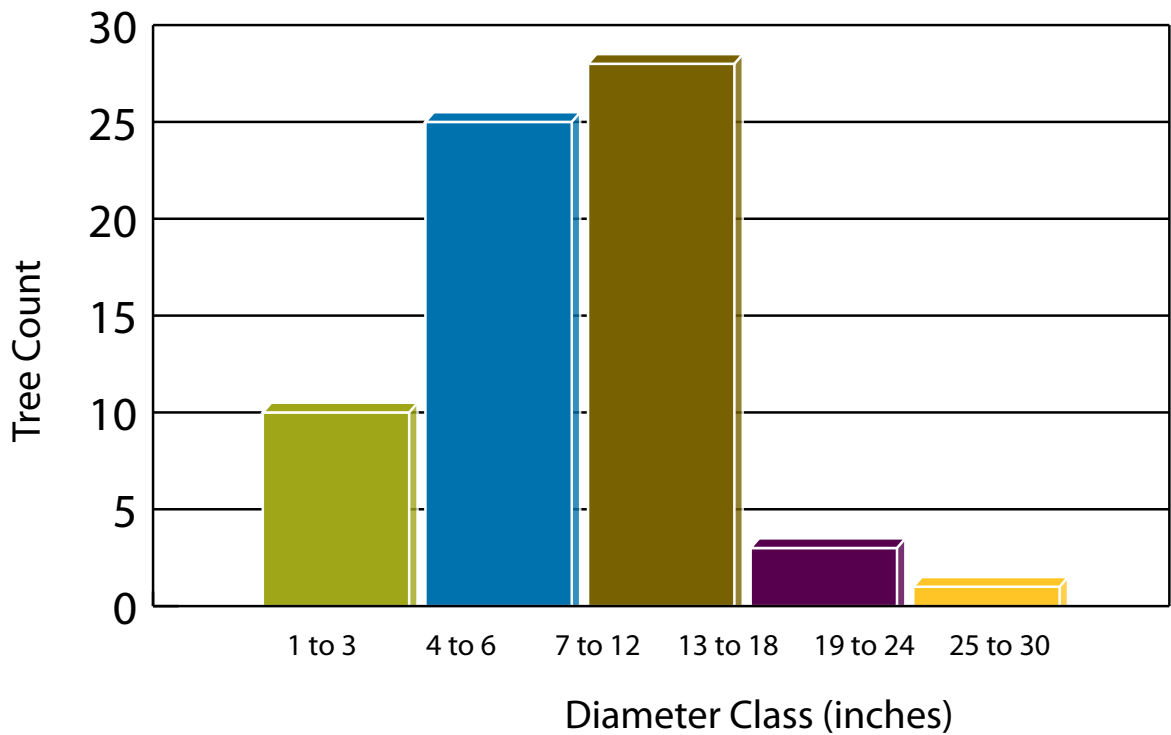


PORTLAND AVENUE MAINTENANCE REQUIREMENT DETAILS	
Task	Tree Count
Remove	31
Pruning – Restoration	6
Prune – Subordinate	28
Prune – Clearance	1



Note the severely topped European hornbeam trees along East Portland Avenue.

**Diameter Distribution.** The graph below depicts the diameter distribution for the trees inventoried in the Portland Avenue NBD. The diameter distribution has the largest number of trees in the smallest diameter classes because of recent planting programs in the district. Since there is an abundance of trees in the lower diameter classes you expect these to perpetuate the population for some time into the future. However, that is not the case since many of these trees will be removed. As a rule of thumb for any given species, twice as many trees need to be planted as are removed in any one year in order to maintain population curve demonstrated in the Portland Avenue NBD diameter distribution graph.



Diameter Class	Percent	Count
1 to 3	14.9%	10
4 to 6	37.3%	25
7 to 12	41.8%	28
13 to 18	4.5%	3
19 to 24	1.5%	1
Total	100%	67

**Planting Spaces.** Planting spaces were determined by evaluating site characteristics such as building entries and signage, sidewalk width, adjoining utilities, planting strip width, view conflicts, and mature tree sizes. Each space was designated as a large, medium, or small planting space. Large spaces accommodate trees greater than 50 feet in height, medium spaces for trees 25 to 50 feet in height, and small spaces for trees 25 feet or less in height.

Potential planting spaces are new tree sites. They are not associated with the removal of existing trees. The removal of existing trees in the district may provide more planting spaces in addition to the new potential planting sites.

There are 42 potential planting sites in the Portland Avenue NBD. There are 6 potential planting sites for small trees, 22 potential planting sites for medium trees, and 14 potential planting sites for large trees. Many of these potential planting sites are in parking strips along the east side of the street. On the west side of the street planting sites are in existing sidewalk cutouts or can be developed from new sidewalk cutouts. Side streets offer the best opportunity since many have wide parking strips. Many other planting sites will be available as trees are removed.

PORTLAND AVENUE PLANTING SPACES	
Tree Size	Tree Count
Large (> 50 feet)	14
Medium (25 – 50 feet)	22
Small (< 25 feet)	6

**Urban Infrastructure Conflicts.** Overhead utilities and street lights are a common infrastructure sharing public space with trees in the Portland Avenue NBD. Over 50% of the existing trees and potential planting spaces have overhead utility or streetlight conflicts.

**Appraised Value.** Trees in urban areas are valued differently than their rural counterparts. Fire trucks have a monetary value (the cost of buying a new one) in addition to their immeasurable value when protecting citizens in the community. Trees, too, have an actual monetary value that is recognized by tree professionals, real estate experts, the judicial system, and the Internal Revenue Service.

Tacoma’s tree population is an important financial asset of the community and has significant monetary value. There were 67 street trees inventoried in the Portland Avenue NBD of the tree inventory project. Since most were small trees or topped trees in poor condition the appraised value is lower.

Portland Avenue Appraised Value	
Total Number of Trees in Report:	67
Total Appraised Value:	\$60,010
Total Mean Appraised Value:	\$900
Median Appraised Value:	\$480
Minimum Appraised Value:	\$0
Maximum Appraised Value:	\$6,200

## PROCTOR

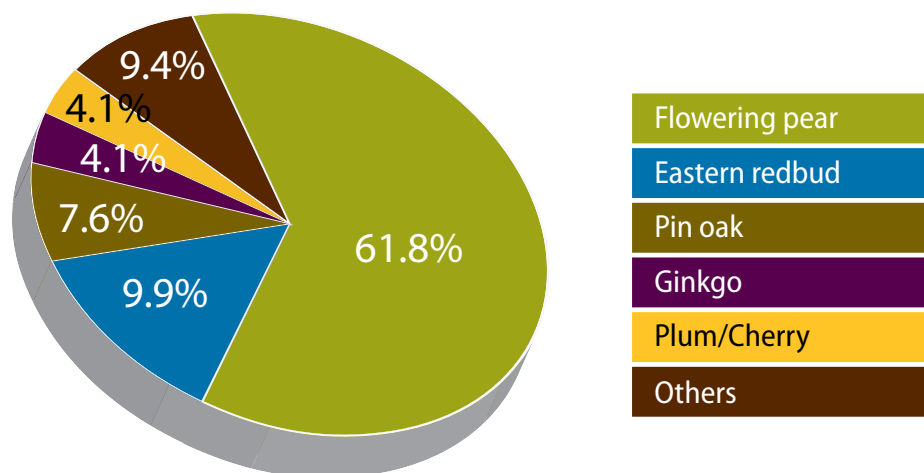
Proctor NBD is a thriving area composed of small and large businesses, apartments, and residential housing. The inventory was conducted along Proctor Avenue from North 28th to North 24th Streets and portions of the side streets along North Proctor Avenue. Proctor NBD has a large number of existing trees and the fewest potential planting spaces of any business district.



- Existing tree
- Planting potential
- Stump



**Species Distribution.** The Proctor NBD has broad species diversity, but by urban forestry standards, is still very limited. The population is dominated by flowering pear which accounts for more than 60% of the trees in the district. Industry standards prefer less than 20% in any one genus in the tree population.



Species	Count	Percent
Flowering pear	105	61.8%
Eastern redbud	22	9.9%
Pin oak	13	7.6%
Ginkgo	7	4.1%
Plum/Cherry	7	4.1%
Others	16	9.4%
Total	170	100%

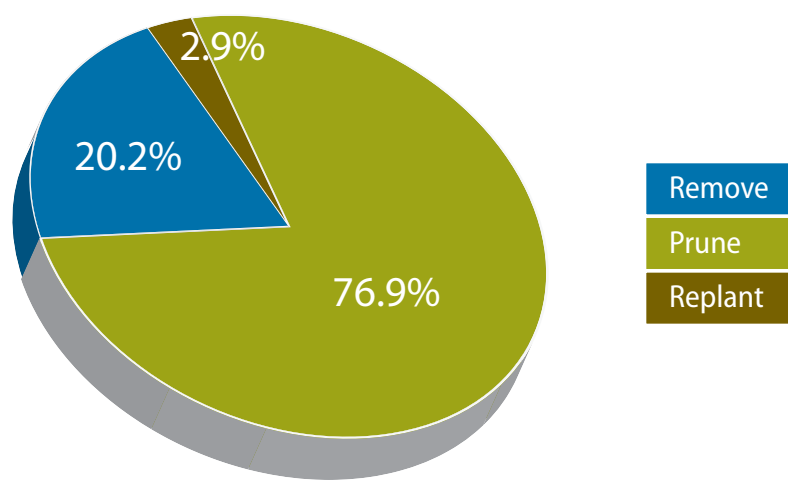


Ornamental flowering pear is the dominant species in the Proctor NBD.

**Maintenance Requirements.** The chart below represents the tree maintenance needs in the Proctor NBD.

**Removal:** There are 35 removal tasks in the Proctor NBD. Over 70% of the trees require some form of pruning treatment and over 20% of the tree population should be removed. Typical inventory results for tree removal in many cities are less than 3% of the population.

**Prune:** There are 133 pruning tasks in the Proctor NBD. Many of the older, larger trees in the population have been severely topped and will require removal. Many of the flowering pears have co-dominant stems, some with significant bark inclusions or branch tearouts from co-dominant stem failures. Previous pruning practices have damaged or ruined existing trees to the degree that many require removal.



PROCTOR MAINTENANCE REQUIREMENT DETAILS	
Task	Trees
Remove	35
Replant	6
Prune – Subordinate	76
Prune – Clearance	28
Prune – Crown clean	23
Prune – Restoration	6

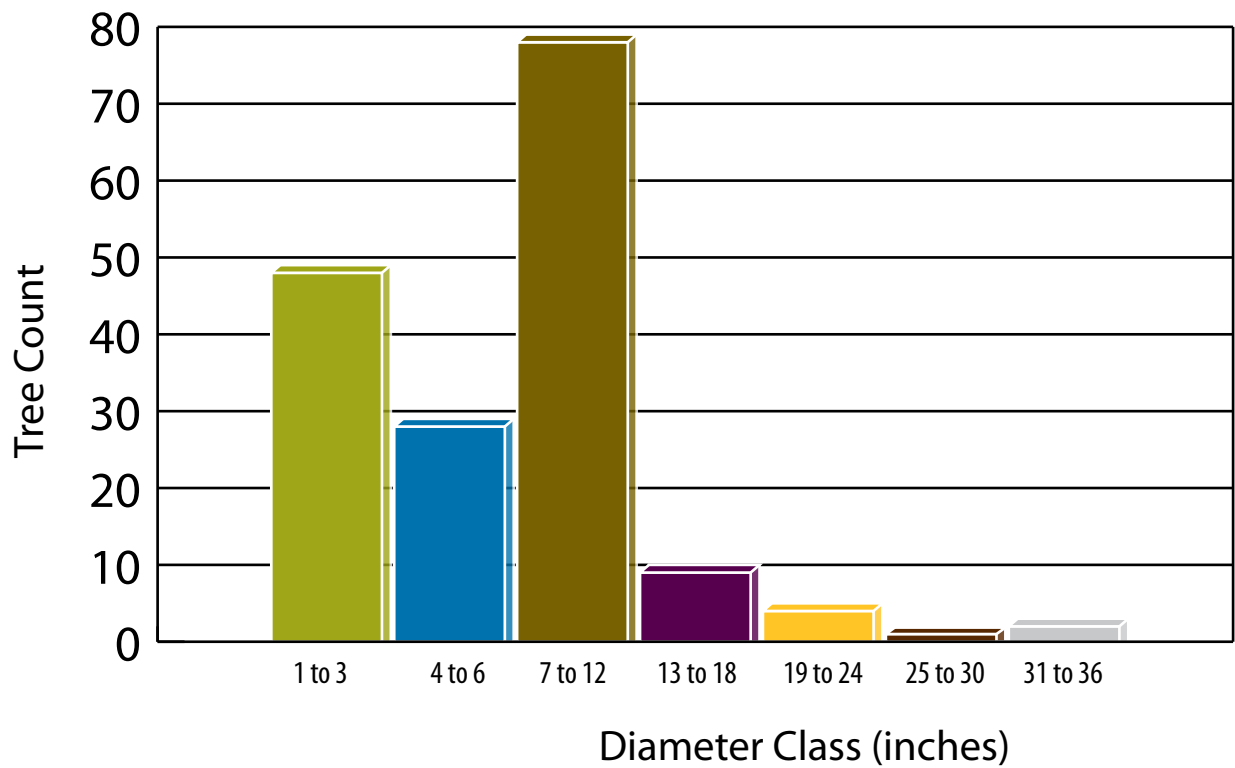


Poor pruning practices have caused extensive damage to existing trees in the Proctor NBD. Note the branch tear outs.



Many trees have been topped in the Proctor NBD.

**Diameter Distribution.** The Proctor NBD, as demonstrated in the graphics, has the largest number of trees in the smallest diameter classes. Most of the population is flowering pears planted in the last ten years. The population peaks in the smallest diameter classes and gradually decreases as diameters increase. This represents a population that will perpetuate itself for some time in the future, since there is an abundance of trees in the lower diameter classes to replace the trees that are over mature. This distribution is ideal if it is a species the NBD wants to retain and promote in the tree population. The older, large diameter trees in the population are pin oaks.



Diameter Class	Percent	Count
1 to 3	28.2%	48
4 to 6	16.5%	28
7 to 12	45.9%	78
13 to 18	5.3%	9
19 to 24	2.4%	4
25 to 30	0.6%	1
31 to 36	1.2%	2
Total	100%	170

**Planting Spaces.** Planting spaces were determined by evaluating site characteristics such as building entries and signage, sidewalk width, adjoining utilities, planting strip width, view conflicts, and mature tree sizes. Each space was designated as a large, medium, or small planting space. Large spaces accommodate trees greater than 50 feet in height, medium spaces for trees 25 to 50 feet in height, and small spaces for trees 25 feet or less in height.

Potential planting spaces are new tree sites. They are not associated with the removal of existing trees. The removal of existing trees in the district may provide more planting spaces in addition to the new potential planting sites.

There are 14 potential planting sites in the Proctor NBD. There are 4 potential planting sites for small trees, 2 potential planting sites for medium trees, and 8 potential planting sites for large trees. There are some wide parking strip widths available for medium and large trees.

PROCTOR PLANTING SPACES	
Tree Size	Tree Count
Large (> 50 feet)	8
Medium (25 – 50 feet)	2
Small (< 25 feet)	4

**Urban Infrastructure Conflicts.** Overhead utilities and ornamental street lights are a common infrastructure sharing public space with trees in the Proctor NBD. Over 90 of the existing trees are planted beneath overhead utility lines.

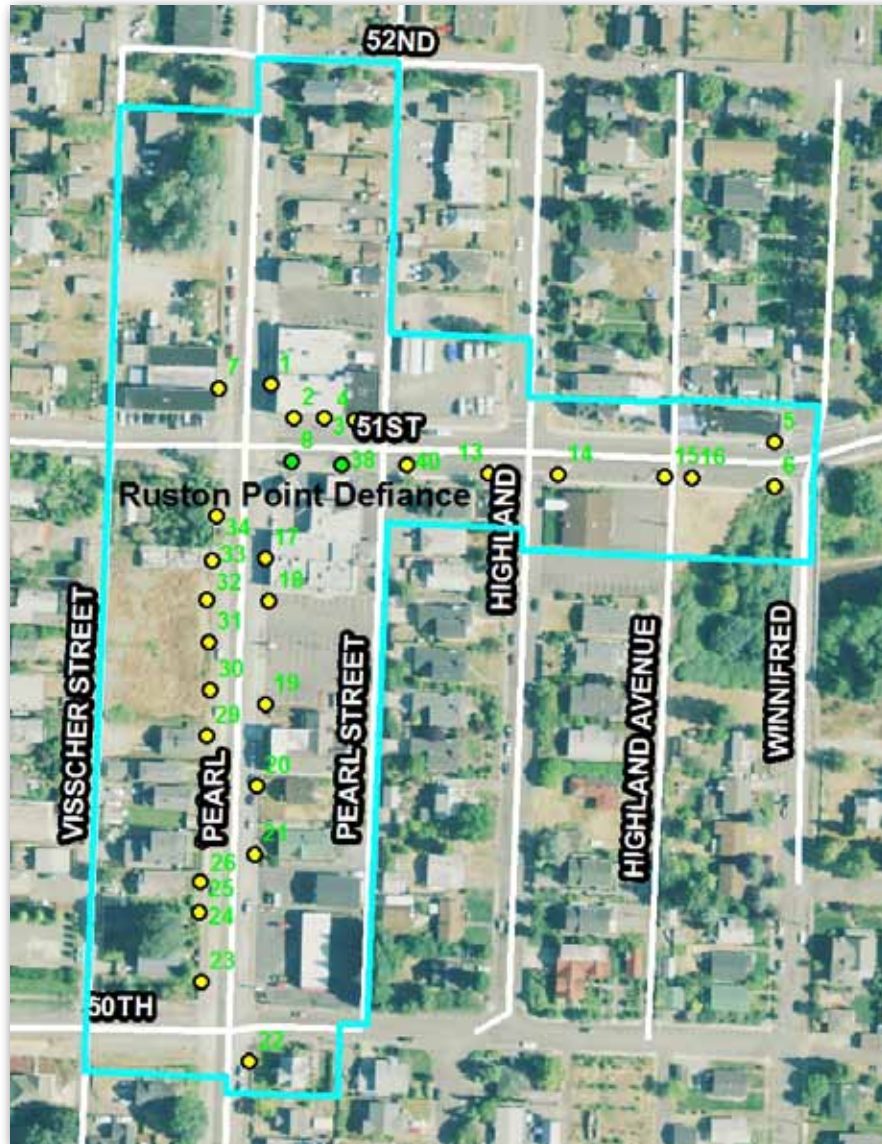
**Appraised Value.** Trees in urban areas are valued differently than their rural counterparts. Fire trucks have a monetary value (the cost of buying a new one) in addition to their immeasurable value when protecting citizens in the community. Trees, too, have an actual monetary value that is recognized by tree professionals, real estate experts, the judicial system, and the Internal Revenue Service.

Tacoma’s tree population is an important financial asset of the community and has significant monetary value. There were 170 street trees inventoried in the Proctor NBD of the tree inventory project. Since most were small trees or topped large trees in poor condition the appraised value is lower.

Proctor Appraised Value	
Total Number of Trees in Report:	170
Total Appraised Value:	\$241,170
Total Mean Appraised Value:	\$1,419
Median Appraised Value:	\$870
Minimum Appraised Value:	\$0
Maximum Appraised Value:	\$19,500

## RUSTON – POINT DEFIANCE

The Ruston – Point Defiance NBD is a small business district with mixed use business and residential, often characterized by integral curb and sidewalk design. The inventory area included North Pearl Street from North 52nd Street to North 50th Street and a two block area of North 51st Street.



- Existing tree
- Planting potential
- Stump





There are many opportunities for new trees in the Ruston-Point Defiance NBD. Removal of concrete or asphalt will be required in some instances to create space for new trees.

**Species Distribution.** There are two trees, Eastern redbuds, in the Ruston-Point Defiance NBD, both of which are small trees in plant containers. Industry standards prefer less than 20% in any one genus in the tree population.

**Maintenance Requirements.** There are two small trees in plant containers that should be removed to create space for larger trees.

**Planting Spaces.** Planting spaces were determined by evaluating site characteristics such as building entries and signage, sidewalk width, adjoining utilities, planting strip width, view conflicts, and mature tree sizes. Each space was designated as a large, medium, or small planting space. Large spaces accommodate trees greater than 50 feet in height, medium spaces for trees 25 to 50 feet in height, and small spaces for trees 25 feet or less in height.

Potential planting spaces are new tree sites. They are not associated with the removal of existing trees. The removal of existing trees in the district may provide more planting spaces in addition to the new potential planting sites.

There are 30 potential planting sites in the Ruston-Point Defiance NBD business district. All 30 of the planting sites are medium tree sites. New tree planting sites will require removal of existing concrete or asphalt to create open soil areas for the trees. Of the 30 potential planting spaces, 25 will require removal of existing sidewalk concrete to create a planting site. There are a few islands on 51st Street that, due to street and parking design changes, provide adequate space for new trees.

RUSTON – POINT DEFIANCCE PLANTING SPACES	
Tree Size	Tree Count
Large (> 50 feet)	0
Medium (25 – 50 feet)	30
Small (< 25 feet)	0

**Urban Infrastructure Conflicts.** Utility conflicts are not a significant factor in the Ruston-Point Defiance NBD. Existing trees or new planting sites are limited by concrete infrastructure.



Creative street designs provide space for planting larger street trees.



## SOUTH TACOMA WAY

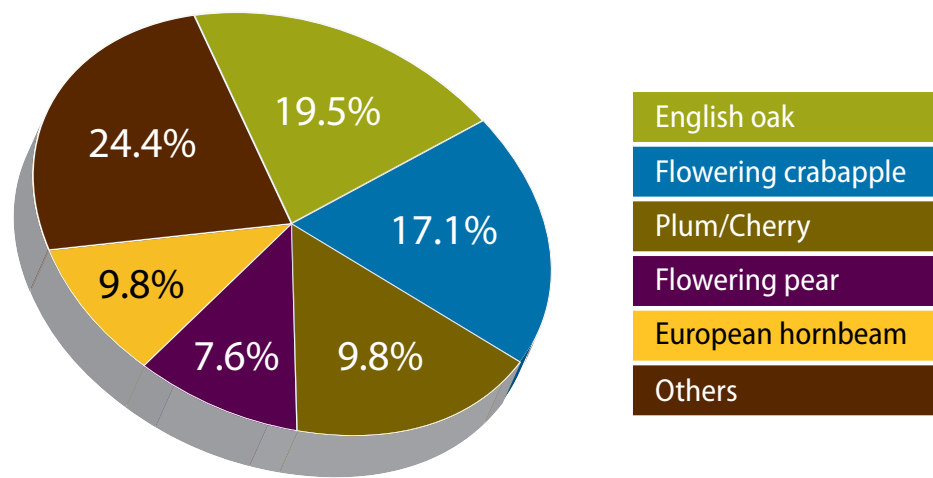
South Tacoma Way NBD inventory area includes South Tacoma Way Street between South 58th Street on the south end, South 47th Street on the north end, South Washington Street on the west side, and South Puget Sound Avenue on the east side. Medians were included in the inventory data collection. The large majority of the land use is businesses.



- Existing tree
- Planting potential
- Stump



**Species Distribution.** There are very few existing trees in the South Tacoma Way NBD. There are 10 species of trees represented in the South Tacoma Way NBD tree population. Industry standards prefer less than 20% in any one genus in the tree population. Species diversity is limited.

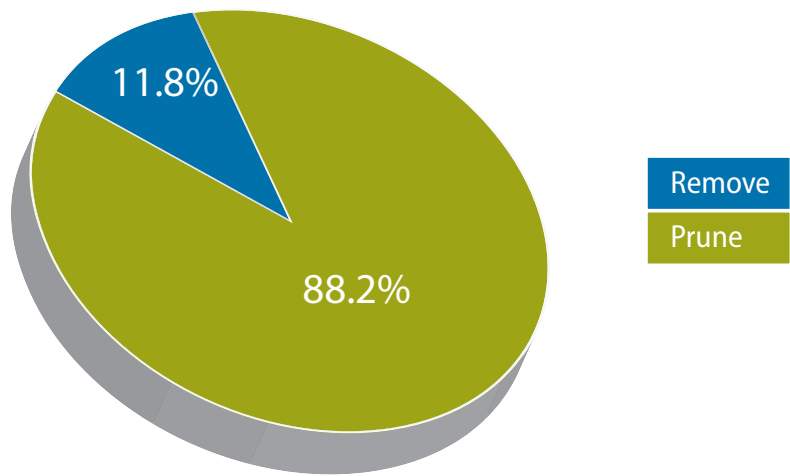


Species	Count	Percent
English oak	8	19.5%
Flowering crabapple	8	19.5%
Plum/Cherry	7	17.1%
Flowering pear	4	9.8%
European hornbeam	4	9.8%
Others	10	24.4%
Total	41	100%

**Maintenance Requirements.** The chart below represents the tree maintenance needs in the South Tacoma Way NBD. Many of the existing trees are recent plantings. The maintenance requirements are minimal due to the smaller tree population and smaller trees.

Removal: There are 2 trees that need to be removed. Topping has occurred on some of the existing tree population.

Prune: There are 15 existing trees that require pruning treatment.



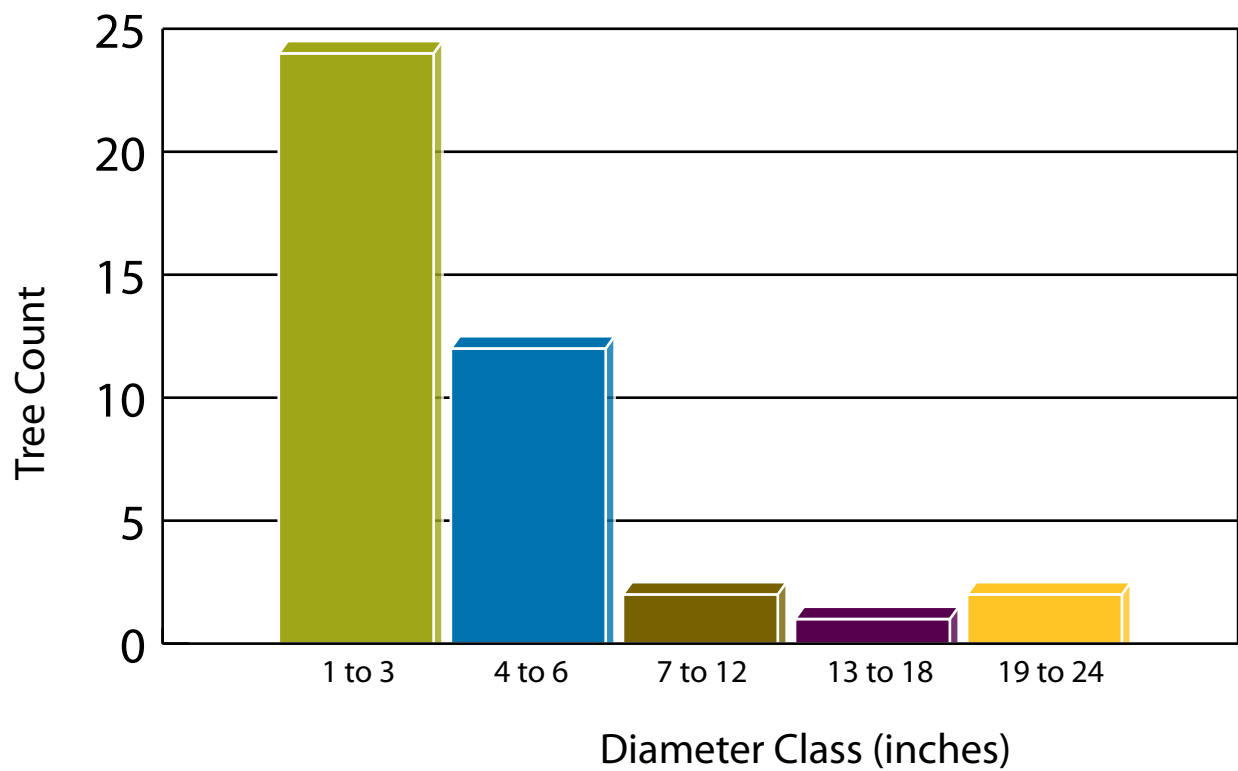
SOUTH TACOMA WAY MAINTENANCE REQUIREMENT DETAILS	
Task	Trees
Remove	2
Prune – Subordinate	7
Prune – Clearance	5
Prune – Crown clean	3





Plum trees in the South Tacoma Way NBD that have been topped.

**Diameter Distribution.** The following graphic depicts diameter distribution of the tree population in the South Tacoma Way NBD. The optimum distribution has the largest number of trees in the smallest diameter classes. South Tacoma Way NBD's diameter distribution is similar to the optimum distribution, however, tree species must be considered to convey a complete picture of the tree population in the district. To perpetuate a specific species, the largest representation must be in the smaller diameter classes. Generally for any given species, twice as many trees need to be planted as are removed in any one year in order to maintain the optimum distribution for the species. If the city wishes to preserve species in perpetuity the diameter distribution should mimic this distribution.



Diameter Class	Percent	Count
1 to 3	58.5%	24
4 to 6	29.3%	12
7 to 12	4.9%	2
13 to 18	2.4%	1
19 to 24	4.9%	2
Total	100%	41

**Planting Spaces.** Planting spaces were determined by evaluating site characteristics such as building entries and signage, sidewalk width, adjoining utilities, planting strip width, view conflicts, and mature tree sizes. Each space was designated as a large, medium, or small planting space. Large spaces accommodate trees greater than 50 feet in height, medium spaces for trees 25 to 50 feet in height, and small spaces for trees 25 feet or less in height.

Potential planting spaces are new tree sites. They are not associated with the removal of existing trees. The removal of existing trees in the district may provide more planting spaces in addition to the new potential planting sites.

There are 123 potential planting sites in the South Tacoma Way NBD. There are 47 potential planting sites for small trees, 71 potential planting sites for medium trees, and 5 potential planting sites for large trees. There are some wider sidewalks in the district that will allow for larger cutouts for medium trees. Many of these potential planting sites are parking strips that have been paved. Removal of the entire pavement rather than cutouts for tree grates would increase the resources for tree growth.

SOUTH TACOMA WAY PLANTING SPACES	
Tree Size	Tree Count
Large (> 50 feet)	5
Medium (25 – 50 feet)	71
Small (< 25 feet)	47

There are many opportunities to plant new trees in South Tacoma Way NBD, although building canopies and business signage will limit potential planting spaces.



Opening paved surfaces or removal of entire sections of pavement will provide space for many new trees in the South Tacoma Way NBD.

**Urban Infrastructure Conflicts.** The potential for planting small and medium trees is better in this district because of wider sidewalks and less utility conflicts. Less than 15% of the existing trees and potential planting sites are impacted by overhead utilities.

Business signs and entries, street entrances, and building overhangs are other conflicts that limit the space for trees.

**Appraised Value.** Trees in urban areas are valued differently than their rural counterparts. Fire trucks have a monetary value (the cost of buying a new one) in addition to their immeasurable value when protecting citizens in the community. Trees, too, have an actual monetary value that is recognized by tree professionals, real estate experts, the judicial system, and the Internal Revenue Service.

Tacoma’s tree population is an important financial asset of the community and has significant monetary value. There were 41 street trees inventoried in the South Tacoma Way NBD of the tree inventory project. In addition to a low tree population, many are small trees so the appraised value is low compared to other districts.

South Tacoma Way Appraised Value	
Total Number of Trees in Report:	41
Total Appraised Value:	\$33,590
Total Mean Appraised Value:	\$820
Median Appraised Value:	\$190
Minimum Appraised Value:	\$160
Maximum Appraised Value:	\$8,700





## STADIUM

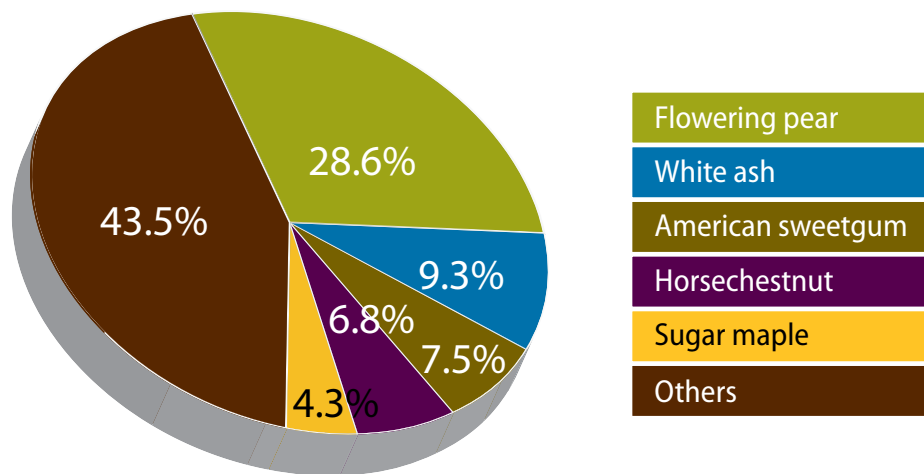
Stadium NBD tree inventory area is bounded by Division, North 3rd Street, Broadway, and North L Street. Land use is predominantly business and apartment buildings, however, residential makes up more than 50 of the 269 tree sites inventoried in the district.



- Existing tree
- Planting potential
- Stump

**Species Distribution.** Stadium NBD has one of the highest tree populations among the districts. There are more than 20 species of trees in the district. At first glance, this number may seem to indicate a varied species population. However, when the data is categorized into more detail and the species representation percentages are calculated, it becomes clear that the Stadium NBD's urban forest is not as diversified as it can or should be. The population is dominated by flowering pear. Flowering pears and four other species account for more than 55% of the population. Industry standards prefer less than 20% in any one genus in the tree population.





Species	Count	Percent
Flowering pear	46	28.6%
White ash	15	9.3%
American sweetgum	12	7.5%
Horsechestnut	11	6.8%
Sugar maple	7	4.3%
Others	70	43.5%
Total	161	100%



Flowering pear is the dominant species in the Stadium NBD.

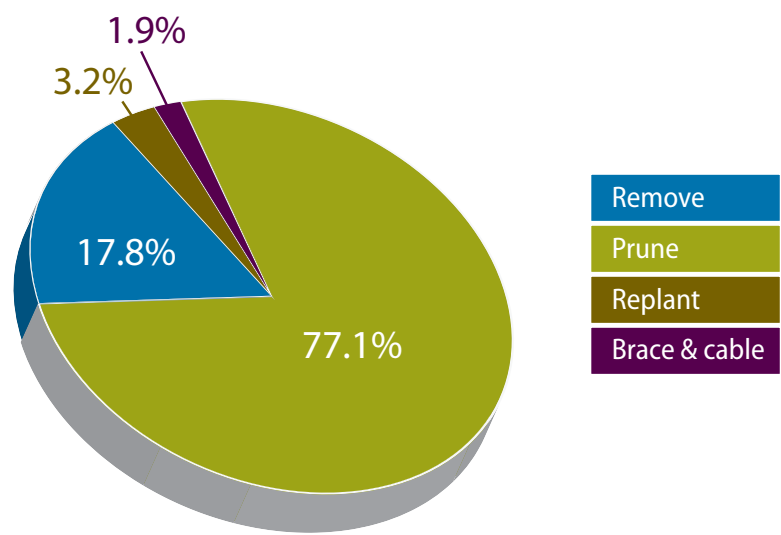
**Maintenance Requirements.** The chart below represents the tree maintenance needs in the Stadium NBD.

**Removal:** Over 17% require removal. Typical inventory results for tree removal in many cities are less than 3% of the population. A large black locust tree at 615 2nd Street requires immediate removal due to a split in the trunk.

**Prune:** There are more than 75% of the inventoried trees that require pruning treatment in the Stadium NBD. The most common structural defect is co-dominant stems particularly on the flowering pear trees.

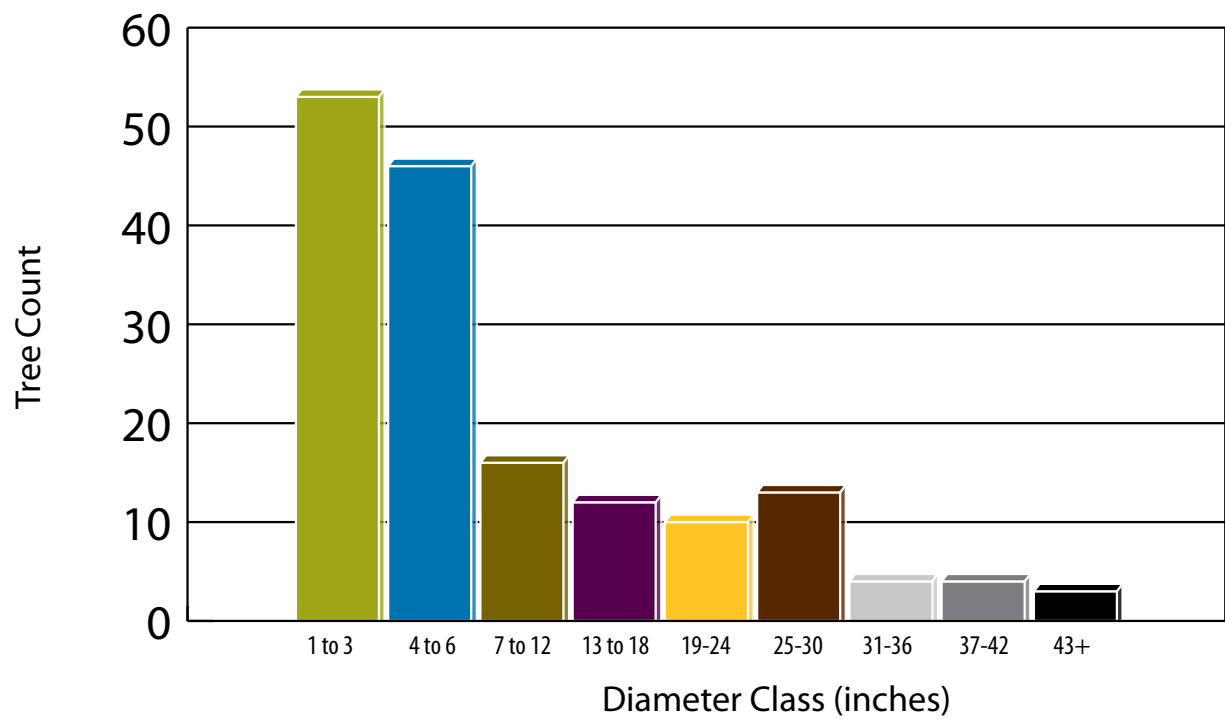
**Replant:** There are 5 trees that require replanting due to improper installation (planted too deeply).

**Brace and Cable:** Cabling and bracing is not often part of municipal maintenance practices due to budget constraints. However, one large tulip tree with co-dominant trunks in this district warrants the investment in cabling and bracing hardware and maintenance due to the size of the tree and lack of any other structural defects other than the co-dominant trunks. The loss of the tree would be significant to the district.



STADIUM MAINTENANCE REQUIREMENT DETAILS	
Task	Trees
Remove	28
Replant	5
Prune – Subordinate	91
Prune – Clearance	6
Prune – Crown clean	18
Prune – Restoration	4
Brace and cable	1

**Diameter Distribution.** The following graphic depicts diameter distribution for existing trees in Stadium NBD. The optimum diameter distribution has the largest number of trees in the smallest diameter classes. The Stadium diameter distribution graph below is similar to the optimum diameter distribution model for tree population trends. The trend is good if you are trying to perpetuate a specific species. The flowering pear dominated the planting program in the Stadium NBD and shows a diameter distribution pattern similar to the one below.



Diameter Class	Percent	Count
1 to 3	32.9%	53
4 to 6	28.6%	46
7 to 12	9.9%	16
13 to 18	7.5%	12
19 to 24	6.2%	10
25 to 30	8.1%	13
31 to 36	2.5%	4
37 to 42	2.5%	4
43 +	1.9%	3
Total	100%	161

**Planting Spaces.** Planting spaces were determined by evaluating site characteristics such as building entries and signage, sidewalk width, adjoining utilities, planting strip width, view conflicts, and mature tree sizes. Each space was designated as a large, medium, or small planting space. Large spaces accommodate trees greater than 50 feet in height, medium spaces for trees 25 to 50 feet in height, and small spaces for trees 25 feet or less in height.

Potential planting spaces are new tree sites. They are not associated with the removal of existing trees. The removal of existing trees in the district may provide more planting spaces in addition to the new potential planting sites.

There are 107 potential planting sites in the Stadium NBD. There are 27 potential planting sites for small trees, 24 potential planting sites for medium trees, and 56 potential planting sites for large trees. There are some wide planting strip widths available for medium and large trees.

SOUTH TACOMA WAY PLANTING SPACES	
Tree Size	Tree Count
Large (> 50 feet)	56
Medium (25 – 50 feet)	24
Small (< 25 feet)	27

**Urban Infrastructure Conflicts.** Overhead utilities and ornamental street lights are not as significant infrastructure conflicts as in other NBDs. The potential for planting medium and large trees is better in this district due to wider parking strip widths in some areas of the district. Other areas are more challenging but still provide planting opportunities.



Large, wide planting strips in the Stadium NBD provide space for large shade trees.



Removal of concrete surfaces will provide additional space for new trees.

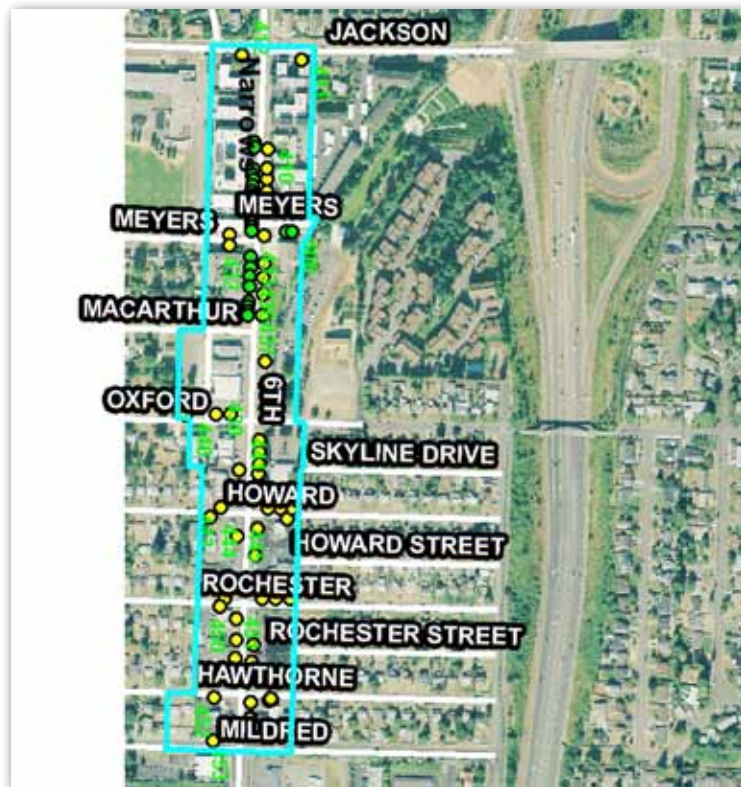
**Appraised Value.** Trees in urban areas are valued differently than their rural counterparts. Fire trucks have a monetary value (the cost of buying a new one) in addition to their immeasurable value when protecting citizens in the community. Trees, too, have an actual monetary value that is recognized by tree professionals, real estate experts, the judicial system, and the Internal Revenue Service.

Tacoma's tree population is an important financial asset of the community and has significant monetary value. There were 161 street trees inventoried in the Stadium NBD tree inventory project. There are more large, mature trees in this district compared to other NBDs so the appraised value of trees in this district is higher than other NBDs.

Stadium Appraised Value	
Total Number of Trees in Report:	<b>161</b>
Total Appraised Value:	<b>\$487,000</b>
Total Mean Appraised Value:	<b>\$3,025</b>
Median Appraised Value:	<b>\$150</b>
Minimum Appraised Value:	<b>\$0</b>
Maximum Appraised Value:	<b>\$37,000</b>

## TACOMA NARROWS

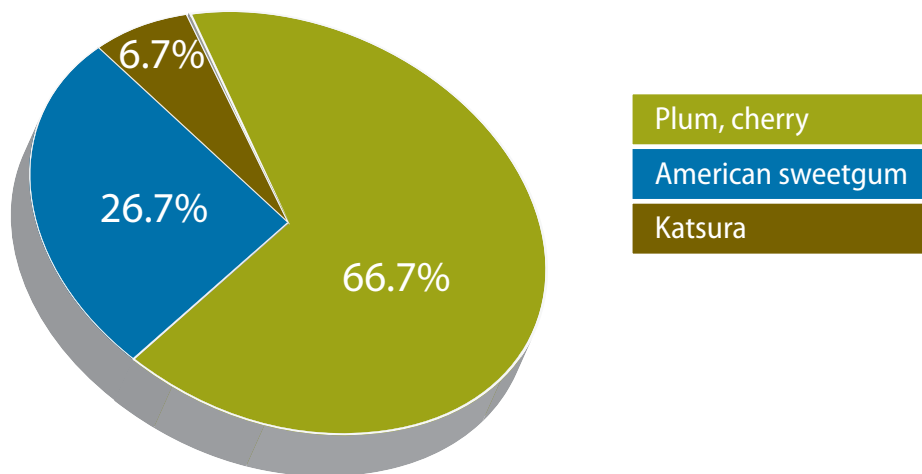
Tacoma Narrows NBD is located on 6th Avenue between Jackson Street on the west and Mildred on the east. Over 50% of the land use is business property. Apartments and municipal properties make most of the remainder of land uses in the Tacoma Narrows NBD.



- Existing tree
- Planting potential
- Stump

**Species Distribution.** There are 30 existing trees in the Tacoma Narrows NBD inventory. Three species are represented in the inventory. Industry standards prefer less than 20% in any one genus in the tree population. Species diversity is limited in the Tacoma Narrows NBD.

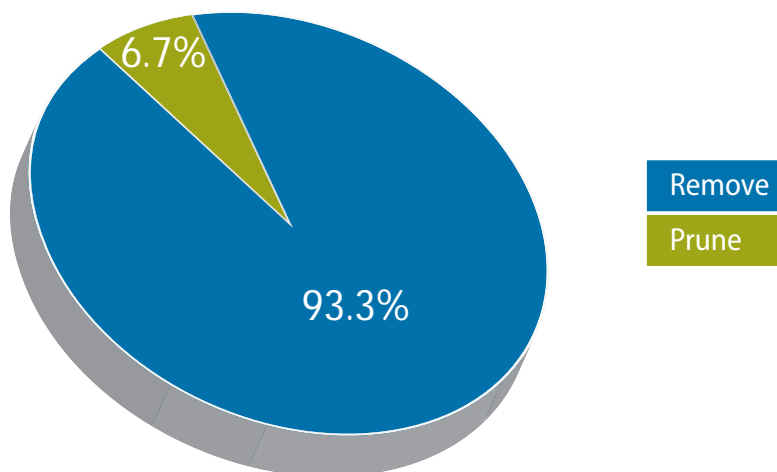




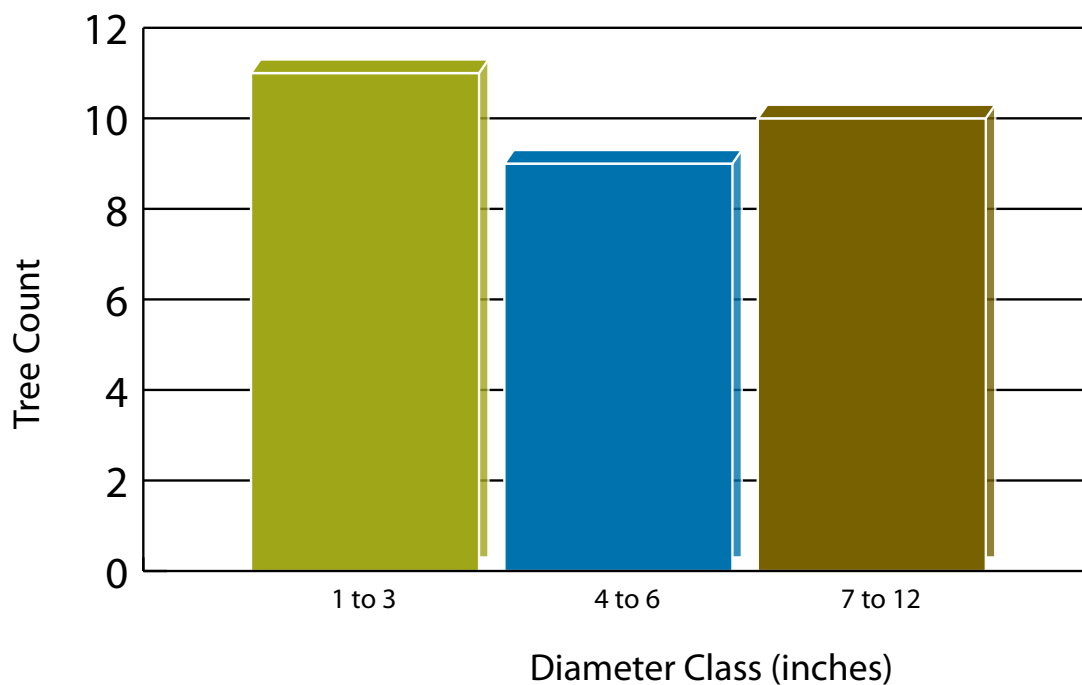
Species	Count	Percent
Plum/Cherry	20	66.7%
American sweetgum	8	26.7%
Katsura	2	6.60%
Total	30	100%

**Maintenance Requirements.** The chart below represents the tree maintenance needs in the Tacoma Narrows NBD.

Removal: There are 28 of the 30 existing trees that require removal. Typical inventory results for tree removal in many cities are less than 3% of the population. The American sweetgums are dead and the cherry plums have co-dominant stems which have been topped so severely that removal is the only maintenance option.



**Diameter Distribution.** The diameter distribution in the Tacoma Narrows NBD is composed of small trees recently planted that have not reached maturity. There are very few medium and large trees due to limited space and infrastructure conflicts.



Diameter Class	Percent	Count
1 to 3	36.7%	11
4 to 6	30.0%	9
7 to 12	33.3%	10
Total	100%	30

**Planting Spaces.** Planting spaces were determined by evaluating site characteristics such as building entries and signage, sidewalk width, adjoining utilities, planting strip width, view conflicts, and mature tree sizes. Each space was designated as a large, medium, or small planting space. Large spaces accommodate trees greater than 50 feet in height, medium spaces for trees 25 to 50 feet in height, and small spaces for trees 25 feet or less in height.

Potential planting spaces are new tree sites. They are not associated with the removal of existing trees. The removal of existing trees in the district may provide more planting spaces in addition to the new potential planting sites.

There are 53 potential planting sites in the Tacoma Narrows, NBD. There are 17 potential planting sites for small trees, 19 potential planting sites for medium trees, and 17 potential planting sites for large trees. Although there are some open space planting sites, most of these potential planting sites are in existing sidewalk cutouts or can be developed from new sidewalk cutouts.

TACOMA NARROWS PLANTING SPACES	
Tree Size	Tree Count
Large (> 50 feet)	17
Medium (25 – 50 feet)	19
Small (< 25 feet)	17

**Urban Infrastructure Conflicts.** Overhead utilities are a common infrastructure sharing public space with trees in the Tacoma Narrows NBD. All existing trees and potential planting sites on the south side of 6th Avenue will conflict with overhead utilities, store front awnings, and limited open space. All existing trees and potential planting sites on the north side of 6th Avenue will conflict with store front awnings and limited open space, however, there are no conflicts with overhead utilities.



Overhead utilities, signs, and limited space are challenges to consider in locating new trees in the Tacoma Narrows NBD.

**Appraised Value.** Trees in urban areas are valued differently than their rural counterparts. Fire trucks have a monetary value (the cost of buying a new one) in addition to their immeasurable value when protecting citizens in the community. Trees, too, have an actual monetary value that is recognized by tree professionals, real estate experts, the judicial system, and the Internal Revenue Service.

Tacoma's tree population is an important financial asset of the community and has significant monetary value. There were 30 street trees inventoried along 6th Avenue in the Tacoma Narrows NBD tree inventory project. Since most were in poor condition or dead the appraised value is very low. The appraised value for those trees is \$5,500.00.

## NBD ACTION PLAN

In many U.S. cities, local business districts are working toward revival and revitalization. There are many needs for improvement such as building upgrades, street and sidewalk improvements, sanitation, stormwater management, and security these needs compete for limited resources. Street trees, whether planted along boulevards, in medians, in parking lots, tree pits, or other spaces are important components to solutions addressing the issues facing business districts today, such as providing an appealing consumer environment and increasing retail success.

Sustainable trees in NBDs require careful management in order to maximize the benefits of green infrastructure while addressing the direct and indirect human influences on the trees. As with any type of NBD infrastructure, street trees require regular maintenance and monitoring to ensure they continue to thrive and provide benefits. Infrastructure such as roads, sewers, and sidewalks that are neglected for many years can only be repaired at a great cost to the business property owners, city, and the people who live in the districts. For the NBD trees, this neglect comes in the form of failing to maintain existing trees, failing to adequately diversify tree species, improper planting and pruning, and failure to utilize planting spaces properly.

The business districts value their trees but have not until recently recognized that trees should have a proactive, comprehensive plan to ensure that street trees in the NBDs are managed to provide maximum benefits now and in the decades to come.

Management, maintenance, and preservation of NBD street trees can only be achieved effectively through the development and implementation of a Strategic Urban Forestry Management Plan, such as this, that standardizes the policies and practices surrounding all activities related to trees. This report lays out the framework for and components of such a strategic plan, one that encompasses a long-term vision with short-term goals for the management of trees in the business districts. It is up to the business districts and the city to provide the short and long-term support required for plan implementation. The goal of the Strategic Urban Forestry Management Plan is to provide specific guidance on managing, maintaining, and preserving trees within the NBD infrastructure.

Employing the best management practices of the arboriculture and urban forestry industries, stakeholders' attitudes and insights about the business districts, city policies, and certain management options, the following recommendations are for enhancing street trees in the NBDs. Community Forestry Consultants, Inc. recommends the following management and maintenance recommendations to improve the health, quality, size, and diversity of the street trees in Tacoma's Neighborhood Business Districts. This section outlines the primary objectives.

## NBD TREE PROGRAM OBJECTIVES

The objective of this report is to provide a framework for a Strategic Urban Forestry Management Plan that will set the parameters for a standardized approach to business district street tree management designed to promote the growth of healthy, functioning trees in the NBDs. The aim is to fulfill this vision in a five year time frame.

### Education

Public education and outreach are essential parts of any strategy to improve the urban forest. Education and outreach can expand public awareness of the importance of the urban forest, the benefits offered by this asset, and proper management techniques of this unique infrastructure and therefore increase community stewardship of the urban forest. Strong community stewardship increases the likelihood of meeting Tacoma's urban forestry vision and goals, increasing community leadership, civic pride and engagement, improved natural systems, and a greater understanding by the community.

The consistent issue across all NBDs is tree topping. It is the cause of many tree removals in the NBDs and pruning restoration treatments.

The following objective should be developed and implemented city wide for contractors, city staff, and Tacoma residents:

- » Education program development that specifically targets the elimination of tree topping in the business districts.

### **Tree Maintenance**

Pruning programs are essential, not only to ensure healthy and aesthetically pleasing trees but also to increase public safety and to decrease public or private liability. Healthy trees confer numerous benefits, yet poorly maintained trees can pose a considerable risk to the surrounding community.

Tree health can be greatly increased by regular pruning, especially when the tree is young. Immature trees that are not pruned can develop many structural problems such as weak branch structure, crossing branches, and co-dominant leaders (International Society of Arboriculture 2005). If corrected early, the tree can develop a strong support structure with a healthy canopy. This in turn will reduce the necessity of more expensive and often intrusive corrective pruning during the life of the tree. If tree condition is improved at a young age and maintained during the tree's life, there will be less need for a reactive approach to pruning.

Tree inspections are a critical component and the first line of defense in proactive tree risk management, tree planting, and maintenance programs. An inspection program can prioritize NBD tree management and maintenance; establish universal inspection methods for all districts; and implement corrective actions in a timely manner.

Over 70% (794) of the trees inventoried in all NBDs require some form of pruning maintenance. To develop an effective tree pruning program, the Neighborhood Business Districts and City need to build capacity to be able to prune NBD street trees in a systematic manner as well as respond to emergency pruning and safety concerns in a timely manner.

Routine pruning should occur on a cyclical basis for the existing tree population once all priority maintenance removal and pruning activities have been completed. If funds do not exist, the routine pruning program can begin after the priority tasks have been completed. This activity is extremely beneficial for the overall health and longevity of NBD street trees. Through routine pruning, potentially serious problems can be avoided by tree inspections during the pruning cycles. Proper decisions can be made about declining trees, and any trees that become potential hazards can be managed appropriately before any serious incidents occur.

Many young trees may have branch structure that can lead to potential problems as they grow, such as double leaders, multiple limbs attaching at the same point on the trunk, and/or crossing/interfering limbs. When trees are small, these problems can be remedied easily and inexpensively.

All newly planted trees should receive their first training pruning in the third year following transplanting. Training pruning should not be done when a tree is planted. The tree is already under stress from transplanting. The tree needs as much of its leaf canopy as possible in order to manufacture food and increase root growth for proper

establishment in its new site. Only dead or broken branches should be removed at the time of transplanting, as well as in the following two years after transplanting.

Historical costs of tree maintenance removal:

- » Historical tree pruning costs average about \$200.00 per tree. The cost to treat all pruning requirements found in the NBD tree inventory data collection is \$158,800.00.
- » Approximately 327 trees warrant removal after the tree inventory data collection. Historical removal costs average about \$550.00 per tree. The cost to remove trees in the business districts is \$179,850.00.

Consumer purchases provide compensatory returns for district wide costs of tree maintenance, as well as enhancement for individual businesses (Wolfe, 2003). Proper pruning adds value to the landscape and is one of the few active management techniques that helps a landscape appreciate in value while minimizing liability concerns. Proper pruning, with an understanding of tree biology, can maintain good tree health and structure while enhancing the aesthetic and economic value street trees provide for the business districts.

**The following objectives for NBD street tree maintenance should be applied for city staff and contractors:**

- » Implement a cyclical 3-year pruning rotation for NBD street trees.
- » Establish a unified tree maintenance program for NBD street trees, which includes structural pruning of young trees; cyclical pruning and crown cleaning of older trees; line-of-sight and height clearance pruning of street trees; tree removal; and replanting efforts.
- » Pruning treatments should follow the best management practices established by the ISA, ANSI Z133.1 and ANSI A300 standards and employ ISA certified arborists or certified tree workers to perform tree maintenance. In addition to ANSI standards, the city should develop pruning specifications that serve to define treatments for different species, ages of trees, pruning techniques, and other tree maintenance issues.
- » Remove high risk trees.

### **Tree Resource Expansion**

There is strong interest in tree and landscape plantings in the NBDs to create green corridors along freeways, streets, and boulevards district-wide. Lack of street trees and overall tree canopy coverage is a significant issue in Tacoma. There is a clear need for a tree planting program to achieve the future tree canopy goals of the NBDs. Such programs will minimize the unintended but gradual degradation of street trees over time, as well as maximize the potential for a sustainable and diversified tree canopy and the associated benefits. The trees in business districts—a relatively young, even-aged, limited, and undiversified population—are not only significant design elements but also represent the future canopy cover at this stage in their growth.

An annual planting program will maintain a healthy and sustainable tree canopy in the NBDs. A comprehensive planting program that identifies the planting needs throughout the business districts should be developed. The program will provide a systematic means and criteria for consistent direction to determine types and frequencies of tree plantings. The program should



*For every dollar spent on tree planting and establishment, a 250% return on investment is provided back to the city in terms of the total services provided at tree maturity.*



include available planting spaces, recommended species, planting specifications, removal/replacement criteria, and maintenance requirements for new trees. The ultimate mature size of trees should be considered when selecting species planted near buildings, utilities, monuments, signs, entrances, view sites, and active pedestrian areas.

Recognize that streets and sidewalks provide a vast amount of open space, and develop complete streets standards and low impact development (LID) street sections for creating a balance between pedestrians, bicycles and automobiles, making sidewalks pleasant and functional open spaces, and accommodating LID stormwater management.

Trees can impact these built features both positively and negatively through shading, dropping flowers or fruits and framing. The key to maintaining a healthy, sustainable business district tree population is the implementation of regular, annual tree plantings, regardless of grant money or catastrophic events. There are over 900 available planting sites in the NBDs. It costs about \$1,000.00 to purchase, ship, and plant a 2-inch caliper shade tree. This does not include tree maintenance after planting. A large number of trees do not need to be planted, but a consistent annual addition of street trees to the business district is critical to maintain a perpetual canopy. **The annual quantity of trees to plant is directly dependent on the quantity of trees the city can maintain.**

A challenge for the city is to plant enough new and replacement trees each year to increase the canopy cover. Without a clear program to guide tree plantings, the business districts may gain trees but not achieve a net increase in tree canopy.

The community tree plan should address some important questions about diversity, tree installation practices, and post-plant maintenance. **Planting objectives should include the following:**

- » Annual planting quotas are directly dependent on funds available to provide 3 – year post plant maintenance.
- » Plant large trees in large spaces. Avoid planting several small trees in spaces that potentially could accommodate large trees.
- » Promote additional street tree plantings to maximize future tree canopy coverage, while considering infrastructure limitations.
- » Review new site development proposals to maximize tree planting and preservation opportunities.
- » Encourage tree planting and preservation on private property; partner with property owners on project design and implementation.
- » Develop guidelines for reviewing tree selection and/or location with regard to the aesthetics of specific architectural and development projects in the business district.
- » Consider the development of tree planting plans for each district to express unified visions and themes for street trees within each district.
- » The final selection of trees and their placement for a landscape shall be made in the field while considering the many elements of that landscape.
- » The tree species chosen for planting, besides meeting design criteria, must be biologically adapted to site conditions and well suited for the level of care it will receive.

### **Diversification**

The 2011 inventory of selected NBD street trees included over 1,200 trees. Street trees in the public right-of-way and medians were included in the data collection. There are more than 60 different species found in the NBD tree population of Tacoma.

This appears to be a diverse population, however, species distribution figures indicate the population is dominated by a few species. Over 40 percent of the tree species are represented by four species. Over 20% of the NBD tree population is flowering pear.

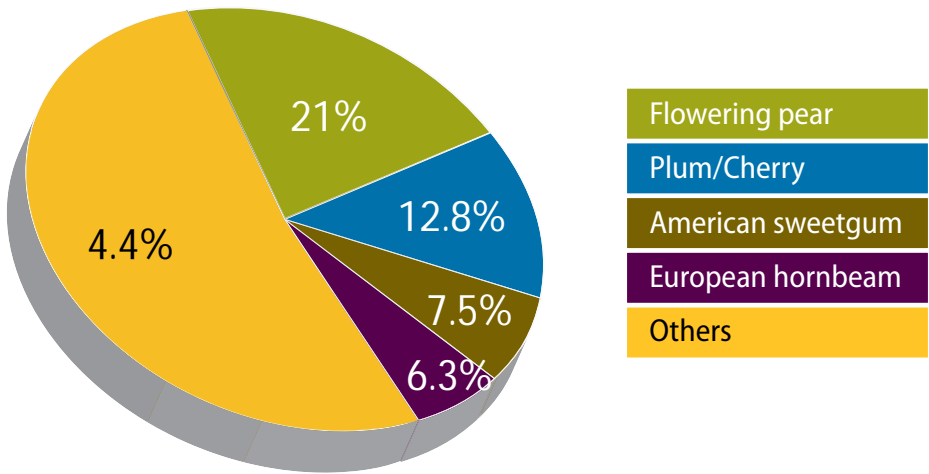
Species diversity in new plantings should be a primary concern. The dangers (e.g., disease and insects) of planting monocultures have proven to be devastating throughout the United States. The goal should be to maintain species diversity throughout the business districts. A common guideline for maintaining species diversity in urban settings is the 10-20-30 rule. That is, no one species should make up more than 10 percent of the trees in a population, no more than 20 percent of any one genus, and no more than 30 percent of one family in the total tree population (Santamour, 1990).

Diversity is an important measure of a forest’s resilience. A more diverse forest, both in total number of species represented and in their relative abundance, is better able to adapt to environmental changes as well as disease and insect infestations. When just a few species dominate the composition of a tree population, these changes or infestations will significantly impact the entire population.

The following objectives will increase species diversity:

- » The NBDs should adopt a more aggressive diversity guide that states that no more than 10% of any one genus as a guiding principle.
- » The NBDs should emphasize a diversity of species in the planting program.

Many species should be avoided that have high maintenance costs, invasive characteristics, high storm damage potential or a history of failure. These should be designated in city documents.



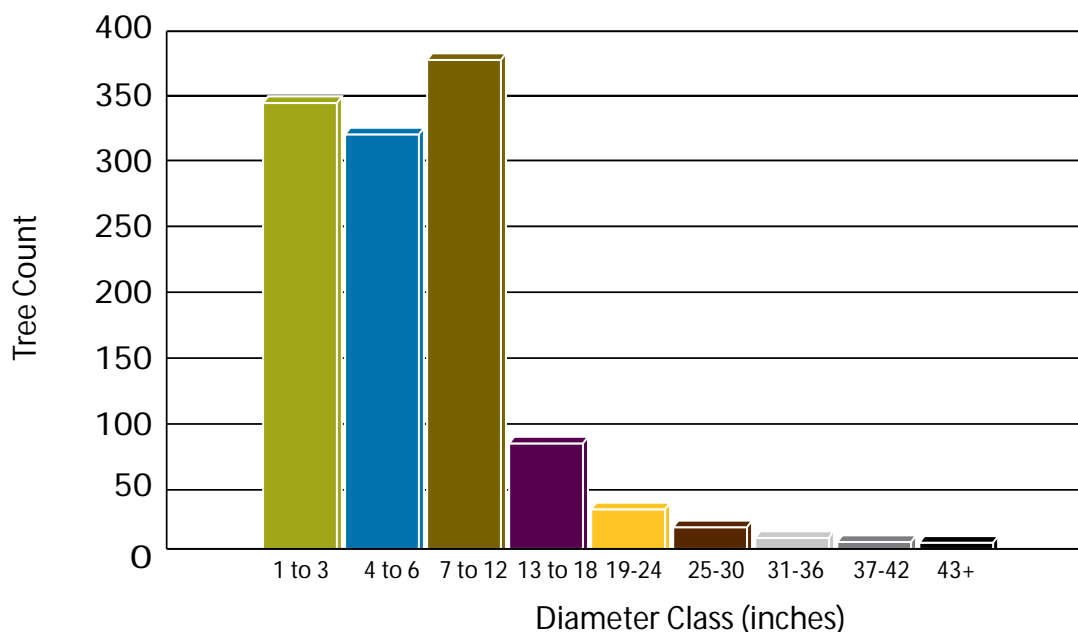
### Diameter Distribution

The graph below depicts the diameter distribution for the majority of trees inventoried from the city tree population in graph form. A population exhibiting the diameter distribution characteristics would indicate the NBDs had planted trees in the recent past.

The optimum diameter distribution for trees considered for retention in the population has the largest number of trees in the smallest diameter classes. As each group of trees within a specific diameter class matures, the numbers within the group diminish through attrition. To perpetuate a specific species, the largest representation must

be in the smaller diameter classes. Generally, for any given species, twice as many trees need to be planted as are removed in any one year in order to maintain the exponential shape of this graph. Species the NBDs want to preserve in perpetuity should mimic the ideal diameter distribution.

A well distributed age-class helps maintain a stable canopy cover. If all the trees within a particular area or Neighborhood Business District are approximately the same age they will mature and decline more or less at the same time, leaving that area with a deficient urban forest canopy. In many parts of the NBDs, young trees of similar age classes dominate the landscape. To mitigate the impacts of an even age canopy maturing at the same time, the NBDs should take steps to increase the age class and species distribution where possible.



**Diameter is measured in inches.**

For example, the City of Davis, CA established the following standard for desired age structure:

- » 40% young (< 6 inch DBH)
- » 30% maturing (6 – 12 inch DBH)
- » 20% mature (12 – 24 inch DBH)
- » 10% old (> 24 inch DBH)

Tacoma's NBD tree population ranges for the same categories of desired age structure are:

- » 56% young (< 6 inch DBH)
- » 31% maturing (6 – 12 inch DBH)
- » 9% mature (12 – 24 inch DBH)
- » 3% old (> 24 inch DBH)

Management activities should strive to improve Tacoma's tree population distribution to reflect current industry standards.

## NBD TREE PLANTING

Areas planned for the most intense and dense development within the City, business districts, downtown, and the other mixed-use centers are home to many of Tacoma's residents as well as where Tacoma residents work, shop, dine and recreate.

City streets are not just thoroughfares for motor vehicles. They often double as public spaces where people walk, shop, meet, and generally participate in many social and recreational activities that make urban living enjoyable. Urban foresters, designers, and planners encourage streetscape tree planting to enhance the livability of urban streets. Large, high quality trees play important roles in community improvement. Trees are as much a part of the city infrastructure as roads, buildings, and street lights. Extensive research has documented the environmental, social, and economic benefits of large trees for communities, municipalities, and regions.

Trees in city business districts influence retail and shopping behavior in positive ways. The results of several studies suggest that trees are good for business. Shoppers prefer trees and consider trees an important amenity. They spend more, shop longer, and are willing to pay more for goods in business districts with mature, healthy trees.

Trees, especially large canopy trees, located at the source of pollution provide the most benefit in mitigating air pollution and sequestering carbon dioxide. Therefore, trees on busy streets and in business districts sequester the carbon as the cars produce it, and provide cleaner air where high pedestrian and bicycle traffic occurs.

One of the biggest challenges for arborists, urban foresters, city planners, landscape architects, soil specialists, engineers, and public works staff is to provide sufficient soil space for root growth and tree health, in a situation where space is at a premium. The trend is to downsize the urban forest and plant smaller trees.

The objective of design strategies is to maximize the distance between trees and infrastructure in order to minimize potential for contact and provide sufficient soil volume for trees to thrive. For new trees, providing adequate space by using larger planting spaces, tree islands, or narrower streets are key preventative strategies for avoiding infrastructure conflict. For established trees, creating additional space using curving sidewalks and pop-outs, larger sidewalk cutouts, or eliminating sidewalks altogether are important remedial strategies.

Tacoma's NBD corridors have very few trees in good or excellent condition. The corridors are under constant competition for space. Many infrastructure items must share the same space and co-exist. The key site condition factor to consider in resolving NBD tree conflicts is to integrate trees into the infrastructure design up front. The fundamental solution to most city tree problems is simple: **give each tree access to more and better soil.**

The Neighborhood Business Districts are the heart of Tacoma. As might be expected in the business districts, several organizations, property owners, and tenants are stakeholders in the management of trees. Most of the NBDs are not fully stocked with trees.

Development and redevelopment of property in the NBDs can mean additional planting opportunities or it can mean facing the loss of opportunities to incorporate trees into the fabric of the NBDs. Providing a planting space of appropriate size for the desired species is critically important.



Trees in sidewalk cutouts in NBD corridors have limited growing resources.





*This is a street in the South Tacoma Way NBD that is a main vehicle/pedestrian arterial for residents and visitors. Note the lack of trees.*

An American Forests article published in the early 80's stated that an oak or maple tree is capable of living up to 400 years in the forest, up to 80 years on a college campus, up to 30 years in a heavily used park, up to 20 years along a city street and about 4 years in a downtown planting pit. Thirty years after the article was published, the same design mistakes are still being made in cities across the United States. There are several challenges when planting trees in any business district area:

- » **Limited Planting Space.** This is one of the greatest challenges to maintaining a healthy urban forest in the NBDs. Small tree wells are the norm in the business districts. These are typically concrete walls on all sides; four feet square and leave little space for root expansion necessary for vigorous tree growth.
- » **Difficult Growing Conditions.** In any location tree growth is limited by the conditions present in its surroundings. In the business districts, limited growing space, poor soil, heat and exposure to sun and wind impose stress on trees. Incorporating new designs that find more growing space for trees and selecting trees more tolerant of harsh growing conditions will definitely help.
- » **Owners and Tenants.** Some business and property owners perceive trees to be an obstacle to business operations because trees create litter, block visibility of signs and displays, and are difficult to maintain. The latest research indicates that trees in downtown corridors increase business, increase shopping time spent, and increase the amount spent per visit (Wolf 2005). Trees and business owners in business districts can co-exist and provide benefits to each other.



*Trees located in small tree pits are not conducive to long-term tree survival.*



» **Poor Maintenance.** Many people do not understand how trees grow or how to best care for them. Trees in the NBDs often go without any regular care. Some trees are topped to clear signs and they become a liability to the adjoining property and the city. Education is crucial to helping owners, tenants, and contractors understand proper pruning and tree care can create assets rather than liabilities.

» **Tree Grates and Guards.** As trees grow and mature their trunks can come into conflict with the grates covering the planting hole. Roots from the trees often grow into the soil under the sidewalk cracking and heaving the concrete. Grates can girdle trunks in a short time without maintenance. If left in place, the grates can damage the trees they were meant to protect. The grates are also trip hazards. Their use should be limited, temporary, and only when necessitated by ADA requirements.



*Tree grates girdle trunks and create trip hazards.*

Often, the business districts are selected as high priority areas to increase the beauty and attractiveness. Traditionally, street trees were installed according to traffic engineering design standards that did not consider the biology and culture requirements of trees.

Tree plantings in the Tacoma NBDs add greatly to the economics and aesthetic appeal of the city. Trees are critical elements of the urban infrastructure and should not be an afterthought relegated to incidental open spaces or planter boxes. They should be given a high priority in the urban fabric and be given prime consideration with other infrastructure in the NBD corridors and along main streets. A concerted effort must be made to consider suitable locations for trees at the beginning of business district design, development, and re-development. Strategies must be employed to increase available soil mass, water, and air to ensure trees thrive.

Tacoma should design, select, and use construction techniques that:

- » Allow for continuous tree rows along streets with overlapping canopies forming distinct street tree canopy cover when practical and possible.
- » Relate tree size with street width (traffic volumes) – as the street width increases so should the tree canopy.
- » Relate tree size with development density (population and building height) – as the density increases so should the tree size and its canopy.
- » Provide adequate space to accommodate the tree's mature structure and crown without adversely affecting other infrastructure.
- » Locate trees in areas that are most favorable in sustaining tree health and longevity, minimizing tree stress, and providing adequate sunlight.
- » Locate trees in site soils and microclimates most favorable to their long-term health.
- » Locate trees to allow for heat gain in the winter.

Several new practices are being used in conjunction with construction and renovation occurring in business and downtown corridors (E.g. Silva cells, structural soils, large raised planters, and moveable planters for trees in places they can't be planted). Tree grates are beginning to be removed, trees in pits are being raised to grade level, mulch installation, and planting a greater variety of species is happening in business and downtown corridors currently. Consider the use of bump-outs, traffic circles, and roundabouts to accommodate a greater number of trees nearer the source of pollution.

In each of these scenarios it is critical to start with quality nursery stock and plant the tree correctly. Nursery stock specifications for NBDs can require crown branch origination above 9 feet on the trunk, to insure branch architecture is established at the time of purchase. Without these first steps an accurate assessment of these practices cannot be made. It is important to assess each of these tree planting treatments under conditions that have followed the best management practices of the arboriculture industry consistently. It provides information about which treatments or combination of treatments will be successful in the NBDs.

Silva cells utilize a modular framework of interlocking cells. An underground planter is constructed which is backfilled with a large volume of high quality, uncompacted soil. The cells meet load bearing standards and can also help manage storm water on site.

Street trees are an important component of the NBD infrastructure in that they contribute to a comfortable pedestrian environment and they effectively calm traffic. Street trees also provide broader reaching benefits related to environmental quality, economic vitality of business districts, public health, improved legibility of urban form, and enhanced livability of the NBD corridors.



***Silva cells utilize a modular framework of interlocking cells. An underground planter is constructed which is backfilled with a large volume of high quality, uncompacted soil. The cells meet load bearing standards and can also help manage storm water on site.***

Recognize that streets and sidewalks provide a vast amount of open space, and develop complete streets standards and low impact development (LID) street sections for creating a balance between pedestrians, bicycles and automobiles, making sidewalks pleasant and functional open spaces, and accommodating LID stormwater management.

The diversity of street types within a municipality calls for a diversity of design treatments. These guidelines apply specifically to the conditions found along most major streets.

- » Create “gateways” to welcome those entering the business district on major thoroughfares.
- » Use a repetition of dominant species to make a strong, lasting impression on motorists. Consistent use of species for major streets will also reinforce the distinct character of each street.
- » Mark major intersections with special plantings.
- » Use informal, naturalistic tree groupings along highway and other open/rural corridors rather than straight-line planting.
- » Use large trees whenever presented the option to create a canopy of foliage over head and bring wider roads to human scale. With repetition, fall color and attractive branching patterns are appropriate for higher-speed streets where subtle effects are not noticeable by drivers.
- » Protect views of surrounding open space, historic or memorable structures, and other important elements.
- » Trees can be used to frame views of signs and other structures but should not obstruct them.
- » Screen objectionable views, such as large parking lots, with trees.

## NBD SUMMARY

The following section provides a summary of key issues in the NBDs found during the tree inventory data collection and applicable costs associated with the recommendations.

### Data results

- » Trees inventoried: 1,221
- » Appraised value of trees inventoried: \$1,640,000.00
- » Appraised value of trees inventoried in better condition: \$2,180,000.00
- » Trees requiring maintenance: 794
- » Trees requiring removal: 327
- » Maintenance cost: \$158,800.00 (Average historical tree pruning cost: \$200.00/tree)
- » Removal cost: \$179,850.00 (Average historical removal cost: \$550.00/tree)
- » Sidewalk damage sites: 18 (Sidewalk lifted greater than 1 inch)
- » Available planting spaces: 906 (190 large tree spaces; 367 medium planting spaces; 349 small planting spaces)
- » Tree planting cost: \$1,000.00 (Average historical cost per tree to purchase, ship, and plant 2 – inch caliper). Does not include additional costs for tree grates; removal of asphalt or concrete from planting strips; etc.)

### Major Issues

- » Tree topping
- » Tree maintenance for existing trees
- » Tree planting
- » Species diversity
- » Education

## CONCLUSION

Community Forestry Consultants, Inc. has completed its assignment of evaluating and making recommendations regarding the partial tree population in the 15 NBDs of Tacoma. This SMP - NBD provides the city with the framework to implement the best management practices for the Neighborhood Business Districts. The management and maintenance needs for a successful urban forestry program have been determined from the best management practices available in the urban forestry and arboriculture industry.

Timely action needs to be taken to prevent tree failures, preserve tree resources, and maintain the street trees in the business districts of Tacoma. Trees are valuable assets to the NBDs. The healthier the trees are in the business districts the more the city's livability is improved. To realize these benefits, tree planting, pruning and removing, increased education, preservation, and volunteerism is needed. The focus goes beyond the individual tree to trees throughout the districts to the working community forest.

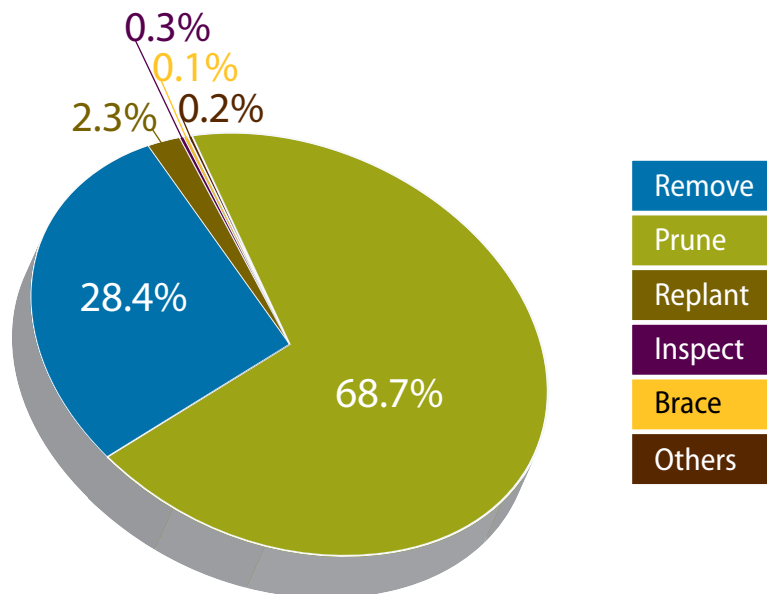
The recommendations will help conserve NBDs tree resource and sustain the tree canopy for future generations. Although this commitment will come with costs, the long-term benefits are significantly greater and will result in a sustainable asset for the citizens of Tacoma today and tomorrow.

## APPENDIX A – MAINTENANCE REQUIREMENTS

There are many arboriculture industry maintenance standards in existence that can be supplanted to the Public Works Design Manual chapters 9.18 and 9.19. The American National Standards Institute (ANSI) A300 Standards for Tree Care Operations: Tree, Shrub and other Woody Plant Maintenance Standard Practices were developed to define the goals and objectives to be achieved and describe the methods that can be used to demonstrate whether or not arboriculture practices and services meet the specified goals and objectives. The standards are performance based. These standards should apply to any person or entity engaged in tree care in the City of Tacoma.

### Pruning and Removal Cycles

There are 1155 maintenance tasks in all the NBDs. These include 794 pruning treatments, 327 removals, and 30 replants. Since many of the trees in the NBDs are not large trees much of this work could be accomplished in one budget cycle and placed in the budget as a three-year rotation maintenance cycle for the business districts. In the initial year the costs may be higher but subsequent maintenance cycles will see a cost reduction as the condition of the trees improves each cycle and the amount of maintenance decreases.



### Annual Removal and Replacement Strategy

There are over 900 potential planting sites in the 15 NBDs. Potential tree planting sites were evaluated according to tree height at maturity (small, medium, or large). The planting space suitable for tree size determined placement of potential planting sites in the NBDs. General arboriculture guidelines recommend matching tree size at maturity with planting space and surrounding infrastructure. Although tree height provides some guidance in matching trees and planting space size, estimating mature trunk diameter at ground level gives a direct assessment of the minimal planting space needed for a species. Additionally most of the tree removals will generate additional planting sites. As stated in the SMP – NBD earlier, the correct amount of annual tree planting should be based on the number of new trees the city can maintain. There is no logic or reason to plant 500 trees if your staff and resources can only maintain 100 properly. Annual replacement strategies should be governed by program resources.



Tree removal projects should be in conjunction with tree replacement projects so the loss of canopy coverage is minimized.

### **Root Pruning Strategies**

As expected, there was very little tree-sidewalk conflicts present in the inventory areas of the NBDs due to small and immature trees. This may change as trees mature, but most likely not because the existing trees in the NBDs are predominantly small ornamental trees.

Keep in mind that not every crack that appears in concrete near trees is associated with a root. Most concrete cracks are due to the expansion and contraction of the concrete, caused by temperature changes. Once cracks do occur, they allow water to penetrate beneath the concrete, and the water in turn is used by roots from nearby trees. Roots will grow under concrete whenever the density, moisture, oxygen, and nutrients allow.

The best cure for tree-sidewalk conflicts is prevention (See Figure *silva* cell). Arborists can install treatments underneath the pavement or alongside the pavement or tree at the time of planting. For existing trees, the installation of root barriers can be a useful tool during sidewalk repair. Know the limitations and applications of root barriers before installation.

Root pruning may be considered an option but it is a serious wound and may affect the stability of the tree. Age, tree condition, species, root size and location, and proximity to the trunk should be considered before using root pruning as a treatment. There is no one single specification for tree root/concrete mitigation. Each case must be examined, each species characteristics must be known, and each root must be evaluated before roots can be severed.

Buttress and lateral roots that are significant in size and function should be protected. Avoid severing roots near the trunk of the tree to minimize decay-causing pathogens entering the lower trunk. Lateral roots often produce sinker roots that go downward from the lateral roots. It is possible to sever lateral roots at the juncture of sinker roots or cut them back to their point of connection with other lateral roots from which they branch. Lateral roots deeper than 10 inches typically are not a problem and should be left alone.

Roots pruned outside the critical root zone radius from the trunk have a greater chance of sealing the wound before decay compromises the tree. Root and trunk decay varies by species and care must be exercised in monitoring trees after root pruning.

### **Street Tree Placement Recommendations**

A common issue found in the NBDs is planting small size trees in planting spaces that will accommodate large trees. Planting sites available for large trees in the NBDs are so limited that it is imperative when present they should be planted with large trees not small ornamentals.

A related problem is planting strips that have been paved or covered by asphalt. Many of these strips are wide and could provide space for medium and large trees. Elimination of the asphalt or pavement would create suitable space for tree growth and provide an opportunity for additional green space in the NBDs.

Small spaces, such as sidewalk cutouts measuring 2 to 4 feet by 2 to 4 feet and planting strips less than 4 feet wide, have a very high damage potential because most species grow large enough to make contact with adjacent infrastructure. Providing a planting space of appropriate size for the desired species is critically important. Where large tree species are desired, sufficiently large planting spaces must be provided. The larger the planting space, the lower the potential for damage or infrastructure conflict.



Small ornamental trees, such as flowering pear, should not be planted at sites that have space for large trees.

### Tree Resource Protection

The primary goal of tree protection is the long-term survival and stability of a tree or group of trees. It is not about trying to save every tree during development and construction, because some trees are not salvageable due to structural problems or poor quality species. It is about preserving and protecting trees that add value to the property or because the community demands trees be preserved and protected.

Arboriculture practices cannot repair construction damage, vandalism, or improper maintenance to a tree or reverse degradation of its growing environment. Our industry has a limited ability to cure these injuries or accumulated stresses to trees. The focus to reach our goal of tree protection is to prevent injury to trees. Implementing the following objectives can prevent canopy loss and sustain the tree population in the business districts.

- » Develop approaches to protect larger tracts of privately held forest lands via conservation easements and acquisition, property tax reduction, or other means.
- » Develop and promote a nomination-based, voluntary Memorial/Heritage Tree Program to recognize and protect unique, landmark or notable private trees.
- » Promote tree-friendly development and land use practices by reviewing and reinforcing policies to preserve mature, significant trees and planning for appropriate replanting.
- » Promote stewardship of native plant communities on private and public property.
- » Prevent unnecessary tree removal on single-family residential lots through property owner education.

### **Tree Protection – Construction**

Construction in and around trees can lead to chemical and physical injury to tree trunks, soil compaction in the root zone, severed roots, smothered roots, split or broken branches, and new exposure to the wind and sun. When construction is necessary it is important for everyone involved in designing, contracting, and managing a project to understand tree preservation and to use best practices in tree protection.

The best way to protect trees from construction damage is to prevent damage to the tree and the surrounding soil. Identify arboriculture treatments such as pruning, irrigation, fertilization, mulching, and pest management that may be needed prior to construction activities and to invigorate trees (Matheny and Clark, 1998).

A tree protection zone should be established and fenced off and contractors should be prohibited from moving or working within the fences. In order to prevent soil compaction and root injury, the fence should be placed at least as wide as the tree canopy's drip line but preferably wider. If the rooting area cannot be off limits, mulch the soil under the tree canopy heavily to reduce compaction.

Driving near trees should be minimized; site access and equipment storage areas should be clearly delineated prior to the start of construction. Trenching near trees should be eliminated and trees should be protected from physical mechanical damage with tree wrap or tree guard.

Monitor trees during construction to evaluate and treat any damage or change in health to trees that occur, and document any conditions that result from construction damage. If trees are injured during construction they should be tended to immediately.

### **Tree Protection – Vandalism**

It is impossible to constantly police every street tree. It is possible, however, to raise awareness in the Neighborhood Business Districts about tree health, and to increase people's respect for the trees in the business districts. Educating business owners, residents, park patrons, and school children about street trees may reduce incidents of tree vandalism (such as girdling and peeling bark, and snapping branches) and encourage reporting of observed tree damage.

Accidental tree damage is also primarily a matter of education. Most people do not realize that slamming a car door (or fender) into a tree, urinating on a tree, hammering a nail into a trunk, or dumping hot coals at the base of a tree may all cause irreparable damage that can eventually lead to hazardous conditions and tree mortality. Even walking on a tree's roots, when done by hundreds of people a day, can seriously compromise the biological and structural integrity of a tree.

Programs that raise the public's awareness of the trees in the community, through emphasizing their benefits they provide, can help influence resident and visitor behavior. See the education and outreach sections of this SMP - NBD for more information on this topic.

### **Tree Protection – Young Trees**

As more young trees are planted along streets or in the parks, the need for a young tree maintenance program will rise. Young trees require more frequent care than older trees. Depending on conditions they may need to be watered, mulched, pruned, and/or protected with temporary fencing, as they are more susceptible to vandalism and adverse environmental conditions.

Humans and large animals are literally the biggest tree pests in the region. Fencing is the only practical, long-term solution for larger pests. Trunk protectors used during the winter season will avoid damage from smaller rodents.

It is worth the investment, as a year's worth of new tree planting losses from large and small animals can quickly exceed the cost of fencing, trunk protectors, maintenance, and upkeep. Planting larger caliper trees from the onset may alleviate some problems with deer.

Education and volunteerism are the best cure for human pests. Encourage volunteers to adopt young trees in the parks and their neighborhood. Volunteers trained in basic tree maintenance, and watering techniques, provided with tools (a hose, trowels, garbage bags, gloves, etc.) and are given the responsibility for the care of the adopted tree. This program promotes citizen involvement in tree care and awareness of the urban forest. This program could be implemented in Tacoma for street or park trees – individuals, families, or school groups could adopt newly planted trees. The city should attempt to organize a 'Tree Stewards' program and utilize the opportunity this group provides for more volunteer hours.

### **Maintenance Standards for Property Owners**

Arboriculture and tree care maintenance and operations are very specialized fields of work. Many years of education and training are required to perform competently and safely in the field and without harm to the trees. Tree care performed by City staff or contractors to Tacoma's public trees should be accomplished by ISA certified arborists or certified tree workers. This should be clearly stated in the City tree ordinances and the Public Work Design Manual Landscaping Chapter of the Tacoma Municipal Code. These regulations should apply to City workers as well as citizens and contractors. The ordinances and regulations are critical to proper tree maintenance but only successful if the City has the resources and the political will to enforce City codes.

The primary maintenance treatment provided by adjoining property owners for new trees or existing mature trees should be water applications. There are many examples of damaged trees or topped trees in the NBDs carried out by adjoining property owners or unqualified contractors hired by the property owner or the NBD.

The opportunity to engage NBD members and citizens in tree planting and pruning young trees is very beneficial to Tacoma's Urban Forestry program. This type of work is also highly suitable for properly trained summer interns, part-time employees, and/or volunteers. Since no bucket truck is required, City staff or volunteers can perform this work at any time. Training pruning can be accomplished from the ground with a minimum amount of equipment. The City should develop an organized, documented approach to cyclical tree maintenance that can be easily managed by City staff and properly trained volunteers, if budgetary issues are a concern.

## APPENDIX B – PUBLIC MEETING MINUTES

**WHAT:** Notes from NBD Tree Inventory/Management Plan Meeting

**WHERE:** 301 Puyallup Ave (Jori's property)

**WHEN:** 2/17/11, 9 to 10:45am

**WHO:**

Christopher List- 6th Ave

Jori Adkins – Dome

Leslie Young – Lincoln

Tom Ehnat – Fern Hill

Reggie Frederick – Proctor

Shari Hart- CEDD, NBD Liaison

Ramie Pierce – Public Works, Urban Forester

Jim Flott – Community Forestry Consultants, Inc.

The meeting started with Shari setting the stage for the project and expectations. Ramie gave an overview of citywide goals, current status, and what that means for business districts (30% canopy coverage goal, as of 2001 citywide coverage was 12.9%). This project will provide data about our infrastructure (trees in business districts) and its condition so we can better plan and manage them. Complete inventories of each district, 2 page summary of inventory findings, management plans with recommendations for maintenance and planting for each business district. All of this will be done June 2011.

Introductions were made and Jim summarized the nature of the project, as well as common themes in several districts that he noticed yesterday while beginning the inventory. Those themes were:

- A lot of pavement
- Trees are planted too deep
- Many have been mutilated (topped, lion-tailed, etc)
- No diversity in species
- Limited soil volume and resources for the tree

Issues brought up by the NBD reps in attendance include:

- Sidewalk v trees conflicts
- Lack of unified treatment for maintenance (poor pruning practices, no pruning, etc)
- Improper species selection
- Sign conflicts
- Trees interfering with buildings
- Poor installation of trees
- **Education** is needed and was discussed throughout the meeting as the key to making changes
- Language barriers
- Inspections of projects, lack thereof
- Address numbers on businesses being clearly visible
- Car oriented existing designs
- Trees are used as scapegoats for other problems that are not easily solvable or controllable

A SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis was completed by those in attendance about trees in business districts. The following are identified by those in attendance.

**Strengths:**

- Beauty
- Added business
- Wildlife attraction
- Feels good
- People want to linger
- Better prices and better products
- Increased community interaction on sidewalks

**WHAT:** Notes from NBD Tree Inventory/Management Plan Meeting

**WHERE:** 8 Tacoma Ave

**WHEN:** 2/22/11, 2:15 to 3:45pm

**WHO:**

Erling Kuester – Proctor

Denny Faker- Stadium

Kathy Menke- Old Town

Shari Hart- Community and Economic Development Department, NBD Liaison

Ramie Pierce – Public Works, Urban Forester

Jim Flott – Community Forestry Consultants, Inc.

The meeting started with Shari setting the stage for the project and expectations. Ramie gave an overview of citywide goals, current status, and what that means for business districts (30% canopy coverage goal, as of 2001 citywide coverage was 12.9%). This project will provide data about our infrastructure (trees in business districts) and its condition so we can better plan and manage them. Complete inventories of each district, 2 page summary of inventory findings, management plans with recommendations for maintenance and planting for each business district. All of this will be done June 2011.

Introductions were made and Jim summarized the nature of the project, as well as common themes in several districts that he noticed yesterday while beginning the inventory. Those themes were:

- A lot of pavement
- Many have been mutilated (topped, lion-tailed, etc)
- Lots of defects (competing leaders-which are called co-dominant stems)
- Lack of diversity in species
- Conflicts and competition with other infrastructure (limited resources for trees, signs, overhead wires, underground utilities etc)
- Lack of maintenance
- Wrong trees in wrong places

Issues brought up by the NBD reps in attendance include:

- Lack of unified treatment for **maintenance** (poor pruning practices, no pruning, etc)
- Sign conflicts
- **Education** is needed and was discussed throughout the meeting as the key to making changes



Other notable items discussed:

- Address numbers on businesses being clearly visible
- Trees are used as scapegoats for other problems that are not easily solvable or controllable

A SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis was completed by those in attendance about trees in business districts. The following are identified by those in attendance.

**Strengths:**

- Connection with residential community by using trees to blend the differing land uses
- Continuity
- Relaxing and enjoyable
- Adds life to an urban area
- Supports shopping- ie. better prices and better products

**Weaknesses:**

- Continuity (lack of diversity)
- Sign conflicts
- Lack of unified or any maintenance (fall clean-up, watering, pruning, etc)
- Lack of understanding of responsibilities around trees

**Opportunities:**

- Holiday lighting, creating an attraction
- Educational programs
- Partnering with residential neighbors on implementation
- Working with property owners
- Solidify relationships between property owners, business owners and business district associations
- Engage the community (schools, property owners, etc)
- Unified and comprehensive maintenance

**Threats:**

- Limited resources
- Uninformed property/business owners
- Lack of plan, unified approach
- Absentee property owners
- Inequity between properties (i.e. costs, quantity of trees, etc.)

Community Identified Priorities

**Old Town:** Education, planting right the first time

**Stadium:** Education, involving property owners on maintenance

**Proctor:** Education, unified and comprehensive maintenance

**Items to discuss in the future:**

- Incentive program ideas for property owners (i.e. carbon credits, surfacewater rates etc.)
- What would unified maintenance/care program look like? (Funding, roles of partners, holiday lighting, etc.)
- Desired characteristics of future trees (fall color, shade, flowering, winter interest, etc.)

**NEXT STEPS:** Jim will continue to inventory the other business districts (as of this meeting, Proctor, Ruston-Pt. Defiance and Old Town were complete). 2 more meetings with NBD will be held next week with the same agenda as this meeting. Then, Jim will provide summary sheets and another meeting(s) will likely be held to get more input based upon the actual inventory data before Jim drafts the management plans. Management plans and inventory data due to the City June 2011. Inventory data will likely be placed on [www.govme.org](http://www.govme.org) and readily available for the public to view. Copies of the plans will be distributed to the NBD's and projects and resources may begin to be identified by districts for implementation. At that time, greater inclusion of the community and property owners is desired to occur.

Notes taken by Ramie Pierce and are intended to capture the intent and scope of the conversation. If you find any of the above in error, please feel free to send corrections to: [trees@cityoftacoma.org](mailto:trees@cityoftacoma.org). Funding assistance provided by the USDA Forest Service and the Washington State Department of Natural Resources Urban and Community Forestry Programs. The USDA is an equal opportunity provider and employer.

## REFERENCES

- American Forests. 2007. Urban Forest Ecosystem Analysis. URL: <http://www.americanforests.org/resources/urbanforests/analysis.php>
- Behe, B. et. al. 2005. Landscape Plant Material, Size, and Design Sophistication Increase Perceived Home Value. *Journal of Environmental Horticulture* 23(3):127-133. September 2005
- Bernatzky, A. 1983. *The Effects of Trees on Urban Climate. Trees in the 21st Century.* Berkhamster Academic Publishers, pp. 59–76.
- Center for Urban Forest Research (CUFR), USDA Forest Service. 2005. <http://wcufre.ucdavis.edu/>
- Coder, Kim 1996. Identified Benefits of Community Trees and Forests. University of Georgia. October 1996
- Dwyer, J., McPherson, E., Schroeder, H. and Rowntree, R. 1992. Assessing the benefits and costs of the urban forest. *Journal of Arboriculture*, Vol. 18, pp. 227–234.
- Floyd, T. 2002. Urban Catchments Enhanced by Green Corridors. Reproduced from the Stormwater Industry Association Bulletin, No. 108.
- Fraser, E.D. and Kenney, W.A. 2000. Cultural background and landscape history as factors affecting perceptions of the urban forest. *Journal of Arboriculture* 26(2): 107-113.
- Kuo, F. 2003. Social Aspects of Urban Forestry: The role of arboriculture in a healthy social ecology. *Journal of Arboriculture*, Vol. 29, No. 3, pp. 148–155.
- Luley, C. J., S. Sisinni, and A. Pleninger. "The Effect of Pruning on Service Requests, Branch Failures, and Priority Maintenance in the City of Rochester, New York, U.S." in *Journal of Arboriculture*, 2002, Vol 28:3, pp. 137-143.
- Matheny, N. and Clark, J. 1998. *Trees and Development: A Technical Guide to Preservation of Trees During Land Development.* International Society of Arboriculture.
- McPherson, E. and Simpson, J. 1999. *Carbon Dioxide Reductions Through Urban Forestry: Guidelines for Professional and Volunteer Tree Planters.* USDA Forest Service.
- McPherson, E. 1994. Energy-saving potential of trees in Chicago. In: McPherson, E., Nowak, D. and Rowntree, R. (editors). *Chicago's urban forest ecosystem: results of the Chicago Urban Forest Climate Project.* USDA Forest Service.
- Miller, Robert W. 1998. *Urban Forestry. Planning and Managing Urban Greenspaces.* Second Edition. Prentice Hall, Upper Saddle River, NJ 404pp.
- Moll, G., Ebenreck, S. 1989. *Shading Our Cities.* Island Press, Washington, 333 pp.
- Nowak, D. 1994. Atmospheric Carbon Dioxide Reduction by Chicago's Urban Forest. In: McPherson, E., Nowak, D. and Rowntree, R. (editors). *Chicago's urban forest ecosystem: results of the Chicago Urban Forest Climate Project.* USDA Forest Service. p. 83-94.

- Nowak, D. 1992. Urban forest structure and the functions of hydrocarbon emissions and carbon storage. In: Proceedings of the fifth National Urban Forestry Conference. American Forestry Association, pp. 48-51.
- Rowntree, R. and Nowak, D. 1991. Quantifying the role of urban forests in removing atmospheric carbon dioxide. *Journal of Arboriculture*, Vol. 17, No. 10, pp. 269–275.
- Santamour, F. S., Jr. "Trees for Urban Planting: Diversity, Uniformity, and Common Sense." in Proceedings of the 7th Conference of METRIA: Metropolitan Tree Improvement Alliance, 1990, 7:57-65.
- Sorte, G. 1995. The Value of Nature and Green Spaces to the Urban Resident: Homo urbaniensis. Proceedings of the IFPRA World Congress.
- Ulrich, R., and Parsons, R. 1992. Influences of Passive Experiences with Plants on Individual Well-being and Health. In Relf, D. (editor): *The Role of Horticulture in Human Well-Being*, pp 93–105.
- United States Department of Agriculture (USDA) Forest Service. 2005. Benefits of Urban Trees. Urban and Community Forestry: Improving Our Quality of Life. <http://www.urbanforestrysouth.org>
- Walton, J. T. 1998. Stormwater runoff reduction by urban trees in Austin, Texas. In *Cities By Nature's Design*, Proceedings of the 8th National Urban Forest Conference, Ed. C. Kollin, Washington, DC: American Forests, pp. 82 - 85.
- Wolf, Kathleen L. 2007. City Trees and Property Values. *Arborist News*: August 2007 p. 34-36
- Wolf, Kathleen L. and Stacey J. Ray, 2005. Trees are Good for Business. International Society of Arboriculture-Pacific Northwest Chapter, Silverton, OR.
- Wolf, K. 2003. Public response to the urban forest in inner-city business districts. In *Journal of Arboriculture*, 29 (3).
- Xiao, Q., McPherson, E., Simpson J., and Ustin, S. 1998. Rainfall interception by Sacramento's urban forest. *Journal of Arboriculture*, Vol. 24. pp 235–244.

