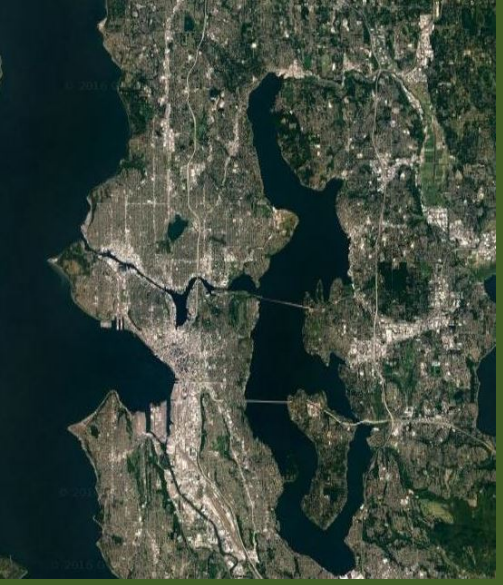
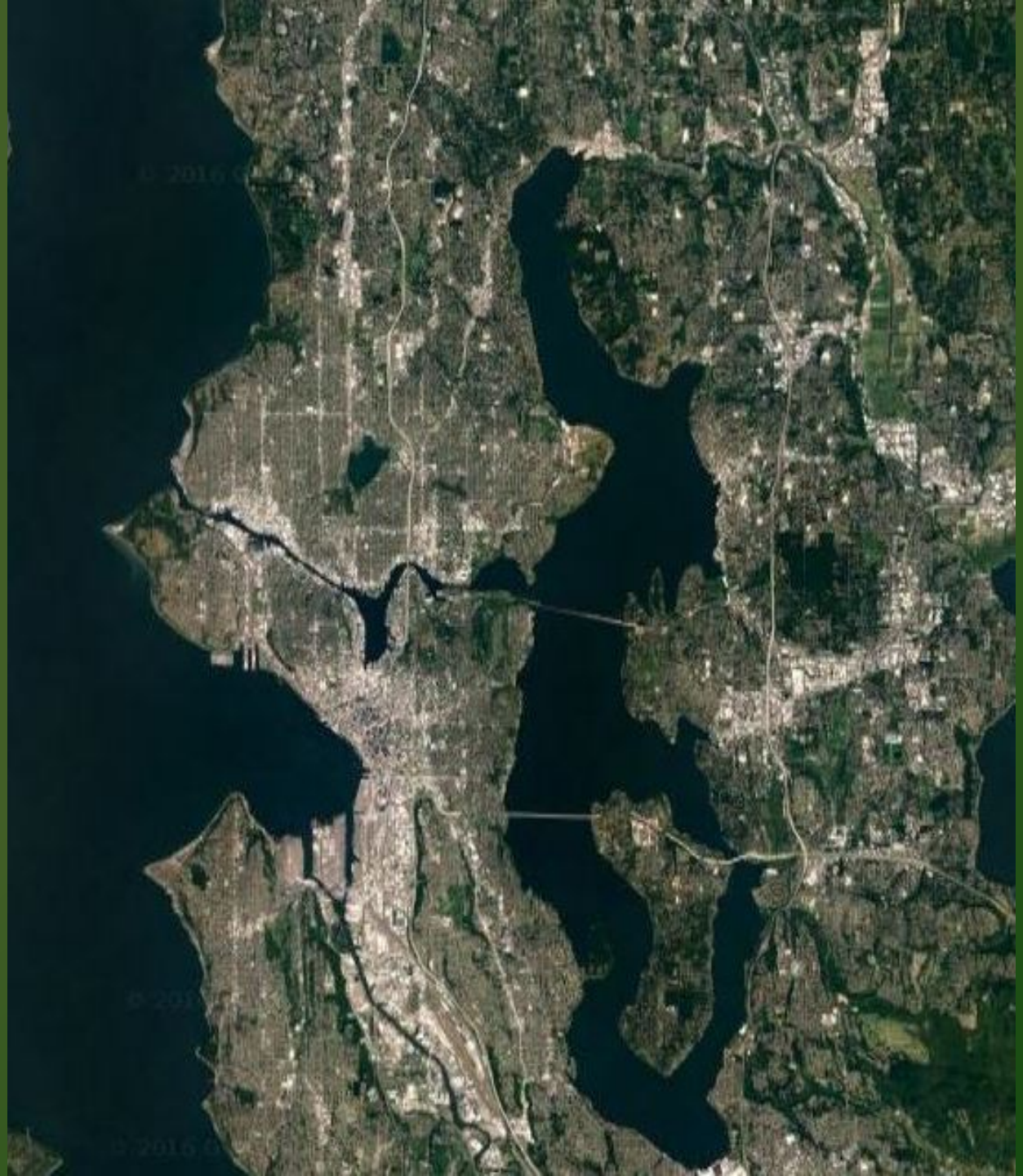


Trees in Cities: Value, Benefits, and Maintaining Tree Health During Development

University of Washington
Botanic Gardens

Raymond J. Larson, M.S.
Curator of Living Collections



Economic Value

- Increasing tree canopy cover is one of the most cost-effective ways to reduce urban heat islands and conserve energy for heating and cooling buildings (McPherson and Simpson, 2003; Rosenfeld et al., 1998; Rosenzweig et al., 2006)
- Property values in tree lined business areas may be up to 6 percent greater than in similar areas without trees (Wolf, 1998)
- Consumers are willing to pay 9 percent more in small cities for equivalent goods and services in business districts having trees (Wolf, 2009)

Economic Value

- Property values of homes with trees are 7 percent higher than homes without trees (Wolf, 2010)
- Large, healthy trees increase residential property values an average of 19 percent (Martin et al, 1989)

Health Value

- The presence of trees and green spaces in cities is associated with increases in perceived consumer friendliness, and sense of well-being (Payton et al., 2008; Wolf, 2005)
- Views of trees and nature from homes and offices provide restorative experiences that ease mental fatigue and help people concentrate (Kaplan and Kaplan, 1989)

Health Value

- A series of studies on human stress caused by general urban conditions and city driving show that views of nature reduce the stress response of both body and mind (Parsons et al., 1998)
- A number of studies have found an association between access to green space and human health (Gidlof-Gunnarsson and Ohrstom, 2007; Maas et al., 2006)

Environmental Benefits

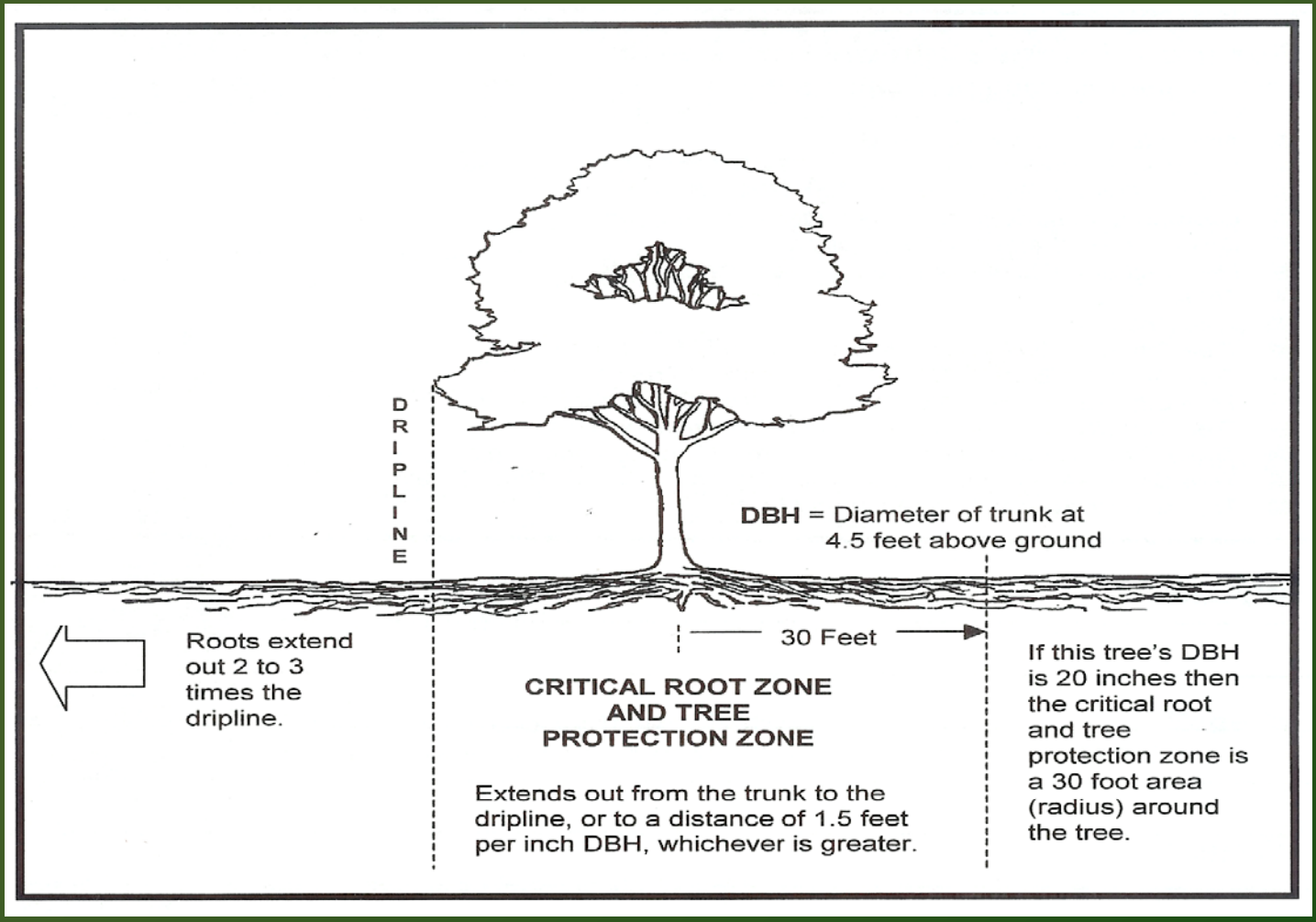
- Although urbanized areas account for 3 percent of total land area and 81 percent of total population in the US (Cox, 2012), Heath, Smith, Skog, Nowak, and Woodall (2011) found that trees in US cities sequester about 14 percent of the amount of carbon sequestered by all US forests
- Trees contribute to water quality, air quality (capturing air-borne pollutants, releasing oxygen), temperature regulation (shade in summer, windbreaks in winter), etc.

Maintenance Factors

- An uneven-aged tree population allows managers to allocate maintenance costs uniformly over many years, and assures a consistent stream of benefits from stable tree canopy cover (McPherson and Kotow, 2013)
- A statewide sample in California found that $5.82 in benefit to municipalities is returned for every $1 spent. (McPherson, van Doorn, de Goede, 2016)

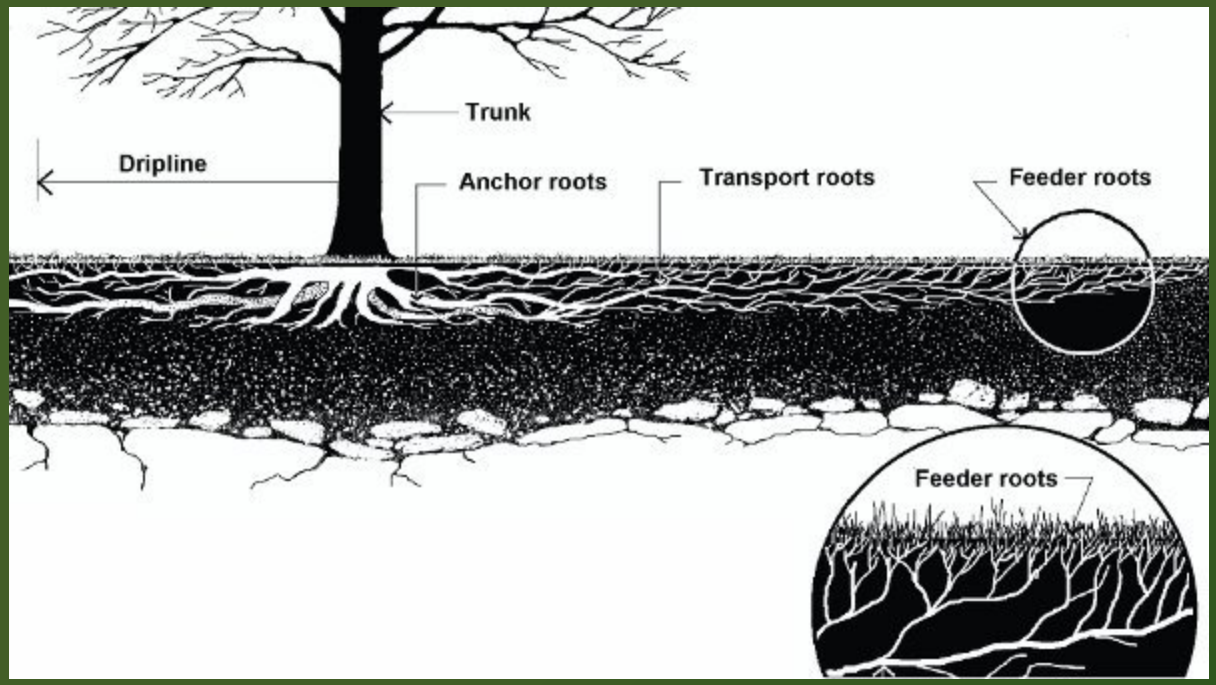
Tree Care

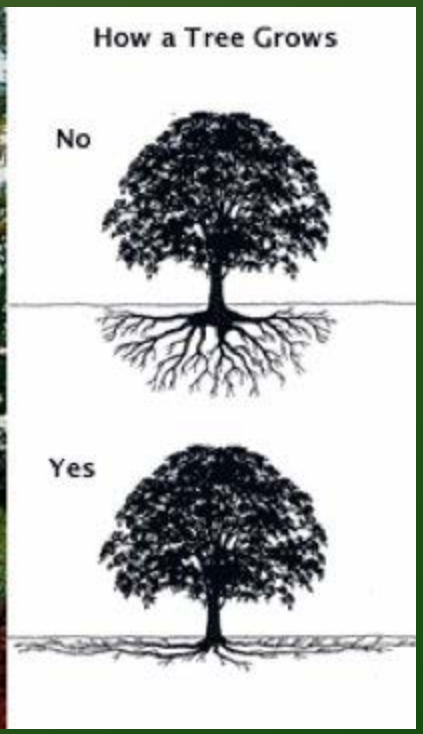
- Trees need soil
  - Roots often extend 2.5 times beyond the drip line
- Tree roots need air and water to live
- 95 percent of tree roots are within 18 inches of the surface
- Most species have a shallow root system


DRIPLINE
DBH = Diameter of trunk at 4.5 feet above ground
Roots extend out 2 to 3 times the dripline.
30 Feet
CRITICAL ROOT ZONE AND TREE PROTECTION ZONE
Extends out from the trunk to the dripline, or to a distance of 1.5 feet per inch DBH, whichever is greater.
If this tree's DBH is 20 inches then the critical root and tree protection zone is a 30 foot area (radius) around the tree.

Tree Care During Development

- Trees should be assessed for health during the planning process
- Establish a valuation of trees prior to construction
  - The Guide for Plant Appraisal, authored by the Council of Tree and Landscape Appraisers (CTLA).
- Protect trees from root damage and soil compaction during construction
  - This is absolutely critical





Images: Washington, DC DOT

Tree Care During Construction

- Establish barriers to keep equipment out of Critical Root Zone (CRZ)
  - Do not drive over, park on, stockpile equipment or store fill in CRZ
- Cleanly cut damaged roots during excavation
- Use an air spade if working in CRZ
- Do not remove more than ¼ of root mass

Tree Care During Construction

- Proper pruning
  - Prevent wounds
    - Understand how trees grow and heal
    - Use only ISA certified arborists for tree work
      - Proper pruning and pruning cuts are essential
  - Avoid edge effects
    - Plan ahead for development
    - Trees species behave differently
    - Mitigate wind sail

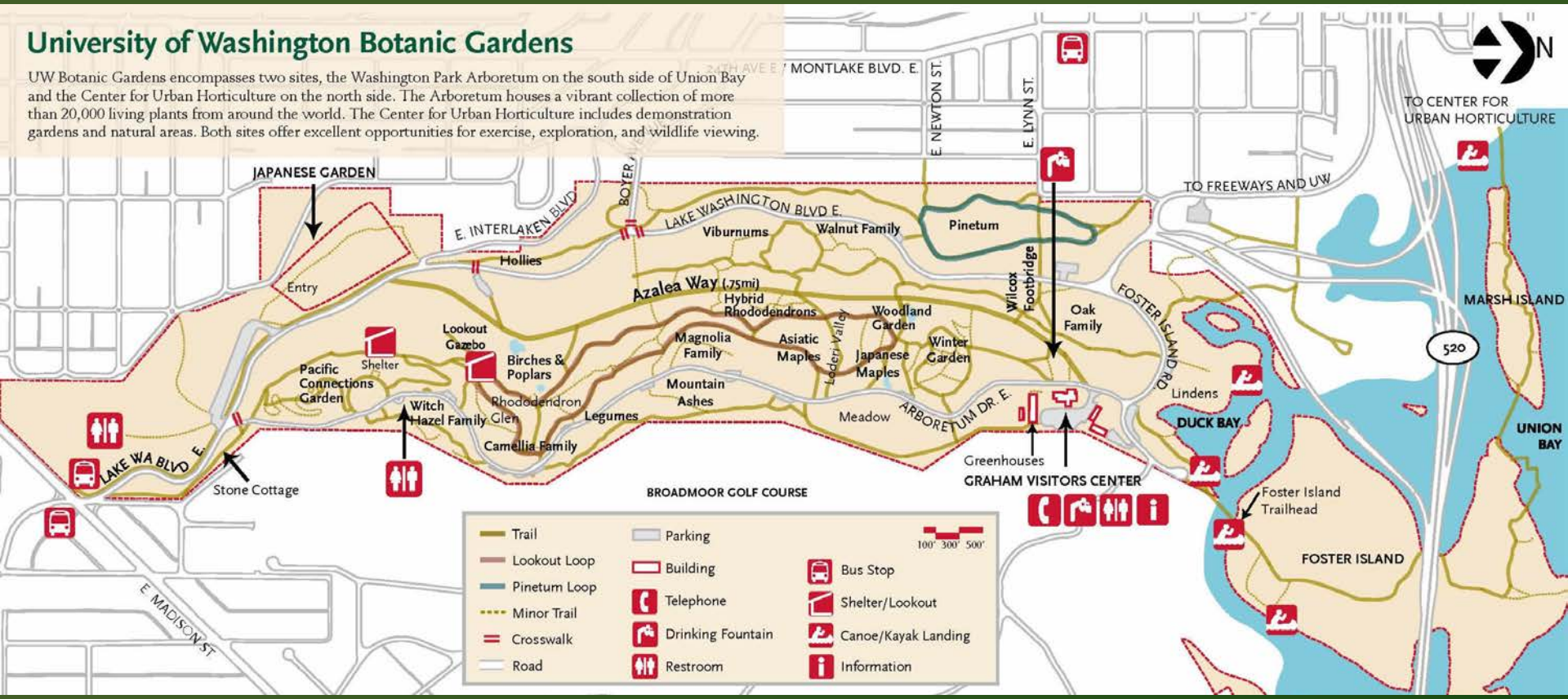
Tree Care in General

- Maintenance
  - Mulching
    - Once a year is best
    - Organic mulch, keep away from trunk, not too deep
  - Watering
    - pay attention to our dry summers, exacerbated in urban conditions
    - Even natives need summer water in urban soil conditions and during establishment
  - Training
    - Proper pruning in youth will pay dividends

Species Diversity

- Diversity is key to a successful, sustainable tree canopy
  - Plant new trees, maintain existing trees, preserve old (healthy) trees
  - More types of trees can be grown in the PNW than other region in temperate North America
  - Right plant, right place
    - A tree for every situation

Visit the UW Botanic Gardens to learn about trees, tree care, and how large tree species will get…



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Thank you

Raymond J. Larson
Curator of Living Collections
halcyon@uw.edu