



Oregon  
Theodore R. Kulongoski, Governor

Department of Land Conservation and Development  
635 Capitol Street, Suite 150  
Salem, OR 97301-2540  
(503) 373-0050  
Fax (503) 378-5518  
www.lcd.state.or.us



NOTICE OF ADOPTED AMENDMENT

02/05/2013

TO: Subscribers to Notice of Adopted Plan  
or Land Use Regulation Amendments

FROM: Plan Amendment Program Specialist

SUBJECT: City of Tigard Plan Amendment  
DLCD File Number 003-11

The Department of Land Conservation and Development (DLCD) received the attached notice of adoption. Due to the size of amended material submitted, a complete copy has not been attached. A Copy of the adopted plan amendment is available for review at the DLCD office in Salem and the local government office.

Appeal Procedures\*

DLCD ACKNOWLEDGMENT or DEADLINE TO APPEAL: Thursday, February 21, 2013

This amendment was submitted to DLCD for review prior to adoption pursuant to ORS 197.830(2)(b) only persons who participated in the local government proceedings leading to adoption of the amendment are eligible to appeal this decision to the Land Use Board of Appeals (LUBA).

If you wish to appeal, you must file a notice of intent to appeal with the Land Use Board of Appeals (LUBA) no later than 21 days from the date the decision was mailed to you by the local government. If you have questions, check with the local government to determine the appeal deadline. Copies of the notice of intent to appeal must be served upon the local government and others who received written notice of the final decision from the local government. The notice of intent to appeal must be served and filed in the form and manner prescribed by LUBA, (OAR Chapter 661, Division 10). Please call LUBA at 503-373-1265, if you have questions about appeal procedures.

\*NOTE: The Acknowledgment or Appeal Deadline is based upon the date the decision was mailed by local government. A decision may have been mailed to you on a different date than it was mailed to DLCD. As a result, your appeal deadline may be earlier than the above date specified. NO LUBA Notification to the jurisdiction of an appeal by the deadline, this Plan Amendment is acknowledged.

Cc: Gary Pagenstecher, City of Tigard  
Gordon Howard, DLCD Urban Planning Specialist  
Anne Debbaut, DLCD Regional Representative  
Amanda Punton, DLCD Natural Resources Specialist

<paa> YA



FORM 2

DLCD

# Notice of Adoption

In person  electronic  mailed

DATE  
STAMP

DEPT OF

FEB 01 2013

LAND CONSERVATION  
AND DEVELOPMENT

For Office Use Only

This Form 2 must be mailed to DLCD within **20-Working Days after the Final Ordinance is signed** by the public Official Designated by the jurisdiction and all other requirements of ORS 197.615 and OAR 660-018-000

Jurisdiction: **City of Tigard**

Local file number: **CPA 2011-00004**

Date of Adoption: **January 22, 2012**

Date Mailed: **January 31, 2012**

Was a Notice of Proposed Amendment (Form 1) mailed to DLCD?  Yes  No Date: 12/20/11

Comprehensive Plan Text Amendment

Comprehensive Plan Map Amendment

Land Use Regulation Amendment

Zoning Map Amendment

New Land Use Regulation

Other: **"Significant Tree Groves" Overlay**

Summarize the adopted amendment. Do not use technical terms. Do not write "See Attached".

Comprehensive Plan amendment incorporating the "Significant Tree Groves" map and Tigard Development Code (Title 18) amendments to Chapters 18.115, 18.120, 18.330, 18.350, 18.360, 18.370, 18.390, 18.530, 18.610, 18.620, 18.630, 18.640, 18.715, 18.745, 18.790, and 18.798.

Tigard Municipal Code amendments to title and chapters 1.16, 6.01, 6.02, 7.40, 8.02 thru 8.20, 9.06, and 9.08 are proposed in support of the Title 18 amendments. In addition, the Urban Forestry Manual was adopted under administrative procedures in TMC 2.04.

Does the Adoption differ from proposal? **Yes.**

For Planning Commission changes please see UFCR Volume V, page 3

For City Council changes please see Attachment B to Ordinance 12-09 and 12-11

For City Council changes to the Administrative Rules please see Attachment B to the Administrative Rules

Plan Map Changed from:

to:

Zone Map Changed from:

to:

Location:

Acres Involved:

Specify Density: Previous:

New:

Applicable statewide planning goals:

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>
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Was an Exception Adopted?  YES  NO

Did DLCD receive a Notice of Proposed Amendment...

35-days prior to first evidentiary hearing?

Yes  No

If no, do the statewide planning goals apply?

Yes  No

If no, did Emergency Circumstances require immediate adoption?

Yes  No

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**DLCD file No.** 003-11 (19111) [17351]

Please list all affected State or Federal Agencies, Local Governments or Special Districts:

Metro – Land Use and Planning, Washington County Department of Land Use and Transportation, U.S. Army Corps of Engineers, Oregon Department of State Lands, Oregon Department of Land Conservation and Development, Oregon Department of Environmental Quality, Tualatin Valley Fire and Rescue, Tigard-Tualatin School District 23J, the cities of Tualatin, Lake Oswego, Beaverton, King City and Durham, Oregon Department of Transportation, Clean Water Services, Oregon Department of Fish and Wildlife

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Local Contact: **Marissa Daniels**

Phone: (503) 718-2428 Extension:

Address: 13125 SW Hall Blvd.

Fax Number: 503-718-2748

City: **Tigard, OR**

Zip: 97224

E-mail Address: [marissa@tigard-or.gov](mailto:marissa@tigard-or.gov)

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## ADOPTION SUBMITTAL REQUIREMENTS

**This Form 2 must be received by DLCD no later than 20 working days after the ordinance has been signed by the public official designated by the jurisdiction to sign the approved ordinance(s) per ORS [197.615](#) and [OAR Chapter 660, Division 18](#)**

1. This Form 2 must be submitted by local jurisdictions only (not by applicant).
2. When submitting the adopted amendment, please print a completed copy of Form 2 on light **green paper if available**.
3. Send this Form 2 and one complete paper copy (documents and maps) of the adopted amendment to the address below.
4. Submittal of this Notice of Adoption must include the final signed ordinance(s), all supporting finding(s), exhibit(s) and any other supplementary information ([ORS 197.615](#)).
5. Deadline to appeals to LUBA is calculated **twenty-one (21) days** from the receipt (postmark date) by DLCD of the adoption ([ORS 197.830 to 197.845](#)).
6. In addition to sending the Form 2 - Notice of Adoption to DLCD, please also remember to notify persons who participated in the local hearing and requested notice of the final decision. ([ORS 197.615](#)).
7. Submit **one complete paper copy** via United States Postal Service, Common Carrier or Hand Carried to the DLCD Salem Office and stamped with the incoming date stamp.
8. Please mail the adopted amendment packet to:

**ATTENTION: PLAN AMENDMENT SPECIALIST  
DEPARTMENT OF LAND CONSERVATION AND DEVELOPMENT  
635 CAPITOL STREET NE, SUITE 150  
SALEM, OREGON 97301-2540**

9. **Need More Copies?** Please print forms on **8½ -1/2x11 green paper only if available**. If you have any questions or would like assistance, please contact your DLCD regional representative or contact the DLCD Salem Office at (503) 373-0050 x238 or e-mail [plan.amendments@state.or.us](mailto:plan.amendments@state.or.us).

**CITY OF TIGARD, OREGON  
TIGARD CITY COUNCIL  
ORDINANCE NO. 12- 09**

AN ORDINANCE TO ADOPT DEVELOPMENT CODE AMENDMENT (DCA 2011-00002) TO AMEND CHAPTERS 18.115, 18.120, 18.310, 18.350, 18.360, 18.370, 18.390, 18.610, 18.620, 18.630, 18.640, 18.715, 18.745, 18.775, 18.790 AND 18.798 OF THE COMMUNITY DEVELOPMENT CODE.

AS AMENDED BY THE TIGARD CITY COUNCIL ON  
NOVEMBER 27, 2012. SEE EXHIBIT B ATTACHED.

WHEREAS, on June 3, 2008 the Tigard City Council adopted an Urban Forest section as part of the Comprehensive Plan in order to establish broad goals and policies to guide the long-term management and enhancement of the urban forest; and

WHEREAS, on August 10, 2010 the Tigard City Council readopted the Urban Forest section as part of the Comprehensive Plan in order to provide more detailed findings to further support and explain the rationale for the city's urban forestry goals and policies; and

WHEREAS, Policy 2.2.1 of the Tigard Comprehensive Plan requires the city to periodically update policies, regulations and standards regarding the city's urban forestry program; and

WHEREAS, Policy 2.2.11 of the Tigard Comprehensive Plan requires the city to develop and implement a citywide Urban Forestry Master Plan to guide the update of the city's urban forestry program; and

WHEREAS, on November 10, 2009, the Tigard City Council adopted Resolution 09-69 accepting the City of Tigard's Urban Forestry Master Plan; and

WHEREAS, the accepted Urban Forestry Master Plan analyzed the past and present conditions of Tigard's Urban Forest, was developed through a public process, and sets forth a course of action for Tigard's urban forestry program through 2016; and

WHEREAS, the Urban Forestry Master Plan recommendations include updates to the city's urban forestry standards for development such as tree planting, preservation and removal requirements in Title 18, and the development of flexible and incentive based land use regulations in Title 18 for significant tree grove preservation, which require CPA2011-00004 to be adopted; and

WHEREAS, on February 16, 2010, the Tigard City Council directed staff to implement the Community Development Code related recommendations in the Urban Forestry Master Plan which include updates to the city's urban forestry standards for development such as tree planting, preservation and removal requirements in Title 18, and the development of flexible and incentive based land use regulations in Title 18 for significant tree grove preservation; and

WHEREAS, a public involvement plan was adopted by the city's Committee for Citizen Involvement in 2010 and implemented during the course of the Urban Forestry Code Revisions project to guide city staff and decision makers; and

WHEREAS, a council appointed Citizen Advisory Committee charged with advising project staff during the Urban Forestry Code Revisions project met 11 times between June 2010 and September 2011; and

WHEREAS, the Citizen Advisory Committee reached consensus on the flexible and incentive based land use regulations for tree grove preservation in Section 18.790.050.D through a set of “tree grove preservation incentives guiding principles”; and

WHEREAS, the Citizen Advisory Committee reached consensus on the other land use regulations in Title 18 that support general urban forest enhancement activities such as tree planting and preservation when not associated with significant tree groves through a set of “urban forestry standards for development guiding principles”; and

WHEREAS, a Technical Advisory Committee comprised of city staff and agency representatives was concurrently convened to advise project staff on technical aspects during the Urban Forestry Code Revisions project met 14 times between June 2010 and November 2011; and

WHEREAS, the Technical Advisory Committee reached consensus on the technical feasibility of the flexible and incentive based land use regulations for tree grove preservation in Section 18.790.050.D; and

WHEREAS, the Technical Advisory Committee reached consensus on the technical feasibility of the other land use regulations in Title 18 that support general urban forest enhancement activities such as tree planting and preservation when not associated with significant tree groves; and

WHEREAS, the development of land use regulations in Title 18 that support general urban forest enhancement activities such as tree planting and preservation when not associated with significant tree groves, is not required to comply with Statewide Planning Goal 5 Rule requirements because these activities do not create or amend a resource list or land use regulation adopted in order to protect a Goal 5 resource; and

WHEREAS, the process for adopting land use regulations for the preservation of natural resources, including the flexible and incentive based land use regulations for tree grove preservation in Section 18.790.050.D, must comply with Statewide Planning Goal 5 Rule requirements; and

WHEREAS, project staff and consultants drafted flexible and incentive based land use regulations for tree grove preservation in Section 18.790.050.D including allowed reduction in minimum density, density transfer, increased building height, reduced setbacks, adjustments to Urban Forestry Plan requirements and adjustments to street and utility standards to facilitate the preservation of significant tree groves as part of the land development process; and

WHEREAS, project staff drafted other land use regulations in Title 18 that support general urban forest enhancement activities such as tree planting and preservation when not associated with significant tree groves, the main purpose of which are to create equitable, achievable and scientifically sound requirements for all major developments to plant or preserve a certain amount of tree canopy to support citywide tree canopy cover goals recommended in the Urban Forestry Master Plan as part of the land development process; and

WHEREAS, on January 13, 2012, prior to the legislative adoption phase of the Urban Forestry Code Revisions project, 14,225 public hearing notices were sent to all Tigard property owners consistent with Measure 56 requirements as further described in the findings of the staff report beginning on page 419 of Urban Forestry Code Revisions Volume II; and

WHEREAS, project staff and consultants held a citywide open house on December 8, 2011; and

WHEREAS, the public response at the citywide open house on December 8, 2011 and after the Measure 56 notices were sent on January 13, 2012, was generally supportive of the flexible and incentive based land use

ORDINANCE No. 12- 09

regulations for tree grove preservation in Section 18.790.050.D and the other land use regulations in Title 18 that support general urban forest enhancement activities such as tree planting and preservation when not associated with significant tree groves; and

WHEREAS, the Tigard Planning Commission reviewed at one workshop and four public hearings between January 2012 and May 2012 the flexible and incentive based land use regulations for tree grove preservation in Section 18.790.050.D and the other land use regulations in Title 18 that support general urban forest enhancement activities such as tree planting and preservation when not associated with significant tree groves; and

WHEREAS, the Tigard Planning Commission supported the amendment of land use regulations in Title 18; and

WHEREAS, the Tigard Planning Commission recommended four non substantive text amendments for correction and clarification purposes; and

WHEREAS, the Tigard Planning Commission recommended three substantive text amendments to increase flexibility in meeting Title 18 requirements which include lowering the per lot minimum tree canopy requirement in lower density residential districts, eliminating the per lot minimum tree canopy requirement in higher density residential and non residential districts and allowing landscape architects, in addition to arborists, to develop urban forestry plans; and

WHEREAS, on May 7, 2012 the Tigard Planning Commission made a unanimous recommendation to the City Council for approval of DCA 2011-00002 as amended by motion and unanimous vote; and

WHEREAS, as described in the findings of the staff report beginning on page 419 of Urban Forestry Code Revisions Volume II, the Planning Commission found the city complied with Statewide Planning Goal 5 Rule requirements throughout the development of flexible and incentive based land use regulations for tree grove preservation in Section 18.790.050.D, and complied with all applicable land use planning requirements when developing land use regulations in Title 18 that support general urban forest enhancement activities such as tree planting and preservation when not associated with significant tree groves; and

WHEREAS, on the following dates in 2012: July 24, August 14, September 11, October 23, November 13, and November 27, the Tigard City Council held a public hearing to consider the Commission's recommendation on DCA 2011-00002; and

WHEREAS, Tigard City Council finds it necessary to delay implementation of the Urban Forestry Code Revisions, which include DCA 2011-00002, until March 1, 2013, to ensure an orderly administrative transition to the new urban forestry regulations; and

WHEREAS sufficient time is needed for the City Manager to administratively adopt the Urban Forestry Manual pursuant to Chapter 2.04.050-070 (Administrative Rulemaking) and Section 8.02.030 (Administrative Rules - Urban Forestry Manual) prior to the adoption of Title 18 amendments which require the Urban Forestry Manual for implementation.

WHEREAS, Council's decision to adopt DCA 2011-00002 is based on the findings and conclusions found in the City of Tigard staff report dated November 20, 2012, and the associated record, which are incorporated herein by reference and are contained in land-use file DCA 2011-00002.

NOW, THEREFORE, THE CITY OF TIGARD ORDAINS AS FOLLOWS:

- SECTION 1: Tigard Development Code (Title 18) is amended to include new text and to rescind existing text as shown in "EXHIBIT A – on odd numbered pages 5 through 183 of Urban Forestry Code Revisions Volume II".
- SECTION 2: This ordinance shall be effective March 1, 2013.
- SECTION 3: Council adopts the findings recommended by the Planning Commission as described in the findings of the staff report dated November 20, 2012.
- SECTION 4: Council further adopts the commentary in Exhibit A (on even numbered pages 4 through 182) as additional legislative intent for the corresponding code amendments.

PASSED: By majority vote of all Council members present after being read by number and title only, this 27<sup>th</sup> day of November, 2012.

Catherine Wheatley  
 Catherine Wheatley, City Recorder

APPROVED: By Tigard City Council this 27<sup>th</sup> day of November, 2012.

C. Dirksen  
 Craig Dirksen, Mayor

Approved as to form:  
[Signature]  
 City Attorney

11/27/12  
 Date



# City of Tigard Memorandum

Exhibit B Ordinance Nos. 12-09  
and 12-11

**To:** Tigard City Council  
**From:** Marissa Daniels, Associate Planner  
**Re:** Urban Forestry Code Revisions  
**Date:** November 27, 2012

On November 27, 2012 Council is scheduled to continue the Urban Forestry Code Revisions public hearing. The purpose of the meeting is to receive a brief staff report, receive public testimony and consider amendments to Planning Commission's recommendation.

### Council Amendments for Consideration

Staff has prepared several amendments to Planning Commission's recommended draft based on Council direction on October 23 and November 13, 2012.

Amendment	Addresses Policy Issue	Brief Description
1	3	Differentiates between residential and non residential maintenance requirements for trees planted with development.
2	4	Removes tree removal permit requirements for single family residential developments.
3	5	Clarifies that hazard trees are required to be removed only in response to verified complaints.
4	7	Enhances the purpose statement in Chapter 18.790 to draw a clear link between the details in the Urban Forestry Manual and the overall purpose of the development code revisions.
5	7	<del>Adds the canopy requirements to the code to draw a clearer link between the details in the Urban Forestry Manual and the overall purpose of the development code revisions.</del>
6	8	Reduces development costs for Minor Land Partitions by not requiring an arborist or landscape architect for partition projects that can meet the requirements by planting street trees in open soil volumes only.

On 11/27/2012, City Council approved amendments 1, 2, 3, 4 and 6. Amendment 5 was not approved.

At the November 13 meeting, Council asked staff if there are any issues associated with not requiring arborists/landscape architects for Minor Land Partition projects that can meet the tree



canopy requirements by planting street trees only (Amendment 6, Policy Issue 8). In deciding whether to adopt this amendment, staff offers the following considerations:

1. **Reverse Incentive** - This amendment could create a reverse incentive where a property owner might remove mature trees and plant only street trees to avoid costs associated with hiring an arborist/landscape architect.
2. **Equity** - In developing the Urban Forestry Code Revisions, one of the main community goals was to address the equity issue in the existing code that places more financial burdens on property owners with mature trees. The canopy approach addresses this issue by applying the same requirements regardless of the amount of existing trees. This amendment could result in an equity issue by exempting owners without trees from hiring arborists/landscape architects, while placing greater requirements on owners that choose to preserve mature trees with development.
3. **Adjacent trees** - Minor Land Partitions involve the creation of two or three new lots in existing residential neighborhoods (aka infill development). Often one of the greatest points of conflict with infill development is the potential development impacts on trees that are on an adjacent property but near the property line. Involving arborists/landscape architects in the development of Minor Land Partitions helps ensure trees adjacent to the site are protected with accepted methods such as tree protection fencing during development. If professionals are not required, there is less certainty for neighbors that their trees will be adequately protected.

More information about each of the amendments, including the affected code sections and specific amendments are included on page 3. Council will have the opportunity to accept, reject, or modify these amendments on November 27.

### **Housekeeping Amendments for Consideration**

In addition to Council's amendments, staff is also recommending a set of housekeeping amendments to the code. These items are insubstantial to the code, and are described in more detail on page 13. For example, Amendments 8 and 9 correct cross references internal to the code.

Amendments to the Urban Forestry Code Revisions Based on Council Direction

**Amendment 1 (Policy Issue 3):** Differentiate between residential and non residential requirements for the maintenance of trees planted with development. Residential trees should have a maintenance period of two years or until a house is sold. Non residential trees should have a one year maintenance period.

**Code/Manual Section:** Urban Forestry Manual Section 11, Part 2 (Urban Forestry Plan Implementation Standards – Tree Establishment Requirements:)

- ...
- A. Prior to any ground disturbance work, the applicant shall provide a tree establishment bond for all trees to be planted per the approved urban forestry plan. The total bond amount;
1. For subdivisions and minor land partitions shall be equivalent to the city's average cost to plant and maintain a tree per the applicable standards in the Urban Forestry Manual for a period of two years after planting multiplied by the total number of trees to be planted and maintained; and
  2. For all other land use review types shall be equivalent to the city's average cost to plant and maintain a tree per the applicable standards in the Urban Forestry Manual for a period of one year after planting multiplied by the total number of trees to be planted and maintained.
- B. Following final building inspection or upon acceptance by the city manager or designee when there is no final building inspection, the tree establishment period shall immediately begin and continue; ~~for a period of two years.~~
1. In subdivisions and partitions, for a period of two years or until such time as each lot is sold; and
  2. In all other land use review types, for a period of one year.
- C. When the land use review type will result in the division of land into multiple lots or tracts, there shall be a separate tree establishment period for each resulting lot or tract where trees are shown to be planted in the approved urban forestry plan.
- D. Following the ~~two-year~~ applicable tree establishment period for each lot or tract, the bond shall be correspondingly reduced based on tree survival following a site inspection, documentation of successful tree establishment and/or replacement according to items E and F below, and receipt by the city manager or designee of written verification of findings and a signature of approval by the project arborist.
- E. For planted open grown trees, successful establishment shall be considered 80 percent survival of the open grown trees planted on the lot or tract, and replacement of 100 percent of the remaining open grown trees planted on the lot or tract that did not survive.
- F. For planted stand grown trees, successful establishment shall be considered survival of at least 80 percent of the original stand grown trees planted on the lot or tract.
- G. If successful establishment for open grown trees is less than 80 percent for any lot or tract, the ~~two-year~~ applicable tree establishment period shall reset for that lot or tract and the establishment process for open grown trees described in part 2.B-F' above shall be repeated until the successful establishment requirement for open grown trees

Amendments to the Urban Forestry Code Revisions Based on Council Direction

is met.

- H. If successful establishment for stand grown trees is less than 80 percent for any lot or tract, the ~~two-year~~ applicable tree establishment period shall reset for that lot or tract and the establishment process for stand grown trees described in Part 2.B-1<sup>2</sup> above shall be repeated until the successful establishment requirement for stand grown trees is met.

...

**Note:** Exhibits A and B to the Resolution revising The Master Fees and Charges Schedule is amended as follows to reflect changes in the methodology for calculating tree establishment bonds:

...

Exhibit A - Legislative Intent for Urban Forestry Fees

...

Tree Establishment Bond (Planting and ~~2-Years of~~ Early Establishment)

\$489 per 1.5 inch caliper open grown tree for subdivisions and minor land partitions\*

\$441 per 1.5 inch caliper open grown tree for land use review types other than subdivisions and minor land partitions\*\*

\$367 per 0.5 inch caliper stand grown tree for subdivisions and minor land partitions\*\*\*

\$351 per 0.5 inch caliper stand grown tree for land use review types other than subdivisions and minor land partitions\*\*\*\*

\*The Tree Establishment Bond for the planting and maintenance of a 1.5 inch caliper tree for the required two years in subdivisions and minor land partitions is based on a formula that combines 50% of the published PNWISA wholesale median tree cost estimate to purchase and install a 3 inch diameter tree, with the average historical cost for City of Tigard staff to perform two years of maintenance on a 1.5 inch caliper tree.

\*\*The Tree Establishment Bond for the planting and maintenance of a 1.5 inch caliper tree for the required one year in land use review types other than subdivisions and minor land partitions is based on a formula that combines 50% of the published PNWISA wholesale median tree cost estimate to purchase and install a 3 inch diameter tree, with the average historical cost for City of Tigard staff to perform one year of maintenance on a 1.5 inch caliper tree.

\*\*\*The Tree Establishment Bond for the planting and maintenance of a tree two feet in height or one gallon container size (estimated 0.5 inch caliper) for the required two years in subdivisions and minor land partitions is based on a formula that combines 16.6% of the published PNWISA cost estimate to purchase and install a 3 inch caliper tree, with the average historical cost for City of Tigard staff to perform two years of maintenance on a 0.5 inch caliper tree.

\*\*\*\*The Tree Establishment Bond for the planting and maintenance of a tree two feet in height

Master Fees and Charges Resolution was not considered/adopted by the council on 11/27/2012

Amendments to the Urban Forestry Code Revisions Based on Council Direction

or one gallon container size (estimated 0.5 inch caliper) for the required one year in land use review types other than subdivisions and minor land partitions is based on a formula that combines 16.6% of the published PNWISA cost estimate to purchase and install a 3 inch caliper tree, with the average historical cost for City of Tigard staff to perform one year of maintenance on a 0.5 inch caliper tree.

...

Exhibit B - Amended Master Fees and Charges Schedule

...

Community Development - Miscellaneous Development

...

Urban Forestry

...

Tree Establishment Bond (Planting & ~~2-Year Maintenance~~ Early Establishment)

<u>1.5" Caliper Street or Open Grown Tree in Subdivisions or Minor Land Partitions</u>	<u>\$489 per tree</u>	<u>3/1/2013</u>
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<u>1.5" Caliper Street or Open Grown Tree in Land Use Review Types other than Subdivisions or Minor Land Partitions</u>	<u>\$441 per tree</u>	<u>3/1/2013</u>
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<u>2' in Height or 1 Gallon Container Minimum Stand Grown Tree in Subdivisions or Minor Land Partitions</u>	<u>\$367 per tree</u>	<u>3/1/2013</u>
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<u>2' in Height or 1 Gallon Container Minimum Stand Grown Tree in Land Use Review Types other than Subdivisions or Minor Land Partitions</u>	<u>\$351 per tree</u>	<u>3/1/2013</u>
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...

Amendments to the Urban Forestry Code Revisions Based on Council Direction

**Amendment 2 (Policy Issue 4):** Do not require tree removal permits for single family residential developments. Applies to Ordinance No. 12-11

**Code/Manual Section:** Tigard Municipal Code Chapter 8.12 (Trees that were Required with Development)

...

8.12.010 Purpose

The purpose of this chapter is to establish standards and procedures for the maintenance, removal and replacement of trees that were required with high density residential and non residential development to maintain their environmental, aesthetic, social and economic benefits after the development process is complete.

8.12.020 General Provisions

A. ~~The provisions of this chapter do not apply unless there is substantial evidence that one of the following situations exists:~~ to residential developments in the R-1, R-2, R-3.5, R-4.5, R-7, and R-12 districts.

B. The provisions of this chapter do apply when there is substantial evidence that one of the following situations exists:

1. Except for those developments listed in 8.12.020.A above, Trees were planted or preserved under a requirement found in Title 18 or found in a land use permit; and

2. Trees were required as replacements for trees originally required under 8.12.020.~~AB~~.1 above.

~~BC.~~ The city manager or designee shall utilize all available land use permit records and data when determining whether a tree is subject to the provisions of this chapter.

...

**Note:** The corresponding commentary for the code amendments is amended as follows to provide a record of legislative intent:

...

Chapter 8.12 TREES THAT WERE REQUIRED WITH DEVELOPMENT

Chapter 8.12 establishes the framework for permitting decisions for trees that were required to be planted or preserved by a land use permit for high density residential and non residential development when the removal is not associated with an active land use permit. The intent of the legislative amendments in Chapter 8.12 is to supersede the planting and preservation requirements for trees that were required by prior land use decisions. This includes trees that are recorded as preserved on property deeds as a result of past land use

## Amendments to the Urban Forestry Code Revisions Based on Council Direction

decisions. However, for these deed restricted trees, applicants (and not the city) will be solely responsible for identifying and removing any applicable deed restrictions. The city will provide any signatures necessary to facilitate the removal of deed restrictions for trees permitted for removal by decisions pursuant to Chapter 8.12.

The reason for not requiring permits for trees required with development in low and medium density residential development is because the owners of these properties are likely to maintain and preserve trees in these locations regardless of code requirements. The circumstances where owners decide to remove healthy trees required with development are expected to be negligible when compared with Tigard's overall urban forest.

However, it is important to note that the permit requirements for Street and Median Trees (Chapter 8.08), Trees in Sensitive Lands (8.10), Trees that were Planted using the Urban Forestry Fund (8.14) and Heritage Trees (8.16) would continue to apply even in low and medium density residential development. In addition, if significant tree groves are preserved in low and medium density residential development, the significant tree grove preservation requirements in section 18.790.050.D would apply.

### 8.12.010 Purpose

The purpose statement explains that the chapter establishes standards and procedures for trees that were required with high density residential and non residential development to maintain their benefits after the development process is complete.

### 8.12.020 General Provisions

The provisions of Chapter 8.12 apply to trees required to be planted or preserved in high density residential and non residential development by a land use permit and trees that are required as replacements for said trees.

The provisions of Chapter 8.12 do not apply to residential developments in the R-1, R-2, R-3.5, R-4.5, R-7, and R-12 districts since these are the primary locations of single family residences. The provisions specify "residential developments" so as not to exempt non residential developments such as schools in residential districts from the requirements.

...

### 8.12.030 Maintenance of Trees That Were Required With Development

Trees that were required to be planted or preserved in high density residential and non residential development by a land use permit are required to be maintained per tree care industry standards.

...

### 8.12.040 Removal of Trees That Were Required With Development

Amendments to the Urban Forestry Code Revisions Based on Council Direction

Permits obtained through the City Manager Decision Making Procedures or the City Board or Committee Decision Making Procedures are required to remove trees required to be planted or preserved in high density residential and non residential development by a land use permit.

...

Amendments to the Urban Forestry Code Revisions Based on Council Direction

**Amendment 3 (Policy Issue 5):** Clarify that hazard trees are required to be removed only in response to verified complaints.

**Code/Manual Section:** Tigard Municipal Code Section 8.06.020 (Hazard Trees Prohibited)

...

A. Hazard trees that are verified through the Hazard Tree Evaluation and Abatement Procedure in Section 1 of the Urban Forestry Manual are prohibited within the City of Tigard.

B. Any hazard tree owner or responsible party identified through the Hazard Tree Evaluation and Abatement Procedure in Section 1 of the Urban Forestry Manual shall be required to complete hazard tree abatement.

C. Failure of a hazard tree owner or responsible party identified through the Hazard Tree Evaluation and Abatement Procedure in Section 1 of the Urban Forestry Manual to complete hazard tree abatement is a nuisance under Chapter 6.02 and subject to penalties under Chapter 1.16.

...

**Note:** The corresponding commentary for the code amendments is amended as follows to provide a record of legislative intent:

...

Chapter 8.06 HAZARD TREES

The hazard trees chapter creates a framework for addressing hazard trees.

The guiding principles for Hazard Trees are in Volume 4 Y of the legislative adoption package for the Urban Forestry Code Revisions. These guiding principles represent the consensus view of the citizen advisory committee that advised staff on the Urban Forestry Code Revisions.

...

8.06.020 General Provisions

Hazard trees (defined in Chapter 8.02) that are verified through the Hazard Tree Evaluation and Abatement Procedure in Section 1 of the Urban Forestry Manual are prohibited in Tigard. The reason for specifying that the prohibition applies only to hazard trees verified through the procedure in the Urban Forestry Manual is to avoid the large scale removal of trees by property owners that would otherwise be unclear whether or not their specific trees are hazards. The definition of hazard tree incorporates by reference the procedure in the Urban Forestry Manual includes an evaluation by a tree risk assessor of the probability of failure, size of defective part and target area before determining whether a tree is a hazard.

...



Amendments to the Urban Forestry Code Revisions Based on Council Direction

**Amendment 4 (Policy Issue 7):** Enhance purpose statement in Chapter 18.790 to draw a clearer link between the details in the Urban Forestry Manual and the overall purpose of the development code revisions.

**Code/Manual Section:** Tigard Development Code Section 18.790.010 (Purpose)

...  
Purpose. The purpose of this chapter is to implement the City's urban forestry goals articulated in the Comprehensive Plan as recommended by the Urban Forestry Master Plan by establishing:

A. Tree canopy cover requirements for new development regardless of the amount of existing trees on site;

B. Alternatives to meeting tree canopy cover requirements when equivalent environmental functions or values are provided;

C. Flexible and incentive based requirements to facilitate the planting of large stature trees, and the preservation of existing trees and significant tree groves;

D. Requirements that ensure successful implementation of urban forestry plans during and after site development; and

E. A process for modifying urban forestry plans to address changes that occur during the development process.

...  
**Note:** The corresponding commentary for the code amendments is amended as follows to provide a record of legislative intent:

...  
18.790.010 Purpose

The purpose ~~has been simplified to~~ statement cross references the Comprehensive Plan and Urban Forestry Master Plan. Both documents provide the detailed policy basis for the extensive revisions to Chapter 18.790. Examples of the chapter provisions that implement the City's urban forestry goals are provided to give users of the code a better understanding of the overall purpose of the chapter.

...

Amendment No. 5 not approved by council on 11/27/2012.  
 This language will not be codified in 18.790.030

Amendments to the Urban Forestry Code Revisions Based on Council Direction

**Amendment 5 (Policy Issue 7):** Add the canopy requirements in the code to draw a clearer link between the details in the Urban Forestry Manual and the overall purpose of the development code revisions.

**Code/Manual Section:** Tigard Development Code Section 18.790.030 (Urban Forestry Plan Requirements)

...  
 A. Urban Forestry Plan Requirements. An urban forestry plan shall demonstrate the following effective tree canopy cover requirements will be met in the following districts:

<u>Effective Tree Canopy Cover Requirement</u>	<u>District</u>
<u>40% for overall site and 15% for each lot or tract</u>	<u>R-1, R-2, R-3.5, R-4.5 and R-7 districts, except for schools (18.130.050(I))</u>
<u>33% for overall site</u>	<u>R-12, R-25, R-40, C-N, C-C, C-G, C-P, MUE, MUE-1, MUE-2, MUC, MUR and I-P districts, except for schools (18.130.050(I))</u>
<u>25% for overall site</u>	<u>MU-CBD, MUC-1, I-L and I-H districts, and for schools (18.130.050(I)) in all districts</u>

An urban forestry plan shall:

1. Be coordinated and approved by a landscape architect (the project landscape architect) or a person possessing dual certifications as a certified arborist and certified tree risk assessor (the project arborist);

...  
**Note:** The corresponding commentary for the code amendments is amended as follows to provide a record of legislative intent:

...  
 18.790.030 Urban Forestry Plan Requirements

This section is renamed to Urban Forestry Plan Requirements.

The effective tree canopy cover requirements are included in the code to provide users of the code a clearer understanding of the overall purpose of the Urban Forestry Plan Requirements without requiring them to read through the details of the Urban Forestry Manual. The effective tree canopy cover requirements were extensively tested during the peer review phase of the Urban Forestry Code Revisions and were found to be achievable through planting and preserving an amount of tree canopy that is acceptable to the community. The peer review results can be found in Volume II, and a more detailed description of the canopy standards can be found in Volume V of the legislative adoption package for the Urban Forestry Code Revisions.

...

Amendments to the Urban Forestry Code Revisions Based on Council Direction

**Amendment 6 (Policy Issue 8):** Reduce development costs for Minor Land Partitions by not requiring arborists or landscape architects for partition projects that can meet the requirements by planting street trees in open soil volumes only.

**Code/Manual Section:** Tigard Development Code Section 18.790.030.A (Urban Forestry Plan Requirements)

...

...An urban forestry plan shall:

1. Be coordinated and approved by a landscape architect (the project landscape architect) or a person possessing dual certifications as a certified arborist and certified tree risk assessor (the project arborist), except for Minor Land Partitions that can demonstrate compliance with effective tree canopy cover and soil volume requirements by planting street trees in open soil volumes only;

...

**Note:** The corresponding commentary for the code amendments is amended as follows to provide a record of legislative intent:

...

18.790.030 Urban Forestry Plan Requirements

...

Urban forestry plans are required to be developed by a landscape architect or a person certified as both an arborist and tree risk assessor. Many arborists are dual certified, and adding the new requirement for tree risk assessment will help ensure safe conditions during and after construction. Landscape architects often work closely with arborists when developing urban forestry plans, so the option of allowing landscape architects to sign off on the plans has been added to reduce costs by eliminating the need for hiring two urban forestry consultants.

Arborists and landscape architects are not required for Minor Land Partitions if the effective tree canopy cover and soil volume requirements can be met by planting street trees in open soil volumes only. The purpose of the exemption is to reduce costs for small scale residential projects where the required level of specialized professional expertise is limited.

...

Housekeeping Amendments to the Urban Forestry Code Revisions

**Amendment 1:** Ensure consistency in the title of Chapter 8.02. Applies to Ordinance No. 12-11

**Code/Manual Section:** Tigard Municipal Code Chapter 8.02 (Definitions, Penalties and Administrative Rules)

...

TIGARD MUNICIPAL CODE

Title 8

URBAN FORESTRY

Chapters:

- 8.02 DEFINITIONS, PENALTIES AND ADMINISTRATIVE RULES
- 8.04 TREE PERMIT PROCEDURES
- 8.06 HAZARD TREES
- 8.08 STREET AND MEDIAN TREES
- 8.10 TREES IN SENSITIVE LANDS
- 8.12 TREES THAT WERE REQUIRED WITH DEVELOPMENT
- 8.14 TREES THAT WERE PLANTED USING THE URBAN FORESTRY FUND
- 8.16 HERITAGE TREES

Chapter 8.02 DEFINITIONS, PENALTIES AND ADMINISTRATIVE RULES

...

**Amendment 2:** Correct a cross reference in Section 8.02.020.C (Defining Words). Applies to Ordinance No. 12-11

**Code/Manual Section:** Tigard Municipal Code Section 8.02.020 (General Provisions)

...

C. Defining Words. Words used in this title and the Urban Forestry Manual have their normal dictionary meaning unless they are listed in Section 8.02.050. Words listed in Section 8.02.04~~5~~0 have the specific meaning stated, unless the context clearly indicates another meaning.

....

Housekeeping Amendments to the Urban Forestry Code Revisions

**Amendment 3:** Ensure the term "Diameter at breast height (DBH)" is placed in alphabetical order in Section 8.02.050 (Definition of Specific Words). Applies to Ordinance No. 12-11

**Code/Manual Section:** Tigard Municipal Code Section 8.02.050 (Definition of Specific Words)

...

GH. "Dripline" - The outer limit of a tree canopy projected to the ground.

HG. "Diameter at breast height (DBH)" - The average diameter of the trunk of a tree measured 4 ½ feet above mean ground level..

...

[note: reverse order to place terms in alphabetical order]

## Housekeeping Amendments to the Urban Forestry Code Revisions

**Amendment 4:** The Pacific Northwest Chapter of the International Society of Arboriculture (PNWISA) developed the current tree risk assessment methodology and certification program. Due to the success of the program, the International Society of Arboriculture (ISA) is in the process of adopting the program internationally. However, in the process of adopting the regional program for international users, the ISA expects to modify some of its aspects.

Terry Flanagan, local arborist, tree risk instructor and President of the ISA, has advised on how to address the expected modifications in light of the pending adoption of the Urban Forestry Code Revisions. Specifically, he has advised generalizing the term "certified tree risk assessor" to "tree risk assessor" because of anticipated revisions to the certification process, and replacing reference to "PNWISA" with "ISA" to reflect the international scope of the program. Finally, he has advised retaining the numerical rating system since that is the currently adopted standard. If the numerical system is revised in the future, it may be replaced with the updated system.

The following amendments implement these recommendations. **Applies to Ordinance No. 12-09 and 12-11. Ordinance No. 12-09 affects Title 18 also known as the Community Development Code while Ordinance No. 12-11 covers affected chapters in the Tigard Municipal Code consisting of active and reserved Titles 1-17.**

**Code/Manual Section:** Tigard Municipal Code Section 8.02.050 (Definition of Specific Words)

...

D. ~~“Certified Tree~~ risk assessor” - An individual ~~certified~~ deemed qualified by the International Society of Arboriculture to conduct tree risk assessments.

...

[note: re-lettering of the section is required to place terms in alphabetical order]

**Code/Manual Section:** Tigard Municipal Code Section 8.02.050.I (Hazard Tree Related Definitions)

...

2. “Hazard tree - Any tree or tree part that has been or could be determined by an independent ~~certified~~ tree risk assessor to constitute a high level hazard requiring hazard tree abatement with an overall minimum risk rating of 8 for trees or tree parts up to 4 inch DBH, 9 for trees or tree parts greater than 4 inch and up to 20 inch DBH, or 10 for trees or tree parts greater than 20 inch DBH using ~~the most current version~~ of the tree risk assessment methodology ~~developed by the International Society of Arboriculture~~ in Appendix 1 of the Urban Forestry Manual.

3. “Hazard tree abatement” - The process of reducing or eliminating a hazard to an overall risk rating of less than 8 for trees or tree parts up to 4 inch DBH, 9 for trees or tree parts greater than 4 inch and up to 20 inch DBH, or 10 for trees or tree parts greater than 20

## Housekeeping Amendments to the Urban Forestry Code Revisions

inch DBH using ~~the most current version of~~ the tree risk assessment methodology developed by the ~~International Society of Arboriculture in Appendix 1 of the Urban Forestry Manual~~ through pruning, tree removal or other means in a manner that complies with all applicable rules and regulations.

...

**Code/Manual Section:** Tigard Development Code Chapter 18.115 (List of Terms)

...

~~Certified~~ Tree Risk Assessor

*See Tree Related Definitions*

...

Tree Related Definitions

- Caliper
- Certified Arborist
- ~~Certified~~ Tree Risk Assessor

...

[note: re-ordering of the section is required to place terms in alphabetical order]

**Code/Manual Section:** Tigard Development Code Section 18.120.030.A.170 (Tree-related definitions)

...

c. ~~“Certified Tree Risk Assessor”~~ - An individual ~~certified~~ deemed qualified by the International Society of Arboriculture to conduct tree risk assessments.

...

g. ~~“Hazard Tree”~~ - Any tree or tree part that has been or could be determined by an independent ~~certified~~ tree risk assessor to constitute a high level hazard requiring hazard tree abatement with an overall minimum risk rating of 8 for trees or tree parts up to 4 inch DBH, 9 for trees or tree parts greater than 4 inch and up to 20 inch DBH, or 10 for trees or tree parts greater than 20 inch DBH using ~~the most current version of~~ the tree risk assessment methodology developed by the ~~International Society of Arboriculture in Appendix 1 of the Urban Forestry Manual~~.

h. ~~“Hazard Tree Abatement”~~ - The process of reducing or eliminating a hazard to an overall risk rating of less than 8 for trees or tree parts up to 4 inch DBH, 9 for trees or tree parts greater than 4 inch and up to 20 inch DBH, or 10 for trees or tree parts greater than 20 inch DBH using ~~the most current version of~~ the tree risk assessment methodology developed by the ~~International Society of Arboriculture in Appendix 1 of the Urban Forestry Manual~~ through pruning, tree removal or other means in a manner that complies with all applicable rules and regulations.

...

[note: re-ordering of the section is required to place terms in alphabetical order]

**Code/Manual Section:** Tigard Development Code Section 18.790.030 (Urban Forestry

Housekeeping Amendments to the Urban Forestry Code Revisions

Plan Requirements)

...

A. Urban Forestry Plan Requirements. An urban forestry plan shall:

1. Be coordinated and approved by a landscape architect (the project landscape architect) or a person ~~possessing dual certifications as~~ that is both a certified arborist and ~~certified~~ tree risk assessor (the project arborist);

...

**Code/Manual Section:** Urban Forestry Manual Section 1 (Hazard Tree Evaluation and Abatement Procedure)

...

**Part 1. Informal Reconciliation**

...The claimant is encouraged to support their claim with documentation by a ~~certified~~ tree risk assessor...

...

**Part 2. Formal Reconciliation**

... Within seven calendar days of receipt of all the required application materials, the city shall gain access to the respondent's property either voluntarily or with a warrant pursuant to Chapter 1.16 of the Tigard Municipal Code, conduct a tree risk assessment by a ~~certified~~ tree risk assessor using the ~~most current version of the~~ tree risk assessment methodology developed by the International Society of Arboriculture in Appendix 1 of the Urban Forestry Manual, determine if the definition of hazard tree in Tigard Municipal Code Chapter 8.02 has been met and, if necessary, prescribe hazard tree abatement as defined in Tigard Municipal Code Chapter 8.02...

...

**Code/Manual Section:** Urban Forestry Manual Section 10 (Urban Forestry Plan Standards)

...

**Part 3. Urban Forestry Plan - Supplemental Report Requirements:**

...

C. The name, address, telephone number, email address, and ISA certified arborist number ~~and PNW-ISA-certified tree risk assessor number~~ of the project arborist or stamp and registration number of the project landscape architect.

...

**Code/Manual Section:** Urban Forestry Manual Appendix 1 (Tree Risk Assessment Form)

...

Date of Evaluation:
<del>Certified</del> Tree Risk Assessor:
<del>Certificate</del> Number:
ISA Number:



## Housekeeping Amendments to the Urban Forestry Code Revisions

~~Certified~~ Tree Risk Assessor Signature: \_\_\_\_\_

...

**Code/Manual Section:** Urban Forestry Manual Appendix 9 (Urban Forestry Plan - Supplemental Report Example Template)

...

### General Information

...

ISA Certified Arborist No.:

~~ISA Certified Tree Risk Assessor No.:~~

...

**Note:** The corresponding commentary for the code amendments is amended as follows to provide a record of legislative intent:

#### 18.120.030 Meaning of Specific Words and Terms

...

~~Certified~~ Tree risk assessor: This term clarifies that ~~certified~~ tree risk assessors are ~~certified~~ individuals deemed qualified by the International Society of Arboriculture (ISA) to conduct tree risk assessments. The Pacific Northwest Chapter of the International Society of Arboriculture (PNWISA) developed the current tree risk assessment methodology and certification program. Due to the success of the program, the ISA is in the process of adopting the program internationally. However, in the process of adopting the program for international users, the ISA expects to modify some of its aspects. One anticipated modification is replacement of the term "certified tree risk assessor" with the term "qualified tree risk assessor". The term and definition of "tree risk assessor" is flexible enough to respond to the anticipated changes.

...

Hazard tree: The term hazard tree has been made more specific to the current PNWISA International Society of Arboriculture Standards so that a more objective evaluation can be made as to what constitutes a hazard tree. A tiered system of rating hazards ensures the risks associated with small diameter tree parts are not understated while the risks associated with large diameter tree parts are not overstated.

The ISA is in the process of adopting the PNWISA program internationally. However, in the process of adopting the program for international users, the ISA expects to modify some of its aspects. The current PNWISA numerical based system is included in Appendix 1 and referenced by the definition of "hazard tree". If the numerical system is revised in the future, it may be replaced with the updated system.

...

[note: re-ordering of the commentary section is required to place terms in alphabetical order]

#### 18.790.030 Urban Forestry Plan Requirements

## Housekeeping Amendments to the Urban Forestry Code Revisions

...

Urban forestry plans are required to be developed by a landscape architect or a person ~~certified as that is~~ both an certified arborist and tree risk assessor. Many arborists possess both qualifications ~~are dual certified~~, and adding the new requirement for tree risk assessment will help ensure safe conditions during and after construction.

...

18.790.070 Modification to the Urban Forestry Plan Component of an Approved Land Use Permit

...

Two levels of modifications to the urban forestry plan component of an approved land use permit will be allowed. Minor modification will be completed as a staff level, technical review. The following items would be considered minor modifications:

- Removal of hazard trees if there is sufficient documentation by the arborist or landscape architect ~~a certified tree risk assessor~~;

...

**Amendment 5:** Ensure consistency between the Site Design Standards (Section 18.620.030) and Landscaping and Screening (Section 18.620.070) in the Tigard Triangle Design Standards. **Applies to Ordinance No. 12-09**

**Code/Manual Section:** Tigard Development Code Section 18.620.030.A (Site Design Standards)

...

3. Front yard setback design - Landscaping, an arcade, or a hard-surfaced expansion of the pedestrian path must be provided between a structure and a public street or accessway. If a building abuts more than one street, the required improvements shall be provided on all streets. Landscaping shall be developed to the applicable standard in Section 18.620.030.A.5 ~~an L-1 standard on public streets and an L-2 standard on accessways~~. Hard-surfaced areas shall be constructed with scored concrete or modular paving materials. Benches and other street furnishings are encouraged. These areas shall contribute to the minimum landscaping requirement per Section 18.520.040B and Table 18.520.2.

...

5. Parking location and landscape design - Parking for buildings or phases adjacent to public street rights-of-way must be located to the side or rear of newly constructed buildings. If located on the side, parking is limited to 50% of the street frontage, ~~and~~ When abutting public streets, parking must be behind a landscaped area constructed to an L-1 Landscape Parking Lot Screen Standard. The minimum depth of the L-1 landscaped area is eight feet or is equal to the adjacent building setback, whichever is greater. All other site landscaping ~~Interior side and rear yards~~ shall be landscaped to an L-2 Landscape General Landscaping Standard, except where a side yard abuts a public street, where it shall be landscaped to an L-1 Landscape Standard. The L-1 and L-2 Standards are more fully described in Section 18.620.070.

...

## Housekeeping Amendments to the Urban Forestry Code Revisions

**Amendment 6:** Ensure consistency between the Site Design Standards (Section 18.630.050) and Landscaping and Screening (Section 18.630.090) in the Washington Square Regional Center Design Standards. **Applies to Ordinance No. 12-09**

**Code/Manual Section:** Tigard Development Code Section 18.630.050.A (Site Design Standards)

...

3. Front yard setback design.

a. Purpose. The front yard is the most conspicuous face of a building and requires special attention. Places for people and pedestrian movement helps create an active and safer street. Higher level of landscape anticipates a more immediate visual result.

b. Standard. For setbacks greater than 0 feet, landscaping, an arcade, or a hard-surfaced expansion of the pedestrian path must be provided between a structure and a public street or accessway. If a building abuts more than one street, the required improvements shall be provided on all streets. Landscaping shall be developed to the applicable standard in Section 18.630.050.A.5 an L-1 standard on public streets and an L-2 standard on accessways. Hard-surfaced areas shall be constructed with scored concrete or modular paving materials. Benches and other street furnishings are encouraged. These areas shall contribute to the minimum landscaping requirement per Section 18.520.040.B and Table 18.520.2.

...

5. Parking location and landscape design.

a. Purpose. The emphasis on pedestrian access and a high quality streetscape experience requires that private parking lots that abut public streets should not be the predominant street feature. Where parking does abut public streets, high quality landscaping should screen parking from adjacent pedestrian areas.

b. Standard. Parking for buildings or phases adjacent to public street rights-of-way must be located to the side or rear of newly constructed buildings. When buildings or phases are adjacent to more than one public street, primary street(s) shall be identified by the City where this requirement applies. In general, streets with higher functional classification will be identified as primary streets unless specific design or access factors favor another street. If located on the side, parking is limited to 50% of the primary street frontage, ~~and~~ When abutting public streets, parking must be behind a landscaped area constructed to an L-1 landscape Parking Lot Screen standard. The minimum depth of the L-1 landscaped area is eight feet or is equal to the adjacent building setback, whichever is greater. All other site landscaping Interior side and rear yards shall be landscaped to an L-2 landscape General Landscaping standard, except where a side yard abuts a public street, where it shall be landscaped to an L-1 landscape standard. The L-1 and L-2 standards are more fully described in Section 18.630.090.

...

Housekeeping Amendments to the Urban Forestry Code Revisions

**Amendment 7:** Ensure consistency between the Site Design Standards (Section 18.640.200.B) and Landscaping and Screening (Section 18.640.200.D) in the Durham Quarry (i.e. Bridgeport) Design Standards. Applies to Ordinance No. 12-09

**Code/Manual Section:** Tigard Development Code Section 18.640.200.B (Site Design Standards)

...

3. Front yard setback design. For setbacks greater than zero feet, landscaping, an arcade, or a hard-surfaced expansion of the sidewalk shall be provided between a structure and a public street or accessway. If a building abuts more than one street, the required improvements shall be provided on all streets. Landscaping shall be developed to the applicable standard in Section 18.640.200.B.5 ~~an L-1 standard on public streets and an L-2 standard on accessways~~. Hard-surfaced areas shall be constructed with scored concrete or modular paving materials. Benches and other street furnishings are required. These areas shall contribute to the minimum landscaping requirements.

...

5. Parking location and landscape design. Parking for buildings or phases adjacent to public street rights-of-way shall be located to the side or rear of newly constructed buildings. When buildings or phases are adjacent to more than one public street, primary street(s) shall be identified where this requirement applies. If located on the side, parking is limited to 50% of the street frontage, ~~and~~ When abutting public streets, parking must be behind a landscaped area constructed to an L-1 Landscape Parking Lot Screen Standard. The minimum depth of the L-1 landscaped area is eight feet or is equal to the adjacent building setback, whichever is greater. All other site landscaping ~~Interior side and rear yards~~ shall be landscaped to an L-2 Landscape General Landscaping Standard ~~except where a side yard abuts a public street, where it shall be landscaped to an L-1 Landscape Standard.~~ See Section 18.640.200.D

....

**Amendment 8:** Correct a cross reference in Section 18.790.050.C.2 (Adjustments to Setbacks). Applies to Ordinance No. 12-09

**Code/Manual Section:** Tigard Development Code Section 18.790.050.C.2 (Adjustments to Setbacks)

...

2. Adjustments to Setbacks. The following setback reductions will be allowed for lots preserving existing trees using the criteria in subsection ~~b~~ a below.

....

Housekeeping Amendments to the Urban Forestry Code Revisions

**Amendment 9:** Correct a cross reference in Section 18.790.050.C.3 (Adjustments to Sidewalks). Applies to Ordinance No. 12-09

**Code/Manual Section:** Tigard Development Code Section 18.790.050.C.3 (Adjustments to Sidewalks)

...

3. Adjustments to Sidewalks. ...If a preserved tree is to be utilized as a street tree, it must meet the criteria found in the Landscaping and Screening Section 18.745.040.A.56.

....

Housekeeping Amendments to the Urban Forestry Code Revisions

**Amendment 10:** During the development of the tree grove preservation incentives, the initial proposal was to require permanent preservation and management of tree groves if applicants utilized any one of the preservation incentives (density transfer, increased building height, setback reduction, etc.). While the Citizen Advisory Committee agreed that permanent preservation was appropriate, they advised staff to strike the management requirement. Their rationale was that the management requirement could be seen as onerous by applicants and act as a disincentive to preservation. Staff struck the management requirement for most of the preservation incentives, but inadvertently failed to strike the requirement for two of the incentives. The purpose of the following amendments is to strike the remaining management requirements consistent with the Citizen Advisory Committee recommendation. **Applies to Ordinance No. 12-09**

**Code/Manual Section:** Tigard Development Code Section 18.790.050.D.3 (Adjustments to Commercial Development Standards)

...

3. Adjustments to Commercial Development Standards. Adjustments to Commercial Development Standards (Table 18.520.2) of up to 50 percent reduction in minimum setbacks and up to 20 feet additional building height are permitted provided:

....

g. The significant tree grove is protected through an instrument or action subject to approval by the director that demonstrates it will be permanently preserved ~~and managed~~ such as:

...

**Code/Manual Section:** Tigard Development Code Section 18.790.050.D.6 (Adjustment to Street and Utility Standards)

...

6. Adjustment to Street and Utility Standards. If requested, the director shall use his or her discretion when considering adjustments to Chapter 18.810, Street and Utility Improvement Standards and Section 18.745.040, Street Trees provided:

...

b. The significant tree grove is protected through an instrument or action subject to approval by the director that demonstrates it will be permanently preserved ~~and managed~~ such as:

...

Housekeeping Amendments to the Urban Forestry Code Revisions

**Amendment 11:** One of the goals when revising the Urban Forestry Standards for Development was to clarify when an urban forestry plan for development is "in effect". The purpose of the clarification is to avoid the current situation where future homeowners must amend their land use approvals to remove trees that were required with development. Initially, the term "active" was used but was later replaced with "in effect" since that term is more commonly used in the land use process. The term "active" was inadvertently left in Section 18.790.060 and the purpose of this amendment is to replace it with "in effect".

**Applies to Ordinance No. 12-09**

**Code/Manual Section:** Tigard Development Code Section 18.790.060 (Urban Forestry Plan Implementation)

...

B. Inspections. Implementation of the urban forestry plan shall be inspected, documented and reported by the project arborist or landscape architect whenever an urban forestry plan is ~~active~~ in effect...

....

**Amendment 12:** Correct spelling error of a tree's common name in the Urban Forestry Manual. **Volume IV – Urban Forestry Manual – Not codified.**

**Code/Manual Section:** Urban Forestry Manual Appendix 2 (Street Tree List - Small Stature Trees)

...

Gloryblower...

....

Housekeeping Amendments to the Urban Forestry Code Revisions

**Amendment 13:** Generalize cross references from the code to the Urban Forestry Manual. If the administrative rules are modified during the upcoming administrative rule adoption process or any other future date, this will make the process more efficient by avoiding the necessity of making changes to corresponding cross references in the code. **Applies to Ordinance No. 12-09 and 12-11. Ordinance No. 12-09 affects Title 18 also known as the Community Development Code while Ordinance No. 12-11 covers affected chapters in the Tigard Municipal Code consisting of active and reserved Titles 1-17.**

**Code/Manual Section:** Tigard Municipal Code Section 8.02.050.1 (Hazard tree related definitions)

...

1. "Claimant" - Any person that believes in good faith there is a hazard tree on a property, can demonstrate that their life, limb or property has the potential to be impacted by said tree and seeks resolution through the Hazard Tree Evaluation and Abatement Procedure specified in ~~Section 4~~ of the Urban Forestry Manual.

...

5. "Respondent" - Any person that receives notice from a claimant seeking resolution through the Hazard Tree Evaluation and Abatement Procedure specified in ~~Section 4~~ of the Urban Forestry Manual.

...

**Code/Manual Section:** Tigard Municipal Code Section 8.06.030 (Hazard Tree Evaluation and Abatement Procedure)

...

A. Any claimant may seek resolution through the Hazard Tree Evaluation and Abatement Procedure specified in ~~Section 4~~ of the Urban Forestry Manual.

B. Once initiated by the claimant, both the claimant and respondent have an obligation to complete the Hazard Tree Evaluation and Abatement Procedure specified in ~~Section 4~~ of the Urban Forestry Manual. Failure of the claimant or respondent to perform their obligations specified in the Hazard Tree Evaluation and Abatement Procedure constitutes a violation of this code by the negligent party.

...

**Code/Manual Section:** Tigard Municipal Code Section 8.06.040 (Emergency Abatement Procedure)

...

If the city has reason to believe a hazard tree poses an immediate danger and there is not enough time to complete the Hazard Tree Evaluation and Abatement Procedure in ~~Section 4~~ of the Urban Forestry Manual, the city may choose to take immediate remedial action as defined in Section 1.16.150 of the Tigard Municipal Code.

...

**Code/Manual Section:** Tigard Municipal Code Section 8.08.030 (Street Tree Planting)

...

No person shall plant a street tree without prior written approval obtained through the City



## Housekeeping Amendments to the Urban Forestry Code Revisions

Manager Decision Making Procedures detailed in Section 8.04.020 using the approval criteria in ~~Section 2, part 4 of the Street Tree Planting Standards~~ in the Urban Forestry Manual.

...  
**Code/Manual Section:** Tigard Municipal Code Section 8.08.040 (Street Tree Maintenance)

...  
A. All street trees shall be maintained in a manner consistent with the ~~sStreet tTree mMaintenance sStandards~~ specified in ~~Section 2, part 2 of the Urban Forestry Manual~~.

...  
**Code/Manual Section:** Tigard Municipal Code Section 8.08.050 (Street Tree Removal)

...  
A. The City Manager Decision Making Procedures detailed in Section 8.04.020 using the approval criteria in ~~Section 3, part 4 of the Street Tree Removal Standards~~ in the Urban Forestry Manual; or

...  
**Code/Manual Section:** Tigard Municipal Code Section 8.08.060 (Median Tree Planting)

...  
No person shall plant a median tree without prior written approval obtained through the City Manager Decision Making Procedures detailed in Section 8.04.020 using the approval criteria in ~~Section 4, part 1 of the Median Tree Planting Standards~~ in the Urban Forestry Manual.

...  
**Code/Manual Section:** Tigard Municipal Code Section 8.08.070 (Median Tree Maintenance)

...  
A. All median trees shall be maintained in a manner consistent with the ~~mMedian tTree mMaintenance sStandards~~ specified in ~~Section 4, part 2 of the Urban Forestry Manual~~.

...  
**Code/Manual Section:** Tigard Municipal Code Section 8.08.080 (Median Tree Removal)

...  
A. The City Manager Decision Making Procedures detailed in Section 8.04.020 using the approval criteria in ~~Section 5, part 4 of the Median Tree Removal Standards~~ in the Urban Forestry Manual; or

...  
**Code/Manual Section:** Tigard Municipal Code Section 8.10.040 (Sensitive Lands Tree Removal)

...  
A. The City Manager Decision Making Procedures detailed in Section 8.04.020 using the approval criteria in ~~Section 6, part 4 of the Sensitive Lands Tree Removal Standards~~ in the Urban Forestry Manual; or

...  
**Code/Manual Section:** Tigard Municipal Code Section 8.12.040 (Removal of Trees That Were Required With Development)

## Housekeeping Amendments to the Urban Forestry Code Revisions

...

A. The City Manager Decision Making Procedures detailed in Section 8.04.020 using the approval criteria in ~~Section 7, part 4 of the Development Tree Removal Standards in the Urban Forestry Manual~~; or

...

**Code/Manual Section:** Tigard Municipal Code Section 8.14.040 (Removal of Trees that were Planted Using the Urban Forestry Fund)

...

A. The City Manager Decision Making Procedures detailed in Section 8.04.020 using the approval criteria in ~~Section 8, part 4 of the Urban Forestry Fund Tree Removal Standards in the Urban Forestry Manual~~; or

...

**Code/Manual Section:** Tigard Municipal Code Section 8.16.070 (Removal of Heritage Tree Designation)

...

A. The City Manager Decision Making Procedures detailed in Section 8.04.020 using the approval criteria in ~~Section 9, part 4 of the Heritage Tree Designation Removal Standards in the Urban Forestry Manual~~; or

...

**Code/Manual Section:** Tigard Development Code Section 18.745.040.A (Street Tree Standards)

- ...
1. Street trees shall be required as part of the approval process for Conditional Use (Type III), Downtown Design Review (Type II and III), Minor Land Partition (Type II), Planned Development (Type III), Site Development Review (Type II) and Subdivision (Type II and III) permits.
  2. The minimum number of required street trees shall be determined by dividing the linear amount of street frontage within or adjacent to the site (in feet) by 40 feet. When the result is a fraction, the minimum number of required street trees shall be determined by rounding to the nearest whole number.
  3. Street trees required by this section shall be planted according to the Street Tree Planting sStandards in ~~Section 2~~ of the Urban Forestry Manual.
  4. Street trees required by this section shall be provided adequate soil volumes according to the Street Tree Soil Volume sStandards in ~~Section 12~~ of the Urban Forestry Manual.
  5. Street trees required by this section shall be planted within the right of way whenever practicable according to the Street Tree Planting sStandards in ~~Section 2~~ of the Urban Forestry Manual. Street trees may be planted no more than 6 feet from the right of

## Housekeeping Amendments to the Urban Forestry Code Revisions

way according to the Street Tree Planting sStandards in ~~Section 2~~ of the Urban Forestry Manual when planting within the right of way is not practicable.

6. An existing tree may be used to meet the street tree standards provided that:
  - a. The largest percentage of the tree trunk immediately above the trunk flare or root buttresses is either within the subject site or within the right of way immediately adjacent to the subject site;
  - b. The tree would be permitted as a street tree according to the Street Tree Planting and Soil Volume sStandards in ~~Sections 2 and 12~~ of the Urban Forestry Manual if it were newly planted; and
  - c. The tree is shown as preserved in the Tree Preservation and Removal site plan (per 18.790.030.A.2), Tree Canopy Cover site plan (per 18.790.030.A.3) and sSupplemental rReport (per 18.790.030.A.4) of a concurrent urban forestry plan and is eligible for credit towards the effective tree canopy cover of the site.

7. In cases where it is not practicable to provide the minimum number of required street trees, the Director may allow the applicant to remit payment into the Urban Forestry Fund for tree planting and early establishment in an amount equivalent to the City's cost to plant and maintain a street tree for three (3) years (per the Street Tree Planting sStandards in ~~Section 2~~ of the Urban Forestry Manual) for each tree below the minimum required.

...  
**Code/Manual Section:** Tigard Development Code Section 18.745.050.B.1.a (Screening of parking and loading areas is required)

...  
(4) All parking areas, including parking spaces and aisles, shall be required to achieve at least 30% tree canopy cover at maturity directly above the parking area in accordance with the Parking Lot Tree Canopy Standards in ~~Section 13~~ of the Urban Forestry Manual.

...  
**Code/Manual Section:** Tigard Development Code Section 18.790.030 (Urban Forestry Plan Requirements)

...  
A. Urban Forestry Plan Requirements. An urban forestry plan shall:

1. Be coordinated and approved by a landscape architect (the project landscape architect) or a person possessing dual certifications as a certified arborist and certified tree risk assessor (the project arborist);
2. Meet the rTree pPreservation and rRemoval sSite pPlan standards in ~~Section 10, part 4~~ of the Urban Forestry Manual;

## Housekeeping Amendments to the Urban Forestry Code Revisions

3. Meet the ~~Tree Canopy Site Plan~~ standards in ~~Section 10, part 2~~ of the Urban Forestry Manual; and

4. Meet the ~~Supplemental Report~~ standards in ~~Section 10, part 3~~ of the Urban Forestry Manual.

B. Tree Canopy Fee. If the ~~Supplemental Report~~ demonstrates that the applicable standard percent effective tree canopy cover in ~~Section 10, part 3, item N~~ will not be provided through any combination of tree planting or preservation for the overall development site (excluding streets) or that the 15 percent effective tree canopy cover will not be provided through any combination of tree planting or preservation for any individual lot or tract in the R-1, R-2, R-3.5, R-4.5 and R-7 districts (when the overall development site meets or exceeds the standard percent effective tree canopy cover), then the applicant shall provide the city a tree canopy fee according to the methodology outlined in the Tree Canopy Fee Calculation Requirements in Section 10, part 4 of the Urban Forestry Manual.

...

**Code/Manual Section:** Tigard Development Code Section 18.790.040 (Discretionary Urban Forestry Plan Review Option)

...

A. General Provisions. In lieu of providing payment of a tree canopy fee when less than the standard effective tree canopy cover ~~required by Section 10, part 3 of the Urban Forestry Manual~~ will be provided, an applicant may apply for a discretionary urban forestry plan review. The discretionary urban forestry plan review cannot be used to modify an already approved urban forestry plan, any tree preservation or tree planting requirements established as part of another land use review approval, or any tree preservation or tree planting requirements required by another chapter in this title.

...

**Code/Manual Section:** Tigard Development Code Section 18.790.050.D.1 (Reduction of Minimum Density)

...

- b. The project arborist or landscape architect certifies the preservation is such that the connectivity and viability of the remaining significant tree grove is maximized while balancing the Significant Tree Grove Preservation ~~Considerations in Section 10, part 5~~ of the Urban Forestry Manual; and

...

**Code/Manual Section:** Tigard Development Code Section 18.790.050.D.2.a (Density may be transferred provided that:)

...

- (ii) The project arborist or landscape architect certifies the preservation is such that the connectivity and viability of the remaining significant tree grove is maximized while balancing the Significant Tree Grove

Housekeeping Amendments to the Urban Forestry Code Revisions

Preservation ~~e~~Considerations in ~~Section 10, part 5~~ of the Urban Forestry Manual;

...  
**Code/Manual Section:** Tigard Development Code Section 18.790.050.D.3 (Adjustments to Commercial Development Standards)

- ...  
b. The project arborist or landscape architect certifies the preservation is such that the connectivity and viability of the remaining significant tree grove is maximized while balancing the Significant Tree Grove Preservation ~~e~~Considerations in ~~Section 10, part 5~~ of the Urban Forestry Manual;

...  
**Code/Manual Section:** Tigard Development Code Section 18.790.050.D.4 (Adjustments to Industrial Development Standards)

- ...  
b. The project arborist or landscape architect certifies the preservation is such that the connectivity and viability of the remaining significant tree grove is maximized while balancing the Significant Tree Grove Preservation ~~e~~Considerations in ~~Section 10, part 5~~ of the Urban Forestry Manual;

...  
**Code/Manual Section:** Tigard Development Code Section 18.790.050.D.5 (Adjustment to Minimum Effective Tree Canopy Cover Requirement)

- ...  
b. The project arborist or landscape architect certifies the preservation is such that the connectivity and viability of the remaining significant tree grove is maximized while balancing the Significant Tree Grove Preservation ~~e~~Considerations in ~~Section 10, part 5~~ of the Urban Forestry Manual;

...  
**Code/Manual Section:** Tigard Development Code Section 18.790.050.D.6 (Adjustment to Street and Utility Standards)

- ...  
a. The adjustments will facilitate preservation and help to maximize the connectivity and viability of a significant tree grove while balancing the Significant Tree Grove Preservation ~~e~~Considerations in ~~Section 10, part 5~~ of the Urban Forestry Manual;

...  
**Code/Manual Section:** Tigard Development Code Section 18.790.060 (Urban Forestry Plan Implementation)

...  
B. Inspections. Implementation of the urban forestry plan shall be inspected, documented and reported by the project arborist or landscape architect whenever an urban forestry plan is active. In addition, no person may refuse entry or access to the director for the purpose of monitoring the urban forestry plan on any site with an effective urban forestry plan. The ~~i~~Inspection ~~r~~Requirements in ~~Section 11, part 4~~ of the Urban Forestry

## Housekeeping Amendments to the Urban Forestry Code Revisions

Manual shall apply to sites with an effective urban forestry plan.

C. ~~Tree Establishment.~~ The establishment of all trees shown to be planted in the ~~Tree e~~Canopy ~~s~~Site ~~p~~Plan (per 18.790.030.A.3) and ~~s~~Supplemental ~~r~~Report (per 18.790.030.A.4) of a previously approved urban forestry plan shall be guaranteed and required according to the ~~Tree e~~Establishment ~~r~~Requirements in ~~Section 11, part 2 of~~ the Urban Forestry Manual.

D. ~~Urban Forest Inventory.~~ Spatial and species specific data shall be collected according to the ~~u~~Urban ~~f~~Forestry ~~i~~nventory ~~r~~Requirements in ~~Section 11, part 3 of~~ the Urban Forestry Manual for each open grown tree and area of stand grown trees in the ~~Tree e~~Canopy ~~s~~Site ~~p~~Plan (per 18.790.030.A.3) and ~~s~~Supplemental ~~r~~Report (per 18.790.030.A.4) of a previously approved urban forestry plan.

...

**Code/Manual Section:** Tigard Development Code Section 18.790.070.B (Exemptions)

...

B. ~~Exemptions.~~ The following activities shall be exempt from the Type I Modification to the Urban Forestry Plan Component of an Approved Land Use Permit process:

1. ~~Removal of any tree shown as preserved in the Tree e~~Canopy ~~s~~Site ~~p~~Plan (per 18.790.030.A.3) and ~~s~~Supplemental ~~r~~Report (per 18.790.030.A.4) of a previously approved urban forestry plan provided:

a. ~~The project arborist or landscape architect provides a written report prior to removal attesting that either the condition rating (per Section 10, part 3, item D.7 of the Urban Forestry Manual) or suitability of preservation rating (per Section 10, part 3, item D.8 of the Supplemental Report Requirements in the Urban Forestry Manual) of the tree has changed to a rating of less than 2; and~~

b. ~~A revised Tree e~~Canopy ~~s~~Site ~~p~~Plan and ~~s~~Supplemental ~~r~~Report are submitted for review and approval prior to removal that reflect the proposed changes to the previously approved urban forestry plan. The revised ~~Tree e~~Canopy ~~s~~Site ~~p~~Plan and ~~s~~Supplemental ~~arborist r~~Report shall demonstrate how the effective tree canopy cover requirements ~~in~~ ~~Section 10, part 3 of the Urban Forestry Manual~~ will be provided by tree planting, preservation and/or payment of a tree canopy fee in lieu of planting or preservation.

...

**CITY OF TIGARD, OREGON**  
**TIGARD CITY COUNCIL**  
**ORDINANCE NO. 12- 10**

AN ORDINANCE ADOPTING COMPREHENSIVE PLAN AMENDMENT CPA 2011-00004 TO INCORPORATE A SIGNIFICANT TREE GROVES MAP INTO THE TIGARD COMPREHENSIVE PLAN.

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WHEREAS, on June 3, 2008 the Tigard City Council adopted an Urban Forest section as part of the Comprehensive Plan in order to establish broad goals and policies to guide the long-term management and enhancement of the urban forest; and

WHEREAS, on August 10, 2010 the Tigard City Council readopted the Urban Forest section as part of the Comprehensive Plan in order to provide more detailed findings to further support and explain the rationale for the city's urban forestry goals and policies; and

WHEREAS, Policy 2.2.1 of the Tigard Comprehensive Plan requires the city to periodically update policies, regulations and standards regarding the city's urban forestry program; and

WHEREAS, Policy 2.2.11 of the Tigard Comprehensive Plan requires the city to develop and implement a citywide Urban Forestry Master Plan to guide the update of the city's urban forestry program; and

WHEREAS, on November 10, 2009, the Tigard City Council adopted Resolution 09-69 accepting the City of Tigard's Urban Forestry Master Plan; and

WHEREAS, the accepted Urban Forestry Master Plan analyzed the past and present conditions of Tigard's Urban Forest, was developed through a public process, and sets forth a course of action for Tigard's urban forestry program through 2016; and

WHEREAS, the Urban Forestry Master Plan recommendations include the development of flexible and incentive based land use regulations for significant tree grove preservation; and

WHEREAS, on February 16, 2010, the Tigard City Council directed staff to implement the Community Development Code related recommendations in the Urban Forestry Master Plan, which include the development of flexible and incentive based land use regulations for significant tree grove preservation; and

WHEREAS, a public involvement plan was adopted by the city's Committee for Citizen Involvement in 2010 and implemented during the course of the Urban Forestry Code Revisions project to guide city staff and decision makers; and

WHEREAS, a council appointed Citizen Advisory Committee charged with advising project staff during the Urban Forestry Code Revisions project met 11 times between June 2010 and September 2011 and reached consensus on the flexible and incentive based land use regulations for tree grove preservation in Section 18.790.050.D through a set of "tree grove preservation incentives guiding principles"; and

WHEREAS, a Technical Advisory Committee comprised of city staff and agency representatives was concurrently convened to advise project staff on technical aspects during the Urban Forestry Code Revisions project, met 14 times between June 2010 and November 2011 and reached consensus on the technical

feasibility of the flexible and incentive based land use regulations for tree grove preservation in Section 18.790.050.D; and

WHEREAS, the process for adopting land use regulations for the preservation of natural resources, including the flexible and incentive based land use regulations for tree grove preservation in Section 18.790.050.D (to be adopted through DCA 2011-00002), must comply with Statewide Planning Goal 5 Rule requirements; and

WHEREAS, Statewide Planning Goal 5 Rule requires an inventory of regulated natural resources, coordination with affected property owners, an Environmental, Social, Economic and Energy (ESEE) Analysis of the consequences of a decision to allow, limit, or prohibit uses that conflict with the inventoried natural resources, and adoption of a map identifying the boundaries of the inventoried natural resources; and

WHEREAS, on July 20, 2012, the Tigard City Council and Planning Commission met with project staff and consultants prior to the inventory stage and concurred that tree groves should be part of the inventory only if they meet the following definition: "a 2-acre or larger contiguous, healthy canopy of predominately native trees that provide scenic, aesthetic, environmental or other functional values to the community."; and

WHEREAS, project staff and consultants conducted an inventory using the above definition and identified and mapped 70 tree groves covering 544 acres; and

WHEREAS, project staff and consultants held an open house with affected property owners on October 6, 2010, to discuss the inventory results, review the map and receive input prior to the drafting of flexible and incentive based land use regulations for tree grove preservation in Section 18.790.050.D; and

WHEREAS, project staff and consultants drafted flexible and incentive based land use regulations for tree grove preservation in Section 18.790.050.D, which are to be adopted through DCA 2011-00002 and include allowed reduction in minimum density, density transfer, increased building height, reduced setbacks, adjustments to Urban Forestry Plan requirements and adjustments to street and utility standards to facilitate the preservation of inventoried tree groves as part of the land development process; and

WHEREAS, project staff and consultants held an open house with affected property owners on February 17, 2011, to discuss the draft flexible and incentive based land use regulations for tree grove preservation in Section 18.790.050.D and found that the draft regulations were generally supported by affected property owners; and

WHEREAS, project staff and consultants drafted an ESEE Analysis of the consequences of a decision to allow, limit or prohibit uses that conflict with the 70 inventoried and mapped tree groves identified as significant, and determined that the proposed limited preservation option in Section 18.790.050.D, which provides flexible and incentive based land use regulations for significant tree grove preservation, is the preferred option; and

WHEREAS, on January 13, 2012, prior to the legislative adoption phase of the Urban Forestry Code Revisions project, 14,225 public hearing notices were sent to all Tigard property owners consistent with Measure 56 requirements as further described in the findings of the staff report beginning on page 419 of Urban Forestry Code Revisions Volume II; and

WHEREAS, the public response at the citywide open house on December 8, 2011 and after the Measure 56 notices were sent on January 13, 2012, was generally supportive of the inventoried and mapped tree groves and the proposed limited preservation option in Section 18.790.050.D that provides flexible and incentive based land use regulations for significant tree grove preservation; and



WHEREAS, the Tigard Planning Commission reviewed at one workshop and four public hearings between January 2012 and May 2012 the inventoried and mapped tree groves and the limited preservation option in Section 18.790.050.D that provides flexible and incentive based land use regulations for significant tree grove preservation, the ESEE Analysis that includes findings that support the limited preservation option in Section 18.790.050.D and the significant tree groves map (CPA 2011-00004) that identifies the location of the 70 significant tree groves that are eligible for the flexible and incentive based land use regulations for significant tree grove preservation in Section 18.790.050.D; and

WHEREAS, while the Tigard Planning Commission supported the flexible and incentive based land use regulations in Section 18.790.050.D and the ESEE Analysis, they recommended amending the boundaries of significant tree groves #38 and #62 in the significant tree groves map (CPA 2011-00004) to reflect recent tree removal from those groves; and

WHEREAS, on May 7, 2012, the Tigard Planning Commission made a unanimous recommendation of approval of CPA 2011-00004 as amended regarding the boundaries of significant tree groves #38 and #62 to City Council by motion and unanimous vote; and

WHEREAS, as described in the findings of the staff report beginning on page 419 of Urban Forestry Code Revisions Volume II, the Planning Commission found the city complied with Statewide Planning Goal 5 Rule requirements throughout the development of flexible and incentive based land use regulations for tree grove preservation in Section 18.790.050.D; and

WHEREAS, on the following dates in 2012: July 24, August 14, September 11, October 23, November 13, and November 27, Tigard City Council held a public hearing to consider the Commission's recommendation on CPA 2011-00004; and

WHEREAS, Tigard City Council finds it necessary to delay implementation of the Urban Forestry Code Revisions, which include CPA 2011-00004, until March 1, 2013, to ensure an orderly administrative transition to the new urban forestry regulations; and

WHEREAS, Council's decision to adopt CPA 2011-00004 is based on the findings and conclusions found in the City of Tigard staff report dated November 20, and the associated record, which are incorporated herein by reference and are contained in land-use file CPA 2011-00004.

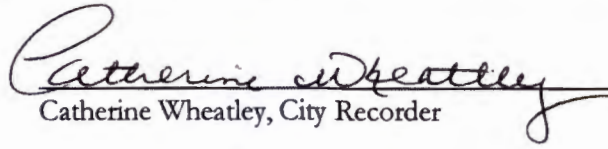
NOW, THEREFORE, THE CITY OF TIGARD ORDAINS AS FOLLOWS:

SECTION 1: Tigard Comprehensive Plan is amended to include "**EXHIBIT A – Significant Tree Groves Map, page 461 of Urban Forestry Code Revisions Volume II.**"

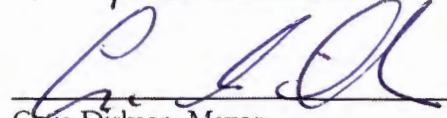
SECTION 2: This ordinance shall be effective March 1, 2013.

SECTION 3: Council adopts the findings recommended by the Planning Commission as described in the findings of the staff report dated November 20, 2012.

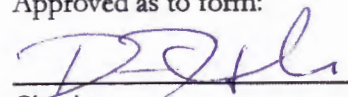
PASSED: By majority vote of all Council members present after being read by number and title only, this 27<sup>th</sup> day of November, 2012.

  
Catherine Wheatley, City Recorder

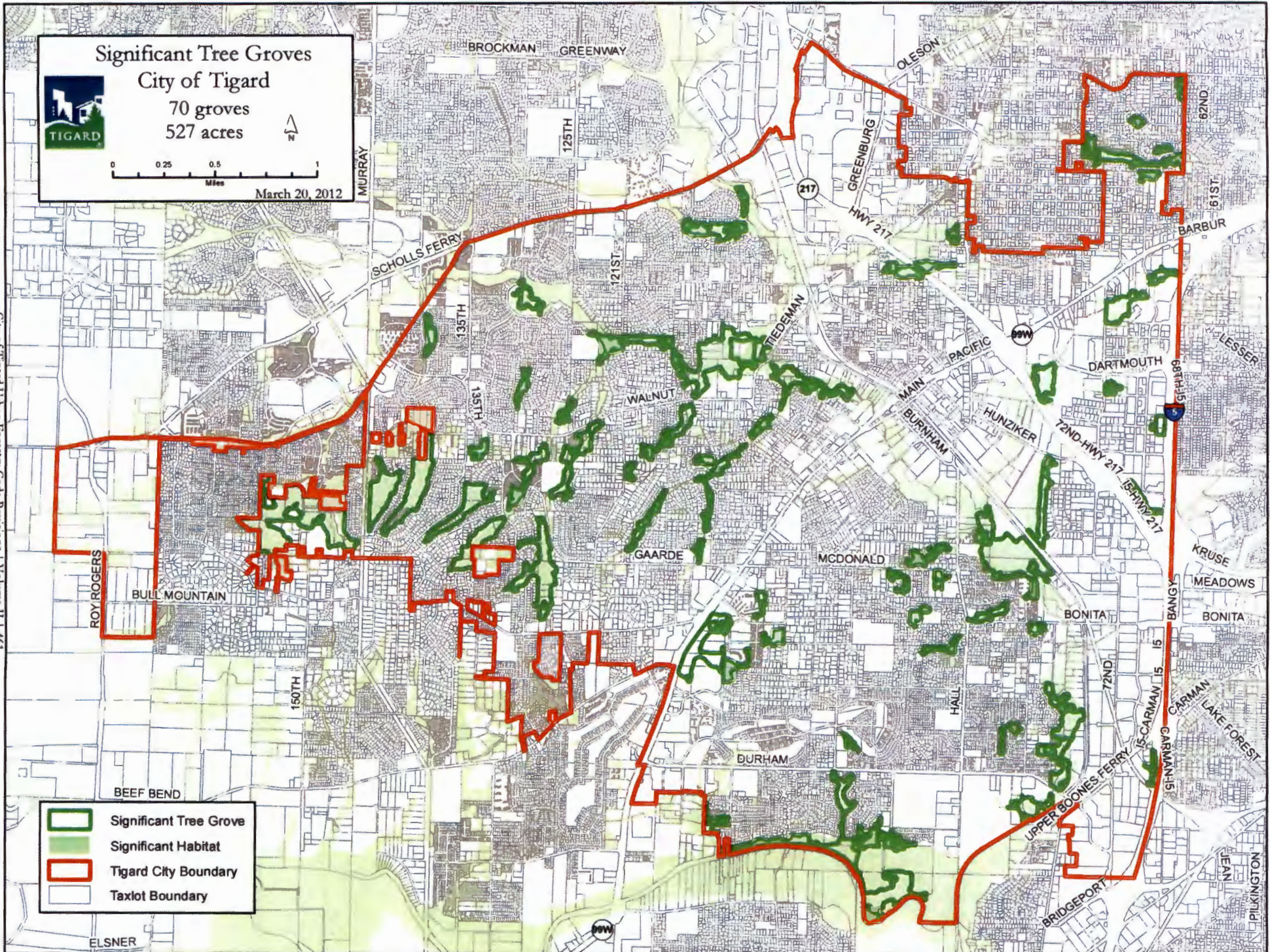
APPROVED: By Tigard City Council this 27<sup>th</sup> day of November, 2012.

  
Craig Dirksen, Mayor

Approved as to form:

  
City Attorney

11/27/12  
Date



City of Tigard Urban Forestry Code Revisions | Volume II | 461

**CITY OF TIGARD, OREGON  
TIGARD CITY COUNCIL  
ORDINANCE NO. 12-11**

AN ORDINANCE TO ADOPT THE NON LAND USE ELEMENTS OF THE URBAN FORESTRY CODE REVISIONS PROJECT BY AMENDING CHAPTERS 1.16, 6.01, 6.02, 7.40, CREATING CHAPTERS 8.02, 8.04, 8.06, 8.08, 8.10, 8.12, 8.14, 8.16, 8.18, AND DELETING CHAPTERS 9.06 AND 9.08 OF THE TIGARD MUNICIPAL CODE.

AS AMENDED BY THE TIGARD CITY COUNCIL ON  
NOVEMBER 27, 2012. SEE EXHIBIT B ATTACHED.

WHEREAS, on June 3, 2008 the Tigard City Council adopted an Urban Forest section as part of the Comprehensive Plan in order to establish broad goals and policies to guide the long-term management and enhancement of the urban forest; and

WHEREAS, on August 10, 2010 the Tigard City Council readopted the Urban Forest section as part of the Comprehensive Plan in order to provide more detailed findings to further support and explain the rationale for the city's urban forestry goals and policies; and

WHEREAS, Policy 2.2.11 of the Tigard Comprehensive Plan requires the city to develop and implement a citywide Urban Forestry Master Plan to guide the update of the city's urban forestry program; and

WHEREAS, on November, 10, 2009, the Tigard City Council adopted Resolution 09-69 accepting the City of Tigard's Urban Forestry Master Plan; and

WHEREAS, the accepted Urban Forestry Master Plan analyzes the past and present conditions of Tigard's Urban Forest, was developed through a public process, and recommends a course of action for Tigard's urban forestry program through 2016; and

WHEREAS, a significant recommendation in the Urban Forestry Master Plan is a comprehensive evaluation of the existing Tigard Municipal Code and implementation of non land use amendments such as hazard tree identification and abatement requirements, tree permit requirements and authorization for administrative rules in the Urban Forestry Manual; and

WHEREAS, on February 16, 2012, the Tigard City Council directed staff to implement the Tigard Municipal Code related recommendations in the Urban Forestry Master Plan which include the non land use amendments to the Tigard Municipal Code through the Urban Forestry Code Revisions project; and

WHEREAS, a public involvement plan was adopted by the city's Committee for Citizen Involvement in 2010 and implemented during the course of the Urban Forestry Code Revisions project to guide city staff and decision makers; and

WHEREAS, a council appointed Citizen Advisory Committee charged with advising project staff during the Urban Forestry Code Revisions project, met 11 times between June 2010 and September 2011, and reached consensus through a set of guiding principles on the non land use amendments to the Tigard Municipal Code; and

WHEREAS, a Technical Advisory Committee comprised of city staff and agency representatives was concurrently convened to advise project staff on technical aspects during the Urban Forestry Code Revisions

ORDINANCE NO. 12- 11

project, met 14 times between June 2010 and November 2011 and reached consensus on the technical feasibility of the non land use amendments to the Tigard Municipal Code; and

WHEREAS, the public involvement plan included a citywide open house on December 8, 2011, at the culmination of the public review phase and provided an opportunity for the public to review and comment on the proposed amendments to the Tigard Municipal Code; and

WHEREAS, the public response at the citywide open house on December 8, 2011, was generally supportive of the of the non land use amendments to the Tigard Municipal Code; and

WHEREAS, the non land use amendments are not land use regulations, but function as elements of the city's comprehensive urban forestry program; and

WHEREAS, the Tigard Planning Commission reviewed these non land use amendments to the Tigard Municipal Code at one workshop and four public hearings between January 2012 and May 2012 while concurrently reviewing the land use amendments (CPA 2011-00004 and DCA 2011-00002) of the Urban Forestry Code Revisions project; and

WHEREAS, on May 7, 2012, the Tigard Planning Commission unanimously advised Tigard City Council that the non land use amendments to the Tigard Municipal Code are consistent with and supportive of the land use amendments; and

WHEREAS, on the following dates in 2012: July 24, August 14, September 11, October 23, November 13, and November 27, the Tigard City Council held a public hearing to consider the non land use amendments to the Tigard Municipal Code and the Tigard Planning Commission's advice; and

WHEREAS, Tigard City Council finds it necessary to delay implementation of the Urban Forestry Code Revisions, which include the non land use amendments to the Tigard Municipal Code, until March 1, 2013, to ensure an orderly administrative transition to the new urban forestry regulations which includes ensuring that the Urban Forestry Manual becomes effective prior to the non land use amendments; and

WHEREAS, on November 27, 2012, the Tigard City Council adopted the non land use amendments by motion, pursuant to the public hearing and its deliberations, to be effective on March 1, 2013.

NOW, THEREFORE, THE CITY OF TIGARD ORDAINS AS FOLLOWS:

- SECTION 1: Tigard Municipal Code is amended to include new text and to amend and rescind existing text as shown in "**EXHIBIT A – on odd numbered pages 3 through 99 of Urban Forestry Code Revisions Volume III**"; and
- SECTION 2: With the exception of amendments to Section 8.02.030 (Administrative Rules - Urban Forestry Manual), this ordinance shall be effective on March 1.
- SECTION 3: Amendments to Section 8.02.030 (Administrative Rules - Urban Forestry Manual) shall be effective 30 days after its passage by the council, signature by the mayor, and posting by the city recorder.
- SECTION 4: Council further adopts the commentary in Exhibit A (on even numbered pages 2 through 99) as additional legislative intent for the corresponding code amendments.

PASSED: By majority vote of all council members present after being read by number and title only, this 27<sup>th</sup> day of November, 2012.

Catherine Wheatley  
City Recorder

APPROVED: By Tigard City Council this 27<sup>th</sup> day of November, 2012.

[Signature]  
Mayor - City of Tigard

Approved as to form:

[Signature]  
City Attorney

11/27/12  
Date



# City of Tigard Memorandum

Exhibit B Ordinance Nos. 12-09  
and 12-11

**To:** Tigard City Council  
**From:** Marissa Daniels, Associate Planner  
**Re:** Urban Forestry Code Revisions  
**Date:** November 27, 2012

On November 27, 2012 Council is scheduled to continue the Urban Forestry Code Revisions public hearing. The purpose of the meeting is to receive a brief staff report, receive public testimony and consider amendments to Planning Commission's recommendation.

### Council Amendments for Consideration

Staff has prepared several amendments to Planning Commission's recommended draft based on Council direction on October 23 and November 13, 2012.

Amendment	Addresses Policy Issue	Brief Description
1	3	Differentiates between residential and non residential maintenance requirements for trees planted with development.
2	4	Removes tree removal permit requirements for single family residential developments.
3	5	Clarifies that hazard trees are required to be removed only in response to verified complaints.
4	7	Enhances the purpose statement in Chapter 18.790 to draw a clear link between the details in the Urban Forestry Manual and the overall purpose of the development code revisions.
5	7	Adds the canopy requirements to the code to draw a clearer link between the details in the Urban Forestry Manual and the overall purpose of the development code revisions.
6	8	Reduces development costs for Minor Land Partitions by not requiring an arborist or landscape architect for partition projects that can meet the requirements by planting street trees in open soil volumes only.

On 11/27/2012, City Council approved amendments 1, 2, 3, 4 and 6. Amendment 5 was not approved.

At the November 13 meeting, Council asked staff if there are any issues associated with not requiring arborists/landscape architects for Minor Land Partition projects that can meet the tree

canopy requirements by planting street trees only (Amendment 6, Policy Issue 8). In deciding whether to adopt this amendment, staff offers the following considerations:

1. **Reverse Incentive** - This amendment could create a reverse incentive where a property owner might remove mature trees and plant only street trees to avoid costs associated with hiring an arborist/landscape architect.
2. **Equity** - In developing the Urban Forestry Code Revisions, one of the main community goals was to address the equity issue in the existing code that places more financial burdens on property owners with mature trees. The canopy approach addresses this issue by applying the same requirements regardless of the amount of existing trees. This amendment could result in an equity issue by exempting owners without trees from hiring arborists/landscape architects, while placing greater requirements on owners that choose to preserve mature trees with development.
3. **Adjacent trees** - Minor Land Partitions involve the creation of two or three new lots in existing residential neighborhoods (aka infill development). Often one of the greatest points of conflict with infill development is the potential development impacts on trees that are on an adjacent property but near the property line. Involving arborists/landscape architects in the development of Minor Land Partitions helps ensure trees adjacent to the site are protected with accepted methods such as tree protection fencing during development. If professionals are not required, there is less certainty for neighbors that their trees will be adequately protected.

More information about each of the amendments, including the affected code sections and specific amendments are included on page 3. Council will have the opportunity to accept, reject, or modify these amendments on November 27.

### **Housekeeping Amendments for Consideration**

In addition to Council's amendments, staff is also recommending a set of housekeeping amendments to the code. These items are insubstantial to the code, and are described in more detail on page 13. For example, Amendments 8 and 9 correct cross references internal to the code.



Amendment 1 approved by council on 11/27/2012. Amendment 1 is not part of an ordinance nor is it to be codified. This amendment is applicable to Volume IV – Urban Forestry Manual (Administrative Rules)

### Amendments to the Urban Forestry Code Revisions Based on Council Direction

**Amendment 1 (Policy Issue 3):** Differentiate between residential and non residential requirements for the maintenance of trees planted with development. Residential trees should have a maintenance period of two years or until a house is sold. Non residential trees should have a one year maintenance period.

**Code/Manual Section:** Urban Forestry Manual Section 11, Part 2 (Urban Forestry Plan Implementation Standards – Tree Establishment Requirements:)

- ...
- A. Prior to any ground disturbance work, the applicant shall provide a tree establishment bond for all trees to be planted per the approved urban forestry plan. The total bond amount:
1. For subdivisions and minor land partitions shall be equivalent to the city's average cost to plant and maintain a tree per the applicable standards in the Urban Forestry Manual for a period of two years after planting multiplied by the total number of trees to be planted and maintained; and
  2. For all other land use review types shall be equivalent to the city's average cost to plant and maintain a tree per the applicable standards in the Urban Forestry Manual for a period of one year after planting multiplied by the total number of trees to be planted and maintained.
- B. Following final building inspection or upon acceptance by the city manager or designee when there is no final building inspection, the tree establishment period shall immediately begin and continue; ~~for a period of two years.~~
1. In subdivisions and partitions, for a period of two years or until such time as each lot is sold; and
  2. In all other land use review types, for a period of one year.
- C. When the land use review type will result in the division of land into multiple lots or tracts, there shall be a separate tree establishment period for each resulting lot or tract where trees are shown to be planted in the approved urban forestry plan.
- D. Following the ~~two-year~~ applicable tree establishment period for each lot or tract, the bond shall be correspondingly reduced based on tree survival following a site inspection, documentation of successful tree establishment and/or replacement according to items E and F below, and receipt by the city manager or designee of written verification of findings and a signature of approval by the project arborist.
- E. For planted open grown trees, successful establishment shall be considered 80 percent survival of the open grown trees planted on the lot or tract, and replacement of 100 percent of the remaining open grown trees planted on the lot or tract that did not survive.
- F. For planted stand grown trees, successful establishment shall be considered survival of at least 80 percent of the original stand grown trees planted on the lot or tract.
- G. If successful establishment for open grown trees is less than 80 percent for any lot or tract, the ~~two-year~~ applicable tree establishment period shall reset for that lot or tract and the establishment process for open grown trees described in part 2.B-F above shall be repeated until the successful establishment requirement for open grown trees

Amendments to the Urban Forestry Code Revisions Based on Council Direction

is met.

- H. If successful establishment for stand grown trees is less than 80 percent for any lot or tract, the ~~two-year~~ applicable tree establishment period shall reset for that lot or tract and the establishment process for stand grown trees described in Part 2.B-1<sup>F</sup> above shall be repeated until the successful establishment requirement for stand grown trees is met.

...

**Note:** Exhibits A and B to the Resolution revising The Master Fees and Charges Schedule is amended as follows to reflect changes in the methodology for calculating tree establishment bonds:

...

Exhibit A - Legislative Intent for Urban Forestry Fees

...

Tree Establishment Bond (Planting and ~~2~~ Years of Early Establishment)

\$489 per 1.5 inch caliper open grown tree for subdivisions and minor land partitions<sup>+</sup>

\$441 per 1.5 inch caliper open grown tree for land use review types other than subdivisions and minor land partitions<sup>\*\*</sup>

\$367 per 0.5 inch caliper stand grown tree for subdivisions and minor land partitions<sup>+</sup><sup>\*\*</sup>

\$351 per 0.5 inch caliper stand grown tree for land use review types other than subdivisions and minor land partitions<sup>+</sup><sup>\*\*</sup><sup>†</sup>

\*The Tree Establishment Bond for the planting and maintenance of a 1.5 inch caliper tree for the required two years in subdivisions and minor land partitions is based on a formula that combines 50<sup>0</sup>% of the published PNWISA wholesale median tree cost estimate to purchase and install a 3 inch diameter tree, with the average historical cost for City of Tigard staff to perform two years of maintenance on a 1.5 inch caliper tree.

\*\*The Tree Establishment Bond for the planting and maintenance of a 1.5 inch caliper tree for the required one year in land use review types other than subdivisions and minor land partitions is based on a formula that combines 50<sup>0</sup>% of the published PNWISA wholesale median tree cost estimate to purchase and install a 3 inch diameter tree, with the average historical cost for City of Tigard staff to perform one year of maintenance on a 1.5 inch caliper tree.

\*\*†The Tree Establishment Bond for the planting and maintenance of a tree two feet in height or one gallon container size (estimated 0.5 inch caliper) for the required two years in subdivisions and minor land partitions is based on a formula that combines 16.6<sup>0</sup>% of the published PNWISA cost estimate to purchase and install a 3 inch caliper tree, with the average historical cost for City of Tigard staff to perform two years of maintenance on a 0.5 inch caliper tree.

\*\*\*The Tree Establishment Bond for the planting and maintenance of a tree two feet in height

Master Fees and Charges Resolution was not considered/adopted by the council on 11/27/2012

Amendments to the Urban Forestry Code Revisions Based on Council Direction

or one gallon container size (estimated 0.5 inch caliper) for the required one year in land use review types other than subdivisions and minor land partitions is based on a formula that combines 16.6% of the published PNWISA cost estimate to purchase and install a 3 inch caliper tree, with the average historical cost for City of Tigard staff to perform one year of maintenance on a 0.5 inch caliper tree.

...  
Exhibit B - Amended Master Fees and Charges Schedule

...  
Community Development - Miscellaneous Development

...  
Urban Forestry

...  
Tree Establishment Bond (Planting & ~~2-Year Maintenance~~ Early Establishment)

<u>1.5" Caliper Street or Open Grown Tree in Subdivisions or Minor Land Partitions</u>	<u>\$489 per tree</u>	<u>3/1/2013</u>
--	-----------------------	-----------------

<u>1.5" Caliper Street or Open Grown Tree in Land Use Review Types other than Subdivisions or Minor Land Partitions</u>	<u>\$441 per tree</u>	<u>3/1/2013</u>
---	-----------------------	-----------------

<u>2' in Height or 1 Gallon Container Minimum Stand Grown Tree in Subdivisions or Minor Land Partitions</u>	<u>\$367 per tree</u>	<u>3/1/2013</u>
---	-----------------------	-----------------

<u>2' in Height or 1 Gallon Container Minimum Stand Grown Tree in Land Use Review Types other than Subdivisions or Minor Land Partitions</u>	<u>\$351 per tree</u>	<u>3/1/2013</u>
--	-----------------------	-----------------

...

Amendments to the Urban Forestry Code Revisions Based on Council Direction

**Amendment 2 (Policy Issue 4):** Do not require tree removal permits for single family residential developments. Applies to Ordinance No. 12-11

**Code/Manual Section:** Tigard Municipal Code Chapter 8.12 (Trees that were Required with Development)

...

8.12.010 Purpose

The purpose of this chapter is to establish standards and procedures for the maintenance, removal and replacement of trees that were required with high density residential and non residential development to maintain their environmental, aesthetic, social and economic benefits after the development process is complete.

8.12.020 General Provisions

A. ~~The provisions of this chapter do not apply unless there is substantial evidence that one of the following situations exists:~~ to residential developments in the R-1, R-2, R-3.5, R-4.5, R-7, and R-12 districts.

B. The provisions of this chapter do apply when there is substantial evidence that one of the following situations exists:

1. Except for those developments listed in 8.12.020.A above, trees were planted or preserved under a requirement found in Title 18 or found in a land use permit; and

2. Trees were required as replacements for trees originally required under 8.12.020.~~AB.1~~ above.

~~BC.~~ The city manager or designee shall utilize all available land use permit records and data when determining whether a tree is subject to the provisions of this chapter.

...

**Note:** The corresponding commentary for the code amendments is amended as follows to provide a record of legislative intent:

...

Chapter 8.12 TREES THAT WERE REQUIRED WITH DEVELOPMENT

Chapter 8.12 establishes the framework for permitting decisions for trees that were required to be planted or preserved by a land use permit for high density residential and non residential development when the removal is not associated with an active land use permit. The intent of the legislative amendments in Chapter 8.12 is to supersede the planting and preservation requirements for trees that were required by prior land use decisions. This includes trees that are recorded as preserved on property deeds as a result of past land use

## Amendments to the Urban Forestry Code Revisions Based on Council Direction

decisions. However, for these deed restricted trees, applicants (and not the city) will be solely responsible for identifying and removing any applicable deed restrictions. The city will provide any signatures necessary to facilitate the removal of deed restrictions for trees permitted for removal by decisions pursuant to Chapter 8.12.

The reason for not requiring permits for trees required with development in low and medium density residential development is because the owners of these properties are likely to maintain and preserve trees in these locations regardless of code requirements. The circumstances where owners decide to remove healthy trees required with development are expected to be negligible when compared with Tigard's overall urban forest.

However, it is important to note that the permit requirements for Street and Median Trees (Chapter 8.08), Trees in Sensitive Lands (8.10), Trees that were Planted using the Urban Forestry Fund (8.14) and Heritage Trees (8.16) would continue to apply even in low and medium density residential development. In addition, if significant tree groves are preserved in low and medium density residential development, the significant tree grove preservation requirements in section 18.790.050.D would apply.

### 8.12.010 Purpose

The purpose statement explains that the chapter establishes standards and procedures for trees that were required with high density residential and non residential development to maintain their benefits after the development process is complete.

### 8.12.020 General Provisions

The provisions of Chapter 8.12 apply to trees required to be planted or preserved in high density residential and non residential development by a land use permit and trees that are required as replacements for said trees.

The provisions of Chapter 8.12 do not apply to residential developments in the R-1, R-2, R-3.5, R-4.5, R-7, and R-12 districts since these are the primary locations of single family residences. The provisions specify "residential developments" so as not to exempt non residential developments such as schools in residential districts from the requirements.

...

### 8.12.030 Maintenance of Trees That Were Required With Development

Trees that were required to be planted or preserved in high density residential and non residential development by a land use permit are required to be maintained per tree care industry standards.

...

### 8.12.040 Removal of Trees That Were Required With Development

Amendments to the Urban Forestry Code Revisions Based on Council Direction

Permits obtained through the City Manager Decision Making Procedures or the City Board or Committee Decision Making Procedures are required to remove trees required to be planted or preserved in high density residential and non residential development by a land use permit.

...

Amendments to the Urban Forestry Code Revisions Based on Council Direction

**Amendment 3 (Policy Issue 5):** Clarify that hazard trees are required to be removed only in response to verified complaints.

**Code/Manual Section:** Tigard Municipal Code Section 8.06.020 (Hazard Trees Prohibited)

...

A. Hazard trees that are verified through the Hazard Tree Evaluation and Abatement Procedure in Section 1 of the Urban Forestry Manual are prohibited within the City of Tigard.

B. Any hazard tree owner or responsible party identified through the Hazard Tree Evaluation and Abatement Procedure in Section 1 of the Urban Forestry Manual shall be required to complete hazard tree abatement.

C. Failure of a hazard tree owner or responsible party identified through the Hazard Tree Evaluation and Abatement Procedure in Section 1 of the Urban Forestry Manual to complete hazard tree abatement is a nuisance under Chapter 6.02 and subject to penalties under Chapter 1.16.

...

**Note:** The corresponding commentary for the code amendments is amended as follows to provide a record of legislative intent:

...

Chapter 8.06 HAZARD TREES

The hazard trees chapter creates a framework for addressing hazard trees.

The guiding principles for Hazard Trees are in Volume IV of the legislative adoption package for the Urban Forestry Code Revisions. These guiding principles represent the consensus view of the citizen advisory committee that advised staff on the Urban Forestry Code Revisions.

...

8.06.020 General Provisions

Hazard trees (defined in Chapter 8.02) that are verified through the Hazard Tree Evaluation and Abatement Procedure in Section 1 of the Urban Forestry Manual are prohibited in Tigard. The reason for specifying that the prohibition applies only to hazard trees verified through the procedure in the Urban Forestry Manual is to avoid the large scale removal of trees by property owners that would otherwise be unclear whether or not their specific trees are hazards. ~~The definition of hazard tree incorporates by reference the procedure in the Urban Forestry Manual includes an evaluation by a tree risk assessor of the probability of failure, size of defective part and target area~~ before determining whether a tree is a hazard.

...

Amendments to the Urban Forestry Code Revisions Based on Council Direction

**Amendment 4 (Policy Issue 7):** Enhance purpose statement in Chapter 18.790 to draw a clearer link between the details in the Urban Forestry Manual and the overall purpose of the development code revisions.

**Code/Manual Section:** Tigard Development Code Section 18.790.010 (Purpose)

...  
Purpose. The purpose of this chapter is to implement the City's urban forestry goals articulated in the Comprehensive Plan as recommended by the Urban Forestry Master Plan: by establishing:

A. Tree canopy cover requirements for new development regardless of the amount of existing trees on site;

B. Alternatives to meeting tree canopy cover requirements when equivalent environmental functions or values are provided;

C. Flexible and incentive based requirements to facilitate the planting of large stature trees, and the preservation of existing trees and significant tree groves;

D. Requirements that ensure successful implementation of urban forestry plans during and after site development; and

E. A process for modifying urban forestry plans to address changes that occur during the development process.

...  
**Note:** The corresponding commentary for the code amendments is amended as follows to provide a record of legislative intent:

...  
18.790.010 Purpose

The purpose ~~has been simplified to~~ statement cross references the Comprehensive Plan and Urban Forestry Master Plan. Both documents provide the detailed policy basis for the extensive revisions to Chapter 18.790. Examples of the chapter provisions that implement the City's urban forestry goals are provided to give users of the code a better understanding of the overall purpose of the chapter.



Amendment No. 5 not approved by council on 11/27/2012.  
 This language will not be codified in 18.790.030

Amendments to the Urban Forestry Code Revisions Based on Council Direction

**Amendment 5 (Policy Issue 7):** Add the canopy requirements in the code to draw a clearer link between the details in the Urban Forestry Manual and the overall purpose of the development code revisions.

**Code/Manual Section:** Tigard Development Code Section 18.790.030 (Urban Forestry Plan Requirements)

...  
 A. Urban Forestry Plan Requirements. An urban forestry plan shall demonstrate the following effective tree canopy cover requirements will be met in the following districts:

<u>Effective Tree Canopy Cover Requirement</u>	<u>District</u>
<u>40% for overall site and 15% for each lot or tract</u>	<u>R-1, R-2, R-3.5, R-4.5 and R-7 districts, except for schools (18.130.050(f))</u>
<u>33% for overall site</u>	<u>R-12, R-25, R-40, C-N, C-C, C-G, C-P, MUE, MUE-1, MUE-2, MUC, MUR and I-P districts, except for schools (18.130.050(f))</u>
<u>25% for overall site</u>	<u>MU-CBD, MUC-1, I-L and I-H districts, and for schools (18.130.050(f)) in all districts</u>

An urban forestry plan shall:

1. Be coordinated and approved by a landscape architect (the project landscape architect) or a person possessing dual certifications as a certified arborist and certified tree risk assessor (the project arborist);

...  
**Note:** The corresponding commentary for the code amendments is amended as follows to provide a record of legislative intent:

...  
 18.790.030 Urban Forestry Plan Requirements

This section is renamed to Urban Forestry Plan Requirements,

The effective tree canopy cover requirements are included in the code to provide users of the code a clearer understanding of the overall purpose of the Urban Forestry Plan Requirements without requiring them to read through the details of the Urban Forestry Manual. The effective tree canopy cover requirements were extensively tested during the peer review phase of the Urban Forestry Code Revisions and were found to be achievable through planting and preserving an amount of tree canopy that is acceptable to the community. The peer review results can be found in Volume II, and a more detailed description of the canopy standards can be found in Volume V of the legislative adoption package for the Urban Forestry Code Revisions.

...

Amendments to the Urban Forestry Code Revisions Based on Council Direction

**Amendment 6 (Policy Issue 8):** Reduce development costs for Minor Land Partitions by not requiring arborists or landscape architects for partition projects that can meet the requirements by planting street trees in open soil volumes only.

**Code/Manual Section:** Tigard Development Code Section 18.790.030.A (Urban Forestry Plan Requirements)

...

...An urban forestry plan shall:

1. Be coordinated and approved by a landscape architect (the project landscape architect) or a person possessing dual certifications as a certified arborist and certified tree risk assessor (the project arborist), except for Minor Land Partitions that can demonstrate compliance with effective tree canopy cover and soil volume requirements by planting street trees in open soil volumes only;

...

**Note:** The corresponding commentary for the code amendments is amended as follows to provide a record of legislative intent:

...

18.790.030 Urban Forestry Plan Requirements

...

Urban forestry plans are required to be developed by a landscape architect or a person certified as both an arborist and tree risk assessor. Many arborists are dual certified, and adding the new requirement for tree risk assessment will help ensure safe conditions during and after construction. Landscape architects often work closely with arborists when developing urban forestry plans, so the option of allowing landscape architects to sign off on the plans has been added to reduce costs by eliminating the need for hiring two urban forestry consultants.

Arborists and landscape architects are not required for Minor Land Partitions if the effective tree canopy cover and soil volume requirements can be met by planting street trees in open soil volumes only. The purpose of the exemption is to reduce costs for small scale residential projects where the required level of specialized professional expertise is limited.

...

Housekeeping Amendments to the Urban Forestry Code Revisions

**Amendment 1:** Ensure consistency in the title of Chapter 8.02. **Applies to Ordinance No. 12-11**

**Code/Manual Section:** Tigard Municipal Code Chapter 8.02 (Definitions, Penalties and Administrative Rules)

...

TIGARD MUNICIPAL CODE

Title 8

URBAN FORESTRY

Chapters:

- 8.02 DEFINITIONS, PENALTIES AND ADMINISTRATIVE RULES
- 8.04 TREE PERMIT PROCEDURES
- 8.06 HAZARD TREES
- 8.08 STREET AND MEDIAN TREES
- 8.10 TREES IN SENSITIVE LANDS
- 8.12 TREES THAT WERE REQUIRED WITH DEVELOPMENT
- 8.14 TREES THAT WERE PLANTED USING THE URBAN FORESTRY FUND
- 8.16 HERITAGE TREES

Chapter 8.02 DEFINITIONS, PENALTIES AND ADMINISTRATIVE RULES

...

**Amendment 2:** Correct a cross reference in Section 8.02.020.C (Defining Words). **Applies to Ordinance No. 12-11**

**Code/Manual Section:** Tigard Municipal Code Section 8.02.020 (General Provisions)

...

C. Defining Words. Words used in this title and the Urban Forestry Manual have their normal dictionary meaning unless they are listed in Section 8.02.050. Words listed in Section 8.02.0450 have the specific meaning stated, unless the context clearly indicates another meaning.

....

Housekeeping Amendments to the Urban Forestry Code Revisions

**Amendment 3:** Ensure the term "Diameter at breast height (DBH)" is placed in alphabetical order in Section 8.02.050 (Definition of Specific Words). Applies to Ordinance No. 12-11

**Code/Manual Section:** Tigard Municipal Code Section 8.02.050 (Definition of Specific Words)

...

~~GH.~~ "Dripline" - The outer limit of a tree canopy projected to the ground.

HG. "Diameter at breast height (DBH)" - The average diameter of the trunk of a tree measured 4 ½ feet above mean ground level..

...

[note: reverse order to place terms in alphabetical order]

Housekeeping Amendments to the Urban Forestry Code Revisions

**Amendment 4:** The Pacific Northwest Chapter of the International Society of Arboriculture (PNWISA) developed the current tree risk assessment methodology and certification program. Due to the success of the program, the International Society of Arboriculture (ISA) is in the process of adopting the program internationally. However, in the process of adopting the regional program for international users, the ISA expects to modify some of its aspects.

Terry Flanagan, local arborist, tree risk instructor and President of the ISA, has advised on how to address the expected modifications in light of the pending adoption of the Urban Forestry Code Revisions. Specifically, he has advised generalizing the term "certified tree risk assessor" to "tree risk assessor" because of anticipated revisions to the certification process, and replacing reference to "PNWISA" with "ISA" to reflect the international scope of the program. Finally, he has advised retaining the numerical rating system since that is the currently adopted standard. If the numerical system is revised in the future, it may be replaced with the updated system.

The following amendments implement these recommendations. **Applies to Ordinance No. 12-09 and 12-11. Ordinance No. 12-09 affects Title 18 also known as the Community Development Code while Ordinance No. 12-11 covers affected chapters in the Tigard Municipal Code consisting of active and reserved Titles 1-17.**

**Code/Manual Section:** Tigard Municipal Code Section 8.02.050 (Definition of Specific Words)

...

D. ~~“Certified Tree risk assessor”~~ - An individual ~~certified~~ deemed qualified by the International Society of Arboriculture to conduct tree risk assessments.

...

[note: re-lettering of the section is required to place terms in alphabetical order]

**Code/Manual Section:** Tigard Municipal Code Section 8.02.050.I (Hazard Tree Related Definitions)

...

2. ~~“Hazard tree - Any tree or tree part that has been or could be determined by an independent certified tree risk assessor to constitute a high level hazard requiring hazard tree abatement with an overall minimum risk rating of 8 for trees or tree parts up to 4 inch DBH, 9 for trees or tree parts greater than 4 inch and up to 20 inch DBH, or 10 for trees or tree parts greater than 20 inch DBH using the most current version of the tree risk assessment methodology developed by the International Society of Arboriculture in Appendix 1 of the Urban Forestry Manual.~~

3. ~~“Hazard tree abatement” - The process of reducing or eliminating a hazard to an overall risk rating of less than 8 for trees or tree parts up to 4 inch DBH, 9 for trees or tree parts greater than 4 inch and up to 20 inch DBH, or 10 for trees or tree parts greater than 20~~

## Housekeeping Amendments to the Urban Forestry Code Revisions

inch DBH using ~~the most current version of~~ the tree risk assessment methodology developed by the International Society of Arboriculture in Appendix 1 of the Urban Forestry Manual through pruning, tree removal or other means in a manner that complies with all applicable rules and regulations.

...

**Code/Manual Section:** Tigard Development Code Chapter 18.115 (List of Terms)

...

~~Certified~~ Tree Risk Assessor

*See Tree Related Definitions*

...

Tree Related Definitions

- Caliper
- Certified Arborist
- ~~Certified~~ Tree Risk Assessor

...

[note: re-ordering of the section is required to place terms in alphabetical order]

**Code/Manual Section:** Tigard Development Code Section 18.120.030.A.170 (Tree-related definitions)

...

c. ~~“Certified Tree Risk Assessor”~~ - An individual ~~certified~~ deemed qualified by the International Society of Arboriculture to conduct tree risk assessments.

...

g. ~~“Hazard Tree”~~ - Any tree or tree part that has been or could be determined by an independent ~~certified~~ tree risk assessor to constitute a high level hazard requiring hazard tree abatement with an overall minimum risk rating of 8 for trees or tree parts up to 4 inch DBH, 9 for trees or tree parts greater than 4 inch and up to 20 inch DBH, or 10 for trees or tree parts greater than 20 inch DBH using ~~the most current version of~~ the tree risk assessment methodology developed by the International Society of Arboriculture in Appendix 1 of the Urban Forestry Manual.

h. ~~“Hazard Tree Abatement”~~ - The process of reducing or eliminating a hazard to an overall risk rating of less than 8 for trees or tree parts up to 4 inch DBH, 9 for trees or tree parts greater than 4 inch and up to 20 inch DBH, or 10 for trees or tree parts greater than 20 inch DBH using ~~the most current version of~~ the tree risk assessment methodology developed by the International Society of Arboriculture in Appendix 1 of the Urban Forestry Manual through pruning, tree removal or other means in a manner that complies with all applicable rules and regulations.

...

[note: re-ordering of the section is required to place terms in alphabetical order]

**Code/Manual Section:** Tigard Development Code Section 18.790.030 (Urban Forestry

Housekeeping Amendments to the Urban Forestry Code Revisions

Plan Requirements)

...

A. Urban Forestry Plan Requirements. An urban forestry plan shall:

1. Be coordinated and approved by a landscape architect (the project landscape architect) or a person ~~possessing dual certifications as~~ that is both a certified arborist and ~~certified~~ tree risk assessor (the project arborist);

...

**Code/Manual Section:** Urban Forestry Manual Section 1 (Hazard Tree Evaluation and Abatement Procedure)

...

**Part 1. Informal Reconciliation**

...The claimant is encouraged to support their claim with documentation by a ~~certified~~ tree risk assessor...

...

**Part 2. Formal Reconciliation**

... Within seven calendar days of receipt of all the required application materials, the city shall gain access to the respondent's property either voluntarily or with a warrant pursuant to Chapter 1.16 of the Tigard Municipal Code, conduct a tree risk assessment by a ~~certified~~ tree risk assessor using the ~~most current version of the~~ tree risk assessment methodology ~~developed by the International Society of Arboriculture in Appendix 1 of the Urban Forestry Manual~~, determine if the definition of hazard tree in Tigard Municipal Code Chapter 8.02 has been met and, if necessary, prescribe hazard tree abatement as defined in Tigard Municipal Code Chapter 8.02...

...

**Code/Manual Section:** Urban Forestry Manual Section 10 (Urban Forestry Plan Standards)

...

**Part 3. Urban Forestry Plan - Supplemental Report Requirements:**

...

C. The name, address, telephone number, email address; and ISA certified arborist number ~~and PNW-ISA-certified tree risk assessor number~~ of the project arborist or stamp and registration number of the project landscape architect.

...

**Code/Manual Section:** Urban Forestry Manual Appendix 1 (Tree Risk Assessment Form)

...

Date of Evaluation:
<del>Certified</del> Tree Risk Assessor:
<del>Certificate Number:</del>
ISA Number:

## Housekeeping Amendments to the Urban Forestry Code Revisions

~~Certified~~ Tree Risk Assessor Signature: \_\_\_\_\_

...

**Code/Manual Section:** Urban Forestry Manual Appendix 9 (Urban Forestry Plan - Supplemental Report Example Template)

...

### General Information

...

ISA Certified Arborist No.:

~~ISA Certified Tree Risk Assessor No.:~~

...

**Note:** The corresponding commentary for the code amendments is amended as follows to provide a record of legislative intent:

18.120.030 Meaning of Specific Words and Terms

...

~~Certified~~ Tree risk assessor: This term clarifies that ~~certified~~ tree risk assessors are ~~certified~~ individuals deemed qualified by the International Society of Arboriculture (ISA) to conduct tree risk assessments. The Pacific Northwest Chapter of the International Society of Arboriculture (PNWISA) developed the current tree risk assessment methodology and certification program. Due to the success of the program, the ISA is in the process of adopting the program internationally. However, in the process of adopting the program for international users, the ISA expects to modify some of its aspects. One anticipated modification is replacement of the term "certified tree risk assessor" with the term "qualified tree risk assessor". The term and definition of "tree risk assessor" is flexible enough to respond to the anticipated changes.

...

Hazard tree: The term hazard tree has been made more specific to the current PNWISA International Society of Arboriculture Standards so that a more objective evaluation can be made as to what constitutes a hazard tree. A tiered system of rating hazards ensures the risks associated with small diameter tree parts are not understated while the risks associated with large diameter tree parts are not overstated.

The ISA is in the process of adopting the PNWISA program internationally. However, in the process of adopting the program for international users, the ISA expects to modify some of its aspects. The current PNWISA numerical based system is included in Appendix 1 and referenced by the definition of "hazard tree". If the numerical system is revised in the future, it may be replaced with the updated system.

...

[note: re-ordering of the commentary section is required to place terms in alphabetical order]

18.790.030 Urban Forestry Plan Requirements



## Housekeeping Amendments to the Urban Forestry Code Revisions

...  
Urban forestry plans are required to be developed by a landscape architect or a person ~~certified as that is~~ both an certified arborist and tree risk assessor. Many arborists possess both qualifications ~~are dual certified~~, and adding the new requirement for tree risk assessment will help ensure safe conditions during and after construction.

...  
18.790.070 Modification to the Urban Forestry Plan Component of an Approved Land Use Permit

...  
Two levels of modifications to the urban forestry plan component of an approved land use permit will be allowed. Minor modification will be completed as a staff level, technical review. The following items would be considered minor modifications:

- Removal of hazard trees if there is sufficient documentation by the arborist or landscape architect ~~a certified tree risk assessor~~;

...  
**Amendment 5:** Ensure consistency between the Site Design Standards (Section 18.620.030) and Landscaping and Screening (Section 18.620.070) in the Tigard Triangle Design Standards. **Applies to Ordinance No. 12-09**

**Code/Manual Section:** Tigard Development Code Section 18.620.030.A (Site Design Standards)

...  
3. Front yard setback design - Landscaping, an arcade, or a hard-surfaced expansion of the pedestrian path must be provided between a structure and a public street or accessway. If a building abuts more than one street, the required improvements shall be provided on all streets. Landscaping shall be developed to the applicable standard in Section 18.620.030.A.5 ~~an L-1 standard on public streets and an L-2 standard on accessways~~. Hard-surfaced areas shall be constructed with scored concrete or modular paving materials. Benches and other street furnishings are encouraged. These areas shall contribute to the minimum landscaping requirement per Section 18.520.040B and Table 18.520.2.

...  
5. Parking location and landscape design - Parking for buildings or phases adjacent to public street rights-of-way must be located to the side or rear of newly constructed buildings. If located on the side, parking is limited to 50% of the street frontage, ~~and~~ When abutting public streets, parking must be behind a landscaped area constructed to an L-1 Landscape Parking Lot Screen Standard. The minimum depth of the L-1 landscaped area is eight feet or is equal to the adjacent building setback, whichever is greater. All other site landscaping ~~Interior side and rear yards~~ shall be landscaped to an L-2 Landscape General Landscaping Standard, ~~except where a side yard abuts a public street, where it shall be landscaped to an L-1~~ Landscape Standard. The L-1 and L-2 Standards are more fully described in Section 18.620.070.

Housekeeping Amendments to the Urban Forestry Code Revisions

**Amendment 6:** Ensure consistency between the Site Design Standards (Section 18.630.050) and Landscaping and Screening (Section 18.630.090) in the Washington Square Regional Center Design Standards. **Applies to Ordinance No. 12-09**

**Code/Manual Section:** Tigard Development Code Section 18.630.050.A (Site Design Standards)

...

3. Front yard setback design.

a. Purpose. The front yard is the most conspicuous face of a building and requires special attention. Places for people and pedestrian movement helps create an active and safer street. Higher level of landscape anticipates a more immediate visual result.

b. Standard. For setbacks greater than 0 feet, landscaping, an arcade, or a hard-surfaced expansion of the pedestrian path must be provided between a structure and a public street or accessway. If a building abuts more than one street, the required improvements shall be provided on all streets. Landscaping shall be developed to the applicable standard in Section 18.630.050.A.5 an L-1 standard on public streets and an L-2 standard on accessways. Hard-surfaced areas shall be constructed with scored concrete or modular paving materials. Benches and other street furnishings are encouraged. These areas shall contribute to the minimum landscaping requirement per Section 18.520.040.B and Table 18.520.2.

...

5. Parking location and landscape design.

a. Purpose. The emphasis on pedestrian access and a high quality streetscape experience requires that private parking lots that abut public streets should not be the predominant street feature. Where parking does abut public streets, high quality landscaping should screen parking from adjacent pedestrian areas.

b. Standard. Parking for buildings or phases adjacent to public street rights-of-way must be located to the side or rear of newly constructed buildings. When buildings or phases are adjacent to more than one public street, primary street(s) shall be identified by the City where this requirement applies. In general, streets with higher functional classification will be identified as primary streets unless specific design or access factors favor another street. If located on the side, parking is limited to 50% of the primary street frontage, ~~and~~ When abutting public streets, parking must be behind a landscaped area constructed to an L-1 landscape Parking Lot Screen standard. The minimum depth of the L-1 landscaped area is eight feet or is equal to the adjacent building setback, whichever is greater. All other site landscaping Interior side and rear yards shall be landscaped to an L-2 landscape General Landscaping standard, except where a side yard abuts a public street, where it shall be landscaped to an L-1 landscape standard. The L-1 and L-2 standards are more fully described in Section 18.630.090.

...

Housekeeping Amendments to the Urban Forestry Code Revisions

**Amendment 7:** Ensure consistency between the Site Design Standards (Section 18.640.200.B) and Landscaping and Screening (Section 18.640.200.D) in the Durham Quarry (i.e. Bridgeport) Design Standards. **Applies to Ordinance No. 12-09**

**Code/Manual Section:** Tigard Development Code Section 18.640.200.B (Site Design Standards)

...

3. Front yard setback design. For setbacks greater than zero feet, landscaping, an arcade, or a hard-surfaced expansion of the sidewalk shall be provided between a structure and a public street or accessway. If a building abuts more than one street, the required improvements shall be provided on all streets. Landscaping shall be developed to the applicable standard in Section 18.640.200.B.5 ~~an L-1 standard on public streets and an L-2 standard on accessways~~. Hard-surfaced areas shall be constructed with scored concrete or modular paving materials. Benches and other street furnishings are required. These areas shall contribute to the minimum landscaping requirements.

...

5. Parking location and landscape design. Parking for buildings or phases adjacent to public street rights-of-way shall be located to the side or rear of newly constructed buildings. When buildings or phases are adjacent to more than one public street, primary street(s) shall be identified where this requirement applies. If located on the side, parking is limited to 50% of the street frontage, ~~and~~ When abutting public streets, parking must be behind a landscaped area constructed to an L-1 Landscape Parking Lot Screen Standard. The minimum depth of the L-1 landscaped area is eight feet or is equal to the adjacent building setback, whichever is greater. All other site landscaping ~~Interior side and rear yards~~ shall be landscaped to an L-2 Landscape General Landscaping Standard ~~except where a side yard abuts a public street, where it shall be landscaped to an L-1 Landscape Standard~~. See Section 18.640.200.D

....

**Amendment 8:** Correct a cross reference in Section 18.790.050.C.2 (Adjustments to Setbacks). **Applies to Ordinance No. 12-09**

**Code/Manual Section:** Tigard Development Code Section 18.790.050.C.2 (Adjustments to Setbacks)

...

2. Adjustments to Setbacks. The following setback reductions will be allowed for lots preserving existing trees using the criteria in subsection ~~b~~ a below.

....

Housekeeping Amendments to the Urban Forestry Code Revisions

**Amendment 9:** Correct a cross reference in Section 18.790.050.C.3 (Adjustments to Sidewalks). Applies to Ordinance No. 12-09

**Code/Manual Section:** Tigard Development Code Section 18.790.050.C.3 (Adjustments to Sidewalks)

...

3. Adjustments to Sidewalks. ...If a preserved tree is to be utilized as a street tree, it must meet the criteria found in the Landscaping and Screening Section 18.745.040.A.56.

....

Housekeeping Amendments to the Urban Forestry Code Revisions

**Amendment 10:** During the development of the tree grove preservation incentives, the initial proposal was to require permanent preservation and management of tree groves if applicants utilized any one of the preservation incentives (density transfer, increased building height, setback reduction, etc.). While the Citizen Advisory Committee agreed that permanent preservation was appropriate, they advised staff to strike the management requirement. Their rationale was that the management requirement could be seen as onerous by applicants and act as a disincentive to preservation. Staff struck the management requirement for most of the preservation incentives, but inadvertently failed to strike the requirement for two of the incentives. The purpose of the following amendments is to strike the remaining management requirements consistent with the Citizen Advisory Committee recommendation. **Applies to Ordinance No. 12-09**

**Code/Manual Section:** Tigard Development Code Section 18.790.050.D.3 (Adjustments to Commercial Development Standards)

...

3. Adjustments to Commercial Development Standards. Adjustments to Commercial Development Standards (Table 18.520.2) of up to 50 percent reduction in minimum setbacks and up to 20 feet additional building height are permitted provided:

...

g. The significant tree grove is protected through an instrument or action subject to approval by the director that demonstrates it will be permanently preserved ~~and managed~~ such as:

...

**Code/Manual Section:** Tigard Development Code Section 18.790.050.D.6 (Adjustment to Street and Utility Standards)

...

6. Adjustment to Street and Utility Standards. If requested, the director shall use his or her discretion when considering adjustments to Chapter 18.810, Street and Utility Improvement Standards and Section 18.745.040, Street Trees provided:

...

b. The significant tree grove is protected through an instrument or action subject to approval by the director that demonstrates it will be permanently preserved ~~and managed~~ such as:

...

Housekeeping Amendments to the Urban Forestry Code Revisions

**Amendment 11:** One of the goals when revising the Urban Forestry Standards for Development was to clarify when an urban forestry plan for development is "in effect". The purpose of the clarification is to avoid the current situation where future homeowners must amend their land use approvals to remove trees that were required with development. Initially, the term "active" was used but was later replaced with "in effect" since that term is more commonly used in the land use process. The term "active" was inadvertently left in Section 18.790.060 and the purpose of this amendment is to replace it with "in effect".

**Applies to Ordinance No. 12-09**

**Code/Manual Section:** Tigard Development Code Section 18.790.060 (Urban Forestry Plan Implementation)

...

B. Inspections. Implementation of the urban forestry plan shall be inspected, documented and reported by the project arborist or landscape architect whenever an urban forestry plan is ~~active~~ in effect...

....

**Amendment 12:** Correct spelling error of a tree's common name in the Urban Forestry Manual. **Volume IV – Urban Forestry Manual – Not codified.**

**Code/Manual Section:** Urban Forestry Manual Appendix 2 (Street Tree List - Small Stature Trees)

...

Gloryblower...

....

Housekeeping Amendments to the Urban Forestry Code Revisions

**Amendment 13:** Generalize cross references from the code to the Urban Forestry Manual. If the administrative rules are modified during the upcoming administrative rule adoption process or any other future date, this will make the process more efficient by avoiding the necessity of making changes to corresponding cross references in the code. **Applies to Ordinance No. 12-09 and 12-11. Ordinance No. 12-09 affects Title 18 also known as the Community Development Code while Ordinance No. 12-11 covers affected chapters in the Tigard Municipal Code consisting of active and reserved Titles 1-17.**

**Code/Manual Section:** Tigard Municipal Code Section 8.02.050.I (Hazard tree related definitions)

...

1. "Claimant" - Any person that believes in good faith there is a hazard tree on a property, can demonstrate that their life, limb or property has the potential to be impacted by said tree and seeks resolution through the Hazard Tree Evaluation and Abatement Procedure specified in ~~Section 4~~ of the Urban Forestry Manual.

...

5. "Respondent" - Any person that receives notice from a claimant seeking resolution through the Hazard Tree Evaluation and Abatement Procedure specified in ~~Section 4~~ of the Urban Forestry Manual.

...

**Code/Manual Section:** Tigard Municipal Code Section 8.06.030 (Hazard Tree Evaluation and Abatement Procedure)

...

A. Any claimant may seek resolution through the Hazard Tree Evaluation and Abatement Procedure specified in ~~Section 4~~ of the Urban Forestry Manual.

B. Once initiated by the claimant, both the claimant and respondent have an obligation to complete the Hazard Tree Evaluation and Abatement Procedure specified in ~~Section 4~~ of the Urban Forestry Manual. Failure of the claimant or respondent to perform their obligations specified in the Hazard Tree Evaluation and Abatement Procedure constitutes a violation of this code by the negligent party.

...

**Code/Manual Section:** Tigard Municipal Code Section 8.06.040 (Emergency Abatement Procedure)

...

If the city has reason to believe a hazard tree poses an immediate danger and there is not enough time to complete the Hazard Tree Evaluation and Abatement Procedure in ~~Section 4~~ of the Urban Forestry Manual, the city may choose to take immediate remedial action as defined in Section 1.16.150 of the Tigard Municipal Code.

...

**Code/Manual Section:** Tigard Municipal Code Section 8.08.030 (Street Tree Planting)

...

No person shall plant a street tree without prior written approval obtained through the City

Housekeeping Amendments to the Urban Forestry Code Revisions

Manager Decision Making Procedures detailed in Section 8.04.020 using the approval criteria in ~~Section 2, part 4 of the Street Tree Planting Standards~~ in the Urban Forestry Manual.

...

**Code/Manual Section:** Tigard Municipal Code Section 8.08.040 (Street Tree Maintenance)

...

A. All street trees shall be maintained in a manner consistent with the ~~s~~Street ~~t~~Tree ~~m~~Maintenance ~~s~~Standards specified in ~~Section 2, part 2 of the Urban Forestry Manual.~~

...

**Code/Manual Section:** Tigard Municipal Code Section 8.08.050 (Street Tree Removal)

...

A. The City Manager Decision Making Procedures detailed in Section 8.04.020 using the approval criteria in ~~Section 3, part 4 of the Street Tree Removal Standards~~ in the Urban Forestry Manual; or

...

**Code/Manual Section:** Tigard Municipal Code Section 8.08.060 (Median Tree Planting)

...

No person shall plant a median tree without prior written approval obtained through the City Manager Decision Making Procedures detailed in Section 8.04.020 using the approval criteria in ~~Section 4, part 1 of the Median Tree Planting Standards~~ in the Urban Forestry Manual.

...

**Code/Manual Section:** Tigard Municipal Code Section 8.08.070 (Median Tree Maintenance)

...

A. All median trees shall be maintained in a manner consistent with the ~~m~~Median ~~t~~Tree ~~m~~Maintenance ~~s~~Standards specified in ~~Section 4, part 2 of the Urban Forestry Manual.~~

...

**Code/Manual Section:** Tigard Municipal Code Section 8.08.080 (Median Tree Removal)

...

A. The City Manager Decision Making Procedures detailed in Section 8.04.020 using the approval criteria in ~~Section 5, part 1 of the Median Tree Removal Standards~~ in the Urban Forestry Manual; or

...

**Code/Manual Section:** Tigard Municipal Code Section 8.10.040 (Sensitive Lands Tree Removal)

...

A. The City Manager Decision Making Procedures detailed in Section 8.04.020 using the approval criteria in ~~Section 6, part 1 of the Sensitive Lands Tree Removal Standards~~ in the Urban Forestry Manual; or

...

**Code/Manual Section:** Tigard Municipal Code Section 8.12.040 (Removal of Trees That Were Required With Development)



## Housekeeping Amendments to the Urban Forestry Code Revisions

...

A. The City Manager Decision Making Procedures detailed in Section 8.04.020 using the approval criteria in ~~Section 7, part 1 of~~ the Development Tree Removal Standards in the Urban Forestry Manual; or

...

**Code/Manual Section:** Tigard Municipal Code Section 8.14.040 (Removal of Trees that were Planted Using the Urban Forestry Fund)

...

A. The City Manager Decision Making Procedures detailed in Section 8.04.020 using the approval criteria in ~~Section 8, part 1 of~~ the Urban Forestry Fund Tree Removal Standards in the Urban Forestry Manual; or

...

**Code/Manual Section:** Tigard Municipal Code Section 8.16.070 (Removal of Heritage Tree Designation)

...

A. The City Manager Decision Making Procedures detailed in Section 8.04.020 using the approval criteria in ~~Section 9, part 1 of~~ the Heritage Tree Designation Removal Standards in the Urban Forestry Manual; or

...

**Code/Manual Section:** Tigard Development Code Section 18.745.040.A (Street Tree Standards)

- ...
1. Street trees shall be required as part of the approval process for Conditional Use (Type III), Downtown Design Review (Type II and III), Minor Land Partition (Type II), Planned Development (Type III), Site Development Review (Type II) and Subdivision (Type II and III) permits.
  2. The minimum number of required street trees shall be determined by dividing the linear amount of street frontage within or adjacent to the site (in feet) by 40 feet. When the result is a fraction, the minimum number of required street trees shall be determined by rounding to the nearest whole number.
  3. Street trees required by this section shall be planted according to the Street Tree Planting ~~s~~Standards in ~~Section 2 of~~ the Urban Forestry Manual.
  4. Street trees required by this section shall be provided adequate soil volumes according to the Street Tree Soil Volume ~~s~~Standards in ~~Section 12 of~~ the Urban Forestry Manual.
  5. Street trees required by this section shall be planted within the right of way whenever practicable according to the Street Tree Planting ~~s~~Standards in ~~Section 2 of~~ the Urban Forestry Manual. Street trees may be planted no more than 6 feet from the right of

## Housekeeping Amendments to the Urban Forestry Code Revisions

way according to the Street Tree Planting sStandards in ~~Section 2~~ of the Urban Forestry Manual when planting within the right of way is not practicable.

6. An existing tree may be used to meet the street tree standards provided that:
  - a. The largest percentage of the tree trunk immediately above the trunk flare or root buttresses is either within the subject site or within the right of way immediately adjacent to the subject site;
  - b. The tree would be permitted as a street tree according to the Street Tree Planting and Soil Volume sStandards in ~~Sections 2 and 12~~ of the Urban Forestry Manual if it were newly planted; and
  - c. The tree is shown as preserved in the Tree Preservation and Removal site plan (per 18.790.030.A.2), Tree Canopy Cover site plan (per 18.790.030.A.3) and sSupplemental rReport (per 18.790.030.A.4) of a concurrent urban forestry plan and is eligible for credit towards the effective tree canopy cover of the site.

7. In cases where it is not practicable to provide the minimum number of required street trees, the Director may allow the applicant to remit payment into the Urban Forestry Fund for tree planting and early establishment in an amount equivalent to the City's cost to plant and maintain a street tree for three (3) years (per the Street Tree Planting sStandards in ~~Section 2~~ of the Urban Forestry Manual) for each tree below the minimum required.

...  
**Code/Manual Section:** Tigard Development Code Section 18.745.050.E.1.a (Screening of parking and loading areas is required)

...  
(4) All parking areas, including parking spaces and aisles, shall be required to achieve at least 30% tree canopy cover at maturity directly above the parking area in accordance with the Parking Lot Tree Canopy Standards in ~~Section 13~~ of the Urban Forestry Manual.

...  
**Code/Manual Section:** Tigard Development Code Section 18.790.030 (Urban Forestry Plan Requirements)

...  
A. Urban Forestry Plan Requirements. An urban forestry plan shall:

1. Be coordinated and approved by a landscape architect (the project landscape architect) or a person possessing dual certifications as a certified arborist and certified tree risk assessor (the project arborist);
2. Meet the rTree pPreservation and rRemoval sSite pPlan standards in ~~Section 10, part 1~~ of the Urban Forestry Manual;

Housekeeping Amendments to the Urban Forestry Code Revisions

3. Meet the ~~Tree e~~Canopy ~~s~~Site ~~p~~Plan standards in ~~Section 10, part 2~~ of the Urban Forestry Manual; and

4. Meet the ~~s~~Supplemental ~~r~~Report standards in ~~Section 10, part 3~~ of the Urban Forestry Manual.

B. Tree Canopy Fee. If the ~~s~~Supplemental ~~r~~Report demonstrates that the applicable standard percent effective tree canopy cover in ~~Section 10, part 3, item N~~ will not be provided through any combination of tree planting or preservation for the overall development site (excluding streets) or that the 15 percent effective tree canopy cover will not be provided through any combination of tree planting or preservation for any individual lot or tract in the R-1, R-2, R-3.5, R-4.5 and R-7 districts (when the overall development site meets or exceeds the standard percent effective tree canopy cover), then the applicant shall provide the city a tree canopy fee according to the methodology outlined in the Tree Canopy Fee Calculation Requirements in ~~Section 10, part 4~~ of the Urban Forestry Manual.

...

**Code/Manual Section:** Tigard Development Code Section 18.790.040 (Discretionary Urban Forestry Plan Review Option)

...

A. General Provisions. In lieu of providing payment of a tree canopy fee when less than the standard effective tree canopy cover ~~required by Section 10, part 3 of the Urban Forestry Manual~~ will be provided, an applicant may apply for a discretionary urban forestry plan review. The discretionary urban forestry plan review cannot be used to modify an already approved urban forestry plan, any tree preservation or tree planting requirements established as part of another land use review approval, or any tree preservation or tree planting requirements required by another chapter in this title.

...

**Code/Manual Section:** Tigard Development Code Section 18.790.050.D.1 (Reduction of Minimum Density)

...

b. The project arborist or landscape architect certifies the preservation is such that the connectivity and viability of the remaining significant tree grove is maximized while balancing the Significant Tree Grove Preservation eConsiderations in ~~Section 10, part 5~~ of the Urban Forestry Manual; and

...

**Code/Manual Section:** Tigard Development Code Section 18.790.050.D.2.a (Density may be transferred provided that:)

...

(ii) The project arborist or landscape architect certifies the preservation is such that the connectivity and viability of the remaining significant tree grove is maximized while balancing the Significant Tree Grove

Housekeeping Amendments to the Urban Forestry Code Revisions

Preservation eConsiderations in ~~Section 10, part 5~~ of the Urban Forestry Manual;

...  
**Code/Manual Section:** Tigard Development Code Section 18.790.050.D.3 (Adjustments to Commercial Development Standards)

- ...  
b. The project arborist or landscape architect certifies the preservation is such that the connectivity and viability of the remaining significant tree grove is maximized while balancing the Significant Tree Grove Preservation eConsiderations in ~~Section 10, part 5~~ of the Urban Forestry Manual;

...  
**Code/Manual Section:** Tigard Development Code Section 18.790.050.D.4 (Adjustments to Industrial Development Standards)

- ...  
b. The project arborist or landscape architect certifies the preservation is such that the connectivity and viability of the remaining significant tree grove is maximized while balancing the Significant Tree Grove Preservation eConsiderations in ~~Section 10, part 5~~ of the Urban Forestry Manual;

...  
**Code/Manual Section:** Tigard Development Code Section 18.790.050.D.5 (Adjustment to Minimum Effective Tree Canopy Cover Requirement)

- ...  
b. The project arborist or landscape architect certifies the preservation is such that the connectivity and viability of the remaining significant tree grove is maximized while balancing the Significant Tree Grove Preservation eConsiderations in ~~Section 10, part 5~~ of the Urban Forestry Manual;

...  
**Code/Manual Section:** Tigard Development Code Section 18.790.050.D.6 (Adjustment to Street and Utility Standards)

- ...  
a. The adjustments will facilitate preservation and help to maximize the connectivity and viability of a significant tree grove while balancing the Significant Tree Grove Preservation eConsiderations in ~~Section 10, part 5~~ of the Urban Forestry Manual;

...  
**Code/Manual Section:** Tigard Development Code Section 18.790.060 (Urban Forestry Plan Implementation)

...  
B. Inspections. Implementation of the urban forestry plan shall be inspected, documented and reported by the project arborist or landscape architect whenever an urban forestry plan is active. In addition, no person may refuse entry or access to the director for the purpose of monitoring the urban forestry plan on any site with an effective urban forestry plan. The ~~Inspection r~~Requirements in ~~Section 11, part 1~~ of the Urban Forestry

## Housekeeping Amendments to the Urban Forestry Code Revisions

Manual shall apply to sites with an effective urban forestry plan.

C. Tree Establishment. The establishment of all trees shown to be planted in the Tree Canopy Site Plan (per 18.790.030.A.3) and Supplemental Report (per 18.790.030.A.4) of a previously approved urban forestry plan shall be guaranteed and required according to the Tree Establishment Requirements in ~~Section 11, part 2~~ of the Urban Forestry Manual.

D. Urban Forest Inventory. Spatial and species specific data shall be collected according to the Urban Forest Inventory Requirements in ~~Section 11, part 3~~ of the Urban Forestry Manual for each open grown tree and area of stand grown trees in the Tree Canopy Site Plan (per 18.790.030.A.3) and Supplemental Report (per 18.790.030.A.4) of a previously approved urban forestry plan.

...

**Code/Manual Section:** Tigard Development Code Section 18.790.070.B (Exemptions)

...

B. Exemptions. The following activities shall be exempt from the Type I Modification to the Urban Forestry Plan Component of an Approved Land Use Permit process:

1. Removal of any tree shown as preserved in the Tree Canopy Site Plan (per 18.790.030.A.3) and Supplemental Report (per 18.790.030.A.4) of a previously approved urban forestry plan provided:

a. The project arborist or landscape architect provides a written report prior to removal attesting that either the condition rating (~~per Section 10, part 3, item D.7 of the Urban Forestry Manual~~) or suitability of preservation rating (~~per Section 10, part 3, item D.8 of the Supplemental Report Requirements in the Urban Forestry Manual~~) of the tree has changed to a rating of less than 2; and

b. A revised Tree Canopy Site Plan and Supplemental Report are submitted for review and approval prior to removal that reflect the proposed changes to the previously approved urban forestry plan. The revised Tree Canopy Site Plan and Supplemental arborist Report shall demonstrate how the effective tree canopy cover requirements in ~~Section 10, part 3 of the Urban Forestry Manual~~ will be provided by tree planting, preservation and/or payment of a tree canopy fee in lieu of planting or preservation.

...



**Proposed Administrative Rule  
Urban Forestry Manual Section 1 – Hazard Tree Evaluation and  
Abatement Procedures**

Administrative Rule No. 8.06.030 01 01  
TMC # Rule # Version #

Effective Date: March 1, 2013

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**1. Description**

This section of the proposed Urban Forestry Manual creates a process for the reconciliation of hazard tree disputes between neighboring property owners.

**2. Sections**

Please see Section 1 of the proposed City of Tigard Urban Forestry Manual in the City of Tigard Urban Forestry Code Revisions Volume IV (attached).

**Approved by:**

*Martha L. Wine*  
Martha L. Wine, City Manager

1.31.2013  
Date



**Proposed Administrative Rule**  
**Urban Forestry Manual Section 2, Part 1 – Street Tree Planting Standards**

Administrative Rule No. 8.08.030 01 01  
TMC # Rule # Version #  
Effective Date: March 1, 2013

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**1. Description**

This section of the proposed Urban Forestry Manual creates a process for property owners to plant trees along streets.

**2. Sections**

Please see Section 2, Part 1 of the proposed City of Tigard Urban Forestry Manual in the City of Tigard Urban Forestry Code Revisions Volume IV (attached).

**Approved by:**

*Martha L. Wine*  
Martha L. Wine, City Manager

1.31.2013  
Date



**Proposed Administrative Rule  
Urban Forestry Manual Section 2, Part 2 – Street Tree Maintenance  
Standards**

Administrative Rule No. 8.08.040 01 01  
TMC # Rule # Version #

Effective Date: March 1, 2013

**1. Description**

This section of the proposed Urban Forestry Manual creates a process for property owners to maintain trees along streets.

**2. Sections**

Please see Section 2, Part 2 of the proposed City of Tigard Urban Forestry Manual in the City of Tigard Urban Forestry Code Revisions Volume IV (attached).

**Approved by:**

  
\_\_\_\_\_  
Martha L. Wine, City Manager

1.31.2013  
\_\_\_\_\_  
Date





**Proposed Administrative Rule  
Urban Forestry Manual Section 3 – Street Tree Removal Standards**

Administrative Rule No. 8.08.050 01 01  
TMC # Rule # Version #  
Effective Date: March 1, 2013

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**1. Description**

This section of the proposed Urban Forestry Manual creates a process for property owners to remove street trees.

**2. Sections**

Please see Section 3 of the proposed City of Tigard Urban Forestry Manual in the City of Tigard Urban Forestry Code Revisions Volume IV (attached).

**Approved by:**

*Martha L. Wine*  
Martha L. Wine, City Manager

1.31.2013  
Date



**Proposed Administrative Rule  
Urban Forestry Manual Section 4, Part 1 – Median Tree Planting  
Standards**

Administrative Rule No. 8.08.060 01 01  
TMC # Rule # Version #  
Effective Date: March 1, 2013

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**1. Description**

This section of the proposed Urban Forestry Manual creates a process for property owners to plant median trees.

**2. Sections**

Please see Section 4, Part 1 of the proposed City of Tigard Urban Forestry Manual in the City of Tigard Urban Forestry Code Revisions Volume IV (attached).

**Approved by:**

*Martha L. Wine*  
Martha L. Wine, City Manager

1-31-2013  
Date



**Proposed Administrative Rule  
Urban Forestry Manual Section 4, Part 2 – Median Tree  
Maintenance Standards**

Administrative Rule No. 8.08.070 01 01  
TMC # Rule # Version #  
Effective Date: March 1, 2013

---

**1. Description**

This section of the proposed Urban Forestry Manual creates a process for property owners to maintain median trees.

**2. Sections**

Please see Section 4, Part 2 of the proposed City of Tigard Urban Forestry Manual in the City of Tigard Urban Forestry Code Revisions Volume IV (attached).

**Approved by:**

*Martha L. Wine*  
Martha L. Wine, City Manager

1.31.2013  
Date



**Proposed Administrative Rule  
Urban Forestry Manual Section 5– Median Tree Removal  
Standards**

Administrative Rule No. 8.08.080 01 01  
TMC # Rule # Version #  
Effective Date: March 1, 2013

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**1. Description**

This section of the proposed Urban Forestry Manual creates a process for property owners to remove median trees.

**2. Sections**

Please see Section 5 of the proposed City of Tigard Urban Forestry Manual in the City of Tigard Urban Forestry Code Revisions Volume IV (attached).

**Approved by:**

*Martha L. Wine*  
Martha L. Wine, City Manager

1.31.2013  
Date



**Proposed Administrative Rule  
Urban Forestry Manual Section 6 – Sensitive Lands Tree Removal  
and Replacement Standards**

Administrative Rule No. 8.10.040 01 01  
TMC # Rule # Version #

Effective Date: March 1, 2013

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**1. Description**

This section of the proposed Urban Forestry Manual details the approval criteria for sensitive lands tree removal through the City Manager Decision Making Procedures (Part 1), including Sensitive Lands Tree Replacement Standards (Part 2).

**2. Sections**

Please see Section 6 of the proposed City of Tigard Urban Forestry Manual in the City of Tigard Urban Forestry Code Revisions Volume IV (attached).

**Approved by:**

Martha L. Wine  
Martha L. Wine, City Manager

1.31.2013  
Date



**Proposed Administrative Rule  
Urban Forestry Manual Section 7 – Development Tree Removal  
and Replacement Standards**

Administrative Rule No. 8.12.040 01 01  
TMC # Rule # Version #

Effective Date: March 1, 2013

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**1. Description**

This section of the proposed Urban Forestry Manual details the approval criteria for development tree removal through the City Manager Decision Making Procedures (Part 1), including replacement standards for development trees (Part 2).

**2. Sections**

Please see Section 7 of the proposed City of Tigard Urban Forestry Manual in the City of Tigard Urban Forestry Code Revisions Volume IV (attached).

**Approved by:**

  
\_\_\_\_\_  
Martha L. Wine, City Manager

1.31.2013  
\_\_\_\_\_  
Date



**Proposed Administrative Rule  
Urban Forestry Manual Section 8 – Urban Forestry Fund Tree  
Removal and Replacement Standards**

Administrative Rule No. 8.14.040 01 01  
TMC # Rule # Version #  
Effective Date: March 1, 2013

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**1. Description**

This section of the proposed Urban Forestry Manual details the approval criteria for Urban Forestry Fund Tree Removal through the City Manager Decision Making Procedures (Part 1), including Urban Forestry Fund Tree Replacement Standards (Part 2).

**2. Sections**

Please see Section 8 of the proposed City of Tigard Urban Forestry Manual in the City of Tigard Urban Forestry Code Revisions Volume IV (attached).

**Approved by:**

*Martha L. Wine*  
Martha L. Wine, City Manager

1.31.2013  
Date



**Proposed Administrative Rule  
Urban Forestry Manual Section 9 – Heritage Tree Designation  
Removal Standards**

Administrative Rule No. 8.16.070 01 01  
TMC # Rule # Version #

Effective Date: March 1, 2013

**1. Description**

This section of the proposed Urban Forestry Manual details the approval criteria for heritage tree designation removal through the City Manager Decision Making Procedures.

**2. Sections**

Please see Section 9 of the proposed City of Tigard Urban Forestry Manual in the City of Tigard Urban Forestry Code Revisions Volume IV (attached).

**Approved by:**

  
\_\_\_\_\_  
Martha L. Wine, City Manager

1.31.2013  
\_\_\_\_\_  
Date





**Proposed Administrative Rule**  
**Urban Forestry Manual Section 10 – Urban Forestry Plan Standards**

Administrative Rule No. 18.790.030 01 01  
TDC # Rule # Version #  
Effective Date: March 1, 2013

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**1. Description**

This section of the proposed Urban Forestry Manual details urban forestry plan standards including tree preservation and removal site plan requirements, tree canopy site plan requirements, supplemental report requirements, tree canopy fee calculation requirements and significant tree grove preservation considerations.

**2. Sections**

Please see Section 10 of the proposed City of Tigard Urban Forestry Manual in the City of Tigard Urban Forestry Code Revisions Volume IV (attached).

**Approved by:**

  
\_\_\_\_\_  
Martha L. Wine, City Manager

AS AMENDED BY THE TIGARD CITY COUNCIL ON  
JANUARY 22, 2013. SEE EXHIBIT B ATTACHED.

1.31.2013  
\_\_\_\_\_  
Date



**Proposed Administrative Rule  
Urban Forestry Manual Section 11 – Urban Forestry Plan  
Implementation Standards**

Administrative Rule No. 18.790.060 01 01  
TDC # Rule # Version #

Effective Date: March 1, 2013

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**1. Description**

This section of the proposed Urban Forestry Manual details urban forestry plan implementation standards including inspection requirements, tree establishment requirements, and urban forest inventory requirements.

**2. Sections**

Please see Section 11 of the proposed City of Tigard Urban Forestry Manual in the City of Tigard Urban Forestry Code Revisions Volume IV (attached).

**Approved by:**

*Martha L. Wine*  
Martha L. Wine, City Manager

AS AMENDED BY THE TIGARD CITY COUNCIL ON  
JANUARY 22, 2013. SEE EXHIBIT B ATTACHED.

1-31-2013  
Date



**Proposed Administrative Rule  
Urban Forestry Manual Section 12 – Street Tree Soil Volume  
Standards**

Administrative Rule No. 18.745.040 01 01  
TDC # Rule # Version #

Effective Date: March 1, 2013

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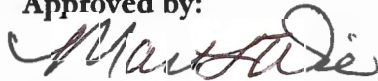
**1. Description**

This section of the proposed Urban Forestry Manual details street tree soil volume standards including soil volume requirements, soil volume calculation requirements, and soil volume plan requirements.

**2. Sections**

Please see Section 12 of the proposed City of Tigard Urban Forestry Manual in the City of Tigard Urban Forestry Code Revisions Volume IV (attached).

**Approved by:**



Martha L. Wine, City Manager

AS AMENDED BY THE TIGARD CITY COUNCIL ON  
JANUARY 22, 2013. SEE EXHIBIT B ATTACHED.

1.31.2013

Date



**Proposed Administrative Rule  
Urban Forestry Manual Section 13 – Parking Lot Tree Canopy  
Standards**

Administrative Rule No. 18.745.050 01 01  
TDC # Rule # Version #

Effective Date: MARCH 1, 2013

**1. Description**

This section of the proposed Urban Forestry Manual details parking lot tree canopy standards including parking lot tree requirements, soil volume calculation requirements, and parking lot tree canopy plan requirements.

**2. Sections**

Please see Section 13 of the proposed City of Tigard Urban Forestry Manual in the City of Tigard Urban Forestry Code Revisions Volume IV (attached).

AS AMENDED BY THE TIGARD CITY COUNCIL ON  
JANUARY 22, 2013. SEE EXHIBIT B ATTACHED.

**Approved by:**

Martha L. Wine, City Manager

1.31.2013

Date



## Proposed Administrative Rule Urban Forestry Manual Appendices

Administrative Rule No. 00.000.000 01 01  
TDC # Rule # Version #  
Effective Date: March 1, 2013

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### 1. Description

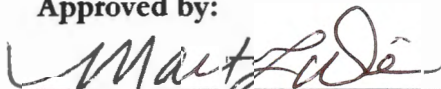
This section of the proposed Urban Forestry Manual includes:

- Appendix 1: Tree Risk Assessment Form
- Appendix 2: Street Tree List
- Appendix 3: Parking Lot Tree List
- Appendix 4: Columnar Tree List
- Appendix 5: Native Tree List
- Appendix 6: Nuisance Tree List
- Appendix 7: Example Tree Preservation and Removal Site Plan
- Appendix 8: Example Tree Canopy Site Plan
- Appendix 9: Example Supplemental Report Template
- Appendix 10: Example Tree Canopy Site Plan for an Individual Lot
- Appendix 11: Example Soil Volume Calculations for Street Trees
- Appendix 12: Example Soil Volume Plan
- Appendix 13: Example Soil Volume Plan for a Single Lot
- Appendix 14: Example Covered Soil Volume Plan Drawings and Example Covered Soil Specifications for Street Trees
- Appendix 15: Example Soil Volume Calculations for Parking Lot Trees
- Appendix 16: Example Parking Lot Tree Canopy Plan
- Appendix 17: Example Covered Soil Volume Plan Drawings and Example Covered Soil Specifications for Parking Lot Trees
- Appendix 18: Example Parking Lot that Meets the 30% Minimum Canopy Cover requirement

### 2. Sections

Please see the appendix of the proposed City of Tigard Urban Forestry Manual in the City of Tigard Urban Forestry Code Revisions Volume IV (attached).

Approved by:

  
Martha L. Wine, City Manager

1.31.2013  
Date



## City of Tigard Memorandum

**To:** Tigard City Council

**From:** Marissa Daniels, Associate Planner

**Re:** Potential Administrative Rules Amendments

**Date:** January 22, 2013

Hearing council's desire for additional flexibility in the Administrative Rules, staff has prepared several amendments for your consideration on January 22, 2013.

### Potential Amendments to the Urban Forestry Manual

Throughout the public hearing process for the code, staff heard from council several additional potential revisions to the Urban Forestry Manual to be made during the administrative rules adoption process. Most of the revisions are aimed at increasing flexibility of the manual. The following table summarizes the potential revisions, the relevant sections of the manual, whether the requirement is already flexible, staff's recommendation, and the reasons for staff's recommendations. While staff recommends council limit their approval to amendments 1, 2, 5 and 7, amendments have been prepared for all 7 items. The specific text of the amendments is included on the following pages. Council will have an opportunity to ask questions of staff and deliberate on the revisions at the January 22, 2013 meeting.

Potential Amendment Number	Requirement Identified for Potential Amendment	Urban Forestry Manual Sections	Already flexible?	Staff Recommendation	Reason for Staff Recommendation
1	Sheet size	10.1.A, 10.2.A, 12.3.B, 13.3.B	No	Increase flexibility	Flexibility OK as long as alternate sheet size is legible
2	Bar scale	10.1.D, 10.2.D	No	Increase flexibility	Flexibility OK as long as alternate bar scale is legible
3	Driplines (to scale)	10.1.J, K, L, 10.2.H,I, 10.2.L, M	No	Do not increase flexibility	Locating tree driplines on site plans is a best practice and ensures conflicts are avoided
4	Tree lists	Appendices 2-6	Yes	Do not increase flexibility	Already flexible, applicants not limited to trees on lists
5	Tree spacing and building setbacks	10.2.L.1-4, 10.2.M.1-5	No, except for building setbacks downtown	Increase flexibility	Allowing building setback flexibility for constrained sites is OK

6	Tree setbacks from pavement and utilities	10.2.L.5-8, 10.2.M.6-9	No	Do not increase flexibility	Setbacks from pavement and utilities protects these infrastructure elements
7	Twice monthly inspection requirement	11.1.B	No, except not required when no active development	Increase flexibility	OK as long as trees are far enough away from planned construction activities

**Previous Amendments to the Urban Forestry Manual**

At the November 27, 2012 meeting, council adopted revisions to the Tigard Development Code and Tigard Municipal Code to implement the Urban Forestry Code Revisions. Some of the code amendments required revisions to the Urban Forestry Manual for consistency purposes. An updated version of the Urban Forestry Manual, which incorporates the revisions from the November 27, 2012 meeting is provided as part of this council packet. The revisions include:

- Differentiation between residential and non residential requirements for the maintenance of trees planted with development (Urban Forestry Manual Section 11.2);
- Housekeeping amendments to the tree risk assessment methodology (Urban Forestry Manual Section 1 and Appendix 1); and
- Housekeeping amendment to correct the spelling of a tree's common name (Urban Forestry Manual Appendix 2).

Potential Amendments to the Urban Forestry Manual

**Potential Amendment 1:** Increase flexibility on sheet size requirement.

**Code/Manual Section:** Urban Forestry Manual Section 10, Part 1 (Urban Forestry Plan Standards – Tree Preservation and Removal Site Plan Requirements:)

...

- A. The plan shall be standard size D (24" x 36"), a reduced ~~legal~~ ledger size (11" x 17") and a PDF, and include all items in part 1.B-O below. When required for clarity, the development impact area information in part 1.I may be detailed separately on multiple plan sheets provided that all of the remaining items in part 1 are included for reference. Alternate sheet sizes may be allowed if approved by the city manager or designee.

...

**Code/Manual Section:** Urban Forestry Manual Section 10, Part 2 (Urban Forestry Plan Standards – Tree Canopy Site Plan Requirements:)

...

- A. The plan shall be standard size D (24" x 36"), a reduced ~~legal~~ ledger size (11" x 17") and PDF format, and include all items in part 2.B-O below. Alternate sheet sizes may be allowed if approved by the city manager or designee.

...

**Code/Manual Section:** Urban Forestry Manual Section 12, Part 3 (Street Tree Soil Volume Standards – Soil Volume Plan Requirements:)

...

- B. A standard size D (24" x 36"), a reduced ~~legal~~ ledger size (11" x 17") and a PDF soil volume plan by a registered landscape architect (the project landscape architect) that includes all of the following elements (alternate sheet sizes may be allowed if approved by the city manager or designee):

...

**Code/Manual Section:** Urban Forestry Manual Section 13, Part 3 (Parking Lot Tree Canopy Standards – Parking Lot Tree Canopy Plan Requirements:)

...

- B. A standard size D (24" x 36"), a reduced ~~legal~~ ledger size (11" x 17") and a PDF parking lot tree canopy plan by a registered landscape architect (the project landscape architect) that includes all of the following elements (alternate sheet sizes may be allowed if approved by the city manager or designee):

...

**Note:** Revising the term "legal" to "ledger" in the sections above corrects a scrivener's error.



Potential Amendments to the Urban Forestry Manual

**Potential Amendment 2: Increase flexibility on bar scale requirement.**

**Code/Manual Section:** Urban Forestry Manual Section 10, Part 1 (Urban Forestry Plan Standards – Tree Preservation and Removal Site Plan Requirements:)

...

D. Bar scale as follows (unless otherwise approved by the city manager or designee):

1. Less than 1.0 acres: 1" = 10'
2. 1.0 - 5.0 acres: 1" = 20'
3. 5.0 – 20.0 acres: 1" = 50'
4. Over 20.0 acres: 1" = 100'.

...

**Code/Manual Section:** Urban Forestry Manual Section 10, Part 2 (Urban Forestry Plan Standards – Tree Canopy Site Plan Requirements:)

...

D. Bar scale as follows (unless otherwise approved by the city manager or designee):

1. Less than 1.0 acres: 1" = 10'
2. 1.0 - 5.0 acres: 1" = 20'
3. 5.0 – 20.0 acres: 1" = 50'
4. Over 20.0 acres: 1" = 100'.

...

## Potential Amendments to the Urban Forestry Manual

**Potential Amendment 3:** Do not require driplines of trees to be shown on site plans to scale.

**Code/Manual Section:** Urban Forestry Manual Section 10, Part 1 (Urban Forestry Plan Standards – Tree Preservation and Removal Site Plan Requirements:)

...

- J. The trunk locations, ~~driplines~~, assigned numbers and “X” marks when applicable (indicating trees proposed for removal) for the following trees within the development impact area and within 25 feet of the development impact area:
1. Trees greater than or equal to 6 inch DBH; and
  2. Other trees that require a permit to remove by Title 8 and are less than 6 inch DBH.
- K. The trunk locations, ~~driplines~~ and assigned numbers for the following trees that are not within the development impact area:
1. Open grown trees greater than or equal to 6 inch DBH; and
  2. Other trees that require a permit to remove by Title 8 and are less than 6 inch DBH.
- L. The ~~driplines~~ locations of stand grown trees greater than or equal to 6 inch DBH that form a contiguous tree canopy. The ~~driplines~~ location of stand grown trees may be delineated at the outer edge of the stand. Each stand shall be assigned a number.

...

**Code/Manual Section:** Urban Forestry Manual Section 10, Part 2 (Urban Forestry Plan Standards – Tree Canopy Site Plan Requirements:)

...

- H. The trunk locations, ~~driplines~~ and assigned numbers for trees to be preserved in parts 1.J and 1.K. Each tree on both the tree preservation and removal site plan and tree canopy site plan shall be assigned the same number on both plans.
- I. The ~~dripline~~ locations of stand grown trees proposed for preservation greater than or equal to 6 inch DBH that form a contiguous tree canopy. The ~~driplines~~ location of stand grown trees may be delineated at the outer edge of the stand. Each stand shall be assigned a number. Each stand on both the tree preservation and removal site plan and tree canopy site plan shall be assigned the same number on both plans.
- ...
- L. The location, species, caliper (in inches for deciduous) or height (in feet for evergreen); and assigned numbers ~~and depiction of the mature tree canopy (in feet as identified on any of the tree lists in the Urban Forestry Manual or by the city manager or designee)~~ for all trees to be planted and maintained as open grown trees...
- ...
- M. The location, species, caliper (in inches for deciduous) or height (in feet for evergreen); and assigned numbers ~~and depiction of the mature tree canopy (in feet as identified on any of the tree lists in the Urban Forestry Manual or by the city manager or designee)~~ for all trees to be planted and maintained as open stand grown

## Potential Amendments to the Urban Forestry Manual

trees. The species of trees planted and maintained as stand grown trees shall be selected from the native tree list in the Urban Forestry Manual. ~~The depiction of the mature tree canopy dripline shall be consistent with dimensions in the native tree list....~~

...

**Note:** Revision of the word "open" to the word "stand" in item M above is to correct a scrivener's error.

### **Potential Amendment 4:** Revise tree lists.

**Code/Manual Section:** Urban Forestry Manual Appendices 2-6 (Street Tree List, Parking Lot Tree List, Columnar Tree List, Native Tree List and Nuisance Tree List)

**Note:** Council will need to provide staff with direction on which species to add or delete if they decide to revise the lists.

Potential Amendments to the Urban Forestry Manual

**Potential Amendment 5: Increase flexibility of setbacks between trees and buildings.**

**Code/Manual Section:** Urban Forestry Manual Section 10, Part 2 (Urban Forestry Plan Standards – Tree Canopy Site Plan Requirements:)

...

L. ...Open grown trees shall be located as follows:

1. Trees categorized as small stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 15 feet on center from other newly planted or existing trees and 10 feet from the face of habitable buildings. ~~In downtown Tigard (Mixed Use Central Business District, MU-CBD),~~ The setback from the face of habitable buildings may be reduced if approved by the city manager or designee;
2. Trees categorized as medium stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 20 feet on center from other newly planted or existing trees and 15 feet from the face of habitable buildings. ~~In downtown Tigard (Mixed Use Central Business District, MU-CBD),~~ The setback from the face of habitable buildings may be reduced if approved by the city manager or designee;
3. Trees categorized as large stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 30 feet on center from other newly planted or existing trees and 20 feet from the face of habitable buildings. ~~In downtown Tigard (Mixed Use Central Business District, MU-CBD),~~ The setback from the face of habitable buildings may be reduced if approved by the city manager or designee;
4. Trees determined by the city manager or designee to have a mature spread of less than 20 feet shall be considered small stature, and shall be spaced no closer than 15 feet on center from other newly planted or existing trees and 10 feet from the face of habitable buildings. ~~In downtown Tigard (Mixed Use Central Business District, MU-CBD),~~ The setback from the face of habitable buildings may be reduced if approved by the city manager or designee;
5. Trees categorized as small stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving;
6. Trees categorized as medium stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 ½ feet from any hard surface paving;

...

**Note:** The addition of "or by the city manager or designee" to item L.6 above is to correct a scrivener's error.

...

M. ...Stand grown trees shall be located as follows:

...

3. ~~Trees~~ categorized as small stature on the native tree list in the Urban Forestry

## Potential Amendments to the Urban Forestry Manual

- Manual or by the city manager or designee shall be spaced no closer than 15 feet from the face of habitable buildings. ~~In downtown Tigard (Mixed Use-Central Business District, MU-CBD),~~ ~~the~~ setback from the face of habitable buildings may be reduced if approved by the city manager or designee;
4. Trees categorized as medium stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 20 feet from the face of habitable buildings. ~~In downtown Tigard (Mixed Use-Central Business District, MU-CBD),~~ ~~the~~ setback from the face of habitable buildings may be reduced if approved by the city manager or designee;
  5. Trees categorized as large stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 30 feet from the face of habitable buildings. ~~In downtown Tigard (Mixed Use-Central Business District, MU-CBD),~~ ~~the~~ setback from the face of habitable buildings may be reduced if approved by the city manager or designee;
  6. Trees categorized as small stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving;
  7. Trees categorized as medium stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 ½ feet from any hard surface paving;

...

**Note:** The addition of "or by the city manager or designee" to item M.7 above is to correct a scrivener's error.

...

Potential Amendments to the Urban Forestry Manual

**Potential Amendment 6:** Increase flexibility of setbacks between trees and pavement and utilities.

**Code/Manual Section:** Urban Forestry Manual Section 10, Part 2 (Urban Forestry Plan Standards – Tree Canopy Site Plan Requirements:)

...

L. ...Open grown trees shall be located as follows:

...

5. Trees categorized as small stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving unless otherwise approved by the city manager or designee;
6. Trees categorized as medium stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 ½ feet from any hard surface paving unless otherwise approved by the city manager or designee;
7. Trees categorized as large stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving unless otherwise approved by the city manager or designee;
8. Where there are overhead utility lines, the tree species selected shall be of a type which, at full maturity, will not interfere with the lines unless otherwise approved by the city manager or designee; and

...

**Note:** The addition of "or by the city manager or designee" to item L.6 above is to correct a scrivener's error.

...

M. ...Stand grown trees shall be located as follows:

...

6. Trees categorized as small stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving unless otherwise approved by the city manager or designee;
7. Trees categorized as medium stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 ½ feet from any hard surface paving unless otherwise approved by the city manager or designee;
8. Trees categorized as large stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving unless otherwise approved by the city manager or designee;
9. Where there are overhead utility lines, the tree species selected shall be of a type which, at full maturity, will not interfere with the lines unless otherwise

## Potential Amendments to the Urban Forestry Manual

approved by the city manager or designee; and

...

**Note:** The addition of "or by the city manager or designee" to item M.7 above is to correct a scrivener's error.

...

### **Potential Amendment 7:** Increase flexibility of the biweekly inspection requirements.

**Code/Manual Section:** Urban Forestry Manual Section 11, Part 1 (Urban Forestry Plan Implementation Standards – Inspection Requirements:)

...

B. Following the completion of item a above, the project arborist or landscape architect shall perform ~~bimonthly~~ semimonthly (twice monthly) site inspections for tree protection measures during periods of active site development and construction, document compliance/non-compliance with the urban forestry plan and send written verification with a signature of approval directly to the city manager or designee within one week of the site inspection. The frequency of site inspections may be decreased if approved by the city manager or designee.

...

E. Prior to final building inspection for any lot or tract with an ~~active~~ urban forestry plan that is still in effect, the project arborist or landscape architect shall perform a site inspection, document compliance/non-compliance with the urban forestry plan and send written verification with a signature of approval to the city manager or designee.

...

**Note:** The revision of the word "active" to the term "in effect" in item E above corrects a scrivener's errors and ensures consistency in terminology used throughout the code and manual.

Except of January 22, 2013 City Council meeting minutes

A portion of the public hearing and council consideration: of the Administrative Rules associated with the Urban Forestry Code Revisions Project and the revisions to the proposed Citywide Master Fees and Charges Schedule:

Council discussion and deliberation:



In response to a question from Mayor Cook – Associate Planner Daniels distributed a summary of changes to further clarify changes to the master fees and charges schedule. Shows each fee being modified and whether it is being added or deleted and a description of the fee. While there are more fees; the costs applying the fee will not mean the costs to develop will be more since the amount of the fees for specific actions are less than what was being charged under the existing requirements.

In response to a question from Councilor Henderson an arborist, in some circumstances, must be hired; however, this is a requirement in the existing code also, including when a developer creates a partition (2 or 3 lots) or a subdivision. No arborist is required for an addition to a single-family home.

In response to a question from Councilor Woodard about a tree establishment bond, Associate Planner Daniels advised that the city currently has such a bond, but it is not part of the fee schedule. Staff is proposing to make these charges a part of the fee schedule so everyone knows what to expect. The money paid for the bonds is refunded when the developer has demonstrated the requirements were met.


Councilor Woodard asked about urban forestry inventory fees. Consultant Prager said this is a new fee. This fee would contribute to building the tree inventory so people can more easily identify trees that are protected on their property. In response to a comment by Councilor Snider, Consultant Prager explained that the council, by adoption of the Comprehensive Plan/Master Plan, directed that the city should provide a publicly accessible tree inventory so people could find this information more easily. Councilor Woodard noted some concerns about whether this fee will end up costing developers and property owners more than anticipated; he indicated he felt more comfortable with letting this proceed because this can be reviewed when needed; i.e., annually.

Principal Planner McGuire suggested that one way to look at the costs associated with establishing a tree inventory: Currently, if a homeowner knows that some trees on their lot might be protected, they must come to the Permit Center to ask staff to help them identify the trees. Staff then must research records, which might be in a paper or electronic format. Instead of taking staff time to do this research, this inspection could be done at the beginning when subdivisions and plans are being approved by simply referring to the city's GIS system. This fee offsets inputting the information into the GIS system. City Manager Wine, in response to a question from Councilor Snider, said the requirement to build a tree inventory is new and a developer applicant is not paying for staff research time now.



Responding to a question from Council President Buehner, staff confirmed during the application process that if a tree is identified to remain on a piece of property, then the developer/applicant must pay \$137 to place the tree within the GIS system.

Councilor Henderson commented on how the City of Tigard compares itself to other cities – should this be something we should do? Associate Planner Daniels said the Planning Commission requested this review be done when it was considering this matter; Tigard is comparable with regard to the fees being imposed. Councilor Henderson said he thinks it's often a good idea to look to see how the city compares to other jurisdictions, he thinks we could always strive to do better regardless.

 Motion by Councilor Snider, seconded by Councilor Buehner, to approve the administrative rules proposed in the Urban Forestry Manual.

> Note: Mayor closed the public hearing prior to the City Council taking a vote on the motion.

The motion was approved by a unanimous vote of City Council present.

Mayor Cook	Yes
Council President Henderson	Yes
Councilor Buehner	Yes
Councilor Snider	Yes
Councilor Woodard	Yes

Associate Planner Daniels referred to the potential amendments to the called out in the staff report and documentation submitted to the council for its consideration of the proposed administrative rules. Clarification was made that the City Council is directing the City Manager to approve the administrative rules. City Attorney Bennett referred to the motion above on the administrative rules. This motion was made and seconded and the City Council approved that motion. By approving the motion, the City Council was directing the City Manager to approve the administrative rules. This action has been taken. The administrative rules proposed to the City Council were based upon the staff memorandum. City Attorney Bennett said he would read that to mean the Council has directed the City Manager to approve the manual, consistent with the staff report presented to the City Council tonight.


City Attorney Bennett said, “To make it clear...you direct the City Manager to implement the administrative rules proposed in the Urban Forestry Manual, based upon the staff report presented to you tonight and the modifications that were included that staff report.” Council members indicated this was its direction.

City Attorney recommended that the City Council entertain a new motion to clarify the decision made by council earlier to direct the city manager.

Motion by Councilor Woodard, seconded by Councilor Buehner, that the City Manager is hereby directed to approve the administrative rules proposed in the Urban Forestry Manual, consistent with the recommended changes in the staff report dated January 22, 2013.

The motion was approved by a unanimous vote of City Council present.

Mayor Cook	Yes
Council President Henderson	Yes
Councilor Buehner	Yes
Councilor Snider	Yes
Councilor Woodard	Yes

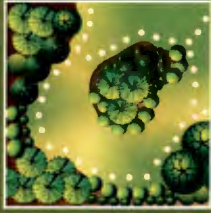
 Consideration of a resolution to amend the citywide master fees and charges schedule.

Councilor Buehner noted that the City Council usually considers the master fees and charges scheduled during the consideration of the budget each year. City Manager Wine advised these charges before the City Council this evening will be included in the schedule submitted to the City Council during the FY 2014 budget adoption process.

Motion by Councilor Buehner, seconded by Councilor Woodard, to adopt Resolution No. 13-03, a resolution to amend the Citywide Master Fees and Charges Schedule as Adopted by Resolution No. 12-22 to institute new and revised fees necessary to implement the Urban Forestry Code Revisions Project.

The motion was approved by a unanimous vote of City Council present.

Mayor Cook	Yes
Council President Henderson	Yes
Councilor Buehner	Yes
Councilor Snider	Yes
Councilor Woodard	Yes



City of Tigard

# Urban Forestry Code Revisions Project

VOLUME IV | URBAN FORESTRY MANUAL (Administrative Rules) | Rev. JANUARY 2013

**City of Tigard**  
COMMUNITY DEVELOPMENT DEPARTMENT  
13125 SW Hall Blvd., Tigard, OR 97223  
[www.tigard-or.gov/trees](http://www.tigard-or.gov/trees)



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## Organization of the Urban Forestry Code Revisions Documents

The Urban Forestry Code Revisions project is presented in five volumes. Volume I provides the project overview and describes the process used to develop all of the elements. Volume II is the land use elements of the code, and Volume III the non land use elements. Volume IV contains the Urban Forestry Manual. Volume V contains technical reports and research that contributed to the code revisions along with details of the public input and deliberations to date.

### Volume I | Project Overview

**Project Overview** includes the following sections:

- Project Introduction
- Overview of Key Elements
- Key Element Summaries
  - Urban Forestry Standards for Development
  - Tree Grove Preservation Incentives
  - Tree Permit Requirements
  - Hazard Trees
  - Urban Forestry Manual

**Appendix A** includes additional detail about the information used to shape the Urban Forestry Code Revisions Project, and includes the following sections:

- Process summary
- Summary of Community Ideas and Concerns
- Summary of Planning Commission Deliberations
- Existing Conditions

### Volume II | Land Use Elements

**Community Development Code (Title 18)** is the Planning Commission's recommended draft of the Development Code. This section includes commentary on the amendments.

**Peer Review** demonstrates how the Planning Commission's recommended draft of the Development Code and Urban Forestry Manual will work in application.

**Tree Grove ESEE Analysis** is a report that addresses Statewide Planning Goal 5 - Natural Resources requirements for the preservation of Significant Tree Groves.

**Staff Report and findings** includes the staff recommendation for approval of the land use elements (Title 18 and the Comprehensive Plan Amendment) and the findings that demonstrate the land use elements meet the necessary approval criteria.

### **Volume III | Non Land Use Elements**

**Tigard Municipal Code** is the staff proposed draft of the Municipal Code (Title 8 and other Municipal Code titles). This section includes commentary on the amendments.

### **Volume IV | Urban Forestry Manual (Administrative Rules)**

**Urban Forestry Manual** consists of administrative rules that implement the technical details of the urban forestry related code provisions in Title 8, Title 18 and other applicable titles in the Tigard Municipal Code.

### **Volume V | Additional Background Materials**

**Planning Commission Deliberations** details Planning Commission discussion and decisions during the public hearing process.

**Amendment Requests Document for the Planning Commission** lists code amendment requests received in response to the first Planning Commission public hearing and staff responses.

**Outstanding Issues for the Urban Forestry Code Revisions** includes additional information on the outstanding issues that were further deliberated by the Planning Commission before making their final recommendation to City Council on May 7, 2012.

**Log of Input** lists the input received and any code changes from the last meeting of the CAC to the staff proposed draft of the Urban Forestry Code Revisions to Planning Commission.

**CAC Guiding Principles** includes the consensus view of the Citizens Advisory Committee (CAC) developed to help guide the legislative adoption process.

**Tree Values** includes information and current research on the environmental, economic, social and aesthetic benefits of trees.

**Canopy Standards** explains the reasons for adopting tree canopy cover requirements as well as the methods used to arrive at the requirements.

**Soil volume** details research about the soil volume required to support a mature tree canopy.

**Tree Canopy Fee** discusses research used to develop a square foot value for tree canopy.

**Regulatory Comparison** is an excerpted report prepared by Metro and the Audubon Society that summarizes and compares regional urban forestry programs and regulations.

**Urban Forestry Master Plan** is the City of Tigard's recommended plan for achieving the urban forestry goals in the Comprehensive Plan.



# **City of Tigard** **URBAN FORESTRY MANUAL**

## **Introduction**

The Urban Forestry Manual consists of administrative rules that implement the details of the urban forestry related code provisions in Title 8, Title 18 and other applicable titles in the Tigard Municipal Code.

The city manager or designee has the authority to amend the Urban Forestry Manual pursuant with the provisions in Chapter 2.04 of the Tigard Municipal Code. The city manager or designee is authorized to administer the Urban Forestry Manual.





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## Section 1 - Hazard Tree Evaluation and Abatement Procedure

### Part 1. Informal Reconciliation:

If interpersonal communication is not feasible or is unsuccessful, the claimant shall contact the respondent by concurrently sending a regular and certified letter that explains the reasons they believe there is a hazard tree on the respondent's property, demonstrates how the claimant's life, limb or property has the potential to be impacted by said tree, and offers to negotiate a solution that is in compliance with all applicable rules and regulations either directly or through a third party mediator. The claimant is encouraged to support their claim with documentation by a tree risk assessor. The respondent shall have seven calendar days or less from receipt of the certified letter or 14 calendar days or less from the postmarked date of the regular letter (whichever is sooner) to respond to the claimant's proposal in writing by concurrent regular and certified mail. In order to become eligible for formal reconciliation, the claimant's letter shall cite Tigard Municipal Code sections 8.06.020 and 8.06.030, explain the respondent's written response deadlines and include all of the other required elements listed above.

### Part 2. Formal Reconciliation:

If the results of informal reconciliation are not acceptable to the claimant or there has been no response for 21 calendar days or more since the claimant sent the concurrent regular and certified letters, the claimant may seek resolution through formal reconciliation by completing a hazard tree dispute resolution application, paying a deposit for all applicable hazard tree dispute resolution fees and providing the city all documentation of informal reconciliation including but not limited to any letters to and from the respondent, proof of certified mail delivery and proof of certified mail receipt (if available).

The city shall use all readily available tools and technology when assigning the hazard tree owner or responsible party as defined in Tigard Municipal Code Chapter 8.02. If the city determines that the claimant's previous correspondence was with the incorrect respondent, then the claimant shall be required to complete the previous steps of the hazard tree evaluation and abatement procedure with the correct respondent before proceeding with formal reconciliation. If the claimant or respondent disagrees with the city's assignment of the hazard tree owner or responsible party, the city shall be presented a land survey by a professional land surveyor that demonstrates the location of the tree in question in relation to property lines within all listed deadlines in order for the city to consider a reassignment of the hazard tree owner or responsible party.

Notes:

See Master Fees and Charges Schedule for current fees

Notes:

See Appendix 1 for  
Tree Risk  
Assessment Form

Within seven calendar days of receipt of all the required application materials, the city shall gain access to the respondent's property either voluntarily or with a warrant pursuant to Chapter 1.16 of the Tigard Municipal Code, conduct a tree risk assessment by a tree risk assessor using the tree risk assessment methodology in Appendix 1 of the Urban Forestry Manual, determine if the definition of hazard tree in Tigard Municipal Code Chapter 8.02 has been met and, if necessary, prescribe hazard tree abatement as defined in Tigard Municipal Code Chapter 8.02.

If the city determines the definition of hazard tree has been met, the city shall send a concurrent regular and certified letter to the respondent, explain that the definition of hazard tree has been met, explain the required hazard tree abatement procedures and require that hazard tree abatement be completed in seven calendar days or less from receipt of the certified letter or 14 calendar days or less from the mailing date of the regular letter (whichever is less). The city shall also bill the respondent for all applicable hazard tree dispute resolution fees, and refund the claimant previously deposited hazard tree dispute resolution fees.

If the respondent fails to complete the hazard tree abatement within the required timeframe, the city shall gain access to the property either voluntarily or with a warrant, abate the hazard, bill the respondent for the cost of abatement including administrative costs or place a lien on the property for the cost of abatement including administrative costs pursuant to Chapter 1.16 of the Tigard Municipal Code.

If the city determines the definition of hazard tree has not been met, the city shall send a concurrent regular and certified letter to both the claimant and respondent explaining that the definition of hazard tree has not been met and close the case.



**END OF SECTION**

## Section 2 - Street Tree Planting and Maintenance Standards

### Part 1. Street Tree Planting Standards:

- A. Street trees shall be planted in a manner consistent with tree care industry standards.
- B. Street trees shall have a minimum caliper of 1 ½ inches at the time of planting.
- C. Street tree species shall be from the street tree list, unless otherwise approved by the city manager or designee.
- D. Street tree species shall be appropriate for the planting environment as determined by the city manager or designee and seek to achieve a balance of the following:
  - 1. Consistency with previously approved street tree plans given space constraints for roots and branches at maturity;
  - 2. Compatibility with space constraints for roots and branches at maturity;
  - 3. Providing adequate species diversity citywide and reasonable resistance to pests and diseases; and
  - 4. Consideration of the objectives of the current street tree planting proposal.
- E. Street trees shall be provided adequate spacing from new and existing trees according to the following standards wherever possible:
  - 1. Street trees categorized as small stature on the street tree list or by the city manager or designee shall be spaced no greater than 20 feet on center and not closer than 15 feet on center from other newly planted street trees or any existing tree that has been in the ground for over three years;
  - 2. Street trees categorized as medium stature on the street tree list or by the city manager or designee shall be spaced no greater than 30 feet on center and not closer than 20 feet on center from other newly planted street trees or any existing tree that has been in the ground for over three years;
  - 3. Street trees categorized as large stature on the street tree list or by the city manager or designee shall be spaced no greater than 40 feet on center and not closer than 30 feet on center from other newly planted street trees or any existing tree that has been in the ground for over three years; and
  - 4. Any tree determined by the city manager or designee to have a mature spread of less than 20 feet shall be considered a small stature tree, and spaced accordingly when used as a street tree.
- F. Street trees shall be placed according to the following standards:

Notes:

See Appendix 2 for Street Tree List

Notes:

See Code Section 8.08 and Manual Section 3 for Street Tree Removal Standards

See Master Fees and Charges Schedule for current fees

1. Street trees categorized as small stature on the street tree list or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving;
  2. Street trees categorized as medium stature on the street tree list or by the city manager or designee shall not be planted with the center of their trunks closer than 2 ½ feet from any hard surface paving;
  3. Street trees categorized as large stature on the street tree list or by the city manager or designee shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving;
  4. Not closer than 4 feet on center from any fire hydrant, utility box or utility pole;
  5. Not closer than 2 feet on center from any underground utility;
  6. Not closer than 10 feet on center from a street light standard;
  7. Not closer than 20 feet from a street right of way corner as determined by the city manager or designee. The city manager or designee may require a greater or lesser corner setback based on an analysis of traffic and pedestrian safety impacts;
  8. Where there are overhead utility lines, the street tree species selected shall be of a type which, at full maturity, will not interfere with the lines; and
  9. Any other standards found by the city manager or designee to be relevant in order to protect public safety and public or private property.
- G. Root barriers shall be installed according to the manufacturer's specifications when a street tree is planted within 5 feet of any hard surface paving or utility box, or as otherwise required by the city engineer.
- II. Street trees planted prior to the adoption of the most current version of the street tree planting standards shall be exempt from the most current version of the street tree planting standards. However, the most current version of the street tree maintenance standards and the most current version of the street tree removal standards shall apply.
- I. If street tree planting is required by another section of the Urban Forestry Manual or Tigard Municipal Code, the city manager or designee may allow for an "in lieu of planting fee" equivalent to the city's cost to plant a street tree per the standards in Section 2, part 1 of the Urban Forestry Manual and maintain a street tree per the standards in Section 2, part 2 of the Urban Forestry Manual for a period of three years after planting. Payment of an in lieu of planting fee shall satisfy the street tree planting requirement.



**Part 2. Street Tree Maintenance Standards:**

- A. Street trees shall be maintained in a manner consistent with tree care industry standards.
- B. Street trees shall be maintained in a manner that does not impede public street or sidewalk traffic consistent with the specifications in section 7.40.060A of the Tigard Municipal Code including:
  - 1. 8 feet of clearance above public sidewalks;
  - 2. 13 feet of clearance above public local and neighborhood streets;
  - 3. 15 feet of clearance above public collector streets; and
  - 4. 18 feet of clearance above public arterial streets.
- C. Street trees shall be maintained so as not to become hazard trees as defined in Chapter 8.02 of the Tigard Municipal Code.

Notes:



END OF SECTION  
END OF SECTION



### Section 3 - Street Tree Removal Standards

#### Part 1. Street Tree Removal Standards:

- A. Street trees shall be removed in a manner consistent with tree care industry standards.
- B. The city manager or designee shall approve the removal of a street tree if any one of the following criteria are met:
  - 1. The tree is a “hazard tree” as defined in Chapter 8.02 and “hazard tree abatement” as defined in Chapter 8.02 cannot be completed in a manner that results in tree retention consistent with tree care industry standards.
  - 2. The tree is dead.
  - 3. The tree is in an advanced state of decline with insufficient live foliage, branches, roots or other tissue to sustain life.
  - 4. The tree is infested with pests or diseases that if left untreated will cause the tree to die, enter an advanced state of decline or cause other trees to die or enter an advanced state of decline.
  - 5. The tree has sustained physical damage that will cause the tree to die or enter an advanced state of decline. If the physical damage was caused by a person in violation of Chapter 8.08 of the Tigard Municipal Code, the enforcement process outlined in Section 8.02.030 shall be completed prior to approval.
  - 6. The tree is listed on the nuisance tree list.
  - 7. The tree location is such that it would not meet all of the street tree planting standards in Section 2, parts 1E and 1F of the Urban Forestry Manual if it were a newly planted tree.
  - 8. The tree roots are causing damage to paved surfaces, infrastructure, utilities, buildings or other parts of the built environment.
  - 9. The tree location conflicts with areas of public street widening, construction or extension as shown in the Transportation System Plan.
  - 10. Tree removal is required for the purposes of an approved building or land use permit, utility or infrastructure installation or utility or infrastructure repair.
  - 11. The tree is recommended for removal by a designated fire marshal for Tualatin Valley Fire and Rescue because it presents a significant fire risk to habitable structures or limits emergency access for rescue workers, and the risk or access issue cannot be abated through pruning or other means that results in tree retention.

Notes:

See Appendix 6 for Nuisance Tree List

Notes:

12. The tree is part of a stand of trees, and a certified arborist or certified forester determines that thinning of interior trees within the stand of trees is necessary for overall stand health, the thinning will result in no less than 80 percent canopy cover at maturity for the area to be thinned, and that thinning of non-native trees is maximized prior to thinning of native trees.
- C. Unless removed for thinning purposes (part 1.B.11above) the city manager or designee shall condition the removal of a street tree upon the planting of a replacement tree in accordance with the Street Tree Planting Standards in Section 2, part 1 of the Urban Forestry Manual. The city manager or designee may consider existing trees as replacement trees if they meet all applicable species, size, condition and location requirements in Section 2, part 1 and were not already required to be planted or preserved by the Tigard Municipal Code.
  - D. If the Street Tree Planting Standards in Section 2, part 1 of the Urban Forestry Manual preclude replanting within the same right of way abutting on, fronting on or adjacent to the property as the tree was removed or on private property within 6 feet of the same right of way as the tree that was removed, the applicant shall be exempt from planting a replacement tree.



**END OF SECTION**

## Section 4 - Median Tree Planting and Maintenance Standards

### Part 1. Median Tree Planting Standards:

- A. Median trees shall be planted in a manner consistent with tree care industry standards.
- B. Median trees shall have a minimum caliper of 1 ½ inches at the time of planting.
- C. Median tree species shall be from the street tree list, unless otherwise approved by the city manager or designee.
- D. Median tree species shall be appropriate for the planting environment as determined by the city manager or designee and seek to achieve a balance of the following:
  - 1. Consistency with previously approved median tree plans given space constraints for roots and branches at maturity;
  - 2. Compatibility with space constraints for roots and branches at maturity;
  - 3. Providing adequate species diversity citywide and reasonable resistance to pests and diseases; and
  - 4. Consideration of the objectives of the current median tree planting proposal.
- E. Median trees shall be provided adequate spacing from new and existing trees according to the following standards wherever possible:
  - 1. Median trees categorized as small stature on the street tree list or by the city manager or designee shall be spaced no greater than 20 feet on center and not closer than 15 feet on center from other newly planted median trees or any existing tree that has been in the ground for over three years;
  - 2. Median trees categorized as medium stature on the street tree list or by the city manager or designee shall be spaced no greater than 30 feet on center and not closer than 20 feet on center from other newly planted median trees or any existing tree that has been in the ground for over three years;
  - 3. Median trees categorized as large stature on the street tree list or by the city manager or designee shall be spaced no greater than 40 feet on center and not closer than 30 feet on center from other newly planted median trees or any existing tree that has been in the ground for over three years; and
  - 4. Any tree determined by the city manager or designee to have a mature spread of less than 20 feet shall be considered a small stature tree, and spaced accordingly when used as a median tree.

Notes:

See Appendix 2 for Street Tree List

Notes:

See Code Section 8.08 and Manual Section 5 for Median Tree Removal Standards

- F. Median trees shall be placed according to the following standards:
  - 1. Median trees categorized as small stature on the street tree list or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving;
  - 2. Median trees categorized as medium stature on the street tree list or by the city manager or designee shall not be planted with the center of their trunks closer than 2 ½ feet from any hard surface paving;
  - 3. Median trees categorized as large stature on the street tree list or by the city manager or designee shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving;
  - 4. Not closer than 4 feet on center from any fire hydrant, utility box or utility pole;
  - 5. Not closer than 2 feet on center from any underground utility;
  - 6. Not closer than 10 feet on center from a street light standard;
  - 7. Not closer than 20 feet from a street right of way corner as determined by the city manager or designee. The city manager or designee may require a greater or lesser corner setback based on an analysis of traffic and pedestrian safety impacts;
  - 8. Where there are overhead utility lines, the median tree species selected shall be of a type which, at full maturity, will not interfere with the lines; and
  - 9. Any other standards found by the city manager or designee to be relevant in order to protect public safety and public or private property.
- G. Root barriers shall be installed according to the manufacturer's specifications when a street tree is planted within 5 feet of any hard surface paving or utility box, or as otherwise required by the city engineer.
- H. Median trees planted prior to the adoption of the most current version of the Median Tree Planting Standards shall be exempt from the most current version of the Median Tree Planting Standards. However, the most current version of the Median Tree Maintenance Standards and the most current version of the Median Tree Removal Standards shall apply.
- I. If median tree planting is required by another section of the Urban Forestry Manual or Tigard Municipal Code, the city manager or designee may allow for an "in lieu of planting fee" equivalent to the city's cost to plant a median tree per the standards in Section 4, part 1 of the Urban Forestry Manual and maintain a street tree per the standards in Section 4, part 2 of the Urban Forestry Manual for a period of three years after planting. Payment of an in lieu of planting fee shall satisfy the median tree planting requirement.

**Part 2. Median Tree Maintenance Standards:**

- A. Median trees shall be maintained in a manner consistent with tree care industry standards.
- B. Median trees shall be maintained in a manner that does not impede public street or sidewalk traffic consistent with the specifications in section 7.40.060A of the Tigard Municipal Code including:
  - 1. 8 feet of clearance above public sidewalks;
  - 2. 13 feet of clearance above public local and neighborhood streets;
  - 3. 15 feet of clearance above public collector streets; and
  - 4. 18 feet of clearance above public arterial streets.
- C. Median trees shall be maintained so as not to become hazard trees as defined in Chapter 8.02 of the Tigard Municipal Code.

Notes:



END OF SECTION





## Section 5 - Median Tree Removal Standards

### Part 1. Median Tree Removal Standards:

- A. Median trees shall be removed in a manner consistent with tree care industry standards.
- B. The city manager or designee shall approve the removal of a median tree if any one of the following criteria are met:
  - 1. The tree is a “hazard tree” as defined in Chapter 8.02 and “hazard tree abatement” as defined in Chapter 8.02 cannot be completed in a manner that results in tree retention consistent with tree care industry standards.
  - 2. The tree is dead.
  - 3. The tree is in an advanced state of decline with insufficient live foliage, branches, roots or other tissue to sustain life.
  - 4. The tree is infested with pests or diseases that if left untreated will cause the tree to die, enter an advanced state of decline or cause other trees to die or enter an advanced state of decline.
  - 5. The tree has sustained physical damage that will cause the tree to die or enter an advanced state of decline. If the physical damage was caused by a person in violation of Chapter 8.08 of the Tigard Municipal Code, the enforcement process outlined in Section 8.02.030 shall be completed prior to approval.
  - 6. The tree is listed on the nuisance tree list.
  - 7. The tree location is such that it would not meet all of the median tree planting standards in Section 4, parts 1E and 1F of the Urban Forestry Manual if it were a newly planted tree.
  - 8. The tree roots are causing damage to paved surfaces, infrastructure, utilities, buildings or other parts of the built environment.
  - 9. The tree location conflicts with areas of public street widening, construction or extension as shown in the Transportation System Plan.
  - 10. Tree removal is required for the purposes of an approved building or land use permit, utility or infrastructure installation or utility or infrastructure repair.
  - 11. The tree is recommended for removal by a designated fire marshal for Tualatin Valley Fire and Rescue because it presents a significant fire risk to habitable structures or limits emergency access for rescue workers, and the risk or access issue cannot be abated through pruning or other means that results in tree retention.

Notes:

See Appendix 6 for  
Nuisance Tree List

Notes:

12. The tree is part of a stand of trees, and a certified arborist or certified forester determines that thinning of interior trees within the stand of trees is necessary for overall stand health, the thinning will result in no less than 80 percent canopy cover at maturity for the area to be thinned, and that thinning of non-native trees is maximized prior to thinning of native trees.
- C. Unless removed for thinning purposes (part 1.B.11 above) the city manager or designee shall condition the removal of a median tree upon the planting of a replacement tree within the same median as the tree was removed in accordance with the Median Tree Planting Standards in Section 4, part 1 of the Urban Forestry Manual. The city manager or designee may consider existing trees as replacement trees if they meet all applicable species, size, condition and location requirements in Section 4, part 1 and were not already required to be planted or preserved by the Tigard Municipal Code.
  - D. If the Median Tree Planting Standards in Section 4, part 1 of the Urban Forestry Manual preclude replanting within the same median as the tree was removed, the applicant shall be exempt from planting a replacement tree.



**END OF SECTION**

## Section 6 - Sensitive Lands Tree Removal and Replacement Standards

### Part 1. Sensitive Lands Tree Removal Standards:

- A. Native trees in sensitive lands shall be removed in a manner consistent with tree care industry standards.
- B. The city manager or designee shall approve the removal of a native tree in sensitive lands if any one of the following criteria are met:
  - 1. The tree is a “hazard tree” as defined in Chapter 8.02 and “hazard tree abatement” as defined in Chapter 8.02 cannot be completed in a manner that results in tree retention consistent with tree care industry standards.
  - 2. The tree is dead.
  - 3. The tree is in an advanced state of decline with insufficient live foliage, branches, roots or other tissue to sustain life.
  - 4. The tree is infested with pests or diseases that if left untreated will cause the tree to die, enter an advanced state of decline, or cause other trees to die or enter an advanced state of decline.
  - 5. The tree has sustained physical damage that will cause the tree to die or enter an advanced state of decline. If the physical damage was caused by a person in violation of Chapter 8.10 of the Tigard Municipal Code, the enforcement process outlined in Section 8.02.030 shall be completed prior to approval.
  - 6. The tree roots are causing damage to paved surfaces, infrastructure, utilities, buildings or other parts of the built environment.
  - 7. The tree location conflicts with areas of public street widening, construction or extension as shown in the Transportation System Plan.
  - 8. Tree removal is required for the purposes of an approved building or land use permit, utility or infrastructure installation or utility or infrastructure repair.
  - 9. The tree is recommended for removal by a designated fire marshal for Tualatin Valley Fire and Rescue because it presents a significant fire risk to habitable structures or limits emergency access for rescue workers, and the risk or access issue cannot be abated through pruning or other means that results in tree retention.
  - 10. A certified arborist or certified forester determines that thinning of interior trees within a stand of trees is necessary for overall stand health, the thinning will result in no less than 80 percent canopy cover at maturity for the area to be thinned, and that thinning of non-native trees is maximized prior to thinning of native trees.

Notes:

Notes:

- C. Unless removed for thinning purposes (part 1.B.10 above) the city manager or designee shall condition the removal of each tree in sensitive lands upon the planting of a replacement tree in accordance with the Sensitive Lands Tree Replacement Standards in Section 6, part 2 of the Urban Forestry Manual.
- D. If the Sensitive Lands Tree Replacement Standards in Section 6, part 2 preclude replanting within the same property as the tree that was removed, the applicant shall be exempt from planting a replacement tree.

**Part 2. Sensitive Lands Tree Replacement Standards:**

- A. Replacement trees shall be planted in a manner consistent with tree care industry standards.
- B. The minimum size of a replacement tree shall be 2 feet in height (from the top of the root ball) or equivalent to a 1 gallon container size.
- C. Replacement trees shall be selected from the native tree list in the Urban Forestry Manual.
- D. The city manager or designee may consider native trees that are less than 6 inches DBH as replacement trees if they meet all applicable species, size, condition and location requirements in this section and were not already required to be planted by the Tigard Municipal Code.
- E. The location of replacement trees shall be as follows:
  - 1. As close as practicable to the location of the tree that was removed provided the location complies with the other standards in this section;
  - 2. No closer than 10 feet on center from newly planted or existing trees;
  - 3. Trees categorized as small stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 15 feet from the face of habitable buildings;
  - 4. Trees categorized as medium stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 20 feet from the face of habitable buildings;
  - 5. Trees categorized as large stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 30 feet from the face of habitable buildings;
  - 6. Trees categorized as small stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving;

See Appendix 5 for  
Native Tree List

7. Trees categorized as medium stature on the native tree list in the Urban Forestry Manual shall not be planted with the center of their trunks closer than 2 ½ feet from any hard surface paving; Trees categorized as large stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving; and
  8. Where there are overhead utility lines, the tree species selected shall be of a type which, at full maturity, will not interfere with the lines.
- F. The city manager or designee may allow for an “in lieu of planting fee” equivalent to the city’s cost to plant a tree in sensitive lands per the standards in this Section and maintain a tree in sensitive lands per the standards in Section 8.10.030 of the Tigard Municipal Code for a period of three years after planting. Payment of an in lieu of planting fee shall satisfy the sensitive lands tree replacement requirement.

Notes:

See Master Fees and Charges Schedule for current fees



END OF SECTION



## Section 7 - Development Tree Removal and Replacement Standards

### Part 1. Development Tree Removal Standards:

- A. Trees subject to the requirements of Chapter 8.12 shall be removed in a manner consistent with tree care industry standards.
- B. The city manager or designee shall approve the removal of trees subject to the requirements of Chapter 8.12 if any one of the following criteria are met:
  - 1. The tree is a “hazard tree” as defined in Chapter 8.02 and “hazard tree abatement” as defined in Chapter 8.02 cannot be completed in a manner that results in tree retention consistent with tree care industry standards.
  - 2. The tree is dead.
  - 3. The tree is in an advanced state of decline with insufficient live foliage, branches, roots or other tissue to sustain life.
  - 4. The tree is infested with pests or diseases that if left untreated will cause the tree to die, enter an advanced state of decline or cause other trees to die or enter an advanced state of decline.
  - 5. The tree has sustained physical damage that will cause the tree to die or enter an advanced state of decline. If the physical damage was caused by a person in violation of Chapter 8.12 of the Tigard Municipal Code, the enforcement process outlined in Section 8.02.030 shall be completed prior to approval.
  - 6. The tree is listed in the nuisance tree list.
  - 7. The tree roots are causing damage to paved surfaces, infrastructure, utilities, buildings or other parts of the built environment.
  - 8. The tree location conflicts with areas of public street widening, construction or extension as shown in the Transportation System Plan.
  - 9. Tree removal is required for the purposes of an approved building or land use permit, utility or infrastructure installation, or utility or infrastructure repair.
  - 10. The tree is recommended for removal by a designated fire marshal for Tualatin Valley Fire and Rescue because it presents a significant fire risk to habitable structures or limits emergency access for rescue workers, and the risk or access issue cannot be abated through pruning or other means that results in tree retention.
  - 11. The tree is part of a stand of trees, and a certified arborist or certified forester determines that thinning of interior trees within the stand of trees is necessary for overall stand health, the thinning will result in no less than 80 percent canopy cover at maturity for the area to be thinned, and that thinning of non-native trees is maximized prior to thinning of native trees.

Notes:

See Appendix 6 for  
Nuisance Tree List

Notes:

- C. Unless removed for thinning purposes (Part 1.B.11 above) the city manager or designee shall condition the removal of each tree upon the planting of a replacement tree in accordance with the Development Tree Replacement Standards in Section 7, part 2 of the Urban Forestry Manual.
- D. If the Development Tree Replacement Standards in Section 7, part 2 preclude replanting within the same property as the tree that was removed, the applicant shall be exempt from planting a replacement tree.

**Part 2. Development Tree Replacement Standards:**

- A. Replacement trees shall be planted in a manner consistent with tree care industry standards.
- B. The replacement tree shall be located so as to replace the function of the tree that was removed. For example, trees removed from parking lots shall be replaced in parking lots and trees removed from landscape buffers shall be replaced in landscape buffers. If planting in the same location would not comply with the other standards in this section, the replacement tree shall be planted as close as practicable to the tree that was removed in compliance with the other standards in this section.
- C. The replacement species shall be the same stature or greater (at maturity) as the tree that was removed. If planting the same stature or greater tree would not comply with the other standards in this section, the replacement tree shall be the most similar stature practicable as the tree that was removed in compliance with the other standards in this section.
- D. If the tree that was removed was part of a stand of trees, then the following standards apply to the replacement tree:
  - 1. The replacement tree shall be selected from the native tree list in the Urban Forestry Manual unless otherwise approved by the city manager or designee;
  - 2. The minimum size of the replacement tree shall be 2 feet in height (from the top of the root ball) or equivalent to a 1 gallon container size; and
  - 3. The replacement tree shall be located as follows:
    - a. No closer than 10 feet on center from newly planted or existing trees;
    - b. Trees categorized as small stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 15 feet from the face of habitable buildings;
    - c. Trees categorized as medium stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 20 feet from the face of habitable buildings;

See Appendices 2-5 for Approved Tree Lists

See Appendix 5 for Native Tree List



- d. Trees categorized as large stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 30 feet from the face of habitable buildings;
  - e. Trees categorized as small stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving;
  - f. Trees categorized as medium stature on the native tree list in the Urban Forestry Manual shall not be planted with the center of their trunks closer than 2 ½ feet from any hard surface paving;
  - g. Trees categorized as large stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving; and
  - h. Where there are overhead utility lines, the tree species selected shall be of a type which, at full maturity, will not interfere with the lines.
- E. If the tree that was removed was an open grown tree, then the following standards apply to the replacement tree:
1. The replacement tree shall be selected from any of the tree lists in the Urban Forestry Manual (except the nuisance tree list) unless otherwise approved by the city manager or designee;
  2. The minimum size of the replacement tree shall be 1½ inch caliper for deciduous or 6 feet in height for evergreen; and
  3. The replacement tree shall be located as follows:
    - a. Trees categorized as small stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 15 feet on center from other newly planted or existing trees and 10 feet from the face of habitable buildings;
    - b. Trees categorized as medium stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 20 feet on center from other newly planted or existing trees and 15 feet from the face of habitable buildings;
    - c. Trees categorized as large stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 30 feet on center from other newly planted or existing trees and 20 feet from the face of habitable buildings;

Notes:

See Appendices 2-5 for Approved Tree Lists

See Appendix 6 for Nuisance Tree List

Notes:

- d. Trees determined by the city manager or designee to have a mature spread of less than 20 feet shall be considered small stature, and shall be spaced no closer than 15 feet on center from other newly planted or existing trees and 10 feet from the face of habitable buildings;
- e. Trees categorized as small stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving;
- f. Trees categorized as medium stature on any of the tree lists in the Urban Forestry Manual shall not be planted with the center of their trunks closer than 2 ½ feet from any hard surface paving;
- g. Trees categorized as large stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving; and
- h. Where there are overhead utility lines, the tree species selected shall be of a type which, at full maturity, will not interfere with the lines.

F. The city manager or designee may consider existing trees as replacement trees if they meet all applicable species, size, condition and location requirements in this Section and were not already required to be planted or preserved by the Tigard Municipal Code.

G. The city manager or designee may allow for an “in lieu of planting fee” equivalent to the city’s cost to plant a tree per the standards in this Section and maintain a tree per the standards in section 8.12.030 of the Tigard Municipal Code for a period of three years after planting. Payment of an in lieu of planting fee shall satisfy the development tree replacement requirement.

See Master Fees and Charges Schedule for current fees



END OF SECTION

## Section 8 - Urban Forestry Fund Tree Removal and Replacement Standards

### Part 1. Urban Forestry Fund Tree Removal Standards:

- A. Trees subject to the requirements of Chapter 8.14 shall be removed in a manner consistent with tree care industry standards.
- B. The city manager or designee shall approve the removal of trees subject to the requirements of Chapter 8.14 if any one of the following criteria are met:
  - 1. The tree is a “hazard tree” as defined in Chapter 8.02 and “hazard tree abatement” as defined in Chapter 8.02 cannot be completed in a manner that results in tree retention consistent with tree care industry standards.
  - 2. The tree is dead.
  - 3. The tree is in an advanced state of decline with insufficient live foliage, branches, roots or other tissue to sustain life.
  - 4. The tree is infested with pests or diseases that if left untreated will cause the tree to die, enter an advanced state of decline or cause other trees to die or enter an advanced state of decline.
  - 5. The tree has sustained physical damage that will cause the tree to die or enter an advanced state of decline. If the physical damage was caused by a person in violation of Chapter 8.14 of the Tigard Municipal Code, the enforcement process outlined in Section 8.02.030 shall be completed prior to approval.
  - 6. The tree is listed in the nuisance tree list.
  - 7. The tree roots are causing damage to paved surfaces, infrastructure, utilities, buildings or other parts of the built environment.
  - 8. The tree location conflicts with areas of public street widening, construction or extension as shown in the Transportation System Plan.
  - 9. Tree removal is required for the purposes of an approved building or land use permit, utility or infrastructure installation or utility or infrastructure repair.
  - 10. The tree is recommended for removal by a designated fire marshal for Tualatin Valley Fire and Rescue because it presents a significant fire risk to habitable structures or limits emergency access for rescue workers, and the risk or access issue cannot be abated through pruning or other means that results in tree retention.
  - 11. The tree is part of a stand of trees, and a certified arborist or certified forester determines that thinning of interior trees within the stand of trees is necessary for overall stand health, the thinning will result in no less than 80 percent canopy cover at maturity for the area to be thinned, and that thinning of non-native trees is maximized prior to thinning of native trees.

Notes:

See Appendix 6 for  
Nuisance Tree List

Notes:

- C. Unless removed for thinning purposes (part 1.B.11 above) the city manager or designee shall condition the removal of each tree upon the planting of a replacement tree in accordance with the Urban Forestry Fund Tree Replacement Standards in Section 8, part 2 of the Urban Forestry Manual.
- D. If the Urban Forestry Fund Tree Replacement Standards in Section 8, part 2 preclude replanting within the same property as the tree that was removed, the applicant shall be exempt from planting a replacement tree.

See Appendices 2-5 for Approved Tree Lists

**Part 2. Urban Forestry Fund Tree Replacement Standards:**

- A. Replacement trees shall be planted in a manner consistent with tree care industry standards.
- B. The replacement species shall be the same stature or greater (at maturity) as the tree that was removed. If planting the same stature or greater tree would not comply with the other standards in this section, the replacement tree shall be the most similar stature practicable as the tree that was removed in compliance with the other standards in this section.
- C. If the tree that was removed was part of a stand of trees, then the following standards apply to the replacement tree:
  - 1. The replacement tree shall be selected from the native tree list in the Urban Forestry Manual unless otherwise approved by the city manager or designee;
  - 2. The minimum size of the replacement tree shall be 2 feet in height (from the top of the root ball) or equivalent to a 1 gallon container size; and
  - 3. The replacement tree shall be located as follows:
    - a. No closer than 10 feet on center from newly planted or existing trees;
    - b. Trees categorized as small stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 15 feet from the face of habitable buildings;
    - c. Trees categorized as medium stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 20 feet from the face of habitable buildings;
    - d. Trees categorized as large stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 30 feet from the face of habitable buildings;
    - e. Trees categorized as small stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving;

See Appendix 5 for the Native Tree List

- f. Trees categorized as medium stature on the native tree list in the Urban Forestry Manual shall not be planted with the center of their trunks closer than 2 ½ feet from any hard surface paving;
  - g. Trees categorized as large stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving; and
  - h. Where there are overhead utility lines, the tree species selected shall be of a type which, at full maturity, will not interfere with the lines.
- D. If the tree that was removed was an open grown tree, then the following standards apply to the replacement tree:
- 1. The replacement tree shall be selected from any of the tree lists in the Urban Forestry Manual (except the nuisance tree list) unless otherwise approved by the city manager or designee;
  - 2. The minimum size of the replacement tree shall be 1 ½ inch caliper for deciduous or 6 feet in height for evergreen; and
  - 3. The replacement tree shall be located as follows:
    - a. Trees categorized as small stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 15 feet on center from other newly planted or existing trees and 10 feet from the face of habitable buildings;
    - b. Trees categorized as medium stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 20 feet on center from other newly planted or existing trees and 15 feet from the face of habitable buildings;
    - c. Trees categorized as large stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 30 feet on center from other newly planted or existing trees and 20 feet from the face of habitable buildings;
    - d. Trees determined by the city manager or designee to have a mature spread of less than 20 feet shall be considered small stature, and shall be spaced no closer than 15 feet on center from other newly planted or existing trees and 10 feet from the face of habitable buildings;
    - e. Trees categorized as small stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving;

Notes:

See Appendices 2-5 for Approved Tree Lists

See Appendix 6 for Nuisance Tree List

Notes:

See Master Fees and Charges Schedule for current fee

- f. Trees categorized as medium stature on any of the tree lists in the Urban Forestry Manual shall not be planted with the center of their trunks closer than 2 ½ feet from any hard surface paving;
- g. Trees categorized as large stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving; and
- h. Where there are overhead utility lines, the tree species selected shall be of a type which, at full maturity, will not interfere with the lines.

E. The city manager or designee may consider existing trees as replacement trees if they meet all applicable species, size, condition and location requirements in this section and were not already required to be planted or preserved by the Tigard Municipal Code.

F. The city manager or designee may allow for an “in lieu of planting fee” equivalent to the city’s cost to plant a tree per the standards in this section and maintain a tree per the standards in section 8.14.030 of the Tigard Municipal Code for a period of three years after planting. Payment of an in lieu of planting fee shall satisfy the urban forestry fund tree replacement requirement.



END OF SECTION

## Section 9 - Heritage Tree Designation Removal Standards

### Part 1. Heritage Tree Designation Removal Standards:

- A. Heritage trees subject to the requirements of Chapter 8.16 shall be removed in a manner consistent with tree care industry standards.
- B. The city manager or designee shall approve the removal of heritage tree designation if any one of the following criteria are met for a designated heritage tree:
1. The heritage tree is a “hazard tree” as defined in Chapter 8.02 and “hazard tree abatement” as defined in Chapter 8.02 cannot be completed in a manner that results in tree retention consistent with tree care industry standards.
  2. The heritage tree is dead.
  3. The heritage tree is in an advanced state of decline with insufficient live foliage, branches, roots or other tissue to sustain life.
  4. The heritage tree has sustained physical damage that will cause the tree to die or enter an advanced state of decline. If the physical damage was caused by a person in violation of Chapter 8.16 of the Tigard Municipal Code, the enforcement process outlined in Section 8.02.030 shall be completed prior to approval.
  5. The tree is recommended for removal by a designated fire marshal for Tualatin Valley Fire and Rescue because it presents a significant fire risk to habitable structures or limits emergency access for rescue workers, and the risk or access issue cannot be abated through pruning or other means that results in tree retention.
  6. The heritage tree is part of a stand of heritage trees, and a certified arborist or certified forester determines that thinning of interior heritage trees within the stand of heritage trees is necessary for overall stand health, the thinning will result in no less than 80 percent canopy cover at maturity for the area to be thinned, and that thinning of non-native heritage trees is maximized prior to thinning of native heritage trees.
- C. Replacement of heritage trees is not required unless a heritage tree is also subject to other provisions of the Tigard Municipal Code that require replacement.

Notes:







## Section 10 - Urban Forestry Plan Standards

### Part 1. Urban Forestry Plan – Tree Preservation and Removal Site Plan Requirements:

- A. The plan shall be standard size D (24" x 36"), a reduced legal size and a PDF, and include all items in part 1.B-O below. When required for clarity, the development impact area information in part 1.I may be detailed separately on multiple plan sheets provided that all of the remaining items in part 1 are included for reference.
- B. Date of drawing or last revision.
- C. North arrow.
- D. Bar scale as follows:
  - 1. Less than 1.0 acres: 1" = 10'
  - 2. 1.0 - 5.0 acres: 1" = 20'
  - 3. 5.0 – 20.0 acres: 1" = 50'
  - 4. Over 20.0 acres: 1" = 100'.
- E. Site address or assessor's parcel number.
- F. The location of existing and proposed property lines.
- G. Location of existing and proposed topographic lines at 1-foot contours unless otherwise approved.
- H. The location and type of sensitive lands areas.
- I. Proposed activities within the development impact area, including but not limited to:
  - 1. Construction of structures and walls;
  - 2. Paving and graveling;
  - 3. Utility and irrigation installation;
  - 4. Construction parking and construction equipment storage;
  - 5. Landscaping;
  - 6. Grading and filling;
  - 7. Stockpiling;
  - 8. Demolition and tree removal;
  - 9. Trenching and boring; and
  - 10. Any other activities that require excavation or soil disturbance.
- J. The trunk locations, driplines, assigned numbers and "X" marks when applicable (indicating trees proposed for removal) for the following trees within the development impact area and within 25 feet of the development impact area:
  - 1. Trees greater than or equal to 6 inch DBH; and
  - 2. Other trees that require a permit to remove by Title 8 and are less than 6 inch DBH.
- K. The trunk locations, driplines and assigned numbers for the following trees that are not within the development impact area:
  - 1. Open grown trees greater than or equal to 6 inch DBH; and

Notes:

See Appendix 7 for Example Tree Preservation and Removal Site Plan

Notes:

2. Other trees that require a permit to remove by Title 8 and are less than 6 inch DBH.
- L. The driplines of stand grown trees greater than or equal to 6 inch DBH that form a contiguous tree canopy. The driplines may be delineated at the outer edge of the stand. Each stand shall be assigned a number.
- M. The location and type of proposed tree protection fencing. If the location of the tree protection fencing will be phased, indicate the location of the tree protection fencing for each corresponding phase. Tree protection fencing shall be minimum 5-foot tall metal unless otherwise approved by the city manager or designee.
- N. Any supplemental tree preservation specifications consistent with tree care industry standards that the project arborist or landscape architect has determined are necessary for the continued viability of trees identified for preservation.
- O. A signature of approval and statement from the project arborist or landscape architect, attesting that the tree preservation and removal site plan meets all of the requirements in Section 10, part 1 of the Urban Forestry Manual.

See Appendix 8 for  
Example Tree  
Canopy Site Plan

**Part 2. Urban Forestry Plan – Tree Canopy Site Plan Requirements:**

- A. The plan shall be standard size D (24" x 36"), a reduced legal size and PDI<sup>1</sup> format, and include all items in part 2.B-O below.
- B. Date of drawing or last revision.
- C. North arrow.
- D. Bar scale as follows:
  1. less than 1.0 acres: 1" = 10'
  2. 1.0 - 5.0 acres: 1" = 20'
  3. 5.0 – 20.0 acres: 1" = 50'
  4. Over 20.0 acres: 1" = 100'.
- E. Site address or assessor's parcel number.
- F. The location of proposed property lines.
- G. The location of proposed building footprints, utilities and irrigation, streets and other paved areas.
- H. The trunk locations, driplines and assigned numbers for trees to be preserved in parts 1.J and 1.K. Each tree on both the tree preservation and removal site plan and tree canopy site plan shall be assigned the same number on both plans.
- I. The dripline locations of stand grown trees proposed for preservation greater than or equal to 6 inch DBH that form a contiguous tree canopy. The dripline may be delineated at the outer edge of the stand. Each stand shall be assigned a number. Each stand on both the tree preservation and removal site plan and tree canopy site plan shall be assigned the same number on both plans.
- J. The location of existing or potential areas of tree growth limiting soils due to compaction, drainage, fertility, pH, contamination or other factors.

- K. Methods for improving areas of tree growth limiting soils if tree planting is proposed in those locations.
- L. The location, species, caliper (in inches for deciduous) or height (in feet for evergreen), assigned numbers and depiction of the mature tree canopy (in feet as identified on any of the tree lists in the Urban Forestry Manual or by the city manager or designee) for all trees to be planted and maintained as open grown trees. The minimum size for all trees planted and maintained as open grown trees is 1 ½ inch caliper for deciduous or 6 feet in height for evergreen. Open grown trees shall be selected from any of the tree lists in the Urban Forestry Manual (except the nuisance tree list) unless otherwise approved by the city manager or designee. If an open grown tree approved for planting is not identified on any of the tree lists in the Urban Forestry Manual, then the project arborist or landscape architect shall determine the average mature tree canopy spread using available scientific literature for review and approval by the city manager or designee. The city manager or designee may consider trees less than 6 inch DBH as equivalent to newly planted trees if they meet all applicable species, size, condition and location requirements in this section. Overall, the selection of open grown trees shall result in a reasonable amount of diversity for the site. Open grown trees shall be located as follows:
  1. Trees categorized as small stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 15 feet on center from other newly planted or existing trees and 10 feet from the face of habitable buildings. In downtown Tigard (Mixed Use-Central Business District, MU-CBD), the setback from the face of habitable buildings may be reduced if approved by the city manager or designee;
  2. Trees categorized as medium stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 20 feet on center from other newly planted or existing trees and 15 feet from the face of habitable buildings. In downtown Tigard (Mixed Use-Central Business District, MU-CBD), the setback from the face of habitable buildings may be reduced if approved by the city manager or designee ;
  3. Trees categorized as large stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 30 feet on center from other newly planted or existing trees and 20 feet from the face of habitable buildings. In downtown Tigard (Mixed Use-Central Business District, MU-CBD), the setback from the face of habitable buildings may be reduced if approved by the city manager or designee;

Notes:  
 See Appendices 2-5 for Approved Tree Lists  
 See Appendix 6 for Nuisance Tree List

Notes:

4. Trees determined by the city manager or designee to have a mature spread of less than 20 feet shall be considered small stature, and shall be spaced no closer than 15 feet on center from other newly planted or existing trees and 10 feet from the face of habitable buildings. In downtown Tigard (Mixed Use-Central Business District, MU-CBD), the setback from the face of habitable buildings may be reduced if approved by the city manager or designee;
5. Trees categorized as small stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving;
6. Trees categorized as medium stature on any of the tree lists in the Urban Forestry Manual shall not be planted with the center of their trunks closer than 2 ½ feet from any hard surface paving;
7. Trees categorized as large stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving;
8. Where there are overhead utility lines, the tree species selected shall be of a type which, at full maturity, will not interfere with the lines; and
9. Where there is existing mature tree canopy or other areas with significant shade, the species selected shall be an understory tree according to available scientific literature. However, understory trees shall only be planted when the planting of non-understory trees is precluded due to site constraints.

See Appendix 5  
for Native Tree  
List

- M. The location, species, size (in height or container size), assigned number and depiction of the mature tree canopy dripline as identified in the native tree list in the Urban Forestry Manual (delineated at the outer edge of the stand) for all trees to be planted and maintained as stand grown trees. The species of trees planted and maintained as stand grown trees shall be selected from the native tree list in the Urban Forestry Manual. The depiction of the mature tree canopy dripline shall be consistent with dimensions in the native tree list. The minimum size of stand grown trees shall be 2 feet in height (from the top of the root ball) or equivalent to a 1 gallon container size. The city manager or designee may consider trees less than 6 inch DBH as equivalent to newly planted trees if they meet all applicable species, size, condition and location requirements in this section. Overall, the selection of stand grown trees shall result in a reasonable amount of diversity for the site. Stand grown trees shall be located as follows:
1. No closer than an average of 10 feet on center from newly planted or existing trees;
  2. No further than an average of 20 feet on center from newly planted or existing trees;

3. Trees categorized as small stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 15 feet from the face of habitable buildings. In downtown Tigard (Mixed Use-Central Business District, MU-CBD), the setback from the face of habitable buildings may be reduced if approved by the city manager or designee;
  4. Trees categorized as medium stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 20 feet from the face of habitable buildings. In downtown Tigard (Mixed Use-Central Business District, MU-CBD), the setback from the face of habitable buildings may be reduced if approved by the city manager or designee;
  5. Trees categorized as large stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 30 feet from the face of habitable buildings. In downtown Tigard (Mixed Use-Central Business District, MU-CBD), the setback from the face of habitable buildings may be reduced if approved by the city manager or designee;
  6. Trees categorized as small stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving;
  7. Trees categorized as medium stature on the native tree list in the Urban Forestry Manual shall not be planted with the center of their trunks closer than 2 ½ feet from any hard surface paving;
  8. Trees categorized as large stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving;
  9. Where there are overhead utility lines, the tree species selected shall be of a type which, at full maturity, will not interfere with the lines; and
  10. Where there is existing mature tree canopy or other areas with significant shade, the species selected shall be an understory tree according to available scientific literature. However, understory trees shall only be planted when the planting of non-understory trees is precluded due to space constraints.
- N. Any supplemental specifications that the project arborist or landscape architect has determined are necessary for the viability of trees proposed for planting.
- O. A signature of approval and statement from the project arborist or landscape architect, attesting that the tree canopy site plan meets all of the requirements in Section 10, part 2 of the Urban Forestry Manual.

Notes:

Notes:

See Appendix 9 for Example Supplemental Report Template

**Part 3. Urban Forestry Plan – Supplemental Report Requirements:**

- A. The supplemental report shall be provided by the project arborist or landscape architect in paper and PDF format, and include all items in part 3.B-P below.
- B. Date of the report.
- C. The name, address, telephone number, email address and ISA certified arborist number of the project arborist or stamp and registration number of the project landscape architect.
- D. The following inventory data in table or other such organized format corresponding to each tree in parts 1.J and 1.K in the tree preservation and removal site plan:
  - 1. The assigned tree number;
  - 2. The genus, species and common name;
  - 3. DBH (in inches);
  - 4. Average tree canopy area (in square feet), calculated as follows:
    - a. Average tree canopy area = (average tree canopy spread/2)<sup>2</sup> x π;
  - 5. Open grown tree or stand grown tree;
  - 6. Heritage tree? (Y or N);
  - 7. Numerical condition rating (0-3) as follows:

Factors considered						
Condition rating	Overall vigor	Tree canopy density	Amount of deadwood	History of failure	Pests	Extent of decay
0	Dead to severe decline	<30%	Large; major scaffold branches	More than one scaffold	Infested	Major; conks and cavities
1	Declining	30-60%	Twig and branch dieback	Scaffold branches	Infested	One to a few conks; small cavities
2	Average	60-90%	Small twigs	Small branches	Minor	Present only at pruning wounds
3	Good to excellent	90-100%	Little or none	None	Minor to Insignificant	Absent to present only at pruning wounds

8. Numerical suitability for preservation rating (0-3) as follows:

Notes:

Rating	Considerations
0	The tree is a "hazard tree" as defined in Chapter 18.120 of the Tigard Development Code and "hazard tree abatement" as defined in Chapter 18.120 in the Tigard Development Code cannot be completed in a manner that results in tree retention consistent with tree care industry standards.
1	The tree is dead, in severe decline or declining but may be retained if desirable for wildlife or other benefits because it is not considered a "hazard tree" or "hazard tree abatement" could be performed.
2	The tree has average health and/or structural stability that could be alleviated with treatment; the tree will be less resilient to development impacts and will require more frequent management and monitoring after development than a tree rated as a "3".
3	The tree has good to excellent health and structural stability; the tree will be more resilient to development impacts, and will require less frequent management and monitoring after development than a tree rated as a "2".

9. Proposed for preservation? (Y or N); and
10. Additional comments.

E. The following inventory data in table or other such organized format corresponding to each existing stand in the tree preservation and removal site plan:

1. The assigned stand number;
2. The genus, species and common name of the tree species estimated to be dominant in the stand;
3. The genus, species and common name of the tree species estimated to be the second and third most common in the stand;
4. The estimated average DBH (in inches) of the dominant tree species in the stand;
5. The estimated average DBH (in inches) of both the second and third most common tree species in the stand;
6. The estimated average condition rating (per part 3.D.7) of the dominant tree species in the stand;
7. The estimated average condition rating (per part 3.D.7) of both the second and third most common tree species in the stand;
8. The total on site tree canopy area (in square feet) of the stand;
9. Numerical suitability for preservation rating of the stand (0-3) as follows:

Notes:

Rating	Considerations
0	Nuisance trees are the dominant species in the stand and/or continued viability of the stand is unlikely due to pests, diseases, competition from nuisance tree or plant species, hydrologic changes or other factors.
1	The stand requires a currently cost prohibitive level of investment and management of pests, diseases, nuisance tree or plant species, hydrology or other factors to become viable.
2	The stand is viable but requires more frequent management and monitoring of pests, diseases, nuisance tree or plant species, hydrology or other factors for continued viability than a stand rated as a "3".
3	The stand is viable and requires less frequent management and monitoring of pests, diseases, nuisance tree or plant species, hydrology or other factors for continued viability than a stand rated as a "2".

10. The total on site tree canopy area (in square feet) of the stand proposed for preservation; and
  11. Additional comments.
- F. Supplemental specifications regarding the location and type of proposed tree protection fencing. If the location of the tree protection fencing will be phased, indicate the location of the tree protection fencing for each corresponding phase. Tree protection fencing shall be minimum 5-foot tall metal unless otherwise approved by the city manager or designee.
- G. Supplemental specifications consistent with tree care industry standards that the project arborist or landscape architect has determined are necessary for the continued viability of trees identified for preservation.
- H. Supplemental specifications consistent with tree care industry standards that the project arborist or landscape architect has determined are necessary for the continued viability of stands identified for preservation.
- I. A general accounting of soil characteristics on site. Areas of existing or potential tree growth limiting soils due to compaction, drainage, fertility, pH, contamination or other factors shall be clearly identified. Methods for improving areas of tree growth limiting soils if tree planting is proposed in those areas shall be specifically addressed.
- J. The following inventory data in table or other such organized format corresponding to each open grown tree proposed for planting in the tree canopy site plan:
1. The assigned tree number;
  2. The genus, species and common name;
  3. The caliper (in inches for deciduous) or height (in feet for evergreen);



4. The average mature tree canopy spread (in feet) as identified on any of the tree lists in the Urban Forestry Manual. If an open grown tree approved for planting is not identified on any of the tree lists in the Urban Forestry Manual, then the project arborist or landscape architect shall determine the average mature tree canopy spread using available scientific literature for review and approval by the city manager or designee;
  5. The average mature tree canopy area (in square feet) calculated as follows:
    - a.  $\text{Average mature tree canopy area} = (\text{average mature tree canopy spread}/2)^2 \times \pi$ ;
  6. The proposed available soil volume (in cubic feet) for each tree according to the methodology in Section 12, part 2 of the Urban Forestry Manual. If the available soil volume is greater than 1000 cubic feet, then it is OK to note soil volume as simply “over 1000 cubic feet”; and
  7. Additional comments.
- K. The following inventory data in table or other such organized format corresponding to each stand proposed for planting in the tree canopy site plan:
1. The assigned stand number;
  2. The genus, species and common name of trees proposed for planting in the stand;
  3. The average spacing (in feet) and total number of each tree species proposed for planting in the stand;
  4. The height (in feet) or container size (in gallons) of each species proposed for planting in the stand;
  5. The mature tree canopy dripline area of the stand (in square feet) delineated at the outer edge of the stand; and
  6. Additional comments
- L. Any supplemental specifications consistent with tree care industry standards that the project arborist or landscape architect has determined are necessary for the viability of trees proposed for planting.
- M. A summary in table or other such organized format clearly demonstrating the effective tree canopy cover that will be provided for the overall development site (excluding streets) and for each lot or tract in the R-1, R-2, R-3.5, R-4.5 and R-7 districts (excluding streets) as follows:
1. The area (in square feet) of the overall development site and each lot or tract; and
  2. The effective tree canopy area that will be provided for the overall development site and each lot or tract which shall be considered the sum of the following:

Notes:

- a. Double the canopy area (in square feet) of all open grown trees in the tree canopy site plan proposed for preservation within the overall development site and each lot or tract (or associated right of way, excluding median trees). Only trees with both a condition rating and suitability for preservation rating of 2 or greater are eligible for credit towards the effective tree canopy cover. The overall development site and each lot or tract (or associated right of way) with the largest percentage of the trunk immediately above the trunk flare or root buttresses shall be assigned the effective tree canopy cover area for the corresponding tree;
- b. Double the canopy area (in square feet) of all stands in the tree canopy site plan proposed for preservation within the overall development site and each lot or tract (or associated right of way, excluding median trees). Only stands with both a condition rating and suitability for preservation rating of 2 or greater are eligible for credit towards the effective tree canopy cover. The eligible tree canopy area shall be the portion directly above the overall development site and each lot or tract (or associated right of way). The canopy area of any stand grown tree with the largest percentage of the trunk immediately above the trunk flare or root buttresses outside of the overall development site and each lot or tract (or associated right of way) shall not be eligible for credit towards the effective tree canopy cover requirement for that development site or lot or tract;
- c. The mature canopy area (in square feet) of all open grown trees in the tree canopy site plan, except for those from the native tree list in the Urban Forestry Manual, to be planted and maintained within the overall development site and each lot or tract (or associated right of way, excluding median trees);
- d. 1.25 times the mature canopy area (in square feet) of all open grown trees from the native tree list in the Urban Forestry Manual in the tree canopy site plan to be planted and maintained within the overall development site and each lot or tract (or associated right of way, excluding median trees);

- e. 1.25 times the mature canopy area (in square feet) of each stand in the tree canopy site plan to be planted and maintained within the overall development site and each lot or tract (or associated right of way, excluding median trees). The eligible mature tree canopy area shall be the portion directly above the overall development site and each lot or tract (or associated right of way); and
  - f. Divide the tree canopy area (calculated per part 3.M.2.a-e above) for the overall development site and each lot or tract by the total area of the overall development site and each lot or tract respectively to determine the effective tree canopy cover for the overall development site and each lot or tract.
- N. The standard percentage of effective tree canopy cover for the overall development site shall be at least:
- 1. 40 percent for R-1, R-2, R-3.5, R-4.5 and R-7 districts, except for schools (18.130.050(J));
  - 2. 33 percent for R-12, R-25, R-40, C-N, C-C, C-G, C-P, MUE, MUE-1, MUE-2, MUC, MUR and I-P districts, except for schools (18.130.050(J)); and
  - 3. 25 percent for MU-CBD, MUC-1, I-L and I-H districts, and for schools (18.130.050(J)) in all districts.
- O. If the percent of effective tree canopy cover is less than the applicable standard percent in item n above for the overall development or less than 15 percent for any lot or tract in the R-1, R-2, R-3.5, R-4.5 and R-7 districts (when the overall development site meets or exceeds the standard percent effective tree canopy cover in item n), calculate the tree canopy fee required to meet the applicable standard percent effective tree canopy cover in item n above for the overall development site or 15 percent effective tree canopy cover for each lot or tract in the R-1, R-2, R-3.5, R-4.5 and R-7 districts (only if the overall development site meets or exceeds the standard percent effective tree canopy cover in item n but individual lots or tracts in the R-1, R-2, R-3.5, R-4.5 and R-7 districts do provide 15 percent effective tree canopy cover) according to the methodology in Section 10, part 4 of the Urban Forestry Manual.
- P. A signature of approval and statement from the project arborist or landscape architect, attesting that:
- 1. The tree preservation and removal site plan meets all of the requirements in Section 10, part 1 of the Urban Forestry Manual;
  - 2. The canopy site plan meets all of the requirements in Section 10, part 2 of the Urban Forestry Manual; and
  - 3. The supplemental report meets all of the requirements in Section 10, part 3 of the Urban Forestry Manual.

**Part 4. Urban Forestry Plan – Tree Canopy Fee Calculation Requirements:**

- A. The tree canopy fee shall be calculated as follows:

Notes:

See Appendix 9 for Example Supplemental Report Template with formula for calculating the Tree Canopy Fee

1. If the percentage of effective tree canopy cover is less than the applicable standard percentage in part 3, item n above for the overall development site find the difference (in square feet) between the proposed effective tree canopy cover and the applicable standard effective tree canopy cover for the overall development site and multiply the difference (in square feet) by:
  - a. The most recent wholesale median tree cost established by the PNW-ISA for a 3 inch diameter deciduous tree in the Willamette Valley, OR divided by 59 square feet.
2. In cases where the overall development site meets the standard percentage in part 3.N above yet the percentage of effective tree canopy cover is less than 15 percent for any individual lot or tract in the R-1, R-2, R-3.5, R-4.5 and R-7 districts, find the difference (in square feet) between the proposed effective tree canopy cover and 15 percent effective tree canopy cover for each deficient lot or tract and multiply the difference (in square feet) by:
  - a. The most recent wholesale median tree cost established by the PNW-ISA for a 3 inch diameter deciduous tree in the Willamette Valley, OR divided by 59 square feet.

#### **Part 5. Urban Forestry Plan – Significant Tree Grove Preservation**

##### **Considerations:**

- A. Connects with and does not become isolated from the remaining portion of the significant tree grove on or off the site;
- B. Preserves the most dominant, resilient and healthiest native trees;
- C. Preserves a diversity of species, ages and sizes of native trees;
- D. Preserves native understory and supports natural succession;
- E. Preserves and minimizes disturbance to native soils and tree roots;
- F. Does not preserve hazard trees or trees likely to soon become hazard trees particularly those subject to windthrow (low live crown ratio, high height to diameter ratio, suppressed root development) and exacerbated by newly created edges and/or removal of adjacent trees; and
- G. Does not preserve trees currently or likely to soon be severely impacted by large scale weed, pest or disease outbreaks and/or changing site conditions (hydrology, light, temperature, wind).



END OF SECTION

## Section 11 - Urban Forestry Plan Implementation Standards

### Part 1. Urban Forestry Plan Implementation Standards – Inspection Requirements:

- A. After tree protection measures are installed and prior to any ground disturbance other than what is necessary for the installation of tree protection measures and erosion, sediment and pollutant controls measures, the project arborist or landscape architect shall perform a site inspection for tree protection measures, document compliance/non-compliance with the urban forestry plan and send written verification with a signature of approval directly to the city manager or designee within one week of the site inspection.
- B. Following the completion of item a above, the project arborist or landscape architect shall perform bimonthly (twice monthly) site inspections for tree protection measures during periods of active site development and construction, document compliance/non-compliance with the urban forestry plan and send written verification with a signature of approval directly to the city manager or designee within one week of the site inspection.
- C. When the land use review type will result in the division of land into multiple lots or tracts, the applicant shall provide on the building site plan for each resulting lot or tract, the information detailed in Section 10, part 2.B-N of the Urban Forestry Manual consistent with the approved urban forestry plan. Prior to issuance of any building permits for each resulting lot or tract, the project arborist or landscape architect shall perform a site inspection for tree protection measures, document compliance/non-compliance with the urban forestry plan and send written verification with a signature of approval with the building permit submittal documents.
- D. When the land use review type will result in the division of land into multiple lots or tracts, the project arborist or landscape architect shall perform a site inspection for tree protection measures for all lots or tracts that are not proposed to be associated with a building permit, document compliance/non-compliance with the urban forestry plan and send written verification with a signature of approval to the city manager or designee prior to the issuance of the first building permit resulting from the land use review type.
- E. Prior to final building inspection for any lot or tract with an active urban forestry plan, the project arborist or landscape architect shall perform a site inspection, document compliance/non-compliance with the urban forestry plan and send written verification with a signature of approval to the city manager or designee.

Notes:

See Appendix 10 for Example Tree Canopy Site Plan (Section 10, Part 2) for an Individual Lot

Notes:

See Master Fees and Charges schedule for current fees

**Part 2. Urban Forestry Plan Implementation Standards – Tree Establishment Requirements:**

- A. Prior to any ground disturbance work, the applicant shall provide a tree establishment bond for all trees to be planted per the approved urban forestry plan. The total bond amount:
  - 1. For subdivisions and minor land partitions shall be equivalent to the city’s average cost to plant and maintain a tree per the applicable standards in the Urban Forestry Manual for a period of two years after planting multiplied by the total number of trees to be planted and maintained; and
  - 2. For all other land use review types shall be equivalent to the city’s average cost to plant and maintain a tree per the applicable standards in the Urban Forestry Manual for a period of one year after planting multiplied by the total number of trees to be planted and maintained.
- B. Following final building inspection or upon acceptance by the city manager or designee when there is no final building inspection, the tree establishment period shall immediately begin and continue:
  - 1. In subdivisions and partitions, for a period of two years or until such time as each lot is sold; and
  - 2. In all other land use review types, for a period of one year.
- C. When the land use review type will result in the division of land into multiple lots or tracts, there shall be a separate tree establishment period for each resulting lot or tract where trees are shown to be planted in the approved urban forestry plan.
- D. Following the applicable tree establishment period for each lot or tract, the bond shall be correspondingly reduced based on tree survival following a site inspection, documentation of successful tree establishment and/or replacement according to items E and F below, and receipt by the city manager or designee of written verification of findings and a signature of approval by the project arborist or landscape architect.
- E. For planted open grown trees, successful establishment shall be considered 80 percent survival of the open grown trees planted on the lot or tract, and replacement of 100 percent of the remaining open grown trees planted on the lot or tract that did not survive.
- F. For planted stand grown trees, successful establishment shall be considered survival of at least 80 percent of the original stand grown trees planted on the lot or tract.
- G. If successful establishment for open grown trees is less than 80 percent for any lot or tract, the applicable tree establishment period shall reset for that lot or tract and the establishment process for open grown trees described in part 2.B-F above shall be repeated until the successful establishment requirement for open grown trees is met.

- II. If successful establishment for stand grown trees is less than 80 percent for any lot or tract, the applicable tree establishment period shall reset for that lot or tract and the establishment process for stand grown trees described in Part 2.B-F above shall be repeated until the successful establishment requirement for stand grown trees is met.

Notes:

**Part 3. Urban Forestry Plan Implementation Standards – Urban Forest Inventory Requirements:**

- A. Following documentation of compliance with the urban forestry plan by the project arborist or landscape architect for each lot or tract, the city shall collect spatial and species specific data for each open grown tree and area of stand grown trees for inclusion in a publicly accessible inventory of trees.
- B. Prior to any ground disturbance work, the applicant shall provide a fee to cover the city’s cost of collecting and processing the inventory data for the entire urban forestry plan.

See Master Fees and Charges Schedule for current fees



END OF SECTION





## Section 12 - Street Tree Soil Volume Standards

### Part 1. Street Tree Soil Volume Standards – Soil Volume Requirements:

- A. Street trees required to be planted by chapter 18.745 shall be provided the following minimum soil volumes based on the width of the proposed right of way measured from the edge of the street (excluding curb) towards the subject site:

Right of Way Width (feet)	Minimum Soil Volume Requirement (cubic feet per tree)
Up to 10	400
Over 10 up to 12	500
Over 12 up to 14	600
Over 14 up to 16	700
Over 16 up to 18	800
Over 18 up to 20	900
Over 20	1000

Notes:

### Part 2. Street Tree Soil Volume Standards – Soil Volume Calculation Requirements:

- A. For open soil volumes, soil depth is assumed to be 3 feet if the tree canopy site plan (per 18.790.030.A.3) and supplemental report (per 18.790.030.A.4) demonstrate that the tree will not be planted in an area of tree growth limiting soil or the area of tree growth limiting soil will be adequately amended to a depth of 3 feet in the specified planting area.
- B. Areas of tree growth limiting soils that have not been adequately amended shall not be eligible for credit towards the minimum soil volume requirements in part 1 of this section.
- C. For covered soil volumes, the soil depth is equal to the depth of the covered soil volume as demonstrated by the soil volume plan in part 3 of this section.
- D. Soil volumes for open soil volumes shall be calculated (in cubic feet) by measuring the open soil volume area (in square feet) times an assumed soil depth of 3 feet.
- E. Soil volumes for covered soils volumes shall be calculated (in cubic feet) by multiplying the area of the covered soil volume times the depth of the covered soil volume as demonstrated by the soil volume plan in part 3 of this section.
- F. The total soil volume provided for a tree shall be calculated (in cubic feet) by adding the available open soil volume (per part 2.C above) to the available covered soil volume (per part 2.D above) within a 50 foot radius of the tree.

See Appendix 11 for three Example Soil Volume Calculations for Street Trees

Notes:

- G. The open and covered soil volumes are considered “available” to a tree only when they are directly connected to the tree by a continuous path of no less than 3 feet in width.
- H. In addition, covered soil volumes are considered “available” to a tree only when demonstrated as available by the soil volume plan in part 3 of this section.
- I. All soil volumes calculated per this section shall be displayed for each corresponding tree in the required supplemental report.

**Part 3. Street Tree Soil Volume Standards – Soil Volume Plan Requirements:**

See Appendix 12 for Example Soil Volume Plan

- A. A soil volume plan shall be required for any street tree required to be planted by chapter 18.745 if a covered soil volume is proposed to be used to meet any portion of the minimum soil volume requirements in part 1 of this section. The soil volume plan shall include all items in part 3.B-E below.
- B. A standard size D (24" x 36"), a reduced legal size and a PDF soil volume plan by a registered landscape architect (the project landscape architect) that includes all of the following elements:
  - 1. Date of drawing or last revision;
  - 2. North arrow;
  - 3. Bar scale;
  - 4. Site address or assessor’s parcel number;
  - 5. The name, address, telephone number, email address and license number of the project landscape architect;
  - 6. The location of property lines or proposed property lines if different from existing;
  - 7. The location of proposed building footprints, utilities and irrigation, streets and other paved areas;
  - 8. The assigned numbers (consistent with the tree canopy site plan and supplemental report of a concurrent urban forestry plan) of all trees;
  - 9. The location of each open soil volume area and each covered soil volume area considered “available” for each tree; and
  - 10. The City of Tigard Example Covered Soil Volume Plan Drawings and Specifications unless otherwise approved by the city manager or designee. If required for clarity, this information may be detailed on a separate plan sheet.
- C. When the land use review type will result in the division of land into multiple lots or tracts, the applicant shall provide on the building site plan for each resulting lot or tract, the information detailed in –part 3.B.1-10 of this section consistent with the approved soil volume plan and a signature of approval from the project landscape architect.

See Appendix 14 for two alternative Example Covered Soil Volume Plan Drawings and an Example Covered Soil Specification for Street Trees

See Appendix 13 for Example Soil Volume Plan for a Single Lot

- D. The project landscape architect shall document compliance/non-compliance (including but not limited to materials receipts and observations from site inspections) with the approved soil volume plan, and send written verification with a signature of approval to the city manager or designee prior to final building inspection for all lots, parcels, or tracts associated with each particular tree. When the land use review type will result in the division of land into multiple lots or tracts, the project landscape architect shall provide the documentation/verification described above for all lots or tracts that are not proposed to be associated with a building permit prior to the issuance of the first building permit resulting from the land use review type. When the land use review type does not involve a building permit, the project landscape architect shall provide the documentation/verification described above prior to final acceptance by the city manager or designee.
- E. If any subsequent modifications to an approved soil volume plan is required to meet the minimum soil volume requirements in part 1 of this section, a revised soil volume plan that meets the requirements of part 3 of this section shall be provided that reflect the revisions.

Notes:



END OF SECTION



## Section 13 - Parking Lot Tree Canopy Standards

### Part 1. Parking Lot Tree Canopy Standards – Parking Lot Tree Requirements:

- A. Parking lot trees shall be planted in a manner consistent with tree care industry standards.
- B. Parking lot trees shall have a minimum caliper of 1 ½ inches (for deciduous) or height of a 6 feet (for evergreen) at the time of planting.
- C. Parking lot tree species shall be from the parking lot tree list, unless otherwise approved by the city manager or designee.
- D. Parking lot trees shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving, including curbs.
- E. Parking lot trees shall be evenly distributed within the parking area, and no greater than 6 feet from the parking area.
- F. Parking lot trees shall be provided a minimum of 1000 cubic feet of soil volume per tree.

### Part 2. Parking Lot Tree Canopy Standards – Soil Volume Calculation Requirements:

- A. Soil volumes for open soil volumes shall be calculated (in cubic feet) by measuring the open soil volume area (in square feet) times an assumed soil depth of 3 feet.
- B. Soil volumes for covered soils volumes shall be calculated (in cubic feet) by multiplying the area of the covered soil volume times the depth of the covered soil volume as demonstrated by the parking lot tree canopy plan in part 3 of this section.
- C. The total soil volume provided for a tree shall be calculated (in cubic feet) by adding the available open soil volume (per part 2.A above) to the available covered soil volume (per part 2.B above) within a 50 foot radius of the tree.
- D. The open and covered soil volumes are considered “available” to a tree only when they are directly connected to the tree by a continuous path of no less than 3 feet in width, and demonstrated as available by the parking lot tree canopy plan in part 3 of this section.
- E. All soil volumes calculated per this section shall be displayed for each corresponding tree in the supplemental report (per 18.790.030.A.4) when an urban forestry plan is concurrently required.

### Part 3. Parking Lot Tree Canopy Standards – Parking Lot Tree Canopy Plan Requirements:

- A. A parking lot tree canopy plan shall be required unless the city manager or designee determines the requirements of a concurrent urban forestry plan per chapter 18.790 will meet the equivalent standards in part 3 of this section. The parking lot tree canopy plan shall include all items in part 3.B-E below.

Notes:

See Appendix 3 for Parking Lot Tree List

See Appendix 15 for three Example Soil Volume Calculations for Parking Lot Trees

See Appendix 16 for Example Parking Lot Tree Canopy Plan

Notes:

See Appendix 17 for two alternative Example Covered Soil Volume Plan Drawings and an Example Covered Soil Specification for Parking Lot Trees

See Appendix 18 for Example Parking Lot that Meets the 30% Minimum Canopy Cover Requirement per Code Section 18.745.050.E.1.a.4

- B. A standard size D (24" x 36"), a reduced legal size and a PDF parking lot tree canopy plan by a registered landscape architect (the project landscape architect) that includes all of the following elements:
1. Date of drawing or last revision;
  2. North arrow;
  3. Bar scale;
  4. Site address or assessor's parcel number;
  5. The name, address, telephone number, email address and license number of the project landscape architect;
  6. The location of property lines or proposed property lines if different from existing;
  7. The location of proposed building footprints, utilities and irrigation, streets and other paved areas;
  8. The location of areas of tree growth limiting soils due to compaction, drainage, fertility, pH, contamination or other factors;
  9. Methods for improving areas of tree growth limiting soils if tree planting is proposed in those areas. If required for clarity, this information may be detailed on a separate plan sheet;
  10. The location of all parking lot striping and the location of the limits of the parking area, which includes all parking spaces, all landscape islands and all parking aisles;
  11. Assigned numbers (consistent with the tree canopy site plan per 18.790.030.A.3 and supplemental report per 18.790.030.A.4 of a concurrent urban forestry plan) of all parking lot trees;
  12. The location, species and caliper (in inches for deciduous) or height (in feet for evergreen) of all parking lot trees;
  13. Depiction of the average mature tree canopy spread (in feet as identified on any of the tree lists in the Urban Forestry Manual) for each parking lot tree. If a parking lot tree is not identified on any of the tree lists in the Urban Forestry Manual, then the project arborist or landscape architect shall determine the average mature tree canopy spread using available scientific literature for review and approval by the city manager or designee;
  14. The location of each open soil volume area and each covered soil volume area considered "available" for each tree; and
  15. If covered soil volumes are proposed to meet any portion of the soil volume requirement in part 1.F of this section, the City of Tigard Example Covered Soil Volume Plan Drawings and Specifications unless otherwise approved by the city manager or designee. If required for clarity, this information may be detailed on a separate plan sheet.
- C. A summary in table or other such organized format clearly demonstrating the proposed percent tree canopy cover at maturity directly over the parking area as follows:
1. The area (in square feet) of the parking area as shown in the parking lot tree canopy plan;

2. The average mature tree canopy area for each parking lot tree as follows:
    - a. Average mature tree canopy area =  $(\text{average mature tree canopy spread}/2)^2 \times \pi$ ;
  3. The total combined mature tree canopy area (in square feet) of all parking lot trees less the percentage not directly over the parking area; and
  4. The total combined mature tree canopy area directly over the parking area (in square feet) divided by the parking area.
- D. The project landscape architect shall document compliance/non-compliance (including but not limited to materials receipts and observations from site inspections) with the approved parking lot tree canopy plan, and send written verification with a signature of approval to the city manager or designee prior to final building inspection or prior to final acceptance when there is no final building inspection.
- E. If any subsequent modifications to an approved parking lot tree canopy plan is required, a revised parking lot tree canopy plan that meets the requirements of part 3 of this section shall be provided that reflect the revisions.

Notes:









# City of Tigard Tree Risk Assessment Form

Hazard Rating:						
Probability of Failure	+	The Target Area	+	Size of Defective Part	=	Overall Risk Rating

Recommended Hazard Tree Abatement Procedures:

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Property Address: \_\_\_\_\_

Location:     Public         Private         Right-of-Way

Protected Tree:                     Yes                     No

Tree Species: \_\_\_\_\_

Diameter at Breast Height (DBH): \_\_\_\_\_

Tree Height: \_\_\_\_\_

Crown Spread: \_\_\_\_\_

Tree Part Subject of Evaluation: \_\_\_\_\_

Diameter of Subject Tree Part: \_\_\_\_\_

Distance to Target of Subject Tree Part: \_\_\_\_\_

Length of Subject Tree Part: \_\_\_\_\_

Target: \_\_\_\_\_

Occupancy of Target:     Occasional Use     Intermittent Use     Frequent Use     Constant Use

Date of Evaluation:
Tree Risk Assessor:
ISA Number:

Tree Risk Assessor Signature: \_\_\_\_\_

**\*Fill out this and supplemental rating form completely and attach: 1) photos of the tree; 2) an aerial photo showing the location of the tree on the subject property; and 3) a supplemental tree risk assessment report more fully describing whether the definition of hazard tree has been met and, if necessary, recommended hazard tree abatement procedures.**



Probability of Failure (1 - 5 points)			(V) One
<b>Low</b> 1 point	Defect is not likely to lead to imminent failure, and no further action is required. In many cases, defects might not be recorded.	Minor branch or crown dieback, small wounds, minor defects.	
<b>Moderate</b> 2 points	One or more defects areas well-established but typically do not lead to failure for several years. Corrective action might be useful to prevent future problems but only if time and money are available. Not the highest priority for action, these are retain and monitor situations used to inform budget and work schedules for subsequent years.	Several defects present. <ul style="list-style-type: none"> <li>• Shell wall exceeds minimum requirement</li> <li>• Cracks initiated but no extensive decay</li> <li>• Cavity opening or other stem damage less than 30% of circumference</li> <li>• Crown damage or breakage less than 50% of canopy (30% in pines)</li> <li>• Dead crown limbs with fine twigs attached and bark intact</li> <li>• Weak branch union such as major branch or codominant stem with included bark</li> <li>• Stem girdling roots with less than 40% of circumference compressed</li> <li>• Root damage or root decay affects less than 33% of roots within the critical zone</li> <li>• Standing dead tree that is recently dead (still has fine twigs) and no other significant defects</li> </ul>	
<b>Moderately High</b> 3 points	One or more defects areas well-established, but not yet deemed to be a high priority issue. Additional testing may be required or, the assessor may feel the problems are not serious enough to warrant immediate action, but do warrant placing the tree on a list of trees to be inspected more regularly. These are Retain and Monitor trees.	Areas of decay that may be expanding; trees that have developed a recent but not yet critical lean; cracks noted but may be stable; edge trees that may adapt and become more stable.	
<b>High</b> 4 points	The defect is serious and imminent failure is likely and corrective action is required immediately. These cases require treatment within the next few days or weeks.	One or more major defects present. <ul style="list-style-type: none"> <li>• Insufficient shell wall thickness</li> <li>• Large cracks, possibly associated with other defects</li> <li>• Cavity opening greater than 30% of circumference</li> <li>• Crown damage or breakage more than 50% of canopy (&gt; 30% in pines)</li> <li>• Dead crown limbs with no fine twigs and bark peeling away. May be some saprophytic fungal evidence</li> <li>• Weak branch union has crack(s) or decay</li> <li>• Stem girdling root affects 40% or more of trunk circumference</li> <li>• More than 33% of roots are damaged within the critical zone</li> <li>• Tree is leaning. Recent root breakage, or soil mounding, or cracks, or extensive decay evident</li> <li>• Standing dead tree, has very few fine twigs, and no other significant defects</li> </ul>	
<b>Extreme</b> 5 points	The tree or component part is already failing. An emergency situation where treatment is required today.	Multiple high or extreme risk defects present. <ul style="list-style-type: none"> <li>• Shell wall is already cracked and failing</li> <li>• Major cracks already open, such as hazard beams or split trunks</li> <li>• More than 30% of circumference defective and cracks or decay obvious</li> <li>• Dead crown limbs, no fine twigs, no bark, decay present</li> <li>• Weak branch union has crack(s) and decay</li> <li>• Leaning tree with recent root failure, soil mounding, and cracks or extensive decay</li> <li>• Dead branches hung up or partly failed</li> <li>• Visual obstruction of traffic signs/lights at intersections</li> <li>• Any partly failed component or whole tree</li> <li>• Standing dead trees that have been dead for more than one season with multiple defects such as cracks, decay, damaged roots, shedding bark</li> </ul>	

The Target Area (1 - 4 points)		(√) One
<b>Low</b> 1 point	Sites rated at one point are very rarely used for any long period of time, and people passing through the area (regardless of how they travel) do not spend a lot of time within the striking range of the tree. There are no valuable buildings or other facilities within striking range. Examples are seldom used back country roads or trails, seldom used overflow or long-term parking, industrial areas where workers drive machines (trucks, forklifts, tractors) with substantial cab protection; natural or wilderness areas; transition areas with limited access; remote areas of yards, parks, or private lands open for public use within set hours. All of these sites have relatively low occupancy within any one day.	
<b>Moderate</b> 2 points	Valuable buildings are at the edge off the striking distance, so they would not be seriously damaged even if the tree did fall down. The site has people within striking range occasionally, meaning less than 50% of the time span in any one day, week, or month, and do not stay within striking range very long. Examples include areas that are used seasonally; more remote areas of camping areas or parks; minor rural roads; picnic areas; low to moderate use trails; most park and school playgrounds.** Moderate to low use parks, parking lots with daily use; secondary roads and intersections, dispersed camping sites, moderate to high use trails, works and/or storage yards.	
<b>Moderately High</b> 3 points	The site has valuable buildings within striking range. People are within striking range more than 50% of the time span in any one day, week, or month, and their exposure time can be more than just passing by. Examples include secondary roads, trails, and access points; less commonly used parking areas and trails within parks; trails alongside fairways, bus stops.	
<b>High</b> 4 points	The highest rated targets have a) a building within striking range frequently accessed by people, often for longer periods of time, or high volumes of people coming and going within striking range. Valuable buildings or other structures within striking range that would suffer major structural damage in the event of tree failure or; b) people within striking distance of the tree, or both, seven days a week, all year long, and at all times of the day. Examples include main roads, the busiest streets or highways; high volume intersections power lines;* paths through busy open space areas and parks; short-term parking constantly in use; institutional buildings such as police stations, hospitals, fire stations; shopping areas; highly used walking trails; pick up and drop off points for commuters; golf tees and greens; emergency access routes and/or marshalling areas; handicap access areas; high use camping areas, visitor centers or shelters; residential buildings; industrial areas where workers take outside breaks; development sites where work activity within striking range lasts more than a few hours at a time.	

\*There are very specific safe work practices required when working close to Power Lines. These vary depending on location, but all employ similar principles.

\*\*It is recognized that there is a tendency to rate playgrounds higher simply because children are involved. Most playgrounds are occupied for short periods of time in daylight hours. Overall, their use is infrequent when compared to other locations such as busy streets.

Size of Defective Part (1 - 3 points)		(√) One
1 point	Branches or stems up to 10 centimeters (4 inches) in diameter	
2 points	Branches or stems between 10 to 50 centimeters (4 to 20 inches) in diameter.	
3 points	Branches or stems greater than 50 centimeters (20 inches) in diameter.	

\*In some cases, there may be large areas of sloughing back bark, dwarf mistletoe brooms, branch stubs, or large bird nests in cavities that pose a risk. The assessor must use his or her judgment to assign a number to these components. In general, the lowest rating (1 point) is reserved for component parts that would not create much impact on a person or property if it were to fail. The highest rating is used for parts that have the potential to kill people or seriously damage property.

Overall Risk Rating and Action Thresholds			(v) One
<i>Risk Rating</i>	<i>Risk Category</i>	<i>Interpretation and Implications</i>	
3	Low 1	Insignificant – no concern at all.	
4	Low 2	Insignificant – very minor issues.	
5	Low 3	Insignificant – minor issues not of concern for many years yet.	
6	Moderate 1	Some issues but nothing that is likely to cause any problems for another 10 years or more.	
7	Moderate 2	Well defined issues – retain and monitor. Not expected to be a problem for at least another 5-10 years.	
8	Moderate 3	Well defined issues – retain and monitor. Not expected to be a problem for at least another 1-5 years.	
9	High 1	The assessed issues have now become very clear. The tree can still reasonably be retained as it is not likely to fall apart right away, but it must now be monitored annually. At this stage, it may be reasonable for the risk manager/owner to hold public education sessions to inform people of the issues and prepare them for the reality that part or the entire tree has to be removed.	
10	High 2	The assessed issues have now become very clear. The probability of failure is now getting serious, or the target rating and/or site context have changed such that mitigation measures should now be on a schedule with a clearly defined timeline for action. There may still be time to inform the public of the work being planned, but there is not enough time to protracted discussion about whether or not there are alternative options available.	
11	High 3	The tree, or a part of it has reached a stage where it could fail at any time. <b>Action to mitigate the risk is required within weeks rather than months.</b> By this stage there is not time to hold public meetings to discuss the issue. Risk reduction is a clearly defined issue and although the owner may wish to inform the public of the planned work, he/she should get on with it to avoid clearly foreseeable liabilities.	
12	Extreme	This tree, or part of it, is in the process of failing. <b>Immediate action is required.</b> All other, less significant tree work should be suspended, and roads or work areas should be closed off, until the risk issues have been mitigated. This might be as simple as removing the critical part, drastically reducing overall tree height, or taking the tree down and cordoning off the area until final clean up, or complete removal can be accomplished. The immediate action required is to ensure that the clearly identified risk of harm is eliminated. For areas hit by severe storms, where many extreme risk trees can occur, drastic pruning and/or partial tree removals, followed by barriers to contain traffic, would be an acceptable first stage of risk reduction. There is no time to inform people or worry about public concerns. Clearly defined safety issues preclude further discussion.	

The Table shown above outlines the interpretation and implications of the risk ratings and associated risk categories. This table is provided to inform the reader about these risk categories so that they can better understand any risk abatement recommendations made in the risk assessment report.

Notes: \_\_\_\_\_  
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Appendix 2

### Street Tree List - Small Stature Trees (up to 25' in height at maturity)

Common Name	Scientific Name	Height (feet)	Spread (feet)	Canopy Area	Soil Type	Suitable for Under Powerlines	Special Features/Considerations
<a href="#">Paperbark Maple</a>	<i>Acer griseum</i>	25'	25'	491 sq. ft.	all	Yes*	peeling bark, tolerates some shade
<a href="#">Tatarian Maple</a>	<i>Acer tataricum</i>	20'	20'	314 sq. ft.	all	Yes	tolerant of urban stresses
<a href="#">Trident Maple</a>	<i>Acer buergeranum</i>	25'	20'	314 sq. ft.	all	Yes	tolerant of urban stresses
<a href="#">Serviceberry</a>	<i>Amelanchier x grandiflora</i>	25'	15'	177 sq. ft.	well drained	Yes	white flowers, edible fruit
<a href="#">Western Serviceberry</a>	<i>Amelanchier alnifolia</i>	20'	20'	314 sq. ft.	loam	Yes	native to Portland metropolitan region
<a href="#">American Hornbeam</a>	<i>Carpinus caroliniana</i>	25'	20'	314 sq. ft.	all	No	needs ample water
<a href="#">Eastern Redbud</a>	<i>Cercis canadensis</i>	25'	25'	491 sq. ft.	all	Yes	pink flowers in spring before leaves emerge
<a href="#">Glorybower Tree</a>	<i>Clerodendrum trichotomum</i>	20'	20'	314 sq. ft.	all	Yes	colorful flowers in summer, blue berries in fall
<a href="#">Kousa Dogwood</a>	<i>Cornus kousa</i>	25'	25'	491 sq. ft.	all	Yes	shade tolerant
<a href="#">Flowering Dogwood</a>	<i>Cornus florida</i>	25'	25'	491 sq. ft.	all	Yes	large number of varieties available
<a href="#">Lavalle Hawthorne</a>	<i>Crataegus x lavallei</i>	25'	20'	314 sq. ft.	all	Yes	white flowers in May, orange-red fruit persist into Winter
<a href="#">Black Hawthorne</a>	<i>Crataegus douglasii</i>	25'	20'	314 sq. ft.	all	Yes	native to Portland metropolitan region, has thorns
<a href="#">Golden Desert Ash</a>	<i>Fraxinus excelsior</i> 'Golden Desert'	20'	20'	314 sq. ft.	all	Yes	golden twigs
<a href="#">Flowering Ash</a>	<i>Fraxinus ornus</i>	25'	25'	491 sq. ft.	all	Yes	fragrant flowers
<a href="#">Merrill Magnolia</a>	<i>Magnolia x loebneri</i> 'Merrill'	25'	25'	491 sq. ft.	all	No	fragrant white flowers
<a href="#">Southern Magnolia</a>	<i>Magnolia grandiflora</i> 'Victoria' or 'Little Gem'	25'	25'	491 sq. ft.	all	No	broadleaf evergreen, large fragrant white flowers
<a href="#">Prairiefire Crabapple</a>	<i>Malus spp.</i> 'Prairiefire'	20'	20'	314 sq. ft.	all	Yes	disease resistant
<a href="#">Japanese Stewartia</a>	<i>Stewartia pseudocamellia</i>	25'	25'	491 sq. ft.	loam	No	needs ample water
<a href="#">Japanese Snowbell</a>	<i>Styax japonicus</i>	25'	25'	491 sq. ft.	well drained	Yes	white flowers hang down from branches
<a href="#">Japanese Tree Lilac</a>	<i>Syringa reticulata</i>	20'	15'	177 sq. ft.	well drained	Yes	showy, creamy white flowers

\*These trees have been approved by Portland General Electric (PGE) for planting beneath overhead powerlines

Appendix 2

**Street Tree List - Medium Stature Trees  
(between 25' and 40' in height at maturity)**

Common Name	Scientific Name	Height (feet)	Spread (feet)	Canopy Area	Soil Type	Suitable for Under Powerlines	Special Features/Consideration
<a href="#">Hedge Maple</a>	<i>Acer campestre</i>	35'	30'	707 sq. ft.	all	No	tolerant of urban stresses
<a href="#">Sunset Maple</a>	<i>Acer truncatum</i> x <i>Acer platanoides</i>	35'	25'	491 sq. ft.	all	No	many varieties available
<a href="#">Strawberry Tree</a>	<i>Arbutus 'Marina'</i>	30'	30'	707 sq. ft.	all	No	broadleaf evergreen
<a href="#">European Hornbeam</a>	<i>Carpinus betulus</i>	35'	25'	491 sq. ft.	all	No	dense crown
<a href="#">Katsura</a>	<i>Cercidiphyllum japonicum</i>	40'	40'	1256 sq. ft.	all	No	requires moist soils
<a href="#">Yellowwood</a>	<i>Cladrastis kentuckia</i>	35'	35'	962 sq. ft.	all	No	fragrant, white, pendulous flowers
<a href="#">June Snow Dogwood</a>	<i>Cornus controversa 'June Snow'</i>	30'	35'	962 sq. ft.	well drained	No	wide spreading, flowers in May/June
<a href="#">Pacific Dogwood</a>	<i>Cornus nuttallii</i>	40'	30'	707 sq. ft.	loam	No	native to Portland metropolitan region, requires moist soil and some shade
<a href="#">Dove Tree</a>	<i>Davidia involucreata</i>	35'	30'	707 sq. ft.	well drained	No	dove-like flowers
<a href="#">Raywood Ash</a>	<i>Fraxinus oxycarpa 'Raywood'</i>	35'	30'	707 sq. ft.	all	No	smog tolerant
<a href="#">Goldenrain Tree</a>	<i>Koelreuteria paniculata</i>	35'	35'	962 sq. ft.	all	No	tolerant of urban stresses
<a href="#">Yulan Magnolia</a>	<i>Magnolia denudata</i>	35'	30'	707 sq. ft.	all	No	white, fragrant flowers
<a href="#">Southern Magnolia</a>	<i>Magnolia grandiflora 'Edith Bogue'</i>	35'	20'	314 sq. ft.	all	No	broadleaf evergreen, many other varieties available
<a href="#">Sourwood</a>	<i>Oxydendrum arboreum</i>	30'	20'	314 sq. ft.	well drained	No	white, midsummer flowers
<a href="#">American Hophornbeam</a>	<i>Ostrya virginiana</i>	35'	25'	491 sq. ft.	all	No	exfoliating bark texture is attractive
<a href="#">Persian Parrotia</a>	<i>Parrotia persica</i>	35'	25'	491 sq. ft.	well drained	No	beautiful bark and fall color
<a href="#">Amur Corktree</a>	<i>Pbellodendron amurense</i>	40'	30'	707 sq. ft.	all	No	fragrant leaves and fruit
<a href="#">Callery Pear</a>	<i>Pyrus calleryana</i>	40'	25'	491 sq. ft.	all	No	many varieties available
<a href="#">Cascara</a>	<i>Rhamnus purshiana</i>	35'	25'	491 sq. ft.	all	No	native to Portland metropolitan region
<a href="#">Frontier Elm</a>	<i>Ulmus 'Frontier'</i>	40'	30'	707 sq. ft.	all	No	pest and disease resistant, substitute for American Elm



Appendix 2

### Street Tree List - Large Stature Trees (over 40' in height at maturity)

Common Name	Scientific Name	Height (feet)	Spread (feet)	Canopy Area	Soil Type	Suitable for Under Powerlines	Special Features/Consideration
<a href="#">Red Maple</a>	<i>Acer rubrum</i>	50'	40'	1256 sq. ft.	any	No	many large stature varieties available
<a href="#">Hackberry</a>	<i>Celtis occidentalis</i>	45'	35'	962 sq. ft.	any	No	tolerant of urban stresses, deep rooted
<a href="#">European Beech</a>	<i>Fagus sylvatica</i>	50'	40'	1256 sq. ft.	well drained	No	beautiful bark
<a href="#">White Ash</a>	<i>Fraxinus americana</i>	60'	45'	1590 sq. ft.	any	No	plant seedless varieties
<a href="#">Oregon Ash</a>	<i>Fraxinus latifolia</i>	60'	30'	707 sq. ft.	any	No	native to Portland metropolitan region
<a href="#">Green Ash</a>	<i>Fraxinus pennsylvanica</i>	50'	40'	1256 sq. ft.	any	No	plant seedless varieties
<a href="#">Maidenhair Tree</a>	<i>Ginkgo biloba</i>	60'	45'	1590 sq. ft.	any	No	many large stature varieties available, plant males only
<a href="#">Honeylocust</a>	<i>Gleditsia triacanthos var. inermis</i>	45'	35'	962 sq. ft.	any	No	thornless, tolerant of urban stresses
<a href="#">Kentucky Coffeetree</a>	<i>Gymnocladus dioica</i>	65'	50'	1963 sq. ft.	any	No	fragrant flowers
<a href="#">Tulip Tree</a>	<i>Liriodendron tulipifera</i>	60'	30'	707 sq. ft.	any	No	beautiful fall color
<a href="#">Southern Magnolia</a>	<i>Magnolia grandiflora</i>	70'	60'	1963 sq. ft.	any	No	broadleaf evergreen, large fragrant white flowers
<a href="#">Blackgum</a>	<i>Nyssa sylvatica</i>	45'	25'	491 sq. ft.	any	No	beautiful fall color
<a href="#">London Planetree</a>	<i>Platanus x acerifolia 'Bloodgood'</i>	50'	40'	1256 sq. ft.	any	No	disease resistant, pollution tolerant
<a href="#">Scotch Pine</a>	<i>Pinus sylvestris</i>	50'	40'	1256 sq. ft.	any	No	evergreen conifer, striking orange bark
<a href="#">Oregon White Oak</a>	<i>Quercus garryana</i>	65'	50'	1963 sq. ft.	any	No	native to Portland metropolitan region
<a href="#">Willow Oak</a>	<i>Quercus phellos</i>	60'	45'	1590 sq. ft.	any	No	tolerant of urban stresses
<a href="#">Red Oak</a>	<i>Quercus rubra</i>	60'	45'	1590 sq. ft.	any	No	beautiful fall color
<a href="#">American Linden</a>	<i>Tilia americana</i>	60'	30'	707 sq. ft.	any	No	tolerant of urban stresses
<a href="#">Sterling Silver Linden</a>	<i>Tilia tomentosa 'Sterling Silver'</i>	45'	30'	707 sq. ft.	any	No	dark green leaves with silver undersides
<a href="#">Zelkova</a>	<i>Zelkova serrata</i>	65'	50'	1963 sq. ft.	any	No	attractive shade tree



Appendix 3

## Parking Lot Trees (recommended for parking lots, large stature)

Common Name	Scientific Name	Height (feet)	Spread (feet)	Canopy Area	Soil Type	Suitable for Under Powerlines	Special Features/ Consideration
<a href="#">Bigleaf Maple</a>	<i>Acer macrophyllum</i>	65'	50'	1963 sq. ft.	any	No	native to Portland metropolitan region
<a href="#">Red Maple</a>	<i>Acer rubrum</i>	50'	40'	1256 sq. ft.	any	No	brilliant red fall color
<a href="#">European Beech</a>	<i>Fagus sylvatica</i>	50'	40'	1256 sq. ft.	well drained	No	beautiful bark
<a href="#">White Ash</a>	<i>Fraxinus americana</i>	60'	45'	1590 sq. ft.	any	No	plant seedless varieties
<a href="#">Green Ash</a>	<i>Fraxinus pennsylvanica</i>	50'	40'	1256 sq. ft.	any	No	plant seedless varieties
<a href="#">Maidenhair Tree</a>	<i>Ginkgo biloba</i>	60'	45'	1590 sq. ft.	any	No	many large stature varieties available, plant males only
<a href="#">Kentucky Coffeetree</a>	<i>Gymnocladus dioica</i>	65'	50'	1963 sq. ft.	any	No	fragrant flowers
<a href="#">Southern Magnolia</a>	<i>Magnolia grandiflora</i>	70'	60'	2826 sq. ft.	any	No	broadleaf evergreen, large fragrant white flowers
<a href="#">Austrian Pine</a>	<i>Pinus nigra</i>	55'	40'	1256 sq. ft.	any	No	evergreen conifer
<a href="#">Eastern White Pine</a>	<i>Pinus strobus</i>	70'	40'	1256 sq. ft.	any	No	evergreen conifer
<a href="#">Scotch Pine</a>	<i>Pinus sylvestris</i>	50'	40'	1256 sq. ft.	any	No	evergreen conifer, striking orange bark
<a href="#">London Planetree</a>	<i>Platanus x acerifolia</i> 'Bloodgood'	50'	40'	1256 sq. ft.	any	No	disease resistant, pollution tolerant
<a href="#">Oregon White Oak</a>	<i>Quercus garryana</i>	65'	50'	1963 sq. ft.	any	No	native to Portland metropolitan region
<a href="#">Willow Oak</a>	<i>Quercus phellos</i>	60'	45'	1590 sq. ft.	any	No	tolerant of urban stresses
<a href="#">Red Oak</a>	<i>Quercus rubra</i>	60'	45'	1590 sq. ft.	any	No	beautiful fall color
<a href="#">Accolade Elm</a>	<i>Ulmus</i> 'Morton'	70'	60'	2826 sq. ft.	any	No	graceful vase shaped tree, disease resistant substitute for American elm
<a href="#">Lacebark Elm</a>	<i>Ulmus parvifolia</i>	60'	50'	1963 sq. ft.	any	No	interesting mottled bark
<a href="#">Pioneer Elm</a>	<i>Ulmus</i> 'Pioneer'	50'	50'	1963 sq. ft.	any	No	rounded spreading crown, disease resistant substitute for American elm
<a href="#">Oregon Myrtle</a>	<i>Umbellularia californica</i>	70'	50'	1963 sq. ft.	any	No	broadleaf evergreen
<a href="#">Zelkova</a>	<i>Zelkova serrata</i>	65'	50'	1963 sq. ft.	any	No	attractive shade tree



Appendix 4

## Columnar Trees (canopy spread of less than 20 feet at maturity, small stature)

Common Name	Scientific Name	Height (feet)	Spread (feet)	Canopy Area	Soil Type	Suitable for Under Powerlines	Special Features/Considerations
<a href="#">Armstrong Maple</a>	<i>Acer rubrum</i> 'Armstrong'	45'	15'	177 sq. ft.	any	No	orange-red fall color
<a href="#">Bowhall Maple</a>	<i>Acer rubrum</i> 'Bowhall'	40'	15'	177 sq. ft.	any	No	bright red fall color
<a href="#">Frans Fontaine Hornbeam</a>	<i>Carpinus betulus</i> 'Frans Fontaine'	35'	15'	177 sq. ft.	any	No	narrowest of the <i>Carpinus b.</i> cultivars
<a href="#">Dawyck Purple Beech</a>	<i>Fagus sylvatica</i> 'Dawyck Purple'	40'	12'	113 sq. ft.	any	No	purple leaves for entire growing season
<a href="#">Princeton Sentry Ginkgo</a>	<i>Ginkgo biloba</i> 'Princeton Sentry'	40'	15'	177 sq. ft.	any	No	seedless, bright yellow fall color
<a href="#">Arnold Tulip Tree</a>	<i>Liriodendron tulipifera</i> 'Arnold'	40'	10'	79 sq. ft.	any	No	fast grower
<a href="#">Edith Bogue Magnolia</a>	<i>Magnolia grandiflora</i> 'Edith Bogue'	30'	15'	177 sq. ft.	any	No	broadleaf evergreen
<a href="#">Galaxy Magnolia</a>	<i>Magnolia</i> × 'Galaxy'	30'	15'	177 sq. ft.	any	No	showy pink flowers
<a href="#">Tschonoskii Crabapple</a>	<i>Malus tschonoskii</i>	30'	15'	177 sq. ft.	any	No	good fall color
<a href="#">Arnold Sentinel Austrian Pine</a>	<i>Pinus nigra</i> 'Arnold Sentinel'	35'	10'	79 sq. ft.	any	No	evergreen conifer
<a href="#">Fastigate White Pine</a>	<i>Pinus strobus</i> 'Fastigiata'	30'	10'	79 sq. ft.	well drained	No	evergreen conifer
<a href="#">Quaking Aspen</a>	<i>Populus tremuloides</i>	30'	15'	177 sq. ft.	any	No	native to the Portland Metro region
<a href="#">Capital Pear</a>	<i>Pyrus calleryana</i> 'Capital'	35'	12'	113 sq. ft.	any	No	glossy summer foliage
<a href="#">Chanticleer Pear</a>	<i>Pyrus calleryana</i> 'Chanticleer'	40'	15'	177 sq. ft.	any	No	resistant to fireblight
<a href="#">Columnar Sargent Cherry</a>	<i>Prunus sargentii</i> 'Columnaris'	35'	15'	177 sq. ft.	any	No	pink flowers and reddish bark
<a href="#">Skyrocket Oak</a>	<i>Quercus robur</i> 'Fastigiata'	45'	15'	177 sq. ft.	well drained	No	may hold brown leaves into winter
<a href="#">Crimson Spire Oak</a>	<i>Quercus robur</i> × <i>Q. alba</i> 'Crimschmidt'	45'	15'	177 sq. ft.	well drained	No	red fall color
<a href="#">Giant Arborvitae "Virescens"</a>	<i>Thuja plicata</i> 'Virescens'	25'	12'	113 sq. ft.	moist	No	evergreen conifer, species native to the Portland Metro Region
<a href="#">Corinthian Linden</a>	<i>Tilia cordata</i> 'Corzam'	45'	15'	177 sq. ft.	any	No	narrowest of the linden cultivars
<a href="#">Columnar Zelkova</a>	<i>Zelkova serrata</i> 'Musashino'	45'	15'	177 sq. ft.	any	No	fine textured leaves



Appendix 5

## Native Trees

Common Name	Scientific Name	Height (feet)	Spread (feet)	Canopy Area	Stature	Suitable for Under Powerlines	Primary Habitat Types
<a href="#">Grand Fir</a>	<i>Abies grandis</i>	150'	40'	1256 sq. ft.	Large	No	Wetland, Riparian, Upland
<a href="#">Big-leaf Maple</a>	<i>Acer macrophyllum</i>	65'	50'	1963 sq. ft.	Large	No	Upland
<a href="#">Red Alder</a>	<i>Alnus rubra</i>	100'	40'	1256 sq. ft.	Large	No	Riparian, Upland
<a href="#">Madrone</a>	<i>Arbutus menziesii</i>	40'	30'	707 sq. ft.	Medium	No	Upland
<a href="#">Pacific Dogwood</a>	<i>Cornus nuttallii</i>	40'	30'	707 sq. ft.	Medium	No	Upland
<a href="#">Black Hawthorn</a>	<i>Crataegus douglasii</i>	25'	20'	314 sq. ft.	Small	Yes	Wetland, Riparian, Upland
<a href="#">Oregon Ash</a>	<i>Fraxinus latifolia</i>	60'	30'	707 sq. ft.	Large	No	Wetland, Riparian
<a href="#">Ponderosa Pine</a>	<i>Pinus ponderosa</i>	200'	30'	707 sq. ft.	Large	No	Upland
<a href="#">Black Cottonwood</a>	<i>Populus balsamifera ssp. trichocarpa</i>	175'	40'	1256 sq. ft.	Large	No	Wetland, Riparian
<a href="#">Quaking Aspen</a>	<i>Populus tremuloides</i>	30'	15'	177 sq. ft.	Medium	No	Wetland, Riparian
<a href="#">Bitter Cherry</a>	<i>Prunus emarginata</i>	30'	20'	314 sq. ft.	Medium	No	Riparian, Upland
<a href="#">Douglas Fir</a>	<i>Pseudotsuga menziesii</i>	180'	40'	1256 sq. ft.	Large	No	Upland
<a href="#">Oregon White Oak</a>	<i>Quercus garryana</i>	65'	50'	1963 sq. ft.	Large	No	Upland
<a href="#">Cascara</a>	<i>Rhamnus purshiana</i>	35'	25'	491 sq. ft.	Medium	No	Riparian, Upland
<a href="#">Pacific Willow</a>	<i>Salix lasida ssp. lasiandra</i>	40'	30'	707 sq. ft.	Medium	No	Wetland, Riparian
<a href="#">Rigid Willow</a>	<i>Salix rigida var. macrogemma</i>	30'	20'	314 sq. ft.	Small	No	Wetland, Riparian
<a href="#">Scouler Willow</a>	<i>Salix scouleriana</i>	40'	40'	1256 sq. ft.	Medium	No	Wetland, Riparian, Upland
<a href="#">Pacific Yew</a>	<i>Taxus brevifolia</i>	40'	30'	707 sq. ft.	Medium	No	Riparian, Upland
<a href="#">Western Red Cedar</a>	<i>Thuja plicata</i>	100'	30'	707 sq. ft.	Large	No	Wetland, Riparian, Upland
<a href="#">Western Hemlock</a>	<i>Tsuga heterophylla</i>	150'	40'	1256 sq. ft.	Large	No	Riparian, Upland



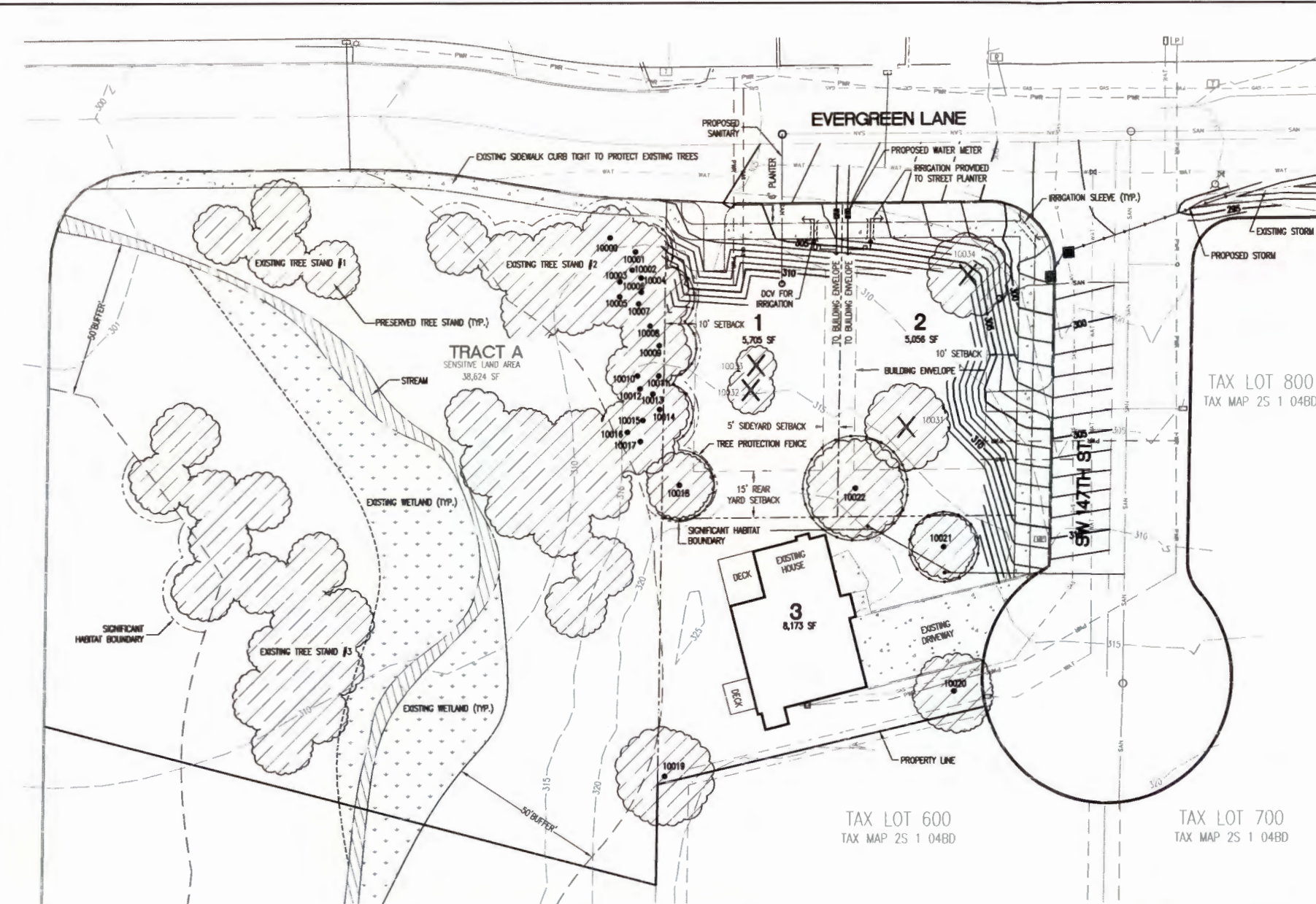


Appendix 6

## Nuisance Tree List

Common Name	Scientific Name	Photos	Photos2	Photos3
<a href="#">Norway maple</a>	<i>Acer platanoides</i>	<a href="#">leaf detail</a>	<a href="#">fruit detail</a>	<a href="#">flower detail</a>
<a href="#">Sycamore maple</a>	<i>Acer pseudoplatanus</i>	<a href="#">leaf detail</a>	<a href="#">fruit detail</a>	<a href="#">flower detail</a>
<a href="#">Tree-of-heaven</a>	<i>Ailanthus altissima</i>	<a href="#">leaf detail</a>	<a href="#">fruit detail</a>	<a href="#">flower detail</a>
<a href="#">European white birch</a>	<i>Betula pendula</i>	<a href="#">leaf detail</a>	<a href="#">fruit detail</a>	<a href="#">flower detail</a>
<a href="#">English hawthorn</a>	<i>Crataegus monogyna</i>	<a href="#">leaf detail</a>	<a href="#">fruit detail</a>	<a href="#">flower detail</a>
<a href="#">English holly</a>	<i>Ilex aquifolium</i>	<a href="#">leaf detail</a>	<a href="#">fruit detail</a>	<a href="#">flower detail</a>
<a href="#">Princess tree</a>	<i>Paulownia tomentosa</i>	<a href="#">leaf detail</a>	<a href="#">fruit detail</a>	<a href="#">flower detail</a>
<a href="#">White poplar</a>	<i>Populus alba</i>	<a href="#">leaf detail</a>	<a href="#">fruit detail</a>	<a href="#">flower detail</a>
<a href="#">Sweet cherry</a>	<i>Prunus avium</i>	<a href="#">leaf detail</a>	<a href="#">fruit detail</a>	<a href="#">flower detail</a>
<a href="#">Black locust</a>	<i>Robinia pseudoacacia</i>	<a href="#">leaf detail</a>	<a href="#">fruit detail</a>	<a href="#">flower detail</a>
<a href="#">European mountain ash</a>	<i>Sorbus aucuparia</i>	<a href="#">leaf detail</a>	<a href="#">fruit detail</a>	<a href="#">flower detail</a>
<a href="#">Siberian elm</a>	<i>Ulmus pumila</i>	<a href="#">leaf detail</a>	<a href="#">fruit detail</a>	<a href="#">flower detail</a>

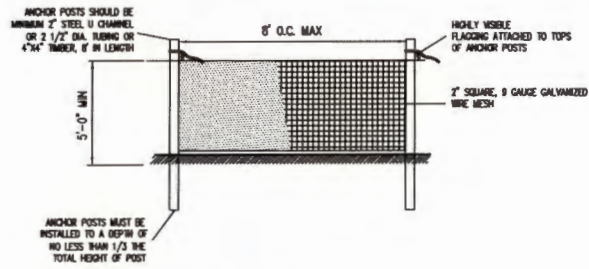




**TREE PROTECTION NOTES:**

- NO CHANGES SHALL BE MADE TO ANY ASPECT OF THE APPROVED URBAN FORESTRY PLAN WITHOUT WRITTEN CONSENT FROM THE PROJECT ARBORIST AND CITY ARBORIST.
- TIMELINE FOR CLEARING, GRADING, AND INSTALLATION OF TREE PROTECTION MEASURES: WORK WILL BEGIN WITHIN THREE (3) WEEKS OF PFT PERMIT INSURANCE BY THE CITY. TREE PROTECTION WILL BE INSTALLED PRIOR TO ANY GROUND DISTURBANCE WORK, CLEARING, AND GRADING WILL FOLLOW.
- PLACING MATERIALS NEAR TREES. NO PERSON MAY CONDUCT ANY ACTIVITY WITHIN THE PROTECTED AREA OF ANY TREE DESIGNATED TO REMAIN, INCLUDING, BUT NOT LIMITED TO, PARKING EQUIPMENT, PLACING SOLVENTS, STORING BUILDING MATERIAL AND SOIL DEPOSITS, DUMPING CONCRETE WASHOUT AND LOCATING BURN HOLES.
- ATTACHMENTS TO TREES DURING CONSTRUCTION - NO PERSON SHALL ATTACH ANY OBJECT TO ANY TREE DESIGNATED FOR PRESERVATION.
- PROTECTIVE BARRIER. PRIOR TO ANY GROUND DISTURBANCE BY THE CONTRACTOR:
  - SHALL ERECT AND MAINTAIN READILY VISIBLE TREE PROTECTION FENCING ALONG THE OUTER EDGE AND COMPLETELY SURROUNDING THE PROTECTED AREA OF ALL PROTECTED TREES OR GROUPS OF TREES AS SHOWN. FENCES SHALL BE CONSTRUCTED OF 5 FOOT TALL METAL, SECURED TO EIGHT FOOT TALL METAL POSTS. POSTS SHALL NOT BE PLACED FURTHER THAN 8 FEET O.C. APART.
  - MAY BE REQUIRED TO COVER WITH MULCH TO A DEPTH OF AT LEAST SIX (6) INCHES, OR WITH PLYWOOD OR SIMILAR MATERIAL, OVER THE ROOT ZONE OF A TREE IN ORDER TO PROTECT ROOTS FROM DAMAGE CAUSED BY HEAVY EQUIPMENT.
  - SHALL PROHIBIT EXCAVATION OR COMPACTING OF EARTH OR OTHER POTENTIALLY DAMAGING ACTIVITIES WITHIN THE TREE PROTECTION ZONE.
  - MAY BE REQUIRED TO MINIMIZE ROOT DAMAGE BY EXCAVATION OF A TWO (2) FEET DEEP TRENCH, AT THE EDGE OF THE TREE PROTECTION ZONE, TO CLEARLY SEVER THE ROOTS OF TREES TO BE RETAINED.
  - MAY BE REQUIRED TO HAVE CORRECTIVE PRUNING PERFORMED ON PRESERVED TREES IN ORDER TO AVOID DAMAGE FROM MACHINERY OR BUILDING ACTIVITY. MAY BE REQUIRED TO MAINTAIN TREES THROUGHOUT CONSTRUCTION PERIOD BY WATERING AND FERTILIZING.
  - SHALL MAINTAIN THE TREE PROTECTION FENCING IN PLACE UNTIL THE PROJECT ARBORIST AND CITY ARBORIST AUTHORIZES THEIR REMOVAL.
  - SHALL ENSURE THAT ANY LANDSCAPING DONE IN THE TREE PROTECTION ZONE SUBSEQUENT TO THE REMOVAL OF THE BARRIERS SHALL BE ACCOMPLISHED WITH LIGHT MACHINERY OR HAND LABOR. USE PLANT MATERIALS WITH COMPATIBLE WATER REQUIREMENTS TO TREE TO BE PRESERVED AND DIRECT SPRAY IRRIGATION AWAY FROM TRUNKS.
- THE GRADE SHALL NOT BE ELEVATED OR REDUCED WITHIN THE TREE PROTECTION ZONE WITHOUT THE PROJECT ARBORIST'S AUTHORIZATION. THE PROJECT ARBORIST MAY ALLOW COVERAGE OF UP TO ONE HALF OF THE AREA OF THE TREE'S ROOT ZONE WITH LIGHT SOILS (NO CLAY) TO THE MINIMUM DEPTH NECESSARY TO CARRY OUT GRADING OR LANDSCAPING PLANS, IF IT WILL NOT IMPAIR THE SURVIVAL OF THE TREE. AERATION DEVICES MAY BE REQUIRED TO ENSURE THE TREE'S SURVIVAL.
- IF THE GRADE ADJACENT TO A PRESERVED TREE IS RAISED SUCH THAT IT COULD SLOUGH OR ERODE INTO THE TREE PROTECTION ZONE, IT SHALL BE PERMANENTLY STABILIZED TO PREVENT SUFFOCATION OF THE ROOTS.
- AN IMPERVIOUS SURFACE SHALL NOT BE INSTALLED WITHIN THE TREE PROTECTION ZONE OF ANY TREE TO BE PRESERVED WITHOUT THE AUTHORIZATION OF THE PROJECT ARBORIST. THE PROJECT ARBORIST MAY REQUIRE SPECIFIC CONSTRUCTION METHODS AND/OR USE OF AERATION DEVICES TO ENSURE THE TREE'S SURVIVAL AND TO MINIMIZE THE POTENTIAL FOR ROOT INDUCED DAMAGE TO THE IMPERVIOUS SURFACE.
- TO THE GREATEST EXTENT PRACTICAL, UTILITY TRENCHES SHALL BE LOCATED OUTSIDE OF THE TREE PROTECTION ZONE OF TREES TO BE PRESERVED. THE PROJECT ARBORIST MAY REQUIRE THAT UTILITIES BE TUNNELED UNDER THE ROOTS OF TREES TO BE PRESERVED IF THE PROJECT ARBORIST DETERMINES THAT TRENCHING WOULD SIGNIFICANTLY REDUCE THE CHANCES OF THE TREES SURVIVAL.
- DIRECTIONAL FELLING. DIRECTIONAL FELLING OF TREES SHALL BE USED TO AVOID DAMAGE TO TREES DESIGNATED FOR PRESERVATION.
- ADDITIONAL REQUIREMENTS. THE PROJECT ARBORIST MAY REQUIRE ADDITIONAL TREE PRESERVATION MEASURES WHICH ARE CONSISTENT WITH TREE CARE INDUSTRY STANDARDS.

- GENERAL NOTES:**
- ALL PORTIONS OF LOTS 1 AND 2 NOT OCCUPIED BY BUILDINGS OR PAVING TO BE LANDSCAPE AND IRRIGATED.
  - ALL NON-NATIVE VEGETATION WITHIN THE 50' STREAM BUFFER IN TRACT A TO BE REMOVED AND REPLACED WITH NATIVE VEGETATION AND TEMPORARY IRRIGATION FOR A PERIOD OF ONE YEAR OR UNTIL PLANTS ARE ESTABLISHED.
- ROOT PROTECTION ZONE NOTES:**
- ENCROACHMENT INTO THE ROOT PROTECTION ZONE IS ALLOWED WITH PROJECT ARBORIST APPROVAL AS DESCRIBED IN THE FOLLOWING NOTES:
- EXCAVATION IN THE TOP 24" OF THE SOIL IN THE CRITICAL ROOT ZONE AREA SHOULD BEGIN AT THE EXCAVATION LINE THAT IS CLOSEST TO THE TREE.
  - THE EXCAVATION SHOULD BE DONE BY HAND/SHOVEL OR WITH A BACKHOE AND A MAN WITH A SHOVEL, PRUNING SHEARS, AND A PRUNING SAW.
  - IF DONE BY HAND, ALL ROOTS 1" OR LARGER SHOULD BE PRUNED AT THE EXCAVATION LINE.
  - IF DONE WITH A BACKHOE (MOST LIKELY SCENARIO), THEN THE OPERATOR SHALL START THE CUT AT THE EXCAVATION LINE AND CAREFULLY "FEEL" FOR ROOTS/RESISTANCE. WHEN THERE IS RESISTANCE, THE MAN WITH THE SHOVEL HAND DIGS AROUND THE ROOTS AND PRUNES THE ROOTS LARGER THAN 1" DIAMETER.



**NOTES:**

- METAL FENCE FOR TREE PROTECTION DEVICE ONLY.
- BOUNDARIES OF PROTECTOR AREA WILL BE ESTABLISHED IN THE FIELD BY THE ARBORIST PRIOR TO CONSTRUCTION.
- BOUNDARIES OF PROTECTION AREA SHOULD BE SIGNED AND FLAGGED BY THE ARBORIST PRIOR TO INSTALLING DEVICES.
- AVOID DAMAGE TO CRITICAL ROOT ZONE. DO NOT DAMAGE OR SEVER LARGE ROOTS WHEN INSTALLING POSTS.
- DEVICE SHOULD BE MAINTAINED THROUGHOUT CONSTRUCTION.

**METAL TREE PROTECTION FENCE**  
 TREE PRESERVATION/REMOVAL PLAN BY JOHN ARBORIST, CERTIFIED ARBORIST #PN-0000, WITH ABC COLLABORATIVE.

**LEGEND**

EXISTING TREE TO BE REMOVED	X
EXISTING TREE DRIFLINE	~~~~~
EXISTING TREE CANOPY AREA	▨
CANOPY AREA	□
TREE PROTECTION FENCE	—●—●—●—
EXISTING SANITARY	—S—
PROPOSED SANITARY	—S—
EXISTING WATER	—W—
PROPOSED WATER	—W—
PROPOSED WATER METER	■
EXISTING WATER METER	□
EXISTING STORM	—S—
PROPOSED STORM	—S—
EXISTING GAS	—G—
PROPOSED GAS	—G—
EXISTING ELECTRIC	—E—
PROPOSED ELECTRIC	—E—
PROPOSED IRRIGATION	—I—
APPROXIMATE STREAM BED LOCATION	—
WETLAND	▨
SIGNIFICANT HABITAT BOUNDARY	—

I, JOHN ARBORIST, ATTEST THAT THIS TREE CANOPY SITE PLAN MEETS ALL OF THE REQUIREMENTS IN SECTION 10, PART 2, OF THE CITY OF TIGARD URBAN FORESTRY MANUAL.

JOHN ARBORIST, CERTIFIED ARBORIST  
 PNN-0000

REVISIONS:


**EXAMPLE TREE PRESERVATION AND REMOVAL SITE PLAN**

OFFICE LOCATED AT:  
 1000 1ST STREET, SUITE 1  
 TIGARD, OREGON 97224  
 PH: (503) 555-XXXX  
 FAX: (503) 555-XXXX  
 EMAIL: INFO@ABC-COLLABORATIVE.COM  
 LICENSED IN OR, WA, & ID

**ABC COLLABORATIVE**  
 ENGINEERING • ARCHITECTURE • PLANNING • LANDSCAPE ARCHITECTURE

DESIGNED BY:	KRJ	DRAWING NO.:	SA
DRAWN BY:	BOT	SCALE:	AS SHOWN
CHECKED BY:	KRJ		
PREPARED FOR:	JOHN SMITH PO BOX 111 TIGARD, OREGON 97223 PH: 503-909-5555 FAX: 503-909-5556		

**EVERGREEN HEIGHTS PARTITION**  
 190 SW 147TH ST.  
 TIGARD TAXLOT 1700

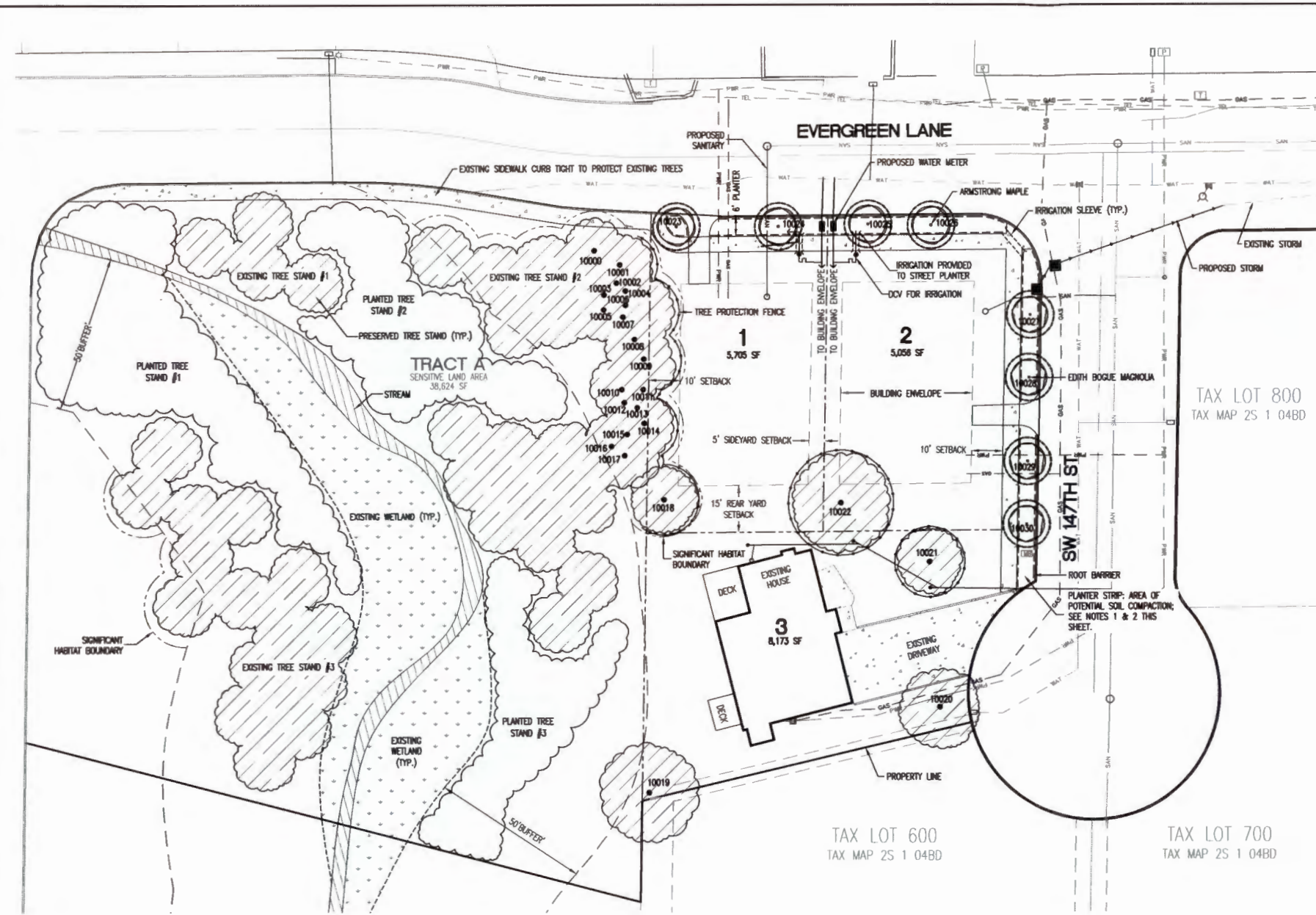
**OREGON**  
 TAXMAP 2 4E 25

DATE: 07-11-2011

**CERTIFIED ARBORIST**  
 JOHN D. ARBORIST  
 LICENSE # PN-0000

JOB NUMBER  
 2001

SHEET  
 APPENDIX 7



**PLANT LEGEND**

SYMBOL	QTES.	BOTANICAL NAME	COMMON NAME	SIZE	CONDITION	SPACING
	3	ACER RUBRUM 'ARMSTRONG'	ARMSTRONG RED MAPLE	2" CAL.	B&B	AS SHOWN
	4	MAGNOLIA GRANDIFLORA 'EDITH BOGUE'	EDITH BOGUE MAGNOLIA	2" CAL.	B&B	AS SHOWN

NOTE:  
 1. PLANTER STRIP AREAS ALONG EVERGREEN LANE AND SW 147TH ARE AREAS OF POTENTIAL SOIL COMPACTION, LIMITING TREE GROWTH. IF SOIL COMPACTION OCCURS, BACKHOE TURNING SHOULD BE USED TO LOOSEN SOIL.  
 2. BACKHOE TURNING: REMOVE ANY LAYERS OF GOOD TOPSOIL. SPREAD 3"-4" OF ORGANICS (HIGH-LIGNIN COMPOST) OR ESCS (EXPANDED SHALE/CALCINE CLAY) AMENDMENT OVER THE AREA PRIOR TO TURNING THE SOIL. MAINTAINING A SAFE DISTANCE FROM PAVING, SIDEWALKS, AND STRUCTURES, USE BACKHOE TO TURN SOIL TO 36" DEPTH. BREAK SOIL INTO LARGE PEEPS AND LOOSELY INCORPORATE THE SOIL AMENDMENT. MAINTAIN A SLOPE OF COMPACTED SOIL AT THE EDGE OF PAVING SO AS NOT TO UNDERMINE THE PAVING SUB-BASE. HAND TURNING MAY BE NECESSARY ALONG THE EDGES OF PAVING AND AT WALLS. DO NOT TILL TO A DEPTH GREATER THAN THE BOTTOM OF FOOTING. AFTER TURNING, RE-SPREAD TOPSOIL AND ADD 3"-5" OF YARD WASTE ORGANIC AMENDMENT OVER THE SURFACE AND LIGHTLY TILL TO BREAK THE SOIL INTO TEXTURE SUITABLE TO FINE GRADE.

**LEGEND**

- EXISTING TREE DRIPLINE
- PLANTED TREE MATURE DRIPLINE
- EXISTING TREE CANOPY AREA
- CANOPY AREA
- TREE PROTECTION FENCE
- EXISTING SANITARY
- PROPOSED SANITARY
- EXISTING WATER
- PROPOSED WATER
- PROPOSED WATER METER
- EXISTING WATER METER
- EXISTING STORM
- PROPOSED STORM
- EXISTING GAS
- PROPOSED GAS
- EXISTING ELECTRIC
- PROPOSED ELECTRIC
- PROPOSED IRRIGATION
- APPROXIMATE STREAM BED LOCATION
- WETLAND
- SIGNIFICANT HABITAT BOUNDARY



I, JOHN ARBORIST, ATTEST THAT THIS TREE CANOPY SITE PLAN MEETS ALL OF THE REQUIREMENTS IN SECTION 10, PART 2, OF THE CITY OF TIGARD URBAN FORESTRY MANUAL.

JOHN ARBORIST, CERTIFIED ARBORIST  
 PNN-0000

DATE: 07-11-2011

REVISIONS:


**EXAMPLE TREE CANOPY SITE PLAN**

OFFICE LOCATED AT:  
 1000 1ST STREET, SUITE 1  
 TIGARD, OREGON 97223  
 PH: (503) 555-1333  
 FAX: (503) 555-1333  
 EMAIL: INFO@ABC-COLLABORATIVE.COM  
 LICENSED IN OR, WA, & ID



DESIGNED BY: KRJ	DRAWING NO.: SA
DRAWN BY: BDT	SCALE: AS SHOWN
CHECKED BY: KRJ	
PREPARED FOR:	JOHN SMITH PO BOX 111 TIGARD, OREGON 97223 PH: 503-909-5555 FAX: 503-909-5556

**EVERGREEN HEIGHTS PARTITION**  
**190 SW 147TH ST.**  
**TIGARD**  
 TAXLOT 1700



JOB NUMBER  
**2001**  
 SHEET  
**APPENDIX 8**

## Urban Forestry Plan –Supplemental Report Example Template

### **General Information**

Date:  
Project Name:  
Project Arborist or Landscape Architect Name:  
Project Arborist or Landscape Architect Address:  
Project Arborist or Landscape Architect Telephone Number:  
Project Arborist or Landscape Architect Email Address:  
ISA Certified Arborist No.:  
Landscape Architect Stamp:

### **Project Summary**

#### **Specifications**

Tree Protection Fencing Specifications:

Tree Preservation Specifications:

Stand Preservation Specifications:

Soil Characteristics and Specifications for Improvement:

Tree Planting Specifications:

Stand Planting Specifications:

## Urban Forestry Plan –Supplemental Report Example Template

### Existing Tree Inventory

Tree #	Genus sp./ Common	DBH	Canopy (ft <sup>2</sup> )	Open or Stand Grown	Heritage Tree?	Cond. Rating	Pres. Rating	Preserve?	Comments

### Existing Stand Inventory

Stand #	Genus sp./ Common of Dominant	Avg. DBH 1	Avg. Cond. Rating 1	Overall Stand Pres. Rating	Total Canopy (ft <sup>2</sup> )	Canopy Preserved (ft <sup>2</sup> )	Comments
	Genus sp./ Common of 2 <sup>nd</sup>	Avg. DBH 2	Avg. Cond. Rating 2				
	Genus sp./ Common of 3 <sup>rd</sup>	Avg. DBH 3	Avg. Cond. Rating 3				

**Urban Forestry Plan –Supplemental Report Example Template**

**Planted Tree Inventory**

<b>Tree #</b>	<b>Genus sp./ Common</b>	<b>Caliper (Decid.) or Height (Evergreen)</b>	<b>Mature Canopy Spread (ft)</b>	<b>Mature Canopy Area (ft<sup>2</sup>)</b>	<b>Available Soil Volume (ft<sup>3</sup>)</b>	<b>Comments</b>

**Planted Stand Inventory**

<b>Stand #</b>	<b>Genus sp./Common 1</b>	<b>Hgt. or Container size</b>	<b>No. of Trees</b>	<b>Avg. Spacing (ft)</b>	<b>Total Mature Canopy Area (ft<sup>2</sup>) Delineated at the Outer Edge of the Stand</b>	<b>Comments</b>
	<b>Genus sp./Common 2</b>	<b>Hgt. or Container size</b>	<b>No. of Trees</b>	<b>Avg. Spacing (ft)</b>		
	<b>Genus sp./Common 3</b>	<b>Hgt. or Container size</b>	<b>No. of Trees</b>	<b>Avg. Spacing (ft)</b>		
	<b>Genus sp./Common 4</b>	<b>Hgt. or Container size</b>	<b>No. of Trees</b>	<b>Avg. Spacing (ft)</b>		
	<b>Genus sp./Common 5</b>	<b>Hgt. or Container size</b>	<b>No. of Trees</b>	<b>Avg. Spacing (ft)</b>		

**Urban Forestry Plan –Supplemental Report Example Template**

**Effective Tree Canopy Cover Summary**

*Lot or Tract # (exclude streets)	Lot or Tract Area (ft <sup>2</sup> )	2x Canopy Area (ft <sup>2</sup> ) of Preserved Trees (w/ cond. and pres.≥2)	2x Canopy Area (ft <sup>2</sup> ) of Preserved Stands (w/ cond. and pres.≥2)	1.25x Mature Canopy Area (ft <sup>2</sup> ) of Native Planted Trees	Mature Canopy Area (ft <sup>2</sup> ) of Non-Native Planted Trees	1.25x Mature Canopy Area (ft <sup>2</sup> ) of Planted Stands	Total Canopy Area (ft <sup>2</sup> ) per lot or tract	Effective % Canopy (Canopy Area ÷ Lot or Tract Area)
<b>Total</b>								

\*Note: effective tree canopy cover is required to be calculated on a lot/tract by lot/tract basis only in the R-1, R-2, R-3.5, R-4.5 and R-7 districts.

The standard percentage of effective tree canopy cover for each lot or tract in the R-1, R-2, R-3.5, R-4.5 and R-7 districts shall be at least 15 percent.

The standard percentage of effective tree canopy cover for the overall development site shall be at least:

- i. 40% for R-1, R-2, R-3.5, R-4.5 and R-7 districts, except for schools (18.130.050(J));
- ii. 33% for R-12, R-25, R-40, C-N, C-C, C-G, C-P, MUE, MUE-1, MUE-2, MUC, MUR and I-P districts, except for schools (18.130.050(J)); and
- iii. 25% for MU-CBD, MUC-1, I-L and I-H districts, and for schools (18.130.050(J)) in all districts.



## Urban Forestry Plan –Supplemental Report Example Template

### Tree Canopy Fee Calculation (if applicable)

If the percentage of effective tree canopy cover is less than the applicable standard percentage for the overall development:

1. Find the required ft<sup>2</sup> of tree canopy:  
(overall development site area) x (standard required % (40%, 33%, or 25%)).
2. Find the ft<sup>2</sup> of tree canopy the development is short:  
(required ft<sup>2</sup> of tree canopy from 1 above) - (proposed ft<sup>2</sup> of tree canopy).
3. Find the \$ value of tree canopy:  
(PNW-ISA wholesale median cost for a 3” deciduous tree in the Willamette Valley) ÷ 59.
4. Find the required tree canopy fee:  
(amount of ft<sup>2</sup> of tree canopy from 2 above) x (the \$ value of tree canopy from 3 above).

If the overall development meets the applicable standard percentage, but the percentage of effective tree canopy cover is less than 15% for any individual lot or tract in the R-1, R-2, R-3.5, R-4.5 and R-7 districts:

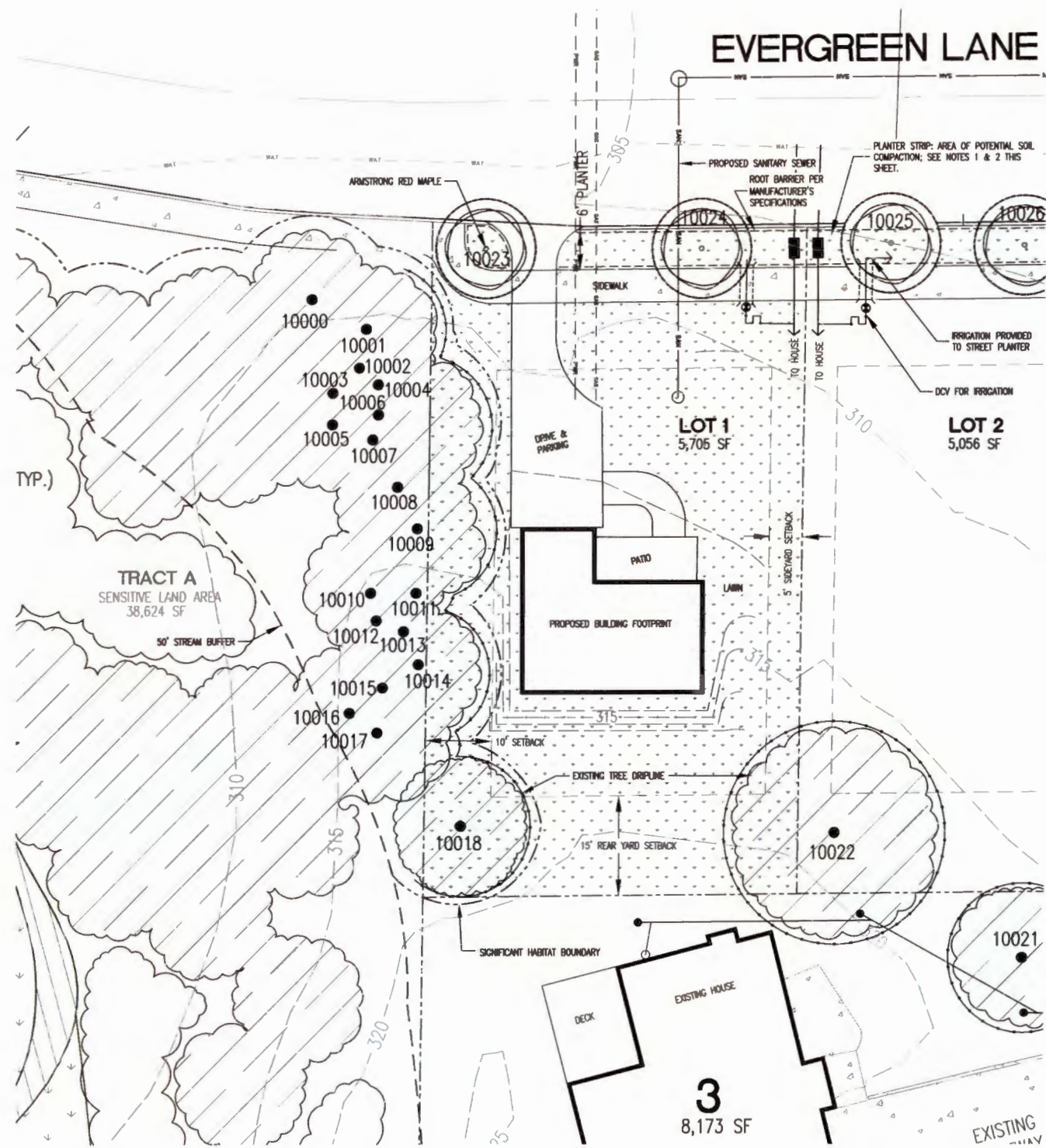
1. Find the required ft<sup>2</sup> of tree canopy for the deficient lot or tract:  
(lot or tract area) x 15%.
2. Find the ft<sup>2</sup> of tree canopy the lot or tract is short:  
(required ft<sup>2</sup> of tree canopy from 1 above) - (proposed ft<sup>2</sup> of tree canopy).
3. Find the \$ value of tree canopy:  
(PNW-ISA wholesale median cost for a 3” deciduous tree in the Willamette Valley) ÷ 59.
4. Find the required tree canopy fee:  
(amount of ft<sup>2</sup> of tree canopy from 2 above) x (the \$ value of tree canopy from 3 above).

### Signature of Approval

I hereby attest that:

1. The Tree Preservation and Removal site plan meets all of the requirements in Section 10, Part 1 of the Urban Forestry Manual;
2. The Tree Canopy site plan meets all of the requirements in Section 10, Part 2 of the Urban Forestry Manual; and
3. The Supplemental Report meets all of the requirements in Section 10, Part 3 of the Urban Forestry Manual.





**STREET TREES**

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	CONDITION	SPACING
	ACER RUBRUM 'ARMSTRONG'	ARMSTRONG RED MAPLE	2" CAL.	B&B	AS SHOWN

NOTE:  
 1. PLANTER STRIP AREAS ALONG EVERGREEN LANE AND SW 147TH ARE AREAS OF POTENTIAL SOIL COMPACTION, LIMITING TREE GROWTH. IF SOIL COMPACTION OCCURS, BACKHOE TURNING SHOULD BE USED TO LOOSEN SOIL.  
 2. BACKHOE TURNING: REMOVE ANY LAYERS OF GOOD TOPSOIL. SPREAD 3"-4" OF ORGANICS (HIGH-LIGNIN COMPOST) OR ESCS (EXPANDED SHALE/CALCINE CLAY) AMENDMENT OVER THE AREA, PRIOR TO TURNING THE SOIL. MAINTAINING A SAFE DISTANCE FROM PAVING, SIDEWALKS, AND STRUCTURES, USE BACKHOE TO TURN SOIL TO 36" DEPTH. BREAK SOIL INTO LARGE PEEPS AND LOOSELY INCORPORATE THE SOIL AMENDMENT. MAINTAIN A SLOPE OF COMPACTED SOIL AT THE EDGE OF PAVING SO AS NOT TO UNDERMINE THE PAVING SUB-BASE. HAND TURNING MAY BE NECESSARY ALONG THE EDGES OF PAVING AND AT WALLS. DO NOT TILL TO A DEPTH GREATER THAN THE BOTTOM OF FOOTING. AFTER TURNING, RE-SPREAD TOPSOIL AND ADD 3"-5" OF YARD WASTE ORGANIC AMENDMENT OVER THE SURFACE AND LIGHTLY TILL TO BREAK THE SOIL INTO TEXTURE SUITABLE TO FINE GRADE.

**LEGEND**

EXISTING TREE DRIPLINE	
PLANTED TREE MATURE DRIPLINE	
EXISTING TREE CANOPY AREA	
CANOPY AREA	
TREE PROTECTION FENCE	
EXISTING SANITARY	
PROPOSED SANITARY	
EXISTING WATER	
PROPOSED WATER	
PROPOSED WATER METER	
EXISTING WATER METER	
EXISTING STORM	
PROPOSED STORM	
EXISTING GAS	
PROPOSED GAS	
EXISTING ELECTRIC	
PROPOSED ELECTRIC	
PROPOSED IRRIGATION	
SIGNIFICANT HABITAT BOUNDARY	



REVISIONS:


**EXAMPLE TREE CANOPY SITE PLAN FOR SINGLE LOT**

OFFICE LOCATED AT:  
 1000 1ST STREET, SUITE 1  
 TIGARD, OREGON 97223  
 PH: (503) 525-XXXX  
 FAX: (503) 525-XXXX  
 EMAIL: INFO@ABC-COLLABORATIVE.COM  
 LICENSED IN OR, WA, & ID



DESIGNED BY: KRJ	DRAWING NO.: 9A
DRAWN BY: BOT	SCALE: AS SHOWN
CHECKED BY: KRJ	
PREPARED FOR: JOHN SMITH PO BOX 111 TIGARD, OREGON 97223 PH: 503-909-5555 FAX: 503-909-5556	

**EVERGREEN HEIGHTS PARTITION**  
**190 SW 147TH ST.**  
**TIGARD**  
 TAILLOT 1700

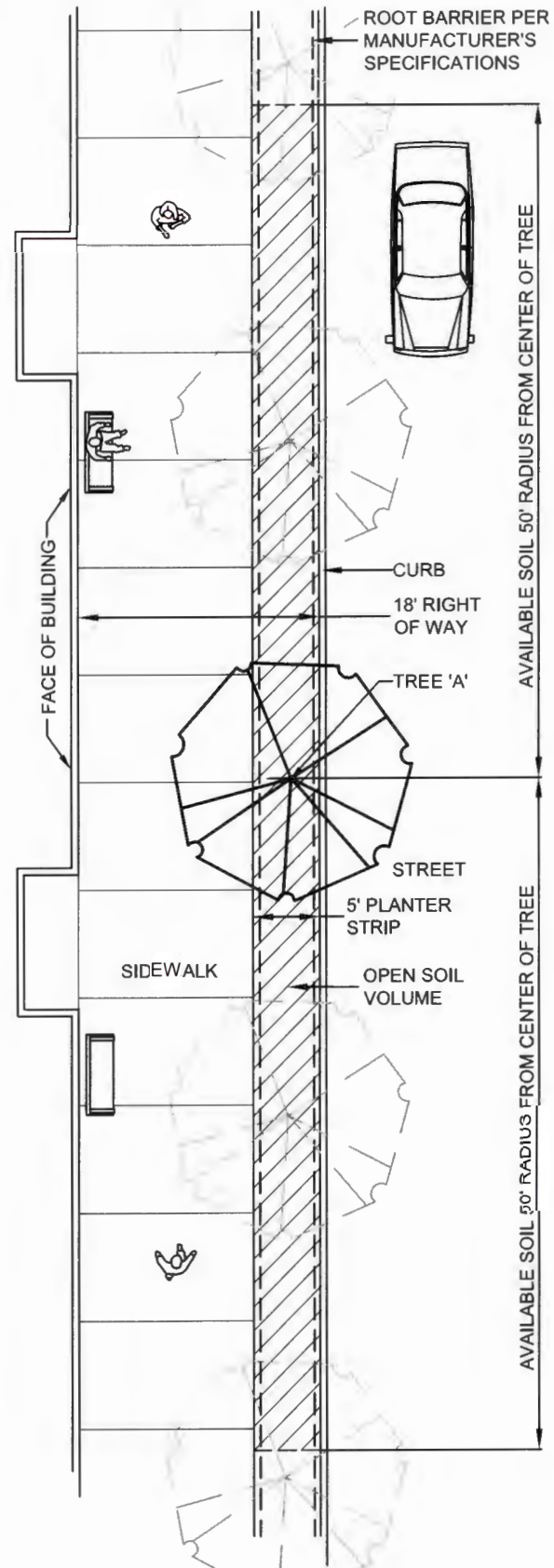


DATE: 07-11-2011



JOB NUMBER  
**2001**  
 SHEET  
**APPENDIX 10**





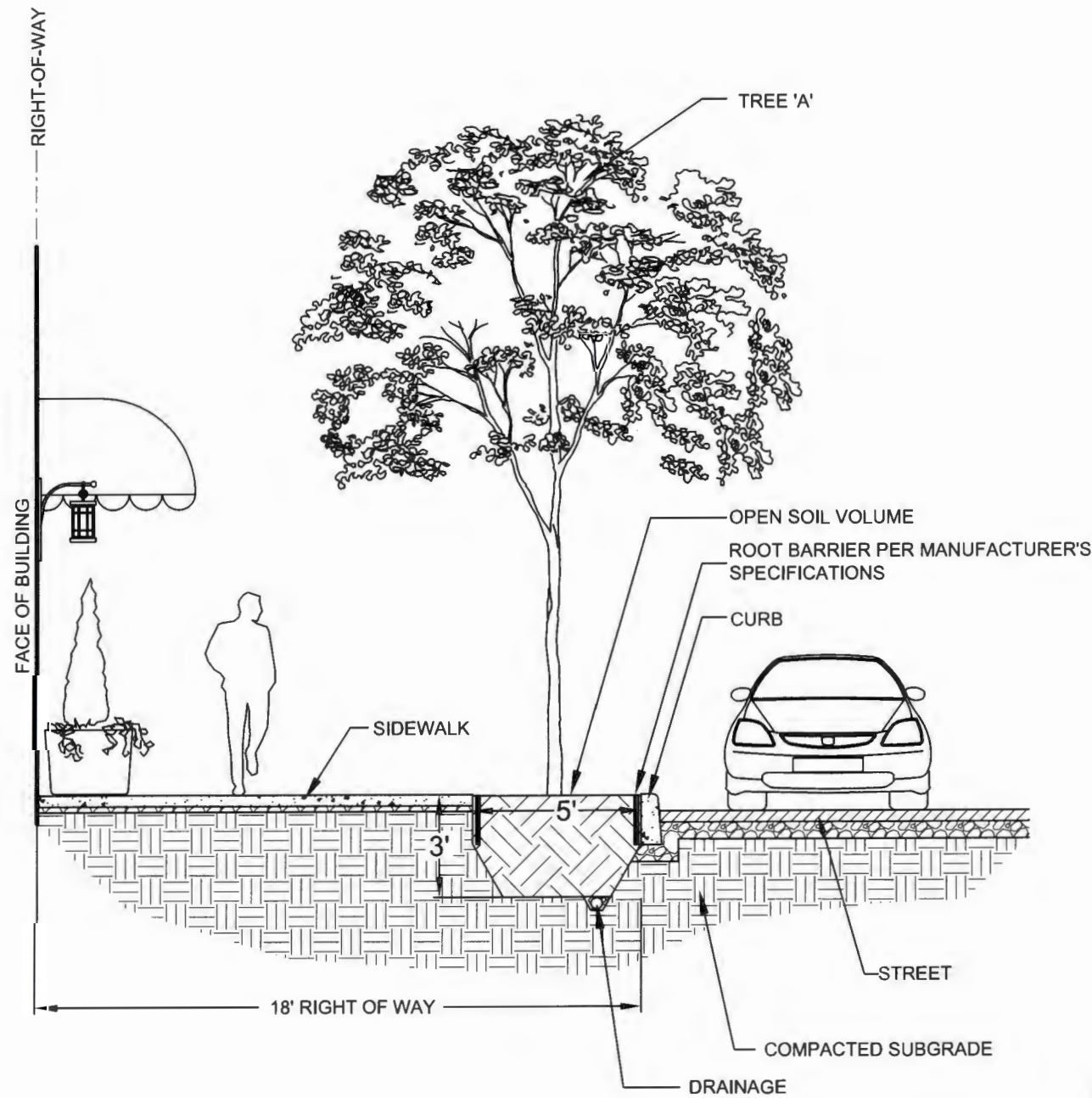
**PLAN**

**TOTAL SOIL VOLUME CALCULATION FOR TREE 'A':**

**OPEN SOIL VOLUME = 100' x 5' x 3' = 1,500 C.F.**  
**COVERED SOIL VOLUME = 0 C.F.**

**TOTAL SOIL VOLUME = 1,500 C.F.**

1,500 C.F. IS GREATER THAN THE SOIL VOLUME REQUIRED BY A STREET TREE IN AN 18' RIGHT OF WAY (800 C.F.) THEREFORE THIS SOIL VOLUME MEETS CITY REQUIREMENTS.



**PROFILE**

**EXAMPLE SOIL VOLUME  
 CALCULATION – STREET TREE  
 WITH OPEN SOIL**

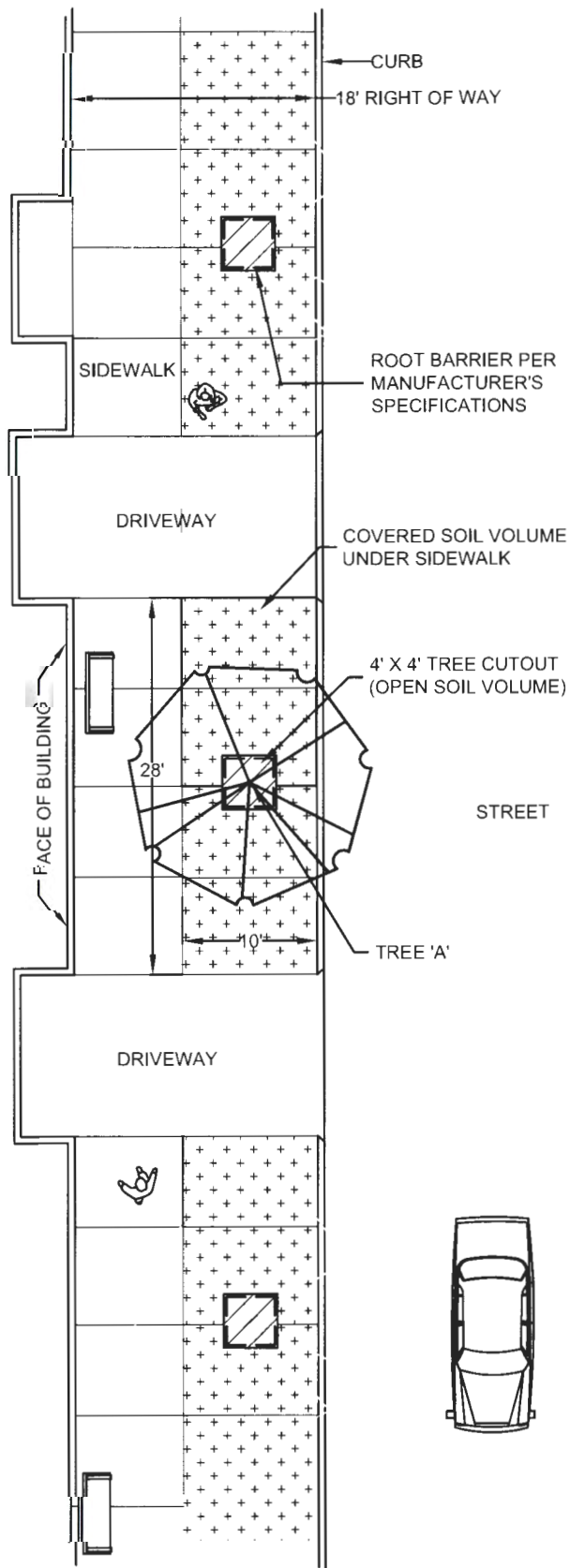
NO SCALE  
 DWG. NO.  
 APPENDIX 1.1

**TOTAL SOIL VOLUME CALCULATION FOR TREE 'A':**

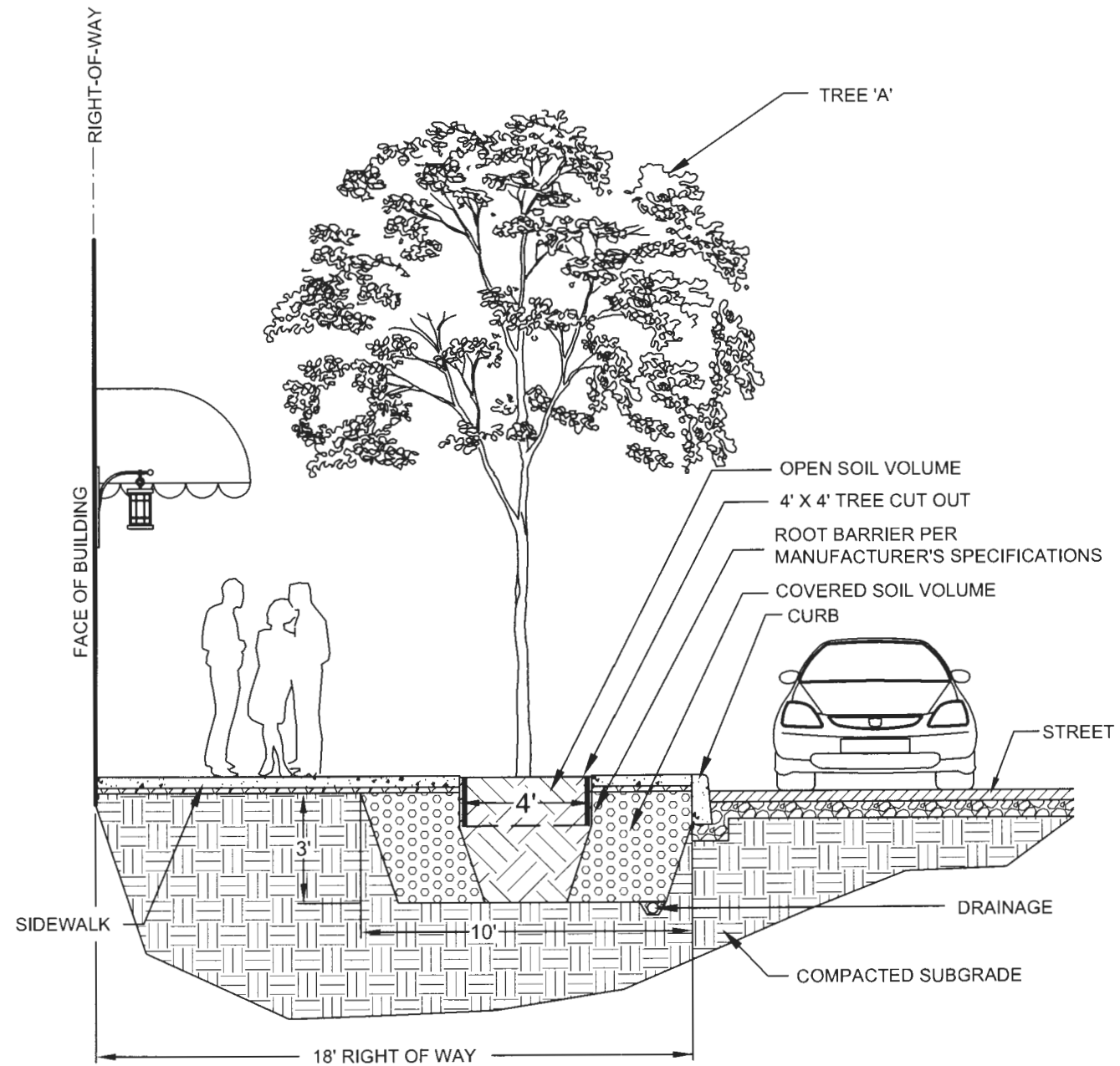
**OPEN SOIL VOLUME = 4' x 4' x 3' = 48 C.F.**  
**COVERED SOIL VOLUME = 28' x 10' x 3' - 48 C.F. = 792 C.F.**

**TOTAL SOIL VOLUME = 840 C.F.**

840 C.F. IS GREATER THAN THE SOIL VOLUME REQUIRED BY A STREET TREE IN AN 18' RIGHT OF WAY (800 C.F.) THEREFORE THIS SOIL VOLUME MEETS CITY REQUIREMENTS.



**PLAN**



**PROFILE**

<p><b>EXAMPLE SOIL VOLUME CALCULATION - STREET TREE WITH COVERED SOIL</b></p>	NO SCALE
	<p>DWG. NO. <b>APPENDIX 11</b></p>

OPEN SOIL VOLUME = (PLANTER STRIP AREA + FRONT YARD AREA CONNECTED BY THE COVERED CONTINUOUS ROOT PATH) x SOIL DEPTH

PLANTER STRIP AREA = 6 FEET X 22 FEET = 132 S. F.

AREA CONNECTED BY CONTINUOUS ROOT PATH = 4,000 S.F.

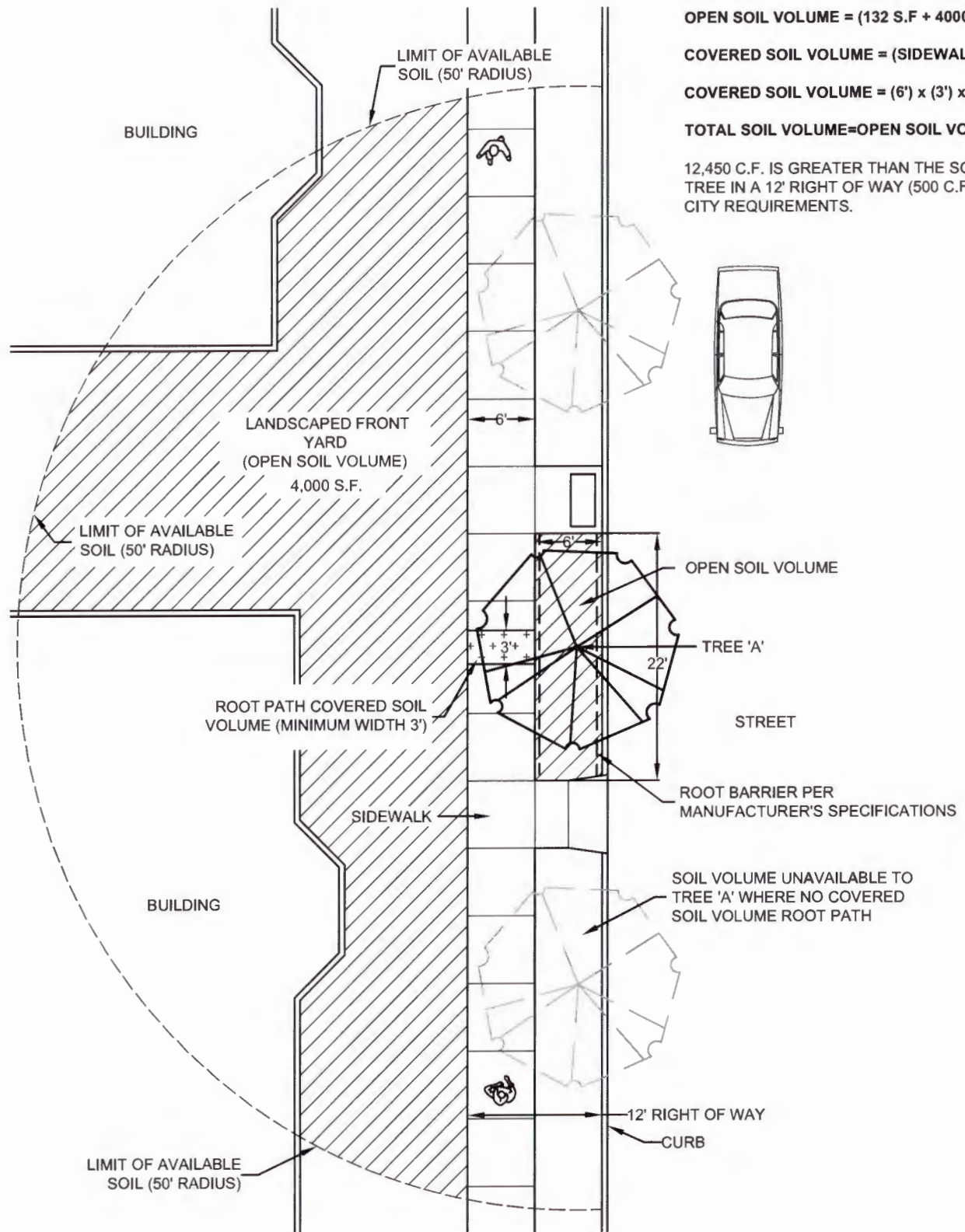
OPEN SOIL VOLUME = (132 S.F + 4000 S.F.) x 3' = 12,396 C.F.

COVERED SOIL VOLUME = (SIDEWALK WIDTH) x (SIDEWALK LENGTH) x (STRUCTURAL SOIL DEPTH)

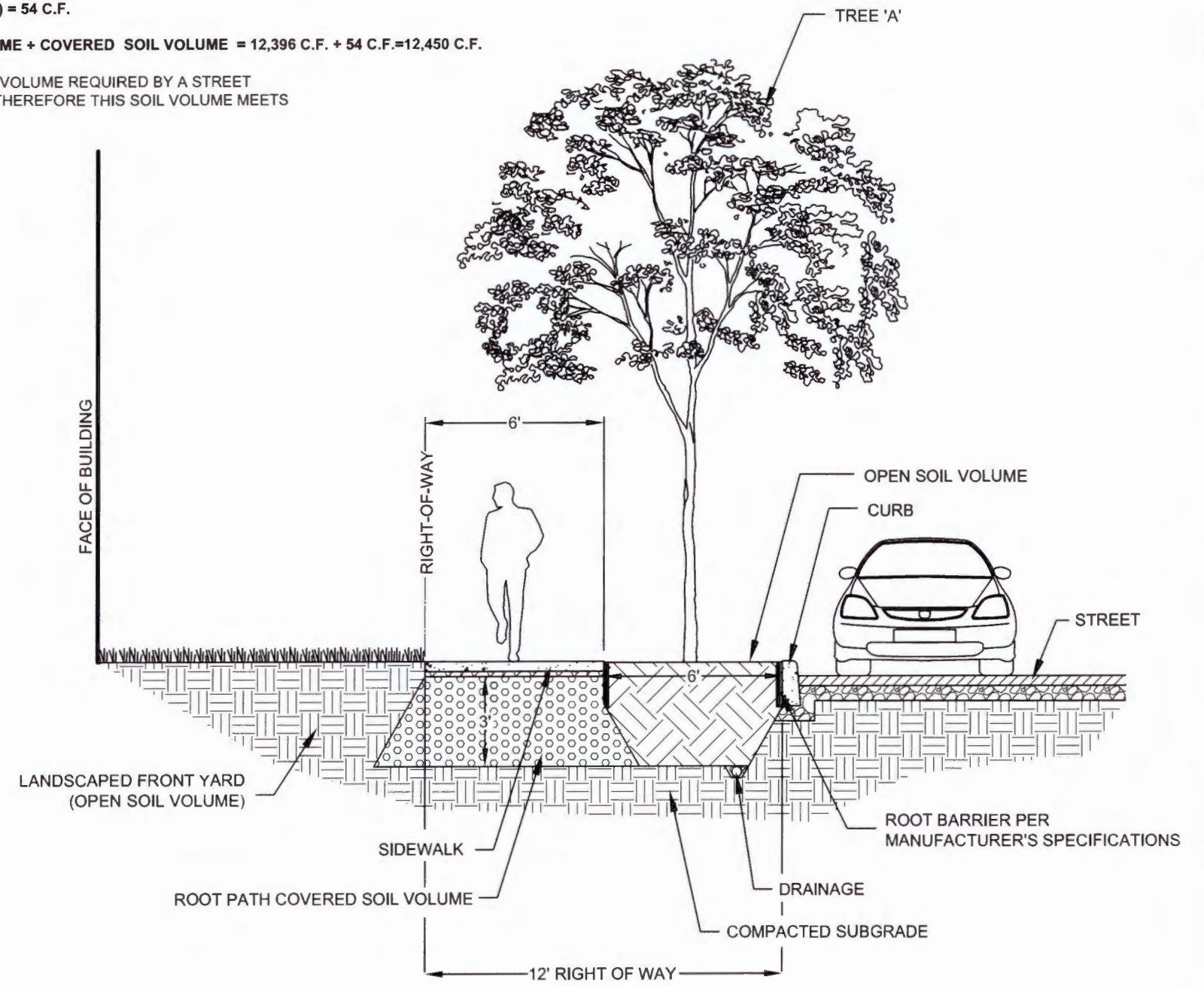
COVERED SOIL VOLUME = (6') x (3') x (3') = 54 C.F.

TOTAL SOIL VOLUME = OPEN SOIL VOLUME + COVERED SOIL VOLUME = 12,396 C.F. + 54 C.F. = 12,450 C.F.

12,450 C.F. IS GREATER THAN THE SOIL VOLUME REQUIRED BY A STREET TREE IN A 12' RIGHT OF WAY (500 C.F.) THEREFORE THIS SOIL VOLUME MEETS CITY REQUIREMENTS.



**PLAN**



**PROFILE**

<p><b>EXAMPLE SOIL VOLUME CALCULATION – STREET TREE WITH ROOT PATH</b></p>	NO SCALE
	<p>DWG. NO. <b>APPENDIX 11</b></p>





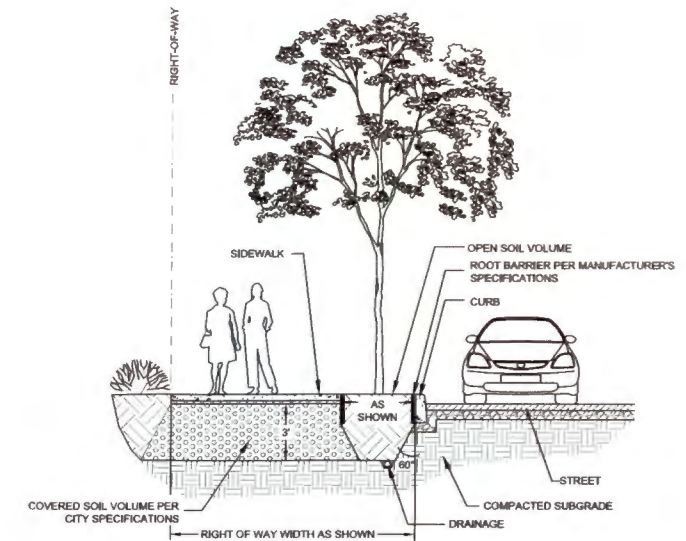
**STREET TREE LEGEND**

SYMBOL	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONDITION	SPACING
	11	ACER RUBRUM	RED MAPLE	3" CAL.	B&B	AS SHOWN

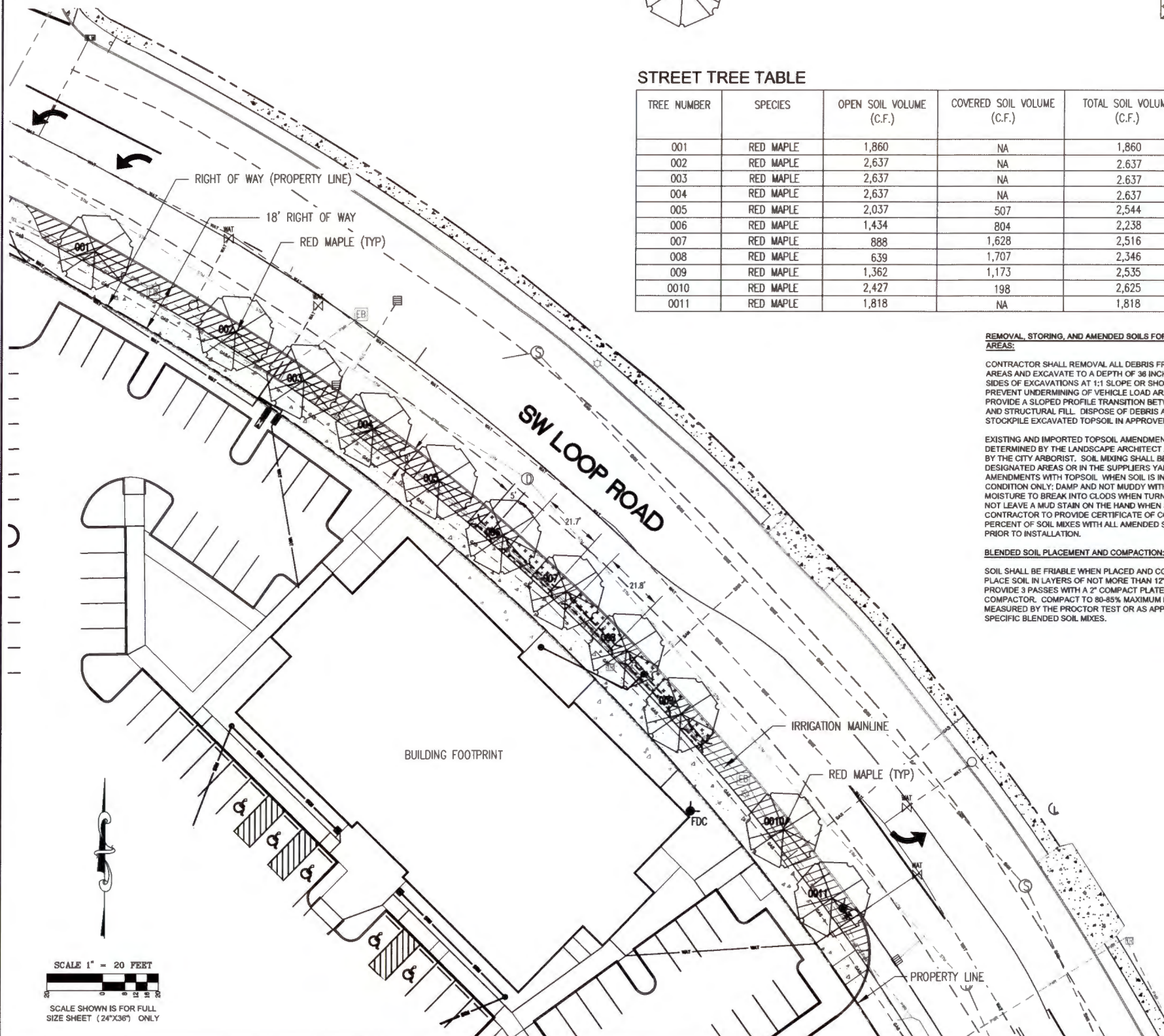


**STREET TREE TABLE**

TREE NUMBER	SPECIES	OPEN SOIL VOLUME (C.F.)	COVERED SOIL VOLUME (C.F.)	TOTAL SOIL VOLUME (C.F.)	REQUIRED SOIL VOLUME FOR 18' RIGHT OF WAY (C.F.)
001	RED MAPLE	1,860	NA	1,860	800
002	RED MAPLE	2,637	NA	2,637	800
003	RED MAPLE	2,637	NA	2,637	800
004	RED MAPLE	2,637	NA	2,637	800
005	RED MAPLE	2,037	507	2,544	800
006	RED MAPLE	1,434	804	2,238	800
007	RED MAPLE	888	1,628	2,516	800
008	RED MAPLE	639	1,707	2,346	800
009	RED MAPLE	1,362	1,173	2,535	800
0010	RED MAPLE	2,427	198	2,625	800
0011	RED MAPLE	1,818	NA	1,818	800



**1 STREET TREE WITH COVERED SOIL DETAIL**  
NOT TO SCALE



**REMOVAL, STORAGE, AND AMENDED SOILS FOR PLANTER AREAS:**

CONTRACTOR SHALL REMOVE ALL DEBRIS FROM PLANTER AREAS AND EXCAVATE TO A DEPTH OF 36 INCHES. SLOPE SIDES OF EXCAVATIONS AT 1:1 SLOPE OR SHORE EDGES TO PREVENT UNDERMINING OF VEHICLE LOAD AREAS AND TO PROVIDE A SLOPED PROFILE TRANSITION BETWEEN SOIL TYPES AND STRUCTURAL FILL. DISPOSE OF DEBRIS AND SUBSOIL STOCKPILE EXCAVATED TOPSOIL IN APPROVED AREA OFF SITE.

EXISTING AND IMPORTED TOPSOIL AMENDMENTS SHALL BE DETERMINED BY THE LANDSCAPE ARCHITECT AND APPROVED BY THE CITY ARBORIST. SOIL MIXING SHALL BE DONE IN DESIGNATED AREAS OR IN THE SUPPLIER'S YARD. MIX AMENDMENTS WITH TOPSOIL WHEN SOIL IS IN A FRIABLE CONDITION ONLY; DAMP AND NOT MUDDY WITH ADEQUATE MOISTURE TO BREAK INTO CLODS WHEN TURNED AND WILL NOT LEAVE A MUD STAIN ON THE HAND WHEN SQUEEZED. CONTRACTOR TO PROVIDE CERTIFICATE OF CONTENT AND PERCENT OF SOIL MIXES WITH ALL AMENDED SOIL TO THE CITY PRIOR TO INSTALLATION.

**BLENDED SOIL PLACEMENT AND COMPACTION:**

SOIL SHALL BE FRIABLE WHEN PLACED AND COMPACTED. PLACE SOIL IN LAYERS OF NOT MORE THAN 12" IN DEPTH. PROVIDE 3 PASSES WITH A 2" COMPACT PLATE VIBRATING COMPACTOR. COMPACT TO 80-85% MAXIMUM DRY DENSITY AS MEASURED BY THE PROCTOR TEST OR AS APPROVED FOR SPECIFIC BLENDED SOIL MIXES.

**STANDARD COVERED SOIL VOLUME SPECIFICATIONS:**

**PART 1. COVERED SOIL MATERIALS**

A. COVERED SOIL SHALL CONSIST OF THE FOLLOWING MIXTURE OF GRAVEL, SOIL AND ADMIXTURES:

- I. CRUSHED ROCK, GRADATION OF 100% PASSING 1.25 INCH, MAX. 30% PASSING 0.75 INCH;
- II. LOAM/ORGANIC TOPSOIL;
- III. SOIL BINDER SUCH AS, STABILIZER, ; AND
- IV. WATER.

**PART 2. PROPORTIONS OF COVERED SOIL MATERIALS**

A. THE PROPORTIONS OF COVERED SOIL MATERIALS SHALL BE AS FOLLOWS:

MATERIAL	AMOUNT FOR 1 CY OF COVERED SOIL	AMOUNT FOR 4.6 CY OF COVERED SOIL
CRUSHED ROCK	23.2 CUBIC FEET	4 CUBIC YARDS
TOPSOIL	5.9 CUBIC FEET	1 CUBIC YARD
SOIL BINDER	13.7 OZ	4 LBS
WATER	1.6 GALLON	46 GALLONS

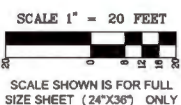
B. THE TARGET MOISTURE CONTENT IS 20% BY WEIGHT OF THE TOPSOIL WEIGHT. THE ABOVE WATER CONTENTS ASSUME THE TOP IS DRY. THE AMOUNT OF WATER THAT WILL NEED TO BE ADDED WILL BE DEPENDENT ON THE MOISTURE CONTENT OF THE RAW MATERIALS. ACTUAL AMOUNTS OF WATER USED SHALL BE DETERMINED DURING MIXING.

**PART 3. COVERED SOIL MIXING PROCEDURES**

- A. MIX COVERED SOIL IN BATCHES OF AN APPROPRIATE SIZE FOR THE EQUIPMENT BEING USED. THE END RESULT IS TO BE A MATERIAL THAT IS UNIFORMLY BLENDED TOGETHER. DO NOT BATCH IN QUANTITIES THAT WILL NOT ALLOW THE EQUIPMENT TO COMPLETELY MIX THE MATERIAL. DETERMINE BATCH SIZE AND QUANTITIES OF EACH MATERIAL NEEDED FOR THE BATCH.
- B. START WITH HALF OF THE CRUSHED ROCK MATERIAL.
- C. ADD ALL OF THE TOPSOIL MATERIAL.
- D. ADD THE SOIL BINDER.
- E. ADD HALF OF THE ESTIMATED WATER.
- F. ADD THE OTHER HALF OF THE CRUSHED ROCK MATERIAL.
- G. MIX THE MATERIAL TOGETHER.
- H. SLOWLY ADD WATER TO THE MIXTURE AND CONTINUE TO MIX. THE FINAL AMOUNT OF WATER WILL VARY WITH MOISTURE CONTENT OF THE CRUSHED ROCK AND TOPSOIL. ADD WATER IN INCREMENTAL AMOUNTS AND MIX THE MATERIAL BETWEEN THE ADDITIONS OF WATER.
- I. STOP ADDING WATER AND MIXING WHEN THERE IS A MINUTE AMOUNT OF FREE TOPSOIL REMAINING. THE TOPSOIL WILL COAT THE CRUSHED ROCK AND NOT FALL OUT OF THE MATERIAL. ALL OF THE CRUSHED ROCK SHALL BE UNIFORMLY COATED WITH TOPSOIL. THERE SHALL BE NO CLUMPS OF TOPSOIL OR UNCOVERED CRUSHED ROCK IN THE MIXTURE.
- J. IF TOO MUCH WATER IS ADDED TO THE MIXTURE, WATER WILL DRAIN OUT OF THE MATERIAL AND THE TOPSOIL WILL WASH OFF OF THE CRUSHED ROCK. IF THIS OCCURS THE BATCH OF MATERIAL SHALL BE DISCARDED AND SHALL NOT BE INCORPORATED INTO THE COMPLETED WORK.

**PART 4. PLACEMENT OF COVERED SOIL**

- A. PROTECT SOILS AND MIXES FROM ABSORBING EXCESS WATER AND FROM EROSION AT ALL TIMES. DO NOT STORE MATERIALS UNPROTECTED FROM RAINFALL EVENTS. DO NOT ALLOW EXCESS WATER TO ENTER SITE PRIOR TO COMPACTION. IF WATER IS INTRODUCED INTO THE MATERIAL AFTER GRADING, ALLOW MATERIAL TO DRAIN OR AERATE TO OPTIMUM COMPACTION MOISTURE CONTENT.
- B. ALL AREAS TO RECEIVE COVERED SOIL MIXTURE SHALL BE INSPECTED BY THE PROJECT LANDSCAPE ARCHITECT AND/OR PROJECT ENGINEER BEFORE STARTING PLACEMENT. ALL DEFECTS SUCH AS INCORRECT GRADING, COMPACTION AND INADEQUATE DRAINAGE, ETC., SHALL BE CORRECTED PRIOR TO BEGINNING PLACEMENT OF COVERED SOIL.
- C. CONFIRM THAT THE SUB-GRADE IS AT THE PROPER ELEVATION AND COMPACTED AS REQUIRED. SUB-GRADE ELEVATIONS SHALL SLOPE PARALLEL TO THE FINISHED GRADE. CLEAR THE EXCAVATION OF ALL CONSTRUCTION DEBRIS, TRASH, RUBBLE AND FOREIGN MATERIAL. FILL ANY OVER EXCAVATION WITH APPROVED FILL AND COMPACT TO THE REQUIRED SUB-GRADE COMPACTION.
- D. INSTALL COVERED SOIL IN 4-INCH LIFTS AND SPREAD UNIFORMLY OVER THE AREA. COMPACT EACH LIFT TO THE REQUIRED PERCENT OF MAXIMUM DENSITY. DELAY PLACEMENT 24 HOURS IF MOISTURE CONTENT EXCEEDS MAXIMUM ALLOWABLE. PROTECT COVERED SOIL WITH PLASTIC OR PLYWOOD DURING DELAY. TAKE PARTICULAR CARE NOT TO DAMAGE UTILITIES WHEN INSTALLING COVERED SOIL. COVERED SOIL THAT WILL BE THE BEDDING FOR UTILITY LINES SHALL BE COMPACTED TO CONFORM TO THE REQUIRED GRADE OF THE UTILITY LINE. DO NOT COMPACT THE IMMEDIATE VICINITY ABOVE A UTILITY LINE UNTIL A FILL DEPTH OF AT LEAST 12-INCHES ABOVE THE UTILITY LINE IS REACHED.
- E. BRING COVERED SOILS TO FINISHED GRADES AS SHOWN IN THE APPROVED DRAWINGS. IMMEDIATELY PROTECT THE COVERED SOIL MATERIAL FROM CONTAMINATION BY WATER BY COVERING WITH PLASTIC OR PLYWOOD.



REVISIONS:


**EXAMPLE SOIL VOLUME PLAN**

OFFICE LOCATED AT:  
1000 1ST STREET, SUITE 1  
TIGARD, OREGON 97223  
PH: (503) 555-XXXX  
FAX: (503) 555-XXXX  
EMAIL: INFO@ABC\_COLLABORATIVE.COM



DESIGNED BY: JMI	DRAWING NO.: 2A.DWG
DRAWN BY: SMH	SCALE: AS NOTED
CHECKED BY: JMI	
PREPARED FOR: HANCOCK ASSOCIATES	1500 SW LOOP ROAD TIGARD, OR 97223

**LOOP ROAD IMPROVEMENTS**  
**1011 SW LOOP ROAD**

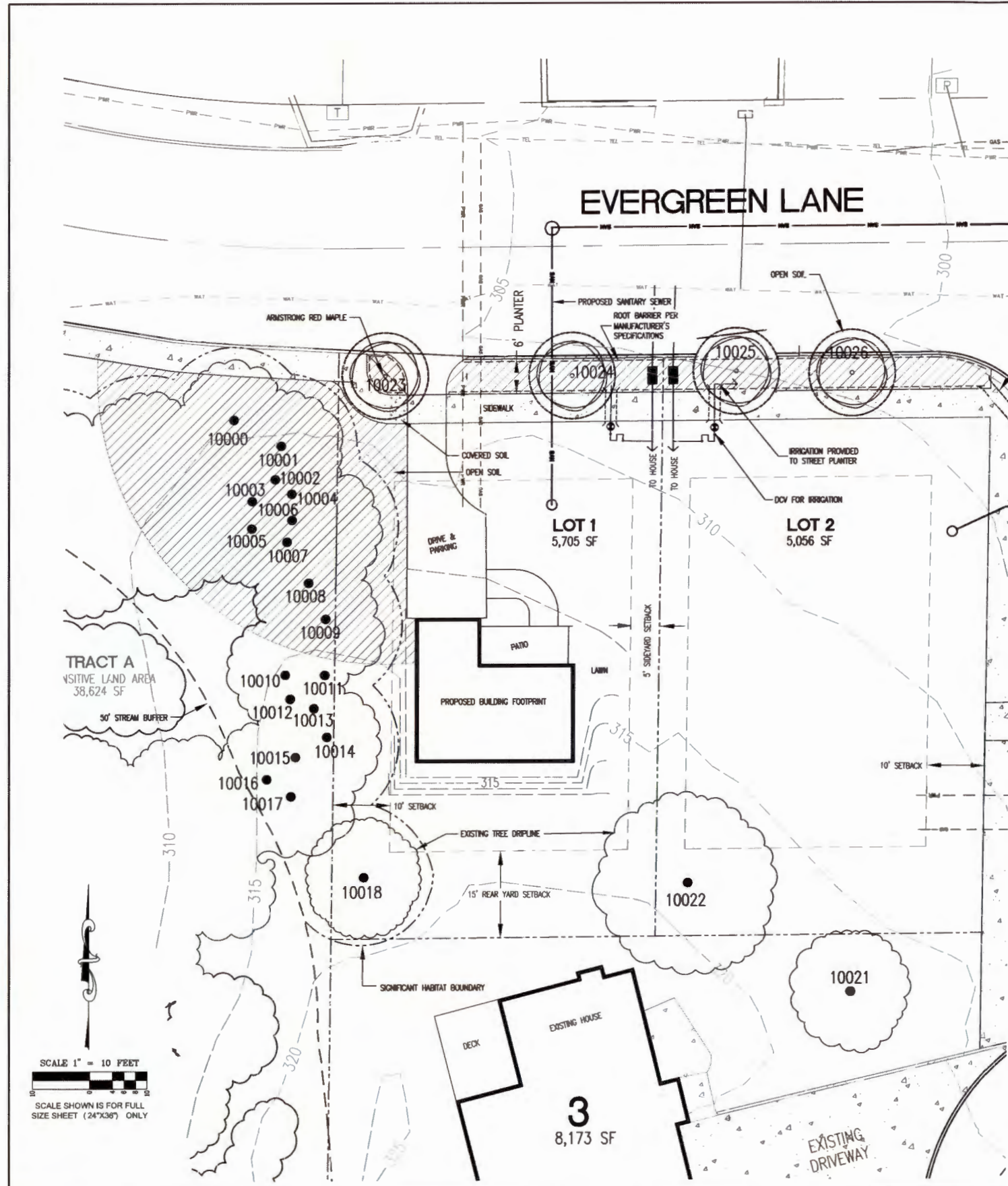
**TIGARD**  
TAX LOT 1000

**OREGON**  
TAX MAP: 25 1 05AB



JOB NUMBER  
**1000**  
SHEET  
**APPENDIX 12**





**SOIL LEGEND**

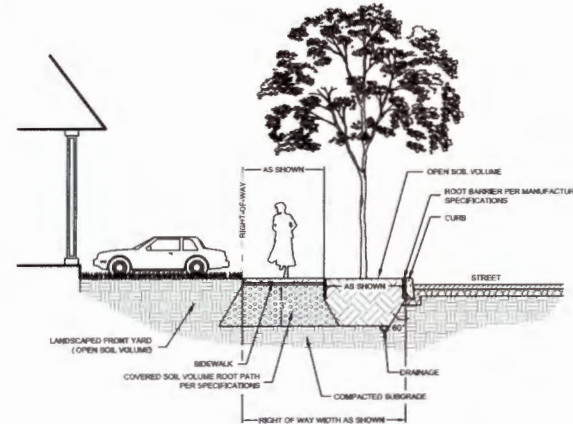
	OPEN SOIL VOLUME
	COVERED SOIL VOLUME

**SOIL VOLUME CALCULATION FOR STREET TREES ADJACENT TO LOT 1**

TREE NUMBER	SPECIES	OPEN SOIL VOLUME (C.F.)	COVERED SOIL VOLUME (C.F.)	TOTAL SOIL VOLUME (C.F.)	REQUIRED SOIL VOLME FOR 11' RIGHT OF WAY (C.F.)
10023	ARMSTRONG MAPLE	6,453	45	6,498	500
10024	ARMSTRONG MAPLE	OVER 1,000	0	OVER 1,000	500

**STREET TREE LEGEND**

SYMBOL	BOTANICAL NAME	COMMON NAME	CONDITION	SIZE	SPACING
	ACER RUBRUM 'ARMSTRONG'	ARMSTRONG MAPLE	B&B	2" CAL.	AS SHOWN



**1 STREET TREE WITH COVERED SOIL DETAIL**  
NOT TO SCALE

**ROOT PROTECTION ZONE NOTES**  
ENCROACHMENT INTO THE ROOT PROTECTION ZONE IS ALLOWED WITH PROJECT ARBORIST APPROVAL AS DESCRIBED IN THE FOLLOWING NOTES:

- EXCAVATION IN THE TOP 24" OF THE SOIL IN THE CRITICAL ROOT ZONE AREA SHOULD BEGIN AT THE EXCAVATION LINE THAT IS CLOSEST TO THE TREE.
- THE EXCAVATION SHOULD BE DONE BY HAND/SHOVEL OR WITH A BACKHOE AND A MAN WITH A SHOVEL, PRUNING SHEARS, AND A PRUNING SAW.
- IF DONE BY HAND, ALL ROOTS 1" OR LARGER SHOULD BE PRUNED AT THE EXCAVATION LINE.
- IF DONE WITH A BACKHOE (MOST LIKELY SCENARIO), THEN THE OPERATOR SHALL START THE CUT AT THE EXCAVATION LINE AND CAREFULLY "FEEL" FOR ROOTS/RESISTANCE. WHEN THERE IS RESISTANCE, THE MAN WITH THE SHOVEL HAND DIGS AROUND THE ROOTS AND PRUNES THE ROOTS LARGER THAN 1" DIAMETER.

**IRRIGATION:**  
IRRIGATION TO BE 'DESIGN-BUILD' BY THE LANDSCAPE CONTRACTOR. PROVIDE PLANS TO THE CITY FOR APPROVAL PRIOR TO BEGINNING INSTALLATION.

**REMOVAL, STORING, AND AMENDED SOILS FOR PLANTER AREAS:**  
CONTRACTOR SHALL REMOVAL ALL DEBRIS FROM PLANTER AREAS AND EXCAVATE TO A DEPTH OF 36 INCHES. SLOPE SIDES OF EXCAVATIONS AT 1:1 SLOPE OR SHORE EDGES TO PREVENT UNDERMINING OF VEHICLE LOAD AREAS AND TO PROVIDE A SLOPED PROFILE TRANSITION BETWEEN SOIL TYPES AND STRUCTURAL FILL. DISPOSE OF DEBRIS AND SUBSOIL STOCKPILE EXCAVATED TOPSOIL IN APPROVED AREA OFF SITE.

EXISTING AND IMPORTED TOPSOIL AMENDMENTS SHALL BE DETERMINED BY THE LANDSCAPE ARCHITECT AND APPROVED BY THE CITY ARBORIST. SOIL MIXING SHALL BE DONE IN DESIGNATED AREAS OR IN THE SUPPLIERS YARD. MIX AMENDMENTS WITH TOPSOIL WHEN SOIL IS IN A FRIABLE CONDITION ONLY (DAMP AND NOT MUDDY WITH ADEQUATE MOISTURE TO BREAK INTO CLODS WHEN TURNED AND WILL NOT LEAVE A MUD STAIN ON THE HAND WHEN SQUEEZED). CONTRACTOR TO PROVIDE CERTIFICATE OF CONTENT AND PERCENT OF SOIL MIXES WITH ALL AMENDED SOIL TO THE CITY PRIOR TO INSTALLATION.

**BLENDED SOIL PLACEMENT AND COMPACTION:**  
SOIL SHALL BE FRIABLE WHEN PLACED AND COMPACTED. PLACE SOIL IN LAYERS OF NOT MORE THAN 12" IN DEPTH. PROVIDE 3 PASSES WITH A 2" COMPACT PLATE VIBRATING COMPACTOR. COMPACT TO 80-85% MAXIMUM DRY DENSITY AS MEASURED BY THE PROCTOR TEST OR AS APPROVED FOR SPECIFIC BLENDED SOIL MIXES.

**STANDARD COVERED SOIL VOLUME SPECIFICATIONS:**

**PART 1. COVERED SOIL MATERIALS**

- A. COVERED SOIL SHALL CONSIST OF THE FOLLOWING MIXTURE OF GRAVEL, SOIL AND ADMIXTURES:
- CRUSHED ROCK, GRADATION OF 100% PASSING 1.25 INCH, MAX. 30% PASSING 0.75 INCH;
  - LOAM/ORGANIC TOPSOIL;
  - SOIL BINDER SUCH AS , STABILIZER, ; AND
  - WATER.

**PART 2. PROPORTIONS OF COVERED SOIL MATERIALS**

A. THE PROPORTIONS OF COVERED SOIL MATERIALS SHALL BE AS FOLLOWS:

MATERIAL	AMOUNT FOR 1 CY OF COVERED SOIL	AMOUNT FOR 4 CY OF COVERED SOIL
CRUSHED ROCK	23.2 CUBIC FEET	4 CUBIC YARDS
TOPSOIL	5.9 CUBIC FEET	1 CUBIC YARD
SOIL BINDER	13.7 OZ	4 LBS
WATER	1.6 GALLON	46 GALLONS

- B. THE TARGET MOISTURE CONTENT IS 20% BY WEIGHT OF THE TOPSOIL WEIGHT. THE ABOVE WATER CONTENTS ASSUME THE TOP IS DRY. THE AMOUNT OF WATER THAT WILL NEED TO BE ADDED WILL BE DEPENDENT ON THE MOISTURE CONTENT OF THE RAW MATERIALS. ACTUAL AMOUNTS OF WATER USED SHALL BE DETERMINED DURING MIXING.

**PART 3. COVERED SOIL MIXING PROCEDURES**

- MIX COVERED SOIL IN BATCHES OF AN APPROPRIATE SIZE FOR THE EQUIPMENT BEING USED. THE END RESULT IS TO BE A MATERIAL THAT IS UNIFORMLY BLENDED TOGETHER. DO NOT BATCH IN QUANTITIES THAT WILL NOT ALLOW THE EQUIPMENT TO COMPLETELY MIX THE MATERIAL. DETERMINE BATCH SIZE AND QUANTITIES OF EACH MATERIAL NEEDED FOR THE BATCH.
- START WITH HALF OF THE CRUSHED ROCK MATERIAL.
- ADD ALL OF THE TOPSOIL MATERIAL.
- ADD THE SOIL BINDER.
- ADD HALF OF THE ESTIMATED WATER.
- ADD THE OTHER HALF OF THE CRUSHED ROCK MATERIAL.
- MIX THE MATERIAL TOGETHER.
- SLOWLY ADD WATER TO THE MIXTURE AND CONTINUE TO MIX. THE FINAL AMOUNT OF WATER WILL VARY WITH MOISTURE CONTENT OF THE CRUSHED ROCK AND TOPSOIL. ADD WATER IN INCREMENTAL AMOUNTS AND MIX THE MATERIAL BETWEEN THE ADDITIONS OF WATER.
- STOP ADDING WATER AND MIXING WHEN THERE IS A MINUTE AMOUNT OF FREE TOPSOIL REMAINING. THE TOPSOIL WILL COAT THE CRUSHED ROCK AND NOT FALL OUT OF THE MATERIAL. ALL OF THE CRUSHED ROCK SHALL BE UNIFORMLY COATED WITH TOPSOIL. THERE SHALL BE NO CLUMPS OF TOPSOIL OR UNCOVERED CRUSHED ROCK IN THE MIXTURE.
- IF TOO MUCH WATER IS ADDED TO THE MIXTURE, WATER WILL DRAIN OUT OF THE MATERIAL AND THE TOPSOIL WILL WASH OFF OF THE CRUSHED ROCK. IF THIS OCCURS THE BATCH OF MATERIAL SHALL BE DISCARDED AND SHALL NOT BE INCORPORATED INTO THE COMPLETED WORK.

**PART 4. PLACEMENT OF COVERED SOIL**

- PROTECT SOILS AND MIXES FROM ABSORBING EXCESS WATER AND FROM EROSION AT ALL TIMES. DO NOT STORE MATERIALS UNPROTECTED FROM RAINFALL EVENTS. DO NOT ALLOW EXCESS WATER TO ENTER SITE PRIOR TO COMPACTION. IF WATER IS INTRODUCED INTO THE MATERIAL AFTER GRADING, ALLOW MATERIAL TO DRAIN OR AERATE TO OPTIMUM COMPACTION MOISTURE CONTENT.
- ALL AREAS TO RECEIVE COVERED SOIL MIXTURE SHALL BE INSPECTED BY THE PROJECT LANDSCAPE ARCHITECT/AND/OR PROJECT ENGINEER BEFORE STARTING PLACEMENT OF MIXTURE. ALL DEFECTS SUCH AS INCORRECT GRADING, COMPACTION AND INADEQUATE DRAINAGE, ETC., SHALL BE CORRECTED PRIOR TO BEGINNING PLACEMENT OF COVERED SOIL.
- CONFIRM THAT THE SUB-GRADE IS AT THE PROPER ELEVATION AND COMPACTED AS REQUIRED. SUB-GRADE ELEVATIONS SHALL SLOPE PARALLEL TO THE FINISHED GRADE. CLEAR THE EXCAVATION OF ALL CONSTRUCTION DEBRIS, TRASH, RUBBLE AND FOREIGN MATERIAL. FILL ANY OVER EXCAVATION WITH APPROVED FILL AND COMPACT TO THE REQUIRED SUB-GRADE COMPACTION.
- INSTALL COVERED SOIL IN 6-INCH LIFTS AND SPREAD UNIFORMLY OVER THE AREA. COMPACT EACH LIFT TO THE REQUIRED MAXIMUM DENSITY. DELAY PLACEMENT 24 HOURS IF MOISTURE CONTENT EXCEEDS MAXIMUM ALLOWABLE. PROTECT COVERED SOIL WITH PLASTIC OR PLYWOOD DURING DELAY. TAKE PARTICULAR CARE NOT TO DAMAGE UTILITIES WHEN INSTALLING COVERED SOIL. COVERED SOIL THAT WILL BE THE BEDDING FOR UTILITY LINES SHALL BE COMPACTED TO CONFORM TO THE REQUIRED GRADE OF THE UTILITY LINE. DO NOT COMPACT THE IMMEDIATE VICINITY ABOVE A UTILITY LINE UNTIL A FILL DEPTH OF AT LEAST 12-INCHES ABOVE THE UTILITY LINE IS REACHED.
- ERECT COVERED SOILS TO FINISHED GRADES AS SHOWN IN THE APPROVED DRAWINGS. IMMEDIATELY PROTECT THE COVERED SOIL MATERIAL FROM CONTAMINATION BY WATER BY COVERING WITH PLASTIC OR PLYWOOD.

**REVISIONS:**


**EXAMPLE SOIL VOLUME PLAN FOR SINGLE LOT**

OFFICE LOCATED AT:  
1000 1ST STREET, SUITE 1  
TIGARD, OREGON 97223  
PH: (503) 555-1333  
FAX: (503) 555-1333  
EMAIL: INFO@ABC\_COLLABORATIVE.COM  
LICENSED IN OR, WA, & ID

**ABC** COLLABORATIVE  
ENGINEERING • ARCHITECTURE • PLANNING • LANDSCAPE ARCHITECTURE

DESIGNED BY: KRJ	DRAWING NO.: SA
DRAWN BY: BOT	SCALE: AS SHOWN
CHECKED BY: KRJ	
PREPARED FOR: JOHN SMITH PO BOX 111 TIGARD, OREGON 97223 PH: 503-909-5555 FAX: 503-909-5556	

**EVERGREEN HEIGHTS PARTITION**  
190 SW 147TH ST.  
TIGARD  
TAXLOT 1700

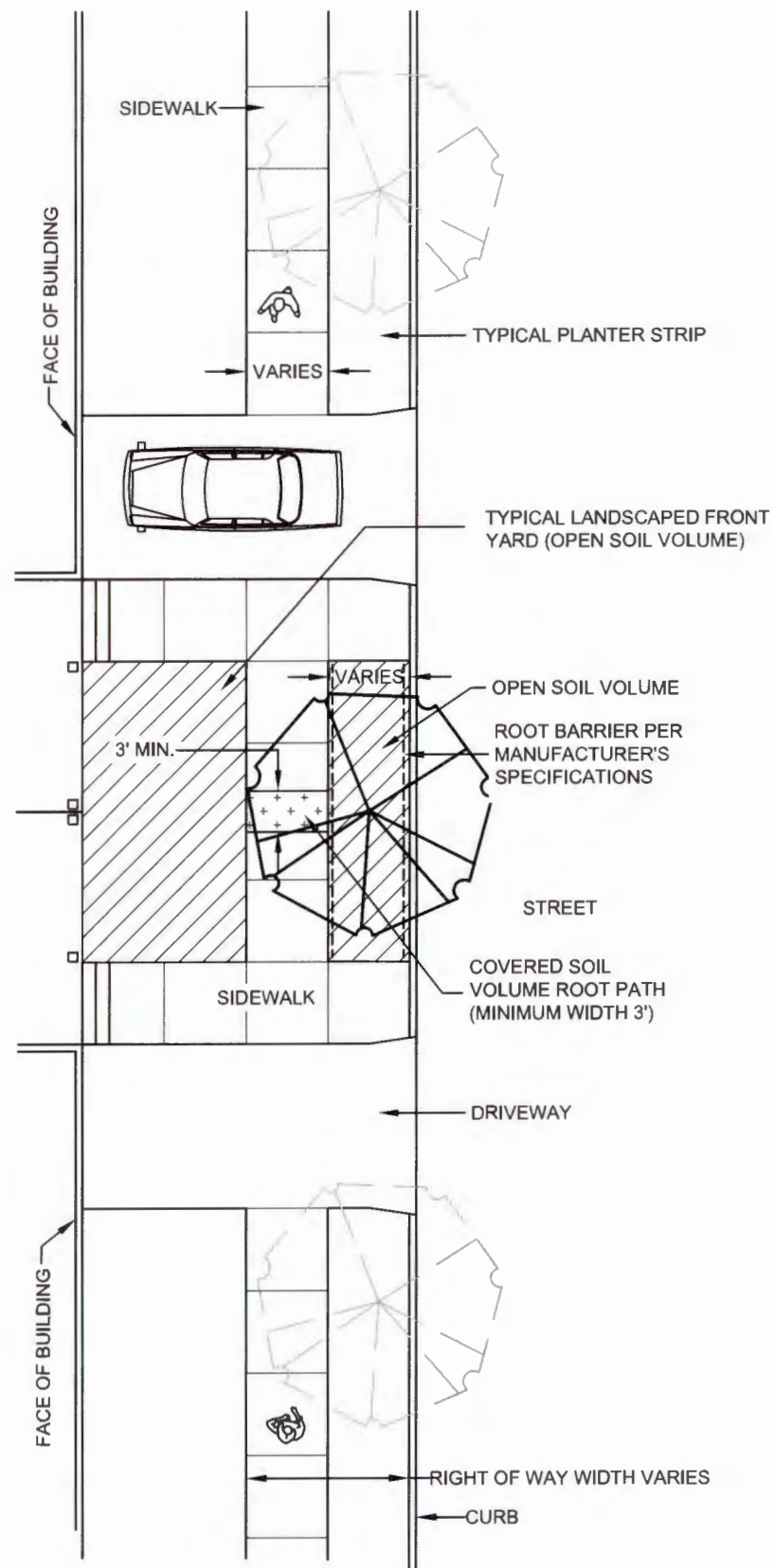
DATE: 07-11-2011

REGISTERED  
LANDSCAPE ARCHITECT  
JOHN H. DOE  
OREGON

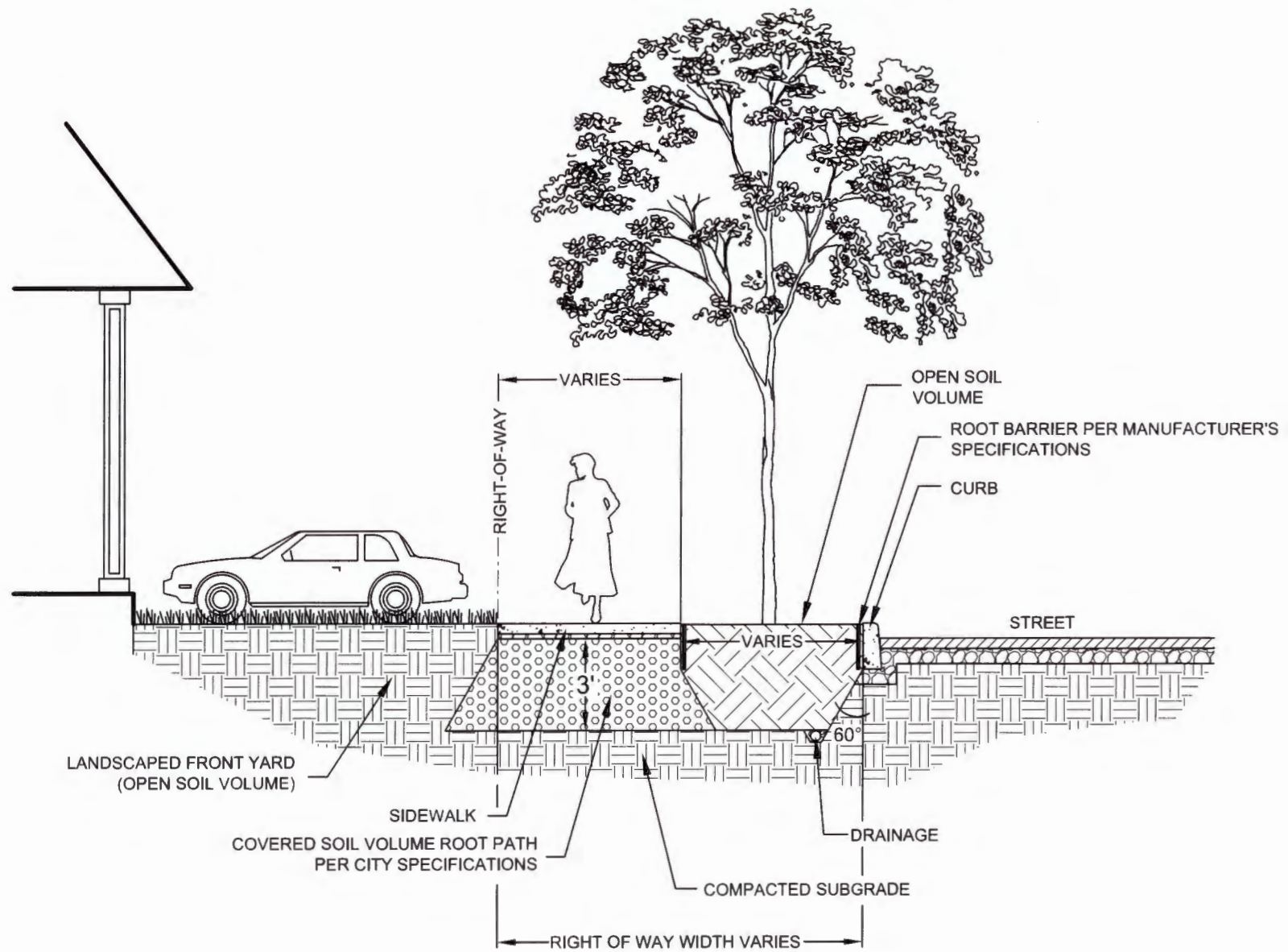
JOB NUMBER  
2001

SHEET  
APPENDIX 13



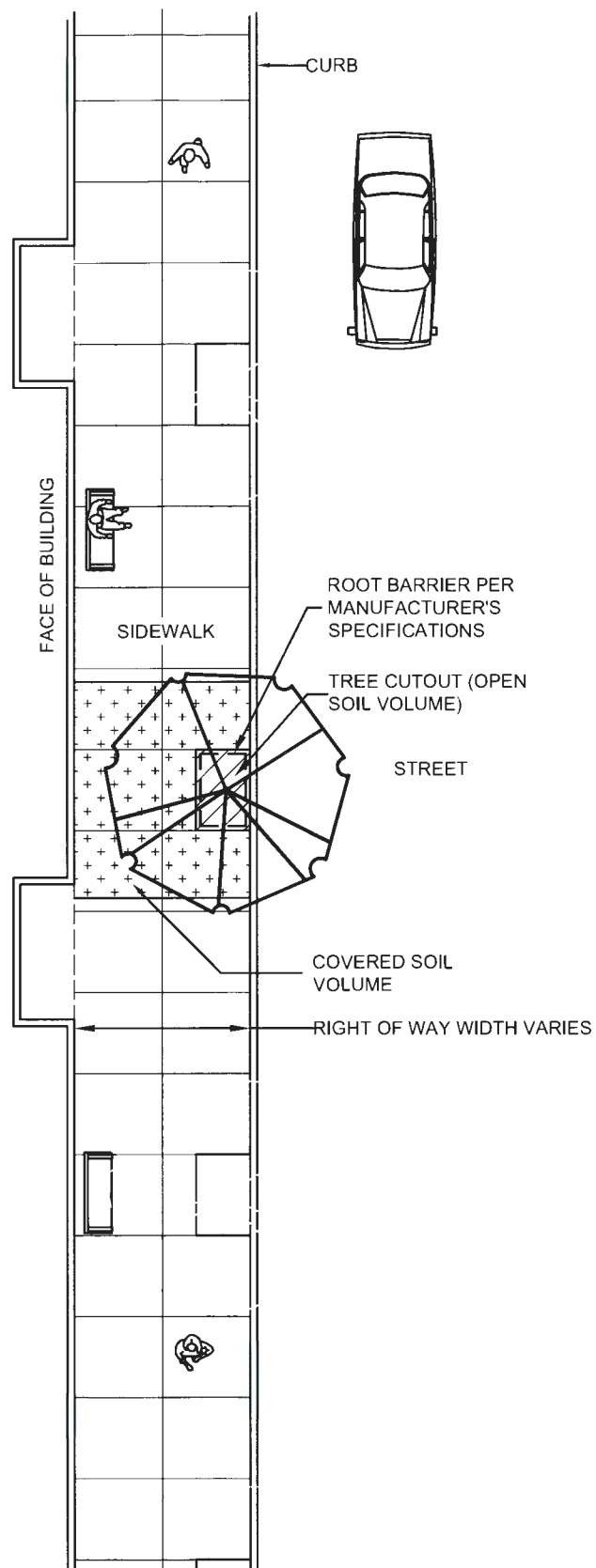


**PLAN**

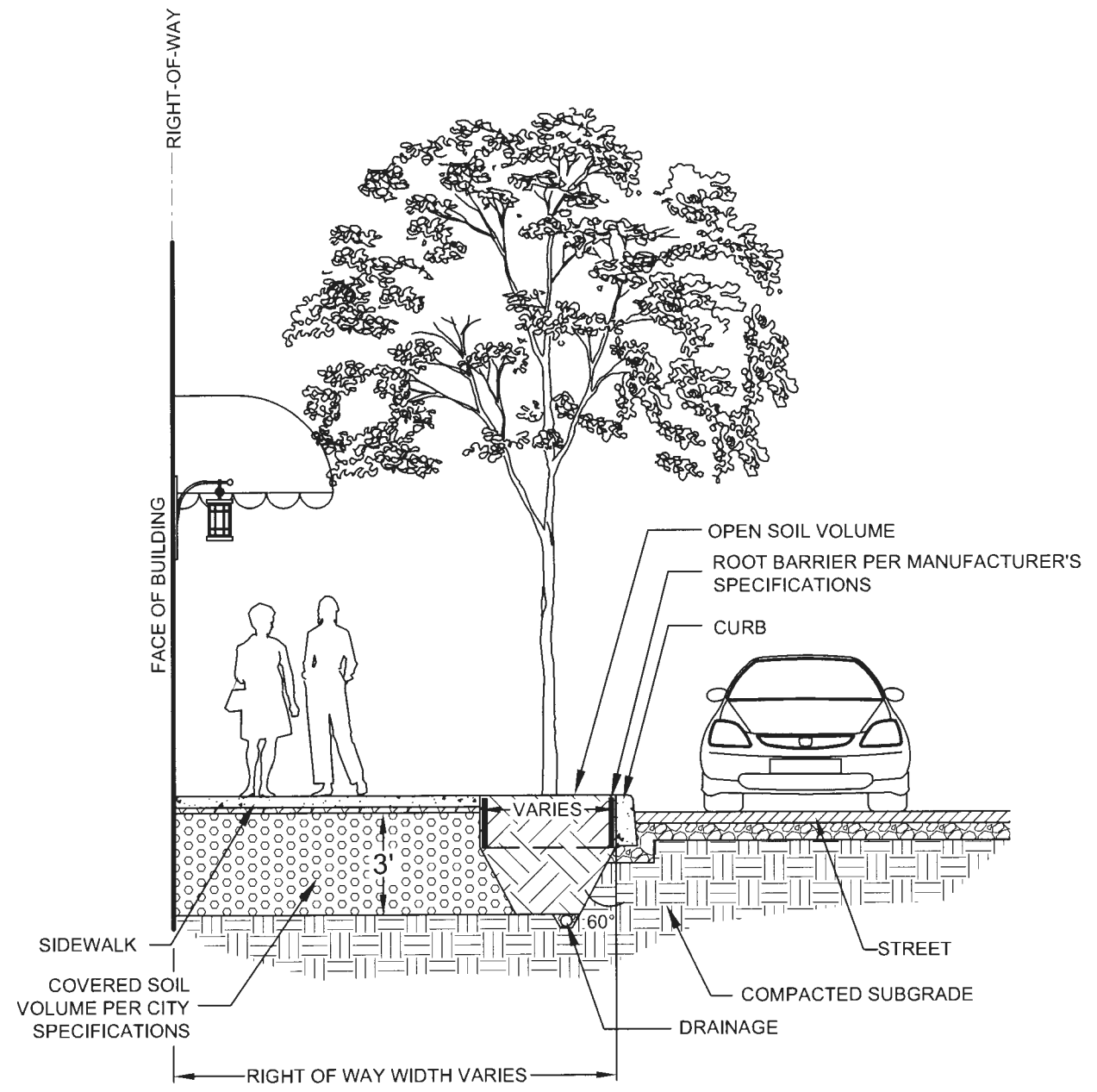


**PROFILE**

<b>EXAMPLE COVERED SOIL VOLUME PLAN DRAWING – ROOT PATH OPTION FOR STREET TREE</b>	NO SCALE
	DWG. NO.
	<b>APPENDIX 14</b>



**PLAN**



**PROFILE**

<p><b>EXAMPLE COVERED SOIL VOLUME PLAN DRAWING – UNDER SIDEWALK OPTION FOR STREET TREE</b></p>	NO SCALE
	<p>DWG. NO. <b>APPENDIX 14</b></p>

## Example Covered Soil Volume Specifications

### Part 1. Covered Soil Materials

- A. Covered soil shall consist of the following mixture of gravel, soil and admixtures:
1. Crushed rock, gradation of 100% passing 1.25 inch, max. 30% passing 0.75 inch;
  2. Loam/Organic Topsoil;
  3. Soil binder such as “Stabilizer”; and
  4. Water.

### Part 2. Proportions of Covered Soil Materials

- A. The proportions of covered soil materials shall be as follows:

Material	Amount for 1 CY of Covered Soil	Amount for 4.6 CY of Covered Soil
Crushed Rock	23.2 cubic feet	4 cubic yards
Topsoil	5.9 cubic feet	1 cubic yard
Soil Binder	13.7 ounces	4 pounds
Water	1.6 gallon	46 gallons

- B. The target moisture content is 20% by weight of the topsoil weight. The above water contents assume the top is dry. The amount of water that will need to be added will be dependent on the moisture content of the raw materials. Actual amounts of water used shall be determined during mixing.

### Part 3. Covered Soil Mixing Procedures

- A. Mix covered soil in batches of an appropriate size for the equipment being used. The end result is to be a material that is uniformly blended together. Do not batch in quantities that will not allow the equipment to completely mix the material. Determine batch size and quantities of each material needed for the batch.
- B. Start with half of the crushed rock material.
- C. Add all of the topsoil material.
- D. Add the soil binder.
- E. Add half of the estimated water.
- F. Add the other half of the crushed rock material.
- G. Mix the material together.
- H. Slowly add water to the mixture and continue to mix. The final amount of water will vary with moisture content of the crushed rock and topsoil. Add water in incremental amounts and mix the material between the additions of water.
- I. Stop adding water and mixing when there is a minute amount of free topsoil remaining. The topsoil will coat the crushed rock and not fall out of the material. All of the crushed rock

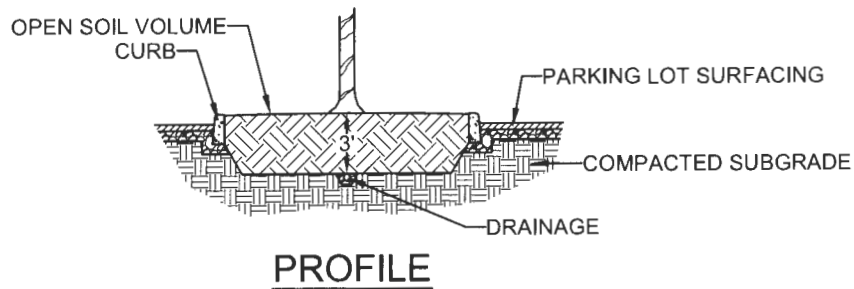
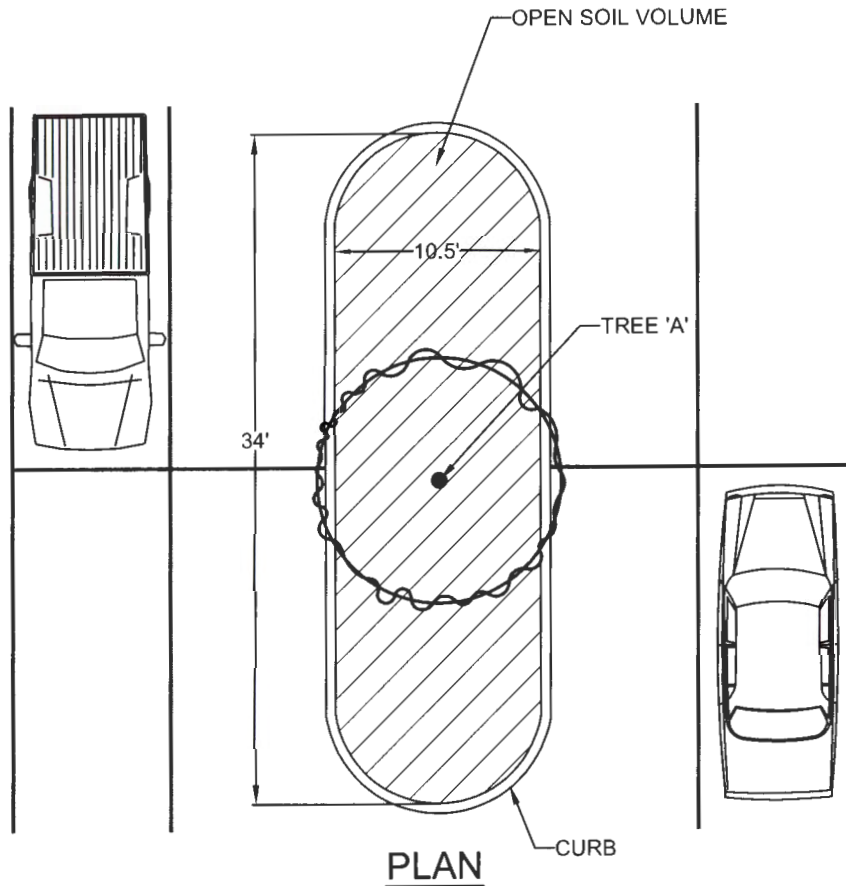
shall be uniformly coated with topsoil. There shall be no clumps of topsoil or uncovered crushed rock in the mixture.

- J. If too much water is added to the mixture, water will drain out of the material and the topsoil will wash off of the crushed rock. If this occurs the batch of material shall be discarded and shall not be incorporated into the completed work.

#### **Part 4. Placement of Covered Soil**

- A. Protect soils and mixes from absorbing excess water and from erosion at all times. Do not store materials unprotected from rainfall events. Do not allow excess water to enter site prior to compaction. If water is introduced into the material after grading, allow material to drain or aerate to optimum compaction moisture content.
- B. All areas to receive covered soil mixture shall be inspected by the project landscape architect and/or project engineer before starting placement of mixture. All defects such as incorrect grading, compaction and inadequate drainage, etc., shall be corrected prior to beginning placement of covered soil.
- C. Confirm that the sub-grade is at the proper elevation and compacted as required. Sub-grade elevations shall slope parallel to the finished grade. Clear the excavation of all construction debris, trash, rubble and foreign material. Fill any over excavation with approved fill and compact to the required sub-grade compaction.
- D. Install covered soil in 6-inch lifts and spread uniformly over the area. Compact each lift to the required percent of maximum density. Delay placement 24 hours if moisture content exceeds maximum allowable, protect covered soil with plastic or plywood during delay. Take particular care not to damage utilities when installing covered soil. Covered soil that will be the bedding for utility lines shall be compacted to conform to the required grade of the utility line. Do not compact the immediate vicinity above a utility line until a fill depth of at least 12-inches above the utility line is reached.
- E. Bring covered soils to finished grades as shown in the approved drawings. Immediately protect the covered soil material from contamination by water by covering with plastic or plywood.





**TOTAL SOIL VOLUME CALCULATION FOR TREE 'A':**

OPEN SOIL VOLUME = (ISLAND AREA) X (SOIL DEPTH) = 336 S.F.  
x 3' = 1,008 C.F.

COVERED SOIL VOLUME = 0 C.F.

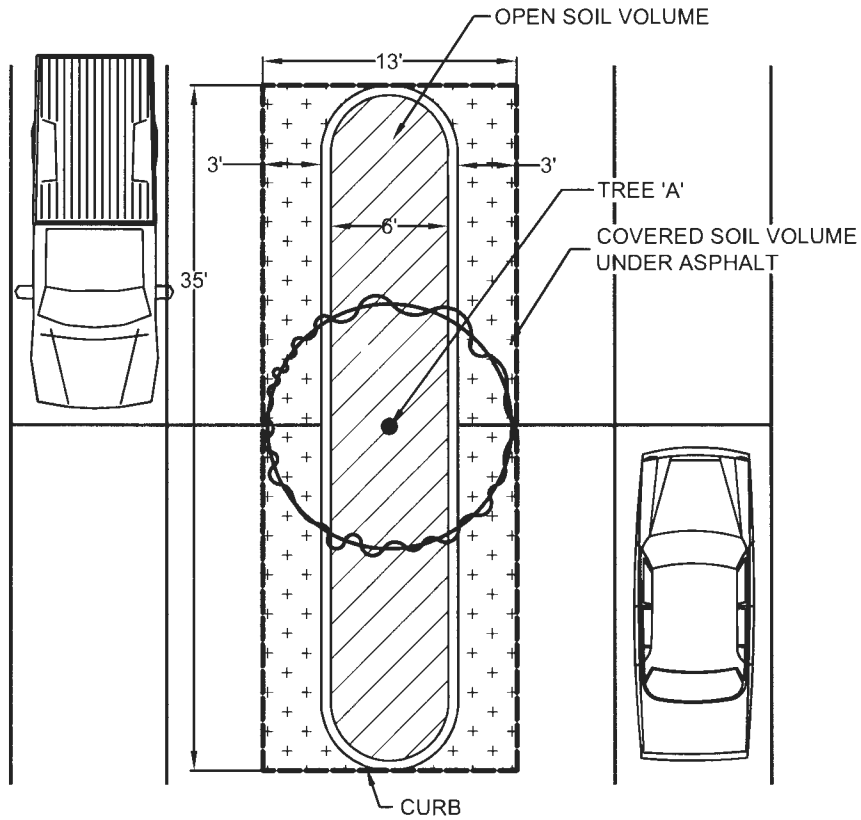
TOTAL SOIL VOLUME = OPEN SOIL VOLUME + COVERED SOIL  
VOLUME = 1,008 C.F. + 0 C.F. = 1,008 C.F.

1,008 C.F. IS GREATER THAN THE SOIL VOLUME REQUIRED FOR  
A PARKING LOT TREE (1,000 C.F.) SO THIS MEETS THE CITY  
REQUIREMENTS.

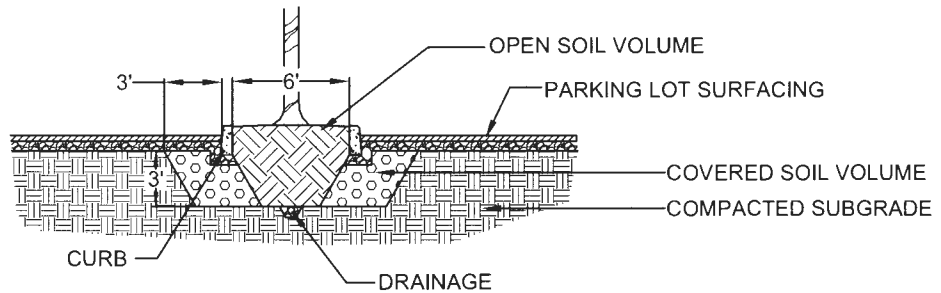
**EXAMPLE SOIL VOLUME  
CALCULATION – PARKING  
LOT TREE WITH OPEN SOIL**

NO SCALE

DWG. NO.  
**APPENDIX 15**



**PLAN**



**PROFILE**

**TOTAL SOIL VOLUME CALCULATION FOR TREE 'A':**

OPEN SOIL VOLUME = (PLANTER AREA) X (SOIL DEPTH) = 196 S.F.  
x 3' = 588 C.F.

COVERED SOIL VOLUME = 259 S.F. X 3' = 777 C.F.

TOTAL SOIL VOLUME = OPEN SOIL VOLUME + COVERED SOIL  
VOLUME = 588 C.F. + 777 C.F. = 1,365 C.F.

1,365 C.F. IS GREATER THAN THE SOIL VOLUME REQUIRED FOR A  
PARKING LOT TREE (1,000 C.F.) SO THIS MEETS THE CITY  
REQUIREMENTS.

**EXAMPLE SOIL VOLUME  
CALCULATION – PARKING LOT  
TREE WITH COVERED SOIL**

NO SCALE

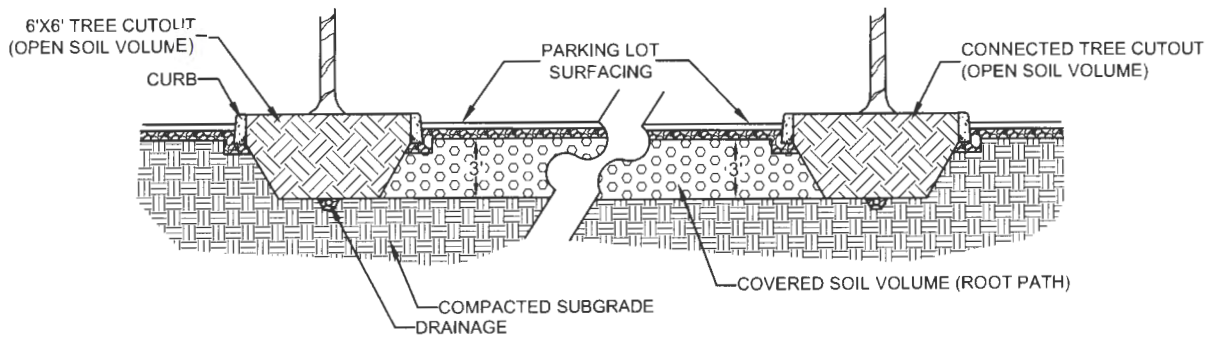
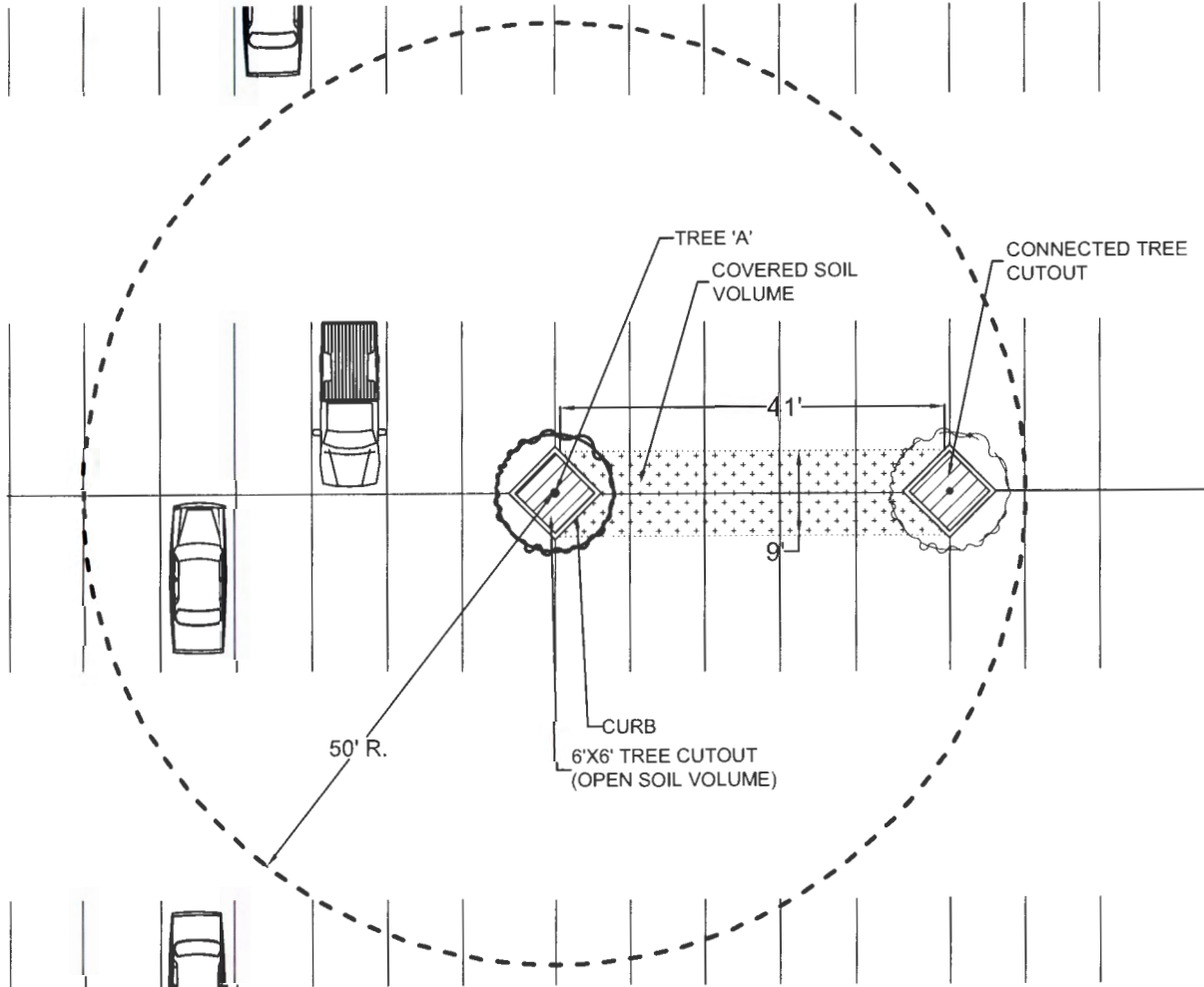
DWG. NO.

**APPENDIX 15**

**TOTAL SOIL VOLUME CALCULATION FOR TREE 'A':**

OPEN SOIL VOLUME = 36 S.F. (TREE CUTOUT AREA) + 36 S.F. (CONNECTED TREE CUTOUT AREA) x 3' (SOIL DEPTH) = 216 C.F.  
 COVERED SOIL VOLUME = 330 S.F. (COVERED SOIL AREA) X 3' (COVERED SOIL DEPTH) = 990 C.F.  
 TOTAL SOIL VOLUME = OPEN SOIL VOLUME + COVERED SOIL VOLUME = 216 C.F. + 990 C.F. = 1,206 C.F.

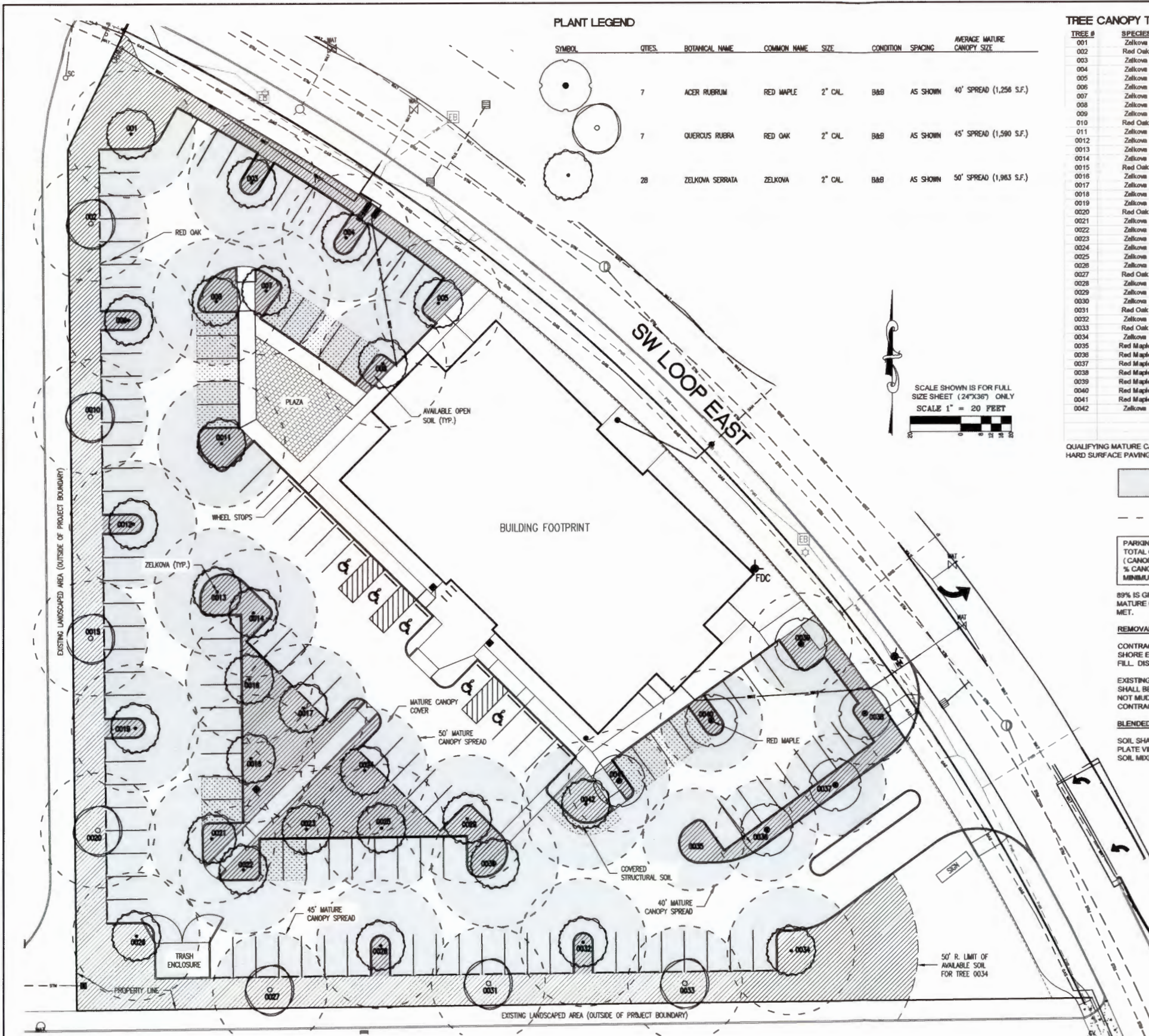
1,206 C.F. IS GREATER THAN THE SOIL VOLUME REQUIRED FOR A PARKING LOT TREE (1000 C.F.) SO THIS MEETS THE CITY REQUIREMENTS.



**EXAMPLE SOIL VOLUME  
 CALCULATION – PARKING  
 LOT TREE WITH ROOT PATH**

NO SCALE  
 DWG. NO.  
**APPENDIX 15**



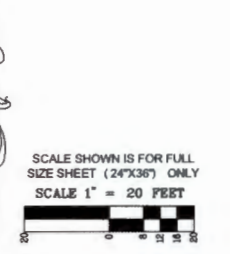


**PLANT LEGEND**

SYMBOL	QTES.	BOTANICAL NAME	COMMON NAME	SIZE	CONDITION	SPACING	AVERAGE MATURE CANOPY SIZE
(Symbol)	7	ACER RUBRUM	RED MAPLE	2" CAL.	B&B	AS SHOWN	40' SPREAD (1,256 S.F.)
(Symbol)	7	QUERCUS RUBRA	RED OAK	2" CAL.	B&B	AS SHOWN	45' SPREAD (1,590 S.F.)
(Symbol)	28	ZELKOVA SERRATA	ZELKOVA	2" CAL.	B&B	AS SHOWN	50' SPREAD (1,963 S.F.)

**TREE CANOPY TABLE**

TREE #	SPECIES	OPEN SOIL VOLUME	COVERED SOIL VOLUME	TOTAL SOIL VOLUME	AVE. MATURE CANOPY	% OF CANOPY OVER PARKING LOT	AREA OVER PARKING LOT
001	Zelkova	5,466 c.f.	0 c.f.	5,466 c.f.	50' spread (1,963 s.f.)	39%	757 s.f.
002	Red Oak	4,539 c.f.	0 c.f.	4,539 c.f.	45' spread (1,590 s.f.)	40%	640 s.f.
003	Zelkova	3,192 c.f.	0 c.f.	3,192 c.f.	50' spread (1,963 s.f.)	92%	1,812 s.f.
004	Zelkova	3,089 c.f.	0 c.f.	3,089 c.f.	50' spread (1,963 s.f.)	89%	1,748 s.f.
005	Zelkova	1,819 c.f.	0 c.f.	1,819 c.f.	50' spread (1,963 s.f.)	93%	1,940 s.f.
006	Zelkova	303 c.f.	2,190 c.f.	2,493 c.f.	50' spread (1,963 s.f.)	50%	984 s.f.
007	Zelkova	348 c.f.	2,190 c.f.	2,538 c.f.	50' spread (1,963 s.f.)	80%	1,575 s.f.
008	Zelkova	578 c.f.	2,188 c.f.	2,766 c.f.	50' spread (1,963 s.f.)	85%	1,868 s.f.
009	Zelkova	3,681 c.f.	0 c.f.	3,681 c.f.	50' spread (1,963 s.f.)	78%	1,488 s.f.
010	Red Oak	4,200 c.f.	0 c.f.	4,200 c.f.	45' spread (1,590 s.f.)	35%	559 s.f.
011	Zelkova	708 c.f.	2,076 c.f.	2,784 c.f.	50' spread (1,963 s.f.)	82%	1,813 s.f.
0012	Zelkova	3,851 c.f.	0 c.f.	3,851 c.f.	50' spread (1,963 s.f.)	79%	1,550 s.f.
0013	Zelkova	1,101 c.f.	0 c.f.	1,101 c.f.	50' spread (1,963 s.f.)	100%	1,963 s.f.
0014	Zelkova	1,101 c.f.	0 c.f.	1,101 c.f.	50' spread (1,963 s.f.)	100%	1,963 s.f.
0015	Red Oak	4,155 c.f.	0 c.f.	4,155 c.f.	45' spread (1,590 s.f.)	38%	596 s.f.
0016	Zelkova	4,178 c.f.	0 c.f.	4,178 c.f.	50' spread (1,963 s.f.)	100%	1,963 s.f.
0017	Zelkova	4,233 c.f.	0 c.f.	4,233 c.f.	50' spread (1,963 s.f.)	100%	1,963 s.f.
0018	Zelkova	4,233 c.f.	0 c.f.	4,233 c.f.	50' spread (1,963 s.f.)	100%	1,963 s.f.
0019	Zelkova	3,630 c.f.	0 c.f.	3,630 c.f.	50' spread (1,963 s.f.)	79%	1,547 s.f.
0020	Red Oak	4,506 c.f.	0 c.f.	4,506 c.f.	45' spread (1,590 s.f.)	41%	844 s.f.
0021	Zelkova	417 c.f.	870 c.f.	1,287 c.f.	50' spread (1,963 s.f.)	100%	1,963 s.f.
0022	Zelkova	444 c.f.	870 c.f.	1,314 c.f.	50' spread (1,963 s.f.)	100%	1,963 s.f.
0023	Zelkova	4,283 c.f.	870 c.f.	5,153 c.f.	50' spread (1,963 s.f.)	100%	1,963 s.f.
0024	Zelkova	4,284 c.f.	870 c.f.	5,154 c.f.	50' spread (1,963 s.f.)	100%	1,963 s.f.
0025	Zelkova	4,284 c.f.	870 c.f.	5,154 c.f.	50' spread (1,963 s.f.)	100%	1,963 s.f.
0026	Zelkova	5,948 c.f.	0 c.f.	5,948 c.f.	50' spread (1,963 s.f.)	48%	938 s.f.
0027	Red Oak	3,702 c.f.	0 c.f.	3,702 c.f.	45' spread (1,590 s.f.)	37%	581 s.f.
0028	Zelkova	2,430 c.f.	0 c.f.	2,430 c.f.	50' spread (1,963 s.f.)	79%	1,558 s.f.
0029	Zelkova	1,077 c.f.	0 c.f.	1,077 c.f.	50' spread (1,963 s.f.)	100%	1,963 s.f.
0030	Zelkova	1,077 c.f.	0 c.f.	1,077 c.f.	50' spread (1,963 s.f.)	100%	1,963 s.f.
0031	Red Oak	4,191 c.f.	0 c.f.	4,191 c.f.	45' spread (1,590 s.f.)	40%	842 s.f.
0032	Zelkova	3,630 c.f.	0 c.f.	3,630 c.f.	50' spread (1,963 s.f.)	80%	1,563 s.f.
0033	Red Oak	4,392 c.f.	0 c.f.	4,392 c.f.	45' spread (1,590 s.f.)	38%	602 s.f.
0034	Zelkova	7,350 c.f.	0 c.f.	7,350 c.f.	50' spread (1,963 s.f.)	45%	882 s.f.
0035	Red Maple	1,416 c.f.	0 c.f.	1,416 c.f.	40' spread (1,256 s.f.)	100%	1,256 s.f.
0036	Red Maple	1,989 c.f.	0 c.f.	1,989 c.f.	40' spread (1,256 s.f.)	100%	1,256 s.f.
0037	Red Maple	2,562 c.f.	0 c.f.	2,562 c.f.	40' spread (1,256 s.f.)	100%	1,256 s.f.
0038	Red Maple	2,529 c.f.	0 c.f.	2,529 c.f.	40' spread (1,256 s.f.)	73%	915 s.f.
0039	Red Maple	1,533 c.f.	0 c.f.	1,533 c.f.	40' spread (1,256 s.f.)	58%	728 s.f.
0040	Red Maple	516 c.f.	1,716 c.f.	2,232 c.f.	40' spread (1,256 s.f.)	81%	1,021 s.f.
0041	Red Maple	516 c.f.	1,716 c.f.	2,232 c.f.	40' spread (1,256 s.f.)	80%	1,007 s.f.
0042	Zelkova	837 c.f.	441 c.f.	1,278 c.f.	50' spread (1,963 s.f.)	92%	1,804 s.f.



**QUALIFYING MATURE CANOPY COVER** (Solid grey)

**INDIVIDUAL TREE MATURE CANOPY OUTLINE** (Dashed line)

**OPEN SOIL VOLUME** (Diagonal hatching)

**COVERED SOIL VOLUME** (Cross-hatching)

**PARKING LOT TREE SOIL VOLUME REQUIREMENTS**

MIN. SOIL VOLUME REQUIREMENT (C.F. PER TREE): 1,000 C.F.

**PARKING LOT AREA:** 84,962 S.F.  
**TOTAL QUALIFYING MATURE TREE CANOPY AREA:** 57,783 S.F.  
**(CANOPY AREA DIRECTLY OVER PARKING LOT)**  
**% CANOPY COVER:** 89%  
**MINIMUM % CANOPY COVER:** 30%

89% IS GREATER THAN THE MINIMUM OF 30% TOTAL QUALIFYING MATURE CANOPY COVER THEREFORE CITY REQUIREMENTS ARE MET.

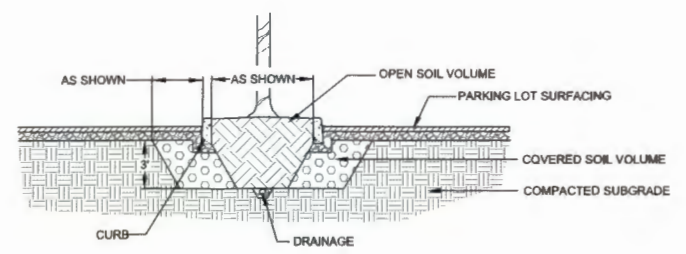
**REMOVAL, STORING, AND AMENDED SOILS FOR PLANTER AREAS:**

CONTRACTOR SHALL REMOVE ALL DEBRIS FROM PLANTER AREAS AND EXCAVATE TO A DEPTH OF 36 INCHES. SLOPE SIDES OF EXCAVATIONS AT 1:1 SLOPE OR SHORE EDGES TO PREVENT UNDERMINING OF VEHICLE LOAD AREAS AND TO PROVIDE A SLOPED PROFILE TRANSITION BETWEEN SOIL TYPES AND STRUCTURAL FILL. DISPOSE OF DEBRIS AND SUBSOIL. STOCKPILE EXCAVATED TOPSOIL IN APPROVED AREA OFF SITE.

EXISTING AND IMPORTED TOPSOIL AMENDMENTS SHALL BE DETERMINED BY THE LANDSCAPE ARCHITECT AND APPROVED BY THE CITY ARBORIST. SOIL MIXING SHALL BE DONE IN DESIGNATED AREAS OR IN THE SUPPLIER'S YARD. MIX AMENDMENTS WITH TOPSOIL WHEN SOIL IS IN A FRIABLE CONDITION ONLY (DAMP AND NOT MUDDY WITH ADEQUATE MOISTURE TO BREAK INTO CLODS WHEN TURNED AND WILL NOT LEAVE A MUD STAIN ON THE HAND WHEN SQUEEZED). CONTRACTOR TO PROVIDE CERTIFICATE OF CONTENT AND PERCENT OF SOIL MIXES WITH ALL AMENDED SOIL TO THE CITY PRIOR TO INSTALLATION.

**BLENDED SOIL PLACEMENT AND COMPACTION:**

SOIL SHALL BE FRIABLE WHEN PLACED AND COMPACTED. PLACE SOIL IN LAYERS OF NOT MORE THAN 12" IN DEPTH. PROVIDE 3 PASSES WITH A 2" COMPACT PLATE VIBRATING COMPACTOR. COMPACT TO 80-85% MAXIMUM DRY DENSITY AS MEASURED BY THE PROCTOR TEST OR AS APPROVED FOR SPECIFIC BLENDED SOIL MIXES.



**1 PARKING TREE WITH COVERED SOIL DETAIL**  
NOT TO SCALE

**REVISIONS:**


**EXAMPLE PARKING LOT TREE CANOPY PLAN**

OFFICE LOCATED AT:  
1000 1ST STREET, SUITE 1  
TIGARD, OREGON 97223  
PH: (503) 555-XXXX  
FAX: (503) 555-XXXX  
EMAIL: INFO@ABC-COLLABORATIVE.COM  
LICENSED IN OR, WA, & ID

**ABC COLLABORATIVE**  
ENGINEERING • ARCHITECTURE • PLANNING • LANDSCAPE ARCHITECTURE

DESIGNED BY:	DRAWING NO.:
DRAWN BY:	SCALE: AS NOTED
CHECKED BY:	
PREPARED FOR:	HANCOCK ASSOCIATES 1500 SW LOOP ROAD TIGARD, OR 97223

**LOOP ROAD IMPROVEMENTS**  
**1011 SW LOOP ROAD**

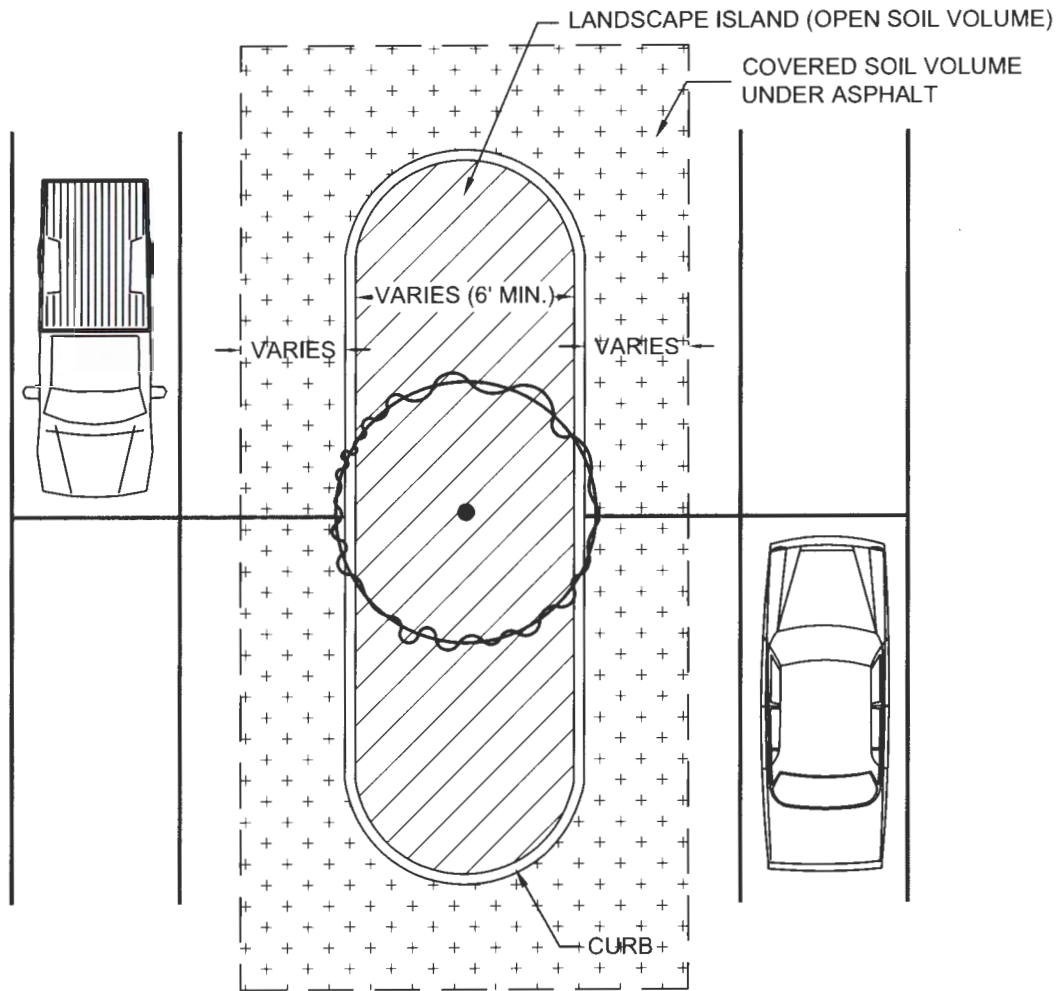
**TIGARD**  
TAX LOT 1000

DATE: 07-11-2011

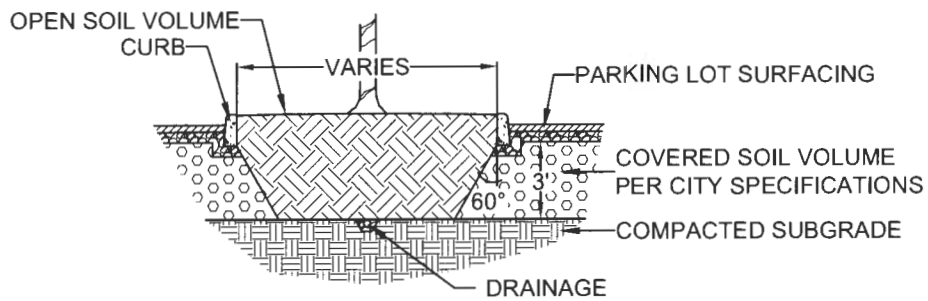
**REGISTERED LANDSCAPE ARCHITECT**  
JOHN H. DOE  
OREGON  
TAX MAP 25 1 05AB

JOB NUMBER: 1000  
SHEET: APPENDIX 16





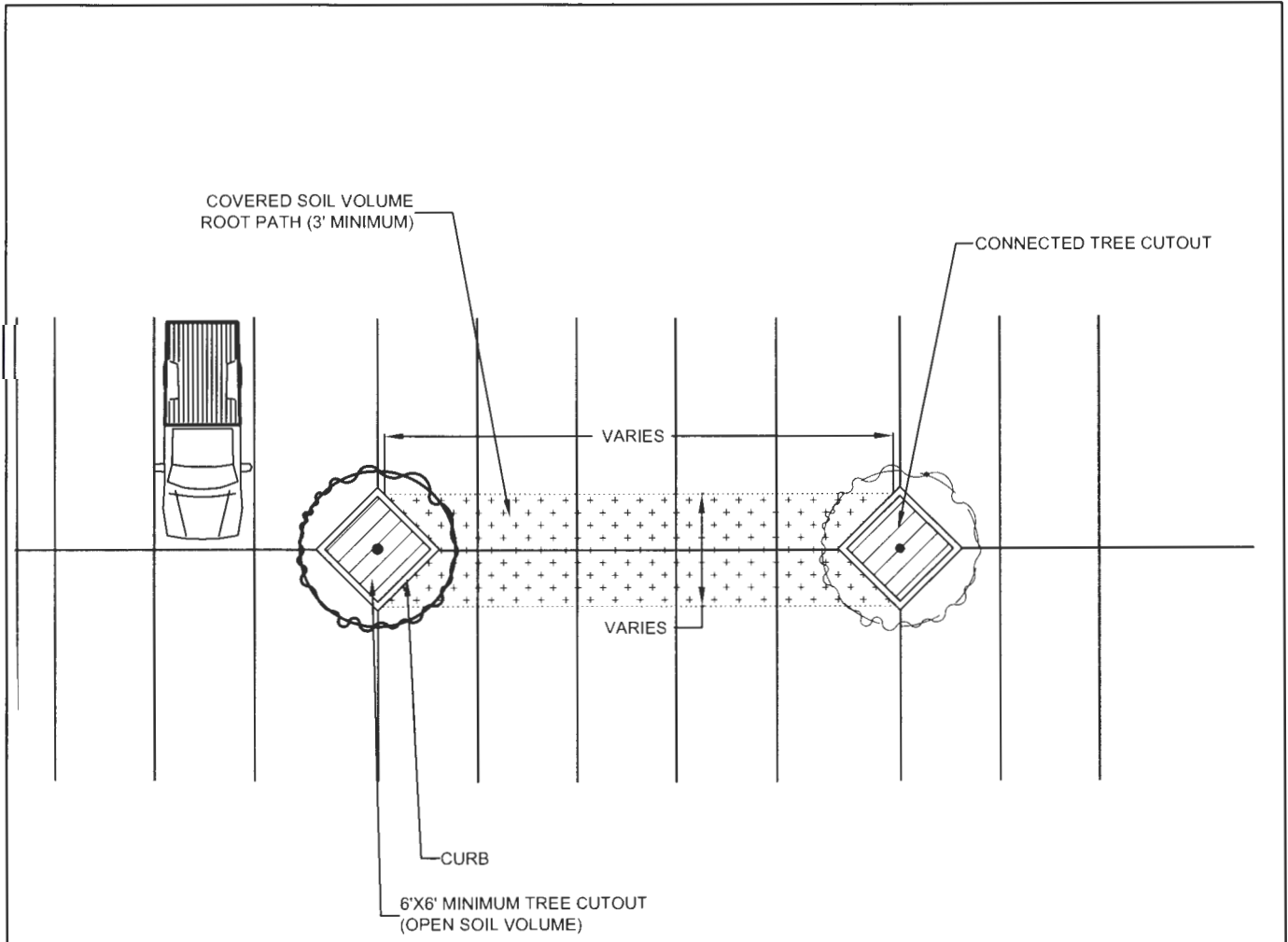
**PLAN**



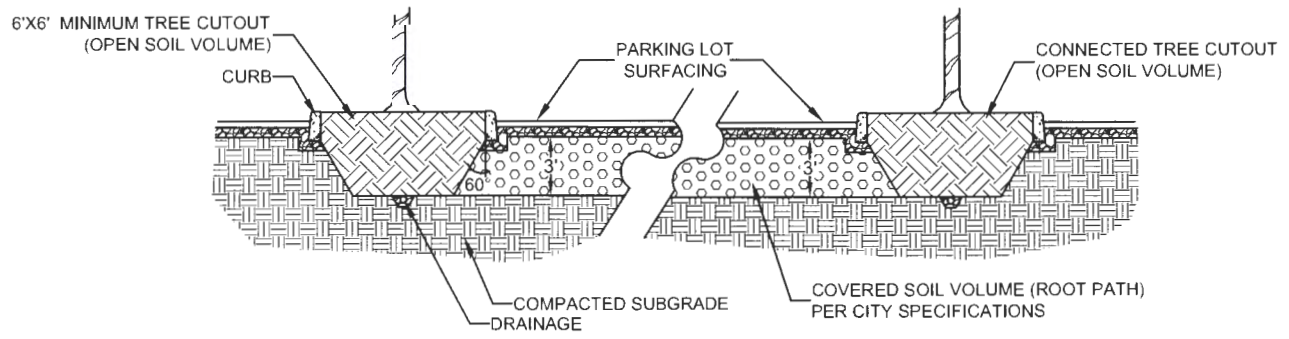
**PROFILE**

**EXAMPLE COVERED SOIL VOLUME  
PLAN DRAWING – UNDER  
PARKING LOT OPTION FOR  
PARKING LOT TREE**

NO SCALE  
DWG. NO.  
**APPENDIX 17**  
PLAN



**PLAN**



**PROFILE**

<p><b>EXAMPLE COVERED SOIL VOLUME DRAWING— ROOT PATH OPTION FOR PARKING LOT TREE</b></p>	<p>NO SCALE</p>
	<p>DWG. NO. <b>APPENDIX 17</b></p>



## Example Covered Soil Volume Specifications

### Part 1. Covered Soil Materials

- A. Covered soil shall consist of the following mixture of gravel, soil and admixtures:
1. Crushed rock, gradation of 100% passing 1.25 inch, max. 30% passing 0.75 inch;
  2. Loam/Organic Topsoil;
  3. Soil binder such as “Stabilizer”; and
  4. Water.

### Part 2. Proportions of Covered Soil Materials

- A. The proportions of covered soil materials shall be as follows:

Material	Amount for 1 CY of Covered Soil	Amount for 4.6 CY of Covered Soil
Crushed Rock	23.2 cubic feet	4 cubic yards
Topsoil	5.9 cubic feet	1 cubic yard
Soil Binder	13.7 ounces	4 pounds
Water	1.6 gallon	46 gallons

- B. The target moisture content is 20% by weight of the topsoil weight. The above water contents assume the top is dry. The amount of water that will need to be added will be dependent on the moisture content of the raw materials. Actual amounts of water used shall be determined during mixing.

### Part 3. Covered Soil Mixing Procedures

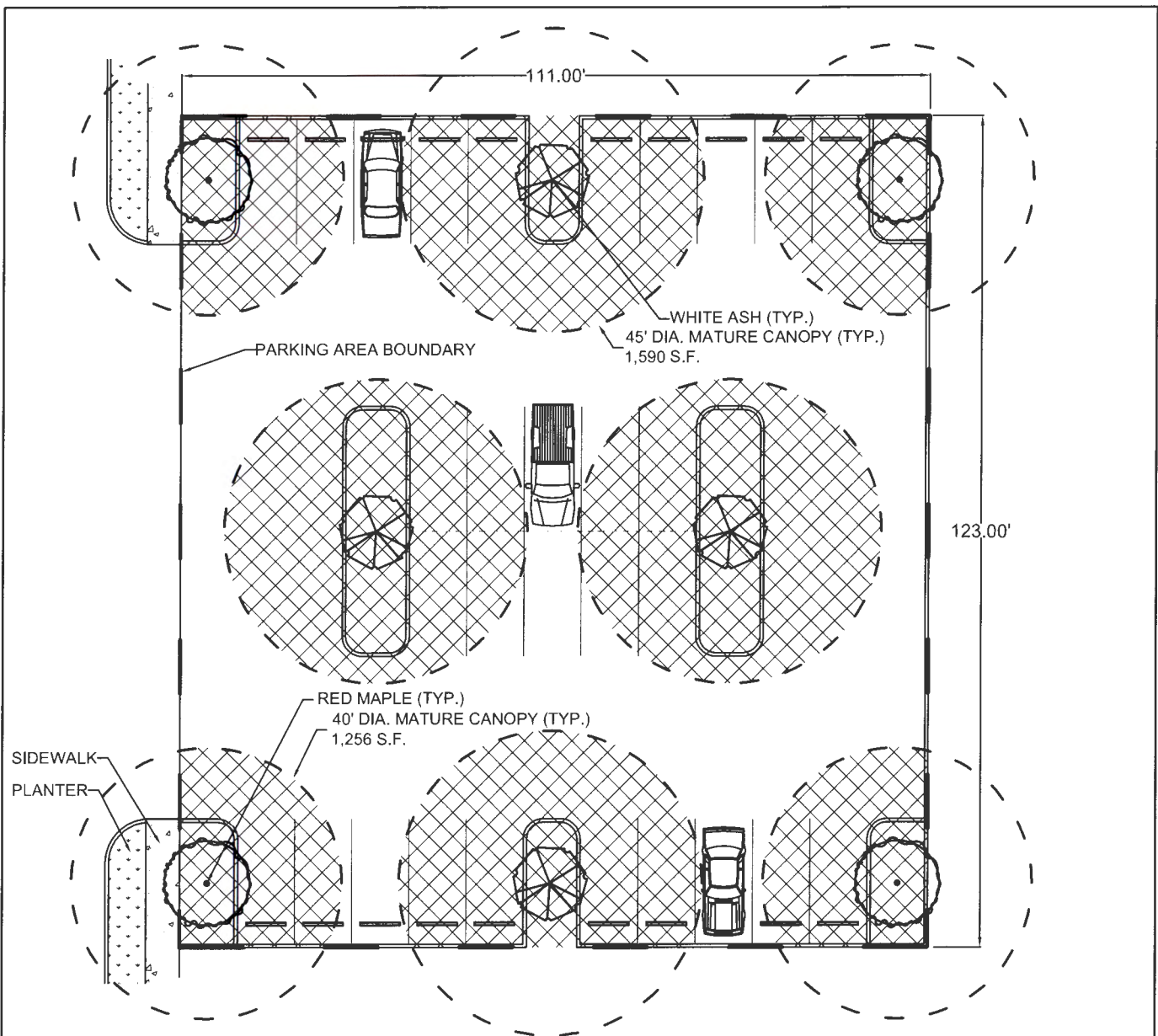
- A. Mix covered soil in batches of an appropriate size for the equipment being used. The end result is to be a material that is uniformly blended together. Do not batch in quantities that will not allow the equipment to completely mix the material. Determine batch size and quantities of each material needed for the batch.
- B. Start with half of the crushed rock material.
- C. Add all of the topsoil material.
- D. Add the soil binder.
- E. Add half of the estimated water.
- F. Add the other half of the crushed rock material.
- G. Mix the material together.
- H. Slowly add water to the mixture and continue to mix. The final amount of water will vary with moisture content of the crushed rock and topsoil. Add water in incremental amounts and mix the material between the additions of water.
- I. Stop adding water and mixing when there is a minute amount of free topsoil remaining. The topsoil will coat the crushed rock and not fall out of the material. All of the crushed rock

shall be uniformly coated with topsoil. There shall be no clumps of topsoil or uncovered crushed rock in the mixture.

- J. If too much water is added to the mixture, water will drain out of the material and the topsoil will wash off of the crushed rock. If this occurs the batch of material shall be discarded and shall not be incorporated into the completed work.

#### **Part 4. Placement of Covered Soil**

- A. Protect soils and mixes from absorbing excess water and from erosion at all times. Do not store materials unprotected from rainfall events. Do not allow excess water to enter site prior to compaction. If water is introduced into the material after grading, allow material to drain or aerate to optimum compaction moisture content.
- B. All areas to receive covered soil mixture shall be inspected by the project landscape architect and/or project engineer before starting placement of mixture. All defects such as incorrect grading, compaction and inadequate drainage, etc., shall be corrected prior to beginning placement of covered soil.
- C. Confirm that the sub-grade is at the proper elevation and compacted as required. Sub-grade elevations shall slope parallel to the finished grade. Clear the excavation of all construction debris, trash, rubble and foreign material. Fill any over excavation with approved fill and compact to the required sub-grade compaction.
- D. Install covered soil in 6-inch lifts and spread uniformly over the area. Compact each lift to at least 85 percent of maximum density. Delay placement 24 hours if moisture content exceeds maximum allowable, protect covered soil with plastic or plywood during delay. Take particular care not to damage utilities when installing covered soil. Covered soil that will be the bedding for utility lines shall be compacted to conform to the required grade of the utility line. Do not compact the immediate vicinity above a utility line until a fill depth of at least 12-inches above the utility line is reached.
- E. Bring covered soils to finished grades as shown in the approved drawings. Immediately protect the covered soil material from contamination by water by covering with plastic or plywood.



TOTAL CANOPY AREA OF PARKING LOT TREES\* = 11,388 S.F.

TOTAL QUALIFYING MATURE CANOPY COVER = CANOPY COVER DIRECTLY OVER THE PARKING AREA IN SQUARE FEET, INCLUDING PLANTING ISLANDS AND AREAS SURROUNDED BY CURB OR HARD SURFACE PAVING ON AT LEAST THREE SIDES.

 TOTAL QUALIFYING MATURE CANOPY COVER = 8,057 S.F.

PARKING LOT AREA = 13,590 S.F.

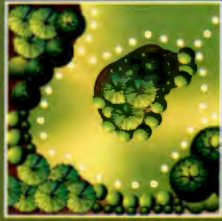
PERCENT ACTUAL CANOPY COVER =  $(8,057 \text{ S.F.}) / (13,590 \text{ S.F.}) = 59\%$

59% IS GREATER THAN THE MINIMUM OF 30% TOTAL QUALIFYING MATURE CANOPY COVER THEREFORE CITY REQUIREMENTS ARE MET.

\*CANOPY AREA PER TREE IS DETERMINED FROM THE VALUE GIVEN IN THE CITY OF TIGARD PARKING LOT TREE LIST FOR A MATURE TREE OF THAT SPECIES.

**EXAMPLE PARKING LOT  
THAT MEETS 30% MINIMUM  
CANOPY COVER  
REQUIREMENT**

NO SCALE  
DWG. NO.  
**APPENDIX 18**



City of Tigard

# Urban Forestry Code Revisions Project

VOLUME I | PROJECT OVERVIEW | JULY 2012

**City of Tigard**  
COMMUNITY DEVELOPMENT DEPARTMENT  
13125 SW Hall Blvd., Tigard, OR 97223  
[www.tigard-or.gov/trees](http://www.tigard-or.gov/trees)



## Acknowledgements

### Tigard City Council

Mayor Craig Dirksen  
Council President Gretchen Buchner  
Councilor Marland Henderson  
Councilor Nick Wilson  
Councilor Mark Woodard

### Tigard Planning Commission

Dave Walsh, President  
Tom Anderson, Vice President  
Dianne Armstrong  
Margaret Doherty  
Calista Fitzgerald  
Andrew Miller  
Matthew Muldoon  
Karen Ryan  
Jason Rogers  
Donald Schmidt  
Richard Shavey

### Citizen Advisory Committee

Scott Bernhard, DC, Parks and Recreation  
Advisory Board  
John Frewing, Citizen at Large  
Ken Gertz, Portland Metropolitan Home  
Builders  
Morgan E. Holen, ISA Certified Arborist  
Bret Licuallen, Tree Board  
Don Schmidt, Planning Commission  
Tony Tycer, Tree Board  
Dave Walsh, Planning Commission  
Brian Wegener, Tualatin Riverkeepers and  
Board Member of OR Community Trees  
John Wyland, Developer

### Project Management Team

Todd Prager, Associate Planner & City  
Arborist, Project Manager  
Marissa Daniels, Associate Planner, Public  
Involvement Lead  
Susan Hartnett, Assistant Community  
Development Director  
Darren Wyss, Senior Planner  
Cheryl Caines, Associate Planner & Code  
Editor  
John Floyd, Associate Planner  
Gary Pagenstecher, Associate Planner

### Technical Advisory Committee

Mark Buffington, ODOT Region 1  
Landscape Manager  
Gus Duenas, Development Engineer  
Ted Kyle, City Engineer  
Ron Kroop, ODOT District 2A Manager  
Steve Martin, Parks and Facilities Manager  
Brian Rager, Assistant Public Works Director  
Damon Reische, Clean Water Services  
Nate Shaub, GIS Analyst  
Albert Shields, Program Development  
Specialist  
Carla Staedter, Surface Water Quality  
Coordinator  
Greg Stout, Grounds and Open Space  
Coordinator  
Mark Van Domelen, Building Official  
Vance Walker, Streets Supervisor

### Additional Tigard Staff Contributors

Marty Wine, City Manager  
Ron Bunch, Community Development  
Director  
Dennis Koellermeier, Public Works Director  
Tom McGuire, Principal Planner  
Doreen Laughlin, Confidential Executive  
Assistant  
Tim Lehrbach, Temporary Planning Assistant

### Consultant Team

Adrienne DeDona, JLA Public Involvement  
Greg Winterowd, Winterbrook Planning  
Keith Jehnke, AKS Engineering and Forestry  
Kirsti Hauswald, AKS Engineering and  
Forestry



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*Community attitude surveys reveal that Tigard Citizens place high value on the protection of trees and are concerned about the impact of development upon existing tree resources.*

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Tigard Comprehensive Plan

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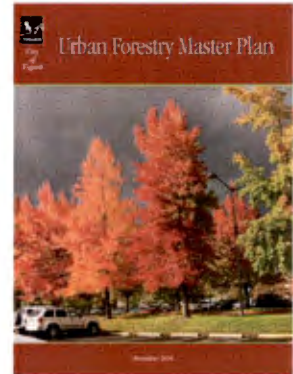
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# Project Introduction

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The City of Tigard has a proud history of commitment to preserving, enhancing and maintaining its urban forest. The city's trees provide an important backdrop for life in Tigard. Unlike natural forests or managed timberland, Tigard's urban forest is a mosaic of native forest remnants and planted landscapes interspersed with buildings, roads and other elements of the built environment. To implement Tigard's Comprehensive Plan as recommended by the Urban Forestry Master Plan, City Council set forth a vision that "Tigard's urban forest is valued and protected by city residents as a thriving, interconnected ecosystem managed to improve quality of life, increase community identity, and maximize aesthetic, economic and ecological benefits."

In pursuit of this vision, council directed staff to undertake the major update of Tigard's urban forestry related code provisions described in the Master Plan. Council intends the new and updated code language to more adequately reflect the needs of our changing and growing community.



The Urban Forestry Master Plan is included in its entirety in Volume V.

## Problem Statement

During the Urban Forestry Master Plan process, a wide range of stakeholders, including community groups, developers and staff, identified concerns about the city's current tree regulations. Key concerns included:

- The code does not promote the preservation of high quality trees.
- The mitigation structure encourages overplanting and the preservation of large diameter trees that are often less likely to survive development impacts.
- The fees for tree removal are excessive.
- The code unfairly burdens those property owners with existing trees more than those owners without trees.
- The code is administratively difficult to implement because it is challenging to track protected and replacement trees in the years and decades following development.
- The code lacks specificity and has conflicts between various provisions, which creates administrative challenges and confusion.
- The code does not require sustainable installation and maintenance methods for trees.
- The code does not provide flexible standards and incentives for preserving native tree groves.



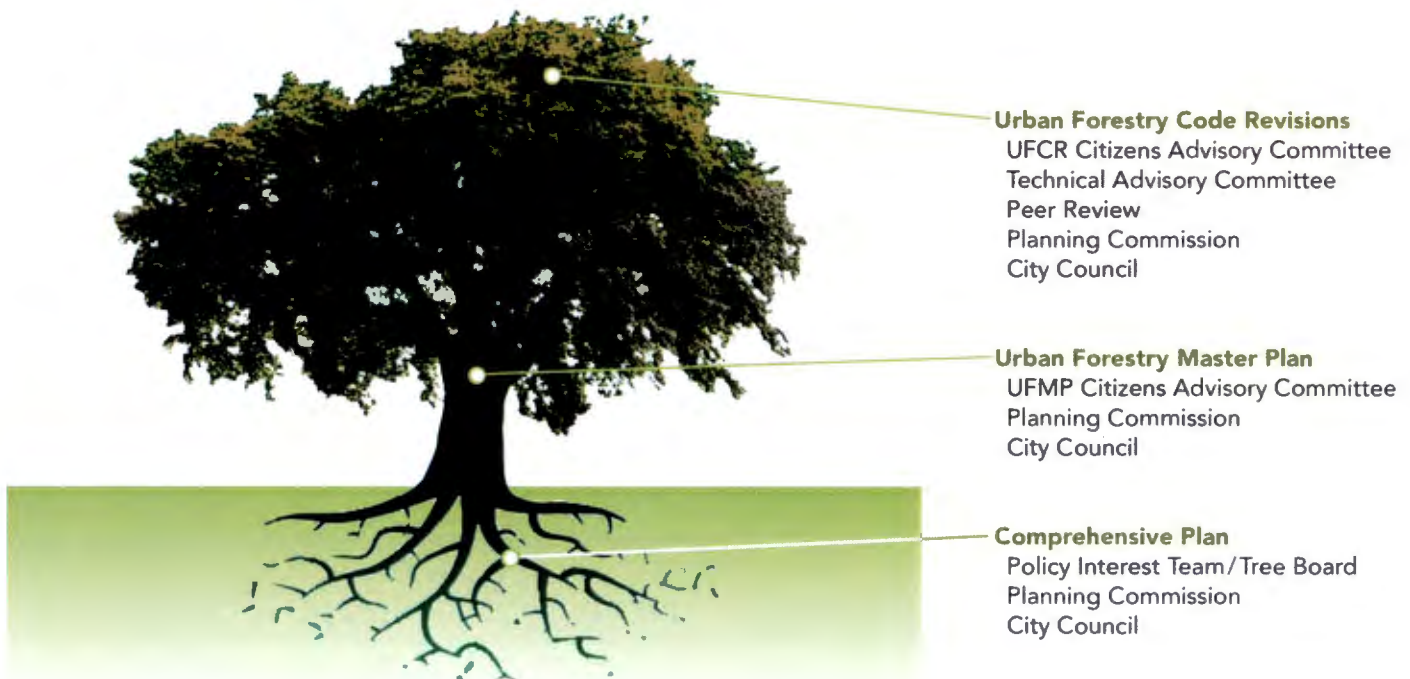
## Goals Statement

Following adoption of the Urban Forestry Master Plan, council directed staff to undertake the Urban Forestry Code Revisions project including:

1. Update Tigard's urban forestry standards for development.
2. Ensure urban forestry standards promote sustainable design and maintenance of the urban forest.
3. Establish an incentive-based program to preserve Tigard's remaining groves of native trees.
4. Develop an equitable and efficient hazard tree identification and abatement program.
5. Improve management of the urban forest by ensuring information is readily available for both the city and the public when making decisions.
6. Promote community-wide participation in urban forest stewardship.

## Collaborative Process

As described above, the Urban Forestry Code Revisions project represents the convergence of community collaboration on several urban forestry related projects. Community input was integral to the completion of both the Urban Forest section of the Comprehensive Plan and the Urban Forestry Master Plan. Public involvement for the Urban Forestry Code Revisions has built on these previous efforts. Led by the Community Development Department, the Urban Forestry Code Revisions Project has involved ongoing, extensive collaboration with city residents and stakeholders, internal city departments such as Public Works and Risk Management, and outside agencies like Clean Water Services.



# Overview of Key Elements

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To implement the project goals, the Urban Forestry Code Revisions project outcomes are presented in five major categories, the key elements of which are described below.

## Urban Forestry Standards for Development (Title 18)

- Requires all major developments to plant or preserve a certain amount of tree canopy to support goals for citywide tree canopy cover. The required tree canopy has been extensively tested and peer reviewed to ensure it is achievable and results in a reasonable balance between trees, open space and development.
- Tree canopy standards are tiered based on zoning. For example, development in low density residential areas will be required to have more tree canopy than in areas of dense zoning, such as downtown Tigard.

“

*Tree Canopy -  
The area above ground  
which is covered by the  
trunk, branches and foliage  
of a tree or group of trees'  
crowns.*

”

Definition, Tigard Urban  
Forestry Code Revisions

## Tree Grove Preservation Incentives (Title 18)

- Provides flexible standards and incentives to preserve large groves of primarily native trees during development. This includes options to have fewer housing units than the code would otherwise require or increase housing units on one part of a property to preserve trees on another part.
- The city identified 70 large groves of primarily native trees covering 527 acres that are eligible for the tree grove preservation incentives. All of the groves have been mapped and property owners have been contacted to raise awareness of the incentives consistent with statewide planning requirements.

## Tree Permit Requirements (Title 8)

- Consolidates existing tree permit requirements scattered throughout the code into the newly created Tigard Municipal Code Title 8 for ease of use. The tree categories that will continue to be protected through a permit process include street trees, trees in sensitive lands, trees required with development, trees planted using the city's Urban Forestry Fund, and Heritage Trees.
- Streamlines the decision-making process without regulating additional tree situations. When the reasons for tree removal are simple (e.g. poor/hazardous condition, damaging structures/infrastructure, etc.) the permitting process will be simple.

When healthy trees are proposed for removal, the public will have an opportunity to comment without requiring an expensive and time consuming land use review.

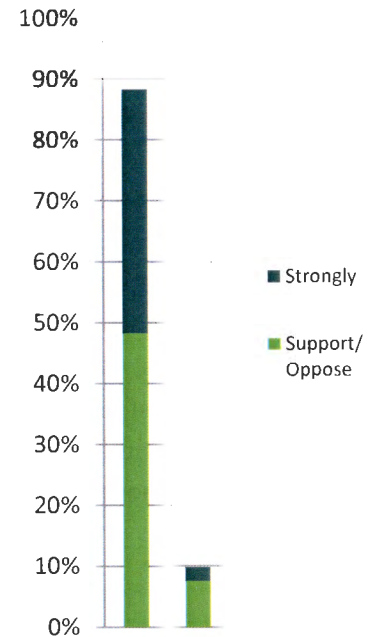
## Hazard Trees (Title 8)

- Creates a process for resolving hazard tree issues in a more equitable, objective and efficient way. While neighbors are encouraged to work out their issues amicably, a third party arborist could be hired to provide an objective voice and a path towards resolution.
- The existing hazard tree process is unclear about the city's role in hazard tree issues. The recommended process clarifies the city's roles which not only makes the process more efficient, but also has the result of limiting the city's legal exposure.

## Urban Forestry Manual

- The Urban Forestry Manual is an essential element of the project because it provides regulatory text in the form of administrative rules that implement the code details in Title 18 and Title 8 described above.
- The Urban Forestry Manual documents most of the city's current administrative practices regarding tree planting, preservation and maintenance which provides certainty to users of the code without making the code itself excessively long.

Would you strongly support, support, oppose, or strongly oppose city regulations that would require that some trees be preserved and new ones planted on sites that are being developed?



\* Excerpted from a statistically valid survey of Tigard residents conducted as part of the 2009 Urban Forestry Master Plan. Full results are available in Appendix A of the Master Plan located in Volume V.

# Organization of the Urban Forestry Code Revisions Documents

The Urban Forestry Code Revisions project is presented in five volumes. Volume I provides the project overview and describes the process used to develop all of the elements. Volume II is the land use elements of the code, and Volume III the non land use elements. Volume IV contains the Urban Forestry Manual. Volume V contains technical reports and research that contributed to the code revisions along with details of the public input and deliberations to date.

## Volume I | Project Overview

Project Overview includes the following sections:

- Project Introduction
- Overview of Key Elements
- Key Element Summaries
  - Urban Forestry Standards for Development
  - Tree Grove Preservation Incentives
  - Tree Permit Requirements
  - Hazard Trees
  - Urban Forestry Manual

**Appendix A** includes additional detail about the information used to shape the Urban Forestry Code Revisions Project, and includes the following sections:

- Process summary
- Summary of Community Ideas and Concerns
- Summary of Planning Commission Deliberations
- Existing Conditions

## Volume II | Land Use Elements

**Community Development Code (Title 18)** is the Planning Commission’s recommended draft of the Development Code. This section includes commentary on the amendments.

**Peer Review** demonstrates how the Planning Commission’s recommended draft of the Development Code and Urban Forestry Manual will work in application.

**ESEE Analysis** is a report that addresses Statewide Planning Goal 5 - Natural Resources requirements for the preservation of Significant Tree Groves.

**Staff Report and findings** includes the staff recommendation for approval of the land use elements (Title 18 and the Comprehensive Plan Amendment) and the findings that demonstrate the land use elements meet the necessary approval criteria.

### **Volume III | Non Land Use Elements**

**Tigard Municipal Code** is the staff proposed draft of the Municipal Code (Title 8 and other Municipal Code titles). This section includes commentary on the amendments.

### **Volume IV | Urban Forestry Manual (Administrative Rules)**

**Urban Forestry Manual** consists of administrative rules that implement the technical details of the urban forestry related code provisions in Title 8, Title 18 and other applicable titles in the Tigard Municipal Code.

### **Volume V | Additional Background Materials**

**Planning Commission Deliberations** details Planning Commission discussion and decisions during the public hearing process.

**Amendment Requests Document for the Planning Commission** lists code amendment requests received in response to the first Planning Commission public hearing and staff responses.

**Outstanding Issues** for the Urban Forestry Code Revisions includes additional information on the outstanding issues that were further deliberated by the Planning Commission before making their final recommendation to City Council on May 7, 2012.

**Log of Input** lists the input received and any code changes from the last meeting of the CAC to the staff proposed draft of the Urban Forestry Code Revisions to Planning Commission.

**CAC Guiding Principles** includes the consensus view of the Citizens Advisory Committee (CAC) developed to help guide the legislative adoption process.

**Tree Values** includes information and current research on the environmental, economic, social and aesthetic benefits of trees.

**Canopy Standards** explains the reasons for adopting tree canopy cover requirements as well as the methods used to arrive at the requirements.

**Soil volume** details research about the soil volume required to support a mature tree canopy.

**Tree Canopy Fee** discusses research used to develop a square foot value for tree canopy.

**Regulatory Comparison** is an excerpted report prepared by Metro and the Audubon Society that summarizes and compares regional urban forestry programs and regulations.

**Urban Forestry Master Plan** is the City of Tigard's recommended plan for achieving the urban forestry goals in the Comprehensive Plan.

# Key Element Summaries

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The following pages summarize the aspects of the proposal that received the most attention throughout the Urban Forestry Code Revisions process.

Below is a guide to the proposal summary:

Category	Land Use or Non Land Use Element	Aspects Covered in Proposal Summary
Urban Forestry Standards for Development	Land Use (Title 18)	<ul style="list-style-type: none"> <li>• Tree Canopy Approach (page 9)</li> <li>• Tree Canopy Requirements (page 12)</li> <li>• Implementation: Urban Forestry Manual (page 14)</li> </ul>
Tree Grove Preservation Incentives	Land Use (Title 18)	<ul style="list-style-type: none"> <li>• Tree Grove Preservation Incentives (page 17)</li> </ul>
Hazard Trees	Non Land Use (Title 8)	<ul style="list-style-type: none"> <li>• Resolution of Hazard Tree Situations (page 20)</li> </ul>
Tree Permit Requirements	Non Land Use (Title 8)	<ul style="list-style-type: none"> <li>• Tree Removal Permits (page 23)</li> <li>• Heritage Tree and Significant Tree Program (page 22)</li> </ul>
Urban Forestry Manual	Non Land Use (Title 8 and Title 18)	<ul style="list-style-type: none"> <li>• The Urban Forestry Manual consists of administrative rules that implement the details of the urban forestry related code provisions. (Page 25)</li> </ul>

At the conclusion of each section the location of additional information within the five volumes is provided.

# Tree Canopy Approach

## Background

The decision to shift Tigard’s urban forestry standards for development to a tree canopy approach has been the subject of several community conversations, first at the Citizens Advisory Committee (CAC) and then at the Planning Commission. A more detailed summary of the tree canopy approach discussions can be found in the appendix to Volume I.

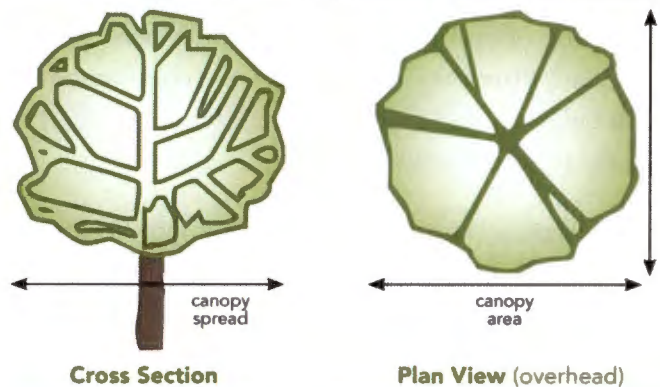
The CAC’s consensus recommendation was that the tree canopy approach, which requires development to achieve a certain percentage of tree canopy through planting or preservation, is the best way to address previously raised community concerns.

During past planning processes, there was general agreement that the existing development code unfairly burdens property owners with existing trees and encourages the overplanting of replacement trees. The reasoning was that mitigation requirements apply only to property owners with existing trees over 12-inch trunk diameter, and replacement trees or fees are required based on the diameter of trees removed.

For example, if a 12-inch diameter tree is removed, replacement with 6, 2-inch diameter trees or a \$1,500 fee in lieu of replacement (\$125/inch fee) is required. While property owners without any trees get off “scot-free”, property owners that have been stewards of their trees over the years could pay into the hundreds of thousands of dollars to make way for development.

During the Urban Forestry Master Plan process, the community recommended addressing this equity issue as part of the development code revisions by creating “... canopy cover... requirements for all lots to be met by either preserving existing trees or planting new trees”. Council concurred during acceptance of the Master Plan.

## TREE CANOPY



### Definition

▲ “Tree Canopy” - The area above ground which is covered by the trunk, branches and foliage of a tree or group of trees’ crowns.

This means that regardless of what a property looks like before development, a certain standard of tree canopy should be met after development is complete.

While the Planning Commission supported the CAC consensus recommendation for a tree canopy approach, key changes were made to the proposal by the Planning Commission, in response to public input, which include:

- Reducing the amount of tree canopy required for higher density residential development;
- Allowing required tree canopy to be measured for the overall development site rather than individual lots for higher density residential development and non-residential development; and
- Granting bonus credits for planting native trees.

Additional details on the tree canopy approach can be found in the Canopy Standards memo in Volume V.



# Tree Canopy Approach

## Innovative Approach

While the tree canopy approach is innovative, the CAC and Planning Commission were comfortable with being on the leading edge and felt it was right for Tigard for three main reasons:

- The canopy approach allows maximum flexibility for the project designer to meet code requirements.
- The canopy approach is more consistent with urban forest science and the city's long-term urban forestry goals. It encourages large stature, appropriately spaced trees, which have the highest benefit/cost ratios.
- The canopy approach requires the project designer to consider future canopy growth, which helps ensure that trees are properly placed within a site to become long-term amenities. It encourages appropriate tree spacing and setbacks from buildings by highlighting mature canopy growth.

The tree canopy approach has the added benefit of supporting the community's long term urban forestry goals to increase tree canopy citywide from the current amount of 24% to 32% by 2027, and 40% by 2047.

## Tree Mitigation vs. Canopy Approach

The following two examples on page 12 demonstrate some of the differences between the tree mitigation approach in the current code and the tree canopy approach in the proposed code. In the current code, mitigation requirements often result in the planting of many, closely spaced trees. This is not only incompatible with most people's landscape design preferences, but overcrowding of trees can be a detriment to long term tree health and stability. In the proposed code, tree canopy requirements ensure adequate spacing which accounts for the long term growth of trees while allowing for aesthetically pleasing landscape design.



### Planning Commission

◀ Commissioners took a significant amount of time to receive public testimony and deliberate on the proposal.

## Peer Review

Staff and consultants extensively tested the tiered tree canopy requirements on a wide range of development projects to ensure they are achievable, result in a reasonable balance between trees and development, and do not force typical development projects to pay a fee in lieu of canopy or utilize the discretionary review option.

The peer review results demonstrate that these goals have been met. The Planning Commission concurred after studying the peer review and discussing the results at length with staff and consultants during their public hearing process. The peer review can be found in Volume II.

## For More Information

Canopy Standards Memo: Volume V

Peer Review: Volume II

Summary of Community Ideas and Concerns, Urban Forestry Standards for Development: Volume I

Planning Commission Deliberations: Volume I

Urban Forestry Master Plan: Volume V

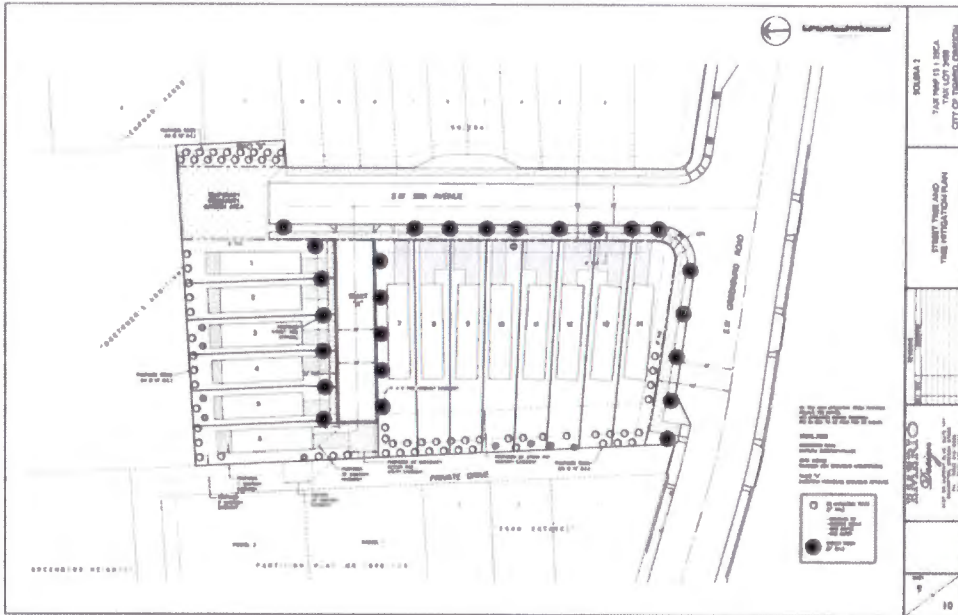
Tree Canopy Fee Memo: Volume V

Tree Values Memo: Volume V

Portland Metro Area Regulatory Comparison Report: Volume V

# Tree Canopy Approach

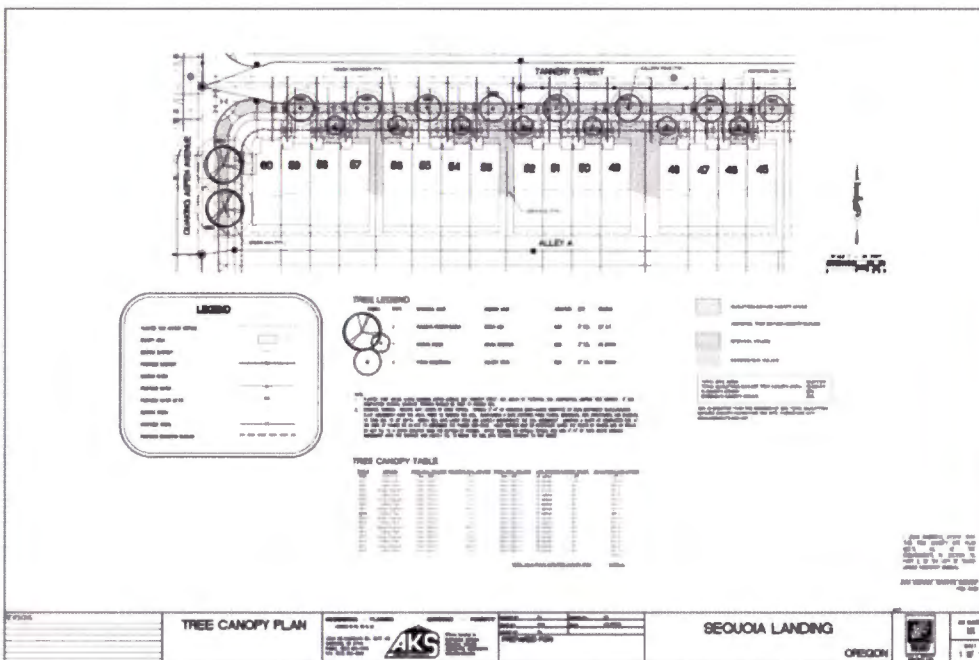
## Tree Planting Plan - Current Code



## Benefits of the Proposed Code

◀ The first site plan shows how tree mitigation requirements in the existing code are met. Note that this plan includes Douglas-firs planted 10 feet on center with up to 8 trees in the backyards of lots. This is incompatible with most people's landscape design preferences.

## Tree Planting Plan - Proposed Code



◀ The second site plan shows how proposed tree canopy requirements, which do account for the future growth of trees, with appropriate spacing and setbacks from buildings, could be met. The second site plan is also desirable because the design enhances street tree canopy, prove to have high environmental benefits and increase the value of surrounding real estate.

# Tree Canopy Requirements

## Summary

The Urban Forestry Standards for Development represent the biggest change from existing to proposed code. A shift in focus from development mitigation requirements to a tree canopy approach is a cornerstone of the proposed code.

Currently, tree planting and preservation requirements are determined by the number and trunk diameter of existing trees on the site during land use review. So, if you have few trees to begin with, few trees will be required with development.

In the Planning Commission’s recommendation for Title 18, each development within the same zone starts with the same requirements, and these requirements are calculated using tree canopy. Hence, the name “tree canopy approach.”

## How it works

- ▶ Chapter 18.790: Urban Forestry Plan sets out effective tree canopy targets for the following types of land use review: Conditional Use, Downtown Design Review, Minor Land Partition, Planned Development, Sensitive Lands Review, Site Development Review, and Subdivisions. See Volume II for Chapter 18.790.
- ▶ The Urban Forestry Manual sets specific tree canopy requirements based on zoning: 40%, 33% or 25% effective canopy across the development. See Volume IV for the details on calculating percent tree canopy.
- ▶ Developers have four options they can combine to meet the effective tree canopy requirements:
  - Preservation
  - Planting
  - Fee in lieu
  - Discretionary Review

- ▶ In the proposal, preservation of existing trees receives 200% canopy credit to incentivize preservation. Planting of native trees also receives bonus credits to encourage species which contribute to Tigard’s sense of place.
- ▶ Bonding is required to ensure the establishment of all newly planted trees which is consistent with the city’s current practice.

## Meeting Canopy Targets ▼

In their guiding principles, the CAC set a preference for flexibility in meeting the tiered tree canopy requirements.



### Preservation

Trees in good condition, suitable for preservation and of appropriate species receive 200% credit based on their existing canopy area.



### Planting

The calculated mature canopy area of all trees planted receive canopy credit, native trees receive credit for 125% of their mature canopy area.



### Fee-in-Lieu

A fee can be paid for planting or preserving trees elsewhere.



### Discretionary Review

Innovative, alternate development proposals that provide equivalent environmental benefits (hydrological, climate or wildlife) can be used instead of planting or preserving trees.

# Tree Canopy Requirements

## Tiered Tree Canopy Requirements

### Tier 1



Effective tree canopy: 40%  
 Actual onsite tree canopy: 16-40%  
 Zones: Low and Medium Density Residential

### Tier 2



Effective tree canopy: 33%  
 Actual onsite tree canopy: 13-33%  
 Zones: Medium-High and High Density Residential; Neighborhood, Community, General, and Professional/Administrative Commercial; Mixed-Use Employment, Commercial, and Residential; and Industrial Park

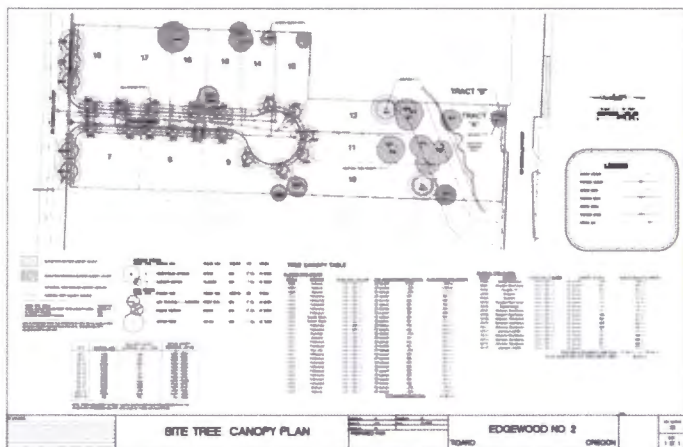
### Tier 3



Effective tree canopy: 25%  
 Actual onsite tree canopy: 10-25%  
 Zones: Mixed Use Central Business District, Mixed Use Commercial-1; Light and Heavy Industrial; and schools in all zones

**Tree Plan Requirements**

▼ In the proposed code urban forestry plans will be required for development projects requiring higher levels of review (Type II or III). Tree plan requirements are included in the Urban Forestry Manual.



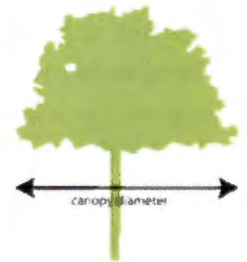
## Effective vs. Actual Onsite Canopy

The term effective tree canopy is used to distinguish the actual tree canopy that may be present within the lot lines of a particular development. To meet effective tree canopy requirements, the preservation of existing trees is granted 200% canopy credit, the planting of native trees is granted 125% canopy credit and planting of street trees is granted full canopy credit even though half of their canopies overhang streets, which are not part of the calculations.

The end result is that even though a particular development may have a 40% effective tree canopy requirement, as little as 16% of the development may actually be covered in tree canopy.

**Mature Canopy Area**

► The expected canopy area for a list of common street trees, parking lot trees and native trees are included in the Urban Forestry Manual.



## For More information

- Urban Forestry Plan Requirements (Development Code, 18.790.030): Volume II
- Discretionary Urban Forestry Plan Review Option (Development Code, 18.790.040): Volume II
- Peer Review: Volume II
- Urban Forestry Plan Standards (Urban Forestry Manual, Section 10): Volume IV

# Implementation: Urban Forestry Manual

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## Summary

The Urban Forestry Manual, which can be found in Volume IV, consists of administrative rules that implement the details of the urban forestry related code provisions. Sections 10 through 13 of the Urban Forestry Manual contain some of the more significant implementation details for the Urban Forestry Standards for Development, such as Urban Forestry Plan requirements, Tree Canopy and Fee-In-Lieu calculations, and Soil Volume requirements. The details for implementing the Urban Forestry Standards for Development in Title 18 are described below.

## How it Works

The Urban Forestry Manual contains administrative rules that implement the details of the urban forestry related code provisions, and is organized into 13 sections. Sections 1 through 9 address tree situations outside of the land use process; hazard trees and street trees are examples. Sections 10 through 13 include the Urban Forestry Standards for Development, which are more fully described below:

Section 10 of the Urban Forestry Manual specifies:

- ▶ Site plan requirements documenting:
  - Trees to be removed or preserved with development (Volume IV, Section 10, Part 1), and
  - The location, species, size and mature canopy of trees to be planted (Volume IV, Section 10, Part 2).
- ▶ Arborist or landscape architect report requirements documenting:
  - Detailed information on each tree shown to be removed, planted or preserved on the site plans (Volume IV, Section 10, Part 3);
  - The effective tree canopy cover; and
  - Tree canopy fee calculations (Volume IV, Section 10, Part 4).

- ▶ Significant tree grove preservation considerations (Volume IV, Section 10, Part 5).

Section 11 of the Urban Forestry Manual specifies implementation standards such as monitoring requirements during development. Sections 12 and 13 detail soil volume standards for street and parking lot trees.

## Calculations

Detailed information about how to calculate effective tree canopy cover is in Section 10, Part 3.M of the Urban Forestry Manual. Here are some of the highlights:

- Tigard citizens favor native trees because they create a strong sense of place. Planting native trees is encouraged by applying their mature canopies at 125%.
- Tigard citizens value healthy mature trees because they are irreplaceable. Preservation of healthy mature trees is encouraged by applying their existing canopies at 200%.
- Tigard citizens value street trees because leafy, tree lined streets help make Tigard “A Place to Call Home”. Street trees are encouraged by granting full canopy credit even though the canopy may cover the street and not the development.

Through strategic site design and species selection, all three of the options described above could be used to minimize the relative amount of tree canopy to open space and development if desired by the project applicant.

# Implementation: Urban Forestry Manual

## Fee in lieu

Although the recommended code has been designed so that the tree canopy requirements are achievable on the typical range of development projects in Tigard, some property owners may just not want any trees on their lot.

The CAC and Planning Commission included a fee in lieu mechanism to address this personal preference while recouping the value of tree canopy for use in tree planting, preservation and other urban forestry program activities elsewhere in the community.

The tree canopy fee in lieu option is described in detail in the Tree Canopy Fee Memo in Volume V. The CAC and Planning Commission decided the tree canopy fee in lieu is a fair and reasonable proposal since it is based on the International Society of Arboriculture’s tree appraisal methodology. In fact, the fee in the proposed code is lower than the fee in lieu in the existing code.

### Fee Comparison

▼ Tigard staff calculated the fee per caliper inch of several local jurisdictions as an approximation in order to establish a common unit for comparison.

City	Fee Per Caliper Inch
City of Tigard (existing)	\$125
City of Tigard (proposed)	\$87
Beaverton	\$45 - \$100
Lake Oswego	\$164
Oregon City	\$145
Portland	\$300
West Linn	\$87.50
Wilsonville	Market Price
Vancouver, WA	Market Price

## Soil Volumes

Trees need soil to grow. In fact, there is a direct relationship between the amount of soil provided and the mature size of trees.

The Urban Forestry Manual includes minimum soil volume standards for street trees and parking lot trees because these tree types are not typically provided adequate soil volumes. Council prioritized increasing tree canopy over streets and parking lots through the Urban Forestry Master Plan. The soil volume concept is described in the Soil Volume memo in Volume V. The details of calculating soil volumes for street trees are in Section 12 of the Urban Forestry Manual and for parking lot trees are in Section 13 of the Urban Forestry Manual in Volume IV.

For street trees, soil volumes standards are tied to the width of the sidewalk. For parking lot trees, 1000 cubic feet of soil volume is required per tree. In addition, parking lots are required to be designed to achieve 30% tree canopy cover at tree maturity.

Right of Way Width (feet)	Minimum Soil Volume Requirement (cubic feet per tree)
Up to 10	400
Over 10 up to 12	500
Over 12 up to 14	600
Over 14 up to 16	700
Over 16 up to 18	800
Over 18 up to 20	900
Over 20	1000

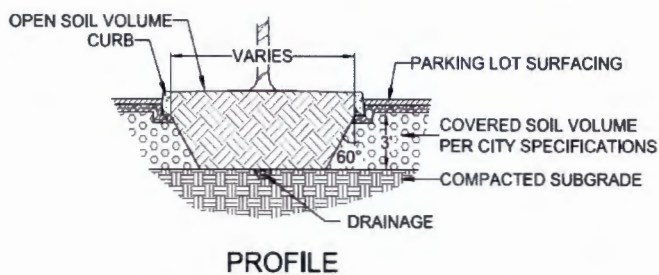
### Soil Volume Standards

▲ For street trees, soil volumes standards are tied to the width of the sidewalk.

# Implementation: Urban Forestry Manual

## Structural Soils

On some development sites, there may not be enough room to provide open soil areas because more parking or paving is needed. In these cases, structural soils may be used under paving to provide trees with the soil volumes they need to grow



### Structural Soils

▲ Appendix 17 of the Urban Forestry Manual includes example covered soil volume specifications and includes requirements for materials, placement, etc.

## For More Information

Urban Forestry Plan Standards (Urban Forestry Manual, Section 10) Volume IV

Urban Forestry Plan Implementation Standards (Urban Forestry Manual, Section 11): Volume IV

Street Tree Soil Volume Standards (Urban Forestry Manual, Section 12): Volume IV

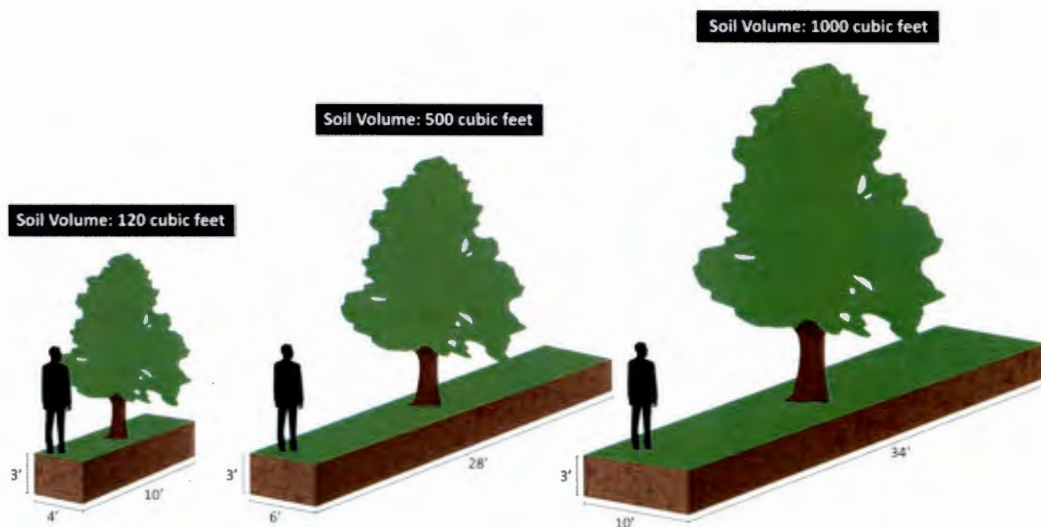
Parking Lot Tree Canopy Standards (Urban Forestry Manual, Section 13): Volume IV

Peer Review: Volume II

Canopy Standards Memo: Volume V

Soil Volume Memo: Volume V

Tree Canopy Fee Memo: Volume V



### Size Potential

◀ There is a direct relationship between the amount of soil provided and the size potential of trees. Soil volume standards are included in the proposal for street and parking lot trees.

# Tree Grove Preservation Incentives

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## Summary

The Urban Forestry Master Plan brought to light that while residents prioritize tree grove preservation, the city's large groves are disappearing. In eleven years, from 1996 to 2007, there was a 24% decline in large tree groves in Tigard. As such, council provided direction through the Urban Forestry Master Plan to, "Establish an incentive-based program to preserve Tigard's remaining groves of native trees."

Flexible standards and incentives are allowed under the proposed code to facilitate the preservation of the city's remaining tree groves. These standards and incentives were developed in compliance with statewide Goal 5 requirements and allow:

- Waiver of minimum density requirements (less units than otherwise required by code),
- Density transfer from the tree grove to the non-tree grove portion of a site,
- Attached units,
- Flexible setbacks,
- Flexible lot sizes,
- Flexible street widths, and
- Increased building heights for commercial and industrial development.

The Tree Grove ESEE analysis in Volume II describes the significant tree grove designation process. Section 18.790.050.D of the Tigard Development Code in Volume II includes the flexible code standards and incentives.

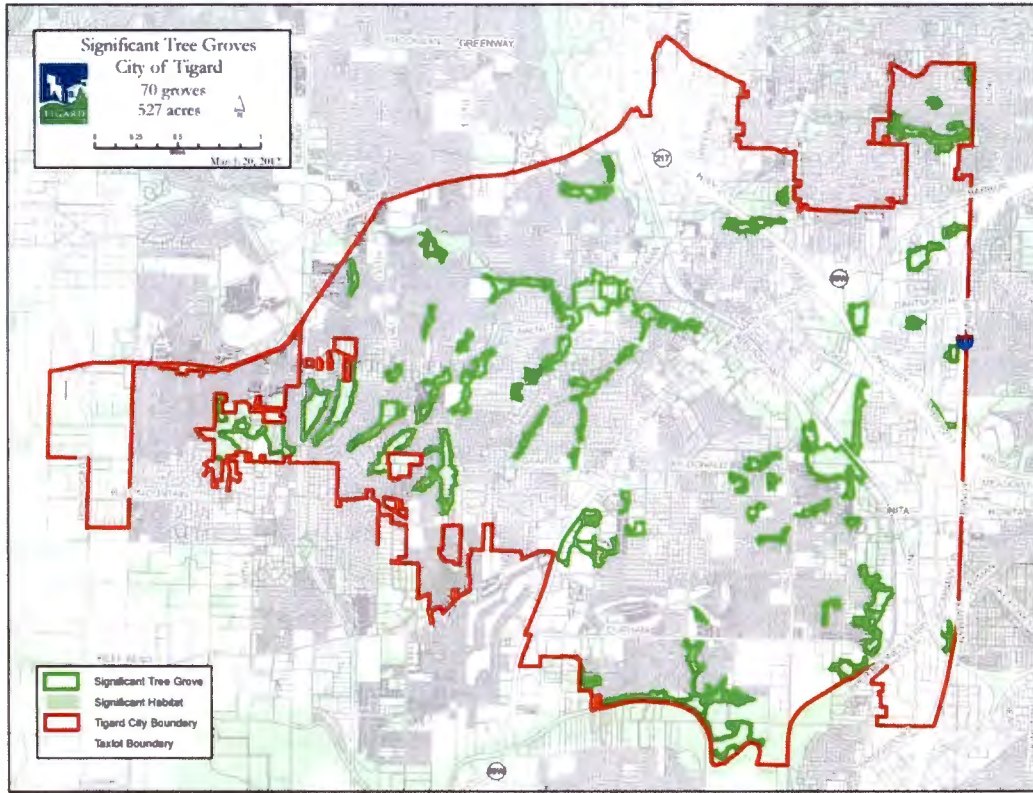
While 527 acres of tree groves are eligible, the 114 acres of tree groves on the city's buildable lands inventory are most likely to be developed and therefore utilize the flexible standards and incentives. All options are designed to increase flexibility and reduce costs for developers to preserve at least a portion of a tree grove.

## How it Works

- ▶ A map of significant tree groves will be adopted into the Comprehensive Plan and maintained by the Community Development Director.
- ▶ In order to qualify for these flexible standards and incentives a new development must:
  - Contain at least 10,000 square feet of significant tree grove outside of protected sensitive lands,
  - Preserve at least 50% of tree grove onsite, and
  - Permanently protect the tree grove, such as by placing it in an open space tract.
- ▶ Project applicants will be required to work with a certified arborist or landscape architect to maximize the connectivity and viability of the preserved portion of a tree grove. Section 10, Part 5 of the Urban Forestry Manual in Volume IV includes Significant Tree Grove Preservation Considerations that will be used to guide which portion of a tree grove to preserve.
- ▶ Neighborhood compatibility components have been included in the flexible standards and incentives.



# Tree Grove Preservation Incentives



## Significant Tree Groves Map

◀ The city identified 70 large groves of primarily native trees covering 527 acres, including 114 acres within the city's buildable lands inventory. This map will be adopted as part of the UFCR project.

## Goal 5 ESEE Analysis

To develop these new flexible standards and incentives, the city was required to follow the statewide Goal 5 requirements. The city hired a consultant to inventory Tigard's tree groves, evaluate the economic, social, environment, and energy (ESEE) consequences of preservation, and to assist in collaborating with affected property owners. 70 large groves of primarily native trees covering 527 acres have been deemed eligible for the flexible standards and incentives, including 114 acres within the city's buildable lands inventory.

The city held two tree grove open houses: one during the inventory phase, and another later in the process to discuss the draft code standards and incentives for tree grove preservation. At the first open house tree grove property owners were somewhat concerned that the city was trying to limit their property rights. However, at the second open house they realized that

the flexible standards and incentives were designed to provide them with additional development options that they would not otherwise have but for the presence of their tree groves. The Tree Grove ESEE Analysis in Volume II demonstrates that the city's process of developing the Tree Grove Preservation Incentives complies with statewide Goal 5 requirements and reflects the local values of the Tigard community.

## For More information

Flexible Standards and Incentives for the Preservation of Significant Tree Groves (Development Code, 18.790.050.D): Volume II

Significant Tree Grove Preservation Considerations (Urban Forestry Manual, Section 10, Part 5): Volume IV

Tree Grove ESEE Analysis: Volume II

# Tree Grove Preservation Incentives

## Tree Grove Preservation Example

### Option 1: Standard lot subdivision, no tree grove preserved



Average Lot Size: 75-8500 sq. ft.  
Number of Units: 28

### Option 2: Standard lot subdivision, all tree grove preserved



Average Lot Size: 75-8500 sq. ft.  
Number of Units: 15  
Minimum Density Waived

### Option 3: Standard and small lot subdivision, portion of tree grove preserved



Average Lot Size: 75-8500 sq. ft. and 35-4500 sq. ft.  
Number of Units: 11 standard, 17 small lot  
28 Units Total

# Resolution of Hazard Tree Situations

## Summary

It is important to recognize that trees are massive living organisms within the urban environment. Trees can sometimes quickly change from healthy specimens to weak, dead or unstable hazards to people or property around them. In recognition of the risks posed by trees, during the Urban Forestry Master Plan process the community recommended and council accepted “develop[ing] a hazard tree identification and abatement program.”

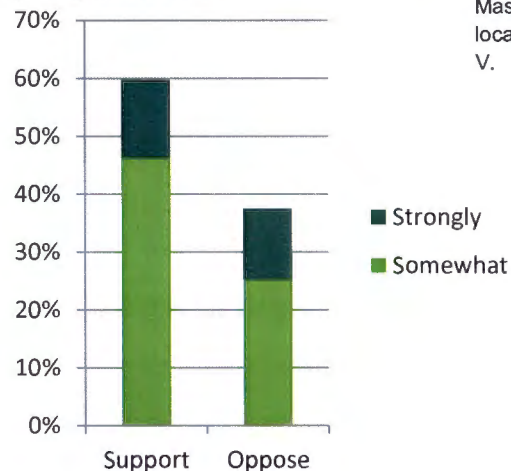
The CAC followed through on this council directive noting in their guiding principles, “When managing the urban forest, safety shall be of primary importance, and clear code standards and procedures for addressing hazard trees creates the regulatory framework for minimizing tree risk.”

Hazard trees are prohibited in both the current and the proposed Tigard Municipal Code. Currently the definition of hazard tree is unclear and there is a lack of understanding about what the city’s role in disputes between private property owners should be. The proposed code provides clarity about what constitutes a hazard tree and sets forth a process for resolving disputes. The purpose, as defined in Chapter 8.06 of the Municipal Code in Volume II is to “protect the health, safety, and welfare of people within the City of Tigard by establishing standards and procedures for the identification, evaluation and abatement of hazard trees.” The Hazard Tree Evaluation and Abatement Procedures are detailed in Section 1 of the Urban Forestry Manual in Volume IV.

## How it Works

- ▶ The definition of “hazard tree” is now consistent with the standardized rating system developed by the International Society of Arboriculture. This helps to remove subjectivity during the hazard tree evaluation

Currently, if there is a dispute between neighboring property owners regarding a potentially hazardous tree, the City does not get involved, and instead directs the neighbors to work out a solution through civil means. Would you strongly support, support, oppose, or strongly oppose the creation of a program where the city would become involved in disputes between neighbors regarding hazard trees?



\* Excerpted from a statistically valid survey of Tigard residents conducted as part of the 2009 Urban Forestry Master Plan. Full results are available in Appendix A of the Master Plan located in Volume V.

process by using industry standard methods and terminology.

- ▶ When there are disputes between private property owners, the owners are required to present clear evidence that they tried to work the issue out themselves before involving the city.
- ▶ When the city does become involved, a third party arborist would be hired to conduct the evaluation in order to provide an objective voice while at the same time limiting the city’s legal exposure.
- ▶ If the arborist does determine there is a hazard, abatement would be required according to a specified timeframe.

In drafting these processes staff worked closely with the city’s risk division and attorney. Both agree that the proposal creates an efficient and effective framework for addressing hazard trees while not unduly exposing the city to liability.

# Resolution of Hazard Tree Situations

## Abatement Procedures

The Hazard Tree Evaluation and Abatement Procedures include the options of 1) *informal reconciliation* between parties without city involvement; or 2) *formal reconciliation* where the claimant submits an application, provides information, and pays fees. The city documents informal reconciliation and ensures abatement and apportionment of costs by private property owners or through city action.

As with the current code, if there is an eminent threat to public safety, the city has the authority to immediately abate the hazard instead of following the procedures described in Section 1 of the Urban Forestry Manual.



### Standing

◀ After discussion, the CAC reached consensus that individuals or organizations who can demonstrate their life, limb or property is at risk by a tree in question have the right to file a hazard tree dispute resolution application. This is intended to limit the concern that people could use the hazard tree process as a means of harassment or intimidation.

### Definition

▲ The definition of hazard tree incorporates by reference the probability of failure, size of defective part and target area.

### For More information

Tigard Municipal Code (Chapter 8.08): Volume III  
Hazard Tree Evaluation and Abatement Procedures (Urban Forestry Manual, Section 1): Volume IV

# Heritage Tree and Significant Tree Program

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## Summary

Tigard's Heritage Tree Program was established in 2005 to identify and raise public awareness of rare and/or exceptional trees due to their age, size, species, horticultural quality or historical importance. The Heritage Tree Program is voluntary, initiated by the owners of the trees.

Once approved by City Council, Heritage Trees becomes protected via deed restriction. In exchange, the property owners receive city assistance with tree maintenance, a plaque, and recognition on the city map and website.

Although the city has the capacity to designate up to two Heritage Trees per year, only four Heritage Trees have been designated since 2005. Some property owners have expressed concern about the deed restriction requirement as a reason for not applying for designation since they would lose flexibility for removing a Heritage Tree in the future.

To address these concerns, the CAC recommended establishing two tracks for publicly recognizing landmark trees. The Heritage Tree track is consistent with the city's existing Heritage Tree Program while the Significant Tree track provides for public recognition without the associated protections from removal. These tracks are detailed in Chapter 8.18 of the Tigard Municipal Code in Volume II.

## How it Works

A two track designation system is proposed for publicly recognizing trees.

- ▶ The Heritage Tree track provides city assistance for maintenance in exchange for regulatory protection.
- ▶ The Significant Tree track allows trees to be publicly recognized without regulatory restrictions. Significant Trees would not be eligible for city assistance for maintenance since the property owner could choose to remove the tree at any time.

## For More Information

Tigard Municipal Code (Chapter 8.18): Volume III



### Monkey-Puzzle Tree

◀ This significant tree, *Araucaria araucana*, is located at SW 103<sup>rd</sup> in Tigard.

# Tree Removal Permits

## Proposal Summary

The following categories of trees are currently regulated by the city:

- Street and median trees,
- Trees in sensitive lands,
- Trees that were required with development,
- Trees that were planted using the Urban Forestry Fund, and
- Heritage trees.

In the proposed Title 8, these categories of trees will continue to be regulated, with no expansion of regulations to additional categories. The most notable change in this topic area is the creation of a consolidated permit system to make the permitting process clear, consistent and user friendly.

The CAC agreed that a consolidated permit system to address these protected categories of trees would make the permitting process more efficient. The group favored a dual track approach with automatic approval through a no- or low-fee process for trees that are in poor or hazardous condition, damaging property or preventing allowed development. A discretionary track would allow more unique situations to be addressed, when there is nothing

wrong with the tree itself, but benefits such as views, solar access or a landscape redesign outweigh the benefits provided by the tree. The discretionary track would allow the public an opportunity to comment without requiring an expensive and time consuming land use review often required by existing code.

The group agreed not to expand the regulations to additional categories of trees.

## For More Information

Tree Permit Procedures (Tigard Municipal Code, 8.04): Volume III, p. xx

Tree Removal Requirements (Tigard Municipal Code Chapter 8.10 – 8.16): Volume III, p. xx

Tree Removal Approval Criteria (Urban Forestry Manual Sections 3-9): Volume IV, p. xx

### Tree Permit Comparison

Tigard currently requires tree removal permits for the categories of trees listed below. The CAC desired the new code to consolidate the permitting process to make it clearer, consistent and user friendly. ▼

Tree Category	Permit Required In		Issues with current code
	Proposed Code	Current Code	
Street and median trees	☑	☑	<ul style="list-style-type: none"> <li>▪ No criteria, so removal is always approved.</li> </ul>
Sensitive lands	☑	☑	<ul style="list-style-type: none"> <li>▪ Currently approval based on erosion, which is difficult to quantify, so permits are almost always approved.</li> <li>▪ The current fee is nearly \$300, which is a significant cost for a process with limited community benefit.</li> </ul>
Required with development	☑	☑	<ul style="list-style-type: none"> <li>▪ To remove a tree required with development, the original land use permit would need to be modified. This is significantly costly and time consuming.</li> </ul>
Urban Forestry Fund	☑	☐	<ul style="list-style-type: none"> <li>▪ Developing and tracking separate written agreements for each planting project is an administrative challenge.</li> </ul>
Heritage Trees	☑	☑	<ul style="list-style-type: none"> <li>▪ Heritage Trees are approved by Council and may only be removed if Council agrees or if they die.</li> </ul>

# Tree Removal Permits

## How it Works

- ▶ Proposed Tigard Municipal Code Chapter 8.04 in Volume II establishes a framework for all tree permit decisions.
- ▶ Permits can be approved by way of two processes: either a staff process for simple situations or a city board or committee for more complex situations.
- ▶ Replacement is required through planting or a fee in lieu when protected trees (except heritage trees) are removed.
- ▶ The approval criteria for removing each of the protected categories of trees can be found in the Urban Forestry Manual:
  - Street and median trees (Section 3 and Section 5)
  - Trees in sensitive lands (Section 6)
  - Trees that were required with development (Section 7)
  - Trees that were planted using the Urban Forestry Fund (Section 8)
  - Heritage Trees (section 9)

## Is a tree permit required?

Yes	No
Street and median trees Trees in sensitive lands Trees required with development Trees planted using the Urban Forestry Fund Heritage trees	All other situations

## What type of permit is required?

Simple	Complex
For example, trees: <ul style="list-style-type: none"> <li>▪ In poor or hazardous condition</li> <li>▪ Considered a nuisance</li> <li>▪ Damaging structures or infrastructure</li> <li>▪ Preventing allowed development</li> </ul>	For example, trees: <ul style="list-style-type: none"> <li>▪ Blocking views or solar access</li> <li>▪ Not desirable due to species or personal preferences such as aesthetics or location</li> </ul>

## What is the process?

Simple	Complex
City staff review based on approval criteria listed in the Urban Forestry Manual	City board or commission uses discretion to weigh tree benefits and reasons for removal

## Trees on City Property

The Citizen’s Advisory Committee didn’t continue current code into proposal, voting to remove the “Trees on City Property” section in favor of consistent regulations that applied to all properties in Tigard, regardless of ownership.

- ▶ *Early Morning Light*  
By Paul August



# Urban Forestry Manual

## Summary

The Urban Forestry Manual in Volume IV consists of administrative rules that implement the details of the urban forestry related code provisions in Title 8, Title 18 and other applicable titles in the Tigard Municipal Code.

These administrative rules were developed for the Urban Forestry Code Revisions project to document most of the city's current administrative practices regarding tree planting, preservation and maintenance without making the code excessively long. For example, administrative items such as planting specifications, tree lists and methods for calculating tree canopy are more appropriate in an administrative

manual rather than in the code. Also when administrative changes are required such as adding or subtracting trees from the tree lists, the amendment process for administrative rules is more efficient while at the same time providing for adequate public notice and the opportunity for public participation.

## How it Works

- ▶ Once authorized by council, the city manager may create and amend administrative rules according to the public process detailed in Chapter 2.04 of the Tigard Municipal Code.

## Topics

Urban Forestry Manual		
Section	Description	Code Title Implemented
1	Hazard Tree Evaluation and Abatement Procedures (creates a process for the reconciliation of hazard tree disputes between neighboring property owners)	Title 8
2	Street Tree Planting and Maintenance Standards (creates a process for property owners to plant and maintain trees along streets)	Title 8
3	Street Tree Removal Standards (creates a process for property owners to remove trees along streets)	Title 8
4	Median Tree Planting and Maintenance Standards (creates a process for the city to plant trees in center landscape medians within streets)	Title 8
5	Median Tree Removal Standards (creates a process for the city to remove trees in center landscape medians within streets)	Title 8
6	Sensitive Lands Tree Removal and Replacement Standards (creates a process for property owners to remove and replace trees within sensitive lands)	Title 8
7	Development Tree Removal and Replacement Standards (creates a process for property owners to remove and replace trees that were required with development)	Title 8
8	Urban Forestry Fund Tree Removal and Replacement Standards (creates a process for property owners to remove and replace trees that were planted using the Urban Forestry Fund)	Title 8
9	Heritage Tree Designation and Removal Standards (creates a process for designating and removing both Heritage Trees and Significant Trees)	Title 8
10	Urban Forestry Plan Standards (includes plan submittal standards and methods for calculating tree canopy cover for development)	Title 18
11	Urban Forestry Plan Implementation Standards (includes requirements for monitoring trees during the development process)	Title 18
12	Street Tree Soil Volume Standards (includes specifications for providing street trees adequate soil volumes)	Title 18
13	Parking Lot Tree Canopy Standards (includes specifications for achieving 30% tree canopy for parking lots and for providing parking lot trees adequate soil volumes)	Title 18



# Appendix: Additional Details

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# Process Summary

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This section describes the planning process and public involvement efforts to date as part of the development of the Urban Forestry Code Revisions proposal. The public process kicked off in June 2010 and continues through the City Council adoption process

## Citizens Advisory Committee

Tigard City Council appointed a Citizens Advisory Committee (CAC) containing a broad range of community interests to advise city staff and seek consensus solutions during the code revisions process. Council recognized the importance of a citizen group for this process as the issues related to the health of the urban forest crosses over a diverse range of interests and would benefit from thoughtful consideration by individuals representing those interests.

The CAC met 11 times between June 2010 and September 2011, and was professionally facilitated by JLA Public Involvement. The 11-member committee included community members appointed by council and representing a broad spectrum of interests and expertise. In January 2011, the CAC meeting schedule was expanded to include additional and longer meetings to ensure the committee had ample time to discuss the project's topics. Community representation included members of existing city boards and committees: The Planning Commission, Parks and Recreation Advisory Board, and Tree Board. The committee also contained two members from the development community, including a Homebuilders Association representative, and single representatives from the environmental community, arborist profession, and citizens at-large.

Morgan Holen, Certified Arborist and CAC member, said, "The city has done a great job of responding to citizen input, and the draft code represents a balance of the various viewpoints heard throughout the process." The guiding principles presented in Volume V of this document represent the culmination of the CAC's work on this project.

## Technical Advisory Committee

The Technical Advisory Committee (TAC) was comprised of city staff and agency representatives. It also advised staff throughout the development of the code. Internal city staff from several departments participated including Finance (Capital Improvement Program), Engineering, Development Services, Parks, Streets, Wastewater/Storm, Information Technology/Geographic Information Services, Permit Coordination, Building, Current Planning and Long Range Planning. External agency representatives included Clean Water Services and the Oregon Department of Transportation.

In total, the 20-member committee met 14 times between June 2010 and November 2011. The group's purpose was to provide recommendations to staff based upon technical knowledge and familiarity with urban forestry issues. In general, the TAC meeting schedule and agendas were similar to that of the CAC. The log of input in Volume V includes the technical input provided by the TAC, and comments of the CAC and public during the technical review phase.



**Figure 1:** CAC and Planning Commission member Don Schmidt with his family at the first Tree Grove open house

## Public Involvement

A public involvement plan for the Urban Forestry Code Revisions project was approved by the city's Committee for Citizen Involvement in May 2010. This plan addressed how the public involvement for the Urban Forestry Code Revisions would meet the city's Comprehensive Plan goals for opportunities for stakeholders to participate, communicate, and receive information about the project. This plan states that communication on the project will be guided by the following set of priorities:

- Employ multiple communication channels to ensure we are able to reach a broad audience.
- Keep city policy makers up-to-speed on the project
- The task is to manage conflict, not resolve it.

The theme of the initial messaging and outreach was that progress would result from improvements rather than solutions. A staff level communications team composed of the project manager and public involvement lead met regularly throughout the process to ensure the Public Involvement Plan was followed. Significant outreach efforts are described below.

Two **open houses** on the tree grove preservation incentives and one on the entire proposed code were held during the process. Comments collected at each open house helped to shape the proposal presented to the Planning Commission

A **project newsletter** was sent to interested parties by email fifteen times between July 2010 and May 2012. This newsletter featured project highlights, local tree information and ways for the community to be involved in the process.

**Public comment** was invited via email and at the beginning of every CAC meeting. This information was shared with both the project management team and the TAC for consideration.

**Outside events** attended by project staff where project information was disseminated included the Balloon Festival, CPO 4B meeting, and the Tigard Area Farmers Market.

The **city's website** was regularly updated throughout the process with project information. Specific Web tools using GIS were developed to help residents and property owners identify tree groves and trees which may be subject to permitting on their property.

The city's **Cityscape newsletter** was regularly used to announce updates about the Urban Forestry Code Revisions Project. Seventeen articles appeared between April 2010 and June 2012.

A summary of community ideas and concerns gathered throughout this process is covered in the following section.

## Planning Commission Outreach

Briefings for the Planning Commission on the Urban Forestry Code Revisions project efforts began in early 2010 and continued through fall 2012. The commission received a comprehensive briefing from Community Development department staff on the Staff Proposed Draft Urban Forestry Code Revisions on January 9, 2012. The purpose of the briefing was to provide an overview of the planning process, draft code amendments and those aspects of the code that received the most attention in order to prepare the Planning Commission for their public hearings.

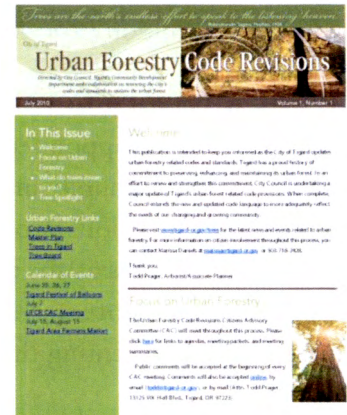


Figure 2: Project newsletters were sent by email and posted on the project website.

## City Council Outreach

After directing staff to undertake the Urban Forestry Code Revisions process in February 2010 City Council remained engaged in the process through regular staff updates.

# Summary of Community Ideas and Concerns

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A wide range of stakeholders, including community groups, developers and staff, identified concerns about the city's current urban forestry regulations. This section summarizes the community's ideas and concerns that were addressed by the Citizen Advisory Committee on each of the urban forestry topics/code categories.

## Urban Forestry Standards for Development

The city currently regulates trees during development through chapter 18.790, which requires tree protection, removal, and replacement plans. Chapter 18.745 also includes requirements for street trees, parking lot trees, and trees as buffers between differing uses.

### Chapter 18.790

The major issues identified with the current tree plan requirements in chapter 18.790 are:

- The mitigation standards encourage overplanting since trees are replaced on an “inch for inch” basis rather than “tree for tree”.
- Since mitigation standards are only applicable to trees over 12-inch diameter, the incentive is to retain larger trees, which are less likely to survive development impacts.
- Tree plan requirements only apply to sites with existing trees. Property owners with trees are penalized while property owners without trees are not.
- Tree plan requirements are only applicable to trees on site at or near the time of development. This incentivizes the removal of trees in advance of development to avoid tree plan requirements and mitigation.
- People often want to modify their tree plans during the course of development when they find there are conflicts between trees and buildings, roads, or infrastructure. However, the modification process is time consuming and cost prohibitive. This creates another incentive to remove all trees before development rather than risk conflicts with trees during the course of development.

The Citizen Advisory Committee consensus was that applying a tree canopy standard, which requires development to achieve a set percentage of tree canopy through planting or preservation, is the best way to address these issues. A tree canopy standard will not encourage overplanting because it is based on the mature growth of the trees rather than number of trees. It will not incentivize the preservation of inappropriate trees because the project designer will not be penalized for tree removal, as long as they replant. The committee recommended a bonus credit for preservation, which eliminates the incentive to remove trees in advance of development.

Since a tree canopy standard is unlikely to fit every future development scenario, the committee agreed there should be a tree canopy fee in lieu option and a discretionary review option when planting and preservation are not possible or are undesired. The committee also agreed there should be a low cost and user friendly process for modifying trees plans for adaptation to unforeseen circumstances during development. The committee addressed post-development tree issues in their discussion of tree permit requirements.

The committee's major issues of debate were whether the city should require a base level of preservation, whether the percent of tree canopy required was reasonable, and whether the tree canopy standard should be applied to additional development scenarios.

In the end, the group decided that requiring a base level of preservation would have the effect of limiting options for people with existing trees compared to people without trees. This type of inequity is what the committee was striving to move away from.

For the tree canopy requirement, the group initially studied a blanket 40% tree canopy requirement for all development citywide for consistency with the long term citywide tree canopy goal in the urban forestry master plan. However, after further discussion there was agreement that the development code was not going to be the sole method for meeting the 40% citywide tree canopy goal, and the committee decided it was important to set achievable tree canopy requirements that were tiered based on each zoning district and the typical development types found in each zone.

The committee considered applying the standards to additional development permits such as grading permits, building additions, and demolition permits. However, after reviewing past projects the group agreed tree removal for these types of smaller scale projects was not a significant issue and it was not necessary to apply additional regulations. The committee agreed that larger projects in sensitive lands should be required to meet additional standards since tree removal in sensitive lands has been a significant community issue in the past.

#### Chapter 18.745

The major issues identified with the current tree planting requirements in chapter 18.745 are:

- Trees planted to meet the landscaping requirements in chapter 18.745, are not eligible for mitigation credit. This contributes to poor design and the overplanting of sites.
- Parking lot and street tree standards do not include industry accepted soil volume requirements. This contributes to high failure rates and pavement damage due to lack of space for roots.
- There is no bonding requirement to ensure the establishment of newly planted trees.

The Citizen Advisory Committee reached consensus that trees planted to meet the standards in chapter 18.745 should receive full credit towards the tree canopy cover requirements. This allows flexibility in design and avoids overplanting of sites. The group also agreed to require bonding to ensure the establishment of all newly planted trees.

Due to cost concerns, the group was initially split as to whether there should be minimum soil volume standards for parking lot trees and street trees. However, the group decided there was enough flexibility in the draft development standards such as reduced parking and increased planting strip size to ensure trees could meet the requirements without more costly methods such as structural soil installation.

## Tree Grove Preservation Incentives

Based on community input, council directed staff to develop new flexible and incentive based code standards for the preservation of Tigard's remaining groves of native trees.

To develop these new standards, the city was required to follow the statewide Goal 5 requirements which involve inventorying tree groves, evaluating the economic, social, environment, and energy (ESEE) consequences of preservation, and involving affected property owners.

The city identified 70 large groves of native trees covering 527 acres, including 114 acres within the city's buildable lands inventory.

The Citizen Advisory Committee agreed to a wide range of flexible standards and incentives for tree grove preservation through staff level reviews. Among them are a waiver of minimum density requirements, density transfer from the tree grove to the non-tree grove portion of a site, attached units, flexible setbacks, flexible lot sizes, flexible street widths, and increased building heights for commercial and industrial development.

In exchange for these flexible standards and incentives, the committee agreed that the remaining portions of the groves should be permanently preserved through instruments such as open space tracts or dedication to the city.

The group was initially split on whether to allow more intense multi-family residential development in single family zones for tree grove preservation, but later reached consensus not to allow it because of compatibility issues.

The group was also initially split as to whether tree removal permits or mitigation should be required for tree groves, but later agreed this would be inconsistent with an incentive-based program. They also thought it could increase tree grove removal from people trying to avoid regulations in advance of adoption of the proposed code.

Finally, the committee requested that staff investigate a tree canopy transfer system whereby excess preservation in one development could be transferred to a subsequent development. After researching the issue, staff recommended against developing such a system because of the equity issue involved with exempting one neighborhood from tree canopy standards due to excess preservation in another neighborhood. Also, the staff time associated with developing and maintaining a transfer system may not be justified given the limited amount of tree groves within buildable lands and uncertainty with the effectiveness of such a system.

## Hazard Trees

The city currently prohibits hazard trees within the city limits of Tigard. However, the definition of what constitutes a hazard tree is unclear and there is a lack of understanding about what the city's role should be when there are disputes over hazard trees between private property owners.

The committee agreed the city should define hazard trees according to the International Society of Arboriculture standard and continue to prohibit hazard trees in Tigard. When there is a hazard tree dispute between private property owners, the committee consensus was that the parties should be encouraged to work out the issues themselves and involve the city only as a last resort. When the city does become involved, a third-party arborist should be retained and the city should recover any costs incurred as a result of the dispute.

The main issue for the committee involved who should have standing to file hazard tree claims with the city. The committee reached consensus that only people that can demonstrate their life, limb, or property is at risk by a tree



Figure 3: Held in February 2011, the second tree grove open house included a presentation from staff

in question has the right to file a claim. This is intended to limit the concern that people could use the hazard tree process as a means of intimidation whether or not a real threat exists.

### **Tree Permit Requirements**

Certain categories of trees are currently protected by the city. Tree removal permits are required for trees in sensitive lands and street trees. Trees that were required to be planted or preserved with development can only be removed by modifying the original land use permit. Heritage Trees are designated by council, and can be removed if approved by council. Trees planted using the Urban Forestry Fund are protected through written agreements with every planting project.

The main issues with the current tree permit requirements include:

- The approval criteria for tree removal in sensitive lands are based on erosion control, which is difficult to quantify, so permits are almost always approved.
- The fee for sensitive lands tree removal permits is nearly \$300, which is a significant cost for a process with limited community benefit.
- There are no approval criteria for street tree removal, so removal is always approved.
- The process for removing and/or redesigning trees that were required with development is cost prohibitive. It involves modifying the original land use permit which costs thousands of dollars.
- The heritage tree process limits participation because of the protections against removing designated trees.
- Developing and tracking separate written agreements for planting projects funded by the Urban Forestry Fund is an administrative challenge.

The Citizen Advisory Committee agreed that a consolidated permit system to address these protected categories of trees would make the permitting process more clear, consistent and user friendly. The group favored a dual track approach with automatic approval through a no- or low-fee process for trees that are in poor or hazardous condition, damaging property or preventing allowed development. A discretionary track would allow more unique situations to be addressed, when there is nothing wrong with the tree itself, but benefits such as views, solar access or a landscape redesign outweigh the benefits provided by the tree.

The group agreed not to regulate any additional tree situations, but they did support creating a new, voluntary “significant tree” process to recognize important trees without the protections and restrictions associated with Heritage Trees.

The committee was initially split as to whether permits should be required for the removal of dead and hazardous trees that fall within one of the protected categories (street trees, sensitive lands tree, etc.). The final consensus was to require permits so there is adequate documentation to limit disputes between neighbors, and to ensure replacement trees are planted.

They also debated whether dead trees, such as those in natural areas, should be required to be retained for wildlife purposes. The consensus decision was not to prevent dead tree removal because the costs associated with tree removal will naturally result in their preservation. However, the group did agree that dead trees (that are not hazards) should not be prohibited in Tigard as they are in the current code.

Finally, the committee discussed requiring permits for removing over a certain number of unprotected trees per year to limit clear cutting in advance of development. The group reached consensus not to require permits because the new standards for development do not incentivize pre-development clearing.

### Use of Existing Tree Mitigation Funds

The city has collected over \$1 million in tree mitigation fees from applicants that did not replace trees that were removed with development. These funds are used by the city to plant trees on public property and along streets. The city's practice has been to use the funds for new tree planting and three years of early establishment only.

The Citizen Advisory Committee discussed whether the use of tree mitigation funds should be expanded to additional items such as preservation of existing trees, long term maintenance, education and outreach, and planning. While the committee was initially split on the issue, they did reach consensus that the city should continue to restrict the use of current tree mitigation funds to planting and three years of early establishment. Their rationale was the development community paid fees with the expectation that the funds would be used for planting trees, and that using those funds for expanded purposes would be inconsistent with that real or perceived commitment. However, the committee did agree that the revised code should allow for future funds collected to be used for a broader range of urban forestry activities.

The committee's recommendation was subsequently endorsed by the Tree Board and forwarded to council. In May 2011, council adopted Resolution 11-16 clarifying that the newly named "Urban Forestry Fund" shall be used for an itemized list of activities required for tree planting and 3 years of early establishment.

For a final summary of the CAC's decisions, see their guiding principles in Volume V.

## Summary of Planning Commission Deliberations

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This section provides a brief summary of the Planning Commission's deliberations which led to their decision to unanimously recommend Council approval of the Urban Forestry Code Revisions on May 7, 2012. A detailed summary of their deliberations can be found in Urban Forestry Code Revisions Volume V.

During the Planning Commission portion of the legislative adoption process, the urban forestry code revisions were considered as four separate yet interconnected elements: 1) The significant tree groves map which was the subject of the comprehensive plan amendment, 2) amendments to the land use regulations in Title 18 which were the subject of the proposed development code amendments, 3) amendments to the non-land use regulations in all other titles except Title 18 which were not part of the commission recommendation to council, and 4) administrative rules in the Urban Forestry Manual which were also non-land use regulations and therefore not part of the commission's recommendation to council.

In order to provide for a comprehensive view, Planning Commission reviewed, took testimony, deliberated, and commented on both the land use elements and non-land use elements in the urban forestry code revisions. However, the Planning Commission's recommendation to Council was limited to the land use elements of the proposal which are the comprehensive plan amendment incorporating the significant tree groves map and development code amendments to Title 18.

The Planning Commission held one workshop and four public hearings on the Staff Proposed Draft Urban Forestry Code Revisions from January 2012 through May 2012. Although they received a range of public testimony from a variety of people during their public hearing process (see Urban Forestry Code Revisions Volume V), the commission's deliberations focused on two major themes:



1. Ensuring the tree canopy requirements appropriately balance the amount of trees, development and open space; and
2. Ensuring the Urban Forestry Code Revisions do not result in an excessive increase in costs for development.

Their deliberations and decisions on both themes are summarized below.

### **Theme 1: Ensuring the tree canopy requirements appropriately balance the amount of trees, development and open space.**

**Deliberations on Theme 1:** The Planning Commission discussed whether the tree canopy requirements, which consist of three tiers based on zoning district intensity, will result in an appropriate balance between the amount of trees, development and open space. They also discussed whether there would be excessive shading as required trees mature over time.

The commission used the results of the peer review, where the tree canopy requirements were tested on actual development projects, to inform their deliberations. Based on the peer review results, the commission felt generally comfortable with the resulting balance between trees, development and open space. However, they did decide to move the R-12 district from Tier 1, which requires the highest percent canopy cover, into Tier 2. This was because the R-12 district was not tested as part of the peer review phase, but the higher density residential districts (R-25 and R-40) were able to meet the Tier 2 requirements.

In addition, to increase flexibility the Commission decided to reduce the minimum amount of tree canopy required per lot from 20% down to 15% in Tier 1, which contains the lower density residential districts and to eliminate the per lot minimum requirement in Tiers 2 and 3, which include all other districts. This change to Tier 2 and 3 also resulted in effectively lowering the tree canopy requirements by allowing the requirements to be met based on the overall development site, rather than on a lot by lot basis.

The commission recognized that the draft code includes a number of options for decreasing the relative amount of trees to development and open space. These options include granting 200% credit for preserving existing trees, and granting full credit for street trees even though half of their canopies overhang streets, which are not part of the lot area calculations. The commission noted that there is also a discretionary review option that allows green building or development techniques instead of trees and an option to provide a fee in lieu of tree canopy.

In addition, the commission included one more option to decrease the relative amount of trees compared to development and open space by granting 125% credit for the planting of native trees.

**Commission Decisions on Theme 1:** The commission decided that in most cases the tree canopy requirements provide a reasonable balance between trees, development and open space. However, to be conservative, the commission moved the R-12 district into the Tier 2 category.

In addition, the commission decided to effectively lower the tree canopy requirements by 20 percent for the use of native trees by giving 125% canopy credit:

Tree Canopy Requirements without Native Trees	Tree Canopy Requirements with Native Trees
Tier 1: 16-40% actual canopy on site	Tier 1: 16-32% actual canopy on site
Tier 2: 13-33% actual canopy on site	Tier 2: 13-26% actual canopy on site
Tier 3: 10-25% actual canopy on site	Tier 3: 10-20% actual canopy on site

Finally, to increase flexibility the commission decided to reduce the per lot minimum from 20% down to 15% for Tier 1 sites, and to eliminate the per lot minimum for Tier 2 and 3 sites.

**Theme 2: Ensuring the Urban Forestry Code Revisions do not result in an excessive increase in costs for development**

**Deliberations on Theme 2:** The commission discussed whether the Urban Forestry Code Revisions would result in an excessive increase in costs for development. Of specific concern for the commission was: 1) Whether the proposed tree canopy fee is fair and reasonable, and 2) Whether urban forestry costs for higher density residential development and Minor Land Partitions will be fair and reasonable.

The proposed tree canopy fee is based on tree appraisal methodology developed by the Pacific Northwest Chapter of the International Society of Arboriculture. The commission agreed it was more fair and reasonable to base the fee on tree care industry methodology, rather than creating the fee without guidance from the tree care industry.

The commission compared the proposed fee to the existing fee in the code, as well as fees across the region. This provided them further evidence that the proposed fee is fair and reasonable because it is less than the existing fee and on the lower end of fees across the region:

Comparison of Fee in Existing and Proposed Code	
Existing Tigard Code	Proposed Tigard Code
Mitigation Based	Canopy Based
\$125/caliper inch	\$2.95/sq. ft.
Fee for 12" DBH Tree = \$1,500	Fee for 12" DBH Tree = \$1,463 <sup>1</sup>
<sup>1</sup> DBH converted to canopy using the Krajicek formula (see the Tree Canopy Fee memo in Volume V for more information on the formula)	

Regional Fee Comparison			
City	Fee	Fee Per Caliper Inch*	Context
City of Tigard (existing)	\$125 per caliper inch	\$125	Based on average cost to purchase, install and maintain a two-inch caliper replacement tree.
City of Tigard (proposed)	\$2.95 per square foot of canopy	\$87	Based on the median wholesale cost of a three-inch deciduous tree in the Willamette Valley (\$174).
Beaverton	\$90 coniferous \$175 deciduous \$200 street tree	\$45 conifer \$87.50 decid. \$100 st. tree	Costs are based on the purchase and planting of two-inch caliper trees to mitigate for loss of Significant Trees/Groves on a 1:1 basis.
Gresham	n/a	n/a	No established fee in lieu program per planner on duty.
Hillsboro	n/a	n/a	No established fee in lieu program per planner on duty.
Lake Oswego	\$328 per mitigation tree	\$164	Code strongly emphasizes protection over mitigation.
Oregon City	\$290 per mitigation tree	\$145	Fee in lieu of replacement tree standards of two-inch caliper deciduous or six-foot high conifers.
Portland	\$300 per caliper inch	\$300	Applies to all trees regulated under Portland code.
Tualatin	n/a	n/a	No established fee in lieu program per planner on duty.
West Linn	\$175 per street tree	\$87.50	Mitigation fees not required. Applicants can pay the city \$175 to install street trees, or \$75 to inspect developer-installed trees.
Wilsonville	Market Price	Market Price	Applications must include the actual cost of the required replacement trees (generally 1:1), with documented bids included with application materials. Per planner on duty.
Vancouver, WA	Market Price	Market Price	Fee in lieu rates based on estimated market cost to purchase, install and maintain required tree units (based upon DBH). Applicant submits documented bid with application materials.

*\* Fee per caliper inch column is an approximate conversion by City of Tigard staff to establish a common unit for comparison.*

In addition to the comparison of fees indicating the proposed fee is fair and reasonable, the peer review results demonstrate the proposed code has been structured so that the canopy requirements are achievable on the typical range of development projects in Tigard, without requiring payment of a fee in lieu. This is in contrast to the existing code where the mitigation requirements are not achievable for many projects, particularly those with many large existing trees. Therefore, the commission viewed the tree canopy fee as a fair and reasonable option for choosing not to plant or preserve trees, rather than something applicants will be required to pay for typical projects.

The second part of the commission's cost discussion involved deciding whether the costs of developing urban forestry plans for higher density residential development are excessive since the peer review results show the requirements can be met through strategic planting of large stature street trees. They also discussed whether the costs for developing urban forestry plans for Minor Land Partitions are excessive since there is less profit associated with these types of developments.

The commission noted that the peer review results do demonstrate that for higher density residential sites, the effective tree canopy requirements can be met primarily through strategic planting of large stature street trees. However, they understood the incentive to maximize street tree canopy is deliberate, as street trees have particularly high benefit to cost ratios in urban areas.

The commission recognized that for street trees to achieve their potential canopy growth, adequate soil resources and proper planting methods are critical. The commission viewed the proposed code as placing high value on the role of arborists in designing and implementing the conditions for sustainable urban tree canopy, which include providing adequate soil volumes.

The commission acknowledged that requiring arborists adds cost to projects, but it is consistent with the direction of the Urban Forestry Code Revisions: to distribute development costs more equitably (rather than only requiring arborists for projects with existing trees) and to focus on establishing healthy future canopy (rather than only penalties for tree removal). They also recognized that the existing code already requires plans developed by a certified arborist for higher density residential projects.

For Minor Land Partitions, again the commission noted that plans developed by a certified arborist for the preservation and planting of trees are already required by the existing code.

Further, the commission analyzed the buildable lands inventory and found that the largest share of buildable sites in Tigard is between 10,000 sq. ft. and 1 acre. This means that Minor Land Partitions likely represent a significant share of future residential development in Tigard. Therefore, the commission decided it was important to apply the Urban Forestry Code Revisions to Minor Land Partitions to support Tigard's long term urban forestry goals.

The cost estimated by staff to develop and implement an urban forestry plan for a Minor Land Partition based on interviews with local arborists is between \$4,000 and \$5,000 (includes inventory field work, site plan, arborist report, revisions based on city review and implementation inspections). However, the commission considered that this is significantly less than costs associated with the existing code for tree removal mitigation which can reach \$30,000 for a Minor Land Partition (this is in addition to the cost of developing a tree plan).

The commission did identify an opportunity for creating efficiencies when developing urban forestry plans, while ensuring high quality design and implementation. The code required a certified arborist to develop urban forestry plans (which involve developing a tree inventory, protection and planting plan). However, the code also required a landscape architect when alternative methods such as structural soils are used to meet soil volume requirements. For projects that use structural soils to meet their requirements, the commission decided it would reduce costs if the landscape architect could also complete the urban forestry plan (without requiring a certified arborist) since landscape architects also have the skill set needed to inventory, protect and plan trees.

**Commission Decisions on Theme 2:** The commission decided the proposed tree canopy fee is fair and reasonable because it is based on tree appraisal methodology developed by the Pacific Northwest Chapter of the International Society of Arboriculture. In addition, they decided the proposed fee is fair and reasonable because it is

less than the existing fee and on the lower end of fees across the region. Finally, they decided the proposed fee is fair and reasonable because the proposed code has been structured so that the requirements are achievable on the typical range of development projects in Tigard, without requiring payment of a fee in lieu. The fee is simply an option for applicants that choose not to plant or preserve trees. Therefore, the commission did not think any revisions to the proposed tree canopy fee were needed.

The commission decided that the costs for developing urban forestry plans were not excessive for higher density residential development and Minor Land Partitions. This is because the existing code requires arborists for these development types to create tree plans. In addition, since mitigation is proposed to be eliminated, costs will likely decrease, particularly for those projects with existing mature trees. The commission decided it is consistent with the direction of the Urban Forestry Code Revisions: to distribute development costs more equitably (rather than only requiring arborists for projects with existing trees) and to focus on establishing healthy future canopy (rather than only penalties for tree removal). Therefore, the commission did not think any revisions to applying the Urban Forestry Plan requirements to higher density residential development and Minor Land Partitions were needed.

However, the commission did think that allowing landscape architects, in addition to arborists, to develop urban forestry plans to reduce costs by eliminating the need for hiring two urban forestry professionals was appropriate.

## Existing Conditions

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Tigard’s urban forest has a rich natural and cultural history that has shaped its present conditions. This section summarizes the history and existing conditions of Tigard’s urban forest.

### EARLY HISTORY

The Kalapuya (Native Americans) were the first known caretakers of Tigard’s urban forest 3,500 years before present. They used a management technique known as pyroculture which thinned native trees and forests through controlled burning to increase plant and animal food production.

At the time of European settlement in the 1850s, the canopy cover within the current city limits of Tigard was estimated to be 52 percent. The predominant tree species in the riparian and wetland areas were Oregon ash, red alder, bigleaf maple, willow, black cottonwood, Oregon white oak, western red cedar, and Pacific dogwood. The upland areas were dominated by Douglas fir, bigleaf maple, grand fir, Pacific dogwood, western hemlock, Oregon white oak, red alder, western red cedar, and ponderosa pine.

While a detailed canopy analysis for the settlement period after the 1850s has not yet been performed, early aerial photography from the 1940s shows relatively large clusters of native forests evenly distributed throughout Tigard. In between these forest clusters was land that was cleared for agricultural and timber production.



Figure 4: Sketch of Kalapuya man drawn by Alfred Agate, a member of the Wilkes Expedition in 1841

## URBAN FOREST MANAGEMENT

As an organized community, Tigard has sought to grow and manage its urban forest since the city's incorporation in 1961. The first street tree planting requirements for development were enacted in 1967. In 1983, the city began requiring permits for the removal of trees on all public and undeveloped lands, and all commercial and industrial lands. In 1997, the city significantly revised its urban forestry code to require removal permits within environmentally sensitive lands. Also in 1997, the city began requiring tree protection, removal, and mitigation plans for certain types of development projects. The current "inch for inch" mitigation standard was enacted which requires, for example, the replacement of one 12-inch diameter tree with six 2-inch diameter trees. An optional fee-in-lieu of replacement plantings was also allowed.



Figure 5: 1940s aerial photo of the city's southern boundary near Cook Park

As fee-in-lieu deposits have accumulated, the Tree Canopy Replacement Program was developed to plant replacement trees within Tigard's neighborhoods on public properties and along streets. Currently, \$150,000 is budgeted annually for the Tree Canopy Replacement Program.

Another city program, the community tree planting challenge, began in 2005 to improve the environmental quality of Tigard's streams. The city budgets approximately \$150,000 annually to meet the goal of planting 135,000 streamside trees by 2025.

To help coordinate, oversee, and implement Tigard's growing urban forestry program, the city hired its first urban forester in 1998 and appointed its first Tree Board in 2001. In recognition of these expanded efforts, Tigard has been designated as a Tree City USA by the National Arbor Day Foundation since 2001 and has received the Tree City USA Growth Award since 2009.

In recent years, the Tigard community has found it increasingly important to direct efforts toward the long-term sustainability of the urban forest. Led by the Tree Board, in 2008 the city's first urban forest section of the Comprehensive Plan was adopted by council and contains broad, 20-year urban forestry goals and policies. This important document ensures trees and forests are integrated into Tigard's long term growth and development plans.

The Comprehensive Plan led to the more specific Urban Forestry Master Plan which was accepted by council in 2009. The development of the Urban Forestry Master Plan involved extensive outreach to citizens, and local development and urban forestry professionals. Included in the outreach efforts was a statistically valid survey of Tigard residents. Among the survey results was support for development regulations (66 percent support), protections for trees on private property (76 percent support) and development of a hazard tree abatement program (60 percent support). There was also a consistent community preference for preserving significant groves of native trees wherever possible.

The Urban Forestry Master Plan summarizes the input received with over 50 specific implementation items to be achieved by the year 2016 when the plan will again be reviewed and updated. The majority of the implementation items relate to revising the urban forestry code with an eye toward increasing citywide tree canopy to 40 percent by the year 2047.

## POLICY FRAMEWORK

The urban forestry code revisions exist within the context of various federal, state, regional and local policies and regulations. The Urban Forestry Manual in Volume V includes a review of the federal, state and regional framework for the urban forestry code revisions in Appendix G and the local framework in Appendix H. The staff report in Volume II provides findings on how the urban forestry code revisions are consistent with and supportive of those policies and regulations that are applicable to the land use elements of the urban forestry code revisions.

## URBAN FOREST CANOPY – A MEASUREMENT OF SUCCESS

In recent years, the city has tracked changes in its urban forest canopy using high resolution aerial photography. Despite high levels of development activity, citywide tree canopy dropped only slightly from 25% in 1996 to 24% in 2007. Tigard's current 24% citywide canopy puts it in the middle of the range for cities in the metro area with neighboring places like Lake Oswego towards the high end (47%) and King City at the low end (12.5%).

Despite Tigard's relatively stable urban forest canopy citywide, it is becoming increasingly fragmented with large forest clusters being replaced by individual trees. In 1996, there were 63 forest clusters over five acres in size and by 2007 this number had dropped to 48 forest clusters. This represents a 24% decline in an 11-year period.

The current urban forest canopy is not evenly distributed throughout the city. While residential zones have a relatively healthy 30% canopy, industrial, commercial, and mixed used zone have much less with 16%, 14%, and 10% canopy respectively.

Finally, the current urban forest canopy is not distributed in a way to maximize environmental and economic benefits. While trees along streets and within parking lots are proven to provide maximum benefits, there is currently only 9% canopy over Tigard streets and 6% canopy over Tigard parking lots.

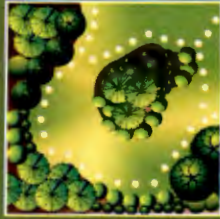
The Urban Forestry Code Revisions are designed to address these deficiencies and support achievement of Tigard's long term tree canopy goals outlined in the Urban Forestry Master Plan.



Figure 6: Tigard's Comprehensive Plan includes a section dedicated to urban forestry



Figure 7: 2011 aerial photo of the city's southern boundary near Cook Park



City of Tigard

# Urban Forestry Code Revisions Project

VOLUME II | LAND USE ELEMENTS | JULY 2012

**City of Tigard**  
COMMUNITY DEVELOPMENT DEPARTMENT  
13125 SW Hall Blvd., Tigard, OR 97223  
[www.tigard-or.gov/trees](http://www.tigard-or.gov/trees)





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## Organization of the Urban Forestry Code Revisions Documents

The Urban Forestry Code Revisions project is presented in five volumes. Volume I provides the project overview and describes the process used to develop all of the elements. Volume II is the land use elements of the code, and Volume III the non land use elements. Volume IV contains the Urban Forestry Manual. Volume V contains technical reports and research that contributed to the code revisions along with details of the public input and deliberations to date.

### Volume I | Project Overview

**Project Overview** includes the following sections:

- Project Introduction
- Overview of Key Elements
- Key Element Summaries
  - Urban Forestry Standards for Development
  - Tree Grove Preservation Incentives
  - Tree Permit Requirements
  - Hazard Trees
  - Urban Forestry Manual

**Appendix A** includes additional detail about the information used to shape the Urban Forestry Code Revisions Project, and includes the following sections:

- Process summary
- Summary of Community Ideas and Concerns
- Summary of Planning Commission Deliberations
- Existing Conditions

### Volume II | Land Use Elements

**Community Development Code (Title 18)** is the Planning Commission's recommended draft of the Development Code. This section includes commentary on the amendments.

**Peer Review** demonstrates how the Planning Commission's recommended draft of the Development Code and Urban Forestry Manual will work in application.

**Tree Grove ESEE Analysis** is a report that addresses Statewide Planning Goal 5 - Natural Resources requirements for the preservation of Significant Tree Groves.

**Staff Report and findings** includes the staff recommendation for approval of the land use elements (Title 18 and the Comprehensive Plan Amendment) and the findings that demonstrate the land use elements meet the necessary approval criteria.

### Volume III | Non Land Use Elements

**Tigard Municipal Code** is the staff proposed draft of the Municipal Code (Title 8 and other Municipal Code titles). This section includes commentary on the amendments.

### Volume IV | Urban Forestry Manual (Administrative Rules)

**Urban Forestry Manual** consists of administrative rules that implement the technical details of the urban forestry related code provisions in Title 8, Title 18 and other applicable titles in the Tigard Municipal Code.

### Volume V | Additional Background Materials

**Planning Commission Deliberations** details Planning Commission discussion and decisions during the public hearing process.

**Amendment Requests Document for the Planning Commission** lists code amendment requests received in response to the first Planning Commission public hearing and staff responses.

**Outstanding Issues for the Urban Forestry Code Revisions** includes additional information on the outstanding issues that were further deliberated by the Planning Commission before making their final recommendation to City Council on May 7, 2012.

**Log of Input** lists the input received and any code changes from the last meeting of the CAC to the staff proposed draft of the Urban Forestry Code Revisions to Planning Commission.

**CAC Guiding Principles** includes the consensus view of the Citizens Advisory Committee (CAC) developed to help guide the legislative adoption process.

**Tree Values** includes information and current research on the environmental, economic, social and aesthetic benefits of trees.

**Canopy Standards** explains the reasons for adopting tree canopy cover requirements as well as the methods used to arrive at the requirements.

**Soil volume** details research about the soil volume required to support a mature tree canopy.

**Tree Canopy Fee** discusses research used to develop a square foot value for tree canopy.

**Regulatory Comparison** is an excerpted report prepared by Metro and the Audubon Society that summarizes and compares regional urban forestry programs and regulations.

**Urban Forestry Master Plan** is the City of Tigard's recommended plan for achieving the urban forestry goals in the Comprehensive Plan.

**Urban Forestry Code Revisions**

# Community Development Code – Planning Commission Recommendation

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# Community Development Code – Planning Commission Recommendation

## How to Read This Section

This section is organized by Community Development Code chapter number. Odd-numbered pages show the existing language with (proposed/recommended/adopted) amendments. Text that is (proposed/recommended) to be added to the code is shown with double underlines. Text that is (proposed/recommended) to be deleted is shown with strikethrough.

Even-numbered pages contain commentary on the amendments, which establish, in part, the legislative intent in adopting these amendments. Staff recommends focusing on the commentary to gain a better understanding of the purpose of the code amendments.

The Urban Forestry Manual consists of administrative rules that implement the details of the urban forestry related code provisions in Title 8, Title 18 and other applicable titles in the Tigard Municipal Code. Section 8.02.040 of the Tigard Municipal Code enables administrative rulemaking for the Urban Forestry Manual. The city manager is authorized to adopt and amend the Urban Forestry Manual according to the procedures in Chapter 2.04 after council adoption of Section 8.02.040. The Urban Forestry Manual is referenced as if it has already been adopted in order to demonstrate how it relates to the code.

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## Commentary

### 18.115 List of Terms

Chapter 18.115 (List of Terms) is a newly codified chapter of the Tigard Development Code (TDC) that is provided for easy reference of defined terms in Chapter 18.120 (Definitions). New, revised and consolidated tree/urban forestry related definitions in Chapter 18.120 are listed in Chapter 18.115.



**Chapter (18.115)****List of Terms**

The following terms are defined in Chapter 18.120, Definitions, unless indicated otherwise.

Abandoned Sign <i>See Chapter 18.780, Signs</i>	Alternative Access	Bay <i>See Design-Related Definitions</i>
Abut	Amendment	Belt Course <i>See Design-Related Definitions</i>
Abutting Lots	Amenity	Bench Sign <i>See Chapter 18.780, Signs</i>
Accept	Americans with Disabilities Act	Berm
Access	Annexation	Bike Lane
Accessory Building	Antenna <i>See also Chapter 18.798, Wireless Communication Facilities</i>	Bikeway
Accessory Dwelling Unit <i>See Dwelling-Related Definitions</i>	Apartment <i>See Dwelling-Related Definitions</i>	Billboard <i>See Chapter 18.780, Signs</i>
Accessory Structure	Appeal	Buildable Area
Acre	Applicant	Building
Active Use Facilities <i>See Open Space Facility-Related Definitions</i>	Application	Building Envelope
Addition	Approval Authority	Building, Primary
Adjacent Lots <i>See Abutting Lots</i>	Approved Plan	Building Height
Adjoining Lots <i>See Abutting Lots</i>	Arcade <i>See Design-Related Definitions</i>	Building Official; <i>See also Chapter 18.780, Signs</i>
Administrative Action	Archaeological Site	Building Permit
Adult Bookstore <i>See Adult Entertainment-Related Definitions</i>	Area <i>See Chapter 18.780, Signs</i>	Business <i>See Chapter 18.780, Signs</i>
Adult Entertainment-Related Definitions	Argument <i>See Section 18.390.080, General Provisions</i>	Caliper <i>See Tree Related Definitions</i>
• Adult Bookstore	Assessed Valuation	Canopy <i>See Design-Related Definitions</i>
• Adult Motion Picture Theater	Attached Dwelling <i>See Dwelling-Related Definitions</i>	<u>Certified Arborist</u> <i>See Tree Related Definitions</i>
• Specified Anatomical Areas	Awning <i>See Design-Related Definitions</i>	<u>Certified Tree Risk Assessor</u> <i>See Tree Related Definitions</i>
• Specified Sexual Activities	Awning Sign <i>See Chapter 18.780, Signs</i>	<del>Canopy Cover</del> <i>See Chapter 18.790, Tree Removal</i>
Adult Motion Picture Theater <i>See Adult Entertainment-Related Definitions</i>	Balloon <i>See Chapter 18.780, Signs</i>	Chamfer <i>See Design-Related Definitions</i>
‘A’-Frame Sign <i>See Chapter 18.780, Signs</i>	Band <i>See Design-Related Definitions</i>	Change of Use
Aisle	Banner <i>See Chapter 18.780, Signs</i>	City
Alley	Base Flood <i>See Flood-Related Definitions</i>	
Alteration, Structural	Basement	

Commentary

18.115 List of Terms

List of terms continued.

- City Engineer  
City of Tigard  
City Recorder  
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  - Arcade
  - Awning
  - Band
  - Bay
  - Belt Course
  - Canopy
  - Chamfer
  - Column
  - Cornice
  - Eaves
  - Entry
  - Frieze
  - Marquee
  - Medallion
  - Parapet
  - Pilaster
  - String Course
  - Transom
  - Turret
  - Visible Transmittance
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- Development Impact Area  
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Development Site  
Diameter at Breast Height (DBH) *See Tree Related Definitions*  
Directional Sign *See Chapter 18.780, Signs*  
Director  
Display Surface *See Chapter 18.780, Signs*  
Drainage Way  
Dripline *See Tree Related Definitions*  
Drive-Through Facility  
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Duplex *See Dwelling-Related Definitions*  
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  - Accessory Dwelling Unit
  - Apartment
  - Attached Dwelling
  - Detached Dwelling
  - Duplex
  - Dwelling
  - Manufactured Home
  - Multiple-Family Dwelling
  - Single-Family Dwelling
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Commentary

18.115 List of Terms

List of terms continued.

- Eaves *See Design-Related Definitions*
- Effective Date *See Section 18.390.080, General Provisions*
- Egress
- Electrical Sign *See Chapter 18.780, Signs*
- Electronic Information Sign *See Chapter 18.780, Signs*
- Enlargement
- Entry *See Design-Related Definitions*
- Entryway Sign *See Chapter 18.780, Signs*
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- Exception
- FAA *See Chapter 18.798, Wireless Communication Facilities*
- Face
- Face of a Building *See Chapter 18.780, Signs*
- FCC *See Chapter 18.798, Wireless Communication Facilities*
- Fence, Sight-Obscuring
- Final Action
- Final Decision *See Final Action*
- Final For Purposes Of Appeal *See Section 18.390.080, General Provisions*
- Final Order *See Final Action*
- Findings
- Flag Lot *See Lot-Related Definitions*
- Flashing Sign *See Chapter 18.780, Signs*
- Floodplain *See Flood-Related Definitions*
- Flood-Related Definitions
- Base Flood
  - Floodplain
  - Floodway
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- Floodway *See Flood-Related Definitions*
- Floodway Fringe *See Flood-Related Definitions*
- Floor Area
- Floor Area Ratio
- Flush Pitched Roof Sign *See Chapter 18.780, Signs*
- Freestanding Sign *See Chapter 18.780, Signs*
- Freeway Interchange *See Chapter 18.780, Signs*
- Freeway-Oriented Sign *See Chapter 18.780, Signs*
- Frieze *See Design-Related Definitions*
- Front *See Yard-Related Definitions*
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- Front Lot Line *See Lot-Related Definitions*
- Garage
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- Glare
- Guyed Tower *See Chapter 18.798, Wireless Communication Facilities*
- Habitable Floor Area
- Hazard Tree *See Tree Related Definitions*
- Hazard Tree Abatement *See Tree Related Definitions*
- Hazard Tree Owner or Responsible Party *See Tree Related Definitions*
- Heritage Tree *See Tree Related Definitions*
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- Implementing Ordinance
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Commentary

18.115 List of Terms

List of terms continued.

- Landscape Architect
- Landscaping
- Landscaping-Related
- Definitions
- ~~Covered Soil Area~~
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  - ~~Root Paths~~
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- Lattice Tower *See Chapter 18.798, Wireless Communication Facilities*
- Lawn Sign *See Chapter 18.780, Signs*
- Legal Entity *See Chapter 18.780, Signs, "Business"*
- Legislative
- Lighting Methods *See Chapter 18.780, Signs*
- Loading Area *See Loading Space*
- Loading Space
- Lot *See Lot-Related Definitions*
- Lot Area *See Lot-Related Definitions*
- Lot Averaging *See Lot-Related Definitions*
- Lot Coverage *See Lot-Related Definitions*
- Lot Depth *See Lot-Related Definitions*
- Lot Line *See Lot-Related Definitions*
- Lot Line Adjustment *See Lot-Related Definitions*
- Lot of Record *See Lot-Related Definitions*
- Lot-Related Definitions
- Corner Lot
  - Flag Lot
  - Front Lot Line
  - Improved Lot
  - Interior Lot
  - Lot
  - Lot Area
  - Lot Averaging
  - Lot Coverage
  - Lot Depth
  - Lot Line
  - Lot Line Adjustment
  - Lot of Record
  - Lot Width
  - Rear Lot Line
  - Side Lot Line
  - Substandard Lot
  - Tax Lot
  - Through Lot
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- Lot Width *See Lot-Related Definitions*
- Maintenance *See Chapter 18.780, Signs*
- Manufactured Home *See Dwelling-Related Definitions*
- Marquee *See Design-Related Definitions*
- Medallion *See Design-Related Definitions*
- Median Tree *See Tree Related Definitions*
- Minimal Use Facilities *See Open Space Facility-Related Definitions*
- Mitigation
- Mixed Solid Waste *See Chapter 18.755, Mixed Solid Waste And Recyclable Storage*
- Mixed-Use Development
- Mobile Home
- Mobile Home Park
- Mobile Home Subdivision
- Monopole *See Chapter 18.798, Wireless Communication Facilities*
- Moving Sign *See Chapter 18.780, Signs*
- Multiple-Family Dwelling *See Dwelling-Related Definitions*
- Multi-Unit Residential Building *See Chapter 18.755, Mixed Solid Waste And Recyclable Storage*
- Neighborhood Activity Center
- Noise
- Nonconforming Sign *See Chapter 18.780, Signs*
- Nonconforming Situation
- Non-Residential Building *See Chapter 18.755, Mixed Solid Waste And Recyclable Storage*
- Non-Structural Trim *See Chapter 18.780, Signs*
- Nuisance Tree *See Tree Related Definitions*
- Occupancy Permit
- Off-Site Impact
- Off-Site Improvement
- Open Grown Tree *See Tree Related Definitions*
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Commentary

18.115 List of Terms

List of terms continued.



- Open Space Facility-Related Definitions
- Active Use Facilities
  - Minimal Use Facilities
  - Passive Use Facilities
- Oregon Administrative Rules
- Oregon Revised Statutes
- Outdoor Storage
- Owner
- Painted Wall Decorations  
*See Chapter 18.780, Signs*
- Painted Wall Highlights *See Chapter 18.780, Signs*
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- Parapet *See Design-Related Definitions*
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- Parking Space
- Partition
- Party
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- Perimeter
- Permitted Use
- Person *See also Chapter 18.780, Signs*
- Pilaster *See Design-Related Definitions*
- Plan Coordination *See Comprehensive Plan-Related Definitions*
- Plat
- Premises *See Chapter 18.780, Signs*
- Projecting Sign *See Chapter 18.780, Signs*
- Projection *See also Chapter 18.780, Signs*
- Provider *See Chapter 18.798, Wireless Communication Facilities*
- ~~Pruning~~ *See Chapter 18.790, Tree Removal*
- Public Business Day
- Public Support Facilities
- Quasi-Judicial
- Reader-Board Sign *See Chapter 18.780, Signs*
- Rear *See Yard-Related Definitions*
- Rear Lot Line *See Lot-Related Definitions*
- Receipt
- Recreational Vehicles
- Remodel
- ~~Removal~~ *See Chapter 18.790, Tree Removal*
- Reserve Strip
- Residence
- Residential Trailer
- Responsible Party, *See Section 18.230.030, Penalty*
- Revolving Sign *See Chapter 18.780, Signs*
- Right-of-Way
- Road
- Roof
- Roof Line *See Chapter 18.780, Signs*
- Roof Sign *See Chapter 18.780, Signs*
- ~~Root Paths~~ *See Landscaping-Related Definitions*
- Rotating Sign *See Chapter 18.780, Signs*
- ~~Sensitive Lands~~ *See Chapter 18.790, Tree Removal*
- Setback
- Shopping Center *See Chapter 18.780, Signs*
- Shopping Plaza *See Chapter 18.780, Signs*
- Side *See Yard-Related Definitions*
- Side Lot Line *See Lot-Related Definitions*
- Sign *See Chapter 18.780, Signs*
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- Significant Tree Grove *See Tree Related Definitions*
- Single-Family Dwelling *See Dwelling-Related Definitions*
- Site
- Slope
- ~~Soil Volume Calculations~~ *See Landscaping-Related Definitions*
- Source-Separated Recyclable *See Chapter 18.755, Mixed Solid Waste And Recyclable Storage*
- Special Adjustments, *See Section 18.370.020, Adjustments*
- Specified Anatomical Areas *See Adult Entertainment-Related Definitions*
- Specified Sexual Activities *See Adult Entertainment-Related Definitions*

Commentary

18.115 List of Terms

List of terms continued.

- Stand (Of Trees) *See Tree Related Definitions*
- Stand Grown Tree *See Tree Related Definitions*
- Storage Area *See Chapter 18.755, Mixed Solid Waste And Recyclable Storage*
- Story
- Story, First
- Story, Half
- Street
- Street, Private
- Street, Public
- Street Tree *See Tree Related Definitions*
- String Course *See Design-Related Definitions*
- Structural Alteration *See Chapter 18.780, Signs*
- Structure
- Subdivision
- Substandard Lot *See Lot-Related Definitions*
- Substantial Improvement
- Surface Street *See Chapter 18.780, Signs*
- Tax Lot *See Lot-Related Definitions*
- Temporary Sign *See Chapter 18.780, Signs*
- Temporary Use
- Tenant Sign *See Chapter 18.780, Signs*
- Through Lot *See Lot-Related Definitions*
- Tigard-Based Nonprofit Organization
- Traffic Flow Plan
- Transom *See Design-Related Definitions*
- Tree *See Tree Related Definitions See also Chapter 18.790, Tree Removal*
- Tree Canopy *See Tree Related Definitions*
- Tree Canopy Cover, Effective *See Tree Related Definitions*
- Tree Care Industry Standards *See Tree Related Definitions*
- Tree Related Definitions
- Caliper
  - Certified Arborist
  - Certified Tree Risk Assessor
  - Covered Soil Volume
  - Diameter at Breast Height (DBH)
  - Dripline
  - Hazard Tree
  - Hazard Tree Abatement
  - Hazard Tree Owner or Responsible Party
  - Heritage Tree
  - Median Tree
  - Nuisance Tree
  - Open Grown Tree
  - Open Soil Volume
  - Parking Lot Tree
  - Significant Tree Grove
  - Stand (Of Trees)
  - Stand Grown Tree
  - Street Tree
  - Tree
  - Tree Canopy
  - Tree Canopy Cover, Effective
  - Tree Care Industry Standards
  - Tree Removal
- Understory Tree
- Tree Removal *See Tree Related Definitions*
- Turret *See Design-Related Definitions*
- Understory Tree *See Tree Related Definitions*
- Uniform Building Code *See Chapter 18.780, Signs*
- Use
- Vehicle Parking Space
- Visible Transmittance *See Design-Related Definitions*
- Vision Clearance Area
- Visual Obstruction
- Wall Sign *See Chapter 18.780, Signs*
- Wetlands
- Will
- Window
- Wireless Communication Facility *See Chapter 18.798, Wireless Communication Facilities*
- Wireless Communication Facility, Attached *See Chapter 18.798, Wireless Communication Facilities*
- Wireless Communication Transmissions Towers *See Chapter 18.798, Wireless Communication Facilities*
- Yard *See Yard-Related Definitions*
-

Commentary

18.115 List of Terms

List of terms continued.

Yard-Related Definitions

- Corner Side
- Front
- Rear
- Side
- Yard

Zero Lot Line *See Lot-Related Definitions*

Zoning District

## Commentary

### 18.120.030 Meaning of Specific Words and Terms

The definitions that were previously included in Chapter 18.790 and Title 9 have been moved into Chapter 18.120 in order to consolidate all urban forestry relevant definitions into one chapter in the Tigard Development Code. Existing tree related definitions that have been substantially modified have been struck and replaced with new definitions. Definitions in Chapter 18.790 have been copied to Title 8, Urban Forestry, to ensure consistency of terms between Title 8 and Title 18. Both Title 8 and Title 18 specify that the title definitions apply to administrative rules (in this case the Urban Forestry Manual).

In Title 18, existing and proposed tree related definitions have been further consolidated under a “tree related definitions section” so that a developer or arborist/landscape architect seeking to apply the definitions can find all of the tree related definitions in one place.

The term “development impact area” is a new term that was created for Chapter 18.790 (Urban Forestry Plan) as a catchall term for any type of ground disturbance on a site. Trees can be severely impacted by any ground disturbance on a site, and Section 10 of the Urban Forestry Manual requires that a complete tree preservation and removal site plan display the development impact area. Since the concept of the development impact area may be useful for future code amendments besides trees, it is not included as one of the tree related definitions.

**Chapter 18.120**

**DEFINITIONS**

**Sections:**

- 18.120.010     Meaning of Words Generally**
- 18.120.020     Meaning of Common Words**
- 18.120.030     Meaning of Specific Words and Terms**

**18.120.010     Meaning of Words Generally**

[No change.]

**18.120.020     Meaning of Common Words**

[No change.]

**18.120.030     Meaning of Specific Words and Terms**

A. For additional words and terms, also see Use Categories (Chapter 18.130); Mixed Solid Waste and Recyclable Storage (Chapter 18.755); Sensitive Lands (Chapter 18.775); Signs (Chapter 18.780); ~~Tree Removal (Chapter 18.790)~~; and Wireless Communication Facilities (Chapter 18.798). As used in this title and corresponding administrative rules, the following words and phrases mean:

- 1. through 41.

[No change]

- ~~42. “Caliper” - The diameter of a tree trunk measured at a prescribed height.~~

**Renumber definitions 43-59**

- ~~60. “Covered soil area” - An area of soil that is under pavement and specially designed accommodate tree root growth.~~

**Renumber definitions 61-70**

- ~~71. “Development Impact Area” - The area on a site or right of way associated with a site affected by any and all site or right of way improvements, including but not limited to buildings, structures, walls, parking and loading areas, street improvements, paved and graveled areas, utilities, irrigation, equipment storage, construction parking and landscaping. The impact area also refers to areas of grading, filling, stockpiling, demolition, tree removal, trenching, boring and any other activities that require excavation or soil disturbance.~~

Commentary

18.120.030 Meaning of Specific Words and Terms

The term “landscape architect” is also a new term that specifies their registration requirements with the State of Oregon. Chapter 18.790 allows landscape architects, in addition to arborists, to create urban forestry plans.

The following new or substantially modified definitions have been included in Chapter 18.120:

Caliper: The term caliper is referenced throughout the code and Urban Forestry Manual when specifying minimum size of nursery trees. The term caliper follows tree care industry standards.

Certified arborist: This term clarifies that certified arborists are certified by the International Society of Arboriculture.

Certified tree risk assessor: This term clarifies that certified tree risk assessors are certified by the International Society of Arboriculture.



**Renumber definitions 71-103**

104. “Landscape Architect” - An individual registered with the Oregon State Landscape Architect Board as a registered landscape architect.

**Renumber definitions 103-120**

~~121. “Open soil” - An unpaved area of soil surrounding a tree, which contains existing, new or amended soil.~~

**Renumber definitions 122-150**

~~151. “Root paths” - Constructed paths that use aeration or drainage strips to give roots a way to grow out of the tree space and under pavement in order to access better planting soils. Root paths can connect tree spaces and adjacent green spaces.~~

**Renumber definitions 152-154**

~~155. “Soil volume calculations” - Sum total of soil volumes from each design method used for a tree. A soil depth of three feet is assumed. Soil volume (cubic feet) = open soil area (length x width x depth) (feet) + covered soil area (length x width x depth) (feet) + root path length (feet) x 0.25 + green space area (length x width x depth) (feet).  
\*Include only applicable soil areas and design methods for each tree.~~

**Renumber definitions 156-169**

170. “Tree-related definitions:” -

- a. “Caliper” - The tree care industry standard for measuring the trunk diameter of nursery stock. Caliper is the average diameter of the trunk of a nursery tree measured six (6) inches above the ground for trunks less than or equal to an average of four (4) inches in diameter (when measured six (6) inches above ground). When the trunk of a nursery tree is greater than an average of four (4) inches in diameter (when measured six (6) inches above ground), caliper is the average diameter at 12 inches above ground (see figure 18.120.3).
- b. “Certified Arborist” - An individual certified by the International Society of Arboriculture as a certified arborist.
- c. “Certified Tree Risk Assessor” - An individual certified by the International Society of Arboriculture to conduct tree risk assessments.

## Commentary

### 18.120.030 Meaning of Specific Words and Terms

**Covered soil volume:** This definition is for Sections 12 and 13 of the Urban Forestry Manual which allows soil volume requirements for street trees and parking lot trees to be met underneath pavement when certain design criteria are met.

**Diameter at breast height (DBH):** The term DBH is referenced throughout the code and Urban Forestry Manual when specifying the size of trees that are subject to various regulations. The term DBH follows tree care industry standards.

**Dripline:** This definition is primarily for Section 10 of the Urban Forestry Manual to clarify what portion of a tree is eligible for the effective canopy requirement.

**Hazard tree:** The term hazard tree has been made more specific to the International Society of Arboriculture Standards so that a more objective evaluation can be made as to what constitutes a hazard tree. A tiered system of rating hazards ensures the risks associated with small diameter tree parts are not understated while the risks associated with large diameter tree parts are not overstated.

**Hazard tree abatement:** The term hazard tree abatement clarifies that abatement is reducing risk below the established threshold. This can be accomplished through pruning or other means, not solely through tree removal.

**Hazard tree owner or responsible party:** Hazard tree issues are often highly contentious, so the hazard tree owner or responsible party definition is very specific in assigning ownership and/or responsibility for the tree in question.

- d. “Covered soil volume” - A volume of soil that is under pavement and specially designed to support the growth of a tree. Covered soil volumes contain existing, new or amended soil with the physical, chemical and biological properties necessary to support the growth of a tree, while at the same time supporting the load-bearing requirements and engineering standards of the overlying pavement. Covered soil volumes would not be considered tree growth limiting by a project arborist or landscape architect in an urban forestry plan developed per the standards in Chapter 18.790 and the Urban Forestry Manual.
- e. “Diameter at Breast Height (DBH)” - The average diameter of the trunk of a tree measured 4 ½ feet above mean ground level at the base of the trunk (see figure 18.120.4). If the tree splits into multiple trunks above ground, but below 4 ½ feet, the DBH is the average diameter of the most narrow point beneath the split (see figure 18.120.5). If the tree has excessive swelling at 4 ½ feet, the DBH is the average diameter of the most narrow point beneath the swelling. If the tree splits into multiple trunks at or directly below ground, it shall be considered one tree and the DBH shall be the square root of the sum of the cross-sectional area of each trunk at 4 ½ feet above mean ground level multiplied by 1.1284 (see figure 18.120.6).
- f. “Dripline” - The outer limit of a tree canopy projected to the ground.
- g. “Hazard Tree” - Any tree or tree part that has been or could be determined by an independent certified tree risk assessor to constitute a high level hazard requiring hazard tree abatement with an overall minimum risk rating of 8 for trees or tree parts up to 4 inch DBH, 9 for trees or tree parts greater than 4 inch and up to 20 inch DBH, or 10 for trees or tree parts greater than 20 inch DBH using the most current version of the tree risk assessment methodology developed by the International Society of Arboriculture.
- h. “Hazard Tree Abatement” - The process of reducing or eliminating a hazard to an overall risk rating of less than 8 for trees or tree parts up to 4 inch DBH, 9 for trees or tree parts greater than 4 inch and up to 20 inch DBH, or 10 for trees or tree parts greater than 20 inch DBH using the most current version of the tree risk assessment methodology developed by the International Society of Arboriculture through pruning, tree removal or other means in a manner that complies with all applicable rules and regulations.
- i. “Hazard Tree Owner or Responsible Party” - The property owner or responsible party with the largest percentage of a hazard tree trunk immediately above the trunk flare or root buttresses. In cases where the hazard tree consists of a branch instead of an entire tree, the hazard tree owner or responsible party is the person who owns or is responsible for the property from where the branch originates.

## Commentary

### 18.120.030 Meaning of Specific Words and Terms

**Heritage tree:** This term has been revised slightly from the existing definition to remove reference to Chapter 9.08 since heritage trees will be administered through Chapter 8.16.

**Median tree:** This term was created to distinguish between median trees (which are between vehicle traffic) and street trees, since median trees are the responsibility of the city.

**Nuisance tree:** A nuisance tree list has been added to the Urban Forestry Manual to specify the types of trees that are prohibited from planting or receiving credit towards the effective canopy requirement. A nuisance tree is defined as any tree on the nuisance list.

**Open grown tree:** Open grown trees are distinguished from stand grown trees in Section 10 of the Urban Forestry Manual so that arborists/landscape architects do not have to inventory every tree in a stand as currently required. Arborists/landscape architects will only have to inventory open grown or isolated trees, and stands of trees can be delineated at their edges. This will cut down on unnecessary inventory work. A definition of the two types of trees is required to distinguish the two.

**Open soil volume:** As with covered soil volume, this definition is for Section 12 and 13 of the Urban Forestry Manual to clarify how to calculate soil volumes for trees.

**Parking lot tree:** Parking lot trees are explicitly defined since they are required by Chapter 18.745 to provide canopy over parking areas and referenced extensively in Section 13 of the Urban Forestry Manual.

**Significant tree grove:** A definition for significant tree groves is needed since flexible standards and preservation incentives that are specific to significant tree groves have been added to Chapter 18.790. A significant tree grove is a native “stand of trees” (already defined) that has been identified as significant through the Statewide Land Use Planning Goal 5 process. A significant tree grove map is available through a publicly accessible mapping program.

**Stand (of trees):** Section 10 of the Urban Forestry Manual allows groups of stand grown trees (stands) to be delineated at their edges. A definition of stand (of trees) is provided for additional guidance as to what is considered a stand.

**Stand grown tree:** A definition of stand grown tree is required to distinguish it from open grown tree so that arborists/landscape architects do not have to inventory every tree in a stand as currently required. Section 10 of the Urban Forestry Manual allows stands of trees to be delineated at their edges.

**Street tree:** This term clarifies the size and location thresholds that define a street tree. The definition also distinguishes street trees from median trees.

- i. “Heritage Tree” - Any tree or stand of trees of landmark importance due to age, size, species, horticultural quality, or historic importance that has been approved as a heritage tree by Tigard City Council.
- k. “Median Tree” - Any tree within the public right of way under City of Tigard jurisdiction between opposing lanes of vehicular traffic. Trees in the centers of cul-de-sacs and roundabouts within the public right of way under City of Tigard jurisdiction shall also be considered median trees.
- l. “Nuisance Tree” - Any tree included on the Nuisance Tree List in the Urban Forestry Manual.
- m. “Open Grown Tree” - Any tree that has grown and established in an isolated manner without significant competition for light, space and nutrients from other trees. Open grown trees generally retain more foliage, develop greater trunk tapers, have more extensive root systems and are more resistant to windthrow than stand grown trees.
- n. “Open Soil Volume” - An unpaved volume of soil, which contains existing, new or amended soil with the physical, chemical and biological properties necessary to support the growth of a tree.
- o. “Parking Lot Tree” - Any tree used to meet the requirements in Section 18.745.050(E).
- p. “Significant Tree Grove” - A stand of trees that has been identified as significant through the Statewide Land Use Planning Goal 5 process. A Significant Tree Grove Map is maintained by the Director.
- q. “Stand (Of Trees)” - A distinct area of stand grown trees, often predominantly native and with contiguous canopies, which form a visual and/or biological unit.
- r. “Stand Grown Tree” - Any tree that has grown and established in close association with other trees and, as a result, has experienced significant competition for light, space, and nutrients from other trees. Stand grown trees generally retain less foliage, develop less trunk taper, have less extensive root systems and are less resistant to windthrow than open grown trees.
- s. “Street Tree” - Any tree equal to or greater than 1 ½ inch caliper or DBH within a public right of way under City of Tigard jurisdiction or easement for public access under City of Tigard jurisdiction, or any tree equal to or greater than 1 ½ inch caliper or DBH outside of a public right of way or easement for public access that the city can demonstrate was planted or preserved as a street tree to meet the requirements for a city permit or project. Median trees shall not be considered street trees.

## Commentary

### 18.120.030 Meaning of Specific Words and Terms

**Tree:** The definition of tree is revised using the standard definition of tree by the International Society of Arboriculture.

**Tree canopy:** Tree canopy is a central theme of the revised code and forms the basis for many of the code revisions and corresponding administrative procedures. The term tree canopy is closely related to dripline. Dripline is specific to only the outer edge of the tree canopy, whereas tree canopy encompasses everything in between.

**Tree canopy cover, effective:** A definition for effective tree canopy cover is required to distinguish it from actual tree canopy cover. Effective tree canopy cover has specific requirements for measurement in Section 10 of the Urban Forestry Manual. For example, preserving existing trees is given double tree canopy credit compared to planting new trees. Therefore, effective tree canopy cover is not the same as actual tree canopy.

**Tree Care Industry Standards:** Tree care industry standards are defined using the American National Standard Institute (ANSI) standards for tree care operations. ANSI standards outline accepted practices for planting, pruning and maintenance of trees. ANSI standards are incorporated by reference rather than explaining the standards in detail.

**Tree removal:** The existing definition of tree removal is retained.

**Understory tree:** This definition is required for Section 10 of the Urban Forestry Manual to allow for the planting of trees beneath the canopies of larger trees when required for constrained sites.

- t. “Tree” - A woody perennial plant, often with one dominant trunk, the capacity to achieve a mature height greater than 16 feet, and primarily referred to as a tree in scientific literature. A standing woody plant, or group of such, having a trunk which is two inches or more in caliper size when measured four feet from the ground.
- u. “Tree Canopy” - The area above ground which is covered by the trunk, branches and foliage of a tree or group of trees’ crowns.
- v. “Tree Canopy Cover, Effective” - A formula detailed in Chapter 18.790 and the Urban Forestry Manual used to calculate the amount of tree canopy that will be provided for a given lot or tract through any combination of preserving existing trees and planting new trees. In general, the formula grants bonus tree canopy credit based on the existing tree canopy of trees that are preserved, and grants additional tree canopy credit based on the projected mature tree canopy of newly planted trees.
- w. “Tree Care Industry Standards” - Generally accepted industry standards for tree care practices detailed in the most current version of the American National Standards Institute (ANSI) A300 Standards for Tree Care Operations. In addition, tree care industry standards shall include adherence to all applicable rules and regulations for the completion of any tree care operation.
- x. “Tree Removal” - The cutting or removing of 50 percent (50%) or more of a crown, trunk or root system of a tree, or any action which results in the loss of aesthetic or physiological viability or causes the tree to fall or be in immediate danger of falling.
- y. “Understory Tree” - Any tree that is adapted to grow and complete its lifecycle within the shade and beneath the canopy of another tree.

### Renumber definitions 171-181

## Commentary

### 18.120.030 Meaning of Specific Words and Terms

Four new figures are added to the end of the chapter where existing figures for definitions are located. The definitions of “caliper” and “DBH” can be confusing for non-arborists/landscape architects, and the figures are meant to better illustrate the definitions. These figures are included to illustrate the definitions for “caliper” and “DBH” in Chapter 8.02 as well.



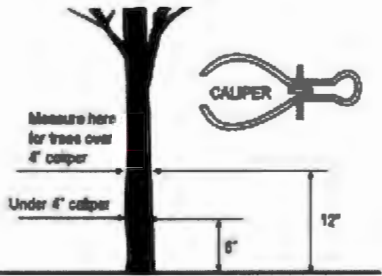


Figure 18.120.3  
Caliper

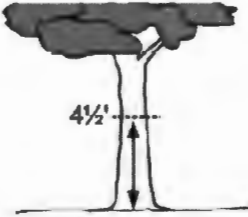


Figure 18.120.4  
Standard DBH

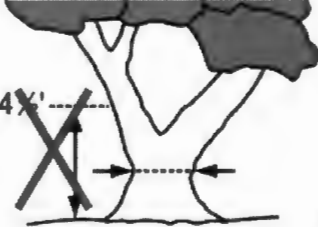


Figure 18.120.5  
DBH for Split Trunk

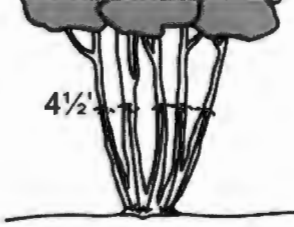


Figure 18.120.6  
DBH for Multiple Trunks

## Commentary

### 18.310 Summary of Land Use Permits

The following revisions to permit types are included in chapter 18.310 (Summary of Land Use Permits):

- Street tree adjustments are struck because they will be handled administratively through Chapter 18.745;
- Modifications to the urban forestry plan component of an approved land use permit will be allowed by Chapter 18.790 through a Type I process so reference is included in table 18.390.1;
- Tree removal permits are struck because they will be administered through Title 8; and
- Discretionary urban forestry plans that are alternatives to standard urban forestry plans will be allowed by Chapter 18.790 through a Type III process so reference is included in table 18.390.1.

**Chapter 18.310**  
**SUMMARY OF LAND USE PERMITS**

**Sections:**

- 18.310.010 Purpose**
- 18.310.020 Summary of Land Use Permits**

**18.310.010 Purpose**

- A. Introduction. In this development code, each land use permit or related action is processed by means of a generic decision-making type, e.g., Types I - IV or Limited Land Use Decisions (LLD) or Expedited Land Divisions (ELD), to which it is assigned. A description of these decision-making procedures are summarized in Chapter 18.390. In addition, to be approved, each permit or related action must comply with specifically-tailored approval criteria, which with few exceptions are contained in Chapters 18.320 - 18.385, as well as all other pertinent development standards, which are found throughout this code.
- B. Purpose. The purpose of this chapter is to provide a table summarizing all land use permits and related actions, including cross-references to type of decision-making process, approval criteria and other development standards. As such, this chapter provides a “road map” for the permit approval process.

**18.310.020 Summary of Land Use Permits**

- A. Summary Table. The table summarizing the decision-making procedure and substantive approval requirements of each land use permit and related action is presented in Table 18.310.1 below:

Commentary

Table 18.310 Summary of Land Use Permits and Related Actions

No changes to the first set of land use permits and related actions in the table.

**TABLE 18.310.1  
SUMMARY OF LAND USE PERMITS AND RELATED ACTIONS**

<u>Land Use Permit/Action</u>	<u>Decision-Making Type</u>	<u>Approval Criteria</u>	<u>Other Development Regulations</u>
<u>Annexation</u>	IV	18.320.020	18.320
<u>Conditional Use</u>			
Initial	III-HO	18.330.030	18.330
Major Modification	III-HO	18.330.030	18.510, 18.520
Minor Modification	I	18.330.030	18.530
<u>Director's Interpretation</u>	-- <sup>1</sup>	----	18.340
<u>Planned Development</u>			
Detailed Plan	III-PC; ELD II	18.350.100 18.350.020	18.350 18.350
<u>Site Development Review</u>			
New Construction	II	18.360.090	18.360
Major Modification	II	18.360.090	18.360
Minor Modification	I	18.360.090	18.360

Commentary

Table 18.310 Summary of Land Use Permits and Related Actions

Street tree adjustments are struck because they will be handled administratively through Chapter 18.745.

Tree removal permits are struck because they will be administered through Title 8.

A more flexible urban forestry plan modification process is proposed in section 18.790.070 (Modification to the Urban Forestry Plan Component of an Approved Land Use Permit). The process allows modifications through a Type I permit and is more fully described in section 18.790.070.

TABLE 18.310.1 (Con't)

<b>Land Use Permit/Action</b>	<b>Decision-Making Type</b>	<b>Approval Other Criteria</b>	<b>Development Regulations</b>
<u>Variances/Adjustments</u>			
Variances	II	18.370.010.C	18.370
Development Adjustments	I	18.370.020.B.2	18.370
Special Adjustments			
• Adjustments in Subdivisions	-- <sup>2</sup>	18.370.020.C.1	18.430
• Reduction of Minimum Res. Densities	I	18.370.020.C.2	18.430, 18.715
• Access/Egress Standards Adjustments	II	18.370.020.C.3.b	18.705
• <del>Landscaping Adjustments</del>			
<del>-Existing Street Trees</del>	<del>I</del>	<del>18.370.020.C.4.a</del>	<del>18.745</del>
<del>-New Street Trees</del>	<del>I</del>	<del>18.370.020.C.4.b</del>	<del>18.745</del>
• Parking Adjustments			
-Reduction in Minimum Prkg. Ratios	II	18.370.020.C.5.a	18.765
-Prkg Reduct. in New Developmts/ Transit Improvements	II	18.370.020.C.5.b	18.765
-Prkg Reduct. in Existing Developmts/ Transit Improvements	II	18.370.020.C.5.c	18.765
-Increases in Maximum Parking Ratios	II	18.370.020.C.5.d	18.765
-Reduction in Bicycle Parking	II	18.370.020.C.5.e	18.765
-Alternative Parking Garage Layout	II	18.370.020.C.5.f	18.765
-Reduction in Stacking Lane Length	I	18.370.020.C.5.g	18.765
• Sign Code Adjustments	II	18.370.020.C.6	18.780
• <del>Tree Removal Adjustments</del>	<del>I</del>	<del>18.370.020.C.7</del>	<del>18.790</del>
• Wireless Communication Facility Adj.			
-Setback from Nearby Residence	II	18.370.020.C.8.a	18.798
-Distance from Another Tower	I	18.370.020.C.8.b	18.798
• Street Improvement Adjustments	II	18.370.020.C.9	18.810
• <u>Modification to the Urban Forestry Plan Component of an Approved Land Use Permit</u>	<u>I</u>	<u>18.790.070.D</u>	<u>18.790</u>

The discretionary urban forestry plan review option is an alternative to meeting the clear and objective effective canopy requirements in chapter 18.790. An applicant could make their case at a public hearing in front of Planning Commission or the hearings officer about how their proposal is an adequate substitute for the functions and values otherwise provided by trees.

The review body (Planning Commission or hearings officer) will depend on whether there is a concurrent Type III review. For example, if an applicant for a Planned Development (Type III Planning Commission review) chooses to receive a discretionary urban forestry plan review, the review body will be the Planning Commission. However, if an applicant for a Conditional Use Permit (Type III hearings officer review) chooses to receive a discretionary urban forestry plan review, the review body will be the hearings officer. Finally, if an applicant does not have a concurrent Type III review (e.g. Subdivision, Minor Land Partition, etc.), yet chooses to receive a discretionary urban forestry plan review, the review body will be the hearings officer.

The discretionary urban forestry plan review process is described more fully in section 18.790.040.



Zoning Map/Text Amendments

Legislative	IV	Comprehensive Plan	18.380
Quasi-Judicial	III-PC	18.380.030.B	18.380

Miscellaneous Permits

Accessory Residential Units 18.710	I	Development Standards in	
Historic Overlay			
• Historic Overlay Designation	III-PC	18.740.040.A	18.740
• Removal Historic Overlay Designation	III-PC	18.740.040.B	18.740
• Exterior Alteration in HO District	II	18.740.040.C	18.740
• New Construction in HO District	II	18.740.040.D	18.740
• Demolition in HO District	II	18.740.040.E	18.740
Home Occupations			
• Type I	I	18.742.040.A	18.742
• Type II	II	18.742.050.A	18.742
Nonconforming Use Confirmation	I	18.760.020.A	18.760
<u>Discretionary Urban Forestry Plan</u>	<u>III-PC, III-HO</u>	<u>18.790.040.C</u>	<u>18.790</u>
<u>Review</u>			

Commentary

Table 18.310 Summary of Land Use Permits and Related Actions

Tree removal permits are struck because they will be administered through Title 8.

TABLE 18.310.1 (Con't.)

Land Use Permit/Action	Decision-Making Type	Approval Criteria	Other Development Regulations
<u>Sensitive Lands</u>			
• Within 100-Year Flood Plain	I, III-HO	18.775.020.E <sup>4</sup> , 18.775.070.B	18.775
• With Excessive Slopes	I, II, III-HO <sup>3</sup>	18.775.020.E <sup>4</sup> , 18.775.070.C	18.775
• Within Drainage Ways	I, II, III-HO <sup>3</sup>	18.775.020.E <sup>4</sup> , 18.775.070.D	18.775
• Within Wetlands	II, III-HO <sup>3</sup>	18.775.070.E	18.775
<u>Signs</u>			
• Existing Each	I	{Development Standards for	
• Modification of Existing	I	{Sign Type, per 18.780	
• Temporary	I	18.780.100	
<u>Temporary Uses</u>			
• Seasonal/Special Events	I	18.785.040.A	18.785
• Emergency	I	18.785.040.B	18.785
• Temporary Sales Office/Home	I	18.785.040.C	18.785
• Temporary Building	I	18.785.040.D	18.785
<del>Tree Removal</del>	<del>I</del>	<del>18.790.050.A</del>	<del>18.790</del>

Land Division

Lot Line Adjustment	I	18.410.040	18.410
Land Partition	II, ELD	18.420.050	18.420
<u>Subdivisions</u>			
• Without Planned Development	II, ELD	18.430.070	18.430
• With Planned Development	III-PC, ELD	18.430.070 18.350.100	18.430, 18.350

<sup>1</sup> Special kind of decision: Type I if not appealed, Type II if appealed by applicant. Because of recent Oregon case law, appeal goes directly to City Council.

<sup>2</sup> Addressed concurrently with subdivision review.

<sup>3</sup> Can be reviewed as either Type II or IIIA, depending on criteria in 18.775.015.D and E.

<sup>4</sup> Type I procedures are reviewed with criteria of Section 18.775.020.E. Type II and III procedures are reviewed with criteria of Section 18.775.070.B.

**KEY:**

Type I:	Ministerial Review (18.390.030)
Type II:	Quasi-Judicial Review by Director (18.390.040)
Type III-HO:	Quasi-Judicial by Hearings Officer (18.390.050)
Type III-PC:	Quasi-Judicial by Planning Commission (18.390.050)
Type IV:	Legislative (18.390.060)
LLD:	Limited Land Use Decision (18.390.070)
ELD:	Expedited Land Division (18.390.070)

## Commentary

### 18.330.030 Approval Standards and Conditions of Approval

The Conditional Use Permits (CUPs) have been, and will continue to be required to meet the requirements of Chapter 18.745 (Landscaping and Screening) and Chapter 18.790 (Urban Forestry Plan). Explicit references to these requirements are made in the approval standards section of the conditional use chapter.

**Chapter 18.330**  
**CONDITIONAL USE**

**Sections:**

- 18.330.010 Purpose**  
**18.330.020 Approval Process**  
**18.330.030 Approval Standards and Conditions of Approval**  
**18.330.040 Additional Submission Requirements**  
**18.330.050 Additional Development Standards for Conditional Use Types**

**18.330.010 Purpose**

[No change.]

**18.330.020 Approval Process**

[No change.]

**18.330.030 Approval Standards and Conditions of Approval**

A. Approval standards. The Hearings Officer shall approve, approve with conditions, or deny an application for a conditional use or to enlarge or alter a conditional use based on findings of fact with respect to each of the following criteria:

1. The site size and dimensions provide adequate area for the needs of the proposed use;
2. The impacts of the proposed use of the site can be accommodated considering size, shape, location, topography, and natural features;
3. All required public facilities have adequate capacity to serve the proposal;
4. The applicable requirements of the zoning district are met except as modified by this chapter;
5. The applicable requirements of 18.330.050; and
6. The supplementary requirements set forth in other chapters of this code including but not limited to Chapter 18.780, Signs, Chapter 18.745, Landscaping and Screening, Chapter 18.790, Urban Forestry Plan, and Chapter 18.360, Site Development Review, if applicable, are met.

B. [No change.]

## Commentary

### 18.330.040 Additional Submission Requirements

The Conditional Use Permits (CUPs) have been, and will continue to be required to meet the requirements of Chapter 18.790 (Urban Forestry Plan). Explicit reference to the submission requirements for an urban forestry plan has been made.

**18.330.040 Additional Submission Requirements**

- A. Additional submission requirements. In addition to the submission requirements required in Chapter 18.390, Decision-Making Procedures, an application for conditional use approval must include the following additional information in graphic, tabular and/or narrative form. The Director shall provide a list of the specific information to be included in each of the following:
1. Existing site conditions;
  2. A site plan;
  3. A grading plan;
  4. A landscape plan;
  5. An urban forestry plan consistent with Chapter 18.790;
  - ~~5~~6. Architectural elevations of all structures; and
  - ~~6~~7. A copy of all existing and proposed restrictions or covenants.

## Commentary

### 18.330.050 Additional Development Standards for Conditional Use Types

Conditional uses have specific requirements based on the type of use. The parking and storage setback requirement for motor vehicle servicing and repair has been increased from 5 to 6 feet so that required parking lot trees can be planted within the perimeter setback.

The Urban Forestry Manual consists of administrative rules to implement the details of the urban forestry related code provisions in Title 8, Title 18 and other applicable titles in the Tigard Municipal Code. Section 13 of the Urban Forestry Manual requires parking lot trees to be planted in locations with minimum dimensions of 6 feet by 6 feet, so the amendment is intended to be consistent with the parking lot tree requirements.

The screening requirements are found in Section 18.745.050, so the existing scrivener's error has been corrected.



**18.330.050 Additional Development Standards for Conditional Use Types**

A. Concurrent variance application(s). A conditional use permit shall not grant variances to the regulations otherwise prescribed by this title. A variance application(s) may be filed in conjunction with the conditional use application and both applications may be heard at the same hearing.

B. Additional development standards. The additional dimensional requirements and approval standards for conditional use are as follows:

1. Adult Entertainment:

[No change.]

2. Motor Vehicle Servicing and Repair:

a. Setbacks:

(i) A six ~~five~~-foot perimeter setback shall surround all outdoor parking and storage areas;

(ii) Buffer screening shall be provided along the perimeter of all outdoor parking and storage areas as required in Section 18.745.045~~0~~; and

(iii) All repair work shall be performed indoors.

3. through 16.

[No change.]

Commentary

18.330.050 Additional Development Standards for Conditional Use Types

Conditional uses have specific requirements based on the type of use. The parking setback requirement for non-accessory parking has been increased from 5 to 6 feet so that required parking lot trees can be planted within the perimeter setback.

The Urban Forestry Manual consists of administrative rules to implement the details of the urban forestry related code provisions in Title 8, Title 18 and other applicable titles in the Tigard Municipal Code. Section 13 of the Urban Forestry Manual requires parking lot trees to be planted in locations with minimum dimensions of 6 feet by 6 feet, so the amendment is intended to be consistent with the parking lot tree requirements.

17. Non-Accessory Parking:
  - a. Minimum lot size shall be 5,000 square feet;
  - b. Minimum setbacks: for structures: shall be those of the applicable zone; for parking area: ~~five~~ six feet around perimeter of paved area for landscaping and screening purposes;
  - c. Height limitation shall be that of the applicable zone;
  - d. Off-street parking requirements shall be in accordance with Chapter 18.765; and
  - e. Screening shall be in accordance with Chapter 18.745.

18. through 20.

[No change.]

## Commentary

### 18.350.040 Concept Plan Submission Requirements

Planned developments (PDs) have been, and will continue to be required to meet the requirements of Chapter 18.790 (Urban Forestry Plan).

In addition, among the stated purposes of PDs (18.350.010) is the preservation of natural resources, with tree preservation called out specifically. PDs are typically approved through a two-step process with a conceptual plan approval followed by a detailed plan approval by Planning Commission. Therefore, the submittal of an urban forestry plan during the conceptual stage will help the Planning Commission implement the purpose of PDs during the conceptual phase of approval.

**Chapter 18.350  
PLANNED DEVELOPMENTS**

**Sections:**

- 18.350.010 Purpose**
- 18.350.020 Process**
- 18.350.030 Administrative Provisions**
- 18.350.040 Concept Plan Submission Requirements**
- 18.350.050 Concept Plan Approval Criteria**
- 18.350.060 Detailed Development Plan Submission Requirements**
- 18.350.070 Detailed Development Plan Approval Criteria**

**18.350.010 Purpose**

[No change.]

**18.350.020 Process**

[No change.]

**18.350.030 Administrative Provisions**

[No change.]

**18.350.040 Concept Plan Submission Requirements**

A. [No change.]

B. Additional information. In addition to the general information described in Subsection A above, the concept plan, data, and narrative shall include the following information, the detailed content of which can be obtained from the Director:

1. Existing site conditions;
2. A site concept including the types of proposed land uses and structures, including housing types, and their general arrangement on the site;
3. A grading concept;
4. A landscape concept indicating a percentage range for the amount of proposed open space and landscaping, and general location and types of proposed open space(s);
5. An urban forestry plan consistent with Chapter 18.790;
56. Parking concept;

Commentary

18.350.040 Concept Plan Submission Requirements

Renumbering of submission requirements continued.

18.350.050 Concept Plan Approval Criteria

Since tree preservation is called out specifically as one of the purposes of PDs, and urban forestry plans are required during the conceptual stage, the concept plan approval criteria should include tree preservation.

The word “significant” is removed because the word is undefined, and could be misconstrued as applying only to “significant tree groves”. The intent of the approval criterion is to consider the preservation of any tree or natural resource as part of PDs.

67. A sign concept;

78. A streets and utility concept; and

89. Structure setback and development standards concept, including the proposed residential density target if applicable.

C. Allowable uses.

[No change.]

**18.350.050 Concept Plan Approval Criteria**

A. The concept plan may be approved by the Commission only if all of the following criteria are met:

1. The concept plan includes specific designations on the concept map for areas of open space, and describes their intended level of use, how they relate to other proposed uses on the site, and how they protect natural features of the site.
2. The concept plan identifies areas of ~~significant~~ trees and other natural resources, if any, and identifies methods for their maximized protection, preservation, and/or management.
3. The concept plan identifies how the future development will integrate into the existing neighborhood, either through compatible street layout, architectural style, housing type, or by providing a transition between the existing neighborhood and the project with compatible development or open space buffers.
4. The concept plan identifies methods for promoting walkability or transit ridership, such methods may include separated parking bays, off street walking paths, shorter pedestrian routes than vehicular routes, linkages to or other provisions for bus stops, etc.
5. The concept plan identifies the proposed uses, and their general arrangement on site. In the case of projects that include a residential component, housing type, unit density, or generalized lot sizes shall be shown in relation to their proposed location on site.
6. The concept plan must demonstrate that development of the property pursuant to the plan results in development that has significant advantages over a standard development. A concept plan has a significant advantage if it provides development consistent with the general purpose of the zone in which it is located at overall densities consistent with the zone, while protecting natural features or providing additional amenities or features not otherwise available that enhance the development project or the neighborhood. (Ord. 06-16)

## Commentary

### 18.350.060 Detailed Development Plan Submission Requirements

A scrivener's error has been corrected to reference Title 18 instead of Title 3.

The detailed development plan submission requirements have been revised to require contour elevations of 1 foot instead of 2 to 5 feet consistent with typical engineering practice and available technology. For tree preservation, accuracy in grading plans is required because a 1-foot difference in a cut or fill could cause a tree to die or become hazardous.

The Urban Forestry Manual consists of administrative rules to implement the details of the urban forestry related code provisions in Title 8, Title 18 and other applicable titles in the Tigard Municipal Code. Contours of 1 foot are required by Section 10 of the Urban Forestry Manual in the tree preservation and removal site plan, so 1 foot contours for PDs is consistent. The phrase "unless otherwise approved" is included because there will be many cases where such detail is not necessary or will make the plans illegible.

A development schedule is required for PDs, and an important element to include is the timing of landscaping. The landscaping phase is important to tree preservation (irrigation installation, etc.) and to insure required trees are planted at appropriate times of year.

### 18.350.070 Detailed Development Plan Approval Criteria

No changes to the detailed development plan approval criteria.



**18.350.060 Detailed Development Plan Submission Requirements**

- A. General submission requirements. The applicant shall submit an application containing all of the general information required for a Type III-PC procedure, as governed by Section 18.390.050, the additional information required by Section 18.350.040.B and the approval criteria under Section ~~18.3~~350.070.
  
- B. Additional information. In addition to the general information described in subsection A above, the detailed development plan, data, and narrative shall include the following information:
  - 1. Contour intervals of one foot unless otherwise approved by the Director ~~two to five feet, depending on slope gradients~~, and spot elevations at breaks in grade, along drainage channels or swales, and at selected points, as needed.
  
  - 2. A specific development schedule indicating the approximate dates of construction activity, including demolition, tree protection installation, tree removal, ground breaking, grading, public improvements, ~~and~~ building construction, and landscaping for each phase.
  
  - 3. A copy of all existing and/or proposed restrictions or covenants.
  
- C. [No change.]

**18.350.070 Detailed Development Plan Approval Criteria**

[No change.]

Commentary

18.360 SITE DEVELOPMENT REVIEW

Site development reviews (SDRs) have been, and will continue to be required to meet the requirements of Chapter 18.790 (Urban Forestry Plan).

18.360.070 Submission Requirements

Explicit reference to the urban forestry plan requirement is made in the submission requirement section.

## Chapter 18.360

## SITE DEVELOPMENT REVIEW

## Sections:

18.360.010	Purpose
18.360.020	Applicability of Provisions
18.360.030	Approval Process
18.360.040	Bonding and Assurances
18.360.050	Major Modification(s) to Approved Plans or Existing Development
18.360.060	Minor Modification(s) to Approved Plans or Existing Development
18.360.070	Submission Requirements
18.360.080	Exceptions to Standards
18.360.090	Approval Criteria

18.360.010 – 18.360.060

[No change.]

#### 18.360.070 Submission Requirements

- A. General submission requirements. The applicant shall submit an application containing all of the general information required for a Type II procedure, as governed by Section 18.390.040.
- B. Additional information. In addition to the submission requirements required in Chapter 18.390, Decision-Making Procedures, an application for the conceptual development plan must include the following additional information in graphic, tabular and/or narrative form. The Director shall provide a list of the specific information to be included in each of the following:
1. An existing site conditions analysis;
  2. A site plan;
  3. A grading plan;
  4. A landscape plan;
  5. An urban forestry plan consistent with Chapter 18.790;
  - 5~~6~~. Architectural elevations of all structures; and
  - 6~~7~~. A copy of all existing and proposed restrictions or covenants.

#### 18.360.080 Exceptions to Standards

[No change.]

## Commentary

### 18.360.090 Approval Criteria

The reference to “preserve trees to the extent possible” in Chapter 18.790 has been struck since the statement does not describe the requirements in Chapter 18.790. A cross reference to Chapter 18.790 has already been provided in Section 18.360.070.

A cross reference stating that landscaping is required to be designed in accordance with both Chapter 18.745 and Chapter 18.790 has been added. Both chapters have specific landscaping requirements.

**18.360.090 Approval Criteria**

A. Approval criteria. The Director shall make a finding with respect to each of the following criteria when approving, approving with conditions, or denying an application:

1. Compliance with all of the applicable requirements of this title including Chapter 18.810, Street and Utility Standards;
2. Relationship to the natural and physical environment:
  - a. Buildings shall be:
    - (1) Located to preserve existing trees, topography and natural drainage where possible based upon existing site conditions;
    - (2) Located in areas not subject to ground slumping or sliding;
    - (3) Located to provide adequate distance between adjoining buildings for adequate light, air circulation, and fire-fighting; and
    - (4) Oriented with consideration for sun and wind.
  - ~~b. Trees shall be preserved to the extent possible. Replacement of trees is subject to the requirements of Chapter 18.790, Tree Removal.~~
  - e~~b~~. Innovative methods and techniques to reduce impacts to site hydrology and fish and wildlife habitat shall be considered based on surface water drainage patterns, identified per Section 18.810.100.A.3. and the City of Tigard “Significant Habitat Areas Map.” Methods and techniques for consideration may include, but are not limited to the following:
    - (1) through (7) [No change.]
3. through 11. [No change.]
12. Landscaping:
  - a. All landscaping shall be designed in accordance with the requirements set forth in Chapter 18.745 and 18.790;
  - b. In addition to the open space and recreation area requirements of Subsections A.5 and 6 above, a minimum of 20% of the gross area including parking, loading and service areas shall be landscaped; and
  - c. A minimum of 15% of the gross site area shall be landscaped.
13. through 15. [No change.]

## Commentary

### 18.370.020 Adjustments

The existing adjustments to allow existing trees to be used as street trees, to modify the street tree planting requirements, and to allow setback adjustment for tree preservation have been struck.

The adjustment to use an existing tree as a street tree should be allowed without paying for an adjustment. Requiring someone to pay to preserve a tree is a disincentive to preservation. The criteria for using an existing tree as a street tree are included in Chapter 18.745.040.A.5.

Modification of street tree requirements is struck because the existing and proposed code allows wide flexibility to vary the placement of street trees to avoid safety conflicts and space constraints. In addition, staff cannot recall any cases where this adjustment has been used.

**Chapter 18.370**  
**VARIANCES AND ADJUSTMENTS**

**Sections:**

**18.370.010**     **Variances**  
**18.370.020**     **Adjustments**

**18.370.010**     **Variances**

[No change.]

**18.370.020**     **Adjustments**

A. [No change.]

B. [No change.]

C. Special adjustments.

1-5. [No change.]

6. ~~Adjustments to landscaping requirements (Chapter 18.745).~~

~~a. Adjustment to use of existing trees as street trees. By means of a Type I procedure, as governed by Section 18.390.030, the Director shall approve, approve with conditions, or deny a request for the use of existing trees to meet the street tree requirements in Section 18.745.030 providing there has been no cutting and filling around the tree during construction which may lead to its loss, unless the following can be demonstrated:~~

~~(1) The ground within the drip line is altered merely for drainage purposes; and~~

~~(2) It can be shown that the cut or fill will not damage the roots and will not cause the tree to die.~~

~~b. Adjustment for street tree requirements. By means of a Type I procedure, as governed by Section 18.390.030, the Director shall approve, approve with conditions, or deny a request for the adjustments to the street tree requirements in Section 18.745.030, based on the following approval criteria:~~

~~(1) If the location of a proposed tree would cause potential problems with existing utility lines;~~

~~(2) If the tree would cause visual clearance problems; or~~

~~(3) If there is not adequate space in which to plant street trees.~~

## Commentary

### 18.370.020 Adjustments

Section 18.790.050 (Flexible Standards for Planting and Preservation) allows for adjustments to setback requirements (and other development standards) to be reviewed concurrently with main land use review type. Requiring an additional process and payment of a fee to preserve a tree is a disincentive to preservation.



**Renumber 7-8**

~~9. Adjustments to setbacks to reduce tree removal (Chapter 18.790). By means of a Type I procedure, as governed by Section 18.390.030, the Director may grant a modification from applicable setback requirements of this Code for the purpose of preserving a tree or trees on the site of proposed development. Such modification may reduce the required setback by up to 50%, but shall not be more than is necessary for the preservation of trees on the site. The setback modification described in this section shall supersede any special setback requirements or exceptions set out elsewhere in this title, including but not limited to Chapter 18.730, except Section 18.730.040.~~

**Renumber 10-11**

## Commentary

### 18.390.020 Description of Decision-Making Procedures

The following revisions to permit types are included in table 18.390.1 (Decision Making Procedures):

- Street tree adjustments are struck because they will be handled administratively through Chapter 18.745;
- Modifications to the urban forestry plan component of an approved land use permit will be allowed by Chapter 18.790 through a Type I process so reference is included in table 18.390.1;
- Tree removal permits are struck because they will be administered through Title 8; and
- Discretionary urban forestry plans that are alternatives to standard urban forestry plans will be allowed by Chapter 18.790 through a Type III process so reference is included in table 18.390.1.

Chapter 18.390

DECISION-MAKING PROCEDURES

Sections:

- 18.390.010 Purpose
- 18.390.020 Description of Decision-Making Procedures
- 18.390.030 Type I Procedure
- 18.390.040 Type II Procedure
- 18.390.050 Type III Procedure
- 18.390.060 Type IV Procedure
- 18.390.070 Special Procedures
- 18.390.080 General Provisions

18.390.010 Purpose

[No change.]

18.390.020 Description of Decision-Making Procedures

- A. [No change.]
- B. [No change.]
- C. Summary of permits by decision-making procedure type. Table 18.390.1 summarizes the various land use permits by the type of decision-making procedure.

**TABLE 18.390.1  
SUMMARY OF PERMITS BY TYPE OF DECISION-MAKING PROCEDURE**

Type	Permit/Land	Cross-Reference(s)
I (18.390.030)	Accessory Residential Units	18.710
	Development Adjustments	18.370.020.B.2
	Design Review Compliance Letter (Track 1)	18.610
	Home Occupation/Type I	18.742
	<del>Landscaping Adjustments</del>	
	<del>Existing Street Trees</del>	<del>18.370.020.C.4.a; 18.745</del>
	<del>New Street Trees</del>	<del>18.370.020.C.4.b; 18.745</del>
	Lot Line Adjustment	18.410.040
	Minimum Residential Density Adjustment	18.370.020.C.2; 18.430; 18.715

## Commentary

### 18.390.020 Description of Decision-Making Procedures

Tree removal permit requirements are struck from Title 18 and included in the consolidated Title 8 provisions that address tree permit requirements when not associated with an urban forestry plan per Chapter 18.790.

A new Type I process is established for major modifications to the urban forestry plan component of an approved land use permit. Type I modifications are performed as a staff level decision and do not require notice of the surrounding neighbors.

The full process for a Modification to the Urban Forestry Plan Component of an Approved Land Use Permit is included in Section 18.790.070.

Nonconforming Use Confirmation	18.385.030.A; 18.760
Parking Adjustments	
- Reduction of Minimum Parking Ratios in Existing Developments/Transit Imp.	18.370.020.C.5.c; 18.765
- Reduction in Stacking Lane Length	18.370.020.C.5.g; 18.765
Signs	
- New	18.780
- Existing	18.780
Site Development/Minor Modification	18.360.090
Temporary Uses	
- Emergency Uses	18.785
- Seasonal/Special Uses	18.785
- Temporary Building	18.785
- Temporary Sales Office/Home	18.765
<u>Urban Forestry Plan</u>	
- <u>Modification to the Urban Forestry Plan Component of an Approved Land Use Permit</u>	18.790.070
<u>Tree Removal</u>	
<del>Removal Adjustment</del>	<del>18.370.020.C.7; 18.790</del>
<del>Removal Permit</del>	<del>18.790</del>
Wireless Communications Facilities -- Setback from Other Towers	18.370.040.C.8.b; 18.798
Conditional Use/Minor Modification	18.330.030

<b>Type</b>	<b>Permit/Land</b>	<b>Cross-Reference(s)</b>
II (18.390.040)	Access/Egress Adjustment	18.370.020.C.3.b
	Downtown Design Administrative Review (Track 2)	18.610
	Historic Overlay	
	- Exterior Alteration	18.740
	- New Construction	18.740
	- Demolition	18.740
	Home Occupation/Type II	18.742

18.390.020 Description of Decision-Making Procedures

A new Type III process is established for a discretionary urban forestry plan review option as an alternative to meeting the clear and objective effective canopy requirements. Type III modifications require notice of the surrounding neighbors, and a hearing in front of Planning Commission or the hearings officer. This option could allow people to utilize green features such as green roofs, green streets, etc. as a substitute for the environmental benefits provided by trees. The full process for a discretionary urban forestry plan review option is included in Section 18.790.040.

The review body (Planning Commission or hearings officer) will depend on whether there is a concurrent Type III review. For example, if an applicant for a Planned Development (Type III Planning Commission review) chooses to request a discretionary urban forestry plan review, the review body will be the Planning Commission. However, if an applicant for a Conditional Use Permit (Type III hearings officer review) chooses to request a discretionary urban forestry plan review, the review body will be the hearings officer. Finally, if an applicant does not have a concurrent Type III review (e.g. Subdivision, Minor Land Partition, etc.), yet chooses to request a discretionary urban forestry plan review, the review body will be the hearings officer.

Type	Permit/Land	Cross-Reference(s)
	Land Partitions <sup>1</sup>	18.420.050
	Parking Adjustments	
	- Reduction in Minimum Parking Ratios	18.370.020.C.5.a; 18.765
	- Reduction of Minimum Parking Ratios in New Developments/Transit Imp	18.370.020.C.5.b; 18.765
	- Increase in Maximum Parking Ratios	18.370.020.C.5.d; 18.765
	- Reduction in Bicycle Parking	18.370.020.C.5.e; 18.765
	- Alternate Parking Garage Layout	18.370.020.C.5.f; 18.765
	Sensitive Lands Permits	
	- In 25%+ Slope	18.775
	- Within Drainageways	18.775
	- Within Wetlands <sup>1</sup>	18.775
	Sign Code Adjustment	18.370.020.C.6; 18.780
	Site Development Review	
	- New Construction	18.360.090
	- Major Modification	18.360.090
	Subdivision Without Planned Development <sup>1</sup>	18.430.070
	Variances	18.370.010.C
	Wireless Communication Facilities -- Adjustment to Setback from Residences	18.370.020.C.8.a; 18.798
	Appeals to Hearings Officer	18.390.040.G
IIIA (18.390.050) (Hearings Officer)	Conditional Use	
	- Initial	18.330.030
	- Major Modification	18.330.030
	Sensitive Lands	
	- Within 100-Year Floodplain	18.775
	- In 25%+ Slope <sup>1</sup>	18.775
	- Within Drainageways <sup>1</sup>	18.775
	- Within Wetlands <sup>1</sup>	18.775
	<u>Urban Forestry Plan</u>	
	- <u>Discretionary Urban Forestry Plan Review Option</u>	18.790.040

Commentary

18.390.020 Description of Decision-Making Procedures

A new Type III process is established for a discretionary urban forestry plan review option as an alternative to meeting the clear and objective effective canopy requirements. Type III modifications require notice of the surrounding neighbors, and a hearing in front of Planning Commission or the hearings officer. This option could allow people to utilize green features such as green roofs, green streets, etc. as a substitute for the environmental benefits provided by trees. The full process for a discretionary urban forestry plan review option is included in Section 18.790.040.

The review body (Planning Commission or hearings officer) will depend on whether there is a concurrent Type III review. For example, if an applicant for a Planned Development (Type III Planning Commission review) chooses to request a discretionary urban forestry plan review, the review body will be the Planning Commission. However, if an applicant for a Conditional Use Permit (Type III hearings officer review) chooses to request a discretionary urban forestry plan review, the review body will be the hearings officer. Finally, if an applicant does not have a concurrent Type III review (e.g. Subdivision, Minor Land Partition, etc.), yet chooses to request a discretionary urban forestry plan review, the review body will be the hearings officer.



<b>Type</b>	<b>Permit/Land</b>	<b>Cross-Reference(s)</b>
IIIB (18.390.050) (Planning Comm.)	Historic Overlay	
	- District Overlay	18.385.010.A; 18.740
	- Removal of District Overlay	18.385.010.B; 18.740
	Planned Development	
	- With Subdivision	18.350.100; 18.430
	- Without Subdivision	18.350.100
	Zone Map/Text Change/Quasi-Judicial	18.380.030.B
	<u>Urban Forestry Plan</u>	
	- <u>Discretionary Urban Forestry Plan Review Option</u>	<u>18.790.040</u>
IIC (18.390.050) (Design Review Board)	Downtown Design Review (Track 3)	18.610
IV (18.390.060)	Annexation	18.320
	Zone Map/Text Change/Legislative	18.380.020

<sup>1</sup>These may be processed as either Type II or III procedures, pursuant to Section 18.775.020.D and E. (Ord. 10-02 § 2; Ord. 09-13)

### **18.390.030 through 18.390.080**

[No change.]

Commentary

18.530 INDUSTRIAL ZONING DISTRICTS

A minor amendment is required to the chapter to correct a cross reference to street trees and caliper.

18.530.050 Additional Development Standards

The amendment corrects the cross reference to street trees and caliper.

**Chapter 18.530**

**INDUSTRIAL ZONING DISTRICTS**

**Sections:**

- 18.530.010 Purpose**
- 18.530.020 List of Zoning Districts**
- 18.530.030 Uses**
- 18.530.040 Development Standards**
- 18.530.050 Additional Development Standards**

**18.530.010 through 18.530.040**

[No change.]

**18.530.050 Additional Development Standards**

A. [No change.]

B. Reduction of lot coverage requirements. Lot coverage may be increased from 75% to 80% as part of the site development review process, providing the following requirements are satisfied:

1. The minimum landscaping requirement shall be 20% of the site.
2. The applicant shall meet the following performance standards with regard to the landscaping plan approved as part of the site development review process:
  - a. Street trees, as required by Section 18.745.040, ~~are to~~ shall be installed with a minimum caliper of three inches ~~rather than the two inches as measured at four feet in height;~~
  - b. The landscaping between a parking lot and street property line shall have a minimum width of 10 feet;
  - c. All applicable buffering, screening and setback requirements contained in Section 18.745.050 shall be satisfied;
  - d. The applicant shall provide documentation of an adequate on-going maintenance program to ensure appropriate irrigation and maintenance of the landscape area.

C. [No change]

Commentary

18.610 TIGARD DOWNTOWN DISTRICT DEVELOPMENT AND DESIGN  
STANDARDS

For consistency purposes, minor amendments are made to this chapter to cross reference Chapter 18.790 (Urban Forestry Plan) in sections 18.610.010.F (Submittal Requirements) and 18.610.035 (Additional Standards).

**Chapter 18.610**  
**TIGARD DOWNTOWN DISTRICT DEVELOPMENT AND DESIGN**  
**STANDARDS**

**Sections:**

- 18.610.010 Purpose and Procedures**
- 18.610.015 Pre-Existing Uses and Developments within the Downtown District**
- 18.610.020 Building and Site Development Standards**
- 18.610.025 Street Connectivity**
- 18.610.030 Building and Site Design Standards**
- 18.610.035 Additional Standards**
- 18.610.040 Special Requirements for Development Bordering Urban Plaza**
- 18.610.045 Exceptions to Standards**
- 18.610.050 Building and Site Design Objectives (to be used with Track 3 Approval Process)**
- 18.610.055 Signs**
- 18.610.060 Off-Street Parking and Loading Requirements**

**18.610.010 Purpose and Procedures**

A. through E. [No change.]

Commentary

18.610.010 Purpose and Procedures

Explicit reference to the urban forestry plan requirement is made in the submission requirement section.

18.610.015 -18.610.030

No changes are required to these sections as a result of the urban forestry code revisions.

F. Downtown design review submittal requirements.

1. General Submission Requirements. The applicant shall submit an application containing all of the general information required for a Type II procedure, as governed by Section 18.390.040, or for a Type III procedure, as governed by Section 18.390.050.
2. Additional Information. In addition to the submission requirements required in Chapter 18.390, Decision-Making Procedures, an application must include the following additional information in graphic, tabular and/or narrative form. The Director shall provide a list of the specific information to be included in each of the following:
  - a. An existing site conditions analysis;
  - b. A site plan;
  - c. A grading plan;
  - d. A landscape plan;
  - e. An urban forestry plan consistent with Chapter 18.790.
  - ~~e.f.~~ Architectural elevations of all structures; and
  - ~~f.g.~~ A copy of all existing and proposed restrictions or covenants.
3. All drawings submitted with applications for development using Tracks 2 and 3 shall be stamped by a registered architect. Applications for landscaping projects only may be stamped by a registered landscape architect. Applications that require engineering or transportation reports must be stamped by the appropriate specialist.

G. through K. [No change.]

**18.610.015 through 18.610.030**

[No change.]

Commentary

18.610.035 Additional Standards

The reference to “Tree Removal” has been changed to “Urban Forestry Plan” consistent with the name change to Chapter 18.790.

18.610 TIGARD DOWNTOWN DISTRICT DEVELOPMENT AND DESIGN STANDARDS

No changes to the standards in Sections 18.610.040 to 18.610.060.



**18.610.035 Additional Standards**

Applications must conform to all applicable standards in the following chapters:

A. through H.

[No change.]

I. ~~Tree Removal~~ Urban Forestry Plan (see Chapter 18.790).

J. through L.

[No change.]

**18.610.040 through 18.610.060**

[No change.]

## Commentary

### 18.620 TIGARD TRIANGLE DESIGN STANDARDS

The Tigard Triangle has design standards that are in addition to the base standards in other chapters in the code. Among these are landscaping standards that specify additional size, species and location standards for the Tigard Triangle. Some of these standards are unclear, incomplete or inconsistent and the purpose of the revisions to this chapter is to clarify, correct and ensure consistency among the provisions.

**CHAPTER 18.620  
TIGARD TRIANGLE DESIGN STANDARDS**

**Sections:**

- 18.620.010 Purpose and Applicability**
- 18.620.020 Street Connectivity**
- 18.620.030 Site Design Standards**
- 18.620.040 Building Design Standards**
- 18.620.050 Signs**
- 18.620.060 Entry Portals**
- 18.620.070 Landscaping and Screening**
- 18.620.080 Street and Accessway Standards**
- 18.620.090 Design Evaluation**

**18.620.010 and 18.620.020**

[No change.]

**18.620.030 Site Design Standards**

A. Compliance. All development must meet the following site design standards. If a parcel is one acre or larger a phased development plan must be approved demonstrating how these standards for the overall parcel can be met. Variance to these standards may be granted if the criteria found in Section 18.370.010.C.2, governing criteria for granting a variance, is satisfied.

1. through 5.

[No change.]

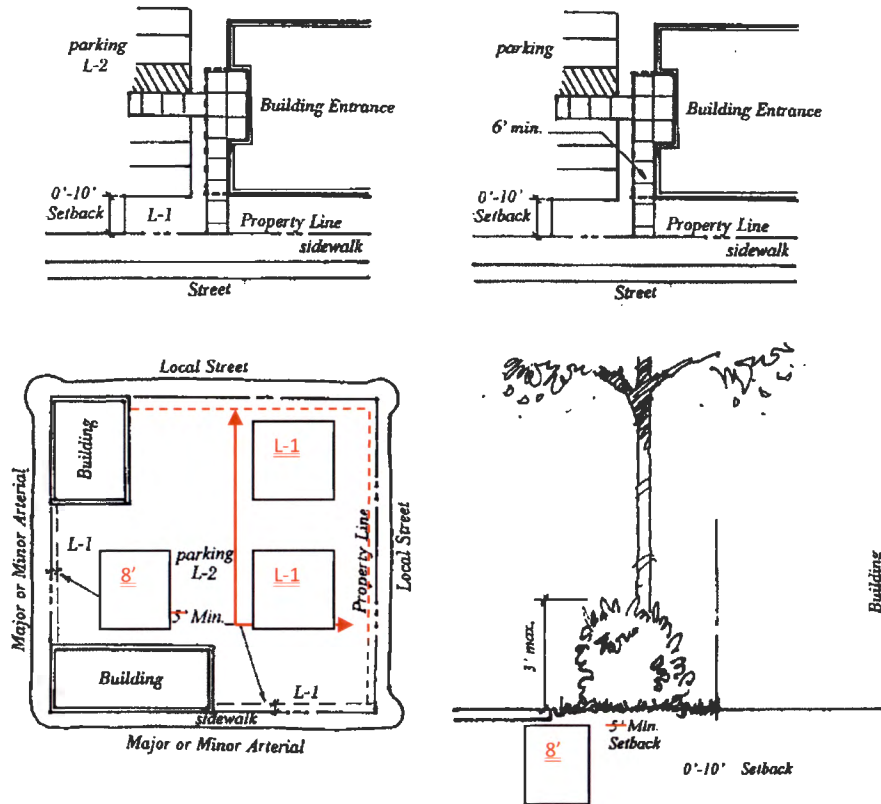
## Commentary

### 18.620.030 Site Design Standards

The L-1 and L-2 standards in the design districts have been problematic because they are unclear. The amendments are intended to clarify the standards, provide additional space for tree growth, while retaining the original intent of the standards.

The landscape setback for parking lots from streets has been increased from 5 to 8 feet to allow parking lot trees to be planted in the setback (consistent with the requirements in Chapter 18.745 and Section 13 of the Urban Forestry Manual) and have additional soil volume in the design district. The Urban Forestry Manual consists of administrative rules to implement the details of the urban forestry related code provisions in Title 8, Title 18 and other applicable titles in the Tigard Municipal Code.

- Parking location and landscape design - Parking for buildings or phases adjacent to public street rights-of-way must be located to the side or rear of newly constructed buildings. If located on the side, parking is limited to 50% of the street frontage and must be behind a landscaped area constructed to an L-1 Landscape Standard. The minimum depth of the L-1 landscaped area is ~~five~~ eight feet or is equal to the building setback, whichever is greater. Interior side and rear yards shall be landscaped to an L-2 Landscape Standard, except where a side yard abuts a public street where it shall be landscaped to an L-1 Landscape Standard. See Diagram 2.



Tigid Triangle Street Plan – Diagram 2

18.620.040 Building Design Standards

[No change]

## Commentary

### 18.620.050 Signs

No change to Section 18.620.050.

### 18.620.060 Entry Portals

In the Landscape and Street Standards (at the end of the existing chapter), it specified that columnar trees were required near entry portals. The amendment reiterates this requirement in the entry portal design requirement.

### 18.620.070 Landscaping and Screening

The design districts have requirements that supersede the requirements in Chapter 18.745. These include the L-1 and L-2 requirements.

The L-1 requirement is essentially an enhanced screen of the parking lot from the street. Larger than average trees are required to provide an immediate screen effect. The language has been modified to make the purpose of the requirements more clear. The term “major or minor arterial” has been changed to “public street” because the other design districts require an L-1 screen from public streets, so for consistency L-1 screens should be required in the Tigard Triangle.

**18.620.050 Signs**

[No change.]

**18.620.060 Entry Portals**

- A. Required locations. Entry portals shall be required at the primary access points into the Tigard Triangle.
1. Location - Entry portals shall be located at the intersections of 99W and Dartmouth; 99W and 72nd; I-5 and Dartmouth; Hwy. 217 and 72nd; and at the Hwy. 217 Overcrossing and Dartmouth.
  2. Design - The overall design of entry portals shall relate in scale and detail to both the automobile and the pedestrian. A triangle motif and at least 2 trees according to the L-2 standard shall be incorporated into the design of entry portals.

**18.620.070 Landscaping and Screening**

- A. Applicable levels. Two levels of landscaping and screening standards are applicable to the Tigard Triangle. The locations where the landscaping or screening is required and the depth of the landscaping or screening are defined in other sub-sections of this section. These standards are minimum requirements. Higher standards may be substituted as long as all height limitations are met.
1. ~~L-1 Low Parking Lot Screen – For general landscaping of landscaped and screened areas within parking lots and along local collectors and local streets, planting standards of Chapter 18.745 Landscaping and Screening, shall apply. The L-1 standard applies to setbacks on public streets major and minor arterials. Where The L-1 standard is in addition to other standards in other chapters of this title. The setback is shall be a minimum of 5 8 feet between the parking lot and a public street, major or minor arterial, L-1 trees shall be considered parking lot trees and spaced between 30 and 40 feet on center within the setback. All L-1 trees shall be a minimum of planted at 3 ½ inch caliper at the time of planting, at a maximum of 28 feet on center. Shrubs shall be of a variety that will provided a 3 foot high screen and a 90% opacity within one year. Groundcover plants must fully cover the remainder of landscape area within two years. Any tree planted in excess of a 2 inch caliper shall be eligible for full mitigation credit.~~

## Commentary

### 18.620.070 Landscaping and Screening

The L-2 requirement is for all other required landscaping and requires larger than average trees to provide an immediate effect. The L-2 requirement is also intended to create cohesive tree designs for various locations in the district. In the landscape and street standards (at the end of the existing chapter), the various tree types and locations are specified. While the design elements have been retained, terminology has been revised to be consistent with the terminology used in the Urban Forestry Manual (small, medium, large, columnar trees), and the table has been moved closer to the L-2 code language to make cross referencing easier. The language has also been modified to make the purpose of the requirements more clear.

### Table 18.620.1 L-2 Tree Standards

The design elements of the landscape and street standards table (at the end of the existing chapter) have been retained. The terminology has been revised to be consistent with the terminology used in the Urban Forestry Manual (small, medium, large, columnar trees), and the table has been moved closer to the L-2 code language to make cross referencing easier.



2. ~~L-2 General Landscaping - For general landscaping of landscaped and screened areas within parking lots, local collectors and local streets, planting standards of Chapter 18.745, Landscaping and Screening, shall apply. The L-2 standard applies to all other trees and shrubs required by this chapter and Chapter 18.745 (except those required for L-1 Parking Lot Screen). For trees and shrubs required by Chapter 18.745, the L-2 standard is an additional standard. L-2 trees that are also street trees, median trees, and trees required to frame entry portals shall be selected in conformance with Table 18.620.1 below. If conformance with Table 18.620.1 is precluded by physical constraints caused by public utilities or required public improvements, the Director may approve alternative selections. All L-2 trees shall be provided at a minimum of 2-1/2 inch caliper at the time of planting, at a maximum spacing of 28 feet. Shrubs shall be of a size and quality to achieve the required landscaping or screening effect within two years. Any tree planted in excess of a 2-inch caliper shall be eligible for full mitigation credit.~~

TABLE 18.620.1  
L-2 TREE STANDARDS

<u>General Tree Type<sup>1</sup></u>	<u>Location</u>	<u>Specific Tree Type<sup>2</sup></u>
<u>Street Tree</u>	<u>72<sup>nd</sup> Avenue</u>	<u>Large Stature Street Trees</u>
<u>Street Tree</u>	<u>Dartmouth Street</u>	<u>Large Stature Street Trees</u>
<u>Street Tree</u>	<u>68<sup>th</sup> Avenue</u>	<u>Columnar Trees</u>
<u>Street Tree</u>	<u>Atlanta Street</u>	<u>Columnar Trees</u>
<u>Street Tree</u>	<u>Hampton Street</u>	<u>Columnar Trees</u>
<u>Street Tree</u>	<u>66<sup>th</sup> Avenue</u>	<u>Large Stature Street Trees</u>
<u>Street Tree</u>	<u>Backage Road</u>	<u>Even Mix of Large, Medium, and Small Stature Street Trees</u>
<u>Street Tree</u>	<u>All other local streets</u>	<u>Medium Stature Street Trees</u>
<u>Median Tree</u>	<u>72<sup>nd</sup> Avenue</u>	<u>Large Stature Street Trees</u>
<u>Median Tree</u>	<u>68<sup>th</sup> Avenue</u>	<u>Large Stature Street Trees</u>
<u>Median Tree</u>	<u>Atlanta Street</u>	<u>Large Stature Street Trees</u>
<u>Median Tree</u>	<u>Hampton Street</u>	<u>Large Stature Street Trees</u>
<u>Portal Tree</u>	<u>All required portals</u>	<u>Columnar Trees</u>

#### 18.620.080 Street and Accessway Standards

[Renumber Table 18.620.1 to Table 18.620.2]

#### 18.620.090 Design Evaluation

[No change.]

<sup>1</sup> When these tree types are required by Chapter 18.620, 18.745, or 18.790, the L-2 Tree Standards apply.

<sup>2</sup> Additional specifications for species, planting, and spacing are in the Urban Forestry Manual.

## Commentary

### Landscape and Street Standards

The design elements of the Landscape and Street Standards table have been retained and converted to table 18.620.1. The terminology has been revised to be consistent with the terminology used in the Urban Forestry Manual (small, medium, large, columnar trees), and the table has been moved closer to the L-2 code language to make cross referencing easier.

## Landscape and Street Standards

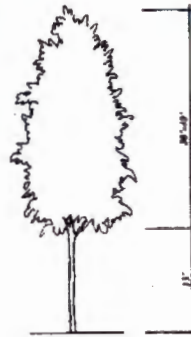
### Landscape Standards: Street Trees

Street Name	Street Tree type	Min. Spacing	Location <sup>1</sup>
72 <sup>nd</sup> Avenue	Broad-spreading	27 feet o.c.	Between sidewalk and street
	Broad-spreading	27 feet o.c.	Center median
Dartmouth Street	Broad-spreading	27 feet o.c.	Between sidewalk and street
68 <sup>th</sup> Avenue	Columnar	22 feet o.c.	Between sidewalk and street
	Broad-spreading	22 feet o.c.	Center median
Atlanta Street	Columnar	22 feet o.c.	Between sidewalk and street
	Broad-spreading	22 feet o.c.	Center median
Hampton Street	Columnar	22 feet o.c.	Between sidewalk and street
	Broad-spreading	22 feet o.c.	Center median
66 <sup>th</sup> Avenue	Broad-spreading	27 feet o.c.	Between sidewalk and street on the west side of the street.
Backage Road	Broad-spreading	27 feet o.c.	Between sidewalk and street. Plant trees random and in clumps along the south side of the street. Provide a variety of species.
Local Streets	Spreading to 25 feet	22 feet o.c.	Between sidewalk and street
Portals	Columnar	22 feet o.c.	Plant trees to frame portal features and architecture.
Parking lots	Broad-spreading	1 per 7 spaces	In planter islands
	Broad-spreading	27 feet o.c.	In setbacks
	Columnar	22 feet o.c.	In setbacks where building lines preclude broad-spreading trees.

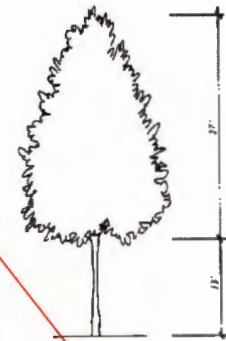
<sup>1</sup> All curb-side planting strips and medians shall be planted with lawn or groundcover. Planter strips between the sidewalk and street along 72<sup>nd</sup> Avenue shall be lawn except where paved areas extend to the curbline and tree grates are provided around trees. Medians on 68<sup>th</sup> Avenue, Atlanta and Hampton shall have consistent lawn or groundcover plantings for the entire length of the street with accents at intersections.



Broad-spreading Street Tree



Columnar Street Tree



Spreading Street Tree

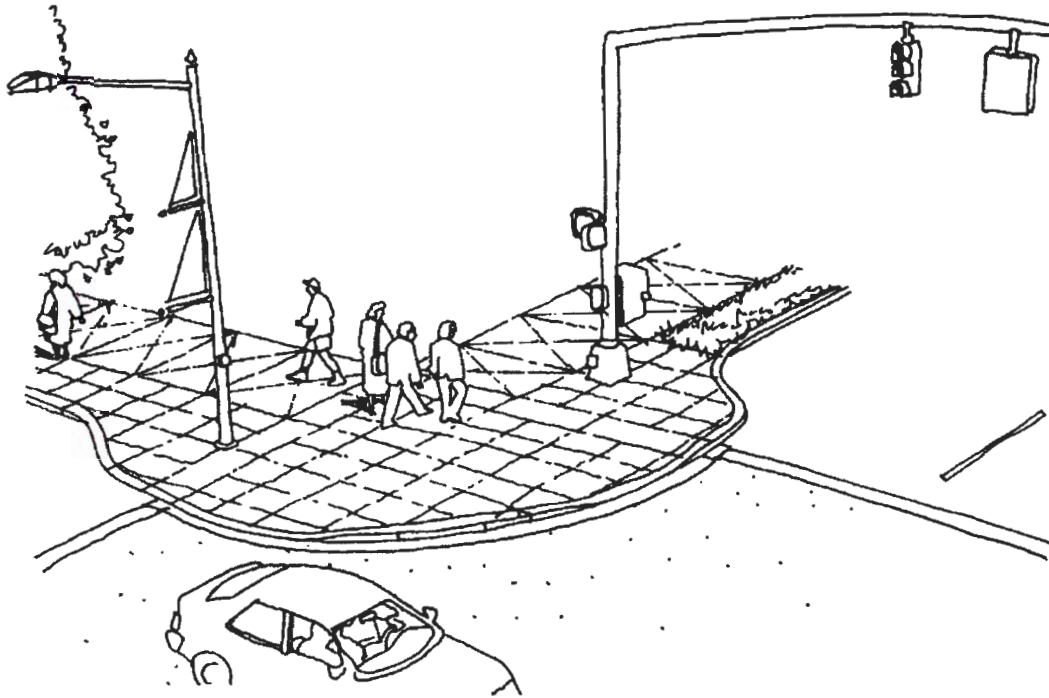
## Tigard Triangle Street Plan Details

## Commentary

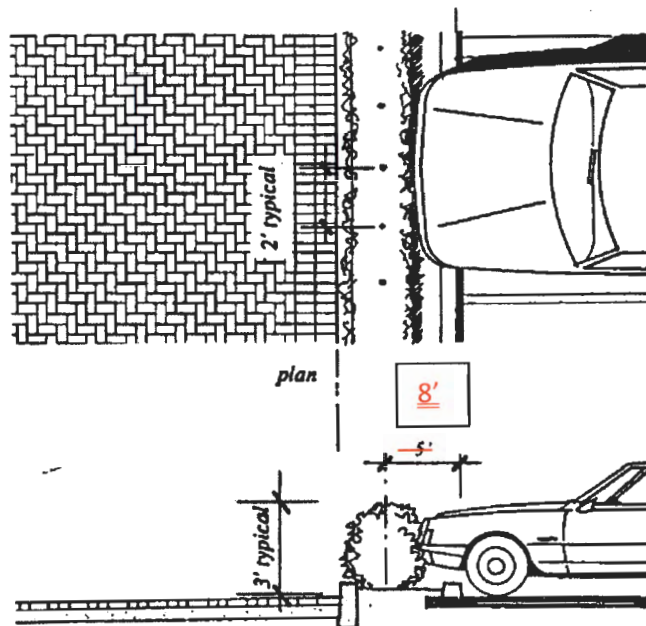
### Tigard Triangle Street Plan

The parking lot setback requirement has been revised to show an 8 foot rather than a 5 foot setback per the revised I.-1 standard.

Landscape and Street Standards



Curb extension and concrete intersection at intersections on Major and Minor Arterials.



Typical landscape and parking at minimum setback

**Tigard Triangle Street Plan**  
*Details*

## Commentary

### 18.630 WASHINGTON SQUARE REGIONAL CENTER DESIGN STANDARDS

The Washington Square Regional Center has design standards that are in addition to the base standards in other chapters in the code. Among these are landscaping standards that specify additional size, species and location standards for the Washington Square Regional Center. Some of these standards are unclear, incomplete or inconsistent and the purpose of the revisions to this chapter is to clarify, correct and ensure consistency among the provisions.

**Chapter 18.630**

**WASHINGTON SQUARE REGIONAL CENTER DESIGN STANDARDS**

**Sections:**

- 18.630.010 Purpose and Applicability**
- 18.630.020 Development Standards**
- 18.630.030 Pre-existing Uses**
- 18.630.040 Street Connectivity**
- 18.630.050 Site Design Standards**
- 18.630.060 Building Design Standards**
- 18.630.070 Signs**
- 18.630.080 Entry Portals**
- 18.630.090 Landscaping and Screening**
- 18.630.100 Street and Accessway Standards**
- 18.630.110 Design Evaluation**

**18.630.010 through 18.830.040**

[No change.]

## Commentary

### 18.630.050 Site Design Standards

The L-1 and L-2 standards in the design districts have been problematic because they are unclear. The amendments are intended to clarify the standards, provide additional space for tree growth, while retaining the original intent of the standards.

The landscape setback for parking lots from streets has been increased from 5 to 8 feet to allow parking lot trees to be planted in the setback (consistent with the requirements in Chapter 18.745 and Section 13 of the Urban Forestry Manual) and have additional soil volume in the design district. The Urban Forestry Manual consists of administrative rules to implement the details of the urban forestry related code provisions in Title 8, Title 18 and other applicable titles in the Tigard Municipal Code.



**18.630.050 Site Design Standards**

- A. Compliance. All development must meet the following site design standards. If a parcel is one acre or larger a phased development plan may be approved demonstrating how these standards for the overall parcel can be met. Variance to these standards may be granted if the criteria found in Section 18.370.010.C.2, governing criteria for granting a variance, is satisfied.

1. through 4.

[No change.]

5. Parking location and landscape design.

- a. Purpose. The emphasis on pedestrian access and a high quality streetscape experience requires that private parking lots that abut public streets should not be the predominant street feature. Where parking does abut public streets, high quality landscaping should screen parking from adjacent pedestrian areas.
- b. Standard. Parking for buildings or phases adjacent to public street rights-of-way must be located to the side or rear of newly constructed buildings. When buildings or phases are adjacent to more than one public street, primary street(s) shall be identified by the City where this requirement applies. In general, streets with higher functional classification will be identified as primary streets unless specific design or access factors favor another street. If located on the side, parking is limited to 50% of the primary street frontage and must be behind a landscaped area constructed to an L-1 landscape standard. The minimum depth of the L-1 landscaped area is ~~five~~ eight feet or is equal to the building setback, whichever is greater. Interior side and rear yards shall be landscaped to an L-2 landscape standard, except where a side yard abuts a public street, where it shall be landscaped to an L-1 landscape standard.

Commentary

18.630.090 Landscaping and Screening

The design districts have requirements that supersede the requirements in Chapter 18.745. These include the L-1 and L-2 requirements.

The L-1 requirement is essentially an enhanced screen of the parking lot from the street. Larger than average trees are required to provide an immediate screen effect. The language has been modified to make the purpose of the requirements more clear.

The L-2 requirement essentially requires that any trees required to be planted in Washington Square Regional Center be 2 ½ caliper at planting to provide a more immediate effect. The language has been clarified to reflect this.

**18.630.060 through 18.630.080**

[No change.]

**18.630.090 Landscaping and Screening**

A. Applicable levels. Two levels of landscaping and screening standards are applicable. The locations where the landscaping or screening is required and the depth of the landscaping or screening are defined in other sub-sections of this section. These standards are minimum requirements. Higher standards may be substituted as long as all height limitations are met.

1. L-1 Low Parking Lot Screen. ~~For general landscaping of landscaped and screened areas within parking lots and along local collectors and local streets, planting standards of Chapter 18.745 Landscaping and Screening, shall apply. In addition the~~ The L-1 standard applies to setbacks on public streets, major and minor arterials, and where parking lots abut public streets. The L-1 standard is in addition to other standards in other chapters of this title. Where the ~~The setback is~~ shall be a minimum of 5 8 feet between the parking lot and a public street; L-1 trees shall be considered parking lot trees and spaced between 30 and 40 feet on center within the setback. All L-1 trees shall be planted at a minimum of 3½ inch caliper at the time of planting, at a maximum of 28 feet on center. Shrubs shall be of a variety that will provide a 3 foot high screen and a 90% opacity within one year. Groundcover plants must fully cover the remainder of landscape area within two years.
2. L-2 General Landscaping. ~~For general landscaping of landscaped and screened areas within parking lots, and along local collectors and local streets, planting standards of Chapter 18.745, Landscaping and Screening, shall apply. The L-2 standard applies to all other trees and shrubs required by this chapter and Chapter 18.745 (except those required for the L-1 Parking Lot Screen). For trees and shrubs required by Chapter 18.745, the L-2 standard is an additional standard. In addition, trees shall be provided at a minimum~~ All L-2 trees shall be 2½ inch caliper at the time of planting, at a maximum spacing of 28 feet. Shrubs shall be of a size and quality to achieve the required landscaping or screening effect within two years.

**18.630.100 and 18.630.110**

[No change.]

Commentary

18.640 DURHAM QUARRY DESIGN STANDARDS

The Durham Quarry Design Standards generally apply to the area known as Bridgeport Village. The proposed amendments to the Durham Quarry Design Standards Chapter include:

Sections 18.640.700 and 800 have been retitled consistent with the updated applicable code sections for sensitive lands and urban forestry plan.

**Chapter 18.640  
DURHAM QUARRY DESIGN STANDARDS**

**Sections:**

- 18.640.010 Purpose
- 18.640.020 Permitted Uses
- 18.640.030 Conditional Uses
- 18.640.040 Applicability
- 18.640.050 Development Standards
- 18.640.060 Determining Net Acres
- 18.640.070 Signs
- 18.640.080 Reserved
- 18.640.090 Reserved
- 18.640.100 Access
- 18.640.200 Design Standards
- 18.640.300 Design Compatibility Standards
- 18.640.400 Landscaping and Screening
- 18.640.500 Off-Street Parking and Loading
- 18.640.600 Environmental Standards
- ~~18.640.700 Floodplain District Sensitive Lands~~
- ~~18.640.800 Wetlands Protection District Urban Forestry Plan~~

18.640.010 through 18.640.100

[No change.]

## Commentary

### 18.640.200 Site Design Standards

The landscape setback for parking lots from streets has been increased from 5 to 8 feet to allow parking lot trees to be planted in the setback (consistent with the requirements in Chapter 18.745 and Section 13 of the Urban Forestry Manual) and have additional soil volume in the design district. The Urban Forestry Manual consists of administrative rules to implement the details of the urban forestry related code provisions in Title 8, Title 18 and other applicable titles in the Tigard Municipal Code.

**18.640.200 Design Standards**

A. [No change.]

B. Site design standards. Development shall meet the following site design standards.

1. through 4.

[No change.]

5. Parking location and landscape design. Parking for buildings or phases adjacent to public street rights-of-way shall be located to the side or rear of newly constructed buildings. When buildings or phases are adjacent to more than one public street, primary street(s) shall be identified where this requirement applies. If located on the side, parking is limited to 50% of the street frontage and must be behind a landscaped area constructed to an L-1 Landscape Standard. The minimum depth of the L-1 landscaped area is ~~five~~ eight feet or is equal to the building setback, whichever is greater. Interior side and rear yards shall be landscaped to an L-2 Landscape Standard, except where a side yard abuts a public street, where it shall be landscaped to an L-1 Landscape Standard. See Section 18.640.200.D.

Commentary

18.640.200 Site Design Standards

The L-1 and L-2 standards in the design districts have been problematic because they are unclear.

The L-1 requirement is essentially an enhanced screen of the parking lot from the street. Larger than average trees are required to provide an immediate screen effect. The language has been modified to make the purpose of the requirements more clear.

The L-2 requirement essentially requires that any trees required to be planted in Bridgeport Village be 2 ½ caliper at planting to provide a more immediate effect. The language has been clarified to reflect this.

No changes to Sections 18.640.300 through 18.640.600.

18.640.700 Sensitive Lands, see Chapter 18.775

The revision reflects the existing chapter title to correct a scrivener's error.

18.640.800 Urban Forestry Plan, see Chapter 18.790

The revision reflects the revised chapter title.



C. [No change.]

D. Landscaping and screening.

1. Applicable levels. Two levels of landscaping and screening standards are applicable. The locations where the landscaping or screening is required and the depth of the landscaping or screening are defined in Section 18.640.400. These standards are minimum requirements. Higher standards may be substituted as long as all height limitations are met.
  - a. L-1 low parking lot screen. ~~For general landscaping of landscaped and screened areas within parking lots and along local collectors and local streets, planting standards in Chapter 18.745, Landscaping and Screening, shall apply. In addition the~~ The L-1 standard applies to setbacks on public streets, major and minor arterials. The L-1 standard is in addition to other standards in other chapters of this title. ~~Where the~~ The setback is shall be a minimum of ~~five~~ eight feet between the parking lot and a ~~public street, major or minor arterial,~~ trees L-1 trees shall be considered parking lot trees and spaced between 30 and 40 feet on center within the setback. All L-1 trees shall be planted at a minimum of 3 ½ inch caliper at the time of planting., at a maximum of 28 feet on center. Shrubs shall be of a variety that will provide a three-foot high screen and a 90% opacity within one year. Groundcover plants must fully cover the remainder of landscape area within two years.
  - b. L-2 general landscaping. ~~For general landscaping of landscaped and screened areas within parking lots, and along local collectors and local streets, planting standards in Chapter 18.745, Landscaping and Screening, shall apply. The L-2 standard applies to all other trees and shrubs required by this chapter and Chapter 18.745 (except those required for the L-1 parking lot screen).~~ For trees and shrubs required by Chapter 18.745, the L-2 standard is an additional standard. In addition, All L-2 trees shall be provided at a minimum 2 ½ inch caliper at the time of planting., at a maximum spacing of 28 feet. Shrubs shall be of a size and quality to achieve the required landscaping or screening effect within two years.

**18.640.300 through 18.640.600**

[No change.]

**18.640.700**     Sensitive Lands, see Chapter 18.775 ~~Floodplain District, see Chapter 18.775~~

**18.640.800**     Urban Forestry Plan, see Chapter 18.790 ~~Wetlands Protection District, see Chapter 18.775~~

Commentary

18.715 DENSITY COMPUTATIONS

Section 18.790.050.D.1 allows a reduction in minimum density for the preservation of a significant tree grove. This allowed reduction in minimum density is reflected in this chapter.

The term “gross acres” (and the corresponding explanation of what gross acres are) has been simplified with the term “total site acres”.

**Chapter 18.715**  
**DENSITY COMPUTATIONS**

**Sections:**

- 18.715.010 Purpose**  
**18.715.020 Density Calculation**  
**18.715.030 Residential Density Transfer**

**18.715.010 Purpose**

- A. Purpose. The purpose of this chapter is to implement the comprehensive plan by establishing the criteria for determining the number of dwelling units permitted.

**18.715.020 Density Calculation**

- A. Definition of net development area. Net development area, in acres, shall be determined by subtracting the following land area(s) from the total site gross acres, ~~which is all of the land included in the legal description of the property to be developed:~~

1. All sensitive land areas:
  - a. Land within the 100-year floodplain,
  - b. Land or slopes exceeding 25%,
  - c. Drainage ways, and
  - d. Wetlands,
  - e. Optional: Significant tree groves or habitat areas, as designated on the City of Tigard Significant Tree Grove Map” or “Significant Habitat Areas Map”;
2. through 5.

[No change.]

- B. and C.

[No change.]

**18.715.030**

[No change.]

## Commentary

### 18.745.010 Purpose

A scrivener's error has been corrected because the chapter is intended to enhance the aesthetic and environmental quality of the city.

Protection of existing street trees during new development is addressed through Chapter 18.790 and Section 10 of the Urban Forestry Manual. The Urban Forestry Manual consists of administrative rules to implement the details of the urban forestry related code provisions in Title 8, Title 18 and other applicable titles in the Tigard Municipal Code.

### 18.745.020 Applicability

The existing applicability section is too broad because it says it applies to all development.

The proposed applicability conforms to current practice by applying the standards to Type I Conditional Use and Site Development Review Minor Modifications, and Type II and III land use reviews. The new soil volume requirements would apply to a more limited list of Type II and III land use reviews outlined in Section 18.745.040.A.4 for street trees and Section 18.745.050.E for parking lot trees.

The section explicitly requires trees in 18.745 to be included and subject to all of the requirements of a concurrent urban forestry plan (per 18.790).

**Chapter 18.745  
LANDSCAPING AND SCREENING**

**Sections:**

- 18.745.010 Purpose**
- 18.745.020 Applicability**
- 18.745.030 General Provisions**
- 18.745.040 Street Trees**
- 18.745.050 Buffering and Screening**
- 18.745.060 Re-vegetation**

**18.745.010 Purpose**

- A. Purpose. The purpose of this chapter is to establish standards for landscaping, buffering, and screening of land use within Tigard in order to enhance the aesthetic and environmental quality of the City:
  1. By ~~protecting existing street trees and~~ requiring the planting of street trees in new developments;
  2. through 4.

[No change.]

**18.745.020 Applicability**

- A. Applicability. The provisions of this chapter shall apply to all development that requires a Type I Conditional Use Minor Modification, a Type I Site Development Review Minor Modification, any Type II land use review or any Type III land use review including the construction of new structures, remodeling of existing structures where the landscaping is nonconforming (Section 18.760.040.C), and to a change of use which results in the need for increased on-site parking or loading requirements or which changes the access requirements unless otherwise specified in any of the sections below.
- B. When urban forestry plan requirements concurrently apply. When the provisions of Chapter 18.790, Urban Forestry Plan, concurrently apply, any trees required by this chapter shall be included in the urban forestry plan and subject to all of the requirements in Chapter 18.790. When site development review does not apply. Where the provisions of Chapter 18.360, Site Development Review, do not apply, the Director shall approve, approve with conditions, or deny a plan submitted under the provisions of this chapter by means of a Type I procedure, as governed by Section 18.390.030, using the applicable standards in this chapter.

Commentary

18.745.030 General Provisions

The general provisions are modified to clarify that applicable industry standards (including tree care industry standards) shall be used to determine what constitutes acceptable maintenance.

Throughout the chapter, the term “landscaping and screening” is used to refer to items required by Chapter 18.745, and the term “plants” is used to refer to trees, shrubs and groundcover.

- C. Site plan requirements. The applicant shall submit a site plan. The Director shall provide the applicant with detailed information about this submission requirement.

#### 18.745.030 General Provisions

- A. ~~Obligation to maintain Maintenance Responsibility.~~ Unless otherwise provided by the lease agreement, the owner, tenant and his agent, if any, shall be jointly and severally responsible for the ongoing maintenance of all landscaping and screening used to meet the requirements of this chapter according to applicable industry standards, ~~which shall be maintained in good condition so as to present a healthy, neat and orderly appearance, shall be replaced or repaired as necessary, and shall be kept free from refuse and debris.~~

- B. ~~Pruning required.~~ All plant growth in landscaped areas of developments shall be controlled by pruning, trimming or otherwise so that:

- ~~1. It will not interfere with the maintenance or repair of any public utility;~~
- ~~2. It will not restrict pedestrian or vehicular access; and~~
- ~~3. It will not constitute a traffic hazard because of reduced visibility.~~

- ~~B.~~ Installation requirements. The installation of all landscaping and screening required by this chapter shall be as follows:

- 1. All landscaping and screening shall be installed according to applicable industry standards ~~accepted planting procedures;~~
- 2. ~~The plant materials~~ All plants shall be of high grade, and shall meet the size and grading standards of the American Standards for Nurberg Nursery Stock (ANSI Z60, 1-1986~~2004~~, and any future revisions); and
- 3. All ~~L-~~landscaping and screening shall be installed in accordance with the provisions of this title.

- ~~D.~~ Certificate of occupancy. Certificates of occupancy shall not be issued unless the landscaping requirements of this chapter have been met or other arrangements have been made and approved by the City such as the posting of a bond.

- ~~D.~~ Protection of existing plants ~~vegetation.~~ Existing ~~vegetation~~ plants on a site shall be protected as follows ~~much as possible:~~

- 1. The developer shall provide methods for the protection of existing ~~vegetation~~ plants to remain during the construction process; ~~and~~
- 2. The plants to remain ~~be saved~~ shall be noted on the landscape plans (e.g., areas plants not to be disturbed to remain can be shown as protected with fencing; and fenced, as in snow fencing which can be placed around individual trees).

## Commentary

### 18.745.030 General Provisions

While snow fencing, etc. may be used to preserve existing shrubs and groundcover, an explicit cross reference is made to the tree preservation requirements in Chapter 18.790.

A link is drawn between the regulations in Chapter 18.745, and other applicable rules in other chapters of the code. This includes regulations related to hazard trees, street trees, urban forestry plan requirements, etc.

### 18.745.040 Street Trees

In accordance with existing practice, street trees are required as part of the approval process for Conditional Use (Type III), Downtown Design Review (Type II and III), Minor Land Partition (Type II), Planned Development (Type III), Site Development Review (Type II) and Subdivision (Type II and III) permits.

The minimum number of street trees required is based on the project's street frontage and must conform to the planting requirements in Section 2 of the Urban Forestry Manual and the soil volume requirements in Section 12 of the Urban Forestry Manual.

The soil volume requirements outlined in Section 12 of the Urban Forestry Manual are based on the width of the non-street portion of the right of way. Soil volume requirements can be met through the use of engineered soil under pavement (covered soil volume) if designed, inspected and documented by a landscape architect. Otherwise, soil volume requirements can be met by planting trees in landscape areas with sufficient soil.



3. The tree protection provisions outlined in Chapter 18.790 and the Urban Forestry Manual shall apply to the land use review types identified in Section 18.790.020.A.
- E. Ongoing tree related rules and regulations. Any trees used to meet the requirements of this chapter shall be subject to all applicable tree related rules and regulations in other chapters and titles of the Tigard Municipal Code and Tigard Development Code.
- F. Care of landscaping along public rights of way. Appropriate methods for the care and maintenance of street trees and landscaping materials shall be provided by the owner of the property abutting the rights of way unless otherwise required for emergency conditions and the safety of the general public.
- G. Conditions of approval of existing vegetation. The review procedures and standards for required landscaping and screening shall be specified in the conditions of approval during development review and in no instance shall be less than that required for conventional development.
- H. Height restrictions abutting public rights of way. No trees, shrubs or plantings more than 18 inches in height shall be planted in the public right of way abutting roadways having no established curb and gutter.

#### 18.745.040 Street Trees

##### A. Street Tree Standards.

1. Street trees shall be required as part of the approval process for Conditional Use (Type III), Downtown Design Review (Type II and III), Minor Land Partition (Type II), Planned Development (Type III), Site Development Review (Type II) and Subdivision (Type II and III) permits.
2. The minimum number of required street trees shall be determined by dividing the linear amount of street frontage within or adjacent to the site (in feet) by 40 feet. When the result is a fraction, the minimum number of required street trees shall be determined by rounding to the nearest whole number.
3. Street trees required by this section shall be planted according to the standards in Section 2 of the Urban Forestry Manual.
4. Street trees required by this section shall be provided adequate soil volumes according to the standards in Section 12 of the Urban Forestry Manual.
5. Street trees required by this section shall be planted within the right of way whenever practicable according to the standards in Section 2 of the Urban Forestry Manual. Street trees may be planted no more than 6 feet from the right of way according to the standards in Section 2 of the Urban Forestry Manual when planting within the right of way is not practicable.

## Commentary

### 18.745.040 Street Trees

Existing trees are allowed as street trees if they would be permitted as newly planted trees and they are adequately protected through the urban forestry plan requirements in Chapter 18.790. This would occur as a technical decision without requiring an adjustment permit in order to incentivize preservation of existing trees.

If the required number of street trees cannot be provided, a fee in lieu of planting option is available to cover the city's cost of planting.

The existing provisions for street trees will be replaced with the new provisions which are primarily in Sections 2 (street tree planting standards) and 12 (street tree soil volume standards) of the Urban Forestry Manual.

6. An existing tree may be used to meet the street tree standards provided that:

- a. The largest percentage of the tree trunk immediately above the trunk flare or root buttresses is either within the subject site or within the right of way immediately adjacent to the subject site;
- b. The tree would be permitted as a street tree according to the standards in Sections 2 and 12 of the Urban Forestry Manual if it were newly planted; and
- c. The tree is shown as preserved in the Tree Preservation and Removal site plan (per 18.790.030.A.2), Tree Canopy Cover site plan (per 18.790.030.A.3) and supplemental report (per 18.790.030.A.4) of a concurrent urban forestry plan and is eligible for credit towards the effective tree canopy cover of the site.

7. In cases where it is not practicable to provide the minimum number of required street trees, the Director may allow the applicant to remit payment into the Urban Forestry Fund for tree planting and early establishment in an amount equivalent to the City's cost to plant and maintain a street tree for three (3) years (per the standards in Section 2 of the Urban Forestry Manual) for each tree below the minimum required.

~~A. Protection of existing vegetation. All development projects fronting on a public street, private street or a private driveway more than 100 feet in length approved after the adoption of this title shall be required to plant street trees in accordance with the standards in Section 18.745.040.C.~~

~~B. Street tree planting list. Certain trees can severely damage utilities, streets and sidewalks or can cause personal injury. Approval of any planting list shall be subject to review by the Director.~~

~~C. Size and spacing of street trees:~~

~~1. Landscaping in the front and exterior side yards shall include trees with a minimum caliper of two inches at four feet in height as specified in the requirements stated in Section 18.745.040.C.2 below.~~

~~2. The specific spacing of street trees by size of tree shall be as follows:~~

~~a. Small or narrow stature trees under 25 feet tall and less than 16 feet wide branching at maturity shall be spaced no greater than 20 feet apart;~~

~~b. Medium-sized trees 25 feet to 40 feet tall, 16 feet to 35 feet wide branching at maturity shall be spaced no greater than 30 feet apart;~~

Commentary

18.745.040 Street Trees

Strikethroughs of existing street tree provisions continued. The existing provisions for street trees will be replaced with the new provisions which are primarily in Sections 2 (street tree planting standards) and 12 (street tree soil volume standards) of the Urban Forestry Manual.

- ~~c. Large trees over 40 feet tall and more than 35 feet wide branching at maturity shall be spaced no greater than 40 feet apart;~~
  - ~~d. Except for signalized intersections as provided in Section 18.745.040.II, trees shall not be planted closer than 20 feet from a street intersection, nor closer than two feet from private driveways (measured at the back edge of the sidewalk), fire hydrants or utility poles to maintain visual clearance;~~
  - ~~e. No new utility pole location shall be established closer than five feet to any existing street tree;~~
  - ~~f. Tree pits shall be located so as not to include utilities (e.g., water and gas meters) in the tree well;~~
  - ~~g. On-premises utilities (e.g., water and gas meters) shall not be installed within existing tree well areas;~~
  - ~~h. Street trees shall not be planted closer than 20 feet to light standards;~~
  - ~~i. New light standards shall not be positioned closer than 20 feet to existing street trees except when public safety dictates, then they may be positioned no closer than 10 feet;~~
  - ~~j. Where there are overhead power lines, the street tree species selected shall be of a type which, at full maturity, will not interfere with the lines;~~
  - ~~k. Trees shall not be planted within two feet from the face of the curb; and~~
  - ~~l. Trees shall not be planted within two feet of any permanent hard surface paving or walkway:
 
    - ~~(1) Space between the tree and the hard surface may be covered by a nonpermanent hard surface such as grates, bricks on sand, paver blocks and cobblestones; and~~
    - ~~(2) Sidewalk cuts in concrete for tree planting shall be at least four by four feet to allow for air and water into the root area.~~~~
- ~~D. Pruning requirements. Trees, as they grow, shall be pruned to provide at least eight feet of clearance above sidewalks and 13 feet above local street, 15 feet above collector street, and 18 feet above arterial street roadway surfaces.~~
- ~~F. Cut and fill around existing trees. Existing trees may be used as street trees if no cutting or filling takes place within the drip line of the tree unless an adjustment is approved by the Director by means of a Type I procedure, as governed by Section 18.390.030, using approval criteria in Section 18.370.020.C.4.a.~~

Commentary

18.745.050 Buffering and Screening

Buffers are required between incompatible land uses. Trees are required in the buffer, and the language and spacing requirements for buffer trees has been revised to be consistent with the requirements in the Urban Forestry Manual.

- ~~F. Replacement of street trees. Existing street trees removed by development projects or other construction shall be replaced by the developer with those types of trees approved by the Director. The replacement trees shall be of a size and species similar to the trees that are being removed unless lesser sized alternatives are approved by the Director.~~
- ~~G. Granting of adjustments. Adjustments to the street tree requirements may be granted by the Director by means of a Type I procedure, as regulated in Section 18.390.030, using approval criteria in Section 18.370.020.C.6.b.~~
- ~~H. Location of trees near signalized intersections. The Director may allow trees closer to specified intersections which are signalized, provided the provisions of Chapter 18.795, Visual Clearance, are satisfied. (Ord. 09-13)~~

**18.745.050 Buffering and Screening**

A. General provisions.

[No change.]

B. Buffering and screening requirements.

- 1. through 3.

[No change.]

Commentary

18.745.050 Buffering and Screening

Buffers are required between incompatible land uses. Trees are required in the buffer, and the language and spacing requirements for buffer trees has been revised to be consistent with the requirements in the Urban Forestry Manual.



4. The minimum improvements within a buffer area shall consist of combinations for landscaping and screening as specified in Table 18.745.1. In addition, improvements shall meet the following specifications:
- a. At least one row of trees shall be planted. They shall be chosen from any of the tree lists in the Urban Forestry Manual (except the Nuisance Tree List) unless otherwise approved by the Director and have a minimum caliper of ~~two~~ 1½ inches ~~at four feet in height above grade~~ for deciduous trees and a minimum height of ~~five~~ six feet ~~high~~ for evergreen trees at the time of planting. Spacing for trees shall be as follows:
    - (1) Small stature or ~~narrow-stature~~ columnar trees, ~~under 25 feet tall or less than 16 feet wide at maturity~~ shall be spaced no less than 15 feet on center and no further greater than 15 20 feet on center ~~apart~~.
    - (2) Medium-sized stature trees ~~between 25 feet to 40 feet tall and with 16 feet to 35 feet wide branching at maturity~~ shall be spaced no less than 20 feet on center and no greater than 30 feet on center ~~apart~~.
    - (3) Large stature trees, ~~over 40 feet tall and with more than 35 feet wide branching at maturity~~, shall be spaced no less than 30 feet on center and no greater than 30 40 feet on center ~~apart~~.
  - b. In addition, at least 10 five-gallon shrubs or 20 one-gallon shrubs shall be planted for each 1,000 square feet of required buffer area.
  - c. The remaining area shall be planted in lawn or other living ground cover.

5. through 9.

[No change.]

C. and D.

[No change.]

## Commentary

### 18.745.050 Buffering and Screening

Special screening standards require trees in parking lots. Language has been added to specify that non-conforming screening in parking lots shall not be allowed to become any less conforming (through a Type I land use permit for example). Screening in parking lots will be required to be brought into conformance when issuing major development permits (Type II and III).

The parking lot screening requirements have been revised to require 30 percent actual canopy cover (directly above the parking area) rather than one tree for every seven parking spaces. Requiring canopy more directly relates to the city's urban forestry goals, whereas requiring a certain number of trees per parking spaces can be met by deleting parking spaces (rather than planting trees). Section 13 of the Urban Forestry Manual is referenced for more detailed parking lot tree, soil volume and canopy plan requirements. Parking lot tree canopy plans are required to be designed, inspected and documented by a landscape architect unless an arborist can meet the requirements through a concurrent urban forestry plan per Chapter 18.790. Soil volume requirements can be met through the use of engineered soil under pavement (covered soil volume) if designed, inspected and documented by a landscape architect. Otherwise, soil volume requirements can be met by planting trees in landscape areas with sufficient soil.

E. Screening: special provisions.

## 1. Screening and landscaping of parking and loading areas:

- a. Screening of parking and loading areas is required. In no cases shall nonconforming screening of parking and loading areas (i.e. nonconforming situation) be permitted to become any less conforming. Nonconforming screening of parking and loading areas shall be brought into conformance with the provisions of this chapter as part of the approval process for Condition Use (Type III), Downtown Design Review (Type II and III), Planned Development (Type III), and Site Development Review (Type II) permits only. The specifications for this screening are as follows:

- (1) Landscaped parking areas shall include special design features which effectively screen the parking lot areas from view. These design features may include the use of landscaped berms, decorative walls and raised planters;
- (2) Landscape planters may be used to define or screen the appearance of off-street parking areas from the public right-of-way;
- (3) Materials to be installed should achieve a balance between low lying and vertical shrubbery and trees;
- (4) All parking areas, including parking spaces and aisles, shall be required to achieve at least 30% tree canopy cover at maturity directly above the parking area in accordance with the Parking Lot Tree Canopy Standards in Section 13 of the Urban Forestry Manual. Trees shall be planted in landscaped islands in all parking areas, and shall be equally distributed and on the basis of one tree for each seven parking spaces in order to provide a canopy effect; and
- (5) ~~The minimum dimension of the landscape islands shall be three feet and the landscaping shall be protected from vehicular damage by some form of wheel guard or curb.~~

## 2. through 4.

[No change.]

F. Buffer Matrix

[No change.]

Commentary

18.745.060 Re-vegetation

For consistency, the term “landscaping and screening” is used to refer to the requirements in Chapter 18.745.

A cross reference has been added to require soil stockpiling consistent with an approved urban forestry plan per 18.790. When there is no urban forestry plan, soil stockpiling shall be outside the driplines of existing trees.

TABLE 18.745.1, BUFFER MATRIX

Table 18.745.1 is unchanged.

**18.745.060 Re-vegetation**

- A. When re-vegetation is required. Where natural vegetation has been removed through grading in areas not affected by the landscaping and screening requirements and that are not to be occupied by structures, such areas are to be replanted as set forth in this section to prevent erosion after construction activities are completed.
  
- B. Preparation for re-vegetation. Topsoil removed from the surface in preparation for grading and construction is to be stored on or near the sites and protected from erosion while grading operations are underway; and
  - 1. Such storage ~~shall may not~~ be located consistent with an approved urban forestry plan per Chapter 18.790 or outside the tree canopy driplines where it would cause suffocation of root systems of trees intended to be preserved in cases when there this is no approved urban forestry plan; and
  
  - 2. After completion of such grading, the topsoil is to be restored to exposed cut and fill embankments or building pads to provide a suitable base for seeding and planting.
  
- C. Methods of Re-vegetation

[No change.]

**TABLE 18.745.1  
BUFFER MATRIX**

**[No Changes to this Table]**

Commentary

Table 18.745.2, BUFFER COMBINATIONS FOR LANDSCAPING AND SCREENING [1]

Specific buffers are required based on the level of incompatibility of adjacent land uses by Table 18.745.1 (Buffer Matrix). The specifications for tree planting in Table 18.745.2 have been revised for compatibility with Section 18.745.050.B and the standards in the Urban Forestry Manual.

Footnote 2 provides a cross reference to the more detailed spacing standards in Section 18.745.050.B.4.

Existing footnote 2 has been struck because there is no adjustment process for buffer trees (scrivener's error).

TABLE 18.745.2

## BUFFER COMBINATIONS FOR LANDSCAPING AND SCREENING [1]

	Options	Width (feet)	Trees [2] (per linear feet of buffer)	Shrubs or Groundcover	Screening
A	--	10	--	Lawn/ living groundcover	--
B	--	10	<del>20</del> <u>15'</u> min/ <del>30'</del> <u>40'</u> max spacing	Lawn/ living groundcover	--
C	1	10	15' min/ <del>30'</del> <u>40'</u> max spacing	Shrubs	4' hedges
	2	8		Shrubs	5' fence
	3	6		Shrubs	6' wall
D	1	20	<del>40'</del> <u>15'</u> min/ <del>20'</del> <u>40'</u> max spacing	Shrubs	6' hedge
	2	15		Shrubs	6' fence
	3	10		Shrubs	6' wall
E	1	30	<del>40'</del> <u>15'</u> min/ <del>20'</del> <u>40'</u> max spacing	Shrubs	6' hedge or fence
	2	25		Shrubs	5' earthen berm or wall
F	--	40	<del>40'</del> <u>15'</u> min/ <del>20'</del> <u>40'</u> max spacing	Shrubs	6' hedge, fence, wall or berm

[1] Buffers are not required between abutting uses that are of a different type when the uses are separated by a street as specified in Section 18.745.050.A.2.

[2] Spacing of trees depends on stature; see Section 18.745.050.B.4.

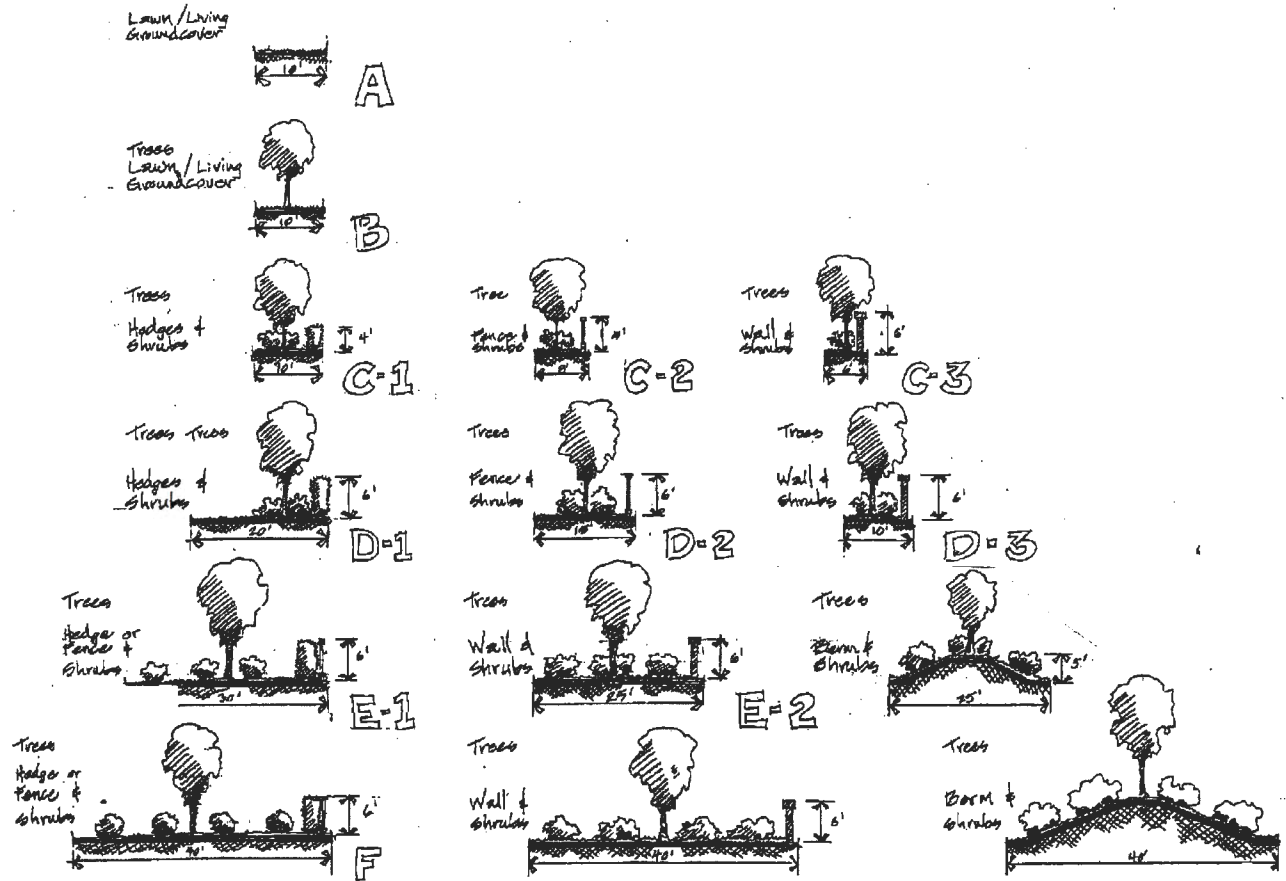
~~[2] Adjustments from these requirements can be obtained; see Section 18.370.020.C.4.~~

Commentary

Table 18.745.2, BUFFER COMBINATIONS FOR LANDSCAPING AND SCREENING [2]

Illustrations left unchanged.





Commentary

18.775 Sensitive Lands

Chapter 18.790 specifics that urban forestry plans are required for Type II and III Sensitive Lands Reviews. After reviewing existing project types and conditions, it was determined that Type II and III Sensitive Lands Reviews have consistent and tangible impacts on trees.

Consistent with the approval criteria for other land use permits, reference to “compliance with all applicable requirements of this title” has been added to each of the approval criteria for each sensitive lands permit type. This cross reference provides a link back to chapter 18.790 to ensure the urban forestry plan standards are met for Type II and III Sensitive Lands Reviews.

**Chapter 18.775  
SENSITIVE LANDS**

**Sections:**

- 18.775.010 Purpose**
- 18.775.020 Applicability of Uses: Permitted, Prohibited, and Nonconforming**
- 18.775.030 Administrative Provisions**
- 18.775.040 General Provisions for Floodplain Areas**
- 18.775.050 General Provisions for Wetlands**
- 18.775.060 Expiration of Approval: Standards for Extension of Time**
- 18.775.070 Sensitive Land Permits**
- 18.775.080 Application Submission Requirements**
- 18.775.090 Special Provisions for Development within Locally Significant Wetlands and Along the Tualatin River, Fanno Creek, Ball Creek, and the South Fork of Ash Creek**
- 18.775.100 Adjustments to Underlying Zone Standards**
- 18.775.110 Density Transfer**
- 18.775.120 Variances to Section 18.775.090 Standards**
- 18.775.130 Plan Amendment Option**
- 18.775.140 Significant Habitat Areas Map Verification Procedures**

**18.775.010 through 18.775.060**

[No change.]

## Commentary

### 18.775.070 Sensitive Lands Permits

Consistent with the approval criteria for other land use permits, reference to “compliance with all applicable requirements of this title” has been added to the approval criteria for sensitive lands permits within the 100-year floodplain. This cross reference provides a link back to chapter 18.790 to ensure the urban forestry plan standards are met for Type II and III Sensitive Lands Reviews within the 100-year floodplain.

Consistent with the approval criteria for other land use permits, reference to “compliance with all applicable requirements of this title” has been added to the approval criteria for sensitive lands permits on steep slopes. This cross reference provides a link back to chapter 18.790 to ensure the urban forestry plan standards are met for Type II and III Sensitive Lands Reviews on steep slopes.

Consistent with the approval criteria for other land use permits, reference to “compliance with all applicable requirements of this title” has been added to the approval criteria for sensitive lands permits within drainageways. This cross reference provides a link back to chapter 18.790 to ensure the urban forestry plan standards are met for Type II and III Sensitive Lands Reviews within drainageways.

Consistent with the approval criteria for other land use permits, reference to “compliance with all applicable requirements of this title” has been added to the approval criteria for sensitive lands permits within wetlands. This cross reference provides a link back to chapter 18.790 to ensure the urban forestry plan standards are met for Type II and III Sensitive Lands Reviews within wetlands.

**18.775.070 Sensitive Land Permits**

A. Permits required. An applicant, who wishes to develop within a sensitive area, as defined in Chapter 18.775, must obtain a permit in certain situations. Depending on the nature and intensity of the proposed activity within a sensitive area, either a Type II or Type III permit is required, as delineated in Sections 18.775.020.F and 18.775.020.G. The approval criteria for various kinds of sensitive areas, e.g., floodplain, are presented in Sections 18.775.070.B—18.775.070.E below.

B. Within the 100-year floodplain. The Hearings Officer shall approve, approve with conditions or deny an application request within the 100-year floodplain based upon findings that all of the following criteria have been satisfied:

1. Compliance with all of the applicable requirements of this title;

Renumber 1. through 7. as 2. through 8.

C. With steep slopes. The appropriate approval authority shall approve, approve with conditions or deny an application request for a sensitive lands permit on slopes of 25% or greater or unstable ground based upon findings that all of the following criteria have been satisfied:

1. Compliance with all of the applicable requirements of this title;

Renumber 1. through 4. as 2. through 5.

D. Within drainageways. The appropriate approval authority shall approve, approve with conditions or deny an application request for a sensitive lands permit within drainageways based upon findings that all of the following criteria have been satisfied:

1. Compliance with all of the applicable requirements of this title;

Renumber 1. through 7. as 2. through 8.

E. Within wetlands. The Director shall approve, approve with conditions or deny an application request for a sensitive lands permit within wetlands based upon findings that all of the following criteria have been satisfied:

1. Compliance with all of the applicable requirements of this title;

Renumber 1. through 8. as 2. through 9.

Commentary

18.775.080 Application Submission Requirements

Because the urban forestry plan standards are required to be met for Type II and III Sensitive Lands Reviews, an urban forestry plan is listed in the application submission requirements for Type II and III Sensitive Lands Reviews (18.775.020.F and G).

**18.775.080 Application Submission Requirements**

A. Application submission requirements. All applications for uses and activities identified in Sections 18.775.020.A—18.775.020.G shall be made on forms provided by the Director and must include the following information in graphic, tabular and/or narrative form. The specific information on each of the following is available from the Director:

1. A CWS Stormwater Connection permit;
2. A site plan;
3. A grading plan; and
4. An urban forestry plan per chapter 18.790 (for 18.775.020.F and G only); and
45. A landscaping plan.

**18.775.090 through 18.775.140**

[No change.]

## Commentary

### 18.790 Urban Forestry Plan

The chapter title has been revised from “Tree Removal” to “Urban Forestry Plan” to better reflect the intent of chapter which is to create a plan to enhance the urban forest through the development process rather than to simply remove trees.

The guiding principles for Urban Forestry Standards for Development are in Volume I of the legislative adoption package for the Urban Forestry Code Revisions. These guiding principles represent the consensus view of the citizen advisory committee that advised staff on the Urban Forestry Code Revisions.

#### 18.790.010 Purpose

The purpose has been simplified to cross reference the Comprehensive Plan and Urban Forestry Master Plan. Both documents provide the detailed policy basis for the extensive revisions to Chapter 18.790.



Chapter 18.790  
**TREE REMOVAL URBAN FORESTRY PLAN**

## Sections:

- 18.790.010 **Purpose**  
 18.790.020 ~~Definitions~~ **Applicability**  
 18.790.030 ~~Tree Plan~~ **Urban Forestry Plan Requirements**  
 18.790.040 ~~Incentives for Tree Retention~~ **Discretionary Urban Forestry Plan Review Option**  
 18.790.050 ~~Permit Applicability~~ **Flexible Standards for Tree Planting and Preservation**  
 18.790.060 ~~Illegal Tree Removal~~ **Urban Forestry Plan Implementation**  
 18.790.070 **Modification to the Urban Forestry Plan Component of an Approved Land Use Permit**

18.790.010 **Purpose**

Purpose. The purpose of this chapter is to implement the City's urban forestry goals articulated in the Comprehensive Plan as recommended by the Urban Forestry Master Plan.

~~Value of trees.~~ After years of both natural growth and planting by residents, the City now benefits from a large number of trees. These trees of varied types add to the aesthetic beauty of the community, help clean the air, help control erosion, maintain water quality and provide noise barriers.

B. Purposes. The purposes of this chapter are to:

- ~~1. Encourage the preservation, planting and replacement of trees in the City;~~
- ~~2. Regulate the removal of trees on sensitive lands in the City to eliminate unnecessary removal of trees;~~
- ~~3. Provide for a tree plan for developing properties;~~
- ~~4. Protect sensitive lands from erosion;~~
- ~~5. Protect water quality;~~
- ~~6. Provide incentives for tree retention and protection; and~~
- ~~7. Regulate commercial forestry to control the removal of trees in an urban environment.~~

C. Recognize need for exceptions. The City recognizes that, notwithstanding these purposes, at the time of development it may be necessary to remove certain trees in order to accommodate structures, streets utilities, and other needed or required improvements within the development.

This section is renamed to Applicability.

Urban forestry plans will be required for larger (Type II or III) development project types (Minor Land Partitions, Subdivisions, Conditional Use Permits, Site Development Reviews, Planned Developments, Downtown Design Reviews and Sensitive Lands Reviews).

After reviewing existing project types and conditions, it was determined that only the larger project types identified above have the most consistent and tangible impacts on trees. All of the larger project types currently require tree plans and a project arborist except Type II or III Downtown Design Reviews and Sensitive Lands Reviews. Type II or III Downtown Design Reviews and Sensitive Lands Reviews are similar in scale to the other projects, and it would be appropriate to require similar tree/urban forestry plan requirements as the other project types.

The projects with the highest likelihood to impact trees and not require an urban forest plan are residential building projects (house additions, retaining walls, landscape grading, etc.). However, a review of past residential building projects illustrate that they rarely are designed in ways that necessitate tree removal. Also, as demonstrated in the Urban Forestry Master Plan, residential property has the highest tree canopy of all zoning types which implies that residential property owners are generally good stewards of their tree resources despite a lack of regulations. If increased regulations on developed residential properties are identified as necessary in the future as the city continues to develop, the code could be revised at that time.

The current proposal will address the redevelopment of existing commercial, industrial and mixed use zones, especially as buildable residential lands in Tigard continue to decrease. The Urban Forestry Master Plan demonstrates that existing commercial, industrial and mixed use zones currently have less than half the tree canopy of residential zones. Staff's proposal is to require significant increases in tree canopy through redevelopment of commercial, industrial, and mixed use zones through the urban forestry plan requirements.

A more flexible urban forestry plan modification process is proposed in section 18.790.070 (Modification to the Urban Forestry Plan Component of an Approved Land Use Permit). The process allows modifications administratively or through a Type I permit depending on the magnitude of the modification. The modification process allows applicant to address issues that arise during development such as shifting tree planting locations, adjusting tree protection fence location, and removing trees that are no longer feasible to preserve due to condition or location. The current code does not provide a process for these types of modifications other than through revisions to the original land use permit (which is expensive and time consuming). The rationale for allowing flexibility in tree removal is to encourage applicants to "take a chance" on preservation given the uncertainty of the development process because they know they will have flexibility for removal in the future if preservation is not feasible. The modification process is more fully described in section 18.790.070.

Some development projects (such as trails and utility projects) are limited to right of ways or easements on property the applicant does not otherwise control. In these situations, planting and preservation requirements should be limited to the right of way or easement portion of the property the applicant does control.

18.790.020 **Definitions** Applicability

The requirements of this chapter apply to the following situations:

A. The following land use reviews:

1. Conditional Use (Type III);
2. Downtown Design Review (Type II and III);
3. Minor Land Partition (Type II);
4. Planned Development (Type III);
5. Sensitive Lands Review (Type II and III);
6. Site Development Review (Type II); and
7. Subdivision (Type II and III).

B. All Type I modifications to the urban forestry plan component of an approved land use permit as required by Section 18.790.070.

C. For land use projects limited to an existing right of way or easement, the development site shall be considered the existing right of way or easement and the urban forestry plan requirements shall be limited to the existing right of way or easement.

~~A. **Definitions.** The following definitions apply to regulations governing the preservation and removal of trees contained in this chapter exclusively:~~

- ~~1. “Canopy cover” means the area above ground which is covered by the trunk and branches of the tree;~~
- ~~2. “Commercial forestry” means the removal of ten or more trees per acre per calendar year for sale. Tree removal undertaken by means of an approved tree removal plan under Section 18.790.030 is not considered commercial forestry under this definition;~~
- ~~3. “Hazardous tree” means a tree which by reason of disease, infestation, age, or other condition presents a known and immediate hazard to persons or to public or private property;~~
- ~~4. “Pruning” means the cutting or trimming of a tree in a manner which is consistent with recognized tree maintenance practices;~~

This section is renamed to Urban Forestry Plan Requirements

Urban forestry plans are required to be developed by a landscape architect or a person certified as both an arborist and tree risk assessor. Many arborists are dual certified, and adding the new requirement for tree risk assessment will help ensure safe conditions during and after construction. Landscape architects often work closely with arborists when developing urban forestry plans, so the option of allowing landscape architects to sign off on the plans has been added to reduce costs by eliminating the need for hiring two urban forestry consultants. The urban forestry plan requirements will consist of three main parts.

The first part, tree preservation and removal site plan, is essentially a demolition/preservation plan identifying trees to remain and trees to be removed. The Urban Forestry Manual consists of administrative rules to implement the details of the urban forestry related code provisions in Title 8, Title 18 and other applicable titles in the Tigard Municipal Code. The detailed requirements for the tree preservation and removal site plan are in Section 10, part 1 of the Urban Forestry Manual. Trees over 6 inch diameter, and those trees less than 6 inch diameter that are protected by Title 8 (street trees, heritage trees, etc.) are required to be shown on the plan. Individual trees near the development impact area are required to be individually inventoried, but cohesive stands of trees away from the development impact area can be delineated at the edge of the stand. Tree protection fencing is required to be shown on the plan as well. The requirements in Section 10, part 1 essentially document the current practice except that trees within stands away from the development impact area are not required to be individually inventoried.

The second part is the tree canopy site plan (Section 10, part 2 of the Urban Forestry Manual). This plan shows all trees to be preserved as well as those to be planted. It is essentially a landscape plan that includes just the trees. It visually displays how the effective tree canopy requirements for the overall development site and individual lots/tracts will be met. It also includes specifications for spacing and placement of trees, measurement of trees, and acceptable/prohibited species.

The third part is the supplemental report (Section 10, part 3 of the Urban Forestry Manual). This is a narrative for the site plans and provides more detailed inventory data on the species, size, condition, and suitability of preservation of trees and stands of trees in a more standardized format than exists currently. It also contains supplemental preservation and planting information to be implemented during the development process. Finally, it contains the standards for determining how the effective tree canopy requirements for the overall development site and individual lots/tracts shall be met.

(Tree canopy fee continued on following commentary page)

~~5. “Removal” means the cutting or removing of 50 percent (50%) or more of a crown, trunk or root system of a tree, or any action which results in the loss of aesthetic or physiological viability or causes the tree to fall or be in immediate danger of falling. “Removal” shall not include pruning;~~

~~6. “Tree” means a standing woody plant, or group of such, having a trunk which is six inches or more in caliper size when measured four feet from ground level;~~

~~7. “Sensitive lands” means those lands described at Chapter 18.775 of the title.~~

~~B. General rule. Except where the context clearly indicates otherwise, words in the present tense shall include the future and words in the singular shall include the plural.~~

### **18.790.030 ~~Free Plan Requirement~~ Urban Forestry Plan Requirements**

A. Urban Forestry Plan Requirements. An urban forestry plan shall:

1. Be coordinated and approved by a landscape architect (the project landscape architect) or a person possessing dual certifications as a certified arborist and certified tree risk assessor (the project arborist);

2. Meet the tree preservation and removal site plan standards in Section 10, part 1 of the Urban Forestry Manual;

3. Meet the tree canopy site plan standards in Section 10, part 2 of the Urban Forestry Manual; and

4. Meet the supplemental report standards in Section 10, part 3 of the Urban Forestry Manual.

B. Tree Canopy Fee. If the supplemental report demonstrates that the applicable standard percent effective tree canopy cover in Section 10, part 3, item N will not be provided through any combination of tree planting or preservation for the overall development site (excluding streets) or that the 15 percent effective tree canopy cover will not be provided through any combination of tree planting or preservation for any individual lot or tract in the R-1, R-2, R-3.5, R-4.5 and R-7 districts (when the overall development site meets or exceeds the standard percent effective tree canopy cover), then the applicant shall provide the city a tree canopy fee according to the methodology outlined in Section 10, part 4 of the Urban Forestry Manual.

C. Tree Canopy Fee Use. Tree canopy fees provided to the city shall be deposited into the Urban Forestry Fund and used as approved by council through a resolution.

The tree canopy fee was developed by converting the wholesale median tree cost in the Willamette Valley, Oregon developed by the PNWISA<sup>3</sup> to a unit canopy cost. According to the PNWISA, the median wholesale cost of a 3-inch diameter deciduous tree is \$174. The formula developed by Krajicek, et al<sup>4</sup> for open grown, broad spreading trees (maximum crown width (feet) = 3.183+1.829\*DBH (inches)) was then utilized to convert tree diameter to canopy diameter. According to the Krajicek formula, a 3-inch diameter tree should have a crown width of 8.67 feet or crown area of 59 square feet. These dimensions were confirmed as reasonable by staff through several local field samples. Using the median cost of a 3-inch deciduous tree (\$174) and the crown area of a 3-inch diameter tree (59 square feet), the unit canopy cost or tree canopy fee should be \$2.95 per square foot.

This methodology is a reasonable approach for three main reasons. First, tree benefits (aesthetic, stormwater management, air quality, etc.) are derived primarily from their canopies, so proposing to place a value to tree canopy is appropriate. Second, in the proposal, tree canopy is valued using the median wholesale tree cost only, whereas standard tree appraisal is based on the wholesale tree cost plus the cost of tree installation. Finally, the Krajicek formula and field samples by staff are based on the maximum crown width to trunk diameter ratio, and a typical tree does not have such a high ratio. If the typical ratio were used, the unit canopy cost would increase.

Based on community discussions, the future use of tree canopy fees (outlined through council resolution) should be as follows:

1. Tree Planting and Early Establishment (50 percent allocation);
2. Preservation of existing trees following a recommendation approved by majority vote of the city board or committee designated by the city manager to give such recommendations (25 percent allocation);
3. Maintenance of those trees planted using the Urban Forestry Fund after the early establishment period has ended (10 percent allocation);
4. Urban Forestry Education and Outreach following a recommendation approved by majority vote of the city board or committee designated by the city manager to give such recommendations (10 percent allocation); and
5. Urban Forestry Planning for activities that support periodic updates of the City of Tigard's Urban Forestry Master Plan, Municipal Code or Development Code following a recommendation approved by majority vote of the city board or committee designated by the city manager to give such recommendations (5 percent allocation).

The planting, early establishment and maintenance items should be implemented by staff because they are technical in nature. However, deciding how and where to use funds for preservation, education and outreach and planning should involve a discussion and recommendation by a designated board (such as the Tree Board) to help ensure expenditures are consistent with community expectations.

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<sup>3</sup> Pacific Northwest Chapter of the International Society of Arboriculture. Species Ratings for Landscape Tree Appraisal, 2<sup>nd</sup> Edition, Silverton, OR: Pacific Northwest ISA, 2007.

<sup>4</sup> Krajicek, J. E., K. E. Binkman, S. F. Gingrich 1961. Crown Competition - A Measure of Density. Forest Science 7:35-42.

- ~~A. Tree plan required. A tree plan for the planting, removal and protection of trees prepared by a certified arborist shall be provided for any lot, parcel or combination of lots or parcels for which a development application for a subdivision, partition, site development review, planned development or conditional use is filed. Protection is preferred over removal wherever possible.~~
- ~~B. Plan requirements. The tree plan shall include the following:~~
- ~~1. Identification of the location, size and species of all existing trees including trees designated as significant by the city;~~
  - ~~2. Identification of a program to save existing trees or mitigate tree removal over 12 inches in caliper. Mitigation must follow the replacement guidelines of Section 18.790.060D, in accordance with the following standards and shall be exclusive of trees required by other development code provisions for landscaping, streets and parking lots:
    - ~~a. Retention of less than 25% of existing trees over 12 inches in caliper requires a mitigation program in accordance with Section 18.790.060D of no net loss of trees;~~
    - ~~b. Retention of from 25% to 50% of existing trees over 12 inches in caliper requires that two-thirds of the trees to be removed be mitigated in accordance with Section 18.790.060D;~~
    - ~~c. Retention of from 50% to 75% of existing trees over 12 inches in caliper requires that 50 percent of the trees to be removed be mitigated in accordance with Section 18.790.060D;~~
    - ~~d. Retention of 75% or greater of existing trees over 12 inches in caliper requires no mitigation.~~~~
  - ~~3. Identification of all trees which are proposed to be removed;~~
  - ~~4. A protection program defining standards and methods that will be used by the applicant to protect trees during and after construction.~~
- ~~C. Subsequent tree removal. Trees removed within the period of one year prior to a development application listed above will be inventoried as part of the tree plan above and will be replaced according to Section 18.790.060D.~~

This section is renamed to Discretionary Urban Forestry Plan Review Option.

The discretionary urban forestry plan review option is an alternative to meeting the clear and objective effective canopy requirements. An applicant could make their case at a public hearing in front of Planning Commission or the hearings officer about how their proposal is an adequate substitute for the functions and values otherwise provided by trees. The functions and values provided by trees that may be substituted through alternative means are broken down into three main categories:

1. Hydrological benefits (managing stormwater quantity and quality);
2. Climate benefits (reducing fossil fuel consumption and carbon emissions when appropriately placed for shading, improving air quality through carbon storage and absorption of gaseous pollutants, intercepting particulates, etc.); and
3. Wildlife benefits (food and shelter).<sup>5</sup>

The discretionary option provides examples of the alternative stormwater management, energy efficiency and wildlife enhancement methods that could be presented to the Planning Commission or hearings officer for consideration as adequate substitutes for the functions and values of trees described above. When deciding whether to approve alternative methods, the Planning Commission or hearings officer is encouraged to require certification through a third party system (e.g. Earth Advantage, LEED, etc.).

The review body (Planning Commission or hearings officer) will depend on whether there is a concurrent Type III review. For example, if an applicant for a Planned Development (Type III Planning Commission review) chooses to receive a discretionary urban forestry plan review, the review body will be the Planning Commission. However, if an applicant for a Conditional Use Permit (Type III hearings officer review) chooses to receive a discretionary urban forestry plan review, the review body will be the hearings officer. Finally, if an applicant does not have a concurrent Type III review (e.g. Subdivision, Minor Land Partition, etc.), yet chooses to receive a discretionary urban forestry plan review, the review body will be the hearings officer.

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<sup>5</sup> McPherson, E.G., S.E. Maco, P.J. Peper, Q. Xiao, A. VanDerZanden, and N. Bell. 2002 Western Washington and Oregon Community Tree Guide: Benefits, Costs, and Strategic Planting. International Society of Arboriculture, Pacific Northwest Chapter, Silverton, OR.



**18.790.040 Incentives for Tree Retention Discretionary Urban Forestry Plan Review Option**

A. General Provisions. In lieu of providing payment of a tree canopy fee when less than the standard effective tree canopy cover required by Section 10, part 3 of the Urban Forestry Manual will be provided, an applicant may apply for a discretionary urban forestry plan review. The discretionary urban forestry plan review cannot be used to modify an already approved urban forestry plan, any tree preservation or tree planting requirements established as part of another land use review approval, or any tree preservation or tree planting requirements required by another chapter in this title.

B. Application Procedures. Discretionary urban forestry plan reviews shall be processed through a Type III procedure using approval criteria contained in Section 18.790.040.C below. When a discretionary urban forestry plan review is submitted for concurrent Type III land use review with one of the land use reviews types listed in Section 18.790.020, the review body will be the one designated for the land use review type listed in Section 18.790.020. If the discretionary urban forestry plan review is not concurrent with any other Type III land use review, then the review body shall be the hearings officer.

C. Approval Criteria. A discretionary urban forestry plan review application will be approved if the review body finds that the applicant has shown that all of the applicable approval criteria are met::

1. The applicant has demonstrated that the proposed plan will equally or better replace the environmental functions and values that would otherwise be provided through payment of a tree canopy fee in lieu of tree planting or preservation. Preference shall be given to projects that will receive certifications by third parties for various combinations of proposed alternatives such as:

a. Techniques that minimize hydrological impacts beyond regulatory requirements such as those detailed in Clean Water Services Low Impact Development Approaches (LIDA) Handbook including but not limited to porous pavement, green roofs, infiltration planters/rain gardens, flow through planters, LIDA swales, vegetated filter strips, vegetated swales, extended dry basins and constructed water quality wetlands;

b. Techniques that minimize reliance on fossil fuels and production of greenhouse gases beyond regulatory requirements through the use of energy efficient building technologies and onsite energy production technologies; and

c. Techniques that preserve and enhance wildlife habitat beyond regulatory requirements including but not limited to the use of native plant species in landscape design, removal of invasive plant species and restoration of native habitat and preservation of habitat through the use of conservation easements or other protective instruments.

## Commentary

### 18.790.040 Discretionary Urban Forestry Plan Review Option

The existing incentives for tree retention have been modified to make them more attractive to developers and user friendly. They are included in Section 18.790.050.

D. Decision. The discretionary urban forestry plan review decision shall be incorporated into the land use review decision types in Section 18.790.020. The discretionary urban forestry plan approved in this section shall supersede and replace any conflicting requirements in this chapter. However, all of the non-conflicting requirements in this chapter shall continue to apply.

~~A. Incentives. To assist in the preservation and retention of existing trees, the Director may apply one or more of the following incentives as part of development review approval and the provisions of a tree plan according to Section 18.790.030:~~

- ~~1. Density bonus. For each 2% of canopy cover provided by existing trees over 12 inches in caliper that are preserved and incorporated into a development plan, a 1% bonus may be applied to density computations of Chapter 18.715. No more than a 20% bonus may be granted for any one development. The percentage density bonus shall be applied to the number of dwelling units allowed in the underlying zone. This bonus is not applicable to trees preserved in areas of floodplain, slopes greater than 25%, drainageways, or wetlands that would otherwise be precluded from development;~~
- ~~2. Lot size averaging. To retain existing trees over 12 inches in caliper in the development plan for any land division under Chapter 18.400, lot size may be averaged to allow lots less than the minimum lot size allowed by the underlying zone as long as the average lot area for all lots and private open space is not less than that allowed by the underlying zone. No lot area shall be less than 80% of the minimum lot size allowed in the zone;~~
- ~~3. Lot width and depth. To retain existing trees over 12 inches in caliper in the development plan for any land division under Chapter 18.400, lot width and lot depth may be reduced up to 20% of that required by the underlying zone;~~
- ~~4. Commercial/industrial/civic use parking. For each 2% of canopy cover provided by existing trees over 12 inches in caliper that are preserved and incorporated into a development plan for commercial, industrial or civic uses listed in Section 18.765.080, Minimum and Maximum Off-Street Parking Requirements, a 1% reduction in the amount of required parking may be granted. No more than a 20% reduction in the required amount of parking may be granted for any one development;~~
- ~~5. Commercial/industrial/civic use landscaping. For each 2% of canopy cover provided by existing trees over 12 inches in caliper that are preserved and incorporated into a development plan, a 1% reduction in the required amount of landscaping may be granted. No more than 20% of the required amount of landscaping may be reduced for any one development.~~

## Commentary

### 18.790.040 Discretionary Urban Forestry Plan Review Option

The existing incentives for tree retention have been modified to make them more attractive to developers and user friendly. They are included in Section 18.790.050.

- ~~B. Subsequent removal of a tree. Any tree preserved or retained in accordance with this section may thereafter be removed only for the reasons set out in a tree plan, in accordance with Section 18.790.030, or as a condition of approval for a conditional use, and shall not be subject to removal under any other section of this chapter. The property owner shall record a deed restriction as a condition of approval of any development permit affected by this section to the effect that such tree may be removed only if the tree dies or is hazardous according to a certified arborist. The deed restriction may be removed or will be considered invalid if a tree preserved in accordance with this section should either die or be removed as a hazardous tree. The form of this deed restriction shall be subject to approval by the Director.~~
- ~~C. Site development modifications granted as incentives. A modification to development requirements granted under this section shall not conflict with any other restriction on the use of the property, including but not limited to easements and conditions of development approval.~~
- ~~D. Design modifications of public improvements. The City Engineer may adjust design specifications of public improvements to accommodate tree retention where possible and where it would not interfere with safety or increase maintenance costs.~~

## Commentary

### 18.790.050 Flexible Standards for Tree Planting and Preservation

This section is renamed to Flexible Standards for Tree Planting and Preservation.

Text has been added to the general provisions portion of the section that all the flexible standards and incentives supersede conflicting standards in the code unless the flexibility would present an unreasonable risk to public health, safety or welfare.

The director has been authorized to use discretion when granting flexibility. The general consensus of the CAC was to allow applicants to take advantage of the flexibility without requiring a public hearing.

There are two categories of flexible standards for planting and preservation. The flexible standards in subsection “C” are available for the planting and/or preservation of all trees. The flexible standards in subsection “D” are available only for development sites with a significant tree grove. However, development sites with significant tree groves are also eligible for all of the flexible standards and incentives in subsection “C”.

The following flexible standards for tree preservation in subsection “C” are proposed to be allowed outright without requiring a variance or adjustment:

- Lot size averaging;
- Flexible setbacks;
- Flexible sidewalk locations;
- Allowing reductions in minimum parking requirements; and
- Allowing reductions in minimum landscape requirements.

Additional flexibility is included in subsection “C” to facilitate the planting of large stature street trees (flexible sidewalk locations such as allowing curb tight sidewalks or allowing sidewalks in easements to increase the size of planting strips without losing developable site area). Also included is flexibility to reduce competition for space between trees and parking lots to facilitate the planting of large stature parking lot trees (allowing reductions in minimum parking requirements when providing canopy through planting).

Tree removal permit provisions are struck from Chapter 18.790 and revised/relocated to Title 8.

**18.790.050 Permit Applicability Flexible Standards for Tree Planting and Preservation**

A. General Provisions. To assist in the preservation and/or planting of trees and significant tree groves, the director may apply one or more of the following flexible standards as part of the land use review approval. To the extent that the standards in this section conflict with the standards in other sections of this title, the standards in this section shall apply except in cases where the director determines there would be an unreasonable risk to public health, safety, or welfare. Use of the flexible standards shall be requested by the project arborist or landscape architect as part of the land use review process. The flexible standards are only applicable to trees that are eligible for credit towards the effective tree canopy cover of the site.

B. Approval Criterion for use of Flexible Standards. The review body may consider modifications for lot dimension standards or site-related development standards as part of the urban forestry plan review process. These modifications are done as part of the urban forestry plan review process and are not required to go through the adjustment process. In order to approve these modifications, the review body must find that the modification request is the least required to preserve and/or plant trees, that the modification will result in the preservation of or an addition to tree canopy on the lot, and that the modification will not impede adequate emergency access to the site.

C. Flexible Standards to Preserve or Plant Trees. The following flexible standards are available to applicants in order to preserve or plant trees on a development site.

1. Lot size averaging. To preserve existing trees in the development plan for any land partition under Chapter 18.420, lot size may be averaged to allow lots less than the minimum lot size required in the underlying zone as long as the average lot area is not less than that allowed by the underlying zone. No lot area shall be less than 80 percent of the minimum lot size allowed in the zone.

2. Adjustments to Setbacks. The following setback reductions will be allowed for lots preserving existing trees using the criteria in subsection b below.

a. Reductions allowed:

(i) Front yard – up to a 25 percent reduction of the dimensional standard for a front yard setback required in the base zone. Setback of garages may not be reduced by this provision.

(ii) Other setbacks - up to a 20 percent reduction of the dimensional standards for other setbacks required in the base zone.

Commentary

18.790.050 Flexible Standards for Tree Planting and Preservation

Flexible standards in subsection “C” continued.



3. Adjustments to Sidewalks. Location of a public sidewalk may be flexible in order to preserve existing trees or to plant new large stature street trees. Sidewalk location and design must be approved by the Development Engineer. For preservation, this flexibility shall be the minimum required to achieve the desired effect. For planting, preference shall be given to retaining the planter strip and separation between the curb and sidewalk wherever practicable. If a preserved tree is to be utilized as a street tree, it must meet the criteria found in the Landscaping and Screening Section 18.745.040.A.5.

4. Adjustments to Commercial/Industrial/Civic Use Parking. For each 2 percent of effective canopy cover provided by preserved or planted trees incorporated into a development plan for commercial, industrial or civic uses listed in Section 18.765.080, Minimum and Maximum Off-Street Parking Requirements, a 1 percent reduction in the amount of required parking may be granted. No more than a 20 percent reduction in the required amount of parking may be granted for any one development.

5. Adjustments to Commercial/Industrial/Civic Use Landscaping. For each 2 percent of effective canopy cover provided by preserved trees incorporated into a development plan, a 1 percent reduction in the minimum landscape requirement may be granted. No more than 20 percent of the minimum landscape requirement may be reduced for any one development.

## Commentary

### 18.790.050 Flexible Standards for Tree Planting and Preservation

The guiding principles for Tree Grove Preservation Incentives are in Volume I of the legislative adoption package for the Urban Forestry Code Revisions. These guiding principles represent the consensus view of the citizen advisory committee that advised staff on the Urban Forestry Code Revisions.

Some base requirements have been included in subsection “D” in order for an applicant to be eligible for the additional flexible standards and incentives for preservation of a significant tree grove:

- There has to be at least 10,000 square feet (~¼ acre) of tree canopy within a development site that is part of a significant tree grove.
- The 10,000 square feet of significant tree grove canopy is not already protected by floodplain, stream corridor and/or wetland regulations.
- The project arborist or landscape architect demonstrates consistency with the applicable provisions in the urban forestry plan for the development site.

If these base requirements are met, there are six flexible standards and incentives that may be utilized by the applicant.

The first is a reduction in minimum density requirements. The applicant will be given the option to remove the significant tree grove portion of their property from their minimum density calculations. This will allow applicants to build only on the non-tree grove portion of their property. The applicant would also be required to work with their project arborist or landscape architect to designate 50 percent or more of their tree grove for preservation, maximize the connectivity and viability of the remaining portion of the tree grove and protect the remaining tree grove through a conservation easement or other protective instrument.

D. Flexible Standards and Incentives for the Preservation of Significant Tree Groves. A Significant Tree Grove Map is maintained by the director. The following additional flexible standards and incentives are available when a development site contains at least 10,000 square feet of tree canopy that is part of a significant tree grove and is not also within sensitive lands identified in Section 18.775.010.G.1-3. If any of these flexible standards and incentives are requested, the project arborist or landscape architect shall clearly demonstrate in the urban forestry plan consistency with the following provisions:

1. Reduction of Minimum Density. The minimum density required by Section 18.510.040.B may be reduced to preserve a significant tree grove. The amount of reduction in minimum density shall be calculated as described in Chapter 18.715. Reduction of minimum density is permitted provided that:

a. At least 50 percent of the significant tree grove's canopy within the development site (and not also within the sensitive lands types in Section 18.775.010.G.1-3) is preserved;

b. The project arborist or landscape architect certifies the preservation is such that the connectivity and viability of the remaining significant tree grove is maximized while balancing the considerations in Section 10, part 5 of the Urban Forestry Manual; and

c. The significant tree grove is protected through an instrument or action subject to approval by the director that demonstrates it will be permanently preserved such as:

(i) A conservation easement;

(ii) An open space tract;

(iii) A deed restriction; or

(iv) Through dedication and acceptance by the city.

Commentary

18.790.050 Flexible Standards for Tree Planting and Preservation

The second flexible standard and incentive is residential density transfer. This will allow applicants to build attached units and reduce lot or unit area so they can preserve a significant tree grove while building to allowed densities on the non-tree grove portion of the site. In order to develop with the 100 percent density transfer, housing types not typically allowed in lower density zones will now be permitted if a tree grove is preserved. These housing types include attached single family and duplexes. Currently these uses are either not permitted in lower density zones, are a conditional use or require a planned development application. The proposed changes would allow these uses with the staff level Type II review and not require a public hearing process.

The development standards are adjusted accordingly to accommodate smaller lots including: 1) reduced lot widths; 2) reduced front, side and rear yard setbacks; 3) reduced garage setbacks and 4) increased building height.

Lots that abut a developed residential zone with the same or lower density are only allowed a 25 percent reduction in lot area so they are more compatible with the abutting lots.

The applicant would also be required to work with their project arborist or landscape architect to designate their tree grove for preservation, maximize the connectivity and viability of the remaining portion of the tree grove, and protect the remaining tree grove through a conservation easement or other protective instrument.

2. Residential Density Transfer. Up to 100 percent density transfer is permitted from the preserved portion of a significant tree grove within a development site to the buildable area of the development site.

a. Density may be transferred provided that:

(i) The standards in Table 18.790.1 are met with the preservation of the corresponding percent of the significant tree grove's canopy within the development site (and not also within the sensitive lands types in Section 18.775.010.G.1-3);

(ii) The project arborist or landscape architect certifies the preservation is such that the connectivity and viability of the remaining significant tree grove is maximized while balancing the considerations in Section 10, part 5 of the Urban Forestry Manual;

(iii) Maximum density for the net site area including the significant tree grove is not exceeded; and

(iv) The significant tree grove is protected through an instrument or action subject to approval by the director that demonstrates it will be permanently preserved such as:

(A) A conservation easement;

(B) An open space tract;

(C) A deed restriction; or

(D) Through dedication and acceptance by the city.

b. The proposed development may include the following:

(i) Zero lot line single-family detached housing for the portion of the development site that receives the density transfer.

(ii) The following variations from the base zone development standards are permitted:

(A) Up to 25 percent reduction of average minimum lot width;

(B) Up to 10 foot minimum front yard setback;

(C) Up to 33 percent reduction of side and rear yard setbacks;

(D) Up to 4 foot minimum garage setback; and

(E) Up to 20 percent increase in maximum height as long as height adjustments comply with the International Building Code.

(iii) When the portion of the development site that receives the density transfer abuts a developed residential district with the same or lower density zoning, the average area of abutting perimeter lots shall at least be 75 percent or greater than the corresponding minimum lot area of the base residential zoning district.

Commentary

18.790.050 Flexible Standards for Tree Planting and Preservation

Table 18.790.1 (Density Transfer Table for Preservation of Significant Tree Groves) allows reduced lot and unit sizes to facilitate density transfer from the tree grove portion to the non-tree grove portion of a site.

**TABLE 18.790.1**  
**DENSITY TRANSFER TABLE FOR PRESERVATION OF SIGNIFICANT TREE GROVES**

<b>Residential Zoning District</b>	<b>Detached SQ. FT.<sup>1</sup> Percent Tree Grove Canopy Preserved / Min Lot or Unit Area</b>	<b>Attached SQ. FT. Percent Tree Grove Canopy Preserved / Min Lot or Unit Area</b>	<b>Duplex Percent Tree Grove Canopy Preserved / Min Lot or Unit Area</b>	<b>Multifamily Percent Tree Grove Canopy Preserved / Min Unit Area</b>
<b>R-1</b> (30,000 sq. ft. per unit)	25-49% / 22,500 sq. ft. 50-74% / 15,000 sq. ft. 75-100% / 7,500 sq. ft.	<u>Not Allowed</u>	<u>Not Allowed</u>	<u>Not Allowed</u>
<b>R-2</b> (20,000 sq. ft. per unit)	25-49% / 15,000 sq. ft. 50-74% / 10,000 sq. ft. 75-100% / 5,000 sq. ft.	Permitted with 75% or greater tree grove canopy preservation / 5,000 sq. ft.	<u>Not Allowed</u>	<u>Not Allowed</u>
<b>R-3.5</b> (10,000 sq. ft. per unit)	25-49% / 7,500 sq. ft. 50-74% / 5,000 sq. ft. 75-100% / 2,500 sq. ft.	Permitted with 75% or greater tree grove canopy preservation / 2,500 sq. ft.	Permitted with 75% or greater tree grove canopy preservation / 5,000 sq. ft.	<u>Not Allowed</u>
<b>R-4.5</b> (7,500 sq. ft. per unit)	25-49% / 5,625 sq. ft. 50-74% / 3,750 sq. ft. 75-100% / 1,875 sq. ft.	Permitted with 75% or greater tree grove canopy preservation / 1,875 sq. ft.	Permitted with 75% or greater tree grove canopy preservation / 3,750 sq. ft.	<u>Not Allowed</u>
<b>R-7</b> (5,000 sq. ft. per unit)	25-49% / 3,750 sq. ft. 50-74% / 2,500 sq. ft. 75-100% / 1,250 sq. ft.	Permitted with 75% or greater tree grove canopy preservation / 1,250 sq. ft.	Permitted with 75% or greater tree grove canopy preservation / 2,500 sq. ft.	<u>Not Allowed</u>
<b>R-12</b> (3,050 per unit)	Single family, duplex and multifamily housing permitted at the following densities: <u>25-49% tree grove canopy preservation / 2,288 sq. ft. per unit</u> <u>50-74% tree grove canopy preservation / 1,525 sq. ft. per unit</u> <u>75-100% tree grove canopy preservation / 763 sq. ft. per unit</u>			
<b>R-25</b> (1,480 sq. ft. per unit)	Single family, duplex and multifamily housing permitted at the following densities: <u>25-49% tree grove canopy preservation / 1,110 sq. ft. per unit</u> <u>50-74% tree grove canopy preservation / 740 sq. ft. per unit</u> <u>75-100% tree grove canopy preservation / 370 sq. ft. per unit</u>			
<b>R-40</b> (None)	Single family, duplex and multifamily housing permitted with no upper density <u>limit.</u>			

## Commentary

### 18.790.050 Flexible Standards for Tree Planting and Preservation

The third and fourth flexible standards and incentives are applicable to commercial and industrial development. They both allow up to 50 percent reduction in minimum setbacks and 20 feet additional building height for significant tree grove preservation. Buffering and screening per Chapter 18.745 would still be required between differing land uses. Maximum floor area ratio (FAR) in the MUE zoning district supersedes the allowed increase in building height in that zone. Maximum FAR in the MUE zone limits traffic impacts on state highway facilities.

The applicant would be required to work with their project arborist or landscape architect to designate 50 percent or more of their tree grove for preservation, maximize the connectivity and viability of the remaining portion of the tree grove and protect the remaining tree grove through a conservation easement or other protective instrument.



3. Adjustments to Commercial Development Standards. Adjustments to Commercial Development Standards (Table 18.520.2) of up to 50 percent reduction in minimum setbacks and up to 20 feet additional building height are permitted provided:

a. At least 50 percent of a significant tree grove's canopy within a development site (and not also within the sensitive lands types in Section 18.775.010(G)(1-3)) is preserved;

b. The project arborist or landscape architect certifies the preservation is such that the connectivity and viability of the remaining significant tree grove is maximized while balancing the considerations in Section 10, part 5 of the Urban Forestry Manual;

c. Applicable buffering and screening standards in Section 18.745.050 are met;

d. Any height adjustments comply with the International Building Code;

e. Maximum floor area ratio is not exceeded in the MUE zoning district as described in Section 18.520.050.C.1;

f. Any setback reduction is not adjacent to residential zoning; and

g. The significant tree grove is protected through an instrument or action subject to approval by the director that demonstrates it will be permanently preserved and managed such as:

(i) A conservation easement;

(ii) An open space tract;

(iii) A deed restriction; or

(iv) Through dedication and acceptance by the city.

4. Adjustments to Industrial Development Standards. Adjustments to Development Standards in Industrial Zones (Table 18.530.2) of up to 50 percent reduction in minimum setbacks and up to 20 feet additional building height are permitted provided:

a. At least 50 percent of a significant tree grove's canopy within a development site (and not also within the sensitive lands types in Section 18.775.010(G)(1-3)) is preserved;

b. The project arborist or landscape architect certifies the preservation is such that the connectivity and viability of the remaining significant tree grove is maximized while balancing the considerations in Section 10, part 5 of the Urban Forestry Manual;

c. Applicable buffering and screening standards in Section 18.745.050 are met;

d. Any height adjustments comply with the International Building Code;

e. Any setback reduction is not adjacent to residential zoning; and

## Commentary

### 18.790.050 Flexible Standards for Tree Planting and Preservation

The fifth flexible and incentive based standard is an adjustment to the minimum effective canopy requirement. A standard urban forestry plan requires 15 percent effective tree canopy in the R-1, R-2, R-3.5, R-4.5 and R-7 districts per lot in addition to the overall development site effective canopy requirement which is based on zoning (25, 33 or 40 percent). In order to facilitate the preservation of significant tree groves, the “per lot” effective canopy requirement could be waived. This could benefit development that uses density transfer and reduced lot sizes to preserve a significant tree grove by not requiring trees on individual lots as long the overall development site meets the zoning specific canopy requirement. The applicant would be required to work with their project arborist to designate 50 percent of their tree grove for preservation, maximize the connectivity and viability of the remaining portion of the tree grove and protect the remaining tree grove through a conservation easement or other protective instrument.

The final flexible and incentive based standard is an adjustment to the street and utility standards. The intent is to highlight the director’s authority in Chapter 18.810 to vary from street and utility standards to preserve natural features (such as a significant tree grove) provided the adjustment does not result in an unreasonable risk to public safety. In addition, variation from the street tree standards in Chapter 18.745 would be permitted to facilitate the preservation of a significant tree grove. The project arborist would be required to show that the variation from the standards will facilitate preservation and help to maximize the connectivity and viability of a significant tree grove. The applicant would also be required to protect the remaining tree grove through a conservation easement or other protective instrument.

f. The significant tree grove is protected through an instrument or action subject to approval by the director that demonstrates it will be permanently preserved such as:

- (i) A conservation easement;
- (ii) An open space tract;
- (iii) A deed restriction; or
- (iv) Through dedication and acceptance by the city.

5. Adjustment to Minimum Effective Tree Canopy Cover Requirement. The requirement for 15 percent effective tree canopy cover per lot or tract in the R-1, R-2, R-3.5, R-4.5 and R-7 districts is not required when:

a. At least 50 percent of a significant tree grove's canopy within a development site (and not also within the sensitive lands types in Section 18.775.010.G.1-3) is preserved;

b. The project arborist or landscape architect certifies the preservation is such that the connectivity and viability of the remaining significant tree grove is maximized while balancing the considerations in Section 10, part 5 of the Urban Forestry Manual;

c. The applicable standard percent effective tree canopy cover in Section 10, part 3, item N of the Urban Forestry Manual will be provided for the overall development site (excluding streets);

d. The significant tree grove is protected through an instrument or action subject to approval by the director that demonstrates it will be permanently preserved such as:

- (i) A conservation easement;
- (ii) An open space tract;
- (iii) A deed restriction; or
- (iv) Through dedication and acceptance by the city.

6. Adjustment to Street and Utility Standards. If requested, the director shall use his or her discretion when considering adjustments to Chapter 18.810, Street and Utility Improvement Standards and Section 18.745.040, Street Trees provided:

a. The adjustments will facilitate preservation and help to maximize the connectivity and viability of a significant tree grove while balancing the considerations in Section 10, part 5 of the Urban Forestry Manual;

b. The significant tree grove is protected through an instrument or action subject to approval by the director that demonstrates it will be permanently preserved and managed such as:

- (i) A conservation easement;
- (ii) An open space tract;
- (iii) A deed restriction; or
- (iv) Through dedication and acceptance by the city.

## Commentary

### 18.790.060 Urban Forestry Plan Implementation

The urban forestry plan implementation requirements standardize the inspection and documentation requirements currently administered through conditions of development approval.

The general provisions section states that urban forestry plans are in effect from the point of land use approval until all applicable urban forestry plan conditions of approval and code requirements have been met (typically after planted trees have met their two year establishment requirement). The reason for requiring an end point for the effective period of an urban forestry plan is to allow future permitting decisions to occur through the regulatory framework in Title 8 (rather than as a modification to a previous land use decision).

**18.790.060 Urban Forestry Plan Implementation**

A. General Provisions. An urban forestry plan shall be in effect from the point of land use approval until the director determines all applicable urban forestry plan conditions of approval and code requirements have been met. For subdivisions and partitions, the urban forestry plan shall remain in effect for each resulting lot or tract separately until the director determines all applicable urban forestry plan conditions of approval and code requirements have been met. Prior and subsequent permitting decisions regarding the planting, maintenance, removal and replacement of trees when not associated with one of the land use review types in Section 18.790.020.A shall be administered through Title 8 (Urban Forestry) of the Tigard Municipal Code.

## Commentary

### 18.790.060 Urban Forestry Plan Implementation

The other implementation elements include regular inspections of tree protection during development, two years of tree establishment for newly planted trees, and an inventory of trees and stands of trees for the city's GIS database. The tree protection inspection requirements conform to current requirements implemented through conditions of development approval. The tree establishment requirements allow for bonding of newly planted trees during the establishment period, require replacement of trees that die and require a renewal of the bonding period if less than 80 percent of the planted trees survive (replacement of trees is required even if over 80 percent survive). The details of the inspection and tree establishment requirements are included in Section 11 of the Urban Forestry Manual.

The urban forest inventory requirements are in Section 11 of the Urban Forestry Manual as well, and require trees to be included in a publicly accessible GIS database. This could allow people to type in their address and find information about the protected trees on their property from the city's website. This will make information retrieval for both the city and public easier than through other instruments such as deed restrictions. Section 11 of the Urban Forestry Manual allows the city to charge a fee to cover its cost of collecting and processing the urban forest inventory data.

Tree removal permit provisions are struck from Chapter 18.790 and revised/relocated to Title 8.

B. Inspections. Implementation of the urban forestry plan shall be inspected, documented and reported by the project arborist or landscape architect whenever an urban forestry plan is active. In addition, no person may refuse entry or access to the director for the purpose of monitoring the urban forestry plan on any site with an effective urban forestry plan. The inspection requirements in Section 11, part 1 of the Urban Forestry Manual shall apply to sites with an effective urban forestry plan.

C. Tree Establishment. The establishment of all trees shown to be planted in the tree canopy site plan (per 18.790.030.A.3) and supplemental report (per 18.790.030.A.4) of a previously approved urban forestry plan shall be guaranteed and required according to the tree establishment requirements in Section 11, part 2 of the Urban Forestry Manual.

D. Urban Forest Inventory. Spatial and species specific data shall be collected according to the urban forestry inventory requirements in Section 11, part 3 of the Urban Forestry Manual for each open grown tree and area of stand grown trees in the tree canopy site plan (per 18.790.030.A.3) and supplemental report (per 18.790.030.A.4) of a previously approved urban forestry plan.

~~A. Removal permit required.~~ Tree removal permits shall be required only for the removal of any tree which is located on or in a sensitive land area as defined by Chapter 18.775. The permit for removal of a tree shall be processed as a Type I procedure, as governed by Section 18.390.030, using the following approval criteria:

- ~~1. Removal of the tree must not have a measurable negative impact on erosion, soil stability, flow of surface waters or water quality as evidenced by an erosion control plan which precludes:
 
  - ~~a. Deposits of mud, dirt, sediment or similar material exceeding 1/2 cubic foot in volume on public or private streets, adjacent property, or into the storm and surface water system, either by direct deposit, dropping, discharge or as a result of the action of erosion;~~
  - ~~b. Evidence of concentrated flows of water over bare soils; turbid or sediment laden flows; or evidence of on-site erosion such as rivulets on bare soil slopes where the flow of water is not filtered or captured on site using the techniques of Chapter 5 of the Washington County Unified Sewerage Agency Environmental Protection and Erosion Control rules.~~~~
- ~~2. Within stream or wetland corridors, as defined as 50 feet from the boundary of the stream or wetland, tree removal must maintain no less than a 75% canopy cover or no less than the existing canopy cover if the existing canopy cover is less than 75%.~~

~~B. Effective date of permit.~~ A tree removal permit shall be effective for one and one-half years from the date of approval.

Commentary

18.790.060

Urban Forestry Plan Implementation

Tree removal permit provisions are struck from Chapter 18.790 and revised/relocated to Title 8.



- ~~C. Extension. Upon written request by the applicant prior to the expiration of the existing permit, a tree removal permit shall be extended for a period of up to one year if the Director finds that the applicant is in compliance with all prior conditions of permit approval and that no material facts stated in the original application have changed.~~
- ~~D. Removal permit not required. A tree removal permit shall not be required for the removal of a tree which:~~
- ~~1. Obstructs visual clearance as defined in Chapter 18.795 of the title;~~
  - ~~2. Is a hazardous tree;~~
  - ~~3. Is a nuisance affecting public safety as defined in Chapter 7.40 of the Municipal Code;~~
  - ~~4. Is used for Christmas tree production, or land registered with the Washington County Assessor's office as tax-deferred tree farm or small woodlands, but does not stand on sensitive lands.~~
- ~~E. Prohibition of commercial forestry. Commercial forestry as defined by Section 18.790.020 A.2., excluding D.4. above, is not permitted.~~

## Commentary

### 18.790.070 Modification to the Urban Forestry Plan Component of an Approved Land Use Permit

Two levels of modifications to the urban forestry plan component of an approved land use permit will be allowed. Minor modification to will be completed as a staff level, technical review. The following items would be considered minor modifications:

- Removal of hazard trees if there is sufficient documentation by a certified tree risk assessor;
- Modification of the quantity, location or species of trees to be planted, provided the same or greater tree canopy will result;
- Modification of the location of tree protection fencing, provided the arborist or landscape architect certifies that the viability of the trees will not be impacted;
- Modifying any other site elements (e.g. paving, building, etc.) that do not also require a modification to the location of the tree protection fencing; and
- Maintenance of trees (pruning, mulching, fertilization, etc.) in accordance with tree care industry standards.

Significant modifications to the urban forestry plan component of an approved land use permit such as cutting down existing trees and replacing them with new trees will be required to be a Type I land use decision. Type I decisions are clear and objective decisions and do not require notice of the surrounding neighbors. The criteria for approving such modifications are:

- The project arborist or landscape architect has provided a report certifying that trees are being removed due to unforeseen circumstances;
- The project arborist or landscape architect has provided a report certifying that there is no practicable alternative to tree removal; and
- The project arborist or landscape architect demonstrates that the canopy requirement will be met through a revised plan.

18.790.070 Modification to the Urban Forestry Plan Component of an Approved Land Use Permit

A. General Provisions. Except as exempted in Section 18.790.070.B below, any modification to the urban forestry plan component of an approved land use permit shall be processed as a Type I land use decision as described below.

B. Exemptions. The following activities shall be exempt from the Type I Modification to the Urban Forestry Plan Component of an Approved Land Use Permit process:

1. Removal of any tree shown as preserved in the tree canopy site plan (per 18.790.030.A.3) and supplemental report (per 18.790.030.A.4) of a previously approved urban forestry plan provided:

a. The project arborist or landscape architect provides a written report prior to removal attesting that either the condition rating (per Section 10, part 3, item D.7 of the Urban Forestry Manual) or suitability of preservation rating (per Section 10, part 3, item D.8 of the Urban Forestry Manual) of the tree has changed to a rating of less than 2; and

b. A revised tree canopy site plan and supplemental report are submitted for review and approval prior to removal that reflect the proposed changes to the previously approved urban forestry plan. The revised tree canopy site plan and supplemental arborist report shall demonstrate how the effective tree canopy cover requirements in Section 10, part 3 of the Urban Forestry Manual will be provided by tree planting, preservation and/or payment of a tree canopy fee in lieu of planting or preservation.

Commentary

18.790.070 Modification to the Urban Forestry Plan Component of an Approved Land Use Permit

Modification procedures continued.

2. Modification of the quantity, location or species of trees to be planted in the tree canopy site plan and supplemental report of a previously approved urban forestry plan provided:

a. The modification results in the same or greater amount of future tree canopy through tree planting as the previously approved urban forestry plan for the lot or tract where the modification is proposed;

b. Payment of a tree canopy fee in lieu of planting is not proposed as part of the modification; and

c. A revised tree canopy site plan and supplemental report are submitted for review and approval prior to planting that reflect the proposed changes to the previously approved urban forestry plan.

3. Modification of the tree protection fencing location in the tree preservation and removal site plan (per 18.790.030.A.2), tree canopy site plan and supplemental report of a previously approved urban forestry plan provided:

a. The project arborist or landscape architect provides a written report prior to modification of the tree protection fencing describing how the proposed modification will continue to protect the viability of the trees shown as preserved in the previously approved urban forestry plan; and

b. A revised tree preservation and removal site plan, tree canopy site plan and supplemental report are submitted for review and approval prior to modification of the tree protection fencing that reflect the proposed modifications to the previously approved urban forestry plan.

4. Modification of any other site elements that do not require any modification of the tree protection fencing location or trees to be planted or preserved in the tree preservation and removal site plan, tree canopy site plan and supplemental report of a previously approved urban forestry plan; and

5. Maintenance of any trees in accordance with tree care industry standards.

C. Application Procedures. Modifications to the urban forestry plan component of an approved land use permit that are not exempted by 18.790.070.B shall be processed as a Type I procedure, using approval criteria contained in Section 18.790.070.D below.

D. Approval Criteria. The director shall approve the modification to the urban forestry plan component of an approved land use permit upon determining:

1. The project arborist or landscape architect has provided a report and statement certifying that the previously approved urban forestry plan did not account for the circumstances that lead to the proposed modification;

Commentary

18.790.070 Modification to the Urban Forestry Plan Component of an Approved Land Use Permit

Modification procedures continued.

18.790.060 Illegal Tree Removal

This section is struck.

Tree violations are now consolidated with other nuisance violations in Title 6. Violations of the new Title 8 (Urban Forestry) are also consolidated into Title 6.

Penalties for tree violations are in Chapter 1.16 where other penalties are already consolidated. Penalties for violations of Title 8 (Urban Forestry) are also outlined in Chapter 1.16.

The details of tree violations and penalties for tree violations are in Title 6 and Chapter 1.16 respectively.

~~2. The project arborist or landscape architect has provided a report and statement certifying that there is no practicable alternative to the proposed modification; and~~

~~3. The project arborist or landscape architect demonstrates through a revised urban forestry plan, compliance with Section 18.790.030.~~

**18.790.060 — Illegal Tree Removal**

~~A. Violations. The following constitute a violation of this chapter:~~

~~1. Removal of a tree:~~

~~a. Without a valid tree removal permit; or~~

~~b. In noncompliance with any condition of approval of a tree removal permit; or~~

~~c. In noncompliance with any condition of any City permit or development approval;  
or~~

~~d. In noncompliance with any other section of this title.~~

~~2. Breach of a condition of any City permit or development approval, which results in damage to a tree or its root system.~~

~~B. Remedies. If the Director has reason to believe that a violation of this chapter has occurred, then he or she may do any or all of the following:~~

~~1. Require the owner of the land on which the tree was located to submit sufficient documentation, which may include a written statement from a qualified arborist or forester, showing that removal of the tree was permitted by this chapter;~~

~~2. Pursuant to Section 18.390.050., initiate a hearing on revocation of the tree removal permit and/or any other permit or approval for which this chapter was an approval standard;~~

~~3. Issue a stop order pursuant to Section 18.230 of this title;~~

~~4. Issue a citation pursuant to Chapter 1.16 of the Municipal Code;~~

~~5. Take any other action allowed by law.~~

Commentary

18.790.060 Illegal Tree Removal

Strikethroughs of existing code language continued.



~~C. Fines. Notwithstanding any other provision of this title, any party found to be in violation of this chapter pursuant to Section 1.16 of the Municipal Code shall be subject to a civil penalty of up to \$500 and shall be required to remedy any damage caused by the violation. Such remediation shall include, but not be limited to, the following:~~

- ~~1. Replacement of unlawfully removed or damaged trees in accordance with Section D below; and~~
- ~~2. Payment of an additional civil penalty representing the estimated value of any unlawfully removed or damaged tree, as determined using the most current International Society of Arboriculture's Guide for Plant Appraisal.~~

~~D. Guidelines for replacement. Replacement of a tree shall take place according to the following guidelines:~~

- ~~1. A replacement tree shall be a substantially similar species taking into consideration site characteristics;~~

Commentary

18.790.060    Illegal Tree Removal

Strikethroughs of existing code language continued.

- ~~2. If a replacement tree of the species of the tree removed or damaged is not reasonably available, the Director may allow replacement with a different species of equivalent natural resource value;~~
  - ~~3. If a replacement tree of the size cut is not reasonably available on the local market or would not be viable, the Director shall require replacement with more than one tree in accordance with the following formula: The number of replacement trees required shall be determined by dividing the estimated caliper size of the tree removed or damaged by the caliper size of the largest reasonably available replacement trees. If this number of trees cannot be viably located on the subject property, the Director may require one or more replacement trees to be planted on other property within the City, either public property or, with the consent of the owner, private property;~~
  - ~~4. The planting of a replacement tree shall take place in a manner reasonably calculated to allow growth to maturity.~~
- ~~E. In lieu of payment. In lieu of tree replacement under Section D above, a party may, with the consent of the Director, elect to compensate the City for its costs in performing such tree replacement.~~
- ~~F. Exclusivity. The remedies set out in this section shall not be exclusive.■~~

Commentary

18.798

WIRELESS COMMUNICATION FACILITIES

In Chapter 18.798, the term “registered” has been changed to “certified” to reflect International Society of Arboriculture terminology.

**Chapter 18.798  
WIRELESS COMMUNICATION FACILITIES**

**Sections:**

- 18.798.010 Purpose**
- 18.798.020 Definitions**
- 18.798.030 Exemptions**
- 18.798.040 Uses Permitted Outright**
- 18.798.050 Uses Subject to Site Development Review**
- 18.798.060 Uses Permitted Subject to Conditional Use Review**
- 18.798.070 Submission Requirements**
- 18.798.080 Collocation Protocol**
- 18.798.090 Abandoned Facilities**

**18.798.010 through 18.798.040**

[No change.]

**18.798.050 Uses Permitted Subject to Site Development Review**

A. [No change.]

B. Review criteria. Any use subject to Site Development Review per Subsection A above, shall be evaluated using the following standards:

1. through 6.

[No change.]

Commentary

18.798.050 Uses Permitted Subject to Site Development Review

The term “registered” has been changed to “certified” to reflect International Society of Arboriculture terminology.

7. Landscaping and screening.

- a. Landscaping shall be placed outside the fence and shall consist of evergreen shrubs which reach six feet in height and 95% opacity within three years of planting;
- b. When adjacent to or within residentially-zoned property, freestanding towers and accessory equipment facilities shall be screened by the planting of a minimum of four evergreen trees at least 15 feet in height at the time of planting. The planting of said trees shall be prescribed in number by a plan prepared by a ~~registered~~ certified arborist in locations that (1) most effectively screen the wireless facilities from residential uses and (2) promote the future survival of the trees while limiting adverse effects of the trees on abutting properties. Existing evergreen trees at least 15 feet in height may be used to meet the screening requirement of this section if the arborist demonstrates that they provide screening for abutting residential uses.

8. [No change.]

C. [No change.]

**18.798.060 Uses Permitted Subject to Conditional Use Review**

A. [No change.]

B. Review criteria. Any use subject to review per Subsection A above, shall be evaluated using the following standards:

1. through 6.

[No change.]

Commentary

18.798.060 Uses Permitted Subject to Conditional Use Review

The term “registered” has been changed to “certified” to reflect International Society of Arboriculture terminology.



7. Landscaping and screening.

- a. Landscaping shall be placed outside the fence and shall consist of evergreen shrubs which reach six-feet in height and 95% opacity within three years of planting.
- b. When adjacent to or within residentially-zoned property, free-standing towers and accessory equipment facilities shall be screened by the planting of a minimum of four evergreen trees at least 15 feet in height at the time of planting. The planting of said trees shall be prescribed in number by a plan prepared by a ~~registered~~ certified arborist in locations that (1) most effectively screen the wireless facilities from residential uses and (2) promote the future survival of the trees while limiting adverse effects of the trees on abutting properties. Existing evergreen trees at least 15 feet in height may be used to meet the screening requirement of this section if the arborist demonstrates that they provide screening for abutting residential uses.

8. [No change.]

C. [No change.]

**18.798.070 through 18.798.090**

[No change.]



# Peer Review

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# City of Tigard Memorandum

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**To:** Planning Commission and City Council  
**From:** Todd Prager, Associate Planner/Arborist  
**Re:** Urban Forestry Code Revisions Peer Review  
**Date:** October 20, 2011

## Introduction

In February 2010, council directed staff to pursue a comprehensive update of the city's urban forestry code provisions. The original scope of work included a peer review phase to test the draft code by a panel of development and urban forestry experts. AKS Engineering and Forestry specializes in both development and urban forestry with in-house expertise in civil engineering, forestry, land surveying, landscape architecture, planning, and arborist services. AKS collaborated with staff on developing the draft Urban Forestry Manual, which contains specifications and examples of how to implement the draft urban forestry code provisions. Based on past work performance and their familiarity with the draft code, staff selected AKS to provide the peer review services for testing the draft code.

## Purpose

The purpose of the peer review is to test the draft urban forestry code provisions and specifications in chapter 18.790 (Urban Forestry Plan), 18.745 (Landscaping and Screening), and the draft Urban Forestry Manual using a set of actual development projects in or near Tigard. This will help staff, policymakers, and citizens identify the feasibility of the draft code provisions, and any key issues that need to be addressed prior to the legislative adoption phase beginning in January 2012.

## Scope/Process

1. City staff worked with AKS to identify six actual development projects that are typical of the range of projects found in Tigard. The projects are:
  - Tigard Distribution Center - Industrial Parking Lot Expansion on Hunziker Street
  - Max's Brew Pub - Downtown Tigard Commercial Parking Lot Expansion
  - Broadway Rose - Performing Arts Center on a School Property (CF Tigard Elementary)
  - Sequoia Landing - Alley Loaded Townhomes in High Density Residential\*
  - Bull Mountain View Estates - 10 Lot Subdivision in Low Density Residential
  - Masters Partition - Three Lot Partition in Medium Density Residential\*\*

\*This site is in Oregon City with R-40 equivalent zoning.  
\*\*This site is in unincorporated Washington County on Bull Mountain with R-7 equivalent zoning.
2. AKS obtained CAD files which contain the approved site plans for each of the projects.

3. Using the CAD files, AKS created Tree Canopy Site Plans and associated arborist reports using the draft code and Urban Forestry Manual standards to evaluate whether the draft standards are achievable and contain any unintended consequences. Some modifications to the existing CAD files such as moving planted tree locations, showing additional planted trees, modifying the dimensions and/or locations of planting areas (such as parking lot islands and planter strips), identifying areas where covered soil volumes would be required, to ensure the draft code standards were met. However, AKS did not make any major revisions to the CAD files such as changing building sizes or locations, or re-engineering of the projects sites.
4. AKS then submitted the Tree Canopy Site Plans and associated arborist reports for review and “approval” by city staff using the draft code and Urban Forestry Manual standards. After some minor revisions, each project was “approved” by city staff.

### Results

Site	Zoning/Use	% Effective Canopy Required	% Effective Canopy Achieved	% Parking Lot Canopy Required	% Parking Lot Canopy Achieved
<b>Tigard Distribution Center</b>	Light Industrial (I-L)	25%	26%	30%	45%
<b>Max’s Brew Pub</b>	Downtown (MU-CBD)	25%	42%	30%	31%
<b>Sequoia Landing</b>	High Density Res. (R-40 equivalent)	33%	35%	N/A	N/A
<b>Bull Mountain View Estates</b>	Low Density Res. (R-4.5)	40%	45%	N/A	N/A
<b>Master’s Partition</b>	Med. Density Res. (R-7 equivalent)	40%	215%	N/A	N/A

### Findings

All six project sites were able to meet the applicable minimum effective canopy requirements through various combinations of tree planting and preservation. Sites with parking lots were able to meet the 30% minimum canopy requirement directly over parking lots, and sites with multiple lots were able to meet the 20% minimum effective canopy requirement per lot. All of the additional draft urban forestry standards such as species selection, soil volume requirements, tree spacing, utility setbacks and building setbacks were reviewed and met for each of the sites. The required number of street trees was provided for each of the sites as well.

Based on their experience applying the draft urban forestry standards, AKS provided the city a peer review which is included in Attachment 7. There were a number of items in the draft code that AKS thought worked well. First, they found the code provided enough flexibility for the project designer to meet the canopy standards while allowing for an aesthetically pleasing result. They also found the code to be equitable in that it did not overly burden property owners with existing trees. Finally, they thought the soil volume standards and planting requirements will result in long success of newly planted trees and reduce future conflicts with infrastructure.

There were a number of items in the draft code that AKS thought could be improved. These included repetition of submittal requirements which were unnecessary and would increase project costs, lack of clarity about calculation methods and submittal requirements, and lack of flexibility on tree placement for more densely developed residential sites. AKS provided the city with a list of recommended additions and clarifications for the draft code based on these issues. Staff addressed each of the additions and clarifications, and revised the draft code as needed.

AKS provided input on issues with the draft code that are difficult to determine at present, but should be monitored after implementation. They estimated the draft code did not necessarily require more trees than the existing code, so the change in landscaping cost is likely to be negligible. However, if covered soil volumes are used to meet the requirements, landscaping costs could increase. This could occur when retrofitting commercial and industrial sites with a high percentage of paving. However for new commercial and industrial sites, less hardscape may result from increased landscape areas thus reducing costs associated with paving.

AKS estimated the difference in cost benefits to property owners between developing a treed versus an un-treed lot would be negligible. This is because although the code provides bonus credits for preservation, there are also costs associated with preserving trees. For sites without existing trees, more trees would need to be planted than on sites with existing trees. The negligible difference in developing a treed versus an un-treed lot is in contrast to the existing code where mitigation requirements significantly increase the cost of developing treed lots.

AKS found the potential for an overreliance on large canopy deciduous trees that are on the city's approved tree lists. This could result in decreased plant diversity over time. They also thought double credit for preservation could incentivize the preservation of trees that may not be able to withstand construction impacts. The last issue AKS recommended monitoring is whether parking lot paving would be extended in some instances to capture the canopy area of existing trees to meet parking lot canopy cover requirements.

## **Conclusion**

The draft urban forestry standards for development have been shown to be achievable on a range of typical development sites in Tigard. The peer review demonstrates that the draft standards provide flexibility for project designers to achieve an aesthetically pleasing and sustainable result, while not overly burdening property owners with existing trees. The peer review also exposed a number of issues with the draft code including repetitive and unclear standards. These issues have been addressed by staff through additional revisions and clarifications. Finally, there are a number of potential implications of the draft code that should be monitored. These include the potential for increased costs if covered soil volumes are relied upon, decreased species diversity if certain species are favored, preservation of non-viable trees, and additional parking lot paving to meet parking lot canopy requirements. If proven to be significant after implementation, the urban forestry standards could be modified to correct the issues.

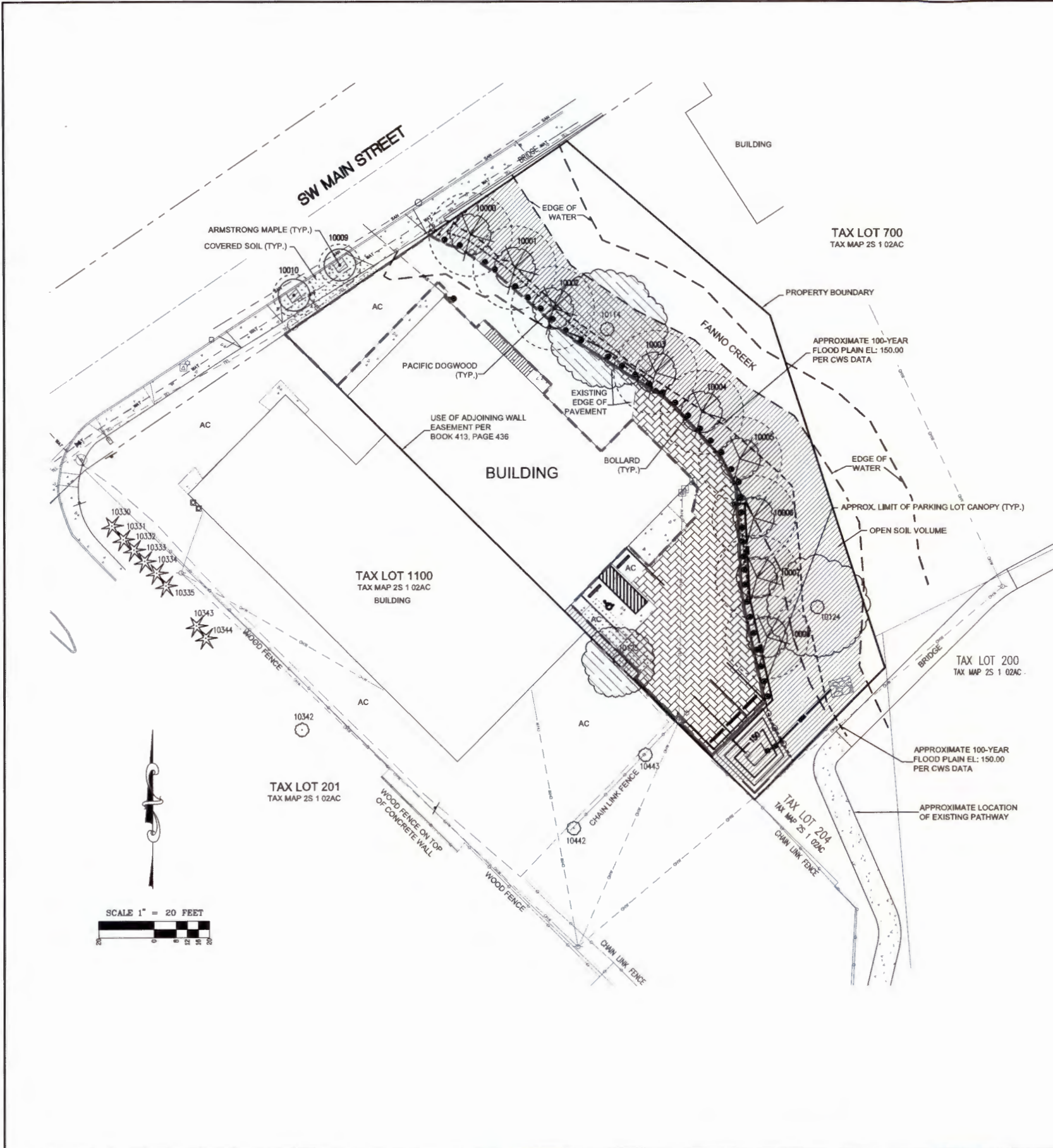
## **Attachments**

- Attachment 1 Tigard Distribution Center Tree Canopy Site Plan
- Attachment 2 Max's Brew Pub Tree Canopy Site Plan
- Attachment 3 Broadway Rose Tree Canopy Site Plan
- Attachment 4 Sequoia Landing Tree Canopy Site Plan

Attachment 5 Bull Mountain View Estates Tree Canopy Site Plan  
Attachment 6 Master's Partition Tree Canopy Site Plan  
Attachment 7 Peer Review by AKS Engineering and Forestry







**TREE LEGEND**

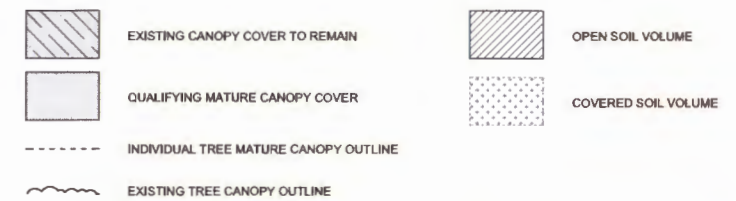
SYMBOL	QTES.	BOTANICAL NAME	COMMON NAME	CONDITION	SIZE	SPACING
	2	ACER RUBRUM 'ARMSTRONG'	ARMSTRONG RED MAPLE	B&B	2" CAL.	AS SHOWN
	9	CORNUS NUTTALLI	PACIFIC DOGWOOD	B&B	2" CAL.	AS SHOWN

NOTES:  
 1. TREE PLANTING SPECIFICATIONS: REFER TO SUPPLEMENTAL ARBORIST REPORT.  
 2. IMPROVE AREAS WITH TREE GROWTH LIMITING SOILS: REFER TO SUPPLEMENTAL ARBORIST REPORT FOR SPECIFICATIONS.

**TREE CANOPY TABLE**

TREE #	SPECIES	OPEN SOIL VOLUME	COVERED SOIL VOLUME	TOTAL SOIL VOLUME	AVE. MATURE CANOPY (FT/ISF)	% CANOPY OVER PARKING LOT	AREA OVER PARKING LOT	QUALIFYING SITE CANOPY	
10000	Pacific Dogwood	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	30' spread	25%	153 s.f.	707 s.f.	
10001	Pacific Dogwood	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	30' spread	25%	174 s.f.	707 s.f.	
10002	Pacific Dogwood	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	30' spread	25%	238 s.f.	707 s.f.	
10003	Pacific Dogwood	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	30' spread	25%	173 s.f.	707 s.f.	
10004	Pacific Dogwood	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	30' spread	25%	178 s.f.	707 s.f.	
10005	Pacific Dogwood	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	30' spread	25%	182 s.f.	707 s.f.	
10006	Pacific Dogwood	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	30' spread	25%	181 s.f.	707 s.f.	
10007	Pacific Dogwood	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	30' spread	25%	183 s.f.	707 s.f.	
10008	Pacific Dogwood	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	30' spread	25%	178 s.f.	707 s.f.	
10009	Armstrong Maple	48 c.f.	900 c.f.	1,038 c.f.	15' spread	177	Street Tree	177 s.f.	
10010	Armstrong Maple	48 c.f.	900 c.f.	1,038 c.f.	15' spread	177	Street Tree	177 s.f.	
							<b>SITE CANOPY SUBTOTAL</b>	<b>6,717 s.f.</b>	
							<b>CANOPY OVER PARKING LOT SUBTOTAL</b>	<b>1,820 s.f.</b>	
							<b>EXISTING SITE CANOPY SUBTOTAL</b>	<b>1,876 s.f. X 2 = 3,752 s.f.</b>	
							<b>EXISTING SITE CANOPY OVER PARKING LOT SUBTOTAL</b>	<b>408 s.f.</b>	
							<b>TOTAL QUALIFYING TREE CANOPY AREA:</b>	<b>10,488 s.f.</b>	
							<b>TOTAL QUALIFYING TREE CANOPY AREA OVER PARKING LOT:</b>	<b>2,118 s.f.</b>	

EXISTING TREE CANOPY  
 TREE# 10114, 10125  
 EXISTING TREE CANOPY OVER PARKING LOT  
 TREE# 10114, 10125



TOTAL SITE AREA:	24,864 S.F.	PARKING LOT AREA:	6,940 S.F.
TOTAL QUALIFYING MATURE TREE CANOPY AREA:	10,488 S.F.	TOTAL QUALIFYING MATURE TREE CANOPY AREA:	2,118 S.F.
% CANOPY COVER:	42%	% CANOPY COVER:	31%
MINIMUM % CANOPY COVER:	25%	MINIMUM % CANOPY COVER:	30%

42% IS GREATER THAN THE MINIMUM OF 25% TOTAL QUALIFYING MATURE CANOPY COVER FOR THE SITE, THEREFORE CITY REQUIREMENTS ARE MET. ADDITIONALLY, THERE IS 31% CANOPY COVER OVER THE PARKING LOT, EXCEEDING THE REQUIRED 30% COVERAGE.

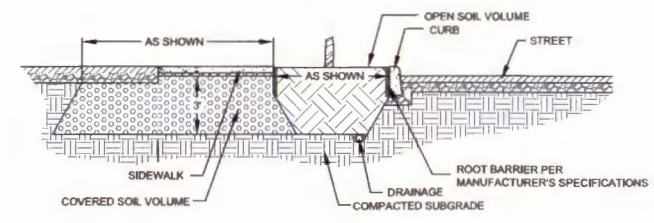
**REMOVAL, STORING, AND AMENDED SOILS FOR PLANTER AREAS:**

CONTRACTOR SHALL REMOVAL ALL DEBRIS FROM PLANTER AREAS AND EXCAVATE TO A DEPTH OF 36 INCHES. SLOPE SIDES OF EXCAVATIONS AT 1:1 SLOPE OR SHORE EDGES TO PREVENT UNDERMINING OF VEHICLE LOAD AREAS AND TO PROVIDE A SLOPED PROFILE TRANSITION BETWEEN SOIL TYPES AND STRUCTURAL FILL. DISPOSE OF DEBRIS AND SUBSOIL. STOCKPILE EXCAVATED TOPSOIL IN APPROVED AREA OFF SITE.

EXISTING AND IMPORTED TOPSOIL AMENDMENTS SHALL BE DETERMINED BY THE LANDSCAPE ARCHITECT AND APPROVED BY THE CITY ARBORIST. SOIL MIXING SHALL BE DONE IN DESIGNATED AREAS OR IN THE SUPPLIERS YARD. MIX AMENDMENTS WITH TOPSOIL WHEN SOIL IS IN A FRAGILE CONDITION ONLY (DAMP AND NOT MUDDY WITH ADEQUATE MOISTURE TO BREAK INTO CLOUDS WHEN TURNED AND WILL NOT LEAVE A MUD STAIN ON THE HAND WHEN SQUEEZED). CONTRACTOR TO PROVIDE CERTIFICATE OF CONTENT AND PERCENT OF SOIL MIXES WITH ALL AMENDED SOIL TO THE CITY PRIOR TO INSTALLATION.

**BLENDED SOIL PLACEMENT AND COMPACTION:**

SOIL SHALL BE FRIABLE WHEN PLACED AND COMPACTED. PLACE SOIL IN LAYERS OF NOT MORE THAN 12" IN DEPTH. PROVIDE 3 PASSES WITH A 2" COMPACT PLATE VIBRATING COMPACTOR. COMPACT TO 80-85% MAXIMUM DRY DENSITY AS MEASURED BY THE PROCTOR TEST OR AS APPROVED FOR SPECIFIC BLENDED SOIL MIXES.



**1 COVERED SOIL DETAIL**  
 NOT TO SCALE

REVISIONS:


**SITE TREE CANOPY PLAN**

ENGINEERING • PLANNING  
 SURVEYING • FORESTRY

LICENSED IN OR, WA & AK

13910 SW GALBREATH DR., SUITE 100  
 SHERWOOD, OR 97140  
 PHONE: (503) 925-8799  
 FAX: (503) 925-8969

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DESIGNED BY:	KJ	DRAWING NO.:	XX
DRAWN BY:	KAH	SCALE:	AS NOTED
CHECKED BY:	KJ		
PREPARED FOR:			

**MAX'S BREW PUB PARKING LOT IMPROVEMENTS**

12562 SW MAIN STREET TIGARD, OREGON

DATE:

JOB NUMBER	XX
SHEET	1 OF 1

**TREE CANOPY TABLE**

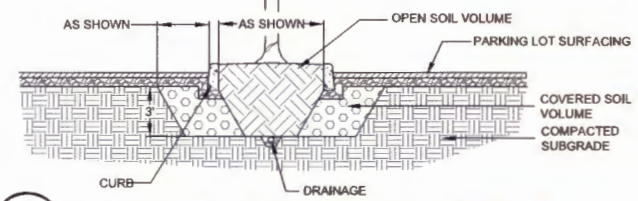
TREE #	SPECIES	OPEN SOIL VOLUME	COVERED SOIL VOLUME	TOTAL SOIL VOLUME	AVE. MATURE CANOPY	% OF CANOPY OVER PARKING LOT	AREA OVER PARKING LOT	QUALIFYING SITE CANOPY
001	Red Maple (Acerubrum)	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	40' spread (1,256 s.f.)	77%	964 s.f.	1,256 s.f.
002	Red Maple (Acerubrum)	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	40' spread (1,256 s.f.)	26%	324 s.f.	1,256 s.f.
003	Accolade Elm (Ulmus Morton)	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	60' spread (2,826 s.f.)	66%	1,864 s.f.	2,826 s.f.
004	Accolade Elm (Ulmus Morton)	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	60' spread (2,826 s.f.)	64%	1,799 s.f.	2,826 s.f.
005	Red Maple (Acerubrum)	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	40' spread (1,256 s.f.)	96%	1,203 s.f.	1,256 s.f.
006	Accolade Elm (Ulmus Morton)	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	60' spread (2,826 s.f.)	67%	1,943 s.f.	2,826 s.f.
007	Red Maple (Acerubrum)	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	40' spread (1,256 s.f.)	81%	1,015 s.f.	1,256 s.f.
008	Red Maple (Acerubrum)	507 c.f.	537 c.f.	1,044 c.f.	40' spread (1,256 s.f.)	43%	537 s.f.	1,256 s.f.
009	Accolade Elm (Ulmus Morton)	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	60' spread (2,826 s.f.)	57%	1,605 s.f.	2,826 s.f.
010	Accolade Elm (Ulmus Morton)	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	60' spread (2,826 s.f.)	33%	936 s.f.	2,826 s.f.
011	Red Maple (Acerubrum)	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	40' spread (1,256 s.f.)	75%	938 s.f.	1,256 s.f.
012	Red Maple (Acerubrum)	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	40' spread (1,256 s.f.)	74%	932 s.f.	1,256 s.f.
013	Red Maple (Acerubrum)	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	40' spread (1,256 s.f.)	29%	351 s.f.	1,256 s.f.
014	Accolade Elm (Ulmus Morton)	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	60' spread (2,826 s.f.)	Not Parking Lot Tree	NA	2,826 s.f.
015	Accolade Elm (Ulmus Morton)	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	60' spread (2,826 s.f.)	Not Parking Lot Tree	NA	2,826 s.f.
016	Accolade Elm (Ulmus Morton)	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	60' spread (2,826 s.f.)	Not Parking Lot Tree	NA	2,826 s.f.
017	Accolade Elm (Ulmus Morton)	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	60' spread (2,826 s.f.)	Not Parking Lot Tree	NA	2,826 s.f.
018	Accolade Elm (Ulmus Morton)	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	60' spread (2,826 s.f.)	Not Parking Lot Tree	NA	2,826 s.f.
019	Accolade Elm (Ulmus Morton)	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	60' spread (2,826 s.f.)	Not Parking Lot Tree	NA	2,826 s.f.

<b>SITE CANOPY SUBTOTAL:</b>	41,134 s.f.
<b>EXISTING SITE CANOPY SUBTOTAL:</b>	5,936 s.f. x 2 = 11,872 s.f.
<b>TOTAL QUALIFYING TREE CANOPY AREA:</b>	<b>53,006 s.f.</b>
<b>TOTAL QUALIFYING CANOPY OVER PARKING LOT:</b>	<b>14,411 s.f.</b>

**TREE LEGEND**

SYMBOL	QTY'S.	BOTANICAL NAME	COMMON NAME	CONDITION	SIZE	SPACING	
	8	ACER RUBRUM	RED MAPLE	B&B	2" CAL.	AS SHOWN	OPEN SOIL VOLUME
	11	ULMUS 'MORTON'	ACCOLADE ELM	B&B	2" CAL.	AS SHOWN	COVERED SOIL VOLUME

QUALIFYING MATURE CANOPY COVER  
 INDIVIDUAL TREE MATURE CANOPY OUTLINE  
 EXISTING TREE CANOPY OUTLINE

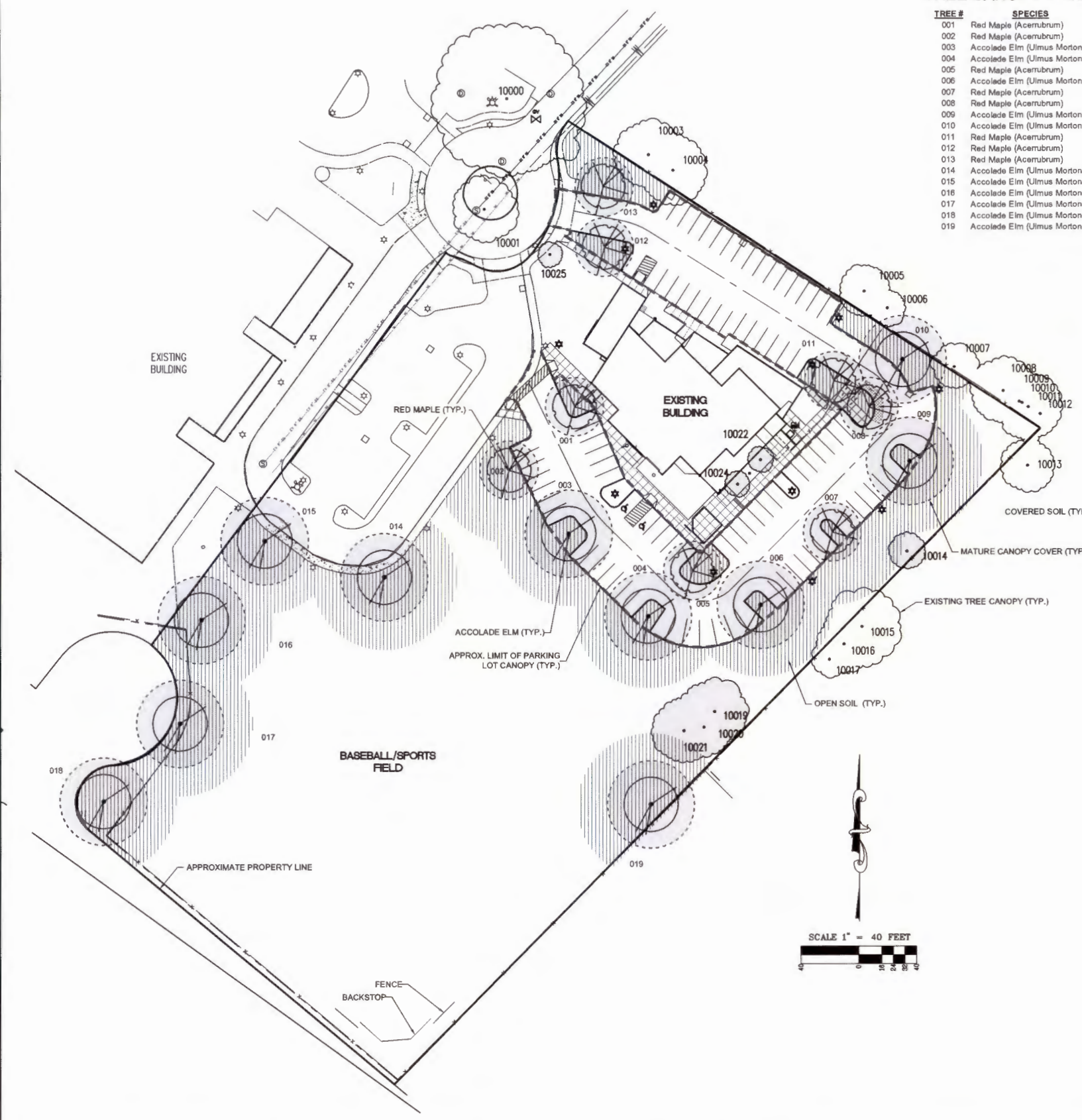
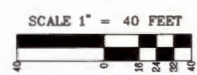


**1 PARKING TREE WITH COVERED SOIL DETAIL**  
NOT TO SCALE

TOTAL SITE AREA:	206,039 S.F.
TOTAL QUALIFYING MATURE TREE CANOPY AREA:	53,006 S.F.
% CANOPY COVER:	26%
MINIMUM % CANOPY COVER:	25%
PARKING LOT AREA:	33,568 S.F.
TOTAL QUALIFYING MATURE TREE CANOPY AREA:	14,648 S.F.
% CANOPY COVER:	42%
MINIMUM % CANOPY COVER:	30%

26% IS GREATER THAN THE MINIMUM OF 25% TOTAL QUALIFYING MATURE CANOPY COVER FOR THE SITE, THEREFORE CITY REQUIREMENTS ARE MET. ADDITIONALLY, THERE IS 42% CANOPY COVER OVER THE PARKING LOT, EXCEEDING THE REQUIRED 30% COVERAGE.

**REMOVAL, STORING, AND AMENDED SOILS FOR PLANTER AREAS:**  
 CONTRACTOR SHALL REMOVAL ALL DEBRIS FROM PLANTER AREAS AND EXCAVATE TO A DEPTH OF 36 INCHES. SLOPE SIDES OF EXCAVATIONS AT 1:1 SLOPE OR SHORE EDGES TO PREVENT UNDERMINING OF VEHICLE LOAD AREAS AND TO PROVIDE A SLOPED PROFILE TRANSITION BETWEEN SOIL TYPES AND STRUCTURAL FILL. DISPOSE OF DEBRIS AND SUBSOIL. STOCKPILE EXCAVATED TOPSOIL IN APPROVED AREA OFF SITE.  
 EXISTING AND IMPORTED TOPSOIL AMENDMENTS SHALL BE DETERMINED BY THE LANDSCAPE ARCHITECT AND APPROVED BY THE CITY ARBORIST. SOIL MIXING SHALL BE DONE IN DESIGNATED AREAS OR IN THE SUPPLIERS YARD. MIX AMENDMENTS WITH TOPSOIL WHEN SOIL IS IN A FRIABLE CONDITION ONLY (DAMP AND NOT MUDDY WITH ADEQUATE MOISTURE TO BREAK INTO CLOUDS WHEN TURNED AND WILL NOT LEAVE A MUD STAIN ON THE HAND WHEN SQUEEZED). CONTRACTOR TO PROVIDE CERTIFICATE OF CONTENT AND PERCENT OF SOIL MIXES WITH ALL AMENDED SOIL TO THE CITY PRIOR TO INSTALLATION.  
**BLENDED SOIL PLACEMENT AND COMPACTION:**  
 SOIL SHALL BE FRIABLE WHEN PLACED AND COMPACTED. PLACE SOIL IN LAYERS OF NOT MORE THAN 12" IN DEPTH. PROVIDE 3 PASSES WITH A 2" COMPACT PLATE VIBRATING COMPACTOR. COMPACT TO 80-85% MAXIMUM DRY DENSITY AS MEASURED BY THE PROCTOR TEST OR AS APPROVED FOR SPECIFIC BLENDED SOIL MIXES.



REVISIONS:


**SITE TREE CANOPY PLAN**

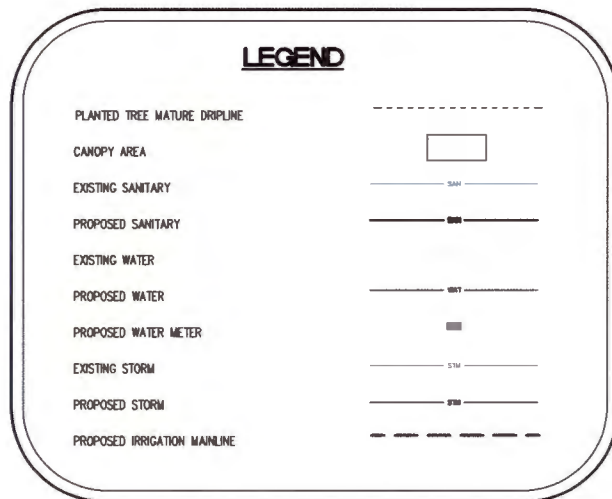
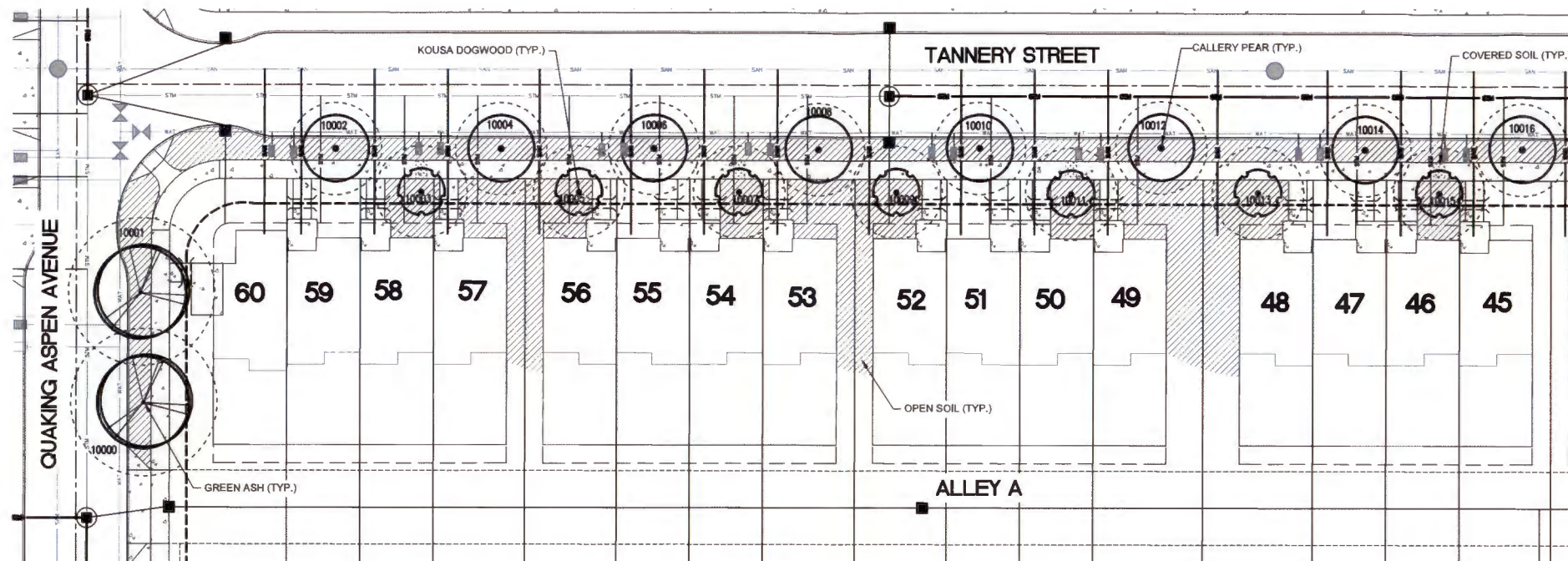
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DESIGNED BY:	KJ	DRAWING NO.:	XX
DRAWN BY:	KAH	SCALE:	AS NOTED
CHECKED BY:	KJ		
PREPARED FOR:			

**BROADWAY ROSE INSTITUTIONAL**  
OREGON

DATE: \_\_\_\_\_

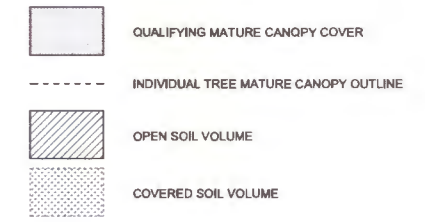
JOB NUMBER	XX
SHEET	1 OF 1



### TREE LEGEND

SYMBOL	QTY	BOTANICAL NAME	COMMON NAME	CONDITION	SIZE	SPACING
	2	FRAXINUS PENNSYLVANICA	GREEN ASH	B&B	2" CAL.	30' O.C.
	7	CORNUS KOUSA	KOUSA DOGWOOD	B&B	2" CAL.	AS SHOWN
	8	PYRUS CALLERYANA	CALLERY PEAR	B&B	2" CAL.	AS SHOWN

**NOTE:**  
 1. PLANTER STRIP AREAS ALONG QUAKING ASPEN AVENUE AND TANNERY STREET ARE AREAS OF POTENTIAL SOIL COMPACTION, LIMITING TREE GROWTH. IF SOIL COMPACTION OCCURS, BACKHOE TURNING SHOULD BE USED TO LOOSEN SOIL.  
 2. BACKHOE TURNING: REMOVE ANY LAYERS OF GOOD TOPSOIL. SPREAD 3"-4" OF ORGANICS (HIGH-LIGNIN COMPOST) OR ESCS (EXPANDED SHALE/CALINE CLAY) AMENDMENT OVER THE AREA, PRIOR TO TURNING THE SOIL. MAINTAINING A SAFE DISTANCE FROM PAVING, SIDEWALKS, AND STRUCTURES, USE BACKHOE TO TURN SOIL TO 36" DEPTH. BREAK SOIL INTO LARGE PEGS AND LOOSELY INCORPORATE THE SOIL AMENDMENT. MAINTAIN A SLOPE OF COMPACTED SOIL AT THE EDGE OF PAVING SO AS NOT TO UNDERMINE THE PAVING SUB-BASE. HAND TURNING MAY BE NECESSARY ALONG THE EDGES OF PAVING AND AT WALLS. DO NOT TILL TO A DEPTH GREATER THAN THE BOTTOM OF FOOTING. AFTER TURNING, RE-SPREAD TOPSOIL AND ADD 3"-5" OF YARD WASTE ORGANIC AMENDMENT OVER THE SURFACE AND LIGHTLY TILL TO BREAK THE SOIL INTO TEXTURE SUITABLE TO FINE GRADE.



TOTAL SITE AREA:	29,511 S.F.
TOTAL QUALIFYING MATURE TREE CANOPY AREA:	10,388 S.F.
% CANOPY COVER:	35%
MINIMUM % CANOPY COVER:	33%

35% IS GREATER THAN THE MINIMUM OF 33% TOTAL QUALIFYING MATURE CANOPY COVER FOR THE SITE, THEREFORE CITY REQUIREMENTS ARE MET.

### TREE CANOPY TABLE

TREE #	SPECIES	OPEN SOIL VOLUME	COVERED SOIL VOLUME	TOTAL SOIL VOLUME	AVE. MATURE CANOPY (T/18F)	QUALIFYING SITE CANOPY
10000	Green Ash	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	40' spread	1,256 s.f.
10001	Green Ash	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	40' spread	1,256 s.f.
10002	Callery Pear	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	25' spread	491 s.f.
10003	Koussa Dogwood	Over 1,000 c.f.	45 c.f.	Over 1,000 c.f.	25' spread	491 s.f.
10004	Callery Pear	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	25' spread	491 s.f.
10005	Koussa Dogwood	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	25' spread	491 s.f.
10006	Callery Pear	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	25' spread	491 s.f.
10007	Koussa Dogwood	Over 1,000 c.f.	45 c.f.	Over 1,000 c.f.	25' spread	491 s.f.
10008	Callery Pear	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	25' spread	491 s.f.
10009	Koussa Dogwood	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	25' spread	491 s.f.
10010	Callery Pear	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	25' spread	491 s.f.
10011	Koussa Dogwood	Over 1,000 c.f.	45 c.f.	Over 1,000 c.f.	25' spread	491 s.f.
10012	Callery Pear	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	25' spread	491 s.f.
10013	Koussa Dogwood	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	25' spread	491 s.f.
10014	Callery Pear	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	25' spread	491 s.f.
10015	Koussa Dogwood	Over 1,000 c.f.	45 c.f.	Over 1,000 c.f.	25' spread	491 s.f.
10016	Callery Pear	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	25' spread	491 s.f.
<b>TOTAL QUALIFYING SITE TREE CANOPY AREA</b>						<b>10,388 s.f.</b>

I, JOHN ARBORIST, ATTEST THAT THIS TREE CANOPY SITE PLAN MEETS ALL OF THE REQUIREMENTS IN SECTION 10, PART 2, OF THE CITY OF TIGARD URBAN FORESTRY MANUAL.

JOHN ARBORIST, CERTIFIED ARBORIST  
PNN-0000

REVISIONS:


## TREE CANOPY PLAN

ENGINEERING • PLANNING  
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13910 SW CALDBREATH DR., SUITE 100  
SHERWOOD, OR 97140  
PHONE: (503) 925-8799  
FAX: (503) 925-8969

Offices Located In:  
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REDMOND, OREGON  
VANCOUVER, WASHINGTON  
www.aks-eng.com

DESIGNED BY:	KJ	DRAWING NO.:	XX
DRAWN BY:	KAH	SCALE:	AS NOTED
CHECKED BY:	KJ		
PREPARED FOR:			

# SEQUOIA LANDING

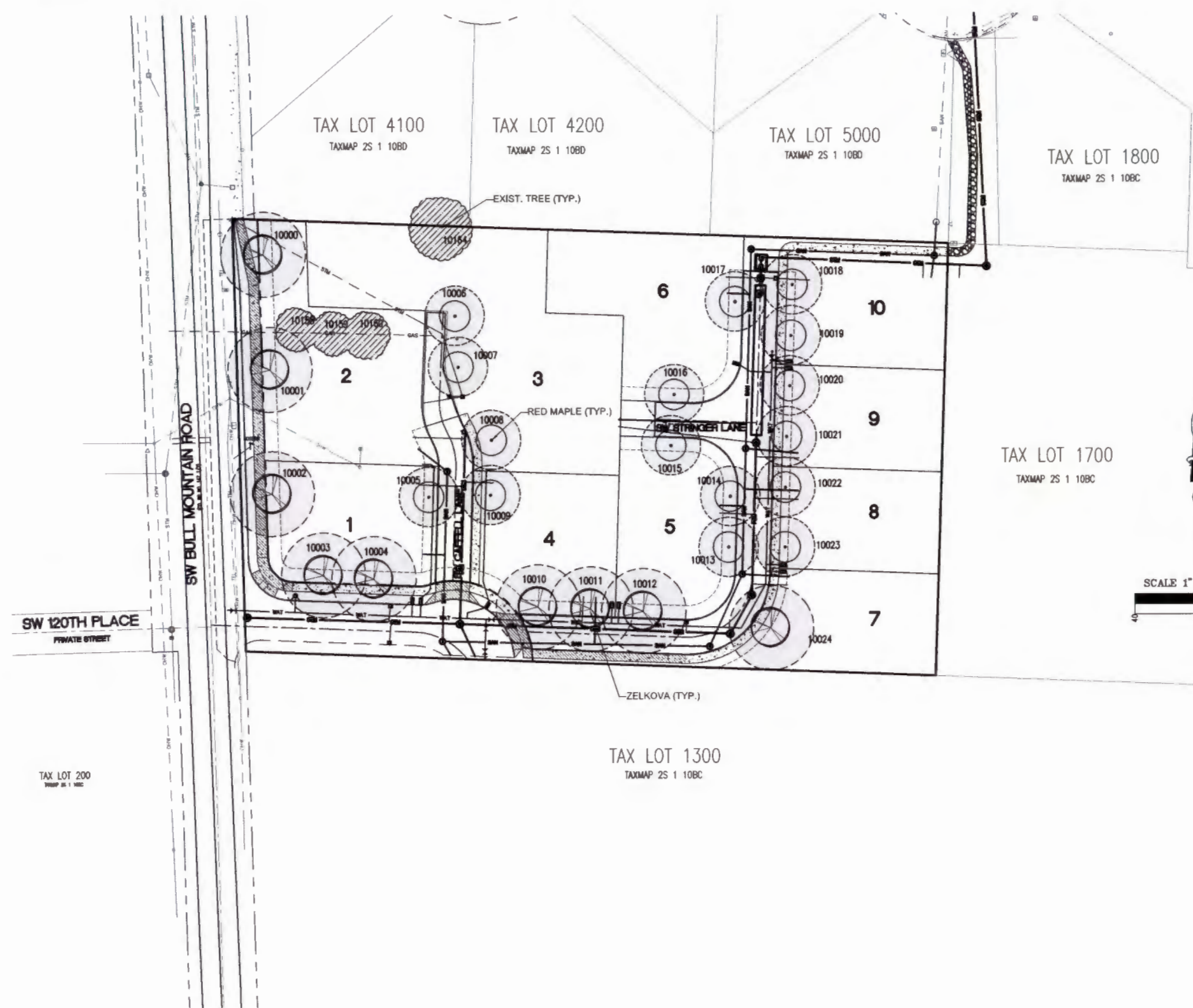
OREGON

DATE: \_\_\_\_\_

JOHN O. ARBORIST  
PNN-0000

JOB NUMBER  
XX

SHEET  
1 OF 1



**TREE LEGEND**

SYMBOL	QTES.	BOTANICAL NAME	COMMON NAME	CONDITION	SIZE	SPACING
	16	ACER RUBRUM	RED MAPLE	B&B	2" CAL.	AS SHOWN
	9	ZELKOVA SERRATA	ZELKOVA	B&B	2" CAL.	AS SHOWN

**NOTES:**

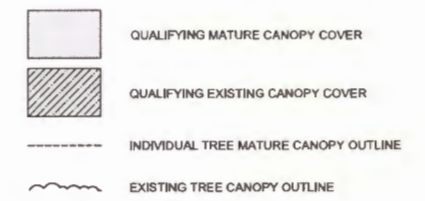
- TREE PLANTING SPECIFICATIONS: REFER TO SUPPLEMENTAL ARBORIST REPORT.
- IMPROVE AREAS WITH TREE GROWTH LIMITING SOILS: REFER TO SUPPLEMENTAL ARBORIST REPORT FOR SPECIFICATIONS.
- PLANTER STRIPS AND RIGHT OF WAYS ARE AREAS OF POTENTIAL SOIL COMPACTION, LIMITING TREE GROWTH. IF SOIL COMPACTION OCCURS, BACKHOE TURNING SHOULD BE USED TO LOOSEN SOIL.
- BACKHOE TURNING: REMOVE ANY LAYERS OF GOOD TOPSOIL. SPREAD 3"-4" OF ORGANICS (HIGH-LIGNIN COMPOST) OR ESCS (EXPANDED SHALE/CALCINE CLAY) AMENDMENT OVER THE AREA, PRIOR TO TURNING THE SOIL. MAINTAINING A SAFE DISTANCE FROM PAVING, SIDEWALKS, AND STRUCTURES. USE BACKHOE TO TURN SOIL TO 36" DEPTH. BREAK SOIL INTO LARGE PEDS AND LOOSELY INCORPORATE THE SOIL AMENDMENT. MAINTAIN A SLOPE OF COMPACTED SOIL AT THE EDGE OF PAVING SO AS NOT TO UNDERMINE THE PAVING SUB-BASE. HAND TURNING MAY BE NECESSARY ALONG THE EDGES OF PAVING AND AT WALLS. DO NOT TILL TO A DEPTH GREATER THAN THE BOTTOM OF FOOTING. AFTER TURNING, RE-SPREAD TOPSOIL, AND ADD 3"-5" OF YARD WASTE ORGANIC AMENDMENT OVER THE SURFACE AND LIGHTLY TILL TO BREAK THE SOIL INTO TEXTURE SUITABLE TO FINE GRADE.

**TREE CANOPY TABLE**

TREE #	SPECIES	OPEN SOIL VOLUME	COVERED SOIL VOLUME	TOTAL SOIL VOLUME	AVE. MATURE CANOPY (FT/FT)	QUALIFYING SITE CANOPY
10000	Zelkova	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	50' spread	1,953
10001	Zelkova	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	50' spread	1,953
10002	Zelkova	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	50' spread	1,953
10003	Zelkova	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	50' spread	1,953
10004	Zelkova	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	50' spread	1,953
10005	Red Maple	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	35' spread	952
10006	Red Maple	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	35' spread	952
10007	Red Maple	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	35' spread	952
10008	Red Maple	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	35' spread	952
10009	Red Maple	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	35' spread	952
10010	Zelkova	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	50' spread	1,953
10011	Zelkova	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	50' spread	1,953
10012	Zelkova	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	50' spread	1,953
10013	Red Maple	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	35' spread	952
10014	Red Maple	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	35' spread	952
10015	Red Maple	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	35' spread	952
10016	Red Maple	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	35' spread	952
10017	Red Maple	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	35' spread	952
10018	Red Maple	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	35' spread	952
10019	Red Maple	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	35' spread	952
10020	Red Maple	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	35' spread	952
10021	Red Maple	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	35' spread	952
10022	Red Maple	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	35' spread	952
10023	Red Maple	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	35' spread	952
10024	Zelkova	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	50' spread	1,953

EXISTING TREE CANOPY  
TREE# 10156, 10150, 10190, 10164

SITE CANOPY SUBTOTAL 33,059 s.f.  
EXISTING SITE CANOPY SUBTOTAL 2,573 s.f. X 2 = 5,146 s.f.  
TOTAL QUALIFYING SITE TREE CANOPY 38,205 s.f.



TOTAL SITE AREA: 85,072 S.F.  
TOTAL QUALIFYING MATURE TREE CANOPY AREA: 38,205 S.F.  
% CANOPY COVER: 44%  
MINIMUM % CANOPY COVER: 40%  
44% IS GREATER THAN THE MINIMUM OF 40% TOTAL QUALIFYING MATURE CANOPY COVER FOR THE SITE, THEREFORE CITY REQUIREMENTS ARE MET.



REVISIONS:


**SITE TREE CANOPY PLAN**

ENGINEERING • PLANNING SURVEYING • FORESTRY  
LICENSED IN OR, WA & AK

13910 SW GALBREATH DR., SUITE 100  
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PHONE: (503) 925-8799  
FAX: (503) 925-8969

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REDMOND, OREGON  
VANCOUVER, WASHINGTON  
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DESIGNED BY: KJ	DRAWING NO.: XX
DRAWN BY: KAH	SCALE: AS NOTED
CHECKED BY: KJ	
PREPARED FOR: TIGARD	

**BULL MOUNTAIN VIEW ESTATES**  
TIGARD OREGON  
WASHINGTON COUNTY TAX MAP NUMBER 25-1-10BC

DATE: \_\_\_\_\_

JOB NUMBER	XX
SHEET	1 OF 1

**TREE CANOPY TABLE**





TREE #	SPECIES	SPREAD (DIAMETER IN FEET)	AREA (SF)
10061	Douglas Fir	34	908
10068	Douglas Fir	40	1257
10069	Douglas Fir	34	908
10100	Douglas Fir	36	1018
10101	Douglas Fir	36	1018
10102	Douglas Fir	34	908
10103	Douglas Fir	34	908
10104	Douglas Fir	34	908
10105	Douglas Fir	35	755
10107	Cherry	35	755
10108	Cherry	21	348
10111	Redwood	14	154
10121	Cherry	21	348
10122	Douglas Fir	25	401
10123	Douglas Fir	36	1018
10124	Douglas Fir	36	1018
10125	Douglas Fir	31	755
10126	Douglas Fir	25	401
10127	Douglas Fir	29	661
10129	Douglas Fir	25	401
10130	Douglas Fir	25	401
10131	Douglas Fir	40	1257
10132	Douglas Fir	32	804
10133	Douglas Fir	32	804
10134	Douglas Fir	40	1257
10135	Douglas Fir	40	1257
10136	Douglas Fir	40	1257
10137	Douglas Fir	32	804
10138	Douglas Fir	40	1257
10139	Douglas Fir	32	804

EXISTING SITE CANOPY TOTAL 25,106 X.2 = 50,212 s.f.

**STREET TREE CANOPY**

TREE #	SPECIES	OPEN SOIL VOLUME	COVERED SOIL VOLUME	TOTAL SOIL VOLUME	AVE. MATURE CANOPY (FT/9F)	QUALIFYING SITE CANOPY
10000	Serviceberry	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	15' spread	177 s.f.
10001	Serviceberry	Over 1,000 c.f.	0 c.f.	Over 1,000 c.f.	15' spread	177 s.f.

TOTAL STREET TREE QUALIFYING CANOPY 354 s.f.  
 TOTAL SITE TREE QUALIFYING CANOPY 50,566 s.f.

-  QUALIFYING MATURE CANOPY COVER
-  QUALIFYING EXISTING MATURE CANOPY COVER
-  INDIVIDUAL TREE MATURE CANOPY OUTLINE
-  EXISTING TREE CANOPY OUTLINE










TOTAL SITE AREA: 23,336 S.F.  
 TOTAL QUALIFYING MATURE TREE CANOPY AREA: 50,566 S.F.  
 % CANOPY COVER: 217%  
 MINIMUM % CANOPY COVER: 40%

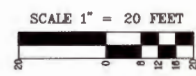
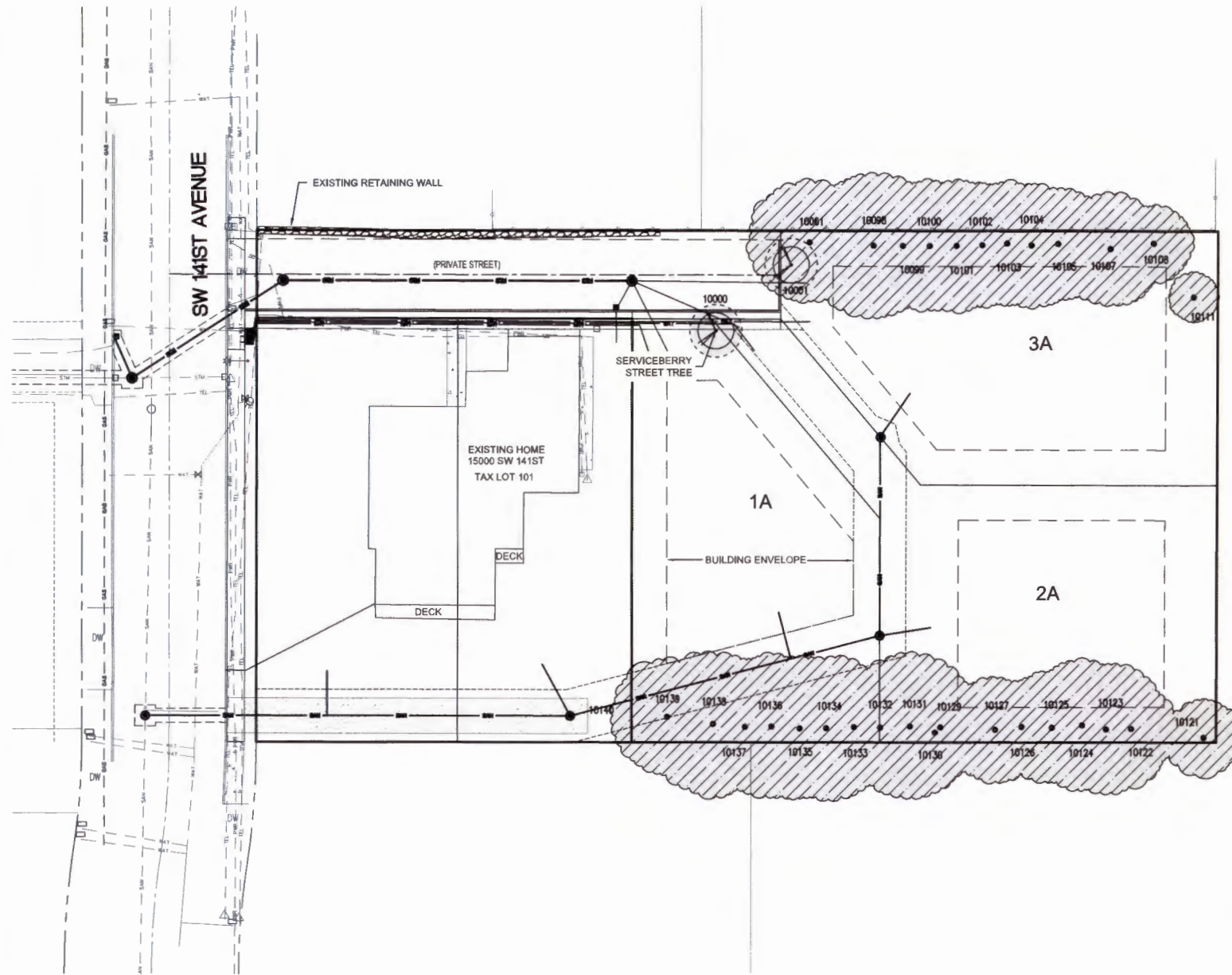
217% IS GREATER THAN THE MINIMUM OF 40% TOTAL QUALIFYING MATURE CANOPY COVER FOR THE SITE. THEREFORE CITY REQUIREMENTS ARE MET.

**STREET TREES**

SYMBOL	QTY.	BOTANICAL NAME	COMMON NAME	CONDITION	SIZE	SPACING
	2	AMELANCHER X GRANDIFLORA	SERVICEBERRY	B&B	2" CAL	AS SHOWN

**LEGEND**

- EXISTING SANITARY 
- PROPOSED SANITARY 
- EXISTING WATER 
- PROPOSED WATER 
- PROPOSED WATER VALVE 
- EXISTING STORM 
- PROPOSED STORM 
- EXISTING TELEPHONE 
- EXISTING POWER 



REVISIONS:


**SITE TREE CANOPY PLAN**

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 LICENSED IN OR, WA & AK

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DESIGNED BY: KJ	DRAWING NO.: XX
DRAWN BY: KAH	SCALE: AS NOTED
CHECKED BY: KJ	
PREPARED FOR:	

DATE: \_\_\_\_\_

**MASTER'S PARTITION**

TIGARD OREGON

JOB NUMBER XX  
 SHEET 1 OF 1

December 8, 2011

Mr. John Floyd, Associate Planner  
Mr. Todd Prager, Associate Planner/Arborist  
City of Tigard  
13125 SW Hall Blvd.  
Tigard, OR 97223

E-Mail: Johnfl@tigard-or.gov  
E-Mail: Todd@tigard-or.gov

**Re: General Case Study Memo for “Peer Review” of the Urban Forestry Plans and Follow Up Reports for Six Development Sites**

Mr. Floyd and Mr. Prager

Attached is our Case Study Memo for the following six sites:

1. Bull Mountain View Estates (a 14 lot residential subdivision-AKS #1283)
2. Sequoia Landing (a 16 lot 4 building 4-plex residential subdivision-AKS #1443)
3. Master’s Partition (a 3 parcel residential partition-AKS #1376)
4. Broadway Rose Site Development (commercial site-AKS #1872)
5. 12565 SW Main Street (Max’s Brew Pub) Parking Lot Improvements (AKS #2049)
6. SW Hunziker & SW Wall St. Industrial Site (commercial site designed by VLMK Engineers)

The Case Study Report as outlined in the accepted proposal of 9/22/11 had a total of 11 man-hours budgeted and the scope of work was defined as:

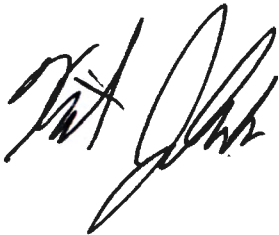
**Case Study Report:**

AKS will then put together a Case Study Report summarizing our findings from implementing the draft code on the six sites. This report will cover items we liked about the code, items in the code we found difficult or expensive to implement, and any other key issues.

At our meeting of 10/20/11 we discussed providing a much more in depth Case Study Report for which a proposal was provided on 10/24/11, however the City decided not to go with that scope and instead chose the much smaller 9/22/11 scope.

The case study is to be a general summary of the order of magnitude differences between the existing and proposed codes.

Very Truly Yours,  
*AKS Engineering & Forestry, LLC*



**KEITH JEHNKE**



CERTIFICATE NUMBER PN-1905  
EXPIRATION DATE: 6-30-2013

Keith Jehnke, PE, PLS, Principal;  
Certified Arborist #PN-1908, Certified Tree Risk Assessor #192  
Member, American Society of Consulting Arborists



# Case Study Report

The purpose of this case study report is to evaluate the current tree code versus the proposed tree code as they apply to the 6 Case Study Sites per our professional opinion. Items to be compared include:

- Flexibility
- Construction Costs
- Effect on Consultant Fees/Design Costs
- Potential Infrastructure savings (sidewalks/curb/etc.)
- Changes in design if projects were started from scratch
- Theoretical difference between an “un-treed” lot and a heavily treed lot
- Potential unintended design consequences

This report will also contain summaries of:

- Items AKS liked about the code
- Items in the code AKS found difficult or expensive to implement
- Technical comments on each of the six sites.
- AKS recommended additions/clarifications to the code

## **FLEXIBILITY:**

The proposed code allows increased flexibility in meeting the higher canopy and soil volume standards over the existing code. The ability to use covered soil areas to meet soil volume requirements allows the landowner to maximize usable spaces while meeting environmental and aesthetic objectives. Additionally, by taking a broader view of tree requirements through the minimum canopy cover percentage requirements, the City allows the landowner to work with the existing conditions and constraints of the site rather than trying to force design requirements that might not fit the site. In short, the proposed code gives options to the landowner and encourages a higher design standard.

## **CONSTRUCTION COSTS:**

Given the cutting edge and unprecedented nature of the proposed code, the exact impacts to construction costs are difficult to predict in the short term. However, the proposed code is likely to increase site costs in these areas:

- Increased soils cost for contractors. Covered soil mixtures costs will vary based on their composition and availability, but will be more than traditional organic soil mixtures used in many planting areas today.
- Increased labor costs due to protecting soil and keeping structural soils at optimum moisture levels for placement.
- Increased labor costs associated with higher tree protection rates due to incentives to keep existing trees.

In doing these peer reviews, tree and vegetation cost increases are likely to be negligible. In most cases the proposed canopy requirements were met by fulfilling the street tree requirements and/or selecting trees with larger canopy areas. By using trees with larger canopy areas in parking lots, we were generally able to meet the increased canopy requirements without adding significantly more trees than were previously required under the old code.

Industrial and infill projects proved the most challenging in meeting the increased canopy requirement due to having a higher ratio of paved area to vegetated area. These types of projects are likely to see a slight increase in vegetation costs under the new code necessitated by increased canopy coverage minimums.

### **EFFECT ON CONSULTANT FEES/DESIGN COSTS:**

Higher consultant fees and design costs are likely under the proposed code. These increases could be a combination of factors, including:

- Initial increase in fees as developers and consultants adjust to working with the ‘un-known’ factor of the new standards.
- Meeting new submittal standards requires more calculated information, construction details and oversight, increased number of sheets, and a higher degree of interdisciplinary coordination between architects, arborists, civil engineers, and landscape architects, thus increasing the level of effort and man hours needed to complete a project.

These extra costs may be small to moderate, depending on the size of the site, existing conditions, desire of the client to implement ‘creative’ solutions, size and ability of the design firm to handle multiple disciplines in house, etc. Industrial sites which require large areas of parking and hardscape and sites with ‘tight’ conditions (such as built-up urban areas, small lots, remodels or renovations, etc.) will be more expensive to design and implement than open sites.

### **POTENTIAL INFRASTRUCTURE SAVINGS:**

The proposed code requires 1,000 cubic feet of available soil for each tree. This soil is to be a minimum of 3 feet deep, tilled, and of adequate composition. This works out to the equivalent minimum area of 18.26 feet wide by 18.26 feet long by 3 feet deep. When each tree is provided with the rooting area that it needs to thrive, it will reduce damage to adjacent public infrastructure such as sidewalk and curb because the roots have adequate room to grow.

Using “covered soil” to connect open soil areas or to provide most of the required rooting volume allows a tree to be planted close to a curb or sidewalk and still allow the roots to grow without damaging the sidewalk or curb.

Trees with adequate rooting area will thrive. Trees that are thriving are less likely to become diseased and are much more likely to recover from physical damage as well. When trees are thriving they grow faster and more quickly beautify their surroundings, purify the air, act as sound barriers, manufacture oxygen, and provide cooling shade in summer. In the 11 year old commercial building where AKS has their office there are site trees some of which were planted with very little rooting volume and some in central areas where there is more

area for the roots. The trees growing in the larger area have had 100% survival and are about 2.5 times the diameter of those trees in the smaller rooting sites. The mortality rate for the trees in the smaller planter areas was also about 33%. The proposed code will result in healthier, larger trees in less time and with less mortality.

### **CHANGES IN DESIGN IF PROJECTS WERE STARTED FROM SCRATCH:**

The proposed code places a higher value on vegetation and tree canopy which will likely have impacts in the site layout and design process. Increased parking island and planter size and less overall hardscape are probable outcomes. Site layout may also be more responsive to existing trees on site with the objective to preserve them for double tree canopy credit.

### **DIFFERENCE BETWEEN A TREED AND UN-TREED LOT:**

Theoretically, under the proposed code, a heavily treed lot will be more desirable to developers due to its increased potential for double tree credits. This potential impact is higher in undeveloped areas where a substantial number of trees are more likely to occur than in urban infill projects. Overall, benefits of having a heavily treed lot versus an 'un-treed' lot are minimal in urban areas or on small lots.

- **TREED:** The treed lot gives the option of preserving trees and eliminating the cost of site trees, but also presents challenges during and after construction. The more trees on the site the better the odds that some of these trees may be in logical areas allowing their preservation and eliminating the need to plant additional site trees. Preserved trees add climate control, positive environmental impacts, and add a sense of maturity to the landscape, however they can also pose a danger to buildings, people, and property if not properly preserved. For instance, if the lot is densely stocked with conifer trees, then these trees will have a large height to diameter ratio and a corresponding higher risk of windthrow, making the tree more hazardous to preserve due to the windthrow risk.
- **UN-TREED:** The un-treed site will require that the entire site's canopy requirement will have to be provided by street trees and site trees resulting in an additional cost to the landowner. Young trees, while having a better chance of survival than a mature tree on a disturbed site, also take longer to have the same aesthetic and environmental impact of the mature tree.

### **POTENTIAL UNINTENDED DESIGN CONSEQUENCES:**

Although our review was limited to six site studies, we identified the following potential unintended design consequences:

- The proposed code favors deciduous trees, which have a larger mature canopy area than conifers, allowing the landowner to plant fewer trees to meet minimum canopy coverage. This may have a negative overall aesthetic effect if evergreen trees, which add year around interest and are important for screening, are excluded in favor of deciduous trees.
- Since mature tree canopy is calculated by the approved tree list, variety of plants is limited. Developers will naturally plant trees with the largest canopy areas to minimize the number

of trees they are required to plant. This may create a monoculture of sorts, which can have negative environmental and aesthetic impacts.

- Emphasis on getting double canopy credit for existing trees may encourage saving questionable trees (or trees that will be negatively affected in the long term by construction activities).
- Landowners may “extend” their parking lot to reach an existing tree in order to utilize its existing canopy area in the parking lot canopy calculations.

#### **ITEMS AKS LIKED ABOUT THE CODE:**

Results Based Code: The proposed code focuses on what the parcel will look like in the future, not what it looks like in the present. That is, the code wants each parcel within a certain zone to meet certain minimum standards for the existing/future area of tree canopy. Many municipal tree codes focus on minimizing the removal of trees—thus “punishing” those owners that have an abundance of trees on their land prior to development while at the same time rewarding those landowners that have few or no trees on their land. The proposed code will encourage landowners to have trees on their parcels.

Flexibility: As mentioned previously, the proposed code gives the landowner the ability to choose between leaving less open soil and more parking places/hardscape at the cost of higher planting costs (due to covered soil) or more open soil and less parking places/hardscape with the bonus of lower planting costs because covered soil is no longer required. This allows us to work creatively with our clients to meet their needs while also building a better site.

Increased Chance of Tree Survival: The stricter soil requirements of the proposed code increase the chances of tree survival and ability to thrive. Long term, this will decrease maintenance and replacement costs typically associated with urban trees. From a personal standpoint, as a service provider, it is always gratifying to see our projects doing well and to see satisfied clients happy with the end result.

#### **ITEMS IN THE CODE AKS FOUND DIFFICULT OR EXPENSIVE TO IMPLEMENT:**

In general, most of the new code, with the clarifying details and example plans, was straight forward and easy to implement with a computer aided drafting program such as AutoCAD.

- One area that seemed to be redundant was the necessity to calculate percent of canopy over parking lot for each individual tree. This process seemed time consuming, especially on larger sites with many parking lot trees, without adding information vital to showing how the site plan meets the minimum standards.
- Since we were working with a relatively fixed site layout, any necessary changes were in response to meeting direct needs related to minimum canopy and soil volumes. However, in the initial stages of a ‘design from scratch’ situation where building and hardscape layouts are not yet fixed, the process of calculating and recalculating soil volumes in the early stages could be time consuming.
- The method for calculating existing tree canopy was not clear to us in the beginning. We recommend that the formula for calculating existing canopy be added to the code and it should be clarified if this calculation accounts for future growth like the planted tree list does.

- In some of the residential sites, we found that we had to adjust the street trees to meet minimum lot canopy at the sacrifice of aesthetics (such as overall symmetry, ‘fairness’ of tree placement, etc.) and on-site conditions (such as placing trees closer to access points and existing tree canopy overhang than we normally recommend).

## **TECHNICAL COMMENTS ON EACH OF THE SIX SITES:**

### **Hunziker Industrial Site**

- Upgraded parking islands from 5’ to 6’ to meet minimum code width for planting islands. This shrinks some parking stalls, but they still fall within the range allowed for compact parking.
- Original tree species used were not on the City’s approved parking lot tree list. Trees with larger canopy sizes were also necessary in order to meet minimum parking lot canopy requirements. We would recommend a procedure for accepting trees not on the list.
- This site had a railroad grade along the north property line. A portion of this rail area was within our site and the ballast rock and rails precluded using any of this area for planting trees, meaning that more trees had to be put elsewhere on site to meet the code.
- Overall the sight was very tight to fit in the required canopy cover. In order to meet the minimum, we had to change all conifers to deciduous (so we could take advantage of their larger canopy size). In this particular instance, it would have been nice to keep the conifers for a screen of the rail yard and for year around interest.

### **Sequoia Landing**

- Upgraded roadside planting strip from 5’ to 6’ to meet minimum code width.
- Changed street tree varieties used to match City’s approved street tree list.
- Overall, site was very tight.
- Showing soil volumes on the same plan as site canopy plan makes it crowded and hard to read. On a very large site, it seems that this might be better as a separate sheet. Also, we didn’t do this on all six sites. Is there a standard/guideline for when it should be shown?
- Trees slightly more crowded (i.e. next to utilities, buildings, etc.) than is ideal.

### **Broadway Rose**

- Technical note: Using the revision cloud tool to make the existing canopy makes it hard to get exact canopy areas for existing trees.
- Overall site easily averaged minimum requirements.

### **Bull Mountain**

- Overall site easily averaged minimum requirements. Did require some adjusting of the street trees to meet minimum lot canopy

### **Max’s Brew Pub**

- Overall Tight if site only existed as one lot (without natural area)

### **Masters’ Partition**

- Are this many existing trees typical of this kind of development?

- Street trees where the “lag”/private road parcel portion of the property intersect the 3 parcels are way too crowded for a real-life situation given the utilities and road access points.

**AKS RECOMMENDED ADDITIONS/CLARIFICATIONS TO THE CODE:**

- Need explanation that existing trees under 6” DBH can be given “planted tree mature crown area” if the tree is located with adequate rooting soil and is located within the specified distances from other trees, existing buildings, etc.
- Are wetland areas included or excluded in total site area calculations for required canopy?
- For street tree canopy calculations, does a tree in the center median area (of a road or a cul-de-sac as at Broadway Rose) count toward existing tree canopy area?
- Define method for canopy area calculations. Potential options would include by formula using DBH, by aerial photo interpretation, or by survey.
- The list of acceptable trees seems limiting in some situations. Is there a procedure for accepting trees not on the list?
- Within parking lots, is it necessary to calculate the percent canopy cover over the parking lot for each individual tree (as opposed to calculating the total canopy cover over the parking lot)? This adds an additional step and is time consuming.
- Showing soil volumes on the same plan as the site canopy makes the sheet crowded and hard to read. On a very large site, it seems that this might be better as a separate sheet. Also, we didn’t do this on all six sites per your instruction. Is there a standard/guideline for when it should be shown?

February 17, 2012

Todd Prager, AICP, Certified Arborist  
Associate Planner/Arborist  
City of Tigard, Community Development  
13125 SW Hall Boulevard  
Tigard, Oregon 97223

**Re: Memorandum-Peer Review of the Implementation of the Proposed Urban Forestry Code Revisions to Tree Canopy Requirements for Gertz Homes at Edgewood 1 and Gertz Homes at Edgewood 2**

Dear Mr. Prager:

At the February 6, 2012 Planning Commission Hearing, a member of the public brought forward two examples of Tree Canopy Site Plans showing the application of the draft Urban Forestry Code Revisions on two sites. These were for Gertz Homes at Edgewood 1 and Gertz Homes at Edgewood 2. AKS has reviewed these project sites and created alternative Tree Canopy Site Plans using the draft Urban Forestry Code Revisions (see attached). Below we will go into detail regarding the contrasts between the example Tree Canopy Site Plans provided at the hearing and the Tree Canopy Site Plans developed by AKS Engineering & Forestry.

For both project sites the draft code requires a minimum of 40% effective canopy coverage on the entire project site as well as a minimum of 20% effective canopy coverage on each lot.

**Gertz Homes at Edgewood 1:**

The example Tree Canopy Site Plan for Gertz Homes at Edgewood 1 presented at the hearing showed 27 trees being planted on the site. Each of these 27 trees had a mature canopy area of 706.5 square feet. We noted that the number of street trees proposed in this plan did not meet the minimum requirements of the draft code. Also, it appeared that the trees were placed to provide a minimum of 40% effective canopy coverage on each lot, instead of the required 20% effective canopy minimum in the draft code. None of the preserved existing trees were shown consistent with the original submittal. The draft code allows the “bonus” of doubling the canopy area when preserving existing trees.

Using the draft code criteria, AKS was able to meet the effective canopy coverage requirements on this site by utilizing 12 street trees in addition to preserving the 3 existing trees shown in the original submittal. The selection of street trees that have large mature canopy areas (1,590 square feet) allowed us to meet the canopy

standards without the use of any additional trees in the front or back yards of the lots. See attached AKS Tree Canopy Site Plan for Gertz Homes at Edgewood 1.

**Gertz Homes at Edgewood 2:**

The example Tree Canopy Site Plan for Gertz Homes at Edgewood 2 (directly east of Gertz Homes at Edgewood 1) presented at the hearing showed 41 trees being planted on the site. Each of these 41 trees had a mature canopy area of 706.5 square feet. It appeared that the trees were placed to provide a minimum of 40% effective canopy coverage on each lot, instead of the required 20% effective canopy minimum in the draft code. Again, none of the preserved existing trees on site were shown, consistent with the original submittal. In fact, the vegetated corridor tract behind lots 10-12 with several preserved existing trees, were not shown on the plan presented at the hearing. The draft code allows the “bonus” of doubling the canopy area when preserving existing trees.

Using the draft code criteria, AKS was able to meet the canopy coverage requirements on this site by utilizing 22 street trees, preserving the 17 existing trees shown in the original submittal, and planting 5 additional appropriately placed trees that will not conflict with the use or enjoyment of the lots. See the attached AKS Tree Canopy Site Plan for Gertz Homes at Edgewood 2. Note that our calculations for effective tree canopy coverage did not include trees that may have been required in the Vegetated Corridor Tracts ‘A’ and ‘B’ to meet Clean Water Services standards.

In conclusion, we feel that with careful attention to the application of the draft Urban Forestry Code Revisions, planting plans can be created that result in a reasonable balance between trees, development and open space. The two sites peer reviewed in this letter clearly demonstrate this to be the case.

Very Truly Yours,  
*AKS Engineering & Forestry, LLC*



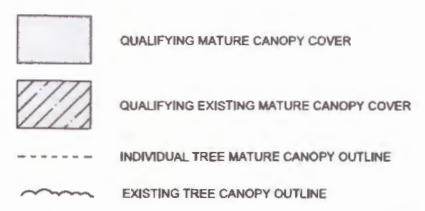
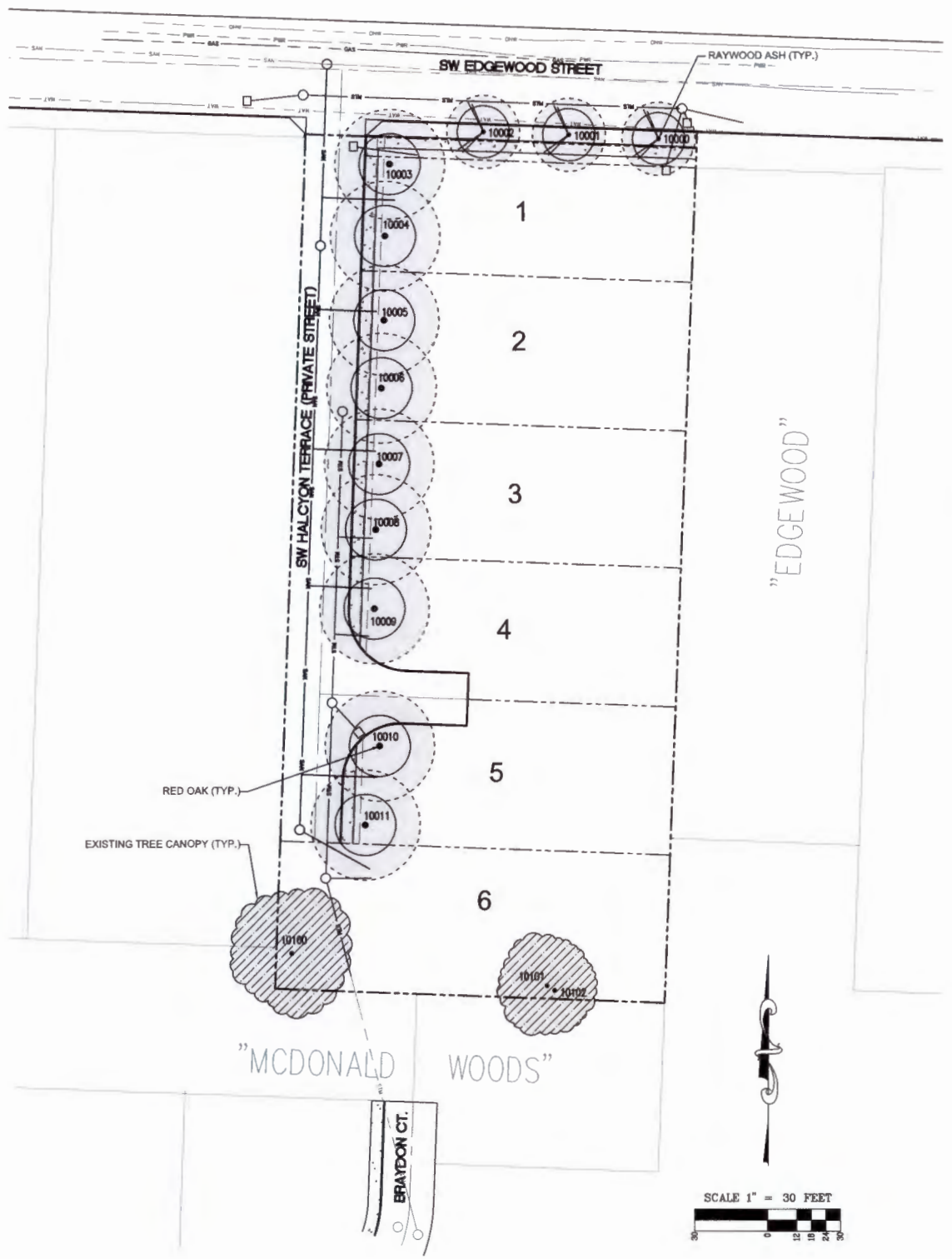
**KEITH JEHNKE**



CERTIFICATE NUMBER PN-1908  
EXPIRATION DATE: 6/30/2013

Keith Jehnke, PE, PLS, Principal;  
Certified Arborist #PN-1908, Certified Tree Risk Assessor #192  
Member, American Society of Consulting Arborists





TOTAL SITE AREA: 47,384 S.F.  
 TOTAL QUALIFYING MATURE TREE CANOPY AREA: 23,499 S.F.  
 % CANOPY COVER: 50%  
 MINIMUM % CANOPY COVER: 40%

50% IS GREATER THAN THE MINIMUM OF 40% TOTAL QUALIFYING MATURE CANOPY COVER FOR THE SITE, THEREFORE CITY REQUIREMENTS ARE MET.

LOT #	LOT AREA (S.F.)	REQUIRED CANOPY COVERAGE (S.F.) (20%)	ACTUAL CANOPY COVERAGE (S.F./%)
LOT 1	7,578	1,516	5,301 (70%)
LOT 2	8,286	1,657	3,180 (38%)
LOT 3	7,807	1,561	3,180 (42%)
LOT 4	6,990	1,398	1,590 (23%)
LOT 5	7,392	1,478	3,180 (43%)
LOT 6	9,531	1,906	7,068 (74%)

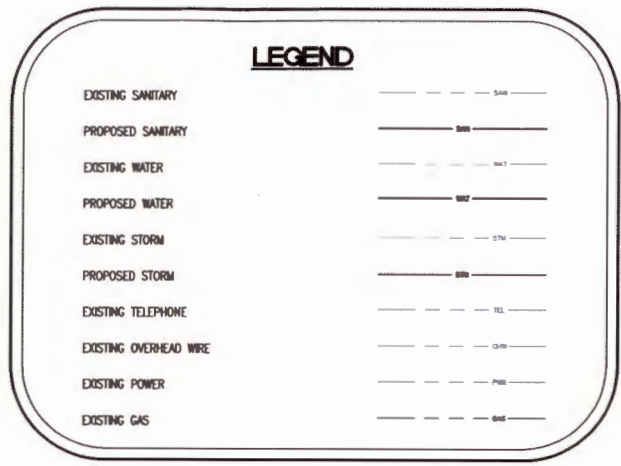
**TREE CANOPY TABLE**

PLANTED TREE CANOPY				
TREE #	SPECIES	TOTAL SOIL VOLUME	AVE. MATURE CANOPY (FT/SF)	QUALIFYING SITE CANOPY
10000	Raywood Ash	Over 1,000 c.f.	30' spread	707
10001	Raywood Ash	Over 1,000 c.f.	30' spread	707
10002	Raywood Ash	Over 1,000 c.f.	30' spread	707
10003	Red Oak	Over 1,000 c.f.	45' spread	1,500
10004	Red Oak	Over 1,000 c.f.	45' spread	1,500
10005	Red Oak	Over 1,000 c.f.	45' spread	1,500
10006	Red Oak	Over 1,000 c.f.	45' spread	1,500
10007	Red Oak	Over 1,000 c.f.	45' spread	1,500
10008	Red Oak	Over 1,000 c.f.	45' spread	1,500
10009	Red Oak	Over 1,000 c.f.	45' spread	1,500
10010	Red Oak	Over 1,000 c.f.	45' spread	1,500
10011	Red Oak	Over 1,000 c.f.	45' spread	1,500
<b>SITE CANOPY SUBTOTAL</b>				<b>16,431 s.f.</b>

EXISTING TREE CANOPY				
TREE #	SPECIES	TOTAL SOIL VOLUME	CANOPY (FT/SF)	QUALIFYING SITE CANOPY
10100	Douglas Fir	Over 1,000 c.f.	50' spread	1,954
10101	Douglas Fir	Over 1,000 c.f.	40' spread	1,246
10102	Big Leaf Maple	Over 1,000 c.f.	20' spread	314
<b>EXISTING SITE CANOPY SUBTOTAL</b>				<b>3,514 s.f. x 2 = 7,028 s.f.</b>
<b>TOTAL QUALIFYING SITE TREE CANOPY AREA</b>				<b>23,459 s.f.</b>

**STREET TREES**

SYMBOL	QTES	BOTANICAL NAME	COMMON NAME	CONDITION	SIZE	SPACING
	3	FRAXINUS OXYCARPA 'RAYWOOD'	RAYWOOD ASH	B&B	2" CAL.	AS SHOWN
	9	QUERCUS RUBRA	RED OAK	B&B	3" CAL.	AS SHOWN



REVISIONS:

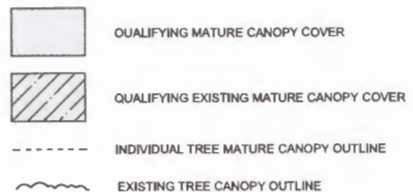
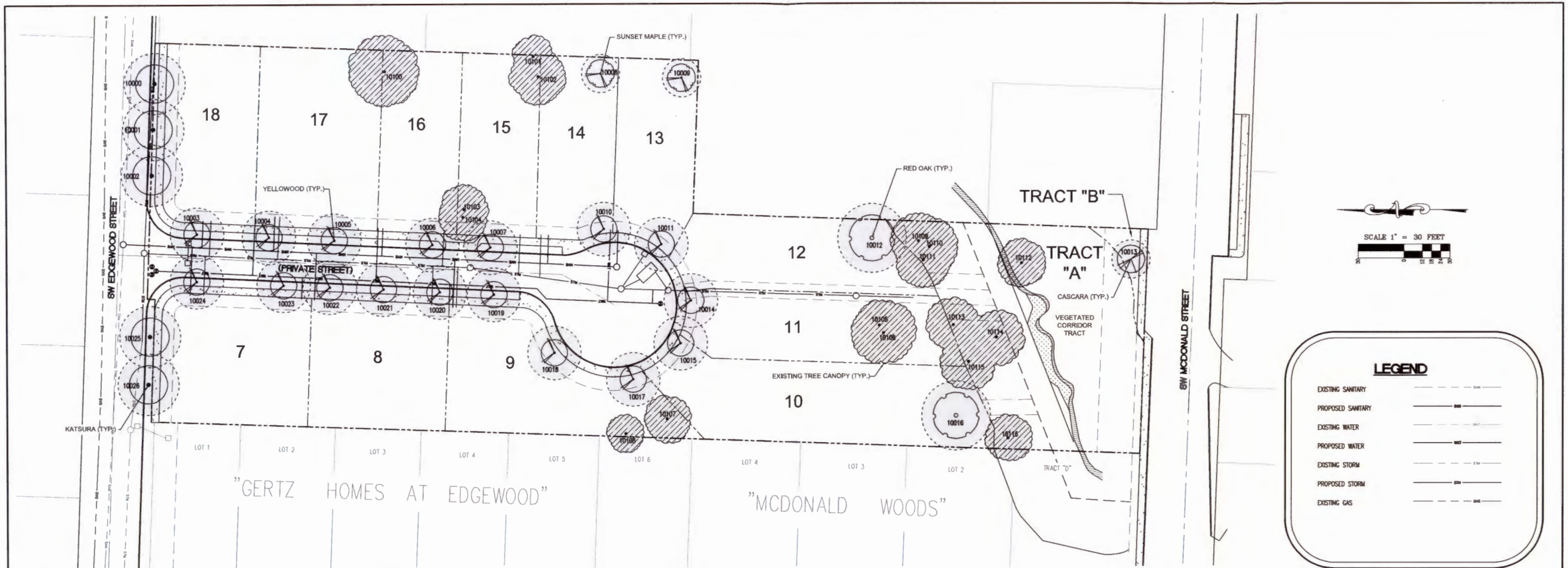

**SITE TREE CANOPY PLAN**

DESIGNED BY: KJ	DRAWING NO.: XX
DRAWN BY: KAH	SCALE: AS NOTED
CHECKED BY: KJ	
PREPARED FOR:	

**EDGEWOOD NO. 1**

TIGARD OREGON

JOB NUMBER XX
SHEET 1 OF 1



TOTAL SITE AREA: 108,390 S.F.  
 TOTAL QUALIFYING MATURE TREE CANOPY AREA: 56,819 S.F.  
 % CANOPY COVER: 52%  
 MINIMUM % CANOPY COVER: 40%

52% IS GREATER THAN THE MINIMUM OF 40% TOTAL QUALIFYING MATURE CANOPY COVER FOR THE SITE, THEREFORE CITY REQUIREMENTS ARE MET.

STREET TREES						
SYMBOL	QTY	BOTANICAL NAME	COMMON NAME	CONDITION	SIZE	SPACING
(Symbol 5)	5	CERCIDIPHYLLUM JAPONICUM	KATSURA	B&B	2" CAL.	AS SHOWN
(Symbol 17)	17	CLADRASTIS KENTUCKEA	YELLOWWOOD	B&B	2" CAL.	AS SHOWN

SITE TREES						
SYMBOL	QTY	BOTANICAL NAME	COMMON NAME	CONDITION	SIZE	SPACING
(Symbol 1)	1	ACER TRUNCATUM X A. PLATANOIDES	SUNSET MAPLE	B&B	2" CAL.	AS SHOWN
(Symbol 2)	2	RHAMNUS PURSHIANA	CASCARA	B&B	2" CAL.	AS SHOWN
(Symbol 2)	2	QUERCUS RUBRA	RED OAK	B&B	2" CAL.	AS SHOWN

### TREE CANOPY TABLE

#### PLANTED TREE CANOPY

TREE #	SPECIES	TOTAL SOIL VOLUME	AVE. MATURE CANOPY (FT/SF)	QUALIFYING SITE CANOPY
10000	Katsura	Over 1,000 c.f.	40' spread	1,256
10001	Katsura	Over 1,000 c.f.	40' spread	1,256
10002	Katsura	Over 1,000 c.f.	40' spread	1,256
10003	Yellowwood	Over 1,000 c.f.	35' spread	962
10004	Yellowwood	Over 1,000 c.f.	35' spread	962
10005	Yellowwood	Over 1,000 c.f.	35' spread	962
10006	Yellowwood	Over 1,000 c.f.	35' spread	962
10007	Yellowwood	Over 1,000 c.f.	35' spread	962
10008	Sunset Maple	Over 1,000 c.f.	25' spread	491
10009	Sunset Maple	Over 1,000 c.f.	25' spread	491
10010	Yellowwood	Over 1,000 c.f.	35' spread	962
10011	Yellowwood	Over 1,000 c.f.	35' spread	962
10012	Red Oak	Over 1,000 c.f.	45' spread	1,590
10013	Cascara	Over 1,000 c.f.	25' spread	491
10014	Yellowwood	Over 1,000 c.f.	35' spread	962
10015	Yellowwood	Over 1,000 c.f.	35' spread	962
10016	Red Oak	Over 1,000 c.f.	45' spread	1,590
10017	Yellowwood	Over 1,000 c.f.	35' spread	962
10018	Yellowwood	Over 1,000 c.f.	35' spread	962
10019	Yellowwood	Over 1,000 c.f.	35' spread	962
10020	Yellowwood	Over 1,000 c.f.	35' spread	962
10021	Yellowwood	Over 1,000 c.f.	35' spread	962
10022	Yellowwood	Over 1,000 c.f.	35' spread	962
10023	Yellowwood	Over 1,000 c.f.	35' spread	962
10024	Yellowwood	Over 1,000 c.f.	35' spread	962
10025	Katsura	Over 1,000 c.f.	40' spread	1,256
10026	Katsura	Over 1,000 c.f.	40' spread	1,256
<b>SITE CANOPY SUBTOTAL</b>				<b>27,287 s.f.</b>

#### EXISTING TREE CANOPY

TREE #	SPECIES	TOTAL SOIL VOLUME	CANOPY (FT/SF)	QUALIFYING SITE CANOPY
10100	Costal Redwood	Over 1,000 c.f.	45' spread	1,590
10101	Western Red Cedar	Over 1,000 c.f.	25' spread	491
10102	Douglas Fir	Over 1,000 c.f.	35' spread	962
10103	Sequoia	Over 1,000 c.f.	30' spread	707
10104	Sequoia	Over 1,000 c.f.	30' spread	707
10105	Western Red Cedar	Over 1,000 c.f.	30' spread	707
10106	Bigleaf Maple	Over 1,000 c.f.	40' spread	1,257
10107	Western Red Cedar	Over 1,000 c.f.	30' spread	707
10108	Western Red Cedar	Over 1,000 c.f.	24' spread	452
10109	Unknown Deciduous	Over 1,000 c.f.	35' spread	962
10110	Unknown Deciduous	Over 1,000 c.f.	35' spread	962
10111	Unknown Deciduous	Over 1,000 c.f.	35' spread	962
10112	Unknown Conifer	Over 1,000 c.f.	30' spread	707
10113	Unknown Deciduous	Over 1,000 c.f.	35' spread	962
10114	Unknown Deciduous	Over 1,000 c.f.	35' spread	962
10115	Unknown Deciduous	Over 1,000 c.f.	35' spread	962
10116	Unknown Conifer	Over 1,000 c.f.	30' spread	707

**EXISTING SITE CANOPY SUBTOTAL** 14,766 s.f. x 2 = 29,532 s.f.  
**TOTAL QUALIFYING SITE TREE CANOPY AREA** 56,819 s.f.

LOT #	LOT AREA (S.F.)	REQUIRED CANOPY COVERAGE (S.F.) (20%)	ACTUAL CANOPY COVERAGE (S.F./%)
LOT 7	7,544	1,508	4,436 (59%)
LOT 8	7,496	1,497	2,886 (39%)
LOT 9	9,210	1,842	5,204 (57%)
LOT 10	10,308	2,061	2,553 (25%)
LOT 11	8,355	1,671	4,890 (59%)
LOT 12	7,356	1,471	1,590 (22%)
LOT 13	8,005	1,601	1,453 (24%)
LOT 14	6,026	1,205	1,453 (24%)
LOT 15	6,066	1,213	6,996 (110%)
LOT 16	6,158	1,232	4,142 (67%)
LOT 17	9,382	1,876	1,924 (21%)
LOT 18	6,307	1,261	4,730 (75%)
TRACT "A"	17,199	3,410	14,371 (84%)
TRACT "B"	988	198	491 (50%)

NOTE: TREES REQUIRED TO MEET CLEAN WATER SERVICES REQUIREMENTS IN THE VEGETATED CORRIDOR ARE NOT INCLUDED IN THESE CALCULATIONS.

REVISIONS:

## SITE TREE CANOPY PLAN

DESIGNED BY: KJ  
 DRAWN BY: KAH  
 CHECKED BY: KJ  
 PREPARED FOR:

## EDGEWOOD NO. 2

TIGARD

OREGON

JOB NUMBER  
XX

SHEET  
1 OF 1

# Project Sites Submitted (Edgewood 1 & 2) During Testimony at the February 6, 2012 Hearing

**Note: Coverage % would be much if a Water Quality Facility was included in calculations**

**Note: Several trees are shown closer than code allows**

## TREE CANOPY AT 40% COVERAGE R-4.5

	Lot	40%	700.5 SF Trees
	1	7586	3034
	2	6286	3314
Missing Items:	3	7805	3042
Street Lights	4	6952	2781
Fire Hydrants	5	7355	2942
Lawn Areas	6	9521	3808
Play Areas	7	7544	3018
Play Structures	8	7486	2904
Swimming Pools	9	9210	3684
Sport Courts	14	6026	2410
Garden Plot	15	6066	2426
	16	6159	2463
	17	9362	3753
	18	6307	2523

### REQUIRED STREET TREES LEFT IN PLACE





# Tree Grove ESEE Analysis

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# City of Tigard Memorandum

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**To:** Urban Forestry Code Revisions Project Management Team

**From:** Darren Wyss, Senior Planner

**Re:** Tree Grove Preservation Program

**Date:** December 12, 2011

The Urban Forestry Code Revisions (UFCR) project included the development of a Tree Grove Preservation Program. This was identified as a top priority of the community during the Tigard Urban Forestry Master Plan (UFMP) process. The intent is to preserve Tigard's remaining groves of native trees through a flexible and incentive-based program, while allowing for the full development of property under current zoning.

The program was developed following State Goal 5 rules, which are specific about process and evidence requirements needed to adopt land use regulations intended to protect natural resources. Even though the city's approach to tree grove preservation is proposed to be flexible and incentive based, it must meet the same Goal 5 standards as if a more regulatory approach was intended.

An important component of the Goal 5 process is conducting an Economic, Social, Environmental and Energy Analysis (ESEE). The ESEE considers alternative program options (protect, allow, limit) and is used to support Goal 5 decisions. The Tigard ESEE supports the proposed limited protection option that is part of the UFCR project.





# Tigard Goal 5 ESEE Analysis for Significant Tree Groves

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## Section 1 – Introduction and Context

This report addresses Statewide Planning Goal 5 – Natural Resources (Goal 5) requirements for protection of Significant Tree Groves (STGs) as shown on Map A: Significant Tree Groves and Impact Areas. Goal 5 requirements should be considered in the context of Tigard’s current Goal 5 program and the Tigard Development Code’s existing “Sensitive Lands” chapter which implements Metro functional plan requirements (Titles 3 and 13). This report supports the Council’s goal of protecting STGs through an incentive-based program that complements Tigard’s existing zoning regulations.

### ***Glossary of Terms and Acronyms Used in this Report***

The report necessarily incorporates terms of art and acronyms from Goal 5, the Metropolitan Service District (Metro), and the City of Tigard’s comprehensive plan and land use regulations. The following terms and acronyms are used throughout this report.

#### **Tigard Planning Terms**

- *Tigard Comprehensive Plan* (**comprehensive plan**) – the controlling long-range planning document for the City of Tigard.
- *Tigard Development Code* (**TDC**) – the land use regulations that implement the comprehensive plan.
- *Tigard Economic Opportunities Analysis* (**EOA**) – a study adopted by the City of Tigard in May of 2011. The EOA includes economic trend analysis, projections and policies; it also includes a comparison of 20-year need for employment land with the supply of buildable employment sites in Tigard.
- *Tigard Sensitive Lands* (**Sensitive Lands**) – land and water areas protected by TDC Chapter 18.775 – Sensitive Lands. Chapter 18.775 is an overlay district that implements Metro Titles 3 and 13 and *already* provides limited protection to most STGs.
- *Tigard Transportation System Plan* (**TSP**) – a long-term plan that identifies the location, timing and funding for multi-modal transportation facilities.

#### **Tigard Urban Forestry Project Terms**

- *Urban Forestry Master Plan* (**UFMP**) – makes recommendations for implementing the comprehensive plan and includes background information and objectives for urban forestry management.
- *Tree Grove Preservation Project* – authorized by UFMP objectives and includes a tree grove inventory, ESEE analysis, and comprehensive plan and TDC revisions.



- *Significant Tree Grove (STG)* – one of 70 locally STGs totaling 544 acres within the Tigard City Limits. Most STGs are within, or partially within, areas already protected by Tigard’s Sensitive Land regulations.
- *Urban Forestry Code Revisions Project* – includes (among other things) draft amendments to the TDC Chapter 18.790 Urban Forests related to tree grove regulatory incentives.
- *Urban Forestry Code Revisions Citizens Advisory Committee (CAC)* – makes recommendations regarding, among other things, an incentives-based program to protect STGs.
- *Tigard Tree Grove Assessment Report (Tree Grove Assessment)* – a Goal 5 inventory report prepared by Winterbrook Planning in 2010 that maps and describes the location, quality (functional characteristics) and quantity of 70 STGs within the Tigard City Limits.
- *Tigard’s Proposed Limited Protection Program (Regulatory Incentives Program)* – the program recommended by the CAC for adoption into TDC Chapter 18.790 Urban Forests to supplement Tigard’s Sensitive Lands program.

### **Metropolitan Service District (Metro) Terms**

- *Metro Title 3 - Water Quality and Flood Management (Title 3)* – a mandatory regulatory program adopted by Metro that applies to mapped Water Quality Resource Areas within the regional Urban Growth Boundary, including the City of Tigard. Title 3 is implemented by Tigard’s Sensitive Lands district and *already* protects portions of STGs in Tigard.
- *Metro Title 13 – Nature in the Neighborhoods (Title 13)* – applies to mapped Habitat Conservation Areas (HCA) within the regional Urban Growth Boundary, including the City of Tigard. Tigard’s Sensitive Lands district implements Title 13 and offers a limited incentives to protect “significant habitat areas” consistent with Tualatin Basin Partners recommendations.

### **Tualatin Basin Partners for Natural Places Terms**

- *Tualatin Basin Goal 5 Program Implementation Report (Tualatin Basin Program)* – the results of a coordinated effort by an alliance of eight Washington County cities (including Tigard), Washington County, Metro, the Tualatin Hills Park and Recreation District (**THPRD**), and Clean Water Services (**CWS**) to address Metro Title 13 requirements by adopting “habitat-friendly development practices” and related incentive-based measures. Tigard amended



its Sensitive Land regulations in January of 2007 to implement some of the Tualatin Basin Program recommendations.

- *Tualatin Basin Goal 5 ESEE Analysis (Tualatin Basin ESEE Analysis)* – considered the economic, social, environmental and energy consequences of alternative program options for “protecting” significant riparian corridors and wildlife habitat areas, and their impact area (the entire Tualatin River Basin). The Tualatin Basin ESEE Analysis supports the recommendations of the Tualatin Basin Report and the CAC’s proposed Regulatory Incentives Program.

### Statewide Planning Goal 5 (Natural Resource) Terms

- *OAR Chapter 660, Division 023 (the Goal 5 rule)* – an administrative rule adopted by the Land Conservation and Development Commission (**LCDC**) that interprets and implements Goal 5.
- *Significant Goal 5 Resource Site* – for the purposes of this ESEE Analysis, one of 70 STGs that have been inventoried and determined significant in the 2010 Tree Grove Assessment.
- *Conflicting Use* – a land use or related activity permitted by applicable Tigard base and overlay zoning districts that could conflict with one or more functional characteristics identified for STGs in the Tigard Tree Grove Assessment.
- *Impact Area* – an area outside the resource site where permitted uses could adversely affect the identified resource (in this case, the STG). For purposes of this ESEE Analysis, the impact area includes properties (tax lots) on which the STG is located and where development could directly impact an STG.
- *Economic, Social, Environmental and Energy consequences analysis (ESEE analysis)*. A goal 5 ESEE analysis that considers alternative program options (full protection, limited protection and no additional protection) that supports adoption of Tigard’s proposed limited protection, Regulatory Incentives Program.
- *Goal 5 Program Decision Options:*<sup>1</sup>
  - *Protect resource fully (full protection)* – adopt *additional* tree grove regulations that prohibit all conflicting uses – including those currently allowed by existing Sensitive Land regulations.
  - *Allow conflicting uses fully (no additional protection)* – allow conflicting uses without additional regulations or incentives (beyond those provided by Tigard Sensitive Lands regulation) to protect STGs.

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<sup>1</sup> The Tualatin Basin ESEE Analysis uses the terms “prohibit” (full protection), “allow” (no additional protection), and “limit” (limited protection).



- *Allow conflicting uses on a limited basis (limited protection)* – adopting additional regulations and/or incentives that further limit conflicting uses allowed by existing regulations.

## **Report Organization**

The report is organized in three sections:

- **Section 1** describes how the tree groves protection project relates to the remainder of Tigard’s urban forestry program, defines key terms and acronyms, summarizes Goal 5 planning requirements as they pertain to tree groves, summarizes the results of Tigard’s 2010 tree grove inventory and the basis for the City’s determination of resource significance, and defines the “impact area” for assessing the ESEE consequences of alternative resource protection options.
- **Section 2** identifies urban uses and activities that conflict with the full protection of STGs in the context of regional and local planning requirements.
- **Section 3** analyzes the ESEE consequences of three decision options for tree grove management: full resource protection (prohibit all conflicting development within an STG), limited resource protection (the City’s proposed Regulatory Incentives Program), or no additional resource protection (do nothing beyond existing Sensitive Land regulations to protect STGs). Section 3 also includes findings demonstrating continued compliance with applicable Statewide Planning Goals (*i.e.*, Goals 1-2 and 5-14).
- **Section 4** describes Tigard’s proposed limited protection (regulatory incentives) program, which is designed to encourage property owners and developers to protect all or part of STGs through density transfer, relaxation of dimensional standards (such as setback and building height), and flexible development standards.

## **Tigard’s Interest in Protecting Significant Tree Groves (STGs)**

Tigard takes urban forestry seriously and is justifiably proud to be recognized as a “Tree City USA”. Recent amendments to the comprehensive plan call for protection of tree groves – while respecting individual property rights and encouraging appropriate urban infill. The City’s *Urban Forestry Master Plan* (UFMP, November 2009) underscores Tigard’s commitment to the comprehensive management of Tigard’s 1,853 acres of existing tree canopy through a variety of methods – including incentives-based protection for STGs.



Despite these accomplishments, Tigard has had only moderate success in actually protecting large tree groves – especially those lying outside of protected Title 3 Sensitive Lands areas. The UFMP (p. 17) includes a map and matrix documenting changes in tree canopy from 1996 – 2007. Although the total acreage of canopy cover has decreased by approximately 100 acres (from 1,953 to 1,853), the distribution of tree canopy by area has changed substantially. There are more small groves (2 acres or fewer) and fewer large groves (5.0 acres or more). In 1996, Tigard had 1,100 acres in large tree groves; by 2007, there were only 766 acres – a 30% decline.

The UFMP includes six “goals” – with corresponding sub-goals and action measures. The UFMP’s “implementation matrix” identifies the lead City division, cites supportive comprehensive plan policies, and provides information related to commitment of staff resources, relative costs, and timing. This background information sets the stage and policy context for the Tigard Tree Grove Protection Project.

Goal 3 of the UFMP is to “develop a tree grove protection program.”<sup>2</sup> There are two sub-goals:

**3.1 Focus on preserving large groves of native trees.**

**3.2 Develop a flexible and incentive based grove preservation program that meets the needs of affected property owners.**

Tree groves are scenic and open space resources that must be inventoried, analyzed and protected consistent with Goal 5. As noted in Section 4, Tigard’s local program to achieve Sub-goals 3.1 and 3.2 also should be considered in the context of Metro, Tualatin Basin, and local planning efforts – which already provide limited tree grove protection in designated “Sensitive Lands” areas.

***Statewide and Regional Planning Context***

Goal 5 sets forth procedures that local governments must follow when developing programs to protect natural resources. Metro Titles 3 and 13 inventories and programs overlap considerably with STGs inventoried in the Tigard Tree Grove Assessment and the CAC’s recommendations for a regulatory incentive program. These programs (as implemented by Tigard’s Sensitive Land regulations, serve as the baseline for Tigard’s Tree Grove Protection Project and are discussed further in Section 3.

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<sup>2</sup> Complementary goals include (1) revise the City’s tree code; (2) revise the City’s landscaping code; (4) develop a hazardous tree program; (5) improve the management of the City’s urban forestry program; and (6) develop an urban forestry stewardship program.



## Statewide Planning Goal 5 – Natural Resources

Goal 5 requires local governments to inventory and protect significant natural and scenic resources – including STGs – based on an analysis of the ESEE (economic, social, environmental and energy) consequences of alternative protection options.

The Goal 5 administrative rule establishes specific requirements for conducting natural resource inventories, determining the significance of resource sites and their “impact areas”, identifying conflicting urban uses and activities, conducting the required ESEE analysis, and developing a local protection program.

Although “tree groves” are not specifically mentioned in the Goal 5 rule, STGs may be classified as both “open space” and “scenic” resources. The “open space” category includes “forests” and “wildlife preserves”; the scenic resources category includes “lands valued for the aesthetic appearance.” (OAR 660-023-0110 and 0220). However, the decision to inventory and protect STGs as open space and scenic resources is optional on the part of local government. This decision is based on Council policy – not state or regional mandate.

Nevertheless, *if* a local government decides to inventory and protect open space and scenic resources (as Tigard has done in the case of STGs), the Goal 5 *process* must be followed by conducting a tree grove inventory, determining local significance, identifying conflicting uses for resource sites and their impact areas, analyzing ESEE consequences of protection options, and adopting a local protection program.

Unlike some other statewide goals, Goal 5 is essentially procedural in nature; the Goal 5 rule establishes a conflict resolution *process* that seeks to balance urban development and resource conservation objectives. Importantly, Goal 5 does not mandate a specific outcome; rather it requires each local government to consider the consequences of three protection options before making a decision regarding the appropriate level of local resource protection.

The remainder of this section describes the inventory process and results, the basis for the City’s “significance” determination, and the impact areas for STGs. Section 2 of this ESEE Analysis goes on to identify conflicting uses and activities and describe the City’s draft limited protection program in the context of Metro and Tualatin Basin Goal 5 programs. Section 3 includes the required Goal 5 ESEE analysis and findings demonstrating compliance with applicable statewide planning goals.

### ***Tigard Tree Grove Assessment Report***

The *City of Tigard Tree Grove Assessment Report* (Winterbrook Planning, 2010) documents the location, quantity and quality of STGs in Tigard. As documented in the Tree Grove Assessment itself, Winterbrook inventoried tree groves as prescribed by the the Goal 5 rule (OAR 660-023-0030).





City planning staff worked with Winterbrook to select potential significant tree groves for initial review. The City used Metro tree canopy maps and GIS technology to identify tree groves with a canopy cover of two acres or greater. Using this criterion alone, City staff determined that there were 100 tree groves in Tigard, covering approximately 930 acres – or about 12.3% of the City's land area. Winterbrook reviewed aerial photographs and boundaries of the initial 100 tree groves to refine Metro canopy mapping. Metro's canopy mapping software does not always differentiate developed areas with buildings and roads, tree shadows, and other landscape patterns that are not trees. Therefore, Winterbrook removed developed and non-forested areas from the City's inventory.

Winterbrook then completed field inventory forms and conducted on- and off-site inventories for potential STGs. Ten functional characteristics were evaluated for each resource site. The range of potential scores for a given grove is 10 to 50 points. Following is a summary of the 10 functional categories and their assessment factors.

- **Grove Maturity/ Tree size.** Scenic values tend to be a function of tree size or age. Also, mature trees are difficult or take a long time to replace. The primary assessment factor in this category is the percentage of large trees (greater than 14" diameter at breast height (dbh)) in the grove. Multi-stem trees are evaluated by the size of the largest individual trunk at chest height.
- **Grove Size.** The vitality and resilience of a grove generally increases with grove area. Scenic, natural and other values often increase with size as well. Based on local grove conditions, groves of greater than five acres are defined as large (high), groves between two and five acres are defined as medium, and groves of less than two acres are defined as small (low).
- **Health.** This category assesses the general health and condition of a grove, including signs of dieback, threats, and disturbance. Threats may include infestations of invasive plants such as English ivy that tend to degrade tree and grove health. It may also include natural processes, such as beaver activity, that change the hydrologic regime to alter the existing tree grove composition and health.
- **Visibility.** Groves that are clearly visible from major streets or public open space have greater value to the community. Assessment factors include visibility from an arterial or local street and/or public or private open space.
- **Screening/Buffering.** Groves may serve as land use buffers. The value of buffering or screening is a function of the grove size, location and nearby uses. The greatest value to the community is when the tree grove provides a buffer between different types of uses, primarily between industrial/commercial use and residential/open space uses.



- **Accessibility.** Accessibility is a function of ownership (public or private) and physical features (topography, trail access, etc.). Public access provides more opportunity for public use and enjoyment. Steep terrain and inaccessible features (wetlands, dense brush) may limit or preclude opportunities for public use.
- **Rarity.** Unusual features, such as large size, rare species, or historic/landmark values, add to community value. This category considers whether such features are present, and whether they are uncommon or unique within the City.
- **Educational/Recreational Potential.** Groves with both public access and noteworthy features offer increased educational values. Groves with public or semi-public access and trail networks offer passive recreation values. Important factors include public versus private ownership and whether developed access exists. This category is a function of accessibility and rarity values: if either ranks low, this function is low; if both rank medium, this function is medium; otherwise, this function is high.
- **Wildlife Habitat Value and Connectivity.** Upland tree groves can provide important habitat for terrestrial wildlife species. The size, location and composition of a grove are all factors influencing the quality of habitat. Larger groves located near or connected to other habitat areas generally provide greater habitat value than smaller, isolated groves. Groves with a diverse mix of species and structure (such as mid-canopy trees, shrubs, groundcover, and standing or downed logs) generally provide higher value forage, cover and nesting habitat than groves with few species or with no understory.
- **Level of Existing Development.** Groves located on undeveloped or partially developed sites offer the opportunity to protect groves through site planning. Groves surrounded by development tend to be more at risk.

## Tree Grove Inventory Results

Seventy STGs were identified within the City of Tigard. The majority of the groves were associated with Fanno and Summer Creeks and their major tributaries. The STGs range from 1.1 to 54.4 acres, with a combined area of 544 acres. The average STG size is 7.8 acres and the median size is 3.8 acres; thus, several larger groves skew the average size upward significantly. The largest STG, Grove 67 on Bull Mountain, covers 54.4 acres.

Most of the STGs have a mix of tree species rather than a pure stand of a single species. The most common identified species include: Douglas fir, ponderosa pine, western red cedar, bigleaf maple, red alder, Oregon ash, Oregon white oak, black cottonwood, and Pacific willow.



- In areas influenced by nearby streams or wetlands, Oregon ash, red alder, Pacific willow, and black cottonwood are dominants, and Douglas fir and western red cedar are often subdominants.
- In upland areas out of the immediate stream corridors or wetlands, dominance shifted to Douglas fir, bigleaf maple, and Oregon white oak, with occasional stands of red alder. Stands with large, open grown Oregon white oak and/or large ponderosa pine usually received higher scores due to the rarity of these features and their importance to wildlife in the Willamette Valley.

Fifty-nine STGs (84%) are located partially or entirely within areas protected by SDC Chapter 17.755 Sensitive Lands. These groves are generally larger and support greater habitat complexity due to variation in the plant community related to moisture gradients between uplands and wetlands. Many of the larger STGs are within the Fanno Creek corridor, where the presence of parks, walking trails, and other amenities enable public access.

### Significance Determination

Under the Goal 5 Rule (OAR Chapter 660, Division 23), local governments must inventory Goal 5 resource sites and determine their significance. Resource sites that do not qualify as “significant” are not subject to the ESEE decision-making process, and are not subject to local Goal 5 regulatory programs.

To determine local significance, tree grove boundaries were refined to include STGs with contiguous canopy cover of one acre or more and to exclude linear or fragmented/developed areas. Winterbrook and City staff used aerial photo interpretation and field observation to make these determinations.

After applying significance criteria, Winterbrook described and mapped the location, quality and quantity of 70 STGs shown on *Map A: Significant Tigard Tree Groves and Impact Areas*.

### Impact Area Determination

The Goal 5 rule requires the determination of “impact areas” – or the area outside of significant resource sites where additional zoning regulation may be appropriate, in order to reduce impacts from development. The rule offers the following direction (OAR 660-023-040):

*(3) Determine the impact area. Local governments shall determine an impact area for each significant resource site. The impact area shall be drawn to include only the area in which allowed uses could adversely affect the identified resource. The impact area defines the geographic limits within which to conduct an ESEE Analysis for the identified significant resource site.*



Tigard has determined that the impact area for tree groves includes the properties (tax lots) on which STGs are located. Conflicting uses allowed within base zones could adversely affect the quantity and quality of inventoried tree groves as a result of root disturbance, drainage alteration, or construction of impervious surfaces. Partial tree grove removal, if improperly carried out, could damage the integrity of the remainder of the tree grove.

*Map A: Significant Tree Groves and Impact Areas* shows the location of each of the 70 STGs and the tax lots upon which they are located. Appendix B includes a spreadsheet showing impacted tax lots, both public and private, and relevant STG acreage. Overall, STGs cover 544 acres and impact 885 tax lots totaling 1,365 acres; thus STGs cover about 40% of the impacted tax lots. Most (73%) of the STGs are within Title 3 Sensitive Lands; STGs cover 124.5 buildable acres – less than a quarter of the 544 STG acre total.

**The ESEE analysis in Section 3 focuses on potential impacts to Tigard’s buildable land supply (land that is not regulated by the Title 3 provisions of TDC Chapter 17.775) that *could* result from implementation of Tigard’s Regulatory Incentive Program.**



## Section 2 - Conflicting Use and Draft Limited Protection (Regulatory Incentives) Program

### ***Introduction***

As required by the Goal 5 rule, this section reviews the Tigard Development Code (TDC) to identify land uses and activities that potentially conflict with tree grove preservation. This review is based on (1) the base zones applicable to each STG and impact area, and (2) existing Title 3 Sensitive Land regulations that apply to most STGs and limit uses and activities otherwise permitted in the base zones.

### ***Methods for Identifying Conflicting Uses***

Once the tree grove inventory has been completed – and the significance of each resource site and its impact area determined – the next step in the Goal 5 process is to identify conflicting uses and activities that customarily<sup>3</sup> are regulated by City zoning. The Goal 5 Rule (OAR 660-23-010) defines “conflicting use” as follows:

*(1) "Conflicting use" is a land use, or other activity reasonably and customarily subject to land use regulations, that could adversely affect a significant Goal 5 resource \* \* \**

Thus, conflicting uses include the use itself *plus* activities customarily associated with the use. The Goal 5 rule also describes how conflicting uses are identified:

*(2) Identify conflicting uses. Local governments shall identify conflicting uses that exist, or could occur, with regard to significant Goal 5 resource sites. To identify these uses, local governments shall examine land uses allowed outright or conditionally within the zones applied to the resource site and in its impact area. Local governments are not required to consider allowed uses that would be unlikely to occur in the impact area because existing permanent uses occupy the site. The following shall also apply in the identification of conflicting uses: (a) If no uses conflict with a significant resource site, acknowledged policies and land use regulations may be considered sufficient to protect the resource site.*  
[Emphases added.]

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<sup>3</sup> In an urban area, there are many examples of conflicting uses that typically are not regulated by zoning, but could adversely affect a Goal 5 resource. For example, air pollution can adversely affect vegetation, but is typically not regulated by local zoning. City zoning regulations typically regulate where and how urban development may (or may not) occur on a specific site.



This section identifies land uses and activities that conflict with full STG protection, based primarily on applicable base and overlay zoning districts. The primary means of identifying conflicting uses is by consulting the *Tigard Development Code* (TDC).

## Primary Tigard Development Districts (Zoning) - Uses

The primary means of identifying conflicting uses is to first determine what zone or zones (including overlay districts) apply to a particular resource site, and then to identify uses and activities that are allowed by the zoning conflict with full protection of inventoried resource values. *Map B: Significant Tree Groves and Corresponding Comprehensive Plan Designations* shows STGs in relation to plan designations (and implementing zoning) within the Tigard City Limits.

Tigard's base zones are organized into four basic categories:

- **Low Density Residential (LDR)**, including the R-1, R-2, R-3.5 and R-4.5 zones. In each case, the suffix refers to the average number of units per net residential acre in the zone.<sup>4</sup> Residential development in these zones is typically allowed through the land division and planned unit development processes, or through building permit review for individual lots. These zones also allow public and semi-public uses, such as parks and schools, through the conditional use process. These zones also allow streets and public facilities necessary to serve development. Vegetation removal, excavation and construction of new impervious surface areas are also allowed.

ESEE consequences for residential development are addressed in Section 3, ESEE Analysis. See also discussion under Goals 5-7 (Natural Resources, Water Quality, and Natural Hazards) and Goal 10 (Housing).

- **Medium and High Density Residential (M-HDR)**, including the R-7, R-12, R-25 and R-40 zoning districts. The suffix in these cases refers to the average number of units per residential acre allowed in each district. Residential development in these zones is typically allowed through the land division and planned unit development processes, or through building permit review for individual lots. Like the Low Density Residential zones, Medium Density Residential zones allow public and semi-public uses through the conditional use process. These zones also allow streets and public facilities necessary to serve development, and vegetation removal, excavation and construction of impervious surface areas.

ESEE consequences for residential development are addressed in Section 3, ESEE

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<sup>4</sup> The R-1 zone has a minimum lot size of 30,000 square feet, the R-2 zone 15,000 square feet, the R-3.5 zone 10,000 square feet, and the R-4.5 zone 7,500 square feet. The R-7 zone allows 8 units per acre, the R-12 zone 14 units per acre, and the R-25 zone 29 units per acre. There are no STGs on land zoned R-40.



Analysis for City Limits. See discussion under Goals 5-7 (Natural Resources, Water Quality, Natural Hazards) and Goal 10 (Housing).

- **Mixed Use Zones (MU)**, including the MUE and MUR zones. The mixed use zones allow varying intensities of industrial, commercial, and residential uses. Large-scale commercial and industrial development is generally restricted in mixed use zones, and public facilities are allowed through the conditional use process. Mixed use zones include open space requirements and preservation of healthy, mature trees to the extent practicable. Vegetation removal and grading are allowed as part of the construction process.<sup>5</sup>

ESEE consequences for mixed use development are addressed in Chapter 5, ESEE Analysis for the City Limits. See discussion under Goals 5-7 (Natural Resources, Water Quality, Natural Hazards) and Goals 9 and 10, (Economy and Housing).

- **Industrial, Commercial and Office (IND-COM)**, including the I-L, I-P, C-G and C-P zones allow industrial uses and varying intensities of office and commercial uses primarily through the building permit review process, although land divisions or planned developments may also be required. Like the residential and commercial zones, streets, public facilities, vegetation removal and grading are allowed as part of the construction process.

ESEE consequences for industrial, commercial and office development are addressed in Section 3, Tigard ESEE Analysis. See discussion under Goals 5-7 (Natural Resources, Water Quality, Natural Hazards) and Goal 10 (Housing).

## Tigard's Existing Natural Resource Protection Program

The Goal 5 Rule recognizes that "acknowledged policies and regulations may be considered sufficient to protect the resource site." Thus, Tigard's proposed Regulatory Incentives Program and this ESEE analysis should be seen in the context of existing programs that already limit conflicting uses for STGs:

- Metro's water quality and riparian corridor functional plans (Title 3 - Water Quality and Flood Management and Title 13 - Nature in the Neighborhoods);
- Tualatin Basin Program recommendations and ESEE analysis for significant riparian corridors and wildlife habitat (which overlap considerably with STGs);
- TDC Chapter 18.775 Sensitive Lands which implements Titles 3 and 13 and Tualatin Basin Program recommendations);
- TDC Chapter 18.790 Urban Forests, which sets standards for urban forest management and provides regulatory incentives for preservation of existing trees; and

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<sup>5</sup> There are no STGs located on land zoned MUE; there are several STGs on land zoned MUR.



- Clean Water Services Design and Construction Standards, which includes standards and incentives related to improving water quality throughout the Tualatin River basin.

Together, these programs provide a baseline of protection for Tigard’s floodplains, steep slopes, wetlands, rivers, streams, and riparian corridors (including forested areas and wildlife habitat).

### **Effect of Tigard’s Regulatory Program**

As noted in Section 1 of this ESEE Analysis and as shown on Map C – Significant Tree Groves in Relation to Regulated (Title 3) and Non-Regulated (Title 13) Sensitive Lands, most of Tigard’s STGs are located (partially or entirely) on land that is protected to some degree by TDC Chapter 18.775 Sensitive Lands.

Chapter 18.775 implements Metro Titles 3 and 13 – one of which is mandatory (Title 3) and one of which is not (Title 13). Accordingly, there are two levels of “Sensitive Lands” protection for land and water resources that are subject to:

- (1) Metro Title 3 protection through TDC Chapter 18.775; and
- (2) Metro Title 13 protection, as interpreted by Tualatin Basin Program recommendations, also through TDC Chapter 18.775.

The distinction is important, because the first level of protection (Title 3) restricts most types of urban development; this is why land with Title 3 protection is considered “unbuildable” and is not included in Metro calculation regarding housing and employment capacity. **Tigard has determined that acknowledged Sensitive Land regulations that implement Metro Title 3 requirements are adequate to protect STGs from all conflicting uses *except* vegetation removal.**

Title 3 Sensitive Land includes property within the 100-year floodplain, land with slopes of 25% or greater, natural drainageways and wetlands (including vegetative buffers). Tigard has 70 STGs covering 544 acres; however, 335 of the 544 inventoried tree grove acres (62%) already have Title 3 protection. Most urban development conflicts have *already* been resolved in favor of resource protection on Title 3 Sensitive Lands.

### **In contrast, Title 13 Sensitive Land regulations offer very limited protection for vacant STGs that are not protected by Title 3.**

- There are a total of 124.5 vacant STG acres (23% of total STG acres); of these 93 vacant acres have a Title 13 Sensitive Lands designation. Title 13 Sensitive Lands are considered “buildable” for planning purposes – *unless* all or part of an STG is dedicated to the city or protected via a restrictive covenant.
- The remaining 32 acres (6%) of Tigard’s STGs are located completely outside of Title 3 and 13 Sensitive Lands.





Since Tigard and CWS have limited funds for tree grove acquisition, protection of STGs outside of Title 3 Sensitive Land areas depends primarily on the effectiveness of Tigard's proposed Regulatory Incentives Program. **This ESEE Analysis focuses on unprotected STGs outside of Title 3 Sensitive Land areas.**

Figure 2.1 shows an example of how Title 3 and 13 Sensitive Lands affect two STGs in Tigard. Note that the STG west of the railroad tracks is entirely within Title 3 Sensitive Lands or Title 13 Sensitive Lands. Note also that the STG boundary excludes developed residential lots. The STG east of the tracks is almost entirely within Title 13 Sensitive Lands.

**Figure 2.1 – Typical STG with Sensitive Lands Overlay**



### **Vegetation Removal, Grading and Construction of Impervious Surfaces**

Tigard Comprehensive Plan designations and primary zoning districts permit land uses that conflict with the full protection of STGs; the primary conflicts occur at the time of site preparation and construction when trees are removed. Vegetation removal, grading, root disturbance and construction activities can have severe adverse impacts on natural resource values identified in the *Tigard Tree Grove Assessment* and summarized



on pages 1-6 and 1-7 of this report. These impacts continue when forested areas are paved or built upon, making re-vegetation and soil permeability unlikely. Maintaining multiple layers of native vegetation is an important factor in determining wildlife habitat significance, water quality and groundwater recharge, and scenic value. Excavation results in loss of vegetation, root disturbance, exposed soils and increased erosion, and altered drainage patterns and water courses. Impervious surface areas decrease water recharge, create urban "heat islands," and eliminate wildlife habitat.

Vegetation removal and grading activities may occur independent of residential, commercial, industrial, park or school construction, and may not be regulated outside of the development review processes (*e.g.*, design review, land divisions, planned developments, or building permits). Because they typically are associated with all conflicting land uses, vegetation removal, grading activities, and creation of impervious surface areas are considered as separate conflicting activities.

### **Conflicting Use Matrix – by Significant Tree Grove**

Table 2.1 shows conflicting use information in another format. It is organized by conflicting use category as determined by the underlying zoning district, identifies STGs that fit within each category, and further describes conflicting uses allowed by zoning. This table also explains where conflicting uses are addressed in Section 3 of this ESEE Analysis.

Please note that Table 2.2 on the following page recognizes that the City's existing Sensitive Lands regulations have *already* limited conflicting uses identified in Table 2.1.

**Table 2.1 Summary of STG Conflicting Uses**

<b>Conflicting Use Categories</b>	<b>STG Numbers</b>	<b>Conflicting Use Description</b>
<b>Low Density Residential</b> (Development Impacts Addressed Under Goal 10, Housing)	3, 8, 9, 10, 11, 12, 13, 14, 17, 19, 22, 25, 32, 33, 35, 36, 37, 42, 45, 46, 47, 48, 49, 51, 51a, 52, 56, 56a, 59, 60, 62, 63, 64, 65, 68, 69, 73, 75, 77, 81, 83, 86a, 91, 93, 95, 96, 99, 99a, 100, 101	The Low Density Residential zones permit lower density urban residential uses (1.2 to 5.8 dwelling units per acre), including detached and attached single-family dwellings, community recreation, day care, residential home and facility, minor utilities. Planned Developments (reviewed through a discretionary process) may allow on-site density transfers. Moderate land clearing and grading, vegetation removal, site maintenance; moderate impervious surfaces.
<b>Medium and High Density Residential</b> (Development Impacts Addressed Under Goal 10, Housing)	2, 22, 24, 25, 31, 37, 42, 46, 55, 57, 59, 65, 67, 71, 73, 74, 75, 79, 83, 86, 86a, 89, 90, 93, 96, 97, 99, 99a, 100, 101	The Medium and High Density Residential zones permit urban residential uses (between 7 to 14 units per acre for Medium, 23 to 29 units per acre for Medium-High, and no minimum lot size for High Density), including detached and attached single-family dwellings, community recreation, day care, residential home and facility, minor utilities. PDs (reviewed



<b>Conflicting Use Categories</b>	<b>STG Numbers</b>	<b>Conflicting Use Description</b>
10, Housing)		through a discretionary process) may allow on-site density transfers. More intensive land clearing and grading, vegetation removal, site maintenance; moderate-to-high impervious surfaces.
<b>Mixed Use Residential</b> (Development Impacts Addressed Under Goal 10, Housing and Goal 9, Economy)	2, 17, 23, 24, 30, 38, 44, 54	The Mixed Use Residential zones permit medium to high density urban residential uses, including attached single-family dwellings, duplexes, and multi-family dwellings and group homes, as well as compact commercial and industrial uses. Larger scale commercial and industrial uses are restricted. Mixed Use zones contain open space requirements and minimum floor-area ratios. PDs allow on-site density transfers. High land clearing and grading, vegetation removal, site maintenance; high impervious surfaces.
<b>Industrial, Commercial and Office</b> (Development Impacts Addressed Under Goal 9, Economy)	3, 23, 30, 38, 40, 44, 62, 71, 92, 93, 97	The Industrial, Office, and Commercial zones permit a wide range of industrial, heavy commercial, commercial uses and related uses. Most industrial and some commercial uses require single-story buildings with large areas devoted to on-site parking, resulting in substantial impervious surface areas, and high vegetation removal and site grading requirements. Other commercial and office uses may be developed in multi-story buildings to reduce the impacts upon surface areas.
<b>Public Facilities</b> (Development Impacts Addressed Under Goal 11, Public Facilities)	<b>Potentially all STGs</b>	Transportation, sanitary sewer, water and storm sewer facilities are necessary to serve primary conflicting uses. Transportation facilities increase impervious surface area, and sometimes must be routed through natural resources to achieve connectivity objectives. Other facilities, such as gravity flow sewer and storm detention facilities benefit from location near STGs, which often are located in riparian corridors and wetlands.

Table 2.2 summarizes the STG acreage within zoning districts that allow conflicting uses and activities outside of Title 3 Sensitive Lands. The matrix shows four broad categories of conflicting uses – Low Density Residential, Medium and High Density Residential, Mixed Use, and Industrial-Commercial.

**Table 2.2: STG Acreage by Zoning Category**

<b>Zone Category</b>	<b>STGs</b>	<b>Total Acres in STGs</b>	<b>Buildable Acres in STGs<sup>6</sup></b>
<b>Low Density Residential (LDR)</b>	3, 8, 9, 10, 11, 12, 13, 14, 17, 19, 22, 25, 32, 33, 35, 36, 37, 42, 45, 46, 47, 48,	253	37

<sup>6</sup> Buildable acres consist of vacant or partially-vacant parcel area located outside of Title 3 Sensitive Lands.



Zone Category	STGs	Total Acres in STGs	Buildable Acres in STGs <sup>6</sup>
	49, 51, 51a, 52, 56, 56a, 59, 60, 62, 63, 64, 65, 68, 69, 73, 75, 77, 81, 83, 86a, 91, 93, 95, 96, 99, 99a, 100, 101		
<b>Medium and High Density Residential (MDR-HDR)</b>	2, 22, 24, 25, 31, 37, 42, 46, 55, 57, 59, 65, 67, 71, 73, 74, 75, 79, 83, 86, 86a, 89, 90, 93, 96, 97, 99, 99a, 100, 101	197	49.5
<b>MU</b>	2, 17, 23, 24, 30, 38, 44, 54	19	4
<b>IND-CO</b>	3, 23, 30, 38, 40, 44, 62, 71, 92, 93, 97	75	34
<b>Total</b>		<b>544</b>	<b>124.5</b>

Source: City of Tigard GIS; Winterbrook Planning.

As shown on Table 2.2, 86% (469 acres) of STGs are located in residential or mixed use residential zones where density transfer is permitted outright. The remaining 14% of STGs are located in Industrial or Commercial Zones. A total of 124.5 buildable acres are not protected by Title 3 Sensitive Land regulations.

**The remainder of this report will focus on the identification and resolution of conflicting uses on STGs that are threatened by development – that is, on the 124.5 buildable STG acres remaining in the City.**

Chapter 3 of ESEE Analysis focuses on the economic, social, environmental and energy consequences of three decision options: (1) full resource protection, (2) no additional resource protection, and (3) providing additional but limited protection for STGs on buildable land through an incentive-based program.

Chapter 4 describes the proposed regulatory incentives program and provides examples of how this program could work in practice.



## Section 3 - Tigard ESEE Analysis for STGs

### *Introduction*

Goal 5 requires that the economic, social, environmental, and energy (ESEE) consequences of three decision options be considered prior to adoption of a formal tree grove protection program. The ESEE Analysis is somewhat complex: it requires that four types of consequences (economic, social, environmental and energy) be analyzed for three decision options (full protection, no additional protection, and limited protection), for uses and activities allowed in two categories of zoning districts applied to STG sites (Residential and Commercial/Industrial).

This ESEE analysis is further complicated by the fact that the Tualatin Basin Partners have prepared a region-wide ESEE Analysis for “significant habitat areas” – which overlap considerably with STGs. Tigard applied this regional ESEE analysis when it adopted flexible standards for development as part of a limited protection program for “significant habitat areas” in 2007.

The ESEE Analysis must be consistent with applicable Statewide Planning Goals, must consider public comments, and must explain why Tigard elected officials selected a specific tree grove protection program.

To simplify this process, this ESEE Analysis is organized around the applicable Statewide Planning Goals and discusses the ESEE consequences of the three decision options in the context of these Goals. Chapter 3 considers the “full protection” and “no additional protection” options under each Statewide Planning Goal and then focuses on the ESEE consequences of the limited protection option: the Regulatory Incentives Program recommended by the CAC and described in Section 2.

### **Goal 5 Rule Requirements**

OAR 660-023-040(4) requires that local governments conduct an ESEE analysis to determine the consequences of three regulatory options: (a) no additional resource protection (*i.e.*, allow conflicting uses and activities consistent with existing regulations without adoption of the proposed Regulatory Incentives Program); (b) limited resource protection (based on the City’s proposed Regulatory Incentives Program); and (c) full resource protection (*i.e.*, prohibit all conflicting development and land use activities).

*(4) **Analyze the ESEE consequences.** Local governments shall analyze the ESEE consequences that could result from decisions to allow, limit, or prohibit a conflicting use. The analysis may address each of the identified conflicting uses, or it may address a group of similar conflicting uses. A local government may conduct a single analysis for two or more resource sites that are within the same area or that are*



*similarly situated and subject to the same zoning. The local government may establish a matrix of commonly occurring conflicting uses and apply the matrix to particular resource sites in order to facilitate the analysis. A local government may conduct a single analysis for a site containing more than one significant Goal 5 resource. The ESEE Analysis must consider any applicable statewide goal or acknowledged plan requirements, including the requirements of Goal 5. The analyses of the ESEE consequences shall be adopted either as part of the plan or as a land use regulation.*

Consistent with the Goal 5 Rule, this section considers the ESEE consequences of:

1. Full resource site (STG) protection – prohibit all conflicting uses and activities;
2. No additional resource site protection (beyond that afforded by the City’s existing Sensitive Land regulations); and
3. Limited resource site protection (based on the Regulatory Incentives Program outlined in Section 2).

### ***Tigard ESEE Approach***

The Tigard STG ESEE Analysis is based on a three-step approach that is consistent with the Goal 5 Rule.

**Step 1** is to determine the overlap that exists between STGs and existing Goal 6 Water Quality and Goal 7 Natural Hazard protection requirements. This analysis occurs under the Goal 6 (Water Quality) and 7 (Natural Hazards) discussion.

**Step 2** is to analyze ESEE consequences of full protection, no additional protection, and limited protection for STGs within the Tigard City Limits. This City-wide approach correlates ESEE requirements with Statewide Planning Goal requirements, as explained in Subsection D, below.

**Step 3** is to analyze ESEE consequences of full protection, no additional protection and limited protection for STGs. In this section, we explain how the ESEE process was used to maintain an adequate supply of buildable land within the City Limits for employment and residential uses, while ensuring that property owners retain reasonable economic use of their property. Step 3 will justify the ultimate balancing choices made by Tigard decision-makers.

### ***Correlation among Goal 5 ESEE Factors and Goals 1-15***

Table 3.1 shows the relationship between the four ESEE factors of Goal 5 and the 13 applicable Statewide Planning Goals. The discussion following Table 3.1 elaborates on these relationships.



**Table 3.1 ESEE Consequences and the Statewide Planning Goals 1-14**

<b>Applicable Statewide Planning Goal ESEE Consequence</b>	<b>Economic</b>	<b>Social</b>	<b>Environmental</b>	<b>Energy</b>
<b>Goal 1 (Citizen Involvement)</b> Document and Consider Citizen Comments	X	X	X	X
<b>Goal 2 (Land Use Planning)</b> Adequate Factual Base Agency Coordination Consider Alternatives Ultimate Policy Choices Implementation Adequate to Carry Out Policies	X	X	X	X
<b>Goals 3 and 4 (Agricultural and Forest Lands)</b>	NA	NA	NA	NA
<b>Goal 5 (Natural Resource Protection)</b> Adequate Goal 5 Inventory Significance Determination ESEE Analysis 3 Decision Options Clear and Objective Standards		X X	X X	
<b>Goal 6 (Water Quality)</b>	X	X	X	
<b>Goal 7 (Natural Hazards)</b> Flooding Hazard Steep Slopes / Slide and Erosion Hazards	X X	X X	X X	
<b>Goal 8 (Recreational Opportunities)</b> Suitable Park Sites Park Development Impacts	X	X	X X	
<b>Goal 9 (Economic Development)</b> Adequate Land Supply Provide Jobs Provide Commercial and Office Uses Development Impacts	X X X	X X X		X
<b>Goal 10 (Housing)</b> Adequate Buildable Land Supply Affordable Housing Opportunities Clear and Objective Standards Development Impacts	X X X	X X X		X
<b>Goal 11 (Public Facilities / Services)</b> Efficient Provision of Urban Services Public Facilities Project Impacts	X X	X X		X
<b>Goal 12 (Transportation)</b> Safe and Efficient Connectivity Multi-Modal Transportation Transportation Project Impacts	X X X	X X X		X
<b>Goal 13 (Energy Conservation)</b> Housing Near Employment Micro-Climate Public Facilities				X X X



Applicable Statewide Planning Goal ESEE Consequence	Economic	Social	Environmental	Energy
Transportation Connectivity				X
Compact Urban Form				X
Maximum Efficiency of Land Use				X
<b>Goal 14 (Urbanization)</b>				
Compact Urban Growth Form	X	X	X	
Maximum Efficiency of Land Use	X	X	X	
Livability	X	X	X	

### Statewide Planning Goal Analysis

As indicated in Table 3.1, Statewide Planning Goals 1-2 and 5-14 are applicable and addressed in this analysis. Goals 3 (Agricultural Lands) and 4 (Forest Lands) are not applicable because the ESEE Analysis does not address rural land outside the Metro Urban Growth Boundary. Goal 15 is not applicable because the Willamette River does not flow through Tigard.

### Goal 1: Citizen Involvement

Goal 1 requires that the City and County actively solicit citizen input during all phases of the planning process, including all phases of the Goal 5 process – from the Goal 5 inventory to adoption of regulations and incentives. As documented below, Tigard property owners, special interests and citizens have been actively involved in each stage of the Tree Grove Protection project.

### ESEE Relationship to Goal 1

The Goal 5 administrative rule requires timely notice to landowners and opportunities for public involvement during the inventory and ESEE process in accordance with the community’s acknowledged citizen involvement program.<sup>7</sup>

### History of Urban Forestry Program

Since 2001, Tigard’s citizens have been actively involved in urban forestry issues. In 2001, the Tree Board was established to develop and administer a comprehensive tree management program for trees on public property. In 2006, the Heritage Tree program was established so that trees of landmark importance could be officially recognized and protected. In 2007 the Tree Board’s mission was expanded to develop a “City Tree

<sup>7</sup> **660-023-0060 Notice and Land Owner Involvement** Local governments shall provide timely notice to landowners and opportunities for citizen involvement during the inventory and ESEE process. Notification and involvement of landowners, citizens, and public agencies should occur at the earliest possible opportunity whenever a Goal 5 task is undertaken in the periodic review or plan amendment process. A local government shall comply with its acknowledged citizen involvement program, with statewide goal requirements for citizen involvement and coordination, and with other applicable procedures in statutes, rules, or local ordinances.





Stewardship and Urban Forest Enhancement Program” in part to ensure tree code revisions occurred in a comprehensive manner. In 2007 (to meet Metro Title 13 requirements), the City adopted a “Significant Habitat Areas Map” which expanded the lands where tree removal permits were required. In 2008, following over a year of work by the Tree Board (which included a substantial public involvement effort) the Comprehensive Plan was amended to include an Urban Forest section. The Urban Forest section contains two goals to be implemented by 22 policies. Goal 2.2 Policy 11 of the Comprehensive Plan states, “The City shall develop and implement a citywide Urban Forestry Management Master Plan.”<sup>8</sup>

In the fall of 2009 Council accepted the City’s first Urban Forestry Master Plan. A significant emphasis of the Plan is to guide the process of making Urban Forestry Code Revisions (UFCR) The UFCR project proposed to update Tigard’s approach to urban forestry regulations consistent with community expectations. The UFCR project includes the public involvement plan described below.<sup>9</sup>

### **Public Involvement Plan – Advisory Committees and Peer Review**

To ensure thorough and representative citizen involvement in the tree grove protection project, Tigard formed a 15-member Citizen Advisory Committee (CAC), composed of citizen stakeholders who advise staff and seek consensus solutions. The CAC has been meeting on tree grove protection issues since October of 2010, and has been led by an independent and neutral project facilitator in order to focus and manage the meetings, ensure meaningful input by all participants, and deal with differing views and ideas. The CAC is composed of representatives of the Planning Commission, Tree Board, Parks and Recreation Advisory Board, Transportation Advisory Committee, development interests, environmental interests, landscape/arborist professionals, and three citizens at large with technical knowledge in urban forestry issues. The CAC met 12 times from 2010-2011.

To ensure that the tree grove preservation project has a sound technical footing, Tigard formed a Technical Advisory Team (TAC). The TAC has fostered information sharing a forum to review technical issues brought to it by the Project Management Team, Citizen Advisory Committee, Peer Review Panel, and other City staff. The TAC met 11 times from 2010-2011.

Tigard also created a Peer Review Panel to provide a comprehensive technical evaluation of the draft amendments prior to consideration by the Planning Commission and City Council. The function of the PRP will be to provide a professional evaluation of the package of code amendments and program recommendations to ensure they are technically sound and are likely to perform as intended. The PRP includes private and

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<sup>8</sup> See “Tigard Urban Forestry Historical Timeline”, Urban Forestry Master Plan Appendix F (City of Tigard, 2009).

<sup>9</sup> UFCR Public Involvement Plan based on Public Involvement Plan for the Urban Forestry Code Revisions (City of Tigard, 2010)



public sector professionals and stakeholders with experience in urban forestry, development, and natural resources.

### **Public Involvement Plan – Opportunities for Participation and Information**

Over the last year, the City has hosted a series of public involvement events related to the tree grove inventory, protection program and ESEE analysis, including workshops and two open houses. These series of events were organized to inform/involve target participants, disseminate/reinforce project messages, and promote connections between project team members and stakeholders. City staff also offered presentations on the project to interested community groups and key stakeholders at their regular meetings.

The Tigard City Council and Planning Commission were briefed on tree grove project progress in work sessions in the fall of 2010, were invited to participate in events, and received project materials including the newsletter. The Tigard Planning Commission and City Council will be holding at least one public hearing each to consider public testimony related to comprehensive plan and development code amendments to implement the Regulatory Incentives Program recommended by the CAC.

Timely information on the Urban Forestry Code Revisions project has been posted on the City of Tigard's website. Website updates are announced to interested stakeholders through email communications. Project information has been made available in multiple formats: maps, flyers, factsheets, mail distribution, posters, customer counter handouts, and project displays. A "communications team" was designated for the project including the project manager. This group meets regularly to ensure successful implementation of the Communications/Public Involvement Plan.

### **CAC Recommendations**

The CAC considered several potential "limited protection" options before recommending the Regulatory Incentives Program reviewed in Section 4 of this ESEE Analysis.

### **Public Hearing Process**

Tigard is in the process of scheduling public hearings to review legislative amendments to the Tigard Comprehensive Plan and the Tigard Development Code. Through the public hearing process, the public will have additional opportunities to comment on the Tree Grove Assessment, this ESEE analysis, and the proposed Goal 5 tree grove protection program.

### **Goal 1 Conclusion**

Because Tigard citizens have been notified and provided the opportunity to be involved in all phases of the Tree Grove Protection Project, the Goal 5 amendments resulting from this project comply with Statewide Planning Goal 1, Citizen Involvement. Citizen comments related to the Limited Protection Program (Draft Regulatory Incentive Program) will be considered through the public hearing process prior to adoption of the Goal 5 program the final ESEE Analysis.



## **Goal 2: Land Use Planning**

Goal 2, like Goal 5, is essentially a procedural goal. Goal 2 requires that:

- There be an adequate factual base for making land use decisions;
- Alternatives be considered before making ultimate policy choices;
- Policy choices be clearly articulated in the comprehensive plan;
- Implementation measures be consistent with and adequate to carry out such policy direction; and that the
- Programs of affected public agencies be considered and accommodated to the extent possible.

## **ESEE Relationship to Goal 2**

### **Factual Basis and Consideration of Alternatives**

The factual basis for the Tree Grove Project includes the Tree Grove Assessment, background documentation related to the selection of Draft Regulatory Incentive Program, and this ESEE Analysis. These documents provide City decision-makers with the information necessary to make informed policy decisions related to balancing development and STG conservation objectives.

Regarding the consideration of alternatives, Goal 5 requires that the ESEE consequences of three “alternative” decision options be considered as part of the Goal 5 process. This ESEE Analysis considers the economic, social, environmental and energy conservation consequences of:

- Fully protecting all STGs;
- Providing no additional local protection for significant STGs (beyond existing sensitive land regulations); and/or
- Providing limited protection for significant STGs outside of Title 3 Sensitive Lands, as specified in the Tigard UFMP and the draft Regulatory Incentive Program.

### **Local Policy Choices**

The Tigard Comprehensive Plan (through the Urban Forestry Master Plan) provides clear direction for a limited tree grove protection program. The UFMP includes six “goals” – with corresponding sub-goals and action measures. The UFMP’s “implementation matrix” identifies the lead City division, cites supportive comprehensive plan policies, and provides information related to commitment of staff resources, relative costs, and timing. This background information sets the stage and policy context for the Tigard Tree Grove Protection Project.



Goal 3 of the UFMP is to “develop a tree grove protection program.”<sup>10</sup> There are two sub-goals:

**3.1 Focus on preserving large groves of native trees.**

**3.2 Develop a flexible and incentive based grove preservation program that meets the needs of affected property owners.**

STGs are scenic and open space resources that must be inventoried, analyzed and protected consistent with Goal 5. As noted in Section 3, Tigard’s local program to achieve Sub-goals 3.1 and 3.2 also should be considered in the context of Metro, Tualatin Basin, and local planning efforts – which already provide limited tree grove protection in designated Sensitive Lands areas.

**Regional, State and Federal Coordination**

There is no state or federal requirement for tree grove protection *per se*. Goal 5 sets forth *procedural* requirements for inventorying and protecting tree groves that are addressed in this document. Although this is a local decision, it should be considered in the context of Metro functional planning requirements (Titles 3 and 13).

***Metro Functional Plans and Tualatin Basin Goal 5 Program***

Metro’s Urban Growth Management Functional Plan (including Titles 3 and 13) has been acknowledged by the Oregon Land Conservation and Development Commission (LCDC) as complying with applicable Statewide Planning Goals – notably Goals 5, 6 and 7. Metro area cities and counties comply with the plan by updating their own comprehensive plans and land use rules to meet regional requirements.

Metro Titles 3 and 13 address watershed health and riparian corridor management consistent with corresponding statewide land use planning goals. Specifically, Title 3 addresses Goals 6 (Water Quality) and 7 (Natural Hazards), while Title 13 addresses Goal 5 (Natural Resources – specifically riparian corridors and wildlife habitat). There is considerable overlap between Title 3 and Title 13 land and water areas: *e.g.*, land may be within a floodplain and support wildlife. Region-wide, 62% of the lands protected under Title 13’s habitat designation are also protected by Title 3 water quality and floodplain designations.

***Title 3 - Water Quality and Flood Management***

The primary goal of **Metro’s Title 3** is to protect water quality and floodplain areas. More broadly, Title 3 reduces flood and landslide hazards, controls soil erosion and reduces pollution of the region’s waterways. Title 3 contains performance standards related to streams, rivers and wetlands to protect and enhance water quality. Title 3

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<sup>10</sup> Complementary goals include (1) revise the City’s tree code; (2) revise the City’s landscaping code; (4) develop a hazardous tree program; (5) improve the management of the City’s urban forestry program; and (6) develop an urban forestry stewardship program.



establishes Water Quality Resource Areas (WQRA) along rivers, streams, and wetlands, and sets mandatory performance standards intended to prevent encroachment into forested corridors along these water bodies. The width of these WQRAs varies depending on the slope of the land adjacent to the water body. The WQRA width is 50 feet generally, and 200 feet where slopes exceed 25%. The performance standards limit encroachment, prohibit storage of hazardous materials in water quality areas, require erosion and sediment control, and require planting of native vegetation on the stream banks when new development occurs. Title 3 also establishes and maps Flood Hazard Management Areas and requirements, including a regional requirement to balance cut and fill in areas identified on Title 3 maps.

Notably, Metro’s Title 3 (as implemented by Tigard’s Sensitive Lands Chapter) restricts most types of urban development that would otherwise conflict with resource protection. Tigard has 544 STG acres of which 335 (62%) are *already* protected by Title 3 Sensitive Lands provisions.

### ***Title 13 – Nature in the Neighborhood (Tualatin Basin Natural Places)***

**Title 13** was adopted by Metro in 2005 and establishes the Nature in Neighborhoods program to protect, conserve and restore significant riparian corridors and wildlife habitat. In its summary and conclusions of the ESEE analysis for Title 13 program alternatives, Metro acknowledged the important role of regulatory and non-regulatory measures to protect important natural resources in the region. Metro observed that non-regulatory tools have been most effective when used in conjunction with a regulatory program to protect important resources.

Tualatin Basin Partners (which included eight Tualatin Basin cities, Washington County, THPRD and CWS) adopted regionally significant riparian corridors and wildlife habitat inventories prepared by Metro *but* conducted a separate ESEE analysis and developed a separate, *non-regulatory* program to implement Title 13. The Tualatin Basin ESEE analysis considered the trade-offs of allowing, limiting or prohibiting conflicting uses from a basin-wide perspective.

From Metro’s perspective, Title 13 areas (that lie outside of Title 3 areas) are considered buildable – unless acquired by a public agency or conserved through a recorded deed restriction. Cities are required to monitor Title 13 areas that are protected through acquisition or easement so that Metro can incorporate this information into its regional buildable lands inventory. Approximately 38% (209 acres) of Tigard’s STGs are *not* protected by Title 3 Sensitive Lands provisions (of these, 84.5 acres are developed – leaving 124.5 vacant buildable acres). Approximately 159 acres (29%) are located on Title 13 Sensitive Lands and the remaining 50 acres (9%) do not have a Sensitive Lands designation.

### ***Tigard 2007 TDC Amendments***

In 2007, Tigard adopted amendments to TDC Chapter 18.775 Sensitive Lands and TDC Chapter 18.790.040 Urban Forests to implement non-regulatory incentives (*e.g.*, density



bonuses, lot size averaging, setback and lot size reductions, and minimum density reductions) based on Title 13 (Tualatin Basin Program) recommendations.<sup>11</sup> However, neither of these chapters specifically restricts tree removal within significant sensitive habitat areas on Title 13 Sensitive Lands.

TDC Section 18.790.040 includes limited incentives for tree retention throughout the community – regardless of whether a tree (or stand of trees) is located within a STG or not. These incentives include modest residential density bonuses; allow lot size averaging; permit modest lot width and depth reductions; and allow limited parking space and landscaping reductions for commercial, industrial and civic land uses.

### ***Tigard's 2011 Regulatory Incentives Program***

As noted in Section 2 of this ESEE Analysis, there is considerable overlap between STGs and Title 13 Sensitive Lands. Tigard's proposed limited protection program includes a series of regulatory incentives (density transfer, height increases, flexible setbacks, lot size reductions, and minimum density reductions). These provisions are consistent with the broad policy direction provided by (a) the Tualatin Basin Program Implementation Report, which was supported by (b) the Tualatin Basin Partners ESEE Analysis. Arguably, the 2004 Tualatin Partners ESEE Analysis covers Tigard's 2011 STG limited protection program.

**However, as documented in Section 4 of this ESEE Analysis (Table 18.790.1), the 2011 STG Regulatory Incentives Program offers much stronger and more effective density transfer, lot size reduction, setback reduction and height increase provisions than recommended by the Tualatin Basin Partners.**

Therefore, this 2011 ESEE Analysis must consider separately the consequences of Tigard's proposed STG Regulatory Incentives Program.

### **Goal 2 Conclusion**

For the reasons stated above, the Tree Grove Assessment provides an adequate factual base, this ESEE Analysis demonstrates that alternative programs were considered and that regional programs have been considered, and the UFMA provides ultimate policy direction that is implemented consistently and effectively by the proposed Regulatory Incentives Program. For these reasons, the Tigard Tree Grove Project complies with Statewide Planning Goal 2, Land Use Planning.

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<sup>11</sup> See *Tualatin Basin Program Implementation Report*, pp. 52-68 and 104-109.



## Goal 5: Natural Resources

Goal 5 reads (in relevant part) as follows:

*To protect natural resources and conserve scenic and historic areas and open spaces.*

*Local governments shall adopt programs that will protect natural resources and conserve scenic, historic and open space resources for present and future generations. These resources promote a healthy environment and natural landscape that contributes to Oregon's livability. \* \* \**

*Following procedures, standards, and definitions contained in commission rules, local governments shall determine significant sites for inventoried resources and develop programs to achieve the goal.*

Goal 5 is largely procedural in nature: it requires that certain steps be followed before making a decision regarding the level of protection that should be afforded to significant Goal 5 resource sites. It sets forth a *process* for resolving conflicts between natural resource preservation on the one hand, and urban development on the other. Goal 5 does not mandate "protection" of significant natural resource sites as that term is commonly used. Rather, as explained in the Goal 5 Rule (OAR Chapter 660, Division 23), "protect" means to develop a program consistent with this division."

As required by the Goal 5 Rule, the Tree Grove Assessment is a valid Goal 5 inventory showing the location, quantity, and quality of STG sites within the Tigard City Limits. The Goal 5 Inventory is shown on Map A. The location, quantity and quantity of STGs are summarized in Section 1 of this ESEE Analysis.

The Goal 5 Rule also requires that uses (*i.e.*, land uses and related activities) that conflict with the full protection of significant Goal 5 resource sites be identified. Section 2, Conflicting Use Identification, describes conflicting uses (*i.e.*, permitted and conditional uses allowed by applicable zoning districts) that are allowed by the Tigard Comprehensive Plan and Development Code. The primary conflicting activities resulting from permitted and conditional uses are vegetation removal and excavation that impacts root systems, which typically occur during the site preparation phase of an approved development, but potentially could occur at any time. Tigard's proposed land use regulations "limit" these activities by offering incentives to minimize impacts on STGs as described in the Regulatory Incentive Program.

Finally, the Goal 5 Rule requires that local governments make a "decision" regarding the level of protection that should be afforded significant Goal 5 resource sites – but only after conducting an ESEE analysis. Section 1 describes the three program options



available to Tigard (full resource protection, no resource protection and limited resource protection). Section 4 includes an outline the Regulatory Incentive Program (limited protection option) selected by CAC. This section discusses the ESEE consequences and Statewide Planning Goal implications of the three decision options for the City Limits as a whole.

### **ESEE Relationship to Goal 5 Significant Resource Sites**

This section focuses on the *environmental and social consequences* of the three Goal 5 decision options.

*Economic consequences* are considered under the discussion of other goals – especially Goals 9 (Economy), 10 (Housing), 11 (Public Facilities) and 12 (Transportation). That discussion addresses the economic consequences of full and no additional protection options on two general conflicting use categories: commercial/industrial (Goal 9), residential (Goal 10), and public facilities (Goals 11 and 12). The economic value of STGs includes enhanced property values, reduced stormwater management costs, carbon sequestration, and reduced energy costs. Economic costs include tree grove maintenance costs. The discussion of *energy consequences* is consolidated under Goal 13, Energy Conservation.

### **Environmental and Social Consequences of Full and No Additional Protection Options for Land without Natural Hazards**

As noted under the Goal 6 and 7 discussions that follow, STGs offer substantial environmental and social benefits by helping to maintain air, water, and land resource quality and by mitigating natural hazards. The discussion below focuses on additional environmental and social consequences that would result from the full protection and no additional protection options.

#### ***Environmental Consequences***

STGs provide a variety of independent ecological functions which are summarized below:

- Air quality benefits: addressed under Goal 6;
- Hydrological water quality and stormwater management benefits (addressed under Goals 6 and 7);
- Microclimate amelioration benefits: addressed under Goal 13; and
- Wildlife habitat and carbon sequestration benefits: addressed below.

#### **Significant Wildlife Habitat Benefits**

The *Tigard Tree Grove Assessment* explicitly inventories and ranks STGs according to their wildlife habitat function. STGs provide food and shelter for urban fauna. Most STGs are within or adjacent to riparian corridors that are part of a regional wildlife habitat system (*e.g.*, Fanno Creek and the Tualatin River). Thus, STGs provide habitat





for wildlife, supplying food, water, and cover for a variety of urban fauna, such as deer, squirrels, and birds.<sup>12</sup>

As documented in the *Tree Grove Assessment*, STGs vary in their potential habitat value depending on the size, structure, and connectedness of the resource site. Healthy forests of large size, high connectivity and/or high structural complexity (mixed herb, shrub and tree layers) generally provide greater habitat values than other resource sites. Resource sites located along riparian corridors or linked to larger upland habitats provide important opportunities for wildlife migration in Tigard.

The full protection option would prohibit all land uses and activities that conflict with (*i.e.*, reduce the integrity of) wildlife habitat values documented in the *Tigard Tree Grove Assessment*, which is incorporated into this ESEE Analysis by reference. Full protection of significant STGs would reinforce connections with regional wildlife habitat systems.

Conversely, the no additional protection option would have negative environmental consequences, because regulatory incentives would not be adopted to encourage STG preservation, making it more likely that conflicting urban uses and activities identified in the *Tree Grove Assessment* would occur. Without effective regulatory incentives, it is highly probable that the environmental values outlined above, and discussed in greater detail in the *Tigard Tree Grove Assessment*, would be lost.

### ***Social Consequences***

The social consequences of the full protection and no additional protection options are mixed.

On the one hand, the Tigard Comprehensive Plan recognizes the importance of tree groves to the quality of life of area residents. Tigard's STGs have matured over the course of many years as the Tigard community itself has grown. The City's urban forests are critically important to the quality of its urban fabric. They define residential neighborhoods and form the backdrop for commercial and industrial developments.

On the other hand, full protection would prohibit many socially-beneficial uses that are currently allowed within Sensitive Land areas, such as public facilities and water-dependent uses.

Social benefits resulting from the full protection option (but would be foregone in the no additional protection option) include:

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<sup>12</sup> See also *Oregon Tree Guide: Benefits, Costs and Strategic Planting* (McPherson, Maco, Peper, Xiao, VanDerZanden and Bell, International Society of Arboriculture, Pacific Northwest Chapter, 2002).



- Aesthetic and scenic values
- Health benefits
- Recreational and educational values
- Public safety and welfare
- Screening and buffering
- Noise attenuation

### **Aesthetic and Scenic Values**

Tigard’s urban forests are an important part of the community’s identity and help to shape and define individual neighborhoods within the City, creating a sense of place. The City’s riparian corridors and associated STGs convey a distinctive character and aesthetic value to residential neighborhoods and to the quality of life of their residents. They enhance the appearance of the built environment and in some cases serve as local landmarks, uniquely distinguishing a neighborhood or place.

Tigard takes urban forestry seriously and is justifiably proud to be recognized as a “Tree City USA”. Recent amendments to the comprehensive plan call for protection of tree groves – while respecting individual property rights and encouraging appropriate urban infill. The City’s *Urban Forestry Master Plan* (UFMP, November 2009) underscores Tigard’s commitment to the comprehensive management of Tigard’s 1,853 acres of existing tree canopy through a variety of methods – including incentives-based protection for STGs.

Research has shown that the public appreciates the connection between trees and the aesthetic quality of their communities. In one study, the majority of residents reported damage to trees as the single greatest loss sustained by their communities in the aftermath of a major storm that caused widespread damage to homes and property (Hull 1992).

### **Stress Reduction and Health Benefits**

STGs are known to have immediate and lasting physical and psychological health benefits. As discussed above, trees improve air quality and remove pollutants such as nitrogen dioxide, carbon monoxide, sulfur dioxide, ozone, and airborne particulates. Every year trees in Tigard purify the air and remove enough pollutants to provide substantial savings in health care and associated costs (American Forests 2001).

While improving air quality and reducing related respiratory illnesses, riparian and upland tree groves can also significantly reduce stress for people who live close to them. Researchers have shown that brief encounters with trees and natural environments can reduce stress and aid cognitive fatigue recovery, improving a person’s capacity to concentrate (Kaplan and Kaplan 1989). Similarly, other researchers have found that people who view trees and natural environments after stressful situations show reduced physiological stress response, as well as better interest and attention and decreased feelings of fear and anger or aggression (Ulrich et al. 1994). Related studies by Ulrich have shown that driving along scenic roads reduced driver stress and had an



“inoculation” effect in which drivers responded more calmly to stressful situations (Aronson 2003).

Forested areas have been credited with reducing aggression and violence in cities and encouraging positive social behavior. Crime reduction can be a major benefit of trees planted in urban neighborhoods (Sullivan and Kuo 1996). Researchers also found that children who could see urban forests from their windows were better able to concentrate and to control impulsive behavior. In general, trees afforded a place for neighbors to meet and get to know each other – a place where friendships developed into a network of support for the residential community.

In a study of recuperation rates after surgery (Ulrich 1984) found that patients recovering from surgery recovered more quickly and needed fewer painkillers if they had a view of trees from their hospital bed. Therapists are now using trees and other plants to help people with physical and mental problems.

As discussed under Economic Consequences, visual contact with nature can also improve office worker productivity and job satisfaction, which has important health implications. Office workers with a view of trees and greenery reported better overall health, and had a significantly lower incidence of illness (Kaplan and Kaplan 1989).

### **Recreational and Educational Values**

Tigard’s extensive system of public parks and open space areas include substantial forested areas. STGs on private lands can also provide neighborhood recreational and educational benefits. Trees greatly contribute to the recreational experience by bringing aesthetic, scenic, and natural qualities to the settings people select for outdoor leisure. They make these places more comfortable by providing shade and moderating local climate conditions.

Forested riparian and upland wildlife habitat areas offer an immediate connection to nature within an urban area, in parks, as protected private open space, and in back yards. This can be especially important to children or people with limited mobility who otherwise have little contact with nature. People appreciate the value that forested areas add to the recreational experience: a survey of park users found a strong preference for a mostly wooded recreational site versus a grassy but sparsely treed site (Dwyer et al.1989).

STGs also attract birds and urban wildlife. Wildlife viewing is a popular activity among metropolitan area residents and visitors. (Houck and Cody, eds. 2000) Wildlife viewing has increased steadily since 1980, when a nationwide survey of wildlife-related recreation found that 55% of respondents interact with wildlife near their homes by watching, feeding, photographing, or painting them (Shaw et al. 1985). In Seattle, a survey found that 90% of park-users reported that the presence of wildlife enhanced their recreational experience of the park (Dick and Hendee 1986).



## **Public Safety and Welfare**

Trees play an important role in protecting communities from risks associated with natural hazards such as landslides and flooding. (See Goal 7 discussion.) Trees are important to maintaining stable slopes and “perform a major engineering role in protecting the landscape” (Morgan and Rickson 1995). Trees and other vegetation help stabilize slopes by absorbing water via roots and transpiring it back into the atmosphere through leaves, by increasing the penetration of water into the soil and thereby reducing surface erosion, and by providing a root system that increases the physical cohesion of the soil mass, both vertically and horizontally (Coppin and Richards 1990). Many of the landslides that occurred during the winter of 1996 in the Portland metropolitan area involved slopes that had previously had trees removed.

Outside of areas already protection by Title 3 Sensitive Land regulations, healthy urban forests can also reduce flood-related injuries and property damages. Urban trees can reduce peak storm runoff by as much as 20% through water absorption and evapotranspiration and significantly reduce the risk of floods (Boykin 2003).

## **Screening and Buffering**

STGs can act as an “edge” between different land uses, creating visual buffers, for example, between business and residential areas. This vegetation can also help to establish community character as noted previously and can help unify developments or neighborhoods, just as they can be used to separate and create buffers.

At a smaller scale, urban forests can screen unattractive areas and objects, and can serve to soften and buffer structures and parking lots. Trees also can be used to create privacy for individual homeowners, such as provided by riparian vegetation along a property line.

## **Noise Attenuation**

Noise in urban areas can reach unhealthy levels: some construction processes, for example, can produce noise exceeding 100 decibels, which is considered high intensity noise that can be very damaging, even in very short durations. Urban forests can form a barrier that partially deadens the sound from traffic, manufacturing processes, construction activities, and other loud noises. STGs reduce sound directly by reflecting and absorbing its energy. For example, a 100-foot-wide tree buffer has been shown to be capable of reducing noise levels by 6 to 8 dba (Leonard and Parr 1970). Trees also can mask some noise with the sound of their rustling leaves and wind through the branches (Harris 1992). STGs can absorb more high frequency than low frequency noise, an added benefit since higher frequencies are most distressing to people (Miller 1997).

## ***Social Costs (Adverse Social Consequences)***

Full protection of natural resource areas *in an urban context* has counter-balancing social costs. In contrast, if Tigard were to maintain existing regulations (the no



additional protection option) then the community would not incur these adverse social costs.

Adverse social consequences associated with the full protection option include:

- *Social Equity* – the view that property owners should not bear the full burden of maintaining STGs solely because they had been good stewards of the land in the past.<sup>13</sup>
- *Urban Wildfires* – Full protection can endanger homes and businesses at the edge of areas with significant and combustible vegetation. There could be adverse social impacts associated with unprotected homes at the edge of fully protected areas. (See Goal 7 ESEE discussion.)
- *Recreational Activities* – full protection of all significant resource areas could prohibit even passive recreational uses and activities, such as trail construction or picnic areas. Such uses and activities have enormous social value for area residents. (See Goal 8 ESEE discussion.)
- *Employment Opportunities* – In limited circumstances (*e.g.*, industrial and commercial areas) – full protection of STGs would marginally decrease the supply of development-ready industrial land necessary for basic employment opportunities. Loss of such jobs could have adverse social consequences for the community. (See Goal 9 ESEE discussion.)
- *Affordable Housing* – The provision of affordable housing is critically important to maintaining to meeting Tigard’s housing and employment goals. Protection of all STGs – with concomitant density transfer – could reduce the City’s residential buildable land area and therefore would further increase housing costs for existing and future residents. (See Goal 10 ESEE discussion.)
- *Efficient Use of Scarce Public Resources* – Tigard decision-makers have a fiduciary responsibility to their constituents to use public monies wisely. The full protection option could increase the costs of providing public infrastructure and therefore would have adverse long-term social consequences for existing and future community residents. Maintaining continued confidence in the ability of City elected officials is also a governance issue: the community’s long-term ability to work together to solve environmental, social, economic and energy problems depends in significant part on the confidence that the citizenry places in local elected officials. (See Goal 11 and 12 ESEE discussions.)
- *Premature Loss of Rural Open Space* – Inefficient use of land within the Tigard City Limits will result in premature conversion of farm and forest land to urban uses to meet urban growth needs. There are enormous social benefits for Tigard area residents associated with maintaining such rural lands. (See Goal 14 ESEE discussion.)

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<sup>13</sup> Social equity issues repeatedly were raised in public workshops and hearings before the CAC. The issue of fairness to property owners who had maintained forested areas for years in anticipation of eventual urban development was a major consideration for CAC members. Evidence of social equity concerns is found in the minutes of public workshops held by the CAC from October 2010 through June 2011.



Full protection of STGs could have other minor social costs. Pollen from vegetation causes allergies for some people. Citizens may incur costs associated with allergy relief and medication. Another social issue relates to safety and defensible space. Forested areas with understory vegetation can be a safety concern for local communities. In Tigard, however, forested areas with dense understory vegetation are uncommon, and are generally located at a distance from populated areas. In Tigard's STGs, trail systems and recreational facilities will be designed with careful attention to public safety issues.

In contrast, the no additional local protection option would avoid both the social costs and benefits that could result from full STG protection. The no additional protection option would be inconsistent with the social values expressed in the Tigard UFMP. The no additional local protection option would result in further degradation to air, land, and water resources quality – with corresponding adverse social consequences. Allowing conflicting uses fully without protection incentives for STGs would result in the loss or degradation of one of the defining characteristics of Tigard neighborhoods, eroding the City's visual quality and livability. Health benefits (with the exception of allergies), recreational and educational values, screening and buffering, and noise attenuation values also would be lost or degraded. Tigard residents place a high premium on environmental values. If such values are not conserved in a balanced manner, public trust in elected officials and in local government would be compromised.

### **Environmental and Social Consequences of Limited Protection Program**

The Regulatory Incentives Program has the potential to achieve the environmental and social benefits of the full protection program, while avoiding most of the negative consequences of the no additional protection option.

- Approximately 86.5 of the 124.5 buildable acres with STGs are designated for residential use (or mixed use) and are therefore eligible for density transfer under proposed TDC amendments – thus providing the opportunity to avoid most of the negative consequences that could result from full protection. In the Goal 10 Housing discussion, Winterbrook estimates that approximately half of these 90 acres will be protected – without loss of residential density – as a result of the Regulatory incentives program.
- Some 34 of the 124.5 buildable acres with STGs are designated for commercial or industrial use – where density transfer is unlikely. In the Goal 9 Economic Development discussion, Winterbrook estimates that the Regulatory Incentives Program will protect relatively little buildable employment land – so that the social benefits (jobs) resulting from efficient use of Tigard's limited supply of employment land are unlikely to be adversely affected.

The density transfer provisions of the Regulatory Incentives Program will allow for strategic placement of public facilities necessary to serve development and transportation improvements necessary to connect development in Tigard. By allowing for removal of dead and diseased trees the likelihood of wild fires will be reduced.



In summary, the Regulatory Incentives Program represents a creative balance that avoids many of the adverse environmental and social problems associated with the two extremes discussed above. The limited protection program provides incentives for protection of all or part of 70 STGs through effective density transfer and setback reduction provisions. The limited protection program allows for public infrastructure and similar relatively low-impact uses that provide substantial public benefits without a corresponding loss of environmental value.

### **Goal 5 Conclusion**

The proposed Regulatory Incentives Program (limited protection program) maintains most of the environmental values described in the *Tree Grove Assessment* without sacrificing important social values associated with social equity, wildfire protection, park development, industrial employment opportunities, affordable housing, the efficient provision of public facilities and services, and compact urban growth form. As a result of this ESEE Analysis the proposed Regulatory Incentives Program would provide *limited* protection for STGs with buildable land outside of Title 3 Sensitive Lands areas – approximately 23% (124.5 acres) of the STGs within the Tigard City Limits.



## Goal 6: Air, Land and Water Resource Quality

Statewide Planning Goal 6 requires that cities adopt policies and implementation measures to ensure that air, land, and water quality are not “degraded” and that state and federal environmental quality standards are met. Statewide Planning Goal 6 is implemented on a regional basis by Metro Title 3 and CWS regulations. Metro Title 3 is implemented by CWS and by the City through Chapter 18.775, Sensitive Lands.

### ESEE Relationship to Goal 6

Tualatin Basin Partnership communities, in coordination with CWS, have adopted several programs to achieve the purposes of Goal 6 throughout the Tualatin River Basin, including:

- Stormwater Master Plans
- Erosion Control regulations
- Pollution Control regulations

The proposed Regulatory Incentives Program does not apply to land that is not already protected by Title 3 Sensitive Lands regulations. Nevertheless, protection of STGs (both within and outside of Title 3 Sensitive Land areas) helps to maintain air, land, and water resource quality by reducing the impacts from urban development. Conversely, if STGs are not protected, there are adverse consequences for air, land and water resource quality.

The Goal 5 administrative rule (OAR 66-023-0240) states that Goal 5 procedural requirements do not apply to measures that implement Goal 6, provided that such measures do not “exceed” the requirements of these goals.

*(1) The requirements of Goal 5 do not apply to the adoption of measures required by Goals 6 and 7. However, to the extent that such measures exceed the requirements of Goals 6 or 7 and affect a Goal 5 resource site, the local government shall follow all applicable steps of the Goal 5 process.*

### ESEE Consequences of Full and No Protection Options for Air, Land, and Water Resource Quality

This section considers environmental, economic and social consequences of fully protecting STGs (including those with limited Title 3 protection) and of not providing additional protection for STGs (allowing conflicting uses fully outside of Title 3 Sensitive Lands). Energy consequences are addressed under Goal 13, Energy Conservation.

During this discussion, it is important to remember that Tigard must comply with regional, state and federal water and environmental quality regulations in any case. Therefore, the no additional protection option retains existing local and state regulatory protection for air, land, and water resources. However, the no additional protection





option means the loss of additional benefits provided by STGs (outside of Title 3 Sensitive Lands) for air, land, and water resources quality.

Title 3, as implemented through Tigard's Sensitive Land regulations, *already* provides limited protection for streams, wetlands, floodplains, steep slopes, and their "Vegetated Corridors" (water quality setback areas) from most types of development, thereby providing benefits for air, land, and water resources quality. However, new public utilities and transportation facilities are permitted within Vegetated Corridors. (TDC 18.775.090)

Thus for Goal 6 purposes:

- The full protection option would prohibit new public utilities and transportation facilities within Title 3 Vegetated Corridors and would prohibit all tree removal and other development within STGs outside of such corridors.
- The no additional protection option would continue to allow public utilities and transportation facilities within Vegetated Corridors subject to local review and mitigation but would do nothing to protect STGs outside Title 3 Sensitive Lands areas.
- The proposed limited protection program would not change existing Title 3 regulations but would provide incentives for protecting approximately 124.5 acres of buildable land within STGs that outside of Title 3 Sensitive Land areas.

### ***Environmental Consequences***

Under the full protection option STGs within Vegetated Corridors would be fully protected. Vegetated riparian setback areas can enhance water quality in many ways. Undisturbed densely-forested riparian corridors trap sediments, inhibit erosion, and filter runoff originating from impervious surfaces, lawns, golf courses, and the like. Sedimentation and erosion, although natural processes, are accelerated in urban areas by increased impervious surfaces. Impervious surfaces also inhibit infiltration. Sediment within a riparian corridor can be from erosion of poorly forested uplands, runoff from impervious surfaces, or floods from an adjacent water resource. Sediments often carry nutrients (*e.g.* phosphates and nitrates) and pollutants (*e.g.* heavy metals, hydrocarbons) to water resources, altering water chemistry, burying spawning gravels and impacting fish and wildlife habitat. Excessive concentration of nutrients in the water can trigger algal blooms, depleting the water of oxygen required by fish and other aquatic organisms. The ability of a riparian corridor to resist erosion is related to slope, soil type, type of vegetation, vegetation cover, landscape position, and degree of human disturbance.

STGs within Vegetated Corridors also provide a valuable flood management function by reducing the force and volume of floodwaters. Floodwaters flowing into a forested, flood-prone riparian corridor can be slowed or temporarily stored, reducing peak flows and downstream flooding. Woody vegetation, in particular, resists floodwaters and reduces its velocity. Topographic features such as swales and depressions can enhance a riparian corridor's ability to manage flood flows. Reducing the velocity of floodwaters



in the riparian corridor allows infiltration of water into the soil. Water entering the soil is slowly released into the main channel, delaying its movement downstream.

STGs that provide shade near streams and wetlands can reduce water temperature. Water temperature affects the ability of a stream to support viable populations of certain aquatic organisms. Riparian shade, especially forest canopy, moderates temperature within and adjacent to a water resource. Although stream temperatures are important throughout the year, summer temperature is generally more critical for fish species such as salmonids. High water temperatures and sunlight are factors that can promote algal blooms, reducing dissolved oxygen required by anadromous fish and other cold-water dependent organisms. The aspect or orientation of the water resource and the height of the adjacent riparian vegetation play important roles in how effective riparian vegetation is in providing shade.

STGs regardless of their location can help protect soil and improve water and air quality. Trees and other plants hold soils in place during rain and wind. Land with steep slopes is especially susceptible to erosion. STGs also helps keep sediment and contaminants from entering water bodies. Trees slow stormwater runoff, thereby minimizing erosion and allowing the ground to filter out sediments and nutrients as the water soaks down into groundwater reserves or passes into streams. Since some of Tigard's STGs are located on hillsides, retention of STGs in hillside areas has positive consequences for land and water quality. STGs also improve air quality by removing carbon dioxide from the air and replenishing it with oxygen. These effects are more noticeable in developed areas, where environmental quality is more degraded.

Poor air quality is both a human and an environmental concern: air that is polluted and high in temperatures can degrade ecological functions and damage the health of local plant and animal communities. Trees within Tigard's STGs remove pollutants such as nitrogen dioxide, carbon monoxide, sulfur dioxide, ozone, and airborne particulates. Trees also help reduce wind speed so that heavy particles settle out. STGs naturally absorb carbon dioxide, storing carbon as they grow, helping to reduce the effects of global warming which can cause widespread damage to ecological communities. The average urban tree, for example, removes nearly a ton of greenhouse gas during its first 40 years of life (Boykin 2003).

STGs also help conserve soils and stabilize slopes, thus maintaining land quality. Fibrous root systems hold soil in place, reducing erosion caused by wind, rain, and surface runoff. Tree branches and leaves reduce the impact of rain on the soil. Leaves fall to the ground, decompose, and provide nutrients to the soil. By binding soils, dissipating erosive forces, and providing nutrients, trees protect and enhance the diversity and abundance of soil organisms. In the same manner, trees and their root systems help to hold and protect steep slopes from erosion and failure. Tree roots reinforce the soil, increasing soil shear strength, and bind soil particles, reducing their susceptibility to erosion.



Full local protection of STGs has clear benefits for air, land, and water quality. To the extent that STGs are removed for public utility and transportation facilities within Vegetated Corridors, some of the benefits described above can be lost. Tree removal within STGs generally will have significant adverse affects on air, land and water resource quality.

Conversely, if conflicting uses were allowed fully on STGs outside of Title 3 Sensitive Lands areas (no additional local protection), then approximately 124.5 STG acres would be lost to conflicting uses – which would have adverse environmental impacts on air, land, and water quality within the Tigard City Limits.

### ***Economic and Social Consequences***

Compliance with state and federal environmental standards can be costly for local governments. However, by fully protecting all STGs, the costs of meeting water and air quality standards can be mitigated.

For example, American Forests developed the CITYgreen 5.0 model in 2003 to calculate the amount of air pollutants removed per unit of forested area in cities throughout the United States. Based on results from the Seattle airshed, urban trees provided the following *avoided* cost results (in 2002 dollars):

- \$970 per ton of carbon monoxide;
- \$1,653 per ton of SO<sub>2</sub>;
- \$4,519 per ton of particulate matter (PM<sub>10</sub>); and
- \$6,768 per ton of volatile organic compounds and ozone.

Similar values were reported in reports prepared by the California Energy Commission (1992) and the US Office of Management and Budget (2003).

Although the 544 acres covered by Tigard’s STGs represent a small portion of Tigard’s tree canopy cover, full protection of Tigard’s STGs would nevertheless provide substantial health benefits to existing and future Tigard residents.

Tigard’s adopted stormwater master plan also recognizes the benefits natural areas provide for on-site stormwater management. When stormwater is treated at the source by saving trees or reducing pavement, then stormwater infrastructure requirements are correspondingly reduced. Costs for compliance with National Marine Fisheries Service (NMFS) requirements related to water quality and temperature can also be reduced.

In Tigard (as in other metropolitan cities), protection of STGs can reduce infrastructure construction costs, and improve long-term community relations – all of which make good economic sense. The message is clear: there are economic benefits associated with full protection of STGs in Tigard.

On the other hand, full protection of STGs may not be the most cost-effective way to achieve environmental standards. For reasons stated in the Goal 8-12 discussion, full



protection of *all* STGs would likely result in decreased efficiency of land use, and resultant increases in land acquisition and development costs for parks, businesses, housing, public facilities and transportation projects. Full protection could also increase out-of-direction travel, with attendant adverse air quality impacts.

In conclusion, there are substantial positive social and economic consequences – in terms of reduced costs for meeting local, state and federal environmental standards – associated with the full resource protection option. However, these costs need to be weighed against urban land acquisition and development costs that are addressed in other sections of this ESEE Analysis.

*If* Tigard were to allow conflicting uses fully, the costs for meeting state and federal environmental standards would likely increase substantially, along with increased infrastructure construction and maintenance costs. Reliance on “after the fact” hard engineering methods of pollution control can have substantial dollar costs that need to be considered when determining the economic consequences of allowing unrestricted development (*i.e.*, allowing conflicting uses fully). On the other hand, there would be no restrictions on development or placement of public utilities and transportation facilities, which would increase land use efficiency.

### **ESEE Consequences of Limited Protection Program for Air, Land and Water Resource Quality**

The proposed Tree Grove Regulatory Incentives Program, when combined with existing Title 3 Sensitive Land and CWS regulatory programs, provides a high level of protection for STGs.

#### ***Environmental Consequences***

Tigard’s limited protection program should be viewed in the context of existing state, regional and local programs to maintain and enhance air, land and water resources quality by strategically protecting urban forests. Although the proposed Regulatory Incentives Program does not have all of the environmental benefits that would accrue from full resource protection, the limited protection program has only marginal adverse environmental consequences for air, land, and water resource quality.

Although limited conflicting uses are permitted within Title 3 Sensitive Land areas, the 335 STG acres that now have Title 3 protection are not seriously threatened by permitted uses and activities. Moreover, about 73% of the 124.5 buildable STG acres that do not have Title 3 Sensitive Lands protection are designated for residential use – and therefore stand to benefit from clear, objective and effective density transfer provisions of the Regulatory Incentives Program.

#### ***Economic and Social Consequences***

To the extent that property owners take advantage of proposed density transfer and dimensional adjustments available through the proposed Chapter 17.090.050 incentives,



the economic and social consequences of the Regulatory Incentives Program are positive, because they will have the effect of reducing public and private stormwater collection and treatment costs and reducing health care costs associated with air pollution. (See discussion under full protection option.)

### **Goal 6 Conclusion**

Both the full protection option and the proposed limited protection program complement existing City, County, and State air, land, and water resource quality programs. When compared with the no additional protection option, both the full and limited protection programs have substantial positive ESEE consequences.



## Goal 7: Natural Hazards

Goal 7 reads (in relevant part) as follows:

*To protect people and property from natural hazards.*

*A. Natural Hazard Planning*

- 1. Local governments shall adopt comprehensive plans (inventories, policies and implementing measures) to reduce risk to people and property from natural hazards.*
- 2. Natural hazards for purposes of this goal are: floods (coastal and riverine), landslides, earthquakes and related hazards, tsunamis, coastal erosion, and wildfires. Local governments may identify and plan for other natural hazards.*

### Natural Hazard Protection and Effect on ESEE Analysis

TDC Chapter 18.775, Sensitive Lands resolves most (but not all) conflicts between development and STG preservation in Title 3 hazard areas (areas within the 100-year floodplain and with slopes of 25% or greater). Chapter 18.775 allows for limited private and public land uses and activities within hazard areas. For example, replacement of existing structures, construction of water dependent and related uses, removal of hazardous trees, construction of transportation and utility facilities, and construction of flood management facilities are permitted in Title 3 Sensitive Lands subject to locational and construction standards.

Metro and the City of Tigard consider such hazard areas “unbuildable” for purposes of meeting housing and employment needs. Because these protected hazard areas are unbuildable for most urban uses, the ESEE consequences of allowing, prohibiting or limiting conflicting uses are different for mapped hazard areas than for otherwise buildable areas.

### ESEE Relationship to Goal 7

Most of Tigard’s STGs are located in areas with Title 3 Sensitive Lands protection:

- 55 of 70 STGs (79%) are protected (at least partially) by Title 3 Sensitive Land regulations; and
- 335 of 544 STG acres (62%) are protected by Title 3 Sensitive Land regulations.

In considering this relationship, Metro and Tigard officials have already determined that protecting STGs in Title 3 natural hazard areas (where most types of development are already prohibited) generally has positive economic, social, and environmental consequences. Therefore, they determined that areas with steep slopes (potentially subject to landslide or severe slope hazards) and areas subject to flooding were considered unbuildable for most types of urban development. It follows that protecting STGs with natural hazards has fewer adverse economic and social consequences for the



general public and for property owners – as least insofar as *urban* development is concerned.

### **ESEE Consequences of Full and No Additional Protection Options for Land with Natural Hazards**

The full protection option would prohibit *all* conflicting uses and activities for STGs both within and outside of Title 3 Sensitive Land areas. The no additional protection option would mean that the City would not adopt the proposed Regulatory Incentives Program to STGS outside of Title 3 Sensitive Land areas.

#### ***Environmental Consequences***

The environmental consequences of fully protecting all STGs are positive and are discussed under Goals 5 and 6. These positive environmental consequences are reinforced in natural hazard areas, because prohibiting all conflicting uses would further decrease the likelihood of flooding in flood-prone areas and slope failure in steeply-sloped areas that in turn could adversely affect water quality in streams and harm fish and wildlife habitat. (See also discussion of environmental impacts under Goal 6.)

The environmental consequences of the no additional protection option (not applying regulatory incentives) have limited adverse impacts given Tigard's existing regulations. Since STGs outside of Title 3 Sensitive Lands provide some flood retention and slope stability benefits, tree removal in STGs that are not already protected by Title 3 Sensitive Land regulations could marginally increase the likelihood of flooding and slope failure – which in turn could degrade land and water quality and riparian habitat values. However, existing CWS stormwater management and erosion control requirements would minimize the impacts.

#### ***Economic and Social Consequences***

The economic and social consequences of full STG protection (prohibiting all conflicting uses) would generally be negative. The full protection option would prohibit all conflicting uses and activities within STGs, with adverse economic and social consequences to property owners, the general public and urban service providers. Such a complete prohibition would severely restrict the use of property for non-construction purposes (*e.g.*, yards and gardens), increase the costs of providing public infrastructure, restrict public recreational opportunities, and increase transportation costs resulting from out-of-direction travel. The full protection option would also limit the ability to locate passive recreational facilities in public parks, and the public would be unable to access natural areas with attendant adverse social consequences.

In contrast, the no additional protection option would rely on existing floodplain and slope regulations found in Chapter 17.775 Sensitive Lands to address hazards – while allowing some conflicting uses with hazard mitigation measures. The no additional protection option thus avoids the excessive restrictions that would result from full



protection of all STGs. However, the no additional protection option does nothing to *encourage* STG protection.

### **ESEE Consequences of Limited Protection Program for Land with Natural Hazards**

The Regulatory Incentives Program (limited protection program) provides incentives for STG protection outside of Title 3 Sensitive Land areas while maintaining existing regulations in areas already protected by Title 3 Sensitive Lands regulations.

#### ***Environmental Consequences***

The environmental consequences of the proposed Regulatory Incentives Program are positive, because protection of STGs reduces runoff and erosion which can contribute to flooding and slide hazards. In this manner, the limited protection program reinforces existing Sensitive Lands regulations to protect people and property from natural hazards.

#### ***Economic and Social Consequences***

Unlike the full resource protection option, the limited protection program allows conflicting private and public land uses and activities (uses allowed in the underlying zoning district, public utilities and transportation facilities) through density transfer and thoughtful site design – while encouraging protection of all or part of the STG on affected properties.

Because the existing Sensitive Lands limited protection program allows for certain private and public uses and activities within hazard areas, subject to engineering and locational standards, adverse social and economic consequences are reduced without compromising public safety.

### **Goal 7 Conclusion**

Existing Sensitive Land regulations protect STGs within Title 3 areas from most types of conflicting uses. The proposed Regulatory Incentives Program (limited protection program) applies outside Title 3 Sensitive Lands and provides an additional level of protection for tree groves on “buildable lands.”

These provisions have positive environmental consequences because they reinforce existing provisions that protect Title 3 Sensitive lands on a limited basis. The proposed TDC urban forest amendments that implement the Tree Grove Regulatory Incentives Program complement existing Goal 7, Natural Hazards, regulations by encouraging tree preservation with attendant erosion and flood control benefits.





## **Goal 8: Recreational Needs**

Goal 8 requires local governments to plan for the park and recreational needs of their community. This Goal is related to the Goal 14 requirement to provide land to meet the “livability” needs of a community. Many STGs overlap publicly-owned land or land reserved for public park and recreational use. In addition, STGs that are protected through the Regulatory Incentives Program must be dedicated to the public or protected via a conservation easement. In this sense, protected STGs will become part of Tigard’s park and open space system.

### **ESEE Relationship to Goal 8**

Planning for, developing and maintaining Tigard’s system of parks, open space, and trails are indirectly related to the level of protection afforded to STGs in the community. On the one hand, protecting STGs provides open space and may provide recreational opportunities for the residents of nearby developments, which translates into positive social and economic consequences. On the other hand, park development and human access to STGs areas can have some adverse environmental consequences.

### **ESEE Consequences of Full and No Protection Options for Meeting Long-Term Park and Recreational Needs**

With respect to park and recreational uses, the full protection option means that STGs, outside of public property, would be largely off limits to the public. Relatively minor conflicting uses such as pedestrian and bicycle trails, picnicking, and passive recreational uses – which can conflict with the preservation of wildlife habitat in STGs – would not be permitted under the full protection option. In contrast, the no additional protection option would allow unlimited development of STGs for residential, commercial, industrial or public uses – meaning that the limited wildlife habitat, water quality, flood control and slope stabilization values of STGs would be compromised.

### ***Environmental Consequences***

The environmental consequences of the full protection option are positive because conflicting active and passive recreational uses would be prohibited. Conversely, the environmental consequences of allowing conflicting park development without restriction would be negative, because environmental values described in the Goal 5, 6 and 7 sections of this ESEE Analysis would be lost.

### ***Economic and Social Consequences***

The economic consequences of the full protection option would be adverse for reasons stated in the Goals 9-14 sections of this ESEE Analysis. In contrast, the no additional protection option would do nothing to protect privately owned STGs for their open space and scenic values.



## **ESEE Consequences of Limited Protection Program for Meeting Long-Term Park and Recreational Needs**

The limited protection program provides strong incentives for the protection of STGs – especially in residential areas. In many cases, STGs overlap both private property and publicly owned parks and open space areas.

### ***Environmental Consequences***

The environmental consequences of the proposed Regulatory Incentives Program are only slightly negative. Passive recreational use of protected STGs by Tigard and area citizens will have some adverse environmental impacts on natural resource values.

### ***Economic and Social Consequences***

These relatively minor adverse environmental consequences are more than offset by the economic and social benefits that local residents and visitors derive from having visual and possibly physical access to STGs that are protected through voluntary regulatory incentives. (See discussion of open space benefits in the Goal 5 section of this ESEE Analysis.)

### **Goal 8 Conclusion**

The proposed STG Regulatory Incentives Program, as implemented by draft amendments to TDC Chapter 18.790 Urban Forestry, will have the effect of augmenting the City's park and open space system. The limited protection program avoids the extremes of full protection (*i.e.*, nature parks that no one can use) on the one hand, and no additional protection (*i.e.*, unrestricted development and loss of STGs) on the other.

Therefore, the proposed legislative changes comply with Goal 8, Recreational Needs.



## **Goal 9: Economy of the State**

Goal 9 requires Tigard to provide sufficient and buildable land within its City Limits to meet long-term needs for industrial, commercial, office and mixed use development.

### **ESEE Relationship to Goal 9**

The Goal 9 ESEE Analysis applies to land that is designated for employment (industrial, commercial, and office) uses on the Tigard Comprehensive Plan Map. The primary concern is that Tigard must maintain an adequate supply of land to meet its economic development objectives as expressed in the recently-adopted *Tigard 2011 Economic Opportunities Analysis*. If land is removed from the industrial, commercial, or office buildable lands inventory to protect Goal 5 resources, and the supply falls below the needs projected in the EOA, then Goal 9 compliance is jeopardized.

Conflicts between Goal 9 and Goal 5 resources often are difficult to resolve because commercial and industrial buildings are often single story and require large parking lots and maneuvering areas. Unlike residential areas, density transfer usually is not a viable option.

The Tigard City Council adopted the EOA in May of 2011. The EOA analyzes three employment land need scenarios ("efficient", "medium", and "high"). The employment land need in each scenario is compared to Tigard's existing buildable employment land supply. As discussed below, there are commercial and industrial land *deficits* in the Medium and High land use scenarios.

Proposed Section 18.790.050.C.3 encourages STG protection on commercial and industrial land when at least 50% of an STG on a commercial or industrial property is protected. Setbacks may be reduced by as much as 50% and heights may be increased up to 20%. Modifications to sidewalk, parking and landscaping location requirements standards may be permitted for STG protection. However, as noted below, the concept of density transfer has limited utility for commercial and industrial development types.

### **ESEE Consequences of Full and No Protection Options for Economic Development Objectives**

#### ***Environmental and Energy Consequences***

Approximately 34 buildable acres with STGs are designated for commercial or industrial use in Tigard; four additional acres are designated for mixed employment uses.

The full protection option would have positive environmental consequences for the STGs located on employment land; these positive environmental consequences are described in the Goal 5, 6 and 7 sections of this ESEE Analysis.



In contrast, the no additional protection option could have adverse environmental consequences – because there would be *no* incentive to protect STGs on scarce and valuable employment land.

As noted in the Goal 13 section, the full protection option could have serious adverse energy consequences because industrial jobs would be forced into other communities, thus increasing commuting distances and energy consumption. The result is unlikely in the no additional protection option.

### ***Economic and Social Consequences of Full and No Protection Options***

In commercial and industrial areas of Tigard, STGs can have some economic and social benefits, including reduced stormwater management and energy costs. Other economic benefits include improved consumer perceptions of businesses and greater worker productivity and job satisfaction. However, where large STGs are concerned, these benefits are less pronounced and are offset by the loss of buildable commercial and industrial land and corresponding loss of local job opportunities.

### **Consumer Perceptions and Behavior**

A recent study by researchers at the University of Washington found that consumers respond positively to commercial shopping environments with attractive trees and landscaping. Well-maintained landscapes with trees send positive messages about the appeal of a business district, the quality of products they offer, and the quality of customer service. Surveys were sent to selected districts in cities of the Pacific Northwest, Austin, Los Angeles, Chicago, Pittsburgh, and Washington, DC (Wolf 1999).

Researchers identified four categories of perceptions from participants' ratings of business districts: Amenity and Comfort, Interaction with Merchants, Quality of Products, and Maintenance and Upkeep. Consumers rated districts that had street trees and other landscaping significantly higher than those that did not. For example, *Amenity and Comfort* ratings were 80% higher, *Quality of Products* ratings were 30% higher, and *Interaction with Merchants* ratings were 15% higher (Wolf 1999).

The study also found that consumers are willing to pay as much as 12% more for products purchased in well-maintained and landscaped business districts with trees. This was true of low-price, convenience goods as well as bigger ticket items. "Given the low profit margins of most retail businesses," the researchers concluded, "trees appear to provide a significant amenity margin" (Wolf 1999).

These studies support the full protection option for STGs located at the edge of commercial retail and office areas or where a STG is located on slopes of 10% or greater – where it is possible to avoid the STG and still provide a suitable building site. However, with regard to STGs in industrial areas, the full protection option would offer relatively few of these economic and social benefits because the STGs are too large to



be integrated into an industrial development. Moreover, industrial land usually is not intended to attract consumers.

The no additional protection option would provide no incentive for protection of STGs on employment land and therefore would have no effect on the supply of employment land in Tigard.

### **Worker Productivity and Job Satisfaction**

Visual contact with trees can also improve office worker productivity and job satisfaction (Kaplan and Kaplan 1989). Office workers with a view of trees and greenery:

- 1) Found their job more challenging,
- 2) Were less frustrated about tasks and generally more patient,
- 3) Felt greater enthusiasm for the job,
- 4) Reported feelings of higher life satisfaction, and
- 5) Reported better overall health.

Office workers without a view noted 23% greater incidence of illness in the prior six months (Kaplan and Kaplan 1989). Again, these studies apply more directly to office or industrial park workers and less to manufacturing and assembly workers. These benefits are off-set in industrial and commercial areas by the high costs of industrial and commercial land, and the need to use such land efficiently within the Tigard City Limits.

In conclusion, the full protection option would mean that no development could occur within protected STGs. Given the limited supply of employment land in Tigard, this option could severely restrict expansion of businesses and could severely limit areas where new commercial and industrial development could occur. Tigard could become noncompliant with Statewide Planning Goal 9 (Economic Development). Job growth in Tigard could be greatly impaired. For these reasons, full resource protection in Tigard is not a realistic public policy option.

On the other hand, in commercial retail, office, and industrial park areas, unrestricted development could remove all vegetation and offer no additional protection for STGs. The no additional protection option, when applied on a City-wide basis, could have some adverse economic consequences for businesses, as noted in the Goal 5 section of this ESEE Analysis. Well-maintained trees and landscaped areas send positive messages about the appeal of business districts, the quality of products they offer, and the quality of customer service, as noted above. However, other City standards require attractive landscaping and canopy cover; so the loss of STGs *per se* would be unlikely to have a significant cost impact in terms of business sales.

In summary, STGs provide important amenity values for employees as well as business customers. Their presence increases worker productivity and job satisfaction significantly. These benefits could be reduced when conflicting uses are fully allowed and vegetation is cleared. However, Tigard's landscaping and tree canopy requirements



will replace these lost benefits over time. Thus, in Tigard’s case, the economic consequences of no additional protection are not substantial.

**ESEE Consequences of Limited Protection Program for Economic Development Objectives**

To address the negative ESEE consequences of the full and no additional protection options, Tigard has developed a limited protection program that provides limited incentives (in terms of setback reductions and building height increases) for retention of STGs on employment sites. Proposed Section 18.790.050.C.3 encourages STG protection on commercial and industrial land when at least 50% of STG on a commercial or industrial property is protected. Increases include the following:

- Minimum setbacks may be reduced by as much as 50%; and
- Maximum building heights may be increased by as much as 20 feet.
- Adjustments to sidewalk, parking and landscaping standards may be permitted to facilitate STG preservation.
- Protected STGs count double towards the tree canopy requirements of Chapter 18.790.050 Urban Forestry Plan.

Table 3.2 below compares employment scenario outcomes with STG acreage in Commercial and Industrial zones. As shown on Table 3.2, Tigard currently has a surplus of employment land (8 commercial acres and 2 industrial acres) under the “efficient” land need scenario, and deficits of both commercial and industrial employment land under the “medium” and “high” land need scenarios. There are 9 acres of STGs on buildable commercial land, 25 acres on buildable industrial land. In all scenarios, full preservation of STGs *would* result in a deficit of buildable commercial and industrial employment land.

**Table 3.2: Impact of STGs on Buildable Employment Land\***

EOA Scenario	Com Land Surplus (Deficit)	STG Acres on Buildable Com Land	Com Land Surplus (Deficit) with Full Protection of STGs	Ind Land Surplus (Deficit)	STG Acres on Buildable Ind Land	Ind Surplus (Deficit) with Full Protection of STGs
“Efficient”	8	9	(1)	2	25	(23)
“Medium”	(19)		(28)	(14)		(39)
“High”	(45)		(54)	(30)		(55)

Note: buildable employment land is by definition located outside of areas that are already protected by the Metro Title 3 provisions of TDC Chapter 17.775 Sensitive Lands.

However, given the short supply of commercial and industrial land in Tigard, it is doubtful whether a property owner would *choose* to use these setback, height and tree canopy incentives to protect the 50% of an STG located on buildable land. However, developers *might* take advantage of the setback, height and tree canopy compensation benefits to protect trees at the edge of large properties or on relatively unsuitable slopes (*e.g.*, “buildable” slopes of between 10 and 25%). Winterbrook estimates that



regulatory incentives will protect about 10% (4 acres) of the STGs located on buildable commercial and industrial land. Table 3.3 shows the results of this estimate:

**Table 3.3: Impact of STGs on Buildable Employment Land Assuming 20% Effectiveness**

EOA Scenario	Com Land Surplus (Deficit)	Protected STG Acres on Buildable Com Land	Com Land Surplus (Deficit) with Full Protection of STGs	Ind Land Surplus (Deficit)	Protected STG Acres on Buildable Ind Land	Ind Surplus (Deficit) with Full Protection of STGs
"Efficient"	8	1	6	2	3	(1)
"Medium"	(19)		(21)	(14)		(17)
"High"	(45)		(47)	(30)		(33)

Under Winterbrook's 10% estimate:

- Tigard will barely meet its 20-year commercial land need under the "efficient" development scenario, but will not meet 20-year commercial needs under either the "medium" or "high" land use scenarios.
- Tigard will not meet its 20-year industrial land need under the "efficient", "medium" or "high" land use scenarios.

### Goal 9 Conclusion

Tigard has a very limited supply of buildable industrial and commercial land. If Tigard were to protect all of the STGs on employment land, the City would be unable to meet employment land needs identified in the EOA.

The setback and height incentives of the proposed Regulatory Incentives Program are unlikely to result in the actual protection of more than 10% of STGs on buildable industrial and commercial land. Even under this limited protection program, Tigard will still have a shortage of industrial land in all three of the EOA's development intensity scenarios, and a shortage of commercial land in all but the "efficient" scenario.

Thus, the economic consequences of both the full protection and the limited protection options could be adverse. If the Council decides to encourage STG protection on employment land, Tigard planning staff should monitor the effectiveness of the STG protection program and, if actual buildable acreage falls below identified 20-year need, the City should amend its comprehensive plan to ensure a sufficient supply of buildable land for the 20-year planning period.



## Goal 10: Housing

Goal 10 requires Tigard to provide sufficient buildable land to meet long-term housing needs, as required by Metropolitan Housing Rule (OAR Chapter 660, Division 007) and ORS 197.303.<sup>14</sup> The Metropolitan Housing Rule requires Tigard to plan for at least a 50:50 split between attached and detached housing types, at a minimum of 10 units per net buildable acre. Providing for a variety of affordable housing opportunities in well-designed and livable neighborhoods is also a primary consideration in the Tigard Comprehensive Plan.

### ESEE Relationship to Goal 10

The Goal 10 ESEE Analysis applies to land that is designated for Low, Medium, and High Density residential uses, and for Mixed Use Residential, in the Tigard Comprehensive Plan. Tigard must maintain an adequate supply of buildable land to meet the requirements of the Metropolitan Housing Rule as well as meeting Metro Title 1 density requirements.

As noted in Table 2.2, Tigard has 70 STGs covering 544 acres of which 124.5 acres qualify as “buildable”. Most the STGs identified in the Tigard *Tree Grove Assessment* are located on land planned and zoned for residential use: 450 overall acres (83%) and 86.5 buildable acres (69% of buildable acres). An additional 19 STG acres are designated Mixed Use – with 4 buildable acres. Thus, under the full protection option there is the potential for reducing the buildable residential land supply by 90.5 acres.

**If land is removed from the residential buildable lands inventory to protect STGs, and the buildable land supply is altered such that Division 007 rule requirements are not longer met, then Goal 10 compliance is jeopardized.**

### ESEE Consequences of Full and No Protection Options for Meeting Housing Needs

#### *Environmental Consequences of Full and No Protection*

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<sup>14</sup> 197.303 “Needed housing” defined. (1) As used in ORS 197.307, until the beginning of the first periodic review of a local government’s acknowledged comprehensive plan, “needed housing” means housing types determined to meet the need shown for housing within an urban growth boundary at particular price ranges and rent levels. On and after the beginning of the first periodic review of a local government’s acknowledged comprehensive plan, “needed housing” also means:

- (a) Housing that includes, but is not limited to, attached and detached single-family housing and multiple family housing for both owner and renter occupancy;
- (b) Government assisted housing;
- (c) Mobile home or manufactured dwelling parks as provided in ORS 197.475 to 197.490; and
- (d) Manufactured homes on individual lots planned and zoned for single-family residential use that are in addition to lots within designated manufactured dwelling subdivisions.





The environmental consequences of the full protection option could be highly positive for reasons stated in the Goal 5, 6 and 7 sections of this ESEE Analysis. By prohibiting all types of residential development, including site preparation (vegetation removal and grading) and construction of supporting public facilities and services, STGs and their attendant environmental values could remain largely intact.

On the other hand, the environmental consequences of allowing all residential uses without incentives for STG protection (no additional protection option) could be extremely negative for the same reason: the majority of Tigard's STGs are located on land planned and zoned for residential use. Unrestricted residential development could result in loss of the STG functions and values described in the Tree Grove Assessment and in the Goal 5, 6 and 7 sections of this ESEE Analysis. This option would be inconsistent with the STG conservation policies found in both the UFMP and the Tigard Comprehensive Plans.

Neither of the above policy options offers the balance sought by Tigard decision-makers, for reasons discussed below.

### ***Economic and Social Consequences of Full and No Protection***

Neither the full protection option nor the no additional protection option achieves the balance envisioned in the Tigard Comprehensive Plan and called for in the UFMP.

Full protection of all STGs – *without* automatic density transfer permitted in the limited protection option – could decrease the supply of buildable residential land by 86.5 acres, resulting in the loss of some 1,036 potential housing units (based on maximum residential capacity and assuming 20% right-of-way). Because most STGs are located on land planned for residential use, the economic consequences of full resource protection for property owners, developers, and existing and future residents could be extremely adverse.

Assuming that raw residential values in Tigard are in the \$400,000 per acre range, the cumulative impact of the full protection option (without density transfer or other benefits provided by the limited protection option) could be in the \$32m range. To a certain extent, these costs would be transferable to future consumers of housing and would reduce developers' ability to provide affordable housing opportunities.

Since the City has a limited supply of buildable land available to meet housing needs over the next 20 years, the full protection option (again, without the automatic density transfer encouraged under the limited protection option) could limit Tigard's ability to provide for needed housing as required by Goal 10. Some 86.5 acres of buildable land would be off-limits to development, which could decrease the supply of land available for housing and could drive up housing costs for existing and potential residents of the area. Moreover, the full protection option could make it impossible to extend public facilities and services necessary to support needed housing, in conflict of both Goals 10 and 11.



The full protection option also could have negative economic consequences for many property owners. While the benefits of STGs could be preserved, prohibiting housing in all such resource areas could deprive some property owners of reasonable economic use of their land. For vacant and partially developed residential lands, full protection of STG resources in Tigard could adversely impact the dwelling unit potential of these lands, or eliminate development potential entirely.

However, as noted below, the full protection option could have a number of positive economic impacts. Economists, ecologists, and urban forestry researchers have documented a wide range of economic benefits that natural open space provides to local communities. As noted in the discussion of the Regulatory Incentives Program (limited protection option), these benefits are better achieved when STGs are integrated into the design of neighborhoods and density transfer allows housing needs to be met in a more compact configuration. STGs in particular add considerable value to existing and developing residential neighborhoods, both for neighbors and for individual property owners.

### **Property Values**

STGs contribute to the economic vitality and stability of a community by increasing property values. The values of houses in wooded neighborhoods have been shown to be higher than those of comparable houses in neighborhoods without trees (Morales 1980; Morales et al. 1983). Research shows that people will pay 3-7% more for properties with significant tree cover versus those with few or no trees. Other studies have suggested that healthy, mature trees may add up to 10% or more to a property's value (Neely 1988). In a major study of the influence of trees on property values, Anderson and Cordell (1988) surveyed actual sales prices of 844 single-family residences and found that each large front yard tree was associated with a 0.88% increase in average home sales price. They found that developers were able to capture the increase in value by protecting trees in buffer zones; the same logic could apply to STGs adjacent to developed residential lots or subdivisions.

Studies in the Portland metropolitan area have shown that nearby forested areas and other types of open space increase homes sales prices. For example, a study compared the relationship between a home's sales price and its proximity to different open space types (Lutzenhiser and Netusil 2001). Five open space types were evaluated: urban parks, natural area parks, specialty parks/facilities, golf courses, and cemeteries. Natural area parks contained more than 50% native and/or natural vegetation with a focus on habitat preservation and passive recreation (*e.g.*, hiking, wildlife viewing). The study found that property values are positively and significantly related to proximity to open spaces (for all open space types except cemeteries). Natural area parks within 1,500 feet of a home were shown to have the largest effect on home sales price (\$14,992 in 2003 dollars). Other open spaces also had statistically significant effects: golf courses (\$12,459), specialty park / facilities (\$7,965), and urban parks (\$1,709).



## **Stormwater Management**

As noted in the Goal 6 and Goal 11 discussions, natural resources can substantially reduce housing costs by reducing the costs of stormwater infrastructure. For example, trees within STGs intercept rainfall on leaves, branches, and trunks, and from there, the water evaporates (through evapotranspiration) or slowly soaks into the ground. Tree groves can provide significant rainfall interception. In Western Washington and Oregon, for example, a single mature oak tree can intercept more than 1,100 gallons of rainwater per year (McPherson et al. 2002). For this reason, trees within an STG can help to reduce stormwater runoff and lower the costs of stormwater management. A recent study showed that trees in metropolitan areas provide enormous benefits in terms of reducing the costs of managing stormwater runoff. The study showed that trees in the city reduced runoff by more than 18 million cubic feet, translating into a stormwater management value of nearly \$110 million, or about \$400,000 expressed on an annual basis (American Forests 2001).

Under the no additional protection option, the economic benefits described above could likely be lost. If STGs were to receive no additional protection and are fully developed, there could be direct adverse impacts on the community livability, a reduction in property values for those living near natural resource areas, and a substantial increase in stormwater management and energy costs that could be transferred to homebuyers and owners.

## **ESEE Consequences of Limited Protection Program for Meeting Housing Needs**

To address the negative ESEE consequences of both the full and no additional protection options, the Tigard CAC recommended the Regulatory Incentives Program. Tigard proposed to adopt an extremely effective density transfer program. As noted in Table 18.790.1 (copied from Section 4 of this ESEE Analysis below), proposed TDC revisions provide for automatic and objective residential density transfer provisions that are proportional to the tree grove area that is fully protected (by dedication to the city, a conservation easement or similar deed restriction). Adjustments to sidewalk, parking, landscaping and lot size and dimensional standards may be permitted.



**Table 18.790.1 (from draft TDC 18.790.050) Proposed Residential Incentives  
DENSITY TRANSFER TABLE FOR PRESERVATION OF SIGNIFICANT TREE GROVES**

<b>Residential Zoning District</b>	<b>Detached SQ. FT.<sup>1</sup> Percent Tree Grove Canopy Preserved / Min Lot or Unit Area</b>	<b>Attached SQ. FT. Percent Tree Grove Canopy Preserved / Min Lot or Unit Area</b>	<b>Duplex Percent Tree Grove Canopy Preserved / Min Lot or Unit Area</b>	<b>Multifamily Percent Tree Grove Canopy Preserved / Min Unit Area</b>
<b>R-1</b> (30,000 sq. ft. per unit)	25-49% / 22,500 sq. ft. 50-74% / 15,000 sq. ft. 75-100% / 7,500 sq. ft.	<u>Not Allowed</u>	<u>Not Allowed</u>	<u>Not Allowed</u>
<b>R-2</b> (20,000 sq. ft. per unit)	25-49% / 15,000 sq. ft. 50-74% / 10,000 sq. ft. 75-100% / 5,000 sq. ft.	Permitted with 75% or greater tree grove canopy preservation / 5,000 sq. ft.	<u>Not Allowed</u>	<u>Not Allowed</u>
<b>R-3.5</b> (10,000 sq. ft. per unit)	25-49% / 7,500 sq. ft. 50-74% / 5,000 sq. ft. 75-100% / 2,500 sq. ft.	Permitted with 75% or greater tree grove canopy preservation / 2,500 sq. ft.	Permitted with 75% or greater tree grove canopy preservation / 5,000 sq. ft.	<u>Not Allowed</u>
<b>R-4.5</b> (7,500 sq. ft. per unit)	25-49% / 5,625 sq. ft. 50-74% / 3,750 sq. ft. 75-100% / 1,875 sq. ft.	Permitted with 75% or greater tree grove canopy preservation / 1,875 sq. ft.	Permitted with 75% or greater tree grove canopy preservation / 3,750 sq. ft.	<u>Not Allowed</u>
<b>R-7</b> (5,000 sq. ft. per unit)	25-49% / 3,750 sq. ft. 50-74% / 2,500 sq. ft. 75-100% / 1,250 sq. ft.	Permitted with 75% or greater tree grove canopy preservation / 1,250 sq. ft.	Permitted with 75% or greater tree grove canopy preservation / 2,500 sq. ft.	<u>Not Allowed</u>
<b>R-12</b> (3,050 per unit)	Single family, duplex and multifamily housing permitted at the following densities: 25-49% tree grove canopy preservation / 2,288 sq. ft. per unit 50-74% tree grove canopy preservation / 1,525 sq. ft. per unit 75-100% tree grove canopy preservation / 763 sq. ft. per unit			
<b>R-25</b> (1,480 sq. ft. per unit)	Single family, duplex and multifamily housing permitted at the following densities: 25-49% tree grove canopy preservation / 1,110 sq. ft. per unit 50-74% tree grove canopy preservation / 740 sq. ft. per unit 75-100% tree grove canopy preservation / 370 sq. ft. per unit			
<b>R-40</b> (None)	Single family, duplex and multifamily housing permitted with no upper density limit.			

As shown on Table 18.790.1, if 50% of a tree grove on a given property is preserved, then an increase in density of 50% is permitted outright – without a formal adjustment. If 75% or more of a tree grove is protected, attached housing and duplexes are allowed in low density residential zones to facilitate density transfer. Substantial reductions in front, garage and sideyard setbacks, and lot width – as well as a 20% increase in building height – are permitted to facilitate density transfer provisions. Substantial variations from development standards are also permitted (25% reduction in average minimum lot width; 10 foot (rather than 15 or 20 foot) front yard setbacks; 33% reduction in side and rear setbacks; 4 foot (rather than 20 foot) garage setbacks; and 20% increase in maximum height.

***Economic and Social Consequences of Limited Protection Program***



The Limited Protection Program achieves the social and economic balance called for by the Tigard City Council when it authorized staff to prepare an incentive-based program to encourage STG preservation *without* loss in residential development potential. By encouraging the protection of STGs in residentially zoned areas through density transfer, the urban amenity benefits of natural resources are achieved without loss of residential development potential.

To demonstrate continued compliance with Statewide Planning Goal 10, Winterbrook analyzed potential dwelling unit impacts that could result from the proposed Regulatory Incentives Program. Tigard has 86.5 STG acres on vacant buildable (undeveloped, outside of Title 3 areas) residentially-zoned land, impacting 71 tax lots with buildable land. These tax lots contain a total of 124.5 vacant buildable acres. Winterbrook ran three scenarios for STG preservation – assuming that 100%, 75%, and 50% of grove area retained – to see what impact, if any, the program would have on dwelling unit potential. The results of the three scenarios are shown on Table 3.4 below.

**Table 3.4: STG Preservation Scenarios**

Scenario	STG Acres Lost	Potential Dwelling Units	Potential Unit Reduction
No STG preservation	86.5	1,036	0
50% STG preservation	43	1,036	0
75% STG preservation	21.5	1,036	0
100% STG preservation	0	951	85 (8%)

As shown on Table 3.4:

- Existing residential zoning on the 71 tax lots with buildable land allows for a potential 1,036 dwelling units with no tree grove preservation.<sup>15</sup>
- When 100% of the STG area is protected,<sup>16</sup> some lots retain too little buildable area to accommodate density transfer effectively, resulting in a reduced dwelling unit potential of 951 – a loss of 85 potential dwelling units (8%).

However, it is extremely unlikely that a rational property owner or developer would protect 100% of a STG if it meant a reduction in actual dwelling units.

Table 3.4 also shows that both the 75% and 50% preservation scenarios allow for full density transfer and 1,036 potential units. It is reasonable to assume that many property owners and developers will take advantage of the clear and objective density transfer provisions offered in draft TDC 18.790.050. Depending on the market, some developers may prefer to continue to build large-lot single-family housing where allowed by zoning. However, as noted in the Goal 11 section, infrastructure costs are likely to be lower when STGs protected and density is transferred because: (a) local street connections may not be required; (b) clustering of housing units will result in lower per unit costs for sanitary sewer and water services. Moreover, protecting STGs also

<sup>15</sup> Dwelling unit potential calculated using minimum lot sizes and an assumption of 20% ROW with development.

<sup>16</sup> Grove protection scenarios assume 15% ROW due to lack of ROW in STG areas.



reduces the tree canopy requirement for the developed portion of the property – which would further reduce development costs. Finally, more affordable duplex and attached housing types are permitted in lower density residential zones when at least 75% of an STG is protected on a property – which supports Goal 10 by increasing the potential for attached housing types in low density residential zoning districts.

Overall, Winterbrook estimates that approximately 50% of STGs on buildable land will be protected because property owners and developers *choose* to take advantage of the density transfer provisions offered in *proposed* TDC 18.790.050. Thus, about 43 STG acres will likely be protected – with attendant economic, social, environmental and energy conservation benefits – if the proposed Regulatory Incentives Program is adopted.

A couple of caveats are in order:

1. *If* the density transfer and dimensional standard modification provisions of TDC 18.790.050 were substantially weakened, it is unlikely that most developers would see an advantage in preserving STGs on their property.
2. *If* the density transfer and dimensional standard modification provisions of TDC 18.790.050 were subject to discretionary review, it is unlikely that planning commissioners (or city councilors on appeal) would approve a development in the face of organized neighborhood opposition.

Therefore, in order for TDC 18.790.050 provisions to be effective in protecting STGs, they must be (a) proportional to the STG area that is protected, and (b) subject to clear and objective approval standards.<sup>17</sup>

In conclusion, the proposed limited protection program is likely to increase rather than reduce needed housing opportunities in Tigard. In fact, per unit development costs would likely decrease if developers take advantage of cluster housing design options, and the values of homes near protected open space and scenic areas are likely to increase.

### ***Environmental Consequences of Limited Protection Program***

The environmental consequences of the Limited Protection Program (proposed Regulatory Incentives Program) are somewhat negative because only half of the 81 acres of STGs on buildable residential land are likely to be protected. On the other hand, the portions of STGs that are retained as a result of density transfer will be better protected through public ownership or conservation easement than they would have been (under the “full protection” option) by local regulations.

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<sup>17</sup> As noted in Section 1 of this ESEE Analysis, *both* Statewide Planning Goals 5 (Open Space and Scenic Resources) and 10 (Housing) require clear and objective review and approval standards.



## Goal 10 Conclusion

The proposed STG Regulatory Incentives Program will help to achieve the economic, social, and environmental values of the Tigard Comprehensive Plan and UFMP as applied to urban residential neighborhoods. This program – which is based on clear and objective density transfer standards – avoids the extremes of the full protection option while protecting an estimated 50% of STGs on buildable land in Tigard.

## Goal 11: Public Facilities and Services

Goal 11 reads in relevant part as follows:

***To plan and develop a timely, orderly, and efficient arrangement of public facilities and services to serve as a framework for urban and rural development.*** *Urban and rural development shall be guided and supported by types and levels of urban and rural public facilities and services appropriate for, but limited to, the needs and requirements of the urban, urbanizable, and rural areas to be served. A provision for key facilities shall be included in each plan. Cities or counties shall develop and adopt a public facility plan for areas within an City Limits ... A Timely, Orderly, and Efficient Arrangement – refers to a system or plan that coordinates the type, locations and delivery of public facilities and services in a manner that best supports the existing and proposed land uses.*

Public facilities and services include sanitary sewer, domestic water, stormwater management, municipal government, schools, police, fire, electrical, and communication facilities. Park and recreational facilities and transportation facilities are addressed respectively in the Goal 8 and Goal 12 sections of this ESEE Analysis.

### ESEE Relationship to Goal 11

Public facilities and services provide the supportive framework necessary for urban development, and the provision of such facilities through the annexation process is the primary growth management tool.

Public facilities and services can conflict with the full protection of significant Goal 5 resource areas. Construction of public facilities and services usually requires vegetation removal and grading and often results in construction of impervious surface area. As urban development occurs, an urban level of public facilities and services is required. Such services sometimes must pass through STGs to serve buildable land outside of such areas. Although facilities like sanitary sewer, water, electrical, and communication lines often are found in public street rights-of-way, sanitary sewer and stormwater management facilities function most efficiently under gravity-flow conditions and benefit from location in or adjacent to natural drainageways. Buildings, parking areas, and recreational / training structures associated with schools and fire stations conflict with STGs in a manner similar to residential or commercial uses.



Tigard has an acknowledged Public Facilities Plan (PFP) as required by Goal 11. Tigard also has detailed master plans for sanitary sewer, domestic water, and stormwater management. These facilities may conflict directly with full STG protection because there may be no reasonable alternative to routing these facilities through tree groves to serve nearby buildable land. The specific locations of these conflicts are found throughout the urban growth area.

## **ESEE Consequences of Full and No Protection Options on the Efficient Provisions of Public Facilities and Services**

### ***Environmental Consequences***

The full protection option would have mostly positive environmental consequences because vegetation removal, grading, and construction of hard surfaces associated with public facilities would not be permitted. The positive environmental consequences of fully protecting STGs are discussed in the Goal 5, 6 and 7 sections of this ESEE Analysis.

The no additional protection option would mean that public facilities and services would be allowed without restriction or mitigation on, through or under STGs throughout the city. Such unregulated construction could adversely affect tree canopy, understory and root systems within STGs, with corresponding adverse impacts on wildlife habitat, scenic values, and water quality. This option could mean that no additional protections could be provided for STGs. Years of community work on a balanced and effective UFMP would be compromised.

### ***Economic and Social Consequences***

Tigard's growth management program depends primarily on ensuring that the full range of public facilities and services is available to support urban development. This program has substantial social and economic benefits to Tigard citizens and businesses. The growth management program helps to ensure an adequate supply of serviced industrial, commercial, residential, and public lands (with associated job opportunities). The growth management program also ensures that local shopping and services are available to residential areas, as are quality housing in well-designed neighborhoods, good and accessible schools, potable water, and adequate sanitation. By managing the direction and timing of growth, the public costs of providing public facilities and services are reduced.

Tigard's growth management program goals would be difficult to achieve under the full protection option. This option could mean that no public facilities construction or maintenance could occur within protected STGs. Since significant natural resource areas comprise 544 acres of largely undeveloped land within the City Limits, avoiding such areas could preclude the efficient provision of public facilities and services that are necessary to support planned urban development. The economic and social costs to the public resulting from a different form of "leap-frog" development could be extremely high.





For example, schools could be unable to expand into STGs under any circumstances. Sanitary sewer and water services could be required to be routed around STGs, regardless of public or private expense. This option could restrict future development patterns, both public and private, as roads and utilities could not be extended through resource areas. Tigard's quality-of-life and its appeal as a place to locate business could suffer substantially.

In conclusion, Tigard's public facilities – particularly its parks, schools, and tree-lined streets – are an important part of the community's identity. Fully protecting all STGs could restrict urban growth and urban design options. Housing costs could increase, and job opportunities could be lost, with attendant social and economic impacts. Conversely, allowing unrestricted development of STGs could mean the loss or degradation of many of the economic benefits described previously.

The full protection option could have at least one significant but frequently overlooked economic benefit. STGs provide substantial stormwater management benefits because they intercept or detain rainfall and reduce stormwater runoff. As noted in the Goal 6 Section of this ESEE Analysis, STGs in Tigard significantly reduce runoff and stormwater management costs. (American Forests 2001) Unrestricted removal of trees to develop public facilities and schools would reduce the City's "green" stormwater infrastructure, necessitating the construction of extensive new facilities to address the increased storm flows. However, as noted above, these benefits can derive from the limited protection program as well.

### **ESEE Consequences of Limited Protection Program for the Efficient Provision of Public Facilities and Services**

Unlike the full protection option, the limited protection program allows the construction of public facilities and services that are (a) permitted by the underlying zoning district and (b) necessary to support planned urban development, consistent with Statewide Planning Goal 11. TDC 18.810 Street and Utility Improvement Standards include development standards to ensure provision of public facilities necessary to serve development. However, the draft TDC 18.790.050(6) allows for adjustments to street and utility standards "to facilitate preservation and help to maximize the connectivity and viability of a significant tree grove..."

#### ***Environmental Consequences***

The UFMP includes policies to protect STGs through a regulatory incentives program. As noted in the introduction to the Goal 11 section of this ESEE Analysis, public facilities and services occasionally must be routed through STGs to serve nearby buildable lands, which could adversely impact the environmental values identified in the Goals 5, 6 and 7 sections of this ESEE Analysis. However, impacts from public facility construction would be mitigated to a certain extent by Chapter 18.790.090 (Urban Forest Plan) standards.

#### ***Economic and Social Consequences***



Any negative environmental consequences from the limited protection program are more than offset by the positive economic and social consequences associated with the efficient provision of public facilities and services required by Tigard Comprehensive Plan policies and Statewide Planning Goal 11. By allowing public facilities and services to be constructed and maintained within STGs, subject to mitigation standards, the negative social and economic consequences described earlier in this section can be avoided.

### **Goal 11 Conclusion**

The proposed Tree Grove Regulatory Incentives Program ensures that Tigard can continue to provide key public facilities and services necessary to support planned urban growth in a timely and efficient manner. This Goal 11 requirement is underscored by the policies of the Tigard Comprehensive Plan, and serves as the cornerstone for managing urban growth within the Tigard City Limits. There would be negative ESEE consequences for allowing public facilities to be constructed without restriction, or for prohibiting public facilities construction and maintenance in all protected natural resource areas.

### **Goal 12: Transportation**

Goal 12 reads in relevant part as follows:

***To provide and encourage a safe, convenient and economic transportation system.*** A transportation plan shall (1) consider all modes of transportation including mass transit, air, water, pipeline, rail, highway, bicycle and pedestrian; (2) be based upon an inventory of local, regional and state transportation needs; (3) consider the differences in social consequences that would result from utilizing differing combinations of transportation modes; (4) avoid principal reliance upon any one mode of transportation; (5) minimize adverse social, economic and environmental impacts and costs; (6) conserve energy; (7) meet the needs of the transportation disadvantaged by improving transportation services; (8) facilitate the flow of goods and services so as to strengthen the local and regional economy; and (9) conform with local and regional comprehensive land use plans. Each plan shall include a provision for transportation as a key facility.

### **ESEE Relationship to Goal 12**

Goal 12 requires that local governments plan for a multi-modal, interconnected transportation system. Goal 12 reinforces the Goal 5 requirement to consider the ESEE consequences of providing transportation facilities to meet this goal. Tigard has an acknowledged Transportation System Plan (TSP) that identifies pedestrian, bicycle, and vehicle projects, as well as their estimated timing, location, and cost.

Some planned transportation facilities may conflict with full STG protection. Like other public facilities and services, transportation facilities and their impacts vary widely – from multi-lane state highways to pervious-surfaced pedestrian trails. Local streets



necessary to serve development are not necessarily shown on TSP maps, but may also have adverse impacts on significant natural resources.

Economic, social and environmental consequences related to transportation facilities are considered in this section. The potential adverse energy consequences of the full protection option are considered in the Goal 13 section that follows.

### **ESEE Consequences of Full and No Protection Options for Meeting Long-Term Transportation Needs**

Most of the Goal 11 ESEE Analysis applies equally to planned transportation facilities. The full protection option could frustrate the construction of a multi-modal, interconnected transportation system; could decrease pedestrian and bicycle use; and could result in some out-of-direction travel. With diminished bicycle and pedestrian accessibility, transportation costs would increase and neighborhoods would become more auto-dependent. Full protection of resources in right-of-way areas could stop planned widening of Tigard streets and planned development of new roads. This could make the City and County noncompliant with Goal 12, as their joint Transportation Systems Plan could no longer be implemented.

There are a number of ESEE benefits related to a multi-modal transportation system. Alternative modes of transportation, such as bicycling, buses, walking, skating, and carpooling or vanpooling, as well as telecommuting, can reduce traffic congestion and provide benefits to individuals and to the community. Reduced traffic congestion and air pollution improve community livability. Less traffic reduces the need for additional, expensive roadway construction projects. Fewer vehicles on the road means less land is needed for parking facilities, allowing it to be used for open space or commercial and residential development. Walking, bicycling and skating can improve health and well-being.

There are also social consequences associated with bicycle travel. The bicycle is a healthy, non-polluting alternative to the automobile that helps to maintain the quality of life in Tigard. Almost all (95%) of Tigard's collector and arterial roadways have bicycle lanes, and there are many miles of multi-use paths. In addition, a large percentage of the city is laid out on a grid system allowing many alternative routes for cyclists to use in getting from one place to another.

The full protection option would preclude the City from constructing transportation facilities – including new pedestrian and bicycle trails – through STGs. This would have substantial adverse social consequences for existing and future area residents and businesses. On the other hand, the no additional protection option would allow for transportation facilities to be constructed through STGs without considering alternatives and with limited mitigation. This could have substantial adverse impacts on the functions and values of STGs as described in the Goal 5, 6 and 7 sections of this ESEE Analysis. The no additional protection option would also adversely affect the quality of residential neighborhoods, with adverse social consequences.



## **ESEE Consequences of Limited Protection Program for Meeting Long-Term Transportation Needs**

Unlike the full protection option, the limited protection program allows the construction of transportation facilities that are (a) permitted by the underlying zoning district and (b) determined necessary to support planned urban growth consistent with the adopted TSP. TDC 18.810 Street and Utility Improvement Standards include development standards to ensure provision of transportation facilities necessary to serve development.

Draft amendments to TDC 18.790.050(6) allow for adjustments to street and utility standards where necessary "to facilitate preservation and help to maximize the connectivity and viability of a significant tree grove..." In other words, local *street* connections may not be required in order to save all or part of an STG; however, because bicycle and pedestrian trails have lower impact than streets, it is likely that pedestrian and bicycle connectivity can be maintained without substantial impacts to STGS. In this manner, the limited protection program allows city officials to balance connectivity needs with the clear benefits of STG protection.

By allowing needed transportation facilities on a limited basis with mitigation, the proposed Tree Grove Regulatory Incentives Program allows for the full implementation of the Transportation Systems Plan with minimal adverse environmental impacts.

### **Goal 12 Conclusion**

By allowing for the maintenance and expansion of existing transportation facilities, and the improvement of planned facilities with mitigation, adverse ESEE consequences are minimized.

### **Goal 13: Energy Conservation**

Goal 13 is short and to the point. It reads as follows:

***To conserve energy.** Land and uses developed on the land shall be managed and controlled so as to maximize the conservation of all forms of energy, based upon sound economic principles.*

### **ESEE Relationship to Goal 13: Energy Conservation**

One of the four key consequences that must be considered in the Goal 5 ESEE Analysis process is "energy consequences." Energy conservation is a theme that runs through several of the Statewide Planning Goals. Energy consequences must be explicitly considered under Goal 5 (Natural Resources), Goal 9 (Economy), Goal 12 (Transportation), Goal 13 (Energy Conservation) and Goal 14 (Urbanization). Evaluation of energy consequences is also implied in the notion of "efficient" public facilities and transportation planning. This ESEE Analysis consolidates the consideration of energy consequences related to all applicable statewide planning goals in this section.



## Energy Conservation Consequences of Full and No Protection Options

As observed repeatedly in other sections of this ESEE Analysis, the full resource protection option *in an urban context* conflicts with key planning principles in the Tigard Comprehensive Plan, Metro functional plans, and several Statewide Planning Goals. This conflict is especially evident with respect to Goal 13, Energy Conservation. The following bulleted list summarizes adverse energy consequences (*i.e.*, increased energy consumption) that would result from implementation of the full resource protection option within the Tigard City Limits:

- **Goal 5 (Natural Resources).** The full protection option means that all STGs are preserved and no conflicting uses are allowed. Full protection of 544 STG acres would require urban services to avoid undeveloped STGs to reach buildable land – and would have the unintended consequence of increasing energy consumption.
- **Goal 8 (Parks and Recreation).** The full protection option would make it impossible to develop or gain access to park and recreational facilities associated with STGs. Even in natural areas, trails, access roads, and parking areas would be prohibited. Without such local connections, area residents would be forced to drive long distances to reach park and recreational facilities, with attendant increases in energy consumption.
- **Goal 9 (Economy).** The full protection option would reduce the supply of industrial and commercial land available for development in Tigard, with attendant reductions in (a) local shopping and service opportunities, and (b) jobs. These reductions would force people to drive further to reach local shopping and service destinations and employment, and people would be less likely to bike or walk to work, with attendant increases in energy consumption.
- **Goal 10 (Housing).** The full protection option (without density transfer and dimensional adjustments) would increase *total* housing costs. Total housing costs include transportation and energy costs, and the costs of services like sewer, water, and storm drainage. Under the full protection option, Tigard's buildable land supply would be reduced, the costs of providing public facilities to serve new housing areas would increase, and travel distances to housing would increase as well – resulting in overall increased housing costs. To reduce direct housing costs, people are willing to drive further, with attendant increases in energy consumption. Thus, an important consideration in maintaining an affordable housing supply is to maintain a buildable land supply near the urban center *and* natural amenities, which has the effect of reducing the need to drive a single-occupancy vehicle (SOV) with attendant energy savings.
- **Goal 11 (Public Facilities).** The full protection option would require public facilities to be routed around natural resource areas, which would increase



energy needed to construct and maintain more dispersed public facilities. Because several STGs are associated with natural drainageways, this option would likely require the use of pump stations because gravity flow sewer would be impossible if all sewer lines needed to be located outside of natural drainage areas. This option could also limit construction of higher elevation water storage reservoirs in natural resource areas, leading to increased consumption from booster pumps. Emergency services could be more expensive to provide, and fire, police, and ambulances would be required to serve a more dispersed area, thus consuming more energy. The effect of avoiding any impacts to STGs could be increased energy costs associated with the provision of key public facilities and services.

- **Goal 12 (Transportation).** As noted in the Goal 12 discussion, the full protection option would make implementation of the TSP difficult, primarily due to needed intersection improvements and road widenings. The TSP calls for a multi-modal, interconnected systems of streets, pedestrian and bicycle facilities, and transit facilities. If the TSP could not be implemented, people would be more reliant on SOVs, there would a substantial increase in out-of-direction travel, and energy consumption would increase dramatically.
- **Goal 14 (Urbanization).** Finally, the full protection option (without density transfer and dimensional adjustments) could result in a less compact urban form, which would disperse housing, jobs, and parks, and force even more reliance on SOVs. Passing over otherwise buildable areas to achieve full resource protection could result in an inefficient growth form. The lack of a compact urban form would have direct and adverse impacts on energy consumption.

**There are, however positive energy consequences associated with the full protection option.** Urban areas typically are warmer than rural areas because of the urban "heat island" effect. Buildings, paved areas, sparse tree canopy, and lack of water in an urban area contribute to the higher temperature. In temperate climates, temperatures of urban centers such as Tigard are rising by approximately 0.5°F or more per decade. This can have major effects on energy consumption and air quality; a study of Los Angeles, for example, showed that a 1-degree rise in temperature could increase the city's smog risk by 3% and its energy demand by 2%, adding \$25 million in electricity costs in a single year (Wade 2000). Trees can help mitigate the heat island effect, and thereby reduce energy costs, by shading buildings and cooling the air through the evaporative process of transpiration.

Research by the USDA Forest Service and others has shown that trees strategically located to shade homes can reduce air conditioning bills significantly (McPherson 1994b). Trees reflect and absorb solar radiation before it heats the dense building and pavement materials of a home or office. Trees planted to the west of a building can significantly reduce air conditioning costs by blocking the hot afternoon sun during



summer. Trees located to the south or east of a building can also provide such benefits, though to a lesser extent.

In the winter, trees can also help reduce energy costs associated with the heating of buildings. Researchers have found that trees act as windbreaks, reducing wind speed and resulting air infiltration by up to 50% (McPherson et al. 2002). This can reduce air infiltration and conductive heat loss from buildings, lowering heating costs. The density of the trees, species and location of tree, type of building, and the local climate determine the amount of wind reduction that occurs. Although both conifers and deciduous trees reduce wind speed, conifers tend to have a greater impact during winter months.

Researchers have studied the effect of trees on energy costs in the Willamette Valley. Two 25-foot tall trees located on the west side of an energy efficient home (in Portland) were estimated to have an energy conservation savings of \$18 each year for cooling (for the 15% of homes that use air conditioning) and \$7 for heating (McPherson et al. 2002). Two trees thus resulted in a combined savings of \$25, which represented a 4% reduction in annual heating and cooling costs.

Reduced energy needs for air conditioning or heating will mean that local power plants are not required to produce as much electricity or gas energy, and this conserves fossil fuels and reduces pollution, including carbon emissions. By providing shade over roads, sidewalks, park and school buildings and parking lots, trees in natural areas reduce the urban heat island effect. Removal of these resources can have significant adverse effects on energy consumption (and costs) and air quality.

In contrast, the no additional protection option could allow for the efficient provision of urban facilities and services, more affordable (but less desirable) housing, a more compact growth form, and attendant reductions in energy consumption. However, as noted in the Goal 5-10 sections of this ESEE Analysis, the no additional protection option would have extremely negative environmental, social and economic consequences.

### **Energy Conservation Consequences of Limited Protection Program**

The key features of the limited protection program that ameliorate the excesses of the full protection program include the following:

- **Goal 5 (Natural Resources).** Rather than fully protecting all STGs, the Regulatory Incentives Program would not apply additional Goal 5 protection to several hundred acres of STGs that are already protected by Title 3 Sensitive Lands provisions. This greatly reduces the “leap-frog” development effect, because urban services no longer need to pass over undeveloped natural resource areas to reach buildable areas within the City. This reduction – coupled with the ability to construct urban facilities through STGs where necessary – allows a compact urban form that will result in energy conservation.



- **Goal 8 (Parks and Recreation).** The Regulatory Incentives Program would make it possible to develop and access park and recreational facilities inside the Tigard City Limits. In natural areas, trails, access roads and parking areas would be allowed with mitigation, thus allowing area residents the opportunity to walk, bicycle, or drive to local park and recreational facilities, with attendant energy savings.
  
- **Goal 9 (Economy).** The Regulatory Incentives Program could further limit the supply of industrial and commercial land available for development, thus limiting (a) local shopping and service opportunities, and (b) industrial jobs. Therefore, it is important for the City to adopt a policy to monitor and determine the effect of the limited protection program on the employment land supply. From an energy conservation perspective, it is important to continue to provide convenient access to local shopping and service destinations and employment, thus increasingly the likelihood that people will bike or walk to work, with attendant energy savings.
  
- **Goal 10 (Housing).** The Regulatory Incentives Program would decrease *total* housing costs by maintaining the *capacity* of the buildable land supply within the City Limits, thereby reducing the per unit costs of providing public facilities to serve new housing areas, and reducing travel distances from employment to housing. Thus, an important consideration in maintaining an affordable housing supply is to maintain a buildable land supply near the urban center, which has the effect of reducing the need to drive single-occupancy vehicles with attendant energy savings.
  
- **Goal 11 (Public Facilities).** The Regulatory Incentives Program would allow public facilities to be routed through STGs, which would decrease energy otherwise needed to construct and maintain more dispersed public facilities. Emergency services would be less expensive to provide, because fire, police, and ambulances could serve a more concentrated area, thus consuming less energy. The effect of this form of concentrated development would be to marginally decrease energy costs associated with the provision of key public facilities and services.
  
- **Goal 12 (Transportation).** As noted in the Goal 12 discussion, the limited protection program facilitates implementation of the TSP possible. The TSP calls for a multi-modal, interconnected systems of streets, pedestrian and bicycle facilities, and transit facilities. If the TSP were not implemented, people would be more reliant on SOVs, there could be an increase in out-of-direction travel, and energy consumption would increase dramatically.
  
- **Goal 14 (Urbanization).** Finally, the Regulatory Incentives Program would result in a more compact urban form, which would concentrate housing, jobs, and parks, and force less reliance on SOVs.





The limited protection program also maintains or improves upon the positive energy conservation effects of the full protection option. By protecting STGs near urban development, there will be a consequent reduction in summer air conditioning and winter heating costs and a reduction in the urban “heat island” effect.

### **Goal 13 Conclusion**

By protecting STGs through regulatory incentives, the limited protection program achieves most of the positive energy consequences of the full protection option while enhancing energy conservation by encouraging a compact urban form and efficient provision of public facilities and services. The limited protection program achieves an appropriate balance between energy and STG conservation.

### **Goal 14: Urbanization**

Goal 14 reads as follows:

***To provide for an orderly and efficient transition from rural to urban land use, to accommodate urban population and employment inside urban growth boundaries, to ensure efficient use of land, and to provide livable communities.***

### **ESEE Relationship to Goal 14**

Goal 14 is designed to ensure a long-term supply of buildable land to meet housing, population and livability (open space) needs within UGBs. Growth management policies are designed to ensure orderly and efficient provision of public facilities and services (as does Goal 11), and to maximize land use efficiency and livability within urban areas.

Metro and Tigard have adopted a growth management program that meets these objectives. Metro has determined that there is sufficient buildable land within the regional UGB to meet long-term growth needs. Maximum efficiency of land use is assured by implementation of minimum density standards and requiring an urban level of services prior to or in conjunction with urban development. As discussed in the Goal 9 section of this ESEE Analysis, the one area where Tigard’s growth management program may have been less effective is ensuring adequate choice among suitable employment sites.

### **ESEE Consequences of Full and No Protection Options for Growth Management**

The ESEE consequences of the full and no additional protection option on the effectiveness of Tigard’s growth management program were analyzed in the Goal 9 through 13 sections of this ESEE Analysis. Basically:

- The full protection option has the effect of marginally reducing land use and public facilities efficiency, increasing housing costs, decreasing job potential, and



decreasing transportation connectivity. These factors combine to increase energy consumption.

- The no additional protection option would mean that the positive ESEE consequences associated with providing incentives to protect at least some of the 124.5 STG acres located outside of Title 3 Sensitive Lands would be lost.

### **ESEE Consequences of Limited Protection Program for Growth Management**

The limited protection program complements and improves Tigard's growth management program in the following ways:

- The Tree Grove Assessment precisely maps STGs in relation to other protected natural resources and hazards, thus increasing certainty in the land development and urbanization processes.
- Draft Chapter 18.790.050 provides clear and objective standards for mapping and protecting STGs through density transfer and adjustments to dimensional zoning standards – without loss of residential development capacity.
- This chapter also clarifies the standards under which public facilities and services necessary to support urban development will be permitted within STGs, thus creating even greater certainty in the land development and urbanization processes.

However, there are two potential adverse economic consequences associated with the limited protection program:

1. Under TDC 18.790.050(X), buildable residential land that is protected through regulatory incentives would no longer be subject to minimum density standards. Although in most cases developers prefer to maximize residential densities, some large-lot single-family developers may take advantage of this provision, the likelihood that residential capacity in Tigard would significantly decrease is small.
2. Under TDC 18.790.050(X), *if* the Regulatory Incentives Program is *too* successful in protecting STGs on buildable employment land, Tigard would have an inadequate supply of building commercial and industrial land under most EOA development scenarios.

To address these two potential adverse economic consequences, Winterbrook recommends that the City amend its comprehensive plan to include policies to monitor the effects of the Regulatory Incentives Program and to adjust the supply of buildable residential and employment land as necessary to maintain Goal 9 and 10 compliance.

Overall, the ESEE consequences of the proposed Regulatory Incentives Program are positive and avoid the adverse ESEE consequences associated with the full and no additional protection options.

### **Goal 14 Conclusion**

The positive ESEE consequences of Tigard's growth management program and limited Goal 5 protection program are addressed in detail in previous sections of this ESEE



Analysis. The limited protection program builds upon and strengthens the positive ESEE consequences of the growth management program.

### **Statewide Planning Goal Conclusion**

The Tigard ESEE Analysis supports the CAC’s recommendation to amend the Tigard Development Code (TDC Chapter 18.790.050 Flexible Planting and Preservation Standards) to include objective density transfer provisions coupled with relaxed dimensional standards to encourage STG preservation – while maintaining development potential on buildable land.

The ESEE Analyses reaches following basic conclusions regarding the appropriate level of STG protection:

- A. **Full protection** of all 70 STGs would prohibit *a//* conflicting uses and activities on 544 acres. This would mean:
  - a. Elimination of 124.5 buildable acres from the City’s residential and employment lands inventory, and
  - b. Tightening of existing Sensitive Lands regulations to prohibit all conflicting uses on STGs – including public facilities such as trails and utilities.

This extreme regulatory approach would have positive environmental consequences for the natural resource, but seriously adverse economic and social consequences on property owners (in terms of reduced property values) and the community at large. Housing and public facilities costs would likely increase, transportation and public facilities connectivity would likely decrease, and employment opportunities would be lost.

- B. **No additional protection** (beyond Tigard’s existing Sensitive Lands regulations) would likely result in the loss of 124.5 STG acres to conflicting residential and employment uses. As documented in Section 3 of the ESEE Analysis, urban forests provide a wide range of economic, social, environmental and energy conservation benefits to existing and future Tigard residents and employees. The no additional protection option would have adverse environmental and social consequences and would be inconsistent with clear policy direction in the Tigard Comprehensive Plan and the adopted UFMP.
- C. The **Regulatory Incentives Program** (the proposed limited protection program recommended by the CAC) provides automatic density transfer and regulatory relief that is likely to protect about half of the threatened STGs without loss of development potential on buildable land. Chapter 4 shows four



development scenarios that illustrate how this program could work in practice. The limited protection program has positive economic, social, environmental and energy consequences – because property rights and STGs can be protected without loss of potential housing units or jobs and without compromising transportation connectivity or the efficient provision of public facilities.

The proposed Regulatory Incentives Program (limited protection program) maintains most of the environmental values described in the *Tree Grove Assessment* without sacrificing important community values associated with social equity, wildfire protection, park development, industrial employment opportunities, affordable housing, the efficient provision of public facilities and services, and compact urban growth form. As a result of this ESEE Analysis the proposed Regulatory Incentives Program would provide *limited* protection for STGs with buildable land outside of Title 3 Sensitive Lands areas – approximately 23% (124.5 acres) of the STGs within the Tigard City Limits.

### **Goal 1 Conclusion**

Because Tigard citizens have been notified and provided the opportunity to be involved in all phases of the Tree Grove Protection Project, the Goal 5 amendments resulting from this project comply with Statewide Planning Goal 1, Citizen Involvement. Citizen comments related to the Limited Protection Program (Draft Regulatory Incentive Program) will be considered through the public hearing process prior to adoption of the Goal 5 program the final ESEE Analysis.

### **Goal 2 Conclusion**

For the reasons stated above, the Tree Grove Assessment provides an adequate factual base, this ESEE Analysis demonstrates that alternative programs were considered and that regional programs have been considered, and the UFMA provides ultimate policy direction that is implemented consistently and effectively by the proposed Regulatory Incentives Program. For these reasons, the Tigard Tree Grove Project complies with Statewide Planning Goal 2, Land Use Planning.

### **Goal 5 Conclusion**

The proposed Regulatory Incentives Program (limited protection program) maintains most of the environmental values described in the *Tree Grove Assessment* without sacrificing important social values associated with social equity, wildfire protection, park development, industrial employment opportunities, affordable housing, the efficient provision of public facilities and services, and compact urban growth form. As a result of this ESEE Analysis the proposed Regulatory Incentives Program would provide *limited* protection for STGs with buildable land outside of Title 3 Sensitive Lands areas – approximately 23% (124.5 acres) of the STGs within the Tigard City Limits.



## **Goal 6 Conclusion**

Both the full protection option and the proposed limited protection program complement existing City, County, and State air, land, and water resource quality programs. When compared with the no additional protection option, both the full and limited protection programs have substantial positive ESEE consequences.

## **Goal 7 Conclusion**

Existing Sensitive Land regulations protect STGs within Title 3 areas from most types of conflicting uses. The proposed Regulatory Incentives Program (limited protection program) applies outside Title 3 Sensitive Lands and provides an additional level of protection for tree groves on "buildable lands." These provisions have positive environmental consequences because they reinforce existing provisions that protect Title 3 Sensitive lands on a limited basis. The proposed TDC urban forest amendments that implement the Tree Grove Regulatory Incentives Program complement existing Goal 7, Natural Hazards, regulations by encouraging tree preservation with attendant erosion and flood control benefits.

## **Goal 8 Conclusion**

The proposed STG Regulatory Incentives Program, as implemented by draft amendments to TDC Chapter 18.790 Urban Forestry, will have the effect of augmenting the City's park and open space system. The limited protection program avoids the extremes of full protection (*i.e.*, nature parks that no one can use) on the one hand, and no additional protection (*i.e.*, unrestricted development and loss of STGs) on the other. Therefore, the proposed legislative changes comply with Goal 8, Recreational Needs.

## **Goal 9 Conclusion**

Tigard has a very limited supply of buildable industrial and commercial land. If Tigard were to protect all of the STGs on employment land, the City would be unable to meet employment land needs identified in the EOA. The setback and height incentives of the proposed Regulatory Incentives Program are unlikely to result in the actual protection of more than 10% of STGs on buildable industrial and commercial land. Even under this limited protection program, Tigard will still have a shortage of industrial land in all three of the EOA's development intensity scenarios, and a shortage of commercial land in all but the "efficient" scenario. Thus, the economic consequences of both the full protection and the limited protection options could be adverse. If the Council decides to encourage STG protection on employment land, Tigard planning staff should monitor the effectiveness of the STG protection program and, if actual buildable acreage falls below identified 20-year need, the City should amend its comprehensive plan to ensure a sufficient supply of buildable land for the 20-year planning period.

## **Goal 10 Conclusion**

The proposed STG Regulatory Incentives Program will help to achieve the economic, social, and environmental values of the Tigard Comprehensive Plan and UFMP as applied to urban residential neighborhoods. This program – which is based on clear and



objective density transfer standards – avoids the extremes of the full protection option while protecting an estimated 50% of STGs on buildable land in Tigard.

### **Goal 11 Conclusion**

The proposed Tree Grove Regulatory Incentives Program ensures that Tigard can continue to provide key public facilities and services necessary to support planned urban growth in a timely and efficient manner. This Goal 11 requirement is underscored by the policies of the Tigard Comprehensive Plan, and serves as the cornerstone for managing urban growth within the Tigard City Limits. There would be negative ESEE consequences for allowing public facilities to be constructed without restriction, or for prohibiting public facilities construction and maintenance in all protected natural resource areas.

### **Goal 12 Conclusion**

By allowing for the maintenance and expansion of existing transportation facilities, and the improvement of planned facilities with mitigation, adverse ESEE consequences are minimized.

### **Goal 13 Conclusion**

By protecting STGs through regulatory incentives, the limited protection program achieves most of the positive energy consequences of the full protection option while enhancing energy conservation by encouraging a compact urban form and efficient provision of public facilities and services. The limited protection program achieves an appropriate balance between energy and STG conservation.

### **Goal 14 Conclusion**

The positive ESEE consequences of Tigard’s growth management program and limited Goal 5 protection program are addressed in detail in previous sections of this ESEE Analysis. The limited protection program builds upon and strengthens the positive ESEE consequences of the growth management program.



## Section 4 – Proposed Limited Protection (Regulatory Incentives)

The Tigard City Council adopted the Urban Forest section of the Comprehensive Plan in 2008 and accepted the Urban Forestry Master Plan (UFMP) in 2009 to help guide and inform an update of the City's tree and urban forestry related code provisions. The Urban Forestry Code Revisions project implements four goals of the UFMP. UFMP Goal 3 is to develop a Goal 5 preservation program by amending TDC Chapter 18.790 Urban Forestry:

### 3. Develop a tree grove preservation program (Chapter 18.790.050)

#### Proposed TDC Chapter 18.790.050 Revisions

Proposed TDC Chapter 18.790 Urban Forestry Plan includes six categories of flexible standards for tree planting and preservation. The first five categories are available for the planting and/or preservation of all trees – regardless of their location. For example, TDC 18.790.050.B provides incentives for STG preservation by slightly reducing parking and landscaping requirements.

The sixth category is much more robust and is available *only* for development sites with a STG that is not protected by Title 3 Sensitive Land regulations. As the title implies, Section 18.790.050, Flexible Standards for Planting and Preservation, provides additional flexibility and incentives *especially* for STG preservation. No other sections of Chapter 18.790 have been modified to incorporate the additional incentives. Only development sites with an STG identified through this Goal 5 planning process are eligible for the additional incentives.

As noted below, the proposed limited protection Regulatory Incentive Program has two basic components: one for residential development and one for commercial/industrial development.

#### Residential Component

Table 18.790.1 (from draft TDC 18.790.050) provides for automatic and objective residential density transfer provisions that are proportional to the tree grove area that is fully protected (by dedication to the city, a conservation easement or similar deed restriction). Adjustments to sidewalk, parking, landscaping and lot size and dimensional standards may be permitted.



**Table 18.790.1 (from draft TDC 18.790.050) proposed Residential Incentives  
DENSITY TRANSFER TABLE FOR PRESERVATION OF SIGNIFICANT TREE GROVES**

<b>Residential Zoning District</b>	<b>Detached SQ. FT. Percent Tree Grove Canopy Preserved / Min Lot or Unit Area</b>	<b>Attached SQ. FT. Percent Tree Grove Canopy Preserved / Min Lot or Unit Area</b>	<b>Duplex Percent Tree Grove Canopy Preserved / Min Lot or Unit Area</b>	<b>Multifamily Percent Tree Grove Canopy Preserved / Min Unit Area</b>
<b>R-1</b> (30,000 sq. ft. per unit)	25-49% / 22,500 sq. ft. 50-74% / 15,000 sq. ft. 75-100% / 7,500 sq. ft.	Not Allowed	Not Allowed	Not Allowed
<b>R-2</b> (20,000 sq. ft. per unit)	25-49% / 15,000 sq. ft. 50-74% / 10,000 sq. ft. 75-100% / 5,000 sq. ft.	Permitted with 75% or greater tree grove canopy preservation / 5,000 sq. ft.	Not Allowed	Not Allowed
<b>R-3.5</b> (10,000 sq. ft. per unit)	25-49% / 7,500 sq. ft. 50-74% / 5,000 sq. ft. 75-100% / 2,500 sq. ft.	Permitted with 75% or greater tree grove canopy preservation / 2,500 sq. ft.	Permitted with 75% or greater tree grove canopy preservation / 5,000 sq. ft.	Not Allowed
<b>R-4.5</b> (7,500 sq. ft. per unit)	25-49% / 5,625 sq. ft. 50-74% / 3,750 sq. ft. 75-100% / 1,875 sq. ft.	Permitted with 75% or greater tree grove canopy preservation / 1,875 sq. ft.	Permitted with 75% or greater tree grove canopy preservation / 3,750 sq. ft.	Not Allowed
<b>R-7</b> (5,000 sq. ft. per unit)	25-49% / 3,750 sq. ft. 50-74% / 2,500 sq. ft. 75-100% / 1,250 sq. ft.	Permitted with 75% or greater tree grove canopy preservation / 1,250 sq. ft.	Permitted with 75% or greater tree grove canopy preservation / 2,500 sq. ft.	Not Allowed
<b>R-12</b> (3,050 per unit)	Single family, duplex and multifamily housing permitted at the following densities: 25-49% tree grove canopy preservation / 2,288 sq. ft. per unit 50-74% tree grove canopy preservation / 1,525 sq. ft. per unit 75-100% tree grove canopy preservation / 763 sq. ft. per unit			
<b>R-25</b> (1,480 sq. ft. per unit)	Single family, duplex and multifamily housing permitted at the following densities: 25-49% tree grove canopy preservation / 1,110 sq. ft. per unit 50-74% tree grove canopy preservation / 740 sq. ft. per unit 75-100% tree grove canopy preservation / 370 sq. ft. per unit			
<b>R-40</b> (None)	Single family, duplex and multifamily housing permitted with no upper density limit.			

As shown on Table 18.790.1, if 50% of a tree grove on a given property is preserved, then an increase in density of 50% is permitted outright – without a formal adjustment. If 75% or more of a tree grove is protected, attached housing and duplexes are allowed in low density residential zones to facilitate density transfer. Substantial reductions in front, garage and sideyard setbacks, and lot width – as well as a 20% increase in building height – are permitted to facilitate density transfer provisions. Substantial variations from development standards are also permitted (25% reduction in average minimum lot width; 10 foot (rather than 15 or 20 foot) front yard setbacks; 33% reduction in side and rear setbacks; 4 foot (rather than 20 foot) garage setbacks; and 20% increase in maximum height.





## Commercial/Industrial Component

Proposed Section 18.790.050.C.3 encourages STG protection on commercial and industrial land when at least 50% of STG on a commercial or industrial property is protected; setbacks may be reduced by as much as 50% and heights may be increased by as much as 20% to facilitate STG preservation. Adjustments to sidewalk, parking and landscaping standards may be permitted to facilitate density transfer. However, density transfer has limited utility for commercial and industrial development types.

## STG Regulatory Incentives Scenarios

The following drawings show four development scenarios that *could* result for a large STG located entirely on buildable residential land. Each of these scenarios would be permitted outright under the revised Chapter 18.790.050, Flexible Standards for Planting and Preservation – depending on the proportion of the tree grove that a developer *decides* to protect (either through dedication to the city or a deed restriction) on a property zoned R 4.5 (a single-family residential zone with a 7,500 square foot minimum lot size).

In all four of these scenarios, all of the property lies outside Title 3 protected areas.





**Option 1 - Standard Lot Subdivision**      **No Tree Grove Preserved**  
**Average Lot Size - 75-8500 SF - 28 Units**

**Option 1** shows an STG entirely removed from a property – because the hypothetical property owner chooses to develop a standard, large-lot, single-family detached subdivision *without* taking advantage of Section 18.790.050, Flexible Standards for Planting and Preservation.

**Effective Result:** The result is the same as the **no additional protection option** because none of the STG area is protected by the City's Sensitive Lands Chapter. The R-4.5 zoning allows 28 lots on this property while providing local street connections.





**Option 2 - Standard Lot Subdivision**  
**Average Lot Size 75-8500 SF - 15 Units**

**All Tree Grove Preserved**

**Option 2** shows a fully protected STG on a property – because the property owner chooses to protect 100% of the tree grove *and* to develop a standard, large-lot, detached subdivision on the remaining buildable portion of the site. The tree grove itself would be considered unbuildable and therefore would not be subject to regional minimum density standards, as provided in Section 18.790.050, Flexible Standards for Planting and Preservation. The remainder of the land would be subject to minimum density standards – but not the land covered by the STG.

**Effective Result:** The result is the same as the **full protection option**, because the tree grove would be preserved in its entirety on the subject property. However, fewer lots would be provided because the property owner chose not to take advantage of density transfer provisions in Section 18.790.050. The only incentive for this type of development is *not* having to comply with regional minimum density standards that would otherwise apply to the property (because none of the property is subject to either Title 3 or Title 13 Sensitive Land regulations).





**Option 3 - Standard and Small Lot Subdivision 40% of Tree Grove Preserved**  
**Average Lot Size - Standard 75-8500SF (11) - Small Lot 35-4500 SF (17)**



**Option 3** shows the same tree grove that is partially protected on a property – because the property owner chooses to take advantage of the density transfer, lot size and setback reduction provisions of Section 18.790.050, Flexible Standards for Planting and Preservation.

**Effective Result:** The result is a **limited protection option**, because the tree grove would be partially preserved while allowing conflicting residential development on 60% of the tree grove on the subject property. In this scenario, smaller lot sizes and flexible dimensional standards are traded for partial tree grove protection. This scenario assumes that the City Engineer has not required a connecting road to the west.





**Option 4 - Rowhouse and Small Lot Subdivision All Tree Grove Preserved**  
**Average Lot Size - Rowhouse 35-4500 SF (18) - Small Lot 45-4900SF (10)**

**Option 4** shows an STG that is protected entirely on a property – because the property owner chooses to take advantage of the density transfer, lot size and setback reduction, and housing type provisions of Section 18.790.050, Flexible Standards for Planting and Preservation.

**Effective Result:** The result is the same as the **full protection option**, because the tree grove would be preserved in its entirety on the subject property. The trade-offs are clear: smaller lot sizes and attached housing are necessary protect the tree grove without a reduction in permitted density. This scenario assumes that the City Engineer has agreed to waive street connectivity requirements to the northwest and west.





# Map A: Significant Tigard Tree Groves and Impact Areas

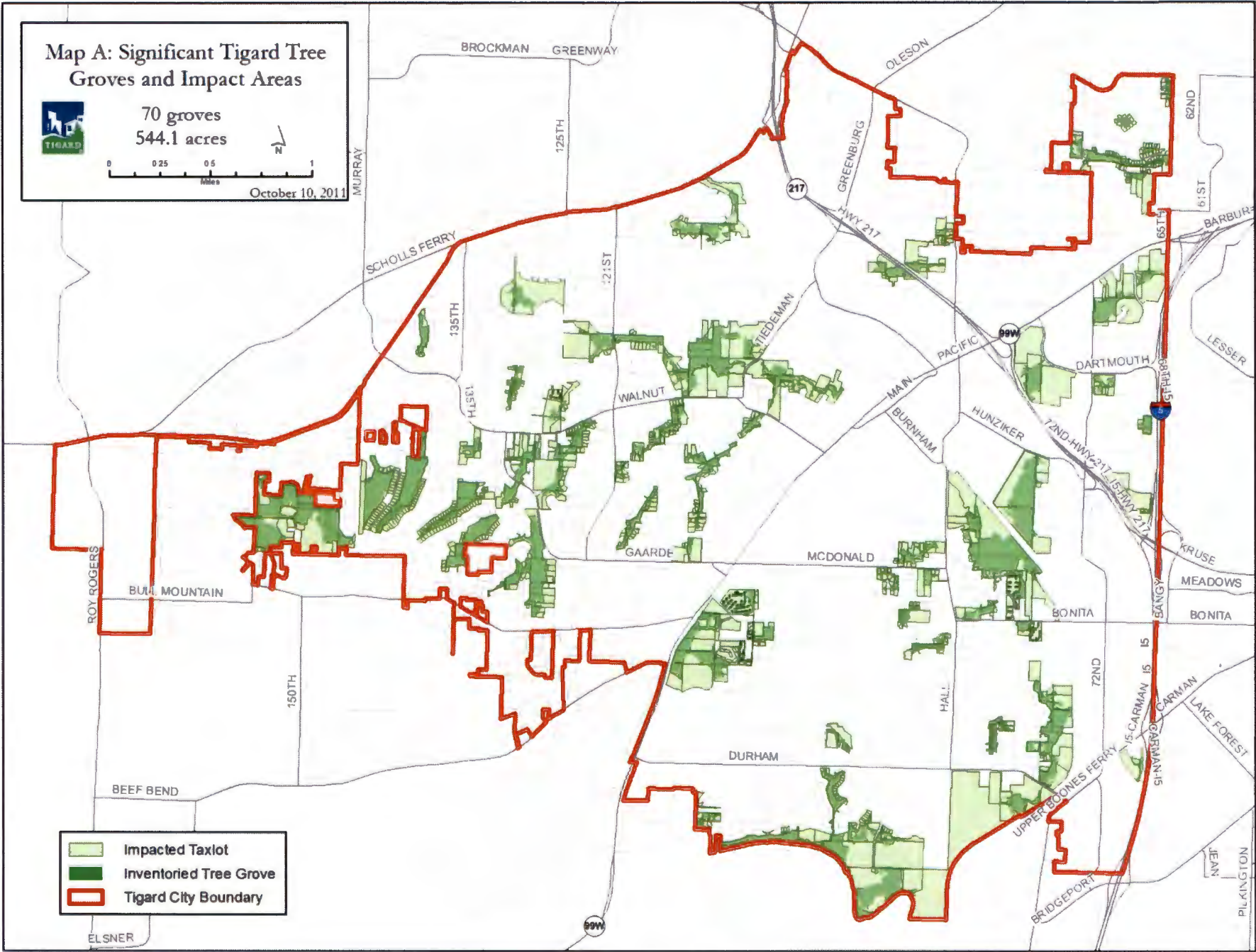


70 groves  
544.1 acres



October 10, 2011

- Impacted Taxlot
- Inventoried Tree Grove
- Tigard City Boundary



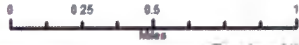




Map B: Significant Tree Groves  
with Comp Plan Designations



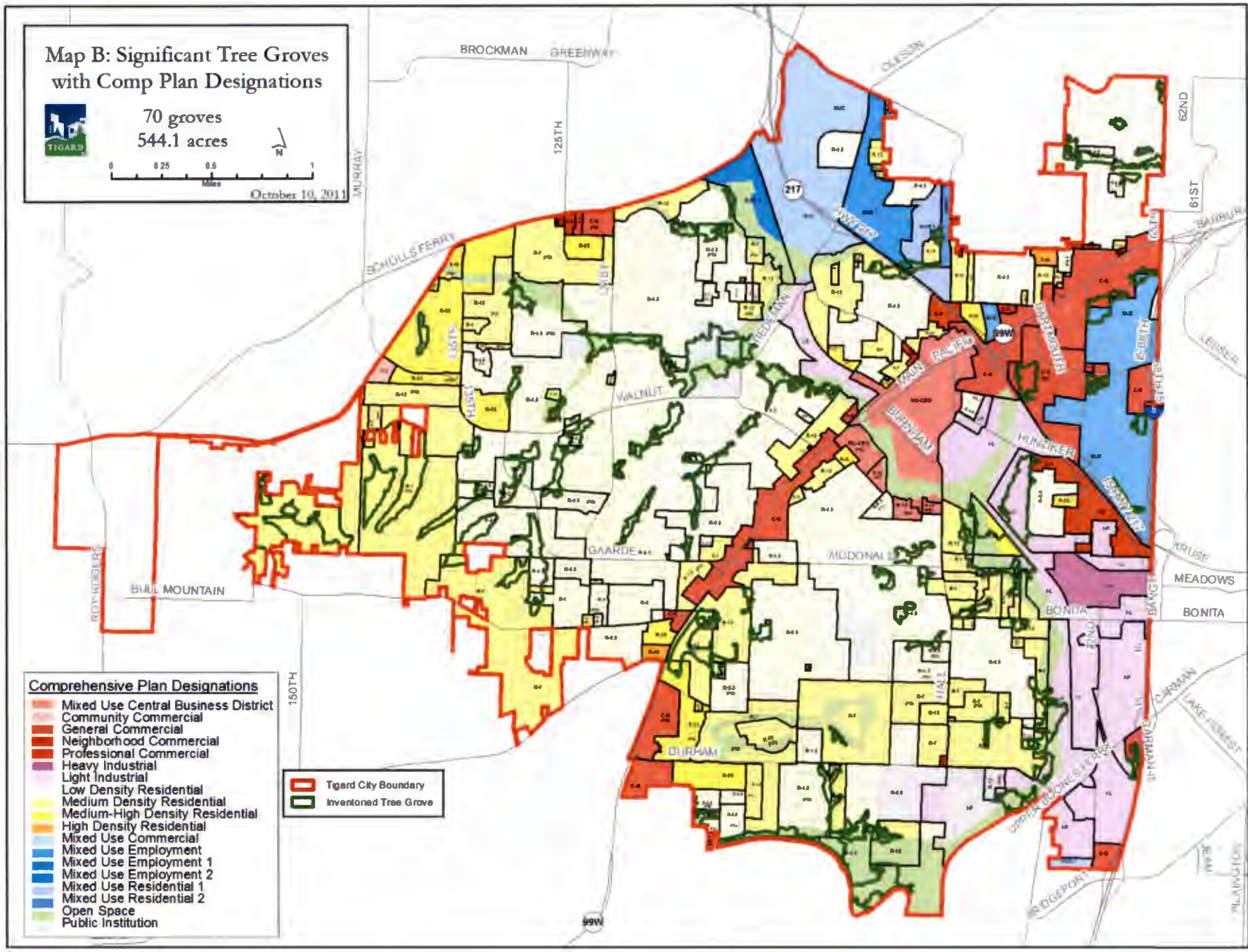
70 groves  
544.1 acres



October 10, 2011

- Comprehensive Plan Designations**
- Mixed Use Central Business District
  - Community Commercial
  - General Commercial
  - Neighborhood Commercial
  - Professional Commercial
  - Heavy Industrial
  - Light Industrial
  - Low Density Residential
  - Medium Density Residential
  - Medium-High Density Residential
  - High Density Residential
  - Mixed Use Commercial
  - Mixed Use Employment
  - Mixed Use Employment 1
  - Mixed Use Employment 2
  - Mixed Use Residential 1
  - Mixed Use Residential 2
  - Open Space
  - Public Institution

- Tigard City Boundary
- Invented Tree Grove





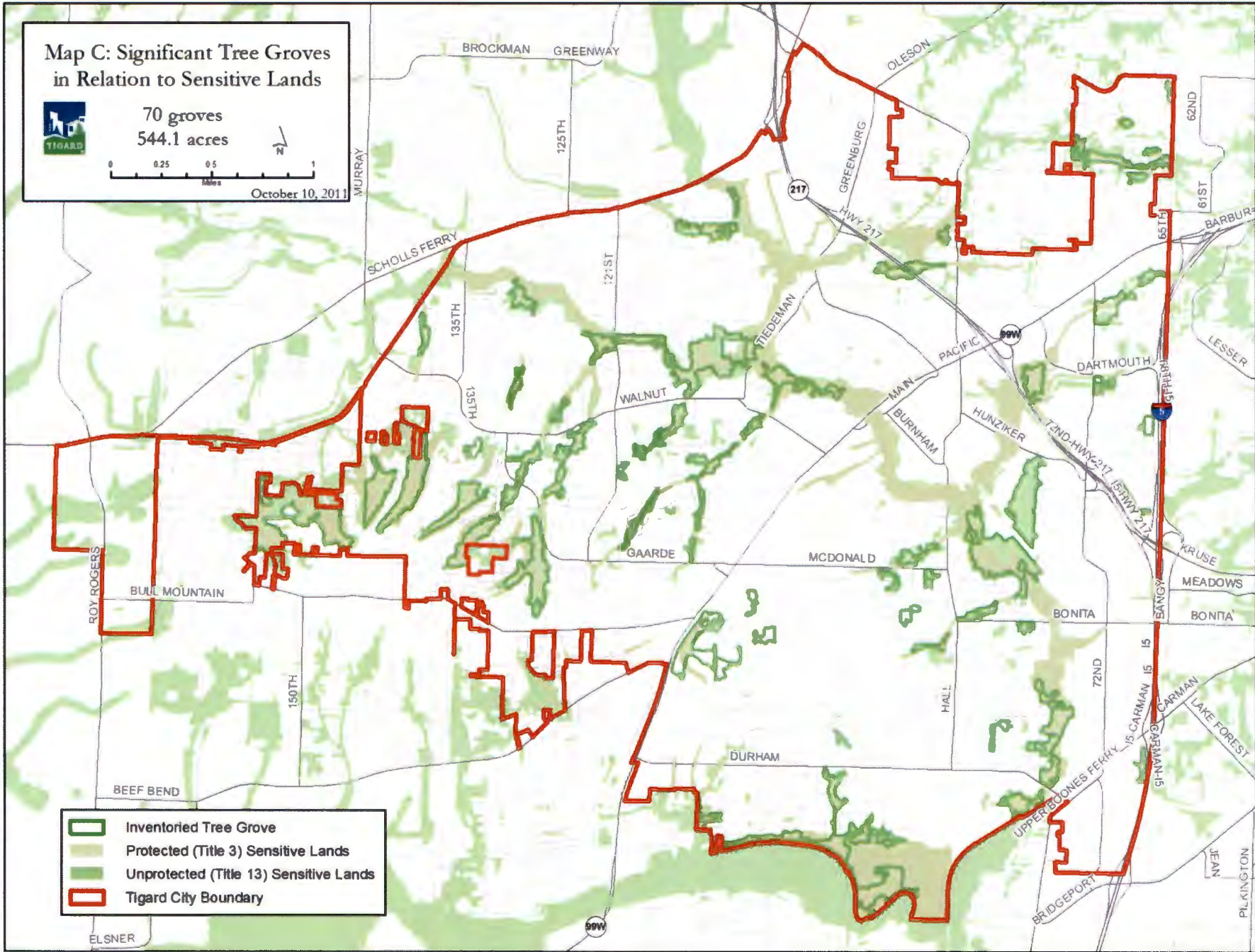
**Map C: Significant Tree Groves  
in Relation to Sensitive Lands**



70 groves  
544.1 acres



October 10, 2011



- Inventoried Tree Grove
- Protected (Title 3) Sensitive Lands
- Unprotected (Title 13) Sensitive Lands
- Tigard City Boundary



## **Appendix A: Tigard Tree Grove Assessment Report**



City of Tigard Urban Forestry Project  
**ESEE Analysis ■ Appendix**  
Prepared by Winterbrook Planning  
November 2011

Appendix A





# City of Tigard Tree Grove Assessment Report

Prepared by:



With

**Richard Brainerd, Carex Working Group**

**November, 2010**

# City of Tigard Tree Grove Assessment

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## INTRODUCTION

Tree groves provide scenic, aesthetic, environmental and other functional values to the Tigard community. The City Council has a commitment to the community to inventory remaining tree groves in Tigard and to protect significant groves through an incentive-based program.

The purpose of the Tree Grove Assessment project is to document the location, quantity and quality of significant tree groves in Tigard. The project follows the inventory process outlined in Statewide Planning Goal 5 (natural resources). The outcome of this work will be the development of policy encouraging the preservation and protection of significant groves through a flexible, incentive-based grove protection program.

This report describes the methodology used to conduct the assessment and provides the results with summary tables and analysis. Appendix A contains the Tree Grove Assessment (TGA) data sheets for each tree grove. These forms include the tree grove information and assessment data described in the Methods section, below.

## SUMMARY

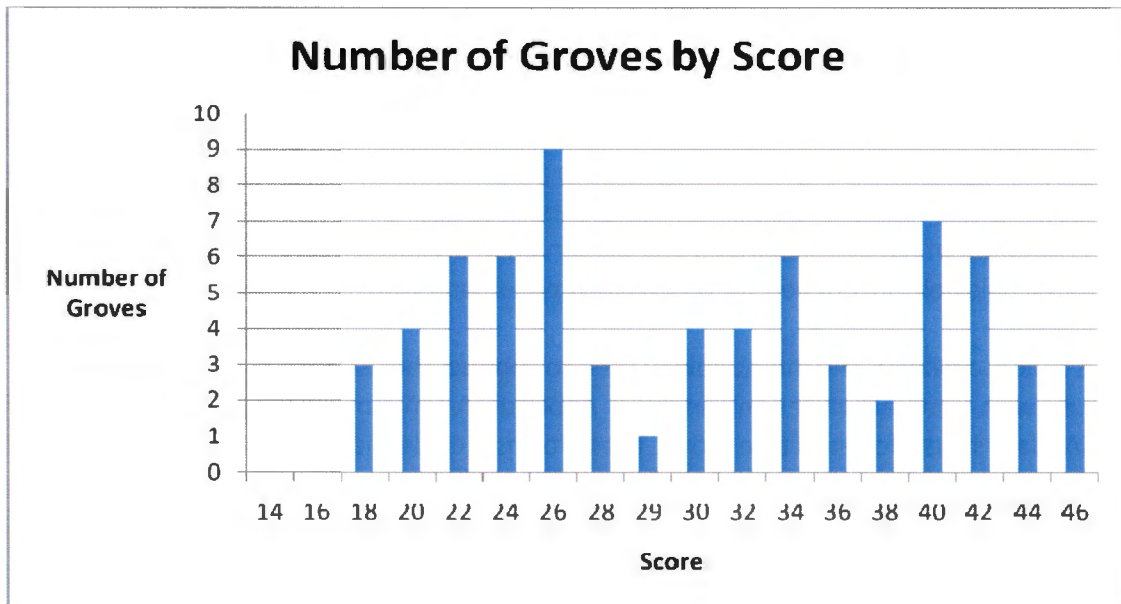
The tree grove assessment field work was conducted within the Tigard city limits in August and September, 2010.

For the purposes of this project, a tree grove is defined as a stand of trees that are predominantly 25 feet or more in height with contiguous canopy cover of one acre or more in area. Tree groves generally do not include linear plantings that are one or two trees wide (e.g., street trees, rows of trees along a property line), or fragmented areas, such as treed areas with a high proportion of the canopy broken by houses, roads, and other developed uses.

Seventy (70) significant tree grove sites were identified within the Tigard city limits. The sites range from 1.06 to 54.40 acres, with a combined area of 544 acres. The average site size is 7.77 acres; the median size is 3.78.

Overall TGA scores ranged from a high of 46 (Sites 36, 71 and 101) to a low of 18 (Sites 10, 38 and 49). The average score for all groves was 31.4; the median score for all groves was 30. A summary of the number of groves by score is presented in Graph 1.

**Graph 1. Tree Grove Assessment Scores**



## **METHODS**

Winterbrook used the following methods to determine the location and the relative quantity and quality of significant tree groves in Tigard.

### **Preliminary Mapping Process**

City planning staff worked with Winterbrook to select potentially significant tree groves for initial review. The City used Metro tree canopy maps and GIS technology to identify tree groves with a canopy cover of two acres or greater. Using this criterion alone, City staff determined that there were 100 tree groves in Tigard, covering approximately 930 acres – or about 12.3% of the City's land area.

Winterbrook then reviewed aerial photographs and boundaries of the initial 100 tree groves to refine Metro canopy mapping. Metro's canopy mapping software does not always differentiate developed areas with buildings and roads, tree shadows, and other landscape patterns that are not trees. These developed or non-forested areas mapped by Metro were removed from the City's tree grove mapping.

Next, using aerial photo interpretation and field observation, tree grove boundaries were refined to include tree groves with contiguous canopy cover of one acre or more; linear or fragmented/developed areas were generally removed from the mapped groves. This

decision was based on City Council direction<sup>1</sup> to concentrate on larger, cohesive tree groves.

**For the purposes of this study, a significant tree grove has a contiguous canopy of one-acre or more. Groves not meeting this threshold were dropped from the inventory.** In cases where features such as roads or development fragmented a grove into smaller groves of more than one acre in size, one or more new groves were created and added to the inventory.

Using the updated base maps, Winterbrook then completed the field inventory.

### **Tree Grove Field Inventory Methods**

Tree groves in Tigard are generally visible from public lands (e.g., parks, streets, schools). Many of the groves are within (or partially within) city parks and could be accessed on site. Other groves proved to be sufficiently visible from public rights-of-way, parks and trail systems, and other public lands.

Winterbrook completed detailed Tree Grove Assessment forms during field visits. The data collected and the assessment parameters used are described below. Once the field data were collected, information was transferred to electronic data sheets and the functional assessment rankings completed.

### Survey Data

Tree Grove Assessment (TGA) survey forms contain information on the general characteristics of the grove such as its size, location, and vegetation composition. The following survey data was recorded on TGA forms in the field (except as noted below).

*Grove Site #* – Follows the City’s grove numbering system, generally a number between 2 and 101.

*Date* – Date(s) of the field survey.

*Field Staff* – Initials of field observers.

*Size* – Site acreage, reflecting any site boundary amendments made in the field; this calculation is provided by GIS.

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<sup>1</sup> The City Council approved this general approach at a July 20, 2010 work session.

*Location* – Site identifiers, such as street intersections, parks or schools, or other characteristics to enable identification of the grove to which the TGA form pertains.

*Goal 5 Site?* – Is any portion of the site part of a Goal 5 (Significant Habitat) site?

*Score* – The cumulative total of points for the ten tree grove functional categories (see discussion below). Scoring was automated using Excel-based TGA forms. The range of potential scores for a given grove is 10 to 50 points. Those sites with the highest scores provide the highest number and quality of functions.

*Map* – The map number for the subject grove (currently, this is same as the grove number).

*Photos* – The numbers for site photographs.

*Description* – General classification of forest or woodland community using National Vegetation Classification System (NVCS). Dominant, co-dominant and secondary tree species are typically noted here, as well as general understory characteristics or species.

### Field Assessments

The assessment section of the survey focuses on the functional characteristics of the tree grove. Ten functional categories are evaluated and each receives a score of low (1), medium (3), or high (5) based on threshold factors established in each category as described below. The range of potential scores for a given grove is 10 to 50 points. Following is a summary of the ten functional categories and their assessment factors.

#### *Grove Maturity/ Tree size*

Scenic values tend to be a function of tree size or age. Also, mature trees are difficult or take a long time to replace. The primary assessment factor in this category is the percent of large trees (greater than 14” diameter at breast height (dbh)) in the grove. Multi-stem trees are evaluated by the size of the largest individual trunk at chest height.

#### *Grove Size*

The vitality and resilience of a grove generally increase with grove area. Scenic, natural and other values often increase with size as well. Based on local grove conditions, groves of greater than five acres are defined as large (high), groves between two and five acres are defined as medium, and groves of less than two acres are defined as small (low).

#### *Health*

This category assesses the general health and condition of a grove, including signs of dieback, threats, and disturbance. Threats may include infestations of invasive plants such as English ivy that tend to degrade forest habitat functions and values. It may also include natural

processes, such as beaver activity, that change the hydrologic regime to alter the existing tree grove composition and health.

#### *Visibility*

Groves that are clearly visible from major streets or public open space have greater value to the community. Assessment factors include visibility from an arterial or local street and/or public or private open space.

#### *Screening/Buffering*

Groves may serve as land use buffers. The value of buffering or screening is a function of the grove size, location and nearby uses. The greatest value to the community is when the tree grove provides a buffer between different types of uses, primarily between industrial/commercial use and residential/open space uses.

#### *Accessibility*

Accessibility is a function of ownership (public or private) and physical features (topography, trail access, etc.). Public access provides more opportunity for public use and enjoyment. Steep terrain and inaccessible features (wetlands, dense brush) may limit or preclude opportunities for public use.

#### *Rarity*

Unusual features, such as large size, rare species, or historic/landmark values, add to community value. This category considers whether such features are present, and whether they are uncommon or unique within the City.

#### *Educational/Recreational Potential*

Groves with both public access and noteworthy features offer increased educational values. Groves with public or semi-public access and trail networks offer passive recreation values. Important factors include public versus private ownership and whether developed access exists. This category is a function of accessibility and rarity values: if either ranks low, this function is low; if both rank medium, this function is medium; otherwise, this function is high.

#### *Wildlife Habitat Value and Connectivity*

Upland tree groves can provide important habitat for terrestrial wildlife species. The size, location and composition of a grove are all factors influencing the quality of habitat. Larger groves located near or connected to other habitat areas generally provide greater habitat value than smaller, isolated groves. Groves with a diverse mix of species and structure (such as mid-canopy trees, shrubs, groundcover, and standing or downed logs) generally provide higher value forage, cover and nesting habitat than groves with few species or with no understory.

### *Level of Existing Development*

Groves located on undeveloped or partially developed sites offer the opportunity to protect groves through site planning. Groves surrounded by development tend to be more at risk.

### *Comments*

The *Comments* section is used to make additional notes relevant to assessment, such as statements of overall quality, invasive species presence, land use context, unusual characteristics and clarifications on assessment rankings.

## **INVENTORY RESULTS**

The tree grove assessment field work was conducted within the Tigard city limits in August and September, 2010.

Seventy (70) significant tree groves sites were identified within the City of Tigard. The majority of the groves were associated with Fanno and Summer Creeks and their major tributaries. The sites range from 1.06 to 54.40 acres, with a combined area of 544 acres. The average site size is 7.77 acres; the median size is 3.78, indicating that several larger groves skew the average size upward significantly. The largest grove, Grove 67 on Bull Mountain, covers 54.4 acres.

Overall TGA scores ranged from a high of 46 (Sites 36, 71 and 101) to a low of 18 (Sites 10, 38 and 49). The average score for all groves was 31.4; the median score for all groves was 30.

Most of the tree groves are composed of a mix of tree species rather than a pure stand of a single species. Species present may include any or all of the following: Douglas fir, ponderosa pine, western red cedar, bigleaf maple, red alder, Oregon ash, Oregon white oak, black cottonwood, and Pacific willow.

- In areas influenced by nearby streams or wetlands, Oregon ash, red alder, Pacific willow, and black cottonwood are dominants, and Douglas fir and western red cedar are often subdominants.
- In upland areas out of the immediate stream corridors or wetlands, dominance shifted to Douglas fir, bigleaf maple, and Oregon white oak, with occasional stands of red alder. Stands with large, open grown Oregon white oak and/or large ponderosa pine usually received higher scores due to the rarity of these features and their importance to wildlife in the Willamette Valley.

Fifty-nine (59), or 84 percent, of the sites are located partially or entirely within Goal 5 Significant Habitat areas. Most of these correspond to drainageways or large wetlands, and are in public ownership. These groves are generally larger and support greater habitat complexity due to variation in the plant community related to moisture gradients between

uplands and wetlands. Many of the larger tree groves are within the Fanno Creek corridor, where the presence of parks, walking trails, and other amenities enable public access.

Table 1 summarizes key characteristics of significant tree groves within the City: their size, score, and dominant vegetation, along with inventory field dates visited and whether they are part of Goal 5 resource sites.

**Table 1. Characteristics of Significant Tree Groves**

Tree Grove #	Size (acres)	Score	Date of field visit	Part Goal 5 resource?	Dominant Species / Other characteristics
2	1.79	26	9/1/2010	Yes	Oregon white oak, Oregon ash. Ash Creek corridor.
3	12.47	42	9/9/2010	Yes	Black cottonwood, Oregon white oak, Oregon ash. Fanno Creek and small tributary confluence. Woodard Park.
8	1.74	20	9/1/2010	No	Oregon ash. Grove interior to large residential lots.
9	1.34	22	9/1/2010	Yes	Oregon ash. Grove interior to residential lots.
10	1.06	18	9/1/2010	Yes	Oregon white oak, bigleaf maple, Douglas fir. Grove interior to residential lots.
11	2.11	26	9/1/2010	Yes	Western red cedar, bigleaf maple, Douglas fir. Large lots, buffering of commercial/industrial areas
12	6.43	40	9/1/2010	Yes	Western red cedar. Large open space tract behind new residential development. Ash Creek corridor.
13	2.54	34	9/1/2010	Yes	Douglas fir, western red cedar, bigleaf maple, red alder. Open space tract along Ash Creek. Abuts local park.
14	3.06	30	9/1/2010	Yes	Western red cedar, red alder. Ash Creek corridor crossing several large lots.
17	1.66	42	9/9/2010	Yes	Black cottonwood, Oregon oak. Scattered trees in park, Goal 5 area. Abuts Fanno Creek corridor.
19	9.71	42	9/9/2010	Yes	Black cottonwood. Large grove part of the Fanno Creek corridor at Englewood Park. Mapped Goal 5.
22	4.90	34	9/10/2010	Yes	Oregon white oak, Oregon ash. Large tree grove, mapped Goal 5. Contains a small grove of ponderosa pine.
23	3.11	26	9/9/2010	Yes	Douglas fir, Oregon white oak, Oregon ash. Goal 5 resource containing tributary of Fanno Creek.
24	3.28	26	9/1/2010	Yes	Oregon ash. Ash swale forest connected to pasture/wetland/park
25	5.50	42	9/9/2010	Yes	Oregon ash Large Goal 5 grove at Summerlake Park.
30	9.61	34	9/9/2010	Yes	Douglas fir, Oregon ash. Large forest with Goal 5 mapping.
31	3.68	22	9/9/2010	Yes	Red alder. Forested open space, all covered by Goal 5 habitat.
32	5.81	36	9/9/2010	Yes	Oregon ash, black hawthorn. Forest abutting Mary Woodard Elementary school.

Tree Grove #	Size (acres)	Score	Date of field visit	Part Goal 5 resource?	Dominant Species / Other characteristics
33	3.79	44	9/9/2010	Yes	<u>One of 4 top scoring sites.</u> Oregon ash. Forest in Goal 5 area and mostly on public property – Fanno Creek Trail..
35	5.50	28	9/9/2010	Yes	Oregon ash, black cottonwood. Public Goal 5 site with adjacent treed backyards. Adjoins Grove 36.
36	30.97	46	9/9/2010	Yes	<u>One of 4 top scoring sites.</u> Douglas fir, ponderosa pine; Oregon ash . Part of grove is a forested ash wetland.
37	2.90	20	9/9/2010	Yes	Oregon ash, Pacific willow. Pond margin.
38	3.10	18	9/9/2010	Yes	Oregon ash.
40	8.36	34	9/9/2010	Yes	Oregon ash, Oregon white oak. Large contiguous parcel with grove and stream corridor in private ownership.
42	2.21	32	9/9/2010	Yes	Pacific willow, Douglas fir. Somewhat fragmented. Jack Park.
44	2.99	24	9/9/2010	No	Oregon white oak, Oregon ash. Large private lots.
45	2.57	40	9/10/2010	Yes	Oregon ash, red alder. Mix of species, some planted, some large and small
46	2.94	26	9/9/2010	No	Douglas fir, bigleaf maple. Large residential lots.
47	2.02	24	9/10/2010	Yes	Oregon ash, red alder, bigleaf maple, Douglas fir. Grove in open space and on large lot in G5 area.
48	6.99	34	9/10/2010	Yes	Red alder, bigleaf maple, western red cedar. Stream corridor grove.
49	1.54	18	9/9/2010	No	Oregon ash, black cottonwood. Large residential lots.
51	5.91	26	9/9/2010	Yes	Douglas fir, Oregon ash. Goal 5 resource mapped along backyards, few larger lots.
51a	12.84	26	9/9/2010	Yes	Douglas fir, Oregon ash. Goal 5 resource mapped along backyards, few larger lots.
52	3.27	38	9/10/2010	Yes	Douglas fir, bigleaf maple, red alder, western red cedar. Not public but appears to be common open space.
54	3.88	20	9/9/2010	Yes	Bigleaf maple. Canopy connection across access road.
55	15.71	40	9/9/2010	Yes	Douglas fir. Goal 5 area, mostly public land.
56	6.69	42	9/10/2010	Yes	Red alder, western red cedar. Goal 5 corridor, developed edges, some public some private.
56a	2.83	36	9/10/2010	Yes	Red alder, Oregon ash. Split from 56 by a public street.
57	20.89	40	9/9/2010	Yes	Douglas fir, bigleaf maple. Larger lots some public and some private, all Goal 5.
59	13.18	30	9/9/2010	Yes	Douglas fir, bigleaf maple. Goal 5 corridor on backs of larger lots, developed edges.
60	5.25	40	9/10/2010	Yes	Red alder, bigleaf maple. Goal 5 corridor, developed edges, some public some private.



Tree Grove #	Size (acres)	Score	Date of field visit	Part Goal 5 resource?	Dominant Species / Other characteristics
62	25.28	32	9/9/2010	Yes	Douglas fir, black cottonwood. Goal 5 site, some buffering against Hwy 217.
63	1.48	22	9/10/2010	Yes	Douglas fir, red alder. Goal 5 corridor, developed edges.
64	5.31	24	9/13/2010	Yes	Red alder, western red cedar. Goal 5 corridor on backs of larger lots, developed edges.
65	13.02	44	9/10/2010	Yes	Red alder, bigleaf maple. Goal 5 corridor on large lots, some public some private.
67	54.40	42	9/9/2010	Yes	Douglas fir, bigleaf maple. Large, sprawling grove on Bull Mtn. Mostly large public and private lots, Goal 5 area.
68	2.76	20	9/13/2010	Yes	Bigleaf maple. Goal 5 area mapped on large residential lots.
69	2.25	24	9/13/2010	Yes	Douglas fir. Goal 5 area mapped on large residential lot.
71	39.20	46	9/9/2010	Yes	<u>One of 4 top scoring sites.</u> Oregon ash, red alder. Large G5 site between development and freeway.
73	1.97	24	9/13/2010	No	Douglas fir, western red cedar. Grove behind apartment complex
74	3.89	29	9/9/2010	Yes	Douglas fir, western red cedar, red alder, bigleaf maple. Parts of grove publicly owned.
75	24.34	38	9/10/2010	Yes	Douglas fir, bigleaf maple, red alder. Long grove with development at edges. Some large lots, some public.
77	2.86	28	9/13/2010	Yes	Douglas fir. Grove crosses several large lots.
79	2.08	22	9/9/2010	Yes	Douglas fir, bigleaf maple. Large residential lot.
81	3.08	36	9/13/2010	Yes	Douglas fir, western red cedar, bigleaf maple. Grove in some public ownership.
83	3.46	32	9/13/2010	Yes	Douglas fir. East Butte Park & Tigard House. Park site is ~3 ac.
86	18.25	32	9/13/2010	No	Douglas fir, bigleaf maple. Larger contiguous patch, became 2 groves when refined.
86a	4.12	30	9/13/2010	No	Douglas fir, bigleaf maple. Larger contiguous patch, became 2 groves when refined.
89	1.21	26	8/30/2010	No	Douglas fir. Golf course with some backyard trees; canopy cover with limited understory.
90	2.53	22	8/30/2010	No	Douglas fir, bigleaf maple. Treed backyards but in larger blocks that together make a grove.
91	1.29	24	9/13/2010	Yes	Douglas fir, western red cedar. Goal 5 grove on a residential lot.
92	2.27	22	8/30/2010	No	Douglas fir. Grove along freeway, generally linear but still fairly wide.
93	21.15	40	9/13/2010	Yes	Douglas fir, western red cedar. Large grove, almost entirely contained within Goal 5 resource.
95	3.76	28	9/13/2010	Yes	Douglas fir, bigleaf maple, Oregon ash, red alder. Large Goal 5 grove contiguous with Tualatin River greenway.

Tree Grove #	Size (acres)	Score	Date of field visit	Part Goal 5 resource?	Dominant Species / Other characteristics
96	6.50	30	9/13/2010	Yes	Douglas fir, bigleaf maple, western red cedar. Large grove comprising private open space around Copper Creek.
97	7.08	40	8/30/2010	Yes	Oregon ash, bigleaf maple. Grove mostly in Goal 5, public land on east side near treatment ponds.
99	5.89	34	8/30/2010	Yes	Red alder, Oregon ash, black cottonwood, willow. Two groves identified (99 and 99a), separated by road.
99a	3.21	26	8/30/2010	Yes	Red alder, Oregon ash, willow. Area east of above site, east of 92 <sup>nd</sup> Avenue.
100	15.39	44	9/13/2010	Yes	Douglas fir, red alder. Large Goal 5 resource site along Tualatin River.
101	19.91	46	9/13/2010	Yes	<u>One of 4 top scoring sites.</u> Bigleaf maple, Douglas fir. Entire site within Goal 5 resource. Part of Cook Park.

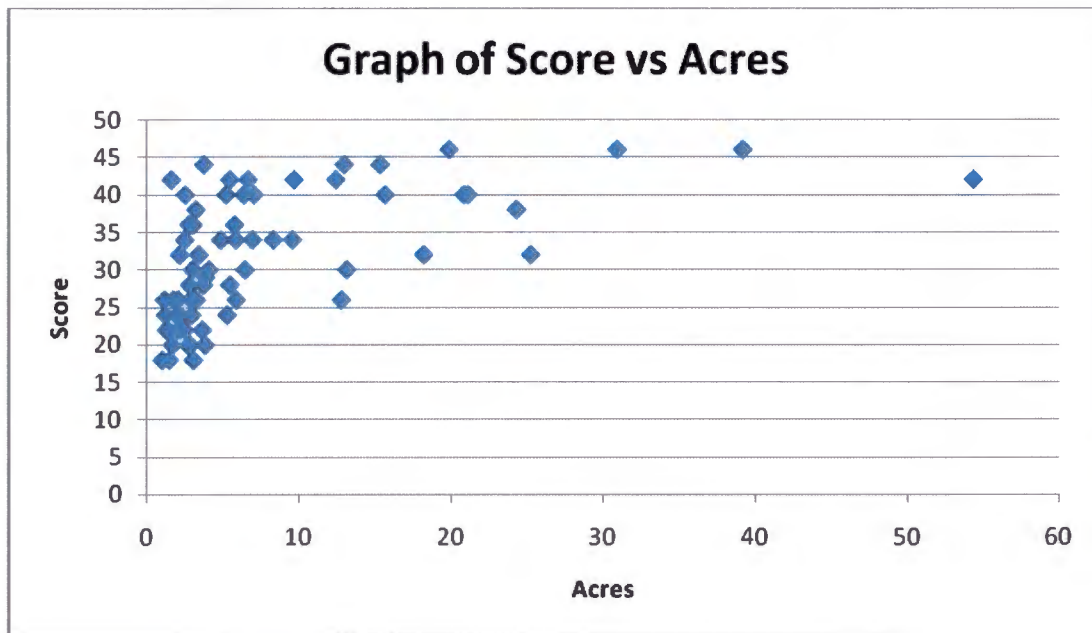
## CONCLUSION

This Tree Grove Assessment report, together with the TGA mapping and assessment forms in Appendix A, document the location, quantity and quality of significant tree groves in Tigard. The highest scoring grove sites cluster around streams, wetlands and other areas mapped as Goal 5 resources.

We conclude with a few observations:

- The City's tree groves and other natural areas form an impressive network of open space and natural habitats that provide a variety of services and amenities to the community.
- The largest groves generally score high, while the smallest groves are all over the map – there are both high and low scores in the one to five acre range (see Graph 2).

Graph 2. Relationship of Grove Score to Size



- Large groves scored high for several reasons:
  - a. intrinsic value – i.e. more habitat diversity, interspersion, scenic value, potential for rare features
  - b. usually in public ownership – higher value for education and recreation
  - c. usually within a significant habitat (Goal 5) area
  - d. often within a major riparian or wetland corridor
  - e. usually with good connectivity to other sites within the same corridor
  
- Many tree groves are badly infested with invasive plants in the understory. In particular, tree groves that are in stream corridors often have dense understories of Armenian (Himalayan) blackberry. Other problem species include English ivy, sweet cherry, and English holly. Invasive species management will be an important consideration in the development of a conservation strategy for tree groves.

## NEXT STEPS

The next step in the Goal 5 process will be an analysis of Economic, Social, Environmental and Energy consequences of different conservation strategies, which will serve as the basis for policy recommendations encouraging the preservation and protection of significant groves through a flexible, incentive-based grove protection program.

Current local regulation generally requires that these areas be set in separate tracts during development, and some of those have transferred to public ownership. Consequently, some

tree groves within or adjacent to wetlands, streams and floodplains have existing local protection. The focus of new policy will be on the groves, or portions of groves, located outside of these Goal 5 protected sites. The goal of the incentive-based program is to create a positive pull toward maintaining these groves and expanding them where desirable and feasible.

## **APPENDIX A:**

<b>GROVE SITE #:</b>	2	<b>SIZE:</b>	1.76 acres	<b>SCORE:</b>	26
<b>DATE:</b>	9/1/2010	<b>LOCATION:</b>	Hall Blvd/Pine	<b>MAP:</b>	2
<b>FIELD STAFF:</b>	DB/AS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5643

<b>Grove Description</b>					
Deciduous Forest; Oregon ash - Oregon oak codominants with black cottonwood and incense cedar.					

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size	✓	Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	0	X 5	8	X 3	2	X 1
<b>TOTALS</b>	0		24		2	

**Comments:** The oak component and proximity to water increase the value of this grove. The Ash Creek floodplain and channel have degraded vegetation and hydraulic function. Dense vegetation in the upland buffer. Invasives heavy at the margins. Some buffering.

<b>GROVE SITE #:</b>	3	<b>SIZE:</b>	12.47 acres	<b>SCORE:</b>	42
<b>DATE:</b>	9/9/2010	<b>LOCATION:</b>	Woodland Park	<b>MAP:</b>	3
<b>FIELD STAFF:</b>	ACS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	

<b>Grove Description</b>					
Deciduous open woodland; Park actively managed - grass, trails. Dominants: black cottonwood, few ponderosa pine, Oregon white oak, Oregon ash. Shrubs: swamp rose (dom), dewberry, snowberry, red elderberry, red osier dogwood.					

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace	✓	>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓	>5 acres in size		2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance	✓	Healthy: no visible threats, low disturbance		Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value	✓	Visible from arterial street or public park/open space		Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses	✓	Between industrial or commercial uses and residential or open space uses		Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access	✓	Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium	✓	Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size	✓	Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (<1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>6</b>	<b>X 5</b>	<b>4</b>	<b>X 3</b>	<b>0</b>	<b>X 1</b>
<b>TOTALS</b>	<b>30</b>		<b>12</b>		<b>0</b>	

**Comments:** upland areas parklike - large mature oak, ash with grassy understory. Riparian corridor trees younger and shrub cover is heavy especially where tree cover is less. Some reed canarygrass along stream.  
Huge ponderosa pine snag with pileated holes. Himalayan blackberry heavy on east side of stream.

<b>GROVE SITE #:</b>	8	<b>SIZE:</b>	1.74 acres	<b>SCORE:</b>	20
<b>DATE:</b>	9/1/2010	<b>LOCATION:</b>	65th and Evelyn	<b>MAP:</b>	8
<b>FIELD STAFF:</b>	DB/AS	<b>GOAL 5 SITE?</b>	No	<b>PHOTOS:</b>	5624-5626

### Grove Description

Moist deciduous forest dominated by Oregon ash with shrubby understory of bigleaf maple, Norway maple, European hawthorn, serviceberry, English ivy, Himalayan blackberry, understory impacted by invasives. Appears to be a small drainageway running north to south through grove.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh	✓	<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size		2 to 5 acres in size	✓	< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features		Uncommon features or combination of features	✓	No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size	✓	Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	0	X 5	5	X 3	5	X 1
<b>TOTALS</b>	0		15		5	

**Comments:** 2 lobes connected by very narrow strip with lawn understory. Many non-native trees. A couple of undeveloped lots. Okay for songbird habitat. Water probably seasonal.

<b>GROVE SITE #:</b>	9	<b>SIZE:</b>	1.34 acres	<b>SCORE:</b>	22
<b>DATE:</b>	9/1/2010	<b>LOCATION:</b>	Near 69th St. / Lola St.	<b>MAP:</b>	9
<b>FIELD STAFF:</b>	AS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5628-5630

<b>Grove Description</b>	
Grove is interior where lots come together. Mixed moist forest. Oregon ash, pine, giant redwood, Douglas fir, Oregon white oak, bigleaf maple.	

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size		2 to 5 acres in size	✓	< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance	✓	Healthy: no visible threats, low disturbance		Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space		Visible from local street or private common open space	✓	Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features		Uncommon features or combination of features	✓	No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size	✓	Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	1	X 5	4	X 3	5	X 1
<b>TOTALS</b>	5		12		5	

**Comments:** Some subdivision possible. Understory mix of native/non-native, not park-like.



<b>GROVE SITE #:</b>	10	<b>SIZE:</b>	1.06 acres	<b>SCORE:</b>	18
<b>DATE:</b>	9/1/2010	<b>LOCATION:</b>	South of Ventura St.	<b>MAP:</b>	10
<b>FIELD STAFF:</b>	AS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5640

<b>Grove Description</b>	
Mixed forest, most viewable between houses. Dominants: Oregon white oak, big leaf maple, Douglas fir; other trees: Oregon ash, black cottonwood.	

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size		2 to 5 acres in size	✓	< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space		Visible from local street or private common open space	✓	Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife	✓	Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)		Partially developed	✓	Developed, or surrounded
<b>SUB-TOTALS</b>	0	X 5	4	X 3	6	X 1
<b>TOTALS</b>	0		12		6	

**Comments:** No connectivity; Understory not visible: likely typical residential maintenance.

<b>GROVE SITE #:</b>	11	<b>SIZE:</b>	2.11 acres	<b>SCORE:</b>	26
<b>DATE:</b>	9/1/2010	<b>LOCATION:</b>	South of Ventura near 67th	<b>MAP:</b>	11
<b>FIELD STAFF:</b>	DB/AS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5641, 5642

**Grove Description**  
Mixed forest: western red cedar, bigleaf maple, Douglas fir with scattered Oregon white oak, red alder. Understory quite weedy , with English ivy, Himalayan blackberry, English holly, some native understory species including thimbleberry, hazelnut, vine maple, sword fern.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses	✓	Between industrial or commercial uses and residential or open space uses		Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features		Uncommon features or combination of features	✓	No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size	✓	Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	1	X 5	6	X 3	3	X 1
<b>TOTALS</b>	5		18		3	

**Comments:** Understory quite impacted by non-natives. Partially developed public ownership at east end is National Guard - no access. Understory has diversity if natives that are threatened by invasives. Screens residential neighborhood from National Guard facility.

<b>GROVE SITE #:</b>	12	<b>SIZE:</b>	6.43 acres	<b>SCORE:</b>	40
<b>DATE:</b>	9/1/2010	<b>LOCATION:</b>	East of 74th, north of Ventura	<b>MAP:</b>	12
<b>FIELD STAFF:</b>	DB/AS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5634

**Grove Description**

Mixed Ever-Decid Forest. Western red cedar (dom), Douglas fir, bigleaf maple, red alder, hazelnut, Douglas spirea, red elderberry, Himalayan blackberry (dom). Site is adjacent to #14 - seperated by road.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace	✓	>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓	>5 acres in size		2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance	✓	Healthy: no visible threats, low disturbance		Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access	✓	Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium	✓	Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity	✓	Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (<1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>5</b>	<b>X 5</b>	<b>5</b>	<b>X 3</b>	<b>0</b>	<b>X 1</b>
<b>TOTALS</b>	<b>25</b>		<b>15</b>		<b>0</b>	

**Comments:** Ash Creek riparian corridor. Some dead mature western red cedar, possibly from elevated hydrology (beavers). Fenced but good access from 74th. Buildout along grove proceeding. Some invasives at margin; ivy in interior.

<b>GROVE SITE #:</b>	13	<b>SIZE:</b>	2.54 acres	<b>SCORE:</b>	34
<b>DATE:</b>	9/1/2010	<b>LOCATION:</b>	Bet/Ventura Dr. & Ventura Pl.	<b>MAP:</b>	13
<b>FIELD STAFF:</b>	DB/AS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5638, 5639

<b>Grove Description</b>	
Mixed forest. Dominants: Douglas fir, western red cedar, bigleaf maple, red alder. Also some Oregon white oak, Oregon ash.	
Understory impacted by English ivy/Himalayan blackberry but with some native shrubs and herbs. Ash Creek flows through site.	

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓	>5 acres in size		2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access	✓	Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium	✓	Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity	✓	Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>2</b>	<b>X 5</b>	<b>8</b>	<b>X 3</b>	<b>0</b>	<b>X 1</b>
<b>TOTALS</b>	<b>10</b>		<b>24</b>		<b>0</b>	

**Comments:** Understory degraded by ivy and blackberry but hazelnut and serviceberry common. Portions on developed lots but large area at east end not developed. Good connectivity along stream corridor.

<b>GROVE SITE #:</b>	14	<b>SIZE:</b>	3.06 acres	<b>SCORE:</b>	30
<b>DATE:</b>	9/1/2010	<b>LOCATION:</b>	Red Cedar & 74th	<b>MAP:</b>	14
<b>FIELD STAFF:</b>	DB/AS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5632-3, 5635

### Grove Description

Mixed coniferous/deciduous forest dominated by: western red cedar, red alder, big leaf maple. Forest located along Ash Creek with a large beaver pond in center. Understory shrub-dominated, impacted by Himalayan blackberry, reed canarygrass, herb Robert, escaped ornamentals.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace	✓	>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity	✓	Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>2</b>	<b>X 5</b>	<b>6</b>	<b>X 3</b>	<b>2</b>	<b>X 1</b>
<b>TOTALS</b>	<b>10</b>		<b>18</b>		<b>2</b>	

**Comments:** Many cedar/ash snags around pond. Very good habitat value. Good interspersions of adjacent internal aquatic/riparian habitat. Residence with associated impacts (outbuildings, ornamentals).

**Invasives:** English ivy, Himalayan blackberry, clematis, English holly, herb Robert, English laurel.

<b>GROVE SITE #:</b>	17	<b>SIZE:</b>	1.66 acres	<b>SCORE:</b>	42
<b>DATE:</b>	9/9/2010	<b>LOCATION:</b>	Fanno Crk. @ Scholls Fy Rd	<b>MAP:</b>	17
<b>FIELD STAFF:</b>	AS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5673

### Grove Description

Deciduous Forest - abuts Fanno Creek. Dominant trees are black cottonwood and Oregon ash, also includes Pacific willow.

Shrub layers contains swamp rose, red osier dogwood, Douglas spirea, ash and cottonwood saplings. Herb layer dominated by reed canarygrass and willow-weed; also contains common rush, mannagrass, cyperus.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy; no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value	✓	Visible from arterial street or public park/open space		Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses	✓	Between industrial or commercial uses and residential or open space uses		Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots	✓	Unrestricted public access		Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values	✓	Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity	✓	Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (<1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>6</b>	<b>X 5</b>	<b>4</b>	<b>X 3</b>	<b>0</b>	<b>X 1</b>
<b>TOTALS</b>	<b>30</b>		<b>12</b>		<b>0</b>	

**Comments:** Tree grove along Fanno Creek. Under management to control invasives (Himalayan blackberry and reed canarygrass). Extensive replanting done in the past 5 years along trail. Diverse communities/hydrologic regime with high interspersed: forested, scrub-shrub, emergent, aquatic bed wetlands and open water plus adjacent uplands.

A few ornamental trees present at margins

<b>GROVE SITE #:</b>	19	<b>SIZE:</b>	9.71	<b>SCORE:</b>	42
<b>DATE:</b>	9/9/2010	<b>LOCATION:</b>	Englewood Park	<b>MAP:</b>	19
<b>FIELD STAFF:</b>	AS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5669-72

**Grove Description**

Deciduous Forest: riparian community with wetland margins; dominated by black cottonwood with lesser coverage by Pacific willow, red alder, Oregon ash, western redcedar, and bigleaf maple. Mostly native understory.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace	✓	>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓	>5 acres in size		2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance	✓	Healthy: no visible threats, low disturbance		Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value	✓	Visible from arterial street or public park/open space		Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access	✓	Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium	✓	Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity	✓	Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (<1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>6</b>	<b>X 5</b>	<b>4</b>	<b>X 3</b>	<b>0</b>	<b>X 1</b>
<b>TOTALS</b>	<b>30</b>		<b>12</b>		<b>0</b>	

**Comments:** Stream corridor with wide margins and upland buffer. Trail network runs throughout. Cedars mostly in upland area with Pacific waterleaf, thimbleberry, swordfern, beaked hazelnut, Oregon grape, and California dewberry; some cottonwood. In the adjacent wetland, same trees but few cedars. Understory characterized by lady fern, skunk cabbage, slough sedge, and other typical wet species. Native plantings include ponderosa pine, Oregon oak, and Douglas fir.

<b>GROVE SITE #:</b>	22	<b>SIZE:</b>	4.90 acres	<b>SCORE:</b>	34
<b>DATE:</b>	9/10/2010	<b>LOCATION:</b>	N of North Dakota & 93rd	<b>MAP:</b>	22
<b>FIELD STAFF:</b>	DB	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	533,534

**Grove Description**

Deciduous forest dominated by Oregon ash and Oregon white oak; west end is mixed with a patch of large ponderosa pine, scattered Oregon white oak and Oregon ash. Understory mostly dominated by invasives, escaped ornamentals but with some native shrub and herb species; e.g., hazelnut, snowberry, dewberry, serviceberry.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value	✓	Visible from arterial street or public park/open space		Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses	✓	Between industrial or commercial uses and residential or open space uses		Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value	✓	Rare natural or cultural features		Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size	✓	Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (<1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>4</b>	<b>X 5</b>	<b>4</b>	<b>X 3</b>	<b>2</b>	<b>X 1</b>
<b>TOTALS</b>	<b>20</b>		<b>12</b>		<b>2</b>	

**Comments:** Buffers residential area from Highway 217.



<b>GROVE SITE #:</b>	23	<b>SIZE:</b>	3.11 acres	<b>SCORE:</b>	26
<b>DATE:</b>	9/9/2010	<b>LOCATION:</b>	E of 68th; S of Hwy 99	<b>MAP:</b>	23
<b>FIELD STAFF:</b>	DB	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	518-519

**Grove Description**

Mixed forest of Douglas fir, Oregon oak, and Oregon ash with diverse mix of other tree species: Scouler willow, black cottonwood, red alder, sweet cherry. Understory dominated by dense Himalayan blackberry and clematis. Other invasive species common - English holly, English hawthorn.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance		Some dieback or potential threats; invasive species	✓	Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size	✓	Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (<1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	1	X 5	6	X 3	3	X 1
<b>TOTALS</b>	5		18		3	

**Comments:** Grove includes riparian corridor of Red Rock Creek. Some nice oaks and large Douglas fir, but understory is totally dominated by invasives. Distant views from I-5, Hwy 99.

<b>GROVE SITE #:</b>	24	<b>SIZE:</b>	3.28 acres	<b>SCORE:</b>	26
<b>DATE:</b>	9/1/2010	<b>LOCATION:</b>	89th and Thorn Street	<b>MAP:</b>	24
<b>FIELD STAFF:</b>	DB/AS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5644

<b>Grove Description</b>	
Deciduous forest dominated by Oregon ash, some bigleaf maple. Ash swale forest with weedy understory. Himalayan blackberry on the periphery. Adjacent to and clearly visible from Highway 217.	

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value	✓	Visible from arterial street or public park/open space		Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features		Uncommon features or combination of features	✓	No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size	✓	Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	1	X 5	6	X 3	3	X 1
<b>TOTALS</b>	5		18		3	

**Comments:** Habitat connection to pasture and wetlands/pond to the north. Buffers Hwy 217 partially.

<b>GROVE SITE #:</b>	25	<b>SIZE:</b>	5.50 acres	<b>SCORE:</b>	42
<b>DATE:</b>	9/9/2010	<b>LOCATION:</b>	Summerlake Park	<b>MAP:</b>	25
<b>FIELD STAFF:</b>	AS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5674-5

**Grove Description**

Mixed forest. Low areas support a Oregon ash / reed canarygrass-dominated swale community. Higher ground is characterized by Douglas fir, with beaked hazelnut, snowberry, Saskatoon serviceberry, English hawthorn, California dewberry, swordfern, thimbleberry, and oceanspray.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓	>5 acres in size		2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value	✓	Visible from arterial street or public park/open space		Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots	✓	Unrestricted public access		Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values	✓	Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity	✓	Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (<1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	6	X 5	4	X 3	0	X 1
<b>TOTALS</b>	30		12		0	

**Comments:** Some invasives - Himalyan blackberry, English holly, English ivy. Some areas in active use (play structures, ornamental understory, trails throughout). Strong chemical odor nearby. Big fir grove. Noxious weed removal in some areas.

<b>GROVE SITE #:</b>	30	<b>SIZE:</b>	9.61 acres	<b>SCORE:</b>	34
<b>DATE:</b>	9/9/2010	<b>LOCATION:</b>	72nd, west of Atlanta	<b>MAP:</b>	30
<b>FIELD STAFF:</b>	DB	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	520

<b>Grove Description</b>	
Mixed forest dominated by Douglas fir, Oregon ash, large black cottonwood and a few Oregon oak scattered. Understory overrun by invasives: Himalayan blackberry, English ivy, English hawthorn, Norway maple, clematis, and escaped ornamental species.	

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓	>5 acres in size		2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance		Some dieback or potential threats; invasive species	✓	Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value	✓	Visible from arterial street or public park/open space		Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access	✓	Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium	✓	Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size	✓	Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (<1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>3</b>	<b>X 5</b>	<b>6</b>	<b>X 3</b>	<b>1</b>	<b>X 1</b>
<b>TOTALS</b>	<b>15</b>		<b>18</b>		<b>1</b>	

**Comments:** Red Rock Creek flows through this tree grove. Access is limited - no trails or access points. Connectivity to up- and downstream habitats is impaired by roads.

<b>GROVE SITE #:</b>	31	<b>SIZE:</b>	3.68 acres	<b>SCORE:</b>	22
<b>DATE:</b>	9/9/2010	<b>LOCATION:</b>	Ashbury, south of Tallwood	<b>MAP:</b>	31
<b>FIELD STAFF:</b>	AS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	520

### Grove Description

Deciduous forest. Red alder dominates with lesser amounts of Oregon ash, black cottonwood, Scouler willow. Beaked hazelnut, English hawthorn and Himalayan blackberry are present in the understory. Bittersweet nightshade dominates in the understory.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh	✓	<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features		Uncommon features or combination of features	✓	No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, - species mix; high connectivity; lg. size	✓	Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	0	X 5	6	X 3	4	X 1
<b>TOTALS</b>	0		18		4	

**Comments:** Residential lots nearly surround this grove. A small drainage runs through the center of the grove.

<b>GROVE SITE #:</b>	32	<b>SIZE:</b>	5.81 acres	<b>SCORE:</b>	36
<b>DATE:</b>	9/9/2010	<b>LOCATION:</b>	Woodward Elementary	<b>MAP:</b>	32
<b>FIELD STAFF:</b>	AS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5667

<b>Grove Description</b>	
Deciduous forest along lakeshore. Edge community consists of black cottonwood, Douglas fir, black hawthorn, and Oregon ash. Understory is a mixture of native and invasive shrubs and herbs.	

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓	>5 acres in size		2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value	✓	Visible from arterial street or public park/open space		Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access	✓	Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium	✓	Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size	✓	Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (<1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>3</b>	<b>X 5</b>	<b>7</b>	<b>X 3</b>	<b>0</b>	<b>X 1</b>
<b>TOTALS</b>	<b>15</b>		<b>21</b>		<b>0</b>	

**Comments:** Area near the school is receiving invasive species removal treatments and replanting. Other areas have moderate to heavy invasive cover. School and areas of private ownership may limit access, but there are other public access points including Windmill Park.

<b>GROVE SITE #:</b>	33	<b>SIZE:</b>	3.79 acres	<b>SCORE:</b>	44
<b>DATE:</b>	9/9/2010	<b>LOCATION:</b>	Fanno Creek @ Tiedeman	<b>MAP:</b>	33
<b>FIELD STAFF:</b>	AS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5660-1

**Grove Description**

Deciduous forest: Oregon ash grove with clustered rose and slough sedge codominant. Other constituents include red-osier dogwood, black hawthorn, and reed canarygrass.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace	✓	>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance	✓	Healthy; no visible threats, low disturbance		Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value	✓	Visible from arterial street or public park/open space		Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots	✓	Unrestricted public access		Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values	✓	Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity	✓	Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (<1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>7</b>	<b>X 5</b>	<b>3</b>	<b>X 3</b>	<b>0</b>	<b>X 1</b>
<b>TOTALS</b>	<b>35</b>		<b>9</b>		<b>0</b>	

**Comments:** Adjacent park, Grove 36, and wetland increase public and habitat values.

<b>GROVE SITE #:</b>	35	<b>SIZE:</b>	5.50 acres	<b>SCORE:</b>	28
<b>DATE:</b>	9/9/2010	<b>LOCATION:</b>	116th and Katherine	<b>MAP:</b>	35
<b>FIELD STAFF:</b>	AS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5665-6

<b>Grove Description</b>	
Deciduous forest: Dominant species include Oregon ash and black hawthorn in the tree layer and slough sedge and field horsetail in the understory. Other species present include English hawthorn, beaked hazelnut, clustered rose, red-osier dogwood, Norway maple, and bittersweet nightshade. Trees are mostly smaller.	

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access	✓	Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features		Uncommon features or combination of features	✓	No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size	✓	Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (<1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>1</b>	<b>X 5</b>	<b>7</b>	<b>X 3</b>	<b>2</b>	<b>X 1</b>
<b>TOTALS</b>	<b>5</b>		<b>21</b>		<b>2</b>	

**Comments:** This grove is contiguous across 116th Avenue.



<b>GROVE SITE #:</b>	36	<b>SIZE:</b>	30.97 acres	<b>SCORE:</b>	46
<b>DATE:</b>	9/9/2010	<b>LOCATION:</b>	Fanno Crk Trail @ Tiedeman	<b>MAP:</b>	36
<b>FIELD STAFF:</b>	ACS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5662-3

<b>Grove Description</b>	
Evergreen forest: Dominants: Douglas fir, ponderosa pine; also bigleaf maple, western red cedar. Shrubs: hazelnut (dom), holly, oceanspray, Oregon grape, snowberry. Herbs: English ivy (dom), sword fern, Dewey's sedge, inside-out flower, starflower.	

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace	✓	>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓	>5 acres in size		2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value	✓	Visible from arterial street or public park/open space		Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots	✓	Unrestricted public access		Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value	✓	Rare natural or cultural features		Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values	✓	Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity	✓	Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (<1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>8</b>	<b>X 5</b>	<b>2</b>	<b>X 3</b>	<b>0</b>	<b>X 1</b>
<b>TOTALS</b>	<b>40</b>		<b>6</b>		<b>0</b>	

**Comments:** Large fir/pine grove in Fanno Creek trail complex. Close to school. Ivy heavy, climbing trees. Holly also heavy. Informal trails throughout but minor trash, damage. Mostly large trees but some younger trees, saplings too.

<b>GROVE SITE #:</b>	37	<b>SIZE:</b>	2.90 acres	<b>SCORE:</b>	20
<b>DATE:</b>	9/9/2010	<b>LOCATION:</b>	Roger Hart W/C; E of 131st	<b>MAP:</b>	37
<b>FIELD STAFF:</b>	ACS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5690-2

<b>Grove Description</b>					
Mixed forest - Oregon ash (dom), Pacific willow (dom), Douglas fir, cottonwood, ornamental trees (silk tassel/paper birch).					
Landlocked - view over rooftops: Roger Hart W/C					

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh	✓	<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space		Visible from local street or private common open space	✓	Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features		Uncommon features or combination of features	✓	No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size	✓	Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	0	X 5	5	X 3	5	X 1
<b>TOTALS</b>	0		15		5	

**Comments:** Minimal visibility; Dominant in wetland: Pacific willow, red alder saplings, Douglas spirea (dom), Himalayan blackberry (dom), reed canarygrass (dom).

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<b>GROVE SITE #:</b>	38	<b>SIZE:</b>	3.10 acres	<b>SCORE:</b>	18
<b>DATE:</b>	9/9/2010	<b>LOCATION:</b>	Elmhurst & 70th	<b>MAP:</b>	38
<b>FIELD STAFF:</b>	DB	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	521,522

**Grove Description**

Deciduous forest with scattered Douglas fir. Dominant is Oregon ash,; some Pacific willow, Oregon white oak, Scouler willow. Canopy is pretty broken; entire grove lies east of 72nd. Mapped portions west of 72nd too small and fragmented.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh	✓	<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance		Some dieback or potential threats; invasive species	✓	Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features		Uncommon features or combination of features	✓	No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife	✓	Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	0	X 5	4	X 3	6	X 1
<b>TOTALS</b>	0		12		6	

**Comments:** Understory dominated by invasives.

<b>GROVE SITE #:</b>	40	<b>SIZE:</b>	8.36 acres	<b>SCORE:</b>	34
<b>DATE:</b>	9/9/2010	<b>LOCATION:</b>	Dartmouth, S of Costco	<b>MAP:</b>	40
<b>FIELD STAFF:</b>	DB	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	523,524

<b>Grove Description</b>	
Deciduous forest dominated by Oregon ash with a patch of slough sedge. Oregon white oak. Red Rock Creek flows through tree grove. There are ponds in center and at northeast corner. Understory with Himalayan blackberry, reed canarygrass, English ivy, English hawthorn	

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓	>5 acres in size		2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value	✓	Visible from arterial street or public park/open space		Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity	✓	Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (≤1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>4</b>	<b>X 5</b>	<b>4</b>	<b>X 3</b>	<b>2</b>	<b>X 1</b>
<b>TOTALS</b>	<b>20</b>		<b>12</b>		<b>2</b>	

**Comments:** Good interspersions of habitats, understory is weedy, some use by homeless people. Open area to east is an old landfill.

<b>GROVE SITE #:</b>	42	<b>SIZE:</b>	2.21 acres	<b>SCORE:</b>	32
<b>DATE:</b>	9/9/2010	<b>LOCATION:</b>	E of 124th	<b>MAP:</b>	42
<b>FIELD STAFF:</b>	ACS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	none

### Grove Description

Mixed forest dominated by Pacific willow, Douglas fir, with scattered black cottonwood and red alder. The understory is dominated by Himalayan blackberry and lawn grass.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value	✓	Visible from arterial street or public park/open space		Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses		Between similar land uses, or similar land use characteristics	✓	No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots	✓	Unrestricted public access		Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values	✓	Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife	✓	Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	3	X 5	5	X 3	2	X 1
<b>TOTALS</b>	15		15		2	

**Comments:** Neighborhood park with small incised creek. West side managed tree grove. East side has trees along stream and buffer, heavy Himalayan blackberry. North of footbridge, stream corridor widens. Understory is mostly reed canarygrass and red alder/Pacific willow at edges. Douglas fir and Himalayan blackberry present above.

<b>GROVE SITE #:</b>	44	<b>SIZE:</b>	2.99 acres	<b>SCORE:</b>	24
<b>DATE:</b>	9/9/2010	<b>LOCATION:</b>	SW of Franklin/66th	<b>MAP:</b>	44
<b>FIELD STAFF:</b>	DB	<b>GOAL 5 SITE?</b>	No	<b>PHOTOS:</b>	525

<b>Grove Description</b>					
Deciduous oak - ash forest with widely spaced large oaks/dense young ash. Understory mostly dense Himalayan blackberry.					
Also English ivy and other invasives and escaped ornamentals.					

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh	✓	<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value	✓	Visible from arterial street or public park/open space		Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife	✓	Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	1	X 5	5	X 3	4	X 1
<b>TOTALS</b>	5		15		4	

**Comments:** Poor connectivity. Large oaks a plus but otherwise not great habitat. Buffers surrounding office/warehouse area from I-5. Note: 67th is put, narrow, gravel road. Keep the portion west of 67th as part of this tree grove.

<b>GROVE SITE #:</b>	45	<b>SIZE:</b>	2.57 acres	<b>SCORE:</b>	40
<b>DATE:</b>	9/10/2010	<b>LOCATION:</b>	S of Walnut & 160th	<b>MAP:</b>	45
<b>FIELD STAFF:</b>	DB	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	535,536

<b>Grove Description</b>	
Deciduous forest dominated by Oregon ash and red alder, with scattered large black cottonwood. Understory: Shrub layer well developed, dominated mostly by natives - salmonberry, red-twig dogwood, scattered snags.	

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance	✓	Healthy: no visible threats, low disturbance		Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots	✓	Unrestricted public access		Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values	✓	Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity	✓	Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (<1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	5	X 5	5	X 3	0	X 1
<b>TOTALS</b>	25		15		0	

**Comments:** Riparian corridor. Derry Dell Creek flows through tree grove. Connectivity to north somewhat limited by street but good structure diversity, perennial stream, native understory. Exceptional for the lack of exotic/invasive species.

<b>GROVE SITE #:</b>	46	<b>SIZE:</b>	2.94 acres	<b>SCORE:</b>	26
<b>DATE:</b>	9/9/2010	<b>LOCATION:</b>	133rd and Walnut	<b>MAP:</b>	46
<b>FIELD STAFF:</b>	ACS	<b>GOAL 5 SITE?</b>	No	<b>PHOTOS:</b>	5685

**Grove Description**

Mixed: Dominated by Douglas fir, bigleaf maple, hazelnut, dewberry. Understory has big leaf maple, red alder, western redcedar saplings, bitter cherry. Himalayan blackberry, swordfern, and English ivy are dominant on the forest floor.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace	✓	>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		> 5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features		Uncommon features or combination of features	✓	No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size	✓	Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	1	X 5	6	X 3	3	X 1
<b>TOTALS</b>	5		18		3	

**Comments:** Pileated woodpecker holes in stumps. Evergreen/deciduous is 80:20 here. Some ivy in trees.



<b>GROVE SITE #:</b>	47	<b>SIZE:</b>	2.02 acres	<b>SCORE:</b>	24
<b>DATE:</b>	9/10/2010	<b>LOCATION:</b>	Carmen & 116th	<b>MAP:</b>	47
<b>FIELD STAFF:</b>	DB	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	537

<b>Grove Description</b>	
Mixed forest of Oregon ash, red alder, Douglas fir, big leaf maple; Understory dominated by invasives: Himalayan blackberry, English ivy. Riparian corridor of tributary to Summer Creek.	

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance		Some dieback or potential threats; invasive species	✓	Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access	✓	Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features		Uncommon features or combination of features	✓	No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size	✓	Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	0	X 5	7	X 3	3	X 1
<b>TOTALS</b>	0		21		3	

**Comments:** Dense ivy climbing trees. Dense Himalayan blackberry. Public at northeast end, but access limited by steep slopes, lack of trails. Connectivity good to east.

<b>GROVE SITE #:</b>	48	<b>SIZE:</b>	6.99 acres	<b>SCORE:</b>	34
<b>DATE:</b>	9/10/2010	<b>LOCATION:</b>	Fonner and 13th	<b>MAP:</b>	48
<b>FIELD STAFF:</b>	DB	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	538-540

<b>Grove Description</b>	
Mixed forest, dom red alder, big leaf maple, western red cedar, Understory dominated by Himalayan blackberry and English ivy. of tributary. Riparian corridor to Summer Creek Large pond is located near southwest end of tree grove.	

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓	>5 acres in size		2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access	✓	Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium	✓	Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity	✓	Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	2	X 5	8	X 3	0	X 1
<b>TOTALS</b>	10		24		0	

**Comments:** Good connectivity along riparian corridor, good interspersions of habitats, understory badly impacted by invasives. English ivy is climbing trees. Pond area is publically owned, access okay. Pond formed by constructed dam.

<b>GROVE SITE #:</b>	49	<b>SIZE:</b>	1.54 acres	<b>SCORE:</b>	18
<b>DATE:</b>	9/9/2010	<b>LOCATION:</b>	Fonner/121st	<b>MAP:</b>	49
<b>FIELD STAFF:</b>	ACS	<b>GOAL 5 SITE?</b>	No	<b>PHOTOS:</b>	5693

<b>Grove Description</b>	
Mixed grove dominated by Oregon ash and black cottonwood, with a few paper birch and Douglas fir trees. The understory is dominated by Himalayan blackberry and ash saplings.	

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh	✓	<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size		2 to 5 acres in size	✓	< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features		Uncommon features or combination of features	✓	No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife	✓	Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	0	X 5	4	X 3	6	X 1
<b>TOTALS</b>	0		12		6	

**Comments:** Could be built on; development surrounds grove.

<b>GROVE SITE #:</b>	51	<b>SIZE:</b>	5.91 acres	<b>SCORE:</b>	26
<b>DATE:</b>	9/9/2010	<b>LOCATION:</b>	Sevilla, south of Walnut	<b>MAP:</b>	51
<b>FIELD STAFF:</b>	ACS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	none

**Grove Description**

Mixed: Douglas fir/big leaf maple in upper areas, bottomland has Oregon ash

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace	✓	>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓	>5 acres in size		2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy; no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space		Visible from local street or private common open space	✓	Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value				Uncommon features or combination of features	✓	No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size	✓	Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>2</b>	<b>X 5</b>	<b>4</b>	<b>X 3</b>	<b>4</b>	<b>X 1</b>
<b>TOTALS</b>	<b>10</b>		<b>12</b>		<b>4</b>	

**Comments:** Overstory viewed from local streets over houses.

<b>GROVE SITE #:</b>	51a	<b>SIZE:</b>	12.84 acres	<b>SCORE:</b>	26
<b>DATE:</b>	9/9/2010	<b>LOCATION:</b>	Alberta St., west of 121st	<b>MAP:</b>	51a
<b>FIELD STAFF:</b>	ACS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	none

**Grove Description**

Mixed: Douglas fir/big leaf maple in upper areas, bottomland has Oregon ash

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace	✓	>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓	>5 acres in size		2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space		Visible from local street or private common open space	✓	Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features		Uncommon features or combination of features	✓	No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size	✓	Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>2</b>	<b>X 5</b>	<b>4</b>	<b>X 3</b>	<b>4</b>	<b>X 1</b>
<b>TOTALS</b>	<b>10</b>		<b>12</b>		<b>4</b>	

**Comments:** Overstory viewed from local streets over houses.

<b>GROVE SITE #:</b>	52	<b>SIZE:</b>	3.27 acres	<b>SCORE:</b>	38
<b>DATE:</b>	9/10/2010	<b>LOCATION:</b>	Gaarde and 129th	<b>MAP:</b>	52
<b>FIELD STAFF:</b>	DB	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	550

**Grove Description**  
Mixed forest dominated by: Douglas fir, big leaf maple, red alder, western red cedar. Understory dominated by: Himalayan a few areas blackberry with dominated by natives (sword fern, vine maple, thimble berry, dew berry). Riparian corridor of Krueger Creek.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots	✓	Unrestricted public access		Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values	✓	Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity	✓	Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (<1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>4</b>	<b>X 5</b>	<b>6</b>	<b>X 3</b>	<b>0</b>	<b>X 1</b>
<b>TOTALS</b>	<b>20</b>		<b>18</b>		<b>0</b>	

**Comments:** Good connectivity (somewhat limited by streets); Perennial stream. Appears to be put open space with a trail running the length of the tree grove (from Guefield to Gaarde Streets). Scattered snags.

<b>GROVE SITE #:</b>	54	<b>SIZE:</b>	3.88 acres	<b>SCORE:</b>	20
<b>DATE:</b>	9/9/2010	<b>LOCATION:</b>	I-5/Hwy 217 interchange	<b>MAP:</b>	54
<b>FIELD STAFF:</b>	DB	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	526

**Grove Description**

Deciduous forest dominated by bigleaf maple with scattered large Douglas fir. A small patch of Oregon oak is located at the northwest end. A small creek runs through the grove. Understory is dominated by English ivy, Himalayan blackberry, and other invasive species.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value	✓	Visible from arterial street or public park/open space		Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses		Between similar land uses, or similar land use characteristics	✓	No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features		Uncommon features or combination of features	✓	No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife	✓	Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)		Partially developed	✓	Developed, or surrounded
<b>SUB-TOTALS</b>	1	X 5	3	X 3	6	X 1
<b>TOTALS</b>	5		9		6	

**Comments:** Broadly linear, surrounded with parking lots. Poor connectivity.

<b>GROVE SITE #:</b>	55	<b>SIZE:</b>	15.71 acres	<b>SCORE:</b>	40
<b>DATE:</b>	9/9/2010	<b>LOCATION:</b>	BPA easement/Nahcotta Dr.	<b>MAP:</b>	55
<b>FIELD STAFF:</b>	AS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5680-1

<b>Grove Description</b>	
Evergreen forest dominated by Douglas fir. Other species present include red alder, bigleaf maple, and beaked hazelnut.	
Understory difficult to see due to impenetrable shrubs/blackberry.	

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace	✓	>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓	>5 acres in size		2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance	✓	Healthy: no visible threats, low disturbance		Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access	✓	Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium	✓	Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity	✓	Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (<1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	5	X 5	5	X 3	0	X 1
<b>TOTALS</b>	25		15		0	

**Comments:** Forest runs parallel to the BPA easement; easement is maintained to control vegetation height. Though public land, the forest is difficult to access due to dense shrubs and Himalayan blackberry in the BPA easement.



<b>GROVE SITE #:</b>	56	<b>SIZE:</b>	6.69 acres	<b>SCORE:</b>	42
<b>DATE:</b>	9/10/2010	<b>LOCATION:</b>	N of Eden & Genesis	<b>MAP:</b>	56
<b>FIELD STAFF:</b>	DB	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	541-542

**Grove Description**

Deciduous forest dominated by red alder, with patches of western red cedar. Understory dominated by natives. Well developed shrub layer of red-twig dogwood, salmonberry. Some vine maple, red elderberry. Riparian corridor of Derry Dell Creek.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓	>5 acres in size		2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance	✓	Healthy: no visible threats, low disturbance		Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots	✓	Unrestricted public access		Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value	✓	Rare natural or cultural features		Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values	✓	Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity	✓	Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>6</b>	<b>X 5</b>	<b>4</b>	<b>X 3</b>	<b>0</b>	<b>X 1</b>
<b>TOTALS</b>	<b>30</b>		<b>12</b>		<b>0</b>	

**Comments:** Good connectivity upstream; Perennial stream; Scattered large snags; Public ownership of stream corridor with excellent access - paved path. Portion south of Eden Court rated separately as Site 56a.

<b>GROVE SITE #:</b>	56a	<b>SIZE:</b>	2.83 acres	<b>SCORE:</b>	36
<b>DATE:</b>	9/10/2010	<b>LOCATION:</b>	S of Eden & Genesis	<b>MAP:</b>	56a
<b>FIELD STAFF:</b>	DB	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	547

**Grove Description**

Deciduous forest dominated by red alder, Oregon ash, scattered large black cottonwood and young Douglas fir and western redcedar. Understory mostly dominated by natives: red-twig dogwood, red elderberry, salmonberry, skunk cabbage, giant horsetail.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh	✓	<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance	✓	Healthy: no visible threats, low disturbance		Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots	✓	Unrestricted public access		Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values	✓	Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity	✓	Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>4</b>	<b>X 5</b>	<b>5</b>	<b>X 3</b>	<b>1</b>	<b>X 1</b>
<b>TOTALS</b>	<b>20</b>		<b>15</b>		<b>1</b>	

**Comments:** Mostly native; good connectivity; public with a paved path.

<b>GROVE SITE #:</b>	57	<b>SIZE:</b>	20.89 acres	<b>SCORE:</b>	40
<b>DATE:</b>	9/9/2010	<b>LOCATION:</b>	Fern/Ascension	<b>MAP:</b>	57
<b>FIELD STAFF:</b>	AS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5678-9

<b>Grove Description</b>					
Mixed forest dominated by Douglas fir, bigleaf maple, black cottonwood, red alder. Understory comprised of English ivy, dull Oregon grape, swordfern, thimbleberry, and bigleaf maple saplings.					

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace	✓	>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓	>5 acres in size		2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value	✓	Visible from arterial street or public park/open space		Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access	✓	Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium	✓	Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity	✓	Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (<1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	5	X 5	5	X 3	0	X 1
<b>TOTALS</b>	25		15		0	

**Comments:** North end developed (low density residential), south end in public ownership. Developed at edges.  
Small drainage runs through center of grove.

<b>GROVE SITE #:</b>	59	<b>SIZE:</b>	13.18 acres	<b>SCORE:</b>	30
<b>DATE:</b>	9/9/2010	<b>LOCATION:</b>	Maplecrest	<b>MAP:</b>	59
<b>FIELD STAFF:</b>	AS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5684

**Grove Description**

Mixed forest dominated by Douglas fir, bigleaf maple. The understory consists of beaked hazelnut, maple saplings, lady fern, and swordfern.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓			2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance	✓	Healthy: no visible threats, low disturbance		Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features		Uncommon features or combination of features	✓	No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size	✓	Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (<1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>3</b>	<b>X 5</b>	<b>4</b>	<b>X 3</b>	<b>3</b>	<b>X 1</b>
<b>TOTALS</b>	<b>15</b>		<b>12</b>		<b>3</b>	

**Comments:** Forested tract is in private ownership. Undeveloped but there are several stubouts leading to the grove.

Small drainage runs through center of grove.

<b>GROVE SITE #:</b>	60	<b>SIZE:</b>	5.25 acres	<b>SCORE:</b>	40
<b>DATE:</b>	9/10/2010	<b>LOCATION:</b>	S o/ 115th & Terrace Trails	<b>MAP:</b>	60
<b>FIELD STAFF:</b>	DB	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	546

<b>Grove Description</b>					
Deciduous forest dominated by red alder, big leaf maple, scattered Douglas fir. Understory mostly dominated by natives:					
Red-twig dogwood, hazelnut, vine maple, giant horsetail. Some Himalayan blackberry thickets and scattered English ivy.					
Riparian corridor of tributary to Derry Dell Creek.					

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh	✓	<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓	>5 acres in size		2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance	✓	Healthy: no visible threats, low disturbance		Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots	✓	Unrestricted public access		Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values	✓	Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity	✓	Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (<1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>6</b>	<b>X 5</b>	<b>3</b>	<b>X 3</b>	<b>1</b>	<b>X 1</b>
<b>TOTALS</b>	<b>30</b>		<b>9</b>		<b>1</b>	

**Comments:** Understory probably recently cleared of invasives, good connectivity, perennial stream. Scattered snags, public ownershp. General trail throughout - good access, limit mapping to stream corridor.

<b>GROVE SITE #:</b>	62	<b>SIZE:</b>	25.28 acres	<b>SCORE:</b>	32
<b>DATE:</b>	9/9/2010	<b>LOCATION:</b>	Wall St, between 217, I-5	<b>MAP:</b>	62
<b>FIELD STAFF:</b>	DB	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	527

**Grove Description**

Deciduous forest with scattered large Douglas fir, black cottonwood. Understory dominated by Himalayan blackberry. A few scattered Oregon oak.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓	>5 acres in size		2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value	✓	Visible from arterial street or public park/open space		Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses	✓	Between industrial or commercial uses and residential or open space uses		Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features		Uncommon features or combination of features	✓	No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size	✓	Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (<1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>4</b>	<b>X 5</b>	<b>3</b>	<b>X 3</b>	<b>3</b>	<b>X 1</b>
<b>TOTALS</b>	<b>20</b>		<b>9</b>		<b>3</b>	

**Comments:** Buffers residential area from Highway 217. Isolated by highway and development.

<b>GROVE SITE #:</b>	63	<b>SIZE:</b>	1.48 acres	<b>SCORE:</b>	22
<b>DATE:</b>	9/10/2010	<b>LOCATION:</b>	N of Gaarde & 110th	<b>MAP:</b>	63
<b>FIELD STAFF:</b>	DB	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	549

<b>Grove Description</b>					
Mixed woodland of large Douglas fir and red alder. Understory quite open. Understory dominated by a mix of native (giant horsetail, Suksdorf's hawthorn, California dewberry, and lady fern) and introduced invasives/ornamental species (Himalayan blackberry, English ivy, red canarygrass, English hawthorn)					

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size		2 to 5 acres in size	✓	< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size	✓	Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	0	X 5	7	X 3	1	X 1
<b>TOTALS</b>	0		21		1	

**Comments:** Private, no access. Perennial creek. Good connectivity; Portions to west should be excluded - developed/fragmented.

<b>GROVE SITE #:</b>	64	<b>SIZE:</b>	5.31 acres	<b>SCORE:</b>	24
<b>DATE:</b>	9/13/2010	<b>LOCATION:</b>	McDonald Avenue	<b>MAP:</b>	64
<b>FIELD STAFF:</b>	AS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5711

**Grove Description**  
Mixed forest in riparian zone of small creek. Red alder, western redcedar codominate, with scattered Douglas fir, bigleaf maple and Oregon ash. English ivy, Himlayan blackberry dominate the upland understory, with reed canarygrass dominating the channel and wet margin. Some understory near residences is ornamental.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh	✓	<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓	>5 acres in size		2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features		Uncommon features or combination of features	✓	No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size	✓	Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>1</b>	<b>X 5</b>	<b>5</b>	<b>X 3</b>	<b>4</b>	<b>X 1</b>
<b>TOTALS</b>	<b>5</b>		<b>15</b>		<b>4</b>	

**Comments:** Drainage and vegetated corridor. Tree canopy extends into large-lot residential yards.

Himalayan blackberry is heavy in the upland understory; some clematis also present.



<b>GROVE SITE #:</b>	65	<b>SIZE:</b>	13.02 acres	<b>SCORE:</b>	44
<b>DATE:</b>	9/10/2010	<b>LOCATION:</b>	SW of Greenfield & Morning	<b>MAP:</b>	65
<b>FIELD STAFF:</b>	DB	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	543,544

<b>Grove Description</b>					
Mixed forest dominated by red alder, big leaf maple, scattered Douglas fir. Understory mostly dominated by Himalayan blackberry but with some native-dominated areas (swordfern, dull Oregon grape, vine maple, hazelnut, etc.).					
Includes riparian corridor of Krueger Creek.					

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace	✓	>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓	>5 acres in size		2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value	✓	Visible from arterial street or public park/open space		Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots	✓	Unrestricted public access		Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values	✓	Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity	✓	Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (<1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	7	X 5	3	X 3	0	X 1
<b>TOTALS</b>	35		9		0	

**Comments:** Good connectivity and interspersion. Riparian corridor with perennial creek.  
 Partial public ownership, good access with sewer ROW/unpaved trail

<b>GROVE SITE #:</b>	67	<b>SIZE:</b>	54.40 acres	<b>SCORE:</b>	42
<b>DATE:</b>	9/9/2010	<b>LOCATION:</b>	Menlor	<b>MAP:</b>	67
<b>FIELD STAFF:</b>	AS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5682-3

**Grove Description**

Mixed forest. Dominant trees include Douglas fir and bigleaf maple, with beaked hazelnut, vine maple, Oregon grape, oceanspray, and swordfern in the understory.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace	✓	>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓	>5 acres in size		2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance	✓	Healthy; no visible threats, low disturbance		Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access	✓	Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value	✓	Rare natural or cultural features		Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values	✓	Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity	✓	Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	6	X 5	4	X 3	0	X 1
<b>TOTALS</b>	30		12		0	

**Comments:** Mature forest with some very low-density residential tucked into the forest. Invasive cover (Himalayan blackberry, English ivy) moderate in places. Most of this grove is in private ownership.

<b>GROVE SITE #:</b>	68	<b>SIZE:</b>	2.76 acres	<b>SCORE:</b>	20
<b>DATE:</b>	9/13/2010	<b>LOCATION:</b>	McDonald/93rd	<b>MAP:</b>	68
<b>FIELD STAFF:</b>	AS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5712-3

<b>Grove Description</b>	
Mixed forest. Bigleaf maple dominates the tree grove, with some Oregon ash, Douglas fir, and red alder.	
Small drainage flows through grove. Understory and grove overrun by invasives: clematis, Himalayan blackberry, English ivy.	

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace	✓	>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance		Some dieback or potential threats; invasive species	✓	Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features		Uncommon features or combination of features	✓	No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife	✓	Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)		Partially developed	✓	Developed, or surrounded
<b>SUB-TOTALS</b>	1	X 5	3	X 3	6	X 1
<b>TOTALS</b>	5		9		6	

**Comments:** Very heavy cover of invasives; ivy and clematis have climbed to the tops of mature trees.

<b>GROVE SITE #:</b>	69	<b>SIZE:</b>	2.25 acres	<b>SCORE:</b>	24
<b>DATE:</b>	9/13/2010	<b>LOCATION:</b>	McDonald Ave.	<b>MAP:</b>	69
<b>FIELD STAFF:</b>	ACS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5710

### Grove Description

Evergreen forest: Douglas fir, English holly. Forest has virtually no understory, similar age class.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance	✓	Healthy: no visible threats, low disturbance		Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features		Uncommon features or combination of features	✓	No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife	✓	Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	1	X 5	5	X 3	4	X 1
<b>TOTALS</b>	5		15		4	

**Comments:** Trees vary from 6" to ~18" in size. Pure stand of Douglas fir with virtually absent shrub herb layers.

Raked debris.

<b>GROVE SITE #:</b>	71	<b>SIZE:</b>	39.20 acres	<b>SCORE:</b>	46
<b>DATE:</b>	9/9/2010	<b>LOCATION:</b>	N end of Milton	<b>MAP:</b>	71
<b>FIELD STAFF:</b>	DB	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	528,529

<b>Grove Description</b>	
Deciduous forest dominated by Oregon white ash, red alder. Scattered large Douglas fir, black cottonwood, bigleaf maple.	
Understory mostly dominated by exotics: Himalayan blackberry, reed canarygrass, jewelweed. English ivy, but with some native shrubs and herbs.	

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓	>5 acres in size		2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value	✓	Visible from arterial street or public park/open space		Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses	✓	Between industrial or commercial uses and residential or open space uses		Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots	✓	Unrestricted public access		Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value	✓	Rare natural or cultural features		Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values	✓	Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity	✓	Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (<1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>8</b>	<b>X 5</b>	<b>2</b>	<b>X 3</b>	<b>0</b>	<b>X 1</b>
<b>TOTALS</b>	<b>40</b>		<b>6</b>		<b>0</b>	

**Comments:** Snags common; Fanno Creek tributaries run through tree grove; also includes marsh and pond habitats. Good interspersion and connectivity. Complex of upland, wetland/aquatic habitats. Mostly public trail access from multiple points. Some large Oregon white oak on east side.

<b>GROVE SITE #:</b>	73	<b>SIZE:</b>	1.97 acres	<b>SCORE:</b>	24
<b>DATE:</b>	9/13/2010	<b>LOCATION:</b>	Canterbury Heights	<b>MAP:</b>	73
<b>FIELD STAFF:</b>	ACS	<b>GOAL 5 SITE?</b>	No	<b>PHOTOS:</b>	5720-1

<b>Grove Description</b>	
Evergreen forest: Douglas fir, western redcedar, hazelnut, sword fern, weedy forbs, grasses	

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace	✓	>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size		2 to 5 acres in size	✓	< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance	✓	Healthy: no visible threats, low disturbance		Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value:		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses	✓	Between industrial or commercial uses and residential or open space uses		Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features		Uncommon features or combination of features	✓	No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife	✓	Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)		Partially developed	✓	Developed, or surrounded
<b>SUB-TOTALS</b>	<b>3</b>	<b>X 5</b>	<b>1</b>	<b>X 3</b>	<b>6</b>	<b>X 1</b>
<b>TOTALS</b>	<b>15</b>		<b>3</b>		<b>6</b>	

**Comments:** Grove at back of SE attached housing. Few invasives, minimal shrub layers.

<b>GROVE SITE #:</b>	74	<b>SIZE:</b>	3.89 acres	<b>SCORE:</b>	29
<b>DATE:</b>	9/9/2010	<b>LOCATION:</b>	NE of Bonita/Hall	<b>MAP:</b>	74
<b>FIELD STAFF:</b>	DB	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	none

**Grove Description**  
Mixed Douglas fir, western red cedar, red alder/big leaf maple. Conifers generally large; understory dominated by invasives: Himalayan blackberry, English ivy, escaped ornamentals. Riparian corridor with a tributary of Fanno Creek.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value	✓	Visible from arterial street or public park/open space		Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size	✓	Good source of food, cover, territory for wildlife	✓	Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	1	X 5	7	X 3	3	X 1
<b>TOTALS</b>	5		21		3	

**Comments:** Very weedy understory. Connectivity is okay, though somewhat fragmented by development and crossing streets. Area east of 80th Place was excluded - too small and fragmented. Part is in public ownership. Access difficult - steep, no trails or access points to the public parcel.

<b>GROVE SITE #:</b>	75	<b>SIZE:</b>	24.34 acres	<b>SCORE:</b>	38
<b>DATE:</b>	9/10/2010	<b>LOCATION:</b>	N of Bull Mountain & 126th	<b>MAP:</b>	75
<b>FIELD STAFF:</b>	DB	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	545

### Grove Description

Mixed forest dominated by Douglas fir, big leaf maple, red alder. Understory dominated by Himalayan blackberry but with some native-dominated areas (sword fern, vine maple, dewberry, hazelnut). Riparian corridor for tributary of Krueger Creek.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace	✓	>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh	-	<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓	>5 acres in size		2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access	✓	Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium	✓	Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity	✓	Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (<1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>4</b>	<b>X 5</b>	<b>6</b>	<b>X 3</b>	<b>0</b>	<b>X 1</b>
<b>TOTALS</b>	<b>20</b>		<b>18</b>		<b>0</b>	

**Comments:** Good connectivity. Perennial stream. Public ownership on part; access possible but limited by steep slopes; understory degraded by invasives.



<b>GROVE SITE #:</b>	77	<b>SIZE:</b>	2.86 acres	<b>SCORE:</b>	28
<b>DATE:</b>	9/13/2010	<b>LOCATION:</b>	Inez St.	<b>MAP:</b>	77
<b>FIELD STAFF:</b>	ACS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5714

<b>Grove Description</b>	
Evergreen forest: Douglas fir is sole dominant, with scattered ponderosa pine, big leaf maple, English hawthorn, bird cherry.	
Understory is a melange of mostly Himalayan blackberry with English ivy, herb-robert, dewberry	

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace	✓	>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size	✓	Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	1	X 5	7	X 3	2	X 1
<b>TOTALS</b>	5		21		2	

**Comments:** Numerous very large trees (36" + dbh) dominate this area. Open shrub layer, weedy ground layer. Ivy, clematis climbing half the trees.

<b>GROVE SITE #:</b>	79	<b>SIZE:</b>	2.08 acres	<b>SCORE:</b>	22
<b>DATE:</b>	9/9/2010	<b>LOCATION:</b>	79th and Bonita	<b>MAP:</b>	79
<b>FIELD STAFF:</b>	DB	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	530

<b>Grove Description</b>					
Mixed Douglas fir and bigleaf maple. Large trees. Also some large western redcedar. Understory dominated by English ivy and a variety of invasives/escaped ornamentals. Scattered vine maple. One house in center but little escaped ornamentals.					

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value	✓	Visible from arterial street or public park/open space		Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features		Uncommon features or combination of features	✓	No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife	✓	Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)		Partially developed	✓	Developed, or surrounded
<b>SUB-TOTALS</b>	1	X 5	4	X 3	5	X 1
<b>TOTALS</b>	5		12		5	

**Comments:** Ornamental manicured yard. Edges on south/east excluded: developed, fragmented.

Isolated from other habitats.

<b>GROVE SITE #:</b>	81	<b>SIZE:</b>	3.08 acres	<b>SCORE:</b>	36
<b>DATE:</b>	9/13/2010	<b>LOCATION:</b>	Pinebrook	<b>MAP:</b>	81
<b>FIELD STAFF:</b>	AS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5717-8

<b>Grove Description</b>	
Evergreen forest dominated by Douglas fir, western redcedar, and bigleaf maple; scattered Oregon ash and red alder also present. The understory supports a variety of species including snowberry, beaked hazelnut, red-osier dogwood, English ivy, Himalayan blackberry, and herb-robert prevalent as well.	

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value	✓	Visible from arterial street or public park/open space		Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access	✓	Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium	✓	Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity	✓	Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (<1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>3</b>	<b>X 5</b>	<b>7</b>	<b>X 3</b>	<b>0</b>	<b>X 1</b>
<b>TOTALS</b>	<b>15</b>		<b>21</b>		<b>0</b>	

**Comments:** Broadly linear grove centered on stream corridor between development. Some development still possible near Schekla/Lady Apple intersection but stream and vegetated corridor should be protected under CWS regs.

<b>GROVE SITE #:</b>	83	<b>SIZE:</b>	3.46 acres	<b>SCORE:</b>	32
<b>DATE:</b>	9/13/2010	<b>LOCATION:</b>	103rd and Canterbury	<b>MAP:</b>	83
<b>FIELD STAFF:</b>	AS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5726

**Grove Description**

Evergreen forest. Douglas fir with no vegetation in understory. Single-age stand.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace	✓	>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance	✓	Healthy: no visible threats, low disturbance		Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses	✓	Between industrial or commercial uses and residential or open space uses		Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots	✓	Unrestricted public access		Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features		Uncommon features or combination of features	✓	No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife	✓	Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>4</b>	<b>X 5</b>	<b>3</b>	<b>X 3</b>	<b>3</b>	<b>X 1</b>
<b>TOTALS</b>	<b>20</b>		<b>9</b>		<b>3</b>	

**Comments:** Single-age stand was likely planted. Understory managed.

Contiguous to this area is a more mixed stand to the west.

<b>GROVE SITE #:</b>	86	<b>SIZE:</b>	18.25 acres	<b>SCORE:</b>	32
<b>DATE:</b>	9/13/2010	<b>LOCATION:</b>	109th (west)	<b>MAP:</b>	86
<b>FIELD STAFF:</b>	AS	<b>GOAL 5 SITE?</b>	No	<b>PHOTOS:</b>	5722, 5725

### Grove Description

Mixed forest dominated by Douglas fir, bigleaf maple, and with a few scattered Scouler willow. The understory is a variety of native and invasive species. Some buffering between high and low-density residential uses and Highway 99.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace	✓	>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓	>5 acres in size		2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses	✓	Between industrial or commercial uses and residential or open space uses		Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features		Uncommon features or combination of features	✓	No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size	✓	Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (<1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>4</b>	<b>X 5</b>	<b>3</b>	<b>X 3</b>	<b>3</b>	<b>X 1</b>
<b>TOTALS</b>	<b>20</b>		<b>9</b>		<b>3</b>	

**Comments:** English ivy has overwhelmed the herb layer and has climbed high in trees. Some heavy Himalayan blackberry cover as well. May be developable.

<b>GROVE SITE #:</b>	86a	<b>SIZE:</b>	4.12 acres	<b>SCORE:</b>	30
<b>DATE:</b>	9/13/2010	<b>LOCATION:</b>	109th (east)	<b>MAP:</b>	86a
<b>FIELD STAFF:</b>	AS	<b>GOAL 5 SITE?</b>	No	<b>PHOTOS:</b>	5723-24

<b>Grove Description</b>	
Mixed forest dominated by Douglas fir, bigleaf maple, with a few western redcedar. Saskatoon serviceberry, poison oak, dull Oregon grape, English holly, snowberry and beaked hazelnut are the most common shrub species. The understory	
762	

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace	✓	>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance	✓	Healthy: no visible threats, low disturbance		Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size	✓	Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	2	X 5	6	X 3	2	X 1
<b>TOTALS</b>	10		18		2	

**Comments:** Grove of large fir (40"+ dbh) and bigleaf maple (14-20" dbh); a few western redcedar but more saplings. There are a few informal trails but no development. Invasives generally at the margins. Buffering between low- and high-density residential uses.

<b>GROVE SITE #:</b>	89	<b>SIZE:</b>	1.21 acres	<b>SCORE:</b>	26
<b>DATE:</b>	8/30/2010	<b>LOCATION:</b>	Golf course/behind church	<b>MAP:</b>	89
<b>FIELD STAFF:</b>	DB,AS,TB	<b>GOAL 5 SITE?</b>	No	<b>PHOTOS:</b>	5618

<b>Grove Description</b>	
Douglas fir with Oregon white oak. Firs 20-42" dbh; Oak 20"; Parklike understory - mowed grass, ornamentals, rhododendrons.	
Areas in golf course similar.	

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace	✓	>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size		2 to 5 acres in size	✓	< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance	✓	Healthy; no visible threats, low disturbance		Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses		Between similar land uses, or similar land use characteristics	✓	No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access	✓	Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium	✓	Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife	✓	Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)		Partially developed	✓	Developed, or surrounded
<b>SUB-TOTALS</b>	<b>2</b>	<b>X 5</b>	<b>4</b>	<b>X 3</b>	<b>4</b>	<b>X 1</b>
<b>TOTALS</b>	<b>10</b>		<b>12</b>		<b>4</b>	

**Comments:** Not in position to provide buffer. Access limited, grove size < 2 acres. Observed white-breasted and red-breasted nuthatches, northern flicker

<b>GROVE SITE #:</b>	90	<b>SIZE:</b>	2.53 acres	<b>SCORE:</b>	22
<b>DATE:</b>	8/30/2010	<b>LOCATION:</b>	Churchhill Ct, S of Ashford	<b>MAP:</b>	90
<b>FIELD STAFF:</b>	DB,AC,TB	<b>GOAL 5 SITE?</b>	No	<b>PHOTOS:</b>	5610-5612

**Grove Description**

Mixed Evergreen-Deciduous Forest; Douglas fir - bigleaf maple codominants with few western red cedar, black cottonwood, and a few ornamentals. Understory is a mix of native and introduced shrub species.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace	✓	>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features		Uncommon features or combination of features	✓	No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife	✓	Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)		Partially developed	✓	Developed, or surrounded
<b>SUB-TOTALS</b>	1	X 5	4	X 3	5	X 1
<b>TOTALS</b>	5		12		5	

**Comments:** Grove is surrounded by residential development, isolated. Well-developed shrub layer in areas.

Generally low habitat functions, but provides some songbird habitat. Variety of introduced shrubs, e.g.,

Himalayan blackberry, sweet cherry.



<b>GROVE SITE #:</b>	91	<b>SIZE:</b>	1.29 acres	<b>SCORE:</b>	24
<b>DATE:</b>	9/13/2010	<b>LOCATION:</b>	76th Avenue	<b>MAP:</b>	91
<b>FIELD STAFF:</b>	AS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5737

**Grove Description**

Evergreen grove dominated by Douglas fir and western redcedar. A few scattered oaks also present.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace	✓	>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size		2 to 5 acres in size	✓	< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features		Uncommon features or combination of features	✓	No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size	✓	Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>1</b>	<b>X 5</b>	<b>5</b>	<b>X 3</b>	<b>4</b>	<b>X 1</b>
<b>TOTALS</b>	<b>5</b>		<b>15</b>		<b>4</b>	

**Comments:** Small grove on residential lot. Lot is likely divisible. Visibility from right-of-way is limited.

<b>GROVE SITE #:</b>	92	<b>SIZE:</b>	2.27 acres	<b>SCORE:</b>	22
<b>DATE:</b>	8/30/2010	<b>LOCATION:</b>	I-5, S. Upper Boones Ferry	<b>MAP:</b>	92
<b>FIELD STAFF:</b>	DB,AS,TB	<b>GOAL 5 SITE?</b>	No	<b>PHOTOS:</b>	5606-7

**Grove Description**

Douglas fir (25-30" dbh) grove with sparse understory; scattered maples and other deciduous trees, cut blackberry, introduced grasses, heavy ivy at south end of site, evidence of herbicide use.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace	✓	>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance		Some dieback or potential threats; invasive species	✓	Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value	✓	Visible from arterial street or public park/open space		Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features		Uncommon features or combination of features	✓	No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife	✓	Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)		Partially developed	✓	Developed, or surrounded
<b>SUB-TOTALS</b>	2	X 5	2	X 3	6	X 1
<b>TOTALS</b>	10		6		6	

**Comments:** Broad linear grove along western edge of I-5 at Upper Boones Ferry Road. Minimal public access, buffers hotel and commercial uses from I-5.

<b>GROVE SITE #:</b>	93	<b>SIZE:</b>	21.15 acres	<b>SCORE:</b>	40
<b>DATE:</b>	9/13/2010	<b>LOCATION:</b>	Durham/74th Avenue	<b>MAP:</b>	93
<b>FIELD STAFF:</b>	AS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5735-6, 5738-9

**Grove Description**

Douglas fir/western redcedar forest with a few red alder, bigleaf maple, and Oregon ash. Understory dominants include Saskatoon serviceberry, beaked hazelnut, and maple saplings. Himalayan blackberry common and frequently heavy at edges.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace	✓	>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓	>5 acres in size		2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value	✓	Visible from arterial street or public park/open space		Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access	✓	Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium	✓	Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity	✓	Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (<1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>5</b>	<b>X 5</b>	<b>5</b>	<b>X 3</b>	<b>0</b>	<b>X 1</b>
<b>TOTALS</b>	<b>25</b>		<b>15</b>		<b>0</b>	

**Comments:** Grove is a combination of public and private ownership, but much the area lies within the vegetated corridor and work within it will be regulated. Habitat values are high due to large size of grove, diversity of habitat types, and proximity to water. Invasive knotweed infestation at the end of 76th Avenue

<b>GROVE SITE #:</b>	95	<b>SIZE:</b>	3.76 acres	<b>SCORE:</b>	28
<b>DATE:</b>	9/13/2010	<b>LOCATION:</b>	Dover Ct.	<b>MAP:</b>	95
<b>FIELD STAFF:</b>	AS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5728-9

### Grove Description

Mixed forest along drainage leading to Tualatin River. Dominant trees are Douglas fir, bigleaf maple, Oregon ash, and red alder. Snowberry is the dominant understory shrub, accompanied by a variety of native and non-native shrubs and herbs. Himalayan blackberry ranges from absent to heavy, with heaviest infestations where light is greatest (edges, deciduous trees).

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace	✓	> 50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value	✓	Visible from arterial street or public park/open space		Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses		Between similar land uses, or similar land use characteristics	✓	No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access	✓	Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features		Uncommon features or combination of features	✓	No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size	✓	Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	2	X 5	5	X 3	3	X 1
<b>TOTALS</b>	10		15		3	

**Comments:** This grove lies at the edge of the city limits; a larger portion lies outside the boundary.

Most of the grove has limited visibility from public rights-of-way, and access from public areas is difficult.

Areas of deciduous tree cover have higher cover of invasive species in the understory, particularly Himalayan blackberry.

<b>GROVE SITE #:</b>	96	<b>SIZE:</b>	6.50 acres	<b>SCORE:</b>	30
<b>DATE:</b>	9/13/2010	<b>LOCATION:</b>	Durham Road/Copper Creek	<b>MAP:</b>	96
<b>FIELD STAFF:</b>	AS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	none

**Grove Description**

Mixed forest along small drainage in a draw between developments. Douglas fir, western redcedar and bigleaf maple are the dominant trees, with beaked hazelnut and a largely native shrub community underneath outside landscaped yards. Herbaceous species include swordfern, lady fern. Some English ivy and Himalayan blackberry, especially at margins.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace	✓	>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓	>5 acres in size		2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value	✓	Visible from arterial street or public park/open space		Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features		Uncommon features or combination of features	✓	No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size	✓	Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>3</b>	<b>X 5</b>	<b>4</b>	<b>X 3</b>	<b>3</b>	<b>X 1</b>
<b>TOTALS</b>	<b>15</b>		<b>12</b>		<b>3</b>	

**Comments:** This grove will be landlocked when the development at the north end is completed. Mature trees with some top breakage. Himalayan blackberry is present where light penetration is greater .

<b>GROVE SITE #:</b>	97	<b>SIZE:</b>	7.08 acres	<b>SCORE:</b>	40
<b>DATE:</b>	8/30/2010	<b>LOCATION:</b>	Fanno Creek at Durham	<b>MAP:</b>	97
<b>FIELD STAFF:</b>	DB,AS,TB	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5613-5616

<b>Grove Description</b>	
Deciduous Forest; Oregon ash - bigleaf maple codominants with some red alder; sizes generally 18-32" dbh.	

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace	✓	>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓	>5 acres in size		2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance	✓	Healthy: no visible threats, low disturbance		Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value		Visible from arterial street or public park/open space	✓	Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access	✓	Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium	✓	Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity	✓	Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (<1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>5</b>	<b>X 5</b>	<b>5</b>	<b>X 3</b>	<b>0</b>	<b>X 1</b>
<b>TOTALS</b>	<b>25</b>		<b>15</b>		<b>0</b>	

**Comments:** Grove is part of riparian forest along Fanno Creek. One large open-growth oak on north side of site.

Good quality habitat, with interspersed habitat types, riparian and wetlands and undeveloped uplands. West edge of site is publicly owned, with school adjacent. Visibility somewhat limited: distant view from Durham and visible from commuter rail.

<b>GROVE SITE #:</b>	99	<b>SIZE:</b>	5.89 acres	<b>SCORE:</b>	34
<b>DATE:</b>	8/30/2010	<b>LOCATION:</b>	SW 92nd/ N of Cook Park	<b>MAP:</b>	99
<b>FIELD STAFF:</b>	DB,AC,TB	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5622-3

**Grove Description**

Dominant trees are willow, red alder, Oregon ash, black cottonwood, with scattered Oregon white oak up hill.

Himalayan blackberry dominates the understory.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓	>5 acres in size		2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value	✓	Visible from arterial street or public park/open space		Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access		Some physical or legal access limits; or part public, part private land	✓	Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features	✓	Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity	✓	Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (<1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>4</b>	<b>X 5</b>	<b>4</b>	<b>X 3</b>	<b>2</b>	<b>X 1</b>
<b>TOTALS</b>	<b>20</b>		<b>12</b>		<b>2</b>	

**Comments:**

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<b>GROVE SITE #:</b>	99a	<b>SIZE:</b>	3.21 acres	<b>SCORE:</b>	26
<b>DATE:</b>	8/30/2010	<b>LOCATION:</b>	east of 92nd, n of Cook Park	<b>MAP:</b>	99a
<b>FIELD STAFF:</b>	DB,AS,TB	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5622-23

**Grove Description**

Dominant riparian trees are red alder, Oregon ash, willow, with some Douglas fir and Oregon white oak farther up the hillslope.  
Diverse: riparian habitats, adjacent wetlands, open space (Cook Park). Understory with lots of reed canarygrass  
and Himalayan blackberry

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh		25-50% of trees have ≥ 14" dbh	✓	<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size		>5 acres in size	✓	2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value	✓	Visible from arterial street or public park/open space		Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots		Unrestricted public access	✓	Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value		Rare natural or cultural features		Uncommon features or combination of features	✓	No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values		Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium	✓	Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity		Diverse structure, species mix; high connectivity; lg. size	✓	Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development		Undeveloped (<1 unit per acre)	✓	Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	1	X 5	6	X 3	3	X 1
<b>TOTALS</b>	5		18		3	

**Comments:**

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<b>GROVE SITE #:</b>	100	<b>SIZE:</b>	15.39 acres	<b>SCORE:</b>	44
<b>DATE:</b>	9/13/2010	<b>LOCATION:</b>	Tualatin R. corridor	<b>MAP:</b>	100
<b>FIELD STAFF:</b>	AS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5731-2

### Grove Description

Mixed forest dominated by Douglas fir and red alder with subdominants including Oregon ash, bigleaf maple, and a few western redcedar. The understory supports a variety of native shrubs and groundcover but most areas have moderate to heavy infestations of invasive species such as Himalayan blackberry, English ivy, and reed canarygrass.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓	>5 acres in size		2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value	✓	Visible from arterial street or public park/open space		Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses		Between industrial or commercial uses and residential or open space uses	✓	Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots	✓	Unrestricted public access		Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> Unusual features (e.g., large grove or tree size, or rare species) or historical value	✓	Rare natural or cultural features		Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values	✓	Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity	✓	Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (<1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	7	X 5	3	X 3	0	X 1
<b>TOTALS</b>	35		9		0	

**Comments:** This grove lies within the Tualatin River floodplain. Some tree mortality is evident; some trees lack tops but in others the reason for mortality is unclear. Corridor is about ~120 feet wide from the river to the edge of adj. development. Trees range from 6" to 40"+ dbh. Beehive in large cedar snag. Forest structure is mixed age classes.

<b>GROVE SITE #:</b>	101	<b>SIZE:</b>	19.91 acres	<b>SCORE:</b>	46
<b>DATE:</b>	9/13/2010	<b>LOCATION:</b>	Cook Park	<b>MAP:</b>	101
<b>FIELD STAFF:</b>	AS	<b>GOAL 5 SITE?</b>	Yes	<b>PHOTOS:</b>	5733-4

**Grove Description**

Mixed forest in Cook Park. This site features large Douglas fir, bigleaf maple, ponderosa pine, Oregon oak, and Oregon ash. The understory community consists of osoberry, snowberry, thimbleberry, Oregon grape, and other riparian upland species. English ivy and Himalayan blackberry are present (and dominant), but the primary vine in the area is California dewberry.

Function/ Characteristic		HIGH		MEDIUM		LOW
<b>Grove maturity/Tree size</b> Scenic and natural values increase with age; mature trees are difficult to replace		>50% of trees have > 14" dbh	✓	25-50% of trees have ≥ 14" dbh		<25% of trees have > 14" dbh
<b>Grove size</b> Vitality, resilience of grove generally increases with size	✓	>5 acres in size		2 to 5 acres in size		< 2 acres in size
<b>Health</b> General condition and signs of dieback, threats, disturbance		Healthy: no visible threats, low disturbance	✓	Some dieback or potential threats; invasive species		Extensive dieback or high disturbance; or invasives dominate
<b>Visibility</b> Groves clearly visible from public lands have greater value	✓	Visible from arterial street or public park/open space		Visible from local street or private common open space		Not visible from street or open space
<b>Screening/Buffering</b> Groves may serve as land use buffers; depending on density, location, uses	✓	Between industrial or commercial uses and residential or open space uses		Between similar land uses, or similar land use characteristics		No (or very limited) buffer function
<b>Accessibility</b> Greater access provides more opportunity for public use; but inappropriate on private lots	✓	Unrestricted public access		Some physical or legal access limits; or part public, part private land		Privately owned or inaccessible
<b>Rarity</b> (Unusual features (e.g., large grove or tree size, or rare species) or historical value)	✓	Rare natural or cultural features		Uncommon features or combination of features		No uncommon features
<b>Educational/Rec. Potential</b> Accessible groves with unusual features offer recreational and/or educational values	✓	Accessibility and Rarity are high or medium		Accessibility and Rarity are both medium		Accessibility or Rarity are low
<b>Wildlife Habitat</b> Habitat functions for terrestrial species, connectivity, diversity	✓	Diverse structure, species mix; high connectivity; lg. size		Good source of food, cover, territory for wildlife		Provides few habitat functions, minimal connectivity
<b>Existing Development</b> Groves with development	✓	Undeveloped (<1 unit per acre)		Partially developed		Developed, or surrounded
<b>SUB-TOTALS</b>	<b>8</b>	<b>X 5</b>	<b>2</b>	<b>X 3</b>	<b>0</b>	<b>X 1</b>
<b>TOTALS</b>	<b>40</b>		<b>6</b>		<b>0</b>	

**Comments:** Very large grove. Some areas under the canopy are developed for park use (picnic tables, trails, etc.)

Invasive species cover is generally light. Soft and paved trails throughout.

**Appendix B: Impacted Taxlots and Significant Tree Grove  
Acreage**





TLID	TAXLOT SIZE (sq ft)			GROVE NUMBER	GROVE TOTAL ACRES
	IN TREE GROVE	OUTSIDE TREE GROVE	TOTAL		
1S125DA00200	4534.51	12453.89	16988.40	8	1.74
1S125DA00300	22112.24	9686.56	31798.80	8	1.74
1S125DA00400	1417.12	6423.68	7840.80	8	1.74
1S125DA00401	2917.43	4923.37	7840.80	8	1.74
1S125DA00500	4220.71	3620.09	7840.80	8	1.74
1S125DA00501	550.11	7290.69	7840.80	8	1.74
1S125DA00601	4352.89	6537.11	10890.00	8	1.74
1S125DA00602	2686.36	11252.84	13939.20	8	1.74
1S125DA00700	575.97	15105.63	15681.60	8	1.74
1S125DA00701	16084.15	33.05	16117.20	8	1.74
1S125DA03001	1901.52	15522.48	17424.00	8	1.74
1S125DA03200	7152.01	10271.99	17424.00	8	1.74
1S125DA06700	2425.80	15433.80	17859.60	9	1.34
1S125DA06800	13267.08	6770.52	20037.60	9	1.34
1S125DA06900	12805.93	7231.67	20037.60	9	1.34
1S125DA07000	1566.59	9323.41	10890.00	9	1.34
1S125DA07001	464.76	8682.84	9147.60	9	1.34
1S125DA07100	16253.00	10754.20	27007.20	9	1.34
1S125DA10500	4047.69	11633.91	15681.60	9	1.34
1S125DA11500	221.46	8054.94	8276.40	8	1.74
1S125DA11600	4018.52	4693.48	8712.00	8	1.74
1S125DB03900	3294.06	27197.94	30492.00	14	3.06
1S125DB06300	2086.62	11416.98	13503.60	9	1.34
1S125DB09100	1308.79	8274.41	9583.20	9	1.34
1S125DB09300	4133.83	11112.17	15246.00	9	1.34
1S125DC00500	35662.14	25321.86	60984.00	14	3.06
1S125DC00600	90758.52	31209.48	121968.00	14	3.06
1S125DC00900	13977.68	30889.12	44866.80	12	6.43
1S125DC02200	1437.38	7710.22	9147.60	12	6.43
1S125DC04800	3888.02	467.98	4356.00	12	6.43
1S125DC08000	4919.00	4664.20	9583.20	12	6.43
1S125DC08100	3660.82	3744.38	7405.20	12	6.43
1S125DC08200	2228.47	6047.93	8276.40	12	6.43
1S125DC08300	1627.57	5342.03	6969.60	12	6.43
1S125DC08400	1469.75	5499.85	6969.60	12	6.43
1S125DC08500	423.15	6110.85	6534.00	12	6.43
1S125DC09000	762.00	6643.20	7405.20	12	6.43
1S125DC09100	6.57	5220.63	5227.20	12	6.43
1S125DC09600	3464.08	2634.32	6098.40	12	6.43
1S125DC09700	165953.74	16998.26	182952.00	12	6.43
1S125DD00500	58187.57	50712.43	108900.00	13	2.54
1S125DD00800	1155.61	7556.39	8712.00	13	2.54
1S125DD00900	6422.05	547.55	6969.60	13	2.54
1S125DD01000	2330.66	5074.54	7405.20	13	2.54
1S125DD01100	1798.28	6042.52	7840.80	13	2.54
1S125DD01200	5042.19	3669.81	8712.00	13	2.54
1S125DD01800	71.09	8640.91	8712.00	11	2.11
1S125DD02200	4390.91	8677.09	13068.00	12	6.43
1S125DD02300	7.00	7833.80	7840.80	12	6.43
1S125DD02900	45.17	8231.23	8276.40	12	6.43
1S125DD03000	143.28	8133.12	8276.40	12	6.43
1S125DD03100	3587.17	6431.63	10018.80	13	2.54
1S125DD03200	4219.42	5363.78	9583.20	13	2.54
1S125DD03300	3039.52	6979.28	10018.80	13	2.54
1S125DD03400	1682.90	8335.90	10018.80	13	2.54
1S125DD03500	1623.79	7523.81	9147.60	13	2.54

TLID	TAXLOT SIZE (sq ft)			GROVE NUMBER	GROVE TOTAL ACRES
	IN TREE GROVE	OUTSIDE TREE GROVE	TOTAL		
1S125DD03600	2061.99	9263.61	11325.60	12	6.43
1S125DD03700	4734.00	6156.00	10890.00	12	6.43
1S125DD03800	4267.83	5750.97	10018.80	12	6.43
1S125DD03900	3399.38	7055.02	10454.40	12	6.43
1S125DD04000	2072.41	7510.79	9583.20	12	6.43
1S125DD04100	2894.60	7124.20	10018.80	12	6.43
1S125DD04200	6074.74	2201.66	8276.40	12	6.43
1S125DD04300	7109.93	5522.47	12632.40	12	6.43
1S125DD04400	2138.10	7880.70	10018.80	12	6.43
1S125DD05700	75.28	9072.32	9147.60	10	1.06
1S125DD05800	2126.72	7892.08	10018.80	10	1.06
1S125DD05900	1249.05	8334.15	9583.20	10	1.06
1S125DD06000	1025.20	8558.00	9583.20	10	1.06
1S125DD06100	11134.36	1933.64	13068.00	10	1.06
1S125DD06200	3168.74	7721.26	10890.00	10	1.06
1S125DD06300	3322.55	6260.65	9583.20	10	1.06
1S125DD06400	47.14	12149.66	12196.80	10	1.06
1S125DD09000	2954.14	8353.57	11307.71	10	1.06
1S125DD09100	3860.91	6157.89	10018.80	10	1.06
1S125DD09300	131.54	9016.06	9147.60	10	1.06
1S125DD09400	293.61	8853.99	9147.60	10	1.06
1S125DD09500	929.91	8217.69	9147.60	10	1.06
1S125DD09600	1921.09	7226.51	9147.60	10	1.06
1S125DD09701	3101.59	5610.41	8712.00	10	1.06
1S125DD09800	530.92	9052.28	9583.20	10	1.06
1S125DD10100	22787.33	1606.27	24393.60	12	6.43
1S125DD10400	15055.76	190.24	15246.00	13	2.54
1S125DD10500	10407.99	1353.21	11761.20	10	1.06
1S125DD10700	2737.16	13815.64	16552.80	13	2.54
1S125DD10900	12940.00	999.20	13939.20	12	6.43
1S133CD08600	713.38	5993.43	6706.81	31	3.68
1S133CD08700	184.05	5547.82	5731.87	31	3.68
1S133CD13900	474.73	5188.07	5662.80	31	3.68
1S133CD14800	1254.85	3101.15	4356.00	31	3.68
1S133CD17400	156371.60	47489.20	203860.80	31	3.68
1S133DA07200	179463.71	766223.89	945687.60	25	5.50
1S133DA07400	9689.13	29950.47	39639.60	25	5.50
1S133DA07500	12348.84	719.16	13068.00	25	5.50
1S133DA09400	5650.48	1754.72	7405.20	25	5.50
1S133DB00104	31410.87	184646.73	216057.60	25	5.50
1S134AA00500	44987.38	114442.22	159429.60	17	1.66
1S134AA02200	6438.16	182612.24	189050.40	17	1.66
1S134AC01000	458.50	8689.10	9147.60	19	9.71
1S134AC01200	750.73	8832.47	9583.20	19	9.71
1S134AC02300	207841.88	98820.52	306662.40	19	9.71
1S134AC02601	165638.21	69962.09	235600.30	19	9.71
1S134AC02614	1004.38	11628.02	12632.40	19	9.71
1S134AC02615	2982.03	8343.57	11325.60	19	9.71
1S134AC02616	2863.24	11075.96	13939.20	19	9.71
1S134AC02623	4413.47	8654.53	13068.00	19	9.71
1S134AC03100	566.55	7709.85	8276.40	19	9.71
1S134AC06600	3818.86	2279.54	6098.40	19	9.71
1S134AD06100	27469.23	99237.64	126706.87	19	9.71
1S134AD09700	25881.81	78662.19	104544.00	17	1.66
1S134CC01500	1426.31	53023.69	54450.00	32	5.81
1S134CC01700	4351.48	460433.72	464785.20	32	5.81

TLID	TAXLOT SIZE (sq ft)			GROVE NUMBER	GROVE TOTAL ACRES
	IN TREE GROVE	OUTSIDE TREE GROVE	TOTAL		
1S134CC02000	231152.88	89224.53	320377.41	32	5.81
1S134CC02800	633.67	10691.93	11325.60	32	5.81
1S134CC02900	1411.42	12092.18	13503.60	32	5.81
1S134CC04200	2014.14	3648.66	5662.80	32	5.81
1S134CC04300	3401.97	4874.43	8276.40	32	5.81
1S134CC05000	7957.57	84825.23	92782.80	32	5.81
1S134CD00100	165010.93	20554.67	185565.60	35	5.50
1S134CD00200	4170.34	1492.46	5662.80	35	5.50
1S134CD00600	803.25	19669.95	20473.20	35	5.50
1S134CD00700	4030.82	16442.38	20473.20	35	5.50
1S134CD00800	4406.27	16066.93	20473.20	35	5.50
1S134CD00900	2571.43	17901.77	20473.20	35	5.50
1S134CD01000	3963.31	16509.89	20473.20	35	5.50
1S134CD01100	12666.70	20438.90	33105.60	35	5.50
1S134CD01200	19457.09	13212.91	32670.00	35	5.50
1S134CD01202	8884.50	31190.70	40075.20	35	5.50
1S134CD06600	600.95	10724.65	11325.60	35	5.50
1S134CD06700	1444.95	7267.05	8712.00	35	5.50
1S134DC03000	2107.17	719682.03	721789.20	36	30.97
1S134DC03002	10803.60	3734.30	14537.90	36	30.97
1S134DC03100	20304.38	43916.81	64221.19	36	30.97
1S134DC03102	19269.69	5667.19	24936.88	36	30.97
1S134DC03300	125857.05	2848.97	128706.02	36	30.97
1S134DC03400	121160.13	7545.91	128706.04	36	30.97
1S134DC03601	6022.71	511.29	6534.00	36	30.97
1S134DC06700	861.83	2717.04	3578.87	36	30.97
1S134DC11100	15306.55	12136.25	27442.80	36	30.97
1S134DD00900	229159.47	410736.93	639896.40	36	30.97
1S134DD01000	175662.58	160185.02	335847.60	33	3.79
1S134DD01600	16032.73	53227.67	69260.40	33	3.79
1S134DD01800	19923.32	26250.28	46173.60	33	3.79
1S135AA03600	1454.20	33393.80	34848.00	2	1.79
1S135AC01700	64160.54	59549.86	123710.40	22	4.90
1S135AC02550	2990.10	80645.10	83635.20	22	4.90
1S135AC90091	100593.30	2643.90	103237.20	22	4.90
1S135AD00900	36560.51	26165.89	62726.40	2	1.79
1S135AD00901	2556.38	12689.62	15246.00	2	1.79
1S135AD01100	19335.34	4622.66	23958.00	2	1.79
1S135AD01102	1725.06	25282.14	27007.20	2	1.79
1S135AD01104	6667.32	16855.08	23522.40	2	1.79
1S135AD01200	6791.48	76843.72	83635.20	2	1.79
1S135AD01400	11537.51	252000.49	263538.00	24	3.28
1S135AD01401	5201.67	16578.33	21780.00	24	3.28
1S135AD01600	74951.89	14781.71	89733.60	24	3.28
1S135AD01700	26389.99	57680.81	84070.80	24	3.28
1S135AD01702	5451.75	21119.85	26571.60	24	3.28
1S135AD03300	943.48	5154.92	6098.40	2	1.79
1S135AD03400	2148.64	19631.36	21780.00	2	1.79
1S135DA02600	21818.12	9545.08	31363.20	22	4.90
1S135DA03900	903.50	28717.30	29620.80	24	3.28
1S135DB08400	7905.07	26942.93	34848.00	22	4.90
1S135DB08900	112.45	6857.15	6969.60	22	4.90
1S135DB09000	1215.18	5754.42	6969.60	22	4.90
1S135DB12600	1807.26	6469.14	8276.40	22	4.90
1S136AA00201	11574.11	276793.09	288367.20	11	2.11
1S136AA00301	31277.72	67167.88	98445.60	11	2.11

TLID	TAXLOT SIZE (sq ft)			GROVE NUMBER	GROVE TOTAL ACRES
	IN TREE GROVE	OUTSIDE TREE GROVE	TOTAL		
1S136AA00400	24136.64	57320.56	81457.20	11	2.11
1S136AA08500	1061.06	5908.54	6969.60	11	2.11
1S136AA08600	6364.52	4961.08	11325.60	11	2.11
1S136AA08700	6650.20	4675.40	11325.60	11	2.11
1S136AA08800	2592.69	5248.11	7840.80	11	2.11
1S136AD06300	28176.44	254527.96	282704.40	23	3.11
1S136AD06390	558.07	3362.33	3920.40	23	3.11
1S136AD06505	8284.32	13931.28	22215.60	23	3.11
1S136AD06507	3774.46	117757.94	121532.40	23	3.11
1S136CD02200	412.55	552363.85	552776.40	40	8.36
1S136CD04200	2017.86	23682.54	25700.40	40	8.36
1S136DA00100	70240.78	359696.42	429937.20	23	3.11
1S136DA00600	24824.28	80155.32	104979.60	30	9.61
1S136DA00900	6038.96	150341.44	156380.40	30	9.61
1S136DA00901	6019.06	24908.54	30927.60	30	9.61
1S136DA00902	307801.18	43292.42	351093.60	30	9.61
1S136DA01000	5299.03	52200.17	57499.20	30	9.61
1S136DA02100	7201.58	32438.02	39639.60	30	9.61
1S136DA02300	25350.47	320080.33	345430.80	30	9.61
1S136DA02400	34776.64	159936.56	194713.20	30	9.61
1S136DA02500	16814.90	21517.90	38332.80	23	3.11
1S136DA02600	7184.80	45958.40	53143.20	23	3.11
2S1010001100	439440.16	137729.84	577170.00	62	25.28
2S1010001200	642001.71	477054.69	1119056.40	71	39.20
2S101AA06700	63975.57	3106.83	67082.40	44	2.99
2S101AA07100	36270.15	6854.25	43124.40	44	2.99
2S101AA07800	16967.86	15702.14	32670.00	44	2.99
2S101AB00100	76701.47	62254.93	138956.40	38	3.10
2S101AB00101	10876.68	13081.32	23958.00	38	3.10
2S101AB00200	32281.73	62679.07	94960.80	38	3.10
2S101AB00300	984.62	38219.38	39204.00	38	3.10
2S101AB00301	3567.89	12113.71	15681.60	38	3.10
2S101AB00302	4275.60	11406.00	15681.60	38	3.10
2S101BA00101	21943.21	725981.99	747925.20	40	8.36
2S101BA00200	281559.78	163623.42	445183.20	40	8.36
2S101BB0.201	53068.96	128576.24	181645.20	40	8.36
2S101CA00100	598784.76	453624.84	1052409.60	62	25.28
2S101CC00100	478978.08	48097.92	527076.00	71	39.20
2S101DA00102	18345.08	207295.72	225640.80	54	3.88
2S101DA00103	86848.70	2449.30	89298.00	54	3.88
2S101DA00104	38038.54	331785.86	369824.40	54	3.88
2S101DA00105	25041.11	176206.09	201247.20	54	3.88
2S101DB00300	32830.84	102640.76	135471.60	62	25.28
2S101DB00400	11877.76	75242.24	87120.00	62	25.28
2S101DB00604	7428.86	10950.59	18379.45	62	25.28
2S101DC00500	9878.16	208357.44	218235.60	62	25.28
2S102BA00300	33058.92	27489.48	60548.40	3	12.47
2S102BA00304	11143.04	92529.76	103672.80	3	12.47
2S102BA00501	23716.98	74728.62	98445.60	3	12.47
2S102BA02000	56000.43	58126.77	114127.20	3	12.47
2S102BA02200	5863.41	23321.79	29185.20	3	12.47
2S102BA02300	13341.18	37624.02	50965.20	3	12.47
2S102BB00600	126431.28	149739.12	276170.40	3	12.47
2S102BB00700	85405.32	155917.08	241322.40	3	12.47
2S102BB00827	2052.45	12757.95	14810.40	3	12.47
2S102BB00828	1829.78	11238.22	13068.00	3	12.47



TLID	TAXLOT SIZE (sq ft)			GROVE NUMBER	GROVE TOTAL ACRES
	IN TREE GROVE	OUTSIDE TREE GROVE	TOTAL		
2S102BB00829	1356.33	11276.07	12632.40	3	12.47
2S102BB00830	3008.62	7445.78	10454.40	3	12.47
2S102BB00831	2728.03	9468.77	12196.80	3	12.47
2S102BB00832	109110.77	38993.23	148104.00	3	12.47
2S102BB00900	28166.09	61131.91	89298.00	3	12.47
2S102BC02000	1379.61	15608.79	16988.40	45	2.57
2S102BC02001	3563.38	13860.62	17424.00	45	2.57
2S102BC02003	5977.81	10139.39	16117.20	45	2.57
2S102BC02006	1965.78	15022.62	16988.40	45	2.57
2S102BC02100	2214.99	10853.01	13068.00	45	2.57
2S102BC05700	8504.77	2820.83	11325.60	45	2.57
2S102BC06700	85302.94	17498.66	102801.60	45	2.57
2S102BC08600	382.38	3102.42	3484.80	45	2.57
2S102DA00500	5876.67	360462.93	366339.60	71	39.20
2S102DA00600	13195.99	311761.61	324957.60	71	39.20
2S102DA00690	8355.96	-79.56	8276.40	71	39.20
2S102DC01300	40447.87	34039.73	74487.60	64	5.31
2S102DC01301	15024.72	25050.48	40075.20	64	5.31
2S102DC01304	4245.49	17534.51	21780.00	64	5.31
2S102DC01305	1117.90	14999.30	16117.20	64	5.31
2S102DC01400	23982.48	33952.32	57934.80	64	5.31
2S102DC01402	11083.16	25071.64	36154.80	64	5.31
2S102DC01500	26438.42	21913.18	48351.60	64	5.31
2S102DC01501	3252.07	19834.73	23086.80	64	5.31
2S102DC02500	35920.51	12866.69	48787.20	64	5.31
2S102DC02501	4415.62	8652.38	13068.00	64	5.31
2S102DC02900	2552.72	4852.48	7405.20	64	5.31
2S102DC03000	3627.24	3342.36	6969.60	64	5.31
2S102DD00100	57708.02	85604.38	143312.40	71	39.20
2S102DD00200	49535.98	71125.22	120661.20	71	39.20
2S102DD00300	59292.21	68338.59	127630.80	71	39.20
2S102DD00401	73119.01	6595.79	79714.80	71	39.20
2S102DD00811	5012.81	11975.59	16988.40	64	5.31
2S102DD00900	8425.93	63883.67	72309.60	64	5.31
2S102DD00901	19680.41	23443.99	43124.40	64	5.31
2S102DD00902	17529.00	12527.40	30056.40	64	5.31
2S102DD00903	8547.66	8876.34	17424.00	64	5.31
2S102DD03200	0.03	7405.17	7405.20	71	39.20
2S102DD03800	12784.19	4204.21	16988.40	71	39.20
2S102DD05400	25584.96	10134.24	35719.20	71	39.20
2S103AA00100	27954.54	157175.46	185130.00	3	12.47
2S103AA00101	77187.02	883310.98	960498.00	36	30.97
2S103AA00200	212074.71	63658.44	275733.15	33	3.79
2S103AA00400	3416.11	128799.69	132215.80	36	30.97
2S103AA01913	2283.43	11220.17	13503.60	3	12.47
2S103AA02900	8744.04	5195.16	13939.20	3	12.47
2S103AB00100	100475.01	406998.99	507474.00	36	30.97
2S103AB00200	146649.78	8636.83	155286.61	36	30.97
2S103AB00403	40037.21	65377.99	105415.20	36	30.97
2S103AB00406	83204.59	47911.01	131115.60	36	30.97
2S103AB02300	3965.00	10409.80	14374.80	48	6.99
2S103AB02400	1074.60	13300.20	14374.80	48	6.99
2S103AB02500	2778.67	11596.13	14374.80	48	6.99
2S103AB02600	1491.62	12883.18	14374.80	48	6.99
2S103AB02700	5389.13	5065.27	10454.40	48	6.99
2S103AB04200	88461.41	88827.79	177289.20	36	30.97

TLID	TAXLOT SIZE (sq ft)			GROVE NUMBER	GROVE TOTAL ACRES
	IN TREE GROVE	OUTSIDE TREE GROVE	TOTAL		
2S103AC00202	18580.24	4942.16	23522.40	48	6.99
2S103AC00203	11551.29	209.91	11761.20	48	6.99
2S103AC00204	31189.02	1916.58	33105.60	48	6.99
2S103AC00501	66612.49	41416.31	108028.80	48	6.99
2S103AC01100	23285.68	12433.52	35719.20	48	6.99
2S103AC01700	49905.19	18484.01	68389.20	56	6.69
2S103AC01701	10259.97	33300.03	43560.00	56	6.69
2S103AC01900	282.53	19319.47	19602.00	56	6.69
2S103AC03900	3109.25	6473.95	9583.20	48	6.99
2S103AC04000	2970.71	5741.29	8712.00	48	6.99
2S103AC04100	999.79	8147.81	9147.60	48	6.99
2S103AC04200	2878.34	6269.26	9147.60	48	6.99
2S103AC04300	3868.10	6586.30	10454.40	48	6.99
2S103AC05400	1215.65	5753.95	6969.60	48	6.99
2S103AC05600	2689.80	6457.80	9147.60	48	6.99
2S103AC05700	3265.84	5010.56	8276.40	48	6.99
2S103AC05800	1545.34	5859.86	7405.20	48	6.99
2S103AC06400	24423.14	11731.66	36154.80	48	6.99
2S103AC08100	3936.28	6953.72	10890.00	48	6.99
2S103AC09100	39457.30	11943.50	51400.80	56	6.69
2S103AD00810	9919.13	2277.67	12196.80	56	6.69
2S103AD00811	40226.18	4640.62	44866.80	56	6.69
2S103AD01000	1395.92	9494.08	10890.00	45	2.57
2S103AD06800	45432.36	9453.24	54885.60	56	6.69
2S103BB00400	1225.02	7486.98	8712.00	42	2.21
2S103BB00700	1694.81	10066.39	11761.20	42	2.21
2S103BB00800	1933.03	8521.37	10454.40	42	2.21
2S103BB03301	199.77	34212.63	34412.40	42	2.21
2S103BB06300	19154.37	84954.03	104108.40	42	2.21
2S103BC02500	3723.73	11522.27	15246.00	51a	12.84
2S103BC02600	6511.12	8734.88	15246.00	51a	12.84
2S103BC03700	32977.49	46301.71	79279.20	51a	12.84
2S103BC03800	59156.96	19686.64	78843.60	51a	12.84
2S103BC04200	2766.88	6380.72	9147.60	51a	12.84
2S103BC04300	4379.11	7382.09	11761.20	51a	12.84
2S103BC04400	5671.08	8703.72	14374.80	51a	12.84
2S103BC04500	7513.15	9475.25	16988.40	51a	12.84
2S103BC04600	29719.82	10790.98	40510.80	51a	12.84
2S103BC05700	2590.42	7863.98	10454.40	51a	12.84
2S103BC05800	7026.91	8654.69	15681.60	51a	12.84
2S103BC05900	25561.81	1009.79	26571.60	51a	12.84
2S103BC07200	1078.75	11553.65	12632.40	51a	12.84
2S103BC07400	1383.41	11248.99	12632.40	51a	12.84
2S103BC07500	721.83	11910.57	12632.40	51a	12.84
2S103BC07600	1309.00	13937.00	15246.00	51a	12.84
2S103BC08400	3451.69	2646.71	6098.40	51a	12.84
2S103BC10300	32009.70	8501.10	40510.80	51a	12.84
2S103BC10400	49513.73	1015.87	50529.60	51a	12.84
2S103BC10600	2043.23	5361.97	7405.20	51a	12.84
2S103BC10900	12058.47	1445.13	13503.60	51a	12.84
2S103BD04000	60853.35	35414.25	96267.60	47	2.02
2S103BD04101	3397.83	10541.37	13939.20	47	2.02
2S103BD04200	3824.51	16213.09	20037.60	47	2.02
2S103BD04300	9050.79	8373.21	17424.00	47	2.02
2S103BD05900	1394.46	5139.54	6534.00	48	6.99
2S103BD06000	1368.23	5601.37	6969.60	48	6.99

TLID	TAXLOT SIZE (sq ft)			GROVE NUMBER	GROVE TOTAL ACRES
	IN TREE GROVE	OUTSIDE TREE GROVE	TOTAL		
2S103BD06100	1131.55	6273.65	7405.20	48	6.99
2S103BD06200	101.24	6432.76	6534.00	48	6.99
2S103BD08700	44190.62	27683.38	71874.00	48	6.99
2S103BD10500	25533.83	11056.57	36590.40	47	2.02
2S103BD10600	1842.42	1642.38	3484.80	48	6.99
2S103CA00102	1955.66	4142.74	6098.40	60	5.25
2S103CA00105	15200.73	20954.07	36154.80	60	5.25
2S103CA00106	13281.22	25051.58	38332.80	60	5.25
2S103CA00108	4294.34	5724.46	10018.80	60	5.25
2S103CA00109	4413.10	14317.70	18730.80	60	5.25
2S103CA00301	7190.30	11104.90	18295.20	49	1.54
2S103CA00302	8723.75	12620.65	21344.40	49	1.54
2S103CA00307	1179.38	20165.02	21344.40	49	1.54
2S103CA00309	18253.19	1348.81	19602.00	49	1.54
2S103CA00310	8195.16	9664.44	17859.60	49	1.54
2S103CA00311	14238.88	3620.72	17859.60	49	1.54
2S103CA02200	1298.85	14818.35	16117.20	49	1.54
2S103CA02300	6383.80	9733.40	16117.20	49	1.54
2S103CA02400	1126.79	14119.21	15246.00	49	1.54
2S103CA05100	3121.80	5590.20	8712.00	60	5.25
2S103CA05200	35658.97	10950.23	46609.20	60	5.25
2S103CB00900	19086.80	64112.80	83199.60	51a	12.84
2S103CB03400	13066.00	15248.00	28314.00	51a	12.84
2S103CB03500	14940.72	9017.28	23958.00	51a	12.84
2S103CB03600	10625.13	10283.67	20908.80	51a	12.84
2S103CB03700	8660.33	17911.27	26571.60	51a	12.84
2S103CB03800	11373.46	16504.94	27878.40	51a	12.84
2S103CB12400	1757.54	12181.66	13939.20	51a	12.84
2S103CD01300	245.36	11080.24	11325.60	60	5.25
2S103CD01400	3042.35	6540.85	9583.20	60	5.25
2S103CD01500	2709.04	7309.76	10018.80	60	5.25
2S103CD01600	1613.24	6663.16	8276.40	60	5.25
2S103CD05000	1524.15	5881.05	7405.20	60	5.25
2S103CD05100	3432.22	5279.78	8712.00	60	5.25
2S103CD05700	63475.78	11883.02	75358.80	60	5.25
2S103CD07200	26908.24	7068.56	33976.80	60	5.25
2S103CD07300	1824.34	6452.06	8276.40	60	5.25
2S103CD07600	1051.05	11581.35	12632.40	60	5.25
2S103CD07700	473.67	9980.73	10454.40	60	5.25
2S103CD08600	44299.34	6230.26	50529.60	60	5.25
2S103DA01900	15663.31	10908.29	26571.60	56	6.69
2S103DA01901	6777.52	14566.88	21344.40	56	6.69
2S103DB00700	1142.02	9747.98	10890.00	56a	2.83
2S103DB04600	2054.42	9271.18	11325.60	56a	2.83
2S103DB04700	3593.75	6425.05	10018.80	56a	2.83
2S103DB04800	1152.99	8865.81	10018.80	56a	2.83
2S103DB04900	63475.53	10140.87	73616.40	56a	2.83
2S103DB05000	158.04	9860.76	10018.80	56a	2.83
2S103DB06800	752.54	10137.46	10890.00	56a	2.83
2S103DB07201	1915.31	8974.69	10890.00	56	6.69
2S103DB07300	2572.12	7882.28	10454.40	56	6.69
2S103DB07400	689.64	10635.96	11325.60	56	6.69
2S103DB07700	60430.81	19719.59	80150.40	56	6.69
2S103DB08400	1064.35	15488.45	16552.80	56	6.69
2S103DB11800	111.07	2502.53	2613.60	56a	2.83
2S103DB11900	5837.55	1567.65	7405.20	56	6.69

TLID	TAXLOT SIZE (sq ft)			GROVE NUMBER	GROVE TOTAL ACRES
	IN TREE GROVE	OUTSIDE TREE GROVE	TOTAL		
2S103DB12100	706.53	600.27	1306.80	56	6.69
2S103DC00100	6142.35	16944.45	23086.80	56a	2.83
2S103DC00200	5524.72	17126.48	22651.20	56a	2.83
2S103DC00300	7386.28	12215.72	19602.00	56a	2.83
2S103DC00400	7345.34	11385.46	18730.80	56a	2.83
2S103DC00824	295.22	8852.38	9147.60	63	1.48
2S103DC01000	4522.32	138354.48	142876.80	63	1.48
2S103DC01100	44307.96	154325.64	198633.60	63	1.48
2S103DC01103	6981.27	4344.33	11325.60	63	1.48
2S103DC01104	7835.44	2618.96	10454.40	63	1.48
2S103DC02700	577.14	6392.46	6969.60	63	1.48
2S103DC06000	9950.51	23590.69	33541.20	56a	2.83
2S103DC06100	4871.60	12988.00	17859.60	56a	2.83
2S103DC06200	4451.75	23426.65	27878.40	56a	2.83
2S103DC06300	410.23	24854.57	25264.80	56a	2.83
2S1040001500	582530.12	156247.48	738777.60	55	15.71
2S1040001600	580517.90	14947.30	595465.20	57	20.89
2S104AA00102	79120.60	37620.20	116740.80	37	2.90
2S104AA00105	1355.47	4742.93	6098.40	37	2.90
2S104AA00108	100.29	2077.71	2178.00	37	2.90
2S104AA00109	76.13	2101.87	2178.00	37	2.90
2S104AA04600	50628.24	144412.80	195041.03	42	2.21
2S104AA11000	538.37	6957.22	7495.59	37	2.90
2S104AA11100	1143.42	6349.99	7493.41	37	2.90
2S104AA11500	1301.62	6306.12	7607.74	37	2.90
2S104AA11600	4403.94	3563.65	7967.59	37	2.90
2S104AA11700	2911.67	4582.52	7494.19	37	2.90
2S104AA11800	1178.49	6314.18	7492.67	37	2.90
2S104AA90000	389.38	93349.22	93738.60	42	2.21
2S104AB05700	4339.76	9163.84	13503.60	37	2.90
2S104AB05800	2487.40	10580.60	13068.00	37	2.90
2S104AB06300	537.08	12530.92	13068.00	37	2.90
2S104AB09200	401.04	7004.16	7405.20	37	2.90
2S104AB12500	26138.93	11322.67	37461.60	37	2.90
2S104AC01701	48.91	11276.69	11325.60	51	5.91
2S104AC08500	94.55	8181.85	8276.40	37	2.90
2S104AC10800	11461.49	29484.91	40946.40	46	2.94
2S104AC10900	48708.67	43638.53	92347.20	46	2.94
2S104AC13300	2562.57	18346.23	20908.80	46	2.94
2S104AC13400	64358.04	26682.36	91040.40	46	2.94
2S104AD03100	7238.68	39806.12	47044.80	51	5.91
2S104AD03301	7790.49	35333.91	43124.40	51	5.91
2S104AD03400	7122.92	52118.68	59241.60	51	5.91
2S104AD03401	19933.34	60217.06	80150.40	51	5.91
2S104AD03501	40750.28	33301.72	74052.00	51	5.91
2S104AD03700	3483.05	25702.15	29185.20	51	5.91
2S104AD03800	57300.61	23285.39	80586.00	51	5.91
2S104AD04100	47932.90	79262.30	127195.20	51a	12.84
2S104AD04500	1666.21	72821.39	74487.60	42	2.21
2S104AD04501	19510.62	100279.38	119790.00	42	2.21
2S104BB14400	869.51	3486.49	4356.00	31	3.68
2S104BD07200	74244.43	9390.77	83635.20	57	20.89
2S104BD07300	27259.43	3232.57	30492.00	57	20.89
2S104CA00100	4210.26	5372.94	9583.20	57	20.89
2S104CA00200	2993.40	7025.40	10018.80	57	20.89
2S104CA00300	3497.94	6520.86	10018.80	57	20.89

TLID	TAXLOT SIZE (sq ft)			GROVE NUMBER	GROVE TOTAL ACRES
	IN TREE GROVE	OUTSIDE TREE GROVE	TOTAL		
2S104CA00400	3412.82	6605.98	10018.80	57	20.89
2S104CA00500	2321.78	7697.02	10018.80	57	20.89
2S104CA00600	3769.84	6248.96	10018.80	57	20.89
2S104CA00700	4616.85	6708.75	11325.60	57	20.89
2S104CA00800	4926.83	5527.57	10454.40	57	20.89
2S104CA00900	4566.47	5016.73	9583.20	57	20.89
2S104CA01000	3752.29	5395.31	9147.60	57	20.89
2S104CA01100	1565.24	7146.76	8712.00	57	20.89
2S104CA01800	9983.30	4827.10	14810.40	57	20.89
2S104CA06900	520.41	8627.19	9147.60	59	13.18
2S104CA07000	2395.63	9365.57	11761.20	59	13.18
2S104CB00100	264.70	11932.10	12196.80	55	15.71
2S104CB00600	878.68	10446.92	11325.60	55	15.71
2S104CB00700	1657.80	10539.00	12196.80	55	15.71
2S104CB00800	1711.86	10484.94	12196.80	55	15.71
2S104CB00900	1000.10	11196.70	12196.80	55	15.71
2S104CB01000	2928.24	9268.56	12196.80	55	15.71
2S104CB01100	4756.14	7440.66	12196.80	55	15.71
2S104CB01200	2236.77	9960.03	12196.80	55	15.71
2S104CB01300	1818.67	8635.73	10454.40	55	15.71
2S104CB01400	1304.50	8714.30	10018.80	55	15.71
2S104CB01700	2174.88	11764.32	13939.20	55	15.71
2S104CB01800	3871.67	10503.13	14374.80	55	15.71
2S104CB01900	3093.79	13023.41	16117.20	55	15.71
2S104CB02000	6637.75	8608.25	15246.00	55	15.71
2S104CB03500	221.74	11103.86	11325.60	57	20.89
2S104CB03600	1924.15	10272.65	12196.80	57	20.89
2S104CB03700	3181.59	9015.21	12196.80	57	20.89
2S104CB03800	2797.03	9399.77	12196.80	57	20.89
2S104CB03900	1523.15	10673.65	12196.80	57	20.89
2S104CB04000	1370.60	10826.20	12196.80	57	20.89
2S104CB04100	1149.92	11046.88	12196.80	57	20.89
2S104CB04200	2981.66	10521.94	13503.60	57	20.89
2S104CB04300	1709.81	12229.39	13939.20	57	20.89
2S104CB04400	5029.35	10216.65	15246.00	57	20.89
2S104CB04500	8791.32	9503.88	18295.20	57	20.89
2S104CB07400	6879.39	3139.41	10018.80	55	15.71
2S104CB07700	270.14	67247.86	67518.00	55	15.71
2S104CB07800	44709.88	10611.32	55321.20	55	15.71
2S104CC04500	504.23	12128.17	12632.40	57	20.89
2S104CC04600	3311.00	11499.40	14810.40	57	20.89
2S104CC04700	4024.29	11221.71	15246.00	57	20.89
2S104CC04800	2822.91	15907.89	18730.80	57	20.89
2S104CC04900	4660.26	14070.54	18730.80	57	20.89
2S104CC05000	7116.21	7694.19	14810.40	57	20.89
2S104CC05100	3835.81	10103.39	13939.20	57	20.89
2S104CC05200	4058.30	9445.30	13503.60	57	20.89
2S104CC05300	4279.89	7481.31	11761.20	57	20.89
2S104CC05400	6085.36	8725.04	14810.40	57	20.89
2S104CC05500	5611.76	8763.04	14374.80	57	20.89
2S104CC05600	38043.16	2467.64	40510.80	57	20.89
2S104CC06300	5200.48	13094.72	18295.20	55	15.71
2S104CC06400	1665.95	8788.45	10454.40	55	15.71
2S104CC06500	973.71	10351.89	11325.60	55	15.71
2S104CC06600	1654.95	9235.05	10890.00	55	15.71
2S104CC06700	2209.75	8244.65	10454.40	55	15.71

TLID	TAXLOT SIZE (sq ft)			GROVE NUMBER	GROVE TOTAL ACRES
	IN TREE GROVE	OUTSIDE TREE GROVE	TOTAL		
2S104CC06800	852.60	9601.80	10454.40	55	15.71
2S104CC06900	703.34	9751.06	10454.40	55	15.71
2S104CC07000	870.83	9583.57	10454.40	55	15.71
2S104CC07100	157.44	12039.36	12196.80	55	15.71
2S104CC07200	1515.41	10681.39	12196.80	55	15.71
2S104CC07300	7709.36	8407.84	16117.20	57	20.89
2S104CC07400	7580.60	8536.60	16117.20	57	20.89
2S104CC07500	6274.67	8535.73	14810.40	57	20.89
2S104CC07600	5868.48	7635.12	13503.60	57	20.89
2S104CC07700	4604.48	5849.92	10454.40	57	20.89
2S104CC07800	3256.80	6326.40	9583.20	57	20.89
2S104CC07900	2870.83	6276.77	9147.60	57	20.89
2S104CC08000	4437.10	6017.30	10454.40	57	20.89
2S104CC08100	5281.71	6043.89	11325.60	57	20.89
2S104CC08200	6391.16	7112.44	13503.60	57	20.89
2S104CC08400	1522.09	15466.31	16988.40	57	20.89
2S104CD02000	2103.60	8350.80	10454.40	59	13.18
2S104CD02100	5196.07	5258.33	10454.40	59	13.18
2S104CD02200	5406.10	5048.30	10454.40	59	13.18
2S104CD02300	4042.10	7719.10	11761.20	59	13.18
2S104CD02400	4229.82	5788.98	10018.80	59	13.18
2S104CD02500	4461.44	5992.96	10454.40	59	13.18
2S104CD02600	4384.02	6505.98	10890.00	59	13.18
2S104CD02700	4330.95	6559.05	10890.00	59	13.18
2S104CD02800	3284.74	8476.46	11761.20	59	13.18
2S104CD02900	3635.79	7689.81	11325.60	59	13.18
2S104CD03000	5409.89	5915.71	11325.60	59	13.18
2S104CD03100	5140.18	6185.42	11325.60	59	13.18
2S104CD03200	5325.25	6435.95	11761.20	59	13.18
2S104CD03300	8175.13	5764.07	13939.20	59	13.18
2S104CD03400	10776.51	7083.09	17859.60	59	13.18
2S104CD03500	20699.17	9357.23	30056.40	59	13.18
2S104CD03600	14278.17	8808.63	23086.80	59	13.18
2S104CD03700	11459.82	8142.18	19602.00	59	13.18
2S104CD03800	10170.37	7689.23	17859.60	59	13.18
2S104CD03900	11953.17	7213.23	19166.40	59	13.18
2S104CD04000	10355.23	7939.97	18295.20	59	13.18
2S104CD04100	11289.91	8312.09	19602.00	59	13.18
2S104CD04200	10269.67	9332.33	19602.00	59	13.18
2S104CD04300	7974.31	10320.89	18295.20	59	13.18
2S104CD04400	7327.87	9224.93	16552.80	59	13.18
2S104CD04500	6265.84	8544.56	14810.40	59	13.18
2S104CD04600	5484.81	8889.99	14374.80	59	13.18
2S104CD04700	2745.86	11193.34	13939.20	59	13.18
2S104CD07400	4104.46	15061.94	19166.40	65	13.02
2S104CD07500	3431.53	17912.87	21344.40	65	13.02
2S104CD07600	173.73	19428.27	19602.00	65	13.02
2S104CD11500	1787.98	3874.82	5662.80	57	20.89
2S104CD11600	2921.04	9711.36	12632.40	57	20.89
2S104DA01000	42350.77	84844.43	127195.20	51a	12.84
2S104DA01300	90921.61	454885.19	545806.80	51a	12.84
2S104DA03100	352.42	8795.18	9147.60	52	3.27
2S104DA04000	1681.03	10515.77	12196.80	52	3.27
2S104DA04100	0.18	8711.82	8712.00	52	3.27
2S104DA14100	6715.25	47299.15	54014.40	51a	12.84
2S104DA15100	113662.20	69725.40	183387.60	51	5.91

TLID	TAXLOT SIZE (sq ft)			GROVE NUMBER	GROVE TOTAL ACRES
	IN TREE GROVE	OUTSIDE TREE GROVE	TOTAL		
2S104DA16400	140436.57	65166.63	205603.20	52	3.27
2S104DB00100	1073.99	8509.21	9583.20	59	13.18
2S104DB04900	209092.47	6529.53	215622.00	59	13.18
2S104DB05200	9894.28	43248.92	53143.20	59	13.18
2S104DB05300	202.09	56861.51	57063.60	46	2.94
2S104DB06000	7047.41	2535.79	9583.20	59	13.18
2S104DB06200	9874.66	7113.74	16988.40	59	13.18
2S104DB06300	2524.30	5752.10	8276.40	59	13.18
2S104DB06400	4321.14	4826.46	9147.60	59	13.18
2S104DB06700	8130.68	14084.92	22215.60	59	13.18
2S104DC01000	3106.05	6041.55	9147.60	65	13.02
2S104DC01100	2930.90	4909.90	7840.80	65	13.02
2S104DC01200	10158.23	7701.37	17859.60	65	13.02
2S104DC02000	1447.43	8135.77	9583.20	59	13.18
2S104DC02100	3116.97	6901.83	10018.80	59	13.18
2S104DC02200	3066.81	6951.99	10018.80	59	13.18
2S104DC02300	3209.26	6809.54	10018.80	59	13.18
2S104DC02400	3194.47	6824.33	10018.80	59	13.18
2S104DC02500	3336.88	7117.52	10454.40	59	13.18
2S104DC02600	3139.39	8186.21	11325.60	59	13.18
2S104DC02700	3465.23	8295.97	11761.20	59	13.18
2S104DC02800	4801.69	8701.91	13503.60	59	13.18
2S104DC02900	2109.95	8344.45	10454.40	59	13.18
2S104DC05200	80683.57	338.03	81021.60	59	13.18
2S104DC05901	83159.47	3960.53	87120.00	65	13.02
2S104DC07100	3240.47	7213.93	10454.40	65	13.02
2S104DC07200	2697.74	6885.46	9583.20	65	13.02
2S104DC07300	2114.73	7904.07	10018.80	65	13.02
2S104DC07400	509.77	8202.23	8712.00	65	13.02
2S104DC07800	61939.83	6449.37	68389.20	65	13.02
2S104DC08100	4325.40	6564.60	10890.00	65	13.02
2S104DC08200	4678.93	6646.67	11325.60	65	13.02
2S104DC08400	2845.35	7609.05	10454.40	65	13.02
2S104DC08500	3731.41	7158.59	10890.00	65	13.02
2S104DC08600	3295.98	7594.02	10890.00	65	13.02
2S104DC08700	2040.95	7977.85	10018.80	65	13.02
2S104DC08800	2671.67	11703.13	14374.80	65	13.02
2S104DC09800	225135.35	23156.65	248292.00	65	13.02
2S104DD03000	20939.45	21749.35	42688.80	75	24.34
2S104DD06600	211534.88	88157.92	299692.80	75	24.34
2S104DD07100	0.23	13938.97	13939.20	75	24.34
2S104DD09600	80124.85	31388.75	111513.60	75	24.34
2S105CD00100	123833.48	16865.32	140698.80	67	54.40
2S105DA00400	45567.70	9753.50	55321.20	67	54.40
2S105DA00500	45318.64	14358.56	59677.20	67	54.40
2S105DB00100	255542.25	21063.75	276606.00	67	54.40
2S105DB00400	361414.39	119052.41	480466.80	67	54.40
2S105DB00500	45631.62	77207.58	122839.20	67	54.40
2S105DB06100	37531.42	21710.18	59241.60	67	54.40
2S105DB06200	891.67	15225.53	16117.20	67	54.40
2S105DC00100	5910.89	133481.11	139392.00	67	54.40
2S105DC00101	181.94	41200.06	41382.00	67	54.40
2S105DC00201	448674.49	80579.51	529254.00	67	54.40
2S105DC00400	13432.38	27078.42	40510.80	67	54.40
2S105DD00100	97848.98	8437.42	106286.40	67	54.40
2S105DD00200	20151.37	321.83	20473.20	67	54.40

TLID	TAXLOT SIZE (sq ft)			GROVE NUMBER	GROVE TOTAL ACRES
	IN TREE GROVE	OUTSIDE TREE GROVE	TOTAL		
2S105DD00300	103859.73	7653.87	111513.60	67	54.40
2S105DD00600	12327.14	28619.26	40946.40	67	54.40
2S105DD01100	338358.79	508012.01	846370.80	67	54.40
2S105DD01800	120682.60	57042.20	177724.80	67	54.40
2S105DD01900	138741.56	-39860.36	98881.20	67	54.40
2S105DD02100	15206.88	3088.32	18295.20	67	54.40
2S105DD02101	5632.52	44461.48	50094.00	67	54.40
2S105DD02200	75672.12	11447.88	87120.00	67	54.40
2S108AB04600	6036.87	6159.93	12196.80	67	54.40
2S108AB04700	3544.79	7780.81	11325.60	67	54.40
2S108AB04800	3838.07	10101.13	13939.20	67	54.40
2S109AA00200	1080.08	35945.92	37026.00	75	24.34
2S109AA00300	249231.54	45669.66	294901.20	75	24.34
2S109AA00400	11522.82	25938.78	37461.60	75	24.34
2S109AA00500	6986.08	25683.92	32670.00	75	24.34
2S109AA00700	49724.44	22585.16	72309.60	75	24.34
2S109AA00800	62790.50	57435.10	120225.60	75	24.34
2S109AA00900	74094.66	64426.14	138520.80	75	24.34
2S109AA01000	22230.32	48772.48	71002.80	75	24.34
2S109AA01100	18356.82	27816.78	46173.60	75	24.34
2S109AA01201	79011.87	8979.33	87991.20	75	24.34
2S109AA03800	17656.26	6737.34	24393.60	75	24.34
2S109AA04800	1289.44	6551.36	7840.80	75	24.34
2S109AA04900	12184.16	9595.84	21780.00	75	24.34
2S109AA05000	10835.37	16171.83	27007.20	75	24.34
2S109AA05800	3682.48	7207.52	10890.00	75	24.34
2S109AA05900	1018.15	18583.85	19602.00	75	24.34
2S109AA06200	4358.68	5660.12	10018.80	75	24.34
2S109AA06300	31380.47	418.33	31798.80	75	24.34
2S109AA06400	198.83	1107.97	1306.80	75	24.34
2S109AB02600	0.03	9147.57	9147.60	65	13.02
2S109AB05600	135625.12	15092.48	150717.60	65	13.02
2S109AB11400	11932.51	18995.09	30927.60	75	24.34
2S109AD00600	28397.62	20389.58	48787.20	75	24.34
2S109AD00700	19410.28	24149.72	43560.00	75	24.34
2S109AD08100	1857.46	5983.34	7840.80	75	24.34
2S109BA00700	1025.49	8557.71	9583.20	65	13.02
2S109BA00800	3920.71	6969.29	10890.00	65	13.02
2S109BA00900	357.48	10532.52	10890.00	65	13.02
2S110AA01700	8589.29	144741.91	153331.20	86	18.25
2S110AA90000	79522.16	427080.64	506602.80	73	1.97
2S110AC00100	34172.69	239.71	34412.40	86	18.25
2S110AC00200	117461.66	53293.54	170755.20	86	18.25
2S110AC00400	83837.13	125250.87	209088.00	86	18.25
2S110AC00500	125168.93	179315.47	304484.40	86	18.25
2S110AC00900	270001.44	87190.56	357192.00	86	18.25
2S110AD01200	1163.09	1562.64	2725.73	73	1.97
2S110AD08690	608.59	8539.01	9147.60	83	3.46
2S110AD08700	150.87	129222.33	129373.20	86	18.25
2S110AD08702	4503.10	31216.10	35719.20	86	18.25
2S110AD08800	17911.27	8660.33	26571.60	86	18.25
2S110AD08802	522.15	24307.05	24829.20	86	18.25
2S110AD08805	10605.51	3769.29	14374.80	86	18.25
2S110AD08806	1646.03	77633.17	79279.20	86a	4.12
2S110AD09600	1263.03	31415.50	32678.53	83	3.46
2S110AD09800	2899.86	53329.49	56229.34	86a	4.12



TLID	TAXLOT SIZE (sq ft)			GROVE NUMBER	GROVE TOTAL ACRES
	IN TREE GROVE	OUTSIDE TREE GROVE	TOTAL		
2S110AD90000	77855.44	141367.31	219222.75	86a	4.12
2S110DA00300	53535.99	19644.81	73180.80	86a	4.12
2S110DA00400	33292.39	36839.21	70131.60	86a	4.12
2S110DA10000	9859.00	159.80	10018.80	86a	4.12
2S110DB00200	14613.95	496780.45	511394.40	86	18.25
2S110DB01400	3573.32	128849.08	132422.40	86	18.25
2S110DB01500	92408.35	5166.05	97574.40	86	18.25
2S111AA00300	9699.73	23841.47	33541.20	69	2.25
2S111AA00500	1156.96	12782.24	13939.20	69	2.25
2S111AA00600	2347.05	12463.35	14810.40	69	2.25
2S111AA00700	74709.94	55534.46	130244.40	69	2.25
2S111AA00800	8512.06	121732.34	130244.40	69	2.25
2S111AA01400	89064.25	175344.95	264409.20	77	2.86
2S111AA06800	1064.94	7647.06	8712.00	77	2.86
2S111AA06900	1561.15	7150.85	8712.00	77	2.86
2S111AA07000	146.61	8129.79	8276.40	77	2.86
2S111AA07500	25146.99	2295.81	27442.80	77	2.86
2S111AB00401	15289.08	1263.72	16552.80	68	2.76
2S111AB00402	15113.26	2746.34	17859.60	68	2.76
2S111AB00403	2739.38	15120.22	17859.60	68	2.76
2S111AB00501	3835.06	8361.74	12196.80	68	2.76
2S111AB00700	6544.46	5652.34	12196.80	68	2.76
2S111AB00800	4827.19	7369.61	12196.80	68	2.76
2S111AB00900	10804.45	956.75	11761.20	68	2.76
2S111AB01000	13854.06	8797.14	22651.20	68	2.76
2S111AB01201	6255.24	16395.96	22651.20	68	2.76
2S111AB01300	8762.02	10404.38	19166.40	68	2.76
2S111AB01400	3575.24	11670.76	15246.00	68	2.76
2S111AB01500	8825.38	10341.02	19166.40	68	2.76
2S111AB01700	1141.45	15411.35	16552.80	68	2.76
2S111AB02100	3161.83	12084.17	15246.00	68	2.76
2S111AB02300	6746.04	8499.96	15246.00	68	2.76
2S111AC00400	572.85	9010.35	9583.20	77	2.86
2S111AC00500	920.65	8226.95	9147.60	77	2.86
2S111AD03400	6060.14	7007.86	13068.00	77	2.86
2S111AD05500	51.52	12145.28	12196.80	81	3.08
2S111AD05600	6770.29	10653.71	17424.00	81	3.08
2S111AD05700	12844.69	12420.11	25264.80	81	3.08
2S111AD05800	3904.45	8727.95	12632.40	81	3.08
2S111AD06201	3837.84	6180.96	10018.80	81	3.08
2S111AD06202	2250.23	6897.37	9147.60	81	3.08
2S111AD07100	50646.86	10337.14	60984.00	81	3.08
2S111AD17300	2038.40	44570.80	46609.20	81	3.08
2S111AD21000	51092.63	17296.57	68389.20	81	3.08
2S111BB02300	716.86	10173.14	10890.00	73	1.97
2S111BC02600	9380.22	80353.38	89733.60	83	3.46
2S111BC02603	112390.39	20903.21	133293.60	83	3.46
2S111BC02900	1072.53	18093.87	19166.40	73	1.97
2S111BC03001	3554.79	17354.01	20908.80	73	1.97
2S111CB01301	3668.12	11577.88	15246.00	83	3.46
2S111CB01311	1756.62	13053.78	14810.40	83	3.46
2S111CB01390	66.19	2983.01	3049.20	83	3.46
2S111CD00300	19129.46	101531.74	120661.20	89	1.21
2S111CD02600	22821.02	141835.78	164656.80	89	1.21
2S111CD02900	607.10	5055.70	5662.80	89	1.21
2S111CD03000	2102.30	9223.30	11325.60	89	1.21

TLID	TAXLOT SIZE (sq ft)			GROVE NUMBER	GROVE TOTAL ACRES
	IN TREE GROVE	OUTSIDE TREE GROVE	TOTAL		
2S111CD03100	2295.24	7287.96	9583.20	89	1.21
2S111CD03400	489.07	3866.93	4356.00	89	1.21
2S111CD03500	1630.95	5774.25	7405.20	89	1.21
2S111CD03600	1309.73	6095.47	7405.20	89	1.21
2S111CD03700	688.26	3667.74	4356.00	89	1.21
2S111CD03800	945.99	3410.01	4356.00	89	1.21
2S111CD03900	541.63	3814.37	4356.00	89	1.21
2S112BA03400	35404.27	36034.13	71438.40	71	39.20
2S112BA04700	9462.83	13188.37	22651.20	74	3.89
2S112BA05602	23693.84	5491.36	29185.20	71	39.20
2S112BA06000	18196.24	4890.56	23086.80	71	39.20
2S112BA06100	5339.98	322.82	5662.80	71	39.20
2S112BA06200	13339.43	229289.77	242629.20	71	39.20
2S112BA06400	10320.12	193105.08	203425.20	71	39.20
2S112BA11900	86320.17	31291.83	117612.00	71	39.20
2S112BA90000	25688.85	256319.45	282008.30	71	39.20
2S112BB04000	7443.30	66173.10	73616.40	74	3.89
2S112BB04100	81557.49	51736.11	133293.60	74	3.89
2S112BB04400	1282.92	10042.68	11325.60	74	3.89
2S112BB04401	3064.53	7825.47	10890.00	74	3.89
2S112BB11200	60441.39	4463.01	64904.40	74	3.89
2S112BB11300	1581.95	5823.25	7405.20	74	3.89
2S112BB12900	53174.54	16521.46	69696.00	71	39.20
2S112BD00400	2610.35	162046.45	164656.80	93	21.15
2S112BD06900	10322.29	4052.51	14374.80	79	2.08
2S112BD01000	68166.33	4143.27	72309.60	79	2.08
2S112BD01100	8978.37	31968.03	40946.40	79	2.08
2S112BD03900	915.67	1262.33	2178.00	79	2.08
2S112BD90000	1176.48	96813.56	97990.04	79	2.08
2S112CA00200	3590.37	23852.43	27442.80	93	21.15
2S112CA00300	47435.47	20953.73	68389.20	93	21.15
2S112CA01400	44130.41	11190.79	55321.20	93	21.15
2S112CA04000	17222.29	23724.11	40946.40	90	2.53
2S112CA11900	48159.70	10210.70	58370.40	93	21.15
2S112CA13400	51815.29	9168.71	60984.00	93	21.15
2S112CA13600	811.89	14434.11	15246.00	90	2.53
2S112CA13700	5276.09	2564.71	7840.80	90	2.53
2S112CA13800	7779.02	2239.78	10018.80	90	2.53
2S112CA13900	21.68	6076.72	6098.40	90	2.53
2S112CB01300	4254.26	537.34	4791.60	90	2.53
2S112CB01500	1017.03	4645.77	5662.80	90	2.53
2S112CB01600	4408.33	4303.67	8712.00	90	2.53
2S112CB01700	3161.19	4244.01	7405.20	90	2.53
2S112CB01800	1582.82	4079.98	5662.80	90	2.53
2S112CB01900	695.82	4966.98	5662.80	90	2.53
2S112CB02000	919.66	4743.14	5662.80	90	2.53
2S112CB02100	172.77	5490.03	5662.80	90	2.53
2S112CC00102	675.82	4551.38	5227.20	90	2.53
2S112CC00104	4912.86	314.34	5227.20	90	2.53
2S112CC00106	5325.11	337.69	5662.80	90	2.53
2S112CC00107	5703.32	2137.48	7840.80	90	2.53
2S112CC00111	4109.62	681.98	4791.60	90	2.53
2S112CC00112	4558.68	232.92	4791.60	90	2.53
2S112CC02700	444.59	5653.81	6098.40	90	2.53
2S112CC02800	2904.98	5807.02	8712.00	90	2.53
2S112CC02900	569.21	8578.39	9147.60	90	2.53

TLID	TAXLOT SIZE (sq ft)			GROVE NUMBER	GROVE TOTAL ACRES
	IN TREE GROVE	OUTSIDE TREE GROVE	TOTAL		
2S112CC03000	564.51	6405.09	6969.60	90	2.53
2S112CC03100	184.39	3736.01	3920.40	90	2.53
2S112CC03200	217.97	4573.63	4791.60	90	2.53
2S112CC03300	3525.07	5622.53	9147.60	90	2.53
2S112CC03400	2455.40	7127.80	9583.20	90	2.53
2S112CC03500	3753.19	5394.41	9147.60	90	2.53
2S112CC03601	4217.06	4494.94	8712.00	90	2.53
2S112CC03800	353.67	6180.33	6534.00	90	2.53
2S112CC03900	5265.50	7366.90	12632.40	90	2.53
2S112CC04000	3831.89	3573.31	7405.20	90	2.53
2S112CC04101	3879.57	4832.43	8712.00	90	2.53
2S112CC04200	2.97	4353.03	4356.00	90	2.53
2S112CC06600	572.77	4218.83	4791.60	90	2.53
2S112CC06800	1127.39	179.41	1306.80	90	2.53
2S112CC19500	229.21	3255.59	3484.80	90	2.53
2S112CC19900	543.40	2941.40	3484.80	90	2.53
2S112CC20900	206.92	3277.88	3484.80	90	2.53
2S112CD00300	56196.71	25696.09	81892.80	91	1.29
2S112CD00400	73448.69	19769.71	93218.40	93	21.15
2S112CD00800	8733.68	22629.52	31363.20	93	21.15
2S112CD00900	39154.01	921.19	40075.20	93	21.15
2S112CD07300	5085.07	4498.13	9583.20	93	21.15
2S112CD07600	4621.05	9318.15	13939.20	93	21.15
2S112CD07700	16570.49	20891.11	37461.60	93	21.15
2S112CD09100	72525.65	9802.75	82328.40	93	21.15
2S112CD09200	1807.74	2548.26	4356.00	93	21.15
2S112DB00600	9284.04	108763.56	118047.60	93	21.15
2S112DB00700	53591.65	146784.35	200376.00	93	21.15
2S112DB00800	196749.74	44572.66	241322.40	93	21.15
2S112DC01400	26903.41	207449.39	234352.80	93	21.15
2S112DC01500	16192.32	184619.28	200811.60	93	21.15
2S112DC01601	39488.56	1457.84	40946.40	93	21.15
2S112DD00701	9364.74	187526.46	196891.20	92	2.27
2S112DD01100	6968.30	23959.30	30927.60	92	2.27
2S113AB00800	140643.56	143367.64	284011.20	93	21.15
2S113B000300	493.97	243442.03	243936.00	97	7.08
2S113B000600	1365.03	2217145.77	2218510.80	97	7.08
2S113BA00100	41582.02	109571.18	151153.20	97	7.08
2S113BA00400	183265.89	309833.31	493099.20	97	7.08
2S113BA00500	36564.46	72771.14	109335.60	97	7.08
2S113BA00600	45226.76	135547.24	180774.00	97	7.08
2S114A001500	62665.79	857321.41	919987.20	101	19.91
2S114AB03100	391.31	9627.49	10018.80	99	5.89
2S114AB03200	3867.83	7893.37	11761.20	99	5.89
2S114AB03300	5626.44	8312.76	13939.20	99	5.89
2S114AB03400	6233.15	11626.45	17859.60	99	5.89
2S114AB03500	4455.95	9047.65	13503.60	99	5.89
2S114AB03600	204.41	8943.19	9147.60	99	5.89
2S114AC00100	1243.09	7468.91	8712.00	99	5.89
2S114AC00200	2731.70	7287.10	10018.80	99	5.89
2S114AC00400	3047.91	9148.89	12196.80	99	5.89
2S114AC00500	9641.92	47421.68	57063.60	99	5.89
2S114AC00600	209694.87	67782.33	277477.20	99	5.89
2S114AC00601	35720.55	1305.45	37026.00	99a	3.21
2S114AC00700	217413.88	467784.92	685198.80	100	15.39
2S114AC01000	699.96	7576.44	8276.40	99a	3.21

TLID	TAXLOT SIZE (sq ft)			GROVE NUMBER	GROVE TOTAL ACRES
	IN TREE GROVE	OUTSIDE TREE GROVE	TOTAL		
2S114AC01100	1727.41	7420.19	9147.60	99a	3.21
2S114AC01200	1022.15	5947.45	6969.60	99a	3.21
2S114AC01300	1499.68	6341.12	7840.80	99a	3.21
2S114AD04700	45303.51	80149.29	125452.80	99a	3.21
2S114BA12400	1142.19	6263.01	7405.20	96	6.50
2S114BA13400	203016.84	19574.76	222591.60	96	6.50
2S114BA15400	1495.24	6345.56	7840.80	96	6.50
2S114BA15500	943.76	5154.64	6098.40	96	6.50
2S114BA15600	858.15	5675.85	6534.00	96	6.50
2S114BA15700	646.20	5452.20	6098.40	96	6.50
2S114BA15800	1537.01	4561.39	6098.40	96	6.50
2S114BA15900	1617.74	4916.26	6534.00	96	6.50
2S114BA16000	1249.33	4849.07	6098.40	96	6.50
2S114BA16100	1523.06	5010.94	6534.00	96	6.50
2S114BA16200	1415.01	4247.79	5662.80	96	6.50
2S114BA16300	3134.44	3399.56	6534.00	96	6.50
2S114BA16400	2457.42	4512.18	6969.60	96	6.50
2S114BA16500	3029.00	6118.60	9147.60	96	6.50
2S114BA16700	453.13	11308.07	11761.20	96	6.50
2S114BA17300	38470.32	9881.28	48351.60	96	6.50
2S114BA17800	543.51	5634.16	6177.67	96	6.50
2S114BA18100	19504.17	8470.43	27974.61	96	6.50
2S114BC00800	4518.70	8549.30	13068.00	100	15.39
2S114BC00900	5315.80	6881.00	12196.80	100	15.39
2S114BC01000	1905.90	9419.70	11325.60	100	15.39
2S114BC01400	87490.43	11390.77	98881.20	100	15.39
2S114BC05200	120840.66	25085.34	145926.00	100	15.39
2S114BD01400	42876.22	109148.18	152024.40	100	15.39
2S114BD04200	59310.64	34343.36	93654.00	100	15.39
2S114BD04300	38594.77	97312.43	135907.20	100	15.39
2S114DA00100	4937.09	1063154.11	1068091.20	101	19.91
2S114DA00300	18258.96	285354.24	303613.20	101	19.91
2S114DB00100	826160.67	522892.53	1349053.20	101	19.91
2S114DB00200	5678.45	2597.95	8276.40	101	19.91
2S115AA01500	15518.09	21943.51	37461.60	95	3.76
2S115AA01600	14338.72	4392.08	18730.80	95	3.76
2S115AA01700	32380.05	10308.75	42688.80	95	3.76
2S115AA01800	17008.51	6949.49	23958.00	95	3.76
2S115AA01900	16499.84	14863.36	31363.20	95	3.76
2S115AA05500	1596.94	8421.86	10018.80	95	3.76
2S115AA06800	6150.85	32181.95	38332.80	95	3.76
2S115AA10800	6267.60	9849.60	16117.20	95	3.76
2S115AD03801	7606.26	17222.94	24829.20	95	3.76
2S115AD07600	46330.06	5941.94	52272.00	95	3.76
2S115AD07700	75096.08	10281.52	85377.60	100	15.39
Total Acres	23304336.44 544.10	36167285.44 830.29	59471621.87 1365.28		

**Urban Forestry Code Revisions**

# Staff Report and Findings

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**STAFF REPORT TO THE  
CITY COUNCIL  
FOR THE CITY OF TIGARD, OREGON**



120 DAYS = N/A

**SECTION I. APPLICATION SUMMARY**

**FILE NAME:** URBAN FORESTRY CODE REVISIONS PROJECT

**CASE NOS:** Comprehensive Plan Amendment (CPA) CPA 2011-00004  
Development Code Amendment (DCA) DCA 2011-00002

**APPLICANT:** City of Tigard  
13125 SW Hall Boulevard  
Tigard, OR 97223

**PROPOSAL:** To implement the city’s Comprehensive Plan, as recommended by the Urban Forestry Master Plan, the City of Tigard is proposing a Comprehensive Plan Amendment adopting the “Significant Tree Groves Map” (Exhibit A) and Tigard Development Code (Title 18) Amendments to Chapters 18.115, 18.120, 18.310, 18.330, 18.350, 18.360, 18.370 18.390, 18.530, 18.610, 18.620, 18.630 18.640, 18.715,18.745, 18.775, 18.790, and 18.798.

**LOCATION:** Citywide

**ZONING:** All zoning classifications

**COMP PLAN:** All Comprehensive Plan Designations

**APPLICABLE REVIEW CRITERIA:**

Community Development Code Chapters 18.380 and 18.390; Comprehensive Plan Goals 1, Environmental Quality; 7, Hazards; 8, Parks Recreation, Trails and Open Space; 9, Economic Development; 10, Housing; 11, Public Facilities and Services; 12, Transportation; 13, Energy Conservation; and 14, Urbanization; Downtown; METRO’s Urban Growth Management Functional Plan Titles 1, 3, 12 and 13; Statewide Planning Goals 1, 2, and 5 through 14.

**SECTION II. STAFF RECOMMENDATION**

Staff recommends that the City Council concur with the Planning Commission and find that this request for a Comprehensive Plan Amendment and Development Code Amendments meets the necessary approval criteria according to the findings found in Section IV of this report. Therefore, staff recommends City Council APPROVE CPA 2011-00004 and DCA 2011-00002.

**SECTION III. BACKGROUND INFORMATION**

**Project History**

The City of Tigard has a proud history of commitment to preserving, enhancing and maintaining its urban forest. The city’s trees provide an important backdrop for life in Tigard. Unlike natural forests or managed

timberland, Tigard's urban forest is a mosaic of native forest remnants and planted landscapes interspersed with buildings, roads and other elements of the urban environment.

On June 3, 2008, Tigard City Council adopted an Urban Forest section as part of its Comprehensive Plan in order to establish broad goals and policies to guide the long-term management and enhancement of the urban forest. During this process, the public voiced concern over existing Development Code provisions, particularly with regard to tree mitigation standards. Development interests felt the standards were overly punitive and served as impediments to development. Environmental interests felt the standards were ineffective at achieving the goal of a healthy and sustainable urban forest.

Soon after adoption, the Home Builders Association of Metropolitan Portland filed a notice of intent to appeal with the Land Use Board of Appeals. The Urban Forest section of Comprehensive Plan was voluntarily remanded as a result. While the city was unable to fully understand the specific concerns of the Home Builders Association, they did take the opportunity to provide more detailed findings to further support and explain the rationale for the city's urban forest goals and policies. These additional findings can be found in the Tree Values Memo beginning on page 149 of Volume V of the Adoption Volumes, which are more fully described on page 4 of this staff report. On August 10, 2010, Tigard City Council readopted the Urban Forest section of the Comprehensive Plan with the additional findings. For reference, the Urban Forest section of the Comprehensive Plan is included beginning on page 292 in Volume V.

To create a roadmap that implements the urban forest goals and policies in the Comprehensive Plan, Tigard City Council directed staff to develop an Urban Forestry Master Plan, which is included in its entirety beginning on page 207 of Volume V. The Urban Forestry Master Plan was developed through a public process, which included specific outreach and involvement of development and environmental interests, as well as the community at large. On November 10, 2009, the Urban Forestry Master Plan was accepted by Council. It outlines issues with the management and regulation of the urban forest and detailed recommendations for addressing those issues. Among the recommendations are suggested code revisions to support the implementation of the urban forest goals and policies in the Comprehensive Plan.

The main issues and recommendations in the Urban Forestry Master Plan include:

Issues:

1. The code does not promote the preservation of high quality trees.
2. The mitigation structure encourages overplanting and the preservation of large diameter trees that are often less likely to survive development impacts.
3. The fees for tree removal are excessive.
4. The code unfairly penalizes those property owners with existing trees more than those owners without trees.
5. The code is administratively difficult to implement because it is challenging to track protected and replacement trees in the years and decades following development.
6. The code lacks specificity and has conflicts between various provisions, which present administrative challenges for the city.
7. The code does not require sustainable installation and maintenance methods for trees.
8. The code does not provide flexible standards and incentives for preserving native tree groves.

Recommendations:

1. Update Tigard's urban forestry standards for development.
2. Ensure urban forestry standards promote sustainable design and maintenance of the urban forest.
3. Establish an incentive-based program to preserve Tigard's remaining groves of native trees.
4. Develop an equitable and efficient hazard tree identification and abatement program.
5. Improve management of the urban forest by ensuring information is readily available for both the city and the public when making decisions.
6. Promote community-wide participation in urban forest stewardship.



To implement the Comprehensive Plan, as recommended by the Urban Forestry Master Plan, City Council directed staff to undertake a major update of Tigard's urban forestry related code provisions. Developed over two years from February 2010 to the spring of 2012, the Urban Forestry Code Revisions Project reflects Tigard City Council's direction for a comprehensive update of the city's urban forestry related code provisions with enhanced public involvement.

The Urban Forestry Code Revisions Project has involved ongoing, extensive collaboration with city residents and stakeholders, internal city departments and outside agencies. In February 2010, a Citizen Advisory Committee was appointed by Council to ensure representation of a broad set of viewpoints during the update process. This committee included two planning commissioners, two Tree Board members, two Parks Board members, two developers (including a representative for the Home Builders Association), one certified arborist, one natural resource advocate and one at-large citizen. In January 2011, the Citizen Advisory Committee timeline was extended to ensure ample time for the committee to discuss code topics. In finalization, the committee reached consensus on a set of guiding principles for each of the code topics.

A Technical Advisory Committee was formed at the same time as the Citizen Advisory Committee. The Technical Advisory Committee included city staff and representatives from outside agencies to advise the project management team on the technical aspects of the code during the update process.

A public involvement plan was developed specifically for the project, to provide enhanced opportunities for participation for the overall community throughout the process. This plan included outreach at city events such as the Balloon Festival and Farmers Market, an email newsletter specific to the Urban Forestry Code Revisions Project, three open houses and a variety of other methods for community feedback.

The draft urban forestry code was peer reviewed by outside development and urban forestry experts in October 2011, to provide additional assurance of technical soundness.

From this collaborative process emerged the staff proposed draft code amendments, which Planning Commission received public testimony and deliberated on during four public hearings from February through May of 2012. On May 7, 2012 the Planning Commission unanimously recommended City Council approval of the land use elements of the Urban Forestry Code Revisions. While the commission's formal recommendation to council was limited to the land use elements of the proposal, the commission also reviewed proposed changes to the Tigard Municipal Code and the proposed Urban Forestry Manual. Based on their review, the commission found these proposals are consistent with and supportive of the recommended land use elements. A detailed description of the Planning Commission deliberations and decisions is included beginning on page 3 of Volume V.

The Planning Commission recommended Development Code Amendments (DCA) to Title 18 (Vol. II, pp. 3) and Comprehensive Plan Amendment (CPA) adopting the significant tree groves map (Exhibit A) are the subject of this application and staff report. The CPA allows for the significant tree grove preservation incentives (Vol. II, pp. 153-161), as required by Statewide Planning Goal 5 rule requirements.

Amendments proposed to the Tigard Municipal Code Chapters 1.16, 6.01, 6.02, 7.40, 8.02 - 8.18, 9.06, and 9.08, address the management of trees when land use regulations are not applicable. For example, these non-land use amendments would address trees that are hazards to people or property outside the land use process. While they are not part of the CPA or DCA in this application, they are included in the full package being considered by City Council (Vol. III).

In addition, proposed administrative rules in the form of an Urban Forestry Manual included in the full package being considered by City Council (Vol. IV). The proposed Urban Forestry Manual contains detailed specifications and procedures to support implementation of the proposed code. The Urban Forestry Manual is provided for reference only; it does not contain land use regulations and is not part of the CPA or DCA in this application.

## **Volumes I, II, III, IV and V of the Urban Forestry Code Revisions**

The Urban Forestry Code Revisions project is presented in five volumes. Volume I provides the project overview and describes the process used to develop all of the elements. Volume II is the land use elements of the code, and Volume III the non land use elements. Volume IV contains the Urban Forestry Manual. Volume V contains technical reports and research that contributed to the code revisions along with details of the public input and deliberations to date.

### **Volume I | Project Overview**

**Project Overview** includes the following sections:

- Project Introduction
- Overview of Key Elements
- Key Element Summaries
  - Urban Forestry Standards for Development
  - Tree Grove Preservation Incentives
  - Tree Permit Requirements
  - Hazard Trees
  - Urban Forestry Manual

**Appendix A** includes additional detail about the information used to shape the Urban Forestry Code Revisions Project, and includes the following sections:

- Process summary
- Summary of Community Ideas and Concerns
- Summary of Planning Commission Deliberations
- Existing Conditions

### **Volume II | Land Use Elements**

**Community Development Code (Title 18)** is the Planning Commission's recommended draft of the Development Code. This section includes commentary on the amendments.

**Peer Review** demonstrates how the Planning Commission's recommended draft of the Development Code and Urban Forestry Manual will work in application.

**ESEE Analysis** is a report that addresses Statewide Planning Goal 5 - Natural Resources requirements for the preservation of Significant Tree Groves.

**Staff Report and findings** includes the staff recommendation for approval of the land use elements (Title 18 and the Comprehensive Plan Amendment) and the findings that demonstrate the land use elements meet the necessary approval criteria.

### **Volume III | Non Land Use Elements**

**Tigard Municipal Code** is the staff proposed draft of the Municipal Code (Title 8 and other Municipal Code titles). This section includes commentary on the amendments.

### **Volume IV | Urban Forestry Manual (Administrative Rules)**

**Urban Forestry Manual** consists of administrative rules that implement the technical details of the urban forestry related code provisions in Title 8, Title 18 and other applicable titles in the Tigard Municipal Code.

## Volume V | Additional Background Materials

**Planning Commission Deliberations** details Planning Commission discussion and decisions during the public hearing process.

**Amendment Requests Document for the Planning Commission** lists code amendment requests received in response to the first Planning Commission public hearing and staff responses.

**Outstanding Issues** for the Urban Forestry Code Revisions includes additional information on the outstanding issues that were further deliberated by the Planning Commission before making their final recommendation to City Council on May 7, 2012.

**Log of Input** lists the input received and any code changes from the last meeting of the CAC to the staff proposed draft of the Urban Forestry Code Revisions to Planning Commission.

**CAC Guiding Principles** includes the consensus view of the Citizens Advisory Committee (CAC) developed to help guide the legislative adoption process.

**Tree Values** includes information and current research on the environmental, economic, social and aesthetic benefits of trees.

**Canopy Standards** explains the reasons for adopting tree canopy cover requirements as well as the methods used to arrive at the requirements.

**Soil volume** details research about the soil volume required to support a mature tree canopy.

**Tree Canopy Fee** discusses research used to develop a square foot value for tree canopy.

**Regulatory Comparison** is an excerpted report prepared by Metro and the Audubon Society that summarizes and compares regional urban forestry programs and regulations.

**Urban Forestry Master Plan** is the City of Tigard's recommended plan for achieving the urban forestry goals in the Comprehensive Plan.

### **Goal 5 Applicability**

The CPA would incorporate the significant tree grove map (Exhibit A) into the city's Comprehensive Plan Resource Document (Volume 1) as a new Goal 5 natural resource inventory. The DCA in Section 18.790.050.D includes regulatory incentives and flexible standards to protect significant tree groves listed in the inventory. Oregon Administrative Rule (ORS) 660-23-0250(3) requires local governments to address Goal 5 requirements when a post acknowledgement plan amendment "...creates...a resource list...or a land use regulation adopted in order to protect a significant Goal 5 resource." Therefore, the significant tree grove map and regulatory incentives and flexible standards are subject to Goal 5 requirements (further described in the Tree Grove ESEF Analysis (Vol. II, p. 219)). The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEF Analysis for Significant Tree Groves (pages 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report.

However, Goal 5 requirements are not applicable to recommended code amendments that support general urban forest enhancement activities, such as tree planting and preservation, when not associated with significant tree groves. These activities do not create or amend a resource list or land use regulation adopted in order to protect a Goal 5 resource.

## Procedural Note

For the purposes of review and adoption, the urban forestry code revisions are comprised of four basic elements:

- 1) The significant tree groves map, which is the subject of the recommended CPA;
- 2) Amendments to the land use regulations in Title 18, which are the subject of the DCA;
- 3) Amendments to the non-land use regulations in all other titles except Title 18, which are not part of this application; and
- 4) Administrative rules in the Urban Forestry Manual, which are also non-land use regulations and also not part of this application.

Because of Oregon land use law, the land use elements (CPA and DCA) will be adopted by separate ordinance from the proposed non-land use amendments (Tigard Municipal Code titles other than Title 18). The Urban Forestry Manual will be adopted as an administrative rule through a separate rule making process in TMC 2.04, which also allows future amendments to these technical specifications using the same process.

## **SECTION IV. APPLICABLE CRITERIA AND FINDINGS**

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### **APPLICABLE CITY OF TIGARD COMMUNITY DEVELOPMENT CODE (TITLE 18)**

#### **Chapter 18.380. ZONING MAP AND TEXT AMENDMENTS**

##### **“18.380.020 Legislative Amendments to this Title and Map**

**A. Legislative amendments. Legislative zoning map and text amendments shall be undertaken by means of a Type IV procedure, as governed by Section 18.390.060.G.”**

The CPA and DCA would establish rules and regulations to be applied generally to all similarly affected properties throughout the City of Tigard. Therefore, the application is being processed as a Type IV procedure, which is a legislative amendment, as governed by Section 18.390.060.G.

#### **Chapter 18.390. DECISION-MAKING PROCEDURES**

##### **“18.390.B.4. Types defined. There are four types of decision-making procedures, as follows: ...**

**4. Type IV Procedure. Type IV procedures apply to legislative matters. Legislative matters involve the creation, revision, or large-scale implementation of public policy. Type IV matters are considered initially by the Planning Commission with final decisions made by the City Council.”**

The CPA and DCA would result in the creation, revision and large-scale implementation of the city’s urban forestry goals and policies in the Comprehensive Plan. Therefore, the application will be reviewed under the Type IV procedure as detailed in the Section 18.390.060.G. In accordance with this section, the CPA and DCA was initially considered by the Planning Commission and they recommended City Council adopt the changes in making the final decision.

##### **“18.390.060.G. Decision-making considerations. The recommendation by the Commission and the decision by the Council shall be based on consideration of the following factors:**

- 1. The Statewide Planning Goals and Guidelines adopted under Oregon Revised Statutes Chapter 197;**
- 2. Any federal or state statutes or regulations found applicable;**
- 3. Any applicable METRO regulations;**
- 4. Any applicable comprehensive plan policies; and**
- 5. Any applicable provisions of the City's implementing ordinances.”**

The applicable decision-making considerations include the following:

- Applicable Statewide Planning Goals - Goals 1, 2, and 5 through 14.
- Applicable federal and state of Oregon statutes – ORS197.
- Applicable METRO regulations - Titles 1, 3, 12 and 13.
- Applicable Comprehensive Plan policies - Goals 1, Citizen Involvement; 2, Land Use Planning; 5, Natural Resources; 6, Environmental Quality; 7, Hazards; 8, Parks Recreation, Trails and Open Space; 9, Economic Development; 10, Housing; 11, Public Facilities and Services; 12, Transportation; 13, Energy Conservation; and 14, Urbanization; 15, Downtown.
- Applicable city ordinances – TMC Chapters 18.380 and 18.390.

**CONCLUSION:** The review criteria listed above are applicable to the CPA and DCA in Volume II. The CPA and DCA were reviewed through the Type IV legislative procedure. The Planning Commission and Council are basing their decisions on applicable federal, state, METRO, and local policies and regulations, which are enumerated and addressed in this staff report. Therefore, the applicable Tigard Development Code provisions are met.

## **APPLICABLE CITY OF TIGARD COMPREHENSIVE PLAN POLICIES**

### **INTRODUCTION**

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**(Excerpt from p. I-3 of the Comprehensive Plan):**

**“As the comprehensive plan is “comprehensive” in nature, there are no parts that can be considered separately from others. Plan goals and policies are intended to be supportive of one another. However, if conflicts arise between goals and policies when using the Plan, the City has an obligation to make findings that indicate why the goal or policy being supported takes precedence. This involves a decision-making process on the part of the city that balances and weighs the applicability and merits of the goals and policies that are in contention.”**

As described in the Project History section of this report, the Urban Forestry Code Revisions Project reflects Tigard City Council’s direction for a comprehensive update of the city’s urban forestry related code provisions with enhanced public involvement.

The Urban Forestry Code Revisions Project has involved ongoing, extensive collaboration with city residents and stakeholders, internal city departments, outside agencies and Planning Commission (Vol. I, p. 26).

From this collaborative process emerged the Planning Commission CPA and DCA described in this report which represent a balance between the range of interests involved in the process, as well as balance between the goals and policies in the Comprehensive Plan.

The primary balancing efforts have focused on developing tree canopy requirements that balance the community’s desire for trees, development, and open space. The Citizen Advisory Committee reached consensus to draft achievable and balanced tree canopy requirements for development that are tiered based on zoning district. For example, development in low density residential areas would be required to have more trees than in areas of dense zoning, such as Downtown Tigard (Vol. V, p. 141).

To implement the consensus of the Citizen Advisory Committee, staff analyzed possible percent tree canopy for each zoning district using the same methodology developed to set tree canopy goals for the Urban Forestry Master Plan as well as an updated methodology using Light Detection and Ranging (LiDAR) technology (Vol. V, p. 159).

The results of these analyses were then used in conjunction with the minimum percent landscaping requirements in the Tigard Development Code to place the various zoning districts within one of three tiers. The exception is school sites, which were placed in the “dense zoning” tier 3 to ensure sufficient room for sports fields (Vol. V, p. 161).

Staff and outside consultants then tested the tiered requirements on a wide range of development projects to ensure the requirements are in fact achievable, result in a reasonable balance between trees, development and open space, and do not force payment of fees in lieu or discretionary review for typical projects.

The peer review results demonstrate that the requirements are achievable without payment of fees in lieu or discretionary reviews (Vol. II, p. 185).

While the Planning Commission kept with the CAC consensus, key changes made to the proposal by Planning Commission, in response to public input, include:

- Reducing the amount of tree canopy required for higher density residential development;
- Allowing required tree canopy to be measured for the overall development site rather than individual lots for higher density residential development and non-residential development; and
- Granting bonus credits for planting native trees.

A detailed description of the Planning Commission deliberations and decisions can be found beginning on page 3 of Volume V.

Based on these analyses, the Planning Commission concluded that the recommended tree canopy requirements balance the community's desire for trees, development and open space, and the goals and policies of the Comprehensive Plan as articulated in the Introduction.

## **CITIZEN INVOLVEMENT**

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### **“GOAL:**

#### **1.1 Provide citizens, affected agencies, and other jurisdictions the opportunity to participate in all phases of the planning process.”**

As described in the Process Summary (Vol. I, p. 26), the city has provided Tigard citizens, affected agencies and other jurisdictions multiple and varied opportunities to participate in all phases of the urban forestry planning process. This included 11 Citizen Advisory Committee meetings where people representing diverse interests and viewpoints discussed and reviewed code concepts and language at 11 meetings, hosted by an independent facilitator. In addition, a Technical Advisory Committee, which included representatives from multiple city departments such as Public Works and Community Development and outside agencies such as the Oregon Department of Transportation and Clean Water Service met 14 times to discuss and review code concepts and language resulting from the Citizen Advisory Committee process. 14,225 public hearing notices, consistent with Measure 56 requirements, were sent to all Tigard property owners on January 13, 2012. Public hearing notices were also provided to interested parties on January 17, 2012, to affected agencies on January 20, 2012 and published in the Tigard Times on January 19, 2012.

The Planning Commission received public testimony and deliberated on the proposed CPA and DCA during four public hearings from February through May 2012. This included consideration of 85 amendment requests that were generated from their February 6, 2012 hearing. Using this input the Planning Commission revised the proposed CPA and DCA, and then made a unanimous recommendation for council approval.

The Planning Commission recommended CPA and DCA will be further considered through the public hearing process at City Council prior to adoption. The tentative council schedule is as follows:

Meeting Date	Meeting Type	Meeting Purpose
July 10, 2012	Council Study Session	Staff reviews legislative adoption process with council and distributes UFCR materials.
July 11, 2012 to July 23, 2012	Project Staff with Councilors	Provide broad overview of proposal components and describe/discuss elements in more detail with councilors, as desired, in advance of public hearings.
July 24, 2012	Council Public Hearing	Receive staff report, listen to public testimony and identify issues of most concern for additional discussion at the August 28, 2012 meeting.
Aug 28, 2012	Council Work Session	Staff report on issues of most concern and council direction on how to address each issue.
Oct 9, 2012	Council Public Hearing	Receive staff report on how issues of most concern were addressed, accept public testimony on those issues and make a final decision on adoption.
Nov 13, 2012	Council Public Hearing	Additional hearing similar in format as previous meeting, if needed.

The Urban Forestry Code Revisions process demonstrates that citizens, affected agencies and other jurisdictions have been provided the opportunity to participate in all phases of the planning process consistent with this policy.

**“GOAL:**

- 1.2 Ensure all citizens have access to:**  
**A. opportunities to communicate directly to the City; and**  
**B. information on issues in an understandable form.”**

**“POLICIES:**

- 5. The City shall seek citizen participation and input through collaboration with community organizations, interest groups, and individuals in addition to City sponsored boards and committees.”**

As described in the Process Summary (Vol. I, p. 26), the Citizen Advisory Committee included representatives from city boards such as the Tree Board, Parks Boards, and Planning Commission, representatives from community organizations and interests groups such as the Tualatin Riverkeepers and HBA and citizens at large. These and other public involvement opportunities demonstrate that the city has sought citizen participation and input through collaboration with community organizations, interest groups and individuals in addition to city sponsored boards and committees consistent with this policy.

- “6. The City shall provide opportunities for citizens to communicate to Council, boards and commissions, and staff regarding issues that concern them.”**

The community had opportunities to participate in the Citizen Advisory Committee process by providing written, electronic and verbal communication at each Citizen Advisory Committee meeting. Staff provided three open house opportunities to provide opportunities for additional community feedback. Two open houses allowed opportunities for property owners with significant tree groves to provide input to the city during the inventory phase and development of regulatory incentives and flexible standards. An additional open house provided opportunities for the overall community to provide feedback on additional urban forestry code amendments, which are not subject to the Goal 5 rule requirements. Therefore, the city has

provided Tigard citizens the opportunity to communicate to Council, boards and commissions, and staff regarding urban forestry issues that concern them, consistent with this policy.

## LAND USE PLANNING

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### **“GOAL:**

- 2.1 Maintain an up-to-date Comprehensive Plan, implementing regulations and action plans as the legislative foundation of Tigard’s land use planning program.”**

### **“POLICIES:**

- 1. The City’s land use program shall establish a clear policy direction, comply with state and regional requirements, and serve its citizens’ own interests.”**

In 2008 the city completed its periodic review and update of its Comprehensive Plan, which has been acknowledged by Oregon Department of Land Conservation and Development DLCD as consistent with Statewide Planning Goals. Included within the Comprehensive Plan is an Urban Forest section, which was initially adopted on June 3, 2008, and readopted on August 10, 2010, with additional findings that further support the goals and policies in the Urban Forest section. The Urban Forest section (Vol. V, p. 292) and the additional findings can be found in the Tree Values Memo (Vol. V, p. 149). On November 10, 2009, City Council accepted the Urban Forestry Master Plan as consistent with, and supportive of, the urban forestry goals and policies in the Comprehensive Plan. The Urban Forestry Master Plan set realistic timelines and provides a balanced framework for implementing updates to the city’s urban forestry code provisions, policies and programs (Vol. V, p. 207). The CPA and DCA have been guided by these past planning processes, which have established clear policy direction in compliance with state and regional requirements and serve citizen’s interests, consistent with this policy.

- “2. The City’s land use regulations, related plans, and implementing actions shall be consistent with and implement its Comprehensive Plan.”**

The Urban Forestry Master Plan provides a roadmap in the form of a matrix for implementing urban forestry goals and policies in the Comprehensive Plan (Implementation Matrix, Vol. V, p. 216). The CPA and DCA implement the recommendations in the Urban Forestry Master Plan matrix. Therefore, they are consistent with related plans and implement the Comprehensive Plan, as required by this policy.

- “3. The City shall coordinate the adoption, amendment, and implementation of its land use program with other potentially affected jurisdictions and agencies.”**

Request for comments on the proposed CPA and DCA were sent to Metro – Land Use and Planning, Washington County Department of Land Use & Transportation, U.S. Army Corps of Engineers, Oregon Department of State Lands, Oregon Department of Land Conservation and Development, Oregon Department of Fish and Wildlife, Oregon Department of Environmental Quality, Tualatin Valley Fire & Rescue, Tigard-Tualatin School District 23J, and the cities of Tualatin, Lake Oswego, Beaverton, King City and Durham. Representatives of the Oregon Department of Transportation and Clean Water Services were also members of the Technical Advisory Committee. DLCD was provided the opportunity to comment and coordinate the application for the Post Acknowledgement Plan Amendment process per ORS 197.610. Therefore, the city has coordinated the adoption, amendment and implementation of the CPA and DCA with potentially affected jurisdictions and agencies consistent with this policy.

- “4. The City’s land use program shall promote the efficient use of land through the creation of incentives and redevelopment programs.”**

The DCA in Section 18.790.050.C (Vol. II, p. 149) include incentives and flexible standards for the preservation and planting of individual trees, while accommodating development. These incentives and flexible standards include lot size averaging, setback adjustments and parking adjustments.



In addition, incentives and flexible standards for the preservation of significant tree groves are recommended in Section 18.790.050.D (Volume II, p. 153). These incentives and flexible standards include density transfer, setback adjustments and additional building height to preserve significant tree groves, while accommodating development. Therefore, the city has promoted the efficient use of land through incentives and flexible standards that accommodate the preservation and planting of individual trees and the preservation of significant tree groves, consistent with this policy.

**“7. The City’s regulatory land use maps and development code shall implement the Comprehensive Plan by providing for needed urban land uses including: ...**

**E) Overlay districts where natural resource protections or special planning and regulatory tools are warranted.”**

The CPA establishes an overlay district for 70 significant tree groves covering 527 acres. As further described in the Tree Grove ESEE Analysis (Vol. II, p. 219), Goal 5 rule requirements allow significant tree groves within the overlay to be eligible for the recommended incentives and flexible standards for their preservation in Section 18.790.050.D. The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEE Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. Therefore, the CPA and DCA implement the Comprehensive Plan by creating an overlay district where natural resource protections and special planning and regulatory tools are warranted consistent with this policy.

**“12. The City shall provide a wide range of tools, such as planned development, design standards, and conservation easements that encourage results such as: ...**

**C) Protection of natural resources;  
D) Preservation of open space; and  
E) Regulatory flexibility necessary for projects to adapt to site conditions.”**

Incentives and flexible standards for the preservation of significant tree groves are recommended in Section 18.790.050.D, such as reduction of minimum density, density transfer, setback adjustments and additional building height to preserve significant tree groves while allowing development to adapt to site conditions. Significant tree groves are a Goal 5 natural resource and the recommended amendments would facilitate the protection of these resources, consistent with this policy.

**“15. In addition to other Comprehensive Plan goals and policies deemed applicable, amendments to Tigard’s Comprehensive Plan/Zone Map shall be subject to the following specific criteria:**

**G) Demonstration that the amendment does not detract from the viability of the City’s natural systems.”**

The CPA creates a significant tree grove overlay, which overlaps with sensitive lands defined in Chapter 18.775, which together represent the city’s natural systems. The recommended flexible standards and incentives for preserving significant trees groves would enhance, rather than detract from the viability of the city’s natural systems, consistent with this policy.

**“18. The Council may at any time, upon finding it is in the overall public interest, initiate legislative amendments to change the Comprehensive Plan text, Plan/Zoning Map(s) and/or the Community Development Code.”**

To implement the Comprehensive Plan as recommended by the Urban Forestry Master Plan, in February 2010 City Council directed staff to undertake a comprehensive update of Tigard's urban forestry related

code provisions. The CPA and DCA reflect City Council direction for a comprehensive update of the city's urban forestry related code provisions, which they have found to be in the overall public interest consistent with this policy.

**“20. The City shall periodically review and, if necessary, update its Comprehensive Plan and regulatory maps and implementing measures to ensure they are current and responsive to community needs, provide reliable information, and conform to applicable state law, administrative rules, and regional requirements.”**

The CPA and DCA amendments were developed in response to community needs identified through the Urban Forestry Master Plan and Urban Forestry Code Revisions Projects. Both of these projects involved a Citizen Advisory Committee to ensure community needs were well represented during the planning process. The CPA and DCA are current and responsive to the community's needs, as evidenced by the Citizen Advisory Committee's unanimously approved guiding principles (Vol. V, p. 139).

In addition, the CPA creates a significant tree grove map (Exhibit A), which provides reliable information. Each significant tree grove was inventoried and assessed using Geographic Information Systems (GIS) and site visits. The inventory and assessment process is further described in the Tree Grove ESEF Analysis (Vol. II, p. 219). The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEF Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. The CPA and DCA conform to applicable state, administrative rules, and regional requirements as identified in the findings for this staff report and the Tree Grove ESEF Analysis. Therefore, the CPA and DCA are consistent with this policy.

**“21. The City shall require all development to conform to site design/development regulations.”**

The Urban Forestry Plan requirements in Chapter 18.790 (Vol. II, p. 219) would continue to require an Urban Forestry Plan for land use projects that were previously required to conform to the chapter requirements. Two additional review types (Downtown Design Review and Sensitive Lands Review) would also be required to conform to the chapter requirements. Therefore, the DCA would continue to require all land use projects, as well as two additional review types, to conform to urban forestry site design and development regulations, consistent with this policy.

**“22. The City shall identify, designate, and protect natural resources as part of its land use program.”**

The CPA creates a significant tree grove overlay for 70 inventoried significant tree groves covering 527 acres. The Tree Grove ESEF Analysis (Vol. II, p. 219) provides greater context for the recommended overlay, which has been designated consistent with Goal 5 rule requirements. The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEF Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. The recommended flexible standards and incentives in Section 18.790.050.D (Vol. II, p. 153) are designed to facilitate the protection of significant tree groves consistent with this policy. It is important to note that Goal 5 rule requirements are not applicable to the preservation and planting of individual trees because individual trees are planted and preserved primarily for their aesthetic, air and water quality benefits, as further described in the Tree Values Memo (Vol. V, p. 149).

**“24. The City shall establish design standards to promote quality urban development and to enhance the community's value, livability, and attractiveness.”**

The DCA in Chapters 18.610 - 18.640, 18.745 and 18.790 in Volume II, include design standards for the planting and preservation of individual trees, which are recognized for their aesthetic benefits as more fully

described in the Tree Values Memo (Vol. V, p. 149). The Tree Values memo explains that individual trees are proven to enhance property values and thereby promote quality urban development and enhance the community's value, livability and attractiveness, consistent with this policy.

**“GOAL:**

**2.2 To enlarge, improve, and sustain a diverse urban forest to maximize the economic, ecological, and social benefits of trees.”**

**“POLICIES:**

**1. The City shall maintain and periodically update policies, regulations, and standards to inventory, manage, preserve, mitigate the loss of, and enhance the community's tree and vegetation resources to promote their environmental, aesthetic and economic benefits.”**

The Urban Forestry Standards for Development require an inventory and plan to manage, preserve and mitigate the loss of the trees as part of the development process (Vol. II, p. 3-184). Incentives in Chapter 18.790, such as the Urban Forestry Plan requirements in Section 18.790.030 encourage the preservation and planting of trees, however a fee-in-lieu of planting or preservation is allowed to mitigate the loss of trees.

In addition, the CPA would create a significant tree grove overlay for 70 inventoried significant tree groves covering 527 acres. The Tree Grove ESEE Analysis (Vol. II, p. 219) provides greater context for the recommended overlay, which has been designated consistent with Goal 5 rule requirements. The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEE Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. Flexible standards and incentives are recommended in Section 18.790.050.D to facilitate preservation of significant tree groves (Vol. II, p. 153).

Through these CPA and DCA , the city is maintaining and updating its policies, regulations and standards to inventory, manage, preserve, mitigate the loss of and enhance the community's tree and vegetation resources to promote their environmental, aesthetic and economic benefits consistent with this policy.

**“2. The City's various codes, regulations, standards, and programs relating to landscaping, site development, mitigation, and tree management shall be consistent with, and supportive of, one another; administration and enforcement shall be regulated and coordinated by the variously impacted departments.”**

Tigard City Council directed staff to pursue a comprehensive update of the city's urban forestry code provisions to ensure the various code, regulations, standards and programs relating to landscaping, site development, mitigation and tree management are consistent with an supportive of, one another. Staff has paid particular attention to ensure consistency between the recommended land use regulations in Title 18 and the non-land use regulations in other titles so administration and enforcement is coordinated before, during and after the development process. In addition, staff from variously impacted departments and outside agencies that have a role in urban forestry served on the Technical Advisory Committee to coordinate developing the urban forestry code provisions. Administration and enforcement of the urban forestry code provisions will be assigned to the Community Development Department. The city's comprehensive approach to developing the CPA and DCA, and planned administration and enforcement by a single department is consistent with this policy.

**“3. The City shall continue to regulate the removal of trees within environmentally sensitive lands and on lands subject to natural hazards.”**

Trees within environmentally sensitive lands and lands subject to natural hazards, as defined in Chapter 18.775, would continue to be subject to the recommended Urban Forestry Plan requirements in Chapter 18.790.030, as part of the development process. When development is not proposed, trees within

environmentally sensitive lands would still be regulated by the provision of Chapter 8.10, which are non-land use regulations and not part of this application. The DCA in Chapter 18.790.030 would continue to regulate the removal of trees within environmentally sensitive lands and on lands subject to natural hazards, consistent with this policy.

**“4. The City shall ensure that street design and land use standards provide ample room for the planting of trees and other vegetation, including the use of flexible and incentive based development standards.”**

The recommended design standards in Chapters 18.610 - 18.640, Chapter 18.745 and Section 18.790.050, require ample room and allow flexible standards and incentives for the planting of trees. Included are increased dimensions for tree planting spaces, reduction in parking for planting parking lot trees, flexible sidewalk locations for planting street trees and minimum soil volume standards for parking lot and street trees. Through the DCA, the city will ensure that street design and land use standards provide ample room for the planting of trees, including the use of flexible and incentive based development standards, consistent with this policy.

**“5. The City shall require the replacement and/or installation of new street trees, unless demonstrated infeasible, on all new roads or road enhancement projects. Trees should be planted within planter strips, or at the back of sidewalks if planter strips are not feasible or would prohibit the preservation of existing trees.”**

Through the DCA in Chapter 18.745.040 (Vol. II, p. 111), the city will require the replacement and/or installation of new street trees, unless demonstrated infeasible, on all new roads or road enhancement projects that are part of the listed land use permits. New roads or road enhancement projects that do not require a land use permit are not part of this application. The existing street design standards in Chapter 18.810 require street trees within planter strips but allow planting in the back of sidewalk if planter strips are not feasible or would prohibit the preservation of existing trees. Chapter 18.810 is not recommended for revision as part of this application. Therefore, the DCA in Chapter 18.745.040 that require new street trees and the existing street design standards in Chapter 18.810 that require street trees in planter strips are consistent with this policy.

**“6. The City shall establish and enforce regulations to protect the public’s investment in trees and vegetation located in parks, within right-of-ways, and on other public lands and easements.”**

The DCA (Vol. II, pp. 3-184) are applicable to trees located in parks, within right of ways and on other public lands and easements as part of the land use permitting process for certain development activities in those locations. Additional provisions protect the public’s investment in trees located in parks, within right of ways and on other public lands and easements outside the development process (Vol. III), but are not land use regulations and not part of this application. The recommended applicability of land use regulations protect the public’s investment in trees located in parks, within rights of ways and on other public lands and easements consistent with this policy.

**“7. The City shall conduct an ongoing tree and urban forest enhancement program to improve the aesthetic experience, environmental quality, and economic value of Tigard’s streets and neighborhoods.”**

The Urban Forestry Code Revisions Project is part of the city’s ongoing tree and urban forest enhancement program. The DCA (Vol. II, pp. 3-184) require development to improve the aesthetic experience, environmental quality and economic value of Tigard’s streets and neighborhoods through tree planting and preservation requirements as part of the land use process, consistent with this policy.

**“8. The City shall continue to maintain and periodically update approved tree lists for specific applications and site conditions, such as street trees, parking lot trees, and trees for wetland and riparian areas.”**

The DCA in Chapters 18.610 through 18.640, Chapter 18.745 and Section 18.790.050, reference the Urban Forestry Manual for a list of recommended trees for specific applications and site conditions such as street trees, parking lot trees and trees for wetland and riparian areas when planting is required as part of the land use process. While the Urban Forestry Manual itself not part of this application, referencing the recommending trees lists within it during the land use process is consistent with this policy.

**“9. The City shall discourage the use or retention of invasive trees and other plants through the development review process.”**

The lists of recommended trees referenced in Goal 2.2 Policy 8 do not include invasive trees. In addition, a nuisance (i.e. invasive) tree list is included in the Urban Forestry Manual and nuisance trees are not eligible for credit when planted to meet the Urban Forestry Plan requirements in Section 18.790.030. While the Urban Forestry Manual itself not part of this application, not allowing nuisance trees to meet the tree planting standards that are part of the development review process discourages their use and retention and is consistent with this policy.

**“10. The City shall require the appropriate use of trees and other vegetation as buffering and screening between incompatible uses.”**

The DCA retain the existing buffering and screening requirements for incompatible uses in Section 18.745.050 (Vol. II, p. 117). The spacing requirements and names of the specific tree types have been amended slightly for consistency with the spacing requirements and names of trees in other sections in Title 18. The slightly modified DCA would continue to require appropriate use of trees and other vegetation as buffering and screening between incompatible uses and is consistent with this policy.

**“11. The City shall develop and implement a citywide Urban Forestry Management Master Plan.”**

Council accepted the Urban Forestry Master Plan (Vol. V, p. 207) on November 10, 2009, consistent with this policy. The Urban Forestry Code Revisions Project implements the Comprehensive Plan as recommended by the Urban Forestry Master Plan. While the Urban Forestry Master Plan is not part of this application, is not a land use regulation and does not contain relevant approval criteria for this application, its development and implementation has helped shape the Urban Forestry Code Revisions and is consistent with this policy.

**“GOAL:**

**2.3 To balance the diverse and changing needs of the city through well designed urban development that minimizes the loss of existing trees to create a living legacy for future generations.”**

**“POLICIES:**

**1. The City shall develop and implement standards and procedures designed to minimize the reduction of existing tree cover, with priority given to native trees and non-native varieties that are long lived and/or provide a broad canopy spread.”**

The DCA are designed to minimize the reduction of existing tree cover through the Urban Forestry Plan requirements in Section 18.790.030 (Vol. II, p. 139). Section 18.790.030 requires tree canopy cover standards to be met as part of the land use process. The standards for meeting tree canopy cover requirements are within the Urban Forestry Manual and are designed to minimize the reduction of existing tree cover by granting bonus credits for preserving existing trees. In addition, standards are designed to

give priority to native trees as well as non-native trees that are long-lived and broad spreading because these tree types will most facilitate achievement of canopy cover standards.

The DCA in Section 18.790.050.C include incentives and flexible standards for the preservation of individual trees (Vol. II, p. 149). The amendments are designed to minimize the reduction of existing tree cover by allowing lot size averaging, setback adjustments and parking adjustments.

In addition, incentives and flexible standards for significant tree groves are recommended in Section 18.790.050.D, such as density transfer, setback adjustments and additional building height to preserve significant tree groves. These incentives and flexible standards for significant tree groves are designed to minimize the reduction of existing tree cover while prioritizing native trees that are long-lived and provide a broad canopy spread. Flexible standards and incentives for the preservation of significant tree groves were developed through the Goal 5 rule requirements as required by state law. Goal 5 rule requirements are not applicable to the preservation and planting of individual trees because individual trees are planted and preserved primarily for their aesthetic, air and water quality benefits.

Therefore, the Urban Forestry Plan requirements in Section 18.790.030 and the incentives and flexible standards for preservation in Section 18.790.050 have the effect of minimizing the reduction of existing tree cover, with priority given to native trees and non-native varieties that are long-lived and/or provide a broad canopy spread consistent with this policy.

**“2. In prescribing the mitigation of the impacts of development, the City shall give priority to the protection of existing trees, taking into consideration the related financial impact of mitigation.”**

The DCA prescribe the mitigation of the impacts of development through Urban Forestry Plan requirements in Section 18.790.030 (Vol. II, p. 139). Section 18.790.030 requires tree canopy cover standards to be met by planting new trees, preserving existing trees or paying a fee in lieu of planting or preservation. The standards are designed to minimize the reduction of existing tree cover by granting bonus credits for preserving existing trees.

The DCA in Section 18.790.050.C include flexible standards to facilitate the preservation of individual trees (Vol. II, p. 149). The flexible standards include lot size averaging, setback adjustments and parking adjustments.

In addition, incentives and flexible standards in Section 18.790.050.D would facilitate the preservation of significant tree groves. These incentives and flexible standards include density transfer, setback adjustments and additional building height to accommodate the preservation of significant tree groves.

A fee in lieu of planting or preservation is recommended and takes into consideration the financial impacts of mitigation. As further described in the Tree Canopy Fee Memo (Vol. V, p. 171), the tree canopy fee was established using a conservative estimated value of tree canopy based on appraisal standards developed by the International Society of Arboriculture.

The peer review results demonstrate that the recommended canopy requirements are likely achievable through planting and preservation for most development projects (Vol. II, p. 185). This further informed the city's consideration of related financial impacts of mitigation when developing the recommended fee in lieu of planting or preservation.

Finally, a discretionary Urban Forestry Plan review option (Vol. II, p. 142) is recommended to be allowed in lieu of meeting the Urban Forestry Plan requirements in Section 18.790.030. The discretionary Urban Forestry Plan review option would allow an applicant to mitigate the lack of canopy cover by incorporating innovative, alternate development proposals that provide equivalent environmental benefits as trees.

The range of options for meeting the recommended Urban Forestry Plan requirements in Section 18.790.030 prioritize the protection of existing trees. However, applicants would be allowed to mitigate through achievable planting requirements, a fee in lieu of planting or preservation or a discretionary review option. These recommended alternatives to preservation were developed with consideration of the financial impacts of mitigation consistent with this policy.

**“3. The City shall develop policies and procedures designed to protect trees, including root systems, selected for preservation during land development.”**

The DCA in Section 18.790.030 would require a tree preservation and removal site plan by a certified arborist or landscape architect (Vol. II, p. 139). The specifications for the tree preservation and removal site plan are in the Urban Forestry Manual and would require the certified arborist or landscape architect to identify methods for protecting trees, including root systems, selected for preservation during land development. The required methods would include, but are not limited to, displaying the type, size and location of tree protection fencing to scale on the tree preservation and removal site plan.

In addition, Section 18.790.060 would require the certified arborist or landscape architect to perform regular inspections of the tree protection fencing and other tree protection methods throughout the land development process (Vol. II, p. 163). The recommended Development Code requirements for a tree preservation and removal site plan along with regular inspections and reporting on that plan during the development process are designed to protect trees, including their root systems, consistent with this policy.

**“4. The City shall address public safety concerns by ensuring ways to prevent and resolve verified tree related hazards in a timely manner.”**

The DCA allow tree removal if the certified arborist or landscape architect determines a tree has become a hazard during the development process (Vol. II, p. 169). The rating system for determining tree hazards is within the Urban Forestry Manual and cross-referenced by the recommended code amendments. Therefore, the DCA ensure the prevention and resolution of verified tree related hazards during the land development process, consistent with this policy.

Additional provisions in Chapter 8.06 in Volume III would prohibit verified tree related hazards and allow for their emergency abatement, however these provisions are not land use regulations and not part of this application.

**“5. The City shall develop and enforce site design and landscape requirements to reduce the aesthetic and environmental impacts of impervious surfaces through the use of trees and other vegetation.”**

The DCA in Chapter 18.745 (Vol. II, p. 107) would require the planting of street trees and parking lot trees as part of the land use process. Street trees would be required based on the amount of street frontage of the development and parking lot trees would be required to provide 30% minimum tree canopy cover at maturity over the parking area. These recommended site design and landscape requirements were developed and would be enforced to reduce to the aesthetic and environmental impacts of impervious surfaces, consistent with this policy.

**“6. The City shall, in order to preserve existing trees and ensure new trees will thrive, allow and encourage flexibility in site design through all aspects of development review.”**

The DCA in Section 18.790.050.C (Vol. II, p. 149) would allow and encourage flexibility in site design for the preservation and planting of individual trees. These flexible site design standards include lot size averaging, setback adjustments and parking adjustments.

In addition, flexibility in site design standards are allowed and encouraged for the preservation significant tree groves by the DCA in Section 18.790.050.D. These flexible site design standards include density

transfer, setback adjustments and additional building height.

Therefore, the DCA in Section 18.790.050.C and 18.790.050.D include flexible site design standards that would allow and encourage flexibility to preserve existing trees and ensure new trees will thrive consistent with this policy.

**“7. The City shall require all development, including City projects, to prepare and implement a tree preservation and landscaping plan, with the chosen trees and other plant materials appropriate for site conditions.”**

The DCA in Chapters 18.745 (Vol. II, p. 107) and 18.790 (Vol. II, p. 135), would require tree preservation and landscaping plans that are appropriate to site conditions. These requirements are applicable to city projects.

The term “development” is so broad that any material change to a property, such as installing a shed, could fall within the definition. Staff and the Citizen Advisory Committee discussed the scale of development that should be required to implement tree preservation and landscaping plans. It was determined that those land use permit types listed in Chapters 18.745 and 18.790 are of appropriate scale that requiring tree preservation and landscaping plans would be roughly proportional to the impacts of development. After evaluating smaller scale projects, such as shed installations or residential additions, it was determined they are usually designed in ways that have minimal impacts on trees and surrounding neighborhoods.

Therefore, the DCA would require appropriate tree preservation and landscaping plans for all development with significant impacts, including city projects, consistent with this policy.

**“8. The City shall continue to cooperate with property owners, businesses, other jurisdictions, agencies, utilities, and non-governmental entities to manage and preserve street trees, wetlands, stream corridors, riparian areas, tree groves, specimen and heritage trees, and other vegetation.”**

As described in the Process Summary (Vol. I, p. 26), the city cooperated with property owners, businesses, other jurisdictions, agencies, utilities and non-governmental entities in developing code amendments as part of the Urban Forestry Code Revisions Project. The DCA in Chapter 18.745.040 (Vol. II, p. 111) contribute to the management and preservation of street trees during the land use process.

The DCA in Section 18.790.050.D (Vol. II, p. 153) contribute to the preservation significant tree groves during the land use process. Flexible site design standards for the preservation of significant tree groves were developed through the Goal 5 rule requirements, as required by state law.

Individual specimen and heritage trees would be required to be included as part of the Urban Forestry Plan through the recommended amendments in Section 18.790.030 (Vol. II, p. 139). Including specimen and heritage trees in the Urban Forestry Plan will contribute to their preservation and management because they could be considered and utilized to meet plan requirements.

The DCA do not affect the preservation and management of wetlands, stream corridors and riparian areas except to the extent that trees preservation and planting activities may overlap with these areas. However, the DCA are intended to support the preservation and management of trees and significant trees groves, not wetlands, stream corridors and riparian areas.

The DCA were developed in cooperation with property owners, businesses, other jurisdictions, agencies, utilities and non-governmental entities. The DCA support the management and preservation of street trees, significant tree groves, specimen and heritage trees during the development process. The DCA were not specifically designed to affect the management or preservation of wetlands, stream corridors or riparian areas. Therefore, the DCA are consistent with this policy.



**“9. The City shall require, as appropriate, tree preservation strategies that prioritize the retention of trees in cohesive and viable stands and groves instead of isolated specimens.”**

The CPA establishes an overlay district for 70 significant tree groves covering 527 acres. The recommended flexible standards and incentives in Section 18.790.050.D (Vol. II, p. 153) include allowed reduction in minimum density, density transfer, increased building height, reduced setbacks, adjustments to Urban Forestry Plan requirements and adjustments to street and utility standards. The recommended flexible standards and incentives would facilitate the preservation of the significant tree groves in cohesive and viable stands instead of isolated specimens consistent with this policy.

**“10. Applications for tree removal and tree management plans shall be reviewed by a certified arborist employed or under contract to the City.”**

The DCA in Section 18.790.030 would require urban forestry plans to be coordinated, reviewed and approved by a certified arborist or landscape architect (Vol. II, p. 139). The city currently employs a certified arborist to review land use permit applications to determine whether urban forestry related requirements are met. The requirement for urban forestry plans to be coordinated, reviewed and approved by a certified arborist or landscape architect and the city’s current practice for land use applications to be reviewed by a certified arborist employed by the city, is consistent with this policy.

**“11. The City shall recognize the rights of individuals to manage their residential landscapes.”**

The DCA in Chapter 18.790 (Vol. II, p. 135) would allow applicants to meet Urban Forestry Plan requirements through any combination of preserving existing trees, planting new trees or paying a fee in lieu of planting or preservation. In addition, a discretionary review process in Section 18.790.040 (Vol. II, p. 143) is available as an alternative to providing the required trees. Finally, Section 18.790.070 would allow individuals to modify their Urban Forestry Plan after the land use approval process to provide additional flexibility to adapt to changing site conditions or personal preferences. Therefore, the DCA in Chapter 18.790 recognize the rights of individuals to manage their residential landscapes, consistent with this policy.

Title 8 amendments include tree permit procedures in Chapter 8.04 of Volume III that allow for increased flexibility for tree management activities outside the land use process. However, amendments to Title 8 are not land use regulations and are not part of this application.

## **NATURAL RESOURCES**

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### **“GOAL:**

**5.1: Protect natural resources and the environmental and ecological functions they provide and, to the extent feasible, restore natural resources to create naturally functioning systems and high levels of biodiversity.”**

### **“POLICIES:**

- 1. The City shall protect and, to the extent feasible, restore natural resources in a variety of methods to:**
  - A. contribute to the City’s scenic quality and its unique sense of place;**
  - B. provide educational opportunities, recreational amenities, and buffering between differential land uses;**
  - C. maximize natural resource functions and services including fish and wildlife habitat and water quality; and**
  - D. result in healthy and naturally functioning systems containing a high level of biodiversity.”**

The recommended Comprehensive Plan amendment establishes an overlay district for 70 significant tree groves covering 527 acres. As further explained in the Tree Grove ESEE Analysis (Vol. II, p. 219), key evaluation criteria in the inventory and selection of significant tree groves were grove maturity/tree size, grove size, health/viability, visibility, screening and buffering, accessibility, rarity, educational/recreational potential, wildlife habitat value and connectivity and the amount of existing disturbance. The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEE Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report.

The DCA in Section 18.790.050.D (Vol. II, p. 153) include regulatory incentives and flexible standards that allow for the preservation of significant tree groves.

The evaluation criteria used for the inventory and selection of significant tree groves and the recommended regulatory incentives and flexible standards support this policy by allowing for the maximum preservation of the functions and values of significant tree groves with the attributes identified in this policy.

**“4. The City shall actively coordinate and consult with landowners, local stakeholders, and governmental jurisdictions and agencies regarding the inventory, protection, and restoration of natural resources.”**

As more fully described in the Tree Grove ESEE analysis (Vol. II, p. 219), the city actively coordinated and consulted with landowners, local stakeholders, governmental jurisdictions and agencies throughout the development of the CPA and DCA. The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEE Analysis for Significant Tree Groves (page 3-4 through 3-58) explain how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report.

During the inventory phase, all property owners with an inventoried tree grove on their property were provided notice, compliant with Goal 5 rule requirements. As part of the notice, property owners were invited to a tree grove open house, which was held on October 6, 2010, to learn more and provide feedback about the process.

After developing draft regulatory incentives and flexible standards based on community input, property owners and the community were invited to a second tree grove open house on February 17, 2011, to learn more and provide feedback on the recommended regulatory incentives and flexible standards.

In addition, the city coordinated with local stakeholders and governmental jurisdictions and agencies as part of the Citizen Advisory Committee and Technical Advisory Committee processes, which are more fully described in the Process Summary (Vol. I, p. 26). Both the Citizen Advisory Committee and Technical Advisory Committee reviewed and approved the recommended regulatory incentives program for significant tree groves. The Citizen Advisory Committee approval is documented in their guiding principles for the Tree Grove Preservation Incentives (Vol. V, p. 143).

Therefore, the city coordinated and consulted with landowners, local stakeholders, governmental jurisdiction and agencies during the inventory and development of regulatory incentives and flexible standards for preserving significant tree groves, consistent with this policy.

**“5. The City shall utilize periodic assessments of the effectiveness of the City’s programs and regulatory structures to guide future decisions regarding natural resource protection, management, and restoration.”**

The city utilized periodic canopy assessments as part of the Urban Forestry Master Plan process. The periodic canopy assessments demonstrated a 24% decline in canopy clusters of over 5 acres in size from

1996 to 2007. These and other findings were used to develop recommendations in the Urban Forestry Master Plan (Vol. V, p. 207) that helped guide the CPA and DCA. The city identified 70 significant tree groves through the statewide Goal 5 planning process as further explained in the Tree Grove ESEE Analysis (Vol. II, p. 219). The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEE Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. Therefore, periodic assessments of the effectiveness of the city's programs and regulatory structures were used to guide the CPA and DCA aimed at the protection, management and restoration of significant tree groves, consistent with this policy.

**“6. The City shall utilize incentives or disincentives, to the extent feasible, to discourage property owners from removing or degrading natural resources prior to application for development or annexation.”**

The city identified 70 significant tree groves through the statewide Goal 5 planning process as further explained in the Tree Grove ESEE Analysis (Vol. II, p. 219). The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEE Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. The development code amendments in Section 18.790.050.D (Vol. II, p. 153) include regulatory incentives and flexible standards to facilitate the preservation of significant tree groves. Regulatory incentives and flexible standards include allowed reduction in minimum density, density transfer, increased building height, reduced setbacks, adjustments to Urban Forestry Plan requirements and adjustments to street and utility standards. The regulatory incentives and flexible standards are voluntary, and thus there is no incentive for property owners to remove or degrade significant trees groves prior to application for development or annexation. Therefore, the DCA in Section 18.790.050.D are consistent with this policy.

**“7. The City shall protect and restore riparian and upland habitats to the maximum extent feasible on public and private lands.”**

The city identified 70 significant tree groves through the statewide Goal 5 planning process as further explained in the Tree Grove ESEE Analysis (Vol. II, p. 219). The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEE Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. The CPA and DCA facilitate the preservation of significant tree groves located in both riparian and upland habitats and on public and private lands. The city also has non-regulatory programs to protect and restore riparian and upland habitats, but these are not land use regulations and not part of this application. Therefore, the CPA and DCA facilitate the preservation of significant tree groves in both riparian and upland habitats on both public and private property, which allows for their further protection and restoration through non-regulatory programs consistent with this policy.

**“10. The City shall complete a baseline inventory of significant natural resources and update or improve it as necessary, such as at the time of Comprehensive Plan Periodic Review, changes to Metro or State programs, or to reflect changed conditions, circumstances, and community values.”**

The city completed a baseline inventory of 70 significant tree groves in compliance with Statewide Planning Goal 5 rule requirements as further detailed in the Tree Grove ESEE Analysis (Vol. II, p. 219). The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEE Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. The significant tree grove map (Exhibit A) represents

the baseline inventory, which will be adopted through the CPA and updated and improved as necessary consistent with this policy.

**“11. The City shall assist landowners in the protection of natural resources through diverse methods including, but not limited to: education, incentives, planned development standards and regulations, and conservation easements.”**

The city identified 70 significant tree groves through the statewide Goal 5 planning process as further explained in the Tree Grove ESEE Analysis (Vol. II, p. 219). The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEE Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. The DCA in Section 18.790.050.D include regulatory incentives and flexible standards to assist landowners in the preservation of significant tree groves (Vol. II, p. 153). Regulatory incentives and flexible standards include allowed reduction in minimum density, density transfer, increased building height, reduced setbacks, adjustments to Urban Forestry Plan requirements and adjustments to street and utility standards. Permanent protection of significant tree groves through instruments such as conservation easements would be required to utilize the incentives and flexible standards. These incentives and flexible standards would assist landowners in the protection of natural resources consistent with this policy.

**“12. The City shall develop and implement standards and procedures that mitigate the loss of natural resource functions and services, with priority given to protection over mitigation.”**

The city identified 70 significant tree groves through the statewide Goal 5 planning process as further explained in the Tree Grove ESEE Analysis (Vol. II, p. 219). The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEE Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. The DCA in Section 18.790.050.D include regulatory incentives and flexible standards to prioritize the preservation of significant tree groves over mitigation. In utilizing these regulatory incentives and flexible standards, applicants would be required to preserve at least 10,000 square feet of significant tree grove canopy and to maximize the connectivity and viability of the remaining portion of the significant tree grove under the direction of a certified arborist or landscape architect (Vol. II, p. 153). Considerations in the Urban Forestry Manual are cross-referenced in Section 18.790.050.D to provide additional guidance for the certified arborist or landscape architect in the preservation of a connected and viable significant tree grove. Therefore, the DCA in Section 18.790.050.D create standards and procedures that mitigate the loss of natural resource functions and services, with priority given to protection of significant tree groves over mitigation, consistent with this policy.

**13. “The City shall identify, preserve, and create linkages between wildlife habitat areas, to the extent feasible, as a key component of parks, open space, and surface water management plans.”**

As further explained in the Tree Grove ESEE Analysis (Vol. II, p. 232), the city identified 70 significant tree groves using wildlife habitat functions, connectivity and diversity as key criteria. The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEE Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. The DCA in Section 18.790.050.D include regulatory incentives and flexible standards to preserve significant tree groves (Vol II, p. 153). In utilizing these regulatory incentives and flexible standards applicants would be required to maximize the connectivity of the remaining portion of the significant tree grove under the direction of a certified arborist or landscape architect. Considerations in the Urban Forestry Manual are cross-referenced in Section 18.790.050.D to provide additional guidance for the certified arborist or landscape architect in the preservation of a connected significant tree grove. Identified significant tree groves overlap parks, open spaces and surface water

management plan areas. Significant tree groves may be preserved to create linkages between wildlife habitats areas when plans are updated for these areas, consistent with this policy. However, this application is not intended as an update to any parks, open space or surface water management plan.

## **ENVIRONMENTAL QUALITY**

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### **“GOAL:**

**6.1 Reduce air pollution and improve air quality in the community and region.”**

### **“POLICIES:**

**6. The City shall encourage the maintenance and improvement of open spaces, natural resources, and the City’s tree canopy to sustain their positive contribution to air quality.”**

The DCA in Section 18.790.050.D include regulatory incentives and flexible standards to encourage the maintenance and improvement of significant tree groves (Vol. II, p. 153). In addition, the DCA in Section 18.790.030 require the achievement of tree canopy through planting, preservation or a fee in lieu to support the city’s urban forestry program (Vol. II, p. 139). One benefit of these DCA is that they encourage the maintenance and improvement of tree canopy citywide, as further detailed in the Tree Values Memo (Vol. V, p. 149), which is well documented to have a positive contribution to air quality, consistent with this policy.

### **“GOAL:**

**6.2 Ensure land use activities protect and enhance the community’s water quality.”**

### **“POLICIES:**

**3. The City shall encourage the use of low impact development practices that reduce stormwater impacts from new and existing development.”**

The discretionary Urban Forestry Plan review (Vol. II, p. 143) allows the use of techniques that minimize hydrological impacts such as those detailed in Clean Water Services Low Impact Development Approached (LIDA) Handbook as an alternative to meeting the clear and objective Urban Forestry Plan requirements in Section 18.790.030 (Vol. II, p. 139). Therefore, the discretionary Urban Forestry Plan review option encourages the use of low impact development practices that reduce stormwater impacts from new and existing development, consistent with this policy.

**4. The City shall protect, restore, and enhance, to the extent practical, the natural functions of stream corridors, trees, and water resources for their positive contribution to water quality.”**

The DCA in Section 18.790.050.D (Vol. II, p. 153) include regulatory incentives and flexible standards to encourage the maintenance and improvement of significant tree groves. In addition, the DCA in Section 18.790.030 require the achievement of tree canopy through planting, preservation or a fee in lieu to support the city’s urban forestry program (Vol. II, p. 139). These DCA protect, restore and enhance the natural functions of trees, which have a positive contribution to water quality, as evidenced by the Tree Values Memo (Vol V, p. 149), consistent with this policy.

## **HAZARDS**

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### **“GOAL:**

**7.1 Protect people and property from flood, landslide, earthquake, wildfire, and severe weather hazards.”**

### **“POLICIES:**

10. **The City shall work with Clean Water Services to protect natural drainageways and wetlands as valuable water retention areas and, where possible, find ways to restore and enhance these areas.”**

As described in the Process Summary (Vol. I, p. 26), the city included Clean Water Services as a member of the Technical Advisory Committee for the Urban Forestry Code Revisions Project. The main purpose of Clean Water Services participation was to ensure the CPA and DCA in this application do not conflict with other standards that protect natural drainage ways and wetlands. The city and Clean Water Services determined that the standards are not in conflict. Therefore, the CPA and DCA are consistent with this policy.

- “13. **The City shall retain and restore existing vegetation with non-invasive species in areas with landslide potential to the greatest extent possible.”**

As further explained in the Tree Grove ESEE Analysis, the city identified 70 significant tree groves using the presence of non-invasive species as a key criterion (Vol. II, p. 231). The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEE Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. The significant tree grove map (Exhibit A) identifies the location of these 70 significant tree groves, many of which overlap areas with landslide potential. The DCA in Section 18.790.050. include regulatory incentives and flexible standards to retain significant tree groves (Vol. II, p. 153).

In addition, the DCA in Section 18.790.030 require the achievement of tree canopy through planting, preservation or a fee in lieu to support the city’s urban forestry program (Vol. II, p. 139). In meeting tree canopy standards, nuisance (i.e. invasive) trees are prohibited from planting by the Urban Forestry Manual. These standards support this policy by encouraging the preservation of significant tree groves with non-invasive species and prohibiting the planting of invasive tree species including within areas with landslide potential.

## **PARKS, RECREATION, TRAILS, AND OPEN SPACE**

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### **“GOAL:**

- 8.1 **Provide a wide variety of high quality park and open spaces for all residents, including both:**
  - A. **developed areas with facilities for active recreation; and**
  - B. **undeveloped areas for nature-oriented recreation and the protection and enhancement of valuable natural resources within the parks and open space system.”**

### **“POLICIES: ...**

2. **The City shall preserve and, where appropriate, acquire and improve natural areas located within a half mile of every Tigard resident to provide passive recreational opportunities.”**

As further explained in the Tree Grove ESEE Analysis, the city identified 70 significant tree groves using visibility, accessibility and educational/recreational potential as key criteria (Vol. II, p. 232). The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEE Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. The significant tree grove map (Exhibit A) identifies the location of these 70 significant tree groves, which are distributed citywide. The DCA in Section 18.790.050.D include regulatory incentives and flexible standards to retain significant tree groves (Vol. II, p. 153). These CPA and DCA support this policy by contributing to the preservation of visible, accessible

and potentially educational/recreational natural areas located within a half mile of every Tigard resident to provide passive recreational opportunities.

**“16. The City shall continue to encourage and recognize the important role of volunteers and community groups in meeting City park, trail, open space, and recreation needs, and in building stewardship and promoting community pride.”**

The Process Summary details the Citizen Advisory Committee’s role in providing recommendations to staff during the development of the CPA and DCA (Vol. I, p. 26). The Citizen Advisory Committee included representation from the Parks and Recreation Advisory Board to allow community interests relating to parks, trails, open spaces, and recreational needs to be well represented throughout the process. The CPA creating a significant tree grove map (Exhibit A) and the DCA in Title 18 are applicable to certain development actions within parks, trails, open spaces and recreational areas. Inclusion of a Parks and Recreation Advisory Board member on the Citizen Advisory Committee is supportive of this policy in that encouraged and recognized the important role of volunteers and community groups in meeting city park, trail, open space and recreational needs, and in building stewardship and promoting community pride.

**“17. The City shall maintain and manage its parks and open space resources in ways that preserve, protect, and restore Tigard’s natural resources, including rare, or state and federally listed species, and provide “Nature in the City” opportunities.”**

As further explained in the Tree Grove ESEE Analysis, the city identified 70 significant tree groves using wildlife habitat value and connectivity as a key criterion (Vol. II, p. 232). The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEE Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. The significant tree grove map (Exhibit A) identifies the location of these 70 significant tree groves, many of which overlap with city’s park and open space resources. The DCA in Section 18.790.050.D include regulatory incentives and flexible standards to preserve significant tree groves (Vol. II, p. 153). In utilizing these regulatory incentives and flexible standards, applicants are required to maximize the connectivity of the remaining portion of the significant tree grove under the direction of a certified arborist or landscape architect. While rare, state and federally listed species were not specifically inventoried as part this process, the preservation of significant tree groves is supportive of their preservation. Therefore, this policy of maintaining and managing park and open space resources in ways that preserve, protect and restore Tigard’s natural resources (including rare or state and federally listed species) and providing “Nature in the City” opportunities, is supported by the CPA and DCA aimed at the preservation of significant tree groves.

**“19. The City shall seek to establish and manage a fully functional urban forest.”**

The Urban Forestry Master Plan (Vol. V, p. 207) provides recommendations for establishing and managing a fully functional urban forest. The recommendations require CPA and DCA to implement the goals and policies in the Urban Forest section of the Comprehensive Plan. The CPA and DCA are consistent with the recommendations in the Urban Forestry Master Plan. Therefore, the city is seeking to contribute to the establishment and management of a fully functional urban forest with this application, consistent with this policy.

## **ECONOMIC DEVELOPMENT**

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### **“GOAL:**

**9.1 Develop and maintain a strong, diversified, and sustainable local economy.”**

### **“POLICIES:**

- 3. The City’s land use and other regulatory practices shall be flexible and adaptive to promote economic development opportunities, provided that required infrastructure is made available.”**

The CPA and DCA in Section 18.790.050.D include regulatory incentives and flexible standards to retain significant tree groves (Vol. II, p. 153). In addition, the DCA in Section 18.790.030 require the achievement of tree canopy through planting, preservation or a fee in lieu to support the city’s urban forestry program (Vol. II, p. 139). Therefore, the CPA and DCA have been designed to be flexible and adaptive to promote economic development opportunities and allow the provision of required infrastructure, consistent with this policy, while concurrently supporting the city’s urban forestry goals and policies.

**“GOAL:**

- 9.3 Make Tigard a prosperous and desirable place to live and do business.”**

**“POLICIES:**

- 2. The City shall adopt land use regulations and standards to ensure a well-designed and attractive urban environment that supports/protects public and private sector investments.”**

During the Urban Forestry Master Plan process the community identified the urban forest as a key component of a well-designed and attractive urban environment (Vol. V, p. 207). The CPA and DCA would create land use regulations and standards that incorporate trees and significant tree groves within the urban environment to support and protect public and private sector investments consistent with this policy.

- “3. The City shall commit to improving and maintaining the quality of community life (public safety, education, transportation, community design, housing, parks and recreation, etc.) to promote a vibrant and sustainable economy.”**

During the Urban Forestry Master Plan process, the community identified the urban forest as a key component to improving and maintaining quality of community life (Vol. V, p. 207). In addition, the Tree Values Memo describes the ability of trees to promote a vibrant and sustainable economy (Vol. V, p. 149). The CPA and DCA would create land use regulations and standards that incorporate trees and significant tree groves within the urban environment to improve and maintain the quality of community life and to promote a vibrant and sustainable economy consistent with this policy.

## **HOUSING**

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**“GOAL:**

- 10.1: Provide opportunities for a variety of housing types to meet the diverse housing needs of current and future City residents.”**

**“POLICIES:**

- 1. The City shall adopt and maintain land use policies, codes, and standards that provide opportunities to develop a variety of housing types that meet the needs, preferences, and financial capabilities of Tigard’s present and future residents.”**

Tigard’s current policies, codes and standards provide opportunities for a variety of housing types, including single-family and multi-family housing on land zoned R-1 to R-40 as well as mixed use and variations through the planned development overlay. As further explained in the Tree Grove ESFE Analysis (Vol. II, p. 219), the city identified 70 significant tree groves through the statewide Goal 5 planning process. The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEE Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are



hereby explicitly incorporated into the findings of this staff report. The significant tree grove map (Exhibit A) identifies the location of these 70 significant tree groves, many of which exist within lands zoned for residential uses. The DCA in Section 18.790.050.D include regulatory incentives and flexible standards that allow variation in housing types such as attached units to retain significant tree groves (Vol. II, p. 153).

In addition, the DCA in Section 18.790.030 would require the achievement of tree canopy through planting, preservation or a fee in lieu to support the city's urban forestry program (Vol. II, P. 139).

These CPA and DCA have been designed to be flexible and adaptive to continue to allow a variety of housing types, while concurrently supporting the city's urban forestry goals and policies. The DCA (pp. 3-184) continue to allow opportunities to develop a variety of housing types that meet the needs, preferences and financial capabilities of Tigard's present and future residents consistent with this policy.

**“GOAL:**

**10.2 Maintain a high level of residential livability.”**

**“POLICIES:**

**1. The City shall adopt measures to protect and enhance the quality and integrity of its residential neighborhoods.”**

During the Urban Forestry Master Plan process, the community identified the urban forest as a key component of the quality and integrity of the city's residential neighborhoods (Vol. V, p. 207). In addition, the Tree Values Memo describes the aesthetic, economic and social contribution of trees to residential neighborhoods (Vol. V, p. 149). The CPA and DCA would create measures to protect and enhance the quality and integrity of the city's residential neighborhoods, consistent with this policy, by incorporating trees and significant tree groves.

**“3. The City shall commit to improving and maintaining the quality of community life public safety, education, transportation, community design; a strong economy, parks and recreation, etc.) as the basis for sustaining a high-quality residential environment.”**

During the Urban Forestry Master Plan process the community identified the urban forest as a key component of a high-quality residential environment (Vol. V, p. 207). In addition, the Tree Values Memo describes the positive contribution of trees to community life, public safety, education, transportation, community design, a strong economy, parks and recreation (Vol. V, p. 149). The CPA and DCA would incorporate trees and significant tree groves into residential, commercial, industrial and institutional environments, as well as the transportation system to maximize the benefits they provide. Therefore, the CPA and DCA will have the effect of improving and maintaining the quality of community life and thereby sustaining a high quality residential environment, consistent with this policy.

**“5. The City shall encourage housing that supports sustainable development patterns by promoting the efficient use of land, conservation of natural resources, easy access to public transit and other efficient modes of transportation, easy access to services and parks, resource efficient design and construction, and the use of renewable energy resources.”**

The DCA in Section 18.790.050.D encourage sustainable development patterns that conserve natural resources through regulatory incentives and flexible standards that allow the preservation of significant tree groves (Vol. II, p. 153). These regulatory incentives and flexible standards would promote the efficient use of land by allowing reduction in minimum density, density transfer, increased building height, reduced setbacks, adjustments to Urban Forestry Plan requirements and adjustments to street and utility standards.

In addition, the discretionary Urban Forestry Plan review option (Vol. II, p. 143) promotes the use of renewable energy sources by allowing onsite energy production such as solar technologies as an alternative to meeting the clear and objective Urban Forestry Plan requirements in Section 18.790.030 (Vol. II, p. 139).

These DCA would support sustainable development patterns by promoting the efficient use of land, conservation of natural resources and the use of renewable energy sources, consistent with this policy.

**“7. The City shall ensure that residential densities are appropriately related to locational characteristics and site conditions such as the presence of natural hazards and natural resources, availability of public facilities and services, and existing land use patterns.”**

As further explained in the Tree Grove ESEE Analysis, the city identified 70 significant tree groves through the statewide Goal 5 planning process (Vol. II, p. 219). The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEE Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. The significant tree grove map (Exhibit A) identifies the location of these 70 significant tree groves, many of which exist within lands zoned for residential uses. The DCA in Section 18.790.050.D would allow reduction in minimum density as one of the methods to preserve significant tree groves in residential areas (Vol. II, p. 153). Therefore, the CPA and DCA support this policy by ensuring residential densities are appropriately related to locational characteristics and site conditions such as the presence of natural resources.

**“8. The City shall require measures to mitigate the adverse impacts from differing, or more intense, land uses on residential living environments, such as: A) orderly transitions from one residential density to another and B) protection of existing vegetation, natural resources and provision of open space areas.”**

As further explained in the Tree Grove ESEE Analysis, the city identified 70 significant tree groves using screening/buffering ability as a key criterion (Vol. II, p. 231). The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEE Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. The significant tree grove map (Exhibit A) identifies the location of these 70 significant tree groves, many of which exist within lands zones for residential uses. The DCA in Section 18.790.050.D include regulatory incentives and flexible standards to retain significant tree groves (Vol. II, p. 153). Regulatory incentives and flexible standards include allowed reduction in minimum density, density transfer, increased building height, reduced setbacks, adjustments to Urban Forestry Plan requirements and adjustments to street and utility standards. In the density transfer option, compatibility with adjacent development with the same or lower density zoning would be ensured by restricting lot size reductions to 75 percent or greater of the base residential zoning district. Also, when additional building height is allowed, applicable buffering and screening requirements would still apply

In addition, the DCA in Section 18.745.050 (Vol. II, p. 149) continue to require buffering and screening with only slight adjustments to tree spacing requirements to ensure consistency with tree spacing requirements in other chapters.

Therefore, the CPA and DCA would require measures to mitigate the adverse impacts from differing, or more intense, land uses on residential living environments by ensuring orderly transitions from one residential density to another and protecting existing vegetation, natural resources and open space areas consistent with this policy.

**“9. The City shall require infill development to be designed to address compatibility with existing neighborhoods.”**

The DCA in Section 18.790.050.D include regulatory incentives and flexible standards such as residential density transfer to retain significant tree groves (Vol. II, p. 153). In the density transfer option, compatibility with adjacent development with the same or lower density zoning would be ensured by

restricting lot size reductions to 75 percent or greater of the base residential zoning district. This would ensure compatibility with existing neighborhoods when designing infill development.

In addition, the DCA in Section 18.790.030 would require the achievement of tree canopy through planting, preservation or a fee in lieu to support the city's urban forestry program (Vol. II, p. 139). The requirements would apply to Minor Land Partitions, which are a primary contributor to infill development. As demonstrated by applying the code to infill development as part of the peer review (Vol. II, 185) and further described in the Canopy Standards memo (Vol. V, p. 159), the amount of tree canopy resulting from the recommended Development Code is estimated to be compatible with existing neighborhoods.

Therefore, the CPA and DCA are designed to require infill development to be compatible with existing neighborhoods, consistent with this policy.

## **PUBLIC FACILITIES**

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### **“GOAL:**

**11.1 Develop and maintain a stormwater system that protects development, water resources, and wildlife habitat.”**

### **“POLICIES: ...**

**7. The City shall encourage low impact development practices and other measures that reduce the amount of, and/or treat, stormwater runoff at the source.”**

The DCA in Section 18.790.050.D (Vol. II, p. 153) include regulatory incentives and flexible standards to retain significant tree groves. In addition, the DCA in Section 18.790.030 would require the achievement of tree canopy through planting, preservation or a fee in lieu to support the city's urban forestry program (Vol. II, p. 139).

In addition, the discretionary Urban Forestry Plan review option (Vol. II, p. 143) would allow the use of techniques that minimize hydrological impacts, such as those detailed in Clean Water Services LIDA Handbook, as an alternative to meeting the clear and objective Urban Forestry Plan requirements.

The Tree Values Memo (Vol. V, p. 149) documents the ability of trees to reduce and treat stormwater at the source. The Clean Water Services LIDA Handbook also documents the ability of the constructed systems detailed, within the handbook, to reduce and treat stormwater at the source. Therefore, the CPA and DCA encourage low impact development practices and other measures that reduce the amount of and/or treat stormwater at the source, consistent with this policy.

## **TRANSPORTATION**

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### **“GOAL:**

**12.1: Develop mutually supportive land use and transportation plans to enhance the livability of the community.”**

### **“POLICIES: ...**

**6. The City shall support land use patterns that reduce greenhouse gas emissions and preserve the function of the transportation system.”**

The DCA incorporate trees, and significant tree groves, within existing land uses and the transportation system (Vol. II, pp. 3-184). The Tree Values Memo details the ability of trees to reduce greenhouse gas emissions through sequestration and shading, which reduces fossil fuel consumption (Vol. V, p. 149). Therefore, the CPA and DCA support land use patterns that reduce greenhouse gas emissions and preserve the function of the transportation system, consistent with this policy.

## **ENERGY**

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**“GOAL:**

**13.1: Reduce energy consumption.”**

**“POLICIES: ...**

**3. The City shall require future development to consider topography, vegetation, and solar access during the design phase to reduce demands for artificial heating, cooling, and lighting.”**

The DCA in Section 18.790.050.D (Vol. II, p. 153) include regulatory incentives and flexible standards that would allow future development to consider retaining significant tree groves during the design phase. In addition, the DCA in Section 18.790.030 would require the achievement of tree canopy through planting, preservation or a fee in lieu to support the city’s urban forestry program (Vol. II, p. 139). These CPA and DCA have been designed to be flexible and adaptive to allow future development to consider topography, trees and solar access during the design phase.

In addition, the discretionary Urban Forestry Plan review option (Vol. II, p. 143) would allow techniques such as solar to reduce the use of fossil fuels for heating, cooling, and lighting as an alternative to meeting the clear and objective Urban Forestry Plan requirements.

The Tree Values Memo documents the ability of trees reduce demands for heating and cooling through strategic placement and shading (Vol. V, p. 149). Therefore, the flexibility in placement of trees afforded by the DCA, and the allowance of alternative techniques that minimize use of fossil fuels, is consistent with this policy, which requires future development to be designed in ways that reduce demands for artificial heating, cooling and lighting.

**“6. The City shall support energy conservation by: ...**

**D) providing flexibility in the land use process to take advantage of solar radiation.”**

The DCA in Section 18.790.030 require the achievement of tree canopy through planting, preservation or a fee in lieu to support the city’s urban forestry program (Vol. II, p. 139). These DCA have been designed to provide flexibility in tree preservation and planting to take advantage of solar radiation.

In addition, the discretionary Urban Forestry Plan review option (Vol. II, p. 143) would allow the use of onsite energy production such as solar power as an alternative to meeting the clear and objective Urban Forestry Plan requirements in Section 18.790.030 (Vol. II, p. 139).

Therefore, the DCA support energy conservation by providing flexibility in the land use process to take advantage of solar radiation, consistent with this policy.

**URBANIZATION**

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**“GOAL:**

**14.3. Promote Tigard citizens’ interests in urban growth boundary expansion and other regional and state growth management decision.”**

**“POLICIES: ...**

**3. The city shall maintain the low-density residential character of its existing single family residential neighborhoods and accommodate more intense urban land uses in its regional and town centers and within major transportation corridors to be consistent with Statewide Planning Goals and the Metro Framework Plan.”**

The DCA in Section 18.790.050.D include regulatory incentives and flexible standards such as reduction of minimum density and residential density transfer to retain significant tree groves (Vol. II, p. 153).

Reduction of minimum residential density would be allowed based on the area of significant tree grove preserved. In the density transfer option, compatibility with adjacent development with the same or lower density zoning would be ensured by restricting lot size reductions to 75 percent or greater of the base residential zoning district. This measure allows for the maintenance of the low-density residential character of existing single-family residential neighborhoods, consistent with this policy

## **SPECIAL PLANNING AREAS: DOWNTOWN**

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### **“GOAL: ...**

**15.3 Develop and Improve the Open Space System and Integrate Natural Features into downtown.”**

### **“POLICIES:**

**1. Natural resource functions and values shall be integrated into downtown urban design.”**

There are no significant tree groves in downtown Tigard, so this policy is not applicable.

### **“GOAL: ...**

**15.4 Develop comprehensive street and circulation improvements for pedestrians, automobiles, bicycles, and transit.”**

### **“POLICIES: ...**

**5. Streetscape and public area design shall focus on creating a pedestrian friendly environment without the visual dominance by automobile-oriented uses.”**

The DCA to Chapter 18.745.040 would continue to require street trees in downtown Tigard. Street trees enhance the pedestrian environment as further explained by the Tree Values Memo (Vol. V, p. 149). Therefore, the DCA contribute to streetscape and public area design that create a pedestrian friendly environment, consistent with this policy.

**CONCLUSION:** Based on the analysis above, staff finds that the CPA and DCA in Volume II are consistent with the applicable goals and policies contained in the City of Tigard Comprehensive Plan.

## **APPLICABLE METRO URBAN GROWTH MANAGEMENT FUNCTIONAL PLAN TITLES**

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**Metro Functional Plan Title 1 – “The Regional Framework Plan calls for a compact urban form and a “fair-share” approach to meeting regional housing needs. It is the purpose of Title 1 to accomplish these policies by requiring each city and county to maintain or increase its housing capacity except as provided in section 3.07.120.”**

To meet Title 1, each jurisdiction was required to determine its housing capacity and adopt minimum density requirements. Tigard adopted an 80% of minimum density requirement for development in 1998, which means that a development must build 80% of the maximum units allowed by the zoning designation. As provided in Section 3.07.120, a city or county may reduce the minimum-zoned capacity to protect natural resources.

The CPA would establish an overlay district for 70 significant tree groves covering 527 acres. As further described in the Tree Grove ESEF Analysis (Vol. II, p. 219), Goal 5 rule requirements would allow significant tree groves within the overlay to be eligible for the recommended incentives and flexible standards for preservation in Section 18.790.050.D. The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEF Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. The recommended incentives and flexible standards would allow for the full development of property under current zoning. Alternatively, the significant tree grove portion of a site may be removed

from the minimum density calculation, reducing the density of the site, as allowed in Section 3.07.120 of Title 1.

In addition, the DCA in Section 18.790.030 require the achievement of tree canopy through planting, preservation or a fee in lieu to support the city's urban forestry program (Vol. II, p. 139). These DCA have been designed to be flexible and adaptive to continue to allow for a compact urban form and a fair-shared approach to meeting regional housing needs, consistent with Metro Title 1.

**Metro Functional Plan Title 3 – “To protect the beneficial water uses and functions and values of resources within the Water Quality and Flood Management Areas by limiting or mitigating the impact on these areas from development activities and protecting life and property from dangers associated with flooding.”**

In 2002, the City of Tigard adopted CPA and DCA amendments to comply with Title 3 of Metro's Urban Growth Management Functional Plan. Title 3 protects the region's health and public safety by reducing flood and landslide hazards, controlling soil erosion and reducing pollution of the region's waterways. Title 3 implements Statewide Planning Goals 5, 6 and 7 by protecting streams, rivers, wetlands and floodplains by avoiding, limiting or mitigating development impacts on these areas. The areas subject to these requirements have been mapped and adopted by the Metro Council, specifically, the FEMA 100-year floodplain and the area of inundation for the February 1996 flood. Title 3 also protects rivers and streams with buffers that are typically 50 feet wide, requires erosion and sediment control, planting of native vegetation on stream banks when new development occurs and prohibits the storage of new uses of uncontained hazardous material in water quality areas. Title 3 results in significant protection and enhancement of that portion of the urban forest in streams and floodways.

The DCA in Section 18.790.050.D (Vol. II, p. 153) include regulatory incentives and flexible standards to encourage the preservation of significant tree groves. In addition, the DCA in Section 18.790.030 would require the achievement of tree canopy through planting, preservation or a fee in lieu to support the city's urban forestry program (Vol. II, p. 139). While these CPA and DCA are not required to meet Title 3, they would result in the planting, preservation and maintenance of trees, which support water quality, flood management and fish and wildlife conservation, as evidenced by the Tree Values Memo (Vol. V, p. 149), consistent with Metro Title 3.

**Metro Functional Plan Title 12 -- “The purpose of Title 12 is to help implement the policy of the Regional Framework Plan to protect existing residential neighborhoods from air and water pollution, noise and crime and to provide adequate levels of public services.”**

Title 12 protects residential neighborhoods by prohibiting cities from increasing density in certain areas, providing access to commercial services within neighborhoods while not creating excessive traffic, noise or air pollution. It also requires safe and convenient walking/biking access to schools, parks and greenspaces for city residents.

During the Urban Forestry Master Plan process, the community identified the urban forest as a key component of residential neighborhoods (Vol. V, p. 207). In addition, the Tree Values Memo describes the positive contribution of trees to preventing air and water pollution, noise and crime (Vol. V, p. 149). The CPA and DCA would incorporate trees and significant tree groves into residential neighborhoods while allowing for the provision of adequate levels of public services, consistent with Metro Title 12.

**Metro Functional Plan Title 13 – “The purposes of this program are to (1) conserve, protect, and restore a continuous ecologically viable streamside corridor system, from the streams' headwaters to their confluence with other streams and rivers, and with their floodplains in a manner that is integrated with upland wildlife habitat and with the surrounding urban landscape; and (2) to control and prevent water pollution for the protection of the public health and safety, and to maintain and improve water quality throughout the region.”**

One of the results of Title 13 was the creation, in the City of Tigard, of 588 acres of habitat designated as “highest” value (i.e. Metro inventoried Class I and II riparian resources within the Clean Water Services Vegetated Corridor). An estimated 370 acres of Class I and II riparian habitat situated outside the Clean Water Services’ vegetated corridor are designated as “moderate” value. In addition, 422 acres of non-Class I and II riparian resources within the city are designated as “lowest” value, including both upland forests and lower-value riparian habitat areas. The highest and moderate value habitats are currently protected through other regulatory processes and agencies such as Clean Water Services. The lowest value habitat consists of primarily upland forests and is currently vulnerable to development. Approximately 22% or 118 acres of the significant tree groves are located on buildable lands outside of Title 3 sensitive lands and overlap with the lowest value habitat described above.

The CPA would establish an overlay district for 70 significant tree groves covering 527 acres. As further described in the Tree Grove ESEE Analysis (Vol. II, p. 219), Goal 5 rule requirements would allow significant tree groves within the overlay to be eligible for the recommended incentives and flexible standards for preservation in Section 18.790.050.D. The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEE Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. Regulatory incentives and flexible standards include allowed reduction in minimum density, density transfer, increased building height, reduced setbacks, adjustments to Urban Forestry Plan requirements and adjustments to street and utility standards.

Although the city is in compliance with Title 13, the regulatory incentives and flexible standards that facilitate the preservation of significant tree groves are consistent with and supportive of Metro Title 13, particularly with regards to preserving vulnerable upland habitat designated through Title 13.

**CONCLUSION:** Based on the analysis above, staff finds that the CPA and DCA in Volume II are consistent with the applicable Metro regulations.

## **FEDERAL OR STATE STATUTES OR REGULATIONS**

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### **Federal Endangered Species Act**

In 1973, the Federal Government passed the Endangered Species Act to protect and recover imperiled species and the ecosystems on which they depend. Under Statewide Planning Goal 5, local governments are required to obtain current habitat inventory information for wildlife habitat inventories. Tigard previously adopted the significant habitat areas map, based on the inventory of regionally significant riparian corridors and wildlife habitat completed by Metro in 2002.

The city identified 70 significant tree groves using wildlife habitat value and connectivity as a key criterion as further explained in the Tree Grove ESEE Analysis (Vol. II, p. 232). The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEE Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. The significant tree grove map (Exhibit A) identifies the location of these 70 significant tree groves.

The DCA in Section 18.790.050.D include regulatory incentives and flexible standards to preserve significant tree groves (Vol. II, p. 153). In utilizing these regulatory incentives and flexible standards, applicants are required to maximize the connectivity of the remaining portion of the significant tree grove under the direction of a certified arborist or landscape architect. While endangered species were not specifically inventoried as part this process, the preservation of significant tree groves is supportive of their preservation to the extent that they depend on these habitats. Therefore, the CPA and DCA, for the preservation of significant tree groves, contribute to the protection of wildlife habitat in support of the Endangered Species Act.

## **Federal Clean Water Act**

The Federal Clean Water Act regulates impacts to wetlands and other navigable waters of the United States. The State Department of Environmental Quality is also charged with establishing standards, regulating and monitoring Oregon's waters for compliance with the Federal Clean Water Act and National Pollutant Discharge Elimination System. Within Tigard, runoff from impervious surfaces, pet waste and erosion/ sedimentation are the most problematic sources of water pollution.

The DCA in Section 18.790.050.D include regulatory incentives and flexible standards to facilitate the preservation of significant tree groves (Vol. II, p. 153). In addition, the DCA in Section 18.790.030 require the achievement of tree canopy through planting, preservation or a fee in lieu to support the city's urban forestry program (Vol. II, p. 139). These DCA would result in the preservation and planting of trees, which have a positive contribution to water quality, as evidenced by the Tree Values Memo (Vol. V, p. 149). While the CPA and DCA in this application are not required for compliance, they are supportive of Federal Clean Water Act requirements.

## **Federal Migratory Bird Treaty Act**

The Migratory Bird Treaty Act is a federal law administered by US Fish and Wildlife that protects specifically listed species of birds. The CPA and DCA address the preservation, planting, and maintenance of trees. When removing trees, it is the sole responsibility of applicants to comply with all applicable state and federal regulations such as the Migratory Bird Treaty Act.

Implementing federal regulations to protect listed species of birds is out of scope for this application, and therefore the Federal Migratory Bird Treaty Act is not applicable.

**Oregon Department of Transportation (ODOT)** ODOT manages approximately 283 acres of right of way in the City of Tigard, including Hall Boulevard, Highways 217 and 99-W and Interstate 5. State Bulletin RD06-03(B) provides specifications for street tree placement and maintenance in ODOT rights of way. These specifications are intended to balance the need for safety along state roadways with the planting and maintenance of street trees.

ODOT served on the Technical Advisory Committee for the Urban Forestry Code Revisions Project. One of the purposes of ODOT's participation was to meet a project goal of clarifying jurisdictional requirements. The city and ODOT met this goal by defining street and median trees as trees within right of way under City of Tigard jurisdiction in Chapter 18.120 (Vol. II, p. 27). This recommended development code amendment would clarify that trees within ODOT right of way are under ODOT jurisdiction. Since the city and ODOT have differing standards for street tree planting, the DCA would ensure consistency with ODOT requirements by allowing each jurisdiction to apply its regulations separately in right of ways under its jurisdiction.

**CONCLUSION:** Based on the analysis above, staff finds that the CPA and DCA in Volume II support (or do not conflict) with state or federal regulations. All affected agencies have been notified of the recommended amendments and have been given the opportunity to comment.

## **STATEWIDE PLANNING GOALS**

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**Statewide Planning Goal 1, Citizen Involvement**, outlines the citizen involvement requirements for adoption of, and changes to the Comprehensive Plans and implementing documents.

As described in the Process Summary, the city has provided Tigard citizens, affected agencies and other jurisdictions multiple and varied opportunities to participate in all phases of the urban forestry planning process (Vol. I, p. 26). This included 11 Citizen Advisory Committee meetings where people representing diverse interests and viewpoints discussed and reviewed code concepts and code language at 11 meetings hosted by an independent facilitator. In addition, the Technical Advisory Committee, which included representatives from multiple city departments such as Public Works and Community Development, and



outside agencies such as the ODOT and Clean Water Services, met 14 times to discuss and review code concepts and language resulting from the Citizen Advisory Committee process.

The city identified 70 significant tree groves through the statewide Goal 5 planning process as further explained in the Tree Grove ESEE Analysis (Vol. II, p. 219). The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEE Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. The significant tree grove map (Exhibit A) identifies the location of these 70 significant tree groves.

In addition, 14,225 public hearing notices consistent with Measure 56 were sent to all Tigard property owners on January 13, 2012. Public hearing notices were also provided to interested parties on January 17, 2012, to affected agencies on January 20, 2012, and published in the Tigard Times on January 19, 2012.

The recommended amendments were further considered through the public hearing process at the Planning Commission and will be considered by City Council prior to adoption. Citizen involvement opportunities utilized to create the CPA and DCA have been consistent with Statewide Planning Goal 1.

**Statewide Planning Goal 2, Land Use Planning**, establishes a land use planning process and policy framework as a basis for all decisions and actions related to use of land and to assure an adequate factual base for such decisions and actions.

The city identified 70 significant tree groves through the statewide Goal 5 planning process as further explained in the Tree Grove ESEE Analysis (Vol. II, p. 219). The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEE Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. The significant tree grove map (Exhibit A) identifies the location of these 70 significant tree groves.

The CPA and DCA are being processed as a Type IV procedure, which requires any applicable Statewide Planning Goals, federal or state statutes or regulations, METRO regulations, Comprehensive Plan policies and city's implementing ordinances, be addressed as part of the decision-making process. All applicable review criteria have been addressed within this staff report. Therefore, the requirements of Statewide Planning Goal 2 have been met.

**Statewide Planning Goal 5, Natural Resources**, requires the inventory and protection of natural resources, open spaces, historic areas and sites suitable for removal and processing of mineral and aggregate resources.

The CPA would establish an overlay district for 70 significant tree groves covering 527 acres in compliance with Goal 5 rule requirements. As further explained in the Tree Grove ESEE Analysis, key evaluation criteria in the inventory and selection of significant tree groves were grove maturity/tree size, grove size, health/viability, visibility, screening and buffering, accessibility, rarity, educational/recreational potential, wildlife habitat value and connectivity and the amount of existing disturbance (Vol. II, p. 219). The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEE Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report.

During the inventory phase, all property owners with an inventoried tree grove on their property were provided notice, compliant with Goal 5 rule requirements. As part of the notice, property owners were invited to a tree grove open house, which was held on October 6, 2010, to learn more and provide feedback about the process.

The DCA in Section 18.790.050.D (Vol. II, p. 153) include regulatory incentives and flexible standards that allow for the preservation of significant tree groves.

Therefore, the CPA and DCA for significant tree groves would result in a limited protection program in compliance with Statewide Planning Goal 5.

Goal 5 requirements are not applicable to recommended code amendments that support general urban forest enhancement activities, such as tree planting and preservation, when not associated with significant tree groves. These activities do not create or amend a resource list or land use regulation adopted in order to protect a Goal 5 resource.

**Statewide Planning Goal 6, Air, Water and Land Resource Quality**, requires the maintenance and improvement of the quality of the air, water and land resources of the state

The city identified 70 significant tree groves through the statewide Goal 5 planning process as further explained in the Tree Grove ESEF Analysis (Vol. II, p. 219). The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEF Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. The significant tree grove map (Exhibit A) identifies the location of these 70 significant tree groves. The DCA in Section 18.790.050.D include regulatory incentives and flexible standards to encourage the maintenance and improvement of significant tree groves (Vol. II, p. 153).

In addition, the DCA in Section 18.790.030 require the achievement of tree canopy through planting, preservation or a fee in lieu to support the city's urban forestry program (Vol. II, p. 139). One benefit of these DCA is they encourage the maintenance and improvement of tree canopy citywide, which as further detailed in the Tree Values Memo (Vol. V, p. 149), is well documented to have a positive contribution to air quality. Therefore, the CPA and DCA are consistent with Statewide Planning Goal 6.

**Statewide Planning Goal 7, Areas Subject to Natural Hazards**, requires the protection of life and property from natural disasters and hazards.

The city identified 70 significant tree groves through the statewide Goal 5 planning process as further explained in the Tree Grove ESEF Analysis (Vol. II, p. 219). The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEF Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. The significant tree grove map (Exhibit A) identifies the location of these 70 significant tree groves, many of which overlap areas subject to natural hazards.

In addition, the DCA in Section 18.790.030 require the achievement of tree canopy through planting, preservation or a fee in lieu to support the city's urban forestry program (Vol. II, p. 139). In meeting tree canopy standards, trees may be planted or preserved in lands subject to natural hazards.

One benefit of these CPA and DCA is that tree roots, canopies and leaf litter have the ability to prevent erosion and thereby protect areas subject to natural hazards. This is more fully described in the Tree Values Memo (Vol. V, p. 149). Therefore, the CPA and DCA are consistent with, and supportive of Statewide Planning Goal 7.

**Statewide Planning Goal 8, Recreational Opportunities**, requires satisfaction of the recreational needs of the citizens of the state and visitors.

The city identified 70 significant tree groves using visibility, accessibility and educational/recreational potential as key criteria as further explained in the Tree Grove ESEF Analysis (Vol. II, p. 232). The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5

ESEE Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. The significant tree grove map (Exhibit A) identifies the location of these 70 significant tree groves, many of which overlap with the city's parks and open space resources.

The DCA in Section 18.790.050.D (Vol. II, p. 153) include regulatory incentives and flexible standards to preserve significant tree groves. In utilizing these regulatory incentives and flexible standards, applicants are required to maximize the connectivity and viability of the remaining portion of the significant tree grove under the direction of a certified arborist or landscape architect.

Significant tree groves provide opportunities for passive and active recreational opportunities for citizens of the state. Therefore, the CPA and DCA are consistent with Statewide Planning Goal 8.

**Statewide Planning Goal 9, Economic Development,** requires provision of adequate opportunities throughout the state for a variety of economic activities vital to public health, welfare and prosperity.

The city identified 70 significant tree groves through the statewide Goal 5 planning process as further explained in the Tree Grove ESEE Analysis (Vol. II, p. 219). The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEE Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. The significant tree grove map (Exhibit A) identifies the location of these 70 significant tree groves. The DCA in Section 18.790.050.D include regulatory incentives and flexible standards to preserve significant tree groves (Vol. II, p. 153).

In addition, the DCA in Section 18.790.030 require the achievement of tree canopy through planting, preservation or a fee in lieu to support the city's urban forestry program (Vol. II, p. 139).

These CPA and DCA have been designed to be flexible and adaptive to promote economic development opportunities and allow the provision of required infrastructure, consistent with Statewide Planning Goal 9.

**Statewide Planning Goal 10, Housing,** requires balancing the needs of tree and forest planting and preservation with the need for housing and efficient use of urban land.

The city identified 70 significant tree groves through the statewide Goal 5 planning process as further explained in the Tree Grove ESEE Analysis (Vol. II, p. 219). The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEE Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. The DCA in Section 18.790.050.D include regulatory incentives and flexible standards that allow for the preservation of significant tree groves (Vol. II, p. 153). Regulatory incentives and flexible standards also provide for needed housing and promote the efficient use of land by allowing density transfer, increased building height, reduced setbacks, adjustments to Urban Forestry Plan requirements and adjustments to street and utility standards.

In addition, the DCA in Section 18.790.030 provide flexibility for meeting tree canopy requirements through planting, preservation or a fee in lieu to support the city's urban forestry program (Vol. II, P. 139). This would allow applicants to design sites efficiently while providing needed housing and incorporating trees.

Therefore, the CPA and DCA are consistent with and supportive of Statewide Planning Goal 10 while meeting the city's urban forestry goals.

**Statewide Planning Goal 11, Public Facilities/Services**, requires planning and development of a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development.

The city identified 70 significant tree groves through the statewide Goal 5 planning process as further explained in the Tree Grove ESEE Analysis (Vol. II, p. 219). The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEE Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. The DCA in Section 18.790.050.D include regulatory incentives and flexible standards that allow for the preservation of significant tree groves (Vol. II, p. 153). Regulatory incentives and flexible standards would allow adjustments to street and utility standards.

In addition, the DCA in Section 18.790.030 provide flexibility for meeting tree canopy requirements through planting, preservation or a fee in lieu to support the city's urban forestry program (Vol. II, p. 139).

Therefore, the CPA and DCA are consistent with and supportive of Statewide Planning Goal 11 because they allow maximum flexibility for the efficient arrangement of public facilities while incorporating trees.

**Statewide Planning Goal 12, Transportation**, requires provision of a safe, convenient and economic transportation system.

The city identified 70 significant tree groves through the statewide Goal 5 planning process as further explained in the Tree Grove ESEE Analysis (Vol. II, p. 219). The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEE Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. As stated above, the DCA in Section 18.790.050.D include regulatory incentives and flexible standards that allow for the preservation of significant tree groves (Vol. II, p. 153). Regulatory incentives and flexible standards would allow adjustments to street and utility standards.

In addition, the DCA in Section 18.790.030 provide flexibility for meeting tree canopy requirements through planting, preservation or a fee in lieu to support the city's urban forestry program (Vol. II, p. 139).

Therefore, the CPA and DCA are consistent with, and supportive of Statewide Planning Goal 12 because they allow maximum flexibility for a safe, convenient and economic transportation system while incorporating trees.

**Statewide Planning Goal 13, Energy Conservation**, requires land and uses developed on the land to be managed and controlled to maximize the conservation of all forms of energy, based upon sound economic principles.

The city identified 70 significant tree groves through the statewide Goal 5 planning process as further explained in the Tree Grove ESEE Analysis (Vol. II, p. 219). The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEE Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. The DCA in Section 18.790.050.D include regulatory incentives and flexible standards that allow for the preservation of significant tree groves (Vol. II, p. 153). In addition, the DCA in Section 18.790.030 require the achievement of tree canopy through planting, preservation or a fee in lieu to support the city's urban forestry program (Vol. II, p. 139).

In addition, the discretionary Urban Forestry Plan review option (Vol. II, p. 143) allows the use techniques such as solar power generation that minimize the use of fossil fuels an alternative to meeting the clear and objective Urban Forestry Plan requirements in Section 18.790.030.

The Tree Values Memo documents the ability of trees to reduce energy demands through strategic placement and shading (Vol. V, p. 149). Therefore, the flexibility in placement of trees afforded by the DCA, and the allowance of alternative techniques that minimize use of fossil fuels, are consistent with Statewide Planning Goal 13, which seeks to maximize energy conservation based on sound economic principles.

**Statewide Planning Goal 14, Urbanization**, requires provision for an orderly and efficient transition from rural to urban land use, to accommodate urban population and urban employment inside urban growth boundaries, to ensure efficient use of land and to provide for livable communities.

The city identified 70 significant tree groves through the statewide Goal 5 planning process as further explained in the Tree Grove ESEE Analysis (Vol. II, p. 219). The analyses and conclusions found in the Statewide Planning Goal Analysis section of the Tigard Goal 5 ESEE Analysis for Significant Tree Groves (page 3-4 through 3-58) explains how the city adhered to the Goal 5 process and meets the applicable criteria. Those analyses and conclusions are hereby explicitly incorporated into the findings of this staff report. The DCA in Section 18.790.050.D include regulatory incentives and flexible standards that allow for the preservation of significant tree groves (Vol. II, p. 153). Regulatory incentives and flexible standards would allow density transfer, increased building height, reduced setbacks, adjustments to Urban Forestry Plan requirements and adjustments to street and utility standards.

In addition, the DCA in Section 18.790.030 provide flexibility for meeting tree canopy requirements through planting, preservation or a fee in lieu to support the city's urban forestry program (Vol. II, p. 139).

Therefore, the CPA and DCA provide flexibility in tree preservation and planting strategies to allow for the efficient use of land to accommodate urban population and employment within the urban growth boundary, consistent with Statewide Planning Goal 14.

**Inapplicable Statewide Planning Goals** include Goal 3 (Agricultural Lands) and Goal 4 (Forest Lands) because they address rural land outside the Metro Urban Growth Boundary; Goal 15 (Willamette River Greenway), because the Willamette River does not flow through Tigard; and Goals 16 (Estuarine Resources), 17 (Coastal Shorelines), 18 (Beaches and Dunes), and 19 (Ocean Resources), because they relate to Oregon's coastal resources.

**CONCLUSION:** Based on the analysis above, staff finds that the recommended amendments are consistent with the applicable Statewide Planning Goals.

## **SECTION V. CITIZEN COMMENTS**

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Comments were received in response to the Measure 56 notice to all city property owners and public hearing notices to interested parties. These comments were provided to the Planning Commission when received during their portion of the legislative adoption process and will be provided to City Council when received during their portion of the legislative adoption process. All citizen comments are available in the project record.

## **SECTION VI. AGENCY COMMENTS**

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**Metro – Land use and Planning, Washington County Department of Land Use & Transportation, U.S. Army Corps of Engineers, Oregon Department of State Lands, Oregon Department of Land Conservation and Development, and Oregon Department of Environmental Quality, Tualatin Valley Fire & Rescue, Tigard-Tualatin School District 23J** were given the opportunity to review this proposal and submitted no comments or objections.

**The cities of Tualatin, Lake Oswego, Beaverton, King City and Durham** were given the opportunity to review this proposal and submitted no comments or objections.

**Oregon Department of Transportation and Clean Water Services** have reviewed the proposal as members of the Technical Advisory Committee and provided input that contributed to the recommended amendments.

**Oregon Department of Fish and Wildlife** provided comments, which were provided to the Planning Commission and are available in the project record.

**Verizon, Comcast Cable Corp, Qwest Communications, Portland General Electric and NW Natural Gas Company** were given the opportunity to review this proposal and submitted no comments or objections.

\_\_\_\_\_  
PREPARED BY: Gary Pagenstecher  
Associate Planner

\_\_\_\_\_  
DATE

\_\_\_\_\_  
REVIEWED BY: Ron Bunch  
Community Development Director

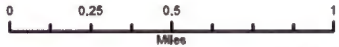
\_\_\_\_\_  
DATE

# Significant Tree Groves

## City of Tigard

70 groves

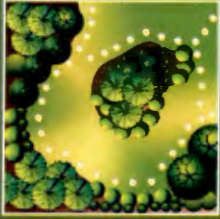
527 acres



March 20, 2012

- Significant Tree Grove
- Significant Habitat
- Tigard City Boundary
- Taxlot Boundary

City of Tigard Urban Forestry Code Revisions | Volume II | 461



City of Tigard

# Urban Forestry Code Revisions Project

VOLUME III | NON LAND USE ELEMENTS | JULY 2012

**City of Tigard**  
COMMUNITY DEVELOPMENT DEPARTMENT  
13125 SW Hall Blvd., Tigard, OR 97223  
[www.tigard-or.gov/trees](http://www.tigard-or.gov/trees)





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## Organization of the Urban Forestry Code Revisions Documents

The Urban Forestry Code Revisions project is presented in five volumes. Volume I provides the project overview and describes the process used to develop all of the elements. Volume II is the land use elements of the code, and Volume III the non land use elements. Volume IV contains the Urban Forestry Manual. Volume V contains technical reports and research that contributed to the code revisions along with details of the public input and deliberations to date.

### Volume I | Project Overview

**Project Overview** includes the following sections:

- Project Introduction
- Overview of Key Elements
- Key Element Summaries
  - Urban Forestry Standards for Development
  - Tree Grove Preservation Incentives
  - Tree Permit Requirements
  - Hazard Trees
  - Urban Forestry Manual

**Appendix A** includes additional detail about the information used to shape the Urban Forestry Code Revisions Project, and includes the following sections:

- Process summary
- Summary of Community Ideas and Concerns
- Summary of Planning Commission Deliberations
- Existing Conditions

### Volume II | Land Use Elements

**Community Development Code (Title 18)** is the Planning Commission's recommended draft of the Development Code. This section includes commentary on the amendments.

**Peer Review** demonstrates how the Planning Commission's recommended draft of the Development Code and Urban Forestry Manual will work in application.

**Tree Grove ESEE Analysis** is a report that addresses Statewide Planning Goal 5 - Natural Resources requirements for the preservation of Significant Tree Groves.

**Staff Report and findings** includes the staff recommendation for approval of the land use elements (Title 18 and the Comprehensive Plan Amendment) and the findings that demonstrate the land use elements meet the necessary approval criteria.

### Volume III | Non Land Use Elements

**Tigard Municipal Code** is the staff proposed draft of the Municipal Code (Title 8 and other Municipal Code titles). This section includes commentary on the amendments.

### Volume IV | Urban Forestry Manual (Administrative Rules)

**Urban Forestry Manual** consists of administrative rules that implement the technical details of the urban forestry related code provisions in Title 8, Title 18 and other applicable titles in the Tigard Municipal Code.

### Volume V | Additional Background Materials

**Planning Commission Deliberations** details Planning Commission discussion and decisions during the public hearing process.

**Amendment Requests Document for the Planning Commission** lists code amendment requests received in response to the first Planning Commission public hearing and staff responses.

**Outstanding Issues for the Urban Forestry Code Revisions** includes additional information on the outstanding issues that were further deliberated by the Planning Commission before making their final recommendation to City Council on May 7, 2012.

**Log of Input** lists the input received and any code changes from the last meeting of the CAC to the staff proposed draft of the Urban Forestry Code Revisions to Planning Commission.

**CAC Guiding Principles** includes the consensus view of the Citizens Advisory Committee (CAC) developed to help guide the legislative adoption process.

**Tree Values** includes information and current research on the environmental, economic, social and aesthetic benefits of trees.

**Canopy Standards** explains the reasons for adopting tree canopy cover requirements as well as the methods used to arrive at the requirements.

**Soil volume** details research about the soil volume required to support a mature tree canopy.

**Tree Canopy Fee** discusses research used to develop a square foot value for tree canopy.

**Regulatory Comparison** is an excerpted report prepared by Metro and the Audubon Society that summarizes and compares regional urban forestry programs and regulations.

**Urban Forestry Master Plan** is the City of Tigard's recommended plan for achieving the urban forestry goals in the Comprehensive Plan.

# Tigard Municipal Code – Staff Recommendation

## How to Read This Section

This section is organized by Municipal Code chapter number. Odd-numbered pages show the existing language with staff recommended amendments. Text that is recommended to be added to the code is shown with double underlines. Text that is recommended to be deleted is shown with strikethrough.

Even-numbered pages contain commentary on the amendments, which establish, in part, the legislative intent in adopting these amendments. Staff recommends focusing on the commentary to gain a better understanding of the purpose of the code amendments.

The Urban Forestry Manual consists of administrative rules that implement the details of the urban forestry related code provisions in Title 8, Title 18 and other applicable titles in the Tigard Municipal Code. Section 8.02.040 of the Tigard Municipal Code enables administrative rulemaking for the Urban Forestry Manual. The city manager is authorized to adopt and amend the Urban Forestry Manual according to the procedures in Chapter 2.04 after council adoption of Section 8.02.040. The Urban Forestry Manual is referenced as if it has already been adopted in order to demonstrate how it relates to the code.

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## Commentary

### 1.16 Civil Infractions

Currently, the “illegal tree removal” section in Chapter 18.790 outlines penalties for tree violations. As part of the city’s Regulatory Improvement Initiative, similar code items are being consolidated wherever possible. Rather than retaining penalties for tree violations in Chapter 18.790, they are being moved to Chapter 1.16, where nuisance infractions are already consolidated. Penalties for violations of Title 8 (Urban Forestry) are also outlined in Chapter 1.16.

The table of contents for Articles I, II, III, and IV of Chapter 1.16 are unchanged. See Section 1.16.640 for code amendments.

**Sections:** **Chapter 1.16 CIVIL INFRACTIONS.**

**ARTICLE I. GENERAL PROVISIONS**

[No change to table of contents.]

**ARTICLE II. JUDICIAL ENFORCEMENT**

[No change to table of contents.]

**ARTICLE III. ADMINISTRATIVE ENFORCEMENT**

[No change to table of contents.]

**ARTICLE IV. PENALTIES, FEES AND COSTS**

[No change to table of contents.]

Commentary

1.16 Article I. General Provisions

Articles I, II and III are unchanged. Article IV, Sections 1.16.600 through 1.16.630 are unchanged.

**ARTICLE I. GENERAL PROVISIONS**

[No change.]

**ARTICLE II. JUDICIAL ENFORCEMENT**

[No change.]

**ARTICLE III. ADMINISTRATIVE ENFORCEMENT**

[No change.]

**ARTICLE IV. PENALTIES, FEES AND COSTS**

**1.16.600 through 1.16.630**

[No change.]



## Commentary

### 1.16.640 Penalties and Fees—Amounts to be Assessed

Violations of Title 8 (Urban Forestry) and Title 18 (Community Development Code) are Class 1 civil infractions. Penalties for Class 1 civil infractions are contained in Section 1.16.640.A.

Existing Chapter 18.790 outlines additional penalties for illegal tree removal, which includes a civil penalty of up to \$500, an additional penalty for the appraised value of the tree and mitigation based on the size of tree removed. These additional penalties recognize the significant value that trees provide to the community and the fact that once a mature tree is removed, it cannot be replaced.

Based on community discussions, additional penalties for illegal tree removal are still warranted. However, flexibility in the penalty amount is desired so that the city has the ability to scale the penalty based on the circumstances surrounding a particular case. A maximum penalty is desired to protect citizens from disproportionate amounts.

During the development process, unauthorized moving, removing or damaging of tree protection fencing and failure to provide required arborist inspection reports have been chronic issues. In many cases, it is less expensive for violators to not comply, rather than hire an arborist as required. A minimum penalty that is more than the cost of hiring an arborist will incentivize compliance and reduce city staff time and resources associated with enforcement.

In addition to the general Class 1 civil infraction penalties for noncompliance with Titles 8 and 18, the following specific penalties for the specific violations described above are:

- A minimum fine of \$250 for illegal tree removal and a maximum fine of the cost to plant and maintain for three years per tree care industry standards and the standards in the Urban Forestry Manual a number of 1 ½ caliper trees equal to the diameter of the tree removed;
- A minimum fine of \$250 and maximum fine of \$500 for unauthorized moving, removing or damaging of tree protection fencing; and
- A minimum fine of \$250 and maximum fine of \$500 for each late or omitted tree protection inspection reports.

**1.16.640 Penalties and Fees—Amounts to be Assessed**

The civil penalty or administrative fee to be assessed for a specific infraction shall be as follows:

- A. For Class 1 infractions,
1. An amount not to exceed \$250 per day under either the judicial or the administrative enforcement process; or
  2. Under the administrative enforcement process, an amount:
    - a. Computed in a manner established by administrative rule pursuant to 1.16.105.
    - b. For the entire period the violation exists and not for each day of the violation; or
    3. For the specific urban forestry violations listed in Section 8.02.030.F, an amount remitted into the Urban Forestry Fund for tree planting and early establishment:
      - a. Not less than \$250 per unlawfully removed tree and not more than the city's cost to plant and maintain for three years an equivalent number of 1 ½ inch caliper trees with a combined caliper equal to the DBH of each unlawfully removed tree;
      - b. Not less than \$250 and not more than \$500 for damaging, moving or removing a tree protection fence;
      - c. Not less than \$250 and not more than \$500 for each failure to provide inspection reports by the project arborist or landscape architect.
- B. For Class 2 infractions, an amount not to exceed \$150 per day;
- C. For Class 3 infractions, an amount not to exceed \$50 per day. (Ord. 86-20 §1(Exhibit A(8)(D)), 1986).

**1.16.650 through 1.16.710**

[No change.]

## Commentary

### 6.01 General Provisions and Penalties

The purpose of Title 6 is to consolidate all nuisance violations into one place for ease of use. This is also consistent with the Regulatory Improvement Initiative. A nuisance is broadly defined as any non-criminal violation of the code that affects public health, safety and peace.

Sections 6.01.020 (Definition of Noxious Vegetation), 6.02.030 (Trees and Bushes) and 6.02.040 (Greenway Maintenance) contain provisions that address hazard trees. These provisions are slightly revised for consistency with hazard tree provisions in Title 8.

**Chapter 6.01**

**GENERAL PROVISIONS AND PENALTIES**

<b>6.01.010</b>	<b>Short Title</b>
<b>6.01.020</b>	<b>Definitions</b>
<b>6.01.030</b>	<b>Nuisances Designated–Class I Civil Infraction</b>
<b>6.01.040</b>	<b>Penalty for Violation of This Title</b>
<b>6.01.050</b>	<b>Administrative Rules</b>
<b>6.01.060</b>	<b>Enforcement–Minimum Requirements</b>

**6.01.010 Short Title**

[No change]

**6.01.020 Definitions**

As used in this title:

A. through K.

[No change.]

Commentary

6.01.020

Definitions

This amendment is designed to replace a list of items with an inclusive term (vegetation) to avoid identification of trees and stumps that might otherwise be beneficial for wildlife habitat and/or erosion control, and are not “likely to cause fire”.

L. “Noxious vegetation” means:

1. Weeds more than 10 inches high;
2. Grass more than 10 inches high and not within the exception stated in paragraph 9 of this subsection;
3. Poison oak, poison ivy or similar vegetation;
4. ~~Dead trees, dead bushes, stumps and any other thing~~ Vegetation that is likely to cause fire;
5. Blackberry bushes that extend into a right-of-way or across a property line;
6. Vegetation that is a health hazard;
7. Vegetation that is a health hazard because it impairs the view of the right-of-way or otherwise makes use of the right-of-way hazardous.
8. Any of the following invasive and noxious plants: *Hedera helix* L. (English ivy), *Heracleum mantegazzianum* (giant hogweed), *Lythrum salicaria* L. (purple loosestrife), *Polygonum cuspidatum* (Japanese knotweed), *Rubus discolor* (Himalayan blackberry);
9. "Noxious vegetation" does not include vegetation that constitutes an agricultural crop, unless that vegetation is a health hazard, a fire hazard or a traffic hazard, and it is vegetation within the meaning of this subsection.

M. through Z.

[No change.]

**6.01.030 through 6.01.060**

[No change.]

Commentary

6.02 Nuisances Affecting Public Health, Safety and Peace

The purpose of Title 6 is to consolidate all nuisance violations into one place for ease of use. This is also consistent with the Regulatory Improvement Initiative. A nuisance is broadly defined as any non-criminal violation of the code.

Sections 6.02.030 (Trees and Bushes) and 6.02.040 (Greenway Maintenance) contain provisions that address hazard trees. These provisions are slightly revised for consistency with hazard tree provisions in Title 8.

The table of contents for Articles I, II, III, IV, V and VI of Chapter 6.02 are unchanged. See Sections 6.02.030 and 6.02.040 for code amendments.

**Chapter 6.02**  
**NUISANCES AFFECTING PUBLIC HEALTH, SAFETY AND PEACE**

**Sections:**

**Article I. General Nuisances**

[No change to table of contents.]

**Article II. Property Development and Maintenance Requirements**

[No change to table of contents.]

**Article III. Junk, Garbage and Putrescible Waste**

[No change to table of contents.]

**Article IV. Streets and Sidewalks**

[No change to table of contents.]

**Article V. Noise Nuisances**

[No change to table of contents.]

**Article VI. Water Service and Meters**

[No change to table of contents.]



Commentary

6.02.030 Trees and Bushes

According to the City of Tigard Streets Division, the minimum height for branch clearance over streets should be 13 feet.

Hazard trees are clearly defined using industry standard terminology in Chapter 8.02, so a cross reference is included in Chapter 6.02 to ensure consistency in the use of terms and to continue to treat hazard trees as nuisances.

**Article I. General Nuisances**

**6.02.010 through 6.02.020**

[No change.]

**6.02.030 Trees and Bushes**

A. No responsible party shall permit branches or roots of trees or bushes on the property to extend into a right of way in a manner which interferes with its use.

B. It shall be the duty of a responsible party to keep the branches of all trees or bushes on the premises that adjoin the right of way, including an adjoining parking strip, trimmed to a height of not less than eight feet above a sidewalk and not less than ~~40~~ 13 feet above a street.

C. No responsible party shall allow to stand any hazard tree as defined in Chapter 8.02 ~~dead or decaying tree that is in danger of falling or otherwise constitutes a hazard to the public or to persons or property on or near the property.~~

## Commentary

### 6.02.040 Greenway Maintenance

The provisions of Chapter 8.10 (Trees in Sensitive Lands) address the removal of trees in sensitive lands in a more comprehensive way than the existing provisions in Chapter 6.02.040. The term “greenway” is not defined in the code, and “sensitive lands” could be considered equivalent or somewhat more expansive. Removing the provisions of 6.02.040.B.2 is an interim solution until a more comprehensive review of Section 6.02.040 occurs.

**6.02.040 Greenway Maintenance**

A. A responsible party shall maintain the property, subject to an easement to the city or to the public for greenway purposes.

B. Except as otherwise provided by this section and Sections 6.02.020 through 6.02.050, 6.02.210 through 6.02.230, and 6.02.310, the standards for maintenance shall be as follows:

1. Land shall remain in its natural topographic condition. No private structures, culverts, excavations or fills shall be constructed within the easement area unless authorized by the city engineer based on a finding of need in order to protect the property or the public health, safety or welfare.

~~2. No tree over five feet in height shall be removed unless authorized by the community development director based on a finding that the tree constitutes a nuisance or a hazard.~~

32. Grass shall be kept cut to a height not exceeding 10 inches, except when some natural condition prevents cutting.

C. In situations where the approval authority establishes different standards or additional standards, the standards shall be in writing and shall be recorded.

D. No person shall be found in violation of this section of the code unless the person has been given actual or constructive notice of the standards prior to the time the violation occurred.

**6.02.050 through 6.02.070**

[No change.]

Commentary

6.02 Nuisances Affecting Public Health, Safety and Peace

Unchanged sections of Chapter 6.02 continued.

**Article II. Property Development and Maintenance Requirements**

[No change.]

**Article III. Junk, Garbage and Putrescible Waste**

[No change.]

**Article IV. Streets and Sidewalks**

[No change.]

**Article V. Noise Nuisances**

[No change.]

**Article VI. Water Service and Meters**

[No change.]

Commentary

Chapter 8.02 DEFINITIONS , PENALTIES AND ADMINISTRATIVE RULES

Chapter 8.02 is a foundational chapter for Title 8. It creates the authority for adopting and amending administrative rules in the Urban Forestry Manual. It establishes penalties for urban forestry violations. It also establishes the definitions sections for Title 8 and the Urban Forestry Manual.

8.02.010 Purpose

The purpose statement explains that the chapter creates the authority to adopt and amend administrative rules in the Urban Forestry Manual. The purpose statement also explains the intent is to provide definition and consistency of terms between the various urban forestry related chapters in Title 8 and the Urban Forestry Manual. Finally, the purpose statement explains the chapter establishes penalties for urban forestry violations.

TIGARD MUNICIPAL CODE

Title 8

URBAN FORESTRY

Chapters:

8.02 DEFINITIONS, PENALTIES AND RULES

8.04 TREE PERMIT PROCEDURES

8.06 HAZARD TREES

8.08 STREET AND MEDIAN TREES

8.10 TREES IN SENSITIVE LANDS

8.12 TREES THAT WERE REQUIRED WITH DEVELOPMENT

8.14 TREES THAT WERE PLANTED USING THE URBAN FORESTRY FUND

8.16 HERITAGE TREES

Chapter 8.02 DEFINITIONS PENALTIES AND ADMINISTRATIVE RULES

Sections:

8.02.010 Purpose

8.02.020 General Provisions

8.02.030 Penalties for Urban Forestry Violations

8.02.040 Administrative Rules – Urban Forestry Manual

8.02.050 Definition of Specific Words

**8.02.010 Purpose**

The purpose of this chapter is to:

A. Enable administrative rulemaking pursuant to Chapter 2.04 to adopt and amend urban forestry related administrative rules called the Urban Forestry Manual;

B. Provide standard definitions of words for Title 8 of the Tigard Municipal Code and corresponding administrative rules in the Urban Forestry Manual;

C. Provide general rules for reading and applying the language in this title and the Urban Forestry Manual; and

D. Establish penalties for urban forestry violations.



## Commentary

### 8.02.020 General Provisions

Many trees are subject to the provisions of multiple chapters in Title 8. For example, a heritage tree may also be required to be preserved with development. When permitting the removal of this type of tree, the more restrictive provisions of Chapter 8.16 (Heritage Trees) would apply.

Trees that are permitted to be planted, removed or replaced by a Title 18 land use permit do not also require a Title 8 tree permit. For example, street trees required to be planted by Chapter 18.745 do not also require a Chapter 8.08 street tree planting permit.

Unless defined in the code, words have their common dictionary definition.

Standards for tenses and uses are included to add clarity for interpretation of the code.

8.02.020 General Provisions.

A. Reading and Applying the Code. When a conflict arises as a result of a particular tree situation spanning multiple chapters and administrative rules, the more restrictive provisions shall apply. When it cannot be determined which provisions are more restrictive, the more specific provisions shall apply.

B. When tree planting, removal and/or replacement is approved through a Title 18 land use permit, no Title 8 tree permit is required.

C. Defining Words. Words used in this title and the Urban Forestry Manual have their normal dictionary meaning unless they are listed in Section 8.02.050. Words listed in Section 8.02.040 have the specific meaning stated, unless the context clearly indicates another meaning.

D. Standards for Tenses and Usage:

1. Words in the singular include the plural. The reverse is also true.
2. Words in the present tense include the future tense. The reverse is also true.
3. The words “shall,” “will” and “may not” are mandatory.
4. “May” is permissive.
5. “Prohibited” means that a particular activity is in violation of this title.
6. When used with numbers, “At least x,” “Up to x,” “Not more than x” and “a maximum of x” all include x.
7. Unless the context clearly indicates otherwise, the following conjunctions have the following meanings:
  - a. “And” indicates that all connected items or provisions apply;
  - b. “Either...or” indicates that the connected items or provisions apply singularly, but not in combination.
8. Lists of items that state “including the following,” “such as” or similar language are not limited to just those items. The lists are intended to provide examples, but not to be exhaustive of all possibilities.

Commentary

8.02.030 Penalties for Urban Forestry Violations.

Section 8.02.030 establishes penalties for urban forestry violations which are defined as violations of Title 8, Chapter 18.790 and the Urban Forestry Manual. Urban forestry violations are Class 1 civil infractions processed according to the procedures in Chapter 1.16.

Based on community discussions, certain specific urban forestry violations should have additional penalties associated with them so there is a deterrent effect. The specific urban forestry violations associated with these additional penalties include unlawful tree removal, unlawful moving, removal or damaging tree protection fencing and late or omitted tree protection inspection reports. All three of these violations contribute to the removal or damage of trees and therefore more stringent preventative measures are appropriate to deter these violations.

8.02.030 Penalties for Urban Forestry Violations.

A. The following shall constitute urban forestry violations of this code:

1. Noncompliance with the requirements of Title 8.

2. Noncompliance with administrative rules in the Urban Forestry Manual that implement the requirements of Title 8.

3. Noncompliance with the requirements of Chapter 18.790.

4. Noncompliance with administrative rules in the Urban Forestry Manual that implement the requirements of Chapter 18.790.

B. An urban forestry violation shall constitute a Class 1 civil infraction, which shall be processed according to procedures established in Chapter 1.16.

C. Each urban forestry violation shall constitute a separate infraction, and each day that an urban forestry violation is committed or permitted to continue shall constitute a separate infraction.

D. A finding of an urban forestry violation shall not relieve the responsible party of the duty to abate the violation. Penalties imposed by this chapter are in addition to and not in lieu of any remedies available to the city.

E. Each urban forestry violation is subject to the penalty or administrative fee established in Chapter 1.16 of this code.

F. The following specific urban forestry violations are associated with specific penalties in section 1.16.640.A.3:

1. Unlawful tree removal in violation of Title 8, Chapter 18.790 or the Urban Forestry Manual.

2. Damaging, moving or removing a tree protection fence in violation of Chapter 18.790 or administrative rules in the Urban Forestry Manual that implement the requirements of Chapter 18.790.

3. Failure to provide inspection reports by the project arborist or landscape architect in noncompliance with Section 18.790.060.B or administrative rules in the Urban Forestry Manual that implement the requirements of Chapter 18.790.

## Commentary

### 8.02.030 Penalties for Urban Forestry Violations.

The requirement to receive retroactive approval for tree removal violations allows the city to clearly document the removal of protected trees, and allows the city to require replacement trees when applicable.

The stop work order provision allows the city to prevent continued violation of Title 8. For example, if a protected stand of trees in sensitive lands is being cleared without a permit, the city may issue a stop work order to prevent continued clearing of the stand. Chapter 1.16 does not currently include specific language that allows for stop work orders, so a provision has been added to Section 8.02.030 to grant the city authority to do so for violations of Title 8.

G. In addition to the procedures of Chapter 1.16, any party found to be in violation of Section 8.08.050 (Street Tree Removal), 8.08.080 (Median Tree Removal), 8.10.040 (Sensitive Lands Tree Removal), 8.12.040 (Removal of Trees that were Required with Development), 8.14.040 (Removal of Trees that were Planted Using the Urban Forestry Fund) or 8.16.070 (Removal of Heritage Tree Designation) shall complete the process for a retroactive city manager tree permit through the City Manager Decision Making Procedures detailed in Section 8.04.020.

H. When any work is being done contrary to the provisions of this title or administrative rule that implements the provisions of this title, the city manager or designee may order the work corrected or stopped by notice in writing served on any persons engaged in the doing or causing such work to be done, and such persons shall forthwith make the necessary corrections or stop work until authorized by the city manager or designee to proceed with the work.

Commentary

8.02.040 Administrative Rules–Urban Forestry Manual.

Section 8.02.040 enables administrative rulemaking for the Urban Forestry Manual which contains the detailed administrative rules referenced by Title 8 and Title 18.

The city manager is authorized to adopt and amend the Urban Forestry Manual according to the procedures in Chapter 2.04 after council adoption of Section 8.02.040.

Section 8.02.040 outlines the specific elements to be included in the Urban Forestry Manual. The subsections correspond to the elements contained in the proposed Urban Forestry Manual:

<b>Subsections of 8.02.040</b>	<b>Urban Forestry Manual Sections</b>	<b>Urban Forestry Manual Appendices</b>
A	1	1
B	2, 3, 4, 5, 6, 7, 8 and 9	2, 3, 4, 5 and 6
C	10	2, 3, 4, 5, 6, 7, 8 and 9
D	11	10
E	12	2, 11, 12, 13 and 14
F	13	3, 15, 16, 17and 18

8.02.040 Administrative Rules–Urban Forestry Manual.

The city manager is authorized to adopt and amend administrative rules to implement the technical details of the urban forestry related code provisions in Title 8, Title 18 and other applicable titles in the Tigard Municipal Code. These administrative rules shall be adopted pursuant to the provisions of Chapter 2.04, be consistent with Title 8, Title 18 and other applicable titles in the Tigard Municipal Code and be known collectively as the Urban Forestry Manual.

The Urban Forestry Manual shall include the following:

A. Hazard tree evaluation and abatement procedures to ensure an objective and efficient process for identifying and resolving hazard tree issues.

B. Tree planting, maintenance and removal standards for trees that require a permit to plant or remove by Title 8 or Title 18 so that approval criteria are clear, consistent and based on sound scientific principles.

C. Urban forestry plan standards for development so that submittal requirements, measurements, calculations and other requirements are clearly outlined for:

1. Tree Preservation and Removal Site Plans;
2. Tree Canopy Site Plans;
3. Supplemental Arborist or Landscape Architect Reports;
4. Tree Canopy Fee Calculations; and
5. Significant Tree Grove Preservation Considerations.

D. Urban forestry plan implementation standards for development to ensure urban forestry plans are successfully implemented and trees are appropriately preserved, planted and inventoried as part of the development process.

E. Street tree soil volume standards for development to ensure street trees are provided adequate soil volumes, and to ensure soil volume calculation, plan submittal and implementation requirements are clearly outlined.

F. Parking lot tree canopy standards for development to ensure parking lot trees are appropriately planted and provided adequate soil volumes, and to ensure soil volume calculation, plan submittal and implementation requirements are clearly outlined.



## Commentary

### 8.02.050 Definition of Specific Words.

All tree related definitions in Title 18 have been incorporated into Title 8 to ensure consistency of terms between the two titles.

The following additional definitions have been developed to address provisions that are specific to Title 8.

**Certified Forester:** This term is defined because certified foresters (in addition to certified arborists) are permitted by Title 8 and the Urban Forestry Manual to approve the thinning of protected stands of trees.

**Significant Tree:** This term is added because Chapter 8.16 authorizes designation of trees as significant tree, rather than heritage trees when permanent protection is not desirable.

**Thinning:** This term is added because thinning of protected stands of trees under the supervision of a certified arborist or certified forester to improve stand health is permitted by Title 8 and the Urban Forestry Manual.

8.02.050 Definition of Specific Words.

The definition of words with specific meaning in Title 8 and the Urban Forestry Manual are as follows:

A. “Caliper” - The tree care industry standard for measuring the trunk diameter of nursery stock. Caliper is the average diameter of the trunk of a nursery tree measured six (6) inches above the ground for trunks less than or equal to an average of four (4) inches in diameter (when measured six (6) inches above ground). When the trunk of a nursery tree is greater than an average of four (4) inches in diameter (when measured six (6) inches above ground), caliper is the average diameter at 12 inches above ground (see figure 8.02.1).

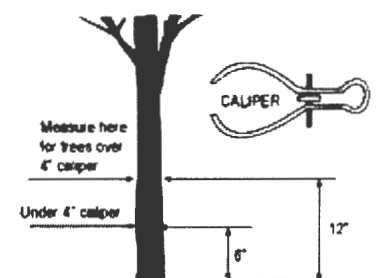


Figure 8.02.1

Caliper

B. “Certified arborist” - An individual certified by the International Society of Arboriculture as a certified arborist.

C. “Certified forester” - An individual certified by the Society of American Foresters as a certified forester.

D. “Certified tree risk assessor” - An individual certified by the International Society of Arboriculture to conduct tree risk assessments.

E. “Covered soil volume” - A volume of soil that is under pavement and specially designed to support the growth of a tree. Covered soil volumes contain existing, new or amended soil with the physical, chemical and biological properties necessary to support the growth of a tree, while at the same time supporting the load-bearing requirements and engineering standards of the overlying pavement. Covered soil volumes would not be considered tree growth limiting by a project arborist or landscape architect in an urban forestry plan developed per the standards in Chapter 18.90 and corresponding administrative procedures.

Commentary

8.02.050 Definition of Specific Words.

Definitions continued.

F. “Development impact area” - The area on a site or right of way associated with a site affected by any and all site or right of way improvements, including but not limited to buildings, structures, walls, parking and loading areas, street improvements, paved and graveled areas, utilities, irrigation, equipment storage, construction parking and landscaping. The impact area also refers to areas of grading, filling, stockpiling, demolition, tree removal, trenching, boring and any other activities that require excavation or soil disturbance.

G. “Dripline” - The outer limit of a tree canopy projected to the ground.

H. “Diameter at breast height (DBH)” - The average diameter of the trunk of a tree measured 4 ½ feet above mean ground level at the base of the trunk (see figure 8.02.2). If the tree splits into multiple trunks above ground, but below 4 ½ feet, the DBH is the average diameter of the most narrow point beneath the split (see figure 8.02.3). If the tree has excessive swelling at 4 ½ feet, the DBH is the average diameter of the most narrow point beneath the swelling. If the tree splits into multiple trunks at or directly below ground, it shall be considered one tree and the DBH shall be the square root of the sum of the cross-sectional area of each trunk at 4 ½ feet above mean ground level multiplied by 1.1284 (see figure 8.02.4).

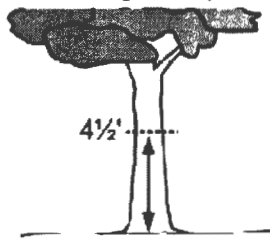


Figure 8.02.2  
Standard DBH

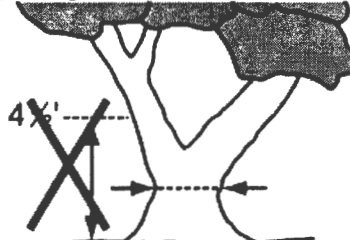


Figure 8.02.3  
DBH for Split Trunk

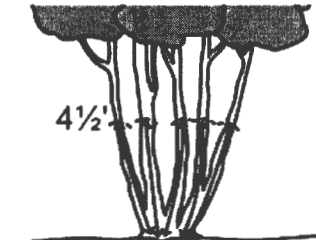


Figure 8.02.4  
DBH for Multiple Trunks

I. “Hazard tree related definitions”

1. “Claimant” - Any person that believes in good faith there is a hazard tree on a property, can demonstrate that their life, limb or property has the potential to be impacted by said tree and seeks resolution through the Hazard Tree Evaluation and Abatement Procedure specified in Section 1 of the Urban Forestry Manual.

2. “Hazard tree - Any tree or tree part that has been or could be determined by an independent certified tree risk assessor to constitute a high level hazard requiring hazard tree abatement with an overall minimum risk rating of 8 for trees or tree parts up to 4 inch DBH, 9 for trees or tree parts greater than 4 inch and up to 20 inch DBH, or 10 for trees or tree parts greater than 20 inch DBH using the most current version of the tree risk assessment methodology developed by the International Society of Arboriculture.

Commentary

8.02.050 Definition of Specific Words.

Definitions continued.

3. “Hazard tree abatement” - The process of reducing or eliminating a hazard to an overall risk rating of less than 8 for trees or tree parts up to 4 inch DBH, 9 for trees or tree parts greater than 4 inch and up to 20 inch DBH, or 10 for trees or tree parts greater than 20 inch DBH using the most current version of the tree risk assessment methodology developed by the International Society of Arboriculture through pruning, tree removal or other means in a manner that complies with all applicable rules and regulations.

4. “Hazard tree owner or responsible party” - The property owner or responsible party with the largest percentage of a hazard tree trunk immediately above the trunk flare or root buttresses. In cases where the hazard tree consists of a branch instead of an entire tree, the hazard tree owner or responsible party is the person who owns or is responsible for the property from where the branch originates. The hazard tree owner or responsible party:

a. Owns the hazard tree;

b. Is the entity or person acting as an agent for the owner of the hazard tree by agreement that has authority over the hazard tree, is responsible for the hazard tree’s maintenance or management, or is responsible for hazard tree abatement;

c. Is any person occupying the property with the hazard tree, including bailee, lessee, tenant or other having possession; or

d. Is the person who is alleged to have committed the acts or omissions resulting in the hazard tree or allowed the hazard tree to exist on the property.

5. “Respondent” - Any person that receives notice from a claimant seeking resolution through the Hazard Tree Evaluation and Abatement Procedure specified in Section 1 of the Urban Forestry Manual.

J. “Heritage tree” - Any tree or stand of trees of landmark importance due to age, size, species, horticultural quality or historic importance that has been approved as a heritage tree by Tigard City Council.

K. “Median tree” - Any tree within the public right of way under City of Tigard jurisdiction between opposing lanes of vehicular traffic. Trees in the centers of cul-de-sacs and roundabouts within the public right of way under City of Tigard jurisdiction shall also be considered median trees.

L. “Nuisance tree” - Any tree included on the Nuisance Tree List in the Urban Forestry Manual.

Commentary

8.02.050 Definition of Specific Words.

Definitions continued.

M. “Open grown tree” - Any tree that has grown and established in an isolated manner without significant competition for light, space and nutrients from other trees. Open grown trees generally retain more foliage, develop greater trunk tapers, have more extensive root systems and are more resistant to windthrow than stand grown trees.

N. “Open soil volume” - An unpaved volume of soil, which contains existing, new or amended soil with the physical, chemical and biological properties necessary to support the growth of a tree.

O. “Parking lot tree” - Any tree used to meet the requirements in Section 18.745.050.E.

P. “Person” - An individual, corporation, governmental agency, official advisory committee of the City of Tigard, business trust, estate, trust, partnership, association or two or more people having a joint or common interest or any other legal entity.

Q. “Significant tree” - Any tree or stand of trees of landmark importance due to age, size, species, horticultural quality or historic importance that has been approved as a significant tree by Tigard City Council or the designated city board or committee and which status has been accepted by the tree owner or responsible party.

R. “Significant tree grove” - A stand of trees that has been identified as significant through the Statewide Land Use Planning Goal 5 process. A Significant Tree Grove Map is maintained by the director of community development for the City of Tigard, or designee.

S. “Stand (of trees)” - A distinct area of stand grown trees, often predominantly native and with contiguous canopies, which form a visual and/or biological unit.

T. “Stand grown tree” - Any tree that has grown and established in close association with other trees and, as a result, has experienced significant competition for light, space and nutrients from other trees. Stand grown trees generally retain less foliage, develop less trunk taper, have less extensive root systems and are less resistant to windthrow than open grown trees.

U. “Street tree” - Any tree equal to or greater than 1 ½ inch caliper or DBH within a public right of way under City of Tigard jurisdiction or easement for public access under City of Tigard jurisdiction, or any tree equal to or greater than 1 ½ inch caliper or DBH outside of a public right of way or easement for public access that the city can demonstrate was planted or preserved as a street tree to meet the requirements for a city permit or project. Median trees shall not be considered street trees.



Commentary

8.02.050 Definition of Specific Words.

Definitions continued.

V. “Thinning” - A tree removal practice that reduces tree density and competition between trees in a stand. Thinning concentrates growth on fewer, high-quality trees and generally enhances tree health.

W. “Tree” - A woody perennial plant, often with one dominant trunk, the capacity to achieve a mature height greater than 16 feet and primarily referred to as a tree in scientific literature.

X. “Tree canopy” - The area above ground which is covered by the trunk, branches and foliage of a tree or group of trees’ crowns.

Y. “Tree canopy cover, effective” - A formula detailed in Chapter 18.790 and corresponding administrative procedures used to calculate the amount of tree canopy that will be provided for a given lot or tract through any combination of preserving existing trees and planting new trees. In general, the formula grants bonus tree canopy credit based on the existing tree canopy of trees that are preserved, and grants additional tree canopy credit based on the projected mature tree canopy of newly planted trees.

Z. “Tree Care Industry Standards” - Generally accepted industry standards for tree care practices detailed in the most current version of the American National Standards Institute (ANSI) A300 Standards for Tree Care Operations. In addition, tree care industry standards shall include adherence to all applicable rules and regulations for the completion of any tree care operation.

AA. “Tree removal” - The cutting or removing of 50 percent or more of a crown, trunk or root system of a tree, or any action which results in the loss of aesthetic or physiological viability or causes the tree to fall or be in immediate danger of falling.

BB. “Understory tree” - Any tree that is adapted to grow and complete its lifecycle within the shade and beneath the canopy of another tree.

## Commentary

### Chapter 8.04 TREE PERMIT PROCEDURES

Chapter 8.04 establishes a consistent framework for tree permit decisions that is referenced by all of the chapters in Title 8 that require tree permits.

The guiding principles for Tree Permit Requirements are in Volume I of the legislative adoption package for the Urban Forestry Code Revisions. These guiding principles represent the consensus view of the citizen advisory committee that advised staff on the Urban Forestry Code Revisions.

#### 8.04.010 Purpose

The purpose statement explains that the chapter is intended to provide two tracks for decision making. The City Manager Decision Making Procedures are for simple decisions to be decided by staff and the City Board or Committee Decision Making Procedures are for complex decisions to be decided by a discretionary review body.

#### 8.04.020 City Manager Decision Making Procedures

The City Manager Decision Making Procedures are implemented administratively by city staff without public review for simple situations such as permitting the planting of street and median trees, and permitting the removal of protected trees that are in poor or hazardous condition, nuisance trees, causing damage fire dangers or preventing allowed development to occur.

The detailed approval criteria in the Urban Forestry Manual are referenced in each chapter of Title 8 that requires a tree permit.

Replacement is required through planting or a fee in lieu when protected trees (except heritage trees) are removed. If there is not room on site for a replacement tree, then no fee in lieu is required. Heritage trees are not required to be replaced because heritage trees are unique and can not necessarily be replaced by planting a new tree.

TIGARD MUNICIPAL CODEChapter 8.04 TREE PERMIT PROCEDURESSections:

- 8.04.010 Purpose.
- 8.04.020 City Manager Decision Making Procedures.
- 8.04.030 City Board or Committee Decision Making Procedures.
- 8.04.040 Emergency Tree Permit Procedures

8.04.010 Purpose.

The purpose of this chapter is to create a flexible framework for tree permit decisions to address both simple and complex situations. The City Manager Decision Making Procedures are implemented administratively by city staff without public review for approving tree permits in situations where the reasons and criteria for tree planting, removal and/or replacement are simple. The City Board or Committee Decision Making Procedures are implemented through a public review process by a designated board or commission in situations where the reasons and criteria for tree removal and/or replacement are complex.

8.04.020 City Manager Decision Making Procedures.

A. City manager tree permit applications shall be made on forms provided by the city manager or designee.

B. City manager tree permit applications shall:

1. Include the information requested on the application form;
2. Address all of the relevant approval criteria in the Urban Forestry Manual in sufficient detail for review and action; and
3. Be accompanied by the required fee.

Commentary

8.04.020 City Manager Decision Making Procedures

City Manager Decision Making Procedures continued.

8.04.030 City Board or Committee Decision Making Procedures

The City Board or Committee Decision Making Procedures are implemented through a public review process by a designated board or committee for more complex situations where the reasons for removal are unclear (solar access, views, aesthetics, etc.). The designated board or committee is authorized to use their discretion to weigh the tree benefits and reasons for removal when making their decision.

The City Board or Committee Decision Making Procedures follow the procedures in Section 18.390.050 except no pre-application conference (18.390.050.A) and no impact study (18.390.050.B.2.e) is required.

C. The city manager's or designee's decision shall address all of the relevant approval criteria in the Urban Forestry Manual. The city manager or designee shall approve, approve with conditions or deny the requested tree permit in writing based on the relevant approval criteria in the Urban Forestry Manual.

D. The city manager's or designee's decision shall be final and valid for a period of up to one year after issuance unless a longer timeframe is conditioned as part of the tree permit decision. However, nothing shall prevent a person from submitting another application for a city manager tree permit if the conditions and circumstances of an unexpired city manager tree permit have changed.

8.04.030 City Board or Committee Decision Making Procedures

A. The city manager or designee shall authorize a city board or committee to issue discretionary decisions pertaining to tree permits.

B. The designated city board or committee shall be authorized to use their discretion when issuing their decision on tree permits and include but not be limited to the following considerations:

1. Solar access;
2. Views;
3. Quality of tree species, condition and location;
4. Contribution to the environment;
5. Contribution to the community; and
6. Aesthetics.

C. The City Board or Committee Decision Making Procedures shall be consistent with the procedures in Section 18.390.050 of the Tigard Municipal Code except 18.390.050.A and 18.390.050.B.2.e do not apply. The review body shall be the city board or committee so designated by the city manager or designee.

D. Decisions made according to the City Board or Committee Decisions Making Procedures shall be final and valid for a period of up to one year unless:

1. A longer timeframe is conditioned as part of the tree permit decision; or
2. A subsequent decision is issued through the City Manager Decision Making Procedures in 8.04.020 that conflicts with an unexpired city board or committee tree permit.

Commentary

8.04.040 Emergency Tree Permit Procedures

In cases of emergency, removal of a protected tree is authorized without a permit as long as retroactive approval through the City Manager Decision Making Procedures is received.

8.04.040 Emergency Tree Permit Procedures

If an emergency exists because a tree presents such a clear and present danger to people, structures, infrastructure or utilities that there is insufficient time to obtain a permit, any person may remove the subject tree without first having obtained a permit. The person shall, within 14 calendar days after having removed such tree, submit a retroactive application for a city manager tree permit through the City Manager Decision Making Procedures detailed in Section 8.04.020. Applicants are encouraged to take photographs of the subject tree and obtain written documentation from a certified arborist prior to the removal. If the city manager or designee determines that there was no emergency, he/she shall pursue enforcement action through Chapter 1.16.



Commentary

Chapter 8.06 HAZARD TREES

The hazard trees chapter creates a framework for addressing hazard trees.

The guiding principles for Hazard Trees are in Volume I of the legislative adoption package for the Urban Forestry Code Revisions. These guiding principles represent the consensus view of the citizen advisory committee that advised staff on the Urban Forestry Code Revisions.

8.06.010 Purpose

The purpose statement explains that the chapter is to establish authority for protecting the public from hazard trees through standards and procedures for hazard tree identification, evaluation and abatement.

8.06.020 General Provisions

Hazard trees (defined in Chapter 8.02) are prohibited in Tigard. The definition of hazard tree incorporates by reference the probability of failure, size of defective part and target area.

TIGARD MUNICIPAL CODE

Chapter 8.06 HAZARD TREES

Sections:

8.06.010 Purpose

8.06.020 General Provisions

8.06.030 Hazard Tree Evaluation and Abatement Procedure

8.06.040 Emergency Abatement Procedure

8.06.010 Purpose

The purpose of this chapter is to protect the health, safety and welfare of people within the City of Tigard by establishing standards and procedures for the identification, evaluation and abatement of hazard trees.

8.06.020 Hazard Trees Prohibited

A. Hazard trees are prohibited within the City of Tigard.

B. Any hazard tree owner or responsible party shall be required to complete hazard tree abatement.

C. Failure of a hazard tree owner or responsible party to complete hazard tree abatement is a nuisance under Chapter 6.02 and subject to penalties under Chapter 1.16.

## Commentary

### 8.06.030 Hazard Tree Evaluation and Abatement Procedure

The Hazard Tree Evaluation and Abatement Procedure is detailed in Section 1 of the Urban Forestry Manual and includes a tiered approach that begins with 1) informal reconciliation between parties without city involvement; yet may progress to 2) formal reconciliation where the claimant submits an application, provides information, pays fees, documents informal reconciliation and the city ensures abatement and apportionment of costs by private property owners or through city action.

In addition to the procedures being detailed in the Urban Forestry Manual, the city will create more user friendly forms that explain the process and timelines.

A person has standing to participate in the Hazard Tree Evaluation and Abatement Procedure only if they can demonstrate that they have the potential to be impacted by a tree they believe is a hazard. Once initiated, both the claimant and respondent are obligated to complete the Hazard Tree Evaluation and Abatement Procedure.

### 8.06.040 Emergency Abatement Procedure

If there is an immediate threat to public safety, the city has the authority through Chapter 1.16 to immediately abate the hazard instead of following the procedures in Section 1 of the Urban Forestry Manual.

8.06.030 Hazard Tree Evaluation and Abatement Procedure

A. Any claimant may seek resolution through the Hazard Tree Evaluation and Abatement Procedure specified in Section 1 of the Urban Forestry Manual.

B. Once initiated by the claimant, both the claimant and respondent have an obligation to complete the Hazard Tree Evaluation and Abatement Procedure specified in Section 1 of the Urban Forestry Manual. Failure of the claimant or respondent to perform their obligations specified in the Hazard Tree Evaluation and Abatement Procedure constitutes a violation of this code by the negligent party.

8.06.040 Emergency Abatement Procedure

If the city has reason to believe a hazard tree poses an immediate danger and there is not enough time to complete the Hazard Tree Evaluation and Abatement Procedure in Section 1 of the Urban Forestry Manual, the city may choose to take immediate remedial action as defined in Section 1.16.150 of the Tigard Municipal Code.

Commentary

Chapter 8.08 STREET AND MEDIAN TREES

Chapter 8.08 establishes the framework for permitting decisions for street and median trees. They replace the provisions previously in Chapter 9.06.

8.08.010 Purpose

The purpose statement explains the chapter establishes standards and procedures for street and median trees to maximize their benefits.

8.08.020 General Provisions

Adjacent property owners are responsible for street trees and the city is responsible for median trees.

The city is authorized to exercise its authority over the right of way (and street trees) when necessary.

TIGARD MUNICIPAL CODE

Chapter 8.08 STREET AND MEDIAN TREES

Sections:

- 8.08.010 Purpose
- 8.08.020 General Provisions
- 8.08.030 Street Tree Planting
- 8.08.040 Street Tree Maintenance
- 8.08.050 Street Tree Removal
- 8.08.060 Median Tree Planting
- 8.08.070 Median Tree Maintenance
- 8.08.080 Median Tree Removal

8.08.010 Purpose

The purpose of this chapter is to provide standards and procedures for the planting, maintenance and removal of street and median trees in order to maximize their environmental, aesthetic, social and economic benefits.

## Commentary

### 8.08.020 General Provisions

General provisions continued (see commentary on previous page).

### 8.08.030 Street Tree Planting

A permit through the City Manager Decision Making Procedures is required for the planting of street trees. The detailed planting specifications are in Section 2, part 1 of the Urban Forestry Manual.

### 8.08.040 Street Tree Maintenance

Street trees are required to be maintained per tree care industry standards and the clearance requirements in Section 2, part 2 of the Urban Forestry Manual.

Street trees that die within three years after planting are allowed to be removed and replaced without a new permit. It is relatively common for trees to not survive the establishment period, and not requiring a permit to remove and replant a newly planted tree that fails to establish improves efficiency for both the applicant and city for a relatively insignificant action.

### 8.08.050 Street Tree Removal

Permits obtained through the City Manager Decision Making Procedures or the City Board or Committee Decision Making Procedures are required to remove a street tree.

The approval criteria for street tree removal through the City Manager Decision Making Procedures are detailed in Section 3 of the Urban Forestry Manual.

According to Section 3 of the Urban Forestry Manual, street tree removal is permitted when:

1. The tree is a hazard and the hazard cannot be abated without removing the tree.
2. The tree is dead or declining.
3. The tree is a nuisance tree.
4. The tree's location is non-conforming (e.g. closer to an intersection than currently allowed).
5. The tree roots are causing damage to paved surfaces, buildings or utilities.
6. Tree removal is required for a street improvement.
7. Tree removal is required for approved development activities or utility installation/repair.
8. The tree presents a fire or emergency access hazard that cannot be abated without removing the tree as determined by the fire marshal.
9. Tree removal is required for thinning of a stand of trees under the supervision of a certified arborist or forester.

Section 3 also requires replacement of street trees when there is room on site unless trees are removed for thinning purposes. A fee in lieu of replacement is allowed at the city's discretion.

### 8.08.060 Median Tree Planting

A permit through the City Manager Decision Making Procedures is required for the planting of median trees. The detailed planting specifications are in Section 4, part 1 of the Urban Forestry Manual.

8.08.020 General Provisions

A. It shall be the duty of owners of lots or portions of lots immediately abutting on, fronting on, adjacent to or owning the largest percentage of any street tree trunk immediately above the trunk flare or root buttresses to maintain and remove street trees in accordance with the provisions of this chapter. No person, except as specified in Section 8.08.020.C of this chapter, shall plant a street tree on any lot, or within the public right of way immediately abutting on, fronting on or adjacent to any lot, without the responsible property owner's permission.

B. It shall be the duty of the city to plant, maintain and remove median trees in accordance with the provisions of this chapter.

C. The city may, at any time, exercise its authority over the public right of way by planting, maintaining or removing any street tree or tree part within a public right of way in accordance with the provisions of this chapter. Any action taken by the city in accordance with this subsection shall not absolve property owners from their ongoing responsibility for street trees pursuant to Section 8.08.020.A of this chapter.

8.08.030 Street Tree Planting

No person shall plant a street tree without prior written approval obtained through the City Manager Decision Making Procedures detailed in Section 8.04.020 using the approval criteria in Section 2, part 1 of the Urban Forestry Manual.

8.08.040 Street Tree Maintenance

A. All street trees shall be maintained in a manner consistent with the street tree maintenance standards specified in Section 2, part 2 of the Urban Forestry Manual.

B. If any street tree subject to the provisions of this chapter dies within three years after planting, it shall be removed and replaced in accordance with the previous permit approval. The street tree removal provisions (Section 8.08.050 below) shall not apply to tree removal and replacement in accordance with this subsection.



## Commentary

### 8.08.070 Median Tree Maintenance

Street trees are required to be maintained per tree care industry standards and the clearance requirements in Section 4, part 2 of the Urban Forestry Manual.

Median trees that die within three years after planting are allowed to be removed and replaced without requiring a new permit. It is relatively common for trees to not survive the establishment period, and not requiring a permit to remove and replant a newly planted tree that fails to establish improves efficiency for both the applicant and city for a relatively insignificant action.

### 8.08.080 Median Tree Removal

Permits obtained through the City Manager Decision Making Procedures or the City Board or Committee Decision Making Procedures are required to remove a median tree.

The approval criteria for median tree removal through the City Manager Decision Making Procedures are detailed in Section 5 of the Urban Forestry Manual and are essentially the same standards for street tree removal.

According to Section 5 of the Urban Forestry Manual, median tree removal is permitted when:

1. The tree is a hazard and the hazard cannot be abated without removing the tree.
2. The tree is dead or declining.
3. The tree is a nuisance tree.
4. The tree's location is non-conforming (e.g. closer to an intersection than currently allowed).
5. The tree roots are causing damage to paved surfaces, buildings or utilities.
6. Tree removal is required for a street improvement.
7. Tree removal is required for approved development activities or utility installation/repair.
8. The tree presents a fire or emergency access hazard that cannot be abated without removing the tree as determined by the fire marshal.
9. Tree removal is required for thinning of a stand of trees under the supervision of a certified arborist or forester.

Section 5 also requires replacement of median trees, when there is room on site, unless trees are removed for thinning purposes. A fee in lieu of replacement is allowed at the city's discretion.

8.08.050 Street Tree Removal

Except as exempted by Section 8.08.040.B, no person shall remove a street tree without prior written approval obtained either through:

A. The City Manager Decision Making Procedures detailed in Section 8.04.020 using the approval criteria in Section 3, part 1 of the Urban Forestry Manual; or

B. The City Board or Committee Decision Making Procedures detailed in Section 8.04.030.

8.08.060 Median Tree Planting

No person shall plant a median tree without prior written approval obtained through the City Manager Decision Making Procedures detailed in Section 8.04.020 using the approval criteria in Section 4, part 1 of the Urban Forestry Manual.

8.08.070 Median Tree Maintenance

A. All median trees shall be maintained in a manner consistent with the median tree maintenance standards specified in Section 4, part 2 of the Urban Forestry Manual.

B. If any median tree subject to the provisions of this chapter dies within three years after planting, it shall be removed and replaced in accordance with the previous permit approval. The median tree removal provisions (Section 8.08.080 below) shall not apply to tree removal and replacement in accordance with this subsection.

8.08.080 Median Tree Removal

Except as exempted by Section 8.08.070.B, no person shall remove a median tree without prior written approval obtained either through:

A. The City Manager Decision Making Procedures detailed in Section 8.04.020 using the approval criteria in Section 5, part 1 of the Urban Forestry Manual; or

B. The City Board or Committee Decision Making Procedures detailed in Section 8.04.030.

## Commentary

### Chapter 8.10 TREES IN SENSITIVE LANDS

Permit requirements for trees in sensitive lands were previously included in Chapter 18.790 (Tree Removal) of the Tigard Development Code. The provisions have been struck from Chapter 18.790 and incorporated into Title 8 for consolidation with the rest of the tree permit provision, for ease of use.

#### 8.10.010 Purpose

The purpose statement explains the chapter and establishes standards and procedures for native trees for their contribution to sensitive lands.

#### 8.10.020 General Provisions

Sensitive lands are defined in Chapter 18.775 and include land potentially unsuitable for development due to their location in:

- A. Floodplains;
- B. Stream corridors;
- C. Wetlands;
- D. Steep slopes; and/or
- E. Significant habitat areas.

A map of sensitive lands is maintained by the city and is used to determine whether a tree is within sensitive lands. This negates the requirement for a detailed delineation if the city and applicant agree whether a tree is within sensitive lands or not. A detailed delineation could be provided to the city to prove the exact location of a tree in relation to sensitive lands if the map boundaries are not acceptable.

TIGARD MUNICIPAL CODE

Chapter 8.10 TREES IN SENSITIVE LANDS

Sections:

- 8.10.010 Purpose
- 8.10.020 General Provisions
- 8.10.030 Sensitive Lands Tree Maintenance
- 8.10.040 Sensitive Lands Tree Removal

8.10.010 Purpose

The purpose of this chapter is to establish standards and procedures for the maintenance, removal and replacement of native trees in sensitive lands for their contribution to the functions and values of sensitive lands.

8.10.020 General Provisions

A. The provisions of this chapter are applicable within sensitive lands under City of Tigard jurisdiction described in Section 18.775.010.G of the Tigard Municipal Code. A map of sensitive lands is maintained by the city and is accessible to the public.

B. The city manager or designee shall utilize the map of sensitive lands to determine whether a particular tree is within sensitive lands. In order for the city manager or designee to reconsider his or her determination, a person shall provide a delineation by a professional land surveyor conducted in accordance with all applicable agency accepted methods for the sensitive lands type in question.

C. Only those native trees listed on the native tree list in the Urban Forestry Manual are subject to the provisions of this chapter.

Commentary

8.10.020 General Provisions (continued)

Only trees on the native tree list in the Urban Forestry Manual are subject to the provisions of the chapter.

8.10.030 Sensitive Lands Tree Maintenance

Native trees over 6 inch DBH and required replacement trees (which can be less than 6 inch DBH) in sensitive lands are required to be maintained per tree care industry standards.

The removal and replacement of trees in sensitive lands is allowed for required trees that die within three years after planting. It is relatively common for trees to not survive the establishment period, and not requiring a permit to remove and replant a newly planted tree that fails to establish improves efficiency for both the applicant and city for a relatively insignificant action.

8.10.040 Sensitive Lands Tree Removal

Permits obtained through the City Manager Decision Making Procedures or the City Board or Committee Decision Making Procedures are required to remove protected trees in sensitive lands.

The approval criteria for sensitive lands tree removal through the City Manager Decision Making Procedures are detailed in Section 6 of the Urban Forestry Manual.

According to Section 6 of the Urban Forestry Manual, sensitive lands tree removal is permitted when:

1. The tree is a hazard and the hazard cannot be abated without removing the tree.
2. The tree is dead or declining.
3. The tree is a nuisance tree.
4. The tree roots are causing damage to paved surfaces, buildings or utilities.
5. Tree removal is required for a street improvement.
6. Tree removal is required for approved development activities or utility installation/repair.
7. The tree presents a fire or emergency access hazard that cannot be abated without removing the tree as determined by the fire marshal.
8. Tree removal is required for thinning of a stand of trees under the supervision of a certified arborist or forester.

Section 6 also requires replacement of trees in sensitive lands, when there is room on site, unless trees are removed for thinning purposes. In addition to newly planted trees, existing trees less than 6 inch DBH can be used as replacement trees provided they meet all of the replacement tree species, size, condition and location standards detailed in Section 6. A fee in lieu of replacement is allowed at the city's discretion.

8.10.030 Sensitive Lands Tree Maintenance

A. Native trees greater than or equal to 6 inch DBH and native trees that were required to be planted as replacement trees by the provisions of this chapter shall be maintained in a manner consistent with tree care industry standards and shall be maintained so as not to become hazard trees as defined in Chapter 8.02 of the Tigard Municipal Code.

B. If any native tree subject to the provisions of this chapter dies within three years after planting, it shall be removed and replaced in accordance with the previous permit approval. The sensitive lands tree removal provisions (Section 8.10.040 below) shall not apply to tree removal and replacement in accordance with this subsection.

8.10.040 Sensitive Lands Tree Removal

Except as exempted by Section 8.10.030.B, no person shall remove any native tree greater than or equal to 6 inch DBH, or any native tree less than 6 inch DBH that was required to be planted as a replacement tree by the provisions of this chapter, without prior written approval obtained either through:

A. The City Manager Decision Making Procedures detailed in Section 8.04.020 using the approval criteria in Section 6, part 1 of the Urban Forestry Manual; or

B. The City Board or Committee Decision Making Procedures detailed in Section 8.04.030.

## Chapter 8.12 TREES THAT WERE REQUIRED WITH DEVELOPMENT

Chapter 8.12 establishes the framework for permitting decisions for trees that were required to be planted or preserved by a land use permit when the removal is not associated with an active land use permit. The intent of the legislative amendments in Chapter 8.12 is to supersede the planting and preservation requirements for trees that were required by prior land use decisions. This includes trees that are recorded as preserved on property deeds as a result of past land use decisions. However, for these deed restricted trees, applicants (and not the city) will be solely responsible for identifying and removing any applicable deed restrictions. The city will provide any signatures necessary to facilitate the removal of deed restrictions for trees permitted for removal by decisions pursuant to Chapter 8.12.

### 8.12.010 Purpose

The purpose statement explains that the chapter establishes standards and procedures for trees that were required with development to maintain their benefits after the development process is complete.

### 8.12.020 General Provisions

The provisions of Chapter 8.12 apply to trees required to be planted or preserved by a land use permit and trees that are required as replacements for said trees.

The city retains records of all land use permits. These records will be used to determine whether a tree was required to be planted or preserved by a land use permit. If there is not a clear record, the tree will be exempt from Chapter 8.12.

TIGARD MUNICIPAL CODE

Chapter 8.12 TREES THAT WERE REQUIRED WITH DEVELOPMENT

Sections:

- 8.12.010 Purpose
- 8.12.020 General Provisions
- 8.12.030 Maintenance of Trees That Were Required With Development
- 8.12.040 Removal of Trees That Were Required With Development

8.12.010 Purpose

The purpose of this chapter is to establish standards and procedures for the maintenance, removal and replacement of trees that were required with development to maintain their environmental, aesthetic, social and economic benefits after the development process is complete.

8.12.020 General Provisions

A. The provisions of this chapter do not apply unless there is substantial evidence that one of the following situations exists:

1. Trees were planted or preserved under a requirement found in Title 18 or found in a land use permit; and
2. Trees required as replacements for trees originally required under 8.12.020.A.1 above.



## Commentary

### 8.12.030 Maintenance of Trees That Were Required With Development

Trees that were required to be planted or preserved by a land use permit are required to be maintained per tree care industry standards.

The removal and replacement of trees subject to the provisions of this chapter is allowed for trees that die within three years after planting. It is relatively common for trees to not survive the establishment period, and not requiring a permit to remove and replant a newly planted tree that fails to establish improves efficiency for both the applicant and city for a relatively insignificant action. Tree establishment associated with an active land use permit is administered through the corresponding regulations for that permit (e.g. Chapter 18.790).

### 8.12.040 Removal of Trees That Were Required With Development

Permits obtained through the City Manager Decision Making Procedures or the City Board or Committee Decision Making Procedures are required to remove trees required to be planted or preserved by a land use permit.

The approval criteria for “development” tree removal through the City Manager Decision Making Procedures are detailed in Section 7 of the Urban Forestry Manual.

According to Section 7 of the Urban Forestry Manual, development tree removal is permitted when:

1. The tree is a hazard and the hazard cannot be abated without removing the tree.
2. The tree is dead or declining.
3. The tree is a nuisance tree.
4. The tree roots are causing damage to paved surfaces, buildings or utilities.
5. Tree removal is required for a street improvement.
6. Tree removal is required for approved development activities or utility installation/repair.
7. The tree presents a fire or emergency access hazard that cannot be abated without removing the tree as determined by the fire marshal.
8. Tree removal is required for thinning of a stand of trees under the supervision of a certified arborist or forester.

Section 7 also requires replacement of development trees, when there is room on site, unless trees are removed for thinning purposes. Replacement trees are required to be of equivalent stature and location so as to replace the function of the tree that was removed. For example, if a tree was required by Chapter 18.745 to provide a buffer between properties, it is required to be replaced with a similar stature tree (at maturity) and similar location so that it can continue to provide a buffering effect. In addition to newly planted trees, existing trees can be used as replacement trees provided they meet all of the replacement tree species, size, condition and location standards detailed in Section 7 and are not already protected by other code provisions. A fee in lieu of replacement is allowed at the city’s discretion.

B. The city manager or designee shall utilize all available land use permit records and data when determining whether a tree is subject to the provisions of this chapter.

8.12.030 Maintenance of Trees That Were Required With Development

A. Trees subject to the provisions of this chapter and trees that were required to be planted as replacement trees by the provisions of this chapter shall be maintained in a manner consistent with tree care industry standards and shall be maintained so as not to become hazard trees as defined in Chapter 8.02 of the Tigard Municipal Code.

B. If any tree subject to the provisions of this chapter dies within three years after planting, it shall be removed and replaced in accordance with the previous permit approval. The removal of trees that were required with development provisions (Section 8.12.040 below) shall not apply to tree removal and replacement in accordance with this subsection.

8.12.040 Removal of Trees That Were Required With Development

Except as exempted by Section 8.12.030.B above, no person shall remove any tree subject to the provisions of this chapter without prior written approval obtained either through:

A. The City Manager Decision Making Procedures detailed in Section 8.04.020 using the approval criteria in Section 7, part 1 of the Urban Forestry Manual; or

B. The City Board or Committee Decision Making Procedures detailed in Section 8.04.030.

Commentary

Chapter 8.14 TREES THAT WERE PLANTED USING THE URBAN FORESTRY FUND

Chapter 8.14 establishes the framework for permitting decisions for trees that were planted using the Urban Forestry Fund.

8.14.010 Purpose

The purpose statement explains that the chapter creates standards and procedures for maintaining, removing and replacing trees that were planted using the city's Urban Forestry Fund. The chapter is intended to ensure maximum benefit when city funds are expended to plant trees.

TIGARD MUNICIPAL CODE

Chapter 8.14 TREES THAT WERE PLANTED USING THE URBAN FORESTRY FUND

Sections:

8.14.010 Purpose

8.14.020 General Provisions

8.14.030 Maintenance of Trees That Were Planted Using the Urban Forestry Fund

8.14.040 Removal of Trees That Were Planted Using the Urban Forestry Fund

8.14.010 Purpose

The purpose of this chapter is to establish standards and procedures for the maintenance, removal and replacement of trees that were planted using the Urban Forestry Fund:

A. To maintain the environmental, aesthetic, social and economic benefits provided by trees;

B. To replace trees that were removed with past development; and

C. To ensure public funds for tree planting are invested wisely by requiring ongoing maintenance and replacement as a condition of expenditure.

## Commentary

### 8.14.020 General Provisions

The provisions are applicable to trees planted using the Urban Forestry Fund. Only those trees planted after the date of adoption of the Urban Forestry Code Revisions will be subject to the provisions of the chapter, since prior plantings were undertaken without knowledge of the code requirements.

The city records of planting projects will be used to determine if a particular tree was planted using the Urban Forestry Fund.

### 8.14.030 Maintenance of Trees that were Planted Using the Urban Forestry Fund

Trees that were planted using the Urban Forestry Fund are required to be maintained per tree care industry standards.

The removal and replacement of trees that were planted using the Urban Forestry Fund is allowed for trees that die within three years after planting. It is relatively common for trees to not survive the establishment period, and not requiring a permit to remove and replant a newly planted tree that fails to establish improves efficiency for both the applicant and city for a relatively insignificant action.

### 8.14.040 Removal of Trees that were Planted Using the Urban Forestry Fund

Permits obtained through the City Manager Decision Making Procedures or the City Board or Committee Decision Making Procedures are required to remove trees that were planted using the Urban Forestry Fund.

The approval criteria for “Urban Forestry Fund” tree removal through the City Manager Decision Making Procedures are detailed in Section 8 of the Urban Forestry Manual.

According to Section 8 of the Urban Forestry Manual, Urban Forestry Fund tree removal is permitted when:

1. The tree is a hazard and the hazard cannot be abated without removing the tree.
2. The tree is dead or declining.
3. The tree is a nuisance tree.
4. The tree roots are causing damage to paved surfaces, buildings or utilities.
5. Tree removal is required for a street improvement.
6. Tree removal is required for approved development activities or utility installation/repair.
7. The tree presents a fire or emergency access hazard that cannot be abated without removing the tree as determined by the fire marshal.
8. Tree removal is required for thinning of a stand of trees under the supervision of a certified arborist or forester.

Section 8 also requires replacement of Urban Forestry Fund trees when there is room on site unless trees are removed for thinning purposes. Replacement trees are required to be of equivalent stature so as to replace the future canopy of the tree that was removed. In addition to newly planted trees, existing trees can be used as replacement trees provided they meet all of the replacement tree species, size, condition and location standards detailed in Section 8 and are not already protected by other code provisions. A fee in lieu of replacement is allowed at the city’s discretion.

8.14.020 General Provisions

A. The provisions of this chapter do not apply unless there is substantial evidence that one of the following situations exists:

1. Trees were planted using the Urban Forestry Fund Number 260 after *[insert date of adoption]*; and
2. Trees were required as replacements for trees in 8.14.020.A.1 above.

B. Determination of Applicability or Exemption. The city manager or designee shall utilize all available records and data when determining whether a tree is subject to the provisions of this chapter.

8.14.030 Maintenance of Trees that were Planted Using the Urban Forestry Fund

A. Trees subject to the provisions of this chapter and trees that were required to be planted as replacement trees by the provisions of this chapter shall be maintained in a manner consistent with tree care industry standards and shall be maintained so as not to become hazard trees as defined in Chapter 8.02 of the Tigard Municipal Code.

B. If any tree subject to the provisions of this chapter dies within three years after planting, it shall be removed and replaced in accordance with the previous permit approval. The removal of trees that were planted using the Urban Forestry Fund provisions (Section 8.14.040 below) shall not apply to tree removal and replacement in accordance with this subsection.

8.14.040 Removal of Trees that were Planted Using the Urban Forestry Fund

Except as exempted by Section 8.14.030.B above, no person shall remove any tree subject to the provisions of this chapter without prior written approval obtained either through:

- A. The City Manager Decision Making Procedures detailed in Section 8.04.020 using the approval criteria in Section 8, part 1 of the Urban Forestry Manual; or
- B. The City Board or Committee Decision Making Procedures detailed in Section 8.04.030.

Commentary

8.16.010 Purpose

The purpose statement explains that the chapter creates a framework for recognizing, appreciating and providing voluntary protection for trees of landmark importance.

TIGARD MUNICIPAL CODE

Chapter 8.16 HERITAGE TREES

Sections:

- 8.16.010 Purpose
- 8.16.020 General Provisions
- 8.16.030 Nomination and Designation of Heritage Trees
- 8.16.040 Maintenance of Heritage Trees
- 8.16.050 Nomination and Designation of Significant Trees
- 8.16.060 Incentives for Heritage Tree Designation
- 8.16.070 Removal of Heritage Tree Designation
- 8.16.080 Removal of Significant Tree Designation

8.16.010 Purpose

The purpose of this chapter is to recognize, appreciate and provide for voluntary protection of trees that are of landmark importance due to age, size, species, horticultural quality or historic importance.



Commentary

8.16.020 General Provisions

The city will designate a board or commission to administer the chapter provisions.

Trees may be granted one of two special designations (heritage tree or significant tree) by the provisions of this chapter. Heritage trees are of landmark importance, afforded regulatory protection from removal and eligible for city funding for maintenance. Significant trees are also of landmark importance, are not afforded regulatory protection from removal and are not eligible for city funding for maintenance.

The reviewing authority may decide a tree that is nominated as a heritage tree should be designated as a significant tree if it is of lesser landmark importance (than a heritage tree). An applicant may nominate a tree directly for designation as a significant tree if they acknowledge a particular tree is of lesser landmark importance, but they would still like the tree to be recognized by the community. Alternatively, an applicant may nominate a tree for significant tree designation if they do not want the tree to be afforded regulatory protection, even if they think the tree could be designated as a heritage tree.

8.16.020 General Provisions

A. The city manager or designee shall authorize a city board or committee to implement the provisions of this chapter.

B. Heritage trees and significant trees may be of equivalent landmark importance due to age, size, species, horticultural quality or historic importance. The designated review body may approve designation as a significant tree for a tree nominated as a heritage tree if the review body determines the tree is of lesser landmark importance, but still worthy of recognition. Alternatively, a tree owner or responsible party may choose to nominate a tree as a significant tree rather than a heritage tree if they determine the tree is of lesser landmark importance, but still worthy of recognition, or if they desire no regulatory protection of the tree they would like to have recognized.

8.16.030 Nomination and Designation of Heritage Trees

The process of nominating and designating a heritage tree begins with someone recognizing that a tree or group of trees is of landmark importance due to age, size, species, horticultural quality or historic importance. The tree owner is required to sign off on the nomination. If the tree owner is the city, the city manager or designee is required to sign off on the nomination.

The designated city board or committee then reviews the nomination materials and can decide to recommend heritage tree designation and forward their decision to City Council, approve designation as a significant tree subject to final approval of the property owner or deny the tree designation as a heritage tree or significant tree.

If the designated city board or committee recommends heritage tree designation, the city will prepare the necessary paperwork to record heritage tree designation on the property deed. The property owner will be required to sign the paperwork in advance of City Council's final decision on the heritage tree. This is a change from current procedures in Chapter 9.08 because there have been instances in the past where, after council voted to approve heritage tree designation, the applicant decided they did not want to sign the paperwork. Under the new procedure, the city would destroy the signed paperwork if City Council does not approve heritage tree designation.

After the necessary paperwork is signed, City Council will review the nomination materials and recommendations by staff and the designated board or commission. City Council may vote to approve heritage tree designation (at which point the heritage tree paperwork will be executed for recording on the deed of the property), approve significant tree designation (subject to final approval of the property owner) or deny the tree heritage or significant tree designation.

Trees that are designated as heritage trees or significant trees will be included in a publicly accessible inventory of trees.

8.16.030 Nomination and Designation of Heritage Trees

A. Any person may nominate a particular tree or group of trees to be designated as a heritage tree due to age, size, species, horticultural quality or historic importance. The nomination shall be submitted by the tree owner or responsible party or accompanied by the tree owner or responsible party's written consent. If the nominated tree is located on city property, the nomination shall be submitted by the city manager or designee or be accompanied by the city manager's or designee's written consent. Upon completion of the nomination process, the remaining portions of this subsection shall apply in the order listed.

B. After reviewing the nomination materials, and any supplemental information provided by the city manager or designee, the designated city board or committee may decide by majority vote to:

1. Recommend approval of the tree to be designated as a heritage tree upon finding it is of landmark importance due to age, size, species, horticultural quality or historic importance, and forward their recommendation to City Council.

2. Approve the tree to be designated as a significant tree upon finding it is of landmark importance due to age, size, species, horticultural quality or historic importance. Upon receipt of the tree owner's or responsible party's written consent for designation as a significant tree, the tree shall be included in a publicly accessible inventory of trees.

3. Deny the tree as a heritage tree and significant tree.

C. When the designated city board or committee recommends that council designate a tree as a heritage tree, the city manager or designee shall prepare for the tree owner or responsible party the paperwork necessary to record the heritage tree designation on the owner's or responsible party's deed, noting on such deed that the tree is subject to the provisions of this chapter. If the tree owner or responsible party fails to sign the necessary paperwork, the heritage tree designation shall be void, the matter shall not move forward to council, and the provisions of this chapter shall cease to apply to the tree.

D. After reviewing the nomination materials, any supplemental information provided by the city manager or designee, and the designated city board or committee's recommendation, the City Council may decide by majority vote to:

1. Approve the tree to be designated as a heritage tree upon finding it is of landmark importance due to age, size, species, horticultural quality or historic importance, at which point the city shall execute the necessary paperwork to record the heritage tree designation on the tree owner's or responsible party's deed, noting on such deed that the tree is subject to the provisions of this chapter. In addition, the tree shall be included in a publicly accessible inventory of trees.

Commentary

8.16.030 Nomination and Designation of Heritage Trees

Nomination and designation provisions continued.

8.16.040 Maintenance of Heritage Trees

Heritage trees are required to be maintained per tree care industry standards.

8.16.050 Nomination and Designation of Significant Trees

Trees can be nominated for significant tree designation directly with the tree owner's approval.

The designated board or commission will review the nomination and will decide whether to approve or deny designation.

Following approval, significant trees are included on a publicly accessible inventory of trees. Significant trees do not have regulatory protection.

2. Approve the tree to be designated as a significant tree upon finding it is of landmark importance due to age, size, species, horticultural quality or historic importance. Upon receipt of the tree owner's or responsible party's written consent for designation as a significant tree, the tree shall be included in a publicly accessible inventory of trees.

3. Deny the tree as a heritage tree and significant tree.

8.16.040 Maintenance of Heritage Trees

Heritage trees shall be maintained in a manner consistent with tree care industry standards and shall be maintained so as not to become hazard trees as defined in Chapter 8.02 of the Tigard Municipal Code.

8.16.050 Nomination and Designation of Significant Trees

A. Any person may nominate a particular tree or group of trees to be designated as a significant tree due to age, size, species, horticultural quality or historic importance. The nomination shall be submitted by the tree owner or responsible party or accompanied by the tree owner or responsible party's written consent. If the nominated tree is located on city property, the nomination shall be submitted by the city manager or designee or be accompanied by the city manager's or designee's written consent. Upon completion of the nomination process, the remaining portions of this subsection shall apply.

B. After reviewing the nomination materials, and any supplemental information provided by the city manager or designee, the designated city board or committee may decide by majority vote to:

1. Approve the tree to be designated as a significant tree upon finding it is of landmark importance due to age, size, species, horticultural quality or historic importance. The tree shall be included in a publicly accessible inventory of trees.

2. Deny the tree as a significant tree.

Commentary

8.16.060 Incentives for Heritage Tree Designation

Designated heritage trees are eligible for incentives such as plaques and maintenance subject to the availability of funds. Significant trees are not eligible for such incentives because regulatory protections for the trees are not in place.

8.16.060 Incentives for Heritage Tree Designation

Designated heritage trees shall be eligible for the following incentives subject to availability of city funding and city approval:

A. Plaques which may be placed on or near heritage trees; and

B. Maintenance of heritage trees including but not limited to:

1. Pruning;
2. Pest control;
3. Unwanted planted removal;
4. Fertilization;
5. Soil amendment; and
6. Cabling and bracing.



## Commentary

### 8.16.070 Removal of Heritage Tree Designation

Permits obtained through the City Manager Decision Making Procedures or the City Board or Committee Decision Making Procedures are required to remove heritage tree designation.

The approval criteria for heritage tree designation removal through the City Manager Decision Making Procedures are detailed in Section 9 of the Urban Forestry Manual.

According to Section 9 of the Urban Forestry Manual, removal of heritage tree designation is permitted when:

1. The tree is a hazard and the hazard cannot be abated without removing the tree.
2. The tree is dead or declining.
3. The tree presents a fire or emergency access hazard that cannot be abated without removing the tree as determined by the fire marshal.
4. Tree removal is required for thinning of a stand of heritage trees under the supervision of a certified arborist or forester.

There is less criteria that would allow the removal of heritage trees through the City Manager Decision Making Procedures than the other protected classes of trees since heritage trees are of special significance. For example, if a street tree has roots damaging a sidewalk it would be approved for removal by the city without public review, whereas the removal of a heritage tree with roots damaging a sidewalk would only be permitted following a public review (City Board or Committee Decision Making Procedures). Through the public review, the public could weigh things like whether the sidewalk could be repaired in a way that preserves the tree, the importance of the tree to the surrounding community and the impact of the tree on the owner.

Section 9 does not require replacement of heritage trees because heritage trees are unique and can not necessarily be replaced by planting a new tree.

Once heritage tree designation is removed, the tree is no longer subject to the chapter provisions.

8.16.070 Removal of Heritage Tree Designation

Heritage trees and heritage tree designations shall not be removed, without prior written approval obtained either through:

A. The City Manager Decision Making Procedures detailed in Section 8.04.020 using the approval criteria in Section 9, part 1 of the Urban Forestry Manual; or

B. The City Board or Committee Decision Making Procedures detailed in Section 8.04.030.

8.16.080 Removal of Significant Tree Designation

A. Significant tree designation shall be removed when requested in writing by the tree owner or responsible party.

B. The tree owner or responsible party shall notify the city in writing of the removal of any significant tree.

## Commentary

### Chapter 9.06 TREES ON CITY PROPERTY.

The provisions of Chapter 9.06 have been struck so there are consistent regulations across ownerships. In other words, the same standards will apply regardless of whether trees are on city property or private property.

Definitions in Chapter 9.06 have been revised and relocated to Chapters 8.02 and 18.120.

The Tree Manual has been revised and is now the Urban Forestry Manual which is referenced in Section 8.02.030.

Provisions in Chapter 9.06 that are specific to street trees have been revised and relocated to Chapter 8.08.

Provisions in Chapter 9.06 that are specific to development are located in Chapter 18.790.

Enforcement provisions in Chapter 9.06 specific to trees are now in Sections 8.02.030 and 1.16.640.

~~Chapter 9.06 TREES ON CITY PROPERTY.~~

~~Sections:~~

~~9.06.010 Purpose.~~

~~9.06.020 Definitions.~~

~~9.06.030 Tree Planting on City property.~~

~~9.06.040 Tree Care and Maintenance on City property.~~

~~9.06.050 Tree Protection.~~

~~9.06.060 Removal of Hazardous Trees from City property.~~

~~9.06.070 Tree Removal and Replanting.~~

~~9.06.080 Enforcement.~~

~~9.06.010 Purpose.~~

~~(1) Value of Trees. The City of Tigard recognizes that trees are vital components of the urban forest environment. Trees reduce air, water, soil and noise pollution, provide energy reducing shade, control erosion, supply oxygen to breathe, provide habitat for wildlife, enhance quality of life and property values in every community, and are sources of pride for the entire city.~~

~~(2) Purposes:~~

~~(A) To provide guidance for the planting, maintenance and protection of trees on City property; and~~

~~(B) To provide a priority system for removal of hazardous trees from City property;~~

~~(C) To ensure the protection of trees during the development of properties on City property.~~

~~(3) Authority to Adopt a Tree Manual. The City Council may adopt by resolution a Tree Manual implementing the provisions of this chapter and providing detailed standards for tree planting, maintenance, protection and removal on City property.~~

Commentary

Chapter 9.06 TREES ON CITY PROPERTY.

Strikethroughs of existing trees on city property provisions continued.

**9.06.020 — Definitions:**

The following definitions apply in this chapter:

(1) ~~City Forester.~~ Under the direction of the Public Works Director is responsible for planning, developing and implementing a comprehensive urban forestry program, and providing community education and advice in support of urban forestry activities.

(2) ~~City Property.~~ “City property” includes all land owned by the City and all lands dedicated to the public and administered by the City, including but not limited to City right of way and City parks.

(3) ~~City-owned Property.~~ City property other than the right of way.

(4) ~~Hazardous Tree.~~ A tree which by reason of disease, infestation, age or other condition presents a known and immediate hazard to persons or to public or private property.

(5) ~~Mitigation.~~ Methods of tree replacement, direct costs, and/or retention used to lessen the environmental impact of development.

(6) ~~Removal.~~ The cutting or removing of 50 percent (50%) or more of a crown, trunk, or root system of a tree, or any action which results in the loss of aesthetic or physiological viability or causes the tree to fall or be in immediate danger of falling.

(7) ~~Street Tree.~~ Any tree that is growing along a street within the public right of way.

(8) ~~Street Tree List.~~ A list of approved tree species that may be planted within the public right of way.

(9) ~~Tree.~~ A standing woody plant having a trunk(s) two inches or more in diameter when measured four and a half feet from the ground. If the tree is on a slope, the measure is taken on the uphill side.

(10) ~~Tree Manual.~~ The manual governing tree planting, care, maintenance and removal adopted by the City by resolution pursuant to Section 9.06.010.

Commentary

Chapter 9.06 TREES ON CITY PROPERTY.

Strikethroughs of existing trees on city property provisions continued.

**9.06.030 — Tree Planting**

~~(1) Tree Planting:~~

~~(A) No person other than the City shall plant a tree on City property without the written approval of the Public Works Director or designee. In approving tree plantings, the Public Works Director or designee may impose conditions of approval;~~

~~(B) Any City department responsible for City property shall consult with the Public Works Director or designee before planting trees on City property;~~

~~(C) The Public Works Director or designee may grant approval of tree planting on City property under subsection a of this section only if the applicant has submitted a tree plan showing compliance with the standards set forth in the Tree Manual, and has signed a maintenance agreement consistent with the standards set forth in the Tree Manual. The requirement for a maintenance agreement may be waived if the tree planting is voluntary and not required by any City code provision or condition of approval;~~

~~(D) All tree plantings on City property shall be undertaken in a manner consistent with the approval of the Public Works Director or designee and the standards set forth in the Tree Manual;~~

~~(E) Only trees listed in the Street Tree List or those specifically approved by the Public Works Director or designee may be planted as street trees.~~

**9.06.040 — Tree Care and Maintenance**

~~(1) General Provisions~~

~~(A) All trees planted pursuant to the written approval of the Public Works Director or designee under Section 9.06.040 shall be cared for and maintained according to the standards set forth in the City Tree Care Manual.~~

**9.06.050 — Tree Protection**

~~(1) Care of Trees on City Property. The City shall follow the Tree Manual in caring for and protecting trees on City property.~~

~~(2) These requirements shall provide for the proper protection of tree roots, trunk(s) (or stem(s)), branches, and foliage within a tree's critical root zone for any tree on City property during any type of construction activity or project (excavation, demolition or any other type of disturbance);~~



Commentary

Chapter 9.06 TREES ON CITY PROPERTY.

Strikethroughs of existing trees on city property provisions continued.

**9.06.060 — ~~Removal of Hazardous Trees from City Property~~**~~(1) Removal Priority~~

~~(A) When any person reports to the Public Works Director or designee that a tree on City property is hazardous, the Public Works Director, or appointed designee, shall evaluate the condition of the tree. The Public Works Director or designee shall establish a removal priority among trees determined to be hazardous and the City shall proceed with removal of hazardous trees from City property according to the priority established by the Public Works Director or designee, subject to the availability of financial and other resources.~~

~~(2) Removal of Hazardous Trees~~

~~(A) The removal of hazardous trees from City property shall be performed by City of Tigard employees or contracted commercial tree care companies with experience in tree removal. The Public Works Director or designee shall provide guidance as to the disposition of any wood or debris from any tree removal on City property.~~

**9.06.070 — ~~Removal of Trees from City Property~~**

~~(1) Removal of Trees from City Property other than Right of Way Prohibited. No person other than the City or a person acting under contract with the City shall remove a tree from any City park or any City-owned property without written approval of the Public Works Director or designee. Any person removing a tree from City property other than right of way shall provide mitigation as specified in the Tree Manual.~~

~~(2) Removal of Trees from Right of Way. No person other than the City or a person acting under contract with the City shall remove a tree from any City right of way without written approval of the Public Works Director or designee. As part of the written approval for tree removal from right of way, the Public Works Director or designee shall require mitigation as specified in the Tree Manual.~~

~~(3) Removal of Wood or Tree Debris from City Property. No person shall remove wood or tree debris from City property without written approval of the Public Works Director or designee; provided however that the Public Works Director or designee may retroactively approve removal of wood or tree debris from City property if the removal was under emergency circumstances. This section does not prohibit clearing of paths or other clean-up that leaves wood or tree debris on City property.~~

Commentary

Chapter 9.06 TREES ON CITY PROPERTY.

Strikethroughs of existing trees on city property provisions continued.

~~9.06.080~~ ~~Enforcement~~

~~(1) The Public Works Director or designee may do any or all of the following if there is reason to believe a violation of this chapter has occurred:~~

~~(A) Issue a stop work order pursuant to Tigard Development Code Section 18.230;~~

~~(B) Issue a civil infraction citation pursuant to Tigard Municipal Code Chapter 1.16;~~

~~(C) Take any other action allowed by law to abate or obtain compensation for the violation. ■ (Ord. 02-34)~~

## Commentary

### Chapter 9.08 HERITAGE TREES

Chapter 9.08 contains the existing provisions for heritage tree designation, maintenance, removal and enforcement. The heritage tree provisions have been revised and moved to Chapter 8.16 (Heritage Trees) in the new consolidated Urban Forestry Title 8.

The revised heritage tree provisions allow for designation of two types of landmark trees (heritage trees and significant trees). The significant tree designation is new and allows for recognition of trees that are either of lesser landmark importance and/or the tree owner does not want regulatory protections for the tree.

**Chapter 9.08 — HERITAGE TREES.**

**Sections:**

~~9.08.010 — Purpose and Definitions.~~

~~9.08.020 — Nomination.~~

~~9.08.030 — Review Process.~~

~~9.08.040 — Protection of Heritage Trees.~~

~~9.08.050 — Recognition of Heritage Trees.~~

~~9.08.060 — Removal of Heritage Tree Designation.~~

~~9.08.070 — Incentives.~~

~~9.08.010 — Purpose and Definitions.~~

~~(1) The purpose of this chapter is to foster appreciation and provide for voluntary protection of designated important trees within the Tigard City limits.~~

~~(2) A “Heritage Tree” is a tree or stand of trees that is designated to be of landmark importance due to age, size, species, horticultural quality or historical importance.~~

~~(3) “City Property” shall mean property owned by the City of Tigard or public right of way under City jurisdiction.~~

~~9.08.020 — Nomination.~~

~~(1) Any person may nominate a particular tree or group of trees for “Heritage” status. If the proposed Heritage Tree is located on property other than City property, the nomination shall be submitted by the property owner or accompanied by the property owner’s written consent. If the proposed Heritage Tree is located on City property, the nomination shall be submitted to the City Forester for evaluation. The City Forester and other City designees shall append his or her recommendation to the nomination.~~

~~(2) All nominations shall include a photograph of the tree(s) and a narrative explaining why the tree qualifies for Heritage status.~~

Commentary

Chapter 9.08 HERITAGE TREES

Strikethroughs of existing heritage tree provisions continued.

**9.08.030 — Review Process**

~~(1) The Tigard Tree Board shall review all Heritage Tree nominations at a public meeting. Notice of the meeting shall be provided to the nominating applicant, the property owner (if different than the applicant), the City Forester and the Chair of any recognized neighborhood association in which the tree is located.~~

~~———— (2) ——— The City Forester shall prepare a report for the Tree Board analyzing whether the tree complies with the requirements for designation.~~

~~———— (3) ——— After considering the City Forester’s report and any testimony by interested persons, the Tigard Tree Board shall vote on the nomination. The Board may designate the tree as a Heritage Tree if the Board determines that the following criteria are met:~~



Commentary

Chapter 9.08 HERITAGE TREES

Strikethroughs of existing heritage tree provisions continued.

~~(A) The tree or stand of trees is of landmark importance due to age, size, species, horticultural quality or historic importance; and~~

~~(B) The tree is not irreparably damaged, diseased, hazardous or unsafe, or the applicant is willing to have the tree treated by an arborist and the treatment will alleviate the damage, disease or hazard.~~

~~(4) If the nomination is approved by the Tree Board, it shall be forwarded, with all elements of the Board's evaluation attached, to the City Council for final evaluation and approval.~~

~~(5) Following approval of the nomination by the City Council:~~

~~(A) If the tree is located on private property, the designation shall be complete upon the property owner's execution of a covenant running with the land and duly recorded by the City. The covenant shall include a legal description of the subject property, generally describe the location of the Heritage Tree, and covenant that the tree is protected as a Heritage Tree by the City of Tigard and is therefore subject to special protection. The Heritage Tree shall be listed on the City Heritage Tree Registry.~~

~~(B) If the tree is located on City Property, the designation shall be complete upon the listing of the tree on the City Heritage Tree Registry.~~

~~9.08.040 Protection of Heritage Trees~~

~~(1) A permit shall be required to remove a designated Heritage Tree.~~

~~(2) If an application for a permit to remove a Heritage Tree is presented, the applicant shall demonstrate that the tree is hazardous or that the burden imposed on the owner outweighs the public benefit provided by the tree. For the purposes of making this determination, the following tree impacts shall not be considered unreasonable burdens on the property owner or City:~~

~~(A) View obstruction;~~

~~(B) Routine pruning, leaf raking and other maintenance activities; and~~

~~(C) Infrastructure impacts or tree hazards that can be controlled or avoided by appropriate pruning or maintenance.~~

Commentary

Chapter 9.08 HERITAGE TREES

Strikethroughs of existing heritage tree provisions continued.

~~(3) Unless there is a permit to remove a dead or hazardous Heritage Tree, the applicant shall be required to follow the mitigation procedures for the loss of the tree as outlined in the Tigard Municipal Code, Chapter 18.790.~~

~~(4) Any person who removes a Heritage Tree without first obtaining a permit to do so shall be subject to a civil penalty equal to twice the value of the tree as determined by the City Forester with reference to the current edition of the Guide to Plan Appraisal, and the person shall be required to mitigate for the loss of the tree.~~

~~9.08.050 — Recognition of Heritage Trees~~

~~(1) A Heritage Tree plaque may be designed and may be furnished by the City to the property owner of a designated Heritage Tree, or if the tree is on City property, to the City Forester. The plaque shall be posted at or near the tree and, if feasible, visible from a public right of way.~~

~~(2) The City shall maintain a Heritage Tree Registry and map of designated Heritage Trees.~~

~~9.08.060 — Removal of Heritage Trees Designation~~

~~(1) A Heritage Tree shall be removed from designation if it dies.~~

~~(2) To request permission to remove a tree from Heritage designation, the interested party or parties shall submit to the City Forester a narrative clearly stating justification for removal. The City Forester shall review the request, and append his or her recommendations to the request and submit the request and recommendation to the City Council for a final decision.~~

~~(3) If the Heritage Tree is on private property, and removal from Heritage designation is approved, the City shall provide a document extinguishing the covenant running with the property, which may be recorded by the property owner.~~

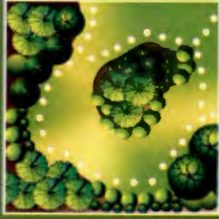
~~— (4) — Once Heritage Tree status is removed, the tree shall be treated as any other tree within the City limits for purposes of planning, development, removal or care.~~

~~9.08.070 — Incentives.~~

~~(1) Incentives for property owners might include:~~

~~— (A) — The City paying for pruning, necessary soil amendments and maintenance of the Heritage Trees; and~~

~~— (B) — The City providing a plaque for each tree identifying the species of tree.~~  
~~(Ord. 05-16) ■~~



*City of Tigard*

# Urban Forestry Code Revisions Project

VOLUME IV | URBAN FORESTRY MANUAL (Administrative Rules) | JULY 2012

**City of Tigard**  
COMMUNITY DEVELOPMENT DEPARTMENT  
13125 SW Hall Blvd., Tigard, OR 97223  
[www.tigard-or.gov/trees](http://www.tigard-or.gov/trees)



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## Organization of the Urban Forestry Code Revisions Documents

The Urban Forestry Code Revisions project is presented in five volumes. Volume I provides the project overview and describes the process used to develop all of the elements. Volume II is the land use elements of the code, and Volume III the non land use elements. Volume IV contains the Urban Forestry Manual. Volume V contains technical reports and research that contributed to the code revisions along with details of the public input and deliberations to date.

### Volume I | Project Overview

**Project Overview** includes the following sections:

- Project Introduction
- Overview of Key Elements
- Key Element Summaries
  - Urban Forestry Standards for Development
  - Tree Grove Preservation Incentives
  - Tree Permit Requirements
  - Hazard Trees
  - Urban Forestry Manual

**Appendix A** includes additional detail about the information used to shape the Urban Forestry Code Revisions Project, and includes the following sections:

- Process summary
- Summary of Community Ideas and Concerns
- Summary of Planning Commission Deliberations
- Existing Conditions

### Volume II | Land Use Elements

**Community Development Code (Title 18)** is the Planning Commission's recommended draft of the Development Code. This section includes commentary on the amendments.

**Peer Review** demonstrates how the Planning Commission's recommended draft of the Development Code and Urban Forestry Manual will work in application.

**Tree Grove ESEE Analysis** is a report that addresses Statewide Planning Goal 5 - Natural Resources requirements for the preservation of Significant Tree Groves.

**Staff Report and findings** includes the staff recommendation for approval of the land use elements (Title 18 and the Comprehensive Plan Amendment) and the findings that demonstrate the land use elements meet the necessary approval criteria.

### **Volume III | Non Land Use Elements**

**Tigard Municipal Code** is the staff proposed draft of the Municipal Code (Title 8 and other Municipal Code titles). This section includes commentary on the amendments.

### **Volume IV | Urban Forestry Manual (Administrative Rules)**

**Urban Forestry Manual** consists of administrative rules that implement the technical details of the urban forestry related code provisions in Title 8, Title 18 and other applicable titles in the Tigard Municipal Code.

### **Volume V | Additional Background Materials**

**Planning Commission Deliberations** details Planning Commission discussion and decisions during the public hearing process.

**Amendment Requests Document for the Planning Commission** lists code amendment requests received in response to the first Planning Commission public hearing and staff responses.

**Outstanding Issues for the Urban Forestry Code Revisions** includes additional information on the outstanding issues that were further deliberated by the Planning Commission before making their final recommendation to City Council on May 7, 2012.

**Log of Input** lists the input received and any code changes from the last meeting of the CAC to the staff proposed draft of the Urban Forestry Code Revisions to Planning Commission.

**CAC Guiding Principles** includes the consensus view of the Citizens Advisory Committee (CAC) developed to help guide the legislative adoption process.

**Tree Values** includes information and current research on the environmental, economic, social and aesthetic benefits of trees.

**Canopy Standards** explains the reasons for adopting tree canopy cover requirements as well as the methods used to arrive at the requirements.

**Soil volume** details research about the soil volume required to support a mature tree canopy.

**Tree Canopy Fee** discusses research used to develop a square foot value for tree canopy.

**Regulatory Comparison** is an excerpted report prepared by Metro and the Audubon Society that summarizes and compares regional urban forestry programs and regulations.

**Urban Forestry Master Plan** is the City of Tigard's recommended plan for achieving the urban forestry goals in the Comprehensive Plan.





# *City of Tigard* **URBAN FORESTRY MANUAL**

## **Introduction**

The Urban Forestry Manual consists of administrative rules that implement the details of the urban forestry related code provisions in Title 8, Title 18 and other applicable titles in the Tigard Municipal Code.

The city manager or designee has the authority to amend the Urban Forestry Manual pursuant with the provisions in Chapter 2.04 of the Tigard Municipal Code. The city manager or designee is authorized to administer the Urban Forestry Manual.



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## Section 1 - Hazard Tree Evaluation and Abatement Procedure

### Part 1. Informal Reconciliation:

If interpersonal communication is not feasible or is unsuccessful, the claimant shall contact the respondent by concurrently sending a regular and certified letter that explains the reasons they believe there is a hazard tree on the respondent's property, demonstrates how the claimant's life, limb or property has the potential to be impacted by said tree, and offers to negotiate a solution that is in compliance with all applicable rules and regulations either directly or through a third party mediator. The claimant is encouraged to support their claim with documentation by a certified tree risk assessor. The respondent shall have seven calendar days or less from receipt of the certified letter or 14 calendar days or less from the postmarked date of the regular letter (whichever is sooner) to respond to the claimant's proposal in writing by concurrent regular and certified mail. In order to become eligible for formal reconciliation, the claimant's letter shall cite Tigard Municipal Code sections 8.06.020 and 8.06.030, explain the respondent's written response deadlines and include all of the other required elements listed above.

Notes:

### Part 2. Formal Reconciliation:

If the results of informal reconciliation are not acceptable to the claimant or there has been no response for 21 calendar days or more since the claimant sent the concurrent regular and certified letters, the claimant may seek resolution through formal reconciliation by completing a hazard tree dispute resolution application, paying a deposit for all applicable hazard tree dispute resolution fees and providing the city all documentation of informal reconciliation including but not limited to any letters to and from the respondent, proof of certified mail delivery and proof of certified mail receipt (if available).

See Master Fees and Charges Schedule for current fees

The city shall use all readily available tools and technology when assigning the hazard tree owner or responsible party as defined in Tigard Municipal Code Chapter 8.02. If the city determines that the claimant's previous correspondence was with the incorrect respondent, then the claimant shall be required to complete the previous steps of the hazard tree evaluation and abatement procedure with the correct respondent before proceeding with formal reconciliation. If the claimant or respondent disagrees with the city's assignment of the hazard tree owner or responsible party, the city shall be presented a land survey by a professional land surveyor that demonstrates the location of the tree in question in relation to property lines within all listed deadlines in order for the city to consider a reassignment of the hazard tree owner or responsible party.

Notes:

See Appendix 1 for  
Tree Risk  
Assessment Form

Within seven calendar days of receipt of all the required application materials, the city shall gain access to the respondent's property either voluntarily or with a warrant pursuant to Chapter 1.16 of the Tigard Municipal Code, conduct a tree risk assessment by a certified tree risk assessor using the most current version of the tree risk assessment methodology developed by the International Society of Arboriculture, determine if the definition of hazard tree in Tigard Municipal Code Chapter 8.02 has been met and, if necessary, prescribe hazard tree abatement as defined in Tigard Municipal Code Chapter 8.02.

If the city determines the definition of hazard tree has been met, the city shall send a concurrent regular and certified letter to the respondent, explain that the definition of hazard tree has been met, explain the required hazard tree abatement procedures and require that hazard tree abatement be completed in seven calendar days or less from receipt of the certified letter or 14 calendar days or less from the mailing date of the regular letter (whichever is less). The city shall also bill the respondent for all applicable hazard tree dispute resolution fees, and refund the claimant previously deposited hazard tree dispute resolution fees.

If the respondent fails to complete the hazard tree abatement within the required timeframe, the city shall gain access to the property either voluntarily or with a warrant, abate the hazard, bill the respondent for the cost of abatement including administrative costs or place a lien on the property for the cost of abatement including administrative costs pursuant to Chapter 1.16 of the Tigard Municipal Code.

If the city determines the definition of hazard tree has not been met, the city shall send a concurrent regular and certified letter to both the claimant and respondent explaining that the definition of hazard tree has not been met and close the case.



END OF SECTION



## Section 2 - Street Tree Planting and Maintenance Standards

### Part 1. Street Tree Planting Standards:

- A. Street trees shall be planted in a manner consistent with tree care industry standards.
- B. Street trees shall have a minimum caliper of 1 ½ inches at the time of planting.
- C. Street tree species shall be from the street tree list, unless otherwise approved by the city manager or designee.
- D. Street tree species shall be appropriate for the planting environment as determined by the city manager or designee and seek to achieve a balance of the following:
  - 1. Consistency with previously approved street tree plans given space constraints for roots and branches at maturity;
  - 2. Compatibility with space constraints for roots and branches at maturity;
  - 3. Providing adequate species diversity citywide and reasonable resistance to pests and diseases; and
  - 4. Consideration of the objectives of the current street tree planting proposal.
- E. Street trees shall be provided adequate spacing from new and existing trees according to the following standards wherever possible:
  - 1. Street trees categorized as small stature on the street tree list or by the city manager or designee shall be spaced no greater than 20 feet on center and not closer than 15 feet on center from other newly planted street trees or any existing tree that has been in the ground for over three years;
  - 2. Street trees categorized as medium stature on the street tree list or by the city manager or designee shall be spaced no greater than 30 feet on center and not closer than 20 feet on center from other newly planted street trees or any existing tree that has been in the ground for over three years;
  - 3. Street trees categorized as large stature on the street tree list or by the city manager or designee shall be spaced no greater than 40 feet on center and not closer than 30 feet on center from other newly planted street trees or any existing tree that has been in the ground for over three years; and
  - 4. Any tree determined by the city manager or designee to have a mature spread of less than 20 feet shall be considered a small stature tree, and spaced accordingly when used as a street tree.
- F. Street trees shall be placed according to the following standards:

Notes:

See Appendix 2 for  
Street Tree List

Notes:

1. Street trees categorized as small stature on the street tree list or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving;
2. Street trees categorized as medium stature on the street tree list or by the city manager or designee shall not be planted with the center of their trunks closer than 2 ½ feet from any hard surface paving;
3. Street trees categorized as large stature on the street tree list or by the city manager or designee shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving;
4. Not closer than 4 feet on center from any fire hydrant, utility box or utility pole;
5. Not closer than 2 feet on center from any underground utility;
6. Not closer than 10 feet on center from a street light standard;
7. Not closer than 20 feet from a street right of way corner as determined by the city manager or designee. The city manager or designee may require a greater or lesser corner setback based on an analysis of traffic and pedestrian safety impacts;
8. Where there are overhead utility lines, the street tree species selected shall be of a type which, at full maturity, will not interfere with the lines; and
9. Any other standards found by the city manager or designee to be relevant in order to protect public safety and public or private property.

G. Root barriers shall be installed according to the manufacturer's specifications when a street tree is planted within 5 feet of any hard surface paving or utility box, or as otherwise required by the city engineer.

H. Street trees planted prior to the adoption of the most current version of the street tree planting standards shall be exempt from the most current version of the street tree planting standards. However, the most current version of the street tree maintenance standards and the most current version of the street tree removal standards shall apply.

I. If street tree planting is required by another section of the Urban Forestry Manual or Tigard Municipal Code, the city manager or designee may allow for an "in lieu of planting fee" equivalent to the city's cost to plant a street tree per the standards in Section 2, part 1 of the Urban Forestry Manual and maintain a street tree per the standards in Section 2, part 2 of the Urban Forestry Manual for a period of three years after planting. Payment of an in lieu of planting fee shall satisfy the street tree planting requirement.

See Code Section 8.08 and Manual Section 3 for Street Tree Removal Standards

See Master Fees and Charges Schedule for current fees

**Part 2. Street Tree Maintenance Standards:**

- A. Street trees shall be maintained in a manner consistent with tree care industry standards.
- B. Street trees shall be maintained in a manner that does not impede public street or sidewalk traffic consistent with the specifications in section 7.40.060A of the Tigard Municipal Code including:
  - 1. 8 feet of clearance above public sidewalks;
  - 2. 13 feet of clearance above public local and neighborhood streets;
  - 3. 15 feet of clearance above public collector streets; and
  - 4. 18 feet of clearance above public arterial streets.
- C. Street trees shall be maintained so as not to become hazard trees as defined in Chapter 8.02 of the Tigard Municipal Code.

Notes:



**END OF SECTION**



## Section 3 - Street Tree Removal Standards

### Part 1. Street Tree Removal Standards:

- A. Street trees shall be removed in a manner consistent with tree care industry standards.
- B. The city manager or designee shall approve the removal of a street tree if any one of the following criteria are met:
  - 1. The tree is a “hazard tree” as defined in Chapter 8.02 and “hazard tree abatement” as defined in Chapter 8.02 cannot be completed in a manner that results in tree retention consistent with tree care industry standards.
  - 2. The tree is dead.
  - 3. The tree is in an advanced state of decline with insufficient live foliage, branches, roots or other tissue to sustain life.
  - 4. The tree is infested with pests or diseases that if left untreated will cause the tree to die, enter an advanced state of decline or cause other trees to die or enter an advanced state of decline.
  - 5. The tree has sustained physical damage that will cause the tree to die or enter an advanced state of decline. If the physical damage was caused by a person in violation of Chapter 8.08 of the Tigard Municipal Code, the enforcement process outlined in Section 8.02.030 shall be completed prior to approval.
  - 6. The tree is listed on the nuisance tree list.
  - 7. The tree location is such that it would not meet all of the street tree planting standards in Section 2, parts 1E and 1F of the Urban Forestry Manual if it were a newly planted tree.
  - 8. The tree roots are causing damage to paved surfaces, infrastructure, utilities, buildings or other parts of the built environment.
  - 9. The tree location conflicts with areas of public street widening, construction or extension as shown in the Transportation System Plan.
  - 10. Tree removal is required for the purposes of an approved building or land use permit, utility or infrastructure installation or utility or infrastructure repair.
  - 11. The tree is recommended for removal by a designated fire marshal for Tualatin Valley Fire and Rescue because it presents a significant fire risk to habitable structures or limits emergency access for rescue workers, and the risk or access issue cannot be abated through pruning or other means that results in tree retention.

Notes:

See Appendix 6 for  
Nuisance Tree List

Notes:

12. The tree is part of a stand of trees, and a certified arborist or certified forester determines that thinning of interior trees within the stand of trees is necessary for overall stand health, the thinning will result in no less than 80 percent canopy cover at maturity for the area to be thinned, and that thinning of non-native trees is maximized prior to thinning of native trees.
- C. Unless removed for thinning purposes (part 1.B.11above) the city manager or designee shall condition the removal of a street tree upon the planting of a replacement tree in accordance with the Street Tree Planting Standards in Section 2, part 1 of the Urban Forestry Manual. The city manager or designee may consider existing trees as replacement trees if they meet all applicable species, size, condition and location requirements in Section 2, part 1 and were not already required to be planted or preserved by the Tigard Municipal Code.
  - D. If the Street Tree Planting Standards in Section 2, part 1 of the Urban Forestry Manual preclude replanting within the same right of way abutting on, fronting on or adjacent to the property as the tree was removed or on private property within 6 feet of the same right of way as the tree that was removed, the applicant shall be exempt from planting a replacement tree.



END OF SECTION

## Section 4 - Median Tree Planting and Maintenance Standards

### Part 1. Median Tree Planting Standards:

- A. Median trees shall be planted in a manner consistent with tree care industry standards.
- B. Median trees shall have a minimum caliper of 1 ½ inches at the time of planting.
- C. Median tree species shall be from the street tree list, unless otherwise approved by the city manager or designee.
- D. Median tree species shall be appropriate for the planting environment as determined by the city manager or designee and seek to achieve a balance of the following:
  - 1. Consistency with previously approved median tree plans given space constraints for roots and branches at maturity;
  - 2. Compatibility with space constraints for roots and branches at maturity;
  - 3. Providing adequate species diversity citywide and reasonable resistance to pests and diseases; and
  - 4. Consideration of the objectives of the current median tree planting proposal.
- E. Median trees shall be provided adequate spacing from new and existing trees according to the following standards wherever possible:
  - 1. Median trees categorized as small stature on the street tree list or by the city manager or designee shall be spaced no greater than 20 feet on center and not closer than 15 feet on center from other newly planted median trees or any existing tree that has been in the ground for over three years;
  - 2. Median trees categorized as medium stature on the street tree list or by the city manager or designee shall be spaced no greater than 30 feet on center and not closer than 20 feet on center from other newly planted median trees or any existing tree that has been in the ground for over three years;
  - 3. Median trees categorized as large stature on the street tree list or by the city manager or designee shall be spaced no greater than 40 feet on center and not closer than 30 feet on center from other newly planted median trees or any existing tree that has been in the ground for over three years; and
  - 4. Any tree determined by the city manager or designee to have a mature spread of less than 20 feet shall be considered a small stature tree, and spaced accordingly when used as a median tree.

Notes:

See Appendix 2 for  
Street Tree List

Notes:

- F. Median trees shall be placed according to the following standards:
1. Median trees categorized as small stature on the street tree list or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving;
  2. Median trees categorized as medium stature on the street tree list or by the city manager or designee shall not be planted with the center of their trunks closer than 2 ½ feet from any hard surface paving;
  3. Median trees categorized as large stature on the street tree list or by the city manager or designee shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving;
  4. Not closer than 4 feet on center from any fire hydrant, utility box or utility pole;
  5. Not closer than 2 feet on center from any underground utility;
  6. Not closer than 10 feet on center from a street light standard;
  7. Not closer than 20 feet from a street right of way corner as determined by the city manager or designee. The city manager or designee may require a greater or lesser corner setback based on an analysis of traffic and pedestrian safety impacts;
  8. Where there are overhead utility lines, the median tree species selected shall be of a type which, at full maturity, will not interfere with the lines; and
  9. Any other standards found by the city manager or designee to be relevant in order to protect public safety and public or private property.
- G. Root barriers shall be installed according to the manufacturer's specifications when a street tree is planted within 5 feet of any hard surface paving or utility box, or as otherwise required by the city engineer.
- H. Median trees planted prior to the adoption of the most current version of the Median Tree Planting Standards shall be exempt from the most current version of the Median Tree Planting Standards. However, the most current version of the Median Tree Maintenance Standards and the most current version of the Median Tree Removal Standards shall apply.
- I. If median tree planting is required by another section of the Urban Forestry Manual or Tigard Municipal Code, the city manager or designee may allow for an "in lieu of planting fee" equivalent to the city's cost to plant a median tree per the standards in Section 4, part 1 of the Urban Forestry Manual and maintain a street tree per the standards in Section 4, part 2 of the Urban Forestry Manual for a period of three years after planting. Payment of an in lieu of planting fee shall satisfy the median tree planting requirement.

See Code Section  
8.08 and Manual  
Section 5 for Median  
Tree Removal  
Standards



**Part 2. Median Tree Maintenance Standards:**

- A. Median trees shall be maintained in a manner consistent with tree care industry standards.
- B. Median trees shall be maintained in a manner that does not impede public street or sidewalk traffic consistent with the specifications in section 7.40.060A of the Tigard Municipal Code including:
  - 1. 8 feet of clearance above public sidewalks;
  - 2. 13 feet of clearance above public local and neighborhood streets;
  - 3. 15 feet of clearance above public collector streets; and
  - 4. 18 feet of clearance above public arterial streets.
- C. Median trees shall be maintained so as not to become hazard trees as defined in Chapter 8.02 of the Tigard Municipal Code.

Notes:



**END OF SECTION**



## Section 5 - Median Tree Removal Standards

### Part 1. Median Tree Removal Standards:

- A. Median trees shall be removed in a manner consistent with tree care industry standards.
- B. The city manager or designee shall approve the removal of a median tree if any one of the following criteria are met:
  - 1. The tree is a “hazard tree” as defined in Chapter 8.02 and “hazard tree abatement” as defined in Chapter 8.02 cannot be completed in a manner that results in tree retention consistent with tree care industry standards.
  - 2. The tree is dead.
  - 3. The tree is in an advanced state of decline with insufficient live foliage, branches, roots or other tissue to sustain life.
  - 4. The tree is infested with pests or diseases that if left untreated will cause the tree to die, enter an advanced state of decline or cause other trees to die or enter an advanced state of decline.
  - 5. The tree has sustained physical damage that will cause the tree to die or enter an advanced state of decline. If the physical damage was caused by a person in violation of Chapter 8.08 of the Tigard Municipal Code, the enforcement process outlined in Section 8.02.030 shall be completed prior to approval.
  - 6. The tree is listed on the nuisance tree list.
  - 7. The tree location is such that it would not meet all of the median tree planting standards in Section 4, parts 1E and 1F of the Urban Forestry Manual if it were a newly planted tree.
  - 8. The tree roots are causing damage to paved surfaces, infrastructure, utilities, buildings or other parts of the built environment.
  - 9. The tree location conflicts with areas of public street widening, construction or extension as shown in the Transportation System Plan.
  - 10. Tree removal is required for the purposes of an approved building or land use permit, utility or infrastructure installation or utility or infrastructure repair.
  - 11. The tree is recommended for removal by a designated fire marshal for Tualatin Valley Fire and Rescue because it presents a significant fire risk to habitable structures or limits emergency access for rescue workers, and the risk or access issue cannot be abated through pruning or other means that results in tree retention.

Notes:

See Appendix 6 for  
Nuisance Tree List

Notes:

12. The tree is part of a stand of trees, and a certified arborist or certified forester determines that thinning of interior trees within the stand of trees is necessary for overall stand health, the thinning will result in no less than 80 percent canopy cover at maturity for the area to be thinned, and that thinning of non-native trees is maximized prior to thinning of native trees.
- C. Unless removed for thinning purposes (part 1.B.11 above) the city manager or designee shall condition the removal of a median tree upon the planting of a replacement tree within the same median as the tree was removed in accordance with the Median Tree Planting Standards in Section 4, part 1 of the Urban Forestry Manual. The city manager or designee may consider existing trees as replacement trees if they meet all applicable species, size, condition and location requirements in Section 4, part 1 and were not already required to be planted or preserved by the Tigard Municipal Code.
  - D. If the Median Tree Planting Standards in Section 4, part 1 of the Urban Forestry Manual preclude replanting within the same median as the tree was removed, the applicant shall be exempt from planting a replacement tree.



**END OF SECTION**

## Section 6 - Sensitive Lands Tree Removal and Replacement Standards

### Part 1. Sensitive Lands Tree Removal Standards:

- A. Native trees in sensitive lands shall be removed in a manner consistent with tree care industry standards.
- B. The city manager or designee shall approve the removal of a native tree in sensitive lands if any one of the following criteria are met:
  - 1. The tree is a “hazard tree” as defined in Chapter 8.02 and “hazard tree abatement” as defined in Chapter 8.02 cannot be completed in a manner that results in tree retention consistent with tree care industry standards.
  - 2. The tree is dead.
  - 3. The tree is in an advanced state of decline with insufficient live foliage, branches, roots or other tissue to sustain life.
  - 4. The tree is infested with pests or diseases that if left untreated will cause the tree to die, enter an advanced state of decline, or cause other trees to die or enter an advanced state of decline.
  - 5. The tree has sustained physical damage that will cause the tree to die or enter an advanced state of decline. If the physical damage was caused by a person in violation of Chapter 8.10 of the Tigard Municipal Code, the enforcement process outlined in Section 8.02.030 shall be completed prior to approval.
  - 6. The tree roots are causing damage to paved surfaces, infrastructure, utilities, buildings or other parts of the built environment.
  - 7. The tree location conflicts with areas of public street widening, construction or extension as shown in the Transportation System Plan.
  - 8. Tree removal is required for the purposes of an approved building or land use permit, utility or infrastructure installation or utility or infrastructure repair.
  - 9. The tree is recommended for removal by a designated fire marshal for Tualatin Valley Fire and Rescue because it presents a significant fire risk to habitable structures or limits emergency access for rescue workers, and the risk or access issue cannot be abated through pruning or other means that results in tree retention.
  - 10. A certified arborist or certified forester determines that thinning of interior trees within a stand of trees is necessary for overall stand health, the thinning will result in no less than 80 percent canopy cover at maturity for the area to be thinned, and that thinning of non-native trees is maximized prior to thinning of native trees.

Notes:

Notes:

- C. Unless removed for thinning purposes (part 1.B.10 above) the city manager or designee shall condition the removal of each tree in sensitive lands upon the planting of a replacement tree in accordance with the Sensitive Lands Tree Replacement Standards in Section 6, part 2 of the Urban Forestry Manual.
- D. If the Sensitive Lands Tree Replacement Standards in Section 6, part 2 preclude replanting within the same property as the tree that was removed, the applicant shall be exempt from planting a replacement tree.

**Part 2. Sensitive Lands Tree Replacement Standards:**

- A. Replacement trees shall be planted in a manner consistent with tree care industry standards.
- B. The minimum size of a replacement tree shall be 2 feet in height (from the top of the root ball) or equivalent to a 1 gallon container size.
- C. Replacement trees shall be selected from the native tree list in the Urban Forestry Manual.
- D. The city manager or designee may consider native trees that are less than 6 inches DBH as replacement trees if they meet all applicable species, size, condition and location requirements in this section and were not already required to be planted by the Tigard Municipal Code.
- E. The location of replacement trees shall be as follows:
  - 1. As close as practicable to the location of the tree that was removed provided the location complies with the other standards in this section;
  - 2. No closer than 10 feet on center from newly planted or existing trees;
  - 3. Trees categorized as small stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 15 feet from the face of habitable buildings;
  - 4. Trees categorized as medium stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 20 feet from the face of habitable buildings;
  - 5. Trees categorized as large stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 30 feet from the face of habitable buildings;
  - 6. Trees categorized as small stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving;

See Appendix 5 for  
Native Tree List

- 7. Trees categorized as medium stature on the native tree list in the Urban Forestry Manual shall not be planted with the center of their trunks closer than 2 ½ feet from any hard surface paving; Trees categorized as large stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving; and
  - 8. Where there are overhead utility lines, the tree species selected shall be of a type which, at full maturity, will not interfere with the lines.
- F. The city manager or designee may allow for an “in lieu of planting fee” equivalent to the city’s cost to plant a tree in sensitive lands per the standards in this Section and maintain a tree in sensitive lands per the standards in Section 8.10.030 of the Tigard Municipal Code for a period of three years after planting. Payment of an in lieu of planting fee shall satisfy the sensitive lands tree replacement requirement.

Notes:

See Master Fees and Charges Schedule for current fees



END OF SECTION





## Section 7 - Development Tree Removal and Replacement Standards

### Part 1. Development Tree Removal Standards:

- A. Trees subject to the requirements of Chapter 8.12 shall be removed in a manner consistent with tree care industry standards.
- B. The city manager or designee shall approve the removal of trees subject to the requirements of Chapter 8.12 if any one of the following criteria are met:
  - 1. The tree is a “hazard tree” as defined in Chapter 8.02 and “hazard tree abatement” as defined in Chapter 8.02 cannot be completed in a manner that results in tree retention consistent with tree care industry standards.
  - 2. The tree is dead.
  - 3. The tree is in an advanced state of decline with insufficient live foliage, branches, roots or other tissue to sustain life.
  - 4. The tree is infested with pests or diseases that if left untreated will cause the tree to die, enter an advanced state of decline or cause other trees to die or enter an advanced state of decline.
  - 5. The tree has sustained physical damage that will cause the tree to die or enter an advanced state of decline. If the physical damage was caused by a person in violation of Chapter 8.12 of the Tigard Municipal Code, the enforcement process outlined in Section 8.02.030 shall be completed prior to approval.
  - 6. The tree is listed in the nuisance tree list.
  - 7. The tree roots are causing damage to paved surfaces, infrastructure, utilities, buildings or other parts of the built environment.
  - 8. The tree location conflicts with areas of public street widening, construction or extension as shown in the Transportation System Plan.
  - 9. Tree removal is required for the purposes of an approved building or land use permit, utility or infrastructure installation, or utility or infrastructure repair.
  - 10. The tree is recommended for removal by a designated fire marshal for Tualatin Valley Fire and Rescue because it presents a significant fire risk to habitable structures or limits emergency access for rescue workers, and the risk or access issue cannot be abated through pruning or other means that results in tree retention.
  - 11. The tree is part of a stand of trees, and a certified arborist or certified forester determines that thinning of interior trees within the stand of trees is necessary for overall stand health, the thinning will result in no less than 80 percent canopy cover at maturity for the area to be thinned, and that thinning of non-native trees is maximized prior to thinning of native trees.

Notes:

See Appendix 6 for  
Nuisance Tree List

Notes:

- C. Unless removed for thinning purposes (Part 1.B.11 above) the city manager or designee shall condition the removal of each tree upon the planting of a replacement tree in accordance with the Development Tree Replacement Standards in Section 7, part 2 of the Urban Forestry Manual.
- D. If the Development Tree Replacement Standards in Section 7, part 2 preclude replanting within the same property as the tree that was removed, the applicant shall be exempt from planting a replacement tree.

**Part 2. Development Tree Replacement Standards:**

- A. Replacement trees shall be planted in a manner consistent with tree care industry standards.
- B. The replacement tree shall be located so as to replace the function of the tree that was removed. For example, trees removed from parking lots shall be replaced in parking lots and trees removed from landscape buffers shall be replaced in landscape buffers. If planting in the same location would not comply with the other standards in this section, the replacement tree shall be planted as close as practicable to the tree that was removed in compliance with the other standards in this section.
- C. The replacement species shall be the same stature or greater (at maturity) as the tree that was removed. If planting the same stature or greater tree would not comply with the other standards in this section, the replacement tree shall be the most similar stature practicable as the tree that was removed in compliance with the other standards in this section.
- D. If the tree that was removed was part of a stand of trees, then the following standards apply to the replacement tree:
  - 1. The replacement tree shall be selected from the native tree list in the Urban Forestry Manual unless otherwise approved by the city manager or designee;
  - 2. The minimum size of the replacement tree shall be 2 feet in height (from the top of the root ball) or equivalent to a 1 gallon container size; and
  - 3. The replacement tree shall be located as follows:
    - a. No closer than 10 feet on center from newly planted or existing trees;
    - b. Trees categorized as small stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 15 feet from the face of habitable buildings;
    - c. Trees categorized as medium stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 20 feet from the face of habitable buildings;

See Appendices 2-5 for Approved Tree Lists

See Appendix 5 for Native Tree List

- d. Trees categorized as large stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 30 feet from the face of habitable buildings;
  - e. Trees categorized as small stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving;
  - f. Trees categorized as medium stature on the native tree list in the Urban Forestry Manual shall not be planted with the center of their trunks closer than 2 ½ feet from any hard surface paving;
  - g. Trees categorized as large stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving; and
  - h. Where there are overhead utility lines, the tree species selected shall be of a type which, at full maturity, will not interfere with the lines.
- E. If the tree that was removed was an open grown tree, then the following standards apply to the replacement tree:
- 1. The replacement tree shall be selected from any of the tree lists in the Urban Forestry Manual (except the nuisance tree list) unless otherwise approved by the city manager or designee;
  - 2. The minimum size of the replacement tree shall be 1½ inch caliper for deciduous or 6 feet in height for evergreen; and
  - 3. The replacement tree shall be located as follows:
    - a. Trees categorized as small stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 15 feet on center from other newly planted or existing trees and 10 feet from the face of habitable buildings;
    - b. Trees categorized as medium stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 20 feet on center from other newly planted or existing trees and 15 feet from the face of habitable buildings;
    - c. Trees categorized as large stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 30 feet on center from other newly planted or existing trees and 20 feet from the face of habitable buildings;

Notes:

See Appendices 2-5 for Approved Tree Lists

See Appendix 6 for Nuisance Tree List

Notes:

- d. Trees determined by the city manager or designee to have a mature spread of less than 20 feet shall be considered small stature, and shall be spaced no closer than 15 feet on center from other newly planted or existing trees and 10 feet from the face of habitable buildings;
- e. Trees categorized as small stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving;
- f. Trees categorized as medium stature on any of the tree lists in the Urban Forestry Manual shall not be planted with the center of their trunks closer than 2 ½ feet from any hard surface paving;
- g. Trees categorized as large stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving; and
- h. Where there are overhead utility lines, the tree species selected shall be of a type which, at full maturity, will not interfere with the lines.

- F. The city manager or designee may consider existing trees as replacement trees if they meet all applicable species, size, condition and location requirements in this Section and were not already required to be planted or preserved by the Tigard Municipal Code.
- G. The city manager or designee may allow for an “in lieu of planting fee” equivalent to the city’s cost to plant a tree per the standards in this Section and maintain a tree per the standards in section 8.12.030 of the Tigard Municipal Code for a period of three years after planting. Payment of an in lieu of planting fee shall satisfy the development tree replacement requirement.

See Master Fees and Charges Schedule for current fees



END OF SECTION

## Section 8 - Urban Forestry Fund Tree Removal and Replacement Standards

### Part 1. Urban Forestry Fund Tree Removal Standards:

- A. Trees subject to the requirements of Chapter 8.14 shall be removed in a manner consistent with tree care industry standards.
- B. The city manager or designee shall approve the removal of trees subject to the requirements of Chapter 8.14 if any one of the following criteria are met:
  - 1. The tree is a “hazard tree” as defined in Chapter 8.02 and “hazard tree abatement” as defined in Chapter 8.02 cannot be completed in a manner that results in tree retention consistent with tree care industry standards.
  - 2. The tree is dead.
  - 3. The tree is in an advanced state of decline with insufficient live foliage, branches, roots or other tissue to sustain life.
  - 4. The tree is infested with pests or diseases that if left untreated will cause the tree to die, enter an advanced state of decline or cause other trees to die or enter an advanced state of decline.
  - 5. The tree has sustained physical damage that will cause the tree to die or enter an advanced state of decline. If the physical damage was caused by a person in violation of Chapter 8.14 of the Tigard Municipal Code, the enforcement process outlined in Section 8.02.030 shall be completed prior to approval.
  - 6. The tree is listed in the nuisance tree list.
  - 7. The tree roots are causing damage to paved surfaces, infrastructure, utilities, buildings or other parts of the built environment.
  - 8. The tree location conflicts with areas of public street widening, construction or extension as shown in the Transportation System Plan.
  - 9. Tree removal is required for the purposes of an approved building or land use permit, utility or infrastructure installation or utility or infrastructure repair.
  - 10. The tree is recommended for removal by a designated fire marshal for Tualatin Valley Fire and Rescue because it presents a significant fire risk to habitable structures or limits emergency access for rescue workers, and the risk or access issue cannot be abated through pruning or other means that results in tree retention.
  - 11. The tree is part of a stand of trees, and a certified arborist or certified forester determines that thinning of interior trees within the stand of trees is necessary for overall stand health, the thinning will result in no less than 80 percent canopy cover at maturity for the area to be thinned, and that thinning of non-native trees is maximized prior to thinning of native trees.

Notes:

See Appendix 6 for  
Nuisance Tree List

Notes:

- C. Unless removed for thinning purposes (part 1.B.11 above) the city manager or designee shall condition the removal of each tree upon the planting of a replacement tree in accordance with the Urban Forestry Fund Tree Replacement Standards in Section 8, part 2 of the Urban Forestry Manual.
- D. If the Urban Forestry Fund Tree Replacement Standards in Section 8, part 2 preclude replanting within the same property as the tree that was removed, the applicant shall be exempt from planting a replacement tree.

**Part 2. Urban Forestry Fund Tree Replacement Standards:**

- A. Replacement trees shall be planted in a manner consistent with tree care industry standards.
- B. The replacement species shall be the same stature or greater (at maturity) as the tree that was removed. If planting the same stature or greater tree would not comply with the other standards in this section, the replacement tree shall be the most similar stature practicable as the tree that was removed in compliance with the other standards in this section.
- C. If the tree that was removed was part of a stand of trees, then the following standards apply to the replacement tree:
  - 1. The replacement tree shall be selected from the native tree list in the Urban Forestry Manual unless otherwise approved by the city manager or designee;
  - 2. The minimum size of the replacement tree shall be 2 feet in height (from the top of the root ball) or equivalent to a 1 gallon container size; and
  - 3. The replacement tree shall be located as follows:
    - a. No closer than 10 feet on center from newly planted or existing trees;
    - b. Trees categorized as small stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 15 feet from the face of habitable buildings;
    - c. Trees categorized as medium stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 20 feet from the face of habitable buildings;
    - d. Trees categorized as large stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 30 feet from the face of habitable buildings;
    - e. Trees categorized as small stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving;

See Appendices 2-5 for Approved Tree Lists

See Appendix 5 for the Native Tree List

- f. Trees categorized as medium stature on the native tree list in the Urban Forestry Manual shall not be planted with the center of their trunks closer than 2 ½ feet from any hard surface paving;
  - g. Trees categorized as large stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving; and
  - h. Where there are overhead utility lines, the tree species selected shall be of a type which, at full maturity, will not interfere with the lines.
- D. If the tree that was removed was an open grown tree, then the following standards apply to the replacement tree:
1. The replacement tree shall be selected from any of the tree lists in the Urban Forestry Manual (except the nuisance tree list) unless otherwise approved by the city manager or designee;
  2. The minimum size of the replacement tree shall be 1 ½ inch caliper for deciduous or 6 feet in height for evergreen; and
  3. The replacement tree shall be located as follows:
    - a. Trees categorized as small stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 15 feet on center from other newly planted or existing trees and 10 feet from the face of habitable buildings;
    - b. Trees categorized as medium stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 20 feet on center from other newly planted or existing trees and 15 feet from the face of habitable buildings;
    - c. Trees categorized as large stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 30 feet on center from other newly planted or existing trees and 20 feet from the face of habitable buildings;
    - d. Trees determined by the city manager or designee to have a mature spread of less than 20 feet shall be considered small stature, and shall be spaced no closer than 15 feet on center from other newly planted or existing trees and 10 feet from the face of habitable buildings;
    - e. Trees categorized as small stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving;

Notes:

See Appendices 2-5 for Approved Tree Lists

See Appendix 6 for Nuisance Tree List

Notes:

See Master Fees and  
Charges Schedule  
for current fee

- f. Trees categorized as medium stature on any of the tree lists in the Urban Forestry Manual shall not be planted with the center of their trunks closer than 2 ½ feet from any hard surface paving;
  - g. Trees categorized as large stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving; and
  - h. Where there are overhead utility lines, the tree species selected shall be of a type which, at full maturity, will not interfere with the lines.
- E. The city manager or designee may consider existing trees as replacement trees if they meet all applicable species, size, condition and location requirements in this section and were not already required to be planted or preserved by the Tigard Municipal Code.
- F. The city manager or designee may allow for an “in lieu of planting fee” equivalent to the city’s cost to plant a tree per the standards in this section and maintain a tree per the standards in section 8.14.030 of the Tigard Municipal Code for a period of three years after planting. Payment of an in lieu of planting fee shall satisfy the urban forestry fund tree replacement requirement.



END OF SECTION



## Section 9 - Heritage Tree Designation Removal Standards

### Part 1. Heritage Tree Designation Removal Standards:

- A. Heritage trees subject to the requirements of Chapter 8.16 shall be removed in a manner consistent with tree care industry standards.
- B. The city manager or designee shall approve the removal of heritage tree designation if any one of the following criteria are met for a designated heritage tree:
  - 1. The heritage tree is a “hazard tree” as defined in Chapter 8.02 and “hazard tree abatement” as defined in Chapter 8.02 cannot be completed in a manner that results in tree retention consistent with tree care industry standards.
  - 2. The heritage tree is dead.
  - 3. The heritage tree is in an advanced state of decline with insufficient live foliage, branches, roots or other tissue to sustain life.
  - 4. The heritage tree has sustained physical damage that will cause the tree to die or enter an advanced state of decline. If the physical damage was caused by a person in violation of Chapter 8.16 of the Tigard Municipal Code, the enforcement process outlined in Section 8.02.030 shall be completed prior to approval.
  - 5. The tree is recommended for removal by a designated fire marshal for Tualatin Valley Fire and Rescue because it presents a significant fire risk to habitable structures or limits emergency access for rescue workers, and the risk or access issue cannot be abated through pruning or other means that results in tree retention.
  - 6. The heritage tree is part of a stand of heritage trees, and a certified arborist or certified forester determines that thinning of interior heritage trees within the stand of heritage trees is necessary for overall stand health, the thinning will result in no less than 80 percent canopy cover at maturity for the area to be thinned, and that thinning of non-native heritage trees is maximized prior to thinning of native heritage trees.
- C. Replacement of heritage trees is not required unless a heritage tree is also subject to other provisions of the Tigard Municipal Code that require replacement.

Notes:



END OF SECTION



## Section 10 - Urban Forestry Plan Standards

### Part 1. Urban Forestry Plan – Tree Preservation and Removal Site Plan Requirements:

- A. The plan shall be standard size D (24" x 36"), a reduced legal size and a PDF, and include all items in part 1.B-O below. When required for clarity, the development impact area information in part 1.I may be detailed separately on multiple plan sheets provided that all of the remaining items in part 1 are included for reference.
- B. Date of drawing or last revision.
- C. North arrow.
- D. Bar scale as follows:
  - 1. Less than 1.0 acres: 1" = 10'
  - 2. 1.0 - 5.0 acres: 1" = 20'
  - 3. 5.0 – 20.0 acres: 1" = 50'
  - 4. Over 20.0 acres: 1" = 100'.
- E. Site address or assessor's parcel number.
- F. The location of existing and proposed property lines.
- G. Location of existing and proposed topographic lines at 1-foot contours unless otherwise approved.
- H. The location and type of sensitive lands areas.
- I. Proposed activities within the development impact area, including but not limited to:
  - 1. Construction of structures and walls;
  - 2. Paving and graveling;
  - 3. Utility and irrigation installation;
  - 4. Construction parking and construction equipment storage;
  - 5. Landscaping;
  - 6. Grading and filling;
  - 7. Stockpiling;
  - 8. Demolition and tree removal;
  - 9. Trenching and boring; and
  - 10. Any other activities that require excavation or soil disturbance.
- J. The trunk locations, driplines, assigned numbers and "X" marks when applicable (indicating trees proposed for removal) for the following trees within the development impact area and within 25 feet of the development impact area:
  - 1. Trees greater than or equal to 6 inch DBH; and
  - 2. Other trees that require a permit to remove by Title 8 and are less than 6 inch DBH.
- K. The trunk locations, driplines and assigned numbers for the following trees that are not within the development impact area:
  - 1. Open grown trees greater than or equal to 6 inch DBH; and

Notes:

See Appendix 7 for  
Example Tree  
Preservation and  
Removal Site Plan

Notes:

2. Other trees that require a permit to remove by Title 8 and are less than 6 inch DBH.

- L. The driplines of stand grown trees greater than or equal to 6 inch DBH that form a contiguous tree canopy. The driplines may be delineated at the outer edge of the stand. Each stand shall be assigned a number.
- M. The location and type of proposed tree protection fencing. If the location of the tree protection fencing will be phased, indicate the location of the tree protection fencing for each corresponding phase. Tree protection fencing shall be minimum 5-foot tall metal unless otherwise approved by the city manager or designee.
- N. Any supplemental tree preservation specifications consistent with tree care industry standards that the project arborist or landscape architect has determined are necessary for the continued viability of trees identified for preservation.
- O. A signature of approval and statement from the project arborist or landscape architect, attesting that the tree preservation and removal site plan meets all of the requirements in Section 10, part 1 of the Urban Forestry Manual.

See Appendix 8 for  
Example Tree  
Canopy Site Plan

**Part 2. Urban Forestry Plan – Tree Canopy Site Plan Requirements:**

- A. The plan shall be standard size D (24" x 36"), a reduced legal size and PDF format, and include all items in part 2.B-O below.
- B. Date of drawing or last revision.
- C. North arrow.
- D. Bar scale as follows:
  - 1. less than 1.0 acres: 1" = 10'
  - 2. 1.0 - 5.0 acres: 1" = 20'
  - 3. 5.0 – 20.0 acres: 1" = 50'
  - 4. Over 20.0 acres: 1" = 100'.
- E. Site address or assessor's parcel number.
- F. The location of proposed property lines.
- G. The location of proposed building footprints, utilities and irrigation, streets and other paved areas.
- H. The trunk locations, driplines and assigned numbers for trees to be preserved in parts 1.J and 1.K. Each tree on both the tree preservation and removal site plan and tree canopy site plan shall be assigned the same number on both plans.
- I. The dripline locations of stand grown trees proposed for preservation greater than or equal to 6 inch DBH that form a contiguous tree canopy. The dripline may be delineated at the outer edge of the stand. Each stand shall be assigned a number. Each stand on both the tree preservation and removal site plan and tree canopy site plan shall be assigned the same number on both plans.
- J. The location of existing or potential areas of tree growth limiting soils due to compaction, drainage, fertility, pH, contamination or other factors.

- K. Methods for improving areas of tree growth limiting soils if tree planting is proposed in those locations.
- L. The location, species, caliper (in inches for deciduous) or height (in feet for evergreen), assigned numbers and depiction of the mature tree canopy (in feet as identified on any of the tree lists in the Urban Forestry Manual or by the city manager or designee) for all trees to be planted and maintained as open grown trees. The minimum size for all trees planted and maintained as open grown trees is 1 ½ inch caliper for deciduous or 6 feet in height for evergreen. Open grown trees shall be selected from any of the tree lists in the Urban Forestry Manual (except the nuisance tree list) unless otherwise approved by the city manager or designee. If an open grown tree approved for planting is not identified on any of the tree lists in the Urban Forestry Manual, then the project arborist or landscape architect shall determine the average mature tree canopy spread using available scientific literature for review and approval by the city manager or designee. The city manager or designee may consider trees less than 6 inch DBH as equivalent to newly planted trees if they meet all applicable species, size, condition and location requirements in this section. Overall, the selection of open grown trees shall result in a reasonable amount of diversity for the site. Open grown trees shall be located as follows:

1. Trees categorized as small stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 15 feet on center from other newly planted or existing trees and 10 feet from the face of habitable buildings. In downtown Tigard (Mixed Use-Central Business District, MU-CBD), the setback from the face of habitable buildings may be reduced if approved by the city manager or designee;
2. Trees categorized as medium stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 20 feet on center from other newly planted or existing trees and 15 feet from the face of habitable buildings. In downtown Tigard (Mixed Use-Central Business District, MU-CBD), the setback from the face of habitable buildings may be reduced if approved by the city manager or designee ;
3. Trees categorized as large stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 30 feet on center from other newly planted or existing trees and 20 feet from the face of habitable buildings. In downtown Tigard (Mixed Use-Central Business District, MU-CBD), the setback from the face of habitable buildings may be reduced if approved by the city manager or designee;

Notes:

See Appendices 2-5 for Approved Tree Lists

See Appendix 6 for Nuisance Tree List

Notes:

4. Trees determined by the city manager or designee to have a mature spread of less than 20 feet shall be considered small stature, and shall be spaced no closer than 15 feet on center from other newly planted or existing trees and 10 feet from the face of habitable buildings. In downtown Tigard (Mixed Use-Central Business District, MU-CBD), the setback from the face of habitable buildings may be reduced if approved by the city manager or designee;
5. Trees categorized as small stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving;
6. Trees categorized as medium stature on any of the tree lists in the Urban Forestry Manual shall not be planted with the center of their trunks closer than 2 ½ feet from any hard surface paving;
7. Trees categorized as large stature on any of the tree lists in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving;
8. Where there are overhead utility lines, the tree species selected shall be of a type which, at full maturity, will not interfere with the lines; and
9. Where there is existing mature tree canopy or other areas with significant shade, the species selected shall be an understory tree according to available scientific literature. However, understory trees shall only be planted when the planting of non-understory trees is precluded due to site constraints.

See Appendix 5  
for Native Tree  
List

- M. The location, species, size (in height or container size), assigned number and depiction of the mature tree canopy dripline as identified in the native tree list in the Urban Forestry Manual (delineated at the outer edge of the stand) for all trees to be planted and maintained as stand grown trees. The species of trees planted and maintained as stand grown trees shall be selected from the native tree list in the Urban Forestry Manual. The depiction of the mature tree canopy dripline shall be consistent with dimensions in the native tree list. The minimum size of stand grown trees shall be 2 feet in height (from the top of the root ball) or equivalent to a 1 gallon container size. The city manager or designee may consider trees less than 6 inch DBH as equivalent to newly planted trees if they meet all applicable species, size, condition and location requirements in this section. Overall, the selection of stand grown trees shall result in a reasonable amount of diversity for the site. Stand grown trees shall be located as follows:
1. No closer than an average of 10 feet on center from newly planted or existing trees;
  2. No further than an average of 20 feet on center from newly planted or existing trees;

3. Trees categorized as small stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 15 feet from the face of habitable buildings. In downtown Tigard (Mixed Use-Central Business District, MU-CBD), the setback from the face of habitable buildings may be reduced if approved by the city manager or designee;
  4. Trees categorized as medium stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 20 feet from the face of habitable buildings. In downtown Tigard (Mixed Use-Central Business District, MU-CBD), the setback from the face of habitable buildings may be reduced if approved by the city manager or designee;
  5. Trees categorized as large stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall be spaced no closer than 30 feet from the face of habitable buildings. In downtown Tigard (Mixed Use-Central Business District, MU-CBD), the setback from the face of habitable buildings may be reduced if approved by the city manager or designee;
  6. Trees categorized as small stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 2 feet from any hard surface paving;
  7. Trees categorized as medium stature on the native tree list in the Urban Forestry Manual shall not be planted with the center of their trunks closer than 2 ½ feet from any hard surface paving;
  8. Trees categorized as large stature on the native tree list in the Urban Forestry Manual or by the city manager or designee shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving;
  9. Where there are overhead utility lines, the tree species selected shall be of a type which, at full maturity, will not interfere with the lines; and
  10. Where there is existing mature tree canopy or other areas with significant shade, the species selected shall be an understory tree according to available scientific literature. However, understory trees shall only be planted when the planting of non-understory trees is precluded due to space constraints.
- N. Any supplemental specifications that the project arborist or landscape architect has determined are necessary for the viability of trees proposed for planting.
- O. A signature of approval and statement from the project arborist or landscape architect, attesting that the tree canopy site plan meets all of the requirements in Section 10, part 2 of the Urban Forestry Manual.

Notes:

See Appendix 9 for Example Supplemental Report Template

**Part 3. Urban Forestry Plan – Supplemental Report Requirements:**

- A. The supplemental report shall be provided by the project arborist or landscape architect in paper and PDF format, and include all items in part 3.B-P below.
- B. Date of the report.
- C. The name, address, telephone number, email address, ISA certified arborist number and PNW-ISA certified tree risk assessor number of the project arborist or stamp and registration number of the project landscape architect.
- D. The following inventory data in table or other such organized format corresponding to each tree in parts 1.J and 1.K in the tree preservation and removal site plan:
  - 1. The assigned tree number;
  - 2. The genus, species and common name;
  - 3. DBH (in inches);
  - 4. Average tree canopy area (in square feet), calculated as follows:
    - a. Average tree canopy area = (average tree canopy spread/2)<sup>2</sup> x π;
  - 5. Open grown tree or stand grown tree;
  - 6. Heritage tree? (Y or N);
  - 7. Numerical condition rating (0-3) as follows:

Factors considered						
Condition rating	Overall vigor	Tree canopy density	Amount of deadwood	History of failure	Pests	Extent of decay
0	Dead to severe decline	<30%	Large; major scaffold branches	More than one scaffold	Infested	Major; conks and cavities
1	Declining	30-60%	Twig and branch dieback	Scaffold branches	Infested	One to a few conks; small cavities
2	Average	60-90%	Small twigs	Small branches	Minor	Present only at pruning wounds
3	Good to excellent	90-100%	Little or none	None	Minor to Insignificant	Absent to present only at pruning wounds



8. Numerical suitability for preservation rating (0-3) as follows:

Notes:

Rating	Considerations
0	The tree is a "hazard tree" as defined in Chapter 18.120 of the Tigard Development Code and "hazard tree abatement" as defined in Chapter 18.120 in the Tigard Development Code cannot be completed in a manner that results in tree retention consistent with tree care industry standards.
1	The tree is dead, in severe decline or declining but may be retained if desirable for wildlife or other benefits because it is not considered a "hazard tree" or "hazard tree abatement" could be performed.
2	The tree has average health and/or structural stability that could be alleviated with treatment; the tree will be less resilient to development impacts and will require more frequent management and monitoring after development than a tree rated as a "3".
3	The tree has good to excellent health and structural stability; the tree will be more resilient to development impacts, and will require less frequent management and monitoring after development than a tree rated as a "2".

9. Proposed for preservation? (Y or N); and

10. Additional comments.

E. The following inventory data in table or other such organized format corresponding to each existing stand in the tree preservation and removal site plan:

1. The assigned stand number;
2. The genus, species and common name of the tree species estimated to be dominant in the stand;
3. The genus, species and common name of the tree species estimated to be the second and third most common in the stand;
4. The estimated average DBH (in inches) of the dominant tree species in the stand;
5. The estimated average DBH (in inches) of both the second and third most common tree species in the stand;
6. The estimated average condition rating (per part 3.D.7) of the dominant tree species in the stand;
7. The estimated average condition rating (per part 3.D.7) of both the second and third most common tree species in the stand;
8. The total on site tree canopy area (in square feet) of the stand;
9. Numerical suitability for preservation rating of the stand (0-3) as follows:

Notes:

Rating	Considerations
0	Nuisance trees are the dominant species in the stand and/or continued viability of the stand is unlikely due to pests, diseases, competition from nuisance tree or plant species, hydrologic changes or other factors.
1	The stand requires a currently cost prohibitive level of investment and management of pests, diseases, nuisance tree or plant species, hydrology or other factors to become viable.
2	The stand is viable but requires more frequent management and monitoring of pests, diseases, nuisance tree or plant species, hydrology or other factors for continued viability than a stand rated as a "3".
3	The stand is viable and requires less frequent management and monitoring of pests, diseases, nuisance tree or plant species, hydrology or other factors for continued viability than a stand rated as a "2".

10. The total on site tree canopy area (in square feet) of the stand proposed for preservation; and
  11. Additional comments.
- F. Supplemental specifications regarding the location and type of proposed tree protection fencing. If the location of the tree protection fencing will be phased, indicate the location of the tree protection fencing for each corresponding phase. Tree protection fencing shall be minimum 5-foot tall metal unless otherwise approved by the city manager or designee.
- G. Supplemental specifications consistent with tree care industry standards that the project arborist or landscape architect has determined are necessary for the continued viability of trees identified for preservation.
- H. Supplemental specifications consistent with tree care industry standards that the project arborist or landscape architect has determined are necessary for the continued viability of stands identified for preservation.
- I. A general accounting of soil characteristics on site. Areas of existing or potential tree growth limiting soils due to compaction, drainage, fertility, pH, contamination or other factors shall be clearly identified. Methods for improving areas of tree growth limiting soils if tree planting is proposed in those areas shall be specifically addressed.
- J. The following inventory data in table or other such organized format corresponding to each open grown tree proposed for planting in the tree canopy site plan:
1. The assigned tree number;
  2. The genus, species and common name;
  3. The caliper (in inches for deciduous) or height (in feet for evergreen);

4. The average mature tree canopy spread (in feet) as identified on any of the tree lists in the Urban Forestry Manual. If an open grown tree approved for planting is not identified on any of the tree lists in the Urban Forestry Manual, then the project arborist or landscape architect shall determine the average mature tree canopy spread using available scientific literature for review and approval by the city manager or designee;
  5. The average mature tree canopy area (in square feet) calculated as follows:
    - a. Average mature tree canopy area = (average mature tree canopy spread/2)<sup>2</sup> x π;
  6. The proposed available soil volume (in cubic feet) for each tree according to the methodology in Section 12, part 2 of the Urban Forestry Manual. If the available soil volume is greater than 1000 cubic feet, then it is OK to note soil volume as simply “over 1000 cubic feet”; and
  7. Additional comments.
- K. The following inventory data in table or other such organized format corresponding to each stand proposed for planting in the tree canopy site plan:
1. The assigned stand number;
  2. The genus, species and common name of trees proposed for planting in the stand;
  3. The average spacing (in feet) and total number of each tree species proposed for planting in the stand;
  4. The height (in feet) or container size (in gallons) of each species proposed for planting in the stand;
  5. The mature tree canopy dripline area of the stand (in square feet) delineated at the outer edge of the stand; and
  6. Additional comments
- L. Any supplemental specifications consistent with tree care industry standards that the project arborist or landscape architect has determined are necessary for the viability of trees proposed for planting.
- M. A summary in table or other such organized format clearly demonstrating the effective tree canopy cover that will be provided for the overall development site (excluding streets) and for each lot or tract in the R-1, R-2, R-3.5, R-4.5 and R-7 districts (excluding streets) as follows:
1. The area (in square feet) of the overall development site and each lot or tract; and
  2. The effective tree canopy area that will be provided for the overall development site and each lot or tract which shall be considered the sum of the following:

Notes:

- a. Double the canopy area (in square feet) of all open grown trees in the tree canopy site plan proposed for preservation within the overall development site and each lot or tract (or associated right of way, excluding median trees). Only trees with both a condition rating and suitability for preservation rating of 2 or greater are eligible for credit towards the effective tree canopy cover. The overall development site and each lot or tract (or associated right of way) with the largest percentage of the trunk immediately above the trunk flare or root buttresses shall be assigned the effective tree canopy cover area for the corresponding tree;
- b. Double the canopy area (in square feet) of all stands in the tree canopy site plan proposed for preservation within the overall development site and each lot or tract (or associated right of way, excluding median trees). Only stands with both a condition rating and suitability for preservation rating of 2 or greater are eligible for credit towards the effective tree canopy cover. The eligible tree canopy area shall be the portion directly above the overall development site and each lot or tract (or associated right of way). The canopy area of any stand grown tree with the largest percentage of the trunk immediately above the trunk flare or root buttresses outside of the overall development site and each lot or tract (or associated right of way) shall not be eligible for credit towards the effective tree canopy cover requirement for that development site or lot or tract;
- c. The mature canopy area (in square feet) of all open grown trees in the tree canopy site plan, except for those from the native tree list in the Urban Forestry Manual, to be planted and maintained within the overall development site and each lot or tract (or associated right of way, excluding median trees);
- d. 1.25 times the mature canopy area (in square feet) of all open grown trees from the native tree list in the Urban Forestry Manual in the tree canopy site plan to be planted and maintained within the overall development site and each lot or tract (or associated right of way, excluding median trees);

- e. 1.25 times the mature canopy area (in square feet) of each stand in the tree canopy site plan to be planted and maintained within the overall development site and each lot or tract (or associated right of way, excluding median trees). The eligible mature tree canopy area shall be the portion directly above the overall development site and each lot or tract (or associated right of way); and
  - f. Divide the tree canopy area (calculated per part 3.M.2.a-e above) for the overall development site and each lot or tract by the total area of the overall development site and each lot or tract respectively to determine the effective tree canopy cover for the overall development site and each lot or tract.
- N. The standard percentage of effective tree canopy cover for the overall development site shall be at least:
- 1. 40 percent for R-1, R-2, R-3.5, R-4.5 and R-7 districts, except for schools (18.130.050(J));
  - 2. 33 percent for R-12, R-25, R-40, C-N, C-C, C-G, C-P, MUE, MUE-1, MUE-2, MUC, MUR and I-P districts, except for schools (18.130.050(J)); and
  - 3. 25 percent for MU-CBD, MUC-1, I-L and I-H districts, and for schools (18.130.050(J)) in all districts.
- O. If the percent of effective tree canopy cover is less than the applicable standard percent in item n above for the overall development or less than 15 percent for any lot or tract in the R-1, R-2, R-3.5, R-4.5 and R-7 districts (when the overall development site meets or exceeds the standard percent effective tree canopy cover in item n), calculate the tree canopy fee required to meet the applicable standard percent effective tree canopy cover in item n above for the overall development site or 15 percent effective tree canopy cover for each lot or tract in the R-1, R-2, R-3.5, R-4.5 and R-7 districts (only if the overall development site meets or exceeds the standard percent effective tree canopy cover in item n but individual lots or tracts in the R-1, R-2, R-3.5, R-4.5 and R-7 districts do provide 15 percent effective tree canopy cover) according to the methodology in Section 10, part 4 of the Urban Forestry Manual.
- P. A signature of approval and statement from the project arborist or landscape architect, attesting that:
- 1. The tree preservation and removal site plan meets all of the requirements in Section 10, part 1 of the Urban Forestry Manual;
  - 2. The canopy site plan meets all of the requirements in Section 10, part 2 of the Urban Forestry Manual; and
  - 3. The supplemental report meets all of the requirements in Section 10, part 3 of the Urban Forestry Manual.

**Part 4. Urban Forestry Plan – Tree Canopy Fee Calculation Requirements:**

- A. The tree canopy fee shall be calculated as follows:

Notes:

See Appendix 9 for Example Supplemental Report Template with formula for calculating the Tree Canopy Fee

1. If the percentage of effective tree canopy cover is less than the applicable standard percentage in part 3, item n above for the overall development site find the difference (in square feet) between the proposed effective tree canopy cover and the applicable standard effective tree canopy cover for the overall development site and multiply the difference (in square feet) by:
  - a. The most recent wholesale median tree cost established by the PNW-ISA for a 3 inch diameter deciduous tree in the Willamette Valley, OR divided by 59 square feet.
2. In cases where the overall development site meets the standard percentage in part 3.N above yet the percentage of effective tree canopy cover is less than 15 percent for any individual lot or tract in the R-1, R-2, R-3.5, R-4.5 and R-7 districts, find the difference (in square feet) between the proposed effective tree canopy cover and 15 percent effective tree canopy cover for each deficient lot or tract and multiply the difference (in square feet) by:
  - a. The most recent wholesale median tree cost established by the PNW-ISA for a 3 inch diameter deciduous tree in the Willamette Valley, OR divided by 59 square feet.

**Part 5. Urban Forestry Plan – Significant Tree Grove Preservation Considerations:**

- A. Connects with and does not become isolated from the remaining portion of the significant tree grove on or off the site;
- B. Preserves the most dominant, resilient and healthiest native trees;
- C. Preserves a diversity of species, ages and sizes of native trees;
- D. Preserves native understory and supports natural succession;
- E. Preserves and minimizes disturbance to native soils and tree roots;
- F. Does not preserve hazard trees or trees likely to soon become hazard trees particularly those subject to windthrow (low live crown ratio, high height to diameter ratio, suppressed root development) and exacerbated by newly created edges and/or removal of adjacent trees; and
- G. Does not preserve trees currently or likely to soon be severely impacted by large scale weed, pest or disease outbreaks and/or changing site conditions (hydrology, light, temperature, wind).



END OF SECTION

## Section 11 - Urban Forestry Plan Implementation Standards

### Part 1. Urban Forestry Plan Implementation Standards – Inspection Requirements:

- A. After tree protection measures are installed and prior to any ground disturbance other than what is necessary for the installation of tree protection measures and erosion, sediment and pollutant controls measures, the project arborist or landscape architect shall perform a site inspection for tree protection measures, document compliance/non-compliance with the urban forestry plan and send written verification with a signature of approval directly to the city manager or designee within one week of the site inspection.
- B. Following the completion of item a above, the project arborist or landscape architect shall perform bimonthly (twice monthly) site inspections for tree protection measures during periods of active site development and construction, document compliance/non-compliance with the urban forestry plan and send written verification with a signature of approval directly to the city manager or designee within one week of the site inspection.
- C. When the land use review type will result in the division of land into multiple lots or tracts, the applicant shall provide on the building site plan for each resulting lot or tract, the information detailed in Section 10, part 2.B-N of the Urban Forestry Manual consistent with the approved urban forestry plan. Prior to issuance of any building permits for each resulting lot or tract, the project arborist or landscape architect shall perform a site inspection for tree protection measures, document compliance/non-compliance with the urban forestry plan and send written verification with a signature of approval with the building permit submittal documents.
- D. When the land use review type will result in the division of land into multiple lots or tracts, the project arborist or landscape architect shall perform a site inspection for tree protection measures for all lots or tracts that are not proposed to be associated with a building permit, document compliance/non-compliance with the urban forestry plan and send written verification with a signature of approval to the city manager or designee prior to the issuance of the first building permit resulting from the land use review type.
- E. Prior to final building inspection for any lot or tract with an active urban forestry plan, the project arborist or landscape architect shall perform a site inspection, document compliance/non-compliance with the urban forestry plan and send written verification with a signature of approval to the city manager or designee.

Notes:

See Appendix 10 for Example Tree Canopy Site Plan (Section 10, Part 2) for an Individual Lot

Notes:

See Master Fees and Charges schedule for current fees

## Part 2. Urban Forestry Plan Implementation Standards – Tree

### Establishment Requirements:

- A. Prior to any ground disturbance work, the applicant shall provide a tree establishment bond for all trees to be planted per the approved urban forestry plan. The total bond amount shall be equivalent to the city's average cost to plant and maintain a tree per the applicable standards in the Urban Forestry Manual for a period of two years after planting multiplied by the total number of trees to be planted and maintained.
- B. Following final building inspection or upon acceptance by the city manager or designee when there is no final building inspection, the tree establishment period shall immediately begin and continue for a period of two years.
- C. When the land use review type will result in the division of land into multiple lots or tracts, there shall be a separate tree establishment period for each resulting lot or tract where trees are shown to be planted in the approved urban forestry plan.
- D. Following the two year tree establishment period for each lot or tract, the bond shall be correspondingly reduced based on tree survival following a site inspection, documentation of successful tree establishment and/or replacement according to item e below, and receipt by the city manager or designee of written verification of findings and a signature of approval by the project arborist or landscape architect.
- E. For planted open grown trees, successful establishment shall be considered 80 percent survival of the open grown trees planted on the lot or tract, and replacement of 100 percent of the remaining open grown trees planted on the lot or tract that did not survive.
- F. For planted stand grown trees, successful establishment shall be considered survival of at least 80 percent of the original stand grown trees planted on the lot or tract.
- G. If successful establishment for open grown trees is less than 80 percent for any lot or tract, the two-year tree establishment period shall reset for that lot or tract and the establishment process for open grown trees described in part 2.B-F above shall be repeated until the successful establishment requirement for open grown trees is met.
- H. If successful establishment for stand grown trees is less than 80 percent for any lot or tract, the two-year tree establishment period shall reset for that lot or tract and the establishment process for stand grown trees described in Part 2.B-F above shall be repeated until the successful establishment requirement for stand grown trees is met.



**Part 3. Urban Forestry Plan Implementation Standards – Urban Forest Inventory Requirements:**

- A. Following documentation of compliance with the urban forestry plan by the project arborist or landscape architect for each lot or tract, the city shall collect spatial and species specific data for each open grown tree and area of stand grown trees for inclusion in a publicly accessible inventory of trees.
- B. Prior to any ground disturbance work, the applicant shall provide a fee to cover the city’s cost of collecting and processing the inventory data for the entire urban forestry plan.

Notes:

See Master Fees and Charges Schedule for current fees



**END OF SECTION**



## Section 12 - Street Tree Soil Volume Standards

**Part 1. Street Tree Soil Volume Standards – Soil Volume Requirements:**

- A. Street trees required to be planted by chapter 18.745 shall be provided the following minimum soil volumes based on the width of the proposed right of way measured from the edge of the street (excluding curb) towards the subject site:

Right of Way Width (feet)	Minimum Soil Volume Requirement (cubic feet per tree)
Up to 10	400
Over 10 up to 12	500
Over 12 up to 14	600
Over 14 up to 16	700
Over 16 up to 18	800
Over 18 up to 20	900
Over 20	1000

Notes:

**Part 2. Street Tree Soil Volume Standards – Soil Volume Calculation Requirements:**

- A. For open soil volumes, soil depth is assumed to be 3 feet if the tree canopy site plan (per 18.790.030.A.3) and supplemental report (per 18.790.030.A.4) demonstrate that the tree will not be planted in an area of tree growth limiting soil or the area of tree growth limiting soil will be adequately amended to a depth of 3 feet in the specified planting area.
- B. Areas of tree growth limiting soils that have not been adequately amended shall not be eligible for credit towards the minimum soil volume requirements in part 1 of this section.
- C. For covered soil volumes, the soil depth is equal to the depth of the covered soil volume as demonstrated by the soil volume plan in part 3 of this section.
- D. Soil volumes for open soil volumes shall be calculated (in cubic feet) by measuring the open soil volume area (in square feet) times an assumed soil depth of 3 feet.
- E. Soil volumes for covered soils volumes shall be calculated (in cubic feet) by multiplying the area of the covered soil volume times the depth of the covered soil volume as demonstrated by the soil volume plan in part 3 of this section.
- F. The total soil volume provided for a tree shall be calculated (in cubic feet) by adding the available open soil volume (per part 2.C above) to the available covered soil volume (per part 2.D above) within a 50 foot radius of the tree.

See Appendix 11 for three Example Soil Volume Calculations for Street Trees

Notes:

- G. The open and covered soil volumes are considered “available” to a tree only when they are directly connected to the tree by a continuous path of no less than 3 feet in width.
- H. In addition, covered soil volumes are considered “available” to a tree only when demonstrated as available by the soil volume plan in part 3 of this section.
- I. All soil volumes calculated per this section shall be displayed for each corresponding tree in the required supplemental report.

**Part 3. Street Tree Soil Volume Standards – Soil Volume Plan Requirements:**

See Appendix 12 for Example Soil Volume Plan

- A. A soil volume plan shall be required for any street tree required to be planted by chapter 18.745 if a covered soil volume is proposed to be used to meet any portion of the minimum soil volume requirements in part 1 of this section. The soil volume plan shall include all items in part 3.B-E below.
- B. A standard size D (24" x 36"), a reduced legal size and a PDF soil volume plan by a registered landscape architect (the project landscape architect) that includes all of the following elements:
  - 1. Date of drawing or last revision;
  - 2. North arrow;
  - 3. Bar scale;
  - 4. Site address or assessor’s parcel number;
  - 5. The name, address, telephone number, email address and license number of the project landscape architect;
  - 6. The location of property lines or proposed property lines if different from existing;
  - 7. The location of proposed building footprints, utilities and irrigation, streets and other paved areas;
  - 8. The assigned numbers (consistent with the tree canopy site plan and supplemental report of a concurrent urban forestry plan) of all trees;
  - 9. The location of each open soil volume area and each covered soil volume area considered “available” for each tree; and
  - 10. The City of Tigard Example Covered Soil Volume Plan Drawings and Specifications unless otherwise approved by the city manager or designee. If required for clarity, this information may be detailed on a separate plan sheet.
- C. When the land use review type will result in the division of land into multiple lots or tracts, the applicant shall provide on the building site plan for each resulting lot or tract, the information detailed in –part 3.B.1-10 of this section consistent with the approved soil volume plan and a signature of approval from the project landscape architect.

See Appendix 14 for two alternative Example Covered Soil Volume Plan Drawings and an Example Covered Soil Specification for Street Trees

See Appendix 13 for Example Soil Volume Plan for a Single Lot

- D. The project landscape architect shall document compliance/non-compliance (including but not limited to materials receipts and observations from site inspections) with the approved soil volume plan, and send written verification with a signature of approval to the city manager or designee prior to final building inspection for all lots, parcels, or tracts associated with each particular tree. When the land use review type will result in the division of land into multiple lots or tracts, the project landscape architect shall provide the documentation/verification described above for all lots or tracts that are not proposed to be associated with a building permit prior to the issuance of the first building permit resulting from the land use review type. When the land use review type does not involve a building permit, the project landscape architect shall provide the documentation/verification described above prior to final acceptance by the city manager or designee.
- E. If any subsequent modifications to an approved soil volume plan is required to meet the minimum soil volume requirements in part 1 of this section, a revised soil volume plan that meets the requirements of part 3 of this section shall be provided that reflect the revisions.

Notes:



END OF SECTION



## Section 13 - Parking Lot Tree Canopy Standards

### Part 1. Parking Lot Tree Canopy Standards – Parking Lot Tree Requirements:

- A. Parking lot trees shall be planted in a manner consistent with tree care industry standards.
- B. Parking lot trees shall have a minimum caliper of 1 ½ inches (for deciduous) or height of a 6 feet (for evergreen) at the time of planting.
- C. Parking lot tree species shall be from the parking lot tree list, unless otherwise approved by the city manager or designee.
- D. Parking lot trees shall not be planted with the center of their trunks closer than 3 feet from any hard surface paving, including curbs.
- E. Parking lot trees shall be evenly distributed within the parking area, and no greater than 6 feet from the parking area.
- F. Parking lot trees shall be provided a minimum of 1000 cubic feet of soil volume per tree.

### Part 2. Parking Lot Tree Canopy Standards – Soil Volume Calculation Requirements:

- A. Soil volumes for open soil volumes shall be calculated (in cubic feet) by measuring the open soil volume area (in square feet) times an assumed soil depth of 3 feet.
- B. Soil volumes for covered soils volumes shall be calculated (in cubic feet) by multiplying the area of the covered soil volume times the depth of the covered soil volume as demonstrated by the parking lot tree canopy plan in part 3 of this section.
- C. The total soil volume provided for a tree shall be calculated (in cubic feet) by adding the available open soil volume (per part 2.A above) to the available covered soil volume (per part 2.B above) within a 50 foot radius of the tree.
- D. The open and covered soil volumes are considered “available” to a tree only when they are directly connected to the tree by a continuous path of no less than 3 feet in width, and demonstrated as available by the parking lot tree canopy plan in part 3 of this section.
- E. All soil volumes calculated per this section shall be displayed for each corresponding tree in the supplemental report (per 18.790.030.A.4) when an urban forestry plan is concurrently required.

### Part 3. Parking Lot Tree Canopy Standards – Parking Lot Tree Canopy Plan Requirements:

- A. A parking lot tree canopy plan shall be required unless the city manager or designee determines the requirements of a concurrent urban forestry plan per chapter 18.790 will meet the equivalent standards in part 3 of this section. The parking lot tree canopy plan shall include all items in part 3.B-E below.

Notes:

See Appendix 3 for  
Parking Lot Tree List

See Appendix 15 for  
three Example Soil  
Volume Calculations  
for Parking Lot  
Trees

See Appendix 16 for  
Example Parking Lot  
Tree Canopy Plan

Notes:

See Appendix 17 for two alternative Example Covered Soil Volume Plan Drawings and an Example Covered Soil Specification for Parking Lot Trees

See Appendix 18 for Example Parking Lot that Meets the 30% Minimum Canopy Cover Requirement per Code Section 18.745.050.E.1.a.4

B. A standard size D (24" x 36"), a reduced legal size and a PDF parking lot tree canopy plan by a registered landscape architect (the project landscape architect) that includes all of the following elements:

1. Date of drawing or last revision;
2. North arrow;
3. Bar scale;
4. Site address or assessor's parcel number;
5. The name, address, telephone number, email address and license number of the project landscape architect;
6. The location of property lines or proposed property lines if different from existing;
7. The location of proposed building footprints, utilities and irrigation, streets and other paved areas;
8. The location of areas of tree growth limiting soils due to compaction, drainage, fertility, pH, contamination or other factors;
9. Methods for improving areas of tree growth limiting soils if tree planting is proposed in those areas. If required for clarity, this information may be detailed on a separate plan sheet;
10. The location of all parking lot striping and the location of the limits of the parking area, which includes all parking spaces, all landscape islands and all parking aisles;
11. Assigned numbers (consistent with the tree canopy site plan per 18.790.030.A.3 and supplemental report per 18.790.030.A.4 of a concurrent urban forestry plan) of all parking lot trees;
12. The location, species and caliper (in inches for deciduous) or height (in feet for evergreen) of all parking lot trees;
13. Depiction of the average mature tree canopy spread (in feet as identified on any of the tree lists in the Urban Forestry Manual) for each parking lot tree. If a parking lot tree is not identified on any of the tree lists in the Urban Forestry Manual, then the project arborist or landscape architect shall determine the average mature tree canopy spread using available scientific literature for review and approval by the city manager or designee;
14. The location of each open soil volume area and each covered soil volume area considered "available" for each tree; and
15. If covered soil volumes are proposed to meet any portion of the soil volume requirement in part 1.F of this section, the City of Tigard Example Covered Soil Volume Plan Drawings and Specifications unless otherwise approved by the city manager or designee. If required for clarity, this information may be detailed on a separate plan sheet.

C. A summary in table or other such organized format clearly demonstrating the proposed percent tree canopy cover at maturity directly over the parking area as follows:

1. The area (in square feet) of the parking area as shown in the parking lot tree canopy plan;



2. The average mature tree canopy area for each parking lot tree as follows:
    - a.  $\text{Average mature tree canopy area} = (\text{average mature tree canopy spread}/2)^2 \times \pi$ ;
  3. The total combined mature tree canopy area (in square feet) of all parking lot trees less the percentage not directly over the parking area; and
  4. The total combined mature tree canopy area directly over the parking area (in square feet) divided by the parking area.
- D. The project landscape architect shall document compliance/non-compliance (including but not limited to materials receipts and observations from site inspections) with the approved parking lot tree canopy plan, and send written verification with a signature of approval to the city manager or designee prior to final building inspection or prior to final acceptance when there is no final building inspection.
- E. If any subsequent modifications to an approved parking lot tree canopy plan is required, a revised parking lot tree canopy plan that meets the requirements of part 3 of this section shall be provided that reflect the revisions.

Notes:



END OF SECTION





# City of Tigard Tree Risk Assessment Form

Hazard Rating:						
Probability of Failure	+	The Target Area	+	Size of Defective Part	=	Overall Risk Rating

Recommended Hazard Tree Abatement Procedures: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Property Address: \_\_\_\_\_

Location:     Public         Private         Right-of-Way

Protected Tree:         Yes         No

Tree Species: \_\_\_\_\_

Diameter at Breast Height (DBH): \_\_\_\_\_

Tree Height: \_\_\_\_\_

Crown Spread: \_\_\_\_\_

Tree Part Subject of Evaluation: \_\_\_\_\_

Diameter of Subject Tree Part: \_\_\_\_\_

Distance to Target of Subject Tree Part: \_\_\_\_\_

Length of Subject Tree Part: \_\_\_\_\_

Target: \_\_\_\_\_

Occupancy of Target:     Occasional Use     Intermittent Use     Frequent Use     Constant Use

Date of Evaluation:
Certified Tree Risk Assessor:
Certificate Number:
ISA Number:

Certified Tree Risk Assessor Signature: \_\_\_\_\_

**\*Fill out this and supplemental rating form completely and attach: 1) photos of the tree; 2) an aerial photo showing the location of the tree on the subject property; and 3) a supplemental tree risk assessment report more fully describing whether the definition of hazard tree has been met and, if necessary, recommended hazard tree abatement procedures.**



Probability of Failure (1 - 5 points)			(√) One
<b>Low</b> 1 point	Defect is not likely to lead to imminent failure, and no further action is required. In many cases, defects might not be recorded.	Minor branch or crown dieback, small wounds, minor defects.	
<b>Moderate</b> 2 points	One or more defects areas well-established but typically do not lead to failure for several years. Corrective action might be useful to prevent future problems but only if time and money are available. Not the highest priority for action, these are retain and monitor situations used to inform budget and work schedules for subsequent years.	Several defects present. <ul style="list-style-type: none"> <li>• Shell wall exceeds minimum requirement</li> <li>• Cracks initiated but no extensive decay</li> <li>• Cavity opening or other stem damage less than 30% of circumference</li> <li>• Crown damage or breakage less than 50% of canopy (30% in pines)</li> <li>• Dead crown limbs with fine twigs attached and bark intact</li> <li>• Weak branch union such as major branch or codominant stem with included bark</li> <li>• Stem girdling roots with less than 40% of circumference compressed</li> <li>• Root damage or root decay affects less than 33% of roots within the critical zone</li> <li>• Standing dead tree that is recently dead (still has fine twigs) and no other significant defects</li> </ul>	
<b>Moderately High</b> 3 points	One or more defects areas well-established, but not yet deemed to be a high priority issue. Additional testing may be required or, the assessor may feel the problems are not serious enough to warrant immediate action, but do warrant placing the tree on a list of trees to be inspected more regularly. These are Retain and Monitor trees.	Areas of decay that may be expanding; trees that have developed a recent but not yet critical lean; cracks noted but may be stable; edge trees that may adapt and become more stable.	
<b>High</b> 4 points	The defect is serious and imminent failure is likely and corrective action is required immediately. These cases require treatment within the next few days or weeks.	One or more major defects present. <ul style="list-style-type: none"> <li>• Insufficient shell wall thickness</li> <li>• Large cracks, possibly associated with other defects</li> <li>• Cavity opening greater than 30% of circumference</li> <li>• Crown damage or breakage more than 50% of canopy (&gt; 30% in pines)</li> <li>• Dead crown limbs with no fine twigs and bark peeling away. May be some saprophytic fungal evidence</li> <li>• Weak branch union has crack(s) or decay</li> <li>• Stem girdling root affects 40% or more of trunk circumference</li> <li>• More than 33% of roots are damaged within the critical zone</li> <li>• Tree is leaning. Recent root breakage, or soil mounding, or cracks, or extensive decay evident</li> <li>• Standing dead tree, has very few fine twigs, and no other significant defects</li> </ul>	
<b>Extreme</b> 5 points	The tree or component part is already failing. An emergency situation where treatment is required today.	Multiple high or extreme risk defects present. <ul style="list-style-type: none"> <li>• Shell wall is already cracked and failing</li> <li>• Major cracks already open, such as hazard beams or split trunks</li> <li>• More than 30% of circumference defective and cracks or decay obvious</li> <li>• Dead crown limbs, no fine twigs, no bark, decay present</li> <li>• Weak branch union has crack(s) and decay</li> <li>• Leaning tree with recent root failure, soil mounding, and cracks or extensive decay</li> <li>• Dead branches hung up or partly failed</li> <li>• Visual obstruction of traffic signs/lights at intersections</li> <li>• Any partly failed component or whole tree</li> <li>• Standing dead trees that have been dead for more than one season with multiple defects such as cracks, decay, damaged roots, shedding bark</li> </ul>	

The Target Area (1 - 4 points)		(√) One
<b>Low</b> 1 point	Sites rated at one point are very rarely used for any long period of time, and people passing through the area (regardless of how they travel) do not spend a lot of time within the striking range of the tree. There are no valuable buildings or other facilities within striking range. Examples are seldom used back country roads or trails, seldom used overflow or long-term parking, industrial areas where workers drive machines (trucks, forklifts, tractors) with substantial cab protection; natural or wilderness areas; transition areas with limited access; remote areas of yards, parks, or private lands open for public use within set hours. All of these sites have relatively low occupancy within any one day.	
<b>Moderate</b> 2 points	Valuable buildings are at the edge off the striking distance, so they would not be seriously damaged even if the tree did fall down. The site has people within striking range occasionally, meaning less than 50% of the time span in any one day, week, or month, and do not stay within striking range very long. Examples include areas that are used seasonally; more remote areas of camping areas or parks; minor rural roads; picnic areas; low to moderate use trails; most park and school playgrounds.** Moderate to low use parks, parking lots with daily use; secondary roads and intersections, dispersed camping sites, moderate to high use trails, works and/or storage yards.	
<b>Moderately High</b> 3 points	The site has valuable buildings within striking range. People are within striking range more than 50% of the time span in any one day, week, or month, and their exposure time can be more than just passing by. Examples include secondary roads, trails, and access points; less commonly used parking areas and trails within parks; trails alongside fairways, bus stops.	
<b>High</b> 4 points	The highest rated targets have a) a building within striking range frequently accessed by people, often for longer periods of time, or high volumes of people coming and going within striking range. Valuable buildings or other structures within striking range that would suffer major structural damage in the event of tree failure or; b) people within striking distance of the tree, or both, seven days a week, all year long, and at all times of the day. Examples include main roads, the busiest streets or highways; high volume intersections power lines;* paths through busy open space areas and parks; short-term parking constantly in use; institutional buildings such as police stations, hospitals, fire stations; shopping areas; highly used walking trails; pick up and drop off points for commuters; golf tees and greens; emergency access routes and/or marshalling areas; handicap access areas; high use camping areas, visitor centers or shelters; residential buildings; industrial areas where workers take outside breaks; development sites where work activity within striking range lasts more than a few hours at a time.	

\*There are very specific safe work practices required when working close to Power Lines. These vary depending on location, but all employ similar principles.

\*\*It is recognized that there is a tendency to rate playgrounds higher simply because children are involved. Most playgrounds are occupied for short periods of time in daylight hours. Overall, their use is infrequent when compared to other locations such as busy streets.

Size of Defective Part (1 - 3 points)		(√) One
1 point	Branches or stems up to 10 centimeters (4 inches) in diameter	
2 points	Branches or stems between 10 to 50 centimeters (4 to 20 inches) in diameter.	
3 points	Branches or stems greater than 50 centimeters (20 inches) in diameter.	

\*In some cases, there may be large areas of sloughing back bark, dwarf mistletoe brooms, branch stubs, or large bird nests in cavities that pose a risk. The assessor must use his or her judgment to assign a number to these components. In general, the lowest rating (1 point) is reserved for component parts that would not create much impact on a person or property if it were to fail. The highest rating is used for parts that have the potential to kill people or seriously damage property.

Overall Risk Rating and Action Thresholds			(v) One
<i>Risk Rating</i>	<i>Risk Category</i>	<i>Interpretation and Implications</i>	
3	Low 1	Insignificant – no concern at all.	
4	Low 2	Insignificant – very minor issues.	
5	Low 3	Insignificant – minor issues not of concern for many years yet.	
6	Moderate 1	Some issues but nothing that is likely to cause any problems for another 10 years or more.	
7	Moderate 2	Well defined issues – retain and monitor. Not expected to be a problem for at least another 5-10 years.	
8	Moderate 3	Well defined issues – retain and monitor. Not expected to be a problem for at least another 1-5 years.	
9	High 1	The assessed issues have now become very clear. The tree can still reasonably be retained as it is not likely to fall apart right away, but it must now be monitored annually. At this stage, it may be reasonable for the risk manager/owner to hold public education sessions to inform people of the issues and prepare them for the reality that part or the entire tree has to be removed.	
10	High 2	The assessed issues have now become very clear. The probability of failure is now getting serious, or the target rating and/or site context have changed such that mitigation measures should now be on a schedule with a clearly defined timeline for action. There may still be time to inform the public of the work being planned, but there is not enough time to protracted discussion about whether or not there are alternative options available.	
11	High 3	The tree, or a part of it has reached a stage where it could fail at any time. <b>Action to mitigate the risk is required within weeks rather than months.</b> By this stage there is not time to hold public meetings to discuss the issue. Risk reduction is a clearly defined issue and although the owner may wish to inform the public of the planned work, he/she should get on with it to avoid clearly foreseeable liabilities.	
12	Extreme	This tree, or part of it, is in the process of failing. <b>Immediate action is required.</b> All other, less significant tree work should be suspended, and roads or work areas should be closed off, until the risk issues have been mitigated. This might be as simple as removing the critical part, drastically reducing overall tree height, or taking the tree down and cordoning off the area until final clean up, or complete removal can be accomplished. The immediate action required is to ensure that the clearly identified risk of harm is eliminated. For areas hit by severe storms, where many extreme risk trees can occur, drastic pruning and/or partial tree removals, followed by barriers to contain traffic, would be an acceptable first stage of risk reduction. There is no time to inform people or worry about public concerns. Clearly defined safety issues preclude further discussion.	

The Table shown above outlines the interpretation and implications of the risk ratings and associated risk categories. This table is provided to inform the reader about these risk categories so that they can better understand any risk abatement recommendations made in the risk assessment report.

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_





## Street Tree List - Small Stature Trees (up to 25' in height at maturity)

Common Name	Scientific Name	Height (feet)	Spread (feet)	Canopy Area	Soil Type	Suitable for Under Powerlines	Special Features/Considerations
<a href="#">Paperbark Maple</a>	<i>Acer griseum</i>	25'	25'	491 sq. ft.	all	Yes*	peeling bark, tolerates some shade
<a href="#">Tatarian Maple</a>	<i>Acer tataricum</i>	20'	20'	314 sq. ft.	all	Yes	tolerant of urban stresses
<a href="#">Trident Maple</a>	<i>Acer buergeranum</i>	25'	20'	314 sq. ft.	all	Yes	tolerant of urban stresses
<a href="#">Serviceberry</a>	<i>Amelanchier x grandiflora</i>	25'	15'	177 sq. ft.	well drained	Yes	white flowers, edible fruit
<a href="#">Western Serviceberry</a>	<i>Amelanchier alnifolia</i>	20'	20'	314 sq. ft.	loam	Yes	native to Portland metropolitan region
<a href="#">American Hornbeam</a>	<i>Carpinus caroliniana</i>	25'	20'	314 sq. ft.	all	No	needs ample water
<a href="#">Eastern Redbud</a>	<i>Cercis canadensis</i>	25'	25'	491 sq. ft.	all	Yes	pink flowers in spring before leaves emerge
<a href="#">Gloryblower Tree</a>	<i>Clerodendrum trichotomum</i>	20'	20'	314 sq. ft.	all	Yes	colorful flowers in summer, blue berries in fall
<a href="#">Kousa Dogwood</a>	<i>Cornus kousa</i>	25'	25'	491 sq. ft.	all	Yes	shade tolerant
<a href="#">Flowering Dogwood</a>	<i>Cornus florida</i>	25'	25'	491 sq. ft.	all	Yes	large number of varieties available
<a href="#">Lavalle Hawthorne</a>	<i>Crataegus x lavalleyi</i>	25'	20'	314 sq. ft.	all	Yes	white flowers in May, orange-red fruit persist into Winter
<a href="#">Black Hawthorne</a>	<i>Crataegus douglasii</i>	25'	20'	314 sq. ft.	all	Yes	native to Portland metropolitan region, has thorns
<a href="#">Golden Desert Ash</a>	<i>Fraxinus excelsior</i> 'Golden Desert'	20'	20'	314 sq. ft.	all	Yes	golden twigs
<a href="#">Flowering Ash</a>	<i>Fraxinus ornus</i>	25'	25'	491 sq. ft.	all	Yes	fragrant flowers
<a href="#">Merrill Magnolia</a>	<i>Magnolia x loebneri</i> 'Merrill'	25'	25'	491 sq. ft.	all	No	fragrant white flowers
<a href="#">Southern Magnolia</a>	<i>Magnolia grandiflora</i> 'Victoria' or 'Little Gem'	25'	25'	491 sq. ft.	all	No	broadleaf evergreen, large fragrant white flowers
<a href="#">Prariefire Crabapple</a>	<i>Malus spp.</i> 'Prariefire'	20'	20'	314 sq. ft.	all	Yes	disease resistant
<a href="#">Japanese Stewartia</a>	<i>Stewartia pseudocamellia</i>	25'	25'	491 sq. ft.	loam	No	needs ample water
<a href="#">Japanese Snowbell</a>	<i>Styrax japonicus</i>	25'	25'	491 sq. ft.	well drained	Yes	white flowers hang down from branches
<a href="#">Japanese Tree Lilac</a>	<i>Syringa reticulata</i>	20'	15'	177 sq. ft.	well drained	Yes	showy, creamy white flowers

\*These trees have been approved by Portland General Electric (PGE) for planting beneath overhead powerlines

## Street Tree List - Medium Stature Trees (between 25' and 40' in height at maturity)

Common Name	Scientific Name	Height (feet)	Spread (feet)	Canopy Area	Soil Type	Suitable for Under Powerlines	Special Features/Consideration
<a href="#">Hedge Maple</a>	<i>Acer campestre</i>	35'	30'	707 sq. ft.	all	No	tolerant of urban stresses
<a href="#">Sunset Maple</a>	<i>Acer truncatum</i> x <i>Acer platanoides</i>	35'	25'	491 sq. ft.	all	No	many varieties available
<a href="#">Strawberry Tree</a>	<i>Arbutus 'Marina'</i>	30'	30'	707 sq. ft.	all	No	broadleaf evergreen
<a href="#">European Hornbeam</a>	<i>Carpinus betulus</i>	35'	25'	491 sq. ft.	all	No	dense crown
<a href="#">Katsura</a>	<i>Cercidiphyllum japonicum</i>	40'	40'	1256 sq. ft.	all	No	requires moist soils
<a href="#">Yellowwood</a>	<i>Cladrastis kentuckia</i>	35'	35'	962 sq. ft.	all	No	fragrant, white, pendulous flowers
<a href="#">June Snow Dogwood</a>	<i>Cornus controversa 'June Snow'</i>	30'	35'	962 sq. ft.	well drained	No	wide spreading, flowers in May/June
<a href="#">Pacific Dogwood</a>	<i>Cornus nuttallii</i>	40'	30'	707 sq. ft.	loam	No	native to Portland metropolitan region, requires moist soil and some shade
<a href="#">Dove Tree</a>	<i>Davidia involucrata</i>	35'	30'	707 sq. ft.	well drained	No	dove-like flowers
<a href="#">Raywood Ash</a>	<i>Fraxinus oxycarpa 'Raywood'</i>	35'	30'	707 sq. ft.	all	No	smog tolerant
<a href="#">Goldenrain Tree</a>	<i>Koelreuteria paniculata</i>	35'	35'	962 sq. ft.	all	No	tolerant of urban stresses
<a href="#">Yulan Magnolia</a>	<i>Magnolia denudata</i>	35'	30'	707 sq. ft.	all	No	white, fragrant flowers
<a href="#">Southern Magnolia</a>	<i>Magnolia grandiflora 'Edith Bogue'</i>	35'	20'	314 sq. ft.	all	No	broadleaf evergreen, many other varieties available
<a href="#">Sourwood</a>	<i>Oxydendrum arboreum</i>	30'	20'	314 sq. ft.	well drained	No	white, midsummer flowers
<a href="#">American Hophornbeam</a>	<i>Ostrya virginiana</i>	35'	25'	491 sq. ft.	all	No	exfoliating bark texture is attractive
<a href="#">Persian Parrotia</a>	<i>Parrotia persica</i>	35'	25'	491 sq. ft.	well drained	No	beautiful bark and fall color
<a href="#">Amur Corktree</a>	<i>Phellodendron amurense</i>	40'	30'	707 sq. ft.	all	No	fragrant leaves and fruit
<a href="#">Callery Pear</a>	<i>Pyrus calleryana</i>	40'	25'	491 sq. ft.	all	No	many varieties available
<a href="#">Cascara</a>	<i>Rhamnus purshiana</i>	35'	25'	491 sq. ft.	all	No	native to Portland metropolitan region
<a href="#">Frontier Elm</a>	<i>Ulmus 'Frontier'</i>	40'	30'	707 sq. ft.	all	No	pest and disease resistant, substitute for American Elm

## Street Tree List - Large Stature Trees (over 40' in height at maturity)

Common Name	Scientific Name	Height (feet)	Spread (feet)	Canopy Area	Soil Type	Suitable for Under Powerlines	Special Features/Consideration
<a href="#">Red Maple</a>	<i>Acer rubrum</i>	50'	40'	1256 sq. ft.	any	No	many large stature varieties available
<a href="#">Hackberry</a>	<i>Celtis occidentalis</i>	45'	35'	962 sq. ft.	any	No	tolerant of urban stresses, deep rooted
<a href="#">European Beech</a>	<i>Fagus sylvatica</i>	50'	40'	1256 sq. ft.	well drained	No	beautiful bark
<a href="#">White Ash</a>	<i>Fraxinus americana</i>	60'	45'	1590 sq. ft.	any	No	plant seedless varieties
<a href="#">Oregon Ash</a>	<i>Fraxinus latifolia</i>	60'	30'	707 sq. ft.	any	No	native to Portland metropolitan region
<a href="#">Green Ash</a>	<i>Fraxinus pennsylvanica</i>	50'	40'	1256 sq. ft.	any	No	plant seedless varieties
<a href="#">Maidenhair Tree</a>	<i>Ginkgo biloba</i>	60'	45'	1590 sq. ft.	any	No	many large stature varieties available, plant males only
<a href="#">Honeylocust</a>	<i>Gleditsia triacanthos var. inermis</i>	45'	35'	962 sq. ft.	any	No	thornless, tolerant of urban stresses
<a href="#">Kentucky Coffeetree</a>	<i>Gymnocladus dioica</i>	65'	50'	1963 sq. ft.	any	No	fragrant flowers
<a href="#">Tulip Tree</a>	<i>Liriodendron tulipifera</i>	60'	30'	707 sq. ft.	any	No	beautiful fall color
<a href="#">Southern Magnolia</a>	<i>Magnolia grandiflora</i>	70'	60'	1963 sq. ft.	any	No	broadleaf evergreen, large fragrant white flowers
<a href="#">Blackgum</a>	<i>Nyssa sylvatica</i>	45'	25'	491 sq. ft.	any	No	beautiful fall color
<a href="#">London Planetree</a>	<i>Platanus x acerifolia 'Bloodgood'</i>	50'	40'	1256 sq. ft.	any	No	disease resistant, pollution tolerant
<a href="#">Scotch Pine</a>	<i>Pinus sylvestris</i>	50'	40'	1256 sq. ft.	any	No	evergreen conifer, striking orange bark
<a href="#">Oregon White Oak</a>	<i>Quercus garryana</i>	65'	50'	1963 sq. ft.	any	No	native to Portland metropolitan region
<a href="#">Willow Oak</a>	<i>Quercus phellos</i>	60'	45'	1590 sq. ft.	any	No	tolerant of urban stresses
<a href="#">Red Oak</a>	<i>Quercus rubra</i>	60'	45'	1590 sq. ft.	any	No	beautiful fall color
<a href="#">American Linden</a>	<i>Tilia americana</i>	60'	30'	707 sq. ft.	any	No	tolerant of urban stresses
<a href="#">Sterling Silver Linden</a>	<i>Tilia tomentosa 'Sterling Silver'</i>	45'	30'	707 sq. ft.	any	No	dark green leaves with silver undersides
<a href="#">Zelkova</a>	<i>Zelkova serrata</i>	65'	50'	1963 sq. ft.	any	No	attractive shade tree



## Parking Lot Trees (recommended for parking lots, large stature)

Common Name	Scientific Name	Height (feet)	Spread (feet)	Canopy Area	Soil Type	Suitable for Under Powerlines	Special Features/ Consideration
<a href="#">Bigleaf Maple</a>	<i>Acer macrophyllum</i>	65'	50'	1963 sq. ft.	any	No	native to Portland metropolitan region
<a href="#">Red Maple</a>	<i>Acer rubrum</i>	50'	40'	1256 sq. ft.	any	No	brilliant red fall color
<a href="#">European Beech</a>	<i>Fagus sylvatica</i>	50'	40'	1256 sq. ft.	well drained	No	beautiful bark
<a href="#">White Ash</a>	<i>Fraxinus americana</i>	60'	45'	1590 sq. ft.	any	No	plant seedless varieties
<a href="#">Green Ash</a>	<i>Fraxinus pennsylvanica</i>	50'	40'	1256 sq. ft.	any	No	plant seedless varieties
<a href="#">Maidenhair Tree</a>	<i>Ginkgo biloba</i>	60'	45'	1590 sq. ft.	any	No	many large stature varieties available, plant males only
<a href="#">Kentucky Coffeetree</a>	<i>Gymnocladus dioica</i>	65'	50'	1963 sq. ft.	any	No	fragrant flowers
<a href="#">Southern Magnolia</a>	<i>Magnolia grandiflora</i>	70'	60'	2826 sq. ft.	any	No	broadleaf evergreen, large fragrant white flowers
<a href="#">Austrian Pine</a>	<i>Pinus nigra</i>	55'	40'	1256 sq. ft.	any	No	evergreen conifer
<a href="#">Eastern White Pine</a>	<i>Pinus strobus</i>	70'	40'	1256 sq. ft.	any	No	evergreen conifer
<a href="#">Scotch Pine</a>	<i>Pinus sylvestris</i>	50'	40'	1256 sq. ft.	any	No	evergreen conifer, striking orange bark
<a href="#">London Planetree</a>	<i>Platanus x acerifolia</i> 'Bloodgood'	50'	40'	1256 sq. ft.	any	No	disease resistant, pollution tolerant
<a href="#">Oregon White Oak</a>	<i>Quercus garryana</i>	65'	50'	1963 sq. ft.	any	No	native to Portland metropolitan region
<a href="#">Willow Oak</a>	<i>Quercus phellos</i>	60'	45'	1590 sq. ft.	any	No	tolerant of urban stresses
<a href="#">Red Oak</a>	<i>Quercus rubra</i>	60'	45'	1590 sq. ft.	any	No	beautiful fall color
<a href="#">Accolade Elm</a>	<i>Ulmus</i> 'Morton'	70'	60'	2826 sq. ft.	any	No	graceful vase shaped tree, disease resistant substitute for American elm
<a href="#">Lacebark Elm</a>	<i>Ulmus parvifolia</i>	60'	50'	1963 sq. ft.	any	No	interesting mottled bark
<a href="#">Pioneer Elm</a>	<i>Ulmus</i> 'Pioneer'	50'	50'	1963 sq. ft.	any	No	rounded spreading crown, disease resistant substitute for American elm
<a href="#">Oregon Myrtle</a>	<i>Umbellularia californica</i>	70'	50'	1963 sq. ft.	any	No	broadleaf evergreen
<a href="#">Zelkova</a>	<i>Zelkova serrata</i>	65'	50'	1963 sq. ft.	any	No	attractive shade tree



## Columnar Trees (canopy spread of less than 20 feet at maturity, small stature)

Common Name	Scientific Name	Height (feet)	Spread (feet)	Canopy Area	Soil Type	Suitable for Under Powerlines	Special Features/Considerations
<a href="#">Armstrong Maple</a>	<i>Acer rubrum</i> 'Armstrong'	45'	15'	177 sq. ft.	any	No	orange-red fall color
<a href="#">Bowhall Maple</a>	<i>Acer rubrum</i> 'Bowhall'	40'	15'	177 sq. ft.	any	No	bright red fall color
<a href="#">Frans Fontaine Hornbeam</a>	<i>Carpinus betulus</i> 'Frans Fontaine'	35'	15'	177 sq. ft.	any	No	narrowest of the <i>Carpinus b.</i> cultivars
<a href="#">Dawyck Purple Beech</a>	<i>Fagus sylvatica</i> 'Dawyck Purple'	40'	12'	113 sq. ft.	any	No	purple leaves for entire growing season
<a href="#">Princeton Sentry Ginkgo</a>	<i>Ginkgo biloba</i> 'Princeton Sentry'	40'	15'	177 sq. ft.	any	No	seedless, bright yellow fall color
<a href="#">Arnold Tulip Tree</a>	<i>Liriodendron tulipifera</i> 'Arnold'	40'	10'	79 sq. ft.	any	No	fast grower
<a href="#">Edith Bogue Magnolia</a>	<i>Magnolia grandiflora</i> 'Edith Bogue'	30'	15'	177 sq. ft.	any	No	broadleaf evergreen
<a href="#">Galaxy Magnolia</a>	<i>Magnolia</i> × 'Galaxy'	30'	15'	177 sq. ft.	any	No	showy pink flowers
<a href="#">Tschonoskii Crabapple</a>	<i>Malus tschonoskii</i>	30'	15'	177 sq. ft.	any	No	good fall color
<a href="#">Arnold Sentinel Austrian Pine</a>	<i>Pinus nigra</i> 'Arnold Sentinel'	35'	10'	79 sq. ft.	any	No	evergreen conifer
<a href="#">Fastigate White Pine</a>	<i>Pinus strobus</i> 'Fastigiata'	30'	10'	79 sq. ft.	well drained	No	evergreen conifer
<a href="#">Quaking Aspen</a>	<i>Populus tremuloides</i>	30'	15'	177 sq. ft.	any	No	native to the Portland Metro region
<a href="#">Capital Pear</a>	<i>Pyrus calleryana</i> 'Capital'	35'	12'	113 sq. ft.	any	No	glossy summer foliage
<a href="#">Chanticleer Pear</a>	<i>Pyrus calleryana</i> 'Chanticleer'	40'	15'	177 sq. ft.	any	No	resistant to fireblight
<a href="#">Columnar Sargent Cherry</a>	<i>Prunus sargentii</i> 'Columnaris'	35'	15'	177 sq. ft.	any	No	pink flowers and reddish bark
<a href="#">Skyrocket Oak</a>	<i>Quercus robur</i> 'Fastigiata'	45'	15'	177 sq. ft.	well drained	No	may hold brown leaves into winter
<a href="#">Crimson Spire Oak</a>	<i>Quercus robur</i> × <i>Q. alba</i> 'Crimschmidt'	45'	15'	177 sq. ft.	well drained	No	red fall color
<a href="#">Giant Arborvitae "Virescens"</a>	<i>Thuja plicata</i> 'Virescens'	25'	12'	113 sq. ft.	moist	No	evergreen conifer, species native to the Portland Metro Region
<a href="#">Corinthian Linden</a>	<i>Tilia cordata</i> 'Corzam'	45'	15'	177 sq. ft.	any	No	narrowest of the linden cultivars
<a href="#">Columnar Zelkova</a>	<i>Zelkova serrata</i> 'Musashino'	45'	15'	177 sq. ft.	any	No	fine textured leaves





## Native Trees

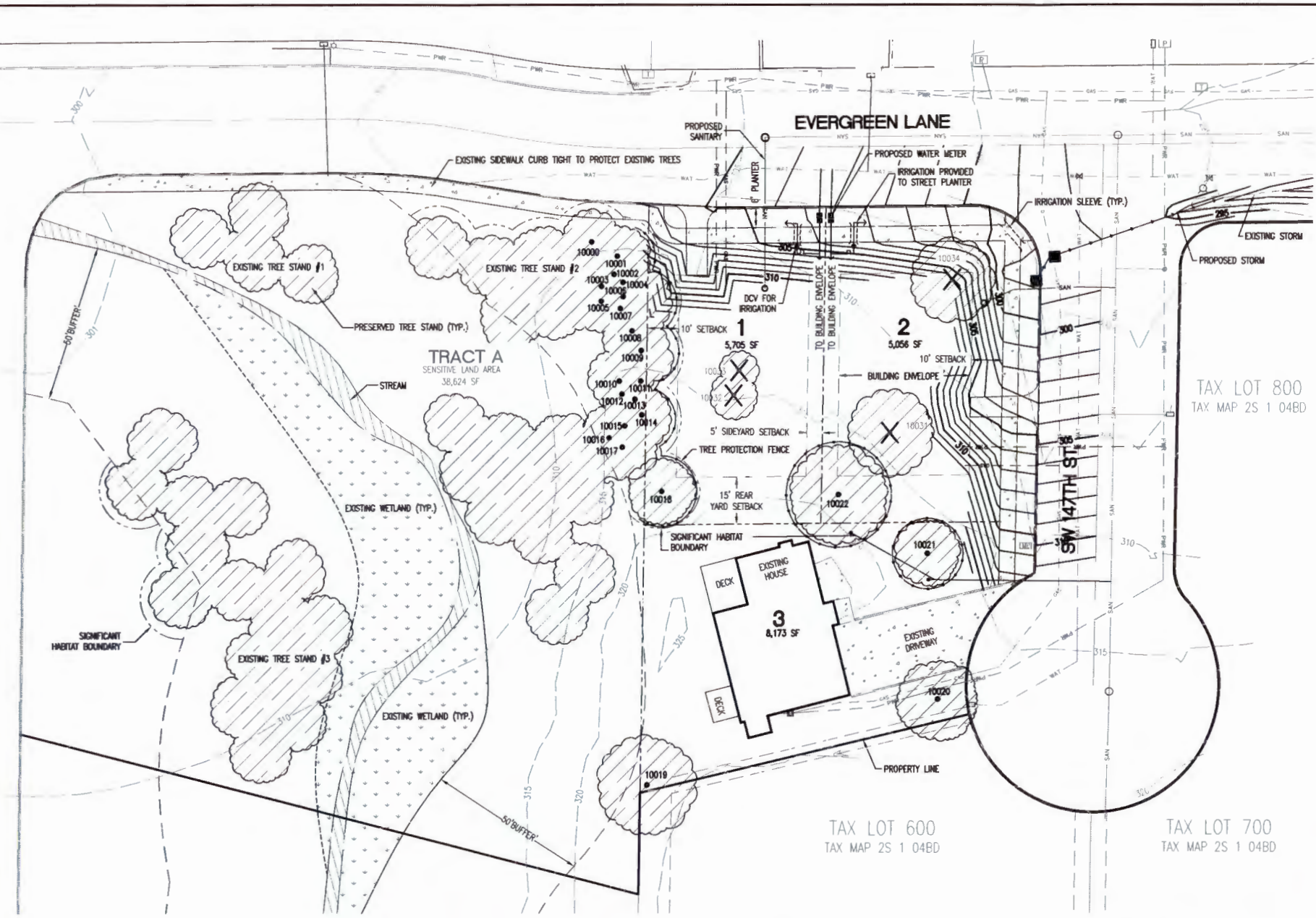
Common Name	Scientific Name	Height (feet)	Spread (feet)	Canopy Area	Stature	Suitable for Under Powerlines	Primary Habitat Types
<a href="#">Grand Fir</a>	<i>Abies grandis</i>	150'	40'	1256 sq. ft.	Large	No	Wetland, Riparian, Upland
<a href="#">Big-leaf Maple</a>	<i>Acer macrophyllum</i>	65'	50'	1963 sq. ft.	Large	No	Upland
<a href="#">Red Alder</a>	<i>Alnus rubra</i>	100'	40'	1256 sq. ft.	Large	No	Riparian, Upland
<a href="#">Madrone</a>	<i>Arbutus menziesii</i>	40'	30'	707 sq. ft.	Medium	No	Upland
<a href="#">Pacific Dogwood</a>	<i>Cornus nuttallii</i>	40'	30'	707 sq. ft.	Medium	No	Upland
<a href="#">Black Hawthorn</a>	<i>Crataegus douglasii</i>	25'	20'	314 sq. ft.	Small	Yes	Wetland, Riparian, Upland
<a href="#">Oregon Ash</a>	<i>Fracinus latifolia</i>	60'	30'	707 sq. ft.	Large	No	Wetland, Riparian
<a href="#">Ponderosa Pine</a>	<i>Pinus ponderosa</i>	200'	30'	707 sq. ft.	Large	No	Upland
<a href="#">Black Cottonwood</a>	<i>Populus balsamifera ssp. trichocarpa</i>	175'	40'	1256 sq. ft.	Large	No	Wetland, Riparian
<a href="#">Quaking Aspen</a>	<i>Populus tremuloides</i>	30'	15'	177 sq. ft.	Medium	No	Wetland, Riparian
<a href="#">Bitter Cherry</a>	<i>Prunus emarginata</i>	30'	20'	314 sq. ft.	Medium	No	Riparian, Upland
<a href="#">Douglas Fir</a>	<i>Pseudotsuga menziesii</i>	180'	40'	1256 sq. ft.	Large	No	Upland
<a href="#">Oregon White Oak</a>	<i>Quercus garryana</i>	65'	50'	1963 sq. ft.	Large	No	Upland
<a href="#">Cascara</a>	<i>Rhamnus purshiana</i>	35'	25'	491 sq. ft.	Medium	No	Riparian, Upland
<a href="#">Pacific Willow</a>	<i>Salix lucida ssp. lasiandra</i>	40'	30'	707 sq. ft.	Medium	No	Wetland, Riparian
<a href="#">Rigid Willow</a>	<i>Salix rigida var. macrogemma</i>	30'	20'	314 sq. ft.	Small	No	Wetland, Riparian
<a href="#">Sculer Willow</a>	<i>Salix scouleriana</i>	40'	40'	1256 sq. ft.	Medium	No	Wetland, Riparian, Upland
<a href="#">Pacific Yew</a>	<i>Taxus brevifolia</i>	40'	30'	707 sq. ft.	Medium	No	Riparian, Upland
<a href="#">Western Red Cedar</a>	<i>Thuja plicata</i>	100'	30'	707 sq. ft.	Large	No	Wetland, Riparian, Upland
<a href="#">Western Hemlock</a>	<i>Tsuga heterophylla</i>	150'	40'	1256 sq. ft.	Large	No	Riparian, Upland



## Nuisance Tree List

Common Name	Scientific Name	Photos	Photos2	Photos3
<a href="#">Norway maple</a>	<i>Acer platanoides</i>	<a href="#">leaf detail</a>	<a href="#">fruit detail</a>	<a href="#">flower detail</a>
<a href="#">Sycamore maple</a>	<i>Acer pseudoplatanus</i>	<a href="#">leaf detail</a>	<a href="#">fruit detail</a>	<a href="#">flower detail</a>
<a href="#">Tree-of-heaven</a>	<i>Ailanthus altissima</i>	<a href="#">leaf detail</a>	<a href="#">fruit detail</a>	<a href="#">flower detail</a>
<a href="#">European white birch</a>	<i>Betula pendula</i>	<a href="#">leaf detail</a>	<a href="#">fruit detail</a>	<a href="#">flower detail</a>
<a href="#">English hawthorn</a>	<i>Crataegus monogyna</i>	<a href="#">leaf detail</a>	<a href="#">fruit detail</a>	<a href="#">flower detail</a>
<a href="#">English holly</a>	<i>Ilex aquifolium</i>	<a href="#">leaf detail</a>	<a href="#">fruit detail</a>	<a href="#">flower detail</a>
<a href="#">Princess tree</a>	<i>Paulownia tomentosa</i>	<a href="#">leaf detail</a>	<a href="#">fruit detail</a>	<a href="#">flower detail</a>
<a href="#">White poplar</a>	<i>Populus alba</i>	<a href="#">leaf detail</a>	<a href="#">fruit detail</a>	<a href="#">flower detail</a>
<a href="#">Sweet cherry</a>	<i>Prunus avium</i>	<a href="#">leaf detail</a>	<a href="#">fruit detail</a>	<a href="#">flower detail</a>
<a href="#">Black locust</a>	<i>Robinia pseudoacacia</i>	<a href="#">leaf detail</a>	<a href="#">fruit detail</a>	<a href="#">flower detail</a>
<a href="#">European mountain ash</a>	<i>Sorbus aucuparia</i>	<a href="#">leaf detail</a>	<a href="#">fruit detail</a>	<a href="#">flower detail</a>
<a href="#">Siberian elm</a>	<i>Ulmus pumila</i>	<a href="#">leaf detail</a>	<a href="#">fruit detail</a>	<a href="#">flower detail</a>





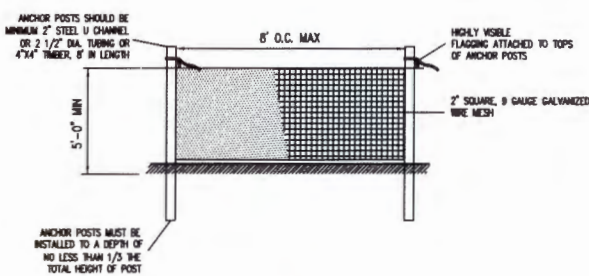
**TREE PROTECTION NOTES:**

- A. NO CHANGES SHALL BE MADE TO ANY ASPECT OF THE APPROVED URBAN FORESTRY PLAN WITHOUT WRITTEN CONSENT FROM THE PROJECT ARBORIST AND CITY ARBORIST.
- B. TIMELINE FOR CLEARING, GRADING, AND INSTALLATION OF TREE PROTECTION MEASURES: WORK WILL BEGIN WITHIN THREE (3) WEEKS OF PFT PERMIT ISSUANCE BY THE CITY. TREE PROTECTION WILL BE INSTALLED PRIOR TO ANY GROUND DISTURBANCE WORK, CLEARING, AND GRADING WILL FOLLOW.
- C. PLACING MATERIALS NEAR TREES. NO PERSON MAY CONDUCT ANY ACTIVITY WITHIN THE PROTECTED AREA OF ANY TREE DESIGNATED TO REMAIN, INCLUDING, BUT NOT LIMITED TO, PARKING EQUIPMENT, PLACING SOLVENTS, STORING BUILDING MATERIAL AND SOIL DEPOSITS, DUMPING CONCRETE WASHOUT AND LOCATING BURN HOLES.
- D. ATTACHMENTS TO TREES DURING CONSTRUCTION - NO PERSON SHALL ATTACH ANY OBJECT TO ANY TREE DESIGNATED FOR PRESERVATION.
- E. PROTECTIVE BARRIER. PRIOR TO ANY GROUND DISTURBANCE BY THE CONTRACTOR:
  - 1. SHALL ERECT AND MAINTAIN READILY VISIBLE TREE PROTECTION FENCING ALONG THE OUTER EDGE AND COMPLETELY SURROUNDING THE PROTECTED AREA OF ALL PROTECTED TREES OR GROUPS OF TREES AS SHOWN. FENCES SHALL BE CONSTRUCTED OF 5 FOOT TALL METAL, SECURED TO EIGHT FOOT TALL METAL POSTS. POSTS SHALL NOT BE PLACED FURTHER THAN 8 FEET O.C. APART.
  - 2. MAY BE REQUIRED TO COVER WITH MULCH TO A DEPTH OF AT LEAST SIX (6) INCHES, OR WITH PLYWOOD OR SIMILAR MATERIAL, OVER THE ROOT ZONE OF A TREE IN ORDER TO PROTECT ROOTS FROM DAMAGE CAUSED BY HEAVY EQUIPMENT.
  - 3. SHALL PROHIBIT EXCAVATION OR COMPACTING OF EARTH OR OTHER POTENTIALLY DAMAGING ACTIVITIES WITHIN THE TREE PROTECTION ZONE.
  - 4. MAY BE REQUIRED TO MINIMIZE ROOT DAMAGE BY EXCAVATION OF A TWO (2) FEET DEEP TRENCH, AT THE EDGE OF THE TREE PROTECTION ZONE, TO CLEANLY SEVER THE ROOTS OF TREES TO BE RETAINED.
  - 5. MAY BE REQUIRED TO HAVE CORRECTIVE PRUNING PERFORMED ON PRESERVED TREES IN ORDER TO AVOID DAMAGE FROM MACHINERY OR BUILDING ACTIVITY. MAY BE REQUIRED TO MAINTAIN TREES THROUGHOUT CONSTRUCTION PERIOD BY WATERING AND FERTILIZING.
  - 6. SHALL MAINTAIN THE TREE PROTECTION FENCING IN PLACE UNTIL THE PROJECT ARBORIST AND CITY ARBORIST AUTHORIZES THEIR REMOVAL.
  - 7. SHALL ENSURE THAT ANY LANDSCAPING DONE IN THE TREE PROTECTION ZONE SUBSEQUENT TO THE REMOVAL OF THE BARRIERS SHALL BE ACCOMPLISHED WITH LIGHT MACHINERY OR HAND LABOR. USE PLANT MATERIALS WITH COMPATIBLE WATER REQUIREMENTS TO TREE TO BE PRESERVED AND DIRECT SPRAY IRRIGATION AWAY FROM TRUNKS.
- F. THE GRADE SHALL NOT BE ELEVATED OR REDUCED WITHIN THE TREE PROTECTION ZONE WITHOUT THE PROJECT ARBORIST'S AUTHORIZATION. THE PROJECT ARBORIST MAY ALLOW COVERAGE OF UP TO ONE HALF OF THE AREA OF THE TREE'S ROOT ZONE WITH LIGHT SOILS (NO CLAY) TO THE MINIMUM DEPTH NECESSARY TO CARRY OUT GRADING OR LANDSCAPING PLANS, IF IT WILL NOT IMPAIR THE SURVIVAL OF THE TREE. AERATION DEVICES MAY BE REQUIRED TO ENSURE THE TREE'S SURVIVAL.
- G. IF THE GRADE ADJACENT TO A PRESERVED TREE IS RAISED SUCH THAT IT COULD SLOUGH OR ERODE INTO THE TREE PROTECTION ZONE, IT SHALL BE PERMANENTLY STABILIZED TO PREVENT SUFFOCATION OF THE ROOTS.
- H. AN IMPERVIOUS SURFACE SHALL NOT BE INSTALLED WITHIN THE TREE PROTECTION ZONE OF ANY TREE TO BE PRESERVED WITHOUT THE AUTHORIZATION OF THE PROJECT ARBORIST. THE PROJECT ARBORIST MAY REQUIRE SPECIFIC CONSTRUCTION METHODS AND/OR USE OF AERATION DEVICES TO ENSURE THE TREE'S SURVIVAL AND TO MINIMIZE THE POTENTIAL FOR ROOT INDUCED DAMAGE TO THE IMPERVIOUS SURFACE.
- I. TO THE GREATEST EXTENT PRACTICAL, UTILITY TRENCHES SHALL BE LOCATED OUTSIDE OF THE TREE PROTECTION ZONE OF TREES TO BE PRESERVED. THE PROJECT ARBORIST MAY REQUIRE THAT UTILITIES BE TUNNELED UNDER THE ROOTS OF TREES TO BE PRESERVED IF THE PROJECT ARBORIST DETERMINES THAT TRENCHING WOULD SIGNIFICANTLY REDUCE THE CHANCES OF THE TREES SURVIVAL.
- J. DIRECTIONAL FELLING. DIRECTIONAL FELLING OF TREES SHALL BE USED TO AVOID DAMAGE TO TREES DESIGNATED FOR PRESERVATION.
- K. ADDITIONAL REQUIREMENTS. THE PROJECT ARBORIST MAY REQUIRE ADDITIONAL TREE PRESERVATION MEASURES WHICH ARE CONSISTENT WITH TREE CARE INDUSTRY STANDARDS.

- GENERAL NOTES:**
- ALL PORTIONS OF LOTS 1 AND 2 NOT OCCUPIED BY BUILDINGS OR PAVING TO BE LANDSCAPE AND IRRIGATED.
  - ALL NON-NATIVE VEGETATION WITHIN THE 50' STREAM BUFFER IN TRACT A TO BE REMOVED AND REPLACED WITH NATIVE VEGETATION AND TEMPORARY IRRIGATION FOR A PERIOD OF ONE YEAR OR UNTIL PLANTS ARE ESTABLISHED.
- ROOT PROTECTION ZONE NOTES:**
- ENCROACHMENT INTO THE ROOT PROTECTION ZONE IS ALLOWED WITH PROJECT ARBORIST APPROVAL AS DESCRIBED IN THE FOLLOWING NOTES:
- EXCAVATION IN THE TOP 24" OF THE SOIL IN THE CRITICAL ROOT ZONE AREA SHOULD BEGIN AT THE EXCAVATION LINE THAT IS CLOSEST TO THE TREE.
  - THE EXCAVATION SHOULD BE DONE BY HAND/SHOVEL OR WITH A BACKHOE AND A MAN WITH A SHOVEL, PRUNING SHEARS, AND A PRUNING SAW.
  - IF DONE BY HAND, ALL ROOTS 1" OR LARGER SHOULD BE PRUNED AT THE EXCAVATION LINE.
  - IF DONE WITH A BACKHOE (MOST LIKELY SCWARD), THEN THE OPERATOR SHALL START THE CUT AT THE EXCAVATION LINE AND CAREFULLY "FEEL" FOR ROOTS/RESISTANCE. WHEN THERE IS RESISTANCE, THE MAN WITH THE SHOVEL HAND DIGS AROUND THE ROOTS AND PRUNES THE ROOTS LARGER THAN 1" DIAMETER.

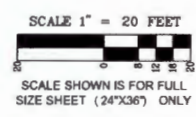
I, JOHN ARBORIST, ATTEST THAT THIS TREE CANOPY SITE PLAN MEETS ALL OF THE REQUIREMENTS IN SECTION 10, PART 2, OF THE CITY OF TIGARD URBAN FORESTRY MANUAL.

JOHN ARBORIST, CERTIFIED ARBORIST  
PNN-0000



- NOTES:**
- METAL FENCE FOR TREE PROTECTION FENCE ONLY.
  - BOUNDARIES OF PROTECTION AREA WILL BE ESTABLISHED IN THE FIELD BY THE ARBORIST PRIOR TO CONSTRUCTION.
  - BOUNDARIES OF PROTECTION AREA SHOULD BE STAKED AND FLAGGED BY THE ARBORIST PRIOR TO INSTALLING DEVICES.
  - AVOID DAMAGE TO CRITICAL ROOT ZONE. DO NOT DAMAGE OR SEVER LARGE ROOTS WHEN INSTALLING POSTS.
  - DEVICE SHOULD BE MAINTAINED THROUGHOUT CONSTRUCTION.

**METAL TREE PROTECTION FENCE**  
TREE PRESERVATION/REMOVAL PLAN BY JOHN ARBORIST,  
CERTIFIED ARBORIST #PN-0000, WITH ABC COLLABORATIVE.



**LEGEND**

- EXISTING TREE TO BE REMOVED: X
- EXISTING TREE DRIPLINE: wavy line
- EXISTING TREE CANOPY AREA: hatched box
- CANOPY AREA: solid box
- TREE PROTECTION FENCE: dashed line with cross-ticks
- EXISTING SANITARY: solid line with 'S' markers
- PROPOSED SANITARY: dashed line with 'S' markers
- EXISTING WATER: solid line with 'W' markers
- PROPOSED WATER: dashed line with 'W' markers
- PROPOSED WATER METER: square symbol
- EXISTING WATER METER: square symbol
- EXISTING STORM: solid line with 'S' markers
- PROPOSED STORM: dashed line with 'S' markers
- EXISTING GAS: solid line with 'G' markers
- PROPOSED GAS: dashed line with 'G' markers
- EXISTING ELECTRIC: solid line with 'E' markers
- PROPOSED ELECTRIC: dashed line with 'E' markers
- PROPOSED IRRIGATION: dashed line with dots
- APPROXIMATE STREAM BED LOCATION: dashed line with wavy pattern
- WETLAND: hatched area
- SIGNIFICANT HABITAT BOUNDARY: dashed line

REVISIONS:


**EXAMPLE TREE PRESERVATION AND REMOVAL SITE PLAN**

OFFICE LOCATED AT:  
1000 1ST STREET, SUITE 1  
TIGARD, OREGON 97223  
PH: (503) 555-XXXX  
FAX: (503) 555-XXXX  
EMAIL: INFO@ABC\_OR.LABORATIVE.COM  
LICENSED IN OR, WA, & ID

**ABC COLLABORATIVE**  
DESIGN • ARCHITECTURE • PLANNING • LANDSCAPE ARCHITECTURE

DESIGNED BY:	KRJ	DRAWING NO.:	9A
DRAWN BY:	BDT	SCALE:	AS SHOWN
CHECKED BY:	KRJ		
PREPARED FOR:	JOHN SMITH PO BOX 111 TIGARD, OREGON 97223 PH: 503-909-5555 FAX: 503-909-5556		

**EVERGREEN HEIGHTS PARTITION**  
**190 SW 147TH ST.**

TIGARD TAXLOT 1700

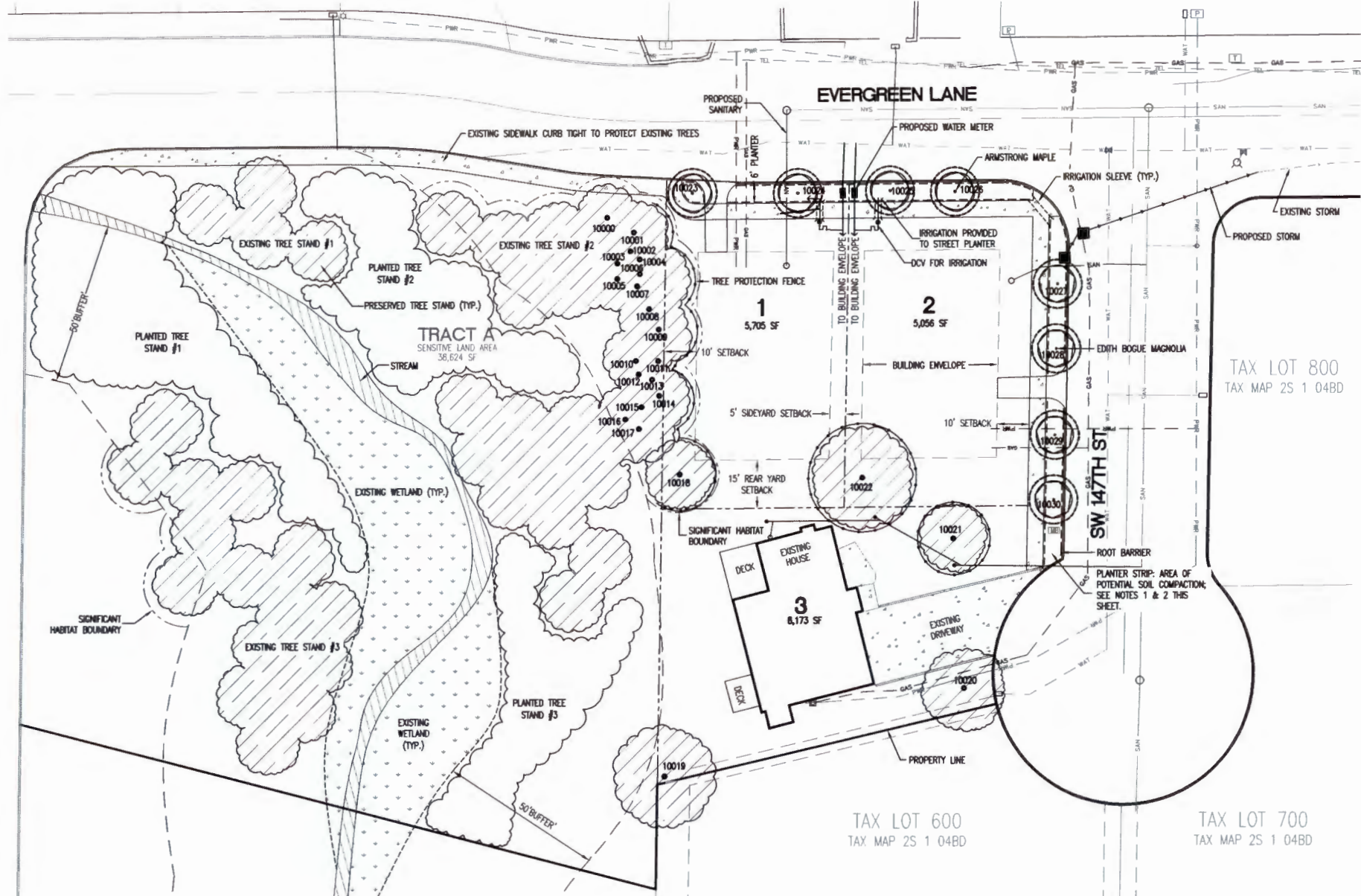
OREGON TAXMAP 2 4E 25

DATE: 07-11-2011

JOHN Q. ARBORIST  
CERTIFIED ARBORIST

JOB NUMBER  
**2001**

SHEET  
**APPENDIX 7**



**PLANT LEGEND**

SYMBOL	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	CONDITION	SPACING
	3	ACER RUBRUM 'ARMSTRONG'	ARMSTRONG RED MAPLE	2" CAL.	B&B	AS SHOWN
	4	MAGNOLIA GRANDIFLORA 'EDITH BOGUE'	EDITH BOGUE MAGNOLIA	2" CAL.	B&B	AS SHOWN

NOTE:  
 1. PLANTER STRIP AREAS ALONG EVERGREEN LANE AND SW 147TH ARE AREAS OF POTENTIAL SOIL COMPACTION, LIMITING TREE GROWTH. IF SOIL COMPACTION OCCURS, BACKHOE TURNING SHOULD BE USED TO LOOSEN SOIL.  
 2. BACKHOE TURNING: REMOVE ANY LAYERS OF GOOD TOPSOIL. SPREAD 3"-4" OF ORGANICS (HIGH-LIGNIN COMPOST) OR ESCS (EXPANDED SHALE/CALCINE CLAY) AMENDMENT OVER THE AREA, PRIOR TO TURNING THE SOIL. MAINTAINING A SAFE DISTANCE FROM PAVING, SIDEWALKS, AND STRUCTURES, USE BACKHOE TO TURN SOIL TO 36" DEPTH. BREAK SOIL INTO LARGE PEDS AND LOOSELY INCORPORATE THE SOIL AMENDMENT. MAINTAIN A SLOPE OF COMPACTED SOIL AT THE EDGE OF PAVING SO AS NOT TO UNDERMINE THE PAVING SUB-BASE. HAND TURNING MAY BE NECESSARY ALONG THE EDGES OF PAVING AND AT WALLS. DO NOT TILL TO A DEPTH GREATER THAN THE BOTTOM OF FOOTING. AFTER TURNING, RE-SPREAD TOPSOIL AND ADD 3"-5" OF YARD WASTE ORGANIC AMENDMENT OVER THE SURFACE AND LIGHTLY TILL TO BREAK THE SOIL INTO TEXTURE SUITABLE TO FINE GRADE.

**LEGEND**

- EXISTING TREE DRIPLINE
- PLANTED TREE MATURE DRIPLINE
- EXISTING TREE CANOPY AREA
- CANOPY AREA
- TREE PROTECTION FENCE
- EXISTING SANITARY
- PROPOSED SANITARY
- EXISTING WATER
- PROPOSED WATER
- PROPOSED WATER METER
- EXISTING WATER METER
- EXISTING STORM
- PROPOSED STORM
- EXISTING GAS
- PROPOSED GAS
- EXISTING ELECTRIC
- PROPOSED ELECTRIC
- PROPOSED IRRIGATION
- APPROXIMATE STREAM BED LOCATION
- WETLAND
- SIGNIFICANT HABITAT BOUNDARY



I, JOHN ARBORIST, ATTEST THAT THIS TREE CANOPY SITE PLAN MEETS ALL OF THE REQUIREMENTS IN SECTION 10, PART 2, OF THE CITY OF TIGARD URBAN FORESTRY MANUAL.

JOHN ARBORIST, CERTIFIED ARBORIST  
 PNN-0000

DATE: 07-11-2011

REVISIONS:


**EXAMPLE TREE CANOPY SITE PLAN**

OFFICE LOCATED AT:  
 1000 1ST STREET, SUITE 1  
 TIGARD, OREGON 97223  
 PH: (503) 555-XXXX  
 FAX: (503) 555-XXXX  
 EMAIL: INFO@ABC-COLLABORATIVE.COM  
 LICENSED IN OR, WA, & ID

DESIGNED BY: KRJ  
 DRAWN BY: BDT  
 CHECKED BY: KRJ

PREPARED FOR: JOHN SMITH  
 PO BOX 111  
 TIGARD, OREGON 97223  
 PH: 503-909-5555  
 FAX: 503-909-5556

DESIGNED BY: KRJ	DRAWING NO.: 9A
DRAWN BY: BDT	SCALE: AS SHOWN
CHECKED BY: KRJ	

**EVERGREEN HEIGHTS PARTITION**  
**190 SW 147TH ST.**  
 TIGARD OREGON  
 TAXMAP 2 4E 25



JOB NUMBER  
**2001**  
 SHEET  
**APPENDIX B**

## Urban Forestry Plan –Supplemental Report Example Template

### **General Information**

Date:

Project Name:

Project Arborist or Landscape Architect Name:

Project Arborist or Landscape Architect Address:

Project Arborist or Landscape Architect Telephone Number:

Project Arborist or Landscape Architect Email Address:

ISA Certified Arborist No.:

ISA Certified Tree Risk Assessor No.:

Landscape Architect Stamp:

### **Project Summary**

#### **Specifications**

Tree Protection Fencing Specifications:

Tree Preservation Specifications:

Stand Preservation Specifications:

Soil Characteristics and Specifications for Improvement:

Tree Planting Specifications:

Stand Planting Specifications:

**Urban Forestry Plan –Supplemental Report Example Template**

**Existing Tree Inventory**

Tree #	Genus sp./ Common	DBH	Canopy (ft <sup>2</sup> )	Open or Stand Grown	Heritage Tree?	Cond. Rating	Pres. Rating	Preserve?	Comments

**Existing Stand Inventory**

Stand #	Genus sp./ Common of Dominant	Avg. DBH 1	Avg. Cond. Rating 1	Overall Stand Pres. Rating	Total Canopy (ft <sup>2</sup> )	Canopy Preserved (ft <sup>2</sup> )	Comments
	Genus sp./ Common of 2 <sup>nd</sup>	Avg. DBH 2	Avg. Cond. Rating 2				
	Genus sp./ Common of 3 <sup>rd</sup>	Avg. DBH 3	Avg. Cond. Rating 3				



**Urban Forestry Plan –Supplemental Report Example Template**

**Planted Tree Inventory**

Tree #	Genus sp./ Common	Caliper (Decid.) or Height (Evergreen)	Mature Canopy Spread (ft)	Mature Canopy Area (ft <sup>2</sup> )	Available Soil Volume (ft <sup>3</sup> )	Comments

**Planted Stand Inventory**

Stand #	Genus sp./Common 1	Hgt. or Container size	No. of Trees	Avg. Spacing (ft)	Total Mature Canopy Area (ft <sup>2</sup> ) Delineated at the Outer Edge of the Stand	Comments
	Genus sp./Common 2	Hgt. or Container size	No. of Trees	Avg. Spacing (ft)		
	Genus sp./Common 3	Hgt. or Container size	No. of Trees	Avg. Spacing (ft)		
	Genus sp./Common 4	Hgt. or Container size	No. of Trees	Avg. Spacing (ft)		
	Genus sp./Common 5	Hgt. or Container size	No. of Trees	Avg. Spacing (ft)		

## Urban Forestry Plan –Supplemental Report Example Template

### Effective Tree Canopy Cover Summary

*Lot or Tract # (exclude streets)	Lot or Tract Area (ft <sup>2</sup> )	2x Canopy Area (ft <sup>2</sup> ) of Preserved Trees (w/ cond. and pres.≥2)	2x Canopy Area (ft <sup>2</sup> ) of Preserved Stands (w/ cond. and pres.≥2)	1.25x Mature Canopy Area (ft <sup>2</sup> ) of Native Planted Trees	Mature Canopy Area (ft <sup>2</sup> ) of Non-Native Planted Trees	1.25x Mature Canopy Area (ft <sup>2</sup> ) of Planted Stands	Total Canopy Area (ft <sup>2</sup> ) per lot or tract	Effective % Canopy (Canopy Area ÷ Lot or Tract Area)
<b>Total</b>								

\*Note: effective tree canopy cover is required to be calculated on a lot/tract by lot/tract basis only in the R-1, R-2, R-3.5, R-4.5 and R-7 districts.

The standard percentage of effective tree canopy cover for each lot or tract in the R-1, R-2, R-3.5, R-4.5 and R-7 districts shall be at least 15 percent.

The standard percentage of effective tree canopy cover for the overall development site shall be at least:

- i. 40% for R-1, R-2, R-3.5, R-4.5 and R-7 districts, except for schools (18.130.050(J));
- ii. 33% for R-12, R-25, R-40, C-N, C-C, C-G, C-P, MUE, MUE-1, MUE-2, MUC, MUR and I-P districts, except for schools (18.130.050(J)); and
- iii. 25% for MU-CBD, MUC-1, I-L and I-H districts, and for schools (18.130.050(J)) in all districts.

## Urban Forestry Plan –Supplemental Report Example Template

### Tree Canopy Fee Calculation (if applicable)

If the percentage of effective tree canopy cover is less than the applicable standard percentage for the overall development:

1. Find the required ft<sup>2</sup> of tree canopy:  
(overall development site area) x (standard required % (40%, 33%, or 25%)).
2. Find the ft<sup>2</sup> of tree canopy the development is short:  
(required ft<sup>2</sup> of tree canopy from 1 above) - (proposed ft<sup>2</sup> of tree canopy).
3. Find the \$ value of tree canopy:  
(PNW-ISA wholesale median cost for a 3” deciduous tree in the Willamette Valley) ÷ 59.
4. Find the required tree canopy fee:  
(amount of ft<sup>2</sup> of tree canopy from 2 above) x (the \$ value of tree canopy from 3 above).

If the overall development meets the applicable standard percentage, but the percentage of effective tree canopy cover is less than 15% for any individual lot or tract in the R-1, R-2, R-3.5, R-4.5 and R-7 districts:

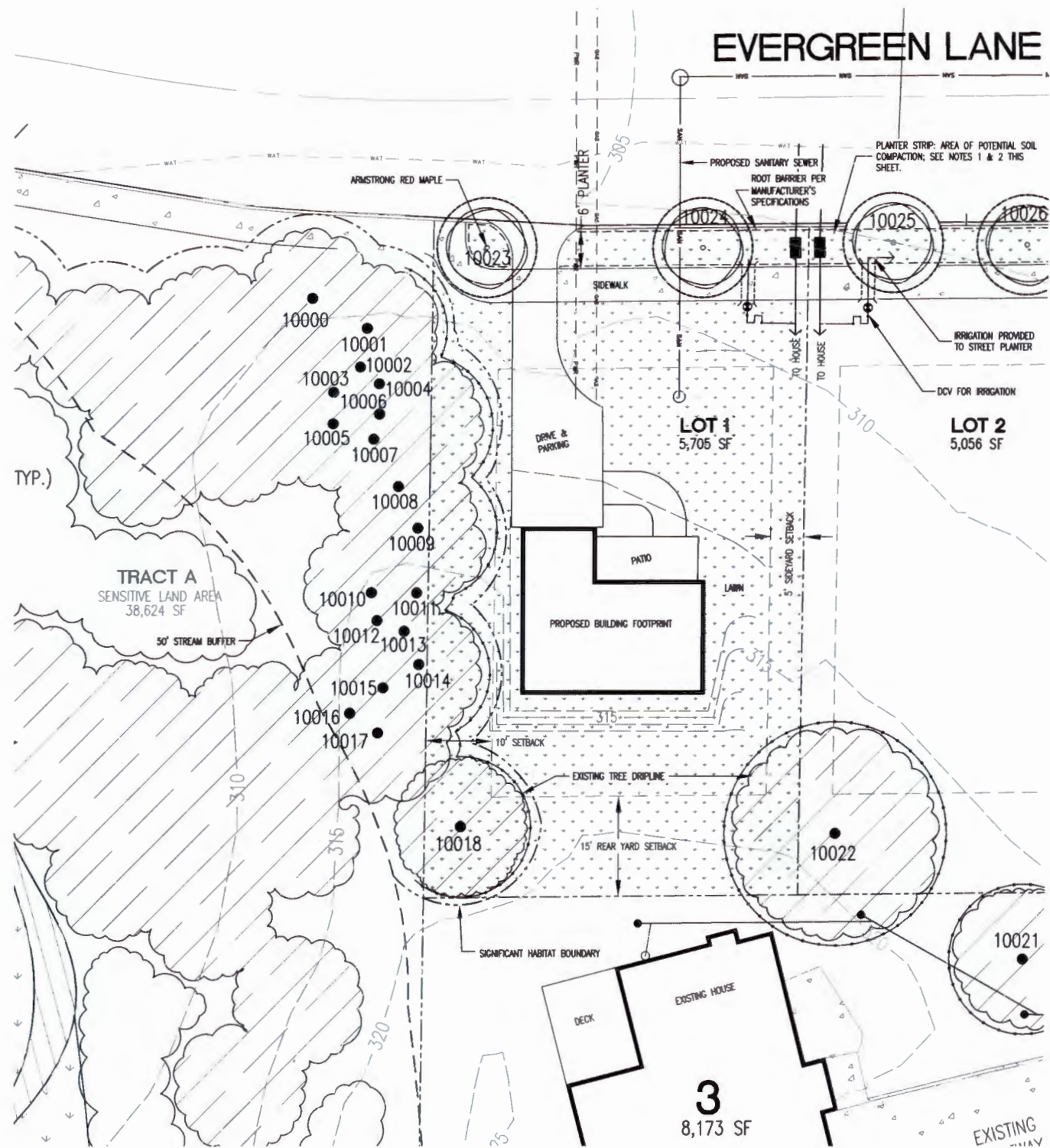
1. Find the required ft<sup>2</sup> of tree canopy for the deficient lot or tract:  
(lot or tract area) x 15%.
2. Find the ft<sup>2</sup> of tree canopy the lot or tract is short:  
(required ft<sup>2</sup> of tree canopy from 1 above) - (proposed ft<sup>2</sup> of tree canopy).
3. Find the \$ value of tree canopy:  
(PNW-ISA wholesale median cost for a 3” deciduous tree in the Willamette Valley) ÷ 59.
4. Find the required tree canopy fee:  
(amount of ft<sup>2</sup> of tree canopy from 2 above) x (the \$ value of tree canopy from 3 above).

### Signature of Approval

I hereby attest that:

1. The Tree Preservation and Removal site plan meets all of the requirements in Section 10, Part 1 of the Urban Forestry Manual;
2. The Tree Canopy site plan meets all of the requirements in Section 10, Part 2 of the Urban Forestry Manual; and
3. The Supplemental Report meets all of the requirements in Section 10, Part 3 of the Urban Forestry Manual.





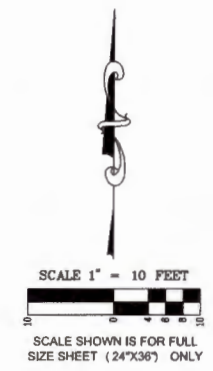
**STREET TREES**

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	CONDITION	SPACING
	ACER RUBRUM 'ARMSTRONG'	ARMSTRONG RED MAPLE	2" CAL.	B&B	AS SHOWN

NOTE:  
 1. PLANTER STRIP AREAS ALONG EVERGREEN LANE AND SW 147TH ARE AREAS OF POTENTIAL SOIL COMPACTION, LIMITING TREE GROWTH. IF SOIL COMPACTION OCCURS, BACKHOE TURNING SHOULD BE USED TO LOOSEN SOIL.  
 2. BACKHOE TURNING: REMOVE ANY LAYERS OF GOOD TOPSOIL. SPREAD 3"-4" OF ORGANICS (HIGH-LIGNIN COMPOST) OR ESES (EXPANDED SHALE/CALCINE CLAY) AMENDMENT OVER THE AREA, PRIOR TO TURNING THE SOIL. MAINTAINING A SAFE DISTANCE FROM PAVING, SIDEWALKS, AND STRUCTURES, USE BACKHOE TO TURN SOIL TO 36" DEPTH. BREAK SOIL INTO LARGE PEGS AND LOOSELY INCORPORATE THE SOIL AMENDMENT. MAINTAIN A SLOPE OF COMPACTED SOIL AT THE EDGE OF PAVING SO AS NOT TO UNDERMINE THE PAVING SUB-BASE. HAND TURNING MAY BE NECESSARY ALONG THE EDGES OF PAVING AND AT WALLS. DO NOT TILL TO A DEPTH GREATER THAN THE BOTTOM OF FOOTING. AFTER TURNING, RE-SPREAD TOPSOIL AND ADD 3"-5" OF YARD WASTE ORGANIC AMENDMENT OVER THE SURFACE AND LIGHTLY TILL TO BREAK THE SOIL INTO TEXTURE SUITABLE TO FINE GRADE.

**LEGEND**

EXISTING TREE DRIFLINE	
PLANTED TREE MATURE DRIFLINE	
EXISTING TREE CANOPY AREA	
CANOPY AREA	
TREE PROTECTION FENCE	
EXISTING SANITARY	
PROPOSED SANITARY	
EXISTING WATER	
PROPOSED WATER	
PROPOSED WATER METER	
EXISTING WATER METER	
EXISTING STORM	
PROPOSED STORM	
EXISTING GAS	
PROPOSED GAS	
EXISTING ELECTRIC	
PROPOSED ELECTRIC	
PROPOSED IRRIGATION	
SIGNIFICANT HABITAT BOUNDARY	



REVISIONS:


**EXAMPLE TREE CANOPY SITE PLAN FOR SINGLE LOT**

OFFICE LOCATED AT:  
 1000 1ST STREET, SUITE 1  
 TIGARD, OREGON 97223  
 PH: (503) 555-XXXX  
 FAX: (503) 555-XXXX  
 EMAIL: INFO@ABC\_COLLABORATIVE.COM  
 LICENSED IN OR, WA, & ID



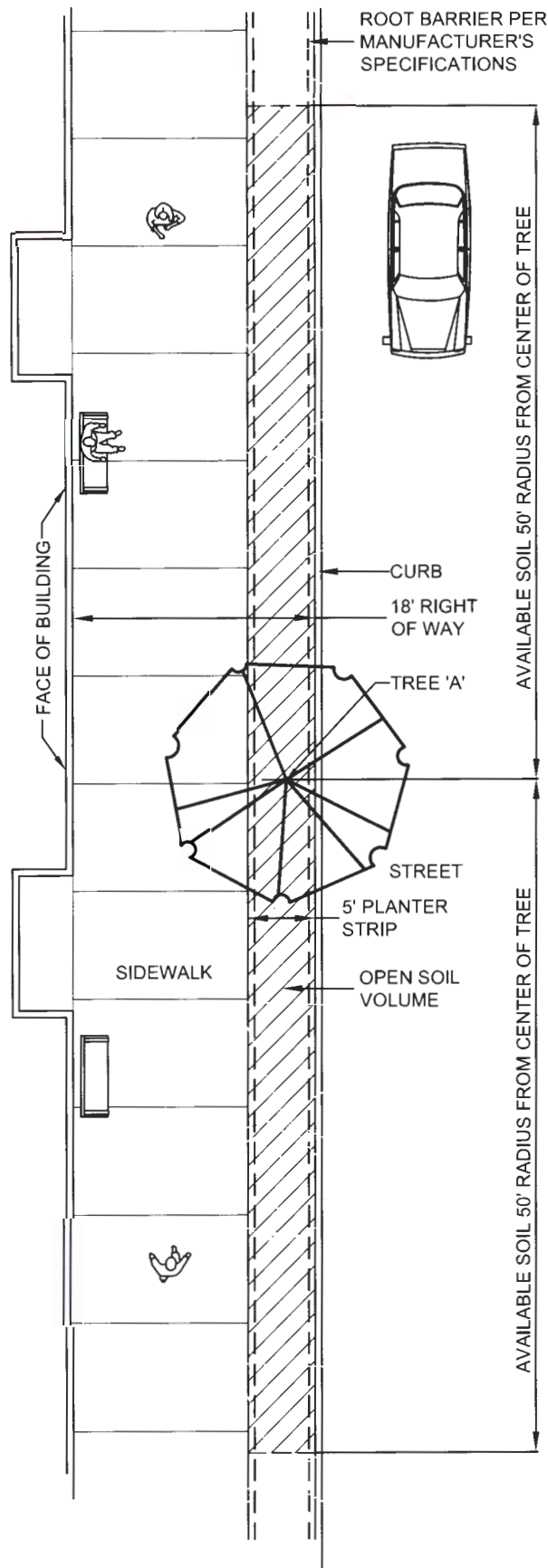
DESIGNED BY: KRJ	DRAWING NO.: 9A
DRAWN BY: BOT	SCALE: AS SHOWN
CHECKED BY: KRJ	
PREPARED FOR:	JOHN SMITH PO BOX 111 TIGARD, OREGON 97223 PH: 503-909-5555 FAX: 503-909-5556

**EVERGREEN HEIGHTS PARTITION**  
**190 SW 147TH ST.**  
 TIGARD OREGON  
 TAXLOT 1700

DATE: 07-11-2011



JOB NUMBER  
**2001**  
 SHEET  
**APPENDIX 10**



**PLAN**

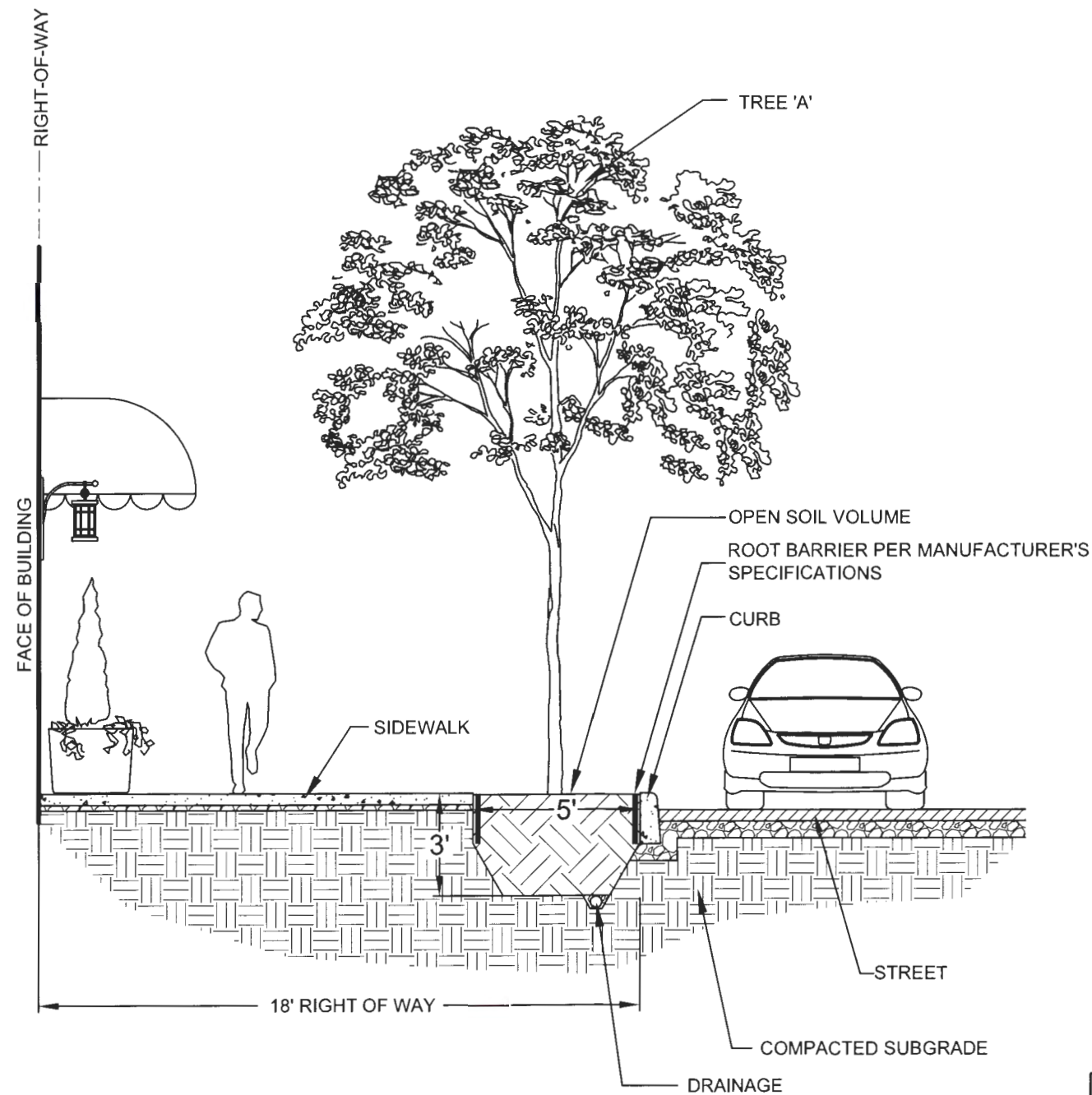
**TOTAL SOIL VOLUME CALCULATION FOR TREE 'A':**

**OPEN SOIL VOLUME = 100' x 5' x 3' = 1,500 C.F.**

**COVERED SOIL VOLUME = 0 C.F.**

**TOTAL SOIL VOLUME = 1,500 C.F.**

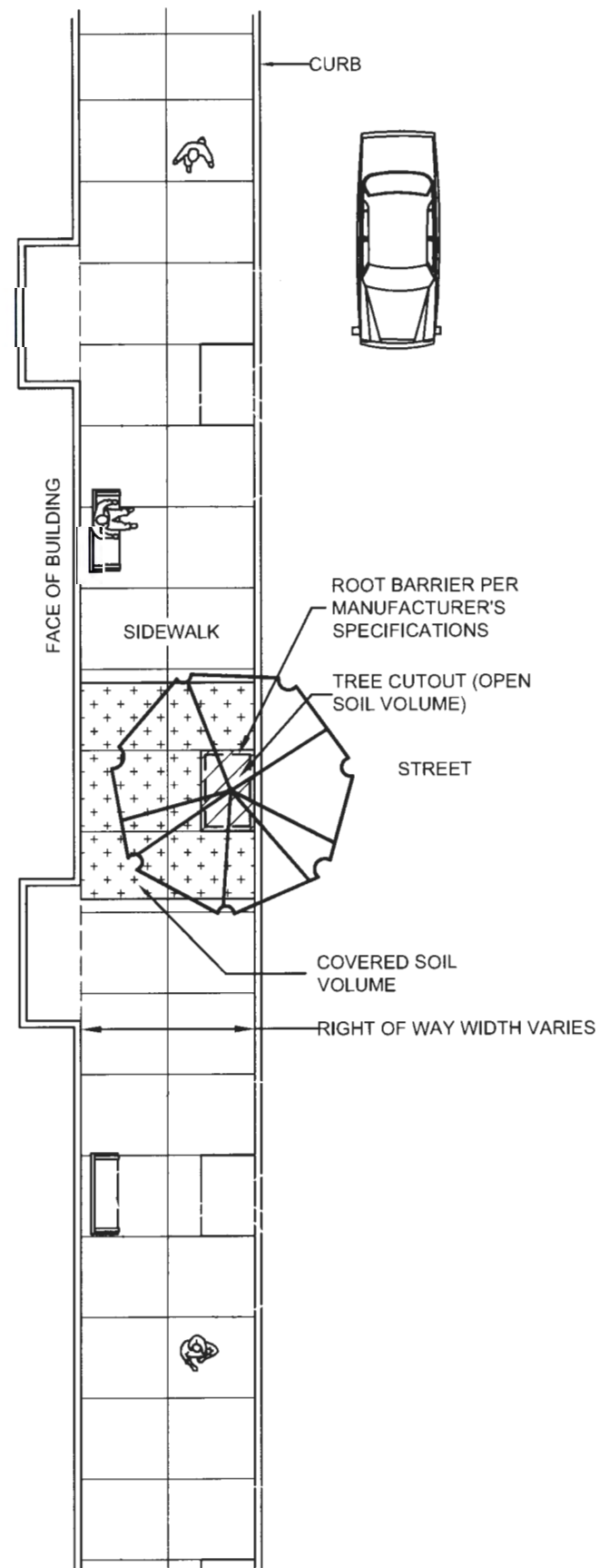
1,500 C.F. IS GREATER THAN THE SOIL VOLUME REQUIRED BY A STREET TREE IN AN 18' RIGHT OF WAY (800 C.F.) THEREFORE THIS SOIL VOLUME MEETS CITY REQUIREMENTS.



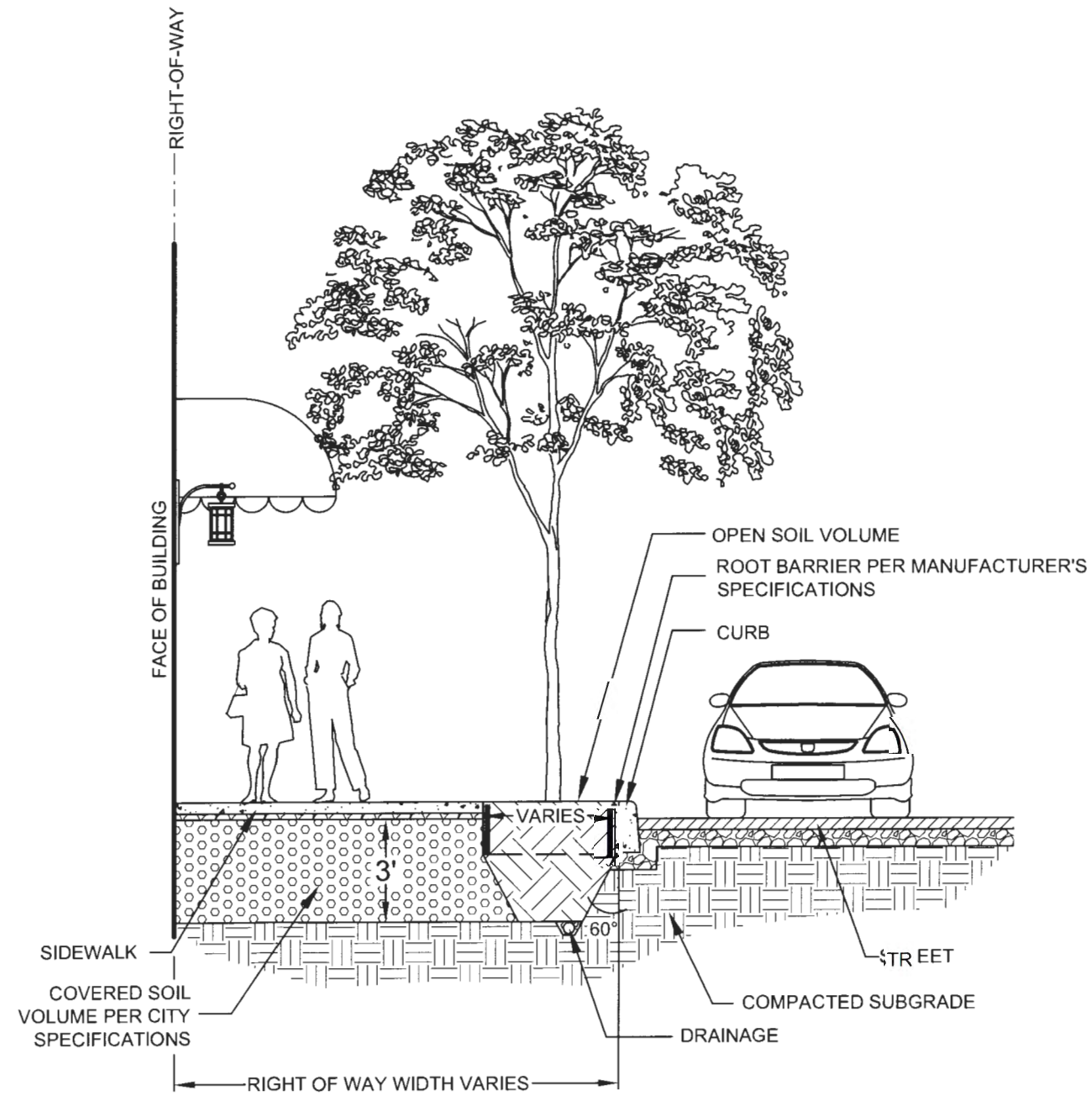
**PROFILE**

**EXAMPLE SOIL VOLUME  
CALCULATION – STREET TREE  
WITH OPEN SOIL**

NO SCALE  
DWG. NO.  
**APPENDIX 11**



**PLAN**



**PROFILE**

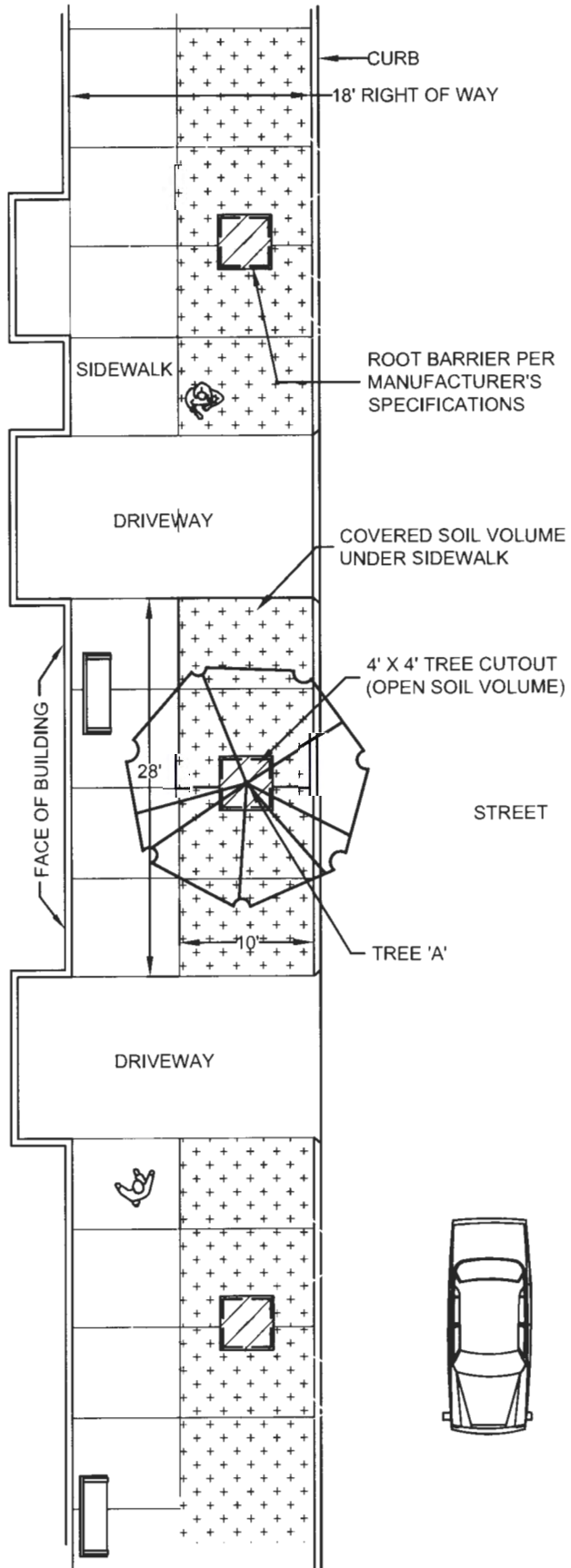
<p><b>EXAMPLE: COVERED SOIL VOLUME: PLAN DRAWING – UNDER SIDEWALK OPTION FOR STREET TREE</b></p>	NO SCALE
	<p>DWG. NO. <b>APPENDIX 14</b></p>

**TOTAL SOIL VOLUME CALCULATION FOR TREE 'A':**

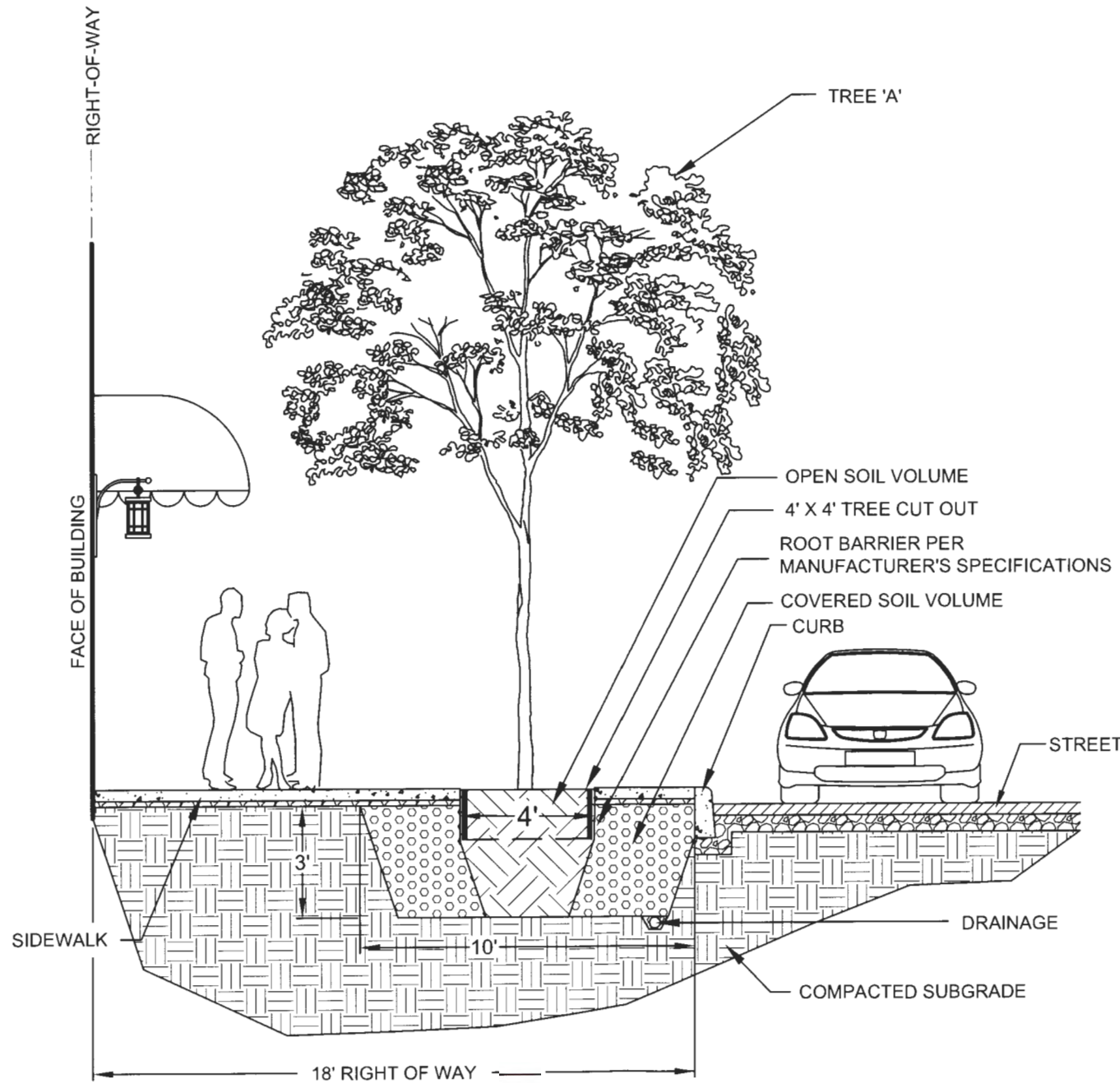
**OPEN SOIL VOLUME = 4' x 4' x 3' = 48 C.F.**  
**COVERED SOIL VOLUME = 28' x 10' x 3' - 48 C.F. = 792 C.F.**

**TOTAL SOIL VOLUME = 840 C.F.**

840 C.F. IS GREATER THAN THE SOIL VOLUME REQUIRED BY A STREET TREE IN AN 18' RIGHT OF WAY (800 C.F.) THEREFORE THIS SOIL VOLUME MEETS CITY REQUIREMENTS.



**PLAN**



**PROFILE**

<p><b>EXAMPLE SOIL VOLUME CALCULATION – STREET TREE WITH COVERED SOIL</b></p>	NO SCALE
	<p>DWG. NO. <b>APPENDIX 11</b></p>



OPEN SOIL VOLUME = (PLANTER STRIP AREA + FRONT YARD AREA CONNECTED BY THE COVERED CONTINUOUS ROOT PATH) x SOIL DEPTH

PLANTER STRIP AREA = 6 FEET X 22 FEET = 132 S. F.

AREA CONNECTED BY CONTINUOUS ROOT PATH = 4,000 S.F.

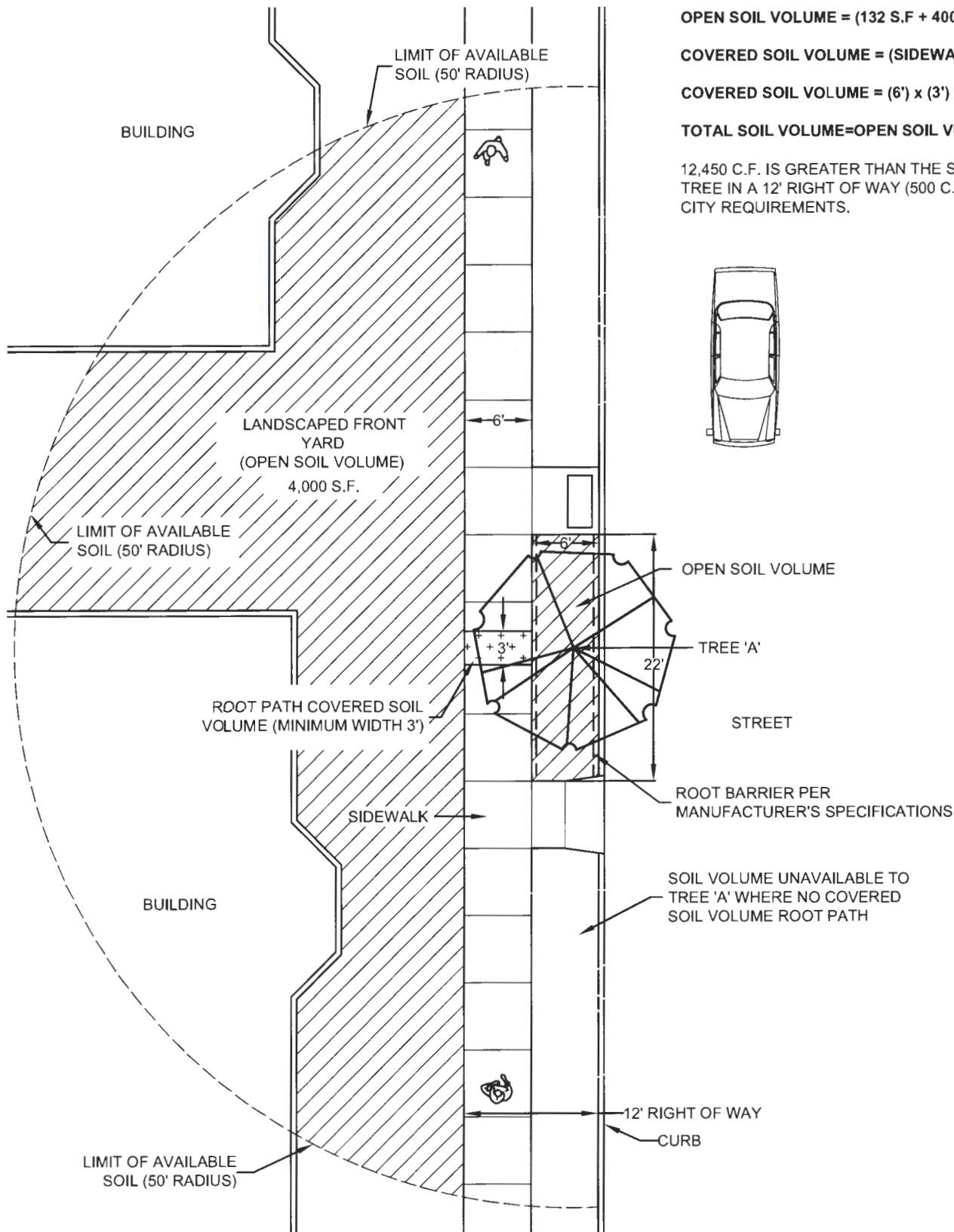
OPEN SOIL VOLUME = (132 S.F. + 4000 S.F.) x 3' = 12,396 C.F.

COVERED SOIL VOLUME = (SIDEWALK WIDTH) x (SIDEWALK LENGTH) x (STRUCTURAL SOIL DEPTH)

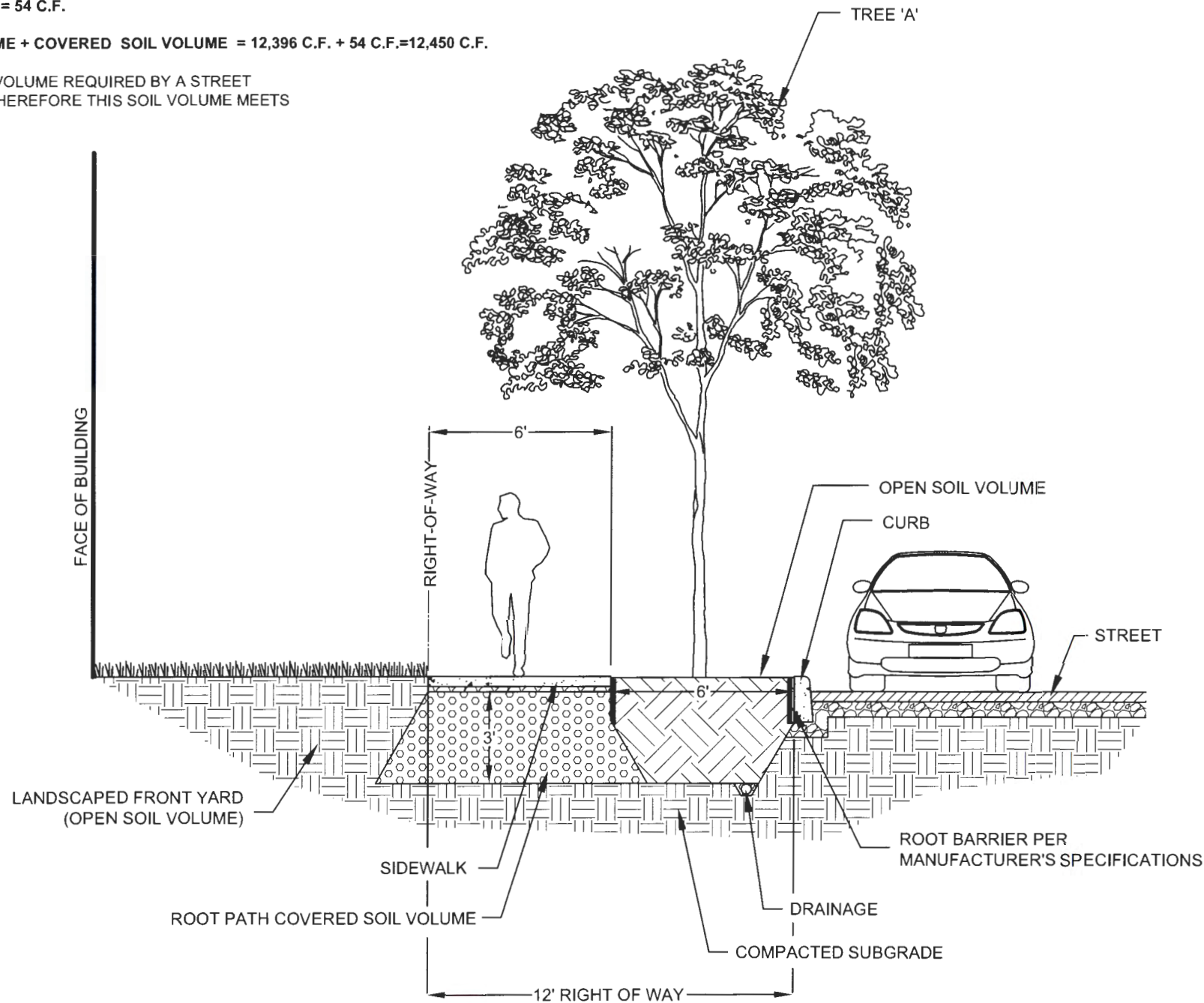
COVERED SOIL VOLUME = (6') x (3') x (3') = 54 C.F.

TOTAL SOIL VOLUME = OPEN SOIL VOLUME + COVERED SOIL VOLUME = 12,396 C.F. + 54 C.F. = 12,450 C.F.

12,450 C.F. IS GREATER THAN THE SOIL VOLUME REQUIRED BY A STREET TREE IN A 12' RIGHT OF WAY (500 C.F.) THEREFORE THIS SOIL VOLUME MEETS CITY REQUIREMENTS.



**PLAN**



**PROFILE**

<p><b>EXAMPLE SOIL VOLUME CALCULATION – STREET TREE WITH ROOT PATH</b></p>	NO SCALE
	<p>DWG. NO. <b>APPENDIX 11</b></p>

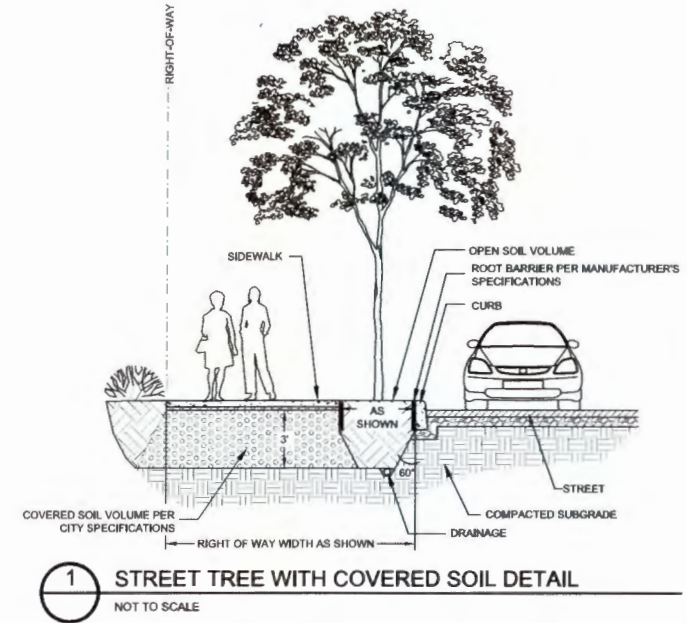
**STREET TREE LEGEND**

SYMBOL	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	CONDITION	SPACING
	11	ACER RUBRUM	RED MAPLE	3" CAL.	B&B	AS SHOWN

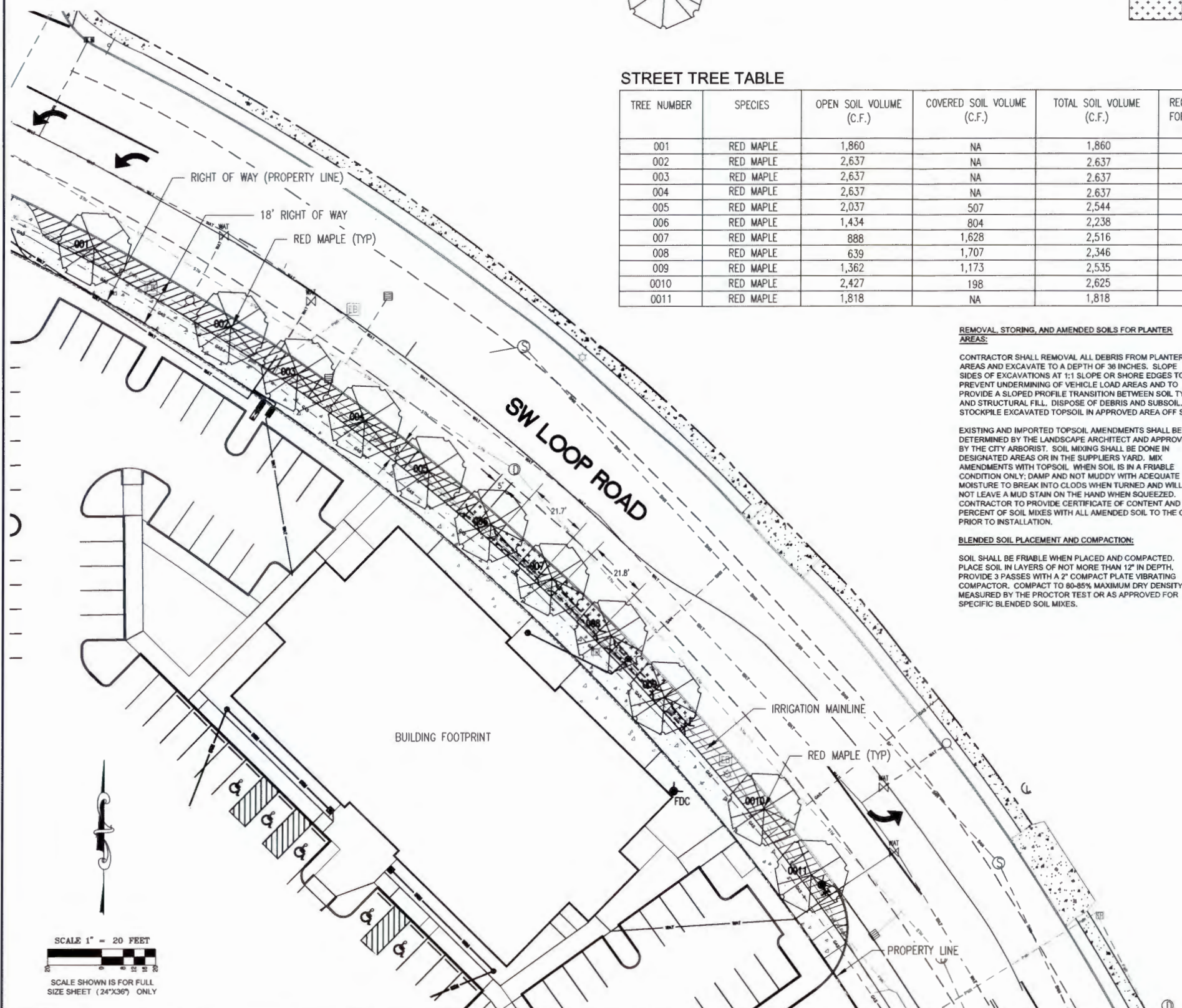


**STREET TREE TABLE**

TREE NUMBER	SPECIES	OPEN SOIL VOLUME (C.F.)	COVERED SOIL VOLUME (C.F.)	TOTAL SOIL VOLUME (C.F.)	REQUIRED SOIL VOLUME FOR 18' RIGHT OF WAY (C.F.)
001	RED MAPLE	1,860	NA	1,860	800
002	RED MAPLE	2,637	NA	2,637	800
003	RED MAPLE	2,637	NA	2,637	800
004	RED MAPLE	2,637	NA	2,637	800
005	RED MAPLE	2,037	507	2,544	800
006	RED MAPLE	1,434	804	2,238	800
007	RED MAPLE	888	1,628	2,516	800
008	RED MAPLE	639	1,707	2,346	800
009	RED MAPLE	1,362	1,173	2,535	800
0010	RED MAPLE	2,427	198	2,625	800
0011	RED MAPLE	1,818	NA	1,818	800



**1 STREET TREE WITH COVERED SOIL DETAIL**  
NOT TO SCALE



**REMOVAL, STORING, AND AMENDED SOILS FOR PLANTER AREAS:**

CONTRACTOR SHALL REMOVE ALL DEBRIS FROM PLANTER AREAS AND EXCAVATE TO A DEPTH OF 36 INCHES. SLOPE SIDES OF EXCAVATIONS AT 1:1 SLOPE OR SHORE EDGES TO PREVENT UNDERMINING OF VEHICLE LOAD AREAS AND TO PROVIDE A SLOPED PROFILE TRANSITION BETWEEN SOIL TYPES AND STRUCTURAL FILL. DISPOSE OF DEBRIS AND SUBSOIL STOCKPILE EXCAVATED TOPSOIL IN APPROVED AREA OFF SITE.

EXISTING AND IMPORTED TOPSOIL AMENDMENTS SHALL BE DETERMINED BY THE LANDSCAPE ARCHITECT AND APPROVED BY THE CITY ARBORIST. SOIL MIXING SHALL BE DONE IN DESIGNATED AREAS OR IN THE SUPPLIER'S YARD. MIX AMENDMENTS WITH TOPSOIL. WHEN SOIL IS IN A FRIBBLE CONDITION ONLY; DAMP AND NOT MUDDY WITH ADEQUATE MOISTURE TO BREAK INTO CLODS WHEN TURNED AND WILL NOT LEAVE A MUD STAIN ON THE HAND WHEN SQUEEZED. CONTRACTOR TO PROVIDE CERTIFICATE OF CONTENT AND PERCENT OF SOIL MIXES WITH ALL AMENDED SOIL TO THE CITY PRIOR TO INSTALLATION.

**BLENDED SOIL PLACEMENT AND COMPACTION:**

SOIL SHALL BE FRIBBLE WHEN PLACED AND COMPACTED. PLACE SOIL IN LAYERS OF NOT MORE THAN 12" IN DEPTH. PROVIDE 3 PASSES WITH A 2" COMPACT PLATE VIBRATING COMPACTOR. COMPACT TO 80-85% MAXIMUM DRY DENSITY AS MEASURED BY THE PROCTOR TEST OR AS APPROVED FOR SPECIFIC BLENDED SOIL MIXES.

**STANDARD COVERED SOIL VOLUME SPECIFICATIONS:**

**PART 1. COVERED SOIL MATERIALS**

- A. COVERED SOIL SHALL CONSIST OF THE FOLLOWING MIXTURE OF GRAVEL, SOIL AND ADMIXTURES:
  - I. CRUSHED ROCK, GRADATION OF 100% PASSING 1.25 INCH, MAX. 30% PASSING 0.75 INCH;
  - II. LOAM/Organic TOPSOIL;
  - III. SOIL BINDER SUCH AS, STABILIZER, ; AND
  - IV. WATER.

**PART 2. PROPORTIONS OF COVERED SOIL MATERIALS**

A. THE PROPORTIONS OF COVERED SOIL MATERIALS SHALL BE AS FOLLOWS:

MATERIAL	AMOUNT FOR 1 CY OF COVERED SOIL	AMOUNT FOR 4.6 CY OF COVERED SOIL
CRUSHED ROCK	23.2 CUBIC FEET	4 CUBIC YARDS
TOPSOIL	5.9 CUBIC FEET	1 CUBIC YARD
SOIL BINDER	13.7 OZ	4 LBS
WATER	1.6 GALLON	46 GALLONS

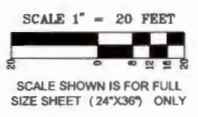
B. THE TARGET MOISTURE CONTENT IS 20% BY WEIGHT OF THE TOPSOIL WEIGHT. THE ABOVE WATER CONTENTS ASSUME THE TOP IS DRY. THE AMOUNT OF WATER THAT WILL NEED TO BE ADDED WILL BE DEPENDENT ON THE MOISTURE CONTENT OF THE RAW MATERIALS. ACTUAL AMOUNTS OF WATER USED SHALL BE DETERMINED DURING MIXING.

**PART 3. COVERED SOIL MIXING PROCEDURES**

- A. MIX COVERED SOIL IN BATCHES OF AN APPROPRIATE SIZE FOR THE EQUIPMENT BEING USED. THE END RESULT IS TO BE A MATERIAL THAT IS UNIFORMLY BLENDED TOGETHER. DO NOT BATCH IN QUANTITIES THAT WILL NOT ALLOW THE EQUIPMENT TO COMPLETELY MIX THE MATERIAL. DETERMINE BATCH SIZE AND QUANTITIES OF EACH MATERIAL NEEDED FOR THE BATCH.
- B. START WITH HALF OF THE CRUSHED ROCK MATERIAL.
- C. ADD ALL OF THE TOPSOIL MATERIAL.
- D. ADD THE SOIL BINDER.
- E. ADD HALF OF THE ESTIMATED WATER.
- F. ADD THE OTHER HALF OF THE CRUSHED ROCK MATERIAL.
- G. MIX THE MATERIAL TOGETHER.
- H. SLOWLY ADD WATER TO THE MIXTURE AND CONTINUE TO MIX. THE FINAL AMOUNT OF WATER WILL VARY WITH MOISTURE CONTENT OF THE CRUSHED ROCK AND TOPSOIL. ADD WATER IN INCREMENTAL AMOUNTS AND MIX THE MATERIAL BETWEEN THE ADDITIONS OF WATER.
- I. STOP ADDING WATER AND MIXING WHEN THERE IS A MINUTE AMOUNT OF FREE TOPSOIL REMAINING. THE TOPSOIL WILL COAT THE CRUSHED ROCK AND NOT FALL OUT OF THE MATERIAL. ALL OF THE CRUSHED ROCK SHALL BE UNIFORMLY COATED WITH TOPSOIL. THERE SHALL BE NO CLUMPS OF TOPSOIL OR UNCOVERED CRUSHED ROCK IN THE MIXTURE.
- J. IF TOO MUCH WATER IS ADDED TO THE MIXTURE, WATER WILL DRAIN OUT OF THE MATERIAL AND THE TOPSOIL WILL WASH OFF OF THE CRUSHED ROCK. IF THIS OCCURS THE BATCH OF MATERIAL SHALL BE DISCARDED AND SHALL NOT BE INCORPORATED INTO THE COMPLETED WORK.

**PART 4. PLACEMENT OF COVERED SOIL**

- A. PROTECT SOILS AND MIXES FROM ABSORBING EXCESS WATER AND FROM EROSION AT ALL TIMES. DO NOT STORE MATERIALS UNPROTECTED FROM RAINFALL EVENTS. DO NOT ALLOW EXCESS WATER TO ENTER SITE PRIOR TO COMPACTION. IF WATER IS INTRODUCED INTO THE MATERIAL AFTER GRADING, ALLOW MATERIAL TO DRAIN OR AERATE TO OPTIMUM COMPACTION MOISTURE CONTENT.
- B. ALL AREAS TO RECEIVE COVERED SOIL MIXTURE SHALL BE INSPECTED BY THE PROJECT LANDSCAPE ARCHITECT AND/OR PROJECT ENGINEER BEFORE STARTING PLACEMENT OF MIXTURE. ALL DEFECTS SUCH AS INCORRECT GRADING, COMPACTION AND INADEQUATE DRAINAGE, ETC., SHALL BE CORRECTED PRIOR TO BEGINNING PLACEMENT OF COVERED SOIL.
- C. CONFIRM THAT THE SUB-GRADE IS AT THE PROPER ELEVATION AND COMPACTED AS REQUIRED. SUB-GRADE ELEVATIONS SHALL SLOPE PARALLEL TO THE FINISHED GRADE. CLEAR THE EXCAVATION OF ALL CONSTRUCTION DEBRIS, TRASH, RUBBLE AND FOREIGN MATERIAL. FILL ANY OVER EXCAVATION WITH APPROVED FILL AND COMPACT TO THE REQUIRED SUB-GRADE COMPACTION.
- D. INSTALL COVERED SOIL IN 6-INCH LIFTS AND SPREAD UNIFORMLY OVER THE AREA. COMPACT EACH LIFT TO THE REQUIRED PERCENT OF MAXIMUM DENSITY. DELAY PLACEMENT 24 HOURS IF MOISTURE CONTENT EXCEEDS MAXIMUM ALLOWABLE. PROTECT COVERED SOIL WITH PLASTIC OR PLYWOOD DURING DELAY. TAKE PARTICULAR CARE NOT TO DAMAGE UTILITIES WHEN INSTALLING COVERED SOIL. COVERED SOIL THAT WILL BE THE BEDDING FOR UTILITY LINES SHALL BE COMPACTED TO CONFORM TO THE REQUIRED GRADE OF THE UTILITY LINE. DO NOT COMPACT THE IMMEDIATE VICINITY ABOVE A UTILITY LINE UNTIL A FILL DEPTH OF AT LEAST 12-INCHES ABOVE THE UTILITY LINE IS REACHED.
- E. BRING COVERED SOILS TO FINISHED GRADES AS SHOWN IN THE APPROVED DRAWINGS. IMMEDIATELY PROTECT THE COVERED SOIL MATERIAL FROM CONTAMINATION BY WATER BY COVERING WITH PLASTIC OR PLYWOOD.



REVISIONS:


**EXAMPLE SOIL VOLUME PLAN**

OFFICE LOCATED AT:  
1000 1ST STREET, SUITE 1  
TIGARD, OREGON 97223  
PH: (503) 555-XXXX  
FAX: (503) 555-XXXX  
EMAIL: INFO@ABC-COLLABORATIVE.COM  
LICENSED IN OR, WA, & ID



DESIGNED BY: JMI  
DRAWING NO.: 2A.DWG  
SCALE: AS NOTED  
PREPARED FOR: HANCOCK ASSOCIATES  
1500 SW LOOP ROAD  
TIGARD, OR 97223

**LOOP ROAD IMPROVEMENTS**  
**1011 SW LOOP ROAD**  
TIGARD  
TAX LOT 1000

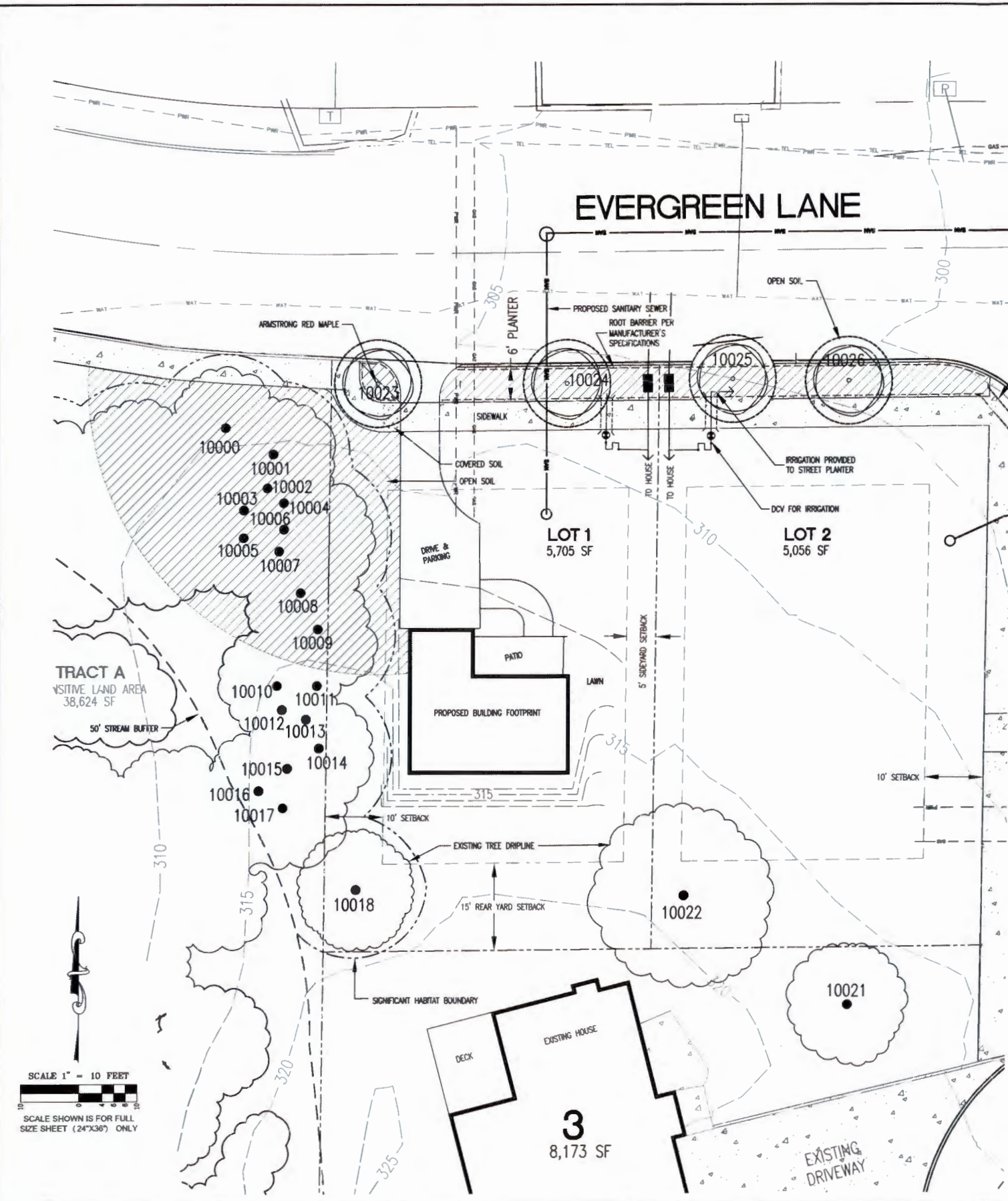
DATE: 07-11-2011

REGISTERED  
JOHN H. DOE  
OREGON  
LANDSCAPE ARCHITECT

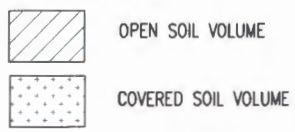
JOB NUMBER  
1000

SHEET  
APPENDIX 12

OREGON  
TAX MAP: 25 1 09AB



**SOIL LEGEND**

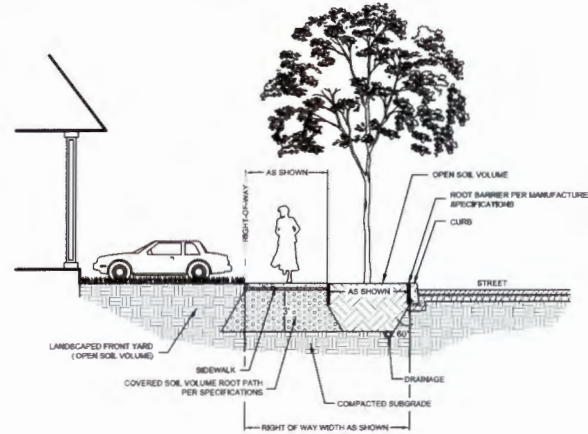


**SOIL VOLUME CALCULATION FOR STREET TREES ADJACENT TO LOT 1**

TREE NUMBER	SPECIES	OPEN SOIL VOLUME (C.F.)	COVERED SOIL VOLUME (C.F.)	TOTAL SOIL VOLUME (C.F.)	REQUIRED SOIL VOLME FOR 11' RIGHT OF WAY (C.F.)
10023	ARMSTRONG MAPLE	6,453	45	6,498	500
10024	ARMSTRONG MAPLE	OVER 1,000	0	OVER 1,000	500

**STREET TREE LEGEND**

SYMBOL	BOTANICAL NAME	COMMON NAME	CONDITION	SIZE	SPACING
	ACER RUBRUM 'ARMSTRONG'	ARMSTRONG MAPLE	B&B	2" CAL.	AS SHOWN



**1 STREET TREE WITH COVERED SOIL DETAIL**  
NOT TO SCALE

**ROOT PROTECTION ZONE NOTES**  
ENCROACHMENT INTO THE ROOT PROTECTION ZONE IS ALLOWED WITH PROJECT ARBORIST APPROVAL AS DESCRIBED IN THE FOLLOWING NOTES:

- EXCAVATION IN THE TOP 24" OF THE SOIL IN THE CRITICAL ROOT ZONE AREA SHOULD BEGIN AT THE EXCAVATION LINE THAT IS CLOSEST TO THE TREE.
- THE EXCAVATION SHOULD BE DONE BY HAND/SHOVEL OR WITH A BACKHOE AND A MAN WITH A SHOVEL, PRUNING SHEARS, AND A PRUNING SAW.
- IF DONE BY HAND, ALL ROOTS 1" OR LARGER SHOULD BE PRUNED AT THE EXCAVATION LINE.
- IF DONE WITH A BACKHOE (MOST LIKELY SCENARIO), THEN THE OPERATOR SHALL START THE CUT AT THE EXCAVATION LINE AND CAREFULLY "FEEL" FOR ROOTS/RESISTANCE. WHEN THERE IS RESISTANCE, THE MAN WITH THE SHOVEL HAND DIGS AROUND THE ROOTS AND PRUNES THE ROOTS LARGER THAN 1" DIAMETER.

**IRRIGATION:**  
IRRIGATION TO BE 'DESIGN-BUILD' BY THE LANDSCAPE CONTRACTOR. PROVIDE PLANS TO THE CITY FOR APPROVAL PRIOR TO BEGINNING INSTALLATION.

**REMOVAL, STORING, AND AMENDED SOILS FOR PLANTER AREAS:**  
CONTRACTOR SHALL REMOVAL ALL DEBRIS FROM PLANTER AREAS AND EXCAVATE TO A DEPTH OF 36 INCHES. SLOPE SIDES OF EXCAVATIONS AT 1:1 SLOPE OR SHORE EDGES TO PREVENT UNDERMINING OF VEHICLE LOAD AREAS AND TO PROVIDE A SLOPED PROFILE TRANSITION BETWEEN SOIL TYPES AND STRUCTURAL FILL. DISPOSE OF DEBRIS AND SUBSOIL STOCKPILE EXCAVATED TOPSOIL IN APPROVED AREA OFF SITE.

EXISTING AND IMPORTED TOPSOIL AMENDMENTS SHALL BE DETERMINED BY THE LANDSCAPE ARCHITECT AND APPROVED BY THE CITY ARBORIST. SOIL MIXING SHALL BE DONE IN DESIGNATED AREAS OR IN THE SUPPLIERS YARD. MIX AMENDMENTS WITH TOPSOIL WHEN SOIL IS IN A FRIABLE CONDITION ONLY (DAMP AND NOT MUDDY WITH ADEQUATE MOISTURE TO BREAK INTO CLOUDS WHEN TURNED AND WILL NOT LEAVE A MUD STAIN ON THE HAND WHEN SQUEEZED). CONTRACTOR TO PROVIDE CERTIFICATE OF CONTENT AND PERCENT OF SOIL MIXES WITH ALL AMENDED SOIL TO THE CITY PRIOR TO INSTALLATION.

**BLENDED SOIL PLACEMENT AND COMPACTION:**  
SOIL SHALL BE FRIABLE WHEN PLACED AND COMPACTION. PLACE SOIL IN LAYERS OF NOT MORE THAN 12" IN DEPTH. PROVIDE 3 PASSES WITH A 2" COMPACT PLATE VIBRATING COMPACTOR. COMPACT TO 80-85% MAXIMUM DRY DENSITY AS MEASURED BY THE PROCTOR TEST OR AS APPROVED FOR SPECIFIC BLENDED SOIL MIXES.

**STANDARD COVERED SOIL VOLUME SPECIFICATIONS:**

- PART 1. COVERED SOIL MATERIALS**
- A. COVERED SOIL SHALL CONSIST OF THE FOLLOWING MIXTURE OF GRAVEL, SOIL AND ADMIXTURES:
- CRUSHED ROCK, GRADATION OF 100% PASSING 1.25 INCH, MAX. 30% PASSING 0.75 INCH;
  - LOAM/ORGANIC TOPSOIL;
  - SOIL BINDER SUCH AS, STABILIZER, ; AND
  - WATER.

**PART 2. PROPORTIONS OF COVERED SOIL MATERIALS**

A. THE PROPORTIONS OF COVERED SOIL MATERIALS SHALL BE AS FOLLOWS:

MATERIAL	AMOUNT FOR 1 CY OF COVERED SOIL	AMOUNT FOR 4 CY OF COVERED SOIL
CRUSHED ROCK	23.2 CUBIC FEET	4 CUBIC YARDS
TOPSOIL	5.9 CUBIC FEET	1 CUBIC YARD
SOIL BINDER	13.7 OZ	4 LBS
WATER	1.6 GALLON	46 GALLONS

B. THE TARGET MOISTURE CONTENT IS 20% BY WEIGHT OF THE TOPSOIL WEIGHT. THE ABOVE WATER CONTENTS ASSUME THE TOP IS DRY. THE AMOUNT OF WATER THAT WILL NEED TO BE ADDED WILL BE DEPENDENT ON THE MOISTURE CONTENT OF THE RAW MATERIALS. ACTUAL AMOUNTS OF WATER USED SHALL BE DETERMINED DURING MIXING.

**PART 3. COVERED SOIL MIXING PROCEDURES**

- MIX COVERED SOIL IN BATCHES OF AN APPROPRIATE SIZE FOR THE EQUIPMENT BEING USED. THE END RESULT IS TO BE A MATERIAL THAT IS UNIFORMLY BLENDED TOGETHER. DO NOT BATCH IN QUANTITIES THAT WILL NOT ALLOW THE EQUIPMENT TO COMPLETELY MIX THE MATERIAL. DETERMINE BATCH SIZE AND QUANTITIES OF EACH MATERIAL NEEDED FOR THE BATCH.
- START WITH HALF OF THE CRUSHED ROCK MATERIAL.
- ADD ALL OF THE TOPSOIL MATERIAL.
- ADD THE SOIL BINDER.
- ADD HALF OF THE ESTIMATED WATER.
- ADD THE OTHER HALF OF THE CRUSHED ROCK MATERIAL.
- MIX THE MATERIAL TOGETHER.
- SLOWLY ADD WATER TO THE MIXTURE AND CONTINUE TO MIX. THE FINAL AMOUNT OF WATER WILL VARY WITH MOISTURE CONTENT OF THE CRUSHED ROCK AND TOPSOIL. ADD WATER IN INCREMENTAL AMOUNTS AND MIX THE MATERIAL BETWEEN THE ADDITIONS OF WATER.
- STOP ADDING WATER AND MIXING WHEN THERE IS A MINUTE AMOUNT OF FREE TOPSOIL REMAINING. THE TOPSOIL WILL COAT THE CRUSHED ROCK AND NOT FALL OUT OF THE MATERIAL. ALL OF THE CRUSHED ROCK SHALL BE UNIFORMLY COATED WITH TOPSOIL. THERE SHALL BE NO CLUMPS OF TOPSOIL OR UNCOVERED CRUSHED ROCK IN THE MIXTURE.
- IF TOO MUCH WATER IS ADDED TO THE MIXTURE, WATER WILL DRAIN OUT OF THE MATERIAL AND THE TOPSOIL WILL WASH OFF OF THE CRUSHED ROCK. IF THIS OCCURS THE BATCH OF MATERIAL SHALL BE DISCARDED AND SHALL NOT BE INCORPORATED INTO THE COMPLETED WORK.

**PART 4. PLACEMENT OF COVERED SOIL**

- PROTECT SOILS AND MIXES FROM ABSORBING EXCESS WATER AND FROM EROSION AT ALL TIMES. DO NOT STORE MATERIALS UNPROTECTED FROM RAINFALL EVENTS. DO NOT ALLOW EXCESS WATER TO ENTER SITE PRIOR TO COMPACTION. IF WATER IS INTRODUCED INTO THE MATERIAL AFTER GRADING, ALLOW MATERIAL TO DRAIN OR AERATE TO OPTIMUM COMPACTION MOISTURE CONTENT.
- ALL AREAS TO RECEIVE COVERED SOIL MIXTURE SHALL BE INSPECTED BY THE PROJECT LANDSCAPE ARCHITECT/AND/OR PROJECT ENGINEER BEFORE STARTING PLACEMENT OF MIXTURE. ALL DEFECTS SUCH AS INCORRECT GRADING, COMPACTION AND INADEQUATE DRAINAGE, ETC., SHALL BE CORRECTED PRIOR TO BEGINNING PLACEMENT OF COVERED SOIL.
- CONFIRM THAT THE SUB-GRADE IS AT THE PROPER ELEVATION AND COMPACTION AS REQUIRED. SUB-GRADE ELEVATIONS SHALL SLOPE PARALLEL TO THE FINISHED GRADE. CLEAR THE EXCAVATION OF ALL CONSTRUCTION DEBRIS, TRASH, RUBBLE AND FOREIGN MATERIAL. FILL ANY OVER EXCAVATION WITH APPROVED FILL AND COMPACT TO THE REQUIRED SUB-GRADE COMPACTION.
- INSTALL COVERED SOIL IN 6-INCH LIFTS AND SPREAD UNIFORMLY OVER THE AREA. COMPACT EACH LIFT TO THE REQUIRED MAXIMUM DENSITY. DELAY PLACEMENT 24 HOURS IF MOISTURE CONTENT EXCEEDS MAXIMUM ALLOWABLE. PROTECT COVERED SOIL WITH PLASTIC OR PLYWOOD DURING DELAY. TAKE PARTICULAR CARE NOT TO DAMAGE UTILITIES WHEN INSTALLING COVERED SOIL. COVERED SOIL THAT WILL BE THE BEDDING FOR UTILITY LINES SHALL BE COMPACTION TO CONFORM TO THE REQUIRED GRADE OF THE UTILITY LINE. DO NOT COMPACT THE IMMEDIATE VICINITY ABOVE A UTILITY LINE UNTIL A FILL DEPTH OF AT LEAST 12-INCHES ABOVE THE UTILITY LINE IS REACHED.
- BRING COVERED SOILS TO FINISHED GRADES AS SHOWN IN THE APPROVED DRAWINGS. IMMEDIATELY PROTECT THE COVERED SOIL MATERIAL FROM CONTAMINATION BY WATER BY COVERING WIT PLASTIC OR PLYWOOD.

REVISIONS:


**EXAMPLE SOIL VOLUME PLAN FOR SINGLE LOT**

OFFICE LOCATED AT:  
1000 1ST STREET, SUITE 1  
TIGARD, OREGON 97223  
PH: (503) 555-XXXX  
FAX: (503) 555-XXXX  
EMAIL: INFO@ABC-COLLABORATIVE.COM  
LICENSED IN OR, WA, & ID



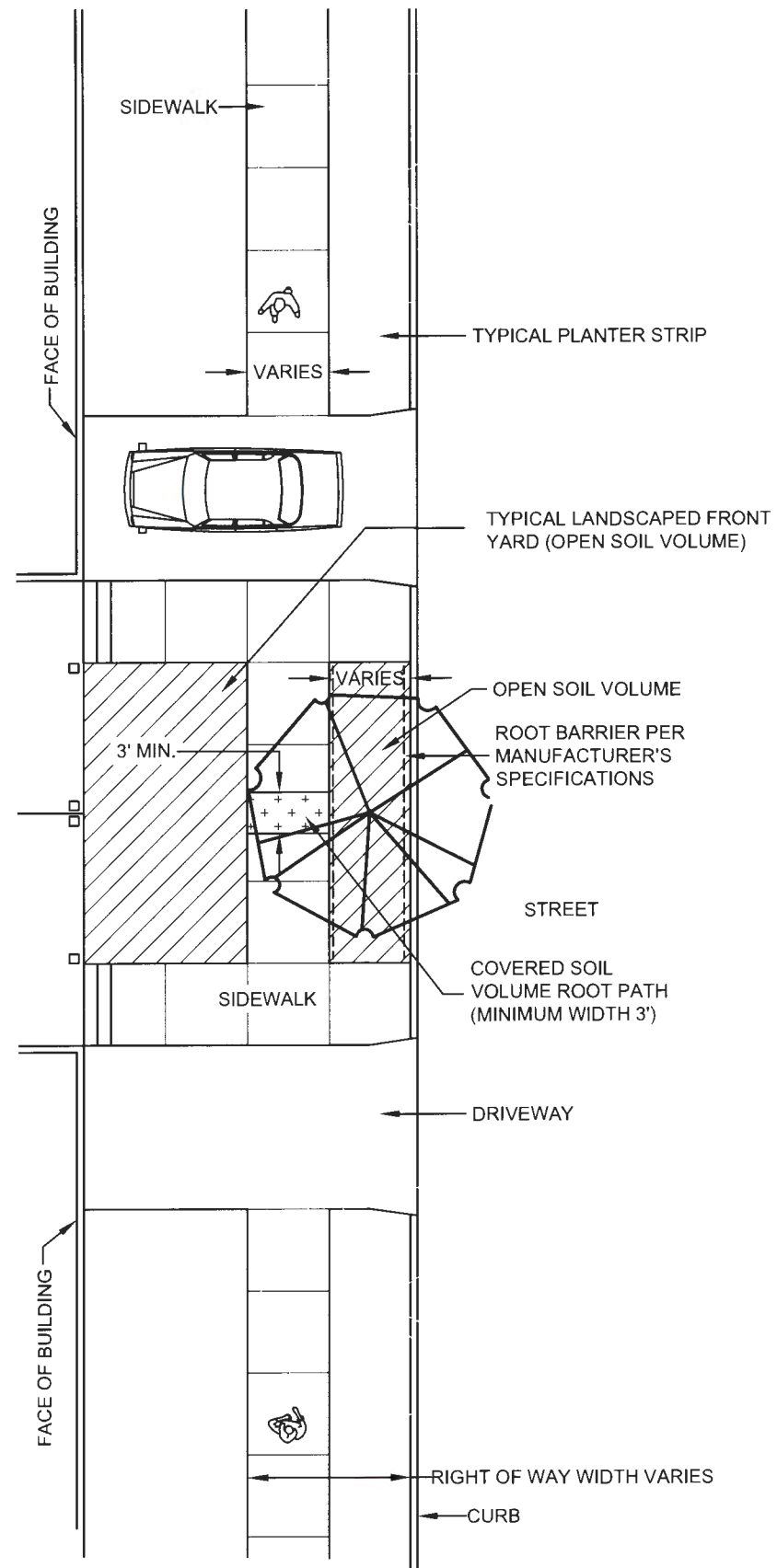
DESIGNED BY: KRJ	DRAWING NO.: BA
DRAWN BY: BDT	SCALE: AS SHOWN
CHECKED BY: KRJ	
PREPARED FOR: JOHN SMITH PO BOX 111 TIGARD, OREGON 97223 PH: 503-909-5555 FAX: 503-909-5556	

**EVERGREEN HEIGHTS PARTITION**  
190 SW 147TH ST.  
TIGARD OREGON  
TAXLOT 1700

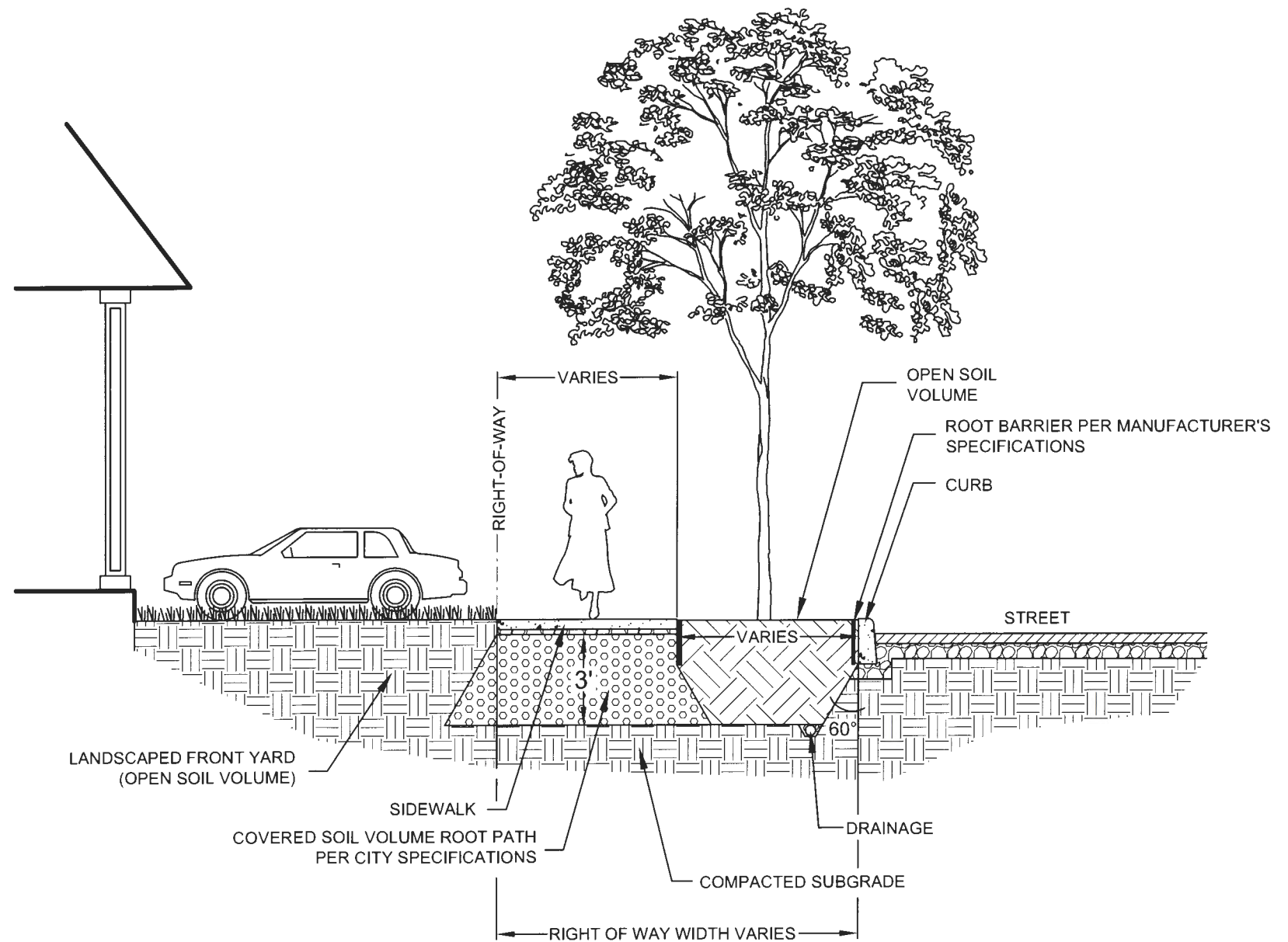
DATE: 07-11-2011

REGISTERED LANDSCAPE ARCHITECT  
JOHN H. DOE  
OREGON

JOB NUMBER 2001  
SHEET APPENDIX 13



**PLAN**



**PROFILE**

<b>EXAMPLE COVERED SOIL VOLUME PLAN DRAWING – ROOT PATH OPTION FOR STREET TREE</b>	NO SCALE
	DWG. NO.
	<b>APPENDIX 14</b>

## Example Covered Soil Volume Specifications

### Part 1. Covered Soil Materials

- A. Covered soil shall consist of the following mixture of gravel, soil and admixtures:
1. Crushed rock, gradation of 100% passing 1.25 inch, max. 30% passing 0.75 inch;
  2. Loam/Organic Topsoil;
  3. Soil binder such as “Stabilizer”; and
  4. Water.

### Part 2. Proportions of Covered Soil Materials

- A. The proportions of covered soil materials shall be as follows:

Material	Amount for 1 CY of Covered Soil	Amount for 4.6 CY of Covered Soil
Crushed Rock	23.2 cubic feet	4 cubic yards
Topsoil	5.9 cubic feet	1 cubic yard
Soil Binder	13.7 ounces	4 pounds
Water	1.6 gallon	46 gallons

- B. The target moisture content is 20% by weight of the topsoil weight. The above water contents assume the top is dry. The amount of water that will need to be added will be dependent on the moisture content of the raw materials. Actual amounts of water used shall be determined during mixing.

### Part 3. Covered Soil Mixing Procedures

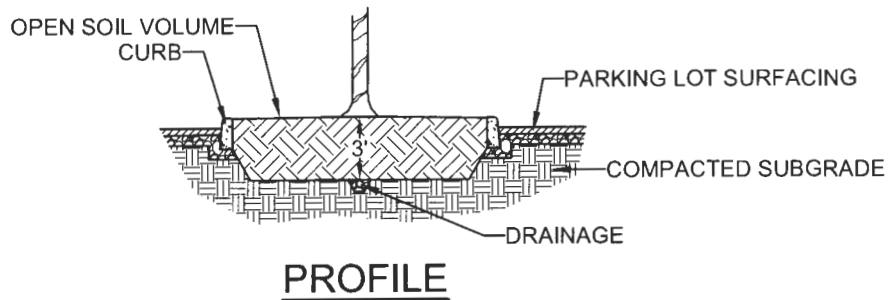
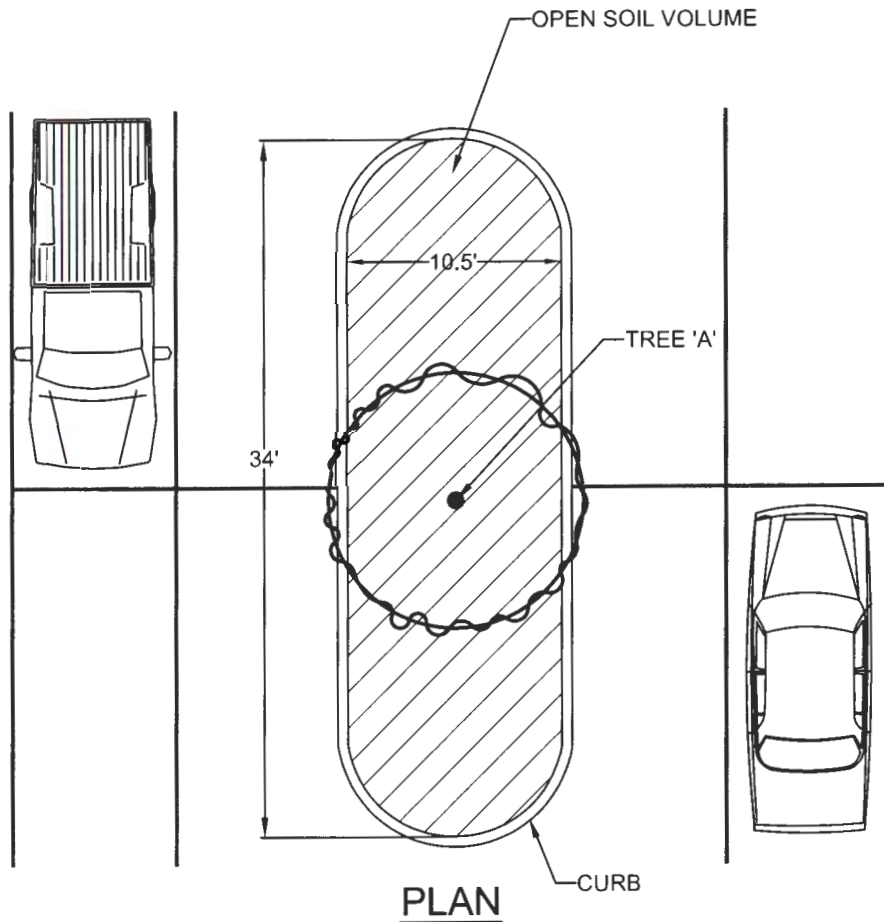
- A. Mix covered soil in batches of an appropriate size for the equipment being used. The end result is to be a material that is uniformly blended together. Do not batch in quantities that will not allow the equipment to completely mix the material. Determine batch size and quantities of each material needed for the batch.
- B. Start with half of the crushed rock material.
- C. Add all of the topsoil material.
- D. Add the soil binder.
- E. Add half of the estimated water.
- F. Add the other half of the crushed rock material.
- G. Mix the material together.
- H. Slowly add water to the mixture and continue to mix. The final amount of water will vary with moisture content of the crushed rock and topsoil. Add water in incremental amounts and mix the material between the additions of water.
- I. Stop adding water and mixing when there is a minute amount of free topsoil remaining. The topsoil will coat the crushed rock and not fall out of the material. All of the crushed rock

shall be uniformly coated with topsoil. There shall be no clumps of topsoil or uncovered crushed rock in the mixture.

- J. If too much water is added to the mixture, water will drain out of the material and the topsoil will wash off of the crushed rock. If this occurs the batch of material shall be discarded and shall not be incorporated into the completed work.

#### **Part 4. Placement of Covered Soil**

- A. Protect soils and mixes from absorbing excess water and from erosion at all times. Do not store materials unprotected from rainfall events. Do not allow excess water to enter site prior to compaction. If water is introduced into the material after grading, allow material to drain or aerate to optimum compaction moisture content.
- B. All areas to receive covered soil mixture shall be inspected by the project landscape architect and/or project engineer before starting placement of mixture. All defects such as incorrect grading, compaction and inadequate drainage, etc., shall be corrected prior to beginning placement of covered soil.
- C. Confirm that the sub-grade is at the proper elevation and compacted as required. Sub-grade elevations shall slope parallel to the finished grade. Clear the excavation of all construction debris, trash, rubble and foreign material. Fill any over excavation with approved fill and compact to the required sub-grade compaction.
- D. Install covered soil in 6-inch lifts and spread uniformly over the area. Compact each lift to the required percent of maximum density. Delay placement 24 hours if moisture content exceeds maximum allowable, protect covered soil with plastic or plywood during delay. Take particular care not to damage utilities when installing covered soil. Covered soil that will be the bedding for utility lines shall be compacted to conform to the required grade of the utility line. Do not compact the immediate vicinity above a utility line until a fill depth of at least 12-inches above the utility line is reached.
- E. Bring covered soils to finished grades as shown in the approved drawings. Immediately protect the covered soil material from contamination by water by covering with plastic or plywood.



TOTAL SOIL VOLUME CALCULATION FOR TREE 'A':

OPEN SOIL VOLUME = (ISLAND AREA) X (SOIL DEPTH) = 336 S.F.  
x 3' = 1,008 C.F.

COVERED SOIL VOLUME = 0 C.F.

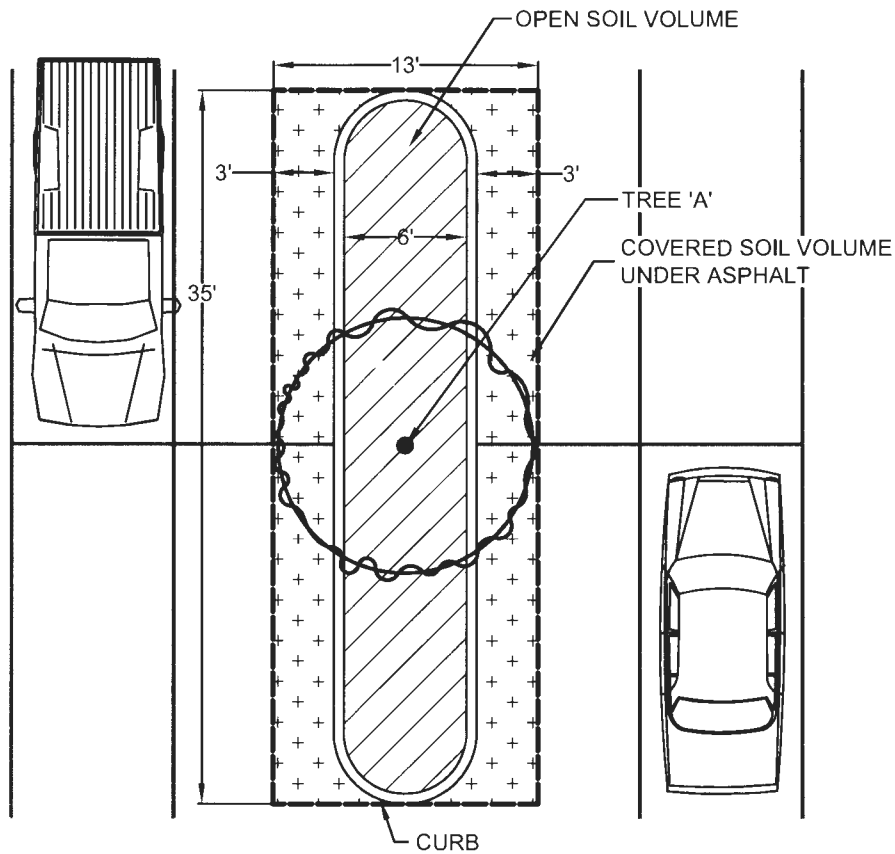
TOTAL SOIL VOLUME = OPEN SOIL VOLUME + COVERED SOIL  
VOLUME = 1,008 C.F. + 0 C.F. = 1,008 C.F.

1,008 C.F. IS GREATER THAN THE SOIL VOLUME REQUIRED FOR  
A PARKING LOT TREE (1,000 C.F.) SO THIS MEETS THE CITY  
REQUIREMENTS.

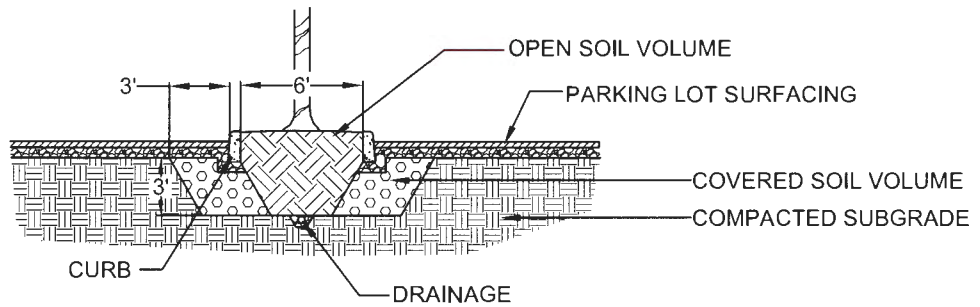
**EXAMPLE SOIL VOLUME  
CALCULATION – PARKING  
LOT TREE WITH OPEN SOIL**

NO SCALE

DWG. NO.  
**APPENDIX 15**



**PLAN**



**PROFILE**

**TOTAL SOIL VOLUME CALCULATION FOR TREE 'A':**

OPEN SOIL VOLUME = (PLANTER AREA) X (SOIL DEPTH) = 196 S.F.  
x 3' = 588 C.F.

COVERED SOIL VOLUME = 259 S.F. X 3' = 777 C.F.

TOTAL SOIL VOLUME = OPEN SOIL VOLUME + COVERED SOIL  
VOLUME = 588 C.F. + 777 C.F. = 1,365 C.F.

1,365 C.F. IS GREATER THAN THE SOIL VOLUME REQUIRED FOR A  
PARKING LOT TREE (1,000 C.F.) SO THIS MEETS THE CITY  
REQUIREMENTS.

**EXAMPLE SOIL VOLUME  
CALCULATION – PARKING LOT  
TREE WITH COVERED SOIL**

NO SCALE

DWG. NO.  
**APPENDIX 15**



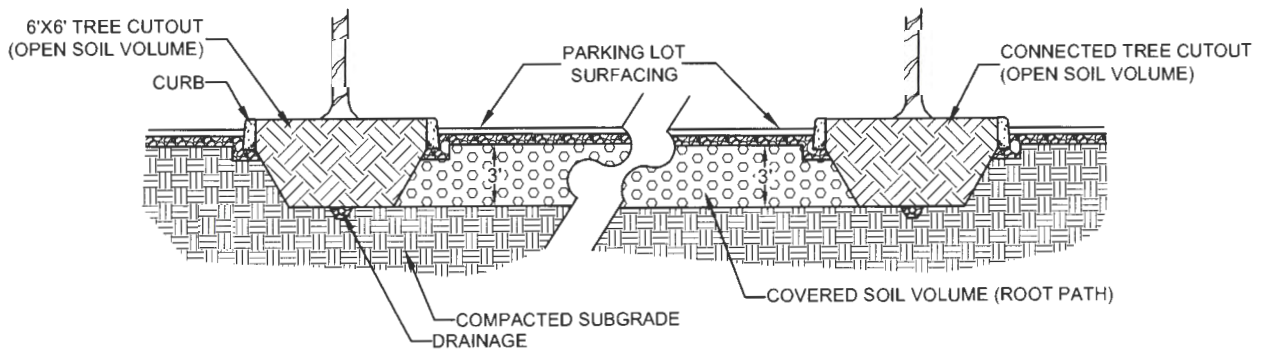
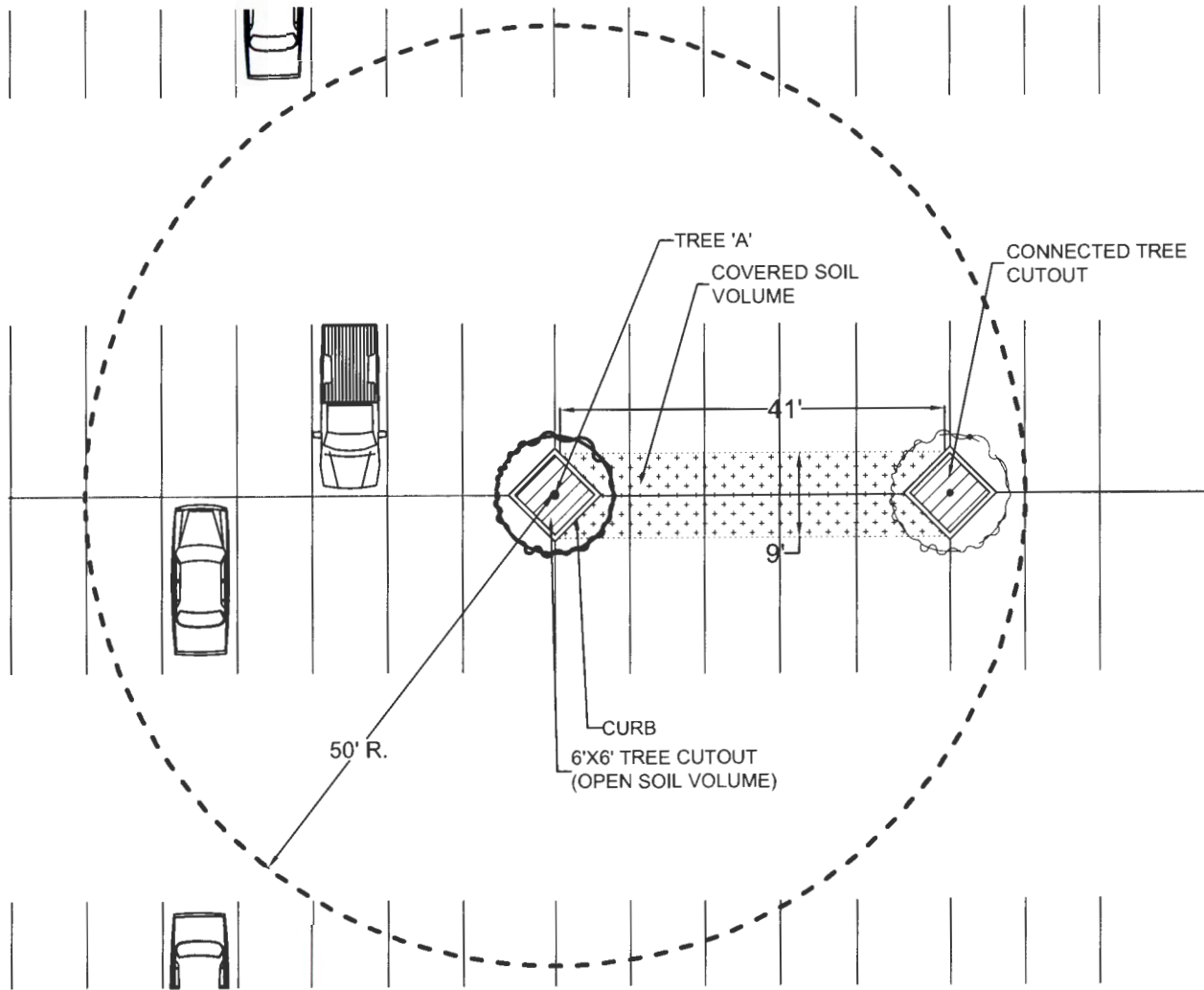
**TOTAL SOIL VOLUME CALCULATION FOR TREE 'A':**

OPEN SOIL VOLUME = 36 S.F. (TREE CUTOUT AREA)+ 36 S.F. (CONNECTED TREE CUTOUT AREA) x 3' (SOIL DEPTH) = 216 C.F.

COVERED SOIL VOLUME = 330 S.F. (COVERED SOIL AREA) X 3' (COVERED SOIL DEPTH) =990 C.F

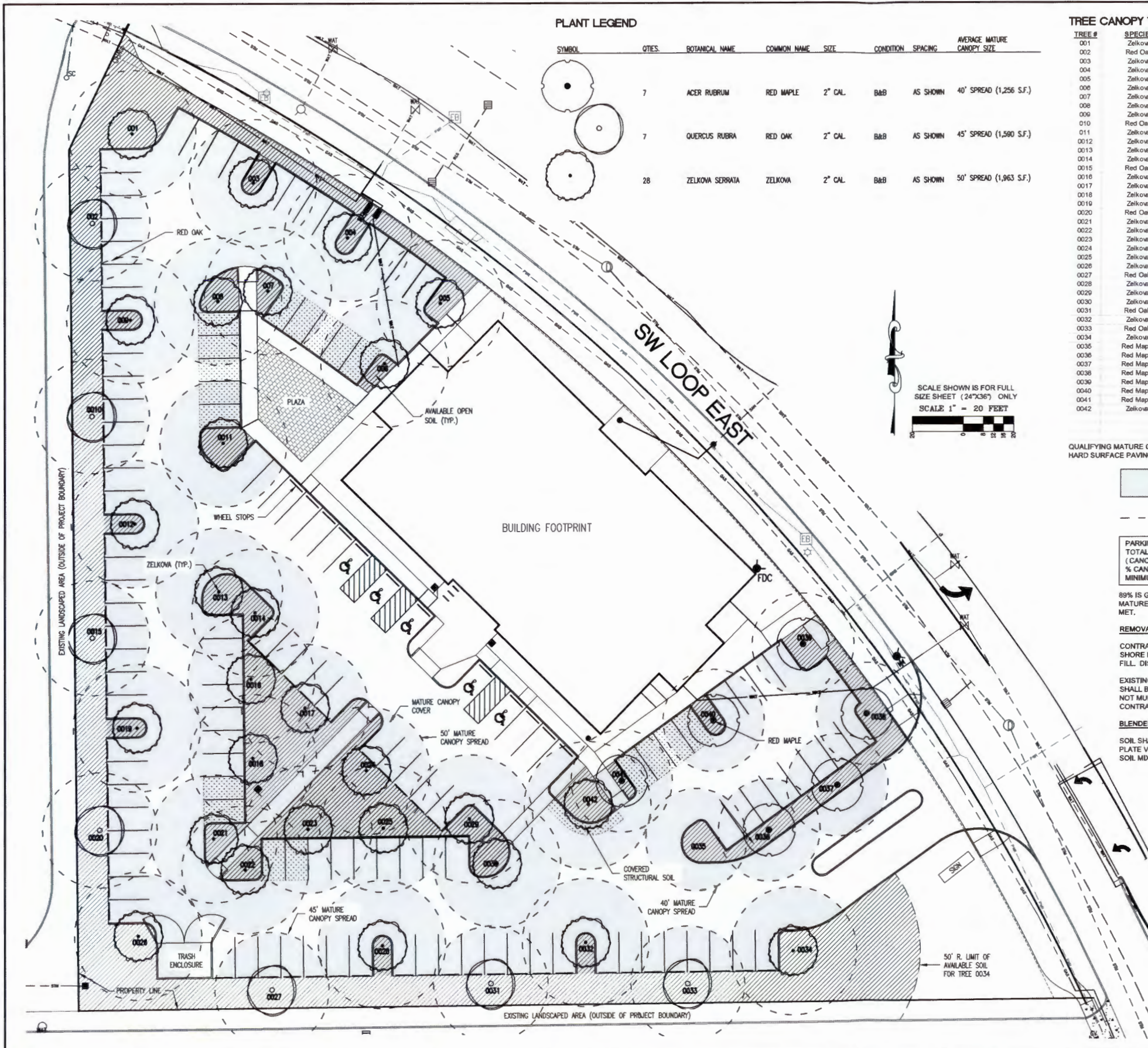
TOTAL SOIL VOLUME = OPEN SOIL VOLUME + COVERED SOIL VOLUME = 216 C.F. + 990 C.F.=1,206 C.F.

1,206 C.F. IS GREATER THAN THE SOIL VOLUME REQUIRED FOR A PARKING LOT TREE (1000 C.F) SO THIS MEETS THE CITY REQUIREMENTS.



<p><b>EXAMPLE SOIL VOLUME CALCULATION – PARKING LOT TREE WITH ROOT PATH</b></p>	NO SCALE
	<p>DWG. NO. <b>APPENDIX 15</b></p>





### PLANT LEGEND

SYMBOL	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONDITION	SPACING	AVERAGE MATURE CANOPY SIZE
	7	ACER RUBRUM	RED MAPLE	2" CAL.	B&B	AS SHOWN	40' SPREAD (1,256 S.F.)
	7	QUERCUS RUBRA	RED OAK	2" CAL.	B&B	AS SHOWN	45' SPREAD (1,590 S.F.)
	28	ZELKOVA SERRATA	ZELKOWA	2" CAL.	B&B	AS SHOWN	50' SPREAD (1,963 S.F.)

### TREE CANOPY TABLE

TREE #	SPECIES	OPEN SOIL VOLUME	COVERED SOIL VOLUME	TOTAL SOIL VOLUME	AVE. MATURE CANOPY	% OF CANOPY OVER PARKING LOT	AREA OVER PARKING LOT
001	Zelkova	5,466 c.f.	0 c.f.	5,466 c.f.	50' spread (1,963 s.f.)	30%	757 s.f.
002	Red Oak	4,530 c.f.	0 c.f.	4,530 c.f.	45' spread (1,590 s.f.)	40%	640 s.f.
003	Zelkova	3,192 c.f.	0 c.f.	3,192 c.f.	50' spread (1,963 s.f.)	92%	1,812 s.f.
004	Zelkova	3,096 c.f.	0 c.f.	3,096 c.f.	50' spread (1,963 s.f.)	96%	1,749 s.f.
005	Zelkova	1,818 c.f.	0 c.f.	1,818 c.f.	50' spread (1,963 s.f.)	53%	1,040 s.f.
006	Zelkova	303 c.f.	2,160 c.f.	2,463 c.f.	50' spread (1,963 s.f.)	50%	984 s.f.
007	Zelkova	348 c.f.	2,160 c.f.	2,508 c.f.	50' spread (1,963 s.f.)	80%	1,576 s.f.
008	Zelkova	576 c.f.	2,160 c.f.	2,736 c.f.	50' spread (1,963 s.f.)	85%	1,668 s.f.
009	Zelkova	3,691 c.f.	0 c.f.	3,691 c.f.	50' spread (1,963 s.f.)	76%	1,498 s.f.
010	Red Oak	4,200 c.f.	0 c.f.	4,200 c.f.	45' spread (1,590 s.f.)	35%	550 s.f.
011	Zelkova	706 c.f.	2,078 c.f.	2,784 c.f.	50' spread (1,963 s.f.)	82%	1,613 s.f.
012	Zelkova	3,651 c.f.	0 c.f.	3,651 c.f.	50' spread (1,963 s.f.)	70%	1,550 s.f.
013	Zelkova	1,101 c.f.	0 c.f.	1,101 c.f.	50' spread (1,963 s.f.)	100%	1,963 s.f.
014	Zelkova	1,101 c.f.	0 c.f.	1,101 c.f.	50' spread (1,963 s.f.)	100%	1,963 s.f.
015	Red Oak	4,155 c.f.	0 c.f.	4,155 c.f.	45' spread (1,590 s.f.)	30%	586 s.f.
016	Zelkova	4,176 c.f.	0 c.f.	4,176 c.f.	50' spread (1,963 s.f.)	100%	1,963 s.f.
017	Zelkova	4,233 c.f.	0 c.f.	4,233 c.f.	50' spread (1,963 s.f.)	100%	1,963 s.f.
018	Zelkova	4,233 c.f.	0 c.f.	4,233 c.f.	50' spread (1,963 s.f.)	100%	1,963 s.f.
019	Zelkova	3,630 c.f.	0 c.f.	3,630 c.f.	50' spread (1,963 s.f.)	70%	1,547 s.f.
020	Red Oak	4,506 c.f.	0 c.f.	4,506 c.f.	45' spread (1,590 s.f.)	41%	644 s.f.
021	Zelkova	417 c.f.	870 c.f.	1,287 c.f.	50' spread (1,963 s.f.)	100%	1,963 s.f.
022	Zelkova	444 c.f.	870 c.f.	1,314 c.f.	50' spread (1,963 s.f.)	100%	1,963 s.f.
023	Zelkova	4,203 c.f.	870 c.f.	5,073 c.f.	50' spread (1,963 s.f.)	100%	1,963 s.f.
024	Zelkova	4,284 c.f.	870 c.f.	5,154 c.f.	50' spread (1,963 s.f.)	100%	1,963 s.f.
025	Zelkova	4,284 c.f.	870 c.f.	5,154 c.f.	50' spread (1,963 s.f.)	100%	1,963 s.f.
026	Zelkova	5,946 c.f.	0 c.f.	5,946 c.f.	50' spread (1,963 s.f.)	48%	936 s.f.
027	Red Oak	3,702 c.f.	0 c.f.	3,702 c.f.	45' spread (1,590 s.f.)	37%	581 s.f.
028	Zelkova	2,430 c.f.	0 c.f.	2,430 c.f.	50' spread (1,963 s.f.)	70%	1,558 s.f.
029	Zelkova	1,077 c.f.	0 c.f.	1,077 c.f.	50' spread (1,963 s.f.)	100%	1,963 s.f.
030	Zelkova	1,077 c.f.	0 c.f.	1,077 c.f.	50' spread (1,963 s.f.)	100%	1,963 s.f.
031	Red Oak	4,191 c.f.	0 c.f.	4,191 c.f.	45' spread (1,590 s.f.)	40%	642 s.f.
032	Zelkova	3,630 c.f.	0 c.f.	3,630 c.f.	50' spread (1,963 s.f.)	80%	1,503 s.f.
033	Red Oak	4,302 c.f.	0 c.f.	4,302 c.f.	45' spread (1,590 s.f.)	38%	602 s.f.
034	Zelkova	7,350 c.f.	0 c.f.	7,350 c.f.	50' spread (1,963 s.f.)	45%	882 s.f.
035	Red Maple	1,416 c.f.	0 c.f.	1,416 c.f.	40' spread (1,256 s.f.)	100%	1,256 s.f.
036	Red Maple	1,989 c.f.	0 c.f.	1,989 c.f.	40' spread (1,256 s.f.)	100%	1,256 s.f.
037	Red Maple	2,502 c.f.	0 c.f.	2,502 c.f.	40' spread (1,256 s.f.)	100%	1,256 s.f.
038	Red Maple	2,526 c.f.	0 c.f.	2,526 c.f.	40' spread (1,256 s.f.)	73%	915 s.f.
039	Red Maple	1,533 c.f.	0 c.f.	1,533 c.f.	40' spread (1,256 s.f.)	58%	728 s.f.
040	Red Maple	516 c.f.	1,716 c.f.	2,232 c.f.	40' spread (1,256 s.f.)	81%	1,021 s.f.
041	Red Maple	516 c.f.	1,716 c.f.	2,232 c.f.	40' spread (1,256 s.f.)	80%	1,007 s.f.
042	Zelkova	837 c.f.	441 c.f.	1,278 c.f.	50' spread (1,963 s.f.)	92%	1,804 s.f.

Total Qualifying Mature Tree Canopy Area: 57,763 s.f.



QUALIFYING MATURE CANOPY INCLUDES ALL AREAS DIRECTLY OVER THE PARKING LOT SURFACE AND AREAS THAT ARE SURROUNDED ON AT LEAST THREE SIDES BY EITHER CURBS OR HARD SURFACE PAVING. THIS INCLUDES BUT IS NOT LIMITED TO PARKING LOT ISLANDS AND PLANTING AREAS BETWEEN THE PARKING LOT AND SIDEWALK.

**QUALIFYING MATURE CANOPY COVER**

**INDIVIDUAL TREE MATURE CANOPY OUTLINE**

PARKING LOT AREA:	84,962 S.F.
TOTAL QUALIFYING MATURE TREE CANOPY AREA:	57,763 S.F.
(CANOPY AREA DIRECTLY OVER PARKING LOT)	
% CANOPY COVER:	68%
MINIMUM % CANOPY COVER:	30%

68% IS GREATER THAN THE MINIMUM OF 30% TOTAL QUALIFYING MATURE CANOPY COVER THEREFORE CITY REQUIREMENTS ARE MET.

**REMOVAL, STORING, AND AMENDED SOILS FOR PLANTER AREAS:**

CONTRACTOR SHALL REMOVAL ALL DEBRIS FROM PLANTER AREAS AND EXCAVATE TO A DEPTH OF 36 INCHES. SLOPE SIDES OF EXCAVATIONS AT 1:1 SLOPE OR SHORE EDGES TO PREVENT UNDERMINING OF VEHICLE LOAD AREAS AND TO PROVIDE A SLOPED PROFILE TRANSITION BETWEEN SOIL TYPES AND STRUCTURAL FILL. DISPOSE OF DEBRIS AND SUBSOIL. STOCKPILE EXCAVATED TOPSOIL IN APPROVED AREA OFF SITE.

EXISTING AND IMPORTED TOPSOIL AMENDMENTS SHALL BE DETERMINED BY THE LANDSCAPE ARCHITECT AND APPROVED BY THE CITY ARBORIST. SOIL MIXING SHALL BE DONE IN DESIGNATED AREAS OR IN THE SUPPLIERS YARD. MIX AMENDMENTS WITH TOPSOIL WHEN SOIL IS IN A FRABLE CONDITION ONLY (DAMP AND NOT MUDDY WITH ADEQUATE MOISTURE TO BREAK INTO CLODS WHEN TURNED AND WILL NOT LEAVE A MUD STAIN ON THE HAND WHEN SQUEEZED). CONTRACTOR TO PROVIDE CERTIFICATE OF CONTENT AND PERCENT OF SOIL MIXES WITH ALL AMENDED SOIL TO THE CITY PRIOR TO INSTALLATION.

**BLENDED SOIL PLACEMENT AND COMPACTION:**

SOIL SHALL BE FRABLE WHEN PLACED AND COMPACTION. PLACE SOIL IN LAYERS OF NOT MORE THAN 12" IN DEPTH. PROVIDE 3 PASSES WITH A 2" COMPACT PLATE VIBRATING COMPACTOR. COMPACT TO 80-85% MAXIMUM DRY DENSITY AS MEASURED BY THE PROCTOR TEST OR AS APPROVED FOR SPECIFIC BLENDED SOIL MIXES.

**OPEN SOIL VOLUME**

**COVERED SOIL VOLUME**

<b>PARKING LOT TREE SOIL VOLUME REQUIREMENTS</b>	
MIN. SOIL VOLUME REQUIREMENT (C.F. PER TREE)	1,000 C.F.

**1 PARKING TREE WITH COVERED SOIL DETAIL**  
NOT TO SCALE

REVISIONS:


## EXAMPLE PARKING LOT TREE CANOPY PLAN

OFFICE LOCATED AT:  
1000 1ST STREET, SUITE 1  
TIGARD, OREGON 97223  
PH: (503) 555-XXXX  
FAX: (503) 555-XXXX  
EMAIL: INFO@ABC\_COLLABORATIVE.COM  
LICENSED IN OR, WA, & ID

ENGINEERING • ARCHITECTURE • PLANNING • LANDSCAPE ARCHITECTURE

DESIGNED BY:  
DRAWN BY:  
CHECKED BY:  
PREPARED FOR: HANCOCK ASSOCIATES  
1500 SW LOOP ROAD  
TIGARD, OR 97223

## LOOP ROAD IMPROVEMENTS

1011 SW LOOP ROAD

**TIGARD**  
TAX LOT 1000

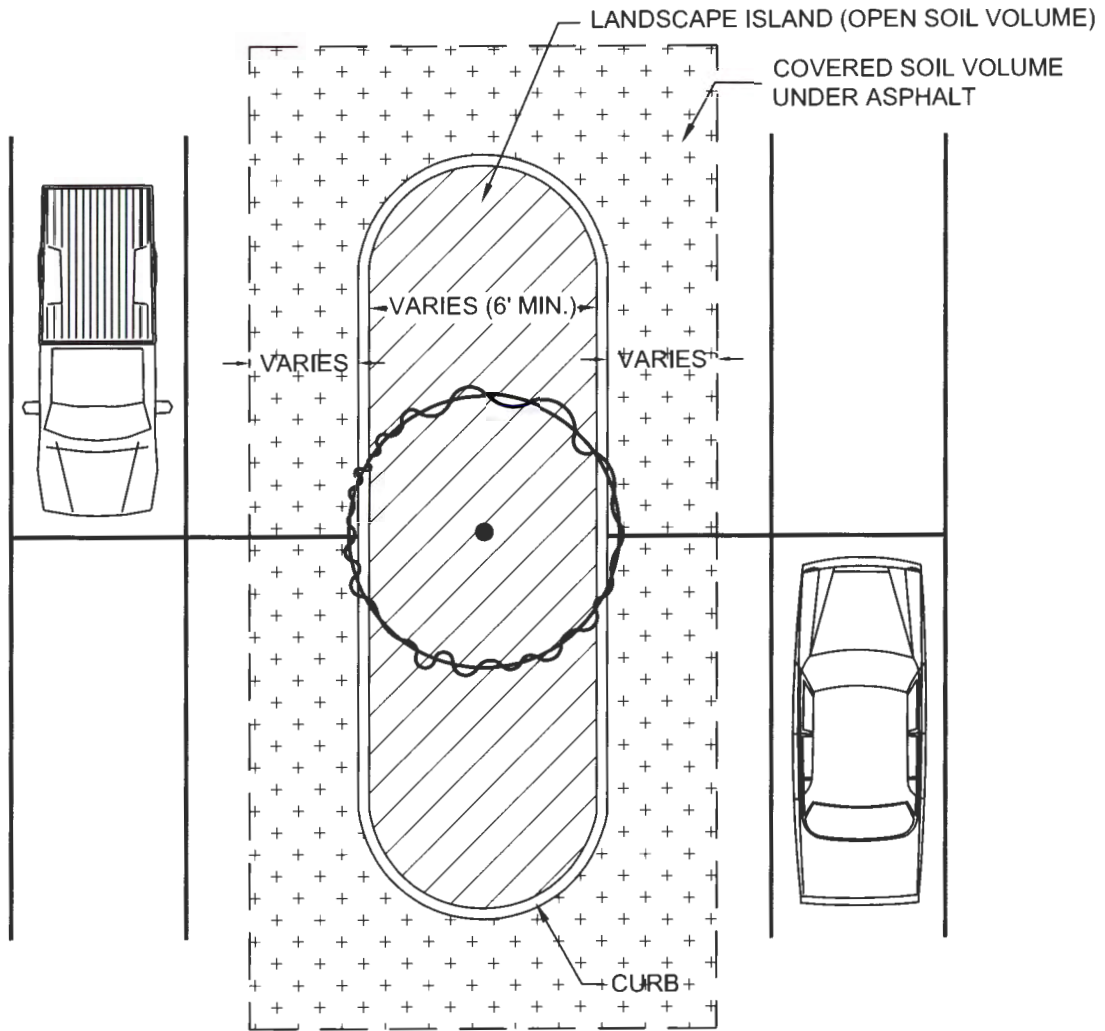
DATE: 07-11-2011

REGISTERED  
LANDSCAPE ARCHITECT  
JOHN H. DOE  
OREGON

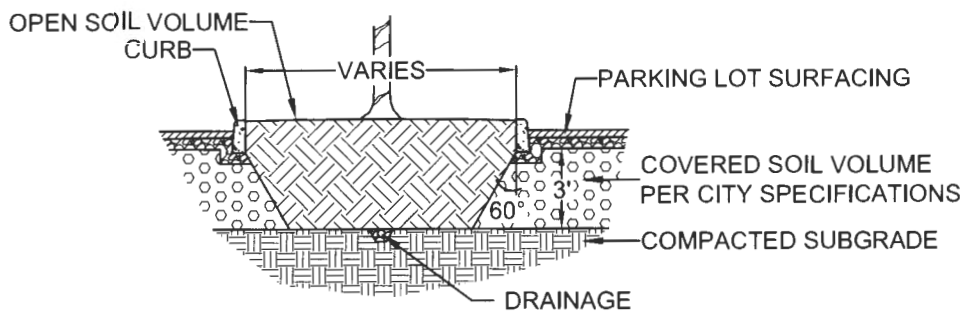
JOB NUMBER  
**1000**

SHEET  
**APPENDIX 16**

OREGON  
TAX MAP 25 1 08A8

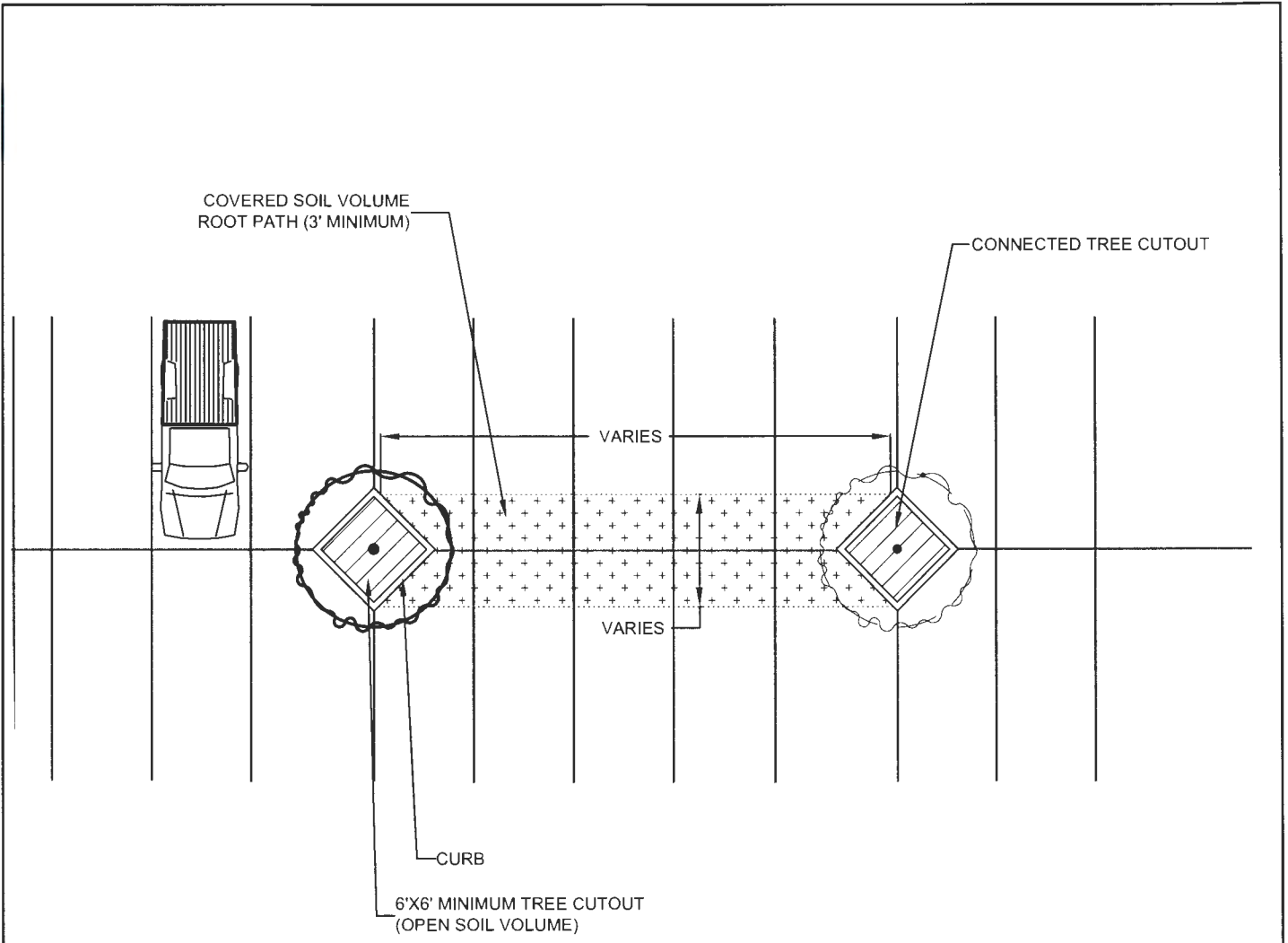


**PLAN**

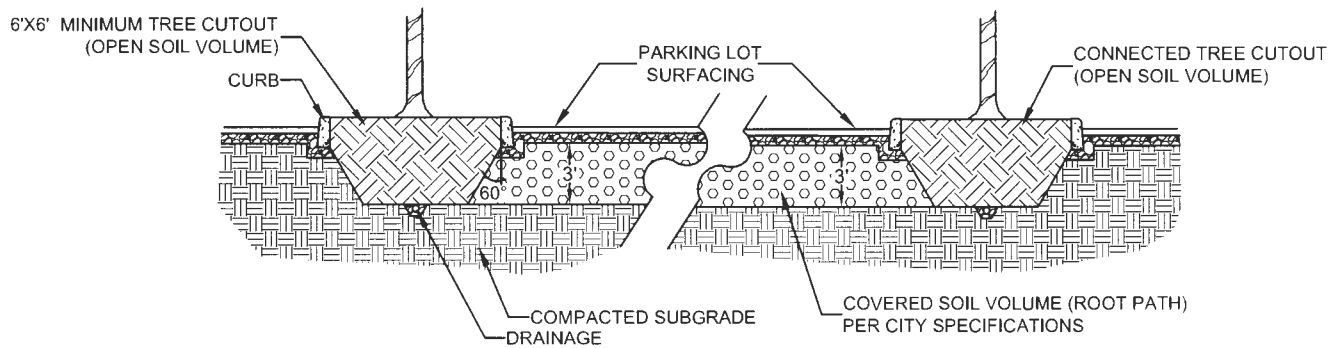


**PROFILE**

<b>EXAMPLE COVERED SOIL VOLUME PLAN DRAWING – UNDER PARKING LOT OPTION FOR PARKING LOT TREE</b>	NO SCALE
	DWG. NO.
	<b>APPENDIX 17</b>
	PLAN



## PLAN



## PROFILE

<b>EXAMPLE COVERED SOIL VOLUME DRAWING— ROOT PATH OPTION FOR PARKING LOT TREE</b>	NO SCALE
	DWG. NO. <b>APPENDIX 17</b>

## Standard Covered Soil Volume Specifications

### Part 1. Covered Soil Materials

- A. Covered soil shall consist of the following mixture of gravel, soil and admixtures:
1. Crushed rock, gradation of 100% passing 1.25 inch, max. 30% passing 0.75 inch;
  2. Loam/Organic Topsoil;
  3. Soil binder such as “Stabilizer”; and
  4. Water.

### Part 2. Proportions of Covered Soil Materials

- A. The proportions of covered soil materials shall be as follows:

Material	Amount for 1 CY of Covered Soil	Amount for 4.6 CY of Covered Soil
Crushed Rock	23.2 cubic feet	4 cubic yards
Topsoil	5.9 cubic feet	1 cubic yard
Soil Binder	13.7 ounces	4 pounds
Water	1.6 gallon	46 gallons

- B. The target moisture content is 20% by weight of the topsoil weight. The above water contents assume the top is dry. The amount of water that will need to be added will be dependent on the moisture content of the raw materials. Actual amounts of water used shall be determined during mixing.

### Part 3. Covered Soil Mixing Procedures

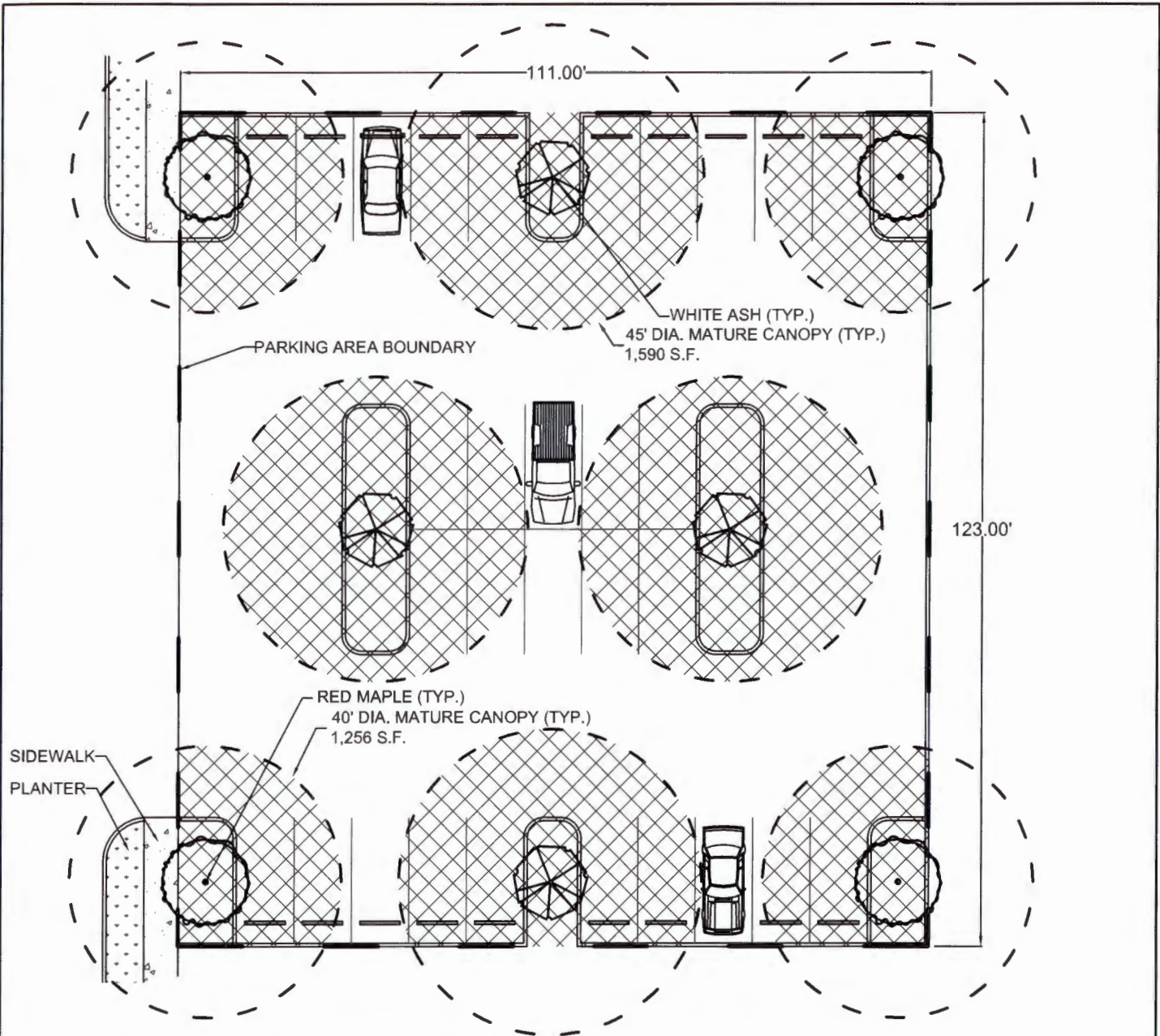
- A. Mix covered soil in batches of an appropriate size for the equipment being used. The end result is to be a material that is uniformly blended together. Do not batch in quantities that will not allow the equipment to completely mix the material. Determine batch size and quantities of each material needed for the batch.
- B. Start with half of the crushed rock material.
- C. Add all of the topsoil material.
- D. Add the soil binder.
- E. Add half of the estimated water.
- F. Add the other half of the crushed rock material.
- G. Mix the material together.
- H. Slowly add water to the mixture and continue to mix. The final amount of water will vary with moisture content of the crushed rock and topsoil. Add water in incremental amounts and mix the material between the additions of water.
- I. Stop adding water and mixing when there is a minute amount of free topsoil remaining. The topsoil will coat the crushed rock and not fall out of the material. All of the crushed rock

shall be uniformly coated with topsoil. There shall be no clumps of topsoil or uncovered crushed rock in the mixture.

- J. If too much water is added to the mixture, water will drain out of the material and the topsoil will wash off of the crushed rock. If this occurs the batch of material shall be discarded and shall not be incorporated into the completed work.

#### **Part 4. Placement of Covered Soil**

- A. Protect soils and mixes from absorbing excess water and from erosion at all times. Do not store materials unprotected from rainfall events. Do not allow excess water to enter site prior to compaction. If water is introduced into the material after grading, allow material to drain or aerate to optimum compaction moisture content.
- B. All areas to receive covered soil mixture shall be inspected by the project landscape architect and/or project engineer before starting placement of mixture. All defects such as incorrect grading, compaction and inadequate drainage, etc., shall be corrected prior to beginning placement of covered soil.
- C. Confirm that the sub-grade is at the proper elevation and compacted as required. Sub-grade elevations shall slope parallel to the finished grade. Clear the excavation of all construction debris, trash, rubble and foreign material. Fill any over excavation with approved fill and compact to the required sub-grade compaction.
- D. Install covered soil in 6-inch lifts and spread uniformly over the area. Compact each lift to at least 85 percent of maximum density. Delay placement 24 hours if moisture content exceeds maximum allowable, protect covered soil with plastic or plywood during delay. Take particular care not to damage utilities when installing covered soil. Covered soil that will be the bedding for utility lines shall be compacted to conform to the required grade of the utility line. Do not compact the immediate vicinity above a utility line until a fill depth of at least 12-inches above the utility line is reached.
- E. Bring covered soils to finished grades as shown in the approved drawings. Immediately protect the covered soil material from contamination by water by covering with plastic or plywood.



TOTAL CANOPY AREA OF PARKING LOT TREES\* = 11,388 S.F.

TOTAL QUALIFYING MATURE CANOPY COVER = CANOPY COVER DIRECTLY OVER THE PARKING AREA IN SQUARE FEET, INCLUDING PLANTING ISLANDS AND AREAS SURROUNDED BY CURB OR HARD SURFACE PAVING ON AT LEAST THREE SIDES.

 TOTAL QUALIFYING MATURE CANOPY COVER = 8,057 S.F.

PARKING LOT AREA = 13,590 S.F.

PERCENT ACTUAL CANOPY COVER =  $(8,057 \text{ S.F.}) / (13,590 \text{ S.F.}) = 59\%$

59% IS GREATER THAN THE MINIMUM OF 30% TOTAL QUALIFYING MATURE CANOPY COVER THEREFORE CITY REQUIREMENTS ARE MET.

\*CANOPY AREA PER TREE IS DETERMINED FROM THE VALUE GIVEN IN THE CITY OF TIGARD PARKING LOT TREE LIST FOR A MATURE TREE OF THAT SPECIES.

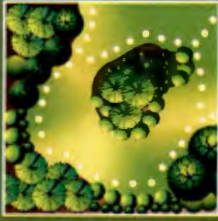
**EXAMPLE PARKING LOT  
THAT MEETS 30% MINIMUM  
CANOPY COVER  
REQUIREMENT**

NO SCALE

DWG. NO.

**APPENDIX 18**





*City of Tigard*

# Urban Forestry Code Revisions Project

VOLUME V | ADDITIONAL BACKGROUND MATERIALS | JULY 2012

**City of Tigard**  
COMMUNITY DEVELOPMENT DEPARTMENT  
13125 SW Hall Blvd., Tigard, OR 97223  
[www.tigard-or.gov/trees](http://www.tigard-or.gov/trees)



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## Organization of the Urban Forestry Code Revisions Documents

The Urban Forestry Code Revisions project is presented in five volumes. Volume I provides the project overview and describes the process used to develop all of the elements. Volume II is the land use elements of the code, and Volume III the non land use elements. Volume IV contains the Urban Forestry Manual. Volume V contains technical reports and research that contributed to the code revisions along with details of the public input and deliberations to date.

### Volume I | Project Overview

**Project Overview** includes the following sections:

- Project Introduction
- Overview of Key Elements
- Key Element Summaries
  - Urban Forestry Standards for Development
  - Tree Grove Preservation Incentives
  - Tree Permit Requirements
  - Hazard Trees
  - Urban Forestry Manual

**Appendix A** includes additional detail about the information used to shape the Urban Forestry Code Revisions Project, and includes the following sections:

- Process summary
- Summary of Community Ideas and Concerns
- Summary of Planning Commission Deliberations
- Existing Conditions

### Volume II | Land Use Elements

**Community Development Code (Title 18)** is the Planning Commission's recommended draft of the Development Code. This section includes commentary on the amendments.

**Peer Review** demonstrates how the Planning Commission's recommended draft of the Development Code and Urban Forestry Manual will work in application.

**Tree Grove ESEE Analysis** is a report that addresses Statewide Planning Goal 5 - Natural Resources requirements for the preservation of Significant Tree Groves.

**Staff Report and findings** includes the staff recommendation for approval of the land use elements (Title 18 and the Comprehensive Plan Amendment) and the findings that demonstrate the land use elements meet the necessary approval criteria.

### Volume III | Non Land Use Elements

**Tigard Municipal Code** is the staff proposed draft of the Municipal Code (Title 8 and other Municipal Code titles). This section includes commentary on the amendments.

### Volume IV | Urban Forestry Manual (Administrative Rules)

**Urban Forestry Manual** consists of administrative rules that implement the technical details of the urban forestry related code provisions in Title 8, Title 18 and other applicable titles in the Tigard Municipal Code.

### Volume V | Additional Background Materials

**Planning Commission Deliberations** details Planning Commission discussion and decisions during the public hearing process.

**Amendment Requests Document for the Planning Commission** lists code amendment requests received in response to the first Planning Commission public hearing and staff responses.

**Outstanding Issues for the Urban Forestry Code Revisions** includes additional information on the outstanding issues that were further deliberated by the Planning Commission before making their final recommendation to City Council on May 7, 2012.

**Log of Input** lists the input received and any code changes from the last meeting of the CAC to the staff proposed draft of the Urban Forestry Code Revisions to Planning Commission.

**CAC Guiding Principles** includes the consensus view of the Citizens Advisory Committee (CAC) developed to help guide the legislative adoption process.

**Tree Values** includes information and current research on the environmental, economic, social and aesthetic benefits of trees.

**Canopy Standards** explains the reasons for adopting tree canopy cover requirements as well as the methods used to arrive at the requirements.

**Soil volume** details research about the soil volume required to support a mature tree canopy.

**Tree Canopy Fee** discusses research used to develop a square foot value for tree canopy.

**Regulatory Comparison** is an excerpted report prepared by Metro and the Audubon Society that summarizes and compares regional urban forestry programs and regulations.

**Urban Forestry Master Plan** is the City of Tigard's recommended plan for achieving the urban forestry goals in the Comprehensive Plan.

**Urban Forestry Code Revisions**

# Planning Commission Deliberations

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## City of Tigard Memorandum

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**To:** City Council

**From:** Todd Prager, Associate Planner/Arborist

**Re:** Planning Commission Deliberations on the Urban Forestry Code Revisions

**Date:** May 16, 2012

### **Introduction**

The Planning Commission held one workshop and four public hearings on the Staff Proposed Draft Urban Forestry Code Revisions from January 2012 through May 2012. Although they received a range of public testimony from a variety of people during their public hearing process, the commission's deliberations focused on the 11 issues listed below. Each issue is listed in the form of a question that framed the commission's deliberations. Also listed is the background information the commission used to inform their deliberations. Finally, the decision made on each issue is listed.

The commission decision on these issues, as well as a handful of other non-substantive amendments to clarify code and correct errors, form the Planning Commission Recommended Draft Urban Forestry Code Revisions. The Planning Commission Recommended Draft was unanimously approved by the Planning Commission at their May 7, 2012 meeting, and will be considered by City Council for adoption.

### **Procedural Note**

Because of Oregon land use law, the land use elements of the proposal, such as the Tigard Development Code (Title 18), Comprehensive Plan, ESEE Analysis and Significant Tree Grove Map are addressed separately from the non-land use elements, such as the Tigard Municipal Code (titles other than Title 18) and Urban Forestry Manual.

In order to provide for a comprehensive approach to the Urban Forestry Code Revisions, the Planning Commission review and deliberations have included both the land use elements and non-land use elements of the proposal. However, the Planning Commission's direct recommendation to City Council is limited to the land use elements of the proposal.

At the same time, there are many aspects of the non-land use elements that are consistent with and supportive of the land use elements. The Planning Commission's recommendation to City

Council states that the non-land elements of the proposal are consistent with and supportive of the land use elements.

### **Planning Commission Issues and Decisions**

**Issue 1,** Why was tree canopy selected over tree count (i.e. tree density or number of trees) as a requirement in the draft code?

**Background Information for Issue 1:** During the Comprehensive Plan and Urban Forestry Master Plan processes, there was general consensus that the existing development code unfairly penalizes property owners with existing trees and encourages the overplanting of replacement trees. The reasoning was that mitigation requirements apply only to property owners with existing trees over 12-inch trunk diameter, and replacement trees or fees are required based on the diameter of trees removed. For example, if a 12-inch diameter tree is removed, replacement with 6, 2-inch diameter trees or a \$1,500 fee in lieu of replacement (\$125/inch fee) is required.

Urban Forestry Master Plan Goal 1.2.a, recommends the city address this equity issue as part of the development code revisions by developing "... canopy cover or tree density requirements for all lots to be met by either preserving existing trees or planting new trees". The Urban Forestry Code Revisions Citizen Advisory Committee affirmed Urban Forestry Master Plan Goal 1.2.a by general consensus through surveys and group discussions, and staff has worked to draft corresponding development code revisions in the project record (see November 10, 2010 pre-meeting survey and meeting minutes).

When drafting the development code revisions, staff studied a tree density requirement (requiring X number of trees per square feet of development area) and compared it with a canopy requirement (requiring X square feet of canopy per square feet of development area). The canopy requirement was selected as the preferred alternative for the following reasons:

- The canopy requirement allows more flexibility for the project designer to meet code requirements due to the wide variation of canopy shapes by species. A tree density requirement presents the project designer with more limited options to meet numerical tree planting requirements.
- The canopy requirement is more consistent with urban forest science and the city's long-term urban forestry goals. The benefits of trees (economic, environmental and social) are derived primarily from their canopies, rather than number of trees. The canopy requirement encourages large stature, appropriately spaced trees, which have the highest benefit/cost ratios. A tree density requirement allows small stature, closely spaced trees to meet numerical requirements.
- The canopy requirement requires the project designer to consider future canopy growth, which helps ensure that trees are properly placed within a site to become long-term amenities. The canopy requirement encourages appropriate tree spacing and setbacks from



buildings by highlighting mature canopy growth, whereas a density requirement focuses on planting a certain number of trees and does not take mature growth into account.

- The canopy requirement provides more consistency in development outcomes. For example, a parking lot planted to meet a numerical tree density requirement can look very different after future growth, depending on whether small ornamental trees or large shade trees are selected. The canopy requirement helps normalize outcomes.
- Planting trees to meet either a canopy requirement or a tree density requirement both rely upon successful establishment and long-term maintenance by property owners. However, the canopy requirement focuses more on long-term growth during the initial design phase so that trees are more likely to become long-term site amenities.

**Commission Decision on Issue 1:** The commission decided to retain the tree canopy requirement in the draft code because it is flexible, consistent with sound urban forestry practices, encourages thoughtful design and supports the community’s long-term urban forestry goals. Therefore, no changes to the current proposal were made based on this issue.

**Issue 2,** Will the tree canopy requirements result in a reasonable balance between trees, development and open space?

**Background Information for Issue 2:** The Urban Forestry Code Revisions Citizen Advisory Committee reached consensus to draft achievable and balanced canopy requirements for development that are tiered, based on zoning district. For example, the development in low density residential areas is required to have more trees than in areas of dense zoning, such as Downtown Tigard.

To implement the consensus of the citizen advisory committee, staff analyzed possible percent canopy for each zoning district using the same methodology developed to set canopy goals for the Urban Forestry Master Plan and also in an updated methodology using Light Detection and Ranging (LiDAR) technology.

The results of the analyses were then used in conjunction with the minimum percent landscaping requirements in the Tigard Development Code to place the various zoning districts within one of three tiers. The exception is school sites, which were placed in the “dense zoning” tier 3 to ensure sufficient room for sports fields:

Tier 1: 40% effective canopy<sup>1</sup>

Tier 2: 33% effective canopy<sup>2</sup>

Tier 3: 25% effective canopy<sup>3</sup>

<sup>1</sup> R-1, R-2, R-3.5, R-4.5, R-7, and R-12

<sup>2</sup> R-25, R-40, C-N, C-C, C-G, C-P, MUE, MUE-1, MUE-2, MUC, MUR, and I-P

<sup>3</sup> MU-CBD, MUC-1, I-L, I-H, and schools (18.130.050(J))

It is important to note that *effective canopy* is very different from *actual canopy* within the lot lines of a particular development. To meet draft effective canopy requirements, the preservation of existing trees is granted double canopy credit and planting of street trees is granted full canopy credit even though half of their canopies overhang streets, which are not part of the calculations.

When considering these factors, the actual canopy required for a particular development would fall into the following ranges:

Tier 1: 16-40% actual canopy

Tier 2: 13-33% actual canopy

Tier 3: 10-25% actual canopy

The low end of each range represents sites with many existing trees that are preserved and maximization of street tree canopy. The high end of each range represents sites with no existing trees and no street tree canopy (all trees planted so the mature canopy stays within the lot lines). The possible percent canopy for each zoning district falls within the actual canopy range for their corresponding tiers above.

The double canopy credit for preservation provides a viable option for meeting canopy requirements in the draft code while incentivizing preservation. This is because buildable lands have significant existing tree resources from which to draw. Staff performed a GIS analysis of the city's buildable lands inventory and determined that buildable lands have an average of 41 percent existing canopy cover (see Urban Forestry Code Revisions Citizen Advisory Committee April 13, 2011 meeting packet, pages 45 to 46 in the project record).

In many cases, development (and tree removal) is restricted on a portion of a development site due to existing sensitive lands protections (for wetlands, streams, floodplains, etc.). Staff performed a GIS analysis of existing canopy that is protected on buildable lands due to its location in protected sensitive lands. The analysis demonstrated that an average of 12.29 percent of canopy on buildable lands would be preserved due to its location in sensitive lands. Therefore, because of double credit for preservation, development on buildable lands would achieve an average of 24.58 percent effective canopy through the preservation of trees that are already required to be preserved (see Urban Forestry Code Revisions Citizen Advisory Committee April 13, 2011 meeting packet, pages 45 to 46 in the project record).

Staff and outside consultants tested the tiered requirements on a wide range of development projects to ensure the draft effective canopy requirements are achievable, result in a reasonable balance between trees and development, and do not force payment of fees in lieu or discretionary review for typical projects.

The peer review demonstrates that the requirements are achievable without payment of fees in lieu or discretionary reviews.

Staff advised the commission that the draft effective tree canopy requirements would result in a reasonable balance between trees, development and open space. However, in the discussion of Issue 3 below, staff included an option for the commission to reduce tree canopy to the following ranges by granting bonus credits for native trees:

- Tier 1: 16-32% actual canopy
- Tier 2: 13-26% actual canopy
- Tier 3: 10-20% actual canopy

Staff also provided an option for the commission to reduce tree canopy by reducing and/or eliminating the per lot minimum. The background information for Issue 4 below, describes how reducing and/or eliminating the per lot tree canopy requirement would have the effect of reducing the tree canopy requirement for the overall development site.

**Commission Decision on Issue 2:** The commission decided that in most cases the tree canopy requirements provide a reasonable balance between trees, development and open space. However, to be conservative, the commission moved the R-12 district into the Tier 2 category. This was because the R-12 district was not tested as part of the peer review phase, and higher density residential districts (R-25 and R-40) were able to meet the Tier 2 requirements.

In addition, as further explained in Issue 3, the commission selected the option to effectively lower the tree canopy requirements by 20 percent for projects that use native trees:

Tree Canopy Requirements without Native Trees	Tree Canopy Requirements with Native Trees
Tier 1: 16-40% actual canopy	Tier 1: 16-32% actual canopy
Tier 2: 13-33% actual canopy	Tier 2: 13-26% actual canopy
Tier 3: 10-25% actual canopy	Tier 3: 10-20% actual canopy

Finally, the commission decided to reduce the per lot minimum from 20 percent down to 15 percent for Tier 1 sites, and to eliminate the per lot minimum for Tier 2 and 3 sites. These decisions further reduces the tree canopy requirements for the overall development sites as further explained in the background information for Issue 4.

**Issue 3,** Will the tree canopy requirements favor lower quality trees (i.e. fast growing, non-native deciduous)?

**Background Information for Issue 3:** The peer review noted that the draft code could result in the unintended consequence of shifting Tigard’s tree population to broad spreading deciduous trees. The rationale is that applicants will naturally plant broad spreading deciduous trees, rather than more narrow growing evergreens as the most cost effective method to meet tree canopy requirements in the draft code. The rate of growth (i.e. fast growing vs. slow growing) has not been noted as a factor in decision-making because the draft code grants tree canopy credit based on mature size, regardless of how long it takes to achieve that size.

Staff does not disagree that overreliance on broad spreading deciduous trees is a potential unintended consequence of the code. Since there are more non-native trees than native trees on the recommended tree lists, there is also the potential for overreliance on non-native trees to meet tree canopy requirements.

It is important to note the draft code requires that collection of spatial and species-specific information on required trees be included in the city’s urban forest inventory. This data will allow the city to periodically evaluate whether there is an overreliance on particular species, because of the draft code.

In addition, Clean Water Services requires preservation and planting of native trees in vegetated corridors, which comprise over 9 percent of land area citywide. Also, the tree grove preservation incentives pertain to large groves of native trees and are intended to facilitate their preservation. Native trees that result from Clean Water Services requirements and tree grove preservation incentives are eligible for credit towards the draft tree canopy requirements and could help balance the ratio between native, non-native, deciduous and evergreen trees.

When surveyed on the issue, the citizen advisory committee consensus was for city to allow the project designer to select a mix of native and non-native trees, depending on site conditions (see November 10, 2010, pre-meeting survey in the project record). A strong preference for native trees did not emerge as part of their discussions.

However, staff understands the planning commission is interested in exploring the potential to increase the relative amount of native to non-native trees. One option could be granting bonus tree canopy credit for the planting of native trees. Staff suggests consideration be given to 1.25 times the maturity canopy spread of trees on the native tree list. Since the native tree list includes several broad spreading evergreens (e.g. grand fir, Douglas fir, and western hemlock) this could also increase the relative amount of evergreen to deciduous trees.

Finally, staff understands the planning commission is interested in exploring ways to reduce the tree canopy requirements to allow for more open space and development. Granting 1.25 canopy credit for native trees would reduce the canopy ranges for development that relies solely on native trees as follows:

Tree Canopy Requirements without Native Trees	Tree Canopy Requirements with Native Trees
Tier 1: 16-40% actual canopy	Tier 1: 16-32% actual canopy
Tier 2: 13-33% actual canopy	Tier 2: 13-26% actual canopy
Tier 3: 10-25% actual canopy	Tier 3: 10-20% actual canopy

**Commission Decision on Issue 3:** The commission decided to grant 1.25 bonus credits to encourage the planting of native trees. As explained in Issue 2, this effectively lowers the tree canopy requirements by 20 percent for projects that use native trees.

**Issue 4**, Should tree canopy be measured across the overall development site only rather than on a lot by lot basis?

**Background Information for Issue 4:** Early in the process, staff initially proposed the tiered tree canopy requirements to be met on a lot by lot basis in addition to the overall development site. The Urban Forestry Code Revisions Citizen Advisory Committee recommended allowing averaging of canopy across the overall development site while setting a minimum per lot tree canopy requirement. Staff proposed a 20 percent minimum per lot requirement at the April 13, 2011, meeting and the committee approved the proposal by consensus (see minutes in the project record). The rationale for having a minimum per lot tree canopy requirement is to spread the distribution of trees, and therefore tree benefits and maintenance responsibilities, more evenly across a development site.

Staff advised the commission that reducing or eliminating the per lot tree canopy requirement would likely not raise major issues since it was not a major part of the deliberations when developing the proposal. Street tree requirements would still apply and support an evening of the distribution of trees across the development site, even if the per lot tree canopy requirements were reduced or eliminated. Finally, the peer review results show that while the tree canopy requirement for the overall development site is met, often small stature additional trees are required in residential backyards to meet the per lot minimum tree canopy requirement. Therefore, if the per lot tree canopy requirement were reduced or eliminated, the effective tree canopy requirement for the overall development site would be reduced.

**Commission Decision on Issue 4:** The commission decided to reduce the per lot minimum to 15 percent for Tier 1 districts (lower density residential development), and to eliminate the per lot minimum requirement for the Tier 2 and 3 districts (higher density residential, commercial, mixed use, industrial, and school development).

The decision to reduce the per lot minimum to 15 percent for Tier 1 districts was based on staff analysis that for most lots, 15 percent tree canopy could be provided by planting one large stature street tree, thereby eliminating the need to plant an additional small stature tree which provide limited benefits in residential backyards.

The decision to eliminate the per lot minimum for Tier 2 and 3 districts was two-fold. First, due to the more limited street frontage of higher density residential lots, it is more difficult to place street trees for each lot to meet the per lot minimum. Eliminating the per lot minimum for higher density residential lots increases flexibility by allowing the project designer to focus on meeting tree canopy requirements for the overall development site. Second, their decision to eliminate the per lot minimum for commercial, mixed use, industrial and school development was because these sites are often a consolidation of unique lots that could present challenges when meeting the requirements on a lot by lot basis.

**Issue 5, Should there be minimum preservation requirements?**

**Background Information for Issue 5:** Consistent with the direction of the Urban Forestry Code Revisions Citizen Advisory Committee majority at their November 10, 2010, meeting (see minutes in the project record), staff drafted code that did not require a base level of preservation. At the citizens advisory committee meeting on April 13, 2011, eight were in favor and one was opposed to the draft requirements, which included tiered tree canopy targets based on zoning, no base level of preservation and bonus credits to incentivize preservation (see minutes in the project record).

The rationale of the committee for not requiring a minimum level of preservation include not unfairly penalizing property owners with trees, allowing flexibility for removing trees that may not be viable or desirable and not limiting infill development. The consensus supported preservation incentives that actually reward landowners with existing trees (see November 10, 2010, meeting minutes in the project record).

It is important to note that the proposed incentive based approach, with no minimum preservation requirement, has already led to additional preservation in one high profile scenario. In the summer of 2011, a property owner at Hunziker and Wall Street voluntarily chose to preserve six acres of existing trees to meet the draft code requirements rather than removing essentially all trees as originally planned. This property owner was aware of the double credit for preservation and made his preservation decision to avoid planting 12 acres of new trees required by the draft code.

If minimum preservation requirements are desired in the draft code, staff would recommend a preservation percentage rather than number to limit variability between properties of different sizes. Also, staff would recommend investigation of a tree removal permit process to limit predevelopment clearing, which is a method used to avoid tree preservation requirements in development codes. Such a tree removal permit process could be limited to trees on the city's buildable lands inventory. However, the message to the community thus far has been that tree removal permits are not proposed to be required in additional situations. Requiring tree removal permits in additional situations has the potential to result in significant concerns in the community.

**Commission Decision on Issue 5:** The commission decided not to include minimum preservation requirements because it would not be consistent with community expectations of an equitable, flexible and incentive based code. Therefore, no changes to the current proposal were made based on this issue.

**Issue 6, How will tree/utility conflicts be limited?**

**Background Information for Issue 6:** The Urban Forestry Plan requirements specify that utilities are to be shown on the plan so conflicts with trees can be easily identified and corrected. The existing code allows utilities and trees to be shown on separate plan sheets, which makes it

difficult to identify conflicts. Staff coordinated with Portland General Electric to include trees in the Urban Forestry Manual that are allowed/required for planting under overhead power lines. In addition, public works staff on the Technical Advisory Committee identified setback requirements for street trees from public utilities to limit conflicts.

**Commission Decision on Issue 6:** The commission decided the current proposal will limit tree and utility conflicts. Therefore, no changes to the current proposal were made based on this issue.

**Issue 7,** How will hazard trees on adjacent properties be addressed?

**Background Information for Issue 7:** Chapter 8.08 would prohibit hazard trees in Tigard. If a tree on an adjacent property is a hazard, Chapter 8.08 would allow people to file a claim with the city. The city would then utilize a third party arborist to evaluate the tree. If the arborist determines there is a hazard, abatement would be required. The city could enter a property, abate a hazard tree, and recover costs in cases where an owner is uncooperative after obtaining a warrant. The city could abate tree hazards without a warrant when there is an imminent threat to public health or safety.

**Commission Decision on Issue 7:** The commission decided the current proposal adequately addresses hazard trees. Therefore, no changes to the current proposal were made based on this issue.

**Issue 8,** Will significant tree groves result in reduced property values for properties with groves?

**Background Information for Issue 8:** The tree grove preservation incentives are voluntary and provide flexible incentives to facilitate preservation. Applicants are not required to utilize the flexible incentives and may develop their properties as if there were no significant tree grove. Therefore, staff thinks properties with significant tree groves will not have reduced property values.

**Commission Decision on Issue 8:** The commission decided that since the tree grove preservation incentives are voluntary, the presence of tree groves will not reduce property values. Therefore, no changes to the current proposal were made based on this issue.

**Issue 9,** Is the tree canopy fee fair and reasonable, and will the tree canopy fee be updated as the PNW-ISA updates the wholesale cost of trees in the Willamette Valley?

**Background Information for Issue 9:** The methodology for the proposed tree canopy fee was developed by converting the wholesale median tree cost in the Willamette Valley, developed by the PNWISA, to a unit canopy cost. According to the PNWISA, the median wholesale cost of a 3-inch diameter deciduous tree is \$174. The formula developed by Krajicek, et al. for open grown, broad spreading trees (maximum crown width (feet) =  $3.183 + 1.829 * DBH$  (inches)) was then utilized to convert tree diameter to canopy diameter. According to the Krajicek formula, a

3-inch diameter tree should have a crown width of 8.67 feet or crown area of 59 square feet. These dimensions were confirmed as reasonable by staff through several local field samples. Using the median cost of a 3-inch deciduous tree (\$174) and the crown area of a 3-inch diameter tree (59 square feet), the unit canopy cost or tree canopy fee should be \$2.95 per square foot.

Staff advised the commission that this methodology is a fair and reasonable approach for three main reasons. First, tree benefits (aesthetic, storm water management, air quality, etc.) are derived primarily from their canopies, so proposing to place a value to tree canopy is appropriate. Second, in the proposal, tree canopy is valued using the median wholesale tree cost only, whereas requirement tree appraisal is based on the wholesale tree cost, plus the cost of tree installation. Finally, the Krajicck formula and field samples by staff are based on the maximum crown width-to-trunk diameter ratio. A typical tree does not have such a high ratio. If the typical ratio were used, the unit canopy cost would increase.

As explained in the “Comparative Fee-in-Lieu Rates” memo from the February 6, 2012 Planning Commission meeting (table excerpted below), the proposed tree canopy fee in lieu would be low when compared with other fees in the region:



City	Fee	Fee Per Caliper Inch*	Context
City of Tigard (existing)	\$125 per caliper inch	\$125	Based on average cost to purchase, install, and maintain a two-inch caliper replacement tree.
City of Tigard (proposed)	\$2.95 per square foot of canopy	\$87	Based on the median wholesale cost of a three-inch deciduous tree in the Willamette Valley (\$174).
Beaverton	\$90 coniferous \$175 deciduous \$200 street tree	\$45 conifer \$87.50 decid. \$100 st. tree	Costs are based on the purchase and planting of two-inch caliper trees to mitigate for loss of Significant Trees/Groves on a 1:1 basis.
Gresham	n/a	n/a	No established fee in lieu program per planner on duty.
Hillsboro	n/a	n/a	No established fee in lieu program per planner on duty.
Lake Oswego	\$328 per mitigation tree	\$164	Code strongly emphasizes protection over mitigation.
Oregon City	\$290 per mitigation tree	\$145	Fee in-lieu of replacement tree standards of two-inch caliper deciduous or six-foot high conifers.
Portland	\$300 per caliper inch	\$300	Applies to all trees regulated under Portland Code.
Tualatin	n/a	n/a	No established fee in lieu program per planner on duty.
West Linn	\$175 per street tree	\$87.50	Mitigation fees not required. Applicants can pay the City \$175 to install street trees, or \$75 to inspect developer-installed trees.
Wilsonville	Market Price	Market Price	Applications must include the actual cost of the required replacement trees (generally 1:1), with documented bids included with application materials. Per planner on duty.
Vancouver, WA	Market Price	Market Price	Fee in lieu rates based on estimated market cost to purchase, install and maintain required tree units (based upon DBH). Applicant submits documented bid with application materials.

\* Fee per caliper inch column is an approximate conversion by City of Tigard staff to establish a common unit for comparison.

Also, the tree canopy fee in lieu in the proposed code is lower than the mitigation fee in lieu in the existing code:

Existing Tigard Code	Proposed Tigard Code
Mitigation Based	Canopy Based
\$125/caliper inch	\$2.95/sq. ft.
Fee for 12" DBH Tree = \$1,500	Fee for 12" DBH Tree = \$1,463 <sup>1</sup>

The commission asked whether the city is interested in potentially increasing revenue by lowering the fee in lieu (so applicants pay the city rather than plant or preserve trees with development). Staff advised the commission that the purpose of the fee is to create an incentive to plant and preserve trees on private property, rather than to create a revenue source for the city. This is consistent with the direction of the citizen advisory committee.

To the second part of Issue 9 for updating the tree canopy fee, the tree canopy fee is based on the “most recent wholesale median tree cost established by the PNW-ISA.” Therefore, as the PNW-ISA updates their costs, the tree canopy fee would be updated as well.

**Commission Decision on Issue 9:** The commission decided the proposed tree canopy fee is fair and reasonable because it is a conservative appraisal of tree canopy, based on industry standard methodologies. The fee is low when compared with other fees in the region, and is less than the mitigation fee in the existing code.

The commission also decided the tree canopy will be updated as the PNW-ISA updates the wholesale cost of trees in the Willamette Valley. Therefore, no changes to the current proposal were made based on this issue.

**Issue 10,** Should the city establish a protocol for protected tree and tree grove information to be filed with the city and/or county so that information will readily available during title research when purchasing a property?

**Background Information for Issue 10:** At the November 10, 2010, meeting, the Urban Forestry Code Revisions Citizen Advisory Committee consensus was to not require the filing of deed restrictions for preserved and planted trees (see minutes in the project record). Their rationale was that deed restrictions are ineffective methods for notifying people of protected trees and that requiring deed restrictions places excessive burdens on applicants and future owners.

In response to the committee consensus, staff included code language requiring the recording of information on protected trees in the city’s publicly accessible GIS system. This would allow the public to retrieve information on protected trees from their home computers. This ability to

<sup>1</sup> DBH converted to canopy using the Krajicek formula

retrieve information would work in concert with the existing city program of sending mailings to new property owners on a quarterly basis to inform them of the city's urban forestry program and regulations.

The commission requested input from the City Attorney regarding the legal requirements for property owners to maintain trees that were planted by developers during the two-year establishment period. The concern raised by the commission was whether property owners could remove trees that were planted by developers.

Section 6.02.180 (Property Development and Maintenance Requirements, Urban Forestry) would prohibit the unauthorized removal of trees during the two-year establishment period. If a property owner were to remove a tree, they would be subject to penalties in Chapter 1.16 (Civil Infractions). In addition, the City Attorney advised that the developer could contractually obligate a property owner to maintain or allow for the maintenance of trees as part of the purchase and sale agreement. This would provide added assurance that trees would not be removed during the establishment period.

**Commission Decision on Issue 10:** The commission decided that existing regulatory and non-regulatory requirements will help ensure property purchasers are aware of tree requirements for a particular property. Therefore, no changes to the current proposal were made based on this issue.

**Issue 11,** Is the cost of developing urban forestry plans for higher density residential development excessive since the peer review results show the requirements can be met through strategic planting of large stature street trees? Is the cost of developing urban forestry plans for Minor Land Partitions (2 and 3 lot residential developments) excessive since there is less profit associated with these types of developments?

**Background Information for Issue 11:** For part one of Issue 11, the peer review results do demonstrate that for high density residential sites, the effective tree canopy requirements can be met primarily through strategic planting of large stature street trees.

The incentive to maximize street tree canopy is deliberate as street trees are scientifically proven to have particularly high benefit to cost ratios in urban areas. Street trees are increasingly viewed as part of the city's "green infrastructure", as essential as other infrastructure elements, such as street lights and storm drains. However, for street trees to achieve their potential canopy growth, adequate soil resources and proper planting methods are critical.

The proposed code places a high value on the role of arborists in designing and implementing the conditions for sustainable urban tree canopy, which include providing adequate soil volumes. In some cases, a landscape architect is required if alternative techniques are utilized, such as structural soil volumes under pavement. For general tree planting on sites, the project arborist is required to evaluate soils and recommend amendments if needed to support tree growth. The project arborist is also responsible for specifying and monitoring the tree

protection fencing for trees to be preserved, which include neighboring trees close to the property lines.

Staff acknowledges that requiring arborists adds cost to projects, but it is consistent with the direction of the Urban Forestry Code Revisions: to distribute development costs more equitably (rather than only requiring arborists for projects with existing trees) and to focus on establishing healthy future canopy (rather than only penalties for tree removal).

For part two of Issue 11, plans developed by a certified arborist for the preservation and planting of trees is already required for Minor Land Partitions by the existing code. The proposed code would continue to require plans developed by a certified arborist for Minor Land Partitions. An analysis of the buildable lands inventory found that the largest share of buildable sites in Tigard is between 10,000 sq. ft. and 1 acre. This means that Minor Land Partitions likely represent a significant share of future residential development in Tigard.

The cost estimated by staff to develop and implement an urban forestry plan for a Minor Land Partition based on interviews with local arborists is between \$4,000 and \$5,000 (includes inventory field work, site plan, arborist report, revisions based on city review, and implementation inspections). However, costs associated with the existing code for tree removal mitigation can reach \$30,000 for a Minor Land Partition (this is in addition to the cost of developing a tree plan).

During the background research for Issue 11, staff did identify an opportunity for creating efficiencies when developing urban forestry plans, while ensuring high quality design and implementation. The code requires arborists to develop urban forestry plans (which involve developing a tree inventory, protection and planting plan). However, the code also requires a landscape architect when alternative methods such as structural soils are used to meet soil volume requirements. This is because landscape architects have more expertise structural soils. For projects that use structural soils to meet their requirements, it would reduce costs if the landscape architect could also complete the Urban Forestry Plan (without requiring a certified arborist) since landscape architects also have the skill set needed to inventory, protect and plan trees.

**Commission Decision on Issue 11:** The commission decided that the costs for developing urban forestry plans were not excessive for higher density residential development and Minor Land Partitions. This is because the existing code requires arborists for these development types to create tree plans. In addition, since mitigation is proposed to be eliminated, costs will likely decrease, particularly for those projects with existing mature trees. The commission decided it is consistent with the direction of the Urban Forestry Code Revisions: to distribute development costs more equitably (rather than only requiring arborists for projects with existing trees) and to focus on establishing healthy future canopy (rather than only penalties for tree removal).

However, the commission did decide to allow landscape architects, in addition to arborists, to develop urban forestry plans to reduce costs by eliminating the need for hiring two urban forestry professionals.



**Urban Forestry Code Revisions**

# Amendment Requests Document for the Planning Commission

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## City of Tigard Memorandum

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**To:** City Council

**From:** John Floyd, Associate Planner and Todd Prager, Associate Planner/Arborist

**Re:** Amendment Requests Document for Planning Commission

**Date:** June 25, 2012

The first Planning Commission hearing for the Urban Forestry Code Revisions (UFCR) on February 6, 2012 generated 85 amendment requests. These amendment requests were considered by Planning Commission and were used to help focus their discussion on the issues of primary concern.

Amendment requests are listed in chronological order, by date received. Each request is documented with the following:

- Number of the request.
- Name of the requester(s).
- Date(s) of the request.
- A generalized statement of the request(s). In cases of short or specific requests, staff has quoted directly from testimony received. In both cases staff drew from the oral testimony at the February 6, 2012 public hearing and written testimony presented to the Planning Commission.
- Staff comment.
- Staff recommendation.
- Recommended amendment language.

In cases where the requester made the same request multiple times, or where two or more parties commented on the same issue, staff combined them into one entry for purposes of efficiency. Thematic variations or opposing requests are noted in each entry. Staff responses are proportional to the specificity and complexity of the amendment request.

Based on the amendment requests received, staff recommended the Planning Commission amend to the staff proposed UFCR in six places listed below by amendment number. See the full request, response and recommendation for complete information:

- Amendment 11: Minor text amendment to the summary heading of section 18.790.030.A
- Amendment 16: Grant 1.25x bonus credit for planting native trees

- Amendment 36: Reduce the per lot effective tree canopy requirement to 15%
- Amendment 37: Correct scrivener's error in section 18.790.030.C
- Amendment 41: Minor text amendment to remove a repetitive approval criterion for tree removal permit requirements in sensitive lands
- Amendment 72: Correct scrivener's error in ESFE and correct boundaries of significant tree groves #38 and #62 to reflect changes due to recent tree removal

After receiving public testimony and comments on the above changes, the Planning Commission considered the following additional amendments:

- Move the R-12 Zone into Tier 2
- Eliminate the 15% per lot minimum for Tier 2 and 3 districts
- Allow landscape architects, in addition to arborists, to develop urban forestry plans

The Planning Commission approved the amendments in both of the lists above at their May 7, 2012 meeting. The memo, which immediately follows this memo, titled "Outstanding Issues for the Urban Forestry Code Revisions" describes the options that were considered by Planning Commission before reaching their final decision.

Key to Acronyms used in this document:

- CAC: Citizen Advisory Committee
- COT: City of Tigard
- CWS: Clean Water Services
- DBH: Diameter at Breast Height
- DLCD: Department of Land Conservation and Development
- ESFE: Economic, Social, Environmental and Energy [elaborate?]
- GIS: Geographic Information System
- LUBA: Land Use Board of Appeals
- ODFW: Oregon Department of Fish and Wildlife
- OAR: Oregon Administrative Rules
- ORS: Oregon Revised Statute
- SDC: Systems Development Charge
- TDC: Tigard Development Code
- TMC: Tigard Municipal Code
- UFCR: Urban Forestry Code Revisions Project
- UFM: Urban Forestry Manual
- UFP: Urban Forestry Plan
- USDA: United States Department of Agriculture

All references to project materials in the following are to the volumes considered by the Planning Commission, not to the volumes under consideration by the City Council.

**1. Steve Martin, January 11, 2012**

**Amendment Request:** Increase allowed residential density in the MUE zone or remove limitations like the MUE-1 zone to make retaining tree groves economically meaningful.

**Staff Response:** The state's Transportation Planning Rule requires a city proposing a zone change to perform a traffic impact analysis. Allowing additional units is a zone change and the city does not have the budget or time to complete a traffic impact analysis as part of the UFCR project.

The MUE zone is located in the Tigard Triangle and it is a goal of the city to increase density and spur development in this area. Currently, a high capacity land use study is being finalized and a Tigard Triangle plan is in its beginning stage. Both processes are looking at potential changes to the Tigard Development Code and zoning that would make the Tigard Triangle more attractive to developers and a location for increased density. The high capacity land use study and Tigard Triangle plan are more appropriate venues for discussing revising MUE regulations to facilitate the preservation of significant tree groves.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**2. Steve Martin, January 11, 2012**

**Amendment Request:** Building height restrictions in the MUE zone need to be increased or removed to allow increased density. If a maximum height must be set, then it should be at least 85 feet.

**Staff Response:** The CAC consensus recommendation was to allow increased building height for commercial and industrial developments to facilitate the preservation of significant tree groves (see UFCR Volume I, page 17). However, the CAC also recommended protecting surrounding development from impacts associated with excessively tall buildings.

The Tigard Building Division advised 20 additional feet of height is needed to accommodate a additional floor for commercial and industrial buildings. The CAC supported the staff proposal of allowing 20 additional feet of building height as a compromise between providing a meaningful tree grove preservation incentive while not allowing excessively tall buildings (see Section 18.790.050.D.3 and .4, page 323 of Volume II)

If additional building height is desired in the MUE zone to allow increased density, staff recommends further analysis through the high capacity land use study and Tigard Triangle planning processes, for the reasons outlined in the previous staff response.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**3. Steve Martin, January 11, 2012**

**Amendment Request:** Increase the reduction in required canopy coverage or give administrator greater flexibility to reduce.

**Staff Response:** The preservation of significant tree grove canopy would also receive double credit for preservation towards the effective tree canopy requirements. In addition, if 50% of a significant tree grove is preserved the “per lot” effective tree canopy requirement would be waived (see Section 18.790.050.D.5, UFCR, Vol. II, p. 325). The CAC did not recommend further reducing effective tree canopy requirements for the preservation of significant tree groves (UFCR, Vol.,I, p.17).

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**4. Steve Martin, January 11, 2012**

**Amendment Request:** Allow rooftop tree canopy coverage to count toward required tree canopy coverage.

**Staff Response:** Trees planted on rooftops would be granted credit toward effective canopy requirements provided the project arborist determines the planting design is viable in the supplemental arborist report (see UFCR, Volume II, page. 390).

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**5. Steve Martin, January 11, 2012**

**Amendment Request:** Remove as much uncertainty as to density, height restrictions, setbacks and required canopy as possible.

**Staff Response:** The flexible standards and incentives for the preservation of significant tree groves in Section 18.790.050.D are clear and objective standards that provide certainty for applicants. A significant tree grove map will be maintained by the director to identify the location and size of significant tree groves. The eligibility requirements for the flexible standards and incentives are based on square footage and percent preservation of significant tree groves. Flexibility on density, height setbacks, and required canopy are also based on numerical standards that can be calculated during land use review.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**6. John Frewing, January 12, 2012**

**Amendment Request:** The canopy target approach should not be used because it is novel to the United States.

**Staff Response:** The canopy target approach in the draft code is not novel in the United States. Many cities and counties throughout the country, particularly in the southeastern United States, have adopted tree canopy ordinances. The list includes, but is not limited to:

- Louisville, Kentucky.
- Chapel Hill, North Carolina.
- Athens-Clark County, Georgia.
- San Antonio, Texas.
- Many cities/counties in Virginia as result of state enabling legislation adopted in 1989.
- Sherwood, Oregon [In the process of adoption, public hearing before City Council scheduled for March 20].

In 2003 the USDA Forest Service completed a white paper<sup>1</sup> describing and comparing ordinances based on the mature canopy growth of trees from sample cities in the southeastern United States.

While tree canopy ordinances are well established in the United States, it is recommended to tailor ordinance provisions to the local community to ensure broad based support during implementation. This has been a priority during the UFCR, as evidenced through the enhanced public engagement efforts throughout the project (see Process Summary, UFCR Volume I, page 17).

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

<sup>1</sup> Hartel, Dudley R. 2003. **Tree Canopy Ordinances**. Athens, GA: Southern Center for Urban Forestry Research and Information, USDA Forest Service. Accessed via the World Wide Web <<http://www.urbanforestrysouth.org/resources/library/tree-canopy-ordinances/file>> on January 17, 2012.

**7. John Frewing**, January 12, 2012 (written), February 6, 2012 (oral), and February 17, 2012 (written); Opposed by **Ken Gertz**, February 17, 2012

**Amendment Request:** Frewing: “require a calculated percentage of existing trees on the development impact area of a site to remain as a condition of approval.”

Gertz: “It is counterproductive and causes more trees to be cut than saved.”

**Staff Response:** Consistent with the direction of the CAC majority, staff drafted code that did not require a base level of preservation but instead gave bonus credits toward meeting canopy targets to incentivize preservation. The rationale of the committee for not requiring a minimum level of preservation included not unfairly penalizing property owners with trees, allowing flexibility for removing trees that may not be viable or desirable and not limiting infill development (see November 10, 2010 meeting minutes in the project record).

At the April 13, 2011 meeting, the eight of nine CAC members present voted to approve the draft standards, which did not require a base level of preservation.

In response to public testimony received on the issue, planning commission further discussed whether to require a base level of preservation at their March 5, 2012, meeting. The commission indicated their support for the CAC recommendation and did not direct staff to include a base level of preservation in the draft code.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**8. John Frewing, January 12, 2012**

**Amendment Request:** The canopy target approach should not be used because the CAC was not provided any alternatives. “I urge you to start from the survey finding that not all trees should be allowed to be removed, subject to mitigation, and then ask staff to develop alternatives, which are in actual practice around the country.”

**Staff Response:** Alternatives to the proposed code were considered, but the CAC selected the canopy target approach as the preferred alternative.

In working with the CAC, staff developed pre-meeting surveys on each of the code topics to differentiate between items where there was general agreement and general disagreement. When there was general agreement on an item, staff drafted code language consistent with the CAC’s consensus. When there was general disagreement on an item, it was pulled for further discussion at a CAC meeting. After discussion at a CAC meeting, staff drafted code based on the direction of a majority of the CAC members. Staff then returned with draft code language for a consensus decision by the CAC as to whether the draft language was consistent with a majority of the viewpoints of the CAC members.

The question of whether to require a base level of tree preservation was asked as part of the pre-meeting survey for the November 10, 2010, meeting of the CAC. The responses varied from the CAC members, so the question was pulled for further discussion at the CAC meeting.

At their November 10, 2010, meeting, the CAC formed three small groups to discuss the issue in more detail. When reporting back on their discussion results, two of the groups were opposed to requiring a base level of preservation and one of the groups was in favor.

Consistent with the direction of the CAC majority, staff drafted code that did not require a base level of preservation, but instead gave bonus credits toward meeting canopy targets to incentivize preservation. The CAC further discussed and refined the draft code at subsequent meetings. At the meeting on April 13, 2011, the CAC voted on the refined draft standards, which included tiered canopy targets based on zoning, no base level of preservation and bonus credits to incentivize preservation. Of the nine CAC members present, eight supported the draft standards and one did not support the draft standards. Mr. Frewing was the dissenting vote, citing the lack of a base preservation requirement as one of his reasons for dissention.

Staff believes the CAC had ample opportunity to discuss alternatives to the proposed code which could have included a base requirement for preservation. However, the consensus of the CAC was to not require a base level of preservation and the proposed code reflects that consensus.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**9. John Frewing, January 12, 2012**

**Amendment Request:** The draft code ignores smaller sites, which predominate in Tigard. Revise so that code applies to infill development and redevelopment. “The City of Portland has set a good example, requiring compliance with the new urban forest code when a specified major change occurs on an existing site – e.g., a specified change in square foot of the development or a specified monetary addition to a development. Such provisions should be included in the Tigard Code.”

**Staff Response:** The draft code does not ignore smaller sites and redevelopment sites in Tigard.

The draft code standards are applicable to Minor Land Partitions (see Section 18.790.020, page 295 of UFCR Volume II) when lots are divided to create two or three lots. These infill sites represent a significant portion of potential future development and applying the draft canopy standards to Minor Land Partitions support Tigard’s long-term urban forestry goals.

The draft code standards are also applicable to larger projects such as Subdivisions and Planned Developments, redevelopment projects that require Conditional Use Permits, Downtown Design Reviews and Site Development Reviews (see Section 18.790.020, page 295 of UFCR Volume II). Redevelopment projects are triggered by activities that exceed specified thresholds and represent significant opportunities to increase canopy by applying the draft code standards in commercial, industrial and institutional areas of Tigard.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A



**10. John Frewing, January 12, 2012**

**Amendment Request:** The draft code should be revised to allow public input on future changes.

**Staff Response:** The public would have input opportunities for changes to the code and administrative rules in the UFM.

Changes to the development code (Title 18) require public notice and opportunity for appeal as governed by Section 18.390.060 of the Tigard Development Code.

Changes to the municipal code (non-Title 18) are required by ordinance, which is noticed publicly through the City Council agenda and packet and governed by Chapter VIII of The City of Tigard Charter. Council practice is to adopt potentially contentious municipal code ordinances (e.g. urban forestry), following a public hearing, to consider any public input prior to voting.

Changes to administrative rules in the UFM require public notice and opportunity for appeal as governed by Section 2.04.070 of the Tigard Municipal Code.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**11. John Frewing, January 12, 2012 and February 17, 2012; Opposed by Ken Gertz, February 17, 2012**

**Amendment Request:** Frewing: The construction of the draft code results in the canopy approach not being enforceable. Code relies upon submittal requirements, not approval criteria. Canopy cover provisions lack certainty as required by Oregon Revised Statutes and LUBA opinions. Include more specific approval criteria and move definitions from Title 8 to Title 18. (January 12)

“I ask that staff prepare appropriate changes to include approval criteria in the development code...[approval criteria] must be clear and objective...both the code and UFM include standards which are not clear and objective, for example (Vol II):

- p. 301 “applicable approval criteria”
- p. 303 “any conflicting requirements”
- p. 307 “unreasonable risk”, “adequate emergency access”
- p. 309 “minimum required to achieve the desired effect”, “preference”
- p. 319 “balancing the considerations”
- p. 387 “unless otherwise approved by the city manager or designee” (February 17)

Gertz: “Be sure the tree plan is a submission requirement and not an approval criteria.”

**Staff Response:** Staff, in conjunction with the City Attorney, has developed code language to ensure the tree canopy cover requirements in the draft code are enforceable for applicable land use permits.

Chapter 18.790 of the code, and Section 10 of the UFM, require tree canopy cover requirements to be met for certain Type II and III land use permits (CUP, DDR, MLP, PD, SLR, SDR, and SUB). This is clearly stated in code Sections 18.790.020 and 18.790.030 (see UFCR Volume II, pages 301 and 303 respectively). The approval criteria in the chapters, for each of these land use permits, references compliance with all applicable development requirements, which include the tree canopy cover requirements in Chapter 18.790 and Section 10 of the UFM. This continues current administration of the code regarding the applicability of the requirements in Chapter 18.790.

However, staff realizes the summary heading in Section 18.790.030.A may be confusing because it uses the term “submittal requirements.” Staff recommends removal of the word “submittal” from the summary heading for clarification purposes.

**Staff Recommendation:** Revise proposed code based on this amendment request.

**Amendment:** (Section 18.790.030.A)

“A. Urban Forestry Plan ~~Submittal~~ Requirements. An urban forestry plan shall:”

...

<b>12. ODFW, January 20, 2012</b>
<b>Amendment Request:</b> Add intact forest stands along Fanno Creek in the Hall St/Burnham/Hunziker area. Supply ODFW with process for selection of tree groves and allow for public review.
<b>Staff Response:</b> Staff met with the Planning Commission, City Council and Winterbrook Planning to develop the criteria for initial review and selection of significant tree groves. Based on those meetings, which included consideration of available budget, the initial review and selection criteria included contiguous groves of native trees over two acres in canopy area. Metro tree canopy maps, GIS technology and field visits were used to identify groves that fit the criteria (see Tigard Tree Grove Assessment Report, UFCR Volume II, page 113). Specific groves that are not included in the inventory likely did not meet the two-acre size threshold.  The ESEE, which was not yet completed at the time the request for comments, was sent to affected agencies. As requested, staff has provided ODFW the ESEE. The ESEE is available for public review as well in UFCR Volume III, page 17.
<b>Staff Recommendation:</b> Do not revise proposed code based on this amendment request.
<b>Amendment:</b> N/A

<b>13. ODFW, January 20, 2012</b>
<b>Amendment Request:</b> Strike that ‘existing’ trees may be used as replacement trees throughout the code and UFM.
<b>Staff Response:</b> Section 10, Part 3 of the UFM, specifies that the effective tree canopy requirements for development can be met through any combination of planting new trees (based on their mature canopy sizes) or preserving healthy existing trees over 6-inch DBH (which receive double credit for their existing canopy sizes). However, there may be healthy existing trees on a development site that are less than 6-inch DBH that could provide viable future canopy growth.  If existing trees less than 6-inch DBH were not eligible for credit based on their mature canopy sizes, there could be an incentive to remove them and replant with new trees. Usually, existing trees have established root systems and higher chances of survival than newly planted trees.
<b>Staff Recommendation:</b> Do not revise proposed code based on this amendment request.
<b>Amendment:</b> N/A

**14. ODFW, January 20, 2012; and Sue Beilke, February 6, 2012**

**Amendment Request:** Add language in the code and UFM to support preservation of Oregon white oak and appropriate replacement of oak with oak, if removal is necessary.

**Staff Response:** The CAC consensus was for flexible standards and incentives to preserve trees rather than requiring preservation (see Guiding Principles, UFCR Volume I, page 16). The flexible standards and incentives for preservation include lot size averaging, setback adjustments, sidewalk adjustments, parking adjustments and landscaping adjustments (see Section 18.790.050.C). In addition, double credit towards effective tree canopy requirements in Section 10, Part 3 of the UFM, is intended to incentivize the preservation of existing trees.

The CAC consensus was also to allow a mix of native and non-native trees to meet effective tree canopy requirements (see November 10, 2010, pre-meeting survey in the project record). This allows applicants to select the most appropriate trees for preservation and planting, based on site conditions. The specific requirement of replacing oak with oak was not discussed by the CAC.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**15. ODFW, January 20, 2012**

**Amendment Request:** “Add language in the UFM and Code to support leaving 5-20 feet of the trunk of a hazard tree located in designated sensitive lands, natural areas, or a significant tree grove if hazard tree abatement requires much of the tree to be removed.”

**Staff Response:** The CAC discussed this concept but the consensus recommendation was to allow the removal of wildlife snags through the same process as for hazard trees, trees causing damage, etc. (see January 8, 2011, meeting minutes in the project record). Their reasoning was that people would generally not go out of their way to remove wildlife snags from natural areas, unless there is good reason to do so. The existing code actually requires the removal of wildlife snags. The proposed code would allow the removal of wildlife snags, but not require their removal if they are not hazards to people or property. The CAC felt this moves the city in right direction.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**16. ODFW, January 20, 2012 and December 21, 2010 (resubmitted on January 20, 2012)**

**Amendment Request:** Add language in the code and UFM that requires 50 percent of newly planted trees to be native in a development/landscape plan. (January 20, 2012)

Consider requiring only native species be planted in developments. Require street trees be native species. (December 21, 2010 and resubmitted on January 20, 2012)

**Staff Response:** When surveyed on the issue, the CAC consensus supported the city allowing the project designer to select a mix of native and non-native trees, depending on site conditions (see November 10, 2010, pre-meeting survey in the project record).

However, in response to public testimony received on the issue, the Planning Commission further discussed whether to increase the relative amount of native tree planting at their March 5, 2012, meeting. The commission indicated support for providing bonus credits towards effective tree canopy cover requirements for the planting of native trees. They did not indicate support for requiring planting of a certain percentage of native trees. Bonus credits for native tree planting would encourage the planting of natives, while allowing the project designer to select the most appropriate trees depending on site conditions.

**Staff Recommendation:** Revise proposed UFM based on this amendment request.

**Amendment:** (Section 10, Part 3.M.2)

... “

- c. The mature canopy area (in square feet) of all open grown trees in the tree canopy site plan, except for those from the native tree list in the Urban Forestry Manual, to be planted and maintained within the overall development site and each lot or tract (or associated right of way, excluding median trees).
- d. 1.25 times the mature canopy area (in square feet) of all open grown trees from the native tree list in the urban forestry manual in the tree canopy site plan to be planted and maintained within the overall development site and each lot or tract (or associated right of way, excluding median trees).
- e. 1.25 times ~~¶~~the mature canopy area (in square feet) of each stand in the tree canopy site plan to be planted and maintained within the overall development site and each lot or tract (or associated right of way, excluding median trees). The eligible mature tree canopy area shall be the portion directly above the overall development site and each lot or tract (or associated right of way).
- f. Divide the tree canopy area (calculated per part 3.M.2.a-~~dc~~ above) for the overall development site and each lot or tract by the total area of the overall development site and each lot or tract respectively to determine the effective tree canopy cover for the overall development site and each lot or tract.” ...

(note: above lettering is revised due to the insertion of item d)

(note: for consistency the Example Supplemental Arborist Report Template in Appendix 9 of the UFM is recommended for amendment per the attached)

**17. ODFW, January 20, 2012 and December 21, 2010 (resubmitted on January 20, 2012)**

**Amendment Request:** Add language in the code and UFM that requires native trees removed to be replaced with native trees.

**Staff Response:** The CAC consensus recommendation was to allow a mix of native and non-native trees to meet effective tree canopy cover requirements (see November 10, 2010, pre-meeting survey in the project record). A replacement requirement for native trees was not discussed by the CAC. However, Clean Water Service has requirements for native tree planting and replacement within vegetated corridors, which would not be precluded by the proposed code requirements.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**18. ODFW, January 20, 2012 and December 21, 2010 (resubmitted on January 20 2012)**

**Amendment Request:** Strike criterion B.2 from Section 6, Part 1 of the UFM, which allows the removal of dead trees from sensitive lands.

Consider implementing a snag removal permitting process, similar to the tree removal permitting process, encouraging avoidance first, trimming second and requiring removal mitigation third.

**Staff Response:** Criterion B.2 in Section 6, Part 1 allows the removal of dead trees from sensitive lands.

The CAC recognized the importance of dead trees and wildlife snags but recommended to allow their removal through the same process as hazard trees, trees causing damage, etc. (see January 8, 2011, meeting minutes in the project record). Their reasoning was that people would generally not go out of their way to remove wildlife snags from natural areas unless there is a good reason to do so. The existing code actually requires the removal of wildlife snags. The draft code would allow the removal of wildlife snags, but not require their removal if they are not hazards to people or property. The CAC felt this moves the city in right direction.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

<b>19. ODFW, January 20, 2012</b>
<b>Amendment Request:</b> Strike “In addition to newly planted trees, existing trees less than 6” DBH can be used as replacement trees...” in the UFM Section 6.
<b>Staff Response:</b> Chapter 8.12 of the proposed code requires tree removal permits for native trees in sensitive lands that are 6-inch DBH or greater. Permit approval would be contingent on replacement with native trees on a 1:1 basis by Section 6 of the UFM. If existing trees less than 6-inch DBH were not eligible for credit, there could be an incentive to remove them and replant with new trees. Usually, existing trees have established root systems and a higher chance of survival than newly planted trees.
<b>Staff Recommendation:</b> Do not revise proposed code based on this amendment request.
<b>Amendment:</b> N/A

<b>20. ODFW, January 20, 2012; and Sue Beilke, February 6, 2012</b>
<b>Amendment Request:</b> Provide language in the UFM specifically for Oregon white oaks impacted in Sensitive Lands.
<b>Staff Response:</b> The consensus recommendation of the CAC was to develop consistent standards for tree removal permits outside the development process, without regulating additional tree situations (see Guiding Principles, UFCR Volume I, page 18). Native trees 6-inch DBH or greater in sensitive lands would be permitted for removal administratively by Section 6 of the UFM, if they are hazardous, dead, in advanced decline, causing property damage, approved for removal with development, a fire hazard or thinned for forest health under arborist or forester supervision. Replacement with native trees would be required on a 1:1 basis by Section 6 of the UFM. Otherwise, following a public review process and approval through a discretionary process by a city board or committee, removal may be permitted (see Section 8.12.040.B, UFCR Volume II, page 91). The board or commission could use their discretion in conditioning replacement. Elevated preservation and replacement requirements for Oregon white oak trees were not specifically discussed by the CAC.
<b>Staff Recommendation:</b> Do not revise proposed code based on this amendment request.
<b>Amendment:</b> N/A

<b>21. ODFW, January 20, 2012; and Sue Beilke, February 6, 2012</b>
<b>Amendment Request:</b> Include code specifically supporting Oregon white oak conservation within the city. Enroll all Oregon white oaks 80 years or older on city property as Heritage Trees, to raise oak conservation awareness. Identify mature oaks on private land throughout the city, and notify landowners of the resource they have on their property and the support services offered from the city if enrolled as a Heritage Tree.
<b>Staff Response:</b> The CAC consensus recommendation was for voluntary Heritage and Significant Tree programs, rather than enrolling trees in these programs without landowner consent (see Chapter 8.18, UFCR Volume II, page 101).
<b>Staff Recommendation:</b> Do not revise proposed code based on this amendment request.
<b>Amendment:</b> N/A

**22. ODFW, January 20, 2012**

**Amendment Request:** Require a minimum of 1 replacement tree if a Heritage tree is removed in Section 9 of the UFM.

**Staff Response:** Section 9 of the UFM does not require replacements because Heritage trees are uniquely designated and highly protected due to their age, size, species, horticultural quality or historic importance. Replacement trees would not necessarily replace the unique values for which the original Heritage trees were designated. Therefore, recognizing and protecting replacement trees as if they were Heritage trees would not be appropriate.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**23. ODFW, January 20, 2012**

**Amendment Request:** Section 18.790.050.D references Section 10, Part 5, of the UFM, Significant Tree Grove Preservation Considerations often. Part 5 should be modified so that dead or dying trees that provide wildlife value, and that do not pose a threat to humans or structures, do not indirectly affect the rating of the Significant Tree Grove by the arborist.

**Staff Response:** The CAC consensus was for the list of considerations to act as general guide for preserving viable tree groves. Their preference was for flexibility in the considerations to allow preservation decisions to be made on a case-by-case basis (see January 8, 2011, meeting minutes in the project record). The considerations do not preclude dead or dying trees that provide wildlife value, as long as they are not hazards to people or property.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**24. ODFW, January 20, 2012**

**Amendment Request:** Include number of dead/dying trees in tree preservation and removal site plan in Section 10, Part 1 or Part 3, of the UFM.

**Staff Response:** Section 10 of the UFM would require all trees within or near the development impact area to be inventoried and numbered on the tree preservation and removal site plan. This includes dead and dying trees.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A



**25. ODFW, January 20, 2012**

**Amendment Request:** Strike the base requirement for 10,000 square feet of significant tree grove canopy not already protected by floodplain, stream corridor and/or wetland regulations, to qualify for significant tree grove preservation incentives and replace with more appropriate language or leave out.

**Staff Response:** The CAC consensus recommendation was to require a base preservation requirement to utilize the tree grove preservation incentives (see Guiding Principles, UFCR Volume I, page 17). Their reasoning was, for applicants to benefit from the tree grove preservation incentives in Section 18.790.050.D (minimum density reduction, density transfer, additional building height, etc.), there should be corresponding community benefit. For example, 20 feet additional building height should not be allowed for preserving one tree that happened to be part of a significant tree grove. The proposed base preservation requirement is 10,000 square feet, or roughly ¼ acre of tree grove canopy, to be eligible for the tree grove preservation incentives.

In many cases, development is already limited or prohibited in floodplains, stream corridors and wetlands by other regulations. Therefore, the proposal is not to provide incentives for preserving tree groves in areas already protected by other regulations. Instead, the proposal is to provide incentives for preserving at least 10,000 square feet of at-risk tree groves, not already protected by other regulations.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**26. ODFW, December 12, 2010 and resubmitted on January 20, 2012**

**Amendment Request:** Require planting plans from developers that consider spatial arrangement and vertical structure, as well as species and quantity of trees.

**Staff Response:** The Urban Forestry Plan requirements in Section 10 of the UFM address tree planting and preservation requirements. There are standards for spatial arrangement, species, and quantity of trees based on tree care industry standards. Vertical structure standards such as requiring shrubs, herbs, and other understory plants are out of scope for the UFCR. It is important to note that other standards such as landscaping and screening requirements in Chapter 18.745 and native planting required by Clean Water Services' Design and Construction Standards would continue to apply and result in vertical structure.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**27. ODFW, December 12, 2010 and resubmitted on January 20, 2012**

**Amendment Request:** Implement a tree removal season: September 1<sup>st</sup> to February 1<sup>st</sup>, with special consideration given to the months of August and March. This is for purpose of protecting nesting birds protected by the Migratory Bird Treaty Act.

**Staff Response:** The Migratory Bird Treaty Act is a federal law, administered by the US Fish and Wildlife Service, that protects specifically listed species of birds. The UFCR addresses the preservation, planting and maintenance of trees. It would be out of scope of the UFCR to implement these federal regulations, through such restrictions as a tree removal season, aimed at protecting listed species of birds.

When removing trees, it is the sole responsibility of applicants to comply with all applicable state and federal regulations, such as the Migratory Bird Treaty Act. It is the city's practice however to highlight the applicants' responsibilities to comply with applicable regulations when issuing tree removal permits.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**28. ODFW, December 12, 2010 and resubmitted on January 20, 2012**

**Amendment Request:** Require that tree habitat potential be included in tree inventories.

**Staff Response:** As further explained in the Tree Grove ESEE Analysis beginning on UFCR Volume III, page 27, wildlife habitat value and connectivity were key evaluation criteria in the inventory and selection of significant tree groves. The proposed Comprehensive Plan Amendment would establish an overlay district for significant tree groves, making them eligible for regulatory incentives and flexible standards for preservation in Section 18.790.050.D.

The Statewide Goal 5 rule requirements require adoption of the inventory and protection program prior to implementing regulations that protect wildlife habitat during the development process. The city cannot require additional discovery and protection of wildlife habitat during the development process without adhering to Goal 5 rule requirements.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**29. John Frewing, January 23, 2012**

**Amendment Request:** Concerned about the methodology used to estimate potential tree canopy cover and implications for the draft code, as “the [November 7, 2011] memo is not understandable to me or the general public...could you have the consultant try again (maybe with graphics) how they came up with the ultimate potential for canopy cover in Tigard (i.e. the 100% of canopy coverage which is the start for the UFP goal of 40% canopy coverage)?”

**Staff Response:** The canopy standards memo in the UFCR (Vol. III, page 7), demonstrates why staff believes the effective tree canopy standards in the draft code are achievable. The approach and results for estimating possible tree canopy are attached to the canopy standards memo.

To simplify, the assumptions are that tree canopy is possible on typical lots, except within building footprints and 50% of lot area not already occupied by tree canopy (to account for open space preference and poor growing conditions).

Based on these assumptions, tree canopy for each zoning district exceed the minimum that is required in the draft code. More importantly, the requirements in the draft code have been tested through the peer review phase, and are shown to be achievable on a range of actual development projects (see Peer Review, UFCR, Vol. II, p. 463).

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**30. John Frewing, January 23, 2012**

**Amendment Request:** Include a provision to the effect that the same root volume should not be counted for more than one tree.

**Staff Response:** The Soil Volume Memo (UFCR, Vol. III, p. 13) explains that the soil volumes standards in the draft code are based on current tree care industry research. In reviewing this research, staff could not find any provisions for discounting soil volume to account for situations when multiple trees share rooting space. In the proposed code, the soil volume standards are for street and parking lot trees. These tree types are required to be spaced at distances to minimize canopy and root competition. Therefore, staff does not believe shared soil volumes calculations should be discounted.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**31. John Frewing, January 23, 2012**

**Amendment Request:** The Goal 5 rule requirements should apply to tree canopy cover regulations, soil volume regulations, etc., in addition to the tree grove preservation incentives.

**Staff Response:** The Goal 5 rule requirements are not applicable to canopy cover regulations, soil volume regulations or other development code regulations other than the tree grove preservation incentives in Section 18.790.050.D. The Department of Land Conservation and Development (DLCD) staff addressed this question directly, in response to the city’s request for clarification on this issue, during the Comprehensive Plan Amendments incorporating urban forestry goals and policies (see DLCD correspondence in the project record). DLCD explained that:

“With regard to establishing policies to protect and encourage the growth of trees within the city, although there may be some shared objectives, there is not necessarily a direct link between such a policy and Goal 5 . . .the applicability requirement for OAR 660-023-0250 is very specific...[in relevant part, to actions] that create or amend a resource list or a portion of an acknowledged plan or land use regulation adopted in order to protect a significant Goal 5 resource.”

The proposed tree canopy cover and soil volume requirements do not create or amend a resource list or land use regulation adopted in order to protect a Goal 5 resource (see summary of the city’s Goal 5 program in the project record).

**Staff Recommendation:** Do not revise the proposed code or ESFE analysis based on this amendment request.

**Amendment:** N/A

**32. Cleon Cox, February 6, 2012**

**Amendment Request:** Fees and taxes associated with these code amendments should not negatively impact property owners.

**Staff Response:** The proposed code has been designed so it is achievable on the typical range of development scenarios in Tigard (see Peer Review, UFCR, Vol. II, p. 463). The proposed tree canopy fee is an option for not providing trees and is a conservative estimate for the value of tree canopy (UFCR, Vol. III, p. 15).

Specific permit costs are established by the City Council through the Master Fees and Charges Schedule and allow for partial or full administrative cost recovery. However, one of the CAC’s Guiding Principles is to provide a low- or no-fee administrative review process for the most common tree permits (UFCR, Vol. I, p. 19).

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**33. Brian Lewis, February 6, 2012**

**Amendment Request:** Agrees with Mr. Frewing that tree count is better than tree canopy requirements. There should be a minimum tree count.

**Staff Response:** When drafting the Development Code revisions, staff studied a tree density requirements (requiring X number of trees per square feet of development area, sometimes referred to as “tree count”) and compared it with a tree canopy requirements (requiring X square feet of canopy per square feet of development area). The tree canopy requirements was selected as the preferred alternative for the following reasons:

- The tree canopy requirement allows more flexibility for the project designer to meet code requirements due to the wide variation of canopy shapes by species. A tree density requirement presents the project designer with more limited options to meet numerical tree planting requirements.
- The tree canopy requirement is more consistent with urban forest science and the city’s long-term urban forestry goals. The benefits of trees (economic, environmental and social) are derived primarily from their canopies, rather than number of trees. The tree canopy requirement encourages large stature, appropriately spaced trees, which have the highest benefit/cost ratios. A tree density requirement allows small stature, closely spaced trees to meet numerical requirements.
- The tree canopy requirements requires the project designer to consider future canopy growth, which helps ensure that trees are properly placed within a site to become long-term amenities. The tree canopy requirement encourages appropriate tree spacing and setbacks from buildings by highlighting mature canopy growth, whereas a tree density requirement focuses on planting a certain number of trees and does not take mature growth into account.
- The tree canopy requirement provides more consistency in development outcomes. For example, a parking lot planted to meet a numerical tree density requirement can look very different after future growth, depending on whether small ornamental trees or large shade trees are selected. The tree canopy requirement helps normalize outcomes.
- Planting trees to meet either a tree canopy requirement or a tree density requirement both rely upon successful establishment and long-term maintenance by property owners. However, the tree canopy requirement focuses more on long-term growth during the initial design phase, so that trees are more likely to become long-term site amenities.

In response to public testimony received on the issue, the Planning Commission further discussed their preference for a tree density versus a tree canopy requirement at their March 5, 2012, meeting. The commission indicated support for continuing with a tree canopy requirement.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**34. Ken Gertz, February 6, 2012**

**Amendment Request:** 18.360.090 - The wording “where possible” is vague and opens the tree plan to appeal. Change to a clear and objective requirement and word to allow development to maximum allowed.

**Staff Response:** This phrase “where possible” in Section 18.360.090 is existing language addressing the relationship of buildings to the natural and physical environment. Because of its broad application, revising this phrase is out of scope for the UFCR.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**35. Ken Gertz, February 6, 2012; Stonebridge Homes, February 14, 2012; and JT Smith Companies, February 15, 2012**

**Amendment Request:** 18.530.050.B - Change requirement for street trees from 3” minimum caliper to 2” minimum caliper.

**Staff Response:** The requirement for three-inch caliper trees in Section 18.530.050.B is an existing code provision when increasing lot coverage from 75% to 80% in Industrial Zoning Districts. Because this existing provision was likely a compromise as part of a past code revision project, staff recommends retaining the provision.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**36. Ken Gertz, February 6, 2012; Opposed by John Frewing, February 17, 2012**

**Amendment Request:** Gertz: 18.790.030.B - Remove 20% minimum canopy requirement, canopy coverage should be averaged out across the site.

Frewing: "I support this idea, with the provision that if a lot has even a single tree > 6 inches in diameter dbh, one such tree must be saved on each lot."

**Staff Response:** Early in the process, staff initially proposed the tiered tree canopy requirements to be met on a lot-by-lot basis, in addition to the overall development. The CAC recommended allowing averaging of canopy across the overall development site, while setting a minimum per lot tree canopy requirement. Staff proposed a 20% per lot minimum requirement at the April 13, 2011, meeting and the committee approved the proposal by consensus (see minutes in the project record). The rationale for having a minimum per lot tree canopy requirement is to spread the distribution of trees, and therefore tree benefits and maintenance responsibilities, more evenly across a development site.

In response to public testimony received, the Planning Commission expressed interest at their March 5, 2012, meeting regarding potentially providing more flexibility on this issue. The Planning Commission considered that reducing the per lot tree canopy requirement would likely not raise major issues since it was not a major part of the deliberations when developing the proposal (see summary of community ideas and concerns, UFCR Volume I, page 36). Also, street tree requirements in Section 18.745.040 would still apply and support an evening of the distribution of trees across the development site. Finally, if the per lot tree canopy requirement were reduced, the effective tree canopy requirement for the overall development site would be reduced, which may be a desired side effect for the commission.

In reviewing past development projects that were peer reviewed by AKS Engineering and Forestry, staff found only four residential lots that had to plant additional trees in backyards to meet the 20% per lot minimum requirement (UFCR, Volume II, p. 463 and the additional peer review provided in the March 5, 2012, Planning Commission meeting packet). While the sample size is small, staff found that if the per lot minimum were reduced to 15% it could be met by planting one medium stature street tree in two of the lots, thus eliminating trees in the backyards. The unique configurations of the other two lots require one backyard tree to meet the 15% per lot minimum requirement. Therefore, staff recommends the commission consider reducing the per lot minimum to 15%.

**Staff Recommendation:** Revise proposed code and UFM based on this amendment request.

**Amendment:** (Section 18.790.030.B)

"B. Tree Canopy Fee. If the supplemental arborist report demonstrates that the applicable standard percent effective tree canopy cover in Section 10, part 3, item N. will not be provided through any combination of tree planting or preservation for the overall development site (excluding streets), or that the ~~20~~ 15 percent effective tree canopy cover will not be provided through any combination of tree planting or preservation for any individual lot or tract (when the overall development site meets or exceeds the standard percent effective tree canopy cover), then the applicant shall provide the city a tree canopy

fee according to the methodology outlined in Section 10, part 4 of the UFM.

(Section 18.790.050.D.5)

1. Adjustment to Minimum Effective Canopy Requirement. The requirement for ~~20~~ 15 percent effective tree canopy cover per lot is not required when:

(Section 18.790.050.D.5, Commentary)

The fifth flexible and incentive based standard is an adjustment to the minimum effective canopy requirement. A standard Urban Forestry Plan requires ~~20~~ 15 percent effective tree canopy per lot in addition to the overall development site effective canopy requirement which is based on zoning (25, 33 or 40 percent).

(UFM Section 10, Part 3.O)

O. If the percent of effective tree canopy cover is less than the applicable standard percent in item n above for the overall development or less than ~~20~~ 15 percent for any lot or tract (when the overall development site meets or exceeds the standard percent effective tree canopy cover in item n), calculate the tree canopy fee required to meet the applicable standard percent effective tree canopy cover in item n above for the overall development site or ~~20~~ 15 percent effective tree canopy cover for each lot or tract (only if the overall development site meets or exceeds the standard percent effective tree canopy cover in item n but individual lots or tracts do provide ~~20~~ 15 percent effective tree canopy cover) according to the methodology in Section 10, part 4 of the Urban Forestry Manual.

(UFM Section 10, Part 4.A.2)

2. In cases where the overall development site meets the standard percentage in part 3.N above yet the percentage of effective tree canopy cover is less than ~~20~~ 15 percent for any individual lot or tract, find the difference (in square feet) between the proposed effective tree canopy cover and ~~20~~ 15 percent effective tree canopy cover for each deficient lot or tract and multiply the difference (in square feet) by:” ...

**37. Ken Gertz, February 6, 2012**

**Amendment Request:** 18.790.030.C - “you skipped C and went directly to D”

**Staff Response:** This scrivener’s error should be corrected. It is important to note the city recorder is authorized to correct such errors by Section 1.01.080 of the Tigard Municipal Code.

**Staff Recommendation:** Revise proposed code based on this amendment request.

**Amendment:** (18.790.030.C)

“~~D.C.~~ Tree Canopy Fee Use. Tree canopy fees provided to the city shall ... “



**38. Ken Gertz, February 6, 2012 and February 17, 2012; Opposed by John Frewing, February 17, 2012**

**Amendment Request:** Gertz: 18.790.050.C.3 - Add language allowing sidewalks in easements with reduced setbacks for preservation and planting.

Frewing: "I oppose such a change. Such a change is simply a ruse to increase density by about 10 percent on a given project, allowing 11 lots on a typical site rather than 10 lots. This translates to about a 10 percent increase in profit for the land developer without any corresponding public benefits, since the already required planter strip will contain trees."

**Staff Response:** The city's development engineer is already authorized to approve sidewalks in easements. It is not necessary to restate the requirement in Section 18.790.050.C.3.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**39. Ken Gertz, February 6, 2012**

**Amendment Request:** 18.790.070.A&B is confusing and ambiguous. Change language to add more clarity.

**Staff Response:** The proposed language in Section 18.790.070 is clear. Modifications to the Urban Forestry Plan component of an approved land use permit are allowed through a Type I process. This is documented in the guiding principles for the urban forestry standards for development (see UFCR Volume I, page 16) and in the commentary for the proposed code amendments (see UFCR Volume II, page 332). Certain minor modification such as removing hazard trees, changing tree planting plans, and modifying tree protection fencing, when approved by the project arborist, would be allowed outright without a permit by Section 18.790.070.B.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**40. Ken Gertz, February 6, 2012 and February 17, 2012**

**Amendment Request:** 18.790.070.b - Modification process should allow payment of fee in lieu as an allowed change to an approved canopy plan.

**Staff Response:** The proposed modification process in Section 18.790.070 provides significant flexibility for applicants to modify their approved urban forestry plans after land use approval. While the modification process is intended to allow applicants to adapt their plans in response to unforeseen circumstances during the course of development, staff believes this should be balanced with community expectation of a certain amount of trees post development. For example, if an applicant's approved plans are to plant 25% effective tree canopy cover for a development, and they then modify those plans by paying a fee in lieu of providing any tree canopy, community expectations may not be met.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**41. Ken Gertz, February 6, 2012 and February 17, 2012**

**Amendment Request:** 6-1.A.6 [section not found, possibly referencing B.6] - Change approval criterion to trees not listed in the native tree list for clarity.

“Section 6 part 1 C” Don’t include weed trees for replacement/permits

**Staff Response:** Chapter 8.12 of the proposed code requires permits for the removal of native trees over 6 -inch trunk diameter in sensitive lands. This would be a revision from current existing code that requires permits for the removal for all trees over 6-inch trunk diameter in sensitive lands.

The approval criteria for removal are listed in Section 6, Part 1 of the UFM. Criterion B.6, in Section 6, Part 1, says “the tree is listed on the nuisance tree list.” This criterion is unnecessary because trees on the nuisance tree list are not native, and therefore not subject to permit requirements by Chapter 8.12. This criterion could be struck.

The replacement criteria in Section 6, Part 2 of the UFM specify that “replacement trees shall be selected from the native tree list in the UFM.” Therefore, nuisance (weed) trees would not be allowed as replacements.

**Staff Recommendation:** Revise proposed UFM based on part one of this amendment request.

**Amendment:** (Section 6, Part 1.B.6)

~~6. “The tree is listed on the nuisance tree list.~~

(note: numbering of the section is revised and cross reference to the Nuisance Tree List in the sidebar is struck due to the deletion of item 6)

(Section 6, Part 1.C)

C. Unless removed for thinning purposes (part 1.B.44 10 above) the city manager or designee shall condition the removal of each tree in sensitive lands upon the planting of a replacement tree in accordance with the Sensitive Lands Tree Replacement Standards in Section 6, part 2 of the UFM.”

**42. Ken Gertz, February 6, 2012**

**Amendment Request:** Section 10, Part 2 of the UFM - Requests Tree Canopy Site Plan requirements be amended to allow a more general delineation of trees to be planted to allow an applicant to not locate every tree on the tree plan, and allow movement of trees during building permit review.

**Staff Response:** Section 18.790.070.B.2 allows modification of the quantity, location, or species of trees to be planted in the tree canopy site plan after land use approval administratively without an additional permit. This provides flexibility for necessary changes during the building permit approval process.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**43. Ken Gertz, February 6, 2012 and February 17, 2012**

**Amendment Request:** Section 10, Part 2 - Medium size street trees should be allowed in a standard planter strip to allow more canopy over streets.

**Staff Response:** Table 18.810.1 in the Tigard Development Code lists the minimum landscape width for standard street cross sections as five feet (excluding curbs). Section 10, Part 2.L.6, of the UFM specifies that medium stature street trees shall not be planted with the center of their trunks closer than 2½ feet from any hard surface paving. The specifications in the UFM were designed to allow medium stature street trees to be planted in standard landscape strips.

**Staff Recommendation:** Do not revise proposed UFM based on this amendment request.

**Amendment:** N/A

**44. Ken Gertz, February 6, 2012**

**Amendment Request:** Page 393, J.6, - Correct typo “; and” at the end of the sentence.

**Staff Response:** Scrivener’s errors should be corrected. The proposed code and UFM will be further reviewed to ensure the format of lists conform to AP standards. It is important to note the city recorder is authorized to correct such errors by Section 1.01.080 of the Tigard Municipal Code.

**Staff Recommendation:** Do not revise proposed UFM at this time based on this amendment request. Consult AP standards to ensure standardized format for lists.

**Amendment:** N/A

**45. Ken Gertz, February 6, 2012 and February 17, 2012**

**Amendment Request:** Section 10, Part 3.M.1 - Subtract “problematic terrain” from area calculations from each lot and tract, including: wetlands, water quality areas, rock outcrop areas, steep slopes, walkways, private drives, flags of flag lots, soil conditions and other situations where the planting of trees would not be viable as represented by the project arborist.

**Staff Response:** The UFCR CAC reached consensus to draft achievable effective canopy standards for development that are tiered based on zoning district (see Guiding Principles, UFCR Volume I, page 15).

Staff and outside consultants tested the tiered standards on a wide range of development projects to ensure the draft effective canopy standards are achievable, result in a reasonable balance between trees and development and do not force payment of fees in lieu or discretionary review for typical projects. The test projects included “problematic terrain” such as wetlands, water quality areas, steep slopes, walkways, private drives, flags of flag lots, poor soil conditions and other challenges. The peer review results demonstrate that the standards are achievable without payment of fees in lieu or discretionary reviews even with these challenges (see UFCR Volume II, page 463).

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**46. Ken Gertz, February 6, 2012; Stone Bridge Homes NW, February 14, 2012; JT Smith Companies, February 15, 2012**

**Amendment Request:** Reduce minimum canopy cover standards for residential projects.

Gertz [verbal comments of February 6]: The canopy requirements are too high for an urban area and should be reduced to:

No minimum requirement < 5,000 square feet (lot size)

20% requirement = 5,000 square feet

25% requirement > 5,000 square feet

Special category: single story residence

Gertz [written comments of February 6]: Section 10, Part 3 N. – HBA believes that 40% is too high, the majority of developable land has no trees, and find 40% unachievable without mitigation. “We find a more reasonable number would be 25-30% for R4.5 and above and 20% on R-7 and No requirement other than street trees for smaller than R7 lots, because the street trees are the only option.”

Stone Bridge Homes NW & JT Smith Companies: Reduce minimum canopy requirements for low and medium density residential projects down to 25% coverage, and medium-high and high density residential projects down to 20% coverage.

**Staff Response:** While staff does not recommend revising the proposing code per this amendment request, other recommended revisions would have the effect of reducing the effective tree canopy requirements towards the requested amounts.

The UFCR CAC reached consensus to draft achievable and balanced canopy requirements for development that are tiered based on zoning district. For example, the requirements require development in low density residential areas to have more trees than are required in areas of dense zoning, such as Downtown Tigard (see Guiding Principles, UFCR Volume I, page 15).

To implement the consensus of the CAC, staff analyzed possible percent canopy for each zoning district using the same methodology developed to set canopy goals for the Urban Forestry Master Plan and also in an updated methodology using Light Detection and Ranging (LiDAR) technology (see UFCR Volume III, page 9).

The results of the analyses were then used in conjunction with the minimum percent landscaping requirements in the Tigard Development Code to place the various zoning districts within one of three tiers. The exception is school sites, which were placed in the “dense zoning” tier 3 to ensure sufficient room for sports fields (see UFCR Volume III, page 11):

- Tier 1: 40% effective canopy<sup>2</sup>
- Tier 2: 33% effective canopy<sup>3</sup>
- Tier 3: 25% effective canopy<sup>4</sup>

It is important to note that effective canopy is very different from actual canopy within the lot lines of a particular development. To meet draft effective canopy requirements, the preservation of existing trees is granted double canopy credit, and planting of street trees is granted full canopy credit, even though half of their canopies overhang streets, which are not part of the calculations.

When considering these factors, the actual canopy required for a particular development would fall into the following ranges:

- Tier 1: 16-40% actual canopy
- Tier 2: 13-33% actual canopy
- Tier 3: 10-25% actual canopy

The low end of each range represents sites with many existing trees that are preserved and maximization of street tree canopy. The high end of each range represents sites with no

<sup>2</sup> R-1, R-2, R-3.5, R-4.5, R-7, and R-12

<sup>3</sup> R-25, R-40, C-N, C-C, C-G, C-P, MUE, MUE-1, MUE-2, MUC, MUR, and I-P

<sup>4</sup> MU-CBD, MUC-1, I-J, I-H, and schools (18.130.050(J))

existing trees and no street tree canopy (all trees planted so the mature canopy stays within the lot lines). The staff analysis found that the possible percent canopy for each zoning district falls within the actual canopy range for their corresponding tiers above (see UFCR Volume III, page 11).

The double canopy credit for preservation provides a viable option for meeting canopy requirements in the draft code, while incentivizing preservation. This is because buildable lands have significant existing tree resources from which to draw. Staff performed a GIS analysis of the city's buildable lands inventory and determined that buildable lands have an average of 41% existing canopy cover (see April 13, 2011 CAC meeting packet, pages 45 to 46 in the project record).

In many cases, development (and tree removal) is restricted on a portion of a development site due to existing sensitive lands protections (for wetlands, streams, floodplains, etc.). Staff performed a GIS analysis of existing canopy that is protected on buildable lands due to its location in protected sensitive lands. The analysis demonstrated that an average of 12.29% of canopy on buildable lands would be preserved due to its location in sensitive lands. Therefore, because of double credit for preservation, development on buildable lands would achieve an average of 24.58% effective canopy through the preservation of trees that are already required to be preserved (see April 13, 2011 CAC meeting packet, pages 45 to 46 in the project record).

Staff and outside consultants tested the tiered requirements on a wide range of development projects to ensure the draft effective canopy requirements are achievable, result in a reasonable balance between trees and development, and do not force payment of fees in lieu or discretionary review for typical projects.

The peer review demonstrates that the requirements are achievable without payment of fees in lieu or discretionary reviews (see UFCR Volume II, page 463).

Based on these analyses, staff is confident that the draft effective tree canopy requirements would result in a reasonable balance between trees, development and open space.

In response to public testimony received on the issue, the Planning Commission further discussed whether to modify the draft effective canopy requirements at their March 5, 2012, meeting. While the commission indicated their support for retaining the draft requirements, they also indicated support for granting bonus credits for planting native trees. If the staff recommendation of 1.25x credit for planting natives is approved the canopy ranges would be reduced to the following amounts for projects that rely on native trees to meet the requirements:

Tier 1: 16-32% actual canopy

Tier 2: 13-26% actual canopy

Tier 3: 10-20% actual canopy

In addition, if the staff recommendation of reducing the per lot effective canopy requirement from 20 percent down to 15 percent is approved, that would further reduce the amount of trees as explained in the staff response to amendment request 36 above.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**47. Ken Gertz, February 6, 2012**

**Amendment Request:** Section 10, Part 4A.1 & 2 - Fee in lieu for not meeting minimum requirements is too high. It should be based upon actual cost to plant those trees right now, rather than on the future canopy of the tree. Viewed as a “back door way to legally replace the current tree fund with what we feel is an SDC.”

**Staff Response:** (much of this staff response is from the Tree Canopy Fee memo, UFCR Volume III, page 15) The draft code includes canopy standards for development based on zoning. For example, development in low density residential areas will be required to have more trees than in areas of dense zoning, such as Downtown Tigard.

The draft canopy standards have been carefully crafted and have undergone a peer review to ensure that they are achievable on the typical range of development scenarios in Tigard. For added flexibility, a discretionary review option is proposed to allow other green building or development methods (e.g. solar panels, green roofs, rain gardens, etc.) in place of planting or preserving the required amount of trees. Finally, a fee-in-lieu option is proposed to allow applicants to pay a “tree canopy fee” to replace the value of canopy not provided through tree planting or preservation.

The tree canopy fee was developed by converting the wholesale median tree cost in the Willamette Valley developed by the PNWISA<sup>5</sup> to a unit canopy cost. According to the PNWISA, the median wholesale cost of a 3-inch diameter deciduous tree is \$174. The formula developed by Krajicek, et al<sup>6</sup> for open grown, broad spreading trees (maximum crown width (feet) =  $3.183 + 1.829 * DBH$  (inches)) was then utilized to convert tree diameter to canopy diameter. According to the Krajicek formula, a 3-inch diameter tree should have a crown width of 8.67 feet or crown area of 59 square feet. These dimensions were confirmed as reasonable by staff through several local field samples. Using the median cost of a 3-inch deciduous tree (\$174) and the crown area of a 3-inch diameter tree (59 square feet), the unit canopy cost or tree canopy fee should be \$2.95 per square foot.

This methodology is a reasonable approach for three main reasons. First, tree benefits (aesthetic, stormwater management, air quality, etc.) are derived primarily from their canopies, so proposing to place a value to tree canopy is appropriate. Second, in the proposal, tree canopy is valued using the median wholesale tree cost only, whereas standard tree appraisal is based on the wholesale tree cost plus the cost of tree installation. Finally, the Krajicek formula and field samples by staff are based on the maximum crown width-to-trunk diameter ratio. A typical tree does not have such a high ratio. If the typical ratio were used, the unit canopy cost would increase.

In addition, staff provided the planning commission a regional comparison of fees in a Comparative Fee-In-Lieu Rates memo for their February 6, 2012 hearing demonstrating the

<sup>5</sup> Pacific Northwest Chapter of the International Society of Arboriculture. 2007. **Species Ratings for Landscape Tree Appraisal**, 2<sup>nd</sup> Edition, Silverton, OR: Pacific Northwest ISA.

<sup>6</sup> Krajicek, J. E., K. E. Brinkman, S. F. Gingrich. 1961. **Crown Competition - A Measure of Density**. *Forest Science* 7:35-42.



proposed tree canopy fee is on the low end of the range.

Finally, the proposed tree canopy fee is not an SDC because it does not meet the definition of an SDC in ORS 223.299(4)(a), which states that an SDC “means a reimbursement fee, an improvement fee or a combination thereof assessed or collected at the time of increased usage of a capital improvement or issuance of a development permit, building permit or connection to the capital improvement.”

The tree canopy fee is not an “improvement fee,” which is defined in ORS 223.299(2) as a “fee for costs associated with capital improvements to be constructed”. The tree canopy fee is a fee for choosing not to preserve and/or plant trees to meet established tree canopy requirements.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**48. Ken Gertz, February 6, 2012**

**Amendment Request:** Appendix 9, page 4-5 UFP – Confused by headings, please clarify.

**Staff Response:** Appendix 9 is a Supplemental Arborist Report Template that may be used by project arborists when creating urban forestry plans. It converts the text from the Section 10 of the UFM into a more user friendly summary form. The consultants used the template during the peer review phase of the project and found it easy to use. The consultants did not raise any issues regarding its clarity nor did they recommend any changes to it in their peer review report (see peer review, UFCR Volume II, page 463).

**Staff Recommendation:** Do not revise proposed UFM based on this amendment request.

**Amendment:** N/A

**49. Eric Schultheis, February 6, 2012**

**Amendment Request:** The code should require that trees planted are the right species for the area and spacing is adequate to ensure the future health of planted and preserved trees.

**Staff Response:** Section 10 of the UFM contains tree preservation and planting specifications to ensure healthy and sustainable trees after the development process is complete. Appendices 2 through 5 of the UFM include recommended tree lists to ensure appropriate species for a variety of planting situations.

**Staff Recommendation:** Do not revise proposed UFM based on this amendment request.

**Amendment:** N/A

**50. Dennis Wilson, February 6, 2012**

**Amendment Request:** The code should not inhibit future development of a property, nor prohibit property owners from removing trees due to personal choice or necessity.

**Staff Response:** (the first paragraph of this staff response is from the Tree Canopy Fee memo, UFCR Volume III, page 15) The draft canopy requirements have been carefully crafted and have undergone a peer review to ensure that they are achievable on the typical range of development scenarios in Tigard. For added flexibility, a discretionary review option is proposed to allow other green building or development methods (e.g. solar panels, green roofs, rain gardens, etc.) in place of planting or preserving the required amount of trees. Finally, a fee-in-lieu option is proposed to allow applicants to pay a “tree canopy fee” to replace the value of canopy not provided through tree planting or preservation.

While not part of the proposed development code amendments, it is important to note that proposed Chapter 8.14 (Trees that were Required with Development) of the Tigard Municipal Code would create a separate process for removing trees after the development process is complete. The existing code requires future owners to amend the original land use permit for removing trees that were required with development. Chapter 8.14 would create a less costly and less time-consuming process for future owners to remove trees due to personal choice or necessity.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**51. Sue Beilke, February 6, 2012**

**Amendment Request:** Require all land use modifications affecting trees to be processed as a Type II procedure in order to provide public notice and input.

**Staff Response:** One of the core Guiding Principles of the CAC was to allow modifications of an Urban Forestry Plan during the course of development through a Type I process so that preservation and planting strategies can be easily adapted (see UFCR Volume I, page 16). Staff committed to the CAC to preserve their Guiding Principles through the legislative adoption process unless otherwise directed by the commission or the council. The commission has not directed staff to remove language allowing modifications through a Type I process.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**52. Sue Beilke, February 6, 2012**

**Amendment Request:** Remove language allowing alternative technologies such as green roofs in lieu of tree canopy.

**Staff Response:** One of the core Guiding Principles of the CAC was to provide flexibility by allowing alternate development proposals such as green roofs or solar instead of providing trees (see UFCR Volume I, page 16). Staff committed to the CAC to preserve their Guiding Principles through the legislative adoption process unless otherwise directed by the Planning Commission or the council. The Planning Commission had not directed staff to remove language allowing alternate development proposals.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**53. Sue Beilke, February 6, 2012**

**Amendment Request:** Create special status protections for all native trees, tree groves and areas considered to be declining or rare; require permits for their removal.

**Staff Response:** The proposed Comprehensive Plan Amendment would establish an overlay district for 70 significant tree groves covering 544 acres. The significant tree groves are comprised primarily of trees native to the Tigard area. As further explained in the Tree Grove ESEE Analysis beginning on UFCR Volume III, page 27, key evaluation criteria in the inventory and selection of significant tree groves were grove maturity/tree size, grove size, health/viability, visibility, screening and buffering, accessibility, rarity, educational/recreational potential, wildlife habitat value and connectivity and the amount of existing disturbance.

The proposed Development Code Amendments in Section 18.790.050.D include regulatory incentives and flexible standards for the optional preservation of significant tree groves. Optional preservation is consistent with the CAC's Guiding Principles for tree grove preservation incentives (see UFCR Volume I, page 17). Staff committed to the CAC to preserve their Guiding Principles through the legislative adoption process unless otherwise directed by the Planning Commission or City Council. The Planning Commission had not directed staff to create additional special status protections for significant tree groves.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**54. Sue Beilke, February 6, 2012**

**Amendment Request:** Amend UFCR to comply with and implement Goal 5 and the Tigard Comprehensive Plan Natural Resources chapter.

**Staff Response:** As further explained in the staff report for CPA 2011-00004/DCA 2011-00002, the proposed UFCR comply with Statewide Planning Goal 5 and the Tigard Comprehensive Plan.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

<b>55. Sue Beilke, February 6, 2012</b>
<b>Amendment Request:</b> Resubmittal of comments provided on March 16, 2009, for DCA2009-00001.
<b>Staff Response:</b> Since these comments are directed at previous Development Code Amendments (DCA2009-00001) staff will not respond to them as part of the proposed UFCR.
<b>Staff Recommendation:</b> Do not revise proposed code based on this amendment request.
<b>Amendment:</b> N/A

<b>56. Robert Ruedy, February 6, 2012</b>
<b>Amendment Request:</b> Publish public hearing notices in “Cityscape”.
<b>Staff Response:</b> Public hearing dates, times, and locations will be published in the Cityscape newsletter as permitted by the Cityscape editor.
<b>Staff Recommendation:</b> Do not revise proposed code based on this amendment request.
<b>Amendment:</b> N/A

<b>57. Robert Ruedy, February 6, 2012 (oral) and February 9, 2012 (written); Ken Gertz, February 17, 2012</b>
<b>Amendment Request:</b> Ruedy: Include standards for “adjacent property line tree preservation, hazard mitigation, [and] canopy/drip-line/root-infringements.”
Gertz: “How do you propose to deal with tree canopy overlapping lot lines?”
<b>Staff Response:</b> Section 10, Part 1.J of the UFM, requires trees within 25 feet of the development impact area to be included on tree preservation and removal site plan. If development impacts occur near the property line, impacted trees on adjacent property would be required to be protected by Section 10, Part 1.M and N.
Section 10, Part 3.M.2, assigns canopy credit for open grown and stand grown trees differently. Open grown trees are considered distinct features, and the lot with the trunk is assigned full credit for the tree canopy area. Stands grown trees are considered cohesive units (stands) and the canopy is apportioned based on the tree canopy area directly above the corresponding lot. The main purpose for treating open grown and stand grown trees differently is for ease of calculation. Open grown tree canopy can be calculated without overreliance on computer software, while stand grown tree canopy can be calculated without requiring project arborists to measure the canopies of individual trees within stands.
<b>Staff Recommendation:</b> Do not revise proposed code based on this amendment request.
<b>Amendment:</b> N/A

<b>58. Robert Ruedy, February 6, 2012 (oral) and February 9, 2012 (written)</b>
<b>Amendment Request:</b> Include solar access standards by establishing height and setback standards for trees, similar to buildings.
<b>Staff Response:</b> As detailed in the Urban Forestry Code Revisions and Solar Access memo provided to the Planning Commission at their February 6, 2012 meeting, the UFCR is not intended to prioritize tree canopy over solar access, nor does it change the existing rights of neighboring landowners if a tree is shading an adjoining property. The UFCR does provide flexible and incentive-based development standards to allow long-term solar access on a project site. This flexibility is provided in an applicant's choice of tree species and planting locations, preservation bonuses, a discretionary path and a fee in lieu option.
<b>Staff Recommendation:</b> Do not revise proposed code based on this amendment request.
<b>Amendment:</b> N/A

<b>59. Robert Ruedy, February 9, 2012</b>
<b>Amendment Request:</b> All property owners should share the costs of citywide tree enhancement regulation by adding an additional fee to existing road and sanitary sewer and surface water management fee structures and billing processes.
<b>Staff Response:</b> Urban Forestry Program Funding is part of the Tigard Tree Board's ongoing work program and not part of the UFCR project.
<b>Staff Recommendation:</b> Do not revise proposed code based on this amendment request.
<b>Amendment:</b> N/A

<b>60. Robert Ruedy, February 6, 2012 (oral) and February 9, 2012 (written)</b>
<b>Amendment Request:</b> Add clarifying language regarding how Measure 49 waivers will be negated or impacted by the new development code and how compensation will be accomplished and measured.
<b>Staff Response:</b> Measure 49 is not applicable within the Urban Growth Boundary and, more specifically, not within the incorporated boundaries of the City of Tigard.
<b>Staff Recommendation:</b> Do not revise proposed code based on this amendment request.
<b>Amendment:</b> N/A

<b>61. Robert Ruedy, February 6, 2012 (oral) and February 9, 2012 (written)</b>
<b>Amendment Request:</b> Add language specifying maintenance responsibilities that will be "equitably distributed among ALL COT property owners both public and private."
<b>Staff Response:</b> Urban Forestry Program Funding is part of the Tigard Tree Board's ongoing work program and not part of the UFCR project.
<b>Staff Recommendation:</b> Do not revise proposed code based on this amendment request.
<b>Amendment:</b> N/A

<b>62. Robert Ruedy, February 9, 2012</b>
<b>Amendment Request:</b> Please hold the record open for an additional two weeks.
<b>Staff Response:</b> The Planning Commission held the record open after the February 6, 2012, meeting until February 17, 2012, at 5pm.
<b>Staff Recommendation:</b> Do not revise proposed code based on this amendment request.
<b>Amendment:</b> N/A

<b>63. Robert Ruedy, February 9, 2012</b>
<b>Amendment Request:</b> Supports other testimony that limits enactment of the UFCR to low density, single-family properties and discretionary “case-by-case” implementation for all other development.
<b>Staff Response:</b> The UFCR CAC reached consensus to draft the following achievable canopy standards for development that are tiered based on zoning district:  Tier 1: 40% effective canopy <sup>7</sup> Tier 2: 33% effective canopy <sup>8</sup> Tier 3: 25% effective canopy <sup>9</sup>  For added flexibility, a discretionary review option allows other green building or development methods (e.g. solar panels, green roofs, rain gardens, etc.) in place of planting or preserving the required amount of trees. Finally, a fee in lieu option allows applicants to pay a “tree canopy fee” to replace the value of canopy not provided through tree planting or preservation (see Guiding Principles, UFCR Volume I, page 15).  The peer review demonstrates that the standards are achievable without payment of fees in lieu or discretionary reviews (see UFCR Volume II, page 463). However, applicants would have the option of paying fees or discretionary review in lieu of providing trees.  Staff committed to the CAC to preserve their Guiding Principles through the legislative adoption process unless otherwise directed by the Planning Commission or the City Council. Neither the CAC nor the Planning Commission has recommended limiting the UFCR to low density residential districts.
<b>Staff Recommendation:</b> Do not revise proposed code based on this amendment request.
<b>Amendment:</b> N/A

<sup>7</sup> R-1, R-2, R-3.5, R-4.5, R-7, and R-12  
<sup>8</sup> R-25, R-40, C-N, C-C, C-G, C-P, MUE, MUE-1, MUE-2, MUC, MUR, and I-P  
<sup>9</sup> MU-CBD, MUC-1, I-L, I-H, and schools (18.130.050(J))

<b>64. Robert Ruedy, February 9, 2012</b>
<b>Amendment Request:</b> “Green Roof” options should be accepted in lieu of trees.
<b>Staff Response:</b> The proposed Discretionary Urban Forestry Plan Review option in Section 18.790.040 would allow applicants to propose the use of green roofs in lieu of trees through a Type III approval process.
<b>Staff Recommendation:</b> Do not revise proposed code based on this amendment request.
<b>Amendment:</b> N/A

<b>65. Gretchen Fehrenbacher, February 10, 2012</b>
<b>Amendment Request:</b> Requests no preservation requirement and no canopy requirement as her property is served with nearby open space (within ½ mile).
<b>Staff Response:</b> Preservation is not required by the proposed code. Tiered canopy standards are proposed that can be met through any combination of planting new trees or preserving existing trees.
If trees are not feasible or desirable, a discretionary review option is proposed to allow other green building or development methods (e.g. solar panels, green roofs, rain gardens, etc.) in place of providing the required amount of trees. Also, a fee in lieu option is proposed to allow applicants to pay a “tree canopy fee” to replace the value of canopy not provided (see Guiding Principles, UFCR Volume I, page 15).
Staff committed to the CAC to preserve their Guiding Principles through the legislative adoption process unless otherwise directed by Planning Commission or the City Council. Neither the CAC nor the Planning Commission has recommended waiving the UFCR when property is served by nearby open space.
<b>Staff Recommendation:</b> Do not revise proposed code based on this amendment request.
<b>Amendment:</b> N/A

**66. Stone Bridge Homes NW, February 14, 2012**

**Amendment Request:** Revise the code to provide more simplicity and brevity, and allow homeowners and landscape architects to perform more work rather than arborists.

**Staff Response:** The core code sections of the UFCR in title 8 and Chapter 18.790 are relatively simple and brief. Much of the length in UFCR Volume II comes from the commentary pages, ensuring consistency between related code chapters and strike-through of existing text.

Title 8 does not require arborists except for the technical tasks of tree risk assessment and thinning stands of trees to improve stand health.

Chapter 18.790 continues the current code requirement for arborists to prepare Urban Forestry Plans for development.

The UFM includes more detailed specifications for implementing the code. However, the specifications largely document the city's current operating procedures and are intended to provide more certainty regarding city requirements. If the city were to provide less detail, disputes over interpretation would likely result after implementation. Lack of certainty and clear expectations are common complaints with the existing code, and the UFM is intended to address these issues.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**67. Harris McMonagle Associates, February 15, 2012**

**Amendment Request:** "The mention of the director having veto power if he/she does not like what they see in the development pattern, this is way too much subjective power to be placed in anyone."

**Staff Response:** Section 18.790.020.A requires urban forestry plans for certain Type II and Type III land use reviews. Section 18.390.020.B says that Type II reviews contain some discretionary criteria and Type III reviews contain predominantly discretionary criteria.

Section 18.790.050 (Flexible Standards for Tree Planting and Preservation) grants the director authority to deviate from standard code requirements such as lot size, setbacks, sidewalk location, parking, etc., to facilitate the planting and preservation of trees. However, if the director makes a finding that deviating from the standard application of the code presents an unreasonable risk to public health, safety or welfare the director may deny the request. As stated above, the director has the authority to exercise such discretion as part of Type II and III land use reviews.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A



<b>68. Harris McMonagle Associates, February 15, 2012</b>
<b>Amendment Request:</b> Revise the canopy calculation formula to one based on front and back yard area, rather than the entire lot.
<b>Staff Response:</b> The formula for calculating effective tree canopy in Section 10, Part 3.M of the UFM, is designed for the overall development site with a separate minimum per lot requirement. The calculations were tested during the peer review phase of the project and were found to be achievable resulting in a reasonable balance between trees and open space (see UFCR Volume II, page 463).
If the formula for calculating effective canopy were revised, the revised formula should be peer reviewed as well. However, since the proposed formula has already been supported through the peer reviewed, staff does not recommending expending additional time and resources testing a new methodology.
<b>Staff Recommendation:</b> Do not revise proposed code based on this amendment request.
<b>Amendment:</b> N/A

<b>69. Harris McMonagle Associates, February 15, 2012</b>
<b>Amendment Request:</b> Allow adjustments to standards to allow the preservation of existing trees.
<b>Staff Response:</b> Section 18.790.050 of the proposed code allows adjustments to standards for the preservation of existing trees.
<b>Staff Recommendation:</b> Do not revise proposed code based on this amendment request.
<b>Amendment:</b> N/A

<b>70. JT Smith Companies, February 15, 2012</b>
<b>Amendment Request:</b> Develop a case study and in-depth review of the feasibility of proposed canopy goals.
<b>Staff Response:</b> A case study and in-depth review of the feasibility of the proposed tree canopy requirements was completed through the peer review phase of the project (see UFCR Volume II, page 463).
<b>Staff Recommendation:</b> Do not revise proposed code based on this amendment request.
<b>Amendment:</b> N/A

**71. John Frewing, February 17, 2012**

**Amendment Request:** “The tree values memo (Urban Forestry Annotated Bibliography) at page 1 of Volume 3 is significantly deficient in not containing any papers which show the vital relationship between trees and wildlife...I ask that you request staff to prepare an amendment to the present proposal which would add appropriate bibliography to the legislative basis for Tigard’s proposal.”

**Staff Response:** The tree values memo is based on the annotated bibliography for the findings for adoption of the Urban Forest section of the Comprehensive Plan (CPA2008-00002). As reflected in the tree values memo, the primary reasons for adopting the Urban Forest section of the Comprehensive Plan and the resulting Urban Forestry Standards for Development (see UFCR Volume II, pages 135 to 341) are stormwater, shading, property value, public health and safety, air quality, carbon sequestration, social and other non-wildlife benefits of trees.

The exception are the Tree Grove Preservation Incentives in Section 18.790.050.D (see UFCR Volume II, page 317), which are being adopted specifically because of the wildlife benefits provided by trees. The Tree Grove ESEE Analysis (see UFCR Volume III, page 17) details the reasons for adopting flexible standards and incentives and highlights wildlife benefits.

It is not necessary to include wildlife benefits of trees in the tree values memo because the UFCR is being adopted primarily for other reasons. The ESEF analysis highlights the wildlife benefits provided by trees for that portion of the UFCR that is being adopted specifically for that purpose.

**Staff Recommendation:** Do not revise the tree values memo based on this amendment request.

**Amendment:** N/A

**72. John Frewing, February 17, 2012**

**Amendment Request:** The ESEF analysis needs editorial corrections to incorporate correct references to the Tigard Development Code, and substantive updating to Site #62 and Grove #71.

**Staff Response:** In reviewing the ESEF analysis, staff recommends correcting some scrivener's errors to ensure accurate references to code chapters.

Staff also recommends revising the boundaries of inventoried Tree Groves #38 and #62 in the Significant Tree Grove Map since portions of these groves have been removed since the original inventory was completed in summer 2010. The Significant Tree Grove Map may be adjusted because the legislative adoption process is not yet completed.

Staff will not be revising the boundaries of Tree Grove #71 in the Significant Tree Grove Map because no trees have been removed since the original inventory was completed in summer 2010.

Finally, staff will not be revising the descriptions for Tree Groves #62 and #71 because they are derived from field notes provided by the consultant at the time of the inventory and do not affect the boundaries or preservation incentives for these groves (see UFCR Volume III, pages 125, 170 and 177).

**Staff Recommendation:** Revise the proposed ESEE analysis and Significant Tree Grove Map based on this amendment request.

**Amendment:** (note: the full text from the ESEE analysis associated with these corrected scrivener's errors is not provided)

Change "18.70" to "18.790" (see UFCR Volume III, page 22)

Change "18.770" to "18.790" (see UFCR Volume III, pages 33 and 83)

Change "18.750" to "18.790" (see UFCR Volume III, page 47)

Change "18.755" to "18.775" (see UFCR Volume III, pages 34 (4 times), 47 and 64)

(note: the amended Significant Tree Grove Map is attached and provided with the staff report for the April 16, 2012 Planning Commission meeting)

Adjust boundaries of inventoried Tree Groves #38 and #62 as shown on the attached Significant Tree Grove Map.

**73. John Frewing, February 17, 2012**

**Amendment Request:** “The ESEE introduction (page 17, Vol III) doesn’t reflect reality in saying that the tree grove preservation program was identified as a “top priority” of the community...in the statistically valid survey (beginning page 285, Vol III), among the open ended input by the community, there was not ONE suggestion that a tree grove program was needed, whereas there were many statements that the major interest was in preserving existing trees generally...I ask that you request staff to include text recognizing the greater importance given to tree preservation over tree groves by Tigard citizens in the legislative basis for this proposal.”

**Staff Response:** The ESEE introduction is an accurate summary of community input (see UFCR Volume III, page 17). The Urban Forestry Master Plan identified the development of a tree grove protection program as one of six implementation goals for the city (see UFCR Volume III, pages 253, 257 and 267-268). An extensive public process gleaned information from the community that was used to create these implementation goals, including a statistically valid survey. Survey question REG6 directly asked respondents their preferred focus of potential new tree protection measures. Focusing on large groves received a 55.25% response rate, while focusing on individual trees received 28.25% (see UFCR Volume III, page 298).

The ESEE analysis is specific to significant tree groves subject to Statewide Planning Goal 5 rule requirements. Individual trees are not addressed in the ESEE because individual trees are not considered goal 5 resources.

**Staff Recommendation:** Do not revise the proposed ESEE analysis based on this amendment request.

**Amendment:** N/A

**74. John Frewing, February 17, 2012**

**Amendment Request:** “The staff report should [be amended and] explicitly state that the UFM is not a code amendment and that as I noted in an earlier comment, the city has “unfettered discretion” in modifying the UFM. Hence, it cannot be relied on by citizens as enforceable regulation for tree protection and urban forest enhancement.”

**Staff Response:** The staff report explicitly describes the UFM in Section III, Background Information of the staff report for CPA 2011-00004/DCA 2011-00002.

Changes to administrative rules in the UFM require public notice and opportunity for appeal, as governed by Section 2.04.070 of the Tigard Municipal Code. Therefore, the city does not have unfettered discretion with regards to the administrative rules in the UFM.

**Staff Recommendation:** Do not revise the staff report based on this amendment request.

**Amendment:** N/A

<b>75. John Frewing, February 17, 2012</b>
<b>Amendment Request:</b> “[have] the code provide a threshold-based rule applying the urban forest regulations to major redevelopments.”
<b>Staff Response:</b> The proposed code applies the Urban Forestry Plan requirements to major development projects that reach the thresholds requiring Type II and III land use permits listed in Section 18.790.020.A.
<b>Staff Recommendation:</b> Do not revise proposed code based on this amendment request.
<b>Amendment:</b> N/A

<b>76. John Frewing, February 17, 2012</b>
<b>Amendment Request:</b> Effective canopy area should be calculated for the Development Impact Area, and not the overall site.
<b>Staff Response:</b> The formula for calculating effective tree canopy in Section 10, Part 3.M of the UFM, are designed for the overall development site with a separate minimum per lot requirement. The calculations were tested during the peer review phase of the project and were found to be achievable, resulting in a reasonable balance between trees and open space (see UFCR Volume II, page 463).  If the formula for calculating effective canopy were revised, the revised formula should be peer reviewed as well. However, since the proposed formula has already been supported through the peer reviewed, staff does not recommending expending additional time and resources testing a new methodology.
<b>Staff Recommendation:</b> Do not revise proposed code based on this amendment request.
<b>Amendment:</b> N/A

**77. John Frewing, February 17, 2012**

**Amendment Request:** “at 18.790.070.B.1.b, B.2.c, and B.3.b...the requirement regarding urban forest modification is worded such that it is only required that a modified plan and justification be submitted before changing the site plantings – review and approval comes later, perhaps too late. I believe better wording would be “Submitted for review and approval prior to (removal, planting, modification)””.

**Staff Response:** In reviewing the code sections referenced above, staff agrees that revising the sentence structure for clarification would be beneficial.

**Staff Recommendation:** Revise proposed code based on this amendment request.

**Amendment:** (18.790.070.B.1)

“b. A revised tree canopy site plan and supplemental arborist report are submitted for review and approval prior to removal ~~for review and approval~~ that reflect the proposed changes to the previously approved Urban Forestry Plan, ~~and~~ The revised tree canopy site plan and supplemental arborist report shall demonstrate how either the effective tree canopy cover requirements in Section 10, part 3 of the UFM will be provided by ~~the proposed combination of tree planting, and preservation; and/or; payment of a tree canopy fee in lieu of planting or preservation. will be provided to make up the difference between the proposed effective tree canopy cover and the effective tree canopy cover requirements in Section 10, part 3, of the UFM for the lot or tract where the modification is proposed.~~”

(18.790.070.B.2)

“c. A revised tree canopy site plan and supplemental arborist report are submitted for review and approval prior to planting ~~for review and approval~~ that reflect the proposed changes to the previously approved Urban Forestry Plan.”

(18.790.070.B.3)

“b. A revised tree preservation and removal site plan, tree canopy site plan and supplemental arborist report are submitted for review and approval prior to modification of the tree protection fencing ~~for review and approval~~ that reflect the proposed modifications to the previously approved Urban Forestry Plan.”

**78. John Frewing, February 17, 2012**

**Amendment Request:** Change the structure of the code to comply with Oregon land use law. “I believe, the proposed structure of Tigard’s proposal (substantive material displaced to an administrative rule) violates Oregon’s land use law. ORS 197.175(2)(b) regarding city planning responsibilities requires Tigard to “enact land use regulations to implement their comprehensive plans”...the law refers to regulations, not administrative rules. ORS 227.173 regarding the basis for land use decisions states that “approval or denial” of a discretionary permit application shall be based on standards and criteria set forth in development ordinances.” ORS 197.805 states that the Land Use Board of Appeals shall have exclusive jurisdiction to review any land use decision. By structuring its material as proposed, Tigard prejudices/eliminates my substantial rights to a land use decision under Oregon land use law.”

**Staff Response:** Section 18.790.030 (Urban Forestry Plan Requirements) requires applicants to demonstrate technical standards in the UFM are met. If someone believes an Urban Forestry Plan does not meet the technical standards in the UFM, they may appeal the decision to the Land Use Board of Appeals. Referencing technical standards in development codes is a common practice such as when performing wetland delineations, traffic studies, road and utility construction, etc. The proposed code complies with Oregon land use laws.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**79. John Frewing, February 17, 2012; Mike McElevey, February 21, 2012**

**Amendment Request:** Frewing: Raise the equivalent Tigard fee from \$87 per caliper inch to \$150 per caliper inch for mitigation and fee-in-lieu trees.

McElevey: Request the fee-in-lieu be maximized “to a point where developers actually make a few decisions in favor of saving large trees.”

**Staff Response:** The proposed methodology for the tree canopy fee is based on the wholesale median tree cost in the Willamette Valley developed by the PNWISA (see UFCR Volume III, page 15). The requested increased in the fee would not be based on the proposed methodology.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**80. Ken Gertz, February 17, 2012**

**Amendment Request:** Add a language at the beginning of the code stating “that regardless of a tree plan requirement, Private Property should be allowed to develop to its stated potential”.

**Staff Response:** The proposed Urban Forestry Plan requirements can be met through any combination of planting new trees or preserving existing trees.

If trees are not feasible or desirable, a discretionary review option is proposed to allow other green building or development methods (e.g. solar panels, green roofs, rain gardens, etc.) in place of providing the required amount of trees. Also, a fee in lieu option is proposed to allow applicants to pay a “tree canopy fee” to replace the value of canopy not provided (see Guiding Principles, UFCR Volume I, page 15).

The Urban Forestry Plan requirements have been designed to provide maximum flexibility so that property can be developed as otherwise allowed by code. It is not necessary to add the language recommended in this amendment request.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**81. Ken Gertz, February 17, 2012**

**Amendment Request:** State in the code that canopy area is to be based on mature canopy.

**Staff Response:** Section 10, Part 3.M.c and d specify that planted trees receive credit based on their mature canopy area when calculating effective tree canopy.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A

**82. Ken Gertz, February 17, 2012**

**Amendment Request:** Revisit “tree boxes” to “determine when exactly they should be required.”

**Staff Response:** Soil volume requirements apply to street trees and parking lot trees per Sections 18.745.040.A.4 and 18.745.050.E.a.4 respectively. The Guiding Principles states that these tree types should be required to meet soil volume requirements because they often have limited access to sufficient soil to support their function of providing canopy over impervious surfaces (see Guiding Principles, UFCR Volume I, page 15).

Staff committed to the CAC to preserve their Guiding Principles through the legislative adoption process unless otherwise directed by the Planning Commission or the C. Planning Commission had not directed staff to revisit soil volume requirements.

**Staff Recommendation:** Do not revise proposed code based on this amendment request.

**Amendment:** N/A



<b>83. Ken Gertz, February 17, 2012</b>
<b>Amendment Request:</b> Include language specifying that mitigation funds be returned on a lot/tract by lot/tract basis, rather than a lump sum.
<b>Staff Response:</b> Section 11 Part 2.D of the UFM specifies that the tree establishment bond amount will be correspondingly reduced on a lot/tract by lot/tract basis.
<b>Staff Recommendation:</b> Do not revise proposed code based on this amendment request.
<b>Amendment:</b> N/A

<b>84. Mike McElevey, February 21, 2012</b>
<b>Amendment Request:</b> Provide leeway for homeowners to maintain and remove trees where unsafe conditions exist.
<b>Staff Response:</b> Chapter 8.04 (Tree Permit Procedures) of the proposed code would establish a permit process that is separate from the land use process for future owners to remove trees where unsafe conditions exist. The existing code requires future owners to revise the original land use permit to remove trees that were required with development, while the proposed code would create a more cost and time efficient process for removing trees after the land use process is complete.
<b>Staff Recommendation:</b> Do not revise proposed code based on this amendment request.
<b>Amendment:</b> N/A

<b>85. Mike McElevey, February 21, 2012</b>
<b>Amendment Request:</b> “If property owners are expected to undergo expense and inconvenience for the enjoyment of the general public, they should be compensated.”
<b>Staff Response:</b> Urban Forestry Program Funding is part of the Tigard Tree Board’s ongoing work program and not part of the UFCR project.
<b>Staff Recommendation:</b> Do not revise proposed code based on this amendment request.
<b>Amendment:</b> N/A



# Outstanding Issues for the Urban Forestry Code Revisions

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## City of Tigard Memorandum

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**To:** City Council  
**From:** Todd Prager, Associate Planner/Arborist  
**Re:** Outstanding Issues for the Urban Forestry Code Revisions  
**Date:** June 25, 2012

At the April 16, 2011, Planning Commission meeting, the commission reviewed and received additional testimony on the Urban Forestry Code Revisions amendment requests, considered staff's recommended amendments and further deliberated on the amendment requests and staff's recommendations. The commission decided to continue the hearing until May 7, 2012, for additional testimony and deliberation on the following three outstanding issues:

1. Application of the proposed code on small residential lots (less than 5000 sq. ft.) and small residential developments (Minor Land Partitions).
2. Legal requirements for property owners to maintain trees that were planted by developers during the two year establishment period.
3. Information on the tree canopy fee in lieu option.

Staff provided for the commission below additional background for each issue, optional amendments to address each issue and staff's recommended amendment option. Also included are the additional amendments from the April 16, 2012, meeting that the commission indicated comfort with, which include bonus credits for native trees, and minor text and map amendments for clarification purposes.

The text amendments for the outstanding issues are in the "Optional Amendments for the Outstanding Issues" section of this document. The text amendment for the additional amendments are in the "Additional Amendments from the April 16, 2012, Planning Commission Meeting" section. Staff determined the exact text that was forwarded to City Council, based on the policy choices made by the Planning Commission.

The Planning Commission selected the staff recommended options as their preferred option for each of the outstanding issues below and forwarded their recommendation to City Council on the Urban Forestry Code Revisions at their May 7, 2012, meeting. Also included in their recommendation to City Council were all of the amendments from the "Additional

Amendments from the April 16, 2012 Planning Commission Meeting” section of this document.

All references to project materials in the following are to the volumes considered by the Planning Commission, not to the volumes under consideration by the City Council.

**Issue 1: Application of the proposed code on small residential lots (less than 5000 sq. ft.) and small residential developments (Minor Land Partitions).**

The peer review results demonstrate that the proposed effective tree canopy requirements are achievable on the range of sites that were tested (see UFCR Volume II, page 463). Two of the residential sites tested have R-4.5 and R-7 zoning, with minimum lot sizes of 7,500 sq. ft. and 5,000 sq. ft. respectively, and met the Tier 1 (40%) effective tree canopy requirements. The other residential site tested has R-25 equivalent zoning, with lot sizes less than 3,000 sq. ft., and met the Tier 2 (33%) effective tree canopy requirement.

The proposed code places the R-12 district, which has a minimum lot size requirement of 3,050 sq. ft., in Tier 1. Since an R-12 site was not tested through the peer review, the commission could move the R-12 district to Tier 2 to be conservative, since the R-25 site (which has smaller lots) was able to meet the requirements.

**1.A. Options for the R-12 Zone Tier:**

1. Move the R-12 district into Tier 2 (staff recommended option).
2. Keep the R-12 district in Tier 1.

In addition, there has been discussion of the challenges of the 15% per lot minimum effective tree canopy requirement on small residential lots (less than 5000 sq. ft.). Due to the more limited street frontage of small residential lots, it is more difficult to place street trees for each lot to meet the per lot minimum. Eliminating the per lot minimum for small residential lots would increase flexibility. There would still likely be an incentive to plant larger stature street trees (which is the commission's preference) because selecting larger growing species to meet the requirements would be less expensive than planting additional trees on the lots. If the per lot minimum is eliminated for small residential lots, staff recommends eliminating it for commercial, mixed use, and industrial development as well, since these sites are often comprised of unique lots that could present challenges when meeting the requirements with limited resulting benefits. This could be accomplished by eliminating the 15% per lot minimum for Tier 2 and 3.

Alternatively, the commission could consider eliminating the per lot minimum in all districts. This would address testimony received regarding the unique challenges presented by some lots or tracts, even in the low density residential districts. However, this could result in unintended consequences, such as smaller stature and/or inconsistent street tree planting when meeting the minimum tree canopy requirement for the overall development site.

**1.B. Options for the Per Lot Minimum Effective Tree Canopy Requirement:**

1. Eliminate the 15% per lot minimum for Tier 2 and 3 districts only (staff recommended option).
2. Eliminate the 15% per lot minimum for all districts.
3. Keep the 15% per lot minimum for all districts.

The peer review results do demonstrate that for residential sites, the effective tree canopy requirements can be met primarily through the strategic use of larger stature street trees (see UFCR Volume II, page 463).

The incentive to maximize street tree canopy is deliberate as street trees are scientifically proven to have particularly high benefit to cost ratios in urban areas (see UFCR Volume III, page 1). Street trees are increasingly viewed as part of the city's "green infrastructure", as essential as other infrastructure elements such as street lights and storm drains. However, for street trees to achieve their potential canopy growth (and trees in general), adequate soil resources and proper planting methods are critical.

The proposed code places a high value on the role of arborists in designing and implementing the conditions for sustainable urban tree canopy, which include providing adequate soil volumes. In some cases, a landscape architect is required if alternative techniques are utilized, such as structural soil volumes under pavement. For general tree planting on sites, the project arborist is required to evaluate soils and recommend amendments if needed to support tree growth. The project arborist is also responsible for specifying and monitoring the tree protection fencing for trees to be preserved, which include neighboring trees close to the property lines.

Staff acknowledges that requiring arborists adds cost to projects, but it is consistent with the direction of the urban forestry code revisions: to distribute development costs more equitably (rather than only requiring arborist for projects with existing trees) and to focus on establishing healthy future canopy (rather than only penalties for tree removal). As expressed by some members of the commission, there is value in consistent application of the urban forestry code revisions across residential zones in order to support the goals of the Urban Forestry Master Plan. That being said, the following options are available to the commission.

#### 1.C. Options for Addressing Urban Forestry Plan Requirements for Residential Zones:

1. Continue to require urban forestry plans for all residential districts (staff recommended option).
2. Do not require urban forestry plans for residential districts that allow small lots (less than 5,000 sq. ft. lot size allowed) which are the R-12 and R-25 districts.

Plans developed by a certified arborist for the preservation and planting of trees are currently required for small residential developments (Minor Land Partitions). The proposed code would continue to require plans developed by a certified arborist for small residential developments. Staff analysis of the buildable lands inventory found that the largest share of buildable sites in Tigard is between 10,000 sq. ft. and 1 acre. This means that Minor Land Partitions likely represent a significant share of future residential development in Tigard.

The commission expressed some concern regarding the cost of developing urban forestry plans. The cost estimated by staff to develop and implement an urban forestry plan for a Minor Land



Partition based on interviews with local arborists is between \$4,000 and \$5,000 (includes inventory field work, site plan, arborist report, revisions based on city review, and implementation inspections). However, costs associated with the existing code for tree removal mitigation can reach \$30,000 for a Minor Land Partition (this does not include the cost to develop a tree plan).

Since project arborists are already required to develop urban forestry plans for Minor Land Partitions, Minor Land Partitions are likely to represent a significant share of future residential development. The costs associated with urban forestry plans will be less in many circumstances than existing costs, due to the elimination of mitigation. Staff recommends continuing to require urban forestry plans for Minor Land Partitions. However, the commission does have the option of not requiring urban forestry plans for Minor Land Partitions.

1.D. Options for Addressing Urban Forestry Plan Requirements for Minor Land Partitions:

1. Continue to require urban forestry plans for Minor Land Partitions (staff recommended option).
2. Do not require urban forestry plans for Minor Land Partitions.

Staff has identified an opportunity for creating efficiencies when developing urban forestry plans, while ensuring high quality design and implementation. Arborists and landscape architects have different skill sets. While arborists have expertise with regards to tree biology and growth, landscape architects have expertise with design, soil amendments and creating construction drawings. For projects that rely on street trees with structural soils to meet their requirements, it would reduce costs if the landscape architect could also complete the urban forestry plan (without requiring a certified arborist). Consideration should be given to allowing either landscape architects or arborists to develop urban forestry plans, to allow these efficiencies to occur.

1.E. Options for Developing Urban Forestry Plans:

1. Allow landscape architects, in addition to arborists, to develop urban forestry plans (staff recommended option).
2. Continue to allow only arborists to develop urban forestry plans.

**Issue 2: Legal requirements for property owners to maintain trees that were planted by developers during the two year establishment period.**

The Planning Commission asked for input from the City Attorney regarding the legal requirements for property owners to maintain trees that were planted by developers during the two year establishment period. The concern raised by the commission was whether property owners could remove trees that were planted by developers.

As suggested by the commission, the City Attorney agreed the developer could contractually obligate a property owner to maintain or allow for the maintenance of trees as part of the purchase and sale agreement. In addition, section 6.02.180 (Property Development and

Maintenance Requirements, Urban Forestry) would prohibit the unauthorized removal of trees during the establishment period. If a property owner were to remove a tree, they would be subject to penalties in Chapter 1.16 (Civil Infractions).

Because adequate safeguards are in place, staff is not proposing changes regarding the two year establishment period.

### **Issue 3: Information on the tree canopy fee in lieu option.**

The Planning Commission requested additional information on the proposed tree canopy fee in lieu methodology. Much of this information is from the Tree Canopy Fee Memo (see UFCR, Volume III, page 15).

The methodology for the proposed tree canopy fee was developed by converting the wholesale median tree cost in the Willamette Valley, developed by the PNWISA to a unit canopy cost. According to the PNWISA, the median wholesale cost of a 3-inch diameter deciduous tree is \$174. The formula developed by Krajicek, et al. for open grown, broad spreading trees (maximum crown width (feet) =  $3.183 + 1.829 * DBH$  (inches)) was then utilized to convert tree diameter to canopy diameter. According to the Krajicek formula, a 3-inch diameter tree should have a crown width of 8.67 feet or crown area of 59 square feet. These dimensions were confirmed as reasonable by staff through several local field samples. Using the median cost of a 3-inch deciduous tree (\$174) and the crown area of a 3-inch diameter tree (59 square feet), the unit canopy cost or tree canopy fee should be \$2.95 per square foot.

This methodology is a reasonable approach for three main reasons. First, tree benefits (aesthetic, stormwater management, air quality, etc.) are derived primarily from their canopies, so proposing to place a value to tree canopy is appropriate. Second, in the proposal, tree canopy is valued using the median wholesale tree cost only, whereas standard tree appraisal is based on the wholesale tree cost, plus the cost of tree installation. Finally, the Krajicek formula and field samples by staff are based on the maximum crown width-to-trunk diameter ratio. A typical tree does not have such a high ratio. If the typical ratio were used, the unit canopy cost would increase.

As shown in the “Comparative Fee-in-Lieu Rates” memo from the February 6, 2012 Planning Commission meeting, the proposed tree canopy fee in lieu would be low when compared with other fees in the region. Also, the tree canopy fee in lieu in the proposed code is lower than the mitigation fee in lieu in the existing code. Consider the following:

Existing Code	Proposed Code
Mitigation Based	Canopy Based
\$125/caliper inch	\$2.95/sq. ft.
Fee for 12" DBH Tree = \$1,500	Fee for 12" DBH Tree = \$1,463 <sup>1</sup>

While staff is unclear on the specific methodology of the alternate fee in lieu proposed in public testimony, significantly reducing the fee would significantly undervalue tree canopy. This would likely reduce the incentive for applicants to plant or preserve trees, resulting in increased payments to the city who would then be obligated to utilize the funds.

The issue raised by the commission is whether the city is interested in potentially increasing revenue by lowering the fee in lieu (so applicants pay the city rather than plant or preserve trees with development). Staff's perspective is that the purpose of the fee is to create an incentive to plant and preserve trees on private property, rather than to create a revenue source for the city. However, if applicants choose to pay a fee in lieu, the fee should be designed to capture the full value of canopy that will not be provided for the community. This is consistent with the direction of the Citizen Advisory Committee.

However, if the Planning Commission would like to encourage payment of fees in lieu of tree planting or preservation, the cost of the tree canopy fee could be reduced. If the tree canopy fee were reduced by half, then 50% of the canopy value would be borne by the applicant with the other 50% borne by the community.

### 3.A. Options for the Tree Canopy Fee In Lieu:

1. Continue to use the tree canopy fee in lieu methodology that captures the full value of tree canopy (currently \$2.95 per sq. ft. of tree canopy which is equivalent to \$174 for a 3-inch caliper tree, this is the staff recommended option).
2. Revise the tree canopy fee in lieu methodology to capture one half the value of tree canopy (currently \$1.47 per sq. ft. of tree canopy which is equivalent to \$87 for a 3-inch caliper tree).

### **Amendments from the April 16, 2012, Planning Commission Meeting**

The Planning Commission indicated support for the following additional amendments at the April 16, 2012, meeting:

1. Minor text amendment to the summary heading of section 18.790.030.A.
2. Reduce the per lot effective tree canopy cover requirement to 15% in Chapter 18.790 and the Urban Forestry Manual.

<sup>1</sup> DBH converted to canopy using the Krajicek formula

3. Correct scrivener's errors in section 18.790.030.C.
4. Correct scrivener's errors in ESEF and boundaries of significant tree groves #38 and #62 to reflect changes due to recent tree removal.
5. Minor text amendment to clarify the review and approval process in sections 18.790.070.B.1-3.
6. Grant 1.25x bonus credit for planting native trees.
7. Minor text amendment to remove a repetitive approval criterion for tree removal permit requirements in sensitive lands.

Staff has included the amendments towards the end of this document in the "Additional Amendments from the April 16, 2012, Planning Commission Meeting" section.

**Optional Amendments for the Outstanding Issues**

<b>Issue 1.A: Options for the R-12 Zone Tier</b>	
<b>Option 1:</b> Move the R-12 Zone into Tier 2 (staff recommended option).	
<b>Non Land Use Amendments:</b> <i>(Urban Forestry Manual Section 10, Part 3.N (Urban Forestry Plan - Supplemental Arborist Report Requirements))</i>	
N.	The standard percentage of effective tree canopy cover for the overall development site shall be at least: <ol style="list-style-type: none"><li>1. 40 percent for <del>Low Density Residential and Medium Density Residential (R-1, R-2, R-3.5, R-4.5, and R-7, and R-12)</del> districts, except for schools (18.130.050(J));</li><li>2. 33 percent for <del>Medium High Density Residential and High Density Residential (R-12, R-25, and R-40), Neighborhood Commercial, Community Commercial, General Commercial and Professional/Administrative Commercial (C-N, C-C, C-G, and C-P), Mixed Use Employment, Mixed Use Employment 1, Mixed Use Employment 2, Mixed Use Commercial and Mixed Used Residential (MUE, MUE-1, MUE-2, MUC, and MUR), and Industrial Park (I-P)</del> districts, except for schools (18.130.050(J)); and</li><li>3. 25 percent for <del>the Mixed Use Central Business District (MU-CBD), Mixed Use Commercial 1 (MUC-1) and Light Industrial and Heavy Industrial (I-L and I-H)</del> districts, and for schools (18.130.050(J)) in all districts.</li></ol>
[Changes will be made by staff to all other relevant references in the Urban Forestry Manual to specify the R-12 district is in Tier 2.]	
<b>Option 2:</b> Keep the R-12 district in Tier 1.	
<b>No Amendments Required</b>	

**Issue 1.B: Options for the Per Lot Minimum Effective Tree Canopy Requirement**

**Option 1:** Eliminate the 15% per lot minimum for Tier 2 and 3 districts only (staff recommended option).

**Land Use Amendments:** *(Section 18.790.030.B (Urban Forestry Plan Requirements))*

B. Tree Canopy Fee. If the supplemental arborist report demonstrates that the applicable standard percent effective tree canopy cover in Section 10, part 3, item N will not be provided through any combination of tree planting or preservation for the overall development site (excluding streets) or that the 20 percent effective tree canopy cover will not be provided through any combination of tree planting or preservation for any individual lot or tract in the R-1, R-2, R-3.5, R-4.5, R-7, and R-12 districts (when the overall development site meets or exceeds the standard percent effective tree canopy cover), then the applicant shall provide the city a tree canopy fee according to the methodology outlined in Section 10, part 4 of the Urban Forestry Manual. ...

[Changes will be made by staff to all other relevant references in the code and commentary for Chapter 18.790 to specify that the per lot minimum is applicable to the R-1, R-2, R-3.5, R-4.5, R-7, and R-12 districts only. If the R-12 district is moved into Tier 2 (33%), then the per lot minimum will not apply to the R-12 district. If the per lot minimum is reduced to 15%, then the text will reflect the change.]

**Non Land Use Amendments:** *(Urban Forestry Manual Section 10, Part 3 (Urban Forestry Plan - Supplemental Arborist Report Requirements))*

M. A summary in table or other such organized format clearly demonstrating the effective tree canopy cover that will be provided for the overall development site (excluding streets) and for each lot or tract in the R-1, R-2, R-3.5, R-4.5, R-7, and R-12 districts (excluding streets) as follows: ...

[Changes will be made by staff to all other relevant references in the Urban Forestry Manual to specify that the per lot minimum is applicable to the R-1, R-2, R-3.5, R-4.5, R-7, and R-12 districts only. If the R-12 district is moved into Tier 2 (33%), then the per lot minimum will not apply to the R-12 district.]

**Option 2:** Eliminate the 15% per lot minimum for all districts.

**Land Use Amendments:**

B. Tree Canopy Fee. If the supplemental arborist report demonstrates that the applicable standard percent effective tree canopy cover in Section 10, part 3, item N will not be provided through any combination of tree planting or preservation for the overall development site (excluding streets) ~~or that the 20 percent effective tree canopy cover will not be provided through any combination of tree planting or preservation for any individual lot or tract (when the overall development site meets or exceeds the standard percent effective tree canopy cover)~~, then the applicant shall provide the city a tree canopy fee according to the methodology outlined in Section 10, part 4 of the Urban Forestry Manual.

[Changes will be made by staff to remove all references in the code and commentary to the per lot minimum for Chapter 18.790.]

**Non Land Use Amendments:** *(Urban Forestry Manual Section 10, Part 3 (Urban Forestry Plan - Supplemental Arborist Report Requirements))*

M. A summary in table or other such organized format clearly demonstrating the effective tree canopy cover that will be provided for the overall development site (excluding streets) ~~and each lot or tract (excluding streets)~~ as follows:

[Changes will be made by staff to remove all references in the Urban Forestry Manual to the per lot minimum.]

**Option 3:** Keep the 15% per lot minimum for all districts.

**No Amendments Required**

**Issue 1.C: Options for Addressing Urban Forestry Plan Requirements for Residential Zones**

**Option 1:** Continue to require urban forestry plans for all residential districts (staff recommended option).

**No Amendments Required**

**Option 2:** Do not require urban forestry plans for residential districts that allow small lots (less than 5,000 sq. ft. lot size allowed) which are the R-12 and R-25 districts.

**Land Use Amendments:** *(Section 18.790.020 (Applicability))*

**18.790.020 Definitions Applicability**

The requirements of this chapter apply to the following situations:

- A. The following land use reviews:
  - 1. Conditional Use (Type III);
  - 2. Downtown Design Review (Type II and III);
  - 3. Minor Land Partition (Type II), except in the R-12 and R-25 districts;
  - 4. Planned Development (Type III), except in the R-12 and R-25 districts;
  - 5. Sensitive Lands Review (Type II and III);
  - 6. Site Development Review (Type II); and
  - 7. Subdivision (Type II and III), except in the R-12 and R-25 districts.

[Changes will be made by staff to all relevant references in the commentary for Chapter 18.790 to explain that the urban forestry plan requirements are not applicable to residential development in the R-12 and R-25 districts.]



**Issue 1.D: Options for Addressing Urban Forestry Plan Requirements for Minor Land Partitions**

**Option 1:** Continue to require urban forestry plans for Minor Land Partitions (staff recommended option).

**No Amendments Required**

**Option 2:** Do not require urban forestry plans for Minor Land Partitions.

**Land Use Amendments:** *(Section 18.790.020 (Applicability))*

**18.790.020 Definitions Applicability**

The requirements of this chapter apply to the following situations:

- A. The following land use reviews:
  - 1. Conditional Use (Type III);
  - 2. Downtown Design Review (Type II and III);
  - 3. ~~Minor Land Partition (Type II);~~
  - 43. Planned Development (Type III);
  - 54. Sensitive Lands Review (Type II and III);
  - 65. Site Development Review (Type II); and
  - 76. Subdivision (Type II and III).

[Changes will be made by staff to all relevant references in the commentary for Chapter 18.790 to explain that the urban forestry plan requirements are not applicable to Minor Land Partitions.]

**Issue 1.E: Options for Developing Urban Forestry Plan**

**Option 1:** Allow landscape architects, in addition to arborists, to develop urban forestry plans (staff recommended option).

**Land Use Amendments:** *(Chapter 18.115 (List of Terms))*

Landscape Architect

[Adds the term “Landscape Architect” to chapter 18.115, no further changes to chapter required.]

*(Section 18.120.030..A (Meaning of Specific Words and Terms))*

104. Landscape Architect” - An individual registered with the Oregon State Landscape Architect Board as a registered landscape architect.

[Changes will be made by staff to all other relevant references in the code and commentary for Chapter 18.120 to add the term “landscape architect” where the term “arborist”, “certified arborist” or “project arborist” is used.]

*(Section 18.745.040...A.6 (Street Trees))*

6. An existing tree may be used to meet the street tree standards provided that:

- a. The largest percentage of the tree trunk immediately above the trunk flare or root buttresses is either within the subject site or within the right of way immediately adjacent to the subject site;
- b. The tree would be permitted as a street tree according to the standards in Sections 2 and 12 of the Urban Forestry Manual if it were newly planted; and
- c. The tree is shown as preserved in the Tree Preservation and Removal site plan (per 18.790.030.A.2), Tree Canopy Cover site plan (per 18.790.030.A.3) and Supplemental ~~Arborist~~ Report (per 18.790.030.A.4) of a concurrent urban forestry plan and is eligible for credit towards the effective tree canopy cover of the site.

[No further changes to chapter required.]

*(Section 18.790.030..A (Urban Forestry Plan Requirements )*

A. Urban Forestry Plan Requirements. An urban forestry plan shall:

1. Be coordinated and approved by a landscape architect (the project landscape architect) or a person possessing dual certifications as a certified arborist and certified tree risk assessor (the project arborist);

2. Meet the tree preservation and removal site plan standards in Section 10, part 1 of the Urban Forestry Manual;

3. Meet the tree canopy site plan standards in Section 10, part 2 of the Urban Forestry Manual; and

4. Meet the supplemental ~~arborist~~ report standards in Section 10, part 3 of the

Urban Forestry Manual.

[Changes will be made by staff to all other relevant references in the code and commentary for Chapter 18.790 to add the term “landscape architect” where the term “arborist”, “certified arborist” or “project arborist” is used, in addition changes will be made by staff to all other relevant references in the code and commentary for Chapter 18.790 to remove the word “arborist” where the term “supplemental arborist report” is used.]

**Non Land Use Amendments:** *(Urban Forestry Manual Section 10, Part 1 (Urban Forestry Plan - Tree Preservation and Removal Site Plan Requirements))*

N. Any supplemental tree preservation specifications consistent with tree care industry standards that the project arborist or landscape architect has determined are necessary for the continued viability of trees identified for preservation.

[Changes will be made by staff to all other relevant references in the urban forestry manual to add the term “landscape architect” where the term “arborist”, “certified arborist” or “project arborist” is used, in addition changes will be made by staff to all other relevant references in the urban forestry manual to remove the word “arborist” where the term “supplemental arborist report” is used.]

**Option 2:** Continue to allow only arborists to develop urban forestry plans.

**No Amendments Required**

**Issue 3.A: Options for the Tree Canopy Fee In Lieu**

**Option 1:** Continue to use the tree canopy fee in lieu methodology that captures the full value of tree canopy (staff recommended option).

**No Amendments Required**

**Option 2:** Revise the tree canopy fee in lieu methodology to capture one-half the value of tree canopy.

**Non Land Use Amendments:** (*Urban Forestry Manual Section 10, Part 5 (Tree Canopy Fee Calculation Requirements)*)

A. The tree canopy fee shall be calculated as follows:

1. If the percentage of effective tree canopy cover is less than the applicable standard percentage in part 3, item n above for the overall development site find the difference (in square feet) between the proposed effective tree canopy cover and the applicable standard effective tree canopy cover for the overall development site and multiply the difference (in square feet) by:
  - a. One-half ~~the~~ the most recent wholesale median tree cost established by the PNW-ISA for a 3 inch diameter deciduous tree in the Willamette Valley, OR divided by 59 square feet.
2. In cases where the overall development site meets the standard percentage in part 3.N above yet the percentage of effective tree canopy cover is less than 20 percent for any individual lot or tract, find the difference (in square feet) between the proposed effective tree canopy cover and 20 percent effective tree canopy cover for each deficient lot or tract and multiply the difference (in square feet) by:
  - a. One-half ~~the~~ the most recent wholesale median tree cost established by the PNW-ISA for a 3 inch diameter deciduous tree in the Willamette Valley, OR divided by 59 square feet.

[Changes will be made by staff to all relevant references in the commentary for Chapter 18.790 to explain why the tree canopy fee in lieu in the Urban Forestry Manual is one-half the value of tree canopy.]

**Additional Amendments from the April 16, 2012 Planning Commission Meeting**

**Additional Amendments 1: Minor text amendment to the summary heading of section 18.790.030.A.**

**Land Use Amendments:** *(Section 18.790.030.A (Urban Forestry Plan Requirements))*

A. Urban Forestry Plan ~~Submital~~ Requirements. An urban forestry plan shall:  
[No further changes.]

**Additional Amendments 2: Reduce the per lot effective tree canopy cover requirement to 15% in Chapter 18.790 and the Urban Forestry Manual.**

**Land Use Amendments:** *(Section 18.790.030.B (Urban Forestry Plan Requirements))*

B. Tree Canopy Fee. If the supplemental arborist report demonstrates that the applicable standard percent effective tree canopy cover in Section 10, part 3, item N. will not be provided through any combination of tree planting or preservation for the overall development site (excluding streets), or that the ~~20~~ 15 percent effective tree canopy cover will not be provided through any combination of tree planting or preservation for any individual lot or tract (when the overall development site meets or exceeds the standard percent effective tree canopy cover), then the applicant shall provide the city a tree canopy fee according to the methodology outlined in Section 10, part 4 of the Urban Forestry Manual.

[No further changes.]

*(Section 18.790.050.D.5 (Flexible Incentives and Standards for the Preservation of Significant Tree Groves))*

1. Adjustment to Minimum Effective Canopy Requirement. The requirement for ~~20~~ 15 percent effective tree canopy cover per lot is not required when:

[No further changes.]

*(Section 18.790.050.D.5, Commentary)*

The fifth flexible and incentive based standard is an adjustment to the minimum effective canopy requirement. A standard Urban Forestry Plan requires ~~20~~ 15 percent effective tree canopy per lot in addition to the overall development site effective canopy requirement which is based on zoning (25, 33 or 40 percent).

[No further changes.]

**Non Land Use Amendments:** *(Urban Forestry Manual Section 10, Part 3.O (Urban Forestry Plan - Supplemental Arborist Report Requirements))*

O. If the percent of effective tree canopy cover is less than the applicable standard percent in item n above for the overall development or less than ~~20~~ 15 percent for any lot or tract (when the overall development site meets or exceeds the standard percent effective tree canopy cover in item n), calculate the tree canopy fee required to meet the applicable standard percent effective tree canopy cover in item n above for the overall development site or ~~20~~ 15 percent effective tree canopy cover for each lot or tract (only if the overall development site meets or exceeds the standard percent effective tree canopy cover in item n but individual lots or tracts do provide ~~20~~ 15 percent effective tree canopy cover) according to the methodology in Section 10, part 4 of the Urban Forestry Manual.

*(Urban Forestry Manual Section 10, Part 4. A.2 (Urban Forestry Plan - Tree Canopy Fee Calculation Requirements))*

2. In cases where the overall development site meets the standard percentage in part 3.N above yet the percentage of effective tree canopy cover is less than ~~20~~

15 percent for any individual lot or tract, find the difference (in square feet) between the proposed effective tree canopy cover and ~~20~~ 15 percent effective tree canopy cover for each deficient lot or tract and multiply the difference (in square feet) by:

[No further changes.]

**Additional Amendments 3: Correct scrivener's errors in section 18.790.030.C.**

**Land Use Amendments:** (18.790.030.C (Urban Forestry Plan Requirements))

~~D.C.~~ Tree Canopy Fee Use. Tree canopy fees provided to the city shall

[No further changes.]

**Additional Amendments 4: Correct scrivener's errors in ESEE and correct boundaries of significant tree groves #38 and #62.**

**Land Use Amendments:** (note: the full text from the ESEE analysis associated with these corrected scrivener's errors is not provided)

Change "18.70" to "18.790" (see UFCR Volume III, page 22)

Change "18.770" to "18.790" (see UFCR Volume III, pages 33 and 83)

Change "18.750" to "18.790" (see UFCR Volume III, page 47)

Change "18.755" to "18.775" (see UFCR Volume III, pages 34 (4 times), 47 and 64)

**Land Use Amendments:** Adjust boundaries of inventoried Tree Groves #38 and #62 on the Significant Tree Grove Map (note: the amended Significant Tree Grove Map is on page 76 of the packet and provided with the staff report for the April 16, 2012 Planning Commission meeting).

**Additional Amendments 5: Minor text amendment to clarify the review and approval process in sections 18.790.070.B.1-3.**

**Land Use Amendments:** *(18.790.070.B.1 (Exemptions [from the Type I Modification to the Urban Forestry Plan Component of an Approved Land Use Permit]))*

b. A revised tree canopy site plan and supplemental arborist report are submitted for review and approval prior to removal ~~for review and approval~~ that reflect the proposed changes to the previously approved Urban Forestry Plan, and The revised tree canopy site plan and supplemental arborist report shall demonstrate how either the effective tree canopy cover requirements in Section 10, part 3 of the Urban Forestry Manual will be provided by ~~the proposed combination of tree planting, and preservation; and/or; payment of a tree canopy fee in lieu of planting or preservation. will be provided to make up the difference between the proposed effective tree canopy cover and the effective tree canopy cover requirements in Section 10, part 3, of the Urban Forestry Manual for the lot or tract where the modification is proposed.~~

[No further changes.]

*(18.790.070.B.2)*

c. A revised tree canopy site plan and supplemental arborist report are submitted for review and approval prior to planting ~~for review and approval~~ that reflect the proposed changes to the previously approved Urban Forestry Plan.

[No further changes.]

*(18.790.070.B.3)*

b. A revised tree preservation and removal site plan, tree canopy site plan and supplemental arborist report are submitted for review and approval prior to modification of the tree protection fencing ~~for review and approval~~ that reflect the proposed modifications to the previously approved Urban Forestry Plan.

[No further changes.]



**Additional Amendments 6: Grant 1.25x bonus credit for planting native trees.**

**Non Land Use Amendments:** *(Section 10, Part 3.M.2 (Urban Forestry Plan - Supplemental Arborist Report Requirements))*

- c. The mature canopy area (in square feet) of all open grown trees in the tree canopy site plan, except for those from the native tree list in the Urban Forestry Manual, to be planted and maintained within the overall development site and each lot or tract (or associated right of way, excluding median trees).
- d. 1.25 times the mature canopy area (in square feet) of all open grown trees from the native tree list in the Urban Forestry Manual in the tree canopy site plan to be planted and maintained within the overall development site and each lot or tract (or associated right of way, excluding median trees).
- e. 1.25 times ~~the~~ the mature canopy area (in square feet) of each stand in the tree canopy site plan to be planted and maintained within the overall development site and each lot or tract (or associated right of way, excluding median trees). The eligible mature tree canopy area shall be the portion directly above the overall development site and each lot or tract (or associated right of way).
- f. Divide the tree canopy area (calculated per part 3.M.2.a-~~d~~ above) for the overall development site and each lot or tract by the total area of the overall development site and each lot or tract respectively to determine the effective tree canopy cover for the overall development site and each lot or tract.

[No further changes.]

(note: above lettering is revised due to the insertion of item d)

(note: for consistency the Example Supplemental Report Template in Appendix 9 of the Urban Forestry Manual is recommended for amendment as shown on page 77 of the April 16, 2012 Planning Commission Packet)

**Additional Amendments 7: Minor text amendment to remove a repetitive approval criterion for tree removal permit requirements in sensitive lands.**

**Non Land Use Amendments:** *(Section 6, Part 1.B.6 (Sensitive Lands Tree Removal Standards))*

~~6. "The tree is listed on the nuisance tree list.~~

[No further changes.]

(note: numbering of the section is revised and the cross reference to the Nuisance Tree List in the sidebar is struck due to the deletion of item 6)

*(Section 6, Part 1.C (Sensitive Lands Tree Removal Standards))*

C. Unless removed for thinning purposes (part 1.B.4 ~~10~~ above) the city manager or designee shall condition the removal of each tree in sensitive lands upon the planting of a replacement tree in accordance with the Sensitive Lands Tree Replacement Standards in Section 6, part 2 of the Urban Forestry Manual.

[No further changes.]

# Log of Input

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## City of Tigard Memorandum

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**To:** City Council, Planning Commission, Members of the Public

**From:** Todd Prager, Associate Planner/Arborist

**Re:** Log of Input on the Draft Urban Forestry Code Revisions

**Date:** December 13, 2011

The Urban Forestry Code Revisions Citizen Advisory Committee advised staff throughout the development of the draft code to ensure its consistency with community goals and policies. Staff logged updates to the draft Urban Forestry Code Revisions for the citizen advisory committee throughout the process to allow them to track changes between drafts.

The last meeting of the citizen advisory committee was September 14, 2011, in which they finalized their set of guiding principles for each topic area of the draft code. The guiding principles represent the consensus view of the citizen advisory committee and serve staff during the technical and public review phase to ensure any code edits remain consistent with their consensus view.

As part of the technical and public review phase of the project (September 14, 2011 to December 12, 2011), staff kept a log of input from the technical advisory committee and public, and staff's response to that input. This allows for tracking of additional changes to the draft Urban Forestry Code Revisions for evaluation of consistency with the citizen advisory committee's guiding principles. It also provides decision-makers understanding of how community input is being addressed by staff through the draft code.



### Technical Advisory Committee Input

#	COMMENTER (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
1.	Todd Prager (9-15-2011)	Remove reference to numerical risk rating in the Tree Risk Assessment Form under “Recommended Hazard Tree Abatement Procedures” line.	This has been incorporated into the draft Urban Forestry Manual. The code required threshold for abatement is tiered based on the size of the tree or tree part, and is not simply “9” (see definition of hazard tree in chapter 8.02). The code, and not the Tree Risk Assessment Form, will be used as the reference to determine when abatement is required	Urban Forestry Manual Appendix 1
2.	Todd Prager (9-15-2011)	Revise commentary for 18.790.030 (Urban Forestry Plan) for consistency with code provisions.	This has been incorporated into the commentary for the draft Urban Forestry Code Revisions. Urban forestry plans require trees over 6-inch diameter and those trees less than 6-inch diameter that are protected by the provisions of Title 8 (e.g. street trees, heritage trees, etc.) to be inventoried prior to development. The commentary for 18.790.030 has been revised to clarify the inventory requirements for trees less than 6-inch diameter.	18.790.030 Commentary
3.	Todd Prager (9-16-2011)	As recommended by a Citizen Advisory Committee member, use the term “in effect” rather than “active” in section 18.790.060 to describe the validity period for an urban forestry plan since the term “in effect” is more commonly used in the development code when describing validity periods.	This has been incorporated into the draft Urban Forestry Code Revisions and commentary. The term “in effect” replaces the term “active” to describe the validity period of an urban forestry plan in section 18.790.060	18.790.060 Code & Commentary

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
4.	Todd Prager (9-16-2011)	As recommended by a Citizen Advisory Committee member, revise the term “requirement” to “standard” in some sections of chapter 18.790 for consistency purposes.	This has been incorporated into the draft Urban Forestry Code Revisions. The term “standard” replaces the term “requirement” in some sections for consistency purposes.	18.790.030 18.790.050 Code
5.	Todd Prager (9-16-2011)	Specify in section 8.20.040 that fines for tree removal will be used for tree planting and early establishment, which is consistent with the use of fines for tree removal specified in section 18.790.080.	This has been incorporated into the draft Urban Forestry Code Revisions. It is specified in section 8.20.040 that fines for tree removal will be used for tree planting and early establishment.	8.20.040 Code
6.	Todd Prager (9-16-2011)	Remove draft dates and the words “preliminary draft” from the Urban Forestry Manual. The Urban Forestry Manual is part of the comprehensive draft code document which is dated and titled on the front cover. There is no need to date and title individual pages.	This has been incorporated into the draft Urban Forestry Manual. Draft dates and the term “preliminary draft” have been removed from the Urban Forestry Manual.	Urban Forestry Manual



#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
7.	Todd Prager (9-19-2011)	In chapter 8.06, provide a cross reference to chapter 2.04 which establishes the authority to adopt and amend administrative rules.	This has been incorporated into the draft Urban Forestry Code Revisions. Previously, the process for adopting and amending administrative rules in the Urban Forestry Manual was outlined in chapter 8.06. However, council recently adopted a process for adopting and amending administrative rules in chapter 2.04. Administrative rulemaking procedures are housed within one chapter of the code to allow cross referencing when various chapters include administrative rules. This makes the process for administrative rulemaking more consistent than if each chapter had a separate process.	8.06.020 8.02.020 Code
8.	Todd Prager (10-7-2011)	Re-letter and re-number within the Urban Forestry Manual sections so the hierarchy is more consistent with the Tigard Municipal Code style guide. Ensure any cross references in the manual are correspondingly changed in the code.	This has been incorporated into the draft Urban Forestry Manual. Re-lettered and re-numbered within the Urban Forestry Manual sections so the hierarchy is more consistent with the Tigard Municipal Code style guide. Ensured any cross references in the manual are correspondingly changed in the code.	Urban Forestry Manual
9.	Tom McGuire (10-11-2011)	Shorten section 18.745.040.A.6 for readability by citing the Urban Forestry Manual standards only once.	This has been incorporated into the draft Urban Forestry Code Revisions. Revised section 18.745.040.A.6 accordingly by citing the Urban Forestry Manual standards only once.	18.745.040

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
10.	Tom McGuire (10-11-2011)	If there is a concurrent Type III Planning Commission review (Type IIIA), allow the review body to be Planning Commission for efficiency purposes. Otherwise, require the review body to be the hearings officer (Type IIIB) for discretionary urban forestry plan reviews.	This has been incorporated into the draft Urban Forestry Code Revisions. The review body (Planning Commission or hearings officer) will depend on whether there is a concurrent Type III review. For example, if an applicant for a Planned Development (Type III Planning Commission review) chooses to receive a discretionary urban forestry plan review, the review body will be the Planning Commission. However, if an applicant for a Conditional Use Permit (Type III hearings officer review) chooses to receive a discretionary urban forestry plan review, the review body will be the hearings officer. Finally, if an applicant does not have a concurrent Type III review (e.g. Subdivision, Minor Land Partition, etc.), yet chooses to receive a discretionary urban forestry plan review, the review body will be the hearings officer.	18.790.040 Code & Commentary
11.	Tom McGuire (10-11-2011)	In the native tree list, change “Garry Oak” to “Oregon White Oak” for consistency with the common name of the tree used in the other tree lists.	This has been incorporated into the draft Urban Forestry Manual. Revised the native tree list in the Urban Forestry Manual accordingly by changing “Garry Oak” to “Oregon White Oak” for consistency with the common name of the tree used in the other tree lists.	Urban Forestry Manual Appendix 5
12.	Damon Reische, CWS (10-18-2011)	In example drawings, the 50-foot stream buffer should be taken from the existing wetland edge in places where the wetland is wider than the stream.	This has been incorporated into the draft Urban Forestry Manual. Revised the example drawings so that the 50-foot stream buffer is taken from the existing wetland edge.	Urban Forestry Manual Appendices 7, 8, 10, and 13

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
13.	Damon Reische, CWS (10-18-2011)	Coordinate on drawings and specifications in the Urban Forestry Manual to ensure they do not conflict with CWS LIDA Handbook.	No revisions were made based on this comment. Todd Prager and Damon Reische met on 10-21-2011 to coordinate on the drawings and specifications for both documents. No conflicts were identified due to the fact that both documents contain examples that can be modified on a project specific basis. There is enough flexibility in design to allow trees to be planted within the CWS example LIDA facilities.	Urban Forestry Manual
14.	Brian Rager Susan Hartnett (10-18-2011)	Do not label drawings as “standard” drawings since the city will allow equivalent alternatives to meet covered soil volume requirements. Consider calling them “example” drawings that applicants could use unless they propose an equivalent alternative.	This has been incorporated into the draft Urban Forestry Manual. Revised the first word from “standard” to “example” in the names of appendices 14 and 17. Revised names accordingly in Sections 12 and 13 of the Urban Forestry Manual.	Urban Forestry Manual Sections 12 and 13 Appendices 14 and 17

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
15.	Steve Martin (10-18-2011)	Consider revising the parking lot canopy standards so that a buffer at the perimeter of a parking lot is included in the calculation of parking area and canopy cover. If there are existing mature trees near the parking perimeter, there could be an incentive to pave to capture the canopy of the mature trees. By adding a buffer at the perimeter, the incentive to pave additional area could be reduced.	No revisions were made based on this comment. Staff studied this issue in more detail and discussed options with the consultant. The issue with creating a standard buffer around the parking area is that it makes the parking lot canopy standards more difficult to achieve in situations where there are no existing mature trees. This is because the buffer would add to the parking area and required additional canopy to cover it. After applying the parking lot canopy standards to the peer review project sites, staff and the consultant are confident that the canopy standards are readily achievable across a range of development scenarios. A scenario where an applicant would pave additional area to capture the dripline of a mature tree represents an outlying exception. However, in order to address these types of outlying exceptions, the draft code allows the director to approve an equivalent alternative parking lot canopy proposal by a landscape architect.	18.745.050 Urban Forestry Manual Section 13
16.	Todd Prager (10-19-2011)	The drawings, specifications, and attachments in the Urban Forestry Manual should be called “appendices”.	This has been incorporated into the draft Urban Forestry Manual. The drawings, specifications, and attachments in the Urban Forestry Manual are now called “appendices” and have each been assigned an appendix number.	Urban Forestry Manual Appendices

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
17.	Todd Prager (10-19-2011)	For scaled drawings, indicate the sheet size so people know how large to print the sheet for the correct scale.	This has been incorporated into the draft Urban Forestry Manual. Indicated sheet size for all scaled drawings.	Urban Forestry Manual Appendices 7, 8, 10, 12, 13, and 16
18.	Todd Prager (10-19-2011)	Do not specify a compaction density in the covered soil volume specifications. This will allow flexibility to meet the compaction requirements for specific applications.	This has been incorporated into the draft Urban Forestry Manual. Revised first sentence of Part 4.D of the covered soil volume specifications as follows "...compact each lift to <del>at least 85</del> <b>the required</b> percent of maximum density."	Urban Forestry Manual Appendix 14
19.	Damon Reische, CWS (10-21-2011)	Ensure that thinning standards in the Urban Forestry Manual do not conflict with CWS standards.	No revisions were made based on this comment. The thinning standards require a certified arborist or certified forester approval that the thinning of interior trees within a stand of trees is necessary for overall stand health, the thinning will result in no less than 80% canopy cover at maturity for the area to be thinned, and that thinning of non-native trees is maximized prior to the thinning of native trees. In addition, CWS will be required to issue a service provider letter before final approval. The combination of a thinning recommendation by a certified professional and final approval by CWS will minimize future conflicts.	Urban Forestry Manual Section 3, 5, 6, 7, 8, and 9

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
20.	Cheryl Caines (11-3-2011)	In chapter 18.115 (List of Terms), delete terms that have been deleted from chapter 18.790.	This has been incorporated into the draft Urban Forestry Code Revisions. Deleted terms: -Commercial Forestry -Pruning -Removal -Sensitive Lands (chapter 18.790 specific definition) -Tree (chapter 18.790 specific definition)	18.115 Code
21.	Cheryl Caines (11-3-2011)	Correct spelling, grammar, and punctuation, and conform to AP standards throughout the code and commentary.	This has been incorporated into the draft Urban Forestry Code Revisions.	Throughout Code & Commentary
22.	Cheryl Caines (11-3-2011)	When determining the required number of street trees (street frontage/40), clarify the required number of street trees when the result is a fraction	This has been incorporated into the draft Urban Forestry Code Revisions. Clarified that when the result is a fraction, the minimum number of required street trees shall be determined by rounding to the nearest whole number.	18.745.040 Code
23.	Cheryl Caines Tom McGuire (11-17-2011)	Add a diagram to visually describe the definition of “caliper”.	This has been incorporated into the draft Urban Forestry Code Revisions. A diagram of caliper from the City of Lawrence, Kansas has been added and labeled as figure 8.02.1 to Title 8 and figure 18.120.3 to Title 18.	8.02 18.120 Code

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
24.	Cheryl Caines Tom McGuire (11-17-2011)	Add a diagram to visually describe the definition of “diameter at breast height (DBH)”.	This has been incorporated into the draft Urban Forestry Code Revisions. Diagrams from the City of Portland have been added for the definition of DBH in Title 8 and Title 18. Figures 8.02.2 and 18.120.4 illustrate DBH for a single trunk tree, figures 8.02.3 and 18.120.5 illustrate DBH for a tree with a split trunk above the ground, and figures 8.02.4 and 18.120.6 illustrate DBH for a tree with multiple trunks at or below ground. Commentary has been added to Chapter 18.120 to explain the figures.	8.02 18.120 Code & Commentary
25.	Cheryl Caines Tom McGuire (11-17-2011)	Revise the definition of “open soil volume” by removing the second sentence. There should not be a standard in a definition.	This has been incorporated into the draft Urban Forestry Code Revisions. The standard has been removed from the definition of open soil volume.	8.02 18.120 Code
26.	Cheryl Caines Tom McGuire (11-17-2011)	Revise the submittal requirement in section 18.330.040.A.4 back to “a landscape plan” for consistency with the submittal requirements in other sections of the code. The elements to be included in a landscape plan will be clarified as part of the upcoming regulatory improvement initiative. Clarifying landscape plan submittal requirements is out of scope for the urban forestry code revisions project.	This has been incorporated into the draft Urban Forestry Code Revisions. The elements to be included in a landscape plan will be clarified as part of the upcoming regulatory improvement initiative.	18.330.040 Code & Commentary

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
27.	Cheryl Caines Tom McGuire (11-17-2011)	Remove the term “concept” and specify that the urban forestry plan needs to meet the requirements of chapter 18.790.	This has been incorporated into the draft Urban Forestry Code Revisions. Since the term “concept” is not defined, it is more explicit to simply require an urban forestry plan that meets the code requirements. Planning commission would still reserve the right to require modifications to the urban forestry plan during the detailed development plan approval process.	18.350.040 Code & Commentary
28.	Cheryl Caines Tom McGuire (11-17-2011)	Remove the word “significant” from section 18.350.050.A.2 because the word is undefined, and could be misconstrued as applying only to “significant tree groves”. The intent of the approval criterion is to consider the preservation of any tree or natural resource as part of planned developments.	This has been incorporated into the draft Urban Forestry Code Revisions. The word “significant” has been removed, and the rationale for removing the word has been included in the commentary.	18.350.050 Code & Commentary
29.	Cheryl Caines Tom McGuire (11-17-2011)	Specify that the director has the authority to approve alternate grading contour intervals for a detailed development plan for a planned development.	This has been incorporated into the draft Urban Forestry Code Revisions. The director is specified as the authority to approve alternate grading contour intervals.	18.350.060 Code



#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
30.	Cheryl Caines Tom McGuire (11-17-2011)	Do not specify that the commission may require alternate urban forestry plans to ensure tree preservation. The existing language allows the commission to require alternate site plans, which encompasses grading plans, urban forestry plans, etc. Specifying that the commission may require alternate urban forestry plans is duplicative.	This has been incorporated into the draft Urban Forestry Code Revisions. There are no changes to the detailed development plan approval criteria.	18.350.070 Code & Commentary
31.	Cheryl Caines Tom McGuire (11-17-2011)	In the site development review submittal requirements, include a cross reference to chapter 18.790.	This has been incorporated into the draft Urban Forestry Code Revisions. Chapter 18.790 is explicitly cross referenced in the site development review submittal requirements.	18.360.070 Code & Commentary
32.	Cheryl Caines Tom McGuire (11-17-2011)	In the Tigard Downtown District Development and Design Standards submittal requirements, include a cross reference to chapter 18.790.	This has been incorporated into the draft Urban Forestry Code Revisions. A cross reference to chapter 18.790 has been added to section 18.610.010. Corresponding commentary has been added to explain the reason for the cross reference.	18.610.010 Code & Commentary

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
33.	Cheryl Caines Tom McGuire (11-17-2011)	Add to the applicability section of the chapter 18.745, Type I Minor Modifications to conform to current practice. For example, when rooftop mechanical equipment is installed through a Type I Minor Modification, staff requires screening of that equipment consistent with the standards in chapter 18.745. The authority to apply these types of standards should continue.	This has been incorporated into the draft Urban Forestry Code Revisions. The proposed applicability generally conforms to current practice by applying the standards to Type I Conditional Use and Site Development Review Minor Modifications, and Type II and III land use reviews.	18.745.020 Code & Commentary
34.	Cheryl Caines Tom McGuire (11-17-2011)	Rearrange the street tree standards so that the first standard includes the types of projects that are required to plant street trees. This makes the code more readable.	This has been incorporated into the draft Urban Forestry Code Revisions. The project types that are required to plant street trees are listed first for code readability. The commentary has been modified correspondingly to reflect the order of the code.	18.745.040 Code & Commentary
35.	Cheryl Caines Tom McGuire (11-17-2011)	Revise footnote [1] of table 18.745.2 back to its original format so that it is consistent with the code language in section 18.745.050.A.2.	This has been incorporated into the draft Urban Forestry Code Revisions. Footnote [1] has been revised back to its original format so that it is consistent with the code language in section 18.745.050.A.2. The commentary has been correspondingly revised.	Table 18.745.2 & Commentary

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
36.	Cheryl Caines Tom McGuire (11-17-2011)	Move the details of the use of the tree canopy fee into a council resolution. Detailed specifications on the use of fees are more appropriate in council resolutions rather than code.	This has been incorporated into the draft Urban Forestry Code Revisions. The activities that the citizen advisory committee agreed the tree canopy fee should be used for have been removed from the code and replaced with a cross reference to a council resolution (to be adopted concurrently with the urban forestry code revisions). The commentary describing the activities the tree canopy should be used for has been left intact. This commentary will inform decision-makers of the citizen advisory committee's recommendations and be used by staff in drafting the resolution for council adoption.	18.790.030 Code & Commentary
37.	Cheryl Caines Tom McGuire (11-17-2011)	Allow setback adjustments for street side setbacks as well to preserve trees. This should be in addition to side and rear yard setback adjustments.	This has been incorporated into the draft Urban Forestry Code Revisions. Adjustments are proposed for street side yard setbacks in addition to side and rear setbacks to preserve trees. The previous omission of street side yard setback adjustments was an oversight. Adding it is not inconsistent with the recommendations of the citizen advisory committee to provide flexible standards for tree preservation.	18.790.050 Code
38.	Cheryl Caines Tom McGuire (11-17-2011)	Move the details of the urban forest inventory requirements into the urban forestry manual.	This has been incorporated into the draft Urban Forestry Code Revisions. The details of the urban forest inventory requirements have been moved into Section 11 of the Urban Forestry Manual with a cross reference provided in the code. The commentary has been correspondingly revised to reflect the changes, and to highlight the proposed fee for collecting the inventory data.	18.790.060 Code & Commentary Urban Forestry Manual Section 11

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
39.	Todd Prager (11-18-2011)	Insert Chapter 18.310 (Summary of Land Use Permits) into the draft Urban Forestry Code Revisions. Reflect changes to the land use permits from the draft Urban Forestry Code Revisions.	This has been incorporated into the draft Urban Forestry Code Revisions. The chapter has been inserted and now reflects the urban forestry permits that have been added and deleted in Title 18.	18.310 Code & Commentary
40.	Todd Prager (11-30-2011)	Strike tree removal adjustments from section 18.370.020.C.9. Adjustments to development standards for tree preservation will be approved through the urban forestry plan component of a land use permit as outlined in section 18.790.050 (Flexible Standards for Planting and Preservation). This is consistent with the citizen advisory committee consensus recommendation, and the strikeout was missed during the previous code revisions.	This has been incorporated into the draft Urban Forestry Code Revisions to correct the oversight. Corresponding commentary has been added to explain the revisions.	18.370.020 Code & Commentary

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
41.	Tom McGuire (12-1-2011)	The city has begun work on a project called the Regulatory Improvement Initiative. The purpose of the project is to revise, reorganize and reformat the Tigard Development Code to limit internal conflicts, clarify provisions, and generally make the code easier to use. Chapter 18.790 is the first chapter to be completely revised since the city began work on the Regulatory Improvement Initiative. Various edits to Chapter 18.790 are required for consistency with the Regulatory Improvement Initiative. These edits do not change the substance of the chapter provisions.	This has been incorporated into the draft Urban Forestry Code Revisions. Requested edits have been made including reordering provisions, shortening sentence length for readability, and ensuring consistent use of terminology. Corresponding commentary has been added to reflect the edits. Cross references in the Urban Forestry Manual have been updated consistent with the reordering of code provisions.	18.790 Code & Commentary Urban Forestry Manual

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
42.	Cheryl Caines (12-8-2011)	Verify with the City Attorney that the removal permit process for trees that were required with development (Chapter 8.14) supersedes the preservation requirements for trees that were recorded as preserved on property deeds as required by prior land use decisions.	<p>This has been incorporated into the commentary for the draft Urban Forestry Code Revisions. The City Attorney has confirmed that the legislative amendments in Chapter 8.14 supersede the preservation requirements for trees that were required by prior land use decisions. This includes trees that are recorded as preserved on property deeds as a result of past land use decisions. However, the City Attorney recommends including boiler plate language when issuing future tree removal permits to the effect that: “There may be a deed restriction on the tree approved for removal by this decision. While the applicant is solely responsible for identifying and removing any applicable deed restrictions, the city will provide any signatures necessary to facilitate the removal of deed restrictions for trees permitted for removal by this decision.”</p> <p>The City Attorney recommends adding language to the commentary that acknowledges the legislative intent of Chapter 8.14 in creating a process that supersedes preservation requirements of past land use decisions, including those for trees with deed restrictions.</p>	8.14 Commentary

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
43.	Keith Jehnke Peer Review Consultant (12-8-2011)	Need explanation that existing trees under 6-inch DBH can be given “planted tree mature crown area” if the tree is located with adequate rooting soil and is located within the specified distances from other trees, existing buildings, etc.	This has been incorporated into the draft Urban Forestry Manual. The city may consider trees less than 6-inch DBH as equivalent to newly planted trees if they meet all applicable species, size, condition and location requirements as newly planted trees.	Urban Forestry Manual Section 10
44.	Keith Jehnke Peer Review Consultant (12-8-2011)	Are wetland areas included or excluded in total development site area calculations for required canopy?	No revisions were made based on this comment.  The definition of “development site” in Chapter 18.120 (Definitions) is as follows:  “Development site” - A lot or combination of lots upon which one or more buildings and/or other improvements are constructed.  If a wetland area is part of the lot being developed, it is included in the development site area used to calculate effective canopy cover.	18.120 Code Urban Forestry Manual Section 10

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
45.	Keith Jehnke Peer Review Consultant (12-8-2011)	For canopy calculations, does a tree in the center median area count toward the tree canopy area?	<p>Clarifying language based on this comment has been incorporated into the draft Urban Forestry Manual.</p> <p>The intent of the draft Urban Forestry Manual is to not grant canopy credit for median trees because they are the maintenance responsibility of the city, and it would be difficult to determine which parcel on which side of a street would receive credit for a median tree (particularly when the parcels are under separate ownership).</p>	Urban Forestry Manual Section 10



#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
46.	Keith Jehnke Peer Review Consultant (12-8-2011)	Define method for existing canopy area calculations. Potential options would include by formula using DBH, by aerial photo interpretation, or by survey.	<p>No revisions were made based on this comment. The methods for calculating existing canopy area are detailed in the Urban Forestry Manual.</p> <p>For open grown trees, the method for calculating existing canopy is:</p> <p>Average tree canopy area = (average tree canopy spread/2)<sup>2</sup> x π</p> <p>For stands of trees, the method for calculating existing canopy is:</p> <p>The total on site tree canopy area (in square feet) of the stand</p> <p>The project arborist would be required to determine the stand canopy area (measured at the dripline of the stand). The most efficient method would likely be aerial photo interpretation. However, any method that accurately captures the stand canopy dripline area would be accepted.</p>	Urban Forestry Manual Section 10
47.	Keith Jehnke Peer Review Consultant (12-8-2011)	The list of acceptable trees seems limiting in some situations. Is there a procedure for accepting trees not on the list?	No revisions were made based on this comment. The various tree lists (except the Nuisance Tree List) include trees that are known to perform well in the Portland area. However, the Urban Forestry Manual states that the City Manager or designee may review and approve alternate trees not on any of the lists on a case by case basis.	Urban Forestry Manual Sections 2, 4, 7, 8, 10, and 13

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
48.	Keith Jehnke Peer Review Consultant (12-8-2011)	Within parking lots, is it necessary to calculate the percent canopy cover over the parking lot for each individual tree (as opposed to calculating the total canopy cover over the parking lot)? This adds an additional step and is time consuming.	This has been incorporated into the draft Urban Forestry Manual. The parking lot canopy standard is based on the cumulative percent canopy cover for all trees over the entire parking area. The requirement to calculate the percent canopy cover over the parking area for each individual tree is not necessary, and has been struck from the manual.	Urban Forestry Manual Section 13
49.	Keith Jehnke Peer Review Consultant (12-8-2011)	Showing soil volumes on the same plan as the Tree Canopy Site Plan makes the sheet crowded and hard to read. On a very large site, it seems that this might be better as a separate sheet. Also, we didn't do this on all six sites per your instruction. Is there a standard/guideline for when it should be shown?	No revisions were made based on this comment. Soil volumes are only required to be displayed for street trees and parking lot trees on the Soil Volume Plan and Parking Lot Tree Canopy Plan, respectively. Soil volumes may be displayed on separate plan sheets for clarity.	Urban Forestry Manual Sections 12 and 13

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
50.	Tom McGuire Susan Hartnett (12-12-2011)	<p>Reword the language allowing a reduction in minimum density for the preservation of significant tree groves in section 18.790.050.C.1. The current language allows a reduction in the “number of units”, but it would be more accurate to allow a reduction in “density”.</p> <p>Also, cross reference the specific code section in Chapter 18.510 to make it easier to find information on density calculations (section 18.510.040.B).</p> <p>Finally cross reference Chapter 18.715 (Density Computations) because it contains additional information on density calculations.</p>	<p>This has been incorporated into the draft Urban Forestry Code Revisions. The term “number of units” has been changed to “density” for accuracy and consistency with the language in Chapter 18.510.</p> <p>More specific cross references have been made to section 18.510.040.B and Chapter 18.715 to make the code easier to navigate.</p>	18.790.050 Code
51.	Tom McGuire Susan Hartnett (12-12-2011)	Section 18.790.050.D.1 allows a reduction in minimum density for the preservation of a significant tree grove. This allowed reduction in minimum density should be reflected in Chapter 18.715 (Density Computations).	This has been incorporated into the draft Urban Forestry Code Revisions. Section 18.715.020.A.1 has been revised to reflect the allowed reduction in minimum density for the preservation of a significant tree grove. Commentary has been added to explain the revisions.	18.715.020 Code & Commentary

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
52.	Tom McGuire Susan Hartnett (12-12-2011)	Incorporate the enforcement provisions and penalties in Title 8 and Chapter 18.790 into Title 6 and Chapter 1.16 respectively. Title 6 and Chapter 1.16 are where enforcement provisions and penalties throughout the code are consolidated. This is where enforcement provisions and penalties for urban forestry violations should be consolidated. Cross reference Title 6 and Chapter 1.16 in Chapter 8.20 (Enforcement). Retain the ability to place stop work orders and require retroactive tree removal permits in Chapter 8.20 since those provisions are not in Title 6 or Chapter 1.16.	This has been incorporated into the draft Urban Forestry Code Revisions. The enforcement provisions and penalties (and corresponding commentary) that were previously in Chapter 8.20 and Section 18.790.080 have been incorporated into Title 6 and Chapter 1.16. Section 6.02.180 now describes what constitutes violations of Title 8 and Chapter 18.790. Section 1.16.640 now describes the penalties for violations of Title 8 and Chapter 18.790. Chapter 8.20 now cross references Title 6 and Chapter 1.16. Chapter 8.20 still retains the ability to place stop work orders and require retroactive tree removal permits. Commentary for Chapter 8.20 has been revised to reflect the changes. Previous cross references throughout the code to enforcement provisions and penalties in Chapter 8.20 and Section 18.790.080 have been corrected.	1.16.180 6.02.180 8.20 Code & Commentary
53.	Tom McGuire Susan Hartnett (12-12-2011)	Remove the provision in section 18.790.080 (Enforcement) requiring the city to file an ethics charge statement if a certified arborist submits false or misleading information. The city could still reserve the right to file an ethics charge statement, but for liability reasons, the city should not be obligated to do so.	This has been incorporated into the draft Urban Forestry Code Revisions. The provision requiring the city to file an ethics charge statement has been removed. Corresponding commentary has also been removed.	18.790.080 Code & Commentary

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
54.	Todd Prager (12-15-2011)	<p>Title 6 (Nuisance Violations) is a new title in draft phase that has not yet been adopted as of the writing of this comment (December 15, 2011). However, in anticipation of its adoption in advance of the adoption of the Urban Forestry Code Revisions, it is included as part of this package of amendments.</p> <p>Existing code language referencing hazard trees that was revised in Sections 7.40.050, 7.40.060, and 7.40.090 has been duplicated and moved to Title 6. The same revisions to the hazard tree language in Title 7 are required in Title 6.</p>	<p>This has been incorporated into the draft Urban Forestry Code Revisions. Hazard trees are addressed in a comprehensive way through Chapter 8.08 and replace the existing provisions in Sections 6.01.020, 6.02.030, and 6.04.040 that lack sufficient clarity for hazard tree evaluation and abatement. These are the same revisions that were made to Sections 7.40.050, 7.40.060, and 7.40.090. Corresponding commentary for the revisions to Title 7 have been incorporated into Title 6.</p>	<p>6.01.020 6.02.030 6.04.040 Code &amp; Commentary</p>

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
55.	Darren Wyss Cheryl Caines Todd Prager (12-19-2011)	<p>Section 18.520.050.C.1 limits the maximum floor area ratio (FAR) in the MUE zone to .4. The purpose is to limit impacts on state highway facilities.</p> <p>It is unclear whether the allowed increase in commercial building height for tree grove preservation (Section 18.790.050.D.3) would supersede the maximum FAR in the MUE zone. It should be clarified that while increasing building height in the MUE zone is allowed for tree grove preservation, exceeding the FAR limit is not. This will continue existing policy to limit impacts on state highway facilities.</p>	<p>This has been incorporated into the draft Urban Forestry Code Revisions. Section 18.790.050.D.3 now specifies that 20 feet additional building height is allowed provided that maximum FAR in the MUE zone is not exceeded. Commentary has been added to explain the provision.</p>	18.790.050 Code & Commentary

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
56.	Darren Wyss (12-19-2011)	Remove from the commentary for the commercial and industrial tree grove preservation incentives (Sections 18.790.050.3 and 4) reference to 20 feet of additional building height being equal to “1 story”. The incentive is to simply allow 20 feet additional building height for tree grove preservation. The incentive does not necessarily guarantee an additional story. Whether an additional story is possible from an additional 20 feet of building height depends on the circumstances and constraints of a particular site.	This has been incorporated into the commentary for the draft Urban Forestry Code Revisions. Reference to 20 feet of additional building height being equal to “1 story” has been removed from the commentary for Sections 18.790.050.3 and 4.	18.790.050 Commentary
57.	Susan Hartnett (12-20-2011)	In the commentary, reference the “guiding principles” for each code topic area. This will allow people reviewing the code to cross reference the guiding principles that relate to each code topic area.	This has been incorporated into the commentary for the draft Urban Forestry Code Revisions. The “guiding principles” are cross referenced at the beginning of each code topic area.	8.04 8.08 18.790 18.790.050 Commentary

## Public Input

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
1.	John Frewing (12-8-2011)	Are tree permit standards clear and objective?	<p>No revisions were made based on this comment. There are two tracks of decision making for tree permits:</p> <ol style="list-style-type: none"> <li>1. The administrative review process by city staff is for simple situations such as trees that are in poor or hazardous condition, nuisance trees, causing damage, fire dangers or preventing allowed development to occur (except heritage trees). The permit criteria for this process are clear and objective.</li> <li>2. The public review process by a designated board or commission is for more complex situations where the reasons for removal are less clear. The designated board or commission is authorized to use their discretion to weigh the tree benefits and reasons for removal when making their decision. The permit criteria for this process are discretionary.</li> </ol> <p>The city attorney has reviewed and approved the process and standards for both of these permit types.</p>	8.04 Code



#	COMMENTER (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
2.	John Frewing (12-8-2011)	Have all tree permit definitions in one place. Cross reference if necessary.	No revisions were made based on this comment. A new Chapter 8.02 (Definitions and Rules) contains all tree related definitions that can be cross referenced during the tree permitting process. Previously, tree related definitions were in various parts of the code and now they are consolidated.	8.02.030 Code
3.	John Frewing (12-8-2011)	Calculate canopy cover as:  Sum of effective canopy area in site development area ÷ total site development area  For commercial and industrial zoned areas, allow as an alternative:  Sum of canopy area on whole site ÷ total site area	No revisions were made based on this comment. Throughout the Urban Forestry Code Revisions process, the canopy cover standards were applied based on the overall development site area and not limited to just the disturbed portion of the development site. Staff and outside consultants tested the canopy cover standards based on the overall development site and determined they result in a reasonable amount of planting and preservation. The Citizen and Technical Advisory Committees also reviewed the results of applying the canopy cover standards based on the overall development site and the general consensus was the results were reasonable. Staff does not recommend modifying the canopy cover calculations without significant technical and public review of the implications.	Urban Forestry Manual Section 10
4.	John Frewing (12-8-2011)	Clarify the definitions of 'open space', 'green space', 'natural area', etc.	No revisions were made based on this comment. Clarification of these definitions is out of scope for the Urban Forestry Code Revisions process because it would extend beyond trees.	18.120 Code

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
5.	John Frewing (12-8-2011)	Mature tree canopy area should be reduced for: <ol style="list-style-type: none"> <li>1. Interference with building footprint, and;</li> <li>2. Location under power or communications cables.</li> </ol>	No revisions were made based on this comment. The tree placement requirements account for these conflicts by: <ol style="list-style-type: none"> <li>1. Requiring setbacks from building footprints based on mature canopy spread, and;</li> <li>2. Requiring trees that will not interfere with overhead utility lines at full maturity.</li> </ol>	Urban Forestry Manual Section 10
6.	John Frewing (12-8-2011)	Make terminology consistent between 'requirements' (18.360.090.A.1) and 'standards' (Urban Forestry Manual Section 10 Part 3.N)	No revisions were made based on this comment. The term 'requirement' is a broad term that encompasses the term 'standard'. The 'standards' in the urban forestry manual are applicable to the land use reviews listed in section 18.790.020.	18.790.030 Code Urban Forestry Manual
7.	Ken Gertz (12-8-2011)	Does the code give credit for overlapping tree canopy?	No revisions were made based on this comment. The tree placement requirements limit canopy overlap by requiring spacing between trees based on mature canopy spread. However, in some cases there would still be some canopy overlap that would receive credit. Part of the reason for granting credit for some overlapping tree canopy is to not overly complicate the calculation methods. Also, in reality, tree canopy does not necessarily overlap. Instead, tree canopy grows towards empty spaces resulting in similar canopy area but with asymmetrical shapes. The exception to this is understory trees, but the draft standards require exhausting the planting of overstory trees before planting understory trees.	Urban Forestry Manual Section 10

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
8.	Ken Gertz (12-8-2011)	Please provide the same drawings for the same sites if there were no existing trees.	No revisions were made based on this comment. The peer review project sites were selected because they represent the typical range of development projects in Tigard. Only one project (Master's Partition) has a significant number of existing trees. Otherwise, the project sites had very few existing trees and one site had no existing trees (Sequoia Landing). The objective of the peer review was to test the draft code for workability on actual projects. Modifying site conditions by removing (or adding) trees was not part of the scope of work and not within the current budget for the peer review. However, if the existing trees were removed from the project sites, the tree canopy standards would likely be met through some additional planting.	Urban Forestry Manual Section 10
9.	Anonymous (12-8-2011)	Overall, the code seems flexible. However, there should be more screening required between developments.	No revisions were made based on this comment. Screening between incompatible developments is required by section 18.745.050 (Buffering and Screening). No screening is required between similar developments and the Citizen Advisory Committee did not recommend it.	18.745.050 Code

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
10.	Fanny Bookout (12-9-2011)	Residents should not have to pay for a hazard tree evaluation by the city.	<p>No revisions were made based on this comment. The Citizen Advisory Committee specifically addressed the cost recovery issue in their guiding principles. Guiding principle 7 for hazard trees states:</p> <p>“Recover costs incurred by the city when parties rely on the formal city process for resolving hazard tree issues. The public should not have to bear the full cost for issues that should be resolved without city involvement.”</p>	Urban Forestry Manual Section 1

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
11.	Fanny Bookout (12-9-2011)	Trees should not be required in parking lots because of leaf clean up and safety issues.	<p>No revisions were made based on this comment. The Citizen Advisory Committee consensus was to implement the recommendations of the Urban Forestry Master Plan to increase tree canopy over parking lots.</p> <p>Parking lots represent opportunity areas to significant increase tree canopy citywide and meet the city's long term canopy goals. Trees in parking lots also provide benefits such as shading, stormwater interception, air quality improvement, and carbon sequestration. Studies in the Pacific Northwest that compare these benefits to costs (leaf clean up, pruning, watering, etc.) have found large canopy trees provide an annual net benefit ranging from \$46.81 to \$51.46.<sup>1</sup></p> <p>Also, recent studies in Portland show that trees with high canopies (such as those on the parking lot tree list) are actually associated with reduced crime levels.<sup>2</sup></p>	18.745.050 Code Urban Forestry Manual Section 13

<sup>1</sup> McPherson, E.G., S.E. Maco, J.R. Simpson, P.J. Peper, Q. Xiao, A. VanDerZanden, and N. Bell. 2002. **Western Washington and Oregon Community Tree Guide: Benefits, Costs, and Strategic Planting.** International Society of Arboriculture, Pacific Northwest Chapter, Silverton, OR.

<sup>2</sup> Donovan, G.H. and J. Prestenmon. 2010. **The Effect of Trees on Crime in Portland, Oregon.** Environment and Behavior: Published online before print, 1-28.

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
12.	John Frewing (12-12-2011)	<p>I don't see how there are 'approval criteria' regarding tree canopy cover for most development situations. 'Approval Criteria' are in there for the optional subjective option for an urban forest plan, but just try to follow the trail for things like a CUP or SDR to find what 'approval criteria' apply. I think state law/regulations call for 'clear and objective' standards -- not found here -- it is left up to the city to decide whatever it wants as 'applicable' sections of the code. See ORS 227.173(1). Please address clearly in commentary or Q/A to the public going forward. The canopy 'standards' are contained in submittal 'requirements' which may be 'applicable' in the code 'approval criteria' for CUP and SDR sections. The table of 'approval criteria' in 18.310 merely point to 18.330.030 and 18.360.090. LUBA has ruled in McConnell v. City of West Linn 17 OrLUBA 502 (1989) that failure to meet submittal requirements is not in itself a basis for remand or disapproval of city actions. In the recent Fields application for extension of Wall</p>	<p>No revisions were made based on this comment. Chapter 18.790 (and the more detailed Urban Forestry Manual) contains tree canopy cover standards that are required to be met for a list of Type II and III land use permits (CUP, DDR, MLP, PD, SLR, SDR, and SUB). This is clearly stated in section 18.790.020.A. The approval criteria in the chapters for each of these land use permits references compliance with all applicable development standards, which includes the tree canopy cover standards in Chapter 18.790. This continues current administration regarding the applicability of the standards in Chapter 18.790. As requested previously by the Citizen Advisory Committee, the City Attorney has reviewed and approved this response.</p>	18.790.020 Code

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
		St across Fanno Creek, the hearings officer ruled that an owner's signature, required on the Land Use Application (an applicable and required city form) was an 'application standard', not an approval criterion, therefore didn't need to be met.		
13.	John Frewing (12-12-2011)	The definition of 'drip line' should make clear that we are talking about a vertical drop from the outside of the crown; it elsewhere in the code talks about an area 'covered' by the crown. See 8.02.030Y.	No revisions were made based on this comment. The definition of dripline addresses the comment:  "Dripline" - The outer limit of a tree canopy projected to the ground.	8.02.030 and 18.120.030 Code

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
14.	John Frewing (12-12-2011)	The city should require a Type II approval process for significant changes to an Urban Forest Plan once it is approved. "Significant" changes would include modifying more than 25% of the required trees to be planted or preserved on a lot.	<p>No revisions were made based on this comment. The Citizen Advisory Committee specifically addressed the Urban Forestry Plan modification issue in its guiding principles. Guiding principle 10 for the urban forestry standards for development states:</p> <p>“Allow modifications of an urban forestry plan during the course of development through a Type I review process so that planting and preservation strategies can be easily adapted.”</p> <p>The Citizen Advisory Committee initially considered a Type II process for significant modifications to an Urban Forestry Plan, but reached consensus on a Type I process. The rationale of the Citizen Advisory Committee was that if the modification process is less burdensome, people would be more willing to “take a chance” on preservation knowing they would have the flexibility for removal as the development process progresses. This could result in additional preservation.</p>	18.790.070 Code



#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
15.	John Frewing (12-12-2011)	TDC 18.790.060 makes reference to 'final acceptance by the Director'. Under what process or inspection does the Director make such 'final acceptance' and how is it documented?	This has been incorporated into the draft Urban Forestry Code Revisions. For clarification as to when an urban forestry plan is no longer in effect, the term “final acceptance” has been replaced with “the director determines all applicable urban forestry plan conditions of approval and code requirements have been met” in section 18.790.060.A. This is determined following a city inspection and will be documented in the city’s permit tracking system (as is current practice).	18.790.060 Code
16.	John Frewing (12-12-2011)	The UFM calculation of effective canopy has some problems with it: 1. No coverage of the public right of way (sidewalk, planter strip, street) is required, yet credit is given to the lot for canopy cover over these areas. If canopy over paved areas is desired, it should be required in some amount; I suggest that at maturity, 20 percent of the right of way should be under a tree canopy. This distortion of the standards is shown most clearly on the Edgewood example, where I think NO trees are required in the back yards on the west	No revisions were made based on this comment. 1. Throughout the Urban Forestry Code Revisions process, the canopy cover standards were applied based on the overall development site area, excluding streets. Staff and outside consultants tested the canopy cover standards based on this method and determined they result in a reasonable amount of planting and preservation. The Citizen and Technical Advisory Committees also reviewed the results of applying the canopy cover standards based on this method and the general consensus was the results were reasonable. Staff does not recommend modifying the canopy cover calculations without significant technical and public review of the implications.	Urban Forestry Manual Section 10

#	COMMENTER (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
		<p>side of the development -- it is exactly this location where trees would contribute to buffering and shading during the summer.</p> <p>2. Credit for canopy cover seems to be granted for situations where tree growth is limited by power lines or by interference with building structure -- see the example of housing at Hall/Hunziker St. Please explain how these situations could be fixed.</p>	<p>The draft code will likely result in significant tree canopy over streets. Street trees are required based on the amount of street frontage for the development. There is an incentive to maximize street tree canopy because full credit is granted even though half of the canopy overhangs streets. Based on staff and outside consultant testing, these incentives result in a shift of canopy over streets.</p> <p>The Citizen Advisory Committee was generally supportive of shifting canopy from backyards to streets since street trees have high benefit to cost ratios, street trees are easier for the city to monitor in the years after development, and more flexibility in backyard landscaping (as opposed to protected trees) was viewed as positive.</p> <p>Also, there are equity issues with requiring certain percentages of tree canopy over the right of way. This is because of the various widths of streets. For example, it would be easier meet percent canopy requirements for developments fronting local streets than developments fronting arterials.</p> <p>2. (This is addressed in response to public comment 5)</p>	

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
17.	John Frewing (12-12-2011)	How does the proposed code deal with the situation where an existing tree is somewhat skewed, so that its canopy is not a perfect circle? When discussing trees to be planted and mature later, a perfect circle of canopy is assumed. How will canopy be evaluated if such a circle does not grow? For an existing tree, is canopy measured with the existing shape of crown or is some other method of measurement used?	No revisions were made based on this comment. For existing open grown trees, Section 10, Part 3 of the Urban Forestry Manual grants credit as follows:  $(\text{average tree canopy spread}/2)^2 \times \pi$ Averaging the canopy spread accounts for asymmetrical canopy growth of existing trees.	Urban Forestry Manual Section 10

#	COMMENTS (DATE)	SUMMARIZED COMMENT	STAFF UPDATE/RESPONSE	CODE SECTION
18.	John Frewing (12-12-2011)	The raised code should address 'redevelopment' on a lot. Portland requires that if a redevelopment exceeds a certain cost, street trees are required, and if redevelopment adds a certain area to a building, a tree plan is required. Tigard should include such provisions.	<p>No revisions were made based on this comment. The draft code addresses the redevelopment of commercial, industrial and mixed use zones because these areas have less than half the tree canopy of residential zones. The general consensus of the Citizen Advisory Committee was to not require additional trees in residential zones for redevelopment (e.g. building additions, remodeling, etc.) because people will plant trees there voluntarily without regulations.</p> <p>The threshold for application of the urban forestry standards are detailed in the corresponding chapters for the Type II and III land use permits that are required to provide Urban Forestry Plans (CUP, DDR, MLP, PD, SLR, SDR, and SUB). The redevelopment thresholds are based on the amount of modification to buildings or sites, rather than cost.</p>	<p>18.330 18.350 18.360 18.420 18.430 18.610 18.775 Code</p>

# CAC Guiding Principles

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# Guiding Principles

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## BACKGROUND

Developed over two years from February 2010 to the spring of 2012, the Urban Forestry Code Revisions project reflects Tigard City Council's direction for a comprehensive urban forestry code update with enhanced public involvement. Recognizing from previous efforts that issues pertaining to trees can be particularly polarizing, council chose this direction to maximize the potential for reaching consensus.

In September 2011, the Citizens Advisory Committee (CAC) completed their work by reaching consensus on the outcomes reflected in the proposed code. The CAC reached a consensus vote on each topic area through a set of "guiding principles." The intent of the principles is to summarize the committee's discussions on each topic and serve as a guide during the adoption process. The principles concisely convey the main elements of each topic area and represent a compromise between the diverse interests and viewpoints of the CAC members. These principles were voted on by topic during a comprehensive review of the code held in August and September 2011.

## Urban Forestry Standards for Development

Development projects build, improve and maintain public and private infrastructure including streets and utilities in accordance with city standards. Development projects shall also contribute to the urban forest component of the city's green infrastructure regardless of existing site conditions as follows:

### Application

1. Provide an urban forestry plan by a certified arborist outlining methods for preserving, planting and maintaining trees in accordance with industry accepted standards.
2. Meet tiered "effective canopy" targets (25 - 40 percent) tailored by zone with:
  - New trees that have adequate soil resources, appropriate species, a diverse mix and are well placed; or
  - Existing trees in good condition, suitable for preservation, appropriate species and are well protected during development.
3. Require street trees and parking lot trees to meet detailed soil volume standards. These trees often have limited access to soil needed to support their function of providing canopy over impervious surfaces.
4. Encourage planting of new trees that will be large stature at maturity to meet tiered canopy targets. Well placed, large stature trees are proven to have high benefit to cost ratios.

Implementation

- 5. Require regular monitoring and reporting of an urban forestry plan during the course of development by a certified arborist to ensure successful implementation.
- 6. Record spatial and species specific data for inclusion in a publicly accessible inventory of trees. Readily accessible information on protected trees benefits citizens and the city when making future decisions in the years following development.

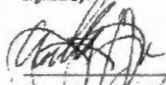
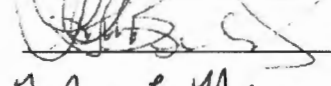
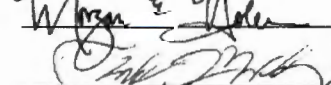
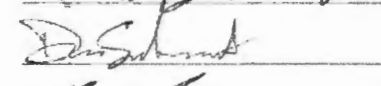
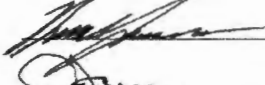

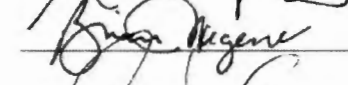



Preservation Incentives and Flexible Standards

- 7. Grant bonus credits toward tiered canopy targets as an incentive for tree preservation.
- 8. Allow a fee in lieu of meeting tiered canopy requirements to be used for a designated range of activities that support the Urban Forestry Master Plan.
- 9. To provide greater flexibility in meeting canopy requirements, allow a discretionary review track. This is in lieu of meeting tiered canopy requirements or fees for incorporating innovative, alternate development proposals that provide equivalent environmental benefits as trees (energy, hydrology, solar, wildlife, etc.).
- 10. Allow modifications of an urban forestry plan during the course of development through a Type I review process so that planting and preservation strategies can be easily adapted.
- 11. Provide flexibility in sidewalk, parking, landscape and lot standards to facilitate preservation and planting.

**Urban Forestry Standards for Development Guiding Principles**

*"I support these principles based upon the group's consensus at the August 10, 2011 meeting."*

Signed by:

	_____	Tony Tycer
	_____	Scott Bernhard
	_____	Morgan Holen
	_____	David Walsh
	_____	Donald Schmidt
	_____	Bret Lievallen
	_____	John Frewing
	_____	Ken Gertz
	_____	Brian Wegener
	_____	John Wyland



## **Tree Grove Preservation Incentives**

Within the city limits, 70 native tree groves covering 544 acres have been identified as significant through the state Goal 5 rule requirements. Development projects with a mapped significant tree grove shall be eligible for flexible standards and incentives to aid in preserving the grove. To be eligible, groves shall be a minimum size with a significant percentage preserved.

### Allowed Density

1. Allow reduction of minimum residential density requirements based on the amount of grove preserved. As more grove is preserved, require fewer units.
2. Allow transfer of residential density from the grove to the non-grove portion of a site. As more grove is preserved, allow a reduction in required setbacks, lot and unit dimensions.
3. Allow additional building height and reduced setbacks for commercial and industrial development that preserves a grove.

### Neighborhood Compatibility

4. Ensure compatibility with the surrounding neighborhood when transferring density for grove preservation.
5. Maintain adequate buffering and screening from surrounding development when adding height and reducing setbacks for commercial and industrial development that preserves a grove.


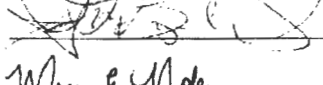
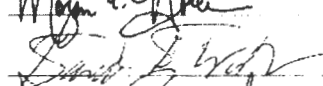

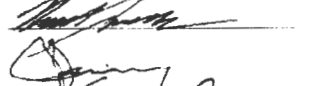


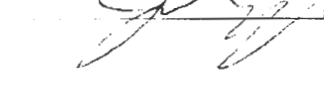

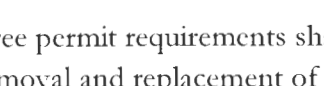
### Tree Grove Health

6. Waive any lot-by-lot canopy standard in favor of preserving cohesive canopy from a grove.
7. Establish authority to adjust street, sidewalk, parking and utility standards in favor of preserving a grove as long as it does not create an unreasonable risk to the public.
8. Require the applicant to work with a certified arborist to maximize the connectivity and viability of the preserved portion of a grove in accordance with industry accepted standards.
9. Require permanent protection of a grove within a development that utilizes any of the flexible standards and incentives for grove preservation.

## Tree Grove Preservation Incentives Guiding Principles

*"I support these principles based upon the group's consensus at the August 10, 2011 meeting."*

Signed by:

	_____	Tony Tyce
	_____	Scott Bernhard
	_____	Morgan Holen
	_____	David Walsh
	_____	Donald Schmidt
	_____	Bret Luenallen
	_____	John Frewing
	_____	Ken Gertz
	_____	Brian Wegener
	_____	John Wyland

## Tree Permit Requirements

Tree permit requirements shall establish clear and consistent standards for permitting the planting, removal and replacement of trees to ensure a healthy and sustainable urban forest.

The tree permit requirements shall not regulate any more tree situations than the city currently does, but rather improve the consistency, clarity and scientific basis for decision-making.

### Code Structure

1. Consolidate tree permit requirements into a single title for ease of use by citizens and decision-makers.
2. Continue to require tree permits for the following categories of trees:
  - Street and median trees;
  - Trees in sensitive lands;
  - Trees that were required with development;
  - Trees that were planted using the Urban Forestry Fund; and
  - Heritage Trees.

### Decision-Making

3. Provide two tracks of decision-making for tree permits:
  - A low- or no-fee administrative review process by city staff for simple situations such as trees that are in poor or hazardous condition, nuisance trees, causing damage, fire dangers or preventing allowed development to occur (except Heritage Trees). Do not allow removal of Heritage Trees for development through an administrative process since Heritage Trees are designated through a public process.
  - A public review process by a designated board or commission for more complex situations where the reasons for removal are less clear. The designated board or commission shall be authorized to use their discretion to weigh the tree benefits and reasons for removal when making their decision.

### Publicly Recognizing Trees

4. Provide two tracks for publicly recognizing unique trees in the community:
  - Heritage trees shall be of landmark importance, afforded regulatory protection from removal and eligible for city funding for maintenance.
  - Significant trees shall also be of landmark importance, but not afforded regulatory protection from removal, and not eligible for city funding for maintenance. The significant tree track allows property owners to publicly recognize their trees without losing flexibility for tree removal on their property.

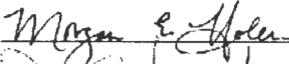
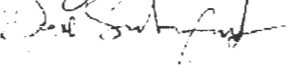



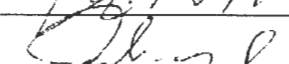
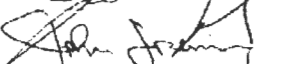


### Enforcement

5. Establish enforcement provisions that deter violations while protecting citizens from disproportionate penalties for tree removal violations.

## Tree Permit Requirements Guiding Principles

*"I support these principles based upon the group's consensus at the September 14, 2011 meeting."*

Signed by

	Morgan Holen
	Donald Schmidt
	Ken Gertz
	Brian Wegener
	Scott Bernhard
	David Walsh
	John Wyland
	John Frewing
	Bret Lienallen
	*Tony Tycer moved.

## Hazard Trees

While the urban forest provides economic and environmental benefits for the community, proper management is essential for maximizing these benefits. When managing the urban forest, safety shall be of primary importance, and clear code standards and procedures for addressing hazard trees creates the regulatory framework for minimizing tree risk.

### Purpose

1. Clearly define what constitutes a hazard tree using the standardized tree risk assessment methodology developed by the International Society of Arboriculture. This methodology factors in the probability of failure, the target area and the size of defective part when evaluating risk.
2. Require hazard tree abatement when the risk rating exceeds a defined threshold. Abatement may be achieved through pruning, tree removal or other means in accordance with applicable rules and regulations.

### Process

3. Establish a process for people (including groups) to resolve hazard tree issues in an objective, equitable and efficient manner. The process shall be structured to limit false or frivolous claims and incentivize people to work out issues informally without formal city involvement.

4. Require people to demonstrate they have standing before filing a formal hazard tree claim. A person shall have standing if they can demonstrate their life, limb or property has the potential to be impacted by the alleged hazard tree, and they have tried unsuccessfully to work the issue out informally.
5. Utilize third-party tree risk assessors when independent hazard tree decisions through the formal city process are warranted. Use of third-party tree risk assessors will help limit the city's liability.
6. Grant the city authority to gain access to property for hazard tree abatement to enforce code provisions or in case of emergency.

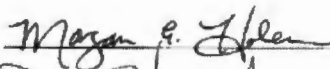
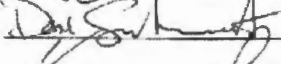

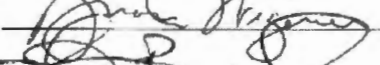
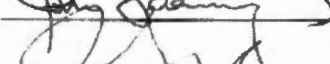

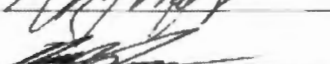

Cost Recovery

7. Recover costs incurred by the city when parties rely on the formal city process for resolving hazard tree issues. The public should not have to bear the full cost for issues that should be resolved without city involvement.

**Hazard Trees Guiding Principles**

*"I support these principles based upon the group's consensus at the September 14, 2011 meeting."*

Signed by:

	_____	Morgan Holen	_____
	_____	Donald Schmidt	_____
	_____	Ken Gertz	_____
	_____	Brian Wegener	_____
	_____	Scott Bernhard	_____
	_____	John Frewing	_____
	_____	John Wyland	_____
	_____	David Walsh	_____
	_____	Bret Lienallen	_____
		*Tony Tyceer moved.	



# Tree Values

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# City of Tigard Memorandum

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**To:** City Council

**From:** John Floyd

**Re:** Urban Forestry Annotated Bibliography

**Date:** November 16, 2011

Community Development staff has assembled the attached bibliography to document the diverse range of benefits and services provided by a healthy urban forest. These benefits and services include environmental, economic, social, and aesthetic contributions. Where the authors have made abstracts of their works available, these existing abstracts are included and are denoted by an asterisk (\*). For each of the other works, staff has composed an abstract.

**Attachment:**  
Annotated Bibliography



## Annotated Bibliography

Center for Urban Forest Research. (2003). *Is All Your Rain Going Down the Drain?* USDA Forest Service, Pacific Southwest Research Station. 4 p.

*Urban trees can be a significant asset for the reduction of stormwater runoff by retaining rainwater and slowing soil erosion. An urban forest of 10,000 trees will reduce runoff by 10 million gallons or more of water each year. Large-crowned trees which are in-leaf coinciding with the most precipitous season, or are evergreens, provide the greatest benefit.*

Center for Urban Forest Research. (2006). *Why Shade Streets? The Unexpected Benefit.* USDA Forest Service, Pacific Southwest Research Station. 4 p.

*This report presents research on the benefits of street trees for road maintenance in California's Central Valley. Evaporation at high temperatures of the binder in asphalt increases the instance of large cracks in pavement over time. Streets that are shaded by trees are less susceptible to this effect and require less frequent maintenance. Shading streets can save between 17% (when small trees are used) and 58% (when large trees are used) on resurfacing and repair costs versus un-shaded streets. Effectiveness is highest when large, deep-rooted trees are selected, adequate soil volume is maintained, and trees are placed at least three feet from any pavement.*

Donovan, G.H., & Butry, D. (2010). "Trees in the City: Valuing Street Trees in Portland, Oregon." *Landscape and Urban Planning* 94(2), 77-83.

*\*Donovan and Butry use a hedonic price model to simultaneously estimate the effects of street trees on the sales price and the time-on-market (TOM) of houses in Portland, Oregon. On average, street trees add \$8,870 to sales price and reduce TOM by 1.7 days. In addition, the authors found that the benefits of street trees spill over to neighboring houses. Because the provision and maintenance of street trees in Portland is the responsibility of adjacent property owners, their results suggest that if the provision of street trees is left solely to homeowners, then there will be too few street trees from a societal perspective.*

Donovan, G.H., Michael, Y.L., Butry, D.T., Sullivan, A.D., & Chase, J.M. (2010). "Urban Trees and the risk of poor birth outcomes." *Health and Place*. 17:390-393. 4p.

*\*This paper investigated whether greater tree-canopy cover is associated with reduced risk of poor birth outcomes in Portland, Oregon. Residential addresses were geocoded and linked to classified-aerial imagery to calculate tree-canopy cover in 50, 100, and 200 m buffers around each home in the sample (n=5696). Detailed data on maternal characteristics and additional neighborhood variables were obtained from birth certificates and tax records. The study found that a 10% increase in tree-canopy cover within 50 m of a house reduced the number of small for gestational age births by 1.42 per 1000 births (95% CI-0.11-2.72). Results suggest that the natural environment may affect pregnancy outcomes and should be evaluated in future research.*

White, Rachel E., Geoffrey H. Donovan, Jeffrey P. Prestemon. 2011. Trees thwart shady behavior. *Nursery Management and Production*. February: 30-33. 4p.

*This study measured trees at 2,813 single-family homes in Portland, Oregon and compared this information with data on crime occurrences. Controls were used for variable such as market value, overall appearance, and visual barriers such as walls and fences, crime prevention measures, and proximity to commercial areas and busy streets.*

*The study found that houses fronted with more street trees and larger yard trees had lower crime rates. This included both total crime rates and specific property crimes such as vandalism and burglary.*

Donovan, Geoffrey II., David Butry. 2011. The effect of urban trees on the rental price of single-family homes in Portland, Oregon. *Urban Forestry and Urban Greening*, 10(3):163-168. 6p.

*\*Few studies have estimated the effect of environmental amenities on the rental price of houses. The study tries to address this gap in the literature by quantifying the effect of urban trees on the rental price of single-family homes in Portland, Oregon. The study found that an additional tree on a house's lot increased monthly rent by \$5.62, and a tree in the public right of way increased rent by \$21.00. These results are consistent with a previous hedonic analysis of the effects of trees on the sale prices of homes in Portland, which suggests that homeowners and renters place similar values on urban trees.*

Geiger, Jim. (2004). *The Large Tree Argument: The Case for Large Trees vs. Small Trees*. Center for Urban Forest Research, USDA Forest Service, Southern Center for Urban Forestry Research & Information. 8p.

*Planting and maintaining as many large-stature trees as possible is economically and environmentally preferable over the long run to planting and maintaining small-stature trees. The article cites a comparison study of costs and benefits for different plans for municipal tree planting and maintenance and provides suggestions for marketing large-stature trees to communities.*

McPherson, E.G., Maco, S.E., Simpson, J.R., Peper, P.J., Xiao, Q., VanDerZanden, A.M., & Bell, N. (2002). *Western Washington and Oregon Community Tree Guide: Benefits, Costs and Strategic Planting*. Center for Urban Forest Research, USDA Forest Service, Pacific Southwest Research Station, pp. 5-12, 17-22.

*\*Decisions about investments in community trees depend on correctly calculating the costs and benefits of planting and maintaining trees in community spaces: yards, parks, and street locations. The Tree Guide describes studies calculating the economic benefits of trees to energy conservation, air cooling, pollutant and runoff reduction, street shading, and land value, as well as studies calculating the costs of planting, pruning, and removing trees, irrigation, pest and disease control, infrastructure repair, cleanup, liability, and administration. Net benefits or costs are calculated by weighing the benefits versus costs at four different scales—parcel, neighborhood, community, and global—then summing the results. The summed results reveal net benefits exceeding net costs for all large trees, all medium residential trees, and all small trees opposite west-facing walls.*

McPherson, E. G., & Muchnick, J. (2005). "Effects of Street Tree Shade on Asphalt Concrete Pavement Performance." *Arboriculture & Urban Forestry* 31(6), 303-310.

*\*Forty-eight street segments were paired into 24 high and low-shade pairs in Modesto, California. Field data were collected to calculate a Pavement Condition Index (PCI) and Tree Shade Index (TSI) for each segment. Statistical analyses found that greater PCI was associated with greater TSI, indicating that tree shade was partially responsible for reduced pavement fatigue cracking, rutting, shoving, and other distress. Using observed relations between PCI and TSI, an un-shaded street segment required 6 slurry seals over 30 years, while an identical one planted with 12 crape myrtles (*Lagerstroemia indica*, 4.4 m [14 ft.] crown diameter) required 5 slurry seals, and one with 6 Chinese hackberry (*Celtis sinensis*, 13.7 m [45 ft.] crown diameter) required 2.5*

*slurry seals. Shade from the large hackberries was projected to save \$7.13/m<sup>2</sup> (\$0.66/ft<sup>2</sup>) over the 30-year period compared to the un-shaded street.*

McPherson, E.G., Simpson, J.R., Peper, P.J., Maco, S.E., & Xiao, Q.(2005). “Municipal Forest Benefits and Costs in Five US Cities.” *Journal of Forestry*, 103(8), 411-416.

*\*Increasingly, city trees are viewed as a best management practice to control stormwater, an urban-heat-island mitigation measure for cleaner air, a CO<sub>2</sub>-reduction option to offset emissions, and an alternative to costly new electric power plants. Measuring benefits that accrue from the community forest is the first step to altering forest structure in ways that will enhance future benefits. This article describes the structure, function, and value of street and park tree populations in Fort Collins, Colorado; Cheyenne, Wyoming; Bismarck, North Dakota; Berkeley, California; and Glendale, Arizona. Although these cities spent \$13–\$65 annually per tree, benefits ranged from \$31 to \$89 per tree. For every dollar invested in management, benefits returned annually ranged from \$1.37 to \$3.09. Strategies each city can take to increase net benefits are presented.*

Nowak, David J. *The Effects of Urban Trees on Air Quality*. USDA Forest Service, Northeastern Research Station. 4p.

*Urban vegetation directly and indirectly alters local and regional air quality in four principal ways. Urban vegetation can reduce air temperature and effect other changes in local meteorology. Trees remove pollutants from the atmosphere both temporarily by intercepting airborne particles and permanently through leaf uptake. Trees emit volatile organic compounds (VOCs) and may result in the emission of additional VOCs from tree maintenance, yet can reduce overall VOC emissions by lowering air temperatures and absorbing evaporative emissions. Appropriately placed, mature trees reduce building energy use, while improperly sited trees may increase building energy use. The combined effects suggest that urban forest management strategies should promote planting and sustaining large, long-lived, and low-maintenance trees in energy-conserving and pollution-reducing locations.*

Sullivan, W.C., Kuo, F.E., & DePooter, S.F. (2004). “The Fruit of Urban Nature: Vital Neighborhood Spaces.” *Environment and Behavior* 36(5) 678-700.

*\*What makes a neighborhood space vital? This article explores the possibility that the presence of trees and grass may be one of the key components of vital neighborhood spaces. The authors report on 758 observations of individuals in 59 outdoor common spaces in a residential development. Twenty-seven of the neighborhood common spaces were relatively green, whereas 32 were relatively barren. Results indicate that the presence of trees and grass is related to the use of outdoor spaces, the amount of social activity that takes place within them, and the proportion of social to nonsocial activities they support. The findings improve and broaden our understanding of the physical characteristics that influence social contact among neighbors and provide evidence that nature plays an important role in creating vital neighborhood spaces.*

Wolf, Kathleen L. (2007). “City Trees and Property Values.” *Arborist News* 16(4), 34-36.

*All forms of urban nature—parks, greenbelts, open space, street trees, etc.—are public goods which provide a range of benefits and services to society. For policy and investment decisions, whether public or private, economic valuation is paramount. Economic decision-making centered on productive use and hard cost can obscure incentives to invest in urban nature. The benefits of urban nature can be represented economically using hedonic pricing and nonmarket valuation. Utilizing these methods can yield evidence in favor of investment in urban nature by revealing non-excludable benefits for all members within a community and added value to properties with trees.*

Wolf, Kathleen L. (2005). "Civic Nature Valuation: Assessments of Human Functioning and Well-Being in Cities." *Forging Solutions: Applying Ecological Economics to Current Problems, Proceedings of the 3<sup>rd</sup> Biennial Conference of the U.S. Society for Ecological Economics*. Tacoma, WA: Earth Economics. 6p.

*\*Civic nature is the collective "constructed nature" of cities and can include parks, open spaces and urban forests, on public or private lands. The existence and quality of civic nature is dependent on comprehensive planning and management. Civic nature advocates are called upon to justify the public costs of amenities that are often perceived as having only aesthetic value. Urban nature provides multiple valuable services, and economic valuation of such services has been initiated. Valuation of the human services provided by urban trees and open space – physical health, mental health and functioning, community health and safety - is another opportunity for research and dialog about nature-based public goods.*

Wolf, Kathleen L. (1998). *Human Dimensions of the Urban Forest, Fact Sheet 1 - Urban Nature Benefits: Psycho-Social Dimensions of People and Plants*. Center for Urban Horticulture, University of Washington, College of Forest Resources. 2p.

*Urban trees are associated with various positive effects on everyday moods, activities, and emotional health. Exposure to nature helps us recover from cognitive fatigue. Views of and proximity to nature in the workplace are correlated with greater enthusiasm and patience for work and increased satisfaction. Green views from the home may be associated with reduced domestic conflict. Well-tended landscapes reduce stress and fear of violence in neighborhoods, on the road, and at school. These and other examples add to the list of environmental reasons to grow more urban plants.*

Wolf, Kathleen L. (1998). *Human Dimensions of the Urban Forest, Fact Sheet 2 - Growing with Green: Business Districts and the Urban Forest*. Center for Urban Horticulture, University of Washington, College of Forest Resources. 2p.

*The fact sheet presents a survey of perceptions of urban trees among business interests including owners, contractors, realtors, and business association staff. Trees present opportunities to maximize profits when they create a positive mood and distinct visual identity for patrons to a business. Trees indicate attention to customer service outside the walls of the business. Concerns about urban trees outside of businesses include reduced visibility for safety and security, engineering and debris impacts, and loss of functional space. Acknowledging these costs helps inform decisions on planting and maintaining the right trees in the right places.*

Wolf, Kathleen L. (1998). *Human Dimensions of the Urban Forest, Fact Sheet 3 - Urban Forest Values: Economic Benefits of Trees in Cities*. Center for Urban Horticulture, University of Washington, College of Forest Resources. 2p.

*The fact sheet introduces a selection of economic benefits of urban trees. Strategic planting and care enhances the urban infrastructure by reducing heating and cooling costs, cleansing the air, and improving water quality. Trees and landscaping attract customers to retail and commercial environments and are associated with higher commercial land values and higher commercial occupancy rates. Residential property values, too, are increased by planting and retaining trees.*

Wolf, Kathleen L. (2003). "Social Aspects of Urban Forestry: Public Response to the Urban Forest in Inner-City Business Districts." *Journal of Arboriculture*, 29(3), 117-126.

*\*Renitalization programs are underway in many inner-city business districts. An urban forestry program can be an important element in creating an appealing consumer environment, yet it may not be considered a priority given that there are often many physical improvements needs. This research evaluated the role of trees in consumer/environment interactions, focusing on the district-wide public goods provided by the community forest. A national survey evaluated public perceptions, patronage behavior intentions, and product willingness to pay in relationship to varied presence of trees in retail streetscapes. Results suggest that consumer behavior is positively correlated with streetscape greening on all of these cognitive and behavioral dimensions. Research outcomes also establish a basis for partnerships with business communities regarding urban forest planning and management.*

Wolf, Kathleen L. (2005). *Trees Are Good for Business: Urban Forest Planning Guidelines for Business Associations*. Presentation, Pacific Northwest Chapter of the International Society of Arboriculture. 12 p.

*This presentation summarizes the results of surveys of business patrons and research in marketing and consumer behavior recommending that trees be utilized to create positive customer experiences. Trees are cues of caring and quality and are correlated with more frequent and longer visits to businesses, greater willingness to travel farther and pay for parking, and increased spending. Respondents to surveys preferred visiting sites with trees to those without trees, and positive reaction increased with tree size.*

Wolf, Kathleen L. (2005). "Trees in the Small City Retail Business District: Comparing Resident and Visitor Perceptions." *Journal of Forestry* 103(8), 390-395.

*\*Many small cities and towns are located near resource lands, and their central business districts serve both residents and visitors. Such quasi-rural retail centers face competitive challenges from regional shopping malls, online purchasing, and big box discount retailers. District merchants must strategically enhance their market position to prevent out-shopping. Streetscape trees are a physical improvement that can be used to attract and welcome consumers. A national survey evaluated public perceptions, patronage behavior intentions, and product willingness-to-pay in relationship to depictions of trees in retail settings. Results suggest that consumer behavior is positively associated with the urban forest on multiple cognitive and behavioral dimensions. Forest amenities of both wild land and built environments can be used to strengthen local economies.*

Wolf, Kathleen L. (2004). *Trees, Parking, and Green Law: Strategies for Sustainability*. Stone Mountain, GA: Georgia Forestry Commission, Urban and Community Forestry, pp. 8-14.

*A critical and frequently overlooked aspect of working toward sustainability goals in communities is responding to the impact of paved areas, especially parking lots, on the natural environment. This report describes scientific research on the effects of parking lots and offers strategies for improving a community's environmental performance with respect to automobile parking. Such strategies will address heat island effects, air quality, stormwater runoff, and economic impacts. A multi-faceted approach to mitigating the impact of paved parking areas will employ creative policy statements and innovative code language to promote vegetation planting, retention, and maintenance, restrict parking lot geometry, and emphasize smart design.*





# Canopy Standards

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# City of Tigard Memorandum

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**To:** Urban Forestry Code Revisions Technical Advisory Committee  
**From:** Todd Prager, Associate Planner/Arborist  
**Re:** Canopy Standards  
**Date:** November 7, 2011

During the Comprehensive Plan and Urban Forestry Master Plan processes, there was general consensus that the mitigation standards in the existing development code unfairly penalize property owners with existing trees and encourage the overplanting of replacement trees.

Urban Forestry Master Plan goal 1.2.a recommends the city address this equity issue as part of the Urban Forestry Code Revisions by “(d)velop(ing) canopy cover or tree density standards for all lots to be met by either preserving existing trees or planting new trees”.

The Urban Forestry Code Revisions Citizen Advisory Committee reached consensus to draft achievable canopy standards for development that are tiered based on zoning district. For example, require development in low density residential areas to have more trees than in areas of dense zoning, such as Downtown Tigard.

To implement the consensus of the Citizen Advisory Committee, staff analyzed possible percent canopy for each zoning district using the same methodology developed to set canopy goals for the Urban Forestry Master Plan and an updated methodology using Light Detection and Ranging (LiDAR) technology (Attachment 1).

The results of the analysis (Attachment 2) were then used in conjunction with the minimum percent landscaping requirements in the Tigard Development Code to place the various zoning districts within one of three tiers. The exception is school sites which were placed in the “dense zoning” tier 3 to ensure sufficient room for sports fields:

- Tier 1: 40% effective canopy<sup>1</sup>
- Tier 2: 33% effective canopy<sup>2</sup>
- Tier 3: 25% effective canopy<sup>3</sup>

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<sup>1</sup> R-1, R-2, R-3.5, R-4.5, R-7, and R-12

<sup>2</sup> R-25, R-40, C-N, C-C, C-G, C-P, MUE, MUE-1, MUE-2, MUC, MUR, and I-P

<sup>3</sup> MU-CBD, MUC-1, I-L, I-H, and schools (18.130.050(J))

Staff and outside consultants then tested the tiered standards on a wide range of development projects to ensure the draft effective canopy standards are achievable, result in a reasonable balance between trees and development, and do not force payment of fees in lieu or discretionary review for typical projects.

It is important to note that effective canopy is very different from actual canopy within the lot lines of a particular development. To meet draft effective canopy standards, the preservation of existing trees is granted double canopy credit, and planting of street trees is granted full canopy credit even though half of their canopies overhang streets which are not part of the calculations. When taking these factors into account, the actual canopy required for a particular development will fall into the following ranges:

Tier 1: 16-40% actual canopy

Tier 2: 13-33% actual canopy

Tier 3: 10-25% actual canopy

The low end of each range represents sites with many existing trees that are preserved, and maximization of street tree canopy. The high end of each range represents sites with no existing trees, and no street tree canopy (all trees planted so the mature canopy stays within the lot lines).

The possible percent canopy for each zoning district (Attachment 2) falls within the actual canopy range for their corresponding tiers above. Application of the tiered effective canopy standards by staff and outside consultants demonstrate the standards are achievable without payment of fees in lieu or discretionary review. Based on these analyses, staff is confident that the draft effective canopy standards will be achievable across the typical range of development sites in Tigard.

**ATTACHMENTS:**

**ATTACHMENT 1:      APPROACH FOR ESTIMATING POSSIBLE PERCENT CANOPY**  
**ATTACHMENT 2:      POSSIBLE PERCENT CANOPY BY ZONING DISTRICT**



## City of Tigard Memorandum

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**To:** Todd Prager, Associate Planner/Arborist

**From:** Nathan Shaub, GIS Programmer/Analyst

**Re:** Approach for Estimating Possible Percent Canopy

**Date:** November 7, 2011

For this analysis, “Possible Canopy Area” was calculated as the sum of the existing canopy area (identified in Metro’s 2007 existing canopy analysis) and an estimated “Potential Canopy Area”. The “Possible Percent Canopy” was then calculated as the Possible Canopy Area divided by the total taxlot area in Tigard. The approach used to arrive at a realistic estimate of Tigard’s Potential Canopy Area and then break this estimate down by zone is outlined in the following paragraphs.

Starting with our Tigard taxlot GIS layer, the first step in estimating Potential Canopy Area was to clip out all larger streams and lakes where canopy coverage may not be possible. Next, the taxlots were divided by residential and non-residential zoning due to the fact that there was an existing GIS layer that defined building footprints within the non-residential areas of town, but no such layer existed for residential areas. Creation of such a GIS layer from scratch would have been very time consuming, and there was promise of such a layer being generated by Metro using Light Detection and Ranging (LiDAR) by the end of the year (2009).

Once the taxlots were divided by residential and non-residential zoning, two different approaches were used to calculate potential canopy area. For non-residential taxlots, the approach was quite simple. First, the area within fifteen feet of a building was clipped from the layer; then the existing canopy area was removed. The resulting shapes were considered to be candidate areas for canopy coverage; however, following the approach used in a similar canopy analysis done in Los Angeles, their area was reduced by 50% to account for residents’ desire for no additional trees and conflicts with higher priority uses [e.g. baseball diamonds, cemeteries]. The halved area was then used as the potential canopy area for the non-residential taxlots.

For the residential taxlots, the approach was slightly more complex. First, setbacks and minimum landscaping requirements in city code were compared to set an “Estimated Landscaping Requirement Area” of 20%. Next the amount of park and sensitive land area within each taxlot was calculated. Finally, the existing canopy area was calculated for each taxlot. Once these three values

were determined, it was first assumed that any existing canopy area would be in the park and sensitive land area, and that any park/sensitive land area above the existing canopy area would be a candidate for canopy coverage (i.e. would be part of the potential). This canopy coverage could exceed the estimated landscaping requirement area. However, if the park or sensitive land area coupled with the existing canopy area did **not** meet the estimated landscaping requirement area, the potential was increased to meet the requirement. If the existing canopy and park/sensitive land canopy exceeded the estimated landscaping requirement area on buildable lands, it was assumed that the existing non-park/sensitive land canopy could be reduced (developed) to the estimated landscaping requirement area.

There are a couple of additional considerations to keep in mind regarding the original possible percent canopy analysis:

1. The non-residential building footprint GIS layer was drawn in 2005, so it was possible for some potential canopy area identified to now be occupied by a building.
2. Parking lots **are** included in the potential canopy area
3. Right of way is **not** included in the potential canopy area

In 2010, Metro delivered the anticipated building footprint layer derived from LiDAR data. This GIS layer included all residential and non-residential building footprints and thus could be used to reassess the original analysis from 2009. In November 2010, the Possible Percent Canopy was recalculated using the new building footprint layer. The approach used for the non-residential taxlots in the original analysis was now used for both residential and non-residential taxlots.

The new LiDAR-based analysis resulted in a sizable Possible Percent Canopy increase in the residential zones and a slight decrease in the non-residential zones. An explanation for the increase in the residential zones is that the assumptions in the original analysis were very conservative and used a 20% landscaping requirement for **all** taxlots. The LiDAR analysis could relax these assumptions somewhat since the building locations were now known. The decrease in the non-residential zones can be explained by the fact that the building footprint layer was drawn in 2005 and didn't include all of the building footprints that showed up in the LiDAR-derived layer. Since the new analysis still yielded Possible Percent Canopy values that were nearly the same or quite a bit greater than the original analysis, the new analysis introduced no concerns.

The final step of the Possible Percent Canopy analysis was to break down the percentages by zone. This step was quite easy: when the taxlots were divided by residential and non-residential zone in the original analysis, they were stamped with their zoning classification. Microsoft Excel functions were then used to sum taxlot areas according to their zoning.

## SUMMARY

	Existing Conditions (original analysis)		Original Analysis		Analysis w/ LiDAR building footprints	
	Total Taxlot Area (sq ft)	Total Existing Canopy Area (sq ft)	Potential UTC (sq ft)	Total Possible % Canopy	Potential UTC (sq ft)	Total Possible % Canopy
<b>Residential</b>						
R-1	1,231,814.71	358,463.73	41,756.41	32%	324,922.10	55%
R-2	2,155,715.61	860,271.02	50,126.42	42%	369,189.74	57%
R-3.5	12,287,992.43	4,234,914.94	129,957.86	36%	2,151,530.55	52%
R-4.5	99,089,225.31	34,634,276.95	6,793,158.96	42%	16,878,284.34	52%
R-7	38,756,959.73	13,597,075.70	1,707,042.98	39%	5,576,380.35	49%
R-12	26,138,548.99	6,895,256.30	2,162,582.51	35%	5,146,965.53	46%
R-25	12,193,061.62	3,289,036.76	917,610.18	35%	1,930,690.20	43%
R-40	184,179.61	34,879.56	18,417.96	29%	15,380.11	27%
<b>Sub Total</b>	192,037,498.00	63,904,174.94	11,820,653.29	39%	32,393,342.92	50%
<b>Non-Residential</b>						
C-C	367,919.39	19,467.21	127,282.38	40%	127,540.80	40%
C-G	15,872,021.56	1,642,552.05	4,892,886.93	41%	4,774,359.02	40%
C-N	90,585.46	14,128.38	22,160.84	40%	20,588.01	38%
C-P	2,803,136.68	523,139.13	764,775.17	46%	727,581.12	45%
I-H	2,189,567.07	66,501.36	525,205.29	27%	513,127.87	26%
I-L	12,444,052.20	1,493,225.80	3,281,440.70	38%	3,277,035.02	38%
I-P	16,517,253.52	3,216,827.06	4,658,638.43	48%	4,628,209.32	47%
MUC	8,892,595.49	429,623.26	2,727,469.24	36%	2,557,592.36	34%
MUC-1	299,086.53	12,487.62	63,982.30	26%	62,953.78	25%
MU-CBD	7,220,050.03	788,070.54	2,052,159.98	39%	1,919,575.02	38%
MUE	7,273,321.64	1,779,609.92	2,125,760.67	54%	1,869,000.94	50%
MUE-1	3,124,334.02	501,577.34	1,050,028.85	50%	889,825.36	45%
MUE-2	2,546,892.59	561,671.39	730,069.31	51%	729,597.04	51%
MUR-1	1,729,685.98	530,588.45	526,063.81	61%	451,245.57	57%
MUR-2	443,813.97	142,798.33	96,849.65	54%	75,892.79	49%
<b>Sub Total</b>	81,814,316.13	11,722,267.82	23,644,773.55	43%	22,624,124.02	42%
<b>TOTALS</b>	273,851,814.13	75,626,442.76	35,465,426.84	41%	55,017,466.95	48%





# Soil Volume

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# City of Tigard Memorandum

**To:** Urban Forestry Code Revisions Technical Advisory Committee

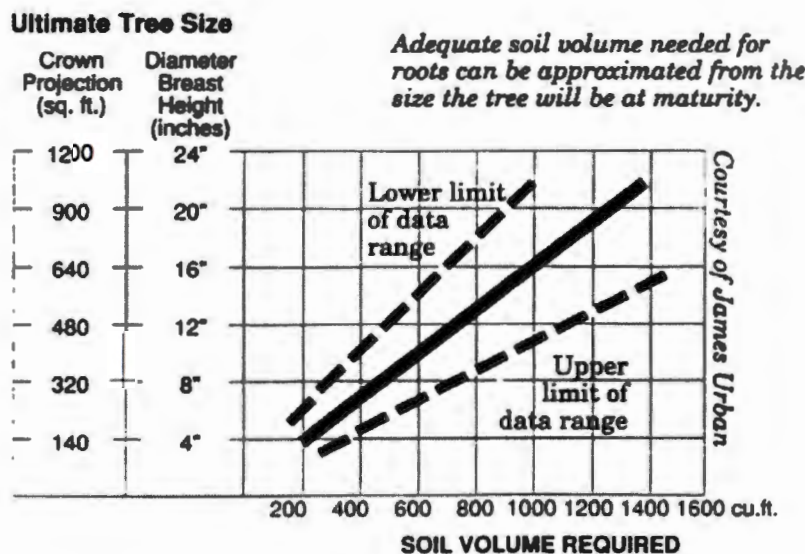
**From:** Todd Prager, Associate Planner/Arborist

**Re:** Draft Soil Volume Standards

**Date:** October 25, 2011

The draft urban forestry code revisions include canopy standards for development based on the full mature growth of various tree species. A tree requires access to an adequate volume of soil that has not been heavily compacted in order to reach its full mature growth potential. The draft urban forestry code revisions includes minimum soil volume standards for street trees and parking lot trees because these tree types are not typically provided adequate soil volumes and the community has prioritized increasing canopy over streets and parking lots<sup>1</sup>.

The draft soil volume standards are derived from research by James Urban<sup>2</sup> that combined data from several sources to graph the relationship between soil volume and tree size.



<sup>1</sup> City of Tigard. 2009. **Urban Forestry Master Plan**. City of Tigard, OR, Community Development Department, Community Planning Division. 101p.

<sup>2</sup> Urban, James. 1992. **Bringing Order to the Technical Dysfunction within the Urban Forest**. Journal of Arboriculture, 18(2), 85-90.

Mr. Urban's research represents the industry accepted standard for soil volume requirements for trees<sup>3,4,5,6</sup>.

In developing the draft soil volume standards for street trees, staff adapted a recommended soil volume standard based on right of way width (curb to property line)<sup>7</sup> developed by an advisory group of experts that included Mr. Urban.

The draft parking lot tree soil volume standard is at the upper end (1,000 cu. ft. per tree) of the aforementioned street tree soil volume standard due to relative flexibility in parking lot design to maximize soil volume.

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<sup>3</sup> Hall, Dennis J. 2007. **Architectural Graphic Standards, 11<sup>th</sup> Edition**. John Wiley and Sons, Hoboken, NJ. 1096 pp.

<sup>4</sup> Hopper, Leonard J. 2007. **Landscape Architectural Graphic Standards**. John Wiley and Sons, Hoboken, NJ. 1120 pp.

<sup>5</sup> Costello, Laurence R. and Katherine S. Jones. 2003. **Reducing Infrastructure Damage by Tree Roots: A Compendium of Strategies**. Western Chapter of the International Society of Arboriculture, Cohasset, CA. 119 pp.

<sup>6</sup> Urban, J. 2008. **Up By Roots: Healthy Soils and Trees in the Built Environment**. Champaign, IL: International Society of Arboriculture. 479p.

<sup>7</sup> Casey Trees. 2008. **Tree Space Design: Growing the Tree Out of the Box**. Washington D.C. Accessed via the World Wide Web <[www.caseytrees.org/planning/design-resources/for-designers/tree-space/documents/TreeSpaceDesignReport.pdf](http://www.caseytrees.org/planning/design-resources/for-designers/tree-space/documents/TreeSpaceDesignReport.pdf)> on October 24, 2011.

Urban Forestry Code Revisions

# Tree Canopy Fee

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# City of Tigard Memorandum

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**To:** Urban Forestry Code Revisions Technical Advisory Committee

**From:** Todd Prager, Associate Planner/Arborist

**Re:** Draft Tree Canopy Fee

**Date:** October 27, 2011

The draft urban forestry code revisions include canopy standards for development based on zoning. For example, development in low density residential areas will be required to have more trees than in areas of dense zoning, such as Downtown Tigard.

The draft canopy standards have been carefully crafted and have undergone a peer review to ensure that they are achievable on the typical range of development scenarios in Tigard. For added flexibility, a discretionary review option is proposed to allow other green building or development methods (e.g. solar panels, green roofs, rain gardens, etc.) in place of planting or preserving the required amount of trees. Finally, a fee-in-lieu option is proposed to allow applicants to pay a “tree canopy fee” to replace the value of canopy not provided through tree planting or preservation.

The tree canopy fee was developed by converting the wholesale median tree cost in the Willamette Valley developed by the PNWISA<sup>1</sup> to a unit canopy cost. According to the PNWISA, the median wholesale cost of a 3-inch diameter deciduous tree is \$174. The formula developed by Krajicek, et al<sup>2</sup> for open grown, broad spreading trees (maximum crown width (feet) =  $3.183 + 1.829 * DBH$  (inches)) was then utilized to convert tree diameter to canopy diameter. According to the Krajicek formula, a 3-inch diameter tree should have a crown width of 8.67 feet or crown area of 59 square feet. These dimensions were confirmed as reasonable by staff through several local field samples. Using the median cost of a 3-inch deciduous tree (\$174) and the crown area of a 3-inch diameter tree (59 square feet), the unit canopy cost or tree canopy fee should be \$2.95 per square foot.

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<sup>1</sup> Pacific Northwest Chapter of the International Society of Arboriculture. 2007. **Species Ratings for Landscape Tree Appraisal**, 2<sup>nd</sup> Edition, Silverton, OR: Pacific Northwest ISA.

<sup>2</sup> Krajicek, J. E., K. E. Brinkman, S. F. Gingrich. 1961. **Crown Competition - A Measure of Density**. *Forest Science* 7:35-42.

This methodology is a reasonable approach for three main reasons. First, tree benefits (aesthetic, stormwater management, air quality, etc.) are derived primarily from their canopies, so proposing to place a value to tree canopy is appropriate. Second, in the proposal, tree canopy is valued using the median wholesale tree cost only, whereas standard tree appraisal is based on the wholesale tree cost plus the cost of tree installation. Finally, the Krajicek formula and field samples by staff are based on the maximum crown width-to-trunk diameter ratio. A typical tree does not have such a high ratio. If the typical ratio were used, the unit canopy cost would increase.



# Regulatory Comparison

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**Portland State**  
UNIVERSITY

## **Regional Urban Forestry Assessment and Evaluation for the Portland-Vancouver Metro Area**

**Prepared by Audubon Society of Portland and  
Portland State University's Department of Environmental  
Science and Management with funding from Metro**

**June 2009**

***(Revised June 2010)***



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- I Comparative analysis of local tree preservation regulations for private land
- J Comparative analysis of local tree preservation and mitigation standards on private land
- K Comparative analysis of local street tree policies
- L Comparative analysis of urban forestry management



## KEY FINDINGS

### **Policies relating to tree removal and preservation on private land outside regulated natural resource areas<sup>1</sup>**

1. There is considerable variation in local urban forestry policies and programs in the region. Policies and programs vary with respect to the applicability, strength and enforcement of regulatory elements, in the level of public investment and extent of incentive/voluntary programs for tree preservation and planting and in the level of citizen involvement and public/private partnerships.
2. Twenty-five out of 30 jurisdictions have some sort of ordinance regulating tree removal or preservation on private land outside of riparian areas subject to water quality and habitat protections.
3. The applicability of these tree removal and preservation regulations vary dramatically. The size of regulated trees, whether development is proposed, zoning and permit exemptions can all determine whether a given tree is subject to preservation, protection and mitigation standards.
4. Seven of those 25 jurisdictions do not apply regulations consistently across all land-uses categories. Thirteen jurisdictions have significant regulatory exemptions that allow the removal of urban trees without a permit or any permit review. Eleven jurisdictions require tree removal permit whether development is proposed or not. Four jurisdictions have Goal 5 programs that regulate removal of upland tree groves. Several others regulate tree removal associated with hillside development.
5. Exemptions, the limited spatial extent of regulations, and/or the absence of protection outside the development review process reduce the applicability and therefore the effectiveness of tree preservation and mitigation standards in several municipal or development codes.
6. Where tree removal or preservations regulations do apply, the authority of local governments to require preservation and mitigation also vary considerably. Jurisdictions tend to fall into four categories with respect to the types of regulations they apply: those that emphasize preservation, those that emphasize mitigation, those with limited regulations, and those with no regulations.
7. Few jurisdictions have clear and objective preservation and mitigation standards. Most have discretionary standards that are reviewed by public officials or staff. Some rely only on the broad policy goals and staff discretion. Six jurisdictions have the authority to require new development to demonstrate proposed designs will remove the least number of trees or basal area.
8. Mitigation standards vary among jurisdictions that require little or no mitigation, to those that require 1 to 1 replacement of trees, and to those that require 1 to 1 replacement of tree diameter.
9. It is difficult to assess the efficacy of compliance and enforcement of local tree regulations, but there appears to be a clear link to level and quality of staffing and citizen involvement. Ten of the 25 jurisdictions with tree regulations reported taking some sort of enforcement of compliance action within the last year.

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<sup>1</sup> This excludes regulations involving permits or design standards related to for heritage tree programs or tree removal on environmentally sensitive lands or natural hazard areas. This section includes regulations applying to publically-owned land regulated by a jurisdiction the same as private land.

### **Policies relating to trees in the public right-of-way**

1. There is greater consistency in policies relating to street trees relative to those regulating trees on private land.
2. Twenty-two out of 30 jurisdictions regulate street tree removal and 19 require a permit for removal in all cases.
3. Twenty-two jurisdictions require street trees to be planted as a condition for approving development. Most jurisdictions that regulate street trees require replacement of street trees when they are removed and have tree planting standards relating to size, species and location.
4. Landowners are responsible for maintaining street trees and the condition of sidewalks and planter strips in most jurisdictions. With few exceptions, local governments provide little or no funding for street tree maintenance and management. Only West Linn, Beaverton, and Tualatin have routine street tree maintenance programs.
5. One of the biggest gaps in street tree policies and programs appears to exist in county urban service areas where permits are not required for street tree removal, policies are weak, patchy, or non-existent and there is less staffing and funding for urban forestry-related activities.

### **Urban forestry management**

1. While most jurisdictions have some local funding sources for urban forestry related-activities, results indicate that the levels and sources of funding vary considerably.
2. Five jurisdictions (Durham, Portland, Lake Oswego, Tualatin, and Vancouver) have an adopted urban forestry management plan. Gresham and Tigard have one in the works.
3. Half of local governments have an established urban tree committee, board or urban forestry commission.
4. Four jurisdictions have an inventory of urban forestry canopy (Vancouver, Tigard, Tualatin, and Lake Oswego) and two have established targets for urban forest cover (Vancouver and Portland).
5. Eleven local governments have heritage tree programs that protect trees at landowner's request.

### **Regional gaps and future research**

1. There are a number of areas where greater regional coordination and consistency would help address gaps and support local urban forestry efforts:
  - Support local governments with little or no tree removal regulations in developing policies for tree preservation, planting and mitigation.
  - Assist in monitoring canopy cover and setting targets for expanding the urban forest.
  - Research and disseminate best management practices for tree protection during construction.
  - Research and disseminate best management practices for tree mitigation.
  - Identify and eliminate barriers to protecting, managing and expanding the urban forest in public right-of-ways, particularly in denser urban neighborhoods.
  - Identify new funding sources for protecting, managing and expanding the urban forest.



- Quantify ecosystem service values of urban trees at a local level.
  - Develop strategies for improving enforcement of tree preservation and protection regulations.
2. Future research and assessment of local urban forestry programs should look more closely at:
- Urban forest management in public parks and greenspaces.
  - Different levels and mechanisms for funding urban forestry related activities.
  - Compliance with tree preservation, planting and mitigation regulations and efficacy of enforcement activities.

## INTRODUCTION

In 2005 the Portland Metro region adopted the Nature in Neighborhoods program (Title 13 of the Regional Functional Plan) to protect and restore regionally significant fish and wildlife habitat in the Portland metro region. This program established land-use protections for the highest value riparian habitats in Metro's inventory of regionally significant fish and wildlife habitat. In adopting Nature in Neighborhoods, the Metro Council chose to rely on a combination of voluntary measures and other local programs to protect the region's upland wildlife habitat including much of the region's urban forest. Nature in Neighborhoods established regional performance indicators and targets to assess and evaluate progress toward protecting and restoring all 80,000 acres of regionally significant fish and wildlife habitat in the region. These measures and targets came to include a region-wide measure of urban forest canopy (although no target) to assess future trends. This regional indicator will provide a means to evaluate the efficacy of voluntary protection efforts and local programs to protect, enhance and manage the regional urban forest over time for its habitat, water quality and other environmental values.

In order to successfully implement the Nature in Neighborhoods program and achieve regional performance targets, the region needs to strengthen and better coordinate local programs while fostering greater citizen understanding and ownership of regional performance targets. There is great potential in making local urban forestry programs and policies a strategic focus in engaging citizens and successfully implementing Nature in Neighborhoods. Despite a growing interest in urban forestry at a local level, a preliminary examination of local urban forestry programs suggests that they vary substantially across the Portland-Vancouver region. Portland State University planning student Clint Wertz conducted a description and analysis of municipal urban forestry programs in 1998 (Wertz 2000).<sup>2</sup> However, the region lacked an up-to-date assessment of urban forestry programs and policies to understand which jurisdictions are doing what and where.

The Regional Urban Forestry Assessment and Evaluation project begins to fill this gap by generating and sharing a consistent body of information on local urban forestry programs in the Portland-Vancouver region. The project aims to provide information to support the efforts of citizens, planners and elected officials to improve local and regional policies and programs over time. Many jurisdictions are in the process of updating their urban forestry programs. Even the process of conducting interviews as part of this study resulted in numerous opportunities to share and exchange information. The project sought to assess policies and programs as comprehensively as possible, but additional research is needed to assess the relative success of policies and programs and the amount and precise mechanisms for funding urban forestry-related activities at the local level. The results of this project and other research combined with information on changes in population and forest canopy cover in the region could provide the basis for evaluating the success of policies and programs over time.

Audubon Society of Portland completed the project from July 2008 to June 2009 under a contract with Metro. Audubon Society of Portland subcontracted with Portland State University Department of Environmental Science and Management to assist with research. The researchers were Jim Labbe, Urban Conservationist, Audubon Society of Portland, and Denisse Fisher, Ph.D. candidate at Portland State University Department of Environmental Science and Management (See Appendix D). Shayna Denny with WEST Consultants, Inc. volunteered her time to complete the GIS analysis.

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<sup>2</sup> Clinton Everette Wertz. Municipal Urban Forestry Programs in the Portland/Vancouver Metropolitan Region. A description and analysis of urban forestry best management practices. Submitted in partial fulfillment of Master's Degree in Urban and Regional Planning. Portland State University. March 2000. Pp. 79.

Dr. Alan Yeakley also provided feedback and guidance throughout the project. Over 30 local government staff from jurisdictions across the region also helped complete this project. Local staff and a number of other citizens actively involved in urban forestry issues in the Portland-Vancouver region lent their time and knowledge in helping complete survey questions and participate face-to-face interviews.

## RESULTS AND FINDINGS

Table 1 (Appendix F) provides summary data on year of incorporation (or year founded for counties), acreage, population, median income and urban tree canopy cover within the 30 jurisdictions that completed Phase I surveys. Considerable variation in the age, size, median income and canopy cover reflect the unique histories of settlement and development over the last 200 years and provides an important context for assessing local urban forestry programs.

**Table 1 – Demographic and tree canopy data by jurisdiction**

Incorporated city/urban area	Year incorporated or founded	Acres	Estimated population (2008)	Estimated median income (1999)	Acres of tree canopy cover (2007)	Percent tree canopy cover (2007)
Beaverton	1893	11840	86,205	47,863	3,020	25.4%
Cornelius	1893	1293	10,955	45,959	235	18.4%
Damascus	2004	10333	9,975	n/a	3,711	37.4%
Durham	1966	265	1,395	51,806	144	54.3%
Fairview	1908	2275	9,735	40,931	429	18.8%
Forest Grove	1872	3192	21,465	40,135	858	23.2%
Gladstone	1911	1586	12,215	46,368	441	27.7%
Gresham	1905	14288	100,655	43,442	4,064	27.1%
Happy Valley	1965	3868	11,455	93,131	1,531	34.0%
Hillsboro	1876	14665	89,285	51,737	3,384	22.9%
Johnson City	1970	43	675	35,517	7	15.1%
King City	1966	392	2,775	28,617	60	13.5%
Lake Oswego	1910	7134	36,590	71,597	3,405	47.1%
Maywood Park	1967	107	750	56,250	47	44.0%
Milwaukie	1903	3166	20,915	43,635	757	23.9%
Oregon City	1844	5947	30,405	45,531	1,697	27.0%
Portland	1851	95260	575,930	40,146	27,231	29.4%
Rivergrove	1971	114	350	85,000	57	48.3%
Sherwood	1924	2644	16,420	62,518	541	19.8%
Tigard	1961	7416	47,150	51,581	1,920	25.4%
Troutdale	1907	3278	15,465	56,593	773	20.0%
Tualatin	1913	5088	26,040	55,762	1,028	19.8%
West Linn	1913	5037	24,400	72,010	1,977	38.7%
Wilsonville	1969	4740	17,940	52,515	1,176	24.9%
Wood Village	1951	603	3,100	43,384	87	14.3%
Vancouver	1857	29485	162,400	41,618	5,425	19.7%
Urban Multnomah County*	1854	7422	Not avail.	Not avail.	Not avail.	Not avail.
Urban Clackamas County*	1843	27648	Not avail.	Not avail.	6,609	23.9%
Urban Washington County*	1849	20404	185,786	Not avail.	8,512	41.7%
Urban Clark County*	1845	17623	Not avail.	Not avail.	Not avail.	Not avail.

\* Unincorporated land inside Metro UBG or in Clark County Three Creeks Planning Area.

**Sources:**

**Population for Oregon Cities:** Population Research Center, Portland State University <http://www.pdx.edu/prc/>. **Population for Urban Washington County:** Steve Kelley, Washington County Land Use and Transportation [Steve\\_Kelley@co.washington.or.us](mailto:Steve_Kelley@co.washington.or.us). **Population for Vancouver:** State of Washington Office of Financial Management: <http://www.ofm.wa.gov/pop/april1/>. **Acreages of Jurisdictions:** Regional Land Information System (Metro). **Median Income:** US Census 1999. **Tree Canopy for Oregon Cities:** Metro State of the Watershed Report <http://www.oregonmetro.gov/index.cfm/go/by.web/id=27579>. **Tree Canopy for Vancouver in 2005:** Vancouver Urban Forestry Management Plan, [http://www.ci.vancouver.wa.us/parks-recreation/parks\\_trails/urban\\_forestry/docs/UFMP\\_final-web.pdf](http://www.ci.vancouver.wa.us/parks-recreation/parks_trails/urban_forestry/docs/UFMP_final-web.pdf). **Tree Canopy for Multnomah, Clackamas, Washington Counties** Calculated from RLIS and Metro Urban Forest Canopy 2007 Data layer.

## Phase I

Local staff from all 30 jurisdictions completed the Phase I survey (Appendix G). In some cases involving smaller jurisdictions with limited staff, it was easier for us to complete the survey over the telephone. The majority of survey questions were answered. Questions that involved specific answers, such as a jurisdiction's annual expenditure on urban forestry related activities, were more often left blank.

## Phase II

For the most part, we completed Phase II surveys (Appendix H) after interviews with local staff. In many cases questions were not applicable or could not capture the unique circumstances, practices or policies in a given jurisdiction. Therefore, Phase II surveys were less complete and we addressed specific questions or issues in the narrative summaries.

### **Policies relating to trees on private land outside regulated natural resource areas.<sup>5</sup>**

Table II, "Comparative analysis of local tree regulations for private land" (Appendix I) and Table III, "Comparative analysis of local tree preservation and mitigation standards on private land" (Appendix J) group and compare tree ordinances on private land and, in many cases, on publically-owned land as well. Both tables summarize policies and standards relating to tree preservation, removal, mitigation and planting, excluding those applying to heritage tree programs or environmentally sensitive lands regulated under Goals 5, 6, and 7 of Oregon land-use planning programs. For the purposes of comparative analysis of policies and programs governing tree removal on private land, we found it useful to classify jurisdictions into the following four categories.

1. **Preservation emphasis:** Jurisdictions that have specific tree preservation standards, criteria or authority to require tree preservation. These jurisdictions tend to have higher staffing levels and political support for implementing robust tree policies and programs.
2. **Mitigation emphasis:** Jurisdictions that have general requirements for tree preservation but put greater relative emphasis on mitigating tree removal at greater than 1 to 1 trees. These jurisdictions also tend to have higher staffing levels and political support for implementing tree policies. In these jurisdictions higher mitigation ratios appear to provide an incentive for tree preservation while maintaining flexible design, but may result in less tree preservation.
3. **Some regulation:** Jurisdictions without clear standards, criteria and little or no discretionary authority to preserve trees, that allow extensive un-permitted tree removal through exemptions, and/or that do not require mitigation of tree removal greater than 1 to 1 trees.
4. **No tree ordinance:** Jurisdictions that do not regulate tree removal on private land. Tree removal regulations on private land vary significantly with respect to where and when they apply. The size of regulated trees, whether development is proposed, the zoning, and permit exemptions, all can determine whether a given tree is subject to preservation, protection and mitigation standards.

Table II (Appendix I) illustrates the wide range of urban tree regulations that potentially apply to developed and developing properties. Twenty-five out of 30 jurisdictions have some sort of ordinance regulating tree removal or preservation on private land. Seven of those 25 jurisdictions do not apply regulations consistently across all land-uses categories. Milwaukie, for example, only

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<sup>5</sup> Our analysis of policies relating to "tree removal on private land" excludes policies related to heritage tree programs or tree removal on environmentally sensitive lands or natural hazard areas. It includes policies applying to publically-owned land where jurisdictions apply regulations to public land.

applies tree regulations to development of flag lots while Portland does not regulate tree removal in some situations that do not involve formal land-divisions.

Thirteen jurisdictions have significant regulatory exemptions that allow the unmitigated removal of trees without a permit or permit review. For example, Gresham allows three to six trees of any size to be removed within a 12 month period depending on lot size. Beaverton entirely exempts developed properties less than ½ acre and has annual exemptions on developed properties greater than ½ acre.

Another gap in most local tree preservation ordinances is the lack of any permit required for tree removal outside the development review process. Eleven jurisdictions always require tree removal permits, whether development is proposed or not. Many jurisdictions do not have clear procedures for ensuring trees that are preserved as a condition of past development are not cut after a development application is approved. Instead these jurisdictions tend to rely on citizen complaints or inquiries in lieu of an established permit process. Other jurisdictions have specifically addressed this issue by requiring a permit to remove any tree above a minimum size even if tree removal is granted without review.

Exemptions, the limited spatial extent of regulations, and/or the absence of protection outside the development review process reduce the applicability and, therefore, the effectiveness of tree preservation and mitigation standards in several municipal or development codes.

Where tree removal or preservation regulations do apply, the authority of local governments to require preservation and mitigation also varies considerably, as illustrated by Table III (Appendix J). Only Portland, West Linn, Oregon City and Vancouver have clear and objective criteria for tree preservation. Most jurisdictions that regulate tree removal have discretionary criteria that staff or public officials must consider before granting a tree removal permit. However, not all of these standards and criteria – whether discretionary or clear and objective – can or do require applicants to avoid and minimize tree removal by demonstrating a low or least impact design. Six jurisdictions have the authority to require new development to demonstrate that proposed designs will remove the least number of trees or basal area. Finally, mitigation standards vary among jurisdictions that require little or no mitigation to those that require 1 to 1 replacement of trees and to those that require 1 to 1 replacement of tree diameter.

Specific regulatory requirements are important to ensure that new development avoids and minimizes tree loss. However, in interviewing local staff and citizens, the efficacy of regulatory programs also depends on local political leadership, staffing levels, the level of citizen involvement and associated enforcement efforts. For example, Wilsonville's code consists of a highly discretionary review process for determining tree preservation, removal and mitigation and specific criteria for tree removal that are not exceptionally restrictive or protective relative to other jurisdictions. However, per-capita staffing levels and expertise allow the city to work more actively and effectively with developers and landowners than other jurisdictions, ensuring the technical expertise and follow-through needed to implement policies and enforce requirements that preserve trees, minimize impacts or more effectively mitigate tree removal.

It was difficult to assess the efficacy of enforcement of tree regulations by local governments. Some local staff admitted and many citizens actively involved in urban forestry issues asserted that enforcement of tree regulations is weak and inconsistent. But in other jurisdictions, staffing levels or organized citizen advocates clearly improve enforcement of tree regulations. To provide a litmus test of a local government's enforcement activities related to tree preservation and protection, we asked each jurisdiction whether or not they had taken enforcement action or compliance efforts

related to their local tree regulations sometime in the past year. Ten of the 25 jurisdictions with tree regulations reported taking some sort of action in the last year.

### **Policies and Programs Relating to Trees Public Right-of-Way**

Table IV, “Comparative analysis of local street tree policies” (Appendix K) compares basic components of local street tree policies and programs in the Portland-Vancouver region. In general, there is greater consistency in policies relating to street trees relative to those regulating trees on private land. Most jurisdictions – 22 out of 30 – regulate street tree removal to some degree and 19 require a permit in all cases. Twenty-two require street trees to be planted as a condition for approving development. Most jurisdictions that regulate street trees require replacement of street trees when they are removed and have tree planting standards relating to size, species and location. Most also make landowners responsible for maintaining street trees and the condition of sidewalks and planter strips. With few exceptions, local governments provide little or no funding for street tree maintenance and management. West Linn, Beaverton, and Tualatin have routine street tree maintenance programs.

Smaller jurisdictions tend not to make policy distinctions between trees located on private land and those located in the public right-of-way. For example, Durham and Rivergrove lack a significant number of street trees and cover street trees under a general tree-cutting ordinance. Cornelius and Sherwood report being able to police street tree removal without a specific permitting process for removal. One of the biggest gaps in street tree policies and programs appears to exist in county urban service areas where permits are not required for street tree removal, policies are weak, patchy, or non-existent and there is less staffing and funding for urban forestry-related activities.

### **Urban forestry management: funding, planning, voluntary programs and partnerships**

Table V, “Comparative analysis of urban forestry management” (Appendix L) details the wide range of staffing, funding and programming levels relating to urban forestry among local governments in the region. While most jurisdictions have some local funding sources for urban forestry-related activities, our results indicate that the levels and sources of funding vary considerably. Five jurisdictions (Durham, Portland, Lake Oswego, Tualatin, and Vancouver) have an adopted urban forestry management plan, while two more (Gresham and Tigard) have one in the works. Half of local governments have an established urban tree committee, board or urban forestry commission. Four jurisdictions have an inventory of urban forestry canopy (Vancouver, Tigard, Tualatin, and Lake Oswego) and two have established targets for urban forest cover (Vancouver and Portland). Ten jurisdictions have a certified arborist on staff. Eight jurisdictions have a dedicated tree fund that pools in lieu planting or penalty funds. Eleven local governments have heritage tree programs that protect trees at landowner’s request.

### **GIS analysis of natural resource overlays and water resource regulations**

The extent of existing urban forest canopy and regionally significant habitat varies considerably among jurisdictions.<sup>6</sup> This is clearly a product of historic land-use patterns, both pre-urban agricultural uses and more recent urbanization. State or regional law requires jurisdictions to limit tree removal adjacent to streams and wetlands to protect water quality, fish and wildlife habitat, or public health and safety. Four jurisdictions – Portland, Wilsonville, Lake Oswego and Hillsboro – have Goal 5 programs that preserve upland forests inside the 2002 UGB, and Beaverton and

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<sup>6</sup> Note that recent analyses in the Metro State of the Watershed Report assessed forest cover within unincorporated areas within Metro’s Boundary however this analysis assessed unincorporated areas inside the UGB.

Washington County require mitigation when development displaces upland forests. Other jurisdictions like Gresham and Tigard regulate tree removal associated with hillside development.

Appendix E provides the results by jurisdiction from the GIS analysis of natural resource overlays and water resource regulations that preserve tree canopy, mitigate removal of trees, or otherwise protect regionally significant wildlife habitat (not all of which includes tree canopy). Results indicate that jurisdictions provide a wide range of protection for their existing urban forest canopy through natural resource overlay zones or other regulations applying to environmentally sensitive lands. Jurisdictions like Gresham and Wilsonville mostly protect a relatively high percentage of their existing urban forest canopy with natural resource overlay zones (38.4% and 37.4% respectively). In contrast, jurisdictions like Damascus, Wood Village, Cornelius and Milwaukie mostly or partially protect a relatively small percentage of existing urban forest canopy (0%, 6.7%, 7.4%, and 9% respectively) with overlay zones or other regulations.



## URBAN FORESTRY POLICIES AND PROGRAM NARRATIVE SUMMARIES

The following narrative summaries detail the specific elements of local urban forestry policies and programs while highlighting strengths, weaknesses and unique circumstances that characterize programs in individual jurisdictions. In surveying local governments' urban forestry policies and programs throughout the entire region, several features of individual jurisdictions stand out as exceptions in their apparent strength, effectiveness, scope or comprehensiveness.

In terms of regulatory programs applying to private land, there are several local government programs that stand out for one or more characteristics. Lake Oswego and Portland both have the most extensive programs for protecting upland tree groves. Lake Oswego's tree removal regulations are particularly thorough at addressing tree removal outside the development review process and in situations involving annexation. Portland's tree regulations for land division provide particularly detailed regulations for preserving trees of different species. Tigard and Oregon City have some of the strongest provisions for mitigating tree removal, requiring mitigation based on regulated tree diameter with few exceptions. Most other jurisdictions require replacement of mature trees with a single sapling. Vancouver's tree regulations include a minimum tree density requirement that can be achieved by either planting or preservation and discretionary provisions to preserve trees of particular ecological or social significance. This mix of clear and objective standards and discretionary criteria provide for both consistency and flexibility in application.

Several local governments have particularly strong or comprehensive urban street tree programs. The City of Portland's Neighborhood Tree Liaison Program provides an exceptional level of training and education to local citizens. Portland has also invested heavily in street tree stocking inventories and funded extensive street tree planting. Beaverton has an especially thorough street tree maintenance program.

Most cities require street tree planting as a condition of approving development but frequently tree planting is lowest on the priority of right-of-way improvements or are not planted due to a higher priority given to driveways, intersection sightlines, utilities and other aspects of the built environment. To address this issue in its planned Villebois community, Wilsonville has developed a system of prioritizing right-of-way improvements to ensure that street tree planting is given higher priority. Oregon City addresses the issue by requiring a set number street trees to be planted based on the length of street frontage associated with a new subdivision lot. If one or more street trees cannot be accommodated due to the placement of driveways, utilities, signage and other built infrastructure, developers must pay into a tree planting fund that pays for trees to be planted on public land at other locations in the city.

Few jurisdictions have conducted urban forestry management plans. Vancouver, Portland and Lake Oswego have the most recent Urban Forestry Management Plans. Vancouver and Portland include specific goals and targets for expanding urban forest cover. The City of Portland also has an Urban Forestry Action Plan and has produced a number of other reports quantifying the ecosystem service value of the urban forest.

### **City of Beaverton**

Beaverton has been part of Tree City USA for the last 15 years. Beaverton has a particularly thorough street tree maintenance program with a set schedule for inspecting and maintaining all street trees every three years.

Beaverton first adopted regulations related to preservation of Significant Natural Resource Areas in 1985 (ORD 3441). In 1990 Beaverton adopted regulations for Preservation of Trees and Vegetation

(ORD 3740), outlining specifics for tree protection, pruning and removal while refining the 1985 regulations. Revisions to the regulations for preservation of trees and vegetation within the Development Code occurred over time with the most recent edits adopted in 2006.

Several types of trees are regulated by Beaverton's development code and defined within Chapter 90:

- **Significant individual trees or tree groves** – Trees and groves that have been identified as possessing exceptional characteristics and are mapped on the city's Inventory of Significant Trees and Groves (60.60)
- **Historic trees or tree groves** – Trees of historic significance due to their association with historic properties or the general growth and development of the city (60.60)
- **Landscape trees** – Trees that have been preserved or planted as part of an approved landscape plan (40.20 and 60.05)
- **Street trees** – Trees located within the public or private right-of-way or easement for vehicular access, or associated with public utility easements (60.15)
- **Trees within a significant natural resource area** (SNRA includes wetlands and riparian corridors) – Trees located within Goal 5 areas (60.67)
- **Community trees** - Healthy trees of at least ten inches (10") DBH located on developed, partially developed or undeveloped land; also includes trees of at least of 6" for various native species (60.60)
- **Mitigation trees** (60.60) – Trees planted in an effort to alleviate the impact of the removal of other trees; a mitigated trees takes on the designation of the tree removed

The city just finished updating a Tree Inventory Map, effective April 30, 2009, that combines the contents of previous mapping efforts and reflects recent changes. Currently, there are no plans to change the development code as it relates to trees and tree regulations.

### **Clackamas County, unincorporated urban**

Clackamas County has extensive and detailed comprehensive plan language relating to urban forests and trees under Chapter 3 for "Natural Resources and Energy." Policy 6 for "Forests" calls for initiating "a tree conservation and planting program for the northwest urban area to preserve urban forest areas and promote tree landscapes." Specific implementation items under this policy include an urban forest inventory; adoption of tree conservation standards in design review, grading and subdivision ordinances that minimizes removal of trees and vegetation on undeveloped lands within the urban area; development of a urban street tree planting and maintenance program; and creation of a special review process for commercial timber harvesting within the urban area.

Despite the breadth and specificity of the comprehensive plan policies, the County has yet to implement them, in part due to funding constraints. Outside the recently adopted Title 13 Habitat Conservation Areas and the Willamette Greenway overlay zone, zoning and development ordinances (ZDOs) have limited and nebulous code language relating to tree preservation and protection inside the Metro UGB. The regulations only apply to new single-family subdivisions and no permit is required for tree removal outside a development application. The County's heritage tree program is entirely voluntary and affords no protection for designated heritage trees. The County has tree-planting requirements for parking lots but only requires street tree planting along a few designated boulevards and in the Sunnyside Village District. Clackamas County is currently undergoing a planning process to adopt more explicit code language governing tree preservation

and protection. A recently convened Urban Tree Task Force aims to improve existing ZDOs to better implement urban tree and forest related policies in the comprehensive plan (see below).

In September 2008, the Clackamas County Board of Commissioners appointed the 13-member Trees Task Force, charged to recommend changes to the ZDOs “to assure that the tree canopy is maintained, preserved and enhanced, by controlling predevelopment tree cutting without prohibiting development.” The citizen task force is also charged with making other recommendations “to contribute to long-term management of the County’s urban forest reserves.”

### **Clark County, unincorporated urban**

Clark County has no urban forestry policies or programs. The County's development code does require landscaping associated with development within the public right-of-way including 2-year maintenance and survival requirements (Subtitle 40.320.020), but no specific standards require tree planting. Clark County's critical area ordinance (Subtitle 40.4) governs tree removal in areas of critical natural resource concern, mainly along streams, wetlands, shorelines and geologic and flood hazard areas. Title 40 requires development and redevelopment to avoid, minimize and provide compensatory mitigation for any impacts to critical area functions and values such that there is no net loss in those functions and values. This includes the functions and values provided by trees and other woody vegetation. Clark County also has forest practices regulations that govern conversion of forest land to other uses and ensure that the County's critical areas ordinance is applied in these situations.

### **City of Cornelius**

Cornelius has limited urban forestry policies and programs and is one of a handful of jurisdictions in the region that do not have Tree City USA status. Cornelius does not regulate tree removal on private land outside its Natural Resource Overlay and does not have a permit process for removing street trees, although staff report that they are able to police street tree removal effectively given Cornelius is roughly two square miles in area. Cornelius’s development code Title 17 for subdivisions does require the planting of street trees as part of frontage improvements for street construction. Trees must be installed along every 30 lineal feet of street frontage in accordance with an approved public works street tree list. City Transportation System Plan details required planter strip widths for new streets; they range from 4 to 6 feet for residential streets.

### **City of Damascus**

As Oregon’s newest city, Damascus does not have an adopted comprehensive plan and zoning code. Therefore it does not currently regulate tree removal as a part of development. However, an increase in clear cutting and tree removal has emerged as a major issue of community concern. To address this issue the Damascus City Council adopted an interim tree-cutting ordinance in 2007 to prevent the wholesale clearing of trees in advance of pending comprehensive plan and zoning decisions. The Council has renewed the ordinance continuously since 2007 (most recently May 4, 2009).

The ordinance prohibits the clear-cutting of trees within the urban growth boundary (UGB) of the city with the intent to protect citizens of the city from personal injury and property damage due to an increased susceptibility to wind and other hazards to public peace, health and safety resulting from clear cuts. The ordinance is interim until the city can consider and adopt long-term legislation regulating forest practices, tree preservation and habitat protection. This ordinance is expressly not intended as be a moratorium on construction or land development, function as a land use regulation, implement Metro Title 13 (Nature in Neighborhoods), or regulate forest practices.

The ordinance’s most significant provision is a prohibition on clear-cutting defined as “the removal of more than ten (10) trees, from a parcel or from adjoining parcels in common ownership, within

any twelve (12)-month period; or the removal of more than five trees from a parcel that leaves less than an average of one tree per 1,000 square feet of lot area, distributed throughout the entirety of the site." The ordinance includes a provision for permitted removal of hazardous trees.

The City of Damascus and local citizens are currently in the process of developing a comprehensive plan and zoning designations including conservation overlays. The community has repeatedly expressed the desire to conserve forested buttes in Damascus for scenic values, wildlife, water quality and sense of place. The city is on schedule to adopt policies to protect natural features in some form within the coming year.

### **City of Durham**

Like many smaller jurisdictions Durham does not have Tree City USA designation, an urban forestry committee or tree board, or a heritage tree program. However, Durham is known for its extensive urban forest cover and for prioritizing tree preservation. It is also one of a handful of jurisdictions that have an adopted urban forestry plan. Durham reports spending roughly \$1,000 on urban forestry-related activities in the 2007/2008 fiscal year, provided by development fees and general fund allocations (property taxes).

In 1975, the city passed its first tree ordinance prohibiting the cutting of trees on both public and private property without a permit whether or not development is proposed. Tree regulations are mostly located within their development code, but some requirements can also be found within the comprehensive plan. The city does not actively regulate trees in the public right-of-way, as very few actually exist in association with a particular property. Durham's tree ordinance (Ordinance Number 228-05) applies to all trees  $\geq 5$  inches in diameter within the city limits, regardless of their location. Unless a tree is dead or hazardous, all tree removals must be approved by the city's planning commission and require a permit. The cost for a tree removal permit is \$10 per tree, plus a \$5 application fee. Emergency removals require an emergency permit and do not have a fee, as determined by the city administrator.

### **City of Fairview**

Fairview has Tree City USA designation but no adopted urban forestry plan or established tree board/committee or urban forestry commission. Fairview funds urban forestry-related activities through stormwater fees and city general fund allocations.

Fairview defines "significant vegetation" as trees with a diameter of  $\geq 6$  inches, except for non-native, invasive species. The city protects "significant vegetation" associated with some development and public work projects. No trees can be planted or removed in the public right-of-way and public property without permission of the city public works director and a tree removal permit. Street trees must be planted no more than 30 feet apart for all developments that are subject to land division and site design review. However, street tree standards may be waived when trees preserved within the front yards provide the same or better shading and visual quality as street trees. The city requires the developer to provide a performance bond in an amount determined by the city engineer to ensure the planting and care of street trees during the first two years after planting. After this time period, street trees become the responsibility of landowners. If street trees are removed they must be replaced with trees of the same type (coniferous or deciduous). While not clearly delineated within its code, the city requires on-site mitigation for regulated trees as part of the development process and for the replacement of street trees (unless trees are hazardous). The mitigation standard stands at 1:1 tree. Mitigation trees must be 1½ inch caliper if deciduous and six inches in height if coniferous.

### **City of Forest Grove**

Forest Grove has had tree-related policies regulations and a tree board/committee in place since 1992, the year it received Tree City USA status. Forest Grove does not have an urban forestry plan but is the only jurisdiction in the region that has a street tree inventory for its entire street network.

In March 2009, Forest Grove adopted new tree-related regulations and administrative practices to better address tree preservation in the land division and development review process. The new code (10.5.100) clarifies when and where tree regulations apply. The new code also requires a tree removal permit to occur earlier in the development permitting process, adds requirements for development applications involving regulated trees, and revises tree preservation and mitigation standards. Forest Grove does not require a permit to remove trees on private property outside the development process, although there are specific criteria for removing trees that were preserved as a condition of past development. Owners of significant “registered trees” are notified annually of their responsibilities that include a public hearing before tree removal. Depending on the code, tree removal decisions are discretionary decisions of staff, the planning director, or the Community Forestry Commission. Forest Grove applies a slightly modified version of Metro’s Title 13 model ordinance to habitat conservation areas. The city requires tree planting for new developments in parking lots, along streets and in buffer areas between zones and provides limited funding for neighborhood tree planting.

### **City of Gladstone, urban**

Gladstone only manages trees within parks and lacks a tree ordinance for private land. Within parks, if trees need to be removed, the city hires an arborist. There is no permitting system for tree removal on private property or in the public right-of-way. Existing street tree maintenance is the responsibility of property owners, except for any street trees that have been planted by the city. The city has limited staff and budget and water and sewer services have been a budgeting priority. Gladstone’s landscaping standards require 15% of a property to be landscaped as part of most new development. However, no tree planting or placement standards exist. Trees are also informally protected within riparian areas as part of the city’s acknowledged Goal 5 program that will be updated before the end of the year in order to substantially comply with Metro Title 13. Gladstone has no tree committee or urban forestry commission, does not have Tree City USA status, and has no adopted urban forestry plan.

### **City of Gresham**

In 2009, Gresham became the newest jurisdiction in the Portland-Metro area to achieve Tree City USA status. Gresham has had tree regulations that apply both during development and outside of the development review process for over 10 years. Development Code Section 9.1000 covers all regulated trees and Section A14.004 applies to significant trees. Gresham has three overlay zones that either directly require or indirectly result in retention of trees when properties are developed and requires planting of street and parking lot trees as a condition of new development. Gresham funds urban forestry-related activities through a combination of stormwater fees, development fees and grants. The staff reported some \$600,000 dedicated to urban forestry-related activities in the 2007-2008 fiscal year.

Gresham hired an urban forestry planner in 2008 who reports to the planning director. The urban forestry planner is charged with a number of tree-related responsibilities including drafting an Urban Forestry Management Plan in 2009 and subsequent review and revision of tree-related codes in 2010. The city also renamed and reconstituted its Tree Preservation Committee into a newly formed Urban Forestry sub-committee to the Natural Resource and Sustainability Advisory Committee.

### **City of Happy Valley**

Happy Valley adopted its tree regulations five years ago and achieved Tree City USA in 2008. Its planning commission acts as its tree board. The city does not have an adopted urban forestry management plan and has yet to develop a heritage tree program. Happy Valley reports spending \$70,000 on urban forestry-related activities in the 2007/2008 fiscal year, provided by development fees.

In May 2009, the city adopted new code and comprehensive plan amendments. Happy Valley requires a permit for trees  $\geq 6$  inches at four feet whether or not development is proposed. The city applies different discretionary standards for tree preservation depending on zoning and whether and what type of development is proposed. Tree mitigation is required for all zones and can be greater than 1:1 when development is proposed. Happy Valley has special regulations that apply to newly annexed lands. Street trees must be planted depending on district and landscaping standards. These requirements include tree planting and buffering requirements for parking lots. Native, nuisance and prohibited plant lists can be found in Appendix A of the development code.

### **City of Johnson City**

Johnson City has no urban tree or forestry related policies or programs.

### **City of Hillsboro**

Urban forestry goals and policies have been embedded in Hillsboro's comprehensive plan for 30 years. In 2005, the revised Hillsboro 2020 Vision and Action Plan (a guiding community vision document and not adopted policy) included a new strategy to establish a tree planting, maintenance and preservation organization and program over the coming years. Other strategies in the action plan address the preservation of natural resources including trees. Hillsboro currently does not have an urban forestry plan, an urban tree board or commission or Tree City USA status.

Hillsboro has limited tree preservation or protection standards outside its natural resource overlay zone; however, the overlay zone does include some protections for upland forests. Mature trees on private land listed on the city's cultural resource inventory or within station community planning areas (near light rail stations) are regulated and can be preserved as a condition of development. In addition, staff reports that some new development approvals include conditions of approval designed to preserve and protect trees on private land but no specific code language was cited.

Street tree planting is required with new development in Hillsboro. All street trees must be planted in compliance with city standards. Property owners in Hillsboro are responsible for the maintenance of adjacent trees within the public right-of-way. Hillsboro does require a permit for street tree removal in most parts of the city. However, mature street trees listed in the city's cultural resource inventory and within Hillsboro's Orenco Townsite Conservation District are regulated. For example, mature street trees within the Orenco Townsite Conservation District may be removed only with prior permission from the planning department based on a report from a registered arborist. Mature street tree removal in this district must be supervised by a registered arborist or professional tree service, and tree replacement standards are in place.

In 2003, Hillsboro adopted a Goal 5 Natural Resources Management Plan that included a Significant Natural Resource Overlay (SNRO) District. The SNRO requires new development in or near mapped natural resource areas – including some upland forests – to avoid, minimize or mitigate impacts and these impacts include those associated with tree removal.

Hillsboro is in the process of completing a citywide street tree inventory using ArcGIS-based software loaded on handheld computers. The location, species, size and condition of 14,000 street trees have been catalogued by community residents, 4-H youth, and university student interns since 2005. The anticipated inventory completion date is fall 2009.

### **City of King City**

According to King City's comprehensive plan, the protection of all regulated trees is to be encouraged so that the "removal of existing trees should be limited to what is necessitated by land development, safety and disease." The city regulates trees that are  $\geq 6$  inches at four feet. City policy aims to limit the removal of existing trees to what is necessitated by land development, safety and disease.

King City adopted its current tree regulations in 2004 under Chapter 16 of its municipal code. This chapter covers tree preservation on developable properties, which require the submittal of a site plan that includes a description of all trees that are to be retained or removed. Trees are also to be protected under best management practices during construction. The city keeps a list of any vegetation listed on a plat map or a document recorded with the plat.

King City has no designated funding source for urban forestry, does not have a designated tree committee or urban forestry commission, an urban forestry plan, or Tree City USA designation.

### **City of Lake Oswego**

Since it initiated its tree preservation efforts over a decade ago, Lake Oswego has had one of the most comprehensive urban forest programs in the region. The city has had Tree City USA designation since 1990 and adopted a new urban forestry plan in 2007. According to their comprehensive plan, Lake Oswego emphasizes tree preservation rather than mitigation. A previous study on this region's urban forestry policies identify the city of Lake Oswego as one of the most active in terms of monitoring and maintenance programs, both for trees on private property and in the public right-of-way. This study recognized that Lake Oswego has some of the most stringent tree preservation standards in the Portland-Vancouver Metro region (Wertz, 2000).

According to their comprehensive plan, the city must develop a planting and maintenance program for trees in public right-of-way, open spaces and parks. Unfortunately, this request was not funded this year. The plan also explains that the city will preserve natural resource sites, through public acquisition and other methods such as conservation easements, to permanently preserve trees and tree groves. Lake Oswego Parks and Recreation is primarily responsible for acquiring conservation easements to protect valuable forest habitats, such as oak savannah.

Lake Oswego adopted a new tree preservation ordinance in 2007 and established a Tree Code Task Force that evaluates and provides amendments to the new tree code. This task force includes an arborist from the Community Forestry Commission, a general arborist, a Natural Resources Advisory Board (NRAB) representative and local residents. Meanwhile, the Community Forestry Commission was formed to hear requests concerning Type II tree cutting permits.

Tree removal is regulated under Lake Oswego's Code (Chapter 55) and the Sensitive Lands Code (Chapter 50). Chapter 50 permits removal of up to two trees greater than 10" dbh a year on single-family residential zones unless the trees are 1) protected as a condition of past development; 2) designated as a Heritage Tree; or 3) located within a Resource Conservation (RC) or Resource Protection (RP) overlay district. The city also provides detailed tree protection instructions during development.

### **City of Maywood Park**

Maywood Park has no urban forestry-related policy goals in its comprehensive plan but has had an ordinance regulating tree removal since 1989. The city requires some tree planting as a condition of development. Removal permits are required for trees on private land and in the public right-of-way. In the latter case, the city tracks street tree planting and removal and also funds some tree planting in the public right-of-way. Urban forestry activities are funded by tree removal permit fees. Maywood Park does not have Tree City USA designation, an adopted urban forestry plan, or an

established tree committee or urban forestry commission. However, the city does have a volunteer city forester.

### **City of Milwaukie**

Milwaukie has had a tree ordinance governing tree removal for 10 years. However, these only apply to trees located in the public right-of-way and trees on flag lots, and the latter only when development is proposed. The city council considered broader tree regulations in the past but these were never adopted. The city's Willamette Greenway zone and Water Quality Resource Areas also govern tree removal. Milwaukie provides limited funding for urban forestry-related activities through its engineering and code enforcement divisions. Milwaukie does not have Tree City USA designation, an adopted urban forestry plan or an established tree committee or board.

### **Multnomah County, urban unincorporated**

Multnomah County has very little land to which it provides urban services and planning. Multnomah County regulates tree removal on this small amount of urban service area through an agreement with the City of Portland. Therefore, the applicable regulatory policies relating to tree removal, preservation and planting are the same as the City of Portland. Multnomah County does not have a tree board or urban forestry commission, an urban forestry plan or Tree City USA designation.

### **City of Oregon City**

Oregon City's tree ordinances have been in place for more than a decade. The city's comprehensive plan identifies the need to develop better policies to protect its urban forest, as the "total tree cover in the city has diminished" as result of development. Oregon City has created tree regulations that apply during development, annexation and land division. Annexations (14.04.050), subdivisions (16.08.040) and multi-family and commercial/industrial development (16.12) require site plans that identify, among other features, wooded areas, isolated trees (all trees  $\geq 6$ " dbh) capable of being preserved and significant natural resource areas.

For new development in single-family residential zones, the development code requires that all regulated trees "shall be preserved outside the building area, which is defined as right-of-way, public utility easements and within building setbacks." According to the code, all regulated trees will remain after development of the site if it is situated in a building setback, is part of landscaping, a public park or landscape strip, or legally reserved open space; is in or separated from the developable remainder of a parcel by an undevelopable area; or is on the applicant's property and not affected by the development. Oregon City currently does not waive building setback requirements to preserve trees. Oregon City does not currently have tree preservation standards that could modify subdivision design. Nor are there discretionary development standards that could require adjustments of building or driveway areas to preserve regulated trees.

Oregon City allows tree removal outside development application and without approval, on all private land with a few exceptions. Additionally, approval for regulated tree removal must be applied for in private properties located in a) the Canemah National Registered Historic District; b) designated historic structures; c) the Unstable Slope Overlay District (slopes over 25% and other unstable areas); d) the Water Quality Resource Overlay District (within 200 feet of stream or wetland); and f) outside single-family residential zones. Additionally, in commercial zones all regulated trees within the property must be mitigated. There is currently no permit system to track tree removal and replacement outside the development review process unless the tree is in the public right-of-way.

Chapter 12.08 regulates community forests, heritage trees and street trees. The city also requires planting of street and parking lot trees as a condition to most new development. Overall, the city's



focus is on retaining canopy cover, with a large emphasis on tree mitigation during development and within sensitive areas. Oregon City is currently in the process of revising its tree regulations, which should be completed sometime this year. The city is also updating its natural overlay district (17.49) to comply with Metro's Title 3 and 13. Historic/heritage trees are regulated by the city. Heritage trees are to be designated by the Natural Resources Committee. A process for designation of Heritage Trees has been written into the latest code amendment, but no trees have been designated yet.

Oregon City does not have Tree City USA designation, an established urban tree committee or board, or an adopted urban forestry plan.

### **City of Portland**

Portland first received Tree City USA designation in 1979. In 1995 Portland adopted its first urban forestry management plan and its current tree regulations and urban forestry commission. The City of Portland's urban forestry plan was revised in 2004 and followed by an Urban Forestry Action Plan in 2007. Both these documents and the comprehensive plan contain policies relating to urban forestry in Portland. Other than Vancouver, it is the only jurisdiction that has explicit targets for urban forest canopy cover by land-use category. Portland has an established Neighborhood Tree Liaison Program that has trained neighborhood representatives as neighborhood tree stewards (NTS) in urban tree care and the city's urban forestry rules and programs. The Parks Urban Forestry Division offers a 7-session course to prospective NTSs that educates stewards on general tree care, tree biology, tree planting, preservation and identification. Once trained, NTSs work with Portland Parks and Recreation staff on tree projects in their neighborhood.

Various city codes and chapters regulate tree removal, protection and mitigation depending on the location, size, species, land use zone and type of development proposed. On a single property, regulations may vary further depending on size of property, size of trees and canopy cover, whether it is public or private ownership, the type of development proposed, whether the property is developed, or whether the tree was preserved as a condition of past development. Since 1972 Portland Parks and Recreation's (Parks) Urban Forestry Division has regulated trees in parks and in the public right-of-way (Chapter 20.40). Since 1995 the parks department has also regulated tree removal on private property in instances that do not involve development (Chapter 20.42). Parks also staffs the Urban Forestry Commission and runs the Heritage Tree Program, a Neighborhood Tree Liaison Program, and various education and planning efforts. Title 16 and Title 17 also include tree regulation in the public right-of-way and associated with other public infrastructure (sewer and stormwater systems). The City is considering a new rule to regulate private street trees by administrative rule (under Chapter 24). The Bureau of Development Services regulates tree preservation, protection and mitigation associated with land divisions and with all development in special overlay zones and plan districts.

In recent years there has been considerable confusion about Portland's tree regulations and concern about regulatory gaps, loopholes, adequacy of mitigation, inspections and enforcement. The City of Portland is in the midst of a comprehensive review and evaluation of tree regulations and their administration and enforcement. The "City-Wide Tree Project" identified a number of problems with the existing regulatory structure including regulatory gaps and administrative complexity. The project has suggested the need for greater consolidation and consistency and to elevate tree preservation and protection in the development review process.

The City of Portland funds urban forestry and urban forestry-related activities through a variety of sources and through different bureaus. The Bureau of Development Services is funded largely through permit fees. The Urban Forestry Division is funded largely through the general fund but also through grants. Portland Parks also conducts natural area acquisition with funds from bonds and system development charges. The Bureau of Environmental Services coordinates Portland's

“Grey to Green Initiative” which uses some sewer and stormwater fees to fund natural area acquisition and watershed re-vegetation, including tree planting. The Grey-to-Green initiative has a goal of planting 83,000 trees over a five-year period at a cost of roughly \$14 million. Meeting this goal will depend on success in securing federal stimulus funds. As part of that goal the city planted some 1,700 street trees through a partnership with Friends of Trees and 144 trees in public parks and natural areas.

In 2007 the City of Portland began the Citywide Tree Project, “a multi-bureau effort to clarify, simplify and provide a consistent and effective regulatory framework for trees in the City of Portland.” Over several months the city has worked with a diverse group of stakeholders to develop a series of issue papers describing the city’s policies, regulations and administrative processes and identify problems and possible solutions for reform. In February 2009 staff presented a preliminary set of policy solutions and regulatory improvements to the planning commission. The interbureau project staff is currently preparing a refined set of policy and regulatory changes scheduled to go before the planning commission in Fall 2009. These include proposals to:

**Establish a clear, cohesive regulatory framework**

- Establish a single point of contact for the public
- Pilot a 24-hour response line
- Create comprehensive consolidated tree/urban forestry title
- Develop a tree technical manual
- Create a consistent, equitable tree cutting permit system
- Clarify and build community understanding of the public and street tree permit system
- Consolidate permitting functions

**Enhance the urban forest through development and redevelopment**

- Establish flexible development standards to improve tree preservation
- Provide advanced mitigation credit for proactive tree planting
- Improve tree preservation, planting and mitigation in land division and other discretionary reviews
- Establish tree planting standards for building permits
- Better address tree preservation and protection in public works and capital projects
- Optimize tree preservation and solar energy systems, sign visibility and views
- Update and clarify in-lieu of planting fees and tree fund
- Improve implementation, inspections and resolution of violations

**City of Rivergrove**

Rivergrove has no urban forestry-related policy goals in its comprehensive plan but has had an ordinance regulating tree removal for over 10 years. The tree ordinance was most recently updated in 2004 and regulates trees on private land and in the public right-of-way. City staff are currently in the process of updating the ordinance again. The City of Rivergrove regulates tree removal near streams and wetlands consistent with Metro’s Title 13 performance standards.

Ordinance No. 74-2004 requires tree-cutting permits for trees on private land and in the public right-of-way with 11.5 inch diameter measured 4.5 from the ground with special provisions for retroactive emergency permits. Permits are granted promptly for up to three trees within a 12-month period on lots located outside a water quality resource area. If located inside a water quality resource area the permit requires the approval of the planning commission at one of its meetings.

**City of Sherwood**

Sherwood has had urban tree regulations in place for the last 17 years, located within their Zoning and Community Development Code and implemented new tree regulations in 2007 (16.142). The city has had Tree City USA designation for four years and has an established urban tree board or

committee. The main goal of the city's tree preservation standards is to minimize the removal of trees and woodlands within the city. Sherwood does not have an adopted urban forestry plan.

The code regulates the size of regulated trees depending on species differently for tree removal and protection requirements within the development process and outside of it. For planned unit developments, site review and subdivision, the code protects Douglas fir, ponderosa pine, red cedar, white oak, big leaf maple and American chestnuts that are ten inches or greater, while all other species are regulated if they are five inches or greater. The code only allows tree removal during development within areas that are needed to build utilities and infrastructure, streets and grading necessary for development in PUD and subdivisions.

Outside of the development process, regulated deciduous trees are those that are 10" or greater and coniferous trees that are 20" or greater. Landowners are allowed to remove five trees per year, not exceeding 100" dbh total. However, there is no permit system in place. Instead, the landowner must report to the planning department at least 48 hours before tree removal. If landowners wish to remove more than the maximum allowance then they must apply for a site plan review at a cost of \$200.

Sherwood's natural resource overlay zones define minimum disturbance standards for resource protection, but do not have any regulations that target tree conservation specifically and regulated areas are exceeded by Clean Water Service's vegetated corridor standards. Sherwood does not regulate any heritage or historic trees.

### **City of Tigard**

Tigard has had Tree City USA designation since 2000 and an established tree board for the past seven years. Tigard implemented its first tree ordinances and regulations 25 years ago. Those tree regulations governed the removal of all trees on undeveloped land, developed commercial and industrial land, and public land. However, changes to the tree ordinance in 1997 now allow the removal of any tree as long as its removal is mitigated. Currently, tree removal permits are processed by means of a Type I procedure.

Tigard regulates trees on both public and private property. Regulated trees during development are defined as any tree  $\geq 6$  inches dbh. Trees that require a removal permit include street trees, trees on city property, trees that were planted as a condition of development approval, trees in sensitive lands areas, trees on developing properties, trees that are restricted on the deed of a property, and heritage trees. Removal is defined as the cutting or removing of 50 percent or more of a crown, trunk or root system of a tree (Section 9.06.020).

In fiscal year 2007/2008, Tigard spent approximately \$200,000 on urban forestry-related activities. Funding comes from general fund allocations (mostly property taxes), development fees and grants. Additional funding comes for urban forestry-related activities come from Clean Water Services stormwater service fees. Through a partnership with Clean Water Services, the City of Tigard is conducting stream restoration and enhancement projects that will result in the planting of approximately 100,000 native trees from 2001 to 2011. Also, the city's public works department annually plants approximately 250 new or replacement trees on public lands, distributes street trees each year to private property owners through the Street Tree Program, and plants 25 trees in celebration of Arbor Day.

Tigard is currently developing an Urban Forestry Master Plan, scheduled for completion in November 2009. This will include revisions to Tigard's tree and landscaping ordinances and the development of a tree grove protection program.

### **City of Troutdale**

Troutdale has had tree regulations that apply both during development and outside of the development review process for at least eight years. The city has had Tree City USA status since 2000 with its parks advisory committee acting as the city's tree board. Troutdale's tree ordinance is in the city's municipal code. It addresses the planting and maintenance of street trees, heritage trees and the removal of trees on undeveloped properties.

The city's street tree fund is restricted to the planting, maintenance and removal of street trees. Resources come from street tree fees during development, donations, grants or penalties. The city has also created a manual that includes a list of approved street trees, prohibited street trees and planting and pruning guidelines. It also has a street tree plan to regulate the maintenance and tree removal of street trees.

Troutdale regulates trees that are  $\geq 6$  inches in diameter. Tree removal regulations can be found within section 13.10.270 of the municipal code. There is no permit requirement for tree removal in developed property, only for undeveloped or underdeveloped properties. These include any vacant platted subdivision lots or partition parcels, or any developed properties able to be partitioned into two or more lots. A tree removal permit can be obtained in conjunction with a land use permit or under a Type II permit when not in concordance with a land use permit. The code allows for the removal of hazardous, dead or diseased trees within city limits, within all land uses.

### **City of Tualatin**

Tualatin has had Tree City USA status since 1987 and has had a tree preservation ordinance and urban tree committee in place since 1979. The city council adopted the existing ordinance in 2001 with an urban forestry management plan that focuses on street trees. Tualatin has won several awards for its urban forestry activities over the last 25 years.

Tualatin regulates removal of trees greater than eight inches in diameter during development review and outside the development process. However, various exemptions allow removal of trees greater than eight inches outside these permit processes. The city of Tualatin does not require mitigation when regulated trees are removed unless those trees were designated for preservation and were lost or damaged during construction. Tualatin is working on developing new regulations that would require mitigation. Some tree preservation and tree protection apply in Tualatin's natural resource protection overlay but these areas are mostly covered by Clean Water Service's vegetated corridor standards. Tualatin regulates street trees and requires the planting as a condition of approving development. The city also pays for some street tree planting. Additional tree planting requirements are applied in parking lots and as part of landscaping requirements. Over the years, urban forestry activities in Tualatin have been funded via a combination of property taxes, development fees, general fund allocations, grants and the city's road fund. In the 2007-2008 fiscal year Tualatin spent \$215,465 on urban forestry-related activities.

Tualatin officials are currently considering a number of potential changes to the city's tree codes including reducing exemptions that allow tree removal outside the permit process, the size of regulated trees, and requiring some mitigation of tree removal. There is also discussion of raising additional funds for urban forestry activities by establishing a tree bank fund for in-lieu mitigation and/or raising funds through a street utility fee.

### **City of Vancouver**

Vancouver first established a street tree ordinance in 1963. The city established an Urban Forestry Commission in 1987 and achieved Tree City USA status with updated policies and regulations relating to urban forestry. Vancouver adopted its existing policies and regulations governing private tree removal and mitigation in 1997. In 2006, Vancouver adopted a revised street tree ordinance to reflect national standards and best management practices.

In 2007 Vancouver adopted its current Urban Forest Management Plan. The plan included a 2003 urban forest canopy inventory that established a baseline of canopy cover by land-use type and established goals for expanding urban forest cover over time. Although the plan specifies no target date for achieving canopy cover goals, the inventory will be revisited in 2011 to evaluate whether existing policies and programs are adequate.

Regulations governing tree protection, removal and mitigation include:

- The Tree Conservation Ordinance, VMC 20.770, established in 1997 and amended in 2004 to regulate trees on private land including Vancouver's Heritage Tree program. VMC 20.770 primarily applies when a property is developed or to trees preserved or planted as a condition of past development.
- Street Tree Ordinance, Vancouver Municipal Code (VMC) 12.04, established in 1963 and amended in 2006 to regulate trees in the public right-of-way.
- Critical Areas Ordinance, VMC 20.740, adopted in 2005 to protect environmentally sensitive or natural hazard lands.
- Landscaping Code, VMC 20.925, requiring tree planting.

The existing suite of ordinances aim to protect and enhance a variety of public values associated with urban forests including air and water quality, wildlife habitat, public health and safety, property values, economic development and implementation of state and federal law. Vancouver requires the planting of street and parking lot trees as a condition of development.

Vancouver's Urban Forestry division's budget for the 2007-2008 fiscal year totaled 950,000. The division has three full time employees including a city forester, funds tree planting in the public right-of-way and on public and private land, and has a number of partnerships with private and private-non-profit entities to promote stewardship and expansion of Vancouver's urban forest. Funding from urban forestry comes from stormwater fees, the city's general fund and compensatory mitigation via a city tree fund.

Vancouver has no specific plans for making policy changes. However an assessment of urban forest canopy cover in 2011 for the entire city will aid in evaluating progress in achieving the goals and targets established in the urban forestry management plan. If goals are not being achieved then the policies and regulations could be revisited and revised. This could include revisiting the required minimum tree density standard.

### **Washington County, urban unincorporated**

Washington County limited policies and regulations relating to tree preservation or mitigation outside "Significant Natural Resources Areas" mapped and regulated as part of the county's acknowledged Goal 5 program or floodplain and natural drainage hazard areas. Policy 10.h for "Biological Resources and Natural Areas" of the comprehensive plan circumscribes tree regulations to significant natural areas by committing the county to "Develop tree conservation standards to regulate the removal of or damage to trees and vegetation in identified Significant Natural Areas within the unincorporated urban area, in order to retain the wooded character and habitat of urban forested lands." Section 421 references the retention of "large trees" in flood areas. Section 422 governs tree removal associated with Significant Natural Resource Areas. These regulations have been in place since 1983. In addition, Section 407 for Landscape Design of the Community Development Code has standards for tree removal but not for tree preservation. Section 407 also contains planting standards associated with development, including street trees. Some community plans have additional tree protections for specific sites; however, all but community plan subordinates tree retention to "development of the site at the planned density." Section 404 has specific tree-related standards for planned developments. No mitigation of tree removal is required.

No permit is required to cut trees outside the development review process unless the site is identified as a Goal 5 resource on the applicable community plan. Washington County has no official sanctioned tree committee, board, or commission. The county does not have an urban forestry management plan.

Discussions with planning staff and citizens in Washington County reveal that tree removal is often deemed unavoidable because of zoned densities. This widespread view may limit more innovative designs. Section 207-5.1 of the CDC specifies that conditions on approved development “shall not restrict densities to less than that authorized by the development standards of this Code.” This provision is often invoked as the reason for not preserving more trees. However there is also some disagreement as to whether staff can or does use its full discretion to preserve trees through clustering or design modification. The widespread view that tree preservation is impractical or unachievable at planned densities may dissuade staff from using their discretionary authority to preserve trees. In sum, both a lack of specific standards for tree preservation and the presumption that trees cannot be accommodated at zoned densities result in little tree preservation in urban unincorporated Washington County.

The Joint-CPO Tree Code Group formed in the summer of 2007 to explore policy and code changes and stem the accelerated loss of trees in urban unincorporated Washington County. CPO representatives and interested citizens worked together to research what policies and development codes other counties and cities have implemented to address tree preservation and increase urban forest canopy. The Joint-CPO Tree Code Group produced an executive summary and research report in Spring 2009 that was submitted to the Washington County Board of Commissioners. The group has requested that development of urban forestry policies be included on the county’s 2009 work program as a Tier 1 (priority) item. The county commissioners did not include the request in the 2009 work program but they will consider it for future work plans. For more information on the Joint-CPO Tree Code Group see: <http://www.washcotreegroup.org/>.

### **City of West Linn**

West Linn has had Tree City USA status for over a decade. West Linn has no explicit urban forestry-related policy goals, beyond those outlined in the purpose of its community tree ordinance No. 1542. The city council adopted these regulations into Sections 8.500-8.750 of the municipal code in 2006 and revised them in 2008 to regulate tree removal on private property and in the public right-of-way when development is not proposed or in instances where tree removal is proposed after a development application for a site has been approved. The West Linn Development Code contains Section 54 Landscaping and Section 55 Design Review that also regulate removal and planting when development is proposed.

West Linn funds urban forestry through development permits and money from the city’s general fund. These funds amounted to \$100,000 in the 2007/2008 fiscal year. Staff in planning, parks, and public works all have responsibilities related to urban tree or forestry. West Linn has a city arborist who works for the parks department but coordinates with planning and public works. West Linn has no urban forestry management plan, tree committee or urban forestry commission. Tree removal, especially in environmentally sensitive areas, has been a controversial issue in West Linn.

No major changes are planned to the tree codes. West Linn staff is planning some minor changes to the municipal code to close loopholes and tighten up some definitions and is also considering revisions to Section 28 for Willamette and Tualatin River protection.

### **City of Wilsonville**

Wilsonville has had Tree City USA designation since 1997. In part due to strong political leadership and community support, the city has put a high priority on conservation of trees, vegetation and natural areas as integral parts of the city’s urban form and quality of life. Since 1997 Wilsonville has

received the Tree City USA Growth Award for its progress in education, partnerships, land-use planning coordination, planning and management and wildlife habitat conservation.

Wilsonville's comprehensive plan and development code includes urban tree and forestry-related policy goals. Section 4.600 of the development code requires a permit whether or not development is proposed. However, approval to remove up to three trees within a 12-month period is granted if the trees proposed for removal are not in a zoned natural resource area, are not street or Heritage trees, and were not required to be retained as a condition of past development. Provisions allow for the removal of trees that are hazardous, diseased, dead or damaged. The city applies discretionary standards including a least impact alternative analysis for situations proposing to remove more than four trees and where development is proposed. Decisions are the discretion of the development director and can be appealed to the development review board and the city council. Wilsonville requires mitigation of most regulated trees. In addition to Section 4.6000, Wilsonville regulates tree removal in the public right-of-way, through a heritage tree program and in its significant resource overlay zone (Section 4.139.00) and Willamette River Greenway overlay zone (Section 4.600.30)

Wilsonville funds urban forestry through development permits, grants, general fund allocations, a local improvement district and a tree mitigation fund. These funds amounted to \$220,000 in fiscal year 2007/2008 and funded three positions engaged in urban forestry-related planning, permitting and programming including two certified arborists. Staff in planning, parks and public works all have responsibilities related to urban tree or forestry. Wilsonville has no urban forestry management plan but does have an established tree board.

### **City of Wood Village**

Apart from some landscaping standards that require some street tree planting and some tree planting and vegetation maintenance in one city park (funded by general funds), Wood Village has no policies or programs related to urban forestry.

Wood Village regulates tree removal near streams and wetlands consistent with Metro's Title 13 performance standards. Riparian transition areas are 50' from top of bank and extending up to 200 feet where adjacent slopes are greater than 25 percent. As of May 2009, Wood Village had yet to substantially comply with Metro Title 13 for water quality and regionally significant fish and wildlife habitat.





Urban Forestry Code Revisions

# Urban Forestry Master Plan

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City  
of  
Tigard

# Urban Forestry Master Plan



November 2009





City of Tigard

# Urban Forestry Master Plan

## ACKNOWLEDGEMENTS

### *Tigard City Council*

Mayor Craig Dirksen, Council President  
Nick Wilson, Councilor  
Gretchen Buehner, Councilor  
Marland Henderson, Councilor  
Sydney Webb, Councilor

### *Urban Forestry Master Plan Citizen Advisory Committee*

Matt Clemo	Mort Ettelstein
Janet Gillis	Phil Hickey
Morgan Holen	Dennis Sizemore
Tony Tycer	David Walsh

### *City of Tigard*

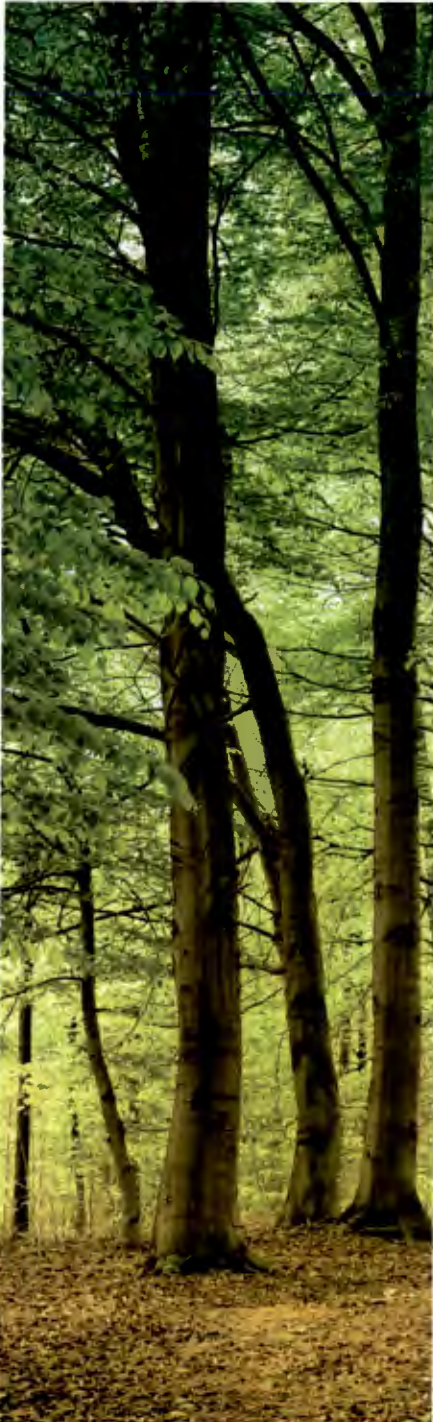
Craig Prosser, City Manager  
Ron Bunch, Community Development Director  
Brian Rager, Assistant Public Works Director  
Dick Bewersdorff, Current Planning Manager  
Darren Wyss, Senior Planner  
Todd Prager Associate Planner/Arborist  
Marissa Daniels, Associate Planner  
John Floyd, Associate Planner  
Nathan Shaub, GIS Analyst  
Patty Lunsford, Planning Assistant  
Sam Tilley, Intern

### *Stakeholder Participants*

Chad Burns, Portland General Electric  
Alan DeHarpport, Home Builder's Association of Metropolitan Portland  
Maryann Escriva, Tigard Tualatin School District  
Terrance Flanagan, Pacific Northwest Chapter of the  
International Society of Arboriculture  
Peter Guillozet, Clean Water Services  
Troy Mears, Oregon Chapter of the American Society of  
Landscape Architects  
Ernie Platt, Home Builder's Association of Metropolitan Portland  
Steve Schalk, Oregon Department of Transportation  
Tigard Tree Board Members (2009)  
Brian Wegener, Tualatin Riverkeepers  
Phil Wentz, Tigard Tualatin School District

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## Executive Summary



“

*Tigard’s urban forest is valued and protected by City residents as a thriving interconnected ecosystem managed to improve quality of life, increase community identity, and maximize aesthetic, economic, and ecological benefits.*

”

This Urban Forestry Master Plan (UFMP) sets a course of action for the City of Tigard’s urban forestry program from the time of its acceptance by Council until the year 2016. The Plan has been developed through a public process involving community outreach and surveys, urban forestry stakeholder interviews, departmental coordination meetings, and review of current City policies and programs. Based on the information received throughout this process, the UFMP Citizen Advisory Committee (CAC) recommends the following implementation goals:

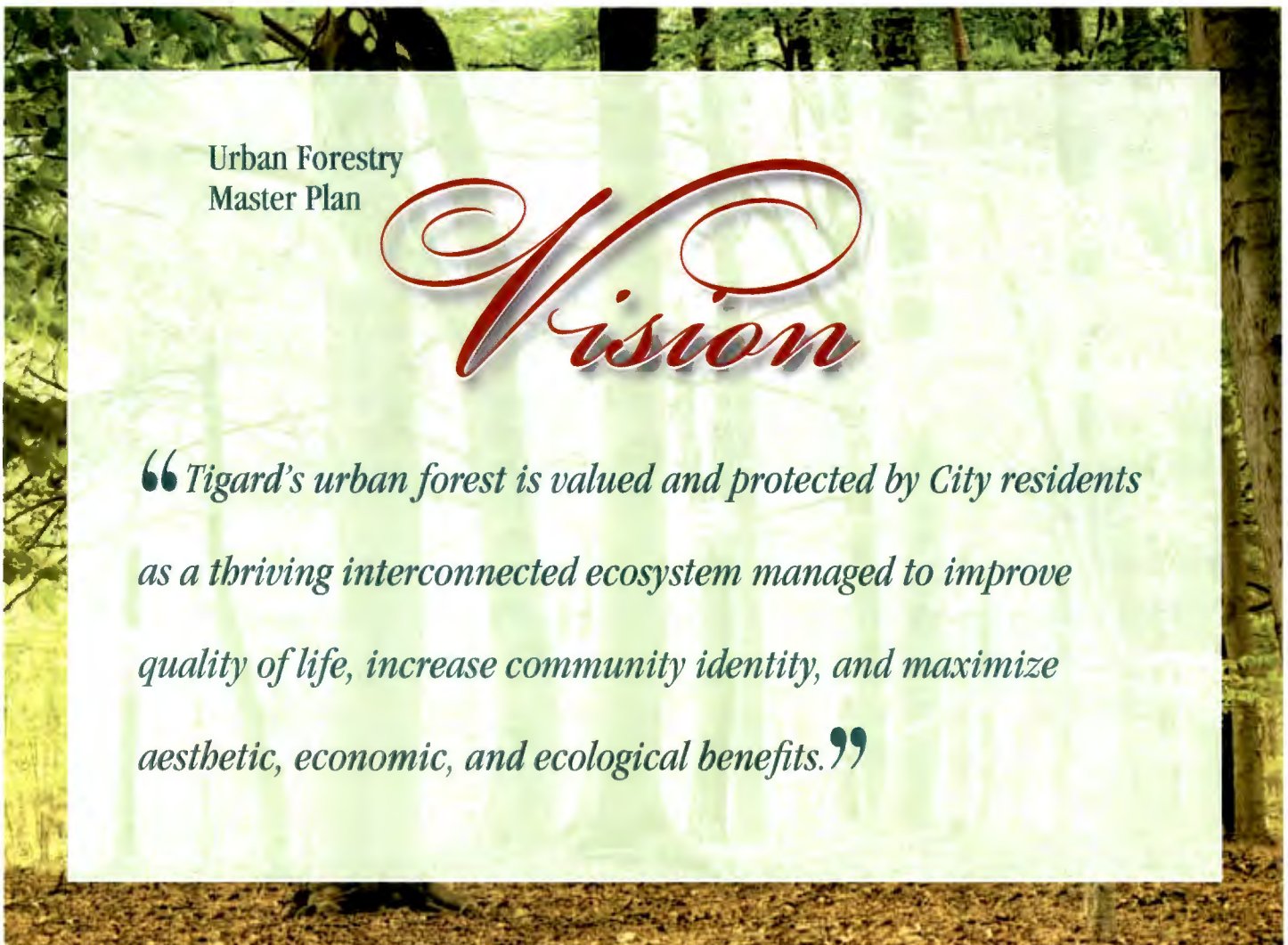
1. Revise Tigard’s tree code (Chapter 18.790, includes development regulations and mitigation).
2. Revise Tigard’s landscaping code (includes street trees, parking lot trees, and other required landscape trees).
3. Develop a tree grove protection program.
4. **Develop a hazard tree identification and abatement program.**
5. Improve the management of the City’s urban forestry program.
6. Develop an urban forest stewardship program.

It is further recommended that the achievement of the above implementation goals occur through a series of sub-goals and action measures which are outlined in the implementation matrix. Implementation goals, sub-goals, and action measures are intended to frame future urban forestry code and program development and set a timeline for both. Tigard’s Tree Board will be charged with overseeing the implementation of the UFMP as part of their annual work plan.

# Implementation Matrix

The following implementation matrix contains all six UFMP implementation goals (highlighted in orange), their associated sub-goals (e.g. 1.1, 1.2, 1.3...), and a series of action measures with the necessary level of detail needed to implement the goals and sub-goals. For each action measure the lead City division, applicable Comprehensive Plan policies, staff and financial resources required, and implementation schedule are included.

Through implementation of the goals, sub-goals, and action measures in this Plan, progress will be made towards the adopted vision of the UFMP CAC:



Implementation Goals		Lead Division	Comp Plan Policies	City Staff Resources*	City's Cost**	Begin Implementation	Complete Implementation
<b>1. Revise Tigard's tree code (Chapter 18.790, includes development regulations and mitigation).</b>							
<b>1.1 Revise tree code to allow for more flexibility and ensure a qualitative approach to tree preservation.</b>							
a.	Determine the most appropriate placement for future tree code provisions within the Tigard Development and Municipal Code chapters.	Long Range Planning	2.2.1, 2.2.2, 2.3.1, 2.3.2, 2.3.3, 2.3.6, 2.3.7, 2.3.9, 2.3.10, 2.3.11	Low	\$	2010	2011
b.	Modify code to focus less on mitigation and more on preservation of long-lived evergreen and broad-leaf deciduous tree species, native and indigenous trees, and other trees identified as of high importance.	Long Range Planning	2.2.1, 2.2.2, 2.2.9, 2.3.1, 2.3.2, 2.3.3, 2.3.4, 2.3.6, 2.3.7, 2.3.9, 2.3.11	High	\$\$	2010	2011
c.	Require private arborists to be involved in the development process from site planning through landscape installation.	Long Range Planning	2.2.1, 2.3.1, 2.3.3, 2.3.6, 2.3.7, 2.3.8, 2.3.9	Low	\$	2010	2011
d.	Develop and implement regulations, standards, and incentives for transferring density and seeking variances and adjustments to preserve trees identified as being of high importance.	Long Range Planning	2.2.1, 2.2.2, 2.3.1, 2.3.3, 2.3.6, 2.3.8, 2.3.9, 2.3.11	High	\$\$	2010	2011
e.	Provide incentives for preserving smaller diameter trees that have a higher ability to withstand development impacts.	Long Range Planning	2.2.1, 2.2.2, 2.2.9, 2.3.1, 2.3.2, 2.3.3, 2.3.4, 2.3.6, 2.3.7, 2.3.9, 2.3.11	Low	\$	2010	2011
f.	Ensure invasive trees are exempt from preservation requirements through the adoption of an inclusive invasive species list.	Long Range Planning	2.2.1, 2.2.2, 2.2.7, 2.2.8, 2.2.9, 2.3.1, 2.3.7, 2.3.8, 2.3.11	Low	\$	2010	2011
g.	Develop standards and procedures for tree code enforcement.	Long Range Planning	2.2.1, 2.2.2, 2.2.3, 2.2.6, 2.3.1, 2.3.8, 2.3.9, 2.3.11	Med.	\$\$	2010	2011
h.	Develop procedures detailing when and how protected trees will be inventoried and permit activities tracked.	Current Planning	2.2.1	Med.	\$\$	2011	2012
i.	Develop and maintain, as part of the City's GIS and permit systems, a publicly accessible inventory of protected trees.	Current Planning	2.2.1	Med.	\$\$	2011	Ongoing
j.	Create a tree manual with drawings and specifications for development related tree inventory and protection standards, and preferred species/tree types for preservation.	Current Planning	2.2.1, 2.2.2, 2.2.8, 2.2.9, 2.3.1, 2.3.2, 2.3.3, 2.3.6, 2.3.7, 2.3.8, 2.3.9	High	\$\$\$	2010	2011

\* Low = 0–8 hours of staff time  
 \*\* \$ = <\$1,000

\* Med. = 8–40 hours of staff time  
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\* High = over 40 hours of staff time  
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Implementation Goals	Lead Division	Comp Plan Policies	City Staff Resources*	City's Cost**	Begin Implementation	Complete Implementation
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1.2 Revise tree code so that standards do not solely impact those property owners with trees.

a.	Develop canopy cover or tree density standards for all lots to be met by either preserving existing trees, or planting new trees.	Long Range Planning	2.2.1, 2.2.2, 2.2.4, 2.2.9, 2.3.1, 2.3.2, 2.3.6, 2.3.7, 2.3.9, 2.3.11	High	\$\$	2010	2011
b.	Investigate possible funding mechanisms to help support an ongoing tree and urban forest enhancement program.	Current Planning	2.2.1, 2.2.2, 2.2.7, 2.3.8	High	\$\$	2011	2012

2. Revise Tigard's landscaping code (includes street trees, parking lot trees, and other required landscape trees).

2.1 Revise street tree planting, maintenance, and removal requirements.

a.	Revise parking lot design requirements to incorporate stormwater management techniques and methods that support increased tree canopy.	Current Planning	2.2.1, 2.2.2, 2.2.4, 2.2.7, 2.2.8, 2.2.10, 2.3.5, 2.3.7, 2.3.8, 2.3.11	Med.	\$\$	2010	2011
b.	Revise Tigard Municipal Code to establish a permit system for planting, removal, and replacement of required trees.	Long Range Planning	2.2.1, 2.2.2, 2.2.4, 2.2.5, 2.2.6, 2.2.8, 2.2.9, 2.2.10, 2.3.5, 2.3.7, 2.3.10, 2.3.11	Med.	\$\$	2010	2011
c.	Incentivize the use, retention, and replacement of long lived evergreen and broad-leaf deciduous tree species, native and indigenous trees, and other trees identified as of high importance.	Current Planning	2.2.1, 2.2.2, 2.2.4, 2.2.5, 2.2.6, 2.2.7, 2.2.8, 2.2.9, 2.2.10, 2.3.1, 2.3.5, 2.3.7, 2.3.8, 2.3.11	Med.	\$\$	2010	2011
d.	Allow required landscape trees to count towards mitigation, canopy cover, and/or tree density standards.	Long Range Planning	2.2.1, 2.2.2, 2.2.4, 2.2.6, 2.2.7, 2.2.8, 2.2.9, 2.2.10, 2.3.5	Low	\$	2010	2011
e.	Require landscape architects to develop landscape plans for projects of a certain type and/or size.	Long Range Planning	2.2.1, 2.2.2, 2.2.7, 2.2.10, 2.3.5, 2.3.7, 2.3.11	Low	\$	2010	2011
f.	Create a design and maintenance manual with drawings and specifications for species selection, planting, and maintenance.	Current Planning	2.2.1, 2.2.2, 2.2.4, 2.2.5, 2.2.6, 2.2.7, 2.2.8, 2.2.9, 2.2.10, 2.3.5, 2.3.7, 2.3.8, 2.3.11	High	\$\$\$	2010	2011
g.	Clarify jurisdictional requirements along ODOT right-of-ways (Highway 99W, Highway 217, and Interstate 5).	Current Planning	2.2.1, 2.2.2, 2.2.4, 2.2.5, 2.2.6, 2.2.7, 2.2.8, 2.3.5, 2.3.8	Low	\$	2010	2011

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Implementation Goals		Lead Division	Comp Plan Policies	City Staff Resources*	City's Cost**	Begin Implementation	Complete Implementation
h.	Do not require new technologies that are cost prohibitive.	Current Planning	2.2.1, 2.2.4, 2.2.7	Low	\$	2010	Ongoing
<b>2.2 Develop an inventory of tree plantings, removals, and replacements.</b>							
a.	Develop procedures for when and how trees will be inventoried and permit activities tracked.	Current Planning	2.2.1	Med.	\$\$	2011	2012
b.	Develop and maintain, as part of the City's GIS and permit systems, a publicly accessible inventory of tree plantings and permitted removals.	Current Planning	2.2.1	Med.	\$\$	2011	Ongoing
<b>3. Develop a tree grove protection program.</b>							
<b>3.1 Focus on preserving large groves of native trees.</b>							
a.	Establish standards and procedures for identifying and inventorying large groves of native trees.	Long Range Planning	2.2.1, 2.2.2, 2.2.3, 2.2.6, 2.2.7, 2.3.1, 2.3.2, 2.3.8, 2.3.9, 2.3.11	High	\$\$\$\$	2010	2011
b.	Develop preservation and maintenance standards and procedures for tree groves identified for protection while allowing for the full development of property under current zoning.	Long Range Planning	2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.6, 2.2.7, 2.2.8, 2.2.9, 2.3.1, 2.3.2, 2.3.3, 2.3.5, 2.3.6, 2.3.7, 2.3.8, 2.3.9, 2.3.11	High	\$\$\$	2011	2012
<b>3.2 Develop a flexible and incentive based grove preservation program that meets the needs of affected property owners.</b>							
a.	Reach out to property owners with identified tree groves early in the process to allow them ample opportunity to participate in the development of regulations.	Long Range Range	2.3.8, 2.3.11	Med.	\$\$	2010	2012
b.	Ensure any future tree grove regulations have flexibility and incentives built in.	Long Range Planning	2.2.1, 2.2.2, 2.2.4, 2.3.6, 2.3.8, 2.3.11	Med.	\$\$	2011	2012
<b>4. Develop a hazard tree identification and abatement program.</b>							
<b>4.1 Establish City storm and hazard tree response protocols.</b>							
a.	Prior to land acquisition conduct a tree hazard assessment.	Parks	2.2.1, 2.2.2, 2.3.4, 2.3.8	Med.	\$\$	2010	Ongoing
b.	Develop and implement a formal emergency response system for tree hazards on City streets.	Streets	2.2.1, 2.2.2, 2.3.4, 2.3.8	Low	\$	2010	Ongoing
c.	Develop and implement a formal emergency response system for tree hazards in City parks/greenspaces.	Parks	2.2.1, 2.2.2, 2.3.4, 2.3.8	Low	\$	2010	Ongoing

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Implementation Goals		Lead Division	Comp Plan Policies	City Staff Resources*	City's Cost**	Begin Implementation	Complete Implementation
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4.2 Establish a City program to facilitate tree hazard identification and abatement on private property.

a.	Revise Tigard Municipal Code to grant authority to the City to become involved in private property tree hazards.	Long Range Planning	2.2.1, 2.3.4, 2.3.8, 2.3.11	High	\$\$	2010	2011
b.	Develop and maintain criteria for what constitutes a tree hazard using the Tree Risk Assessment methodology developed by the PNWISA.	Current Planning	2.2.1, 2.2.2	Med.	\$\$	2010	2011
c.	Develop and maintain criteria for hazard abatement and risk mitigation.	Current Planning	2.2.1, 2.2.2, 2.3.4, 2.3.11	Med.	\$\$	2010	2011
d.	Develop procedures for mediating disputes including assigning responsibility.	Long Range Planning	2.3.4, 2.3.11	High	\$\$\$	2010	2011
e.	Make information about hazard tree identification and abatement program available to the public.	Current Planning	2.3.4, 2.3.8	Med.	\$\$	2010	2011

5. Improve management of the City's urban forestry program.

5.1 Begin developing a tree and urban forest inventory.

a.	Develop procedures for when and how protected trees, tree groves, street trees, heritage trees, and required landscape trees will be inventoried and permit activities tracked.	Current Planning	2.2.1	Med.	\$\$	2011	2012
b.	Develop and maintain, as part of the City's GIS and permit systems, a publicly accessible inventory of protected trees, tree groves, street trees, heritage trees, and required landscape trees.	Current Planning	2.2.1	Med.	\$\$	2011	Ongoing
c.	Develop and maintain, as part of the City's GIS system, a publicly accessible inventory of sites where urban forestry fees are being utilized. Link sites with the City's accounting system so detailed analyses of urban forestry expenditures can be obtained.	Current Planning	2.2.1, 2.2.2, 2.2.7	Med.	\$\$	2011	Ongoing

5.2 Improve management of City owned trees and forests.

a.	Create and route a budget sheet to appropriate divisions prior to park and greenspace acquisitions so anticipated costs and benefits can be identified and evaluated.	Parks	2.2.1, 2.2.2, 2.2.7, 2.3.4	Low	\$	2010	2011
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Implementation Goals		Lead Division	Comp Plan Policies	City Staff Resources*	City's Cost**	Begin Implementation	Complete Implementation
b.	Create a greenspace coordinator position to manage City owned natural areas and develop a proactive hazard tree identification and abatement program for those areas.	Parks	2.2.1, 2.3.4, 2.3.8	High	\$\$\$\$	2011	2011
c.	Develop a written set of urban forestry standards and specifications for City projects.	Current Planning	2.2.1, 2.2.2, 2.2.5, 2.2.6, 2.2.7, 2.3.1, 2.3.3, 2.3.7, 2.3.9	High	\$\$	2011	2012
d.	Identify and secure long term funding sources for urban forestry projects as mitigation funds decline.	Current Planning	2.2.1, 2.2.2, 2.2.7	Low	\$	2014	2016
e.	Designate City Arborist as lead coordinator for implementation of the Urban Forestry Master Plan.	Current Planning	2.2.2, 2.2.6, 2.2.11, 2.3.4, 2.3.7	Low	\$	2010	Ongoing
<b>6. Develop an urban forestry stewardship program.</b>							
<b>6.1 Develop and provide urban forestry outreach materials.</b>							
a.	Provide Tigard citizens with pertinent urban forestry outreach information such as workshops, flyers, online tools, "ask the arborist" service, etc.	Current Planning	2.2.7, 2.3.8	Med.	\$\$	2012	2013
b.	Maintain a list of invasive trees and other plants, discourage their sale and propagation, and promote their removal.	Current Planning	2.2.1, 2.2.7, 2.2.8, 2.2.9, 2.3.8, 2.3.11	Low	\$	2012	2013
<b>6.2 Fund urban forestry projects for private property owners.</b>							
a.	Utilize mitigation and other funding sources for tree planting and urban forest management on public and private property and public right-of-way.	Current Planning	2.2.7, 2.3.8	High	\$\$\$	2013	2014
b.	Present a cost/benefit study for a leaf pickup program for Council's consideration.	Current Planning	2.2.7, 2.3.8	Low	\$	2013	2013
<b>6.3 Prevent pre-development clearing of lots.</b>							
a.	Develop standards that require tree removal permits prior to the removal of a specified number of trees per year.	Long Range Planning	2.2.1, 2.2.2, 2.2.7, 2.3.1, 2.3.8	Med.	\$\$	2010	2011

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\*\* \$ = <\$1,000

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\*\* \$\$\$ = \$10,000–\$50,000

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Implementation Goals		Lead Division	Comp Plan Policies	City Staff Resources*	City's Cost**	Begin Implementation	Complete Implementation
6.4 Regularly update the Urban Forestry Master Plan, set achievable goals, and continually monitor progress.							
a.	Strive to achieve no net loss in citywide tree canopy from 2007–2015.	Current Planning	2.2.7, 2.2.11, 2.3.8	Low	\$	2015	2015
b.	Strive to achieve 32% citywide tree canopy by 2027	Current Planning	2.2.7, 2.2.11, 2.3.8	Low	\$	2027	2027
c.	Strive to achieve 40% citywide tree canopy by 2047	Current Planning	2.2.7, 2.2.11, 2.3.8	Low	\$	2047	2047
d.	Update Urban Forestry Master Plan every 5–7 years.	Current Planning	2.2.1, 2.2.2, 2.2.11, 2.3.1, 2.3.8	High	\$\$\$	2015	2016
e.	To help inform future Plan updates, collect baseline tree inventory data in addition to canopy cover data.	Current Planning	2.2.1, 2.2.7, 2.2.11	High	\$\$	2014	2015

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# Basis for Decision Making

The following information was used as the basis for decision making when formulating goals, sub-goals, and action measures for the UFMP.

## Urban Forestry Survey

An independent, scientific telephone survey of 400 randomly selected citizens about their attitudes towards existing and potential urban forestry policies and programs was completed by Steve Johnson and Associates in December of 2008. The survey was funded in part by a grant from the Oregon Department of Forestry and the USDA Forest Service. The purpose of the survey was to gain a more detailed understanding of community attitudes towards urban forestry issues in Tigard. Exact questions and complete results from the survey are included in Appendix A.



## Canopy Analysis

In cooperation with Metro, Tigard's tree canopy from 1996 and 2007 was identified and mapped using aerial photography. This has allowed for easy identification of where the urban forest is increasing, decreasing, and remaining the same. It will also allow for continual tracking of canopy change in the future as Metro runs the software that can detect the presence of tree canopy cover every two years. Using the results, management decisions were made such as where preservation and planting efforts should be targeted. Full results of the canopy analysis are in Appendix B.

## Stakeholder Interviews

City staff interviewed major community stakeholder groups and jurisdictions that regularly contribute to and/or are affected by the management of Tigard's urban forest. The full stakeholder interview notes are included in Appendix C.

## City of Tigard, Internal Coordination Meetings

The City of Tigard has multiple departments, divisions, boards, and committees that administer and implement the City's urban forestry

program. Key City staff members with roles in coordinating and implementing Tigard’s urban forestry programs, policies, and codes met to discuss urban forestry coordination needs and to identify solutions. The purpose of this coordination is to provide for more effective administration of the urban forestry program and to inform recommendations made in the UFMP. Full results of the internal coordination meetings can be found in Appendix D.

### Review of Current and Historical Urban Forestry Codes, Polices, and Programs

A thorough review and analysis of urban forestry related laws, codes, policies, and programs was undertaken to inform recommendations in the UFMP. Particular attention was paid to the Urban Forest Section of the Comprehensive Plan (Appendix E) which contains the goals, policies, and action measures that guide Tigard’s urban forestry program. Appendix E also provides examples of the social, ecological, and economic benefits of urban trees and forests.

Appendix F contains a historical timeline relative to urban forestry in Tigard. Appendix G contains a review and analysis of the major Federal, State, and Regional policies that provide a framework for Tigard’s urban forestry program. Appendix H is a review and analysis of current urban forestry related City codes.

### UFMP CAC

The UFMP CAC was comprised of the Tree Board plus four additional residents/business interests at large including two certified arborists, one homebuilder, and one resident with expertise in public administration. They met every other month to receive information as it was being collected and advised staff on Plan development.



*City staff interviewed major community stakeholder groups and jurisdictions that regularly contribute to and/or are affected by the management of Tigard’s urban forest. The full stakeholder interview notes are included in Appendix C.*



## CHAPTER 1:

# Development Regulations and Mitigation Requirements



### Implementation Goal 1:

**Revise Tigard’s tree code (Chapter 18.790, includes development regulations and mitigation).**

Revising Tigard’s tree code is purposely listed as Goal 1 due to strong dissatisfaction with the existing code by those both inside and outside of the development community.

Tigard’s existing tree code is located in Chapter 18.790 of the Tigard Development Code. This Code requires certain types of development projects to prepare a tree plan and identify trees to be preserved and removed during construction. Tree replacement, or mitigation, is required on an “inch for inch” basis. This means that if a tree with a trunk that is 12 inches in diameter is removed, it needs to be replaced with 6, 2-inch diameter replacement trees. If a developer chooses not to replant trees, then the City requires a “fee-in-lieu payment” to the Tigard Tree Fund at the current rate of \$125 per diameter inch (2009).

Some of the criticism of the tree code from stakeholders is that the mitigation structure promotes overplanting, it does not require preservation of quality trees, and it encourages the retention of large diameter trees that are less likely to survive development impacts. The Home Builder’s Association of Metropolitan Portland (HBAMP) position is that the fee-in-lieu of mitigation is excessive and that the tree code does not adequately reward the preservation of high quality trees. The HBAMP and other stakeholders agree that the tree code unfairly penalizes those property owners with existing trees more than those owners without trees. For the City, the tree code is also **administratively difficult to implement** because it is challenging to track protected and replacement trees in the years and decades following development.

The previous tree code that went into effect in 1983 was more preservationist than today’s code because it required a permit prior to the removal of any tree on all undeveloped land, developed commercial and industrial land, and public land. In 1997 Tigard’s tree code was revised to

its current form. The code currently allows any or all trees to be removed as long as they are replaced. Due in part to dissatisfaction with the existing tree code, the Tigard Tree Board was charged with developing a “City Tree Stewardship and Urban Forest Enhancement Program” in 2007. Following over a year of work by the Tree Board, a comprehensive plan for the urban forest was developed in 2008. The Urban Forest section of the Comprehensive Plan (Appendix E) contains two goals to be implemented by 22 policies. The goals and policies in the Comprehensive Plan guide the recommendations made in this Plan.

While many are unhappy with the current tree code, the UFMP community survey confirmed Tigard residents want the City to require some trees are preserved and new trees planted during development (~88% support). A majority (~57%) of respondents say they support new development regulations even if they limit the size and extent of potential buildings or profits. Approximately 32% of respondents oppose tree regulations limiting development. (See Figure 1 at right).

Protecting Tigard’s urban forest on developable land must be balanced with State, Metro, and City planning goals and regulations which favor density in urban areas. Specifically, development regulations must be clear and objective, and not discourage needed housing through unreasonable cost or delay according to State law. Only 7% of Tigard’s land area and 12% of its citywide tree canopy are on developable property so a comprehensive urban forestry code and program must address areas outside of development.

Direction received from the community and stakeholders regarding tree code revisions have been folded into several sub-goals and implementation measures. Major recommendations include:

- Determining the most appropriate placement for future tree code provisions to improve administration and address situations outside development;
- Less focus on mitigation and more on preserving high quality trees;
- Revising tree preservation incentives so that they are more attractive to developers; and
- Not unfairly penalizing those property owners with trees.

Also included in the recommendations are steps the City should take to better track protected and replacement trees after development is complete.

Would you strongly support, support, oppose, or strongly oppose tree removal regulations during property development, even when they limit the size and extent of potential buildings or profits?

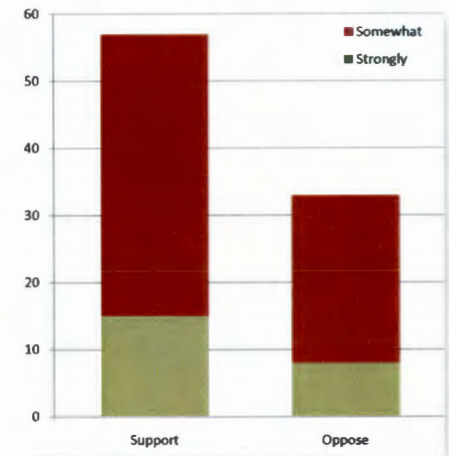


FIGURE 1

## CHAPTER 2:

# Landscaping Requirements

“

*Stakeholder interviews highlighted the need for requirements addressing the planting of high quality trees and ensuring that design and maintenance of areas such as parking lots and street side plantings are sustainable and aesthetically pleasing.*

”

### Implementation Goal 2:

**Revise Tigard’s landscaping code (includes street trees, parking lot trees, and other required landscape trees).**

Revising Tigard’s landscaping code is the second goal of the UFMP. The intention of the revisions is to improve the quality and protection of the City’s streetscapes and commercial and industrial landscapes.

Tigard’s existing landscaping codes are scattered throughout the Development and Municipal Codes. Many of the provisions in the landscaping codes **lack specificity, are conflicting, and present** administrative challenges for the City. Also, the City’s standards and design guidelines do not specify industry accepted installation and maintenance requirements for trees.

Stakeholder interviews highlighted the need for requirements addressing the planting of high quality trees and ensuring that design and maintenance of areas such as parking lots and street side plantings are sustainable and aesthetically pleasing. The Oregon Chapter of the American Society of Landscape Architects (OASLA) suggested Tigard create a **tree and landscape design manual with drawings and specifications** so that landscape architects have a clear idea of the City’s overall tree and landscape vision. Such a tree and landscape design manual could also address the Tree Board’s request to translate Code revisions into something the public can understand.

**Internally, the lack of a comprehensive tree inventory has led to difficulty tracking street trees and required landscape trees.**

Although the UFMP community survey revealed that Tigard citizens are **highly satisfied with the current overall state of Tigard’s urban forest**, 74% of respondents believe more street trees will be good for the City. Tigard’s canopy analysis supports this, as street trees currently provide only 9% canopy in City street right-of-ways. The canopy analysis also found that the City’s parking lot tree standards are not effective due to the relatively low tree canopy in parking lots. (See Figure 2 on next page.)

Direction for revising Tigard’s landscaping code is included in the **sub-goals and implementation of section two of the matrix.** Specific

recommendations include developing a landscape design manual with drawings and specifications, improving parking lot design, establishing a permit system for the planting, replacement, and removal of required trees, and improving the tracking and inventorying of street trees and other required landscape trees.



Based on a random sample, Tigard parking lots (outlined in yellow) are covered by approximately 6% tree canopy (areas highlighted in green).

FIGURE 2

## CHAPTER 3:

# Tree Grove Protection



### Implementation Goal 3: Develop a tree grove protection program.

The third goal of the UFMP is to develop a tree grove protection program which creates mechanism for protecting Tigard’s remaining groves of native trees while allowing for the full development of property under current zoning.

Many tree groves in Tigard are currently afforded some level of protection due to their location in sensitive lands (stream corridors, steep slopes, **significant habitat areas, wetlands, and floodplains**) as defined by the Tigard Development Code. Tigard’s Development Code limits the type and intensity of development within sensitive lands, and requires permits for tree removal in these areas. However, the Development Code does not explicitly protect tree groves in sensitive lands, and tree removal permits are automatically issued if an erosion control plan is provided. Also, currently there are no protections for tree groves located outside of sensitive lands. Prior to enacting any regulations protecting tree groves, the City must comply with Federal, State, and Regional regulations (see Appendix G). Particular attention shall be paid to State laws including the requirements for an economic, social, environmental, and energy (ESEE) analysis prior to protecting “Goal 5” (natural) resources.

Some of the stakeholders interviewed for the UFMP such as the Pacific Northwest Chapter of the International Society of Arboriculture (PNWISA), the OASLA, the Tualatin Riverkeepers and Clean Water Services, support the City’s efforts to preserve and maintain native trees and groves in Tigard. Multiple stakeholders also suggest the City take a leadership role in tree grove protection by hiring a greenspace coordinator to provide long term maintenance of City-owned natural areas. The HBAMP suggested affected property owners be **directly notified** about regulations and incentives proposed for incorporation into any City code calling for the preservation of tree groves.

The UFMP community survey shows that Tigard residents support future regulations to protect native tree groves. Most residents (~55%) would like to see regulations focused on larger groves of native trees as opposed to individual trees of **significant size** (~28% support). In addition, 37%

of respondents said they prefer to see new tree regulations focused on natural areas as opposed to ornamental trees (~3% support). However, approximately 48% said they would like to see regulations applied to natural areas and ornamental trees equally. (See Figure 3 at right.) 73% of respondents said the decision of whether to preserve trees should not be left solely to the developer, and a majority (57%) said they support tree regulations even if they limit the size and extent of potential buildings or profits.

While residents prioritize grove protection, the canopy analysis revealed that Tigard’s tree groves are disappearing. In 1996, there were 63 canopy clusters greater than 5 acres in size within the City limits. In 2007, there were 48 canopy clusters greater than 5 acres in size. This represents a 24% decline in large sized canopy clusters in eleven years. (See Figure 4 on next page.)

As a result of trends shown in the canopy analysis, community preference, and stakeholder input, the UFMP developed a number of sub-goals and action measures to guide the development of a tree grove protection program that is compliant with Federal, State, Regional, and Local requirements. Included are recommendations to contact all property owners that would be impacted by a tree grove protection program and providing grove preservation incentives.

If the City were to enact new tree protection measures, would you like to see them focused on natural areas, ornamental landscape trees, both types equally, or on something else.

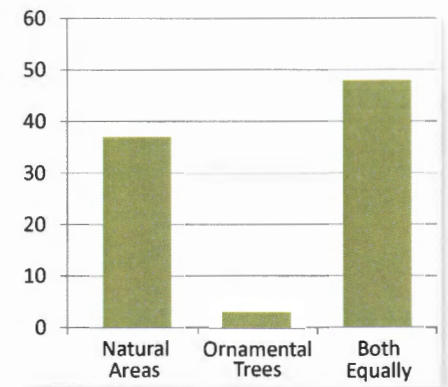
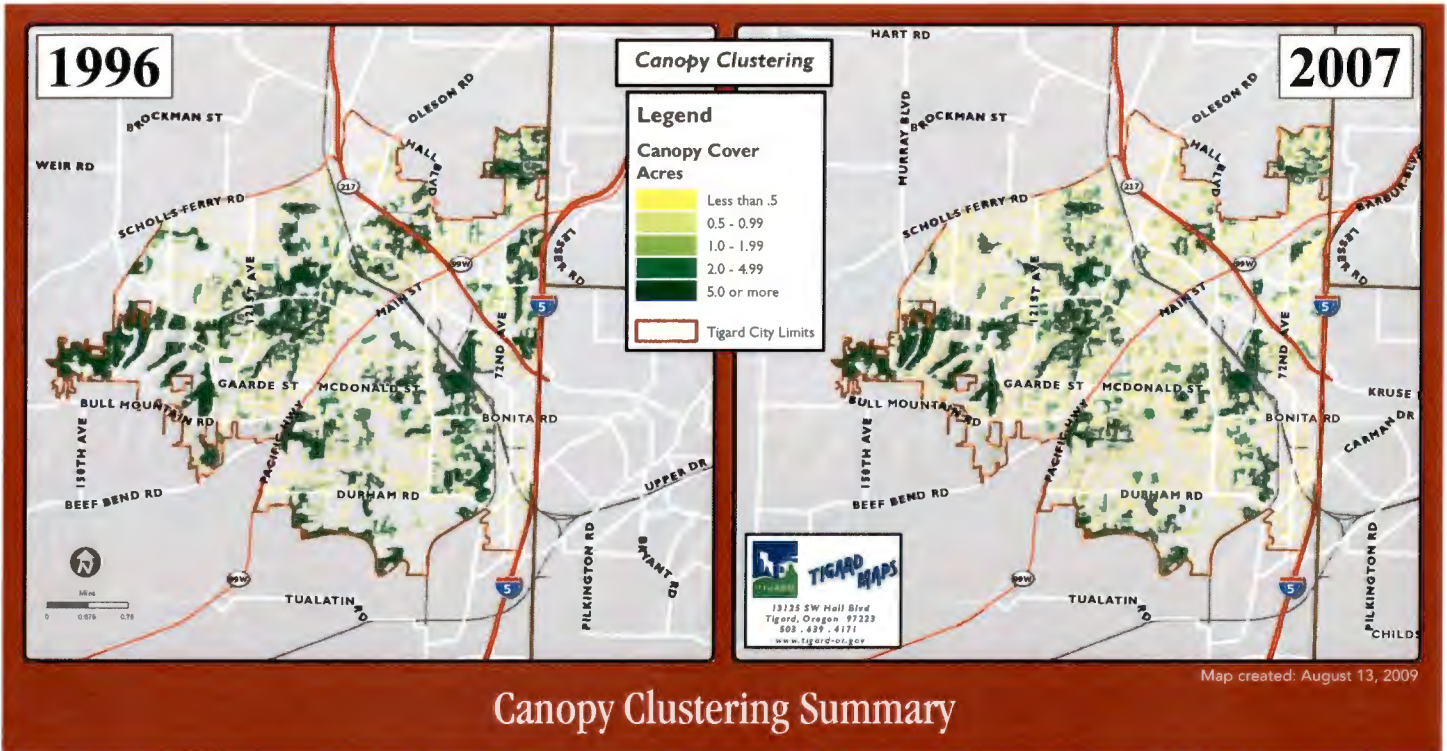


FIGURE 3





Canopy Clustering Summary

Canopy Cluster Size Class	1996				2007			
	Total Acres of Canopy Cover	Acres as a % of Total Canopy Cover	No. of Clusters	No. of Clusters as a % of Total	Total Acres of Canopy Cover	Acres as a % of Total Canopy Cover	No. of Clusters	No. of Clusters as a % of Total
Less than .5 acres	366.55	18.77%	4356	90.94%	584.3	31.54%	7231	93.86%
0.5 to .99 acres	135.76	6.95%	197	4.11%	167.25	9.03%	242	3.14%
1.0 to 1.99 acres	159.25	8.16%	113	2.36%	177.88	9.60%	131	1.70%
2.0 to 4.99 acres	190.86	9.77%	61	1.27%	157	8.47%	52	0.67%
5.0 or more acres	1100.33	56.35%	63	1.32%	766.26	41.36%	48	0.62%
<b>Total</b>	<b>1952.75</b>	<b>100%</b>	<b>4790</b>	<b>100%</b>	<b>1852.69</b>	<b>100%</b>	<b>7704</b>	<b>100%</b>

FIGURE 4

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## CHAPTER 4: Hazard Trees

### Implementation Goal 4: Develop a hazard tree identification and abatement program.

The fourth goal in the UFMP is to develop a hazard tree identification and abatement program that adequately addresses tree hazards on both public and private property.

Currently Tigard’s Municipal Code prohibits hazard trees, but there is a lack of specificity on what constitutes a hazard and what the mechanism is for abating hazards in a timely manner. There is also no formal process for identifying and abating tree hazards on City property.

During the stakeholder interviews the Tree Board suggested that the City increase communications between departments. Interdepartmental communication is integral to effectively addressing tree hazards in a timely manner. Other stakeholders suggested that the City hire a greenspace coordinator who could provide proactive management of tree hazards in City parks and greenspaces. The HBAMP said the City should allow private property owners to manage their land as they see fit, which implies the City should have no involvement in private property tree hazard issues.

As a result of the City’s internal coordination meetings, specific methods for responding to public tree hazards were developed and are detailed in Appendix D. The Parks Division echoed the stakeholders by highlighting the need to hire a greenspace coordinator to proactively manage tree hazards on City property.

The community survey results indicate public support for a hazard tree identification and abatement program. Approximately 76% of residents think more resources should be directed to better maintain and protect existing trees. A majority of residents said they would support additional funding from increased city fees, charges, or property taxes to fund a more comprehensive tree program in Tigard parks and open spaces (~56% support, ~39% oppose). A portion of that funding could be used by the City for a hazard tree program. Finally, a majority of residents said they would support the creation of a program where the City would become involved in disputes between neighbors regarding hazardous trees on private property (60% support, 38% oppose). (See Figure 5 at left.)

Currently, if there is a dispute between neighboring property owners regarding a potentially hazardous tree, the City does not get involved, and instead directs the neighbors to work out a solution through civil means. Would you strongly support, support, oppose, or strongly oppose the creation of a program where the City would become involved in disputes between neighbors regarding hazardous trees?

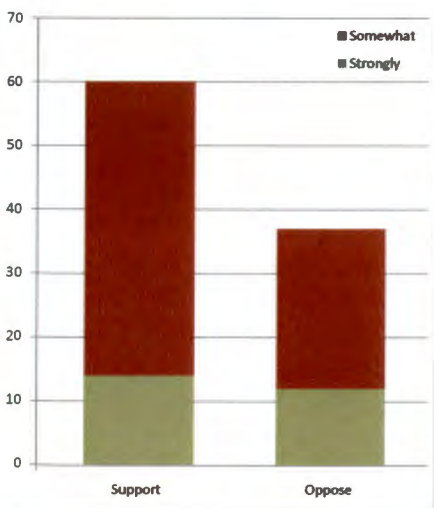


FIGURE 5

The sub-goals and implementation measures recommended in the UFMP support the creation of a **hazard tree identification and abatement program** for public and private property. The recommendations include formalizing the City's hazard response protocols, hiring a greenspace coordinator to help manage tree hazards on City property, and developing a process whereby the City would have authority to become involved in tree hazards on private property. In order to provide consistency in tree hazard identification and abatement, it is recommended that the City adopt the PNWISA Tree Risk Assessment methodology as its standard.



## CHAPTER 5:

# Urban Forestry Program Management

“

*The public showed a preference for urban forestry efforts to focus on streamside trees and other natural forested areas.*

”



### Implementation Goal 5: Improve the management of the City’s urban forestry program.

Implementation Goal 5 was developed to improve the coordination and management of the City’s urban forestry program.

Tigard’s urban forestry program is currently implemented by multiple City departments and divisions. In addition, code provisions relating to urban forestry are scattered throughout the Municipal and Development Codes. Management of City-owned tree and forest resources has been declining as more land is acquired without additional funding for maintenance and proactive management. Improved communication between City departments and divisions, unifying urban forestry related Code provisions, **and providing adequate staffing is needed for more effective management of the City’s urban forestry program.** Also, securing a sustainable funding source will be necessary to provide long term support of the urban forestry program as the Tree Fund declines due to less future development.

Stakeholders such as the PNWISA and Clean Water Services suggested that the City hire a greenspace coordinator to proactively manage City tree and forest resources. The Tualatin Riverkeepers said the City needs to establish a sustainable source of funding for its urban forestry program to assist in the long term management of invasive species. The Tree Board suggested that there needs to be more coordination between City departments and divisions when administering the urban forestry program. Although a minority view, the HBAMP’s position is that there should be no urban forestry program because the costs outweigh the benefits of such a program.

The City’s internal coordination meetings highlighted the need for more communication between departments and divisions. More communication would improve the management of tree hazards, ensure City development projects are adhering to applicable Code requirements, improve the tracking of trees after development, and provide more transparency as to how and where the Tree Fund is being utilized. The internal coordination meetings also highlighted the need for a written set of tree protection

and replacement standards for City projects so that the City can take a leadership role in urban forestry.

The community survey results demonstrate public support for increased funding through fees and taxes for the City’s urban forestry program (~56% support, ~39% oppose). (See Figure 6 at right.) The public showed a preference for urban forestry efforts to focus on streamside trees and other natural forested areas. These results indicate that residents would support the hiring of a greenspace coordinator to directly manage the nearly 180 acres of City-owned tree canopy in Tigard.

The sub-goals and implementation measures recommended in the UFMP to support the goal of improved City management include developing methods for inventorying and tracking trees and urban forestry related expenditures, developing a written set of urban forestry standards for City projects, securing a sustainable funding source for urban forestry, and hiring a greenspace coordinator to manage the City’s natural areas.

Would you strongly support, support, oppose, or strongly oppose additional funding from increased City fees, charges or property taxes to fund a more comprehensive tree planting and maintenance program in Tigard parks and open spaces?

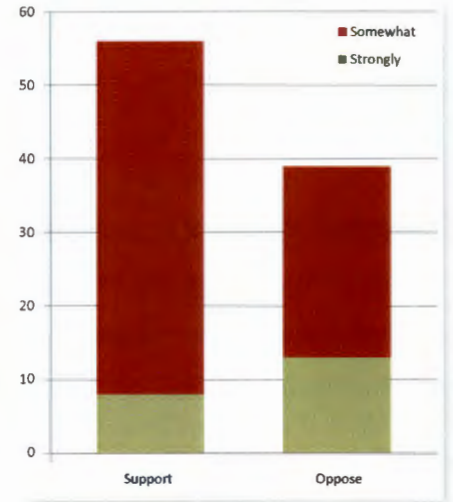


FIGURE 6

## CHAPTER 6: Stewardship



### Implementation Goal 6: Develop an urban forestry stewardship program.

Urban Forest stewardship has been a vital component of life in the area now known as Tigard for thousands of years. 3,500 years before present, Kalapuya (Native Americans) began managing the forests of the Willamette Valley using fire (pyroculture). At about the time of European settlement in 1851, canopy coverage within the current City limits of Tigard was estimated to be 52.4% (3,966.9 acres). The predominant tree species were Oregon ash, red alder, bigleaf maple, willow, black cottonwood, Oregon white oak, western red cedar, and Pacific dogwood in the riparian and wetland areas. The upland areas were dominated by Douglas-fir, bigleaf maple, grand fir, Pacific dogwood, western hemlock, Oregon white oak, red alder, western red cedar, and ponderosa pine. (See Figure 7 below.)

“

*In 2007, Tigard had 24% citywide tree canopy which is well below American Forests’ target recommendation of 40% for Pacific Northwest cities.*

”



Forest types/  
vegetation  
present circa  
1851.<sup>1</sup>  
Estimated 1851  
canopy cover  
within 2008  
Tigard city limits  
(outlined in red)  
based on forest  
types is 52.4%.<sup>2</sup>

FIGURE 7

<sup>1</sup>Hulse, D., S. Gregory, and J. Baker, eds. 2002. **Willamette River Basin Planning Atlas: Trajectories of Environmental and Ecological Change.** The Pacific Northwest Ecosystem Research Consortium. Corvallis, OR: Oregon State University Press.

<sup>2</sup>Johnson, B.R., 2008. **Personal communication on November 12.** Associate Professor of Landscape Architecture, University of Oregon. Eugene, OR.

Abbreviation	Forest Type	Vegetation Type
<b>FF</b>	Closed forest; Upland	Douglas fir forest, often with bigleaf maple, grand fir, dogwood, hazel, yew. No other conifers present. No Oak.
<b>OFZ</b>	Woodland	Douglas fir woodland or “timber” often with bigleaf maple, alder or dogwood. No oak, hemlock or cedar. Brushy undergrowth of hazel, vine maple, young Douglas fir, bracken etc.
<b>OFOPZ</b>	Woodland	“Scattering” or “thinly timbered” Douglas fir-white oak-ponderosa pine woodland, with brushy undergrowth of hazel, bracken, etc. May include small openings.
<b>FFP</b>	Closed forest; Upland	Douglas fir-ponderosa pine forest; no oak, includes ash, red alder, hazel, Oregon grape, vine maple.
<b>FALW</b>	Closed forest; Riparian & Wetland	Ash-alder-willow swamp, sometimes with bigleaf maple. Often with vine maple, ninebark, hardhack, cattails. Ground very soft, mirey or muddy, usually with extensive beaver dams.
<b>OFOZ</b>	Woodland	Scattering or thinly timbered Douglas fir-white oak woodland. May contain bigleaf maple; brushy understorey of hazel, young oaks, oak brush, young fir, bracken. No pine.
<b>FFHPP</b>	Closed forest; Upland	Mixed conifer forest, with ponderosa pine. May include Douglas fir, red cedar, western hemlock, bigleaf maple, white oak, red alder, dogwood, vine maple.
<b>OFHC</b>	Woodland	Conifer-dominated woodland; various combinations of Douglas fir, red cedar, hemlock, bigleaf maple, white oak, red alder, dogwood. No ash present.
<b>FFHCbu</b>	Closed forest; Upland	FFHC, but burned, often with scattered trees surviving fire.
<b>FFHC</b>	Closed forest; Upland	Mesic mixed conifer forest with mostly deciduous understorey. May include Douglas fir, western hemlock, red cedar, grand fir, bigleaf maple, yew, dogwood, white oak, red alder.
<b>FFO</b>	Closed forest; Upland	Douglas fir-white oak (bigleaf maple) forest, with brushy understorey of hazel, young oak, oak brush, oak sprout, bracken, briars, sometimes willow.
<b>FFA</b>	Closed forest; Riparian & Wetland	Ash-mixed deciduous riparian forest with combinations of red alder, bigleaf maple, black cottonwood, white oak, dogwood. Conifers may be present in small quantities.

As Tigard became settled, native forests were cleared for agricultural uses and timber to help support development. After Tigard was incorporated in 1961, the City began passing codes to manage the urban forest beginning in 1967 with street tree planting requirements, and continuing in 1983 and 1997 with the passage of codes that regulated tree removal. The City hired its first urban forester in 1998 and created the Tree Board in 2001. The City of Tigard has been named a Tree City USA every year since 2001 and was awarded the Tree City USA Growth Award in 2009 for its expanded urban forestry efforts.

In 2007, Tigard had 24% citywide tree canopy which is well below American Forests’ target recommendation of 40% for Pacific Northwest



Logging in Tigard area — 1904



The Hunziker Dairy Farm near Garden Home. Mr. Hunziker is in center of picture wearing hat and coat.



“

*The City of Tigard has been named a Tree City USA every year since 2001 and was awarded the Tree City USA Growth Award in 2009 for its expanded urban forestry efforts.*

”

cities. An analysis of existing tree canopy combined with plantable locations confirmed that 40% citywide tree canopy cover is achievable in Tigard. While citywide tree canopy is currently stabilized (1% decrease from 1996–2007), it is becoming increasingly fragmented (larger groves are being replaced by individual trees). (See Figure 8, next page.) Because 78% of Tigard’s tree canopy is on private property and only 7% of Tigard’s land area is on buildable lands, it is critical to develop an urban forest stewardship program that includes all residents and property owners in the City.





### Canopy/Property Ownership Summary

	May 13, 2008 Taxlots		2007 Canopy Cover	
Taxlot Ownership	Number of Taxlots	Total Acres	Acres of Canopy Cover in 2007	Percent Canopy Cover in 2007
City of Tigard	235	388.41	179.18	46.13%
Public Right-of-Way	n/a	1,288.30	117.45	9.12%
Other Public Entity	79	431.65	105.1	24.35%
Private	15,880	5,447.64	1,450.96	26.63%
Total	16,194	7,556.00	1,852.69	24.52%

FIGURE 8

Most stakeholder groups support the goal of developing and participating in an urban forest stewardship program. The Tree Board wants future urban forestry codes to address areas outside development and provisions translated into something the public can understand. They also want more community education on urban forestry issues, and for the City to continually measure progress on canopy changes and community attitudes so that policy effectiveness can be easily evaluated in the future.

Portland General Electric and the Tigard-Tualatin School District have offered to partner with the City on tree planting and maintenance projects. The Tualatin Riverkeepers and Clean Water Services would like more focus on managing invasives in natural areas and have offered to assist the public on long term resource management.

Although there is a high level of satisfaction with the current state of Tigard’s urban forest, survey results show the public would support an urban forest stewardship program with 76% of residents wanting more resources directed towards maintaining and protecting existing trees. (See Figure 9.) Many would be willing to become directly involved with 52% of residents saying they would prefer volunteering to plant and maintain trees rather paying a fee to the City to do it. Residents also want to protect the trees in their existing neighborhoods with 75% saying they would support regulations for developed private property that would protect large, healthy trees. (See Figure 10.)

The sub-goals and implementation measures in the UFMP that support the goal of developing an urban forest stewardship program include increasing urban forestry outreach materials, utilizing funding for tree planting and maintenance on public and private property, and developing regulations to prevent clear cutting. Also, long term objectives include periodically updating the Urban Forestry Master Plan in order to track progress and set new goals, achieving not net loss of tree canopy between 2007 and 2015, and achieving 32% and 40% citywide tree canopy by 2027 and 2047 respectively.

It would benefit the City if more resources could be directed to better maintain and protect existing trees.

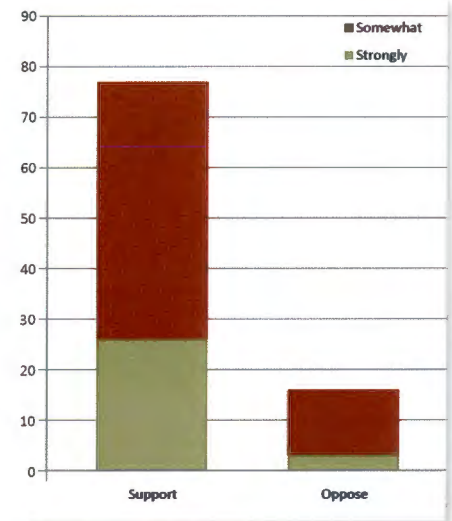


FIGURE 9

Would you strongly support, support, oppose, or strongly oppose city regulations that would provide some level of protection for large, healthy trees on developed private property? This would apply to all current private property.

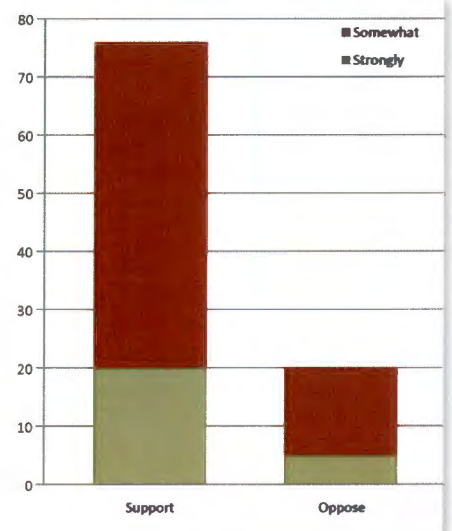
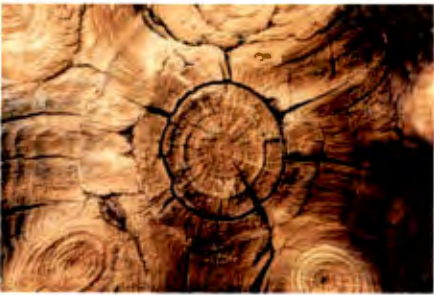


FIGURE 10

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## Glossary



**Buildable Lands Inventory (BLI)** — The Tigard BLI defines buildable land as: 1) privately owned taxlots that are vacant; or 2) larger privately owned taxlots that are developed but with  $\frac{1}{4}$  acre or greater of the taxlot vacant. Additionally, publicly owned land, sensitive lands, water quality tracts, and homeowner association owned lots within subdivisions are not included. Platted, vacant lots within subdivisions are considered buildable until development has occurred.

**Canopy Cluster** — A contiguous area of canopy cover created by a group of trees. Using Feature Analyst software on aerial photos of Tigard, a canopy layer was created in Tigard’s GIS database. This layer was used to analyze the size and location of canopy clusters in Tigard.

**Canopy Cover** — The area above ground which is covered by the trunk, branches, and foliage of a tree or group of trees’ crowns.

**GIS (Geographic Information System)** — An integrated collection of computer software, and data used to view and manage information about geographic places, analyze spatial relationships, and model spatial processes. A GIS provides a framework for gathering and organizing spatial data and related information so that it can be displayed and analyzed.

**Invasive** — Species that spread at such a rate that they cause harm to human health, the environment, and/or the economy.

**Ornamental Trees** — Trees cultivated primarily for aesthetics and other direct human benefits.

**Sensitive Lands** — As defined by the Tigard Development Code, lands potentially unsuitable for development because of their location within:

1. The 100-year floodplain or 1996 flood inundation line, whichever is greater;
2. Natural drainageways;
3. Wetland areas which are regulated by the other agencies including the U.S. Army Corps of Engineers and the Division of State Lands, or are designated as significant wetland on the City of Tigard “Wetland and Stream Corridors Map”;
4. Steep slopes of 25% or greater and unstable ground; and
5. Significant fish and wildlife habitat areas designated on the City of Tigard “Significant Habitat Areas Map.”

**Tree Density** — The number of trees per unit area.

**Tree Fund** — A fund created by the City of Tigard for the purpose of replacing trees that are removed during development activities. It is funded by development projects that do not plant replacement trees, and is used by the City to cover its costs of planting an equivalent amount of trees elsewhere.

**Tree Grove** — A group of trees, often with contiguous crowns, which form a visual and/or biological unit.

**Tree Hazard Assessment** — A systematic process of identifying tree hazards.

**Tree Risk Assessment** — A systematic process to determine the level of risk posed by a tree, tree part, or group of trees.

# Appendix



## APPENDICES

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<b>Appendix C:</b> Stakeholder Interview Notes	<b>a24</b>
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<b>Appendix E:</b> Urban Forest Section of the Comprehensive Plan	<b>a46</b>
<b>Appendix F:</b> Tigard Urban Forestry Historical Timeline	<b>a55</b>
<b>Appendix G:</b> Review of Current Federal/State/Regional Urban Forestry Policy Framework	<b>a56</b>
<b>Appendix H:</b> Review of Current City of Tigard Urban Forestry Policy Framework	<b>a63</b>
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**CITY OF TIGARD**

**2008 URBAN FORESTRY SURVEY**

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**STEVE JOHNSON & ASSOCIATES \* P. O. BOX 3708 \* EUGENE, OREGON 97403**

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**TOPLINE FREQUENCIES**

*\*\*Topline results include the text of each question, the response categories, and the number and percent of responses in each category. All questions include categories for Refused (7 or 97), Don't Know (8 or 98) and No Answer (9 or 99). In the interest of space, responses such as "I don't know," "I can't think of anything," and "no comment" have been removed from the document. The "open answers" are recorded verbatim. They have been corrected for spelling but not grammar.*

**HELLO1** Hello, I'm calling on behalf of the City of Tigard. They have asked us to conduct a survey of residents 18 and older about trees in the city and urban forestry. The survey takes about ten minutes and is voluntary and anonymous. I'd like to start now.

[INTERVIEWER NOTE: IF RESPONDENT SELF IDENTIFIES AS UNDER 18 ASK FOR SOMEONE OVER 18. IF NO ONE IS AVAILABLE TRY AND SCHEDULE CALL BACK. IF THIS IS THE LAST DIAL ATTEMPT GO TO NOQUAL]

PRESS START TO BEGIN – OR – PRESS DISPO TO SCHEDULE CALLBACK

\*INTRO FOR PARTIALS: Hi, I'm calling back to finish an interview for the City of Tigard that we began earlier. Is that (you/person available)?

**SATIS1** I'd like to begin by asking if you are very satisfied, satisfied, dissatisfied or very dissatisfied with the quantity and quality of trees in the following locations. First, what about the trees on your street?

PROBE: Are you very satisfied, satisfied, dissatisfied, or very dissatisfied with the quantity and quality of trees on your street?

1 VERY SATISFIED	103	25.75%
2 SATISFIED	246	61.5%
3 DISSATISFIED	32	8%
4 VERY DISSATISFIED	10	2.5%
7 REF/ 8 DK/ 9 NA	9	2.25%
	400	100%

**SATIS2** What about the trees in your neighborhood?

PROBE: Are you very satisfied, satisfied, dissatisfied, or very dissatisfied with the quantity and quality of trees in your neighborhood?

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1 VERY SATISFIED	104	26%
2 SATISFIED	242	60.5%
3 DISSATISFIED	43	10.75%
4 VERY DISSATISFIED	5	1.25%
7 REF/ 8 DK/ 9 NA	<u>6</u>	<u>1.5%</u>
	400	100%

**SATIS3** What about trees in the city as a whole?

PROBE: Are you very satisfied, satisfied, dissatisfied, or very dissatisfied with the quantity and quality of trees in the city as a whole?

1 VERY SATISFIED	61	15.25%
2 SATISFIED	251	62.75%
3 DISSATISFIED	59	14.75%
4 VERY DISSATISFIED	10	2.5%
7 REF/ 8 DK/ 9 NA	<u>19</u>	<u>4.75%</u>
	400	100%

**HOOD** Does your neighborhood need more trees and landscaping to improve its appearance and environmental quality?

1 YES	101	25.25%
2 NO	294	73.5%
7 REF/ 8 DK/ 9 NA	<u>5</u>	<u>1.25%</u>
	400	100%

**IMPORT1** Now I would like to read you some statements people have made about trees. For each one, would you tell me if you strongly agree, agree, disagree, or strongly disagree. First, trees are important to a community's character and desirability as a place to live.

PROBE: Do you strongly agree, agree, disagree, or strongly disagree?

1 STRONGLY AGREE	249	62.25%
2 AGREE	138	34.5%
3 DISAGREE	10	2.5%
4 STRONGLY DISAGREE	1	0.25%
7 REF/ 8 DK/ 9 NA	<u>2</u>	<u>0.5%</u>
	400	100%

**IMPORT2** It is important to me to have a view of trees from my home.

PROBE: Do you strongly agree, agree, disagree, or strongly disagree?

1 STRONGLY AGREE	218	54.5%
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## APPENDIX A

2 AGREE	148	37%
3 DISAGREE	28	7%
4 STRONGLY DISAGREE	4	1%
7 REF/ 8 DK/ 9 NA	<u>2</u>	<u>0.5%</u>
	400	100%

**IMPORT3** Trees contribute to the value of residential property.

PROBE: Do you strongly agree, agree, disagree, or strongly disagree?

1 STRONGLY AGREE	200	50%
2 AGREE	170	42.5%
3 DISAGREE	19	4.75%
4 STRONGLY DISAGREE	3	0.75%
7 REF/ 8 DK/ 9 NA	<u>8</u>	<u>2%</u>
	400	100%

**IMPORT4** Trees contribute to the value of commercial property.

PROBE: Do you strongly agree, agree, disagree, or strongly disagree?

1 STRONGLY AGREE	125	31.25%
2 AGREE	205	51.25%
3 DISAGREE	45	11.25%
4 STRONGLY DISAGREE	3	0.75%
7 REF/ 8 DK/ 9 NA	<u>22</u>	<u>5.5%</u>
	400	100%

**IMPORT5** More street trees would be good for the City.

PROBE: Do you strongly agree, agree, disagree, or strongly disagree?

1 STRONGLY AGREE	97	24.25%
2 AGREE	202	50.5%
3 DISAGREE	62	15.5%
4 STRONGLY DISAGREE	9	2.25%
7 REF/ 8 DK/ 9 NA	<u>30</u>	<u>7.5%</u>
	400	100%

**IMPORT6** It would benefit the City if more resources could be directed to better maintain and protect existing trees.

PROBE: Do you strongly agree, agree, disagree, or strongly disagree?

1 STRONGLY AGREE	102	25.5%
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2 AGREE	203	50.75%
3 DISAGREE	50	12.5%
4 STRONGLY DISAGREE	10	2.5%
7 REF/ 8 DK/ 9 NA	<u>35</u>	<u>8.75%</u>
	400	100%

**IMPORT7** The City should require that some trees be preserved and new ones planted on sites that are being developed.

PROBE: Do you strongly agree, agree, disagree, or strongly disagree?

1 STRONGLY AGREE	160	40%
2 AGREE	193	48.25%
3 DISAGREE	30	7.5%
4 STRONGLY DISAGREE	9	2.25%
7 REF/ 8 DK/ 9 NA	<u>8</u>	<u>2%</u>
	400	100%

**FOREST1** All cities have an urban forest. The urban forest in Tigard consists of the trees in parks, along streets, in yards, on empty lots and in forested areas. Do you think the overall quality of Tigard’s urban forest has increased, decreased or stayed the same in the last 10 years?

1 INCREASED	73	18.25%
2 DECREASED	166	41.5%
3 STAYED THE SAME	117	29.25%
7 REF/ 8 DK/ 9 NA	<u>44</u>	<u>11%</u>
	400	100%

**FOREST2** In the future, do you expect the overall quality of Tigard’s urban forest to increase, decrease, or stay the same?

1 INCREASED	113	28.25%
2 DECREASED	126	31.5%
3 STAYED THE SAME	138	34.5%
7 REF/ 8 DK/ 9 NA	<u>23</u>	<u>5.75%</u>
	400	100%

**FOREST3** On a scale of 1-10, where one is poor and 10 is excellent, how would you rate the extent and appearance of trees in Tigard?

1 ONE	3	0.75%
2 TWO	0	0%
3 THREE	14	3.5%
4 FOUR	11	2.75%

5 FIVE	61	15.25%
6 SIX	48	12%
7 SEVEN	96	24%
8 EIGHT (GO TO TAX1)	119	29.75%
9 NINE (GO TO TAX1)	19	4.75%
10 TEN (GO TO TAX1)	24	6%
7 REF/ 8 DK/ 9 NA	<u>5</u>	<u>1.25%</u>
	400	100%

**FOREST4** What could be done to improve the appearance and quality of trees in Tigard?

OPEN ENDED – RECORD EXACT RESPONSE

- Not cut them all. They are cutting out more than they are putting in. They should require developers to keep some of the existing trees.
- Better maintenance.
- More variety.
- They need to plant more trees when they remove them. Do not just plant commercialized trees.
- Maintain the trees. Trimming them and things like that.
- Ask the people to clean up more. During the fall, clean up sidewalk areas like they should.
- More maintenance,
- I say plant more, just preserve the ones that are there.
- Certain areas. Save certain trees.
- Taken care of the trees.
- I don't have any good ideas. Don't cut down more big trees.
- Trimmed when it comes to wires, and in areas with no trees new ones could be planted. When they are doing commercial development they should plant trees when they are done building.
- In the vast expanses of parking lots there should be shade trees for the cars. It would help with gas so people don't have to use the AC. Shade trees help a lot.
- Public awareness.
- Developers not remove existing trees as much.
- One thing I don't like is the power company coming along and trimming them to look stupid.
- Better trees that don't tear up streets and utilities.
- Don't do anything. They'll grow by themselves. No sense in paying tax payers' money on trees that can take care of themselves.
- High quality maintenance.
- Let the trees get older.
- You know you do a good job. Keep up the good work.
- Add trees along Durham Road and downtown Main Street.
- More fir trees or pine green trees.
- Plant more, I guess.
- I think more of them. And better maintenance of the area around the trees.
- Plant more trees; take care of them.
- They don't have a nice setup in Tigard, lack of parks.

## APPENDIX A

### Maintenance

More maintenance from landowners and the city.

Better protection of the exciting trees in areas.

Keeping them clean, away from street signs and pruning them.

Quit cutting them down I think.

They could be taken care of.

Trimming.

Quit cutting them down.

They can be trimmed up so they can plant more trees.

Plant more trees.

Prevent cut down of existing ones, plant more trees.

They could put the areas back that used to be there, that are gone.

Plant more.

I think if they planted the proper trees so that the roots would not appear and break up the sidewalks. I think people either put them down and don't pull out the roots.

Ones left are well maintained, pick up leaves off sidewalks and streets for bikers.

To trim them.

Plant more street trees on Greenburg Road.

Not letting people cut them down.

Grow more.

There are places where there are a lot of trees and places where there are none, trees should be everywhere, especially where there are none. It would also be good to discuss the things people don't want to see, especially industrial areas. Trees should be used to shield them from their neighbors.

Streets be lined with trees.

Leave them alone.

Basic maintenance.

I think if there is some sort of a plan. When you build new housing areas and existing areas you should have a comprehensive plan about the comprehensive trees. Whether the city is going plant the trees or it is going to be left to individuals.

In some areas I think you need to have management people that know what is going on.

Placement of trees and people with knowledge of what is going on. It would be more beneficial to have more parks. Percentage of parks in a residential area.

Protection of some of the areas, like stream land from development.

Maintenance around power lines.

More trees. Nothing else.

Trees aren't taken care of well, trees in vacant lots should become less neglected.

Fertilize.

Find a way to keep away all the leaves.

Pruning and maintained health, be maintained better.

More volunteers to maintain them.

Plant more trees! Plant more quality trees.

I think that we need to keep the landscaping up. We need to maintain our trees. If we have more trees we will have a better community.

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Put them in strategic locations like downtown. They should put a ton of trees downtown.  
 They want to improve downtown they should put in good trees. Don't put them there for no reason.  
 Just so much building going on more regulations about what trees need to remain.  
 Probably the amount.  
 There could be more of them on major highways. Highway 99 has none on that road.  
 Plant more trees.  
 More placed in better locations, not be so messy.  
 Add more trees, keep the exciting trees.  
 Better pruning with trees along the streets a lot that have grown big and unruly.  
 Better maintenance. I think that some of the street trees get in the way.  
 Probably just more attention to them. The property owners need to pay more attention to their trees probably. If we are going to have trees, they need to be maintained.  
 Not be willing to cut so many when they are developing.  
 Don't know, maintain them.  
 Get the city counsel in the city forest, they should be running the city not the trees.  
 Maintain damage is done.  
 Leave them standing, pruning assisting their health.  
 Maintain what they have and not let the new buildings do away with the trees. Plant new ones after they have built homes or buildings.  
 Plant more and not chop down forest to put up condos.  
 I wish people would take care of trees better.  
 They could have more trees where there are no trees.  
 More street trees.  
 Don't think anything should be done.  
 Trim them.  
 Highway 99 at the bridge. Just be conscientious.  
 Plant more trees, when you remove trees, plant trees where the space is available. It should be a law to plant trees.  
 Provide good maintenance.  
 Downtown area needs more trees.  
 Old trees be cut down, plant new ones.  
 Preserve during development.  
 Better overall maintenance.  
 Better maintained.  
 Pick up more leaves.  
 I don't have a problem with it, so nothing.  
 Need more trees in old town.  
 Cut them all down, too many large trees, they are blocking the view of everything. They need to at least be trimmed.  
 Developer should put trees of appropriate size for the lot.  
 A little bit better maintained by people that take care of the trees.  
 More of them along the main streets.  
 They could be preserved. Planting the right trees. And more of them.  
 Trimming and landscaping around trees.  
 Like the downtown, they made it look all cutesie.

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Plant more, let more streets be planted next to trees. Less shopping malls, have an area of trees planted, 99 west. They put ugly storage unit, they cut down beautiful trees for that.

Improve the city council decisions.

Pruning.

A little bit of pruning.

There could be improvements on highway 99 and on commercial properties. I see a lot of death that needs to be maintained a little bit better. More trees on busier streets.

Plant more of them, take care of them, and cut their branches and everything.

First of all plant more trees if there is the space.

Largely, plant new ones and stop cutting down the old ones.

Probably more aggressive street tree planting program. Out reach to property owners that have trees and preserve them.

Most of the trees are on private property. As to the ones that are on public domain, they should be maintained professionally with an eye towards long term growth.

I like where homes don't go right to the creek and there is green spaces along creeks.

Maybe more trimming on trees.

Plant more.

Expert looking at the issue.

Old ones let go. Cleaned up.

By preserving existing trees.

Better maintenance.

Leave them alone.

Remove many of them. Public works departments are not funded to protect neighborhoods as a result of leaf fall. There is not enough street sweeping services.

Downtown could plant trees.

Lining the streets and putting them in parks, but I think they're doing that right now. Where I live there are many trees in the community.

More trees, as far as the existing trees, I'm not sure what to say about their quality and appearance.

Proper maintenance of the trees and removal of the dead or improper growth.

Plant more, rip up cement and plant trees.

In certain neighborhoods there could just be more of them. And more yard debris pick-up, so that people are not afraid to have trees. Anything that would make having a tree easier would be good.

I would like to see their messes cleaned up quicker.

If they had left the old trees to live, it would have been better. They put up some new dinky trees. And they just don't look as good. It's too late.

Maybe better maintained and kept trees.

Maintain existing trees.

Plant more. City to replace trees that are deceased or need to be replaced.

Cut down dying trees, take care of trees next to main roads.

Stop cutting them down. When a large tree is cut down, requires two of three tree in their place.

Adding variety.

More of them in public areas. In downtown Tigard.



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I think they need to plant more trees along streets and in newly developed areas.

Add some along 99.

Better trimming and maintenance.

Maybe more appropriate trees in the area they're going to be planted. I guess I'm thinking about some trees are planted too close to the street, and that causes problems with leaves in the sewer and sidewalks heaving from the roots.

Maintenance

Maintenance and replanting with trees that die.

Just encourage more people to plant proper trees and take care of the ones they have. And not cut them down unnecessarily.

Pruning.

In the greenway, we have lots of English ivy that is destroying our trees. Dead trees.

Not cutting down massive amounts when they build new areas. Plant more trees along the parks.

I don't know what could be done to make them better. I noticed when new development is going in where there is a forestry area and they take out the trees and I don't like that. I don't like the ripping up of the stuff along Vano Creek.

Stop chopping down trees.

More maintenance and planting more trees.

Plant more decorative trees. Some of the ones that flower in the spring. More evergreens. The big scrub maples, big yellow leaves. Replace stuff with more colors for spring and fall. More red maples.

Planting more trees in the downtown Tigard area and taking care of trees that are at the end of their life. Taking down and replacing trees that are dying.

They're in pretty good shape.

Maintain the one we have, and plant more.

Keep them trimmed away from the important stuff.

Replace trees as they are taken out.

Medians planted with trees. Uniform tree type on various streets so that it isn't so ragged looking.

Better upkeep.

Get rid of the old ones that are dying. Just clean up.

Plant more. Help maintain the huge fir trees.

I think that the city needs to be a little more proactive in trimming them so things can be seen. So that people who are unfamiliar with the area can see the street signs. It's a huge sign. If people are elderly then they can't trim them themselves. Need to be more proactive.

I really don't know if I like a tree in front of my house, I wouldn't plant it but I think trees are important.

Stop cutting down all the trees on all developments.

Keep them trimmed up a little bit nicer and leaves in the fall are a big problem, they make a mess.

Nothing I think they are fine.

Take down the trees that drop leaves.

I'm not sure we need more trees.

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I don't really know, stop cutting down all the trees, build where they do not have to remove trees.

Just prune and thin out the trees. Increase the health of trees.

More open green spaces and more trees in commercial areas.

Plant more trees.

Better maintaining by replanting. More planting.

Plant more.

I'm thinking of the one on the corner of my lot, it has pruning problems due to the power lines. It really distorts the shape of the tree.

Stop building houses.

Cutting them back and some pruning them.

More planting.

Do not cut down anymore than they absolutely have to.

I think maybe stronger education on how to take care of trees.

More development of downtown, Tigard with lots of trees and landscaping.

Better management by the city and government.

When developing, keep more trees that are already existing. Or replanting trees that have been taken down to build a new house.

Regular maintenance.

I think there should be more, plant more.

I feel that every time they cut one down they put new ones in. They've stopped doing that.

They don't replace anything, it looks like a concrete forest.

I think more of the visual stuff and getting the community more involved, too many businesses.

I think they are okay.

I don't have an opinion on it.

Planting to include green space and park settings, Bull Mountain is an example of how not to do it.

More trees. Better upkeep.

Not cut them down.

I would think that they could be better shaped, and trimmed when needed. I fit the location where they fit size wise.

Leave the consumer alone. They have their own trees, so let them do what they want.

Some of them need to be shaped better. The ones on the road.

I don't know, just make sure they're maintained and plant new trees as ones die or become available.

They are properly cared for and planted more of them.

Better maintenance.

Better care and clean up.

Variety and maintenance.

I would presume plant more.

We're going to suggest the city does a better job of maintaining them. To improve our park, we're on Woodard park, it would improve the park if they would thin the trees that are diseased and prune them, or remove them.

Quit cutting them down for new developments.

Planting more trees.

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- Just constant vigilance.
- More and just more.
- Plant trees where there are no trees. Where I live there are lots of trees.
- Leave them alone.
- Better maintenance.
- Plant more.

**TAX1** Currently, property owners are responsible for maintaining street trees in front of their property. Would you strongly support, support, oppose, or strongly oppose a program that transfers the responsibility for maintaining street trees to the City?

1 STRONGLY SUPPORT	65	16.25%
2 SUPPORT	128	32%
3 OPPOSE	136	34%
4 STRONGLY OPPOSE	38	9.5%
7 REF/ 8 DK/ 9 NA	<u>33</u>	<u>8.25%</u>
	400	100%

**TAX2** Would you strongly support, support, oppose, or strongly oppose additional funding from increased city fees, charges, or property taxes to fund a City street tree program?

1 STRONGLY SUPPORT	25	6.25%
2 SUPPORT	151	37.75%
3 OPPOSE	132	33%
4 STRONGLY OPPOSE	63	15.75%
7 REF/ 8 DK/ 9 NA	<u>29</u>	<u>7.25%</u>
	400	100%

**TAX3** Would you strongly support, support, oppose, or strongly oppose additional funding from increased city fees, charges, or property taxes to fund a more comprehensive tree planting and maintenance program in Tigard parks and open spaces?

**PROBE:** This would include trees throughout Tigard, not just on streets.

1 STRONGLY SUPPORT	32	8%
2 SUPPORT	190	47.5%
3 OPPOSE	104	26%
4 STRONGLY OPPOSE	53	13.25%
7 REF/ 8 DK/ 9 NA	<u>21</u>	<u>5.25%</u>
	400	100%

**TAX4** Would you prefer volunteering to plant and maintain trees or paying a fee to the City to do this?

**PROBE:** Even if you are not a property owner, which would you prefer?

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1 PLANT	208	52%
2 PAY	106	26.5%
3 IF VOL – NEITHER	61	15.25%
7 REF/ 8 DK/ 9 NA	<u>25</u>	<u>6.25%</u>
	400	100%

**CHOICE1** Which of the following would be your first choice of where the city should plant more trees?

(PROBE FROM LIST)

1 ALONG STREETS	99	24.75%
2 IN PEOPLE'S YARDS	10	2.5%
3 IN COMMERCIAL/INDUSTRIAL AREAS	51	12.75%
4 IN PARKS	79	19.75%
5 NEAR STREAMS/NATURAL FORESTED AREAS	129	32.25%
7 REF/ 8 DK/ 9 NA	<u>32</u>	<u>8%</u>
	400	100%

**CHOICE2** Which of the following statements most closely represents your opinion about trees.

1 PRESERVE AS MANY TREES AS POSSIBLE	128	32%
2 WHEN TREES ARE REMOVED, REPLACE THEM	129	32.25%
3 PRESERVE LARGE OR UNIQUE TREES	60	15%
4 ALLOW INDIVIDUALS REMOVE TREES IF WISH	71	17.75%
5 IF VOL – NONE OF THESE STATEMENTS	1	0.25%
7 REF/ 8 DK/ 9 NA	<u>11</u>	<u>2.75%</u>
	400	100%

**HAZARD** Currently, if there is a dispute between neighboring property owners regarding a potentially hazardous tree, the City does not get involved, and instead directs the neighbors to work out a solution through civil means. Would you strongly support, support, oppose, or strongly oppose the creation of a program where the City would become involved in disputes between neighbors regarding hazardous trees?

1 STRONGLY SUPPORT	54	13.5%
2 SUPPORT	185	46.25%
3 OPPOSE	101	25.25%
4 STRONGLY OPPOSE	49	12.25%
7 REF/ 8 DK/ 9 NA	<u>11</u>	<u>2.75%</u>
	400	100%

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**REG1** Would you strongly support, support, oppose, or strongly oppose tree removal regulations during property development, even when they limit the size and extent of potential buildings or profits?

1 STRONGLY SUPPORT	59	14.75%
2 SUPPORT	168	42%
3 OPPOSE	99	24.75%
4 STRONGLY OPPOSE	32	8%
7 REF/ 8 DK/ 9 NA	<u>42</u>	<u>10.5%</u>
	400	100%

**REG2** If you had the opportunity to develop your property, would you be in favor of city tree regulations that required preservation of existing large trees and landscaping or tree planting afterwards?

1 YES	264	66%
2 NO	97	24.25%
3 IF VOL – IT DEPENDS	14	3.5%
7 REF/ 8 DK/ 9 NA	<u>25</u>	<u>6.25%</u>
	400	100%

**REG3** Should the City allow the decision to preserve trees to be left to the developer?

1 YES	80	20%
2 NO	293	73.25%
3 IF VOL – IT DEPENDS	17	4.25%
7 REF/ 8 DK/ 9 NA	<u>10</u>	<u>2.5%</u>
	400	100%

**REG4** If the City were to enact new tree protection measures, would you like to see them focused on natural areas, ornamental landscape trees, both types equally, or on something else.

1 NATURAL AREAS	149	37.25%
2 ORNAMENTAL TREES	11	2.75%
3 BOTH	192	48%
4 SOMETHING ELSE	25	6.25%
7 REF/ 8 DK/ 9 NA	<u>23</u>	<u>5.75%</u>
	400	100%

**REG5** Would you strongly support, support, oppose, or strongly oppose city regulations that would provide some level of protection for large, healthy trees on developed private property?

**PROBE:** This would apply to all current private property.

1 STRONGLY SUPPORT	78	19.5%
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2 SUPPORT	224	56%
3 OPPOSE	60	15%
4 STRONGLY OPPOSE	20	5%
7 REF/ 8 DK/ 9 NA	<u>18</u>	<u>4.5%</u>
	400	100%

**REG6** If the city were to enact new tree protection measures, where would you prefer to see them focused: on larger groves of native trees or individual trees of significant size.

1 LARGE GROVES	221	55.25%
2 INDIVIDUAL TREES	113	28.25%
3 IF VOL – BOTH	31	7.75%
4 IF VOL – NEITHER	18	4.5%
7 REF/ 8 DK/ 9 NA	<u>17</u>	<u>4.25%</u>
	400	100%

**AGE** In what year were you born?

Coded Categories:

AGE 18-24	3	0.75%
AGE 25-34	23	5.75%
AGE 35-44	59	14.75%
AGE 45-54	106	26.5%
AGE 55-64	91	22.75%
AGE 65 AND OLDER	118	29.5%
7 REF/ 8 DK/ 9 NA	<u>0</u>	<u>0%</u>
	400	100%

**GENDER** Are you male or female?

1 MALE	160	40%
2 FEMALE	240	60%
7 REF/ 8 DK/ 9 NA	<u>0</u>	<u>0%</u>
	400	100%

**RENT** Do you own your home, or do you rent?

1 OWN	344	86%
2 RENT	49	12.25%
7 REF/ 8 DK/ 9 NA	<u>7</u>	<u>1.75%</u>
	400	100%

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**STREET** What neighborhood do you live in?

**PROBE:** What is your closest elementary school?

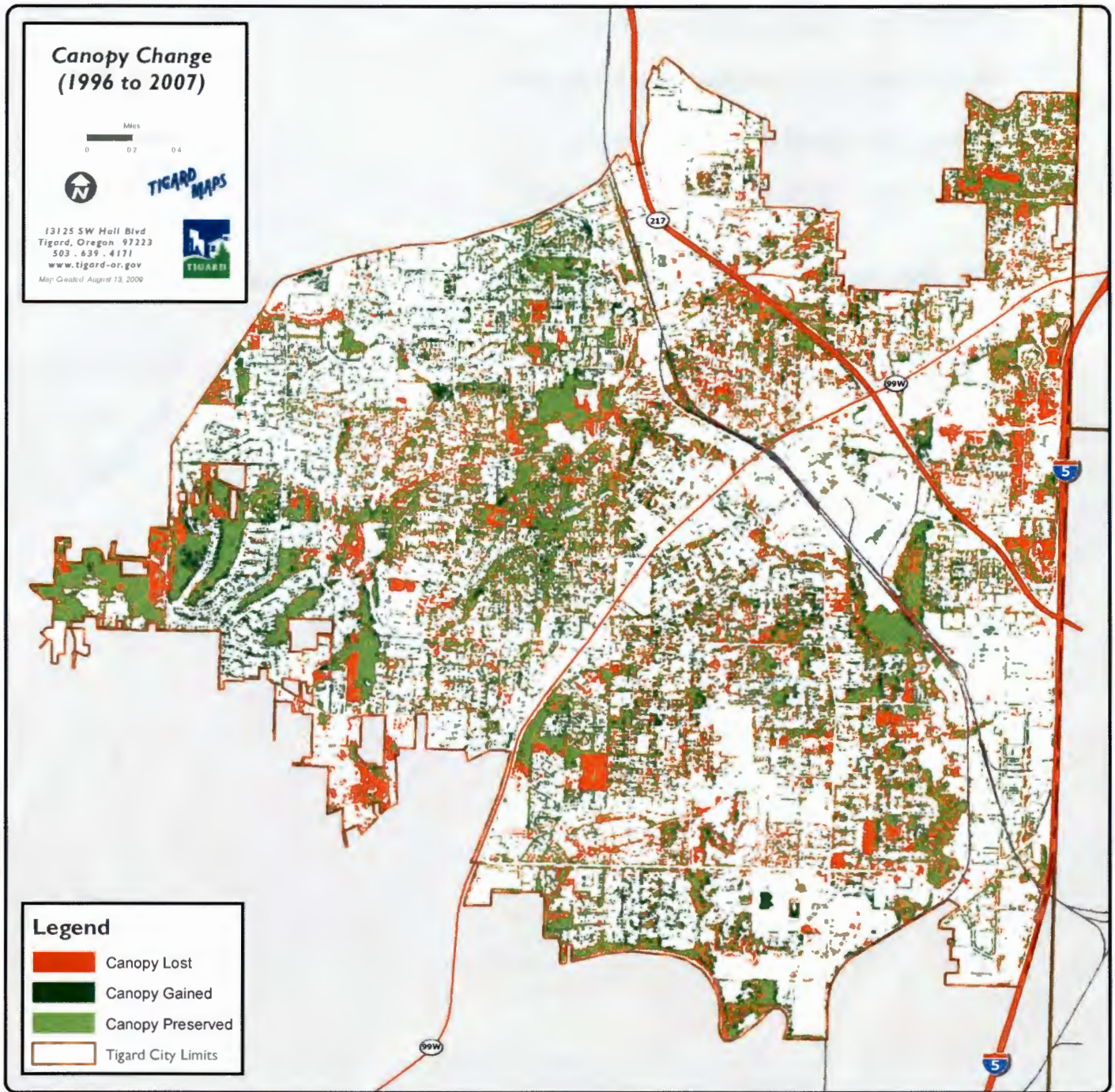
**PROBE:** What is your closest cross street?

**OPEN ENDED – RECORD EXACT RESPONSE**

**END** That's the end of the survey! On behalf of the City of Tigard, we would like to thank you for your time and participation. Have a great day. Good bye.

**NOQAL** I'm sorry, we can only interview residents of who are 18 years of age or older). I'm sorry to have bothered you. Have a nice (day/evening).

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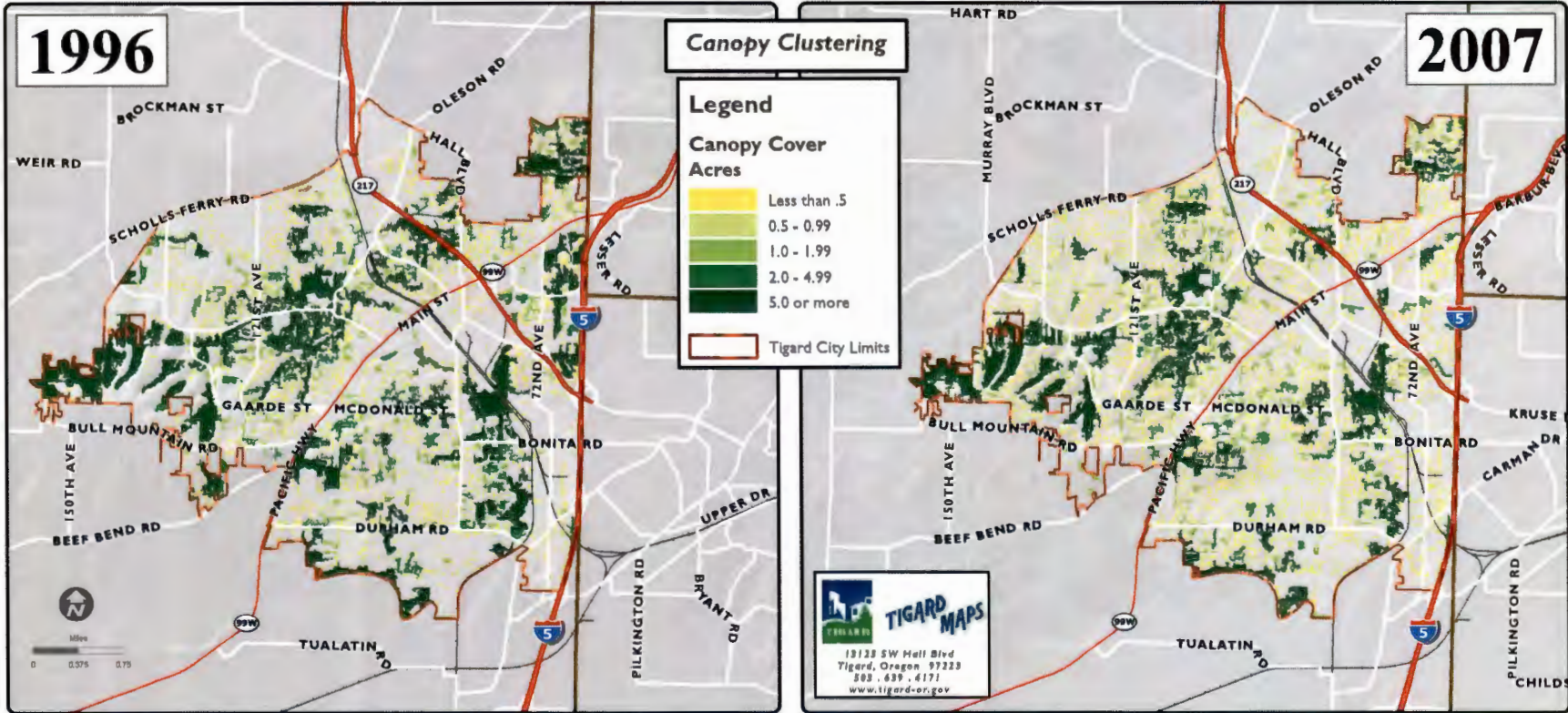


Citywide Canopy Change Summary

	1996		2007	
	Acres	Percent *	Acres	Percent *
Tigard's Total Canopy Cover	1952.75	25.84%	1852.69	24.52%

\* of June 2008 city limits

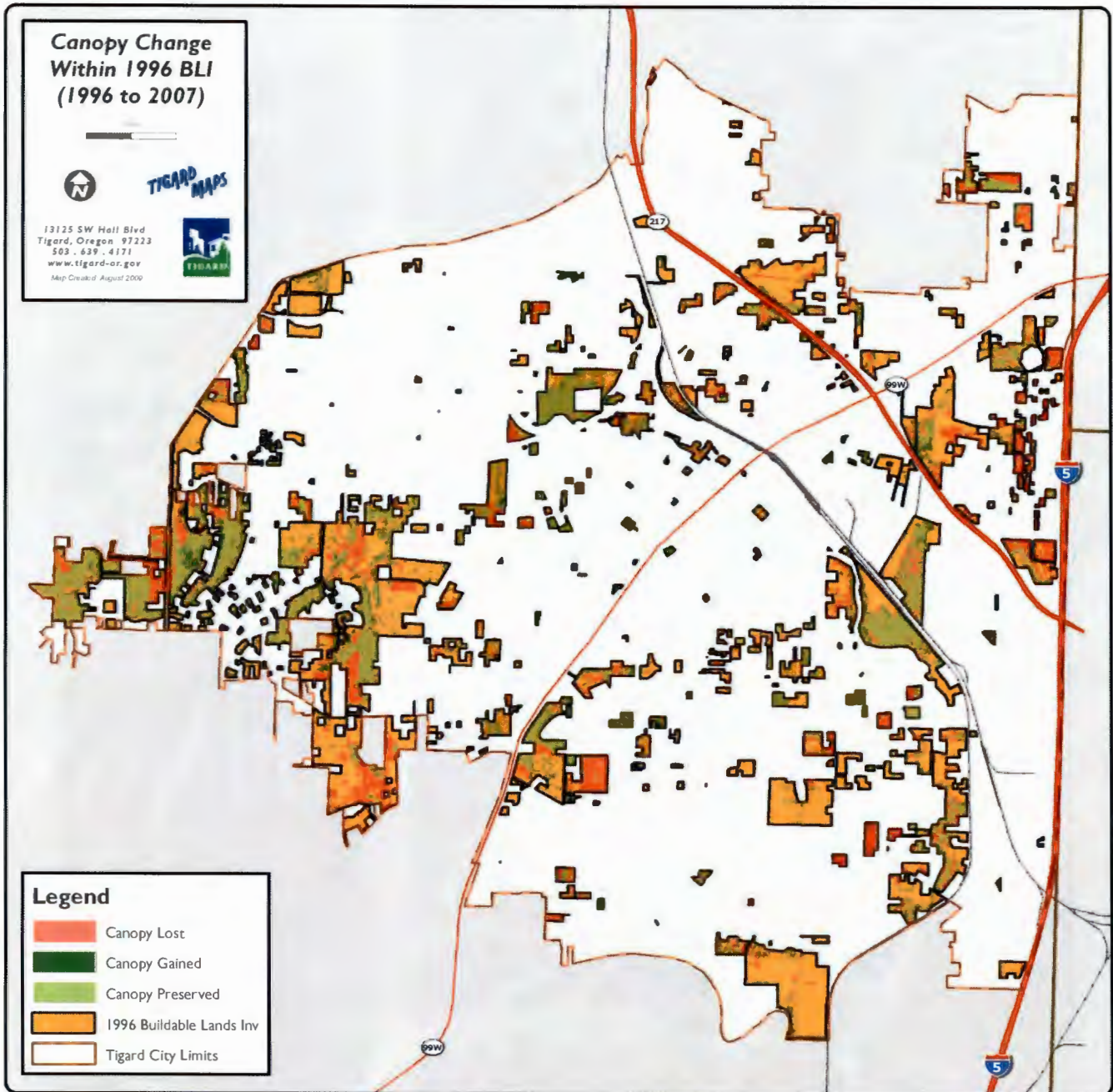




Map Created: August 13, 2009

Canopy Cluster Size Class	1996				2007			
	Total Acres of Canopy Cover	Acres as a Percent of Total Canopy Cover	No. of Clusters	No. of Clusters as a Percent of Total	Total Acres of Canopy Cover	Acres as a Percent of Total Canopy Cover	No. of Clusters	No. of Clusters as a Percent of Total
Less than 0.5 acres	366.55	18.77%	4356	90.94%	584.3	31.54%	7231	93.86%
0.5 to .99 acres	135.76	6.95%	197	4.11%	167.25	9.03%	242	3.14%
1.0 to 1.99 acres	159.25	8.16%	113	2.36%	177.88	9.60%	131	1.70%
2.0 to 4.99 acres	190.86	9.77%	61	1.27%	157	8.47%	52	0.67%
5.0 or more acres	1100.33	56.35%	63	1.32%	766.26	41.36%	48	0.62%
<b>Total</b>	<b>1952.75</b>	<b>100%</b>	<b>4790</b>	<b>100%</b>	<b>1852.69</b>	<b>100%</b>	<b>7704</b>	<b>100%</b>

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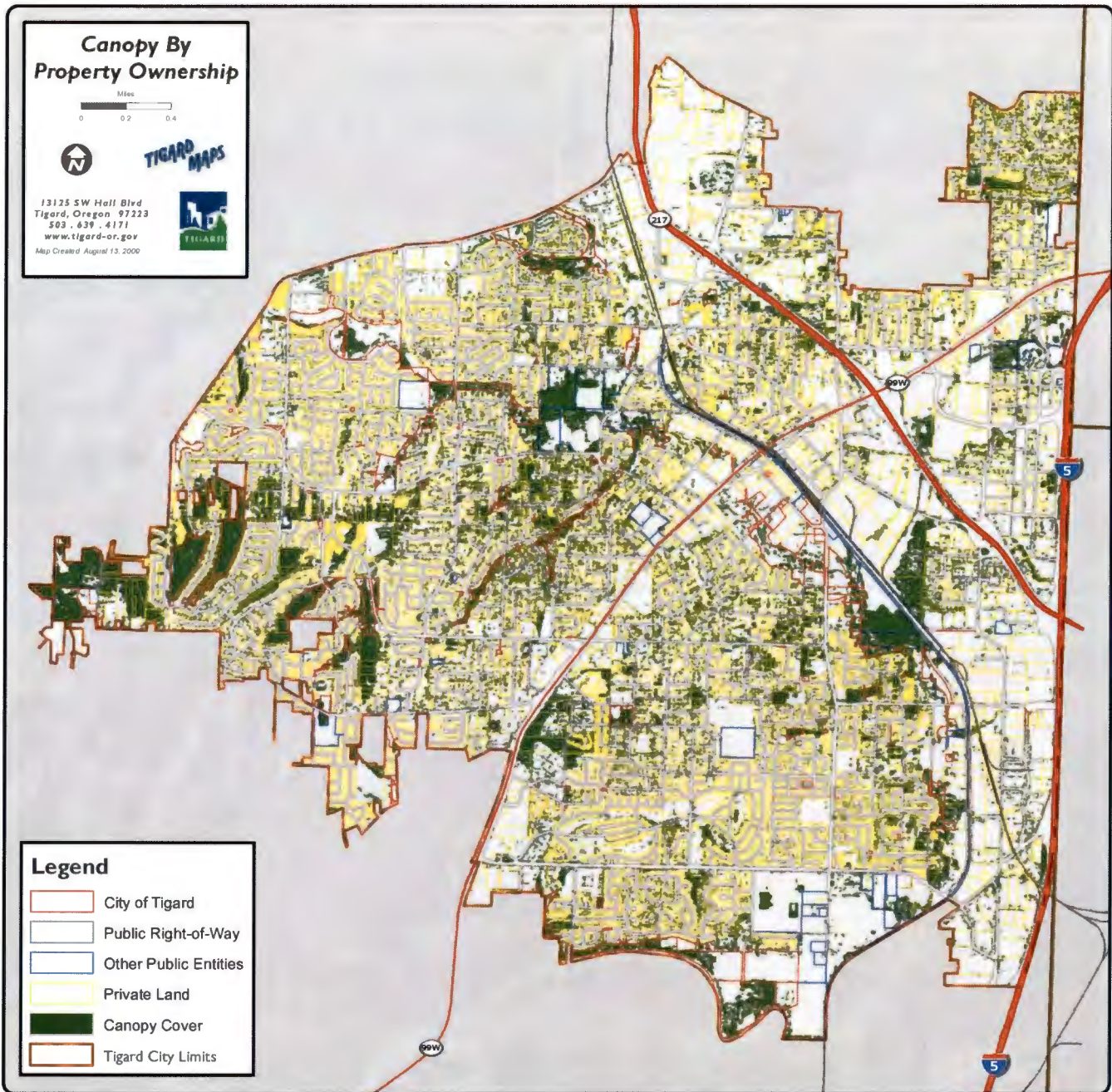


Citywide Canopy Change Within 1996 BLI Area Summary

	1996		2007		Percent Change
	Acre	Percent	Acre	Percent	
Tigard's Canopy Cover within 1996 BLI (1423.32 acres)	646.52	45.42%	495.24	34.79%	-10.63%

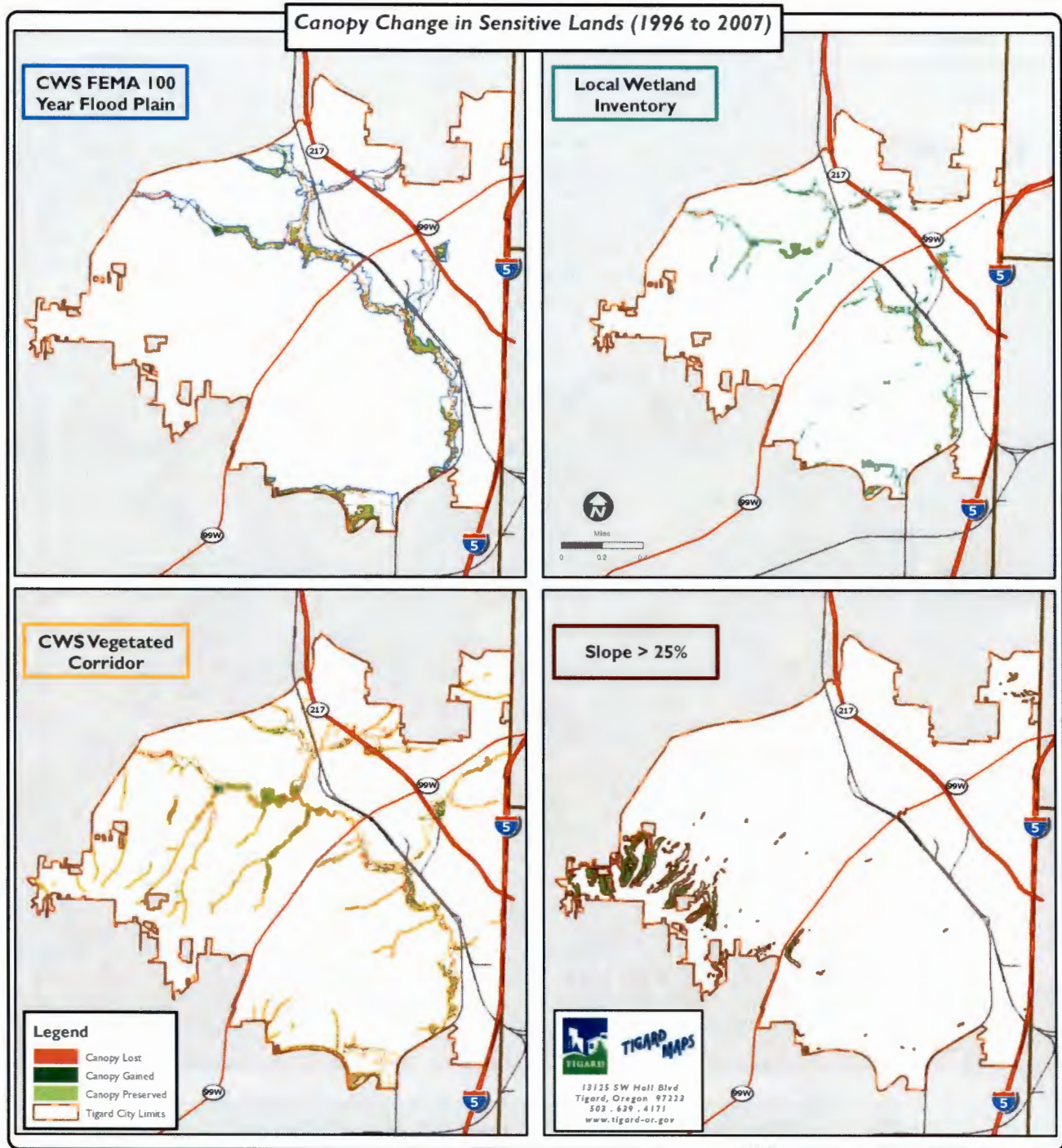
Citywide Canopy Cover Within BLI Summary

	1996			2007		
	BLI Acres	Acres of Canopy Cover	Percent	BLI Acres	Acres of Canopy Cover	Percent
Tigard's Canopy Cover within BLI	1423.32	646.52	45.42%	528.75	226.26	42.79%



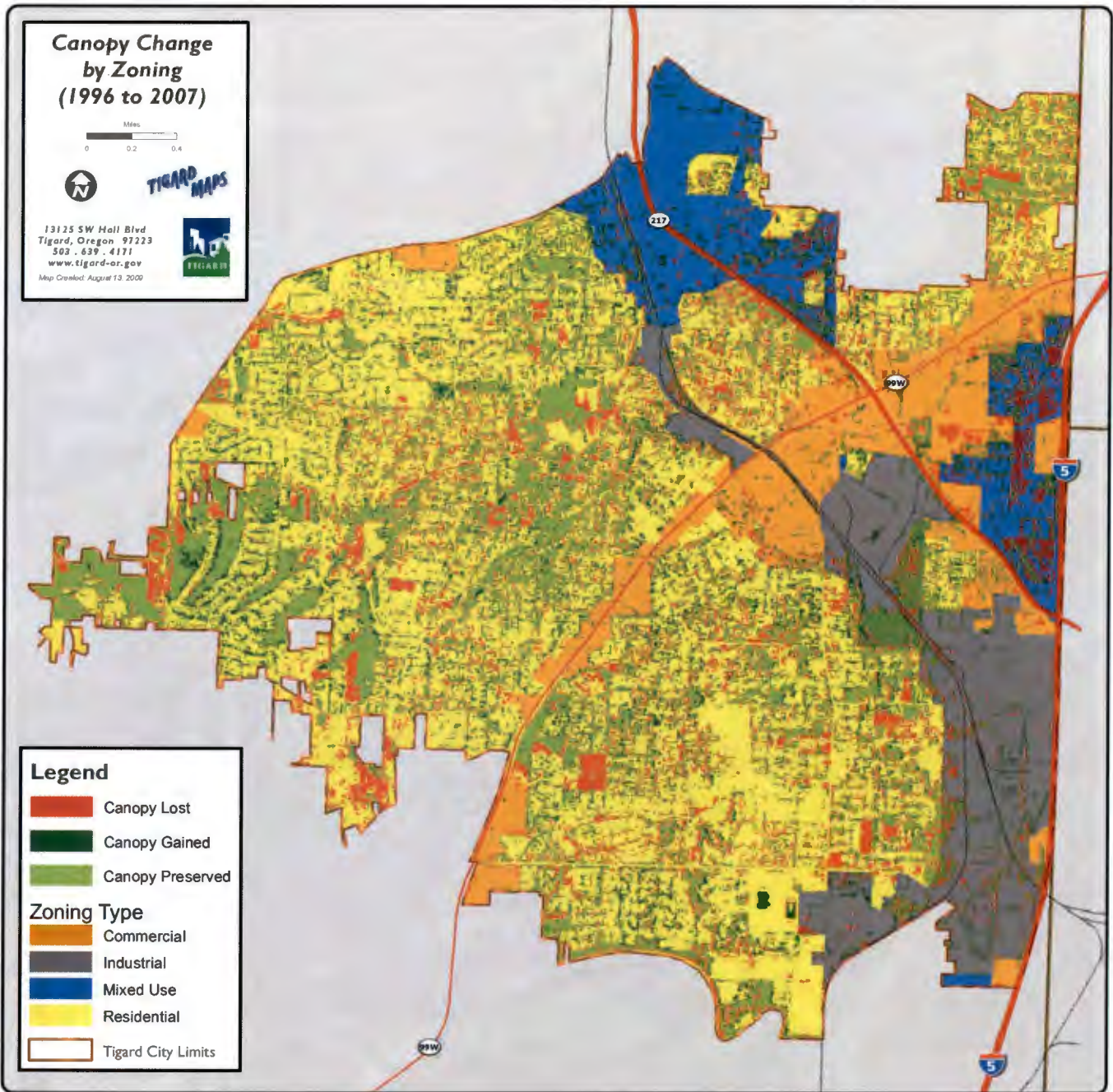
Canopy/ Property Ownership Summary				
Taxlot Ownership	May 13, 2008 Taxlots		2007 Canopy Cover	
	Number of Taxlots	Total Acres	Acres of Canopy Cover in 2007	Percent Canopy Cover in 2007
City of Tigard	235	388.41	179.18	46.13%
Public Right-of-Way	n/ a	1,288.30	117.45	9.12%
Other Public Entity	79	431.65	105.1	24.35%
Private	15,880	5,447.64	1,450.96	26.63%
<b>Total</b>	<b>16,194</b>	<b>7,556.00</b>	<b>1,852.69</b>	<b>24.52%</b>

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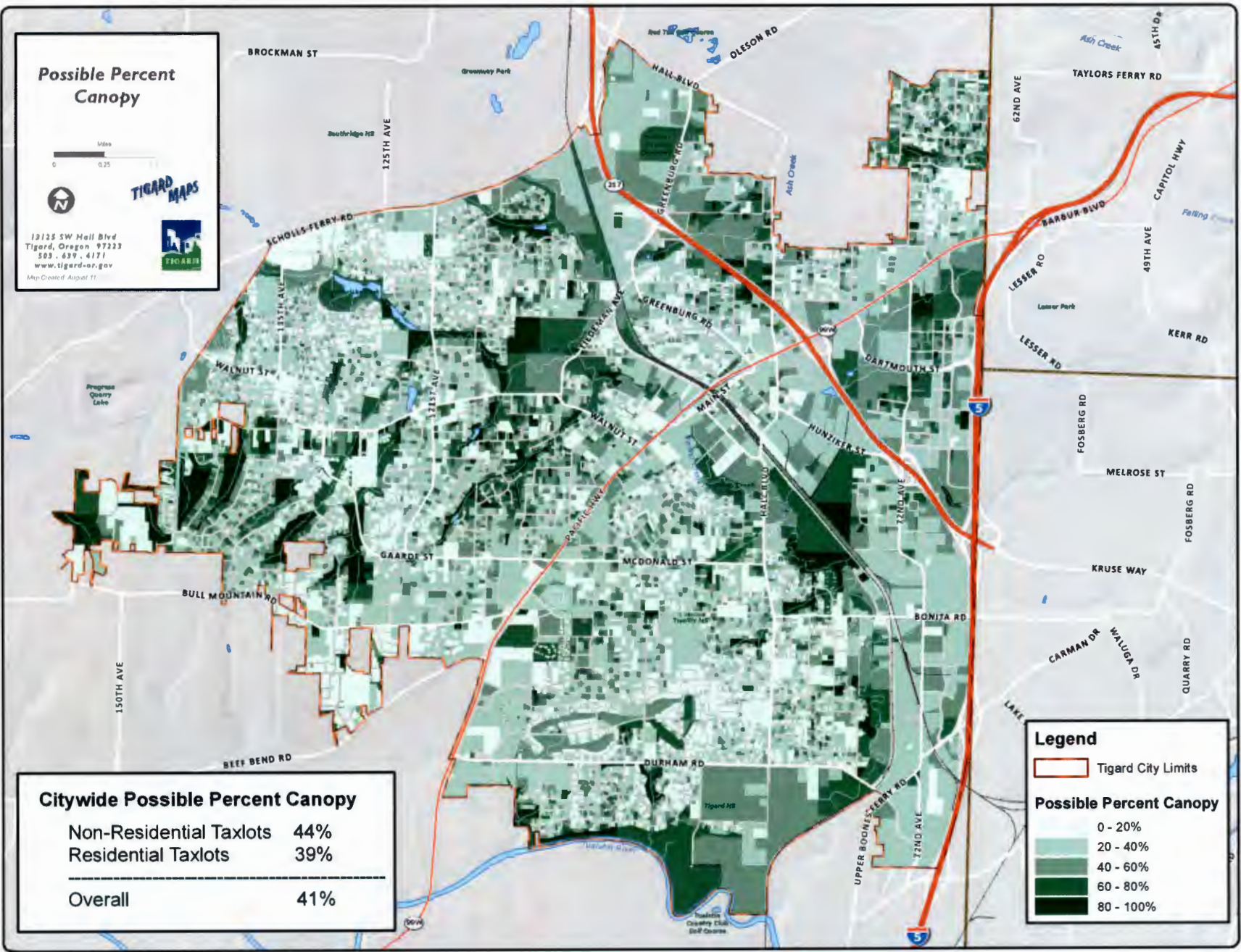
Citywide Canopy Change Within Sensitive Lands Summary

	Sensitive Land Acres	1996			2007			Percent Change
		Canopy Acres	Percent Canopy	Percent of 1996 Canopy Cover	Canopy Acres	Percent Canopy	Percent of 1996 Canopy Cover	
Local Wetland Inventory	290.91	145.98	50.18%	7.48%	116.01	39.88%	6.26%	-10.30%
CWS Vegetated Corridor	704.78	348.16	49.40%	17.83%	302.85	42.97%	16.35%	-6.43%
FEMA 100-yr Floodplain	592.6	213.17	35.97%	10.92%	188.05	31.73%	10.15%	-4.24%
Slopes > 25%	195.51	130.28	66.64%	6.67%	129.64	66.31%	7.00%	-0.33%
<b>Total</b>	<b>1783.8</b>	<b>837.59</b>	<b>46.96%</b>	<b>42.89%</b>	<b>736.55</b>	<b>41.29%</b>	<b>39.76%</b>	<b>-5.66%</b>



Citywide Canopy Change By Zoning Summary

2008 Zoning	Total Acres	1996		2007		Percent Change
		Acres	Percent	Acres	Percent	
Commercial	800	88.13	11.02%	80.52	10.07%	-0.95%
Industrial	863	139.81	16.20%	137.58	15.94%	-0.26%
Mixed Use	701	150.3	21.44%	99.79	14.24%	-7.21%
Residential	5192	1574.42	30.32%	1534.72	29.56%	-0.76%
<b>Total</b>	<b>7556</b>	<b>1952.66</b>	<b>25.84%</b>	<b>1852.61</b>	<b>24.52%</b>	<b>-1.32%</b>



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Parking Lot Sample Acreage:	508.77 acres
Parking Lot Sample Acres covered by canopy:	30.72 acres
Percent Parking Lot Sample Canopy Coverage:	6%

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Home Builder's Association of Metropolitan Portland Stakeholder Interview Notes

1. What is your level of interaction with Tigard's urban forestry program?
  - The 1000+ members of the Home Builder's Association of Metropolitan Portland (HBAMP) rely on the homebuilding industry for their livelihood. It is in the interest of the membership to develop land and create building sites for new homes. Land development requires tree removal on sites that have trees and are zoned for development.
  - Applications for land development are currently required to include tree preservation/removal plans prior to development in order to meet Tigard Development Code requirements.
  - Under the current code section 18.790, applicants may pay a fee in lieu of mitigation or are required to mitigate tree removal by planting replacement trees within the City.
  - HBAMP members have attended Tree Board, Planning Commission, and City Council meetings to provide input on tree related matters such as the Urban Forest section of the Comprehensive Plan.
  - The HBAMP has a representative on the Urban Forestry Master Plan Citizen Advisory Committee.
  
2. What features of Tigard's urban forestry program work well?
  - Tree planting when the right tree is planted in the right place.
  - The City's overall goal of preserving trees.
  - Requiring developers to utilize the expertise of independent, certified arborists when evaluating the conditions of trees and their viability of survival with site development.
  
3. What features of Tigard's urban forestry program do not work well, and why?
  - The HBAMP's position is that the City's mitigation requirements are unreasonable and punitive.
  - The mitigation structure in section 18.790.030.B.2(a-d) is unreasonable because it is not practicable to retain even 25% of the trees on sites zoned for medium to high density residential development (5 units per acre or more). There has likely never been a development in Tigard with 75% or greater retention on property zoned R4.5 or higher. Heavy equipment, grading, roads, and utilities are very disruptive to trees. Significant amounts of grading must take place outside the right of way when driveways are cut in, sidewalks are poured, and building footprints are cleared for structures. This results in tree retention being limited to the perimeter of developed sites.
  - The City's current program incentivizes the preservation of trees that will cause potential future hazards. For example, trees over 12" in diameter have root systems and canopies that extend at least 10' from the trunk. Larger trees have larger areas around them that need to remain undisturbed. This is not practicable in high density situations.



Even if a younger but potentially large tree species such as Doug.-fir is able to be retained, it often makes sense to remove it to avoid potential hazards in the future.

- The fee structure associated with fee in lieu of planting for mitigation far exceeds the actual cost to plant trees. For example, a recent mitigation project to plant trees in Cook Park for the Fletcher Woods development cost the developer \$20,000 to complete. However, the City required the developer to submit a bond for \$106,000 or \$110 per caliper inch as assurance and to cover the City's cost of planting should the developer fail to mitigate.
- The incentives in section 18.790.040 should be updated. For example, the density bonus incentive allows for a 1% density bonus for 2% canopy cover retained. This bonus does not yield any practical benefit unless the site is very large. For a site that is 10 lots, it would take 20% retention for a 10% density bonus to add just one unit. Moreover, by adding another unit and decreasing the amount of land available for infrastructure and buildings, the result is lots that are significantly smaller than zoning allows. This creates a direct conflict with lot size requirements in section 18.510.
- Finally, it is the consensus of the HBAMP that tree regulation and tree plan requirements require additional resources adding cost and time to any development project. In addition, Tigard's current program is divisive and creates legal conflicts in the form of appeals to the Land Use Board of Appeals for tree related issues.

#### 4. What could be done in the future to improve the programs that do not work well?

- The City should not regulate trees on private property. Private property owners should be allowed to cut trees as they have done since the establishment of Tigard. This "hands off" approach has successfully been done for decades with virtually no loss (and perhaps even some gain) in tree canopy. Trees are not community property and belong to the owners of the land.
- Eliminate the punitive standards that cost developers large sums of money for unavoidable tree removal. There is currently over \$1,000,000 in the tree mitigation fund. It is expected to grow to over \$2,000,000 within the next year. This fund can only be used to plant trees. Last year's City budget for tree planting was \$50,000. There is little available land within the City where future trees can be planted.
- If the City does continue to regulate trees in the future, developers should only be required to mitigate only for unnecessary tree removal.
- The City should not incentivize the preservation of potentially hazardous trees.
- The mitigation fee in lieu should be revised to reflect the actual cost of planting trees.
- Revise incentives to create higher motivation for developers to utilize the incentives.
- The City forestry program should be balanced with the right to subdivide and develop private property. The cost of an urban forestry program should not outweigh the benefits.

#### 5. How can we work together in the future to improve Tigard's urban forest?

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- HBAMP and its members continue to participate in the public process so that their views are understood by the City's decision makers.
  - It is the view of those HBAMP members who have participated in the process that the HBAMP's views are dismissed while the views of the Tree Board and one extremely active Tigard citizen are taken very seriously. It is always simple to achieve "consensus" when everyone in the room shares the same view. The key to real and balanced stakeholder participation is to find the people who have concerns about the forestry program and openly discuss the views of the stakeholders' concerns and have dialogue. The HBAMP has received virtually no feedback from City staff, the Tree Board or the Citizen Advisory Committee about the information and testimony HBAMP's representatives have provided at meetings, public hearings and worksessions. This needs to be addressed.
  - By requiring costly tree mitigation and/or fees for tree removal, it is the view of the HBA members who have been involved in this process that the Tree Board and City Staff are putting the interest of trees ahead of the interest of property owners. This is unacceptable.
  - City staff has not made a concentrated effort to contact those property owners who have the most potential impact under the current and future tree code. These owners should be contacted and advised of the financial impact the current tree code could have on their property values. These are the single most impacted stakeholder group, yet they have never been invited to any meetings. This needs to be addressed.
6. What should be included/excluded from Tigard's urban forestry programs?
- There should be no urban forestry program because the benefits of such a program do not outweigh the costs.
  - Do not regulate trees on private property, and allow owners to manage their land as they see fit.
  - However, if the City does continue to regulate trees in the future the following should be included/excluded from the program:
    - Eliminate punitive mitigation standards and only require developers to mitigate for unnecessary tree removal.
    - Revise fee in lieu of mitigation to reflect the actual cost of tree replacement.
    - Do not incentivize the preservation of large and potentially hazardous trees.
    - Revise incentives for tree preservation so that developers are able to utilize the incentives.
    - Make a concerted effort to include the HBAMP and affected property owners in the process.

Clean Water Services Stakeholder Interview Notes

1. What is your level of interaction with Tigard's urban forestry program?

- Watershed Management Department manages revegetation projects in Tigard’s stream corridors.
- Partnered with urban forester (currently unfilled) on many acres of tree planting in Tigard’s stream corridors including Englewood Park, Fanno Creek Park, and Cook Park. These projects were funded by Surface Water Management (SWM) fees which come from sewer system ratepayers.
- Development Services issues Service Provider Letters (SPL) for development projects with potential impacts on stream corridors.
- CWS inspectors monitor Vegetated Corridor work of private developers to ensure compliance with CWS standards.
- Some stream restoration projects require City of Tigard tree removal permits and tree protection plans.

2. What features of Tigard’s urban forestry program work well?

- Tigard Public Works is effective at using volunteers for planting projects.
- In theory, the tree mitigation fund works well (if the money is actually used for tree planting).
- Tigard has worked well with Clean Water Services on tree planting projects and meeting “Tree for All” planting goals.

3. What features of Tigard’s urban forestry program do not work well, and why?

- Tree survey requirements can be counterproductive for restoration projects in stream corridors. The money for tree surveys and protection plans in areas dominated by non-native or invasive trees would be better spent on tree planting.
- Invasive and non-native trees in Sensitive Areas and Vegetated Corridors should not be protected and/or require a tree removal permit. Protecting invasives and non-natives is a barrier to restoration.
- Vegetated Corridor and other natural area plantings require long term maintenance beyond the two-year maintenance period typically required of developers.

4. What could be done in the future to improve the programs that do not work well?

- The City should be more diligent about taking a proactive approach to inspecting Vegetated Corridors during the maintenance period if their Urban Forestry Program includes CWS Vegetated Corridor requirements.
- Restoration projects in degraded Sensitive Areas and Vegetated Corridors should be exempt from tree survey and protection requirements.
- Tigard needs to adopt an inclusive invasive species list and exempt the removal of invasive trees from Sensitive Areas and Vegetated Corridors from permit requirements.
- There needs to be more focus on long term maintenance of private and public riparian plantings. This could be addressed through a combination of Code requirements, SWM

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funds, and tree mitigation funds. The City should secure a stable source of funding for vegetation maintenance.

5. How can we work together in the future to improve Tigard's urban forest?
  - Continue stewardship of "Tree for All" sites even after the program ends.
  - Coordinate public outreach about invasive plants and the responsibilities of streamside property owners.
  - Ensure City of Tigard and Clean Water Services regulatory requirements are coordinated in future. Allow Clean Water Services to review/comment on Code changes that affect stream corridors prior to adoption.
  - Continue partnering to co-implement Stormwater Management Permits.
  - Coordinate on implementing an integrated pest management plan.
  
6. What should be included/excluded from Tigard's urban forestry programs?
  - Exempt stream restoration projects in degraded Sensitive Areas and Vegetated Corridors from tree survey and protection requirements.
  - Exempt invasive and non-native tree removal in stream corridors from permit requirements.
  - Adopt an inclusive invasive species list and exempt invasive tree removal from permit requirements.
  - Focus on long term maintenance of riparian plantings through Code revisions, SWM funds, and tree mitigation funds.
  - Secure a stable funding source for long term riparian vegetation management.
  - Monitor expenditure of SWM funds to ensure that adequate funding is provided for riparian vegetation management.
  - Fill the urban forester position so that riparian revegetation projects continue/expand in the future.
  - Coordinate City planting standards in stream corridors with Clean Water Services standards.
  - Implement an Integrated Pest Management (IPM) Plan in cooperation with Clean Water Services.

#### Oregon Department of Transportation Stakeholder Interview Notes

1. What is your level of interaction with Tigard's urban forestry program?
  - During development, the Oregon Department of Transportation (ODOT) reviews street tree planting plans in ODOT right of ways for compliance with ODOT specifications.
  - ODOT reviews and grants permits for City tree planting projects in ODOT right of ways (99W, Hall Boulevard, Highway 217).

2. What features of Tigard's urban forestry program work well?
  - No comment.
3. What features of Tigard's urban forestry program do not work well, and why?
  - Street tree planting under powerlines causes conflicts because traffic lanes are closed for ongoing maintenance issues.
  - Some trees cause damage to infrastructure (sidewalks, curbs, streets).
  - Trees planted on top of underground utilities cause future conflicts due to root interference.
  - Some City tree planting and placement requirements are not coordinated with ODOT requirements (root barriers, site distance, clear distance, limb clearance)
4. What could be done in the future to improve the programs that do not work well?
  - Require overhead utilities to be shown on site plans to avoid inappropriate tree planting that will create future conflicts. Route plans to Portland General Electric for review.
  - Select street trees that will not conflict with hard features. Require root barriers and other design feature that will help to minimize conflicts.
  - Require development projects to locate utilities on planting plans prior to ODOT and City review. This help to ensure that trees are not planted on top of existing utilities.
  - Clarify jurisdictional requirements and coordinate during future Code updates.
5. How can we work together in the future to improve Tigard's urban forest?
  - Clarify jurisdictional requirements and coordinate during future Code updates.
6. What should be included/excluded from Tigard's urban forestry programs?
  - Prohibit the planting of trees that will conflict with powerlines. Route plans to Portland General Electric for review.
  - Require root barriers and other design feature that will help to minimize conflicts with hard features.
  - Require development projects to locate utilities on planting plans prior to ODOT and City review.
  - Clarify jurisdictional requirements in ODOT right of ways:
    - ODOT site distance requirements supersede Tigard requirements.
    - ODOT clear distance requirements supersede Tigard requirements.
    - ODOT branch clearance requirements supersede Tigard requirements.
    - ODOT has final signoff authority on any trees planted or removed in ODOT right of way (ODOT permit required).

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### The Parks and Recreation Advisory Board Stakeholder Interview Notes

The Parks and Recreation Advisory Board declined to comment at their February 23, 2009 meeting.

### Portland General Electric (PGE) Stakeholder Interview Notes

1. What is your level of interaction with Tigard’s urban forestry program?
  - PGE continually trims trees away from overhead conductors in Tigard to provide for the safe, reliable and continual source of electricity to meet the needs of commercial and residential customers.
  - PGE considers the City of Tigard an integral participant in this process in terms of establishing approved street tree lists, encouraging appropriate and responsible plantings, approving of ideal specimens for their heritage tree program and having the long term vision to develop and maintain an urban forestry program.
  
2. What features of Tigard’s urban forestry program work well?
  - As a whole, Tigard’s urban forestry program works extremely well. There is very qualified and attentive stewardship of trees in the City of Tigard.
  
3. What features of Tigard’s urban forestry program do not work well, and why?
  - Some inappropriate street tree plantings in the City of Tigard.
  - Several potentially hazardous tree/utility conflicts in the City of Tigard.
  
4. What could be done in the future to improve the programs that do not work well?
  - Remove and replace inappropriate street trees.
  - Aid in the hazardous tree removal by providing the labor and equipment necessary.
  
5. How can we work together in the future to improve Tigard’s urban forest?
  - PGE can contribute appropriate trees to new planting sites.
  - Aid in hazardous tree removal where the threat of an overhead conductor is a factor.
  - Attend monthly City coordination meetings.
  - Share in the exchange of information and of past experiences of what works well and what doesn’t work quite well in other municipalities.
  - Assist in any educational capacity such as right tree/right place programs.
  
6. What should be included/excluded from Tigard’s urban forestry programs?

- Future programs need to recognize the conflict between a static overhead distribution system of electricity and the dynamic nature of vegetation management around PGE facilities.
- Invite PGE to monthly City coordination meetings.
- Route tree plans to PGE for review.

### Pacific Northwest Chapter of the International Society of Arboriculture Stakeholder Interview Notes

1. What is your level of interaction with Tigard's urban forestry program?
  - High level of involvement with tree ordinance through development projects.
  - Assist private property owners with tree management outside the development process.
2. What features of Tigard's urban forestry program work well?
  - Tree code helps to incentivize preservation because increasing tree removal requires increasing mitigation and associated costs.
  - Bi-weekly arborist report condition of approval helps to ensure better project oversight and tree plan implementation.
3. What features of Tigard's urban forestry program do not work well, and why?
  - Tree code penalizes property owners with heavily treed lots more than those with un-treed lots. Mitigation is tied solely to tree removal. This may have the effect of precluding development in heavily treed areas such as the Tigard Triangle that are zoned for dense development.
  - Mitigation standards encourage overplanting of trees or planting of small stature trees to meet mitigation requirements. Requiring tree replacement on a caliper inch basis may not be appropriate for every tree and contributes to overplanting.
  - No sustainable funding for urban forestry programs. There needs to be a stable funding source for Tigard's urban forestry program that can be utilized for tree maintenance, not just tree planting.
  - Bi-weekly arborist reports can be hard for the City to track, especially during the transition from site development to building phase.
  - Project arborists are hired to protect their clients. This can result in arborist reports with false or misleading information.
4. What could be done in the future to improve the programs that do not work well?
  - Determine tree stocking levels based on plantable areas as is done in the City of Vancouver, WA. This could be accomplished by matching available soil volumes for lots of various sizes with trees.

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- Allow required trees such as parking lot and street trees to count for mitigation. This will help alleviate overplanting of mitigation trees.
  - Provide incentives for planting of natives and large stature mitigation trees. One incentive could be to offer more mitigation credit for planting natives and large stature trees. This will help alleviate overplanting and encourage the planting of trees that offer the most environmental benefits.
  - Develop spacing standards based on the mature size of trees to improve long term growth and health.
  - Urban forestry funding can be more sustainable if it tied to stable sources such as stormwater fees, permit fees, transportation fees, etc. This will also allow for the urban forestry funds to be used for long term tree maintenance.
  - Bi-weekly arborist reports should be required in future code updates. The City should require a copy of the contract for bi-weekly reports and require the project arborist to send a notice to the City if the contract is terminated. If a different arborist is to provide bi-weekly reports, then the original project arborist should have to sign off prior to the new arborist amending the tree preservation plan.
  - The City should require more personal accountability for project arborists to discourage false or misleading information. Measures could include revoking business licenses and/or fines so that project arborists have more personal accountability when providing false or misleading information.
  - An alternative method to limit false or misleading reports would be for the City to hire a third party the arborist to do the tree preservation report and bi-weekly inspections.
5. How can we work together in the future to improve Tigard's urban forest?
- ISA can provide input and review on future tree code revisions.
  - ISA can be a resource for code provisions that have been successful in other jurisdictions and may be appropriate for Tigard.
6. What should be included/excluded from Tigard's urban forestry programs?
- Require mitigation based on stocking levels, not on a caliper inch basis.
  - Develop clear and specific mitigation requirements that favor native and large stature trees, and require spacing per industry standards. Allow required landscape trees and street trees to count towards mitigation requirements.
  - Do not unfairly penalize property owners with heavily treed lots that will have trees that are overcrowded and not in good condition.
  - Incentivize protection and replanting of natives and large stature trees.
  - Identify sustainable funding sources for urban forestry programs. Fund long term maintenance of trees, not just tree planting.
  - Require project arborists to be brought onto the project team as early as possible.
  - Allow the project arborist to drive the tree preservation plan in future code updates, not the project engineer.



- Require metal fencing in future code updates.
- Develop a zone of clearance for building footprints, and don't penalize developers for removing trees in clearance zones. This zone could be 5'-10' or 3 to 5 times the diameter of the tree. However, site and species characteristics should be considered when crafting code revisions.
- Increase planting strip size and require root barriers to protect streets and sidewalks.
- Require utilities to be under the street, not in the planter strip where trees should be.
- Hire a greenspace coordinator to manage the City's greenspaces.

#### Tigard Area Chamber of Commerce Stakeholder Interview Notes

On March 9, 2009, I spoke with Christopher Zoucha, Chief Executive Officer of the Tigard Area Chamber of Commerce regarding the Urban Forestry Master Plan. Christopher informed me that urban forestry has not been an issue for the Chamber members, and therefore declined providing input as a stakeholder group for the Urban Forestry Master Plan.

#### Tree Board Stakeholder Interview Notes

1. What is your level of interaction with Tigard's urban forestry program?
  - The Tree Board is an oversight body for Tigard's urban forestry program.
2. What features of Tigard's urban forestry program work well?
  - The City actively works to include the greater community in developing its urban forestry program.
  - The City collects substantial fees to be used for the planting of trees.
3. What features of Tigard's urban forestry program do not work well, and why?
  - The City's departments are not well coordinated on urban forestry issues due to lack of communication.
  - Tree management provisions are scattered throughout the Code and not unified.
  - The Tree Code is too focused on development.
4. What could be done in the future to improve the programs that do not work well?
  - More communication between City departments.
  - Unify tree related provisions in Code.
  - Focus future Code on areas outside development, and fix the mitigation issue.
5. How can we work together in the future to improve Tigard's urban forest.

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- The Tree Board can help create a plan for the future management of Tigard's urban forest.
  - The Tree Board can help execute the action measures in the plan. Mitigation funds can be used to implement the plan.
  - The Tree Board can continue to reach out to stakeholders when implementing the plan.
6. What should be included/excluded from Tigard's urban forestry programs?
- Increase communication between City departments.
  - Unify tree related Code provisions.
  - Focus future Code revisions on areas outside development.
  - Make sure Code revisions can be translated into something the public can understand.
  - Expand community education on urban forestry issues. Use Eastmoreland outreach materials as a model.
  - Continually measure progress on canopy preservation/expansion and community attitudes.
  - Plan for future annexations of tree resources in areas outside of the City limits.

Oregon Chapter of the American Society of Landscape Architects Stakeholder Interview Notes

1. What is your level of interaction with Tigard's urban forestry program?
- High level of familiarity with Tigard's tree and landscape ordinances.
  - Regularly implements codes during development projects to meet landscape and mitigation requirements.
2. What features of Tigard's urban forestry program work well?
- Tigard actually has a tree and landscape ordinance whereas some cities do not.
  - Tigard staff is easily accessible to discuss issues with and work out solutions.
  - The Urban Forestry Master Plan will result in a more comprehensive approach to future tree and landscape ordinance updates.
3. What features of Tigard's urban forestry program do not work well, and why?
- Replanting on a caliper inch basis does not work because it incentivizes overplanting.
  - Site planning is focused too heavily on building needs and not on existing site conditions. This causes an excessive amount of clear cutting.
  - Landscape architects do not have enough flexibility in landscape design because landscape code requirements are overly specific.
  - Street tree list is outdated, and many of the species are no longer appropriate or relevant.

- Street trees and streetscapes are non-uniform. Different development projects choose different types of trees so city blocks become a hodgepodge of street trees.
  - Many parts of the tree code are overly vague, which creates loopholes and a wide variety of interpretations. For example, there are no spacing, species, or nursery stock quality standards with respect to mitigation trees.
  - Need more tree and landscape related expertise on the Tree Board.
4. What could be done in the future to improve the programs that do not work well?
- Focus tree code revisions on preservation and less on mitigation. If preservation requirements are increased, then mitigation could occur on a tree for tree basis rather than inch for inch.
  - Need to be stricter on grading with respect to trees. This can occur by focusing more on existing conditions and how trees can be incorporated into the building design. Also, landscape architects should be required to collaborate more with project arborists in order to identify which trees are appropriate for preservation, and how to adjust grading to preserve trees. Perhaps there should be a dual sign off on preservation plans between the landscape architect and project arborist.
  - Allow for more flexibility in landscape requirements in future updates. Require landscape architects to be part of the design team, and sign off on planting before, during, and after installations.
  - Update street tree list.
  - To improve uniformity of streetscapes, the developers should have to survey the street trees in a 4-5 block radius and choose trees that complement existing plantings.
  - The tree/mitigation code sections need more specificity. The City of Salem has a detailed development design handbook with detailed drawings and specifications that are referred to in their development code. This allows for more clarity as to what is expected of the development.
  - When advertising Tree Board vacancies, specify that you are looking for members with tree and landscape expertise. Advertise vacancies with local professional organizations.
5. How can we work together in the future to improve Tigard's urban forest?
- Sends drafts of tree and landscape code revisions to ASLA for review and comment.
  - Contact ASLA to see if members could get credit hours for developing codes and design handbooks.
  - Hire ASLA members to help develop code and design guidelines.
  - Share example codes that require maximum preservation of existing trees.
6. What should be included/excluded from Tigard's urban forestry programs?
- More focus on preservation through improved grading plans, less focus on mitigation. The City needs to take a leadership role in this.

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- More focus on sustainable landscapes. Not necessarily native trees, but trees that are appropriate for site conditions.
- Need detailed design/preservation manual with illustrations.
- Need to have a warranty period for required landscaping to ensure establishment.
- Need to require powerlines to be shown on landscape plans to avoid future overhead utility conflicts.
- Landscape architects should be a required member of the design team.

### Tigard Tualatin School District Stakeholder Interview Notes

1. What is your level of interaction with Tigard's urban forestry program?
  - Somewhat limited.
  - Participation in the Tigard Neighborhood Trails Study.
  - Manage trees on School District property.
2. What features of Tigard's urban forestry program work well?
  - Adequate budget for tree planting and early establishment.
  - City of Tigard is very cooperative with the School District.
3. What features of Tigard's urban forestry program do not work well, and why?
  - Lack of communication prior to planting trees on School District property. It is important to coordinate with Facilities Division so that long term maintenance issues can be addressed prior to planting.
4. What could be done in the future to improve the programs that do not work well?
  - Bring Facilities Division into the planning process from the beginning of a tree planting project.
5. How can we work together in the future to improve Tigard's urban forest?
  - School District properties may offer opportunities to utilize City tree planting funds.
  - Wetlands on School District properties may offer wetland mitigation opportunities for the City.
  - Facilities Division would be able to provide guidance as to the types of trees and planting layouts that will facilitate long term maintenance by the District.
  - School District can contact City Arborist to find out if permits are required for tree removal and/or planting.
6. What should be included/excluded from Tigard's urban forestry programs?

- Bring Facilities Division into the planning process from the beginning of tree planting projects on School District properties.
- Focus on low maintenance plantings with evergreens and other trees with low leaf litter.

### Tualatin Riverkeepers Stakeholder Interview Notes

1. What is your level of interaction with Tigard's urban forestry program?
  - High level of involvement.
  - Work closely with the City and Metro on restoration projects in Tigard.
  - Provide comments on municipal separate storm sewer systems (MS4) permits.
  - Provide comments on City of Tigard Parks plans and occasionally on private development applications.
  - Participated in the development of the Healthy Streams Plan by Clean Water Services.
  - Member of Oregon Community Trees, a non-profit organization that promotes urban and community forestry in Oregon.
2. What features of Tigard's urban forestry program work well?
  - Mitigation fee structure provides an adequate budget for tree planting.
3. What features of Tigard's urban forestry program do not work well, and why?
  - Trees could be better utilized for stormwater management in developed areas such as along street and in parking lots.
  - Urban forestry funds could be collected and utilized more strategically. An example would be to use stormwater management fees to fund restoration programs.
  - The City of Tigard could make more of a public commitment to sustainability efforts such as by signing the Mayor's Climate Protection Agreement.
4. What could be done in the future to improve the programs that do not work well?
  - Improve parking lot design standards to incorporate stormwater treatment features and more tree canopy.
  - Retrofit existing parking lots to improve stormwater treatment and tree canopy using grant money and other funding sources.
  - Encourage/require the use of more evergreen species in parking lots and streets so that the stormwater benefits of trees can be utilized during the winter rainy season.
  - Collect urban forestry funds more strategically through stormwater fees, development fees, etc. so that the funding sources are more sustainable and can be used for more than just tree planting.

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5. How can we work together in the future to improve Tigard's urban forest?
  - Tualatin Riverkeepers can assist with volunteer recruitment for urban forestry projects.
  - Tualatin Riverkeepers can help educate kids about the importance of environmental stewardship through camp and recreation programming.
  - Tualatin Riverkeepers can help identify potential restoration sites.
  - Tualatin Riverkeepers can provide training to Planning Commission, City Council, City staff, and others on low impact development techniques.
  
6. What should be included/excluded from Tigard's urban forestry programs?
  - Improve parking lot design standards to incorporate stormwater treatment and more tree canopy.
  - Increase stormwater incentives/requirements for development such as the "no runoff" provisions as in Lacey Washington.
  - Collect urban forestry funds more strategically through stormwater fees, development fees, etc. so that the funding sources are more sustainable and can be used for more than just tree planting.
  - More public commitment to sustainability efforts such as signing the Mayor's Climate Protection Agreement.
  - More efforts in invasive species removal. Incentivize and/or require private landowners to remove invasives.

### City of Tigard Internal Coordination Meeting Results

On January 21, 2009, a coordination meeting was attended by key City staff members that have a role in coordinating and implementing Tigard's urban forestry programs, policies, and ordinances. Meeting attendees included representatives from a range of City departments (Community Development, Public Works, and Financial and Information Services) and divisions (Capital Construction & Transportation, Current Planning, Development Review, Information Technology, Public Works Administration, Parks, Streets, Wastewater/Storm, and Water). The purpose of the meeting was to discuss urban forestry coordination issues, and identify those areas where coordination could be improved. As a result of the meeting, the following list was generated that identified areas where urban forestry coordination efforts could be improved.

1. Street trees on record drawings don't reflect where they are actually planted (Planning, Engineering, Public Works, IT/GIS);
2. Development engineering inspects vegetated corridors after development, but no long term/sustained maintenance requirements (Engineering, Planning/Arborist and Code Enforcement, IT/GIS);
3. Difficult to track deed restricted trees after development (Planning, IT/GIS);
4. Difficult to track required landscape trees (parking lot trees, buffer trees, etc.) after development (Planning/Arborist and Code Enforcement, IT/GIS);
5. Difficult to track mitigation trees after development (Planning/Arborist, IT/GIS);
6. No inventory of street trees (Planning, Engineering, Public Works, IT/GIS);
7. When City acquires greenspaces, no detailed understanding of maintenance costs (especially regarding hazard trees) (Planning/Arborist, Public Works);
8. No policy for protecting deed restricted trees and significant habitat trees during building additions (Planning, Building);
9. No policy of requiring exempt City projects to follow standards required by private development (Planning, Capital Construction and Transportation, Public Works);
10. No review of exempt City projects for trees by planning staff (Planning, Capital Construction and Transportation, Public Works);
11. No formal hazard evaluation process for parks/greenspaces (Planning/Arborist, Public Works/Parks, Risk);
12. No formal emergency response system for tree hazards on streets (Planning/Arborist, Public Works/Streets);
13. No formal emergency response system for tree hazards in parks/greenspaces (Planning/Arborist, Public Works/Parks);
14. Tree removal in sensitive lands requires tree removal permits, not sure if there is awareness of this Code provision (Planning, Capital Construction and Transportation, Public Works);
15. No formal process for spending/tracking tree mitigation fund expenditures and planting (Planning/Arborist, Public Works, IT/GIS, Finance); and
16. No formal process for determining adjustments to street standards to preserve trees (18.810.030.A.7) (Planning/Arborist, Engineering).
17. No formal street tree maintenance process for limb/root clearance and removal (Planning/Arborist, Public Works/Streets).

After the list was generated, a series of meetings was held with representatives from the groups affected by the coordination issues. The purpose of the smaller group meetings was to discuss the coordination issues

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and formulate possible solutions that could improve coordination efforts. The following list identifies possible solutions for the coordination issues that were formulated after the group meetings.

1. Street trees on record drawings don't reflect where they are actually planted (Planning, Engineering, Public Works, IT/GIS);
  - Make note on record drawings that actual street tree locations may vary, see street trees in GIS for actual locations.
  - Require developers to GPS or pay a fee to the City to GPS actual locations of street trees prior to final approval. The spatial data can then be loaded into the City's GIS system for tracking.
  - Information on street trees to include location (x/y coordinates), size (dbh), species, date planted, condition, tree ID code, and any additional information necessary to conduct resource analyses in the future.
  - Consider creating program where developers pay a fee to the City to plant and GPS street trees.
  
2. Development engineering inspects vegetated corridors after development, but no long term/sustained maintenance requirements (Engineering, Planning/Arborist and Code Enforcement, IT/GIS);
  - Development engineering inspects vegetated corridors after planting, and after a defined maintenance period (usually two years) to ensure compliance with Clean Water Services (CWS) requirements.
  - If the vegetated corridor becomes City property, then the Wastewater/Storm Division of Public Works assigns crews to ensure long term maintenance.
  - If the vegetated corridor is privately owned, the City of Tigard does not currently have a program to inspect/enforce long term vegetation maintenance. The City will clarify with CWS what agency is responsible for ensuring long term maintenance of vegetated corridors.
  
3. Difficult to track deed restricted trees after development (Planning, IT/GIS);
  - Require developers to GPS or pay a fee to the City to GPS locations of deed restricted trees prior to final approval. The spatial data can then be loaded into the City's GIS system for tracking.
  - Information on deed restricted trees to include location (x/y coordinates), size (dbh), species, date inventoried, condition, tree ID code, and any additional information necessary to conduct resource analyses in the future.
  
4. Difficult to track required landscape trees (parking lot trees, buffer trees, etc.) after development (Planning/Arborist and Code Enforcement, IT/GIS);
  - Require developers to GPS or pay a fee to the City to GPS actual locations of required landscape trees prior to final approval. The spatial data can then be loaded into the City's GIS system for tracking.



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- Information on required landscape trees to include location (x/y coordinates), size (dbh), species, date planted, condition, tree ID code, and any additional information necessary to conduct resource analyses in the future.
5. Difficult to track mitigation trees after development (Planning/Arborist, IT/GIS);
- Require developers to GPS or pay a fee to the City to GPS actual locations of mitigation trees prior to final approval. The spatial data can then be loaded into the City's GIS system for tracking.
  - Information on mitigation trees to include location (x/y coordinates), size (dbh), species, date planted, condition, cash assurance/bond release date, tree ID code, and any additional information necessary to conduct resource analyses in the future.
6. No inventory of street trees (Planning, Engineering, Public Works, IT/GIS);
- Require developers to GPS or pay a fee to the City to GPS actual locations of street trees prior to final approval. The spatial data can then be loaded into the City's GIS system for tracking.
  - Hire AmeriCorps member and/or recruit volunteers to assist in inventory of existing street trees outside development process.
  - GPS actual locations of street trees planting during annual street tree planting program.
  - Information on street trees to include location (x/y coordinates), size (dbh), species, date planted, condition, tree ID code, and any additional information necessary to conduct resource analyses in the future.
  - Consider creating program where developers pay a fee to the City to plant and GPS street trees.
7. When City acquires greenspaces, no detailed understanding of maintenance costs (especially regarding hazard trees) (Planning/Arborist, Public Works);
- Create budget sheet to track personnel, material, and service costs associated with greenspace acquisition.
  - Budget sheet should detail first year costs as well as costs for years two through five.
  - A benefits section should be included on the form to identify mitigation, connectivity, and other potential benefits.
  - The budget sheet needs to be routed to the appropriate departments and divisions for input before it is finalized.
  - There is an evaluation form for land acquisition that was used for CIP projects that may be used as a template (contact Carissa).
  - If hazard trees are an issue during land acquisition associated with development projects, require developer's arborist to conduct a hazard assessment for review and inspection by City Arborist.

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8. No policy for protecting deed restricted trees and significant habitat trees during building additions (Planning, Building);
  - This item should be further addressed during the Tree Code updates.
  - However, for deed restricted trees, the City can require a protection plan for building additions that complies with the original tree protection plan for the development project.
  - For trees in sensitive lands, the City can restrict access/building within the driplines of trees through the use of tree protection fencing. Section 18.790.060 prohibits damage to a protected tree or its root system.
  
9. No policy of requiring exempt City projects to follow standards required by private development (Planning, Capital Construction and Transportation, Public Works);
  - City Arborist to attend “kickoff meetings” for City projects to identify applicable City rules and regulations.
  - Project plans will be routed to City Arborist for review and comment prior to completion.
  - Depending on the size of the project, the City Arborist may provide assistance on tree protection and planting specifications, or recommend that the City hire a project arborist.
  - Work with the Tree Board and Community Development Director on developing a set of standards for City projects to follow.
  
10. No review of exempt City projects for trees by planning staff (Planning, Capital Construction and Transportation, Public Works);
  - City Arborist to attend “kickoff meetings” for City projects to identify applicable City rules and regulations.
  - Project plans will be routed to City Arborist for review and comment prior to completion.
  - Depending on the size of the project, the City Arborist may provide assistance on tree protection and planting specifications, or recommend the City hire a project arborist.
  
11. No formal hazard evaluation process for parks/greenspaces (Planning/Arborist, Public Works/Parks, Risk);
  - Budgeting has eliminated non-emergency management and evaluation of hazards in parks/greenspaces due to the transfer of the greenspace coordinator (urban forester) position from Public Works to the associate planner/arborist (city arborist) position to Community Development.
  - Proactive evaluation and management of City owned parks/greenspaces would be best accomplished through the hiring of a greenspace coordinator to fill the position vacated in Public Works.

- A greenspace coordinator could develop a program based off of protocols developed by the USDA Forest Service and/or International Society of Arboriculture.
- Alternatively, the City could contract with a private arborist to develop a hazard evaluation and management program.

12. No formal emergency response system for tree hazards on streets (Planning/Arborist, Public Works/Streets);

- When a member of the public calls the City about a potential hazard tree on a City street, they should be forwarded to the Public Works front desk (503-639-4171).
- Operators at Public Works will route the call to the Streets Division manager, who will in turn assign a staff member to investigate the complaint.
- If the tree clearly is not a hazard, the Streets Division will contact the citizen and close the case.
- If the tree is already down or is clearly an immediate hazard, the Streets Division will coordinate traffic control, contact other impacted agencies (such as PGE if power lines are involved), and remove the tree from the street and sidewalk right-of-way using the City's contract arborist (or any other available private arborist if the contract arborist is not available). The debris from the removal will be placed on the owner's property, and debris disposal will occur at the owner's expense.
- If the tree hazard is a borderline case, the City Arborist will make a determination whether the tree should be retained, monitored, removed, or further investigated by the contract arborist.
- If the City Arborist decides the tree is a hazard and there is enough time, he will write a letter to the responsible property owner giving them a specific period of time to abate the hazard. If the deadline is not met, the responsible owner will be cited through Code Enforcement.
- If the hazard is after hours, citizens will need to call the Public Works after-hours number (503-639-1554). Public Works will then investigate the hazard after hours and either contact the contract arborist (or any other available private arborist if the contract arborist is not available) if there is an immediate hazard, or forward the inquiry to the Streets Division for follow up the following business day if the hazard is not immediate. The Streets Division will then follow the same process outlined above.

13. No formal emergency response system for tree hazards in parks/greenspaces (Planning/Arborist, Public Works/Parks);

- When a member of the public calls the City about a potential hazard tree on City property, they should be forwarded the Public Works front desk (503-639-4171).
- Operators at Public Works will route the call to the appropriate division manager, who will in turn assign a staff member to investigate the complaint.

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- If the tree clearly is not a hazard, the responsible division will contact the citizen and close the case.
  - If the tree is determined to be an immediate hazard, the responsible division will contact the City's contract arborist (or any other available private arborist if the contract arborist is not available) to abate the hazard immediately.
  - If the tree hazard is a borderline case, the City Arborist will make a determination whether the tree should be retained, monitored, removed, or further investigated by the contract arborist.
  - The City Arborist is estimated to respond to one "borderline" call per week on average. If the time commitment is significantly more, the process may need to be reevaluated.
  - If the hazard is after hours, citizens will need to call the Public Works after-hours number (503-639-1554). Public Works will then investigate the hazard after hours and either contact the contract arborist (or any other available private arborist if the contract arborist is not available) if there is an immediate hazard, or forward the inquiry to the appropriate division if the hazard is not immediate for follow up the following business day. The responsible division will then follow the same process outlined above.
14. Tree removal in sensitive lands requires tree removal permits, not sure if there is awareness of this Code provision (Planning, Capital Construction and Transportation, Public Works);
- City Arborist to attend "kickoff meetings" for City projects to identify applicable City rules and regulations.
  - Tree removal permits and fees in Tigard Development Code Section 18.790.050 are applicable for any tree removal over six inches in diameter within sensitive lands (including City projects).
  - Publicize program through periodic Community Development/Public Works/Capital Construction and Transportation coordination meetings.
  - Ensure the sensitive lands GIS layer is available through Tigard Maps for all divisions/departments.
  - Clarify with Community Development Director if invasive/exotic trees are exempt from tree removal permit requirements.
15. No formal process for spending/tracking tree mitigation fund expenditures and planting (Planning/Arborist, Public Works, IT/GIS, Finance); and
- GPS actual locations of mitigation trees/areas. The spatial data can then be loaded into the City's GIS system for tracking.
  - Information on mitigation trees to include location (x/y coordinates), size (dbh), species, date planted, condition, cash assurance/bond release date, tree ID code, and any additional information necessary to conduct resource analyses in the future.
  - Link mitigation trees (via a GIS point layer) and mitigation areas (via a GIS polygon layer) with IFIS (accounting system) so that expenditures can be directly related to specific projects.

16. No formal process for determining adjustments to street standards to preserve trees (18.810.030.A.7) (Planning/Arborist, Engineering).

- The City's policy is to maintain the required curb to curb width standards in the Tigard Development Code in all cases, regardless of existing trees.
- However, during the development review process, when a healthy and sustainable tree in the right of way is identified by the project arborist and/or City Arborist, Development Engineering will allow adjustments to planter strip and/or sidewalk standards on a case by case basis.
- The City does not currently have the authority to require private developers to preserve trees if they choose not to.

17. No formal street tree maintenance process for limb/root clearance and removal (Planning/Arborist, Public Works/Streets).

- If the street tree is the responsibility of the City, the corresponding division will maintain the clearance requirements outlined in the Tigard Municipal Code.
- If a citizen complaint is received, the Streets Division will investigate.
- If there is an immediate hazard (e.g. blocked stop sign, hanging limb, etc.), the Streets Division will prune the tree immediately.
- If there is not an immediate hazard, the Streets Division will contact the responsible party directly and explain the Code requirements, or gather the information and forward to Code Enforcement if the owner is nonresponsive.
- If the potential branch clearance hazard is after hours, citizens will need to call the Public Works after-hours number (503-639-1554). Public Works will then investigate the hazard after hours and either contact the contract arborist (or any other available private arborist if the contract arborist is not available) if there is an immediate hazard, or forward the inquiry to the Streets Division if the hazard is not immediate for follow up the following business day. The Streets Division will then follow the same process outlined above.
- When tree roots are impacting City streets or utilities, the responsible division will investigate and, if needed, contact the City Arborist for root pruning advice.
- If the City Arborist decides the tree can be safely root pruned to make the necessary repairs, the responsible division will absorb the cost of root pruning.
- If the tree cannot be safely root pruned and the tree needs to be removed, the City will absorb the cost of removal, but the property owner will be responsible for stump removal and replanting. Prior to removing a street tree, the City Arborist shall be contacted.

## APPENDIX E

LAND USE PLANNING

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## Section 2: Tigard's Urban Forest

A defining community feature of Tigard is its trees and the urban forest they create. Unlike natural forests or managed timberland, Tigard's urban forest is a mosaic of native forest remnants and planted landscape elements interspersed with buildings, roads and other elements of the urban environment. The protection, management, and enhancement of this resource is important not only for Tigard's aesthetic identity and sense of place, but for the social, ecological, and economic services it provides to the community.

Trees and other types of vegetation are integral to the quality of Tigard's aesthetic, economic, and natural environments. Plants provide variation in color, texture, line and form that softens the hard geometry of the built environment. They also enhance the public and private realm through the provision of shade from the sun and wind, providing habitat for birds and wildlife, enhancing community attractiveness and investment, improving water quality and soil stability, and promoting human health and well-being.

Tigard's trees and native plant communities have experienced significant disruption and displacement, first by agriculture and logging in the 19th century, and by increasingly dense urban development in the 20th Century. Competition from introduced invasive species such as English ivy, reed canary grass, and Himalayan blackberries has made it difficult for remaining native plant communities to thrive. However, remnant stands of native tree and associated plant communities still remain within the City Limits. Trees are important members and contributors to natural resource systems including upland habitat areas and plant communities, and functioning riparian corridors including the Tualatin River, Fanno Creek and its tributaries, and their adjacent flood plains and wetlands.

In addition to remnants of the native forest, Tigard possesses a large number of




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**LAND USE PLANNING**

mature and outstanding specimens of native and non-native trees planted when the area was rural country-side in the late 19th and early 20th centuries. Aerial photos demonstrate that increasingly more trees were planted on both public and private property during a period of large lot residential subdivision development from the late 1940's through the 1970's, many of which survive to this day.

Community attitude surveys reveal that Tigard Citizens place high value on the protection of trees and are concerned about the impact of development upon existing tree resources. Community surveys conducted in 2004 and 2006 show that residents value their neighborhood as a suburban retreat, a place that allows for views of trees and other natural areas. The 2006 Community Attitudes Survey found “the protection of trees and natural resource areas” as rating the highest of all “livability” characteristics posed to the respondents, scoring 8.4 out of 10 points. Preservation of trees and other natural resources scored higher on resident’s livability index than neighborhood traffic (8.2), maintaining existing lot sizes (7.8), pedestrian and bike paths (7.7), and compatibility between existing and new development (7.6). A follow-up question contained in the 2007 survey revealed that 84% of Tigard Residents supported regulations to protect existing trees, with only 6% strongly disagreeing and 9% somewhat disagreeing. In addition, 90% of Tigard residents thought the City should take the lead in preserving open space. These values are also shared by residents of adjoining jurisdictions who maintain, or have begun significant updates to, their tree protection ordinances.

The City of Tigard has been a Tree City, USA since 2001 because of aggressive programs to plant trees on public property. In partnership with Clean Water Services, the City of Tigard is in the early stages of a series of stream restoration and enhancement projects intended to improve water quality, reduce erosion, and provide shade, structure and food sources to fish and other wildlife. Projects currently underway within the City’s floodplains and riparian areas will result in the planting of approximately 100,000 native trees over a 10 year period (Fiscal Years 2001-2011). Through volunteer projects, cooperative efforts with non-profits, contract services, and the labor of Public Works crews, thousands of young trees are annually planted on public property.

Not including restoration projects, the City’s Public Works Department annually plants approximately 250 new or replacement trees on public lands, distributes approximately 50 street trees each year to private property owners through the Street Tree Program, and plants an addition 25 trees in celebration of arbor day.

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Native species are given preference and are regularly planted along trails, riparian areas, and in new park and green space areas. The objective is to increase the total number of trees, particularly in areas where summer shade is desired such as picnic areas and next to sidewalks. Money is budgeted each year to maintain new trees being established and to remove hazard trees located on public property. As more public property is added and trees grow older, the number of hazard trees pruned or removed each year will continue to grow. The level of new tree planting is limited by the maintenance capacity of City work crews.

Conditions and circumstances have significantly changed since the adoption of Tigard's Comprehensive Plan in 1983. Rapid urban development has resulted in a general perception that the City has experienced a significant loss of tree canopy, and other vegetation essential for wildlife habitat, erosion control, slope stability, water quality, air-quality, and community aesthetics. Driving this perception are METRO land use regulations, failed annexation efforts and changing market conditions resulting in higher density development than was anticipated in 1983, further challenging the City to protect trees and canopy cover while accommodating new development. Additionally, the City does not currently have a comprehensive tree management and urban forest enhancement program to address these issues in a unified and consistent manner. As a result there is general feeling among residents, developers, and other stakeholders that the existing regulatory structure is not adequate and hinders both the strategic protection of trees and the orderly urbanization of the City.

The City has historically relied upon its Development Code to manage and protect trees on private property, particularly heritage trees and those located within steep slopes, wetlands, and other sensitive lands. Existing regulations require new development to protect and/or replace existing trees wherever possible, to pay into a mitigation fund when trees are removed, and to plant new street trees and landscape trees as part of all new construction. In addition, trees within vegetated corridors surrounding wetlands, riparian corridors, and other natural bodies of water are also protected by Clean Water Services as part of their stormwater management program. These regulatory structures do not recognize or protect existing trees outside of those areas, and offer little protection unless a development action is pending, or prior conditions of development approval designated the affected tree(s) for future protection. As a result, the existing regulatory structure does not encompass a significant number of trees across the city, which may be removed by the property owner without City consultation or permit. Additionally, because the City does not have a compre-





hensive tree removal consultation or permit system, protected trees (such as street trees) have been removed despite existing regulations or restrictions in force.

#### KEY FINDINGS:

- A defining community feature is Tigard's urban forest, a mosaic of native forest remnants and planted landscape elements interspersed throughout the City.
- This urban forest provides social, economic, and ecological services that create public and private value to residents, businesses, and visitors.
- Mature and well-managed trees provide the maximum public benefits.
- The City continues to allocate staff and resources to tree planting, tree maintenance, and outreach activities. Additionally, new development is required to install street trees, landscape trees, and trees for mitigation purposes.
- The existing urban forest continues to experience significant disruption and displacement through the conversion of land to more intense urban land uses and competition from invasive species.
- Existing tree regulations are dispersed throughout the code; applied by multiple divisions in a non-unified and inconsistent manner; and sometimes conflicting between different code sections.
- The City does not presently have a comprehensive and unified process to monitor tree removal and enforce existing tree protections outside of development permit review. Furthermore, landowners are not always aware of regulatory protections applicable to their property or street trees adjacent to their property.
- Community attitude surveys reveal that Tigard residents place high value on the protection of trees within the community, that they are concerned about the impact of development upon existing tree resources, and are strongly in favor of a regulatory structure that would protect additional trees.

#### GOAL:

- 2.2 To enlarge, improve and sustain a diverse urban forest to maximize the economic, ecological, and social benefits of trees.

#### POLICIES:

1. The City shall maintain and periodically update policies, regulations and standards to inventory, manage, preserve, mitigate the loss of, and

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## LAND USE PLANNING

enhance the community's tree and vegetation resources to promote their environmental, aesthetic and economic benefits.

2. The City's various codes, regulations, standards and programs relating to landscaping, site development, mitigation, and tree management shall be consistent with, and supportive of, one another; administration and enforcement shall be regulated and coordinated by the variously impacted departments.
3. The City shall continue to regulate the removal of trees, within environmentally sensitive lands and on lands subject to natural hazards.
4. The City shall ensure that street design and land use standards provide ample room for the planting of trees and other vegetation, including the use of flexible and incentive based development standards.
5. The City shall require the replacement and/or installation of new street trees, unless demonstrated infeasible, on all new roads or road enhancement projects. Trees should be planted within planter strips, or at the back of sidewalks if planter strips are not feasible or would prohibit the preservation of existing trees.
6. The City shall establish and enforce regulations to protect the public's investment in trees and vegetation located in parks, within right-of-ways, and on other public lands and easements.
7. The City shall conduct an ongoing tree and urban forest enhancement program to improve the aesthetic experience, environmental quality, and economic value of Tigard's streets and neighborhoods.
8. The City shall continue to maintain and periodically update approved tree lists for specific applications and site conditions, such as street trees, parking lot trees, and trees for wetland and riparian areas.
9. The City shall discourage the use or retention of invasive trees and other plants through the development review process.
10. The City shall require the appropriate use of trees and other vegetation as buffering and screening between incompatible uses.
11. The City shall develop and implement a citywide Urban Forestry



Management Master Plan.

**RECOMMENDED ACTION MEASURES:**

- i. Develop and implement a comprehensive, coordinated update and enhancement of all tree related regulations, standards, programs, and plans.
- ii. Develop and implement an inspection and enforcement program that will ensure ongoing maintenance of trees and other vegetation required by development approval, with particular attention to challenges introduced by the change of ownership of affected properties.
- iii. Develop and implement an inspection and enforcement program that will ensure non-development related tree management and removal complies with the City's tree protection ordinances such as heritage trees, street trees, and trees on sensitive lands.
- iv. Inventory and evaluate street tree, parking lot and landscape area plantings that have failed to thrive, and determine if site conditions or management practices can be modified, and/or if trees can be planted elsewhere in order to satisfy conditions of development approval or provide the benefits expected of the original planting.
- v. Develop and maintain, as part of the City's GIS and permit systems, a publicly accessible inventory of tree plantings, permitted removals, and the state of the City's urban forest.
- vi. Develop and distribute educational materials and programs regarding City policies, regulations, and good arboricultural practices for the general public, developers and city staff regarding tree planting, maintenance, and protection. Materials should be published in both paper and electronic media and in multiple languages. Particular focus should be given to new property owners who may be unfamiliar with the City's regulations and development related restrictions affecting their property.
- vii. Encourage and promote the removal of nuisance/invasive plants,

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and the installation of trees and vegetation that are low maintenance, drought tolerant, site appropriate, and require minimal chemical applications. Strategies could include the production and distribution of approved tree lists to area nurseries, landscaping companies, libraries and similar businesses and public resources.

- viii. Utilize approved tree and plant lists that emphasize long lived evergreens, broad-spreading deciduous varieties, and native species, but allow flexibility to choose a wide variety of species that are proven suitable for local climate conditions and for specific uses and locations.
- ix. Encourage efforts by community groups and neighborhoods to plant trees and undertake other projects, such as restoration of wetlands and stream corridors.
- x. Maintain a list of invasive plants, discourage the sale and propagation of these plant materials within the City, promote their removal, and prevent their reestablishment or expansion.

**GOAL:**

- 2.3 To balance the diverse and changing needs of the City through well-designed urban development that minimizes the loss of existing trees to create a living legacy for future generations.

**POLICIES:**

1. The City shall develop and implement standards and procedures designed to minimize the reduction of existing tree cover, with priority given to native trees and non-native varieties that are long lived and/or provide a broad canopy spread.
2. In prescribing the mitigation of the impacts of development, the City shall give priority to the protection of existing trees, taking into consideration the related financial impact of mitigation.
3. The City shall develop policies and procedures designed to protect trees, including root systems, selected for preservation during land



- development.
4. The City shall address public safety concerns by ensuring ways to **prevent and resolve verified tree related hazards in a timely manner.**
  5. The City shall develop and enforce site design and landscape requirements to reduce the aesthetic and environmental impacts of impervious surfaces through the use of trees and other vegetation.
  6. The City shall, in order to preserve existing trees and ensure new trees **will thrive, allow and encourage flexibility in site design through all aspects of development review.**
  7. The City shall require all development, including City projects, to prepare and implement a tree preservation and landscaping plan, with the chosen trees and other plant materials appropriate for site conditions.
  8. The City shall continue to cooperate with property owners, businesses, other jurisdictions, agencies, utilities, and non-governmental entities to manage and preserve street trees, wetlands, stream corridors, riparian areas, tree groves, specimen and heritage trees, and other vegetation.
  9. The City shall require, as appropriate, tree preservation strategies that **prioritize the retention of trees in cohesive and viable stands and groves** instead of isolated specimens.
  10. Applications for tree removal and tree management plans shall be **reviewed by a certified arborist employed or under contract to the City.**
  11. The City shall **recognize the rights of individuals to manage their residential landscapes.**

#### RECOMMENDED ACTION MEASURES:

- i. Develop and implement regulations, standards, and incentives to encourage developers to transfer density, seek variances and adjustments necessary to preserve trees and natural open space in a **manner that optimizes tree preservation and protection.**

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- ii. Develop tree-mitigation regulations and standards to guide the City in assessing fees or compelling compensatory action resulting from violation of its tree protection standards and/or conditions of development approval. Consideration shall be given to off-site mitigation on both public and private lands, and the maintenance of a publicly accessible registry of mitigation sites both historical and potential.
- iii. Conduct surveys, workshops, and/or other public outreach strategies to identify and implement an appropriate strategy and form for tree protection regulations outside of the development review process.
- iv. Encourage other jurisdictions operating within and adjacent to Tigard to prepare and implement a tree preservation and landscaping plan as part of all development and infrastructure projects.
- v. Develop standards and procedures to identify and abate tree related hazards on both public and private property..

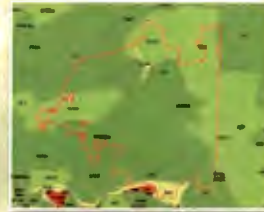
# Tigard Urban Forestry Historical Timeline

Sketch of Kalapuya man drawn by Alfred Agate, a member of the Wilkes Expedition in 1841.



3500 years before present Kalapuya (Native Americans) began managing the forests of the Willamette Valley using fire (pyroculture).<sup>1</sup>

In 1851, canopy coverage within the current city limits of Tigard was estimated to be 52.4% (3,966.9 acres).



In the early 1850s, Tigard was settled by several families of European descent including the Tigard family headed by Wilson M. Tigard. Native forests were cleared for agricultural uses and timber help support development in the area.<sup>2</sup>

In 1910, the Oregon Electric Railway arrived, triggering more rapid development at the rail stop near Main Street. Fruit and nut packaging and canning plants and lumber mills set up shop at that point to capitalize on the agriculture and logging activity.<sup>2</sup>



▲ One Cloud Surveying Crew 1903 - 1905  
Survey crew of Oregon Electric Co. Railroad (from Charles F. Tigard)

**Downtown Tigard**  
Left to right: Mrs. P.E. Lewis' Dry Goods Store, Bolens (later Schubring & Binderman's) Grocery Store, Krueger's Pool Hall and Barber Shop and Rickert's Plumbing Shops.  
Notice unpaved street and no walkways between buildings. Circa 1911.



In the 1940s, the population was about 300 people even after the arrival of the Capitol Highway (99W).<sup>1</sup>

Tigard was incorporated as a City in 1961. There were 1,749 residents and 572 occupied residences at the time of incorporation.<sup>2</sup>

The biggest boom period took place in the 1960s, averaging 26% population growth.<sup>2</sup>

In 1967, Tigard adopted its first zoning ordinance. The only mention of trees in the zoning ordinance was in Section 180-7, which required trees in industrial developments to provide a buffer for streets and residential zones.

In 1972, the Municipal Code contained provisions to protect the public from dangerous trees and branches blocking streets and sidewalks. Planned developments were required "to the maximum extent possible... to assure that natural features of the land are preserved" and to provide "a preliminary tree planting plan (with)... all existing trees over six inches in diameter and groves of trees."



In 1982, Tigard adopted its first Comprehensive Plan with several policies that call for the preservation of stream corridors, fish and wildlife habitat, tree and timbered areas, and wetlands.

In 1983, the Community Development Code was revised to comply with the Comprehensive Plan. The Tree Removal section of the new Code required a City permit prior to tree removal for all undeveloped land, developed commercial and industrial land, and public land.

In 1983, the Landscaping and Screening Chapter was also established and required street tree planting, protection, and replacement during development. It also required trees to be used as a buffer between differing land uses and for shading of parking lots.

In 1985, the Sensitive Lands Chapter of the Community Development Code prohibited development in or in close proximity to significant wetlands.



In 1987, the Tigard Municipal Code was expanded to prohibit dead or hazardous trees that pose a threat to the public and private property owners (Section 7.40.060).

In 2001, the Tigard Triangle Design Standards in the Community Development Code established additional landscaping and screening requirements for the Tigard Triangle (the area bound by Highways 5, 99, and 217).



In 1997, the Tree Removal Chapter was significantly revised. Tree plans were required for development, mitigation standards were established, and tree removal permits were required for trees in sensitive lands.

In 1998, the City hired its first Urban Forester.

Tigard has been named a Tree City USA by the National Arbor Day Foundation every year since 2001.



In 2001, the Tree Board was established to develop and administer a comprehensive tree management program for trees on public property.

In 2002, the Tigard Municipal Code was revised to increase protections for trees on City property.

In 2002, the Washington Square Regional Center Design Standards and the Durham Quarry Design Standards established additional landscaping and screening requirements in the Washington Square and Bridgeport areas respectively.

In 2002, the Sensitive Lands Chapter was significantly revised in order to implement "Clean Water Services (CWS) Design and Construction Standards", the "Metro Urban Growth Management Functional Plan," and "Statewide Planning Goal 5 (Natural Resources)."



In 2006, the Heritage Tree program was established so that trees of landmark importance could be officially recognized and protected.

In 2007 the Tree Board's mission was expanded to develop a "City Tree Stewardship and Urban Forest Enhancement Program" in part to ensure tree code revisions occurred in a comprehensive manner.

In 2007, the City adopted a "Significant Habitat Areas Map" which expanded the lands where tree removal permits were required.

In 2008, an Urban Forest section was added to the Comprehensive Plan following over a year of work by the Tree Board. The Urban Forest section of the Comprehensive Plan contains two goals to be implemented by 22 policies. Goal 2.2 Policy 11 of the Comprehensive Plan states, "The City shall develop and implement a citywide Urban Forestry Management Master Plan." This Plan is intended to meet this policy requirement.

In 2009, Tigard received a Tree City USA growth award for its expanded urban forestry efforts.



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## Federal/State/Regional Urban Forestry Policy Framework

The City of Tigard is required to comply with various Federal, State, and Regional requirements when managing its urban forest. Urban forest management practices also have positive externalities that further progress towards other jurisdictional goals and mandates. The following represent major Federal, State, and Regional agencies and programs that influence or are benefitted by urban forest management in Tigard:

## Oregon Department of Forestry

The Oregon Department of Forestry (ODF) is responsible for administering the Forest Practices Act (FPA). The FPA was designed to promote the proper management of Oregon's forests and ensure that forests remain healthy and productive. The Oregon Legislature has given cities the authority to regulate forests in place of having ODF administer the FPA as long as the local options meet the FPA's minimum standard.<sup>1</sup>

To meet the standards, local forest practice regulations must:

- Protect soil, air, water, fish and wildlife resources;
- Be acknowledged as in compliance with land use planning goals;
- Be developed through a public process;
- Be developed for the specific purpose of regulating forest practices; and
- Be developed in coordination with the State Forestry Department and with notice to the Department of Land Conservation and Development.<sup>2</sup>

## Oregon Department of Transportation

The Oregon Department of Transportation (ODOT) manages approximately 283 acres of right-of-way in the City of Tigard including Hall Boulevard, and Highways 217, 5, and 99W. ODOT Bulletin RD06-03(B) provides specifications for street tree placement and maintenance in ODOT right-of-ways. These specifications are intended to balance the need for safety along State roadways with trees, and supersede Tigard street tree requirements within City limits.

## Oregon Department of Land Conservation and Development

The Oregon Department of Land Conservation and Development (DLCD) administers Oregon's Statewide Land Use Planning Program and ensures that the comprehensive plans of Oregon cities comply with Oregon Statewide Land Use Planning Goals.

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<sup>1</sup> Oregon Department of Forestry and Land Conservation and Development. 1999. **Guidelines for Developing Urban Forest Practice Ordinances**. State of Oregon, Department of Forestry and Department of Land Conservation and Development. 16p.

<sup>2</sup> Oregon Department of Forestry. 2008. **Forest Facts: Urban Growth Boundaries and the Oregon Forest Practices Act**. Accessed via the World Wide Web: <[http://www.oregon.gov/ODF/PUBS/docs/Forest\\_Facts/Forest\\_Facts\\_Urban\\_Growth\\_Boundaries.pdf](http://www.oregon.gov/ODF/PUBS/docs/Forest_Facts/Forest_Facts_Urban_Growth_Boundaries.pdf)> on March 25, 2009.



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The City of Tigard Comprehensive Plan is required to be consistent with 12 of the 19 Oregon Statewide Land Use Planning Goals.

The following statewide planning goals directly relate to the urban forestry in Tigard:

**Goal 5. “To protect natural resources and conserve scenic and historic areas and open spaces.”**

This goal requires local governments to develop programs to protect resources including fish and wildlife habitats, stream corridors, and natural areas. Urban forestry programs and policies can further progress towards achievement of Goal 5. Economic, social, environmental, and energy (ESEE) analyses are required to protect Goal 5 resources.

**Goal 6. “To maintain and improve the quality of the air, water and land resources of the state.”** It is well documented that urban trees and forests contribute to air and water quality improvement.

**Goal 7. “To protect life and property from natural disasters and hazards.”** Trees roots, canopies, and leaf litter in natural hazard areas help to prevent erosion and flooding (Portland Urban Forest Management Plan).

**Goal 10. “To provide for the housing needs of citizens of the state.”** This goal requires the City to balance the needs of tree and forest preservation with the need for housing and efficient use of urban land.

Local jurisdictions within the Metro regional planning boundary must also be consistent and coordinated with relevant Metro requirements such as the Urban Growth Management Functional Plan which is described in more detail below.

DLCD has approved or “acknowledged” the City’s Comprehensive Plan (including the Urban Forest section) as being in compliance with statewide planning goals, and consistent with Metro requirements. <sup>1</sup>

#### Oregon Division of State Lands

The Oregon Division of State Lands (DSL) establishes criteria and procedures for the identification of wetlands. In 1997, Tigard’s Local Wetland Inventory was approved by DSL. Approval by DSL means that the inventory meets State standards, and therefore becomes part of the State Wetlands Inventory and must be used in lieu of the National Wetlands Inventory. <sup>2</sup>

Development in these areas is regulated by a variety of federal, state, regional, and local laws. Tigard Development Code Chapter 18.775 (Sensitive Lands) contains specific provisions to protect wetlands from development and requires

<sup>1</sup>Oregon Department of Forestry and Land Conservation and Development. 1999. **Guidelines for Developing Urban Forest Practice Ordinances**. State of Oregon, Department of Forestry and Department of Land Conservation and Development. 16p.

<sup>2</sup>City of Tigard. 2009. **Comprehensive Plan (as of April 22, 2009)**. City of Tigard, OR, Community Development Department, Long Range Planning Division. 230p.

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concurrent approvals from the U.S. Army Corps of Engineers, Oregon Division of State Lands, and Clean Water Services. As a result, trees and native vegetation in Local Wetlands gain a highly protected status.

### Oregon Department of Environmental Quality

The Oregon Department of Environmental Quality (DEQ) is responsible for protecting Oregon's air quality by issuing permits, developing programs, and monitoring air pollution to ensure communities meet the National Ambient Air Quality Standards (NAAQS), and to protect Oregon's pristine views. Air pollutants identified in the 2005 DEQ Air Quality Report as the greatest concern in Oregon are: Ground-level ozone, commonly known as smog; Fine particulate matter; Hazardous air pollutants; and Carbon monoxide.<sup>1</sup>

Regional efforts have been established to monitor and plan for pollutants. The City of Tigard is part of the Portland Area Airshed (PAA), which is defined by the Metro service boundary. The DEQ is responsible for ensuring the PAA meets the national standards, and for developing the necessary plans to continue compliance. Currently, the PAA meets all NAAQS standards. However, DEQ is required to develop maintenance plans for carbon monoxide and ozone to ensure continued compliance.<sup>1</sup>

Trees have a natural ability to convert and sequester compounds that contribute to air pollution. Trees also offset power plant emissions by shading and sheltering buildings from sun and wind.<sup>2</sup> At the local level, the City can protect existing natural areas and mature trees, and promote and participate in tree planting efforts to improve air quality and decrease building energy usage. Within urban areas, air quality is often much worse along major roadways. Trees strategically planted along or near roadways have an increased ability to filter air pollutants and improve air quality before exhaust is released in the atmosphere.<sup>1</sup>

DEQ is also charged with establishing standards, regulating, and monitoring Oregon's waters for compliance with the Federal Clean Water Act (CWA) and National Pollutant Discharge Elimination System (NPDES). Within Tigard, run-off from impervious surfaces, pet waste, and erosion/ sedimentation are the most problematic sources of water pollution. Planting and maintaining tree canopy, water quality facility construction and maintenance (vegetated swales and retention basins), and stream corridor and wetland enhancements are all urban forestry activities that help to improve water quality and meet State and Federal requirements.<sup>1</sup>

### Oregon Public Utility Commission

The Oregon Public Utility Commission (PUC) regulates utility industries to ensure that customers receive safe and reliable services at reasonable rates. In order to ensure safety, the PUC requires Portland General Electric to maintain

<sup>1</sup>City of Tigard. 2009. **Comprehensive Plan (as of April 22, 2009)**. City of Tigard, OR, Community Development Department, Long Range Planning Division. 230p.

<sup>2</sup>McPherson, E.G., S.E. Maco, J.R. Simpson, P.J. Peper, Q. Xiao, A. VanDerZanden, and N. Bell. 2002. **Western Washington and Oregon Community Tree Guide: Benefits, Costs, and Strategic Planting**. International Society of Arboriculture, Pacific Northwest Chapter, Silverton, OR.

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zones surrounding overhead utility lines clear of trees for safety and in order to help prevent outages. The result is increased maintenance costs and trees that become eyesores as a result of heavy pruning. Portland General Electric spends approximately \$500,000 annually pruning trees away from the utility lines.<sup>1</sup> These costs are passed on to utility ratepayers. The urban forestry program can help to decrease maintenance costs and improve the aesthetic quality of local trees by aiding in the selection of appropriate trees near overhead lines.<sup>2</sup>

## Metro

Metro helps the region's cities implement Statewide Planning Goals through the Urban Growth Management Functional Plan (functional plan). Metro cities are required to adopt comprehensive plans and implementing regulations that correspond with the titles and policies in the functional plan. The functional plan contains 13 titles, some of which directly or indirectly impact urban forest management in Tigard. DLCD has acknowledged Tigard's Comprehensive Plan as being in compliance with statewide planning goals, and consistent with Metro's functional plan.<sup>3</sup> The following excerpts from the functional plan have significant impact on urban forestry in Tigard:

**Title 1** of the functional plan is intended to meet Statewide Planning Goal 10, and focuses on increasing housing capacity in order to use land within Urban Growth Boundaries (an invisible line that separates rural areas from suburban) efficiently. To meet Title 1, each jurisdiction was required to determine its housing capacity and adopt minimum density requirements. Tigard adopted an 80% of minimum density requirement for development in 1998, which means that a development must build 80% of the maximum units allowed by the zoning designation.<sup>4</sup> The Home Builder's Association of Metropolitan Portland (HBAMP) and others have cited this requirement as a significant impediment to preserving trees in urban areas, particularly for those properties that are zoned for high density.

**Title 3** protects the region's health and public safety by reducing flood and landslide hazards, controlling soil erosion and reducing pollution of the region's waterways. Title 3 implements Statewide Planning Goals 5, 6 and 7 by protecting streams, rivers, wetlands and floodplains by avoiding, limiting or mitigating development impacts on these areas. The areas subject to these requirements have been mapped and adopted by the Metro Council, specifically, the FEMA 100-year floodplain and the area of inundation for the February 1996 flood. Title 3 also protects rivers and streams with buffers that are typically 50 feet wide, requires erosion and sediment control, planting of native vegetation on stream banks when new development occurs, and prohibits the storage of new uses of uncontained hazardous material in water quality areas. Title 3 results in significant protection and enhancement of that portion of the urban forest in streams and floodways. Finally, Title 3 establishes performance standards to protect regionally significant fish and wildlife habitat areas to implement Statewide Goal 5.<sup>3</sup>

<sup>1</sup>Burns, C. 2008. **Personal communication on October 6**. Western Forester, Portland General Electric Company. Portland, OR.

<sup>2</sup>Oregon Public Utility Commission. 2009. **Oregon Public Utility Commission Homepage**. Accessed via the World Wide Web: <<http://www.puc.state.or.us/>> on March 26, 2009.

<sup>3</sup>Metro. 2009. **Urban Growth Management Functional Plan**. Accessed via the World Wide Web: <<http://www.oregonmetro.gov/files/about/chap307.pdf>> on March 31, 2009.

<sup>4</sup>City of Tigard. 2009. **Comprehensive Plan (as of April 22, 2009)**. City of Tigard, OR, Community Development Department, Long Range Planning Division. 230p.

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**Title 12** of the functional plan protects residential neighborhoods by prohibiting cities from increasing density in certain areas and requiring easy access to parks and greenspaces for City residents.<sup>1</sup>

**Title 13** is intended to “(1) conserve, protect, and restore a continuous ecologically viable streamside corridor system, from the streams’ headwaters to their confluence with other streams and rivers, and with their floodplains in a manner that is integrated with upland wildlife habitat and with the surrounding urban landscape; and (2) to control and prevent water pollution for the protection of the public health and safety, and to maintain and improve water quality throughout the region.”<sup>1</sup>

One of the results of Title 13 was the creation in the City of Tigard of 588 acres of habitat designated as “highest” value (i.e. Metro inventoried Class I and II riparian resources within the Clean Water Services Vegetated Corridor). An estimated 370 acres of Class I and II riparian habitat situated outside the Clean Water Services’ vegetated corridor are designated as “moderate” value. In addition, 422 acres of non-Class I and II riparian resources within the City are designated as “lowest” value, including both upland forests and lower-value riparian habitat areas. The highest and moderate value habitat are currently protected through other regulatory processes and agencies such as CWS. The lowest value habitat consists of primarily upland forests and is currently vulnerable to development. Additional ESEE analyses would be required to protect lower value habitat and additional Statewide Planning Goal 5 resources in the future.<sup>2</sup> At the time of the writing of this document, the City of Tigard has proposed budgeting funds in FY2009-10 to protect additional upland tree resources.

#### Clean Water Services

The City collaborates with Clean Water Services (CWS), the surface water management and sanitary sewer system utility for urban Washington County, to protect local water resources. Through CWS Design and Construction Standards, local governments in the Tualatin Basin (including Tigard) developed a unified program to address water quality and flood management requirements for Title 3 of Metro’s Urban Growth Management Functional Plan.<sup>2</sup>

In 2002, the City of Tigard adopted regulations restricting development within, and adjacent to, sensitive water resource areas, including streams, through standards in the CWS Design and Construction Standards. The CWS standards provide for vegetated corridor buffers, ranging from 15 to 200 feet wide, and mandate restoration of corridors in marginal or degraded condition. Native trees over 6 inches in diameter in vegetated corridors are protected, and their removal requires replacement on a tree for tree basis. In addition, land-use applicants proposing development near streams and wetlands are required to prepare a site assessment and obtain approval from CWS prior to submitting a land use application to the City.<sup>2</sup>

<sup>1</sup> Metro. 2009. **Urban Growth Management Functional Plan**. Accessed via the World Wide Web: <<http://www.oregonmetro.gov/files/about/chap307.pdf>> on March 31, 2009.

<sup>2</sup> City of Tigard. 2009. **Comprehensive Plan (as of April 22, 2009)**. City of Tigard, OR, Community Development Department, Long Range Planning Division. 230p. <sup>7</sup> Oregon Public Utility Commission. 2009. **Oregon Public Utility Commission Homepage**. Accessed via the World Wide Web: <<http://www.puc.state.or.us/>> on March 26, 2009.

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The City of Tigard also collaborates in implementing CWS' Healthy Streams Plan (June 2005). The goal of this plan is to improve watershed and stream health for community benefit by recommending a number of policy and program refinements, as well as outlining a capital projects program. The capital projects focus on stream preservation and enhancement, flow restoration, community tree planting, stormwater outfall and culvert replacement. Tigard's Public Works Department is instrumental in achieving the goals of the Healthy Streams Plan through its Surface Water Quality program.<sup>1</sup> Many of goals of the Healthy Streams Plans are met through proper urban forest management activities such as invasive species control and streamside tree canopy restoration.

Large municipalities typically have NPDES permits for their wastewater treatment facilities and for stormwater runoff, called a Municipal Separate Storm Sewer System (MS4) permit. In urban Washington County, which includes the City of Tigard, the permits have been combined and are held by CWS. The combined permit was issued for the entire Tualatin River watershed to guide a basin-wide effort to improve water quality. It requires CWS to submit a Stormwater Management Plan and a Wastewater Management Plan to DEQ. These two plans outline the best management practices that CWS, its member cities, and Washington County commit to employ to reduce pollutant discharges, regulate temperature, and comply with any Total Maximum Daily Load (TMDL) levels that have been established.<sup>1</sup> Trees and urban forests are excellent stormwater managers and contribute to the achievement of water quality goals, yet are not typically addressed in Stormwater Management Plans.

#### Constitutional Takings Issue

In response to the question of whether a tree preservation ordinance constitutes a regulatory taking, the City Attorney has provided the following response:

Oregon courts recognize that regulation of real property can go too far and become tantamount to a government appropriation of property. A regulation which goes too far results in a regulatory taking or inverse condemnation, in violation of Article I, section 18 of the Oregon Constitution. See *Coast Range Conifers, LLC v. State*, 339 Or 136, 117 P3d 990 (2005); *Boise Cascade Corp. v. Board of Forestry*, 325 Or 185, 935 P2d 411 (1996); *Dodd v. Hood River County*, 317 Or 172, 855 P2d 608 (1993).

The approach of courts under the Oregon Constitution “has been to ask whether the regulation leaves the owner with any economically viable use of the property.” *Coast Range Conifers*. “Additionally, the court has recognized that regulations that deny an owner the ability to put his or her property to any economically viable use will result in a taking and entitle the owner to compensation.” *Id*; see also *Dodd* (phrasing test as whether property retains “some substantial value”).

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<sup>1</sup>City of Tigard. 2009. **Comprehensive Plan (as of April 22, 2009)**. City of Tigard, OR, Community Development Department, Long Range Planning Division. 230p.

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Whether there remains any economically viable use of property is based on the effect of the regulation as specific to the characteristics of any property at issue. Therefore, it is imperative that when utilizing the Urban Forest Master Plan as a tool to guide the drafting of regulations, that the City Attorney be consulted regarding the constitutionality of the specific regulations in light of any new jurisprudence on the topic.

## City of Tigard Urban Forestry Policy Framework

The City of Tigard has various policies and laws that frame and implement the urban forestry program.

### Comprehensive Plan

The City of Tigard Comprehensive Plan acts as the City's "land use constitution." It is the document that provides the broad policy basis for Tigard's land use planning program and ultimately guides all actions relating to the use of land in the City. The Plan also signals that the City's land use planning efforts will implement state and regional requirements, including Oregon's land use planning goals and related laws, state administrative rules, and applicable Metro plans and requirements. The Comprehensive Plan contains goals, policies and recommended action measures that identify the intent of the City to accomplish certain results. The Urban Forest Section of the Comprehensive Plan contains **two (2) goals, 22 policies, and 11 action measures specific to urban forestry in Tigard.** The goals and policies are obligations the City wishes to assume. The City must follow relevant goals and policy statements when developing other plans or ordinances which affect land use. Therefore, the Urban Forestry Master Plan and future revisions to the tree ordinance must be consistent with Comprehensive Plan goals and policies. Recommended action measures support the obligations to achieve a desired end, but do not signify an obligation themselves. The discretion to what degree Plan policies are implemented belongs primarily to the City Council.

### Zoning Map

The Zoning Map implements the Comprehensive Plan and guides development throughout the City. Zoning determines the type and intensity of development, as well as applicable Code provisions such as density requirements. As a result, zoning can impact the extent and feasibility of tree preservation for a given site.

### Code Provisions

The Tigard Municipal Code and Development Code contain specific provisions that regulate trees and urban forestry in Tigard. The following is a list of the major tree and urban forestry related Code provisions, as well as commentary on those provisions that present administrative challenges.

Chapter 7.40 (Nuisances) requires property owners to maintain minimum branch clearances of eight (8) feet over sidewalks and ten (10) feet over streets (section 7.40.060.A). It also prohibits owners from retaining dead or hazardous trees that threaten public or private property (section 7.40.060.B). However, there is no procedure established for abating hazards on private property such as trees that are in imminent danger of falling.

Section 7.40.050 (Noxious Vegetation) requires property owners to maintain vegetation and weeds so that they do not become unsightly or a hazard. However, it is unclear if invasive species control is required by this Code provision.

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Section 7.40.090 (Greenway Maintenance) establishes standards for greenway maintenance and prohibits the removal of non-hazardous trees over five (5) feet in height in greenways. However, the term “greenway” is not well defined.

Chapter 9.06 (Trees on City Property) regulates the planting, maintenance, and removal of trees on City property including parks and public right-of-ways. It also authorizes Council to adopt by resolution a Tree Manual that provides detailed tree related standards and the City to create an approved Street Tree List. The Chapter defines a “tree” as a standing woody plant with a trunk diameter of two (2) inches at 4.5 feet above ground level. Chapter 18.790 (Tree Removal) defines a “tree” at six (6) inches in diameter at four (4) feet above ground level.

Section 9.06.030 (Tree Planting) requires written permission from the City prior to planting street trees or trees on public property. Section 9.06.050 (Tree Protection) requires development projects on City property to protect trees according to the specifications in the Tree Manual. Section 9.06.060 (Removal of Hazardous Trees from City Property) obligates the City to inspect reports of hazardous trees on City property and prioritize their removal based on the level of hazard.

Section 9.06.070 (Removal of Trees from City Property) requires written permission for tree removal from City property and right-of-way, and requires mitigation per the requirements in the Tree Manual.

The Tree Manual, which was adopted in 2002, provides detailed specifications for Chapter 9.06. However, administering the provisions in the Tree Manual are challenging because there are some conflicts with Code provisions elsewhere in the City Code. For example, street tree planting specifications in section 030 of the Tree Manual are different than the street tree planting specifications in Chapter 18.745 (Landscaping and Screening). Also, the branch clearance requirements for sidewalks and streets in the Tree Manual are different than those in Chapters 7.40 and 18.745. Finally, referencing the Tree Manual is a challenge because the index at the beginning of the Manual does not correspond with the sections in the body.

A tree plan and mitigation is required by sections 070 and 090 of the Tree Manual, but there it is unclear what triggers the tree plan requirement and what the scope of the tree plan should be.

Chapter 9.08 of the Municipal Code contains the requirements for the City's Heritage Tree Program. The Chapter recognizes and protects trees or stands of trees on public or private property that are designated to be of landmark importance due to age, size, species, horticultural quality or historical importance. Participation in the program is voluntary and administered by the Tree Board, City Council, and staff.

Title 18 (Community Development Code) defines a tree as a standing woody plant with a trunk that is two (2) inches in diameter at four (4) feet above the ground. This definition is inconsistent with the definitions of tree in Chapter 9.06 and 18.790 of the Code.



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Chapter 18.330 (Conditional Use) authorizes the hearings officer to require conditional use developments to improve landscaping and increase tree and habitat preservation as a condition of development approval.

Chapter 18.350 (Planned Developments) states as one of its purposes “to preserve to the greatest extent possible the existing landscape features and amenities (trees, water resources, ravines, etc.) through the use of a planning procedure (site design and analysis, presentation of alternatives, conceptual review, then detailed review) that can relate the type and design of a development to a particular site”. Specific provisions in the Chapter require plans that identify areas of significant natural resources and methods for their maximized protection, preservation, and/or management. Planned Developments are approved by a Type III process by the Planning Commission. Therefore, Planning Commissioners have discretionary authority to require that sites are developed in a manner that trees and other natural features are incorporated into the project design. However, the Home Builders’ Association of Metropolitan Portland (HBAMP) and others have commented that the Planned Development provisions are in need of revision because they are not conducive to infill development.

The approval criteria in Site Development Review section 18.360.090, includes many provisions requiring the preservation of trees and natural areas. For example, approval criteria A.2.a requires buildings to be “. . . located to preserve existing trees . . . where possible based upon existing site conditions”. The approval criteria also requires trees to be preserved to the extent possible (A.2.b) and the use of innovative methods to preserve fish and wildlife habitat located on the “Significant Habitat Areas Map”. Site Development Review applications are reviewed and approved by staff through a Type II process which limits the amount of staff discretion. Therefore, the non-specific approval criteria above does not provide the tools needed to implement tree and habitat preservation.

Chapter 18.370 (Variances and Adjustments) allows for Type I adjustments to use existing trees as street trees or to vary from the street tree requirements in Chapter 18.745 (Landscaping and Screening) if there are space constraints.

Section 18.385.040 (Sensitive Land Permits) requires development within the 100-year floodplain, steep slopes, drainageways, and wetlands to obtain permits to preserve the safety and functionality of these areas. Tree Removal permits are required for the removal of trees in sensitive lands by section 18.790.050 of the Code. However, there is no tree protection plan requirement (section 18.790.030) for development within sensitive lands.

Chapters 18.510, 18.520, and 18.530 describe the development standards for residential, commercial (including mixed use), and industrial zones respectively. Among the provisions are minimum landscaping requirements, minimum and maximum density requirements, minimum building setback requirements, and minimum lot sizes and dimensions. These standards may have the greatest impact on the extent of tree and forest retention during development.

Chapters 18.620 (Tigard Triangle Design Standards), 18.630 (Washington Square Regional Center Design Standards) and 18.640 (Durham Quarry Design Standards) increase the caliper size of all required landscape and street trees

## APPENDIX H

in those planning areas. Some of the planting provisions in these special planning areas conflict which make interpretation difficult. For example, the landscaping and screening provisions in section 18.620.070, require tree spacing at a maximum of 28 feet on center. However, the provisions on page 18 of the Triangle Design Standards specify one parking lot tree for every seven parking spaces (this creates spacing of more than 28 feet on center). In addition the definition of tree types on page 18 are overly specific and therefore difficult to apply.

Chapter 18.745 (Landscaping and Screening) specifies street tree, parking lot tree, buffer tree, and other landscaping requirements. The Chapter specifies that it is applicable to all development, but it does not detail what types of permits trigger the standards. The landscaping provisions are administratively applied to those developments that require a tree plan (section 18.790.030). The General Provisions (Chapter 18.745.030) require trees and landscaping to be appropriately planted, pruned, maintained, and protected during development. However, there is a lack of specificity in these requirements that make it challenging to ensure that trees and landscaping are properly installed, protected, and maintained. Section 18.745.040 (Street Trees) specifies the location and spacing of variously sized street trees. However, these specifications differ from those in section 030 of the Tree Manual. Also, there is no minimum spacing requirement for street trees and the branch clearance requirements for sidewalks and streets in Chapter 18.745.040 are different than those in Chapter 7.40 and in the Tree Manual. Section 18.745.050 (Buffering and Screening) requires trees and landscaping to be used as a buffer between differing land uses, aesthetics, and to provide shading for parking lots. The parking lot tree requirements (18.745.050.E) have not resulted in successful shading of parking lots. This is likely due to the limited soil volumes the provisions allow (minimum parking island dimensions are three feet by three feet) and the lack of specificity on installation requirements (e.g. irrigation is not specified for parking lot trees).

The Sensitive Lands Chapter 18.775 protects sensitive lands for safety, functionality, and fish and wildlife habitat. It also implements “Clean Water Services (CWS) Design and Construction Standards”, the “Metro Urban Growth Management Functional Plan”, “Statewide Planning Goal 5 (Natural Resources)” and meets the National Flood Insurance Program requirements. The chapter requires a CWS Stormwater Connection permit when tree removal occurs in sensitive lands (section 18.775.020.A.9). Lawns and gardens are permitted in sensitive lands except in “CWS Water Quality Sensitive Areas or Vegetated Corridors” and “the Statewide Goal 5 vegetated corridor established for the Tualatin River” (18.775.020.B.1). Exemptions from the provisions of the sensitive lands chapter are emergency repair, stream restoration projects, non-native vegetation removal, and routine maintenance as long as they comply with City Standards and Specifications for Riparian Area Management (section 18.775.020.C). Section 18.775.020.D requires development to obtain permits from regulating jurisdictions such as the Army Corps of Engineers or CWS prior to development in jurisdictional wetlands. Section 18.775.070 specifies the approval criteria for sensitive lands permits. Section 18.775.100 allows for adjustments to dimensional standards such as setbacks, building heights, or lot areas to preserve habitat and vegetation cover such as trees. Section 18.775.110 allows for density transfers in order to better protect vegetated corridors. While tree removal permits are required for sensitive lands areas by section 18.790.050, and habitat protection is a stated purpose for the sensitive lands chapter, there are no implementing provisions in either Code Chapter that explicitly require the protection of trees and forests in sensitive lands.

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Chapter 18.790 (Tree Removal) is what most people think of as the “Tree Code”. This portion of the code regulates tree removal and replacement during certain types of development projects, requires tree removal permits for trees in sensitive lands, and prescribes the penalties for illegal tree removal. It also prohibits commercial forestry within the City limits. Section 18.790.020 provides definitions for some of the words used in the Chapter. Many have commented that some of the definitions need revision or clarification. For example, a “tree” is defined as a woody plant with a diameter of six inches when measured four feet above the ground. This definition is inconsistent with the definition of tree in the Municipal Code and does not account for trees that are less than six inches such as required mitigation trees. Also, the definition of “hazardous tree” is non-specific and could potentially include trees that are not intended to be defined as hazardous such as those in a forested area with little potential of striking people or other high value targets. Finally, the definition of commercial forestry is specific to the removal of 10 or more trees for sale per acre, per year. The definition is unclear whether the acreage should be measured for the entire property, or for the stand of trees where the removal is occurring.

Section 18.790.030 (Tree Plan Requirement) requires a tree protection, removal, and replacement plan for Subdivision, Partition, Site Development Review, Planned Development, and Conditional Use projects. Missing from the list are Sensitive Lands projects, building additions, demolitions, and other development projects with significant potential to result in tree damage or removal.

Tree plans require mitigation for tree removal on an “inch for inch” basis. Therefore, developers are required to replant the number of diameter inches of existing trees removed from a development site with an equivalent amount of diameter inches of replacement trees. For example, if a 24 inch tree is removed from a development site, the City may require replacement with up to 12, two inch diameter trees.

Also, as the percentage of trees removed from a site is increased, the percentage of replacement trees required for mitigation is increased. This has resulted in the overplanting of development sites to meet mitigation requirements as well as the preservation of inappropriate trees in order to avoid mitigation requirements.

If developers are unable or unwilling to plant replacement trees, there is a fee in lieu of planting option (18.790.060.E) to cover the City’s cost of replanting. This fee is currently assessed as \$125 per diameter inch removed, and viewed as excessive by many of those in the development community. Also, the methodology used to create the fee in lieu is not well defined and has resulted in many questions as to the legitimacy of the \$125 per inch figure.

The tree protection requirements of the tree plan are not defined, and are left to the discretion of the project arborist. This has resulted in wide inconsistencies between protection methods for development projects, and limits the City’s ability to require increased levels of tree protection.

Trees removed within a period of one year before a development application are required to be inventoried and mitigated as part of the tree plan. This provision has created a loophole that some developers have exploited by

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removing trees from a site, waiting one year, and then submitting a development application in order to avoid tree mitigation requirements.

Section 18.790.040 (Incentives for Tree Retention) provides developers incentives and flexibility options in order to preserve trees. However, the incentives are seldom utilized, and often criticized for their impracticality. Many in the development community have called for an overhaul of the incentives so that they are more appealing and practical for developers.

Section 18.790.040.B requires preserved trees to be protected after development through a deed restriction. This requirement is difficult for City staff to administer as development plans are archived and difficult to quickly and easily assess in responses to inquires that occur years and decades after development.

Section 18.790.050 (Permit Applicability) requires tree removal permits for trees in sensitive lands areas. However, the approval criteria relate strictly to erosion control and not the other benefits provided by trees. Therefore, if an appropriate erosion control plan is provided by the applicant, any or all trees may be removed from sensitive lands areas. While hazardous trees are exempt from permit requirements, there is not a clear definition of what constitutes a hazardous tree and who is qualified to deem a tree hazardous.

Section 18.790.060 (Illegal Tree Removal) outlines the penalties for illegal tree removal and specifics the tree replacement requirements for violations and mitigation. The tree replacement requirements in 18.790.060.D are vague and difficult to administer. The most challenging aspect is the lack of spacing requirements, which further contributes to overplanting and lack of adequate spacing for mitigation trees. There is also little specificity on species requirements, which tend to lead to the planting of small stature and narrow crowned trees so that more trees can be planted to meet the “inch for inch” replanting requirements. Finally, the fines for illegal tree removal include the appraised value of the tree illegally removed. This can be challenging when there is not clear documentation of the previous condition of the tree. One solution may be to set a minimum penalty for cases where there is no evidence of the species or condition of the illegally removed tree.

Section 18.810 (Street and Utility Improvement Standards) specifies the minimum planting strip width for street trees (5 feet per table 18.810.1) and allows for adjustments to street standards to protect trees, habitat areas, and other existing natural feature (section 18.810.030.7). Section 18.810.070.C allows adjustments to planting strip widths to protect existing trees and natural features. Currently the City adheres to standard specifications for street widths from curb to curb regardless of existing trees and natural features. The City does actively allow adjustments to sidewalk and planter strip standards in order to preserve trees. Finally, the five foot standard planter strip width limits the selection of large stature street trees due to the high likelihood of tree root damage to curbs and sidewalks. There are currently no street tree planting specifications such as the use of root barriers aimed at reducing future tree root conflicts.

## Findings from City of Tigard Policy Framework:

- The Comprehensive Plan complies with State and Regional requirements and contains two (2) goals and 22 policies specific to urban forestry that must be adhered to when developing other urban forestry plans or ordinances which affect land use.
- The Zoning Map implements the Comprehensive Plan, and frames the type and intensity of development for various areas of the City. Code provisions in Chapter 18.500 provide specification for development based on development in the various zones. These Development Code provisions may have the greatest impact on the extent of tree and forest retention during development.
- Tree and forest related Code provisions are scattered throughout the Municipal Code and the Development Code. Some of the Code provisions in the Municipal Code and Development Code conflict.
- Tree provisions in Chapter 7.40 (Nuisances) of the Municipal Code address hazardous trees and vegetation. There is lack of specificity in the provisions, thus limiting their ability to be enforced. There is also no program established to abate immediate hazards.
- Chapter 9.06 (Trees on City Property) of the Municipal regulates public trees. The Chapter contains definitions and requirements that conflict with those in the Development Code. The Chapter and associated Tree Manual also lack specificity regarding when the Code provisions are applicable and how they can be met.
- Chapter 9.08 regulates the City's Heritage Tree Program and is a functional Chapter.
- Many Chapters in the Development Code contain aspirational statements regarding tree and habitat preservation, but few implementing provisions that specifically require preservation.
- Chapters 18.620 (Tigard Triangle Design Standards), 18.630 (Washington Square Regional Center Design Standards) and 18.640 (Durham Quarry Design Standards) contain provisions that increase the type and size of landscaping in these districts. Some of the provisions within the Chapter conflict.
- Chapter 18.745 (Landscaping and Screening) specifies street tree, parking lot tree, buffer tree, and other landscaping requirements during development. The Chapter lacks a level of specificity to ensure that trees are properly installed, protected, and maintained after development. Planting and maintenance provisions differ from those in the Municipal Code, and parking lot tree requirements have not been successful at providing long term canopy.
- Chapter 18.775 (Sensitive Lands) protects steep slopes, drainageways, floodplains, and wetlands from development. Trees and forests located on sensitive lands are therefore protected as well.
- Chapter 18.790 (Tree Removal) regulates tree removal and replacement during certain types of development projects. Some development such as development in sensitive lands and building additions are not subject to the Chapter's provisions even though there is significant likelihood that trees will be impacted.
- Some of the definitions within Chapter 18.790 are inconsistent with those in the Municipal Code and lack clarity making them difficult to administer.

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- Mitigation for tree removal on an “inch for inch” basis is required by Chapter 18.790, and seen as excessive by many in the development community. It also contributes to overplanting of trees.
- The fee in lieu of mitigation tree planting is \$125 per caliper inch, which is also seen by developers as excessive. The methodology used to create the fee in lieu is not well defined and has resulted in many questions as to its legitimacy.
- There is a loophole in Chapter 18.790 that some developers have exploited by removing trees from a site, waiting one year, and then submitting a development application in order to avoid tree mitigation requirements.
- Incentives for tree preservation in Chapter 18.790 are not appealing or practical for developers.
- Tree Removal permits are required for trees in sensitive lands by Chapter 18.790, but the approval criteria do not require preservation as long as erosion is adequately controlled.
- Penalties for illegal tree removal in Chapter 18.790 can be challenging to apply when the condition and species of the tree removed are not known.
- The tree replacement guidelines in Chapter 18.790 lack specificity and are difficult to administer, especially with regards to species and spacing requirements.
- Throughout the Code, tracking of protected trees is a continual challenge in the years and decades after development is complete.

**CITY OF TIGARD, OREGON  
TIGARD CITY COUNCIL  
RESOLUTION NO. 09- 69**

A RESOLUTION ACCEPTING THE CITY OF TIGARD'S URBAN FORESTRY MASTER PLAN

WHEREAS, the Urban Forestry Master Plan supports the City Council's Goal of implementing the Comprehensive Plan; and

WHEREAS, an analysis of past and current urban forest conditions and City management practices was completed to identify program strengths, weaknesses, opportunities, and constraints; and

WHEREAS, urban forestry surveys, interviews, meetings and workshops were completed to identify stakeholder and community preferences; and

WHEREAS, the Urban Forestry Master Plan was completed by the Citizen Advisory Committee appointed by Council; and

WHEREAS, Planning Commission reviewed the Urban Forestry Master Plan and found it to be consistent with and supportive of the Comprehensive Plan; and

WHEREAS, Council has reviewed the Urban Forestry Master Plan; and

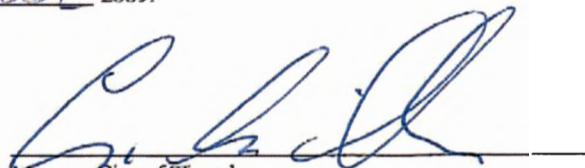
WHEREAS, the Plan before Council sets realistic timelines and provides a balanced framework for implementing updates to the City's urban forestry codes, policies and programs.

NOW, THEREFORE, BE IT RESOLVED by the Tigard City Council that:

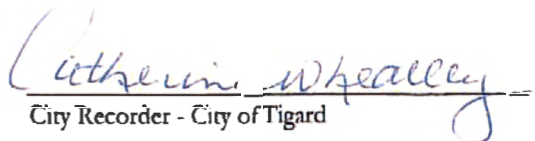
SECTION 1: The Council accepts the City of Tigard's Urban Forestry Master Plan (Exhibit A).

SECTION 2: This resolution is effective immediately upon passage.

PASSED: This 16<sup>th</sup> day of November 2009.

  
Mayor - City of Tigard

ATTEST:

  
Catherine Whealley  
City Recorder - City of Tigard

RESOLUTION NO. 09- 69

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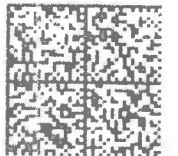
Associate Planner Marissa Daniels  
City of Tigard Community Development  
13125 SW Hall Boulevard  
Tigard OR 97223

DEPT OF

FEB 01 2013

LAND CONSERVATION  
AND DEVELOPMENT

**ATTN: PLAN AMENDMENT SPECIALIST  
DEPT OF LAND CONSERVATION & DEV.  
635 CAPITOL STREET NE SUITE 150  
SALEM OR 97301-2540**



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