

Benson Hill Public Property Tree Inventory and Assessment Report

December 2009



Prepared by:



RENTON. AHEAD OF THE CURVE.

City of Renton



Benson Hill Public Property
Tree Inventory and Assessment Report

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City of
Renton



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Executive Summary

In November of 2007, residents in the Benson Hill neighborhood voted to annex into the City of Renton. This annexation became effective on March 1, 2008. As part of the city's continued commitment to its green infrastructure, Davey Resource Group (DRG) was hired to perform a tree inventory and assessment of public property trees in the Benson Hill neighborhood. The inventory was performed during 2009.

The Benson Hill project area includes street trees along forty-four miles of right-of-way, trees on two open space properties and trees at two fire stations. The project area also includes trees at Cascade Park, however, an inventory of these trees was conducted in January, 2009 by TreeSource, Incorporated. This report incorporates the Cascade Park trees where appropriate, otherwise the Appendix provides a summary and the full report can be viewed at the City's website (www.rentonwa.gov).

Excluding Cascade Park, data was collected on 2,526 trees and 195 street tree vacant planting sites. Tree attributes were collected based on the City of Renton's existing tree inventory data. The data will be integrated into the City's comprehensive tree inventory. The trees are sub-categorized as follows:

▪ Street Trees	1,677 Trees
▪ Edlund Property (17611 SE 103 Ave)	349 Trees
▪ Craig Property (adjacent to Edlund Property)	353 Trees
▪ Fire Station #13 (10828 SE 118 Ave)	64 Trees
▪ Fire Station #17 (14810 SE Petrovitsky Road)	83 Trees
▪ Cascade Park (16165 126 th Ave)*	370 Trees
▪ Total Benson Hill Public Property Trees	2,896 Trees*

**Cascade Park was inventoried and summarized by Tree Source Inc.; please see Appendix F for the Cascade Park Tree Inventory and Assessment Report Summary. The total in the above listing includes trees in Cascade Park.*

Tree values were calculated using the Trunk Formula Method as described in the Guide for Plant Appraisal, 9th Edition (The Guide) by the Council of Tree & Landscape Appraisers. The Guide and the Trunk Formula Method are established commonly recognized guidelines and provide a process for appraising trees. It considers a trees diameter, species, condition, location and replacement costs which factor into a formula providing a dollar value that contributes to the overall value of real property.

Using The Guide, the total appraised values of the trees in the project area are as follows:

▪ Benson Hill Street Trees	\$4,303,988
▪ Edlund Property (17611 SE 103 Ave)	\$931,075
▪ Craig Property	\$1,026,172
▪ Fire Station #13 (10828 SE 118 Ave)	\$67,285
▪ Fire Station #17 (14810 SE Petrovitsky Road)	\$402,208

The most common species in the Benson Hill project area was *Thuja occidentalis*, (American arborvitae), a coniferous species, with a population of 525 trees. Its prevalence in the area was mainly because of its frequent use as a hedge along city streets. The second most numerous tree was *Prunus cerasifera* (purple leaf plum), a deciduous species, with 165 trees and the third most common was *Pseudotsuga menziesii* (Douglas fir) with 214 trees.

The trees inventoried were assessed for health problems and priority treatments. The most common problems observed on trees in the project area were poor structural development, decay from past pruning practices and tree topping. In most cases, the problems observed are the result of little or no tree care or incorrect tree care practices (e.g. topping). Over 85% of the trees inventoried can be corrected through a routine maintenance schedule.



Another goal of this inventory was to identify eligible planting spaces for new trees along Benson Hill streets. Where there were spaces in the right-of-way that could support a tree, those locations were inventoried as eligible planting spaces. In front of residential properties, the arborist inventoried only one eligible planting space per property if there were no trees present, and there was space in the public right-of-way to support a tree. Through this project, 195 planting spaces were identified of variable sizes.

Changes to Renton's urban forest are significant with the addition of the Benson Hill area. The following table provides a summary of this new tree total and the change in the number of street trees, park trees, open space trees and those located at fire stations. For street trees, management units were created to efficiently manage these trees. This occurred in the 2007 inventory and is shown in the table for both street tree inventories as the Southeast Management Unit (referenced as the South Management Unit in the 2007 inventory). Please see Table 2 on page 13 for the Adjusted Street Tree Totals in City Management Units for the entire city.

Table 1. Summary of City of Renton Public Property Tree Inventories by General Designation

	Vacant Planting Sites*	Street Trees	Park Trees	Open Space Trees	Fire Stations	Southeast Mgt. Unit (Street Trees)	Tree Totals
2007 Inventory	1,740	4,220	20,000	105,367	0	716	129,587
2009 Inventories	195	1,677	370**	702***	147	1,677	2,896
Totals	1,935	5,897	20,370	106,069	147	2,393*	132,483

*Not part of tree totals

**Cascade Park

***Edlund and Craig Properties

The information gathered in this project provides a significant new resource of data to the community. It is recommended that the city maximize the benefits of this project in the following ways:

- The community now has digital maps of all their trees which city departments and the public can reference as part of planning discussions and right-of-way maintenance decisions.
- By having prioritized maintenance managers can make informed decisions to improve public safety and make wise budget decisions.
- Identification of existing vacant street tree planting spaces provides the potential for increasing tree canopy coverage.
- Because the city has inventoried trees by species and size potential risks to the health of the urban forest can be effectively assessed.
- Having an appraised value for all the trees allows the city to consider the economic contribution trees provide the community.

By commissioning this project, the City of Renton has taken an effective proactive step toward protecting, maintaining, and developing their existing tree population.

1. Introduction

As part of the city's continued commitment to its green infrastructure, Davey Resource Group (DRG) was hired in 2009 to perform a tree inventory and assessment of public property trees in the Benson Hill neighborhood and to integrate it with the City's existing tree inventory.

This new public property tree inventory and assessment is intended to inform the City of Renton with clear information about the safety, health, and value of their newly acquired tree population. Additionally, the inventory and assessment information provides city managers with summaries on the location, age, and density of the public trees. These summaries support annual operational planning and long term strategic planning.

The City of Renton is correct to recognize the role that tree inventories and assessments play in the long term development of an effective and sustainable urban forestry program. Historically, the city had commissioned a public property inventory of street, park, and natural area trees to assist in the care of the trees under its charge. By continuing to support their urban forest through inventory and assessment projects, tree maintenance and urban forest planning, the City is ensuring their community's safety and livability while maximizing the environmental benefits of these appreciating urban forest assets.

The summary analysis and project details in this report are meant to be a supplement to the City's 2007 Public Property Tree Inventory and Assessment Report and the 2009 Cascade Park Tree Inventory and Assessment Report. For more complete details of the entire city's public trees, readers are encouraged to obtain copies of the 2007 and 2009 reports through the City of Renton's Urban Forestry webpage at <http://rentonwa.gov/living/default.aspx?id=16702>.



2. Methodology

The inspection of the project area and field data collection occurred using an International Society of Arboriculture (ISA) Certified Arborist. This section describes the process for data collection and the attributes that were gathered.

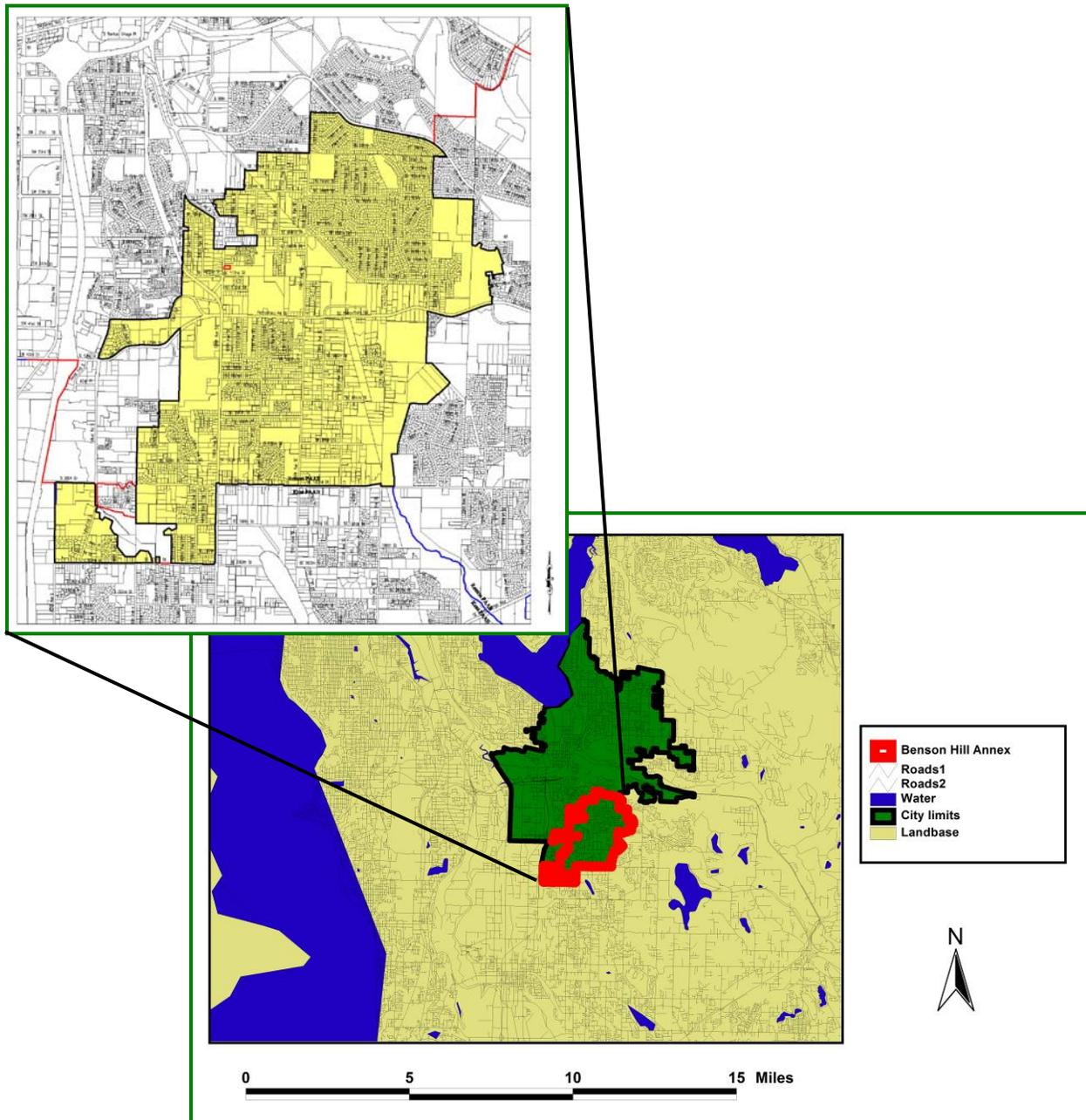


Figure 1. The Benson Hill Area in Renton, WA

2.1 Equipment

Using digital basemaps and data layers provided by the City of Renton's Utilities Systems Division, DRG customized the data collection process and configured its proprietary Work Planning Software (WPS) for field use. This software was installed on a Panasonic CF-19 Toughbook tablet computer, which supports field data collection using a stylus pen writing directly on the screen. The computer was connected to a Trimble global positioning system (GPS) unit via Bluetooth wireless technology. Data was then reviewed for positional accuracy in relation to the map data and aerial orthophotography in ArcView and stored on DRG's TreeKeeper data management software.

2.2 Patrol and Inventory Criteria

Once on site, the DRG arborist systematically patrolled every street in the project area identifying trees or eligible planting sites that qualified for the inventory. The arborist used digitized parcel maps, easement maps and aerial orthophotography provided by the city and compared these reference map locations with a field GPS unit to determine whether a tree (or planting site) identified in the field was within the public right-of-way. Additionally, where there appeared to be discrepancy in the mapping, field indications such as electrical utilities, telephone or water lines, fences and sidewalks were all used to help define the public space.

Trees that were identified in the public right-of-way were inventoried. Where there were spaces in the right-of-way that that could support a tree, those locations were inventoried as eligible planting spaces. In front of residential properties, the arborist would inventory only one eligible planting space per property if there were no trees present, and there was space in the public right-of-way to support a tree.

2.3 Data Collection Specification

For any tree inventoried in this project, the attributes collected and assessment criteria were based on the same methodology used in the City of Renton's 2007 tree inventory. The following is a brief description of the attributes collected:

Unique ID number

As trees were collected in WPS, a unique ID number was automatically generated. After all the data was compiled, records were renumbered according to the City of Renton's existing tree data. Renumbering to coincide with the past inventory allows integration of the new data into the City's existing geographic information system.

Designation

Trees and planting sites (for street trees) were designated according to five major classifications: Right-of-Way (street trees), Edlund Property (open space trees), Craig Property (open space trees), Fire Station #13 (public property trees), or Fire Station #17 (public property trees).

Management Unit

The City of Renton Parks, Recreation and Open Space Implementation Plan used management units to describe planning areas within Renton. These designated areas and nomenclature were used to organize street tree data in this inventory as done in the 2007 inventory. All trees collected in the Benson Hill inventory were designated in the Southeast Management Unit. Prior to Benson Hill annexation, this area was formally known as the South Management Unit.

Scientific Name

Each tree inventoried was identified to species using scientific names. A tree's scientific name is comprised of the genus (the first name) and the species (the second name). For example, a sugar maple tree's scientific name is *Acer* (genus) *saccharum* (species).

Diameter at Breast Height (DBH)

Each tree was measured by diameter at breast height (DBH), which is a measurement collected at 54" above ground level. For this project, only trees with a DBH greater than one inch (1") were inventoried. On the Edlund and Craig properties the DBH lower threshold for a tree was increased to 4" due to an overabundance of stump sprouts on the property.

Site Description

This attribute was chosen to help describe the site specific location of the tree and also provides an indication of potential maintenance needs associated with the tree. The following is a list of the site descriptions and their definition for this project.

- **Planting Strip** - Area of planting between road and sidewalk.
- **Cut-Out** - Area of planting surrounded by sidewalk.
- **Island** - Area of planting surrounded by road.
- **Natural Area** - Area not developed and in a natural state.
- **Other Area** - Areas maintained within the City's right-of-way that do not fit into any other category.
- **Park** - Area maintained for public recreation.
- **Tree Grate** - Similar to Cut-Out with metal grating surrounding planting.
- **Un-Identified** - Any planting not classified by the above descriptions.

Problem

Trees growing along streets encounter many problems during their lives. Each tree that was inventoried in this project was assessed for problems according to the following list. At each tree, the most critical problem associated with the long term health of the tree was recorded as problem #1. A secondary problem was also recorded when necessary.

- **None** – no problems
- **Clearance** – the street, sidewalk, traffic sign or other structure blocked by branches.
- **Damage** - a wound on the stem or branches.
- **Decay** – evidence of wood rot
- **Disease/Insect** – Presence of insect damage or disease
- **Hardscape & Lift** – sidewalk, curb, and other structures displaced by tree parts.
- **Root Problem** – damage to the roots.
- **Structure** - poor growth of tree stem and/or branches.
- **Wires** – overhead utility wires.
- **Stump** – tree has been cut and stump remains to be removed.
- **Buried** – tree stem covered with soil.
- **Co-dominant** – Multiple branch leaders in the tree.
- **Deadwood** – dead branches in the tree.
- **Disease** – a complex of organisms threatening the health of the tree.
- **Drainage** – poor soil conditions that hold water and harmful anaerobic conditions near the tree.
- **Not Identified** – Problem not successfully identified in the field.
- **Staked** – post and wire used for tree support during planting and installation not removed.
- **Topped** – a destructive pruning practice removing the main stem and/or branches of the tree.
- **Ivy** – vine plant growing on the tree.

Treatment

For this attribute, the arborist determined the primary treatment recommended in order to treat the problems present at each tree.

- **None** – No treatment recommendation
- **Clearance** - Tree requires pruning to maintain safe clearance
- **Excavate** – Root inspection/root pruning required
- **Monitor** – Tree should be re-inspected more frequently
- **Mulch** – Tree requires mulch for healthy roots.
- **Prune** – Pruning for structure or safety required
- **Remove** – Schedule for removal
- **Repair** – Sidewalk or street repair required
- **Stump Removal** – Removal of a stump
- **Treat Disease** – A disease treatment is required
- **Un-stake** – Removal of old staking

Maintenance Priority

After assessing the health of the tree, and in consideration of other visible safety risks present at the location, each tree was classified into one of the following recommended maintenance priorities:

- **High** - Trees with conditions that should be reviewed as soon as scheduling allows.
- **Medium** - Trees without concerns of eminent failure that may be addressed on a schedule accelerated above routine.
- **Low** - Routine maintenance work.
- **None** - No pressing maintenance concerns.

Condition Rating

Condition indicates the current state of a tree's health, structural soundness, overall shape, and growth rate. Symptoms of poor condition include discoloration, decay, dieback, decreased growth rate, and/or disfigured or necrotic stems or roots. To some extent, condition class is also a reflection of the life expectancy of the tree. Crown development, trunk condition, major branch structure, twig growth rate, insects/diseases, and root condition are all considered. For this project, the condition of each tree was recorded in one of the following categories adapted from the rating system established by the ISA.

- **Good to Excellent** - 90% to 100% condition class. The tree is nearly perfect in condition, vigor, and form. This rarely used category is applicable to small diameter trees recently transplanted that are well established.
- **Fair to Good** - 70% to 80% condition class. Overall, the tree is healthy and satisfactory in condition, vigor, and form. The tree has no major structural problems, no mechanical damage, and may only have insignificant aesthetic, insect, disease, or structure problems.
- **Poor to Fair** - 60% to 65% condition class. The tree has no major structural problems, no significant mechanical damage, may have only minor aesthetic insect, disease, or structure problems, yet is in good health.
- **Very Poor to Poor** - 40% to 50% condition class. The tree may exhibit the following characteristics: minor structural problems, mechanical damage, significant damage from diseases, thin crown, or stunted growth compared to adjacent trees. This condition also includes trees that have been topped but show reasonable vitality with no obvious signs of decay.
- **Dead to Very Poor** - 0% to 30% condition class. The tree has a major structural problem that presents an unacceptable risk, has severe mechanical damage, crown dieback, very little vigor, and/or has an insect or disease problem that is fatal and may threaten other trees on the property. A tree rated 0% is considered dead.

2.4 Appraised Valuation

As a key component to the proper evaluation of the benefits provided by the Benson Hill public trees, the trees were assessed an economic replacement value. The tree values were calculated using the Trunk Formula Method as described in the Guide for Plant Appraisal, 9th Edition (The Guide) by the Council of Tree & Landscape Appraisers. Additional variables for the appraisal formula were supplied by the 2007 Species Ratings For Landscape Tree Appraisal, 2nd Edition by the Pacific Northwest Chapter of the International Society of Arboriculture.

The Guide and the Trunk Formula Method are established, commonly recognized guidelines and provide a process for appraising trees. It considers a trees diameter, species, condition, location and replacement costs which factor into a formula providing a dollar value that contributes to the overall value of real property.

Species Rating

This rating represents the influence of the tree species on the overall appraised value of the tree. Species ratings are based upon the knowledge and opinions of the Pacific Northwest Chapter of ISA Species Rating Committee. The ratings are region specific, and the Coastal Ratings are used in this report.

Location Factor

Along with field data gathered about a tree, to appraise the value of a tree, the location factor was calculated. This calculation was determined by taking the average of three ratings: Site rating, Contribution rating and Placement rating. Each rating had a value of 0-100% defined as the following.

- **Very High** 90-100%
- **High** 80-90%
- **Average** 70-79%
- **Low** 60-69%
- **Very Low** 0-59%

Site Rating

This is a value of the site expressed by relative market value of the property and was measured in categories from 0-100%. A site is rated in relation to other areas in the same city, county, or region including the areas economic, functional, and aesthetic aspects. For the Benson Hill project area, most site ratings were in the range of 60% - 90%.

Contribution Rating

This is the value of the functional and aesthetic contributions of a tree measured in categories from 0-100%. Evaluation of the tree for its contribution rating includes consideration of size, shape, branch structure, foliage density, and distribution. For the Benson Hill project area, the contribution rating ranged from 10% to 95%.

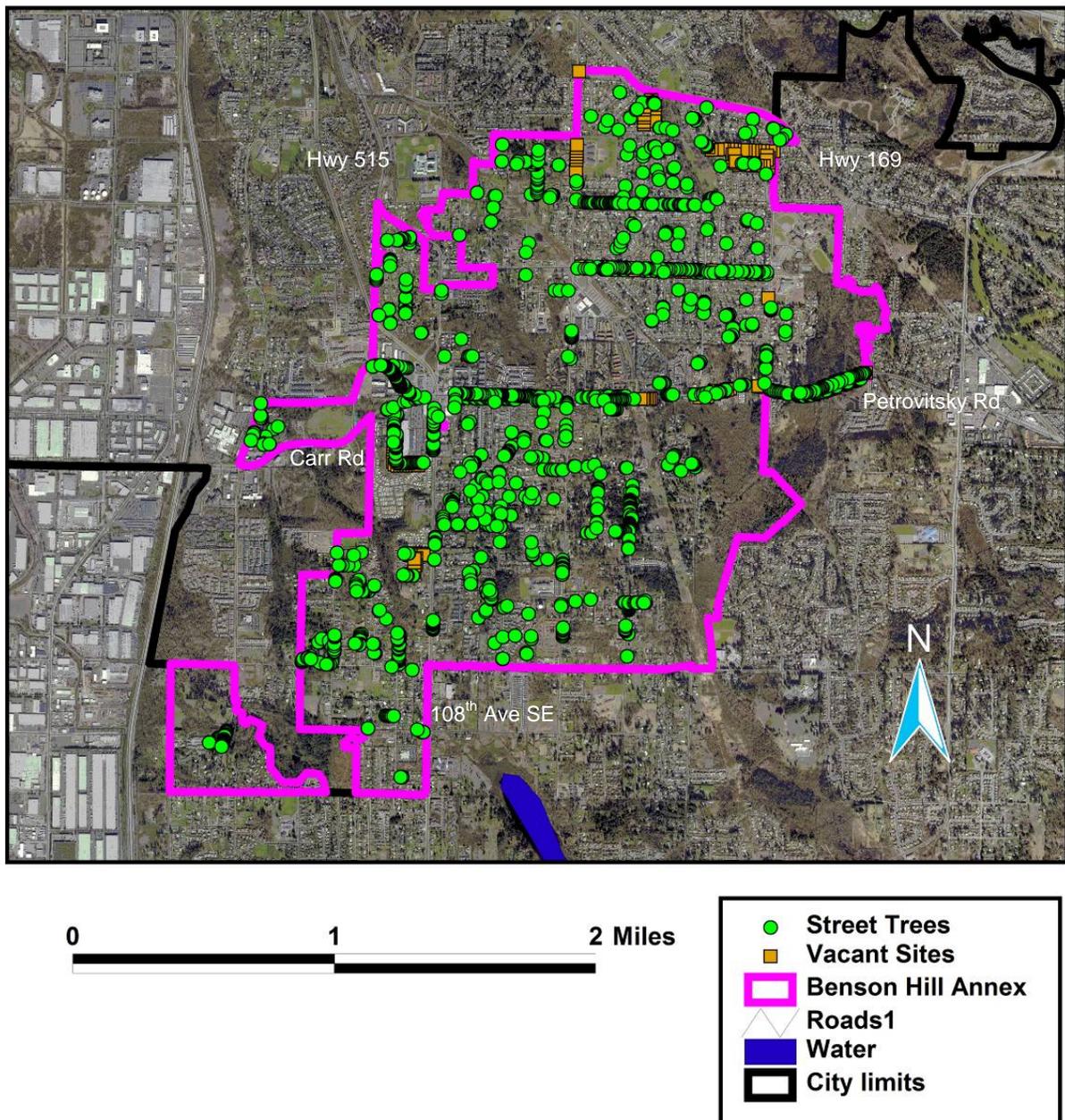
Placement Rating

This is the value of the effectiveness of plant functionality and aesthetics to its placement; and is measured from 0-100%. Considerations may include how the tree provides shading or windscreen benefits. For the Benson Hill project area, the placement rating ranged from 50% to 90%.

3. Street Tree Inventory – Summary Results

Within the Benson Hill project area, there are 44 miles of public right-of way. Through the systematic patrol and inspection of the right-of-way, there were 1,677 trees inventoried and 195 vacant planting sites identified. Since the historical development of the project area had a lot of variety in infrastructure design, there was variation in the right-of-way locations. The Benson Hill project area had many streets with no curbs, sidewalks, or street trees.

Figure 2. Map of Distribution of Street Trees.



The street trees in the project area were categorized in the Southeast Management Unit of the City (South Management unit prior to Benson Hill annexation). According to the 2007 tree inventory, this management unit contained 716 street trees, but with the annexation of Benson Hill, the additional street trees increased the total population to 2,393 street trees. This is more than double the number of trees of any other management unit (Table 2).

Table 2. Adjusted Street Tree Totals in City Management Units.

Management Unit	Number of Street Trees*
North	1021
East	562
Southeast (was South)	2,393 (was 716)
Southwest	537
West	441
Central	943

*Data from Renton Inventory (2007)

3.1 Tree Species

The inventory collected information on 48 genera and 98 different species along the project area streets. Of the 1,677 street trees in Benson Hill, the six most common genera were two species of *Thuja* (Cedar), nine species of *Prunus* (cherry/plum), *Pseudotsuga* (Douglas-fir), eight species of *Acer* (maple), *Pyrus* (pear), and *Liquidambar* (sweetgum) as listed in Table 3.

Table 3. Street Tree Genera Totaling More Than 3% of the Population.

Genus	Count	Percent of Total
<i>Thuja</i>	587	35.0%
<i>Prunus</i>	299	17.8%
<i>Pseudotsuga</i>	147	8.8%
<i>Acer</i>	132	7.9%
<i>Pyrus</i>	57	3.4%
<i>Liquidambar</i>	53	3.2%

The most prevalent street tree species in the Benson Hill project area was *Thuja occidentalis* (American arborvitae) with 524 trees present. Its predominance in the area was mainly because of its frequent use as a hedge along city streets. The second most predominant tree was *Prunus cerasifera* (purple leaf plum) with 157 trees and the third most common was *Pseudotsuga menziesii* (Douglas fir) with 147 trees. The street tree species distribution in Benson Hill contrasts with the 2007 street tree inventory where *Acer platanoides* (Norway maple; 820 trees) and *Prunus cerasifera* (purple leaf plum; 676 trees) were the most common.

3.2 Diameter/Age Groups

Using the approximate age classes established in the 2007 tree inventory for diameter at breast height (DBH), the street trees are mostly 7 to 50 years of age (Table 4). This indicates a tree population that is moderately young to mature.

Table 4. Summary of Street Trees DBH Classes and Approximate Ages.

1 – 3”	% of	4 – 12”	% of	13 – 24”	% of	25 – 36”	% of	37”+	% of
1-6 yrs	Total	7-24 yrs	Total	25-50 yrs	Total	51-75 yrs	Total	76+ yrs	Total
227	13.5%	898	53.5%	429	25.6%	91	5.4%	32	1.9%

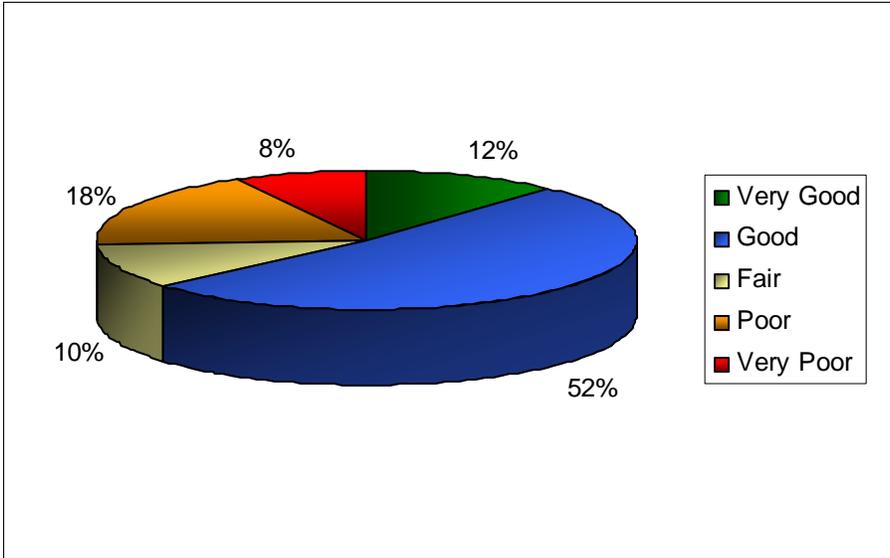
3.3 Tree Condition

The majority of trees across Benson Hill are in fair to good condition. Almost 12% of the trees are in very good condition, and only 8% fall into the very poor condition class. These results indicate a measurable potential for improving the overall health and safety of the street trees by performing maintenance on the poor and fair trees to improve their health, and conducting maintenance or removal/replacement mitigation where necessary. Table 5 displays the condition rating percentage ranges by class and Figure 3 displays the proportions.

Table 5. Number of Street Trees by Condition Rating Percentage.

Very Good	% of Total	Good	% of Total	Fair	% of Total	Poor	% of Total	Very Poor	% of Total
197	11.7%	871	51.9%	169	10.1%	304	18.1%	136	8.1%

Figure 3: Street Trees Condition Class Percentages.



3.4 Valuation

Using the Guide for Plant Appraisal mentioned in section 2.4, the 1,677 street trees in the Benson Hill area were appraised at a total approximate value of \$4,303,988. Table 6 lists the trees by condition class and their average value per tree. Because trees with a condition of less than 40% (very poor) are typically targeted for removal, their negligible value is not included.

Table 6. Street Tree Totals and Values By Condition Class

Condition Class	Number of Trees	Total Tree Value	Average Value per Tree
40%	78	\$211,064	\$2,706
50%	224	\$622,423	\$2,779
60%	168	\$669,050	\$3,982
70%	368	\$1,593,286	\$4,330
80%	501	\$863,092	\$1,723
90%	142	\$253,666	\$1,786
100%	54	\$91,407	\$1,693
Total	1,535	\$4,303,988	\$2,714

3.5 Tree Problems

Of the Benson Hill street tree population, 947 trees were observed to have at least one problem. A positive observation from this data is that just less than half (43.5%) of the trees had no problems. Without an established record of tree care, the top three problems are evidence of poor tree care. One common problem among the trees was that 16.2% had been topped (Table 7, next page). Tree topping is quickly becoming an unaccepted practice through effective public education. The problems of the remaining trees can be mitigated over time with proper care.

Table 7: Occurrence of Tree Problems In Street Trees

Problem	Count	Percent of Occurrence
Structure	343	22.7%
Decay	327	21.7%
Topped	245	16.2%
Wires	163	10.8%
Deadwood	109	7.2%
Root Problem	95	6.3%
Lift	58	3.8%
Co-dominant	53	3.5%
Ivy	46	3.0%
Damage	27	1.8%
Clearance	23	1.5%
Staked	7	0.5%
Disease / Insect	4	0.3%
Drainage	4	0.3%
Disease	3	0.2%
Not Identified	2	0.1%

3.6 Maintenance Recommendations

Based on their condition at the time of inventory, 515 street trees (about 31%) were prescribed treatments to mitigate the aforementioned problems (Table 8).

Table 8. Street Trees Treatment Recommendations Summary

Recommended Treatment	Count	Percent of Total
Clearance	220	13.1%
Monitor	119	7.1%
Mulch	3	0.2%
Prune	97	5.8%
Remove	25	1.5%
Repave	42	2.5%
Unstake	9	0.5%
None	1162	69.3%
Total	1,677	100.0%

The majority of recommended maintenance treatments can be scheduled with routine work. This indicates that even though problems were identified on many trees, the severity of these problems is such that mitigation efforts could be managed within a routine maintenance program. Less than 1% of the street tree population requires high priority work and should be considered the most important trees to investigate and mitigate (Table 9, next page).

Table 9. Street Trees Maintenance Priority

Maintenance Priority	Count	Percent of Total
High	11	0.7%
Medium	222	13.2%
Low	1439	85.8%
None	5	0.3%
Total	1,677	100.0%

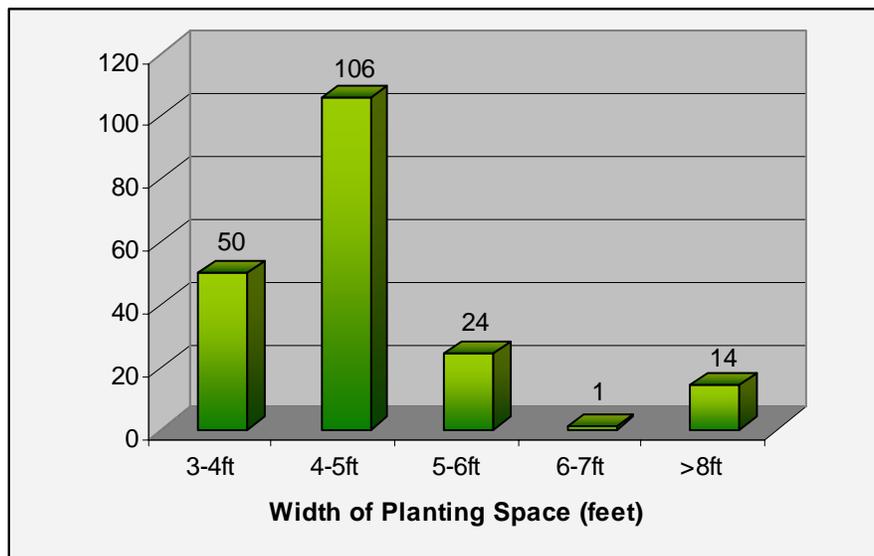
3.7 Vacant Planting Sites

195 vacant planting sites were inventoried across Benson Hill right-of-ways. These were recorded by maximum width in one of the following size categories:

- 3-4 feet
- 4-5 feet
- 6-7 feet
- Greater than 8 feet

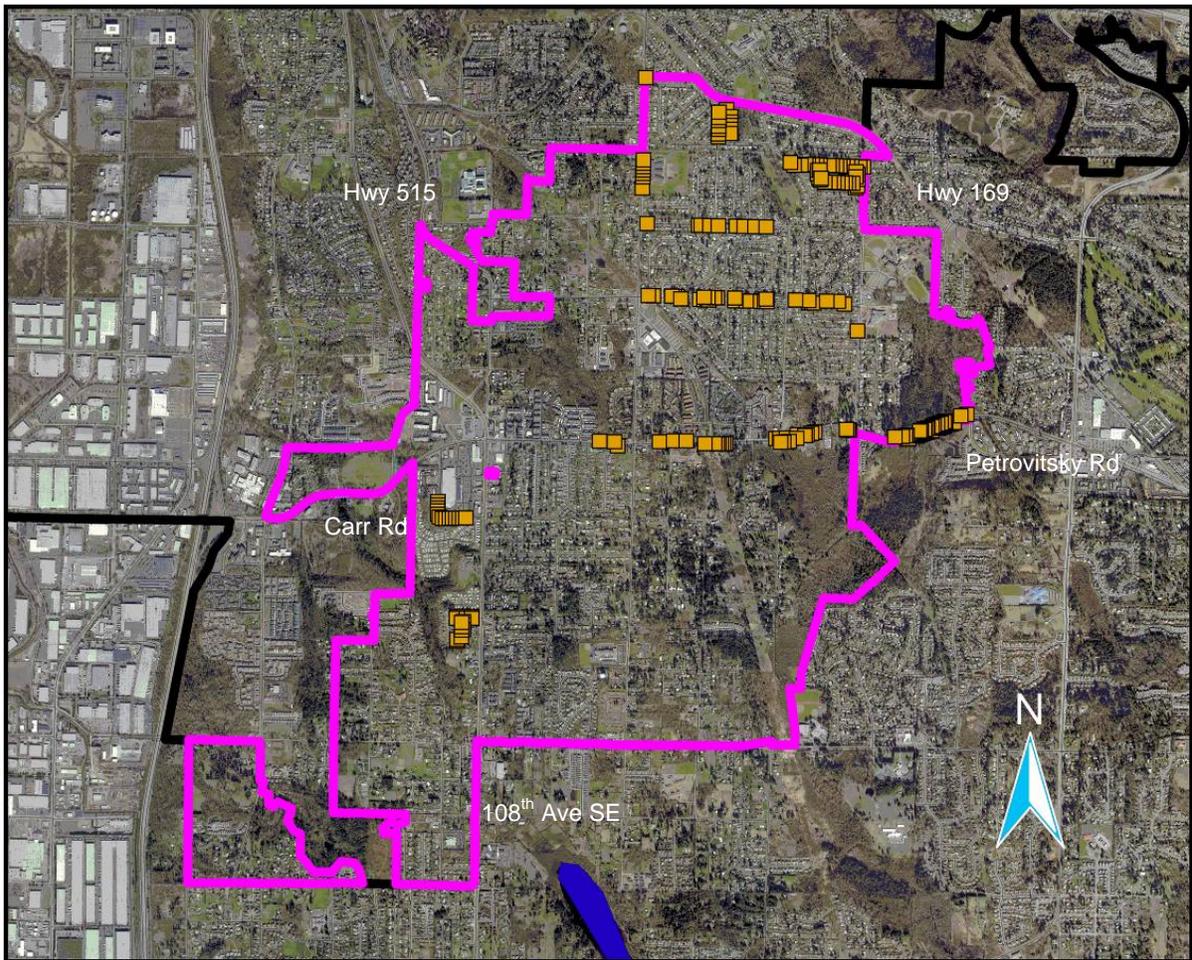
Figure 4 shows the totals by class; the street tree planting site widths are overwhelmingly five feet and smaller. Figure 5 (next page) gives an overview of the distribution of vacant planting sites around Benson Hill.

Figure 4. Vacant Street Tree Planting Site Totals by Class.



Although the larger planting space (>8ft) locations can potentially support the biggest and most long-lived species, it will also take the most amount of time to achieve this size of tree. It is recommended that these locations be identified as high priority planting locations in the City’s planting program. By installing the largest trees possible in these locations, the City will be maximizing its return on environmental benefits in the long term.

Figure 5. Vacant Planting Site Distribution.



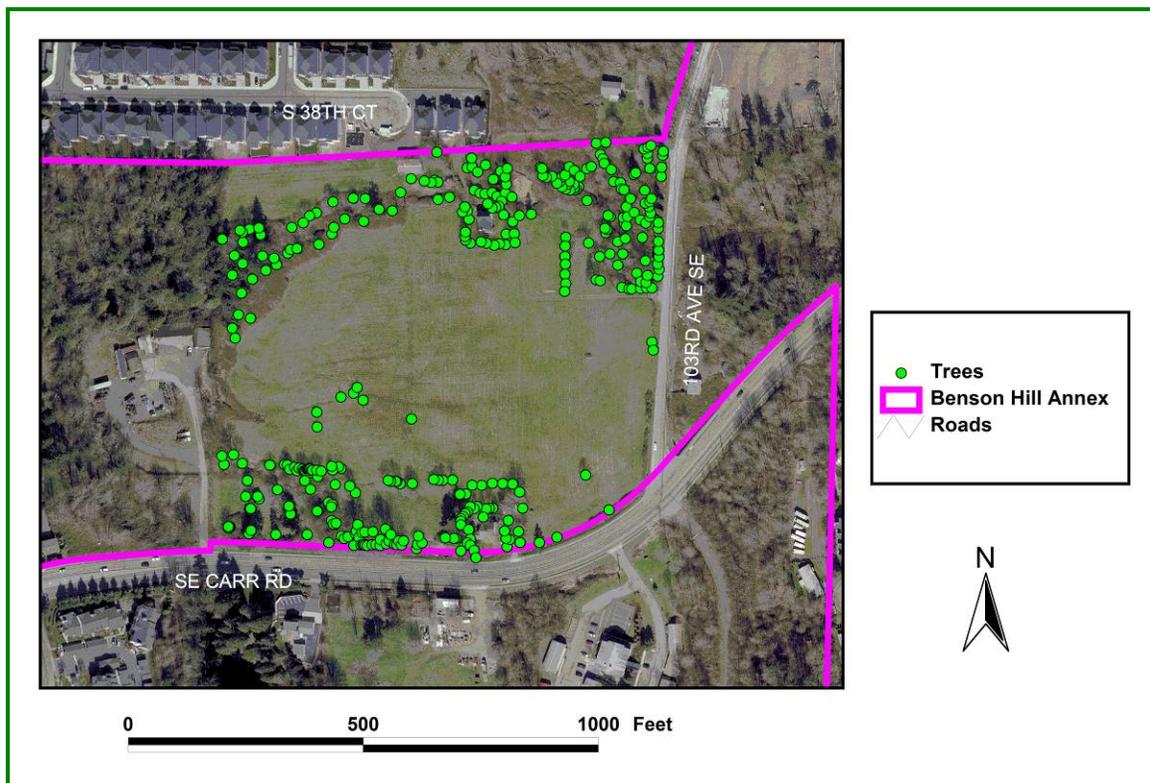
0 1 2 Miles



4. Edlund Property

At the Edlund Property, located at 17611 SE 103 Avenue, 349 trees were inventoried. No vacant planting sites were inventoried at this site. The property is approximately 18 acres with a tree density of 20 trees per acre. Of note, one of the more outstanding limitations of the site is the presence of Himalayan blackberry. While the sod areas are periodically mowed to prevent blackberry from dominating, blackberry does impede access to most locations where trees exist. Future control of this invasive plant would provide such benefits as access to trees for maintenance, wildlife habitat enhancement and public access.

Figure 6. Overview of Trees at Edlund Property.



4.1 Tree Species

There are 30 genera and 43 different species. The most common species is *Alnus rubra*, red alder, which totals nearly half of the tree population. Otherwise, the property is fairly diverse. Table 10 highlights the genera totaling more than three percent of the trees at the Edlund Property.

Table 10. Tree Genera Totaling More Than 3% of the Population of Edlund Property.

Genus	Count	Percent of Total
<i>Alnus</i>	147	42.1%
<i>Acer</i>	21	6.0%
<i>Populus</i>	21	6.0%
<i>Betula</i>	20	5.7%
<i>Prunus</i>	18	5.2%
<i>Chamaecyparis</i>	16	4.6%
<i>Malus</i>	16	4.6%
<i>Pseudotsuga</i>	15	4.3%
<i>Sorbus</i>	11	3.2%
<i>Thuja</i>	11	3.2%

4.2 Diameter/Age Groups

From investigation into the age class distribution, the trees at the Edlund Property are mostly 7 to 50 years of age. This indicates a tree population that is moderately young to mature. Only trees greater than four inches DBH were recorded at this property because of the overabundance of stump sprouts less than four inches. Table 11 shows the tree count by approximate age class.

Table 11. Summary of Edlund Property DBH Classes and Approximate Ages

4 – 12"	% of	13 – 24"	% of	25 – 36"	% of	37"+	% of
7-24 yrs	Total	25-50 yrs	Total	51-75 yrs	Total	76+ yrs	Total
118	33.8%	175	50.1%	42	12%	14	4%

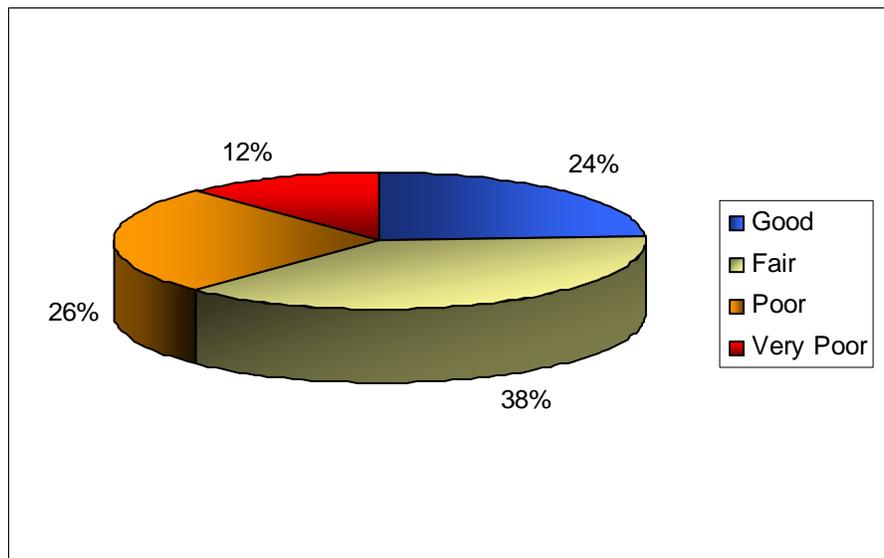
4.3 Tree Condition

The Edlund Property was acquired by the City of Renton in 2004, and the trees reflect a lesser degree of maintenance and care in their condition. Nearly one quarter of the trees are in good condition, and approximately 64% of the trees are in fair to poor condition. Table 12 displays the condition rating percentages by class and Figure 7 displays the proportions.

Table 12. Number of Edlund Property Trees by Condition Rating Percentage

Very Good	% of Total	Good	% of Total	Fair	% of Total	Poor	% of Total	Very Poor	% of Total
0	0%	84	24.1%	133	38.1%	89	25.5%	43	12.3%

Figure 7. Edlund Property Condition Class Percentages.



4.4 Valuation

Using the Guide for Plant Appraisal described in section 2.4, the trees at the Edlund Property were appraised at a total approximate value of \$931,075. Because trees with a condition of less than 40% (very poor) are typically targeted for removal, their negligible value is not included.

Table 13. Edlund Tree Totals and Values By Condition Class

Condition Class	Number of Trees	Total Tree Value	Average Value per Tree
40%	30	\$71,729	\$2,391
50%	59	\$163,389	\$2,769
60%	133	\$392,416	\$2,950
70%	81	\$299,145	\$3,693
80%	3	\$4,396	\$1,465
90%	0	\$0	\$0
100%	0	\$0	\$0
Total	306	\$931,075	\$3,043

4.5 Tree Problems

Of the 349 trees inventoried at Edlund Property, 172 trees were observed to have at least one recordable problem. There are 261 occurrences of different problems, summarized in Table 14.

Table 14: Occurrence of Tree Problems at Edlund Property

Problem	Count	Percent of Occurrence
Decay	96	36.8%
Deadwood	69	26.4%
Structure	61	23.4%
Ivy	15	5.7%
Disease / Insect	12	4.6%
Co-dominant	4	1.5%
Damage	2	0.8%
Topped	2	0.8%

4.6 Maintenance Recommendations

Based on their condition at the time of inventory, only 12 trees at the Edlund Property were prescribed for treatment (Table 15).

Table 15. Edlund Property Trees Treatment Recommendations Summary

Recommended Treatment	Count	Percent of Total
Clearance	8	2.3%
Remove	4	1.1%
None	337	96.6%
Total	349	100.0%

The majority of recommended maintenance treatment can be scheduled with routine work. No trees at the Edlund Property were found that require high priority work.

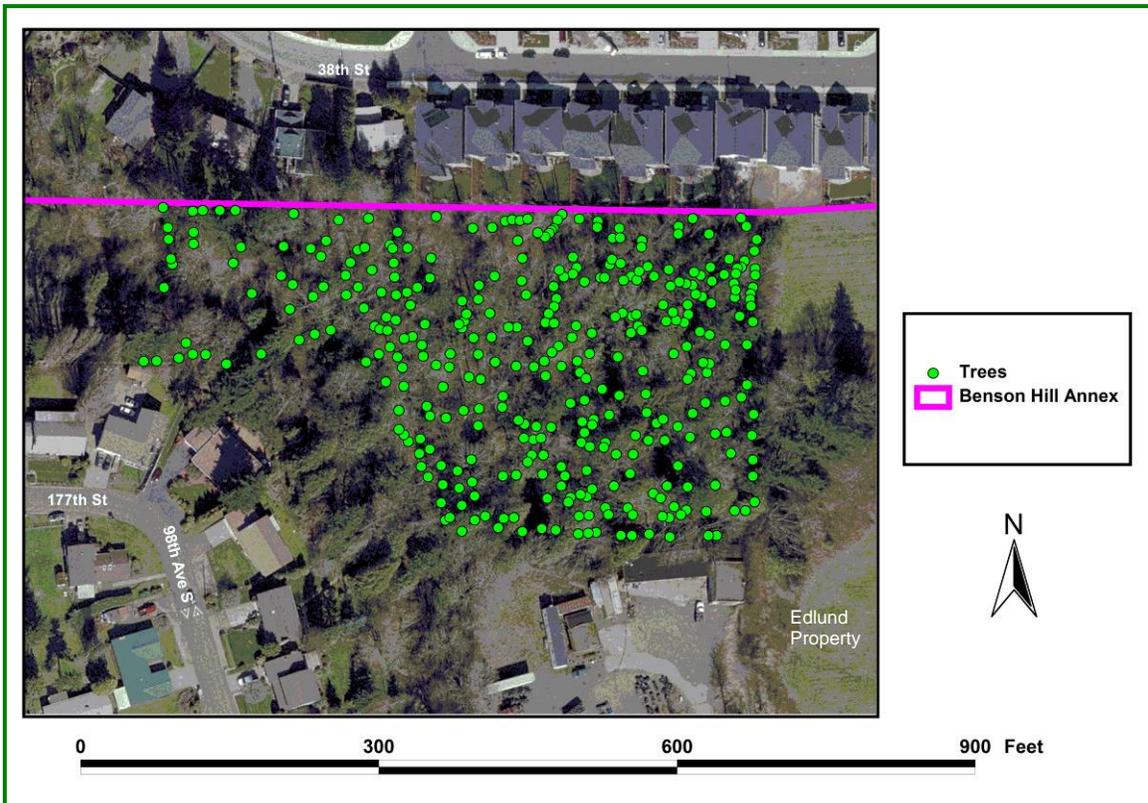
Table 16. Edlund Property Trees Maintenance Priority

Maintenance Priority	Count	Percent of Total
High	0	0.0%
Medium	1	0.3%
Low	344	98.6%
None	4	1.1%
Total	349	100.0%

5. Craig Property

At the Craig Property, located west of and adjacent to the Edlund Property, 353 trees were inventoried. No vacant planting sites were inventoried at this site. The property is approximately 3.58 acres with a tree density of 99 trees per acre. This property is essentially undeveloped and fairly dense.

Figure 8. Overview of Trees at Craig Parcel.



5.1 Tree Species

There are 9 genera and 10 different species. The most common species is *Acer macrophyllum*, bigleaf maple, which totals nearly half of the tree population. The second most numerous species is *Thuja plicata*, western red cedar, which totals nearly a third of the population. Table 17 highlights the genera totaling more than three percent of the trees at the Craig Property.

Table 17. Tree Genera Totaling More Than 3% of the Population of Craig Property.

Genus	Count	Percent of Total
<i>Acer</i>	174	49.3%
<i>Thuja</i>	109	30.9%
<i>Pseudotsuga</i>	39	11.0%
<i>Populus</i>	12	3.4%
<i>Tsuga</i>	12	3.4%

5.2 Diameter/Age Groups

From investigation into the age class distribution, the trees at the Craig Property are mostly 7 to 75 years of age. This indicates a tree population that is young to mature. Only trees greater than four inches DBH were recorded at this property because of the overabundance of stump sprouts less than four inches. Table 18 shows the tree count by approximate age class.

Table 18. Summary of Craig Parcel DBH Classes and Approximate Ages

1 – 3"	% of	4 – 12"	% of	13 – 24"	% of	25 – 36"	% of	37"+	% of
1-6 yrs	Total	7-24 yrs	Total	25-50 yrs	Total	51-75 yrs	Total	76+ yrs	Total
1	0.3%	125	35.4%	154	43.6%	51	14.4%	22	6.2%

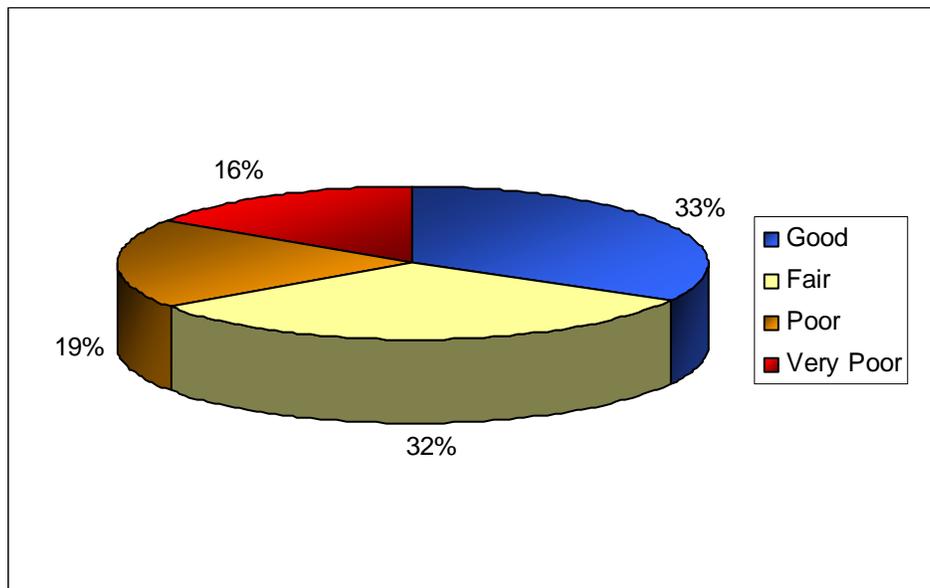
5.3 Tree Condition

The Craig Property was acquired by the City of Renton in 2009, and the trees reflect a lesser degree of maintenance and care in their condition. Nearly one third of the trees are in good condition, and approximately half of the trees are in fair to poor condition. Table 19 displays the condition rating percentages by class and Figure 9 displays the proportions.

Table 19. Number of Craig Property Trees by Condition Rating Percentage

Very Good	% of Total	Good	% of Total	Fair	% of Total	Poor	% of Total	Very Poor	% of Total
0	0%	117	33.1%	113	32.0%	68	19.3%	55	15.6%

Figure 9. Craig Property Condition Class Percentages.



5.4 Valuation

Using the Guide for Plant Appraisal described in section 2.4, the trees at the Craig Property were appraised at a total approximate value of \$1,026,172. Because trees with a condition of less than 40% (very poor) are typically targeted for removal, their negligible value is not included.

Table 20. Craig Tree Totals and Values By Condition Class

Condition Class	Number of Trees	Total Tree Value	Average Value per Tree
40%	25	\$91,245	\$3,650
50%	43	\$234,283	\$5,448
60%	113	\$320,411	\$2,835
70%	112	\$372,031	\$3,322
80%	5	\$8,202	\$1,640
90%	0	\$0	\$0
100%	0	\$0	\$0
Total	298	\$1,026,172	\$3,444

5.5 Tree Problems

Of the 353 trees inventoried at Craig Property, 181 trees were observed to have at least one recordable problem. There are 242 occurrences of different problems, summarized in Table 21.

Table 21: Occurrence of Tree Problems at Craig Property

Problem	Count	Percent of Occurrence
Deadwood	106	43.8%
Decay	96	39.7%
Structure	24	9.9%
Damage	6	2.5%
Co-dominant	5	2.1%
Ivy	2	0.8%
Not Identified	2	0.8%
Disease / Insect	1	0.4%

5.6 Maintenance Recommendations

Based on their condition at the time of inventory, only 13 trees at the Craig Property were prescribed for treatment (Table 22).

Table 22. Craig Property Trees Treatment Recommendations Summary

Recommended Treatment	Count	Percent of Total
Remove	6	1.7%
Prune	4	1.1%
Monitor	3	0.8%
None	340	96.3%

Most of the trees on the property require no treatment reflecting the relative good condition of the forest. However, six trees are recommended for removal because of their poor condition rating. These trees should be removed because they represent a higher risk of failure and are adjacent to nearby properties.

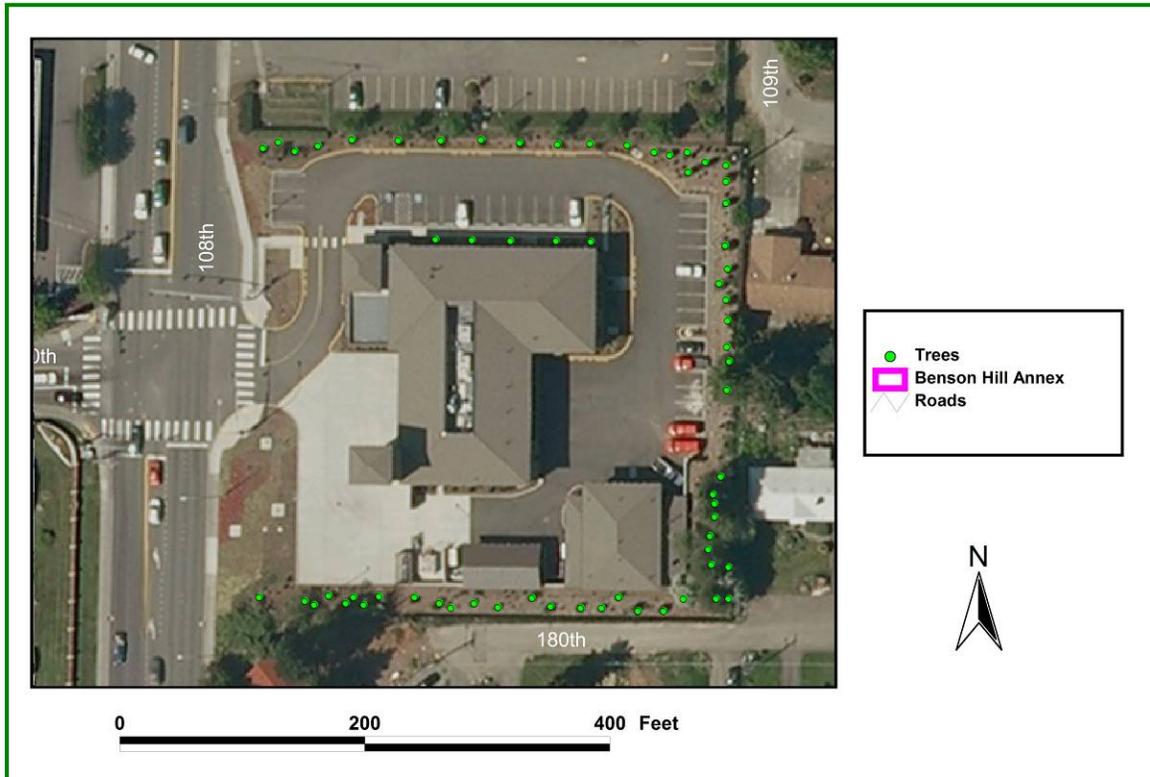
Table 23. Craig Property Trees Maintenance Priority

Maintenance Priority	Count	Percent of Total
Low	7	2.0%
Medium	2	0.6%
High	2	0.6%
None	342	96.9%
Total	353	100.0%

6. Fire Station #13

The inventory of trees at Fire Station #13, located at 10828 SE 108 Avenue, identifies 64 trees on the site. No vacant planting sites were inventoried at this site.

Figure 10. Overview of Trees at Fire Station #13



6.1 Tree Species

There are 9 genera and 11 different species at Fire Station #13. The most abundant species are *Thuja plicata*, western red cedar, and *Tsuga heterophylla*, western hemlock, both comprising more than 20% of the population. Table 24 highlights the genera totaling more than three percent of the trees.

Table 24. Tree Genera Totaling More Than 3% of the Population at Fire Station #13.

Genus	Count	Percent of Total
<i>Thuja</i>	15	23.4%
<i>Tsuga</i>	14	21.9%
<i>Calocedrus</i>	12	18.8%
<i>Acer</i>	8	12.5%
<i>Cornus</i>	7	10.9%
<i>Juniperus</i>	4	6.3%
<i>Amelanchier</i>	2	3.1%

6.2 Diameter/Age Groups

The trees at Fire Station #13 were recently planted and are less than 6 years of age. This indicates a tree population that is immature. Table 25 summarizes the DBH/age classes.

Table 25. Summary of Fire Station #13 DBH Classes and Approximate Ages

1 – 3"	% of	4 – 12"	% of	13 – 24"	% of	25 – 36"	% of	37"+	% of
1-6 yrs	Total	7-24 yrs	Total	25-50 yrs	Total	51-75 yrs	Total	76+ yrs	Total
49	76.6%	7	10.9%	5	7.8%	2	3.1%	1	1.6%

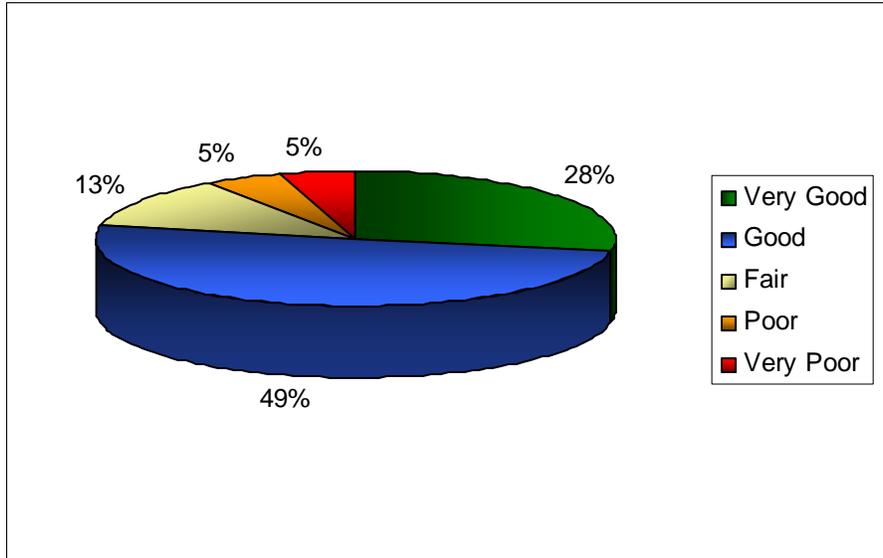
6.3 Tree Condition

Over 3/4 of the trees at Fire Station #13 are in good or better condition. Presumably, this is due to a high level of care. Only 4.7% (3 trees) are in very poor condition. Table 26 displays the condition rating percentages by class and Figure 9 (next page) displays the proportions.

Table 26. Number of Fire Station #13 Trees by Condition Rating Percentage

Very Good	% of Total	Good	% of Total	Fair	% of Total	Poor	% of Total	Very Poor	% of Total
18	28.1%	32	50.0%	8	12.5%	3	4.7%	3	4.7%

Figure 9: Fire Station #13 Condition Class Percentages



6.4 Valuation

Using the Guide for Plant Appraisal described in section 2.4, the trees at Fire Station #13 were appraised at a total approximate value of \$67,285. Because trees with a condition of less than 40% (very poor) are typically targeted for removal, their negligible value is not included.

Table 27. Fire Station #13 Totals and Values By Condition Class

Condition Class	Number of Trees	Total Tree Value	Average Value per Tree
40%	0	\$0	\$0
50%	3	\$25,403	\$8,468
60%	8	\$13,021	\$1,628
70%	16	\$23,919	\$1,495
80%	16	\$1,858	\$116
90%	16	\$2,003	\$125
100%	2	\$1,081	\$541
Total	61	\$67,285	\$1,103

6.5 Tree Problems

Of the 64 trees inventoried at Fire Station #13, only 22 trees were observed to have a recordable problem. There are 35 occurrences of different problems (Table 28).

Table 28: Occurrence of Tree Problems At Fire Station #13

Problem	Count	Percent of Occurrence
Structure	10	15.6%
Deadwood	8	12.5%
Co-dominant	6	9.4%
Decay	3	4.7%
Disease / Insect	2	3.1%
Ivy	2	3.1%
Not Identified	2	3.1%
Damage	1	1.6%
Topped	1	1.6%

6.6 Maintenance Recommendations

Based on their condition at the time of inventory, only 7 trees at Fire Station #13 are prescribed for treatment (Table 29).

Table 29. Fire Station #13 Treatment Recommendations Summary.

Recommended Treatment	Count	Percent of Total
Monitor	3	4.7%
Prune	3	4.7%
Remove	1	1.6%
None	57	89.1%
Total	64	100.0%

The majority of recommended maintenance treatment can be scheduled with routine work (Table 30). Only one tree at Fire Station #13 requires high priority work, a removal in very poor condition.

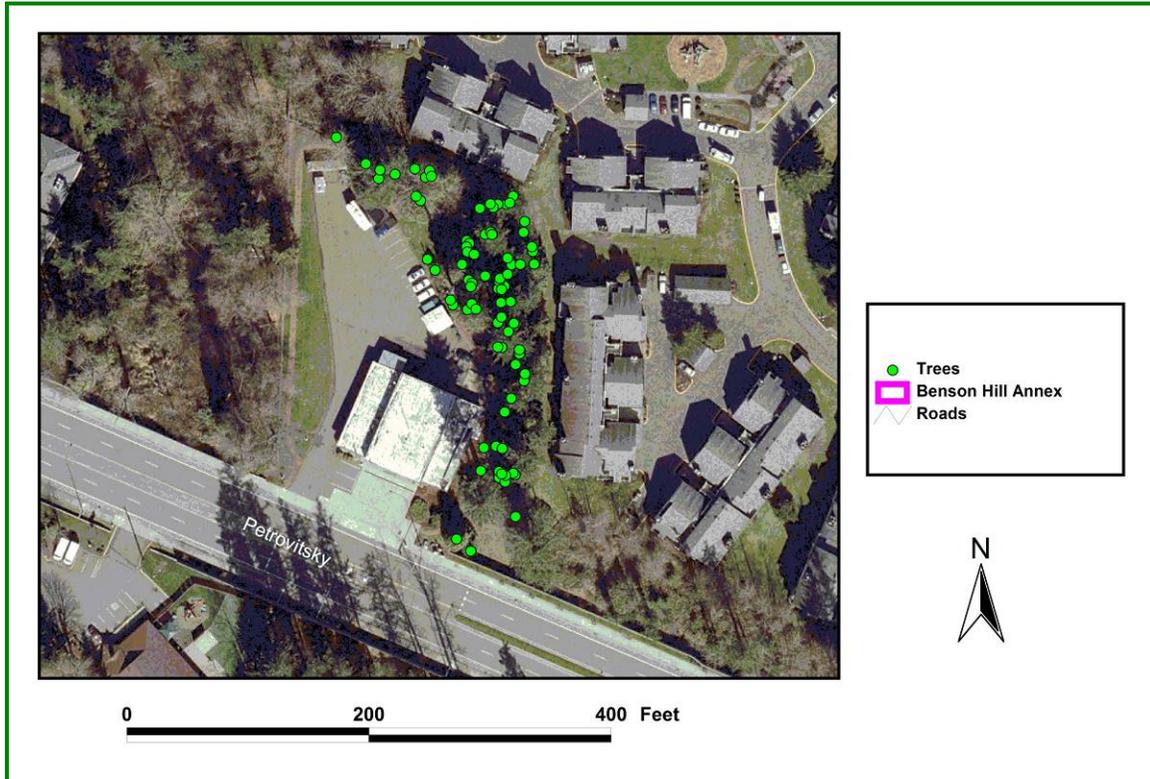
Table 30. Fire Station #13 Maintenance Priority.

Maintenance Priority	Count	Percent of Total
High	1	1.6%
Medium	3	4.7%
Low	60	93.8%
Total	64	100.0%

7. Fire Station #17

The inventory of trees at Fire Station # 17, located at 14810 Petrovitsky Road SE, identifies 83 trees on the site. No vacant planting sites were inventoried at this site.

Figure 10. Overview of Trees At Fire Station #17.



7.1 Tree Species

There are 7 genera and 8 different species at Fire Station #17. The most numerous species are *Thuja plicata*, western red cedar, *Acer* (maple; 2 species), and *Pseudotsuga menziesii*, Douglas-fir. Table 31 highlights the genera totaling more than three percent of the trees at Fire Station #17.

Table 31. Tree Genera Totaling More Than 3% of the Population of Fire Station #17

Genus	Count	Percent of Total
Thuja	31	37.3%
Acer	28	33.7%
Pseudotsuga	13	15.7%
Prunus	4	4.8%
Tsuga	3	3.6%

7.2 Diameter/Age Groups

The majority of trees at Fire Station #17 are less than 24 years old. Table 32 summarizes the DBH/age classes.

Table 32. Summary of Fire Station #17 DBH Classes and Approximate Ages

1 – 3"	% of	4 – 12"	% of	13 – 24"	% of	25 – 36"	% of	37"+	% of
1-6 yrs	Total	7-24 yrs	Total	25-50 yrs	Total	51-75 yrs	Total	76+ yrs	Total
21	23.5%	36	43.4%	17	20.5%	6	7.2%	3	3.6%

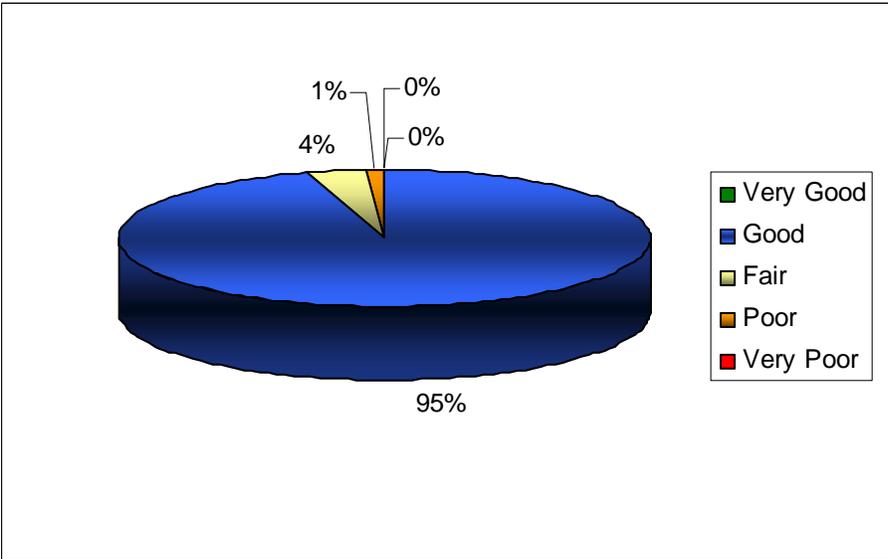
7.3 Tree Condition

Nearly all of the trees at Fire Station #17 are in good condition. None of the trees were observed to be in very poor condition, and only 1.2% are in poor condition. Table 33 displays the condition rating percentage ranges by class.

Table 33. Number of Fire Station #17 Trees by Condition Rating Percentage

Very Good	% of Total	Good	% of Total	Fair	% of Total	Poor	% of Total	Very Poor	% of Total
0	0%	79	95.2%	3	3.6%	1	1.2%	0	0%

Figure 11: Fire Station #17 Condition Class Percentages



7.4 Valuation

Using the Guide for Plant Appraisal described in section 2.4, the trees at Fire Station #17 were appraised at a total approximate value of \$402,208. Because trees with a condition of less than 40% (very poor) are typically targeted for removal, their negligible value is not included.

Table 34. Fire Station #17 Totals and Values By Condition Class

Condition Class	Number of Trees	Total Tree Value	Average Value per Tree
40%	1	\$4,532	\$4,532
50%	0	\$0	\$0
60%	3	\$36,646	\$12,215
70%	32	\$132,432	\$4,139
80%	47	\$228,598	\$4,864
90%	0	\$0	\$0
100%	0	\$0	\$0
Total	83	\$402,208	\$4,846

7.5 Tree Problems

Of the 83 trees inventoried at Fire Station #17, only 18 trees were observed to have a recordable problem. There are 24 occurrences of different problems, summarized in Table 35.

Table 35: Fire Station #17 Problems Tree Count

Problem	Count	Percent of Occurrence
Structure	9	10.8%
Decay	6	7.2%
Co-dominant	4	4.8%
Deadwood	2	2.4%
Root Problem	2	2.4%
Disease / Insect	1	1.2%

7.6 Maintenance Recommendations

Based on their condition at the time of inventory, only two trees at Fire Station #17 are prescribed for treatment.

Table 36. Fire Station #17 Treatment Recommendations Summary

Recommended Treatment	Count	Percent of Total
Monitor	1	1.2%
Prune	1	1.2%
None	81	97.6%
Total	83	100.0%

The majority of recommended maintenance treatment can be scheduled with routine work. Only one tree at Fire Station #17 was found to require high priority work, a tree with health issues requiring monitoring by the City Forester.

Table 37. Fire Station #17 Maintenance Priority

Maintenance Priority	Count	Percent of Total
High	1	1.2%
Medium	0	0%
Low	82	98.8%
Total	83	100.0%

8. Summary Observations

The inventory and assessment of public trees in the Benson Hill neighborhood combined with Renton's existing tree inventory demonstrates a substantial increase in Renton's tree population. Many of these trees are determined to be in a good condition such that routine care may be all that is necessary to improve the value and functional benefits they provide to the community.

The results of this project provide some immediate and long-term benefits to the city. First, the City of Renton has received a comprehensive digital and spatially accurate map locating all trees within the Benson Hill area. By having mapped the trees, other city agencies, community groups and others can reference the existing green infrastructure as part of planning and right-of-way maintenance for example.



The second outcome of this project is prioritized maintenance recommendations.. These priorities help inform managers to mitigate tree hazards, improve public safety and make efficient budget decisions. Although many trees inventoried did not require immediate attention, those that were evaluated for high priority mitigation should receive prompt attention and a follow-up safety assessment.

Thirdly, identification of existing vacant planting spaces assists with showing where the street tree canopy can be increased and an amount to budget for planting these spaces.

Fourthly, the city of Renton has received a comprehensive breakdown of all species within the Benson Hill neighborhood that helps to assess potential risks to the health of the urban forest. Besides the aesthetic appeal of tree diversity, having a mixture of trees in the urban forest can minimize the potential impacts of diseases or insect outbreaks on the overall forest population.

Finally, an appraised value for all the trees in the Benson Hill neighborhood allows the city to consider the economic contribution each tree provides to the community. This appraised value data can be readily used to assess any compensation that may be due to the city as a result of any unauthorized or negligent acts that lead to tree damage or removal. As an example, the effect of tree topping, which is a harmful practice that is still performed on many trees, can be controlled and reduced when the effect of this practice is realized in the quantified change of the appraised value for the impacted tree.

Trees are dynamic living organisms, and as such, the value of the data captured in this inventory will decrease over time without performing routine updates to the data to reflect the changes. It is recommended that the city maintain integrated data management processes within their urban forestry program that supports routine updates to the inventory data. Most commonly this is achieved during any prescribed maintenance activities on the trees, or through a routine inspection process.

The city’s trees are a major component to the green infrastructure and, unlike many other municipal assets they will appreciate in value over time. Through active inspection and management of this asset, the City of Renton will enjoy the increasing environmental, economic and aesthetic benefits that the trees provide.

As Table 38 demonstrates, a significant increase in the city’s public trees has occurred with the Benson Hill annexation area, especially at the management unit level for street trees, an increase of 70%.

Table 38. Summary of City of Renton Public Property Tree Inventories by General Designation

	Vacant Planting Sites*	Street Trees	Park Trees	Open Space Trees	Fire Stations	Southeast Mgt. Unit (Street Trees)	Tree Totals
2007 Inventory	1,740	4,220	20,000	105,367	0	716	129,587
2009 Inventories	195	1,677	370**	702***	147	1,677	2,896
Totals	1,935	5,897	20,370	106,069	147	2,393*	132,483

**Not part of tree totals*

***Cascade Park*

****Edlund and Craig Properties*

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Appendix A: Street Trees by Genus and Species

Scientific Name	Common Name	Count	Percent of Total
ABIES BALSAMEA	Balsam fir	1	0.1%
ABIES GRANDIS	Grand fir	2	0.1%
ACER CIRCINATUM	Vine maple	13	0.8%
ACER GINNALA	Amur maple	1	0.1%
ACER JAPONICUM	Fullmoon maple	1	0.1%
ACER MACROPHYLLUM	Bigleaf maple	27	1.6%
ACER PALMATUM	Japanese maple	19	1.1%
ACER PLATANOIDES	Norway maple	16	1.0%
ACER RUBRUM	Red maple	54	3.2%
ACER SACCHARINUM	Silver maple	1	0.1%
AESCULUS HIPPOCASTAN	Horse chestnut	2	0.1%
AILANTHUS ALTISSIMA	Tree of heaven	1	0.1%
ALBIZIA JULIBRISSIN	Silktree or Mimosa	1	0.1%
ALNUS RUBRA	Red alder	15	0.9%
ARBUTUS MENZIESII	Pacific madrone	3	0.2%
BETULA PAPYRIFERA	Paper birch	11	0.7%
BETULA PENDULA	European white birch	11	0.7%
CEDRUS ATLANTICA	Atlas cedar	1	0.1%
CEDRUS DEODARA	Deodara cedar	5	0.3%
CERCIDIPHYLLUM JAPON	Katsura tree	2	0.1%
CERCIS CANADENSIS	Eastern redbud	5	0.3%
CHAMAECYPARIS LAWSON	Port orford cedar	6	0.4%
CHAMAECYPARIS NOOTKATENSIS	Nootka cypress	5	0.3%
CHAMAECYPARIS PISIFERA	Sawara false cypress	6	0.4%
CORNUS FLORIDA	Flowering dogwood	15	0.9%
CORNUS KOUSA	Kousa dogwood	4	0.2%
CORNUS NUTTALLII	Pacific dogwood	4	0.2%
CORYLUS AVELLANA	European filbert	5	0.3%
CORYLUS COLURNA	Turkish filbert	7	0.4%
COTINUS OBOVATUS	American smoke tree	1	0.1%
CRATAEGUS LAEVIGATA	English hawthorne	2	0.1%
CRYPTOMERIA JAPONICA	Japanese cedar	3	0.2%
CUPRESSUS GLABRA	Smooth Arizona cypress	20	1.2%
CUPRESSUS LEYLANDII	Leyland cypress	9	0.5%
CUPRESSUS SEMPERVIRENS	Italian cypress	3	0.2%
EUCOMMIA ULMOIDES	Hardy rubber tree	1	0.1%
FITZROYA CUPRESSOIDES	Chilean false larch	1	0.1%
FRAXINUS AMERICANA	White ash	16	1.0%
FRAXINUS LATIFOLIA	Oregon ash	6	0.4%
FRAXINUS ORNUS	Flowering ash	1	0.1%
FRAXINUS OXYCARPA	Desert or Raywood ash	2	0.1%
ILEX AQUIFOLIUM	English holly	10	0.6%
JUGLANS SPECIES	Walnut species	1	0.1%

Scientific Name	Common Name	Count	Percent of Total
JUNIPERUS CHINENSIS	Chinese juniper	1	0.1%
LABURNUM ALPINUM	Scotch laburnum	3	0.2%
LABURNUM X WATERERI	Goldenchain	1	0.1%
LIQUIDAMBAR STYRACIFLUA	American sweetgum	53	3.2%
MAGNOLIA X SOULANGIANA	Saucer magnolia	1	0.1%
MALUS FLORIBUNDA	Japanese flowering crabapple	1	0.1%
MALUS FUSCA	Oregon crabapple	37	2.2%
MALUS MAGDEBURGENSIS	Flowering crabapple	3	0.2%
MALUS PUMILA	Common apple	1	0.1%
MALUS SARGENTII	Sargent crabapple	1	0.1%
NOT IDENTIFIED TREE	Unknown (dead)	1	0.1%
PICEA ABIES	Norway spruce	5	0.3%
PICEA ENGELMANNII	Engelmann spruce	2	0.1%
PICEA GLAUCA	White spruce	2	0.1%
PICEA KOYAMOI	Koyamoi spruce	7	0.4%
PICEA PUNGENS	Colorado spruce	22	1.3%
PINUS SPECIES	Pine species	11	0.7%
PINUS BANKSIANA	Jack pine	1	0.1%
PINUS CONTORTA	Lodgepole pine	4	0.2%
PINUS DENSIFLORA	Japanese red pine	4	0.2%
PINUS NIGRA	Austrian pine	10	0.6%
PINUS PARVIFLORA	Japanese white pine	2	0.1%
PINUS RESINOSA	Red pine	5	0.3%
PINUS STROBUS	Eastern white pine	2	0.1%
PINUS SYLVESTRIS	Scotch pine	1	0.1%
PINUS THUNBERGIANA	Japanese black pine	7	0.4%
POPULUS NIGRA ITALICA	Italian poplar	10	0.6%
POPULUS TREMULOIDES	Quaking aspen	3	0.2%
POPULUS TRICHOCARPA	Black cottonwood	3	0.2%
PRUNUS	Cherry -other	14	0.8%
PRUNUS CERASIFERA	Purple leaf plum	157	9.4%
PRUNUS CERASUS	Sour cherry	1	0.1%
PRUNUS PERSICA	Peach	1	0.1%
PRUNUS SARGENTII	Sargent cherry	33	2.0%
PRUNUS SERRULATA	Japanese flowering cherry	80	4.8%
PRUNUS SUBHIRTELLA	Higan cherry	5	0.3%
PRUNUS VIRGINIANA	Choke cherry	2	0.1%
PRUNUS X YEDOENSIS	Akebono cherry	6	0.4%
PSEUDOTSUGA MENZIESII	Douglas-fir	147	8.8%
PYRUS CALLERYANA	Callery pear	57	3.4%
QUERCUS PALUSTRIS	Pin oak	5	0.3%
RHUS TYPHINA	Staghorn sumac	7	0.4%
ROBINIA PSEUDOACACIA	Black locust	4	0.2%
SALIX BABYLONICA	Weeping willow	2	0.1%
SALIX LUCIDA	Pacific willow	1	0.1%
SEQUIADENDRON GIGANTEUM	Giant sequoia	1	0.1%

Scientific Name	Common Name	Count	Percent of Total
SORBUS AMERICANA	American mountainash	6	0.4%
STYRAX JAPONICUS	Japanese snowbell	1	0.1%
SYRINGA VULGARIS	Common lilac	1	0.1%
TAXUS BREVIFOLIA	Pacific yew	1	0.1%
THUJA OCCIDENTALIS	American arborvitae	524	31.2%
THUJA PLICATA	Western redcedar	63	3.8%
THUJOPSIS DOLABRATA	Hiba arborvitae	2	0.1%
TILIA CORDATA	Little-leaf linden	24	1.4%
TSUGA HETEROPHYLLA	Western hemlock	8	0.5%

Appendix B: Edlund Property Trees By Genus and Species

Scientific Name	Common Name	Count	Percent of Total
ACER MACROPHYLLUM	Bigleaf maple	20	5.7%
ACER PALMATUM	Japanese maple	1	0.3%
ALNUS RUBRA	Red alder	147	42.1%
BETULA PENDULA	European white birch	20	5.7%
CARYA OVATA	Shagbark hickory	1	0.3%
CHAMAECYPARIS NOOTKATENSIS	Nootka cypress	16	4.6%
CORYLUS AVELLANA	European filbert	1	0.3%
CRATEGUS LAVALLEI	Carriere hawthorn	7	2.0%
FICUS CARICA	Edible fig	1	0.3%
GLEDITSIA TRIACANTHOS	Honeylocust	1	0.3%
JUGLANS CINEREA	Butternut	1	0.3%
JUGLANS REGIA	English walnut	4	1.1%
JUNIPERUS VIRGINIANA	Eastern redcedar	3	0.9%
MAGNOLIA X SOULANGIANA	Saucer magnolia	2	0.6%
MALUS DOMESTICA	Domestic apple	6	1.7%
MALUS FUSCA	Oregon crabapple	2	0.6%
MALUS MAGDEBURGENSIS	Flowering crabapple	2	0.6%
MALUS SPECIES	Apple species	6	1.7%
NOT IDENTIFIED - CONIFER	Unknown conifer	1	0.3%
NOT IDENTIFIED TREE	Unknown (dead)	1	0.3%
PICEA PUNGENS	Colorado spruce	1	0.3%
PINUS NIGRA	Austrian pine	4	1.1%
PINUS VIRGINIANA	Virginia pine	3	0.9%
PLATANUS X ACERIFOLIA	London plane tree	4	1.1%
POPULUS TREMULOIDES	Quaking aspen	6	1.7%
POPULUS TRICHOCARPA	Black cottonwood	15	4.3%
PRUNUS	Cherry -other	2	0.6%
PRUNUS CERASIFERA	Purple leaf plum	8	2.3%
PRUNUS SERRULATA	Japanese flowering cherry	7	2.0%
PRUNUS VIRGINIANA	Choke cherry	1	0.3%
PSEUDOTSUGA MENZIESII	Douglas-fir	15	4.3%
PYRUS CALLERYANA	Callery pear	4	1.1%
QUERCUS ALBA	White oak	1	0.3%
QUERCUS RUBRA	Northern red oak	1	0.3%
RHAMNUS PURSHIANA	Cascara	1	0.3%
RHUS TYPHINA	Staghorn sumac	1	0.3%
SALIX ALBA	White willow	5	1.4%
SALIX SCOULERIANA	Scouler willow	3	0.9%
SORBUS AMERICANA	American mountainash	5	1.4%
SORBUS AUCUPARIA	European mountainash	6	1.7%
THUJA PLICATA	Western redcedar	11	3.2%
TSUGA HETEROPHYLLA	Western hemlock	1	0.3%
ULMUS PUMILA	Siberian elm	1	0.3%

Appendix C: Craig Property Trees By Genus and Species

Scientific Name	Common Name	Count	Percent of Total
ACER MACROPHYLLUM	Bigleaf maple	174	49.3%
ALNUS RUBRA	Red alder	5	1.4%
PINUS NIGRA	Austrian pine	1	0.3%
POPULUS TRICHOCARPA	Black cottonwood	12	3.4%
PSEUDOTSUGA MENZIESII	Douglas fir	39	11.0%
THUJA OCCIDENTALIS	American arborvitae	1	0.3%
THUJA PLICATA	Western redcedar	108	30.6%
THUJOPSIS DOLABRATA	Hiba arborvitae	1	0.3%
TSUGA HETEROPHYLLA	Western hemlock	12	3.4%

Appendix D: Fire Station #13 Trees By Genus and Species

Scientific Name	Common Name	Count	Percent of Total
ACER CIRCINATUM	Vine maple	7	10.9%
ACER PALMATUM	Japanese maple	1	1.6%
AMELANCHIER ARBOREA	Downy serviceberry	2	3.1%
CALOCEDRUS DECURRANS	Incense cedar	12	18.8%
CORNUS FLORIDA	Flowering dogwood	5	7.8%
CORNUS NUTTALLII	Pacific dogwood	2	3.1%
CRATEGUS LAVALLEI	Carriere hawthorn	1	1.6%
JUNIPERUS VIRGINIANA	Eastern redcedar	4	6.3%
PRUNUS	Cherry -other	1	1.6%
THUJA PLICATA	Western redcedar	15	23.4%
TSUGA HETEROPHYLLA	Western hemlock	14	21.9%

Appendix E: Fire Station #17 Trees By Genus and Species

Scientific Name	Common Name	Count	Percent of Total
ACER CIRCINATUM	Vine maple	9	10.8%
ACER MACROPHYLLUM	Bigleaf maple	19	22.9%
BETULA PENDULA	European white birch	2	2.4%
PRUNUS EMARGINATA	Bitter cherry	4	4.8%
PSEUDOTSUGA MENZIESII	Douglas-fir	13	15.7%
RHAMNUS PURSHIANA	Cascara	2	2.4%
THUJA PLICATA	Western redcedar	31	37.3%
TSUGA HETEROPHYLLA	Western hemlock	3	3.6%

Appendix F: Cascade Park Tree Inventory Report Summary

Summary

The City of Renton, Washington, engaged the services of TreeResource, Incorporated to perform a physical inventory of the trees in Cascade Park. Cascade Park, located at 16165 126th Avenue SE, in the Benson Hill neighborhood. The Benson Hill neighborhood was annexed into the City of Renton in March 2008. It was about that time when Cascade Park was purchased from King County.

TreeResource collected data on each tree within the park boundaries, identified high risk trees with paint, trees recommended for immediate removal, and indicated on a park survey the approximate location of each tree in the park. The data collected was transferred to an Excel spreadsheet. This report provides a summary of the information collected.

Current stand conditions suggest a natural succession occurring throughout the park where pioneer species predominate. The park has thirteen (13) trees recommended for immediate removal. Most of the trees identified for removal can be found adjacent to surrounding homes or near the walking paths in the park. Also, there are a number of trees with ivy attached to the trunks and these have been noted for ivy removal. There are many trees that are in poor condition, but with no recommendation for action, due to a lack of targets and these are considered wildlife trees. Continued tree care should be limited to some minor pruning, invasive removal and monitoring unless otherwise noted in this report.

There are a total of 370 trees of which 195 are black cottonwood trees representing 53% of the total species composition. Other pioneer species include willow, alder, cherry and poplar. There are scattered Douglas fir trees that comprise 11% of the species. Overall, the average age of the dominant trees is 50 years old.

Appendix G: Executive Summary of the 2007 Tree Inventory Report



Public Property Tree Inventory and Assessment Report
March 2007

Executive Summary

The City of Renton has a diverse urban forest that includes trees growing along street rights-of-way, in parks and natural areas, in private yards, on commercial and industrial properties, and on public and private woodlands and wetlands. As a whole, these trees contribute to the quality of life in Renton and create a favorable climate for residents to live, work and play.

“The tree inventory is a proactive management tool. It is the cornerstone of a long-term urban forestry maintenance and management program. Tree inventories are fundamental to the development of comprehensive, sustainable, and appropriate arboricultural and management practices.”¹ To get an idea of the quantity and diversity of trees in the urban forest, and to begin planning for their care, the City commissioned a public property inventory of street, park and natural area trees in 2003. This report provides a summary of the inventory with detailed information found in the appendix.

A tree inventory is important for many reasons including:

- Determining the quantity and composition of trees;
- Understanding the quality, the health and condition of trees;

¹ The Tree Inventory as a Proactive Management Tool, M. Duntemann & S. Gasperini, *City Trees*, March/April 2007, Volume 43, No. 2, page 6.

- Assessing the real estate value of trees;
- Calculating the environmental benefits of trees;
- Finding the location of trees;
- Learning about the maintenance needs of trees;
- Establishing risk management goals for trees;
- Informing residents of their tree resources;
- Developing a management plan to maintain trees;
- Discovering new tree planting opportunities and;
- Beginning point for a comprehensive urban forestry program.

A tree inventory is a dynamic process because all trees grow, becoming larger with time. In addition, the inventory changes as new trees are planted, others are pruned and some removed. Annexations can affect an inventory when new areas are added, increasing trees in the community. Since 2003, this inventory was updated to reflect the additions of the Panther Creek Wetlands and Tonkin Park – areas not included in the original inventory.

Only trees found on street rights-of-way and City-owned properties were considered in the inventory. Trees found on private lands were not inventoried. The general categories of trees represented are street trees, park trees and natural area trees. Information about street and park trees was gathered using global positioning satellite (GPS) equipment. This equipment pinpoints a tree on land using coordinates triangulated and transmitted by satellites and is accurate within a few millimeters. The “tree points” were plotted onto aerial photographs called orthophotographs used as a scalable base map. Each tree on the inventory base map is represented by a green tree symbol. The LandInfo Parcel Map’s program within the City’s intranet system, known as RentonNet, provides a visual location of the tree and inventory information that can be viewed on a computer.

Natural area trees were inventoried differently than street and park trees without using GPS equipment. Instead one-tenth acre sample plots were established, tree information gathered and the data extrapolated to provide a total tree estimate for the wooded portion of each area. Tree species and number of trees were tallied for the natural area inventory.

Street and park tree information collected during the inventory included tree species, diameter, condition, maintenance needs, tree problems and more. Appraisal data was gathered to apply a monetary value to trees. Street tree data was collected by six management units presented in the document, “Parks, Recreation and Open Space Implementation Plan.”

This report is divided into four sections:

- The Introduction (Page 6)

- Street Tree Inventory (Page 10)
- Park Tree Inventory (Page 23)
- Natural Area Tree Inventory (Page 28) and;
- The Appendix (Page 34).

The Street Tree Inventory section defines street trees as those within the public right-of-way. These are trees growing either in sidewalk cutouts, in planting strips between sidewalk and curb, in boulevards or in other landscaped islands. Renton has 4,220 street trees within 205 miles of street rights-of-way. The Community Services Department - Parks Division maintains approximately 1,000 of these street trees and the Planning/Building/Public Works Department has responsibility for the remainder.

A reason for collecting inventory information is to determine the diversity of species being planted, with greater diversity being the goal. Reliance on too many of one species or genus has proven to be costly in the past when an insect or disease epidemic affects an entire city's tree population consisting of one species or genus of tree. In Renton, 35% of the street tree population are maple trees. Researchers recommend that only 10% of the total street tree population be comprised of a particular genus or species to avoid problems such as those experienced with American elms caused by Dutch Elm Disease in the later half of the 20th Century and the recent outbreak of emerald ash borer on ash trees in the Lake States.²

The inventory indicates Renton has a relatively young street tree population with 82% of the trees less than 25 years old. Sixty percent (60%) are in fair to excellent condition. Renton's street tree population has a value of approximately \$6.6 million. Improving the existing street tree population through active maintenance such as planting, pruning, removing tree-staking wire, mulching and other practices can increase condition, health and value of trees. Identifying unsafe trees in the inventory and removing them before they cause problems is important - 215 trees were identified for potential removal. Planting opportunities abound – the inventory discovered 1,740 vacant sites along streets within planting strips between sidewalks and curbs.

The Park Tree Inventory section identifies 2,918 trees that were planted and another 17,082 trees that are remnant forest trees found in small groves within parks. In developed areas of established parks, maples (38%) are more prevalent than other species followed by pines (12%). Park trees tended to be older, larger, in better condition and with fewer problems than street trees. Because of their larger average size and better condition, park trees present a greater value per tree than street trees. Total value of the planted landscape trees found in parks is \$9.7 million.

² R.W. Miller. 1997. *Urban Forestry: Planning and Managing Urban Greenspaces*. Prentice Hall

105,367 trees are included in The Natural Area Tree Inventory section. Natural areas comprise 769 acres; the areas inventoried comprised 401 acres of fully wooded portions or 52% of total natural area acres. The remaining acreage had few if any trees - comprised of wetlands, fields and other open space lacking groupings of trees. Natural areas are comprised of:

- Bigleaf maple - 31%
- Cottonwood - 20%
- Alder - 18%
- Hemlock 9%
- Douglas fir 9%
- Western redcedar - 7%
- Others – 6%

The number of natural area trees per acre is considerably lower than is typical for many Washington forests, a result of having been logged in the past but not replanted. Inferior species such as cottonwood and invasive plants like Himalayan blackberry have dominated and have prevented more desirable species from becoming established such as, Oregon ash, Garry Oak, Douglas fir, Western red cedar and Western hemlock. However, the land remains valuable for recreation, wildlife habitat, and watershed. The current timber value of trees in natural areas is approximately \$1.2 million.

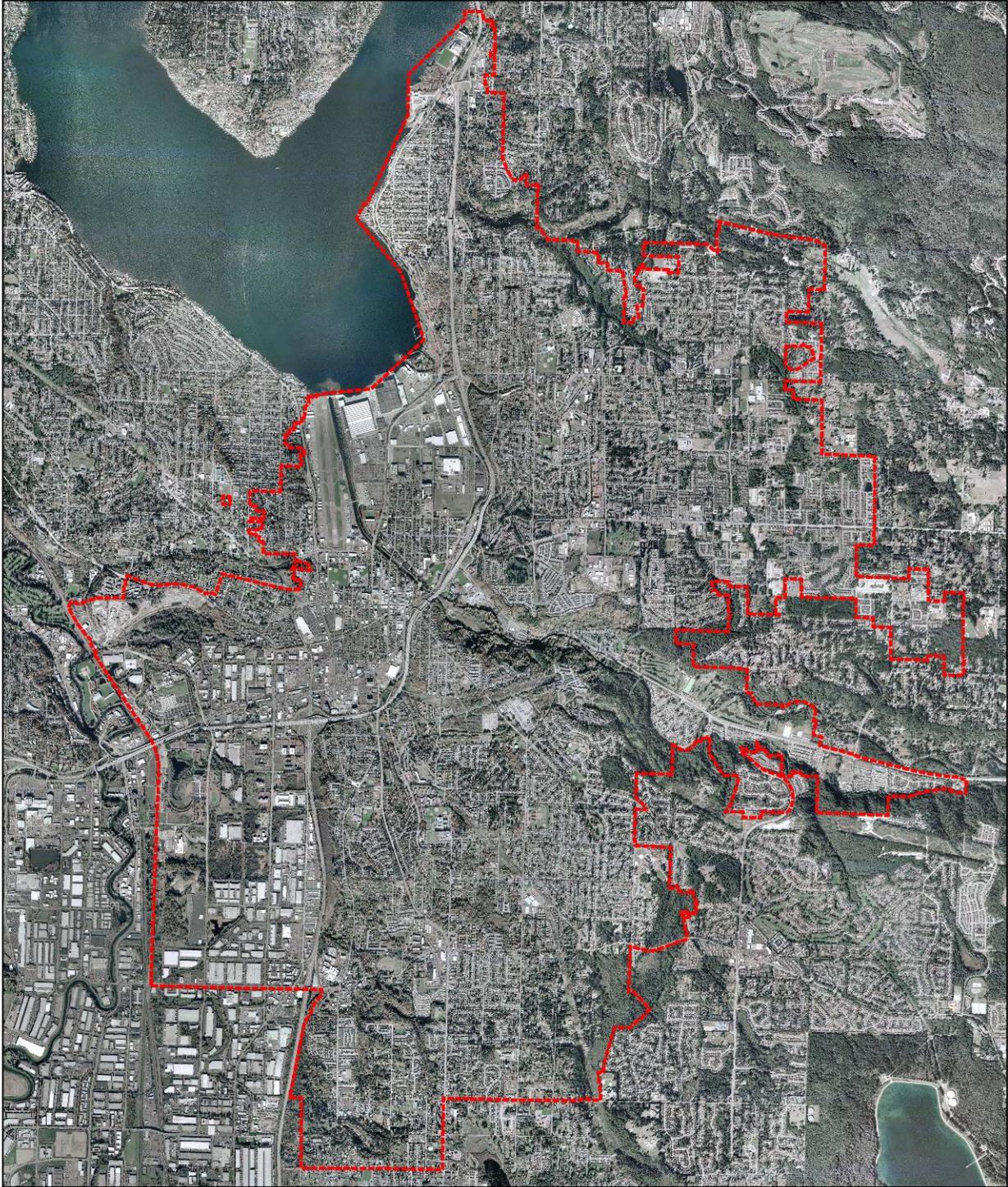


In summary, 4,220 street trees, 20,000 park trees and 105,367 natural area trees exist. These 129,587 trees present many challenges to those managing this valuable resource. The tree inventory provides information that should prove useful to managers for increasing the value of the City's urban forest resource and managing it more wisely into the future. The inventory is the

“springboard” for an urban forest management plan which would address the maintenance recommendations found in the inventory.

Appendix H: City Aerial Photo 2007

City of Renton



PUBLIC WORKS DEPARTMENT
Gregg Zimmerman, Administrator
Technical Services
B. MacOrvie, D. Vianesi
Printed on July 27, 2009

This document is a graphic representation, not guaranteed to survey accuracy, and is based on the best information available as of the date shown. This map is intended for City display purposes only.

 Renton City Limits

0 1,200 2,400'



Notice of Disclaimer

Assessment data provided by Davey Resource Group is based on data recorded at the time of inspection. Davey Resource Group is not responsible for discovery or identification of risks observed or recorded after field data was recorded. Records may not remain accurate after assessment due to variable deterioration of assessment material. Davey Resource Group provides no warranty with respect to the fitness of the urban forest for any use or purpose whatsoever.