



How to Calculate Tree Density

Calculating Tree Density on Residential Properties

1. All pieces of property, regardless of zoning or use, within the City of Olympia are required to maintain a minimum tree density (OMC 16.60.080). The density requirement is 30 tree units per acre.
2. Units are derived from the size of a tree (measured by DBH, or diameter of the trunk taken at 4.5 feet from the base).
3. The tree unit chart can be found in the Urban Forestry Manual on page 15. Examples:
 - a. 1"-6" DBH = 1 tree unit.
 - b. 16" = 3 tree units
 - c. 19" = 4.5 tree units

4. Calculating tree density. Example: A residential property is .5 acre.
 $.5 \times 30 \text{ tree units/acre} = \text{a required minimum tree density of 15 tree units.}$

The property has on it two 20" Douglas-fir trees, one 15" Red oak, and two 8" alders.

- a. 20" Douglas-fir = 5 tree units x 2 (trees) = 10 tree units
- b. 15" Red oak = 2.5 tree units
- c. 8" Alder = 1.5 tree units x 2 (trees) = 3 tree units

Total tree units on site: $10 + 2.5 + 3 = 15.5 \text{ tree units.}$

Minimum tree density is met.

5. Tree Removal Permits. A tree removal permit is only required when the proposed trees for removal will drop the property below the minimum tree density requirement.
Example: A residential property is .25 acre. $.25 \times 30 \text{ tree units/acre} = 7.5 \text{ required tree units.}$ The property currently has 3 Douglas-fir trees that each measure 18" DBH.
 $18" \text{ DBH} = 4 \text{ tree units} \times 3 \text{ (trees)} = 12 \text{ tree units.}$

The owner of the property wants to remove 2 of the trees: $12 \text{ tree units} - 8 \text{ tree units} = 4 \text{ tree units.}$
Because four tree units will not meet the minimum density requirement of 7.5 units, a *permit is required.*

The property owner must submit their proposed removal plan for review by the Urban Forester. There is a \$50 review and permit fee. If the property will drop below the minimum tree density, the plan must include replacement trees.

6. Replacement trees are worth 1 tree unit. To maintain tree density, in the above example, the property owner would need to submit a replacement plan which includes planting 4 trees to satisfy the minimum tree density requirement.

7. Newly planted trees must meet a minimum size requirement:
 - a. 1.25" caliper for deciduous trees*
 - b. 4' tall for conifer trees*

*Residential properties—for commercial, industrial, multi-family, see the Urban Forestry Manual, page 16.
8. Exemptions. Tree removal that does *not* drop a property below the minimum required tree density, is exempt from a tree removal permit.
9. Example: A residential property is .16 acre, with one 15" red maple, one 8" purple-leaf plum, and two 6" apple trees on it. Minimum tree density is (.16 x 30) 5 tree units. The existing trees on site total 7 tree units.

The owner wants to remove the purple-leaf plum, worth 1.5 units.
 $7 - 1.5 = 5.5$ tree units, so this tree removal is exempt. Even with removal of the purple-leaf plum the parcel still meets the minimum tree density. No tree removal permit is needed.

Note: In some cases, it takes just one BIG tree to meet tree density on a small, urban lot.

Example: a property is .16 acre. Required minimum tree density is 5 tree units. One BIG Douglas-fir measuring 21" DBH = 5.5 tree units. Technically, all other trees on the property can be removed and are exempt from requiring a permit.

This form has been approved for use by the Olympia Community Planning and Development (CPD) Department.



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12/1/2016

Date