

Portland's  
**URBAN FORESTRY  
MANAGEMENT PLAN**

---

1995

**Prepared by**  
Portland Parks and Recreation  
and the  
Urban Forestry Management Plan Technical Advisory Committee

**Project Staff**

Nancy Harvey Gronowski, Project Manager – Portland Parks and Recreation  
Sheli Bryan, Graduate Student – Portland State University  
Fouad Elgarabli, Staff – Portland Parks and Recreation  
Geoffrey Sauncy – Graphic Illustrator, Portland Planning Bureau

Funding for this plan was provided by:  
Portland Bureau of Environmental Services  
Portland Parks and Recreation

**Adopted by City Council June 28, 1995**  
**Effective July 28, 1995**  
**Ordinance No. 168979**

**Portland Parks and Recreation**

Charlie Hales, Commissioner-In-Charge  
Charles Jordan, Parks and Recreation Director  
David Judd, Parks and Recreation Deputy Director  
John Sewell, Chief Planner

**Portland City Council**

Vera Katz, Mayor  
Earl Blumenauer, Commissioner  
Charlie Hales, Commissioner  
Gretchen Kafoury, Commissioner  
Michael Lindberg, Commissioner



**July 1995**  
**Printed on Recycled Paper**

### **Technical Advisory Committee**

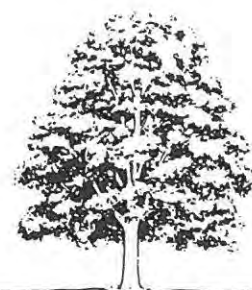
John Alland – Southwest Neighborhood Information  
David Ausherman – Metro Planning Department, Growth Management  
Dick Courter – Soil and Water Conservation Service  
Gail Curtis – City of Portland, Bureau of Planning  
Fred Deis – City of Portland, Bureau of Buildings  
Mike Faha, American Society of Landscape Architects  
Terry Gibson – Home Builders Association  
Greg Goodman – City Center Parking  
Jane Hart – Metro Regional Parks and Greenspaces  
Mike Houck – Urban Streams Council  
Bill Hughes – City of Portland, Office of Transportation  
Dave Johnson, Portland General Electric – Urban Forestry Commission  
Steve Kenworthy – City of Portland, Bureau of Environmental Services  
Barbara Krieg – City of Portland, Office of Transportation, Bureau of Maintenance  
Will Lighty – Oregon Association of Nurserymen  
Jerry Markesino – City of Portland, Office of Transportation, Bureau of Transp. Engineering  
Teri Marshall – Urban Forestry Commission  
Tom McGuire – City of Portland, Bureau of Planning  
Brian McNerney, Urban Forestry Manager – City of Portland, Parks and Recreation  
Pat Moran – Oregon Department of Transportation, Planning Section  
Ray Myer, Tree Care Unlimited – Oregon Landscape Contractors Association  
Curt Nichols – City of Portland, Portland Energy Office  
Joseph Poracsky, Director, Cartographic Center, P.S.U. – Urban Forestry Commission  
Paul Ries, State Urban and Community Forestry Program Manager – Oregon Dept. of Forestry  
Richard Seidman, Executive Director – Friends of Trees  
Chuck Stalsberg – City of Portland, Bureau of Buildings  
Mark Uhrich – US Geological Survey, Water Resources Division  
Alex Wynstra – Former Portland City Forester

### **Urban Forestry Commission**

Bill Naito, Chair  
Jane Glazer  
Teri H. Marshall  
Jerome Caston  
Dave Johnson  
Ann Sullivan  
Joseph Poracsky  
Robert Mazany  
Ed Ceccacci







## TABLE OF CONTENTS

---

<b>EXECUTIVE SUMMARY .....</b>	<b>i</b>
<b>VISION STATEMENT .....</b>	<b>iii</b>
<b>INTRODUCTION .....</b>	<b>1</b>
Need for an Urban Forestry Management Plan .....	1
Purpose of the Plan .....	1
Goals of the Plan .....	2
Information in the Plan .....	3
The Audience .....	3
Summary .....	3
<b>Chapter One: THE URBAN FOREST .....</b>	<b>5</b>
Introduction .....	5
The Urban Forest .....	5
Economic Benefits of the Urban Forest .....	5
Environmental Benefits of the Urban Forest .....	8
Physical and Psychological Benefits of the Urban Forest .....	10
Portland's Urban Forest .....	12
Summary .....	23
<b>Chapter Two: CURRENT ADMINISTRATION AND MANAGEMENT .....</b>	<b>25</b>
Introduction .....	25
Urban Forest Management Framework and Coordination .....	25
Existing Ordinances and Legal Authority .....	34
Relationship to Other Plans .....	40
Summary .....	42
<b>Chapter Three: IMPLEMENTATION PLAN .....</b>	<b>47</b>
Introduction .....	47
Principles .....	47
Recommended Actions – Baseline, Short Term, Long Term .....	49
Making the Vision a Reality .....	69
Summary .....	71

---

<b>Chapter Four: MANAGEMENT UNITS .....</b>	<b>73</b>
Introduction .....	73
New Development Management Unit .....	73
Natural Areas/Stream Corridors Management Unit .....	76
Commercial/Industrial/Institutional Management Unit .....	80
Residential Management Unit .....	84
Parks and Open Spaces Management Unit .....	88
Transportation Corridors and Rights of Way Management Unit .....	91
Summary .....	98

## APPENDICES

Tree Planting Potential Study and Five Year Planting Plan .....	Appendix 1
Planning for Development in the Urban Forest .....	Appendix 2
Landscaping for Wildlife Habitat .....	Appendix 3
Native Plants of Portland .....	Appendix 4
Historic and Heritage Trees .....	Appendix 5
Street Tree Planting and Maintenance Guidelines .....	Appendix 6
Recommended Street Trees .....	Appendix 7
Planting for Energy Conservation and Solar Access .....	Appendix 8
Solar Friendly Trees Report and Fact Sheet .....	Appendix 9
Environmental Zoning Summary .....	Appendix 10
Subunits - Parks and Open Space Management Unit .....	Appendix 11
Subunits - Transportation Corridors and Rights of Way Management Unit .....	Appendix 12
Title 20, Chapter 20.40 Street Trees and Other Public Tree Regulations .....	Appendix 13
Tree Cutting Ordinances #168534 and #168486 .....	Appendix 14



## EXECUTIVE SUMMARY

---

Portland's urban forest is at a critical crossroads. While many areas of the urban forest are in good condition, it is as often by accident as by design. Those areas that receive knowledgeable care are healthy and productive. Other areas are not so fortunate. Development, invasive non-natives, and poor maintenance threaten large portions of the urban forest. Without a comprehensive plan to guide its protection, maintenance and restoration, the City risks degrading an enormously valuable resource, one that is a critical element of both our environment and our infrastructure.

Two documents were prepared as part of this project - a full report with detailed information on the urban forest and appendices, and a brief summary report.

The plans were prepared by staff of Portland Parks and Recreation with the assistance of a Technical Advisory Committee representing a broad cross-section of agencies, landscape and tree professionals, commercial interests and the public. Principal funding for the project came from the Bureau of Environmental Services, with additional funds from Parks and Recreation.

### VALUE OF THE URBAN FOREST

The urban forest provides great value in many different areas. Among them are: increased resale values for residential properties, savings that come from decreased heating and cooling costs, reduction of air pollution, and control of erosion and storm water. It has been estimated that a tree with a 50-year life span provides nearly \$60,000 of dollar-value benefit over its lifetime. A conservative estimate of Portland's street trees alone values them at \$65 million dollars and the whole of Portland's urban forest at more than two billion dollars!

Other benefits are less easily measured, but no less valuable. The urban forest provides beauty that inspires us, recreation that refreshes us and the contact with nature that lifts our spirits. The aesthetic and inspirational value of the hundreds of thousands of trees in Portland's urban forest is incalculable.

### CURRENT CONDITIONS

Portland is extremely fortunate in having a climate that is very conducive to plant growth, but that alone will not ensure that we have a healthy urban forest. At present, the management and care of the urban forest is fragmented or nonexistent. There is little in the way of inventory or data on its distribution. Planting standards and guidelines are not available for many areas of the forest. Property owners perform

most maintenance, often with little information. No coordinated education program exists. Enforcement of regulations is very lax. Administrative efforts are not coordinated.

### **KEY RECOMMENDATIONS**

The plan makes major recommendations in eight areas. One element that is common to all eight areas is the need to coordinate the many activities among the various agencies and groups that manage the urban forest. Creating and filling a position for an urban forestry coordinator is vital to implementing the plan.

Recommended actions in the major areas include:

- Assess and inventory the health and condition of the urban forest;
- Continue to identify planting opportunities and needs; promote and coordinate planting among neighborhood associations, private property owners, non-profit groups, the nursery industry and the City;
- Develop planting and design standards and guidelines for all areas of the urban forest;
- Promote maintenance practices that foster the health of the urban forest;
- Develop a public education program to promote the care, preservation and enhancement of the urban forest;
- Develop and promote incentive programs to encourage compliance with recommendations that improve the urban forest;
- Provide adequate funding to effectively enforce regulations;
- Coordinate the management and administration of the urban forest between the City agencies and other groups that care for, and affect, the urban forest.

### **IMPLEMENTATION**

It will take great commitment and cooperation among all of Portland's citizens to make today's vision of the urban forest into tomorrow's reality, creating a thriving and sustainable urban forest. In this era of intense competition for general fund money, this plan proposes alternate funding possibilities as well as consolidation and improvement of existing services and resources. Suggestions range from establishing new public/private partnerships, to forming tree banks for mitigation, to establishing trust funds.

### **SUMMARY**

The results of our actions, or of our inactions, will be measured in the years to come. If we want a healthy and sustainable urban forest that contributes to the economic and environmental well-being of the City, we must plan for it now.

## **VISION STATEMENT**

### **A VISION FOR THE FUTURE: PORTLAND'S URBAN FOREST IN THE YEAR 2015**

*The view from the eastern plains at the foot of Mt. Hood to the ridgelines of the West Hills is a panorama of a healthy and diverse forest with groves of tall native evergreens that identify Portland as a Pacific Northwest city. The health of this urban forest, a mosaic of the planted landscape and the remaining native forest, is a reflection of the city's health, well-being, and livability. These trees and plants are a vital part of Portland's character, giving it a special sense of place.*

*The urban forest canopy is cohesive, not fragmented, because development includes trees as part of the total vision for sustainable development. The air and water are cleaner because the trees and plants remove pollution from the air and reduce runoff. Open spaces and urban stream corridors define a sense of space in our communities while providing a quiet respite from hectic urban life. Neighborhoods with tree-lined streets offer shade and protect us from inclement weather. Shoppers frequent shaded business districts where trees help save energy, reduce noise, and soften the hard edges of structures and paved areas.*

*Coordinated management of the urban forest occurs because city agencies, businesses, civic organizations and citizens have formed partnerships to make a place for trees in the City. Portlanders recognize trees as a vital, functioning part of the City's infrastructure and ecosystem and provide adequate, stable funding to maintain and enhance the urban forest.*

*We have achieved a healthy, sustained urban forest, carefully managed and cared for, which contributes to the economic and environmental well-being of the City. Portland has made room for trees.*

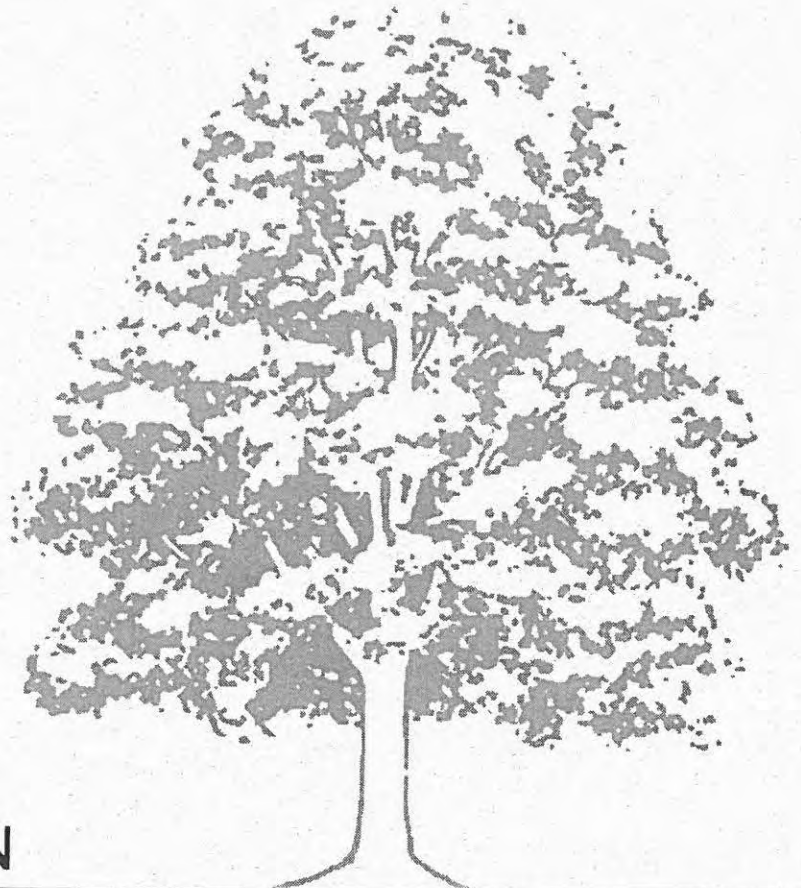






## INTRODUCTION

Need for an Urban Forestry Management Plan  
Purpose of the Plan  
Goals of the Plan  
Information in the Plan



Portland's  
**URBAN FORESTRY  
MANAGEMENT PLAN**

---





# INTRODUCTION

---



## Need for an Urban Forestry Management Plan

Portland's urban forest is at a critical point. While it is in good condition in many areas, it is declining in many other areas. There are conditions throughout the City that threaten our urban forest. Development is the most obvious threat to the wooded hillsides, stream corridors and underdeveloped residential areas of the city – many of which are forested and contribute to the scenic views in and around the City. The urban forest in older established neighborhoods and parks is aging and becoming over mature. Invasive non-native plants threaten many natural areas. Maintenance is often done infrequently or not at all, resulting in harm rather than benefit. The urban forest canopy is unevenly distributed resulting in unequal benefits for the citizens of the City.

*"Trees need to be perceived as an urban requirement and not a decorative afterthought."*

Henry F. Arnold  
*Trees In Urban Design*

The urban forest is a critical part of the infrastructure that provides service as well as beauty to the citizens of the City. While it is easy to take for granted all the positive things that the urban forest does, it is critical that we recognize its value – both in monetary and non-monetary terms.



*Critical part of urban infrastructure*

Without a comprehensive understanding of the urban forest and a coordinated management plan to maintain and enhance it, we risk losing an enormously valuable resource – one that affects our physical, emotional and economic well-being and our quality of life.

## Purpose of the Plan

This plan provides a comprehensive and multi-objective management plan for Portland's urban forest, consistent with various city, state and federal goals and regulations.

*Comprehensive management plan*

The plan recommends methods to manage and care for urban trees and related vegetation on all land within the city limits, both individually and as part of the urban ecosystem, and ways to promote and maintain a healthy and diverse urban forest.

The plan addresses how the urban forest improves air and water quality, promotes energy efficiency, enhances noise control, improves urban livability and aesthetics, fosters the mental and physical health and well-being of its citizens, and promotes and improves wildlife habitat.

Adoption of this plan is the first step in a series of coordinated actions that will lead to the realization of the Vision Statement.

### Goals of the Plan

*What the Plan will accomplish*



*Integrated approach to management*

- Develop an integrated, coordinated approach to the management of the urban forest, which has the support of all concerned organizations, agencies, the business community and citizens.
- Ensure that the protection and management of the urban forest are citywide priorities. The urban forest is part of the City's infrastructure; it is a necessity, not a nicety.
- Secure stable funding and management resources to maintain and enhance the urban forest.
- Maximize and expand the urban tree canopy, where feasible and appropriate, to produce a multi-aged and diverse forest.
- Assure that the urban forest is as self-sustaining as possible.
- Reestablish the native landscape that reflects the natural regional landscape.
- Carry out the plan using education as the primary means of implementation, incentives as the next, and regulations as the last resort.
- Develop a plan that is socially equitable, providing equal benefits to all the citizens of the City.
- Develop a plan that is adaptable and responsive to change, providing benchmarks and schedules for implementation.
- Provide various approaches to implementation, involving all aspects of the community in creative alliances and partnerships.

## Information in the Plan

- Description of Portland's urban forest in 1994-95, including the current management and administration of the urban forest.
- Description of the current ordinances and their strengths and weaknesses.
- Principles of urban forest management.
- Recommended actions on:
  - Assessment
  - Planting Opportunities and Needs
  - Planting and Design Guidelines and Standards
  - Maintenance of the Urban Forest
  - Education
  - Incentives
  - Regulations
  - Administration of the Urban Forest

*What is in the Plan*

## The Audience

This document is for the general public as well as many special audiences including developers and private property owners.

*Who the Plan is for*

For the general public:

- Information on what makes up the urban forest, where it is and the benefits that it provides.

For private property owners, the 'green' industry, and neighborhood groups:

- Information about street tree and landscaping requirements.
- Information about activities in Environmental Zones and natural areas.
- General information about trees and related vegetation.

For developers:

- Requirements for tree preservation and landscaping.
- Information on advantages of preplanning and using tree professionals.

For City Bureaus and related agencies:

- Information on responsibilities of various bureaus who manage different aspects of the urban forest.
- Coordination needed to improve the urban forest.

## Summary

This plan is the first step in a new effort by the City to deal with one of its most important components.



*First step in a new effort*



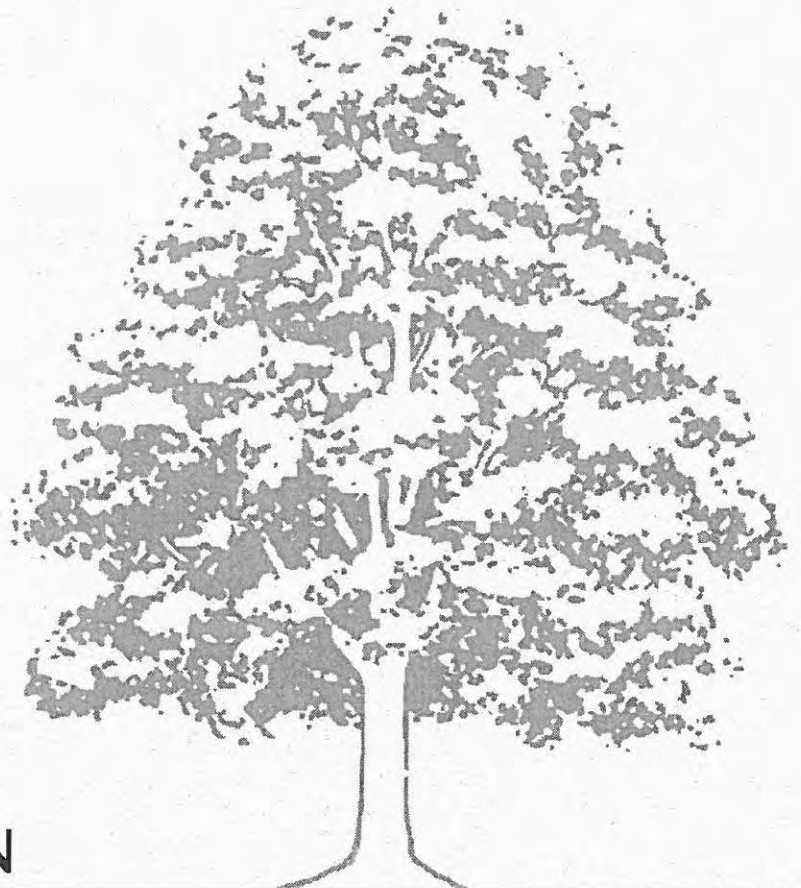
# **Chapter One**

## **THE URBAN FOREST**

**Introduction**  
**The Urban Forest**  
**Economic Benefits of the Urban Forest**  
**Environmental Benefits of the Urban Forest**  
**Physical and Psychological Benefits of the Urban Forest**  
**Portland's Urban Forest**  
**Summary**

**Portland's**  
**URBAN FORESTRY**  
**MANAGEMENT PLAN**

---









# Chapter One

## THE URBAN FOREST

---



### Introduction

This chapter presents background information on the urban forest in general – what it is, how it functions, and why it is important. It also describes Portland’s urban forest and the threats currently facing it.

### The Urban Forest

The urban forest is “the complex system of trees and smaller plants, associated organisms, soil, water, air and people in and around human settlements ranging from rural communities to densely populated metropolitan areas.” It is all the vegetation on the streets, in residential, commercial and industrial areas, in the parks and natural areas. It includes our lawns and our gardens, the trees on undeveloped public and private land, the street trees that line our transportation and utility corridors, and the forested lands and stream corridors within watersheds. While part of the urban forest grows naturally with little or no human interference, much of it is carefully managed and maintained.

The urban forest is a significant part of the environment that people interact with directly and indirectly as part of their daily lives. It is a living part of the urban infrastructure, an element as necessary for the sustainability of the city, as are the highways, utilities and other public services. It is part of the urban ecosystem, the habitat for people, structures, vegetation, and wildlife species. We often take the urban forest for granted, but we need to be aware of its value and importance.

Unlike many parts of the natural forest, the urban forest requires the active intervention of people to survive and to thrive. We must protect and nurture it, providing space, nutrients, maintenance and care.

### Economic Benefits of the Urban Forest

Many studies have shown that the urban forest has tangible benefits that can be measured in dollars and cents. With proper management, these benefits can increase over time instead of deteriorating like other elements of the urban infrastructure.

*What is the Urban Forest?*



*Significant part of our environment*

*Measurable values*



*Increased sales price*

## Enhanced Resale Values

Studies have shown that landscaping with trees is associated with an increase of 3.5% to 4.5% in the sales price of residential properties. Intermediate and large sized trees, regardless of species, have more of an effect than small trees. Because trees are associated with the sales price, this translates to an increase in the tax base for the community as well. Other studies have shown that good tree cover can account for as much as six to 15 percent of the total sales price. Typically, properties with trees sell faster.

*Nearly \$60,000 in  
benefits*

## Annual Dollar-Value Benefit

According to a 1985 study by the American Forestry Association, an urban tree with a 50-year life span provides the following dollar-value benefit for one year:

Air Conditioning	\$73
Erosion & Storm Water Control	\$75
Wildlife Shelter	\$75
Air Pollution Reduction	\$50

The total is \$273 per year. Compounding this amount for fifty years at 5% results in a total savings of \$57,151 over the life of the tree.

## Tree Valuation

The main factor in determining the value of a tree is the size of the tree or the diameter of the trunk. Larger trees are much more valuable than small ones. Some experts have developed the base value of a tree with a 10" diameter trunk (measured at 4.5' above ground level) at \$1,700, while a tree with 30" diameter trunk is valued at about \$15,500. Other factors in determining value are species, location and condition.

*Street trees worth \$65  
million*

A general rule of thumb is that a typical tree in good condition is worth \$100 per inch of trunk diameter, measured at 4.5' from the ground. If one assumes that an average street tree is 5" in diameter, Portland's 130,000 street trees are worth \$65 million dollars. Of course, many areas of the City have street trees that are much larger and more valuable than that.

*Great economic value*

## Economic Value of the Urban Forest

Because of the size and complexity of the urban forest, it is difficult to provide more than an educated guess on its economic value, but the following gives some idea of its great worth.

About half of Portland's urban forest is located in parks. In 1979, Parks and Recreation assessed the value of park trees. This study calculated

aesthetic value according to standards established by the International Society of Arboriculture; timber value, based on current stumpage prices; and cordwood values for trees that did not have lumber qualities. Trees in all parks except Forest Park, and those in other large wild areas and golf courses were rated.

The totals for the study were:

Aesthetic value	\$167,027,545
Lumber value	\$3,044,870
Cordwood value	\$259,535

The total value at that time was \$170,331,950. Using the consumer price index and assuming that tree removals and replacements have resulted in approximately the same number of trees, their value in 1995 dollars is \$318,361,128.

*Park trees worth over  
\$300 million*

This study looked only at developed parks and did not include the annual dollar-value figures noted above. If we include the heavily wooded Forest Park and those other natural areas which make up 6000 acres of the 9600 acres in Parks and Recreation ownership, we could double or triple this estimate to nearly a billion dollars. And this is for only one component of the urban forest!

When we include the street trees and the trees in residential yards, as well as those on unimproved lands throughout the City, we can again double that number to *two billion dollars*. A resource that is well worth our most serious consideration and protection!!

*\$2,000,000,000 -  
A resource worthy of  
protection!*

## **Economic Costs**

While the urban forest provides many economic benefits, there are costs as well. Some of these costs include: the costs to establish and maintain trees and vegetation, the costs to repair parts of the urban infrastructure (sidewalks and utilities) because of conflicts with tree roots, lost opportunities for solar collection, and for activities such as gardening and sports.

It takes resources, both in terms of time, money and effort to care for the urban forest. However, studies have shown that for every dollar spent on the urban forest, \$2.50 worth of value is returned. And it should be noted, many problems can be avoided by planting the right tree in the right place, and then giving it the right care.

*Plant the right tree in the  
right place*

## Environmental Benefits of the Urban Forest

Among the many direct environmental benefits of the urban forest are:

### Air Pollution Reduction

*Cleaner air*

The urban forest removes pollution, both particulates and gases, from the air. Particulates are removed when plants reduce winds, causing the particulates to settle out of the atmosphere under the influence of gravity onto plants or the ground where precipitation washes them into the soil below.

Certain gases such as nitrogen oxides, carbon monoxide, chlorine and fluorine halogens, ammonia, and ozone are removed by absorption and stored in the leaves and needles of some woody vegetation.

While some plants can reduce the effects of air pollution, many other plants have a low tolerance for pollutants. The best method for reducing air pollution comes from controlling the pollutants at their source.

### Erosion Control



*Reduced erosion*

Soils in urban areas can be exposed to erosive forces of nature when construction or overuse damages the natural soil structure. Since the hard surfaces common to urban areas are impervious to water infiltration, the force of water movement is accelerated and the ability of the soil to absorb runoff from rain and snow is reduced. The rapidly moving water erodes the soil, causing serious water pollution problems and the siltation of vital urban waterways.

Plants play a vital role in stabilizing soils and preventing erosion. Their roots hold the soil in place, the plants slow the runoff velocity, and they absorb some of the water.

### Water Quality Improvements

*Reduced need for water treatment*

Costs to treat water are high and getting higher. At the same time, the demand for clean water is increasing. The urban forest can help reduce these problems by intercepting and absorbing surface runoff before it requires treatment, especially in areas along streets and highways and in parking lots.

In some areas, urban forests are used to help clean partially-treated municipal wastewater and to recharge the urban water supply aquifers. Some urban woodlands have been used to filter partially-treated wastewater, and some municipalities irrigate nearby forests and landscape areas with partially-treated effluent.



## Energy Efficiency

The urban forest can have significant impacts on energy needs. A well-designed landscape can increase energy efficiency by reducing heat loss in winter and increasing cooling in summer.

The proper placement of evergreen vegetation can reduce wind velocity that pulls heat out of buildings in the winter. It also can provide an insulating effect by trapping air close to buildings. Using deciduous vegetation around buildings also allows solar gain in the winter months, thereby reducing heating costs. In the summer, trees can intercept up to 90% of the solar energy, reducing interior temperatures and the need to air-condition buildings. See *Appendices 8 and 9 for more information.*



*Solar access and shading*

## Sound Control

Leaves, twigs, and branches on trees and shrubs absorb sound energy as do grasses and other low growing plants, especially in the higher frequencies which are the most bothersome to people. Barriers of trees can deflect sounds away and even reflect sound back to its source. Plants can dissipate sound energy by refraction that occurs when sound passes through vegetative barriers and bends around plant structures.

*Reduced noise*

Vegetation masks unwanted sound by providing the sounds of nature – rustling leaves and singing birds – to cover unwanted noise.

Humans are able to listen to those sounds of nature that are more pleasing and to filter out the unwanted sounds of the city.

## Glare and Reflection Reduction

Buildings, roads and walkways often have smooth, reflective surfaces that can result in serious glare and reflection problems in urban areas. Depending on the time of year, the angle of the sun and the amount of cloud cover, the resultant glare can cause discomfort or even hazardous conditions. Vegetation can filter or block the source of the unwanted light, or cover the surface, eliminating the reflection of the light.

## Wildlife Habitat

The urban forest provides habitat for many species of birds, mammals, insects and amphibians that enrich urban life and offer opportunities for study. Squirrels and chipmunks live in and around the trees; numerous species of birds abound in the vegetation; raccoons and bats inhabit the secret places in the urban forest. Even coyote, and occasionally deer, are found in the city if there is cover, food and water. See *Appendix 3.*



*Forest habitat*

## Psychological and Physical Benefits of the Urban Forest

In addition to the quantifiable effects and benefits that the urban forest gives to its residents, it also provides many benefits that are less measurable, but no less valuable.

### Psychological Benefits

#### *Restorative benefits*

While people have always felt that the urban forest increases the enjoyment of everyday life and provides a meaningful connection to the natural environment, recent research now provides the scientific basis to support those feelings. Urban forests have a clear role to play in reducing stress-related impacts on health. Studies show that exposure to nature and the urban forest provide significant “restorative” benefits.

Various studies using slides of different subjects show that those of natural scenes and urban nature settings hold the viewer’s attention more effectively than those of urban scenes without nature. They also reduce stress and are more restorative. Even slides of unspectacular natural scenes sustain attention more effectively during a lengthy viewing session, and produce more positive emotional states, than urban scenes without trees.

#### *Less stress*

Hospital patients recovering from surgery have more favorable recovery courses, including shorter hospital stays, and lower intake of narcotic pain drugs if their windows overlook trees instead of a brick wall. Patients feel less stressed on days when a large mural depicting a scene with trees is hung on a wall of the waiting room, in contrast to days when the wall is blank.

Examination of acutely stressed patients in presurgical holding rooms indicates that patients exposed to “serene” views (primarily displaying trees, water or other natural elements) have systolic blood pressure levels 10–15 points lower than patients exposed either to “exciting” pictures (e.g., a sail boarder leaning into the wind) or to no picture at all. Prison research suggests that views of nature from cell windows are associated with lower frequencies of prisoner stress symptoms, such as digestive illness and headaches.



*Positive aesthetic element*

### Aesthetics

Positive emotional states are also associated with being in, or looking at, things that are pleasing. Trees and vegetation provide much of the color, variety, textures, shapes and sounds that are important aesthetic elements in the city in all seasons of the year. Several studies have shown that aesthetic preferences are higher for scenes that show well-maintained trees and vegetation.

Trees are among the most important features contributing to the aesthetic quality of our residential streets and community parks. The Visual Preference Survey conducted in Portland last year showed that small parks and open spaces were uniformly desirable in all settings of the City.

### **Significance of the Urban Forest**

Interviews were conducted with 185 residents of Charleston, South Carolina following the devastation by Hurricane Hugo. Participants were asked to identify a physical feature of the city damaged by the hurricane that was special to them. Thirty percent of the respondents answered that some aspect of the urban forest was the most significant thing damaged. Also, more than 10% of the respondents mentioned that they had previously taken for granted how much they valued the urban forest.



*Significance of trees*

Trees have deep significance to people, especially in an urban setting which often contrasts strongly with the natural world. Trees and forests provide beauty and serenity that we can experience in the sensory realm. The constantly changing sights, sounds, and smells of plants fascinate and delight us.

Trees also have deep symbolic meaning. Trees are used by many cultures to represent strength and wisdom. Our love of trees is shown in our desire to remember loved ones with memorial tree plantings. Planting trees shows our commitment to the future and our need to improve the places where we live. While the economic benefits of the urban forest are important, to many people they are insignificant compared to the experiences that trees offer.

*Deep symbolic meaning*

### **Recreation Value**

The urban forest provides wonderful recreation areas, ranging from the urban wilderness of Forest Park to the cool and refreshing local parks found in most of our neighborhoods. Without vegetation, the value of these areas would be reduced. Having recreation areas nearby reduces the need to drive fuel-consuming and carbon dioxide-producing vehicles.

*Recreation that refreshes us*

### **The Urban Forest and Human Comfort**

Among the elements that affect human comfort are solar radiation, air movement, air temperature, humidity and precipitation. Often, the urban forest can provide some control over these elements.

**Solar Radiation.** Vegetation can be placed to block solar radiation where it is not desirable and to allow solar radiation where warming is

*Shade*



desired. Deciduous trees provide shade during months when solar radiation is a problem, and allow energy through when it is desirable. Local conditions must be known to obtain the desired effect.

*Wind control*

**Air Movement.** Just as plants can be used to control the solar radiation, they can be used to manipulate air movement. Trees and shrubs can be placed to block undesirable prevailing wind and provide effective barriers. Walls of vegetation can be used to direct air to sites where cooling is wanted. Vegetation can reduce wind velocity. Layers of vegetation close to and on a building's exterior walls can have an insulating effect.

*Cooling*

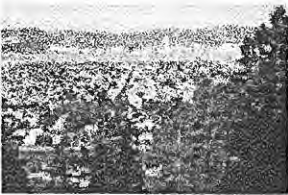
**Air Temperature.** Large areas of vegetation, such as forest stands, can moderate temperature extremes. Individual trees have a cooling effect because they block the sun and intercept the solar radiation.

*Shelter*

**Humidity and Precipitation.** Trees can affect human comfort in this category by intercepting rain or snow as it falls, offering some shelter from the weather. Large numbers of trees can also create zones of increased humidity and redirect drying arid winds.

## Portland's Urban Forest

### The Environmental Setting



*Portland's setting*

Portland is located in the northern portion of the Willamette Valley in Northwest Oregon. The Willamette River bisects the city as it flows north to its confluence with the Columbia River. Tributaries of the Willamette course through the city above and below the ground. Portland's physical landscape has been shaped by a spectacular geological history involving massive basalt flows, folding of the west hills, catastrophic floods, and volcanic activity.

Downtown Portland is located on the river and is framed by the Tualatin Range to the west which rises to 1000 feet. To the east, one views forested terraces, with low volcanic peaks rising out of the residential neighborhoods. On a clear day, the Cascade range and its foothills are seen in the distance. Mt. Hood and Mt. St. Helens rise above the skyline. Neighborhood parks and other open areas are scattered throughout the city.

### Climate

Portland typically experiences mild wet winters and clear dry summers. The average annual precipitation is 37.4 inches, falling mostly as rain between October and May. The average January

temperature is 38.9 degrees F., while the average temperature for July, typically the hottest month, is only 67.7 degrees F. (from National Weather Service data 1941–1985).

*Comfortable climate*

Several factors contribute to this moderate climate: the mid-latitude location that accounts for the modest seasonal fluctuations in temperature and precipitation; Portland's location between the ocean and the high desert; the buffering effects of the Coast Range to the west that moderate the marine influences and the Cascade Range to the east that shelters the Willamette Valley from the extreme summer and winter continental air masses.

## **Soils**

Little information is available on soils in heavily developed areas because much of the urban land is covered by buildings and concrete and many remaining areas have been cut, graded, filled, and compacted during construction. According to the Soil Survey of Multnomah County (U.S.D.A. Soil Conservation Service, 1983), most of the land in central Portland is classified only as "Urban Land." This area is on the flood plains of the Willamette River where the slope is less than 3%. Original soils were gravely loam, silt loam, or silty clay loam with sandy materials. Street trees and plants in difficult situations must be able to withstand poor or compacted soils.

*Poor soils downtown*

Land east of the river is composed of several different soil complexes. Though most of the land has been disturbed, some yards and open areas between buildings retain the original qualities of a moderately well drained loam soil. Elevations range from 50 to 400 feet. These soils can support a wide variety of vegetation, although they often need summer irrigation.

The soils in the West Hills are composed of deep silt mixed with volcanic ash deposits. A silty clay fragipan overlays basalt bedrock. The slope is steep in many places and the potential for erosion and landslides is high. Though much of the West Hills is protected as park land, institutional and residential developments are scattered throughout the southern portion. In addition to the urban uses, these soils also support a large stand of mixed coniferous forest. These trees form an impressive backdrop for the city and serve to remind Portlanders of the characteristic Northwest forest from which the city was carved.

*Good soils in other urban areas*

## Wildlife

The most dramatic impact of urbanization on wildlife is the loss of habitat. As wetlands are drained and filled, forests cleared, and fertile valleys cultivated and built upon, the homes of many species have been, and continue to be, eliminated. Further problems come from the predators that accompany urbanization - cats, dogs and non-native species of birds and animals.



*Critical wetlands*

Wetlands are especially critical for migrating waterfowl and shorebirds. They provide resting, breeding, and feeding places for many bird species as well as reptiles, amphibians, and aquatic mammals. Coniferous forests provide important habitat for amphibians, mammals and other species of birds. Riparian forests shade streams for cool-water fish species.

While thoughtful landscaping of residential yards and community open spaces contributes to the food source and habitat of song birds and butterflies, many other species need larger, connected systems of open spaces that include streams and wetlands.

## Native Vegetation

*Thick forests*

At the time of European settlement, heavy forests covered the region. Stands of Douglas fir, western hemlock, grand fir, and western red cedar dominated the landscape. Deciduous bigleaf maple and red alder were intermixed. Wetlands and flood plains along the river supported Oregon ash, willows, and black cotton wood. Oregon white oak and Pacific madrone grew in drier uplands. Understory upland vegetation included: vine maple, western hazel, oceanspray, snowberry, thimbleberry, Oregon-grape, salal, red huckleberry, ferns, and forbs. Wetland species included: elderberry, Douglas spirea, dogwood, sedges and rushes. The "Portland Plant List", published by the Bureau of Planning (1991), contains trees, shrubs, and ground covers native to the region.

*Introduced species  
replaced natives*

Most native plants have been removed by development and replaced by introduced species in the contemporary landscape. Native conifers still stand as single specimens in parks and lawns. Remnants of the native forest communities exist in some open areas and parks. Though non-native plant species are also present, these areas continue to sustain populations of native plants and animals. Large natural areas such as Oaks Bottom and Forest Park provide wildlife, educational, recreational, and scenic values. Smaller fragments located in forested ravines in the West Hills and along riparian corridors also provide environmental benefits.

Current efforts to expand urban greenspace consider the attributes of both indigenous and introduced plant materials. Natural area restoration projects use appropriate upland and wetland species. Programs to promote wildlife habitat in residential yards urge the use of indigenous plants. However, site constraints and aesthetics in urbanized areas may limit the feasibility of native plants in many situations.

### **Introduced Vegetation**

In addition to supporting lush native coniferous forests, the moderate climate of Portland sustains vegetation from many other parts of the world. Many common landscape plants have their origins in the Eastern United States, Europe, and Asia. These plants have been introduced, both intentionally and accidentally. Nurserymen were among the first European settlers of the region. The importation of trees, shrubs, and flowers started with the arrival of these pioneers. Fruit trees were the first trees brought to the region and by the turn of the century, a wide selection of ornamental plants was available.

*Many plants from East Coast, Europe and Asia*

Most of the street trees in the city today are cultivars of introduced species. Cultivars offer predictability in form and behavior for a given situation. They are bred for certain features such as fall color, flower quality, and disease resistance. They can also be selected to withstand poor soils and difficult growing conditions.

Some exotic species have less desirable qualities. Plants such as Himalayan blackberry, Scot's broom, and English ivy have invaded many natural areas and displaced more diverse and beneficial native plant communities. English ivy in particular is a problem in natural areas, as it smothers the native plants on the ground and creates a monoculture that has no value for wildlife except for rats.

*Ivy wasteland*

### **History of Portland's Urban Forest Management**

At the time of settlement, and throughout the expansion of Portland, chunks of native forest were cleared and replaced with buildings and infrastructure. In addition to transportation and service systems, the infrastructure included a network of parks, and utility easements where trees and other vegetation were planted. Early settlers to the area brought with them seeds and seedlings of plants native to their home lands. Nurserymen arrived soon after with stock to supply orchards and private pleasure gardens.

**Parks.** The first city parks were set aside in 1852. Today Chapman and Lownsdale Squares and the Park Blocks add considerable beauty and shade to downtown. City Park (now Washington Park) was acquired



*Park Blocks*



in 1871. A million-dollar bond measure passed in 1907 allowed the purchase and improvement of Mt. Tabor, Laurelhurst, Peninsula, Kenilworth, and Sellwood Parks. Terwilliger Boulevard, which remains a largely forested parkway, was dedicated in 1914. In the 1920s, Parks development emphasized smaller neighborhood parks and playgrounds with facilities for tennis, baseball, and swimming. Landscaping and forest cover in these parks is still determined largely by the original type of use. Today's park system of 9,600 acres contributes significantly to the overall canopy of the city, yet some neighborhoods remain void of open space.

In addition to the parks, there is also a citywide trail system known as the 40 Mile Loop. This system, in and around the city, was proposed in a 1903 report by the Olmsted brothers. It is now nearly complete at 140 miles.

1974 - First City Forester

**Park Trees and Street Trees.** In the early 1950s, Parks trees were maintained by a four-person bureau tree crew. Over the years, the crew size increased as additional responsibilities were added. At its largest point, there was a full-time crew of 29 in 1983-84. Until 1974, when the City hired the first City Forester, most work was done in the parks. Since that time, the Forestry Division has maintained and administered both park and street trees. The responsibility for maintaining street trees is, as it has always been, that of the adjacent property owners.



Park and street trees

In 1975, Forestry took over spraying street trees from Multnomah County. From 1975 to 1980, the City participated in a tree planting program that enabled Forestry to plant 20,000 street trees. At its largest point, there was a full-time crew of 29 in 1983-84 that was responsible for large-scale tree planting projects and planting individual trees at the request of property owners. When funding reductions forced layoffs, Forestry had to discontinue several activities related to street trees including low limbing, small tree maintenance, stump grinding, some spraying, planting and general pruning.

At present, there are 19 full-time employees in Forestry. Their responsibilities include the management of all public trees and other vegetation as mandated by City Code. See *Chapter Two: Current Administration and Management* for a detailed listing of their responsibilities.

**Street Tree Inventories.** The first census of street trees was completed with the aid of a WPA grant in 1938. This project enabled Parks and Recreation to develop a master tree plan and provide employment

opportunities. The result of the inventory is a list of 78,886 trees composed of 173 species.

Seven genera accounted for most of the trees (71%), ( see list below). Other species accounted for less than 1% of the total. At that time, conifers made up 15% of the total.

*First street tree inventory*

Maple	18,074	23%
Walnut	12,060	15%
Elm	6,719	8%
Hawthorn	6,366	8%
Birch	5,616	7%
Buckeye	4,803	6%
Mountain Ash	3,278	4%
Conifers (all species)		15%

In 1944, the estimated worth of the street tree resource was \$4,000,000, although problems were emerging. Trees planted in neighborhoods at the time of development were reaching maturity; trees were too closely spaced; sidewalks and curbs were rupturing; trees were in conflict with utility wires. C.P. Keyser, Superintendent of Parks, argued that the administration of street trees should be assumed by the city government and that a systematic cycle of planting, trimming and replacing trees be started. That has yet to occur.

A second inventory of street trees was done in 1976. This was a partial survey of 57% of the City, which projected an approximate total of 69,564 street trees for the entire city; 9322 fewer street trees than in 1938. There were nearly twice as many available planting spaces as trees, that is, there was room for about 140,000 more street trees. This survey counted 197 varieties of trees. Though the species composition had changed significantly since the 1938 survey, several genera still dominated the population. However, conifers accounted for only 4% of the total, compared to 15% in 1938.

*Loss of conifers as street trees*

Cherry and Plum	8349	21%
Maple	7759	20%
Birch	3701	9%
Hawthorn	2946	7%
Walnut	1891	5%
Sweetgum	1879	5%
Elm	1768	4%
Oak	1065	3%
Conifers (all species)		4%



*Street trees*

The survey also provided important information about the health of street trees. Forty-one percent were in excellent or good condition compared to 56% in fair or poor condition. Thirteen percent needed pruning, 10% had been topped and 1% needed to be removed.

*Fewer trees in less affluent neighborhoods*

That survey sampled twenty-six neighborhood areas which showed that some neighborhoods had far more street trees per street mile than others. Irvington, Westmoreland, and Laurelhurst were well above average. Eliot, Corbett–Terwilliger, Brooklyn, and Buckman were below the 34% average. These trends continue today in many parts of the City.

**Ordinances.** The first street tree ordinance was passed in April of 1972. This ordinance was substantially revised in 1989; other amendments to the code have further defined the legal framework for the regulation of street trees. In 1987, the Street Tree Advisory Committee became the Urban Forestry Commission. Other important ordinances include the Tree Cutting Ordinance passed in 1995. More detailed information on City ordinances that relate to the urban forest can be found in *Chapter Two: Current Administration and Management*.



**Tree City USA.** For the past 18 years, Portland has been honored as a Tree City USA, a national recognition from The National Arbor Day Foundation. To become a Tree City USA, a community must meet four standards: it must have a tree board or department, a city tree ordinance, a comprehensive community forestry program and an Arbor Day observance. The Tree City USA program is sponsored by The National Arbor Day Foundation, the USDA Forest Service and the National Association of State Foresters.

**Environmental Zones.** In 1987, the City began implementation of Statewide Goal 5 which directs the city to “conserve open space, protect natural and scenic resources” by applying two environmental overlay zones to natural resource areas. These zones cover approximately 15,825 acres or about 17 percent of the city’s 89,600 acres. More than half of this acreage is in public ownership and much of the remainder is privately-owned open space such as cemeteries, golf courses and private lakes. Many forested areas and riparian areas are protected by the environmental zones and are very important parts of the urban forest.



*Stumptown no longer*

### **The Current Condition of Portland's Urban Forest**

Looking at a panoramic view of the city from many viewpoints, one sees a skyline dominated by trees. Deciduous canopy, conifers



standing tall, roof tops and bridges cover the land. Walking in the Park Blocks, or driving through one of several historic neighborhoods, one can easily be deceived. The city once called "Stumptown" has been again transformed and the problems of the urban forest are not apparent to the casual observer. A greater understanding of the urban ecosystem and a closer look are required to see them.

Patches of native forest communities and riparian areas are becoming fewer, smaller and increasingly overcome with aggressive non-native plant species. Runoff creates erosion problems in riparian areas. Stands of beautiful park trees, many of the same age, are over-mature. Many of the trees in older neighborhoods are also in states of decline. Dutch Elm Disease continues to threaten elms throughout the city. Inadequate and uneven standards of care, especially the all-too-prevalent practice of topping trees, have resulted in many trees in poor to hazardous condition. The urban forest canopy is unevenly distributed; economically disadvantaged neighborhoods have fewer trees than more wealthy areas. Unhealthy and inadequate tree cover has negative environmental, economic, and social consequences.



*Topping kills trees*

There is a lack of current information about the state of the forest citywide, although there have been efforts recently to survey trees in several neighborhoods. Irvington and Hosford-Abernathy have been inventoried and mapped by a group of Portland State University students led by Dr. Joseph Poracsky. The results of these surveys are still preliminary and are not yet available. Phyllis Reynolds, author of "Trees of Greater Portland" has also conducted an inventory of the "significant" trees in Irvington.

In 1989, Kielbaso and Cotrone produced a report on The State of the Urban Forest that included data on street trees in 320 cities across the country, including Portland. The inventory looked at numbers, sizes and conditions of street trees. In many respects, Portland was at or somewhat below the national average. In terms of tree sizes, Portland has many more sapling size trees (less than 3" diameter) and fewer trees in the small, medium and large sizes. The numbers of trees in excellent, good, fair, or poor condition are similar to the national average. However, Portland has nearly 50% more empty tree spaces than the national average. According to this study, there are three empty spaces for every tree. It should be noted that many areas that were surveyed included industrial areas and residential areas that have very narrow tree planting spaces. For reference, the street trees in Salem and Corvallis were much better than in Portland, while street trees in Eugene were about the same as in Portland.

*Room for many more street trees*

Work done as part of another national study by E. Gregory McPherson in 1993, provided some general information on Portland's urban forest and its relation to land use categories. About 42 percent of Portland is covered with trees, nearly 23 percent is either grass or bare soil, 12 percent is covered by buildings, 19 percent is paved and 4 percent is water. No data was provided on condition of the trees. This data is summarized below and shows further information on the location of the tree cover as it relates to land use categories.

PORTLAND LAND USE AND COVER

COVER LAND USE	TREE/ PARK	TREE/ YARD	TREE/ UNIMP	TREE/ STREET	GRASS/ PARK	GRASS/ YARD	GRASS/ UNIMP	GRASS/ STREET	BUILDING	PAVING	WATER	TOTAL % LAND USE
SINGLE FAMILY	—	14.3	—	—	—	12.20	—	—	7.38	6.58	—	40.4
MULTI-FAMILY	—	1.06	—	—	—	1.12	—	—	1.63	1.48	—	5.29
IND/COMM	—	0.22	—	—	—	1.41	—	—	2.49	3.57	—	7.69
INSTITU.	—	0.62	—	—	—	1.12	—	—	0.53	1.08	—	3.35
TRANSP.	—	—	—	0.27	—	—	—	0.84	0.05	6.13	—	7.30
PARK	20.8	—	—	—	1.18	—	—	—	—	0.22	0.10	22.30
VACANT	—	—	4.67	—	—	—	4.33	—	—	—	3.90	12.90
MISC.	—	—	—	—	—	0.46	0.07	—	0.05	0.14	—	0.72
TOTAL % COVER	20.8	16.2	4.67	0.27	1.18	16.3	4.40	0.84	—	—	—	
	41.9*				22.7**				12.1	19.2	4.00	100

\* Percent of tree cover is as follows:

Parks	50%
Yards	38%
Unimproved Land	11%
Streets	01%

\*\* Percent of Grass/bare soil is as follows:

Parks	05%
Yards	72%
Unimproved Land	19%
Streets	04%

Overall tree canopy is 64.9%

Source: E. Gregory McPherson. 1993. Modeling Benefits and Costs of Community Tree Plantings

A master's thesis project by Paul Newman of the Portland State Geography Department uses satellite imagery to measure tree crown density within the city. This information can be used with other information in a geographic system to correlate urban forest density with other features such as population density and zoning, as well as to show relative densities among neighborhoods or other land uses. This data is particularly useful because it measures not only street trees, but all components of urban forest and all types of vegetation. A baseline for future comparison can easily be established without extensive field work; however, some ground survey is necessary to check the accuracy of the interpretation of the data. Similar

information can also be derived from interpretation of aerial photos, although it is easier to connect it to other sources of computerized data with the satellite images.

A ground survey of at least a sample of the urban forest is needed to determine species composition, age, and health for ongoing monitoring and planning purposes. Planting projects and maintenance programs require more site specific details. Currently most forestry work is done in response to request from citizens, other agencies, or in response to emergencies. A complete tree and location inventory is not economically feasible or necessarily required, although it may be desirable and useful in the future.

*Survey needed*

Larger greenspace and natural area inventories may also be applicable to a comprehensive urban forest assessment. The Metropolitan Greenspaces Inventory, completed in 1989, mapped certain remaining natural areas within the region and is available in a geographic information system. Subsequent analyses, protection, and restoration of some of these open areas will be done through this program.

Within the city, the Bureau of Planning has mapped significant natural resources as part of the environmental zoning work. There is considerable overlap between the greenspaces inventory and the environmental zones. Planning has developed further inventory work and resource management plans for eight of the resource areas. Further information on environmental zones is found in *Chapter Two* and in *Appendix 10*.

**Current Activity in the Urban Forest Forestry Division.** Since the formation of the Forestry Division in 1974, approximately 130,000 trees have been planted. Because Portland has enlarged its boundaries through recent annexations, it is somewhat difficult to track the numbers of trees and the numbers of planting sites. However, the Urban Forestry Manager estimates that there are still approximately 100,000 available street tree planting locations. Unfortunately, budget cuts have reduced the Division's staffing and limited the funding available for planting and maintenance of street and park trees.

*100,000 street trees needed*

**Friends of Trees.** More recently the work of Friends of Trees (FOT), a private nonprofit organization, has facilitated the planting of street trees and revegetation projects in natural areas. This work has occurred primarily in economically disadvantaged neighborhoods that lack tree cover. FOT estimates that they will plant about 3,000 trees in 1996. They also participate in reforestation of natural areas.



*Friends of Trees*

**Office of Transportation.** As part of transportation corridor improvements, Portland's Office of Transportation plants approximately 2000 street trees per year. Most of these trees are 3" caliper trees, often in tree grates in urban settings.

### **City Budgetary Support for Urban Forestry**

The Urban Forestry Division budget is quite small and accounts for only about \$1.1 million of the City budget. This is similar to the national average of 0.41% but much lower than the average of 0.73% for cities in the Pacific Northwest. Compared to cities of comparable size across the country, Portland spends \$2.65 per capita on the urban forest while other cities spend \$3.61. The current urban forest budget only provides for care of trees in parks. Any other tree work is reactive and involves removal of hazards, not health care or preventive maintenance.

*Infrastructure element  
that needs to be funded*

Other elements of the urban infrastructure, such as sewer, water and transportation have budgets many, many times larger for capital and operating expenses. The urban forest is as much a part of the infrastructure as are the wires, pipes and pavement of other utilities. Like these utilities, the urban forest requires an investment of capital and operating money in order to maintain and improve our investment.

### **Threats to Portland's Urban Forest**

Portland's urban forest is at a critical point. In many areas it is in good condition and relatively safe, but in many other areas, it is in poor condition and threatened with degradation.

*Impact of development*

Development is among the most obvious threats. The need to build more housing and facilities within the city limits is leading to the removal of the urban forest on wooded hillsides, in stream corridors and in underdeveloped residential areas of the city. Many of these forested areas are privately owned and will soon be developed. Preservation is an issue.

Parts of the urban forest in older established neighborhoods and parks are aging and becoming over mature. Many street trees have become too large for the spaces in which they were planted and are potentially hazardous. Inadequate care over the years has taken its toll. Maintenance, removal and replacement are issues in these areas.

*Invasive plants*

Invasive non-native plants are threats in many areas, especially in natural areas and some park areas. Without plans for managing these plants, we will lose the diversity and interest that our native plants



provide. Regional character and retaining Portland's sense of place are issues.

Many residential areas, especially in lower income areas, are deficient in terms of urban forest cover. Since adjacent property owners plant and maintain the street trees, many economically disadvantaged areas have few street trees and many of those trees are in poor condition from inadequate care. All residents of the city deserve the benefits that come from a healthy urban forest. Equal benefits for all are an issue.

### Summary

The urban forest provides many benefits to the citizens of Portland who have a long history of involvement with, and interest in, the urban forest. The time has come to decide the level of our future involvement and interest in the urban forest. This resource is much too valuable to risk less than a full effort to protect, maintain and enhance it.

*Unequal distribution of urban forest*



*Protect, maintain and enhance*

### Sources:

- Abbott, C. 1983. *Portland, Planning, Politics, and Growth in a Twentieth-Century City*. University of Nebraska Press, Lincoln and London.
- City of Portland, Bureau of Planning. 1991. *Portland Plant List*.
- Price, L. W. "Portland's Landscape Setting". 1987. *Portland's Changing Landscape*. L. W. Price Editor. Department of Geography, Portland State University and the Association of American Geographers, Portland OR.
- Reynolds, P. C. and E. D. Dimon. 1993. *Trees of Greater Portland*. Timber Press, Portland, OR.
- U.S. Army Corps of Engineers. 1979. *Regional Urban Wildlife Habitat Report*. Portland, OR.
- U.S.D.A. Soil Conservation Service. 1983. *Soil Survey of Multnomah County, Oregon*.
- McPherson, E. Gregory, 1993. *Modeling Benefits and Costs of Community Tree Plantings*. U.S.D.A. Forest Service, Northeastern Forest Experiment Station.
- City of Portland, Parks and Recreation. 1979. *Park Tree Valuation*.
- Hull, Bruce R. and Ulrich, Roger S. 1991. "Health Benefits and Costs of Urban Trees." *Alliances for Community Trees, Proceedings of the Fifth Urban Tree Conference*. p. 69-72.
- Willeke, Donald C. 1991. "A True and Full Accounting of the Urban forest." *Alliances for Community Trees, Proceedings of the Fifth Urban Tree Conference*. p. 40-47.
- Kielbaso, J. James and Cotrone, Vincent. 1989. "The State of the Urban forest." *Make Our Cities Safe for Trees, Proceedings of the Fourth Urban Tree Conference*. p. 11-18.
- Kielbaso, J. James. 1989. *Street Tree Survey of US Cities and Towns*. American Forestry Association.
- Gutowski, Robert. 1994. "The Basics of Urban and Community Forestry." *The Public Garden*. January 1994.
- Morales, D.J. 1983. "The Contribution of Trees to Residential Properties." *Journal of Arboriculture*. 6(11):305-308.
- Morales, D.J. and others. 1983. "Two Methods of Valuating Trees on Residential Sites." *Journal of Arboriculture*. 9(1):21-24.
- Miller, Robert W. 1988. *Urban forestry: Planning and Managing Urban Greenspaces*. Prentice Hall, Englewood Cliffs N.J.

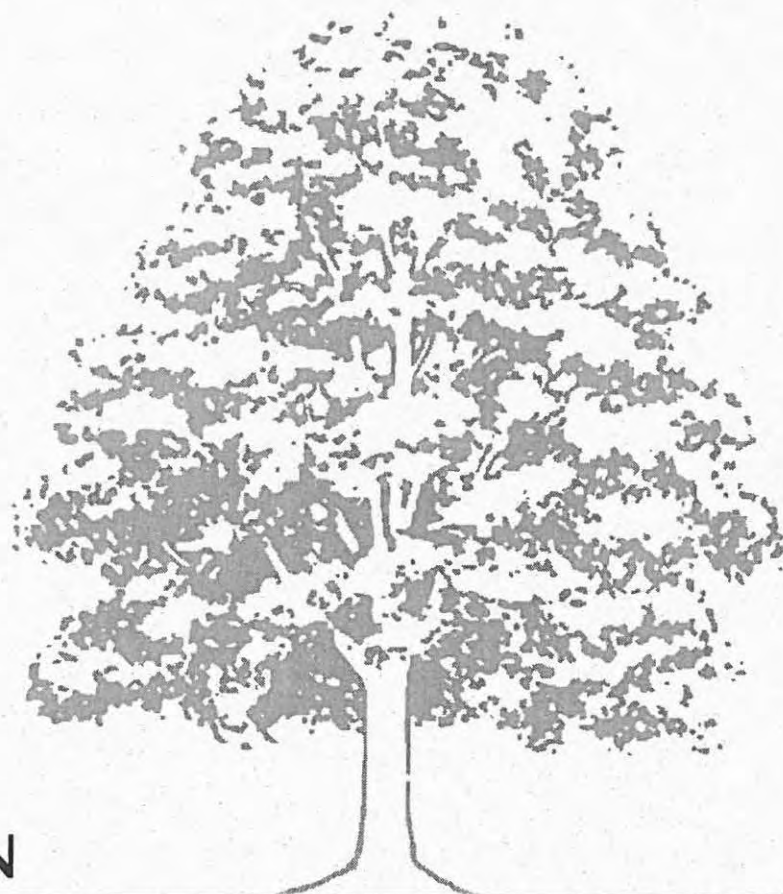


- Adopted Budget, City of Portland: Fiscal Years 1994–1996.
- Tschantz, Barbara A. and Sacamano, Paul L. 1994. Municipal Tree Management in the United States: A 1994 Report. Davey Resource Group and Communication Research Associates, Inc.
- Dwyer, John F. and others. 1994. The Deep Significance of Urban Trees and Forests. The Ecological City: Preserving and Restoring Urban Biodiversity. University of Massachusetts Press.
- A. Nelessen Associates, Inc. Picture This...The Results of a Visual Preference Survey. June 1993. Princeton N.J. and Seattle WA.

## **Chapter Two**

# **CURRENT ADMINISTRATION AND MANAGEMENT**

Introduction  
Urban Forest Management Framework and Coordination  
Existing Ordinances and Legal Authority  
Relationship to Other Plans  
Summary



Portland's  
**URBAN FORESTRY  
MANAGEMENT PLAN**

---



## Chapter Two

# CURRENT ADMINISTRATION AND MANAGEMENT

---



### Introduction

This chapter identifies and describes the current administration and management of the various elements of the urban forest. It describes the activities of City agencies, existing cooperative agreements between them, and the current City ordinances that regulate part of the urban forest.

*"The healthier the urban forest, the greater the benefit it provides to the community."*

*Municipal Tree  
Management in the United  
States*

### Urban Forest Management Framework and Coordination

The urban forest is managed by numerous bureaus, agencies, utilities, and nonprofit agencies whose activities affect various portions of the urban forest. The following section identifies their roles and responsibilities and the coordination that exists between them.

### City of Portland

The following City agencies manage trees on public property and to some extent make requirements of private property owners regarding the trees and vegetation on their property.

### Urban Forestry Commission (UFC)

Commission of nine citizens serving without compensation. Duties as outlined in the City Code include:

*Policy making body*

- Provide assistance in the development of the Urban Forestry Management Plan,
- Advise the City Forester, the Superintendent of Parks, and the Budget Advisory Committee on the preparation of the Annual Forestry Unit budget request,
- Review plans and policies related to urban forestry and other matters brought forward by the City Forester,
- Prepare and submit an annual report containing a section dealing with the relations with, and concerns of, the various City Bureaus,
- Sub-committee of the UFC sponsors and promotes the Heritage Tree program.

## **Parks and Recreation**

### Forestry Division

#### *Public trees*

Primary authority for the management of all public trees and other vegetation mandated by City Code. In 1994, Parks and Recreation changed the job title from City Forester to Urban Forestry Manager and expanded the responsibilities of that position to be more comprehensive in dealing with all aspects of the urban forest. The Urban Forestry Manager oversees the operations of the Forestry and Horticulture Divisions.

- Coordinates planning, planting, inspection and maintenance of street trees with other bureaus.
- Provides forestry services at city-owned facilities through interagency agreements.
- Reviews development plans to preserve trees. Reviews Environmental Zone permits and tree preservation plans.
- Enforces city codes by issuing permits for tree pruning, tree planting, tree removal and root pruning; enforces tree cutting ordinance to preserve significant trees on undeveloped and underdeveloped properties.
- Provides emergency response services to mitigate hazardous situations involving trees such as storm damage.
- Provides advice and physical support for citizen and business groups to achieve large scale tree planting projects.
- Works with Urban Forestry Commission to resolve conflicts related to trees. Provides information and clerical support to the Urban Forestry Commission.
- Provides support to Friends of Trees and other nonprofit organizations to promote trees and enhance the urban forest.
- Maintains an experimental planting of ornamental trees to test their suitability for use on Portland streets and in parks.
- Educates public through use of brochures developed by organizations such as National Arbor Day Foundation, flyers, workshops and presentations to community groups.
- Conducts workshops such as the "Hazard Tree" presentation to educate park employees and recreation leaders.

#### *Developed gardens*

### Horticultural Division

Responsible for management of vegetation in parks, transit malls, rose gardens and community gardens throughout the city.

- Manages production facilities that supply plant materials ranging from annual bedding plants to wetland restoration plants.
- Through interagency agreements, provides consulting and horticultural services to other bureaus. For example, contracts with



the Office of Transportation to design, install, and maintain landscaping in street area projects. Some of this work is done by the Forestry Division, some by other Parks crews, and some is contracted out. Has cooperative water quality improvement projects with the Bureau of Environmental Services where Parks designs projects, supplies plant materials and helps to organize youth crews to install plants.

- Responsible for Pest Management Program for Parks which also involves educational and policy components.
- Other education and public involvement programs include coordinating support groups and volunteers, demonstration gardens and an orchard, and educational programs for youth.

#### Operations and Natural Resources Division

Responsible for the management, conservation and enhancement of seven natural area sites within the city: Forest Park, Hoyt Arboretum, Oaks Bottom, Powell Butte, Elk Rock Island, Springwater Corridor, and Marquam Nature Park.

*Natural areas*

- Assists with preservation and restoration projects at other sites. Helps to coordinate Friends group activities in most of the areas.
- Has cooperative arrangements with Metro and other organizations for special projects such as ivy removal in Forest Park.
- Hoyt Arboretum has educational programs aimed at interpretation of the large collection of native, and exotic species, and general education for visitors and supporters of the friends group.

#### Park Districts

Primary responsibility for care of vegetation in traditional parks.

#### **Bureau of Planning**

Responsible for implementing the City's Comprehensive Plan land use policies and objectives and implements Title 33 Zoning Code and Title 34 Subdivision and Partitioning Regulation of the City Code.

*City code and land use regulations*

- Responsible for the regulation of development on lands in Environmental Zones; approves land subdivisions, new development, landscaping and screening of parking lots, and other landscape requirements.
- Responsible for zoning and policies that impact the urban forest.
- Coordinates with other bureaus and the public on policy and program issues.
- Manages development of Community and Neighborhood Plans. The following plans make specific reference to vegetation: Lents,

Brentwood – Darlington, Belmont, Eliot, Mt. Scott – Arleta, along 72nd Ave. , Foster Road, 82nd Ave., Harold St., and Woodstock.

### **Bureau of Environmental Services**

*Water quality issues*

Responsible for implementation of Best Management Practices (BMPs) with regard to environmental quality, especially water quality.

- BMPs that relate to urban vegetation include: funding of the Urban Forest Management Plan and coordinating with the Bureau of Planning to revise landscape requirements as necessary.
- Involved in a demonstration project that employs all of the BMPs in one sub-basin. This project is intended to measure the effectiveness of various approaches to improve water quality. Tree planting and maintenance strategies will be used.
- Coordinates with other organizations on watershed management and stream bank restoration projects, and produces educational flyers and brochures on water quality improvement.

### **Energy Office**

*City's energy policies*

Assures support for the City's energy policies.

- Promotes planting and maintaining trees to reduce carbon dioxide emissions.
- Concerned with locating trees that provide summer shade to reduce energy needs for cooling, and that provide solar access in winter months.

### **Office of Transportation, Department of Transportation Engineering**

*Design and planning of City's transportation elements*

Responsible for the design and construction of the transportation infrastructure; street trees are recognized as part of this system.

- Coordinates with the Urban Forestry Manager to see that street trees are included in the design stage of new construction projects. Traffic circles and diverters which are designed primarily to slow or direct traffic flow also provide areas for landscaping throughout neighborhoods.
- Investigating the use of flexible sand-set pavers as an alternative to concrete slab sidewalks.
- Interested in finding ways to separate the sidewalk from the curb, principally to improve pedestrian safety and experience. The current 40-foot right of way for residential streets allows for 26 feet of road bed, 10 feet of sidewalk (5 feet on either side) and only two feet on either side for the curb, the planting strip and the utilities.

This width does not allow adequate planting area for most varieties of street trees. These standards are being reviewed and revised to allow street trees to be planted in more situations.

### **Office of Transportation, Bureau of Maintenance**

Concerned with interactions between trees and sidewalks, cutouts, curbs, and streets.

*Repair and maintenance of streets*

- Responsible for street cleaning of tree debris. One objective stated in the "Sidewalk Maintenance Program, Policy and Operating Guidelines" is to: "Manage the maintenance of sidewalks, curbs, and driveways in a way that protects street trees and other desirable vegetation whenever possible." Property owners are responsible for the maintenance of the sidewalk adjacent to their property.
- Routinely coordinates with the Urban Forestry Manager to reduce damage to trees because of hardscape (pavement) repair and vice versa.
- Contracts with Parks and Recreation to maintain landscaping on certain arterial projects.

### **Office of Transportation, Bureau of Traffic Management**

Concerned with street trees or trees on private property when they obstruct visibility of traffic signals and oncoming traffic at intersections and curves.

*Management of traffic*

- Works with neighborhood groups to identify traffic problems and solutions to those problems. Use of landscaped traffic circles and diverters is one of several approaches.

### **Office of Transportation, Bureau of Traffic Management, Division of Street Lighting**

Concerned with street trees and trees on private property which can interfere with street lights. Proper selection of tree species, proper location of trees and lights, pruning, and flexible lighting designs can reduce conflicts. Columnar species block less light and are preferable in some situations.

*Effective street lighting*

- Contracts annually with Division of Forestry to prune trees to maintain clearance for lights. Pruning occurs primarily in response to citizen requests.

### **Bureau of Buildings**

Building inspectors are responsible for assuring that street trees are planted in commercial developments and at remodels before the occupancy permit is issued.

*Compliance with City standards*

- Enforces landscape requirements in Environmental Zones.
- Works with Forestry on street trees in new subdivision developments.

## Private Utilities

### Portland General Electric (PGE)

*Maintain trees under  
power lines*

Serves most of the Portland area. PGE's Forestry Division employs five professional foresters that contract maintenance of all trees under power lines on a three-year cycle.

- Maintains landscaping around power transformers.
- Tree replacement program provides funds and technical assistance to replace or plant appropriate trees under lines.
- Educational activities include a brochure on planting appropriate tree species under power lines, notices in annual newsletter to customers, and information in bill inserts.

### Pacific Power and Light (PPL)

Serves portion of Northeast Portland.

- Maintains trees under power lines.
- Has tree replacement program to assist property owners to remove hazardous trees and replace them with suitable species.
- Sponsors "Green Corps" grant program for tree planting projects.
- Tree crews distribute tree care information. Educational materials are also distributed through nurseries and at special events.

## Non-Profit Organizations

### Friends of Trees

*Tree planting and  
reforestation*

Facilitates neighborhood street tree plantings and natural area reforestation projects throughout Portland. Works closely with Division of Forestry and local nurseries to assist neighborhoods in planting appropriate trees in right location.

- Promotes partnerships and coordinates efforts of many groups and volunteers to plant, care for, and preserve urban trees.
- Strong focus on education and strengthening neighborhoods. Coordinates with Bureau of Environmental Services on demonstration watershed enhancement project.
- Education and public involvement programs include: a quarterly newsletter, distribution of tree care brochures, sponsoring of public service announcements, conferences, and neighborhood tree walks.



- The "Youth Tree Corps" is a program to involve youth in tree planting, care, and environmental education projects. Middle and high school students are trained to organize planting projects.
- The "Tree Team" is a program that trains volunteers to monitor trees planted with the help of Friends of Trees.
- Volunteers distribute tree care literature and informational door hangers in assigned neighborhoods.

### **Portland State University**

Provides mapping and inventory services.

- Has Satellite and aerial mapping capabilities.
- Assists in developing Geographic Information Systems for various groups.
- Performs tree inventories in various parts of the City.
- Develops displays and presentations relating to urban forest issues.

*GIS capabilities*

### **Save Our Elms**

Community elm inoculation program.

- A model program to protect Portland's American Elm trees from Dutch Elm Disease—a devastating and incurable disease.
- Reinforces Forestry Division program of elm spraying and sanitation.

*Protecting Portland's elm trees*

### **Portland Public Schools**

Participates in many partnership projects.

- Participates in Green City Data project, a partnership between the National Science Foundation and other private and public groups to provide opportunities for middle and high school children to assist in data collection and field surveys, primarily in natural areas.
- Participates in Community Tree House project, a partnership that provides environmental education opportunities to under-represented audiences.

*Public/private partnerships*

### **Wetlands Conservancy**

A land trust dedicated to the preservation and restoration of area wetlands and related upland habitats.

*Wetlands preservation*

- Group is involved with acquisition and management of areas throughout the metropolitan region. Wetlands are used for educational and scientific research purposes.
- Educational programs include: a monthly newsletter, tours,



conferences, work parties, and presentations to schools and service organizations. The organization has developed a slide show and is working on a wetland protection handbook for private individuals.

### **Urban Streams Council**

*Stream corridor  
restoration*

A program of the Wetlands Conservancy, the Urban Streams Council is dedicated to the restoration of stream corridors within the metropolitan region.

- Restoration, education and public involvement projects include: projects on the Columbia Slough, Beaverton's Johnson Creek and Beaver Creek, developing a "Stream Group Handbook", a video on wetland restoration, a newsletter on regional watersheds, the "North Portland Youth Conservation Corps", and the "Model Watershed" program.
- The Council provides technical support and helps to facilitate the activities of various friends groups.

### **Plant Amnesty**

*Ending tree torture*

This organization exists to "end the senseless torture and mutilation of trees and shrubs caused by mal-pruning." Though founded and based in Seattle, there is a small group of people in Portland interested in starting a local chapter.

- Plant Amnesty has set up their educational display at several local events such as lawn and garden shows and forestry related conferences.
- They distribute a variety of educational materials including: a newsletter, a slide show of pruning horrors, public service announcements on tree topping suitable for television, brochures on proper pruning, and many other articles related to tree and landscape care.

### **Portland Audubon Society**

*Numerous education  
programs*

- Publishes a newsletter and sponsors a variety of educational programs including one to encourage backyard wildlife through plantings and feeders.
- Manages forested Audubon Wildlife Sanctuary within the City.

### **Various Friends of Parks and Friends of Streams Groups**

*Volunteer projects*

Many city parks and stream corridors have friends groups that do volunteer projects to maintain and enhance the natural resources within them.

## Other Organizations and Agencies

### **Metropolitan Parks and Greenspaces Program**

Responsible for the management of several parks, natural areas and open spaces within the City of Portland.

*Other natural resource agencies*

- Involved in building a regional trail system and restoring greenspaces within the Urban Growth Boundary.
- Has an active outreach program that publishes and distributes a calendar of events including the activities of many local conservation oriented groups.

### **Oregon State Parks**

Owns and manages Tryon Creek State Park within the City of Portland.

### **Oregon Department of Forestry, Urban and Community Forestry Assistance Program**

Provides technical assistance to communities throughout Oregon.

- Administers several grant programs that fund many community forestry activities.
- Develops and provides other educational materials in the form of a newsletter and topical brochures.
- Sponsors conferences and seminars.

### **Oregon Urban and Community Forest Council**

Promotes urban forestry issues on statewide basis. Representatives from around the state work cooperatively on educational programs and special projects.

- Provides forum for networking between communities. Lobbies for urban forests and greenspaces.
- Reviews grant proposals for urban forestry projects.

### **Oregon Department of Transportation**

Manages landscaped areas in the right of way along state and federal roadways within the City of Portland.

### **Private Citizens**

Many individuals and organizations have an interest in and role to play in the stewardship of the urban forest. Among the most important are Portland's citizens. Property owners are obligated to maintain street trees in the right of way according to standards

*Citizen support essential to urban forest*

established by the Forestry Division and many maintain a wide variety of trees and shrubs in their yards.

- Responsible for the maintenance of the privately owned landscape. This component of the urban forest includes residential, commercial, industrial, and institutional settings.
- Citizens support a wide variety of community development, conservation and service organizations through volunteer labor and monetary contributions.

### **Others**

Numerous other organizations and individuals have an interest in the urban forest including: federal and state governmental agencies, professional societies and associations, nursery growers and retail nursery people, arborists, landscape contractors, gardeners, wildlife biologists, and urban forestry academicians, consultants and planners.

## **Existing Ordinances and Legal Authority**

### *Land use goals*

The following ordinances describe the legal authority for development of the UFMP. Other legal requirements are also identified.

### **Statewide Planning Goals**

Statewide land use goals adopted by the Land Conservation and Development Commission form the framework for the development of local comprehensive plans. Several of the 19 goals relate to urban natural resources and community livability, including:

**Goal 4:** To conserve forest lands for forest uses. Forest lands include forested lands in urban areas which provide urban buffers, scenic corridors, and recreational uses. Forest uses other than wood and fiber production include: open space, visual separation between conflicting uses, soil protection from erosion, maintenance of clean air and water, and wildlife and fisheries habitat. Preservation of this resource can be accomplished through zoning and ordinances to retain vegetation during development, by requiring permits for removing street trees, maintaining forestation along stream beds and in hazard areas, and by developing an urban forestry program (Leonard, 1983).

**Goal 5:** To conserve open spaces and protect natural and scenic resources. Directs local governments to inventory, analyze and protect significant resources.

**Goal 6:** To maintain and improve the quality of the air, water, and land resources of the state.

**Goal 13:** To conserve energy.

**Goal 15:** To protect, conserve, enhance, and maintain the natural, scenic, historical, agricultural, economic, and recreational qualities of lands along the Willamette River.

## Portland City Code

**Chapter 20.40.** Passed April 6, 1972. Establishes the Urban Forestry Commission and calls upon it to develop and establish a Comprehensive Urban Forestry Plan, (Section 345 also identifies the Parks and Recreation Superintendent as being responsible for the developing and maintaining the UFMP); describes the duties and authority of the City Forester (now the Urban Forestry Manager); describes the requirements for the planting of trees on streets and in parks; identifies property owner as responsible for maintenance for street trees; includes section calling for a comprehensive street tree plan to be developed and for a survey to be conducted; describes the designation and care of Heritage Trees. See *Appendix 13*.

*Urban Forestry  
Commission*

A Heritage Tree Subcommittee identifies trees that qualify as heritage trees and provides plaques that recognize the adopted trees in order to educate the public of their presence. An "Adopt a Tree" program has been implemented to assure that the trees are properly maintained by a qualified arborist if the property owner cannot afford the care. These trees can only be removed with the consent of the Commission after a public hearing or by the Forestry Manager if a hazard exists. See *Appendix 5*.

*Heritage trees*

Analysis: Compared to key ordinance provisions in "Guidelines for Developing and Evaluation Tree Ordinances" (Bernhardt and Swiecki, 1991), Portland's ordinance contains most of the elements listed, with these exceptions:

- It does not specify cooperation between other bureaus.
- It does not specify the procedure for resolution of conflicts between trees and structures or other tree disputes. (This is mainly in reference to solar access issues. This procedure is covered to some degree in the solar access ordinance).
- Topping trees is not explicitly declared unlawful.
- Private tree care firms are not regulated by the city.
- Does not contain a variety of penalties under penalties section to deter violators.
- Does not have mitigation section to allow for restoration of the urban forest off-site.



Problems with compliance are often due to lack of awareness about the ordinance as well as to weaknesses in the ordinance itself. Lack of enforcement due to insufficient staffing is a major problem.

Other issues include:

- Many people are simply ignorant of proper arboricultural standards.
- People know of the regulations but fail to comply because they think a view of a sign is more important, or they don't want to pay for sidewalk repair so they won't replant street trees.
- Tree care companies are totally unregulated. Although most are reputable, there are untrained and unscrupulous individuals who make a living on tree butchery.

Education may prove effective in alleviating many of these problems. For example, clearly written and widely distributed standards for tree care (National Arborists Association's) may reduce the practice of tree topping.

*Regulation of tree  
cutting*

**Tree Cutting Ordinance.** Ordinance 168486, passed on Feb. 2, 1995. Regulates the cutting of trees 12" dbh or greater in all areas, except on fully developed residential parcels, as defined in the ordinance. This ordinance is in effect until February 1997. See *Appendix 14*.

Analysis:

This ordinance was recently passed and will be evaluated after it has been in place for a sufficient time to see if it is effective. Tree removal needs to be addressed from initial design considerations through final inspections.

**Tree Cutting on Sloped Areas.** Ordinance 168340, passed on Dec. 7, 1994. Amends Title 24 regulations to require clearing permits for tree cutting and root grubbing on sloped areas of 25% or more.

**Title 33 of the City Code.** The Planning Bureau is primarily responsible for the following regulations, although approvals of site plans that include street trees are coordinated with the Urban Forestry Manager. These chapters address elements of the urban forest other than street trees and public trees.

*Landscaping  
requirements*

**Chapter 33.266 Parking and Loading.** Requires minimum setbacks and perimeter landscaping for surface parking lots and for interior landscaping. Requirements are to landscape at the rate of 20 sq. ft. per stall and provide one tree for every 200 sq. ft. of landscaping or to



provide one tree for every four parking stalls. Perimeter setbacks and landscaping are also required in loading areas.

Analysis:

Problems include:

- The requirements do not adequately consider the physiological needs of trees. Minimum tree planting areas are 4' in concrete areas and 3' in asphalt areas. All should be at least 4', preferably greater.
- There is insufficient monitoring and enforcement of these regulations.
- Installation is regulated, but standards for maintenance are not included ("in a healthy manner" is not specific enough) or enforced.
- The requirements specify tree stems but not tree canopy coverage. This allows the planting of many narrow columnar trees in areas where a tree with a broader canopy would be more beneficial for the urban forest. An alternative would be to require a specified percent of tree canopy of the lot at maturity, ie, 50% coverage.
- There is no mechanism to apply these regulations to existing developments unless there are other considerable improvements to the property being made.

*Note: This section of the Code is currently being reviewed and revised.*

**Chapter 33.248 Landscaping and Screening.** Requires reestablishment of vegetation for aesthetic, health and urban wildlife reasons; promotes retention of existing vegetation and native plants and mitigates for loss of natural resource values; establishes standards to be met in various areas of the City and regulates types and placement of plants.

*Promotes existing native vegetation*

Analysis:

Protection and conservation need to be emphasized over new plantings. Maintenance and plant replacement should be addressed. Designers tend to use same plants repeatedly, resulting in a monoculture of photinia hedges around parking lots. Clustering of trees would provide variety; it is allowed but is seldom used. Enforcement is poor. Goals are not always achieved because of inadequate resources for following up on requirements.

**Chapter 33.410 Buffer Zone.** Provides for additional buffering between non-residential and residential areas. Additional landscaping is called for in certain areas.

Analysis:

This regulation has little impact because it applies in few areas of the City.

*Special zones*

**Chapter 33.420 Design Zone.** Recognizes areas of the City that have special historic, architectural or cultural value. Design guidelines have been adopted for the following areas:

- Central City Plan District
- South Auditorium Plan District
- Ladd's Addition Design District
- Lair Hill Design District
- Macadam Design District
- Terwilliger Design District
- Albina Community Plan

*Natural resource protection*

**Chapter 33.430 Environmental Zones .** These regulations carry out Statewide Planning Goal 5 – to “conserve open space, protect natural and scenic resources.” The Environmental zones protect and conserve natural resources and resource values through the Environmental Conservation (c) and Environmental Protection (p) overlay zones and the following plans that have been adopted by the City:

- Columbia Corridor Plan, 1989, 2967 acres covered by environmental zoning.
- Balch Creek Watershed Protection Plan, 1991, 710 acres
- Johnson Creek Basin Protection Plan, 1991, 1795 acres
- Northwest Hills Natural Areas Plan, 1992, 5717 acres
- Southwest Hills Resource Protection Plan, 1992, 2911 acres
- East Buttes & Terraces Resource Conservation Plan, 1993, 666 acres
- Fanno Creek and Tributaries Protection Plan, 1993, 942 acres
- Skyline West Natural Areas Plan, 1994, 617 acres

Lands within these plan areas can be regulated according to two categories of environmental zoning. The “Environmental Protection” zone is strictly controlled. The “Environmental Conservation” status requires that activity avoid damage to the resource or mitigate where damage is unavoidable. Collectively, the environmental zones cover approximately 15,825 acres or about 17 percent of the city’s 89,600 acres. More than half of this acreage is in public ownership and much of the remainder is privately-owned open space such as cemeteries, golf courses and private lakes.

Analysis: Forest resources within these eight plan areas are protected to the extent that these regulations provide. Development is subject to land use review. Mitigation guidelines specify use of native plants from the “Portland Native Plant List.” Maintenance through time of establishment, and ongoing monitoring of mitigation projects is the responsibility of the property owner.

These regulations were recently revised to include clear and objective standards and a better notification process. Environmental zones share many goals with urban forestry, especially the use of education as a management tool. An Environmental Handbook will be prepared to explain how to develop within Environmental zones and will include information about the urban forest.

**Chapter 33.440 Greenway Zones.** Regulates and protects the lands and resources along Portland's rivers; establish standards and procedures for development. Landscaping is required to conserve or reestablish vegetative cover in the required setbacks. Standards require one tree per 20' of river frontage and one shrub per 2' of river frontage. Native plants are required.

**Chapter 33.480 Scenic Resource Zone.** Protects significant scenic resources including view corridors and scenic corridors. Requires the preservation of all trees 6" or more in diameter at a height of 5' from the ground within the street setback.

**Solar Access Regulations.** Ordinance No. 157990, November 20, 1985. This ordinance amended Title 33 of the Planning and Zoning Code to establish solar access regulations in multiple zones to private property rights regarding access to sunlight. A 'solar-friendly' tree list was prepared as part of this project based on branch density and foliar period. (See *Appendices 8 and 9*.) Solar-friendly trees are exempted from access design regulations. Substantial pre-existing vegetation is 'grandfathered' and there are limited exceptions to the solar standards.

*Solar-friendly trees*

**Downtown Trees.** Ordinance No. 153668, August 12, 1982, amends Title 33 of the City Code to require planting of street trees in the downtown district, for all new construction and all alterations exceeding 50% of the value of the existing building or improvement. The Urban Forestry Commission reviews downtown development plans to assure compliance with this code. Fire Bureau and other City Bureaus must also approve plans. Care and maintenance is the responsibility of the property owner.

**Dutch Elm Disease.** Ordinance No. 159750, June 10, 1987, declared trees with Dutch elm disease to be a nuisance; infected trees must be removed at the expense of the property owner. City personnel can inspect elm trees on private property. Oregon Department of Agriculture has established a quarantine against all species of Elm and related genera within Portland.

**Commercial Development and Street Trees.** Ordinance No. 163739, December 26, 1990, requires planting of street trees when commercial development or improvements exceed \$25,000.

### **Title 34 of the City Code**

Provides uniform standards for subdivisions and partitioning of land and the installation of related improvements. When this section is rewritten, there will be an opportunity for input on urban forest issues and coordination of regulations.

### **Relationship to Other Plans**

#### **Sustainable City Principles.**

*Moving to a sustainable future*

In November of 1994, the City of Portland adopted a set of principles to promote a sustainable future that meets today's needs without compromising the ability of future generations to meet their needs. The following principles are particularly applicable to the urban forest:

- 1. Encourage and develop connections between environmental quality and economic vitality.* Promote development that reduces adverse effects on ecology and the natural resource base and supports employment opportunities for our citizens.
- 2. Include long term and cumulative impacts in decision making* and work to protect the natural beauty and diversity of Portland for future generations.
- 4. Ensure environmental quality and understand environmental linkages* when decisions are made regarding growth management, land use, transportation, energy, water, affordable housing, indoor and outdoor air quality and economic development.
- 6. Prevent additional pollution through planned, proactive measures* rather than only corrective action.
- 9. Educate citizens and businesses about Portland's Sustainable City Principles and take advantage of community resources.* Facilitate citizen participation in City policy decisions and encourage everyone to take responsibility for their actions that otherwise adversely impact the environment.

### **Portland Comprehensive Plan**

*Urban forest component of many land use elements*

The Comprehensive Plan (City of Portland, Bureau of Planning) was adopted in 1980 and was revised in 1993. A well-managed, diverse urban forest is an essential component of several of the 12 land use elements identified in this plan.



**Urban Development:** The integration of parks, trails, and other open spaces will provide recreational opportunities and visual relief in the city.

**Neighborhoods:** Trees contribute to the stability, vitality and unique character of neighborhoods.

**Transportation:** Street trees and landscaped traffic management devices contribute to safe and livable streets. Landscaping can buffer more heavily used transportation corridors from adjacent residential and commercial uses.

**Energy:** Urban trees provide shade and cool the air through transpiration, thus reducing the need for summer cooling and related energy consumption. Trees mitigate urban heat island effects and larger global warming trends.

**Environment:** Trees are inextricably linked to air and water quality, and wildlife habitat.

**Urban Design:** The urban forest blankets the physical setting of the city and significantly contributes to the scenic quality of Portland. Panoramic views, vistas, and intimate open spaces are defined by trees.

### **Portland Energy Office**

**Carbon Dioxide Reduction Strategy (City of Portland, 1993).** As part of an international effort to reduce carbon dioxide emissions, Portland is participating in the "Urban Carbon Dioxide Reduction Project." Tree planting is one of six elements identified in this strategy to reduce emissions. Goals, objectives, and actions are outlined for reforestation throughout Oregon and within the urban area. All of the actions listed are closely linked to the purposes of the urban forestry program. They include:

*Trees reduce carbon dioxide*

- Plant 100,000 street trees in Portland with an emphasis on achieving an optimum diverse tree canopy.
- Plant 40,000 street trees in the metropolitan area outside Portland.
- Expand funding of urban tree maintenance activities to protect mature trees, and allow juvenile trees to reach a healthy maturity.
- Promote private tree planting in the Portland metropolitan area.
- Site new trees for solar access and cooling benefits.
- Expand metropolitan greenspace and add trees where possible.
- Expand measures to preserve large trees during development.
- Publish information on urban trees.



### **Community and Neighborhood Plans**

Many districts and neighborhoods have or are getting community development plans. Tree planting, maintenance and other landscaping projects are an integral part of building vital communities. Where certain species or themes have been established as part of a neighborhood plan, new forestry projects should be coordinated accordingly. The UFMP can serve as a technical and design resource for new neighborhood planting and maintenance projects.

### **Metropolitan Greenspaces Program Master Plan**

The Metropolitan Greenspaces Program Master Plan (Metro, 1992) is a policy document that outlines goals and specific tasks required to achieve a coordinated regional greenspace system. Remaining natural area sites throughout the region have been identified and assessed as a result of this program. This document establishes a framework prioritizing acquisition, and/or preservation and restoration of natural areas, open spaces, trails, and greenways for wildlife and people. Site specific plans or standards for trails and greenways are yet to be developed. Technical and design standards in the UFMP can serve as a resource for the development and maintenance of vegetation within the City of Portland.

### **Other plans that share goals consistent with the UFMP**

- Individual Park Management Plans
- The Metro Region 2040 Plan
- The Willamette Greenway Plan
- The 40 Mile Loop Master Plan
- Transportation Planning Rule
- Federal Water Quality Act – clean water requirements
- Clean River Program
- Park Futures
- Portland State University District Plan

### **Summary**

Numerous bureaus, groups and organizations manage certain aspects of the urban forest, sometimes cooperatively, sometimes not. The urban forest is of specific value to many of them and a source of work for all. Certain activities in the urban forest are regulated. Regulations need to be studied and consolidated where possible. Urban forest management must be coordinated and improved.

The following matrix summarizes the current conditions in several categories.

## CURRENT CONDITIONS

### URBAN FORESTRY MANAGEMENT PLAN

	ASSESSMENT	PLANTING OPPORTUNITIES AND NEEDS	PLANTING AND DESIGN STANDARDS AND GUIDELINES	MAINTENANCE OF THE URBAN FOREST	EDUCATION	INCENTIVES	REGULATIONS	ADMINISTRATION OF THE URBAN FOREST
<b>Current</b>  <b>What we have now</b>	<p>Some recent, very general information is available, as is some historic data. Comprehensive data for the city is needed.</p> <p>Existing information includes:</p> <ul style="list-style-type: none"> <li>• 1938 WPA Inventory of street trees.</li> <li>• 1976 Street Tree inventory - 57% of City covered.</li> <li>• 1979 Study of the economic value of Portland's street and park trees.</li> <li>• 1989 MSU Street Tree study included Portland.</li> <li>• 1990 McPherson <u>Modeling Benefits and Costs</u> included Portland.</li> <li>• Maintenance is currently doing inventory of street elements - might be possible to add street trees.</li> <li>• Some detailed neighborhood inventories for areas such as Irvington have been done.</li> </ul>	<p>Planting opportunities are available in many areas of the City and in all management units. The Plan addresses those opportunities in detail.</p> <p>Items below are being done now.</p> <ul style="list-style-type: none"> <li>• FOT plants between 600 - 1000 street trees annually as well as 200 - 1000 seedlings in riparian areas and some trees in parks and on school grounds.</li> <li>• The City endorses planting 100,000 street trees in next 20 years as part of the Energy Office's CO<sup>2</sup> Reduction Strategy but no bureau is responsible for planning and planting them. FOT is evaluating planting opportunities for CO<sup>2</sup> Reduction with PGE.</li> <li>• Some native trees and shrubs are planted in Forest Park after ivy removal.</li> <li>• Parks plants 300 trees/year in the City's parks. The ratio of plantings to removals is about 1:1.</li> </ul>	<p>There are few adopted City Standards but guidelines are available from many sources. They are not coordinated for the various management units.</p> <ul style="list-style-type: none"> <li>• The only Planting Standards used consistently are those found in various City Code requirements for development and for street trees.</li> <li>• Guidelines are available on request from many sources including the City Forester and local nurseries.</li> </ul>	<p>Maintenance is fragmented with most of the urban forest being maintained by the property owners with little guidance or information. There is little or no coordination between programs.</p> <ul style="list-style-type: none"> <li>• The city maintains Parks trees and street trees in some areas.</li> <li>• Most street trees are maintained by the adjacent property owner with a lack of consistent application of arboricultural standards.</li> <li>• Many street trees are being topped creating future hazard trees.</li> <li>• All other maintenance is by private property owners.</li> <li>• Community clean up activities such as SOLV - IT.</li> <li>• Metro and quasi-public organizations such as Audubon maintain their parks and greenspaces.</li> <li>• FOT Tree Team provides follow-up to tree plantings.</li> </ul>	<p>There is no coordinated education program about the urban forest.</p> <p>The following is available at present:</p> <ul style="list-style-type: none"> <li>• UFC has slide show ready to present to neighborhood assoc. and other groups.</li> <li>• Publications of individual groups are distributed in various places: Forestry Division Extension Publ. Home &amp; Garden shows.</li> <li>• FOT has a number of activities, but on a small scale.</li> <li>• Arbor Day activities.</li> <li>• Earth Day activities.</li> <li>• Heritage tree program provides some education.</li> </ul>	<p>Few tangible incentives exist to make it easier to maintain and enhance the urban forest.</p> <ul style="list-style-type: none"> <li>• FOT provides street trees at reduced cost.</li> <li>• Personal pride of place is main incentive.</li> </ul>	<p>Tree removal and replacement is regulated in certain instances listed below. Enforcement of these regulations is very lax.</p> <ul style="list-style-type: none"> <li>• Street Tree ordinance.</li> <li>• Heritage Tree ordinance.</li> <li>• Tree cutting ordinance - on underdeveloped properties only.</li> <li>• Slope (25%) cutting ordinance in newly annexed areas.</li> <li>• Planning Bureau Codes: Street Tree requirements, Parking Lot requirements, Buffering requirements, Landscape coverage requirements.</li> <li>• Dutch elm removal requirements.</li> <li>• Solar access ordinance - includes list of solar-friendly trees.</li> </ul>	<p>Various groups, agencies, and bureaus are responsible for administration of various aspects of the urban forest, but these efforts are not coordinated.</p> <p>There are some cooperative agreements between some City bureaus.</p> <ul style="list-style-type: none"> <li>• See Chapter 2 of Draft UFMP for details on the following: UFC Parks: Forestry Division Horticulture Division Natural Resources Planning Environmental Services PDOT: Transportation Eng. Maintenance Traffic Management Street Lighting Buildings</li> <li>• Other groups within the area such as Metro Regional Parks and Greenspaces and Audubon administer parts of the urban forest.</li> </ul>

**Sources:**

Code of the City of Portland. 1993. Barbara Clark, Auditor. Portland, OR.  
Carbon Dioxide Reduction Strategy. 1993. City of Portland.  
Comprehensive Plan. Bureau of Planning, City of Portland.  
Sustainable City Principles. 1994. City of Portland.  
Metropolitan Greenspaces Program Master Plan. 1992. Metro.

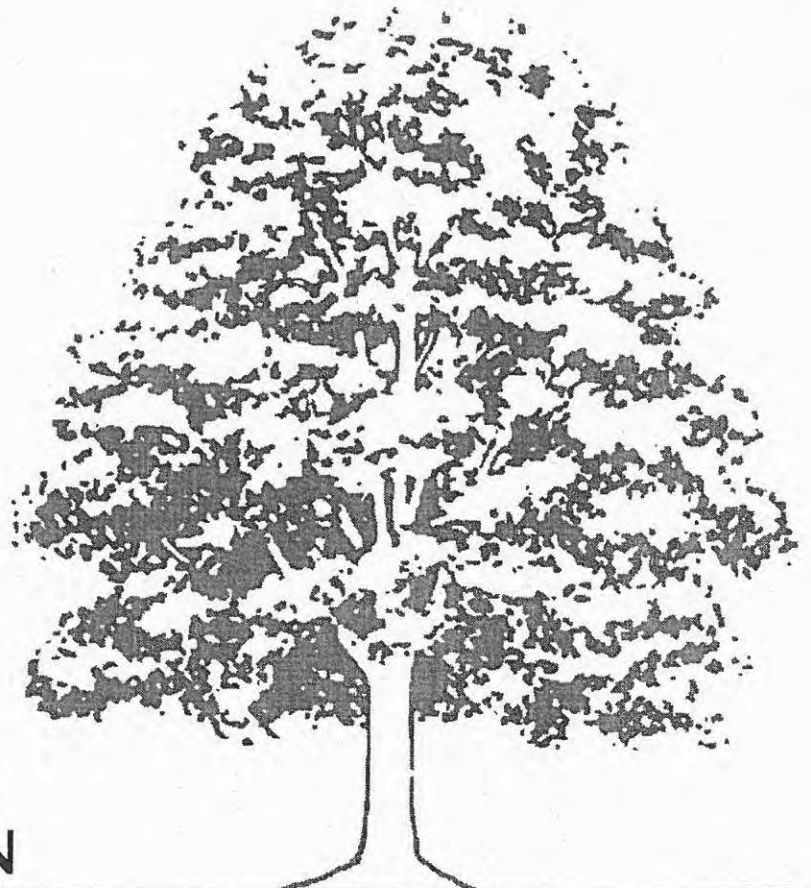


## **Chapter Three IMPLEMENTATION PLAN**

**Introduction  
Principles  
Recommended Actions - Baseline, Immediate, Short Term, Long Term  
Making the Vision a Reality  
Summary**

**Portland's  
URBAN FORESTRY  
MANAGEMENT PLAN**

---







## Chapter Three

# IMPLEMENTATION PLAN

---



### Introduction

We have examined the current conditions and analyzed the management and administration of the urban forest. This chapter consolidates that information into a series of principles and recommended actions that will allow us to achieve our vision of Portland's urban forest in the year 2015. These recommendations are further elaborated and expanded in the next chapter on Management Units.

*"When tree plans become as common as zoning plans, we will have made a major change for more humane, livable cities."*

Henry F. Arnold  
*Trees In Urban Design*

### Principles

Development of this plan is based on ecological planning principles which includes human needs and considerations. Without humans, the urban forest would not exist. Our decisions determine which trees survive and thrive, how the urban forest functions and whether it produces more benefits than costs. Our decisions have long-term as well as short-term consequences. It is very important to understand that the choices we make now will affect the choices that are available to us in ten, twenty or fifty years.

In managing the urban forest, we need to understand that the forest crosses our boundaries and property lines. Trees on private property are affected by and affect trees on public property. We are working with the whole, not the pieces. We must balance community needs with natural system needs and look for those solutions that provide sustainable and responsible results.

The following principles apply in general to the management of Portland's urban forest, but may be modified for specific circumstances:

**The green infrastructure is as important as the gray infrastructure.** The urban forest, watersheds, ridgelines and open spaces are as important to our well-being and health as the utilities, roads and sewers.



*Ecological planning principles*



*Retain wetlands*

**Respect natural landscapes including forest lands, wetlands, grasslands and other non-wooded areas.**

Maintain and improve all areas of vegetation in City.

**Mitigate for tree loss caused by development and redevelopment.**

Replace trees lost because of clearing for development and other reasons. Use education and replacement requirements available through city codes. Develop appropriate planting standards and design guidelines.

**Replace dying trees.**

Identify dying trees – causes and remedies; determine who is responsible for their replacement. Dead or dying trees in certain areas may be retained for wildlife purposes.

**Maximize multiple objectives for planting.**

Identify objectives and their coordination.

*Restore native vegetation*

**Restore the natural, native landscape.**

Encourage use of natives and other plants naturally adapted to this environment, except for those plants that are nuisance plants and non-native invasives. Select plants that are pest and disease resistant and either long-lived or self-sustaining. Where appropriate, encourage or require the use of native trees, shrubs and ground covers to maintain the regional character of the City and Portland's "sense of place."

**Work for species diversity.**

Use a variety of plants to encourage general health of the urban forest.

**Discourage planting of aggressive non-natives and encourage remedial action in problem areas.**

Eliminate and control aggressive non-natives that suppress natural succession of plants and reduce the natural revegetation of natural areas and open spaces.

*Plant larger trees*

**Encourage planting of large canopy trees in appropriate areas.**

Educate the public about benefits and desirability of planting large trees.

**Promote practices that result in net gains in the urban forest.**

For every tree that is removed, plant others of equal or greater environmental value.

**Protect mature trees in all areas.**

Educate the citizens and developers about the importance of maintaining and respecting the mature trees of the City.

**Develop a new aesthetic for all kinds of development.**

Promote a concept of differing levels of landscape treatments and maintenance, especially on large parcels of property: Locate refined ornamental plantings with highly maintained/irrigated settings near buildings and site entrances; recreate or maintain natural plant communities with low-maintenance requirements in areas away from buildings.



*A new aesthetic*

**Educate rather than regulate.**

Use education in all forms to promote the protection, maintenance and enhancement of the urban forest. Use regulations as the method of last resort. Educate all sectors of the public about the urban forest – private property owners, developers, school children, city employees. Promote correct actions that inspire correct actions by others.

**Promote proper care of young and newly planted trees.**

Early proper care will improve the health of trees as they mature.

**RECOMMENDED ACTIONS – Baseline/Immediate, Short Term, Long Term**

The following recommended actions move the City toward the realization of the vision for Portland's urban forest. The actions are organized as follows:

*Realizing the vision*

**Baseline/Immediate Actions** – those items that must be completed within three years, and before other work can occur;

**Short Term Actions** – those items that need to be completed within three to five years;

**Long Term Actions** – those items that need to be completed in five to ten years.

*Work in each level must be completed before work on the next level is started.*

The recommended actions are listed under the following categories:

- Assessment

- Planting Opportunities or Needs

- Planting and Design Guidelines and Standards

- Maintenance of the Urban forest

- Education

- Incentives

- Regulations

- Administration of the Urban forest

Summary matrices follow these recommendations.



## ASSESSMENT

*Characterize and document Portland's urban forest.*

### **Baseline/Immediate Actions:**

#### **Identity the boundaries and elements of the urban forest.**

Describe the landscape character and regional continuity of the urban forest for the City of Portland. Identify the locations and conditions of each management unit.

#### **Map canopy cover of city – by neighborhoods, or other planning units.**

Note general canopy cover, or stems if appropriate, by neighborhood and by management unit. Different types of mapping are appropriate for different management units.

#### **Assess health and condition of urban forest.**

Inventory management units or individual trees as needed to determine health and condition.

#### **Establish baseline and monitoring process for changes in quantity and quality of urban forest.**

Determine elements or areas that need to be monitored, frequency of monitoring. Work with neighborhoods that are willing to participate in detailed inventory and analysis.

#### **Work with City and regional groups on common mapping needs.**

Coordinate mapping needs and opportunities with other City bureaus and agencies such as Metro.

### **Short Term Actions:**

#### **Survey areas available for additions and improvements to the urban forest.**

Note opportunities for planting trees and other plants.

#### **Inventory paved areas to determine possible planting areas.**

**Identify landscape types:** Wooded, Grasslands, Wetlands, Watersheds and Stream Corridors.

**Study need for and method of obtaining data for comprehensive tree inventory.**

**Determine information needs for efficient management of the urban forest.**



*Assess conditions*

*Evaluate existing  
condition of urban forest*

*Identify areas for  
additions*

**Long Term Actions:**

**Inventory street trees.**

*Perform detailed surveys*

Provide information on location, species, size, health of trees in rights-of-way.

**Inventory Heritage Trees.**

Provide comprehensive information on the location and condition of potential Heritage Trees.

## PLANTING OPPORTUNITIES AND NEEDS

*Coordinate public and private efforts to maximize quantity and quality of urban forest.*

### **Baseline/Immediate Actions:**

**Identify all planting plan opportunities.**

Focus planting efforts on tree-deficient areas of Portland.

**Look for non-traditional planting areas, ie. roof tops.**

Identify tree-deficient areas from inventory. Determine strategies for replacing trees.

**Evaluate benefits of City management of street trees.**

Street tree plantings are not uniform throughout the City because their maintenance is the responsibility of adjacent property owners. Not all property owners can afford this. Determine methods to equalize the benefits of street trees throughout the City. Form a Street Tree Study Group to determine if the City should take over this role. Look at funding implications.

**Plant 10,000 street trees/year, beginning in 1996, to implement the City's Carbon Dioxide Reduction Strategy.**

The City has adopted a plan to plant 100,000 street trees in the next 20 years as part of the Carbon Dioxide Reduction Strategy. This action will accomplish that plan in 10 years.

**Plant and improve the urban forest on City property.**

The City should lead by example and practice what it preaches.

### **Short Term Actions:**

**Carry out recommendations of Street Tree Study Group.**

**Identify suitable sites for tree plantings under a Tree Bank mitigation program.**

Find and purchase or obtain permission to plant trees as mitigation for tree cutting that occurs in other areas of the City. Note: Establishment of a Tree Bank is listed as Baseline Action under Maintenance of the urban forest.

### **Long Term Actions:**

**Identify end result desired.**

Describe what various management units will look like under optimal conditions, use benchmarks or other methods of determining status and progress.



*Planting opportunities*

*Plant 10,000 street trees/  
year for the next 10  
years*

*Set up tree bank*

*Establish benchmarks*



*Standards and guidelines*

## **PLANTING AND DESIGN STANDARDS AND GUIDELINES**

*Develop planting and design standards and guidelines that promote a healthy and diverse urban forest.*

### **Baseline/Immediate Actions:**

**Continue review and assessment of existing standards and guidelines.**

List and analyze all existing requirements that apply to the urban forest from Planning, Forestry, Environmental Services, etc.

**Research and adopt appropriate standards; develop new standards where needed.**

Use nationally recognized, industry-wide standards. Contact appropriate groups for information. Develop new standards where needed. Determine if standards are needed for native materials or other unusual planting situations.

**Establish standards and guidelines for each management unit.**

Prepare information that will further the improvement of each management unit. Work with other City bureaus to provide for the urban forest as they develop their management guidelines.

### **Short Term Actions:**

**Develop guidelines for homeowners and private property owners.**

Prepare easily understood suggestions that property owners can easily carry out.

### **Long Term Actions:**

**Assess effectiveness of standards and guidelines. Adjust as needed.**

Determine if standards and guidelines are meeting the objectives of the plan.

*Develop guidelines*

*Assist homeowners*

*Assess standards*

## MAINTENANCE OF THE URBAN FOREST

*Coordinate a maintenance program that ensures the health of the urban forest and protects the public safety.*

### **Baseline/Immediate Actions:**

**Increase current levels of numbers, canopy cover and species of trees. Establish practices that promote net gains in the urban forest.** Provide maintenance care and practices that protect and improve the existing urban forest.

### **Identify and resolve existing urban forest maintenance problems – both on public and private lands.**

Look at the current health of the urban forest. List public and private responsibilities for maintenance. Consider items such as hazard trees and nuisance trees. Prohibit/discourage tree topping. Develop information on the problems caused by tree-topping; especially hazards created by the public to the City's street trees. Note that early and effective maintenance practices are critical to the health of trees as they mature.

### **Determine most cost effective and beneficial methods of maintaining Street Trees.**

Establish a preventive street tree maintenance cycle to improve tree health and reduce maintenance costs.

### **Establish Tree Bank as mitigation for unavoidable tree cutting.**

Set up program to plant trees as mitigation for tree cutting that occurs in other areas of the City. Identify appropriate sites for tree planting.

### **Short Term Actions:**

**Carry out recommendations of Street Tree study group.**

### **Research and adopt appropriate maintenance standards for each management unit.**

Adopt national maintenance standards for pruning, irrigation, etc. Develop a maintenance cycle for street trees.

### **Monitor landscape modifications and their impact on the urban forest.**

Identify areas where modifications are needed including removal of invasive non-natives.

### **Identify pests, threats to urban forest and appropriate response.**

Prepare plans to deal with outbreaks of pests and diseases in native and non-native landscapes.



*Care for the resource*

*Adopt standards of care*



**Develop proactive program to deal with consequences of increased planting and maintenance of urban forest; i.e., leaf and yard debris.** Consider best methods for disposing of and recycling additional vegetative materials, storing, composting, redistributing.

**Long Term Actions:**

**Consider and assess use of underground utilities to decrease tree maintenance needs.**

*Reduce impacts from  
utilities*

Work with all utility companies to reduce the impacts on trees from utility lines above and below the ground.

## EDUCATION

*Create increased awareness and understanding of urban forests, the value and benefits of the urban forest and how to care for the urban ecosystem.*

### **Baseline/Immediate Actions:**

**Develop an education plan to improve the quality of tree care, promote the planting of trees, and raise awareness of the urban forest.**

Consider the following in all education:

The audience – who do we want to reach? The message (content) – what do we want to say? The delivery system – what is the best method of getting the information to the audience? Evaluate the results of the education effort; be flexible.

### **Incorporate urban forest information into Community Plans.**

Work with the Planning Bureau as they develop Community and Neighborhood Plans.

### **Short Term Actions:**

**Coordinate educational programs – internally through city bureaus, and externally through partner agencies, including neighborhood associations and coalitions.**

Coordinate efforts to reduce duplication and improve effectiveness of education programs. Establish the position of Tree Liaison for each neighborhood association.

**Develop materials that graphically describe quantifiable benefits of trees, tree care, related regulations and resources.**

Provide easy to understand visual information about the urban forest and its care, including benefits and aesthetics, invasive non-natives.

Possible Audiences: Media, Political Leaders, Neighborhood Associations and District Neighborhood Coalition Offices, Schools, City Bureaus, Green Industry, Other Businesses, Home Owners, Developers.

### **Link education with incentives.**

Use education to provide information on incentive programs.

**Develop educational program on pests and threats to urban forest.**

Inform people of common pests and diseases that threaten the health of the urban forest. Deal with pests and disease on comprehensive City-wide basis.



*Develop education program*

*Coordinate efforts*

**Assess possibility of establishing 'Tree Keeper' program.**

Work with Oregon State Extension Service to determine need for, costs of, and benefits from 'Tree Keeper' program that would help in education and maintenance of urban forest, similar to Master Gardener program.

**Long Term Actions:**

**Continue and expand education activities.**

*Expand education*

Assess effectiveness of education program; adjust and improve as needed.

## INCENTIVES

*Develop and implement a set of incentives that provide a tangible benefit for the planting and care of the urban forest.*

### Baseline/Immediate Actions:

**Develop a variety of incentives such as, but not limited to:**

- Land use density bonus, transfer of development rights in sensitive areas.
- Credit for trees that meet stormwater requirements including street trees.
- Property tax incentives for large and/or heritage trees, meeting canopy requirements.
- Covenants and easements that protect the urban forest.
- Rebates and discounts, such as Seattle's program that offers trees at a discount through a nursery/government program.
- Promote Urban Forestry Commission awards program.

**Develop and promote two or three of the listed incentive programs.** Choose programs that will have the most benefits on the expansion of the urban forest. Look for programs that involve many segments of the population and that also provide educational benefits.

### Short Term Actions:

**Develop rewards to encourage voluntary compliance with recommendations and actions that will improve the urban forest.**

Examples:

- Reward positive changes in landscape/hardscape.
- Encourage biological controls and organic maintenance practices.
- Reward existing commercial/industrial developments that upgrade to meet current landscape codes.
- Provide incentives for aesthetic preservation, (ridgelines, etc.) and wildlife habitat. (Define 'aesthetics' for clear and objective standards, get information on existing code relating to view protection.)

### Long Term Actions:

**Evaluate incentives program and adjust as needed.**

Examine effectiveness of incentives in meeting objectives of Urban Forestry Management Plan. Adjust as needed.



*Develop incentives for good urban forest care*

*Reward good stewardship of urban forest*

*Evaluate program*



*Consolidate and streamline regulations*

## REGULATIONS

*Develop and implement comprehensive set of regulations to ensure the effective implementation of the UFMP.*

### **Baseline/Immediate Actions:**

**Assess existing regulations; determine need for new regulations; streamline and improve regulations.**

Look at language, applicability, penalties, enforceability of all regulations and requirements that affect the urban forest. Look at urban forestry goals and ways of achieving compliance. Consider need for land clearing ordinance. Consolidate and reduce regulations and make them clear and easy to understand. Require certified arborist for work on street trees; recommend their use for other work. Explore the possibility of training sidewalk inspectors to check for street tree violations.

**Enforce existing regulations; develop appropriate penalties for violations.**

Fully implement Tree Cutting ordinance. Develop fine system for mitigation with monies designated for urban forestry programs.

### **Short Term Actions:**

**Educate the public about regulations.**

Provide information about regulations at appropriate times so the public knows what is expected and why.

**Evaluate effectiveness of regulations.**

*Evaluate effectiveness*

Examine effectiveness of regulations in meeting objectives of Urban Forestry Management Plan. Adjust as needed.

### **Long Term Actions:**

**Provide effective penalties and enforceable regulations.**

*Provide appropriate enforcement*

Increase compliance with regulations by making non-compliance very unattractive.

**Provide single source contact for enforcement of regulations.**

Improve enforceability of regulations by utilizing eyes and ears of neighbors. Provide seven-day a week contact for emergencies. Consider joint effort with other bureaus that deal with environmental issues.

**Continue to evaluate the effectiveness of regulations.**



## ADMINISTRATION OF THE URBAN FOREST

*Identify UFMP responsibilities and coordinate network of bureau, agency and partner activities.*

### **Baseline/Immediate Actions:**

#### **Hire urban forestry coordinator to coordinate activities across bureaus.**

Determine responsibilities of urban forestry coordinator and where position should be located; ie, within a bureau or as staff to Urban Forestry Commission or other.



*Coordinate urban forest management*

#### **Establish inter-bureau policy group to review City-wide urban forest issues.**

Include representative from each bureau involved with management of urban forest as well as representatives of other groups and agencies.

*Interbureau policy group*

#### **Evaluate and strengthen the existing Urban Forestry Commission.**

Look at status of UFC and their areas of responsibility. Identify areas where UFC should have more control or influence.

#### **Establish stable funding source and other stable management practices.**

Work with all organizations, agencies, bureaus and interested persons to find stable funding and establish partnerships to promote and enhance the urban forest.

*Establish stable funding*

#### **Establish partnership with Friends of Trees to provide certain services to the City.**

Friends of Trees is an established provider of trees for many areas of the City. Examine ways to include their abilities in more areas of the urban forest.

#### **Provide single-source public contact for information on projects and to report problems.**

All bureaus with urban forestry responsibilities to share in staffing and funding this position. Coordinate with or combine with the urban forest coordinator position.

*Single-source contact*

### **Short Term Actions:**

#### **Establish policies and framework flowchart for urban forest administration.**

Work with UFC and all bureaus to coordinate management of the urban forest, make policies decisions and manage areas of responsibility across bureau jurisdictions.

*Perform annual review of current management*

**Evaluate effectiveness of all UFMP actions on a regular basis.**  
Perform annual review and evaluation of UFMP programs and activities, consider all consequences of activities – intended and unintended.

**Long Term Actions:**

**Cooperate with other regional municipalities on regional management of the urban forest.**

*Cooperate on regional basis*

Portland's urban forest extends beyond political and governmental boundaries to include the urban forests of other municipalities. As this region grows and develops, we will need to work with other cities and towns to provide seamless and comprehensive management of our natural resources.

The following matrices summarize the information found in the lists above.

## BASELINE/IMMEDIATE RECOMMENDED ACTIONS

### URBAN FORESTRY MANAGEMENT PLAN

	ASSESSMENT	PLANTING OPPORTUNITIES AND NEEDS	PLANTING AND DESIGN STANDARDS AND GUIDELINES	MAINTENANCE OF THE URBAN FOREST	EDUCATION	INCENTIVES	REGULATIONS	ADMINISTRATION OF THE URBAN FOREST
<b>Baseline/ Immediate</b>  <b>What we need in 0 - 3 years.</b>	<ul style="list-style-type: none"> <li>Identify the boundaries and elements of the urban forest. <i>(UF Coordinator using existing inventory maps)</i></li> <li>Map canopy cover of city - by neighborhoods, or other planning units. <i>(UF Coordinator)</i></li> <li>Assess health and condition of urban forest. <i>(Arborist consultant)</i></li> <li>Establish baseline and monitoring process for changes in quantity and quality of urban forest. <i>(Arborist consultant)</i></li> <li>Work with City and regional groups on common mapping needs. <i>(UF Coordinator)</i></li> </ul>	<ul style="list-style-type: none"> <li>Identify all planting plan opportunities. Focus planting efforts on tree-deficient areas. <i>(UF Coordinator)</i></li> <li>Evaluate benefits of City management of Street Trees. <i>(UF Coordinator with special TAC/CAC or inter-bureau group)</i></li> <li>Plant 10,000 trees/year as part of CO<sup>2</sup> Reduction Strategy. <i>(UF Coordinator with inter-bureau group.)</i></li> <li>Plant and improve the urban forest on City property. <i>(All bureaus and City agencies)</i></li> </ul>	<ul style="list-style-type: none"> <li>Continue review and assessment of existing standards and guidelines. <i>(UF Coordinator)</i></li> <li>Research and adopt appropriate standards; develop new standards where needed. <i>(UF Coordinator)</i></li> <li>Establish standards and guidelines for each management unit. <i>(UF Coordinator)</i></li> </ul>	<ul style="list-style-type: none"> <li>Increase current levels of numbers, canopy cover and species of trees. Establish practices that promote net gains in the urban forest.</li> <li>Identify and resolve existing urban forest maintenance problems - both on public and private lands. <i>(UF Coordinator)</i></li> <li>Determine most cost effective and beneficial methods of maintaining Street Trees. <i>(UF Coordinator with TAC/CAC)</i></li> <li>Establish Tree Bank as mitigation for unavoidable tree cutting. <i>(UF Coordinator)</i></li> </ul>	<ul style="list-style-type: none"> <li>Develop an education plan to improve the quality of tree care; promote the planting of trees; and raise awareness of the urban forest. <i>(UF Coordinator with consultant)</i></li> <li>Incorporate urban forest information into Community plans. <i>(UF Coordinator with Planning Bureau)</i></li> </ul>	<ul style="list-style-type: none"> <li>Develop a variety of incentives such as, but not limited to:  <i>(see detailed list in Plan)</i> <i>(UF Coordinator)</i></li> <li>Develop and promote 2 or 3 of these incentive programs. <i>(UF Coordinator)</i></li> </ul>	<ul style="list-style-type: none"> <li>Assess existing regulations; Determine need for new regulations; Streamline regulations. <i>(UF Coordinator, with inter-bureau group)</i></li> <li>Enforce existing regulations; develop appropriate penalties for violations.</li> </ul>	<ul style="list-style-type: none"> <li>Hire urban forestry coordinator to coordinate activities across bureaus. <i>(UF Manager, with additional funding from other bureaus)</i></li> <li>Establish inter-bureau policy group to review City-wide urban forest issues.</li> <li>Evaluate and strengthen the existing Urban Forestry Commission. <i>(UFC with Inter-bureau group)</i></li> <li>Establish stable funding source and other stable management practices.</li> <li>Establish partnership with FOT to provide certain services to City. <i>(UF Manager)</i></li> <li>Provide single source public contact for information on projects and to report problems. <i>(UF Coordinator)</i></li> </ul>

## SHORT TERM RECOMMENDED ACTIONS

### URBAN FORESTRY MANAGEMENT PLAN

	ASSESSMENT	PLANTING OPPORTUNITIES AND NEEDS	PLANTING AND DESIGN STANDARDS AND GUIDELINES	MAINTENANCE OF THE URBAN FOREST	EDUCATION	INCENTIVES	REGULATIONS	ADMINISTRATION OF THE URBAN FOREST
<b>Short Term</b>  <b>What we need in 3 - 5 years.</b>  <b>Note: This assumes achievement of Baseline recommendations.</b>	<ul style="list-style-type: none"> <li>Survey areas available for additions and improvements to the urban forest. <i>(UF Coordinator)</i></li> <li>Study need for and method of obtaining data for comprehensive tree inventory. <i>(UF Coordinator, with special TAC/CAC or inter-bureau group)</i></li> </ul>	<ul style="list-style-type: none"> <li>Carry out recommendations of Street Tree study group. <i>UF Coordinator with inter-bureau group)</i></li> <li>Identify suitable sites for tree plantings under Tree Bank mitigation program. <i>(UF Coordinator)</i></li> </ul>	<ul style="list-style-type: none"> <li>Develop planting guidelines for homeowners and private property owners. <i>(UF Coordinator)</i></li> </ul>	<ul style="list-style-type: none"> <li>Carry out recommendations of Street Tree study group. <i>(UF Coordinator with inter-bureau group)</i></li> <li>Research and adopt appropriate maintenance standards for each management unit. <i>(UF Coordinator)</i></li> <li>Monitor landscape modifications and their impact on the urban forest. <i>(UF Coordinator, with assistance from Planning and Building bureaus)</i></li> <li>Identify pests, threats to urban forest and appropriate response. <i>(Arborist consultant)</i></li> <li>Develop pro-active program to deal with consequences of increased planting and maintenance of urban forest; ie, leaf and yard debris. <i>(UF Coordinator)</i></li> </ul>	<ul style="list-style-type: none"> <li>Coordinate educational programs - internally through city bureaus, and externally through partner agencies. <i>(UF Coordinator)</i></li> <li>Develop materials which graphically illustrate quantifiable benefits of trees, tree care, related regulations and resources. <i>(UF Coordinator)</i></li> <li>Link educational programs with incentives. <i>(UF Coordinator)</i></li> <li>Develop educational program on pests and threats to urban forest. <i>(UF Coordinator)</i></li> <li>Assess possibility of establishing Tree Keeper program. <i>(UF Coordinator)</i></li> </ul>	<ul style="list-style-type: none"> <li>Develop rewards to encourage voluntary compliance with recommendations and actions that will improve the urban forest. <i>(UF Coordinator)</i></li> </ul>	<ul style="list-style-type: none"> <li>Educate people about regulations. <i>(UF Coordinator)</i></li> <li>Evaluate effectiveness of regulations. <i>(UF Coordinator)</i></li> </ul>	<ul style="list-style-type: none"> <li>Establish policies and framework flowchart for urban forest administration. <i>(UF Coordinator with inter-bureau group)</i></li> <li>Evaluate effectiveness of all UFMP actions on a regular basis. <i>(UF Coordinator)</i></li> </ul>



# LONG TERM RECOMMENDED ACTIONS URBAN FORESTRY MANAGEMENT PLAN

	ASSESSMENT	PLANTING OPPORTUNITIES AND NEEDS	PLANTING AND DESIGN STANDARDS AND GUIDELINES	MAINTENANCE OF THE URBAN FOREST	EDUCATION	INCENTIVES	REGULATIONS	ADMINISTRATION OF THE URBAN FOREST
<p><b>Long Term</b></p> <p><b>What we need in 5 - 10 years.</b></p> <p><b>Note: This assumes achievement of Baseline and Short Term recommendations.</b></p>	<ul style="list-style-type: none"> <li>•Inventory street trees, if appropriate. <i>(UF Coordinator)</i></li> <li>• Inventory Heritage Trees. <i>(UF Coordinator and UFC subcommittee)</i></li> </ul>	<ul style="list-style-type: none"> <li>•Identify end result desired - quantities. <i>(UF Coordinator, with TAC/CAC &amp;/or inter-bureau policy group)</i></li> </ul>	<ul style="list-style-type: none"> <li>• Assess effectiveness of standards and guidelines. Adjust as needed. <i>(UF Coordinator)</i></li> </ul>	<ul style="list-style-type: none"> <li>•Consider and assess use of underground utilities to decrease tree maintenance needs. <i>(UF Coordinator, with UF Manager and utility company reps.)</i></li> </ul>	<ul style="list-style-type: none"> <li>• Continue and expand education activities. <i>(UF Coordinator)</i></li> </ul>	<ul style="list-style-type: none"> <li>• Evaluate incentives program and adjust as needed. <i>(UF Coordinator, with TAC/CAC &amp;/or inter-bureau policy group)</i></li> </ul>	<ul style="list-style-type: none"> <li>•Provide effective penalties and enforceable regulations. <i>(UF Coordinator, with TAC/CAC &amp;/or inter-bureau policy group)</i></li> <li>•Provide single source contact for enforcement of regulations. <i>(UF Coordinator, with TAC/CAC &amp;/or inter-bureau policy group)</i></li> <li>• Continue to evaluate effectiveness of regulations. <i>(UF Coordinator, with TAC/CAC &amp;/or inter-bureau policy group)</i> <i>(UF Coordinator)</i></li> </ul>	<ul style="list-style-type: none"> <li>• Cooperate with other regional municipalities on regional management of the urban forest. <i>(UF Coordinator, with TAC/CAC &amp;/or inter-bureau policy group)</i></li> </ul>



## Making the Vision a Reality

It will take a great deal of commitment and effort by all members of Portland's population to make the vision of the urban forest a reality. There is intense competition for general fund money. This plan proposes alternate funding possibilities as well as consolidation and improvement of existing services and resources. Listed below are some possible ways to carry out the recommended actions.



*Realizing the vision*

## Funding and Financial Possibilities

- Look at alternate ways to fund elements of the plan, including:
  - Public bond measure for the urban forest.
  - Establish an endowment; operate off the interest.
  - Front foot assessment.
  - Permit fees.
  - Gas tax/road tax for street trees.Establish a logical connection between the funding source and the expenditure.
- Allocate funds within the City to carry out various goals of the UFMP. Ensure that bureaus have adequate funds to manage that portion of the urban forest for which they are responsible. Look for ways to economize and coordinate efforts.
- Assist in establishing public/public and private/public partnerships.
- Establish a trust fund account to be used only for urban forest improvements. Funds could come from tax-exempt donations or proceeds from sale of unused city-owned properties.
- Develop a voucher/coupon system to encourage tree planting. City or others could provide partial funding.
- Establish a relevant surcharge that relates to the urban forest, such as a tax on lumber.

## Organizational Possibilities

- Establish a Tree Bank to provide for mitigation in those cases where trees must be cut and cannot be replaced on site.

- Urge all City Bureaus, including Portland Development Commission, to make tree planting a priority in their developments and capital improvements.
- Work with utility companies when they plant trees to offset carbon dioxide emissions.
- Work with the Bureau of Environmental Services to allow use of tree plantings to offset surface water treatment charges.
- Require additional plantings in development, construction, and reconstruction projects. (Combine requirements and mitigation; look at Title 34 requirements for methods of funding elements such as street lights.)
- Provide for and enforce penalties for non-compliance in required plantings.
- Assist in developing local assessment or local improvement districts for street tree plantings.
- Look at contracting out certain elements of urban forest management now done by the Forestry Division.
- Develop incentives to encourage developers to retain vegetation on their properties.
- Encourage each Neighborhood Association to appoint a "Tree Liaison" representative as the contact person for local tree issues. Coordinate with Neighborhoods to establish local 'Tree Board' to deal with urban forest issues.
- Examine the organizational structure of the Forestry Division to find ways to increase its effectiveness in dealing with urban forest issues across City Bureau jurisdictions.
- Establish a blue-ribbon committee, working with the Urban Forestry Commission, to promote the recommendations of this plan.
- Establish cycle of preventive maintenance.
- Look at ways of turning problems into opportunities.

## Summary

It is important to have well-planned and well-directed management that is coordinated across bureau and organizational lines. The urban forest must be included as an element of the City's infrastructure.

Implementation of these policies and actions will allow us to achieve the far-reaching vision presented at the beginning of this plan. We will have "a healthy, sustained urban forest, carefully managed and cared for, which contributes to the economic and environmental well-being of the city."

## Sources:

- Belton, Sharon S. 1993. Tree Budgets as Part of the City Infrastructure. *Growing Green Communities: Proceedings of the Sixth National Urban Forest Conference*.
- Sampson, R. Neil and Rowan Rowntree. 1991. The Living City. *Alliances for Community Trees: Proceedings of the Fifth National Urban Forest Conference*.



## **Chapter Four MANAGEMENT UNITS**

**Introduction**

**New Development Management Unit**

**Natural Areas/Stream Corridors Management Unit**

**Commercial/Industrial/Institutional Management Unit**

**Residential Management Unit**

**Parks and Open Spaces Management Unit**

**Transportation Corridors and Rights of Way Management Unit**

**Summary**

**Portland's  
URBAN FORESTRY  
MANAGEMENT PLAN**

---







## Chapter Four

# MANAGEMENT UNITS

---



### Introduction

For ease of discussion and organization, the urban forest has been divided into six management units based on their similar characteristics, issues, goals and proposed actions. Each management unit is an important element of the urban forest providing various benefits and serving different needs. Many parts of the City have more than one management unit, but the management units provide a coherent basis for discussion.

Some management units are well managed; others depend on the knowledge of private property owners, management is sporadic at best.

The six management units are:

- New Development
- Natural Areas and Stream Corridors
- Commercial/Industrial/Institutional
- Residential
- Parks and Open Spaces
- Transportation Corridors and Rights of Way

These specific actions build on the principles and recommendations in Chapter Three.

### New Development Management Unit

*Vacant undeveloped and underdeveloped land; areas that are being redeveloped.*

#### Description

This management unit consists of presently undeveloped lands in the City. These lands can be in residential areas or in commercial and industrial areas. Many of them are lands that are difficult to build on because they have steep sites or soils that need special engineering considerations. Often these areas are heavily wooded; development here will significantly reduce the local urban forest.

*"In managing the urban forest, we are playing a long-term chess game, with both living and non-living pieces. Some of our moves are direct, many are strategic. All must be planned toward a designed future."*

*R. N. Sampson and  
R. Rowntree  
The Living City*



*New development*

### Issues

**Protection versus Development.** Many forested lands in the New Development management unit are areas that we take for granted as remaining natural, but these areas will be developed as the city grows within the Urban Growth Boundary. As these areas are developed, this resource will be impacted and reduced in size and variety. The right of property owners to develop their property must be in balance with the benefits that the urban forest gives to all the citizens. Tree preservation must work in partnership with future development.

**Loss of Vegetation.** New development, as currently practiced, results in the loss of most vegetation on the development site. Trees still remaining on the site are then subjected to construction activities that frequently result in immediate or more subtle long term damage that results in their eventual loss. See *Appendix 2*.

**Maintenance.** After construction is completed, there is little in the way of assurance that the preserved and newly planted trees will remain and be properly maintained. Without proper maintenance, their future is questionable.

### Goals and Actions

**Goal 1. Provide clear regulations to protect existing urban forest as development occurs.**

#### Actions:

- Review existing codes and revise to apply in all appropriate situations. Many code requirements now only apply in "designated areas" such as: Environmental Zones, Greenways, Scenic Zones, and certain Plan Districts. Develop new code requirements if needed. Coordinate with Planning as sections of the Code are being rewritten.
- Change clearing code to encompass the entire city and address not only tree preservation for the tree's sake but also the impacts that result from tree and vegetation removal such as increased runoff, erosion, and slope instability.
- Assess effectiveness of recently adopted tree cutting ordinance and adjust as needed.
- Develop educational brochure that advises property owners of their responsibilities under the tree cutting ordinance.

- Adopt landscape requirements for new and remodeled multi-family housing to be regulated by the Bureau of Planning in conjunction with the Division of Forestry that address retention of trees during construction, and mitigation for trees lost during development. Requirements should include at least the following:
  - The developer shall employ a certified arborist if an accepted design for a site includes the preservation of a tree over 8" in diameter, dbh. The arborist will provide an accurate tree survey of the property, report on the health of the stand, and provide a tree protection plan to be followed during construction.
  - Maintain newly planted trees according to standards adopted by the City.

**Goal 2. Educate property owners and developers on the benefits of the urban forest and the importance of retaining trees and vegetation.**

**Actions:**

- Prepare material describing how to build with and around trees. Distribute as handouts with permits or development applications, to homebuilders, to Associated General Contractors, and others such as the developers' subcontractors, excavators and utilities working on the site.
- Develop and distribute material that highlights the multiple benefits of preserving existing trees and vegetation and on the proper care of the urban forest. Note that in most cases, it is less expensive and more desirable to retain the existing trees than it is to replant.

**Goal 3. Establish permit and review process that addresses urban forest preservation and enhancement.**

**Actions:**

- Require tree survey, report, and plan showing all trees 6" and larger as part of development permit process. Work with developers to preserve trees and limit tree removal.
- Address the urban forest issues at the pre-application stage so the developer will know what to expect. Provide Planning Bureau with accurate information about impacts of construction on the urban forest. Promote the following:
  - Avoid impacts to the resource where possible;

Replant on the site if possible;  
Replant in nearby areas;  
Contribute to the Tree Bank as a last resort.

- Provide funding for Forestry staff to participate in the pre-application process.
- Establish Tree Bank to mitigate for tree losses due to development and other tree removals.
- Establish on-site pre-construction conferences for large projects (more than one dwelling unit) to address urban forest concerns. At construction sites, clearly mark and enforce 'no disturbance' zones.
- Provide adequate enforcement and monitoring functions. Promote and develop a trained citizen advocacy to monitor development and compliance with established regulations.
- Coordinate administrative and regulatory actions with other agencies that have related activities, policies, and regulations.
- Establish a tiered stormwater fee structure that is related to the retention of trees and vegetation to treat on-site surface water.
- Develop a periodic review process for codes, standards, policies, and the UFMP.



*Natural areas*

## **Natural Areas and Stream Corridors Management Unit**

*Generally Undeveloped Public and Private Natural Areas*

### **Description**

Lands in this management unit are publicly or privately owned; many are significant natural resources, protected by regulating development in Environmental Conservation or Environmental Protection zones. Many of these areas are near streams and in watersheds. Recreation use is passive.

This management unit includes 7,600 acres of natural areas owned by the City and Metro Regional Parks and Greenspaces. These large blocks of urban wild lands are remnants of the natural landscape that provide important refuges for people and wildlife alike. Many of these regional and metropolitan natural areas include, or are joined by the 40 Mile Loop, a system of a more than 140 miles of trails that link parks and natural areas.



Privately-owned undeveloped areas may be regulated by various overlay zones which impose additional conditions on development in those areas.

**Environmental Zones.** Areas where the natural resources have special protection. Developments and activities are restricted. There is an emphasis on maintaining natural vegetation and plantings. Tree cutting is restricted.

**Greenway Zones.** Areas along rivers within the City. The best opportunities for enhancing the urban forest are in the River Natural, River Recreational, and River General zones. There may be some opportunities in River Industrial.

**Scenic Resources.** These areas are view corridors or areas of scenic significance where trees over 6" dbh have additional protection. If these trees are cut, they must be replaced with trees at least 2" dbh.

## Issues

**Protection versus Development.** A major issue in this management unit is protection of the privately-owned natural areas where new development is allowed and must be accommodated. Education of users and coordination of regulations are needed to protect the resources.

**Invasive non-native species.** Non-native plants, especially English Ivy, are a particular problem in the natural areas of the city. These plants crowd out desirable native plants and have serious impacts on wildlife habitats.

**Hazards.** Natural areas are at particular risk from a number of hazards including:

- Fires – both natural and human-caused.
- Erosion and water pollution
- Insect infestations and diseases.

**Illegal Activities.** Natural areas can be sites for illegal activities such as dumping of debris and garbage, and homeless camping. These activities can also pose risks to residents and legitimate users of the resources.

**Enforcement of regulations.** Many bureaus are involved in planning and enforcement of environmental regulations. At present most of the

enforcement is being handled by Building Bureau staff who are trained in building codes, not in landscaping and environmental requirements.

## **Goals and Actions**

**Goal 1. Coordinate regulations and enforcement in natural resource areas.**

### **Actions:**

- Identify and amend overlapping regulations. Solicit input for implementation strategies from all levels of city government and the public.
- Evaluate current inspection efforts. Assist in education of inspectors and enforcement of regulations on privately owned lands.
- Centralize enforcement issues. Provide a single-source contact for information on the Natural Areas and Stream Corridors and enforcement of Environmental Zone and watershed management plan regulations.
- Establish partnerships with various agencies and groups such as Friends of Trees, Bureau of Environmental Services, Portland Energy Office, Public Utilities, Johnson Creek Corridor Committee, The 40 Mile Loop Land Trust, Neighborhood Associations and Coalitions to provide more protection and management for the urban forest.
- Develop monitoring plan.

**Goal 2. Reduce natural and human-caused risks in natural areas.**

### **Actions:**

- Develop contingency plans and strategies to deal with emergencies such as disease and insect infestations.
- Work with Fire Bureau to maintain accurate record of potential fire hazards and to develop contingency plans related to fire issues. Coordinate UFMP goals and fire prevention activities.

**Goal 3. Educate owners and developers about value of urban forest and how to develop within it.**

### **Actions:**

- Develop "non-technical" presentation of educational materials and

programs for citizens and bureau staff to gain a comprehensive understanding of the urban forest.

- Promote property owner-based protection measures such as conservation easements.
- Collaborate with the Planning Bureau on the publication and distribution of the Environmental Handbook to include a section on the urban forest.

**Goal 4. Coordinate community involvement in protection and maintenance of urban forest within natural areas.**

**Actions:**

- Coordinate bureau outreach programs through the Office of Neighborhood Associations (ONA) and coalition offices, as well as other sources.
- Assist in the development of guided streamside tours, watershed outreach programs, demonstration projects, and workshops to foster positive public awareness and involvement.

**Goal 5. Restore damaged natural areas.**

**Actions:**

- Establish program to abate invasive non-native species:
- Educate public and bureau staff on issues and concerns related to invasive species.
- Coordinate with the Oregon Department of Agriculture (ODA Weed Division) to address issues and concerns associated with English Ivy and Himalayan blackberry.
- Recommend that English Ivy and Himalayan blackberry be placed on the State Quarantine list and develop radical extermination program.
- Replace plantings in natural areas after non-native invasives are removed. Ivy and other invasives suppress natural regeneration of trees, shrubs and herbaceous plants. As these are removed, replant native vegetation.
- Identify opportunities and processes for restoration activities.

- Educate property owners about appropriate restoration methods.
- Create partnerships with "Friends" groups.
- Establish and solicit grants for neighborhood associations and coalitions to restore local natural areas and stream corridors.

**Goal 6. Identify and acquire additional lands that need protection beyond normal regulations.**

**Actions:**

- Work with Metro to identify areas suitable and necessary for acquisition.
- Evaluate possibility of city-wide bond measure to acquire specific sites integral to the health of the urban forest in natural areas and stream corridors.



*Commercial areas*

**Commercial/Industrial/Institutional Management Unit**

*Urban and Neighborhood Commercial Areas; Malls; Manufacturing and Warehousing Areas; Industrial and Wholesale Sales; Industrial Parks; Quasi-Public Areas Such as Schools, Religious Institutions, Government Facilities.*

**Description**

This management unit has a low percentage of vegetative cover in comparison to other management units. Properties within this management unit are typically covered by buildings and parking lots, especially in older developments. New developments are required to have 15% landscaping.

Because these properties are developed to maximize building size and parking lots, they are typically cleared and graded. This reduces the potential to protect existing natural vegetation. Any urban forest found on these properties is usually that which has been created by the landscaping requirements of the development code. These landscaping requirements, found in Title 33 of the City Code, have implications for the urban forest:

- Street tree requirements: Street trees are required in commercial and industrial developments. Species, size and spacing are at the discretion of the Urban Forestry Manager.
- Parking Lot tree requirements: Minimum standards are set for trees in and around parking lots in order to ease the climatological and visual impact of vast expanses of hard surfacing.

- **Buffer planting:** Buffer landscaping is required where new commercial or industrial property abuts differing land uses. Trees are required at 30 feet on center, in addition to hedge and groundcover plantings.
- **Landscape coverage requirement:** Fifteen percent of total site area; for areas less than 30' deep – one tree per 30 lineal feet is required; for areas 30' deep and greater – one tree per 800 sq. ft. is required. (Consider changing to % canopy cover at maturity.)

## Issues

**Harsh environment.** Trees and vegetation in this management unit are often subject to greater stress and poorer conditions than other vegetation in the urban forest. Conditions in older industrial areas can be quite grim – there is extensive paving, frequent use by heavy vehicles, polluted surface water and air, and compacted soils.

**Owner's concerns and perceptions.** Commercial and industrial property owners have the following real and perceived concerns about the urban forest:

- Vegetation and street trees obstruct overall visibility from the street and negatively impact business.
- Improperly placed trees block signage and building facades.
- Trees interfere with truck vehicular access, especially wide-spreading branched trees.
- Protecting existing native stands of trees constrains development and requires extra effort in grading the site.
- Deciduous trees are perceived to have high maintenance requirements – leaf litter and other debris, roots that may break sidewalks and pavement.

**Rigid interpretation of City codes.** Landscape architects and designers rigidly interpret code requirements, resulting in geometric designs of tree and landscape patterns.

- Current screening and buffering requirements are resulting in a monoculture of photinia and Otto Luyken laurel hedges.
- Parking lot and buffer tree plantings are typically evenly spaced single rows of same-species trees.
- Street trees are usually specified with uniform spacing requirements.

**Lack of site clearing permits.** Current regulations do not enhance opportunities to connect commercial and industrial landscapes/tree canopies with natural vegetation corridors. Erosion problems are increased and opportunities for preserving existing stands of trees are eliminated.



**Construction practices.** Construction vehicles have full access to the building site which usually results in compacted soil conditions; conditions which are not good for new or existing vegetation.

**Code enforcement.** The Building Bureau is not completely enforcing landscape requirements with respect to tree planting. Currently, the Building Bureau is sending one inspector to each site to inspect the work of all trades. This is stretching the abilities of an inspector who is not trained in landscaping and urban forestry practices. Occupancy permits are often issued before tree and landscaping requirements are satisfied.

**Maintenance.** Commercial and industrial property owners frequently ignore landscape and tree maintenance issues until crises evolve.

**Older Parking Lots.** Many parking lots in existence before landscaping was required are large expanses of non-treed asphalt. There are no requirements to retroactively landscape these lots.

## **Goals and Actions**

### **Goal 1. Incorporate multiple-objectives into development on commercial and industrial properties:**

#### **Actions:**

- Use the Transportation Planning Rule to create new opportunities for enhancing pedestrian environments.
- Incorporate future water quality requirements into landscape requirements, including area set-asides for on-site stormwater treatment.

### **Goal 2. Educate designers, owners, developers and enforcers about the urban forest.**

#### **Actions:**

- Educate design professionals about the flexibility of existing codes. Encourage creativity in parking lot design that employs various tree planting patterns using groves, swathes, interconnections with natural systems. Parking lot trees requirements do not necessarily ordain geometric – evenly spaced tree plantations. Consider use of canopy cover or bio-mass requirements. Screening and buffering requirements should include deciduous native shrub communities.

- Educate developers and commercial/industrial property owners about the benefits of installing trees and landscaping, which include:
  - Energy savings (Summer cooling, winter winds protection);
  - Aesthetic appeal (Curb appeal, overall quality of development);
  - Urban runoff water quality (Temperature, sediment control, biofiltration).
- Work with various members of the 'green' industry, including designers, installers, suppliers, urban foresters, friends association to promote the values of the urban forest.
- Educate developers and commercial/industrial property owners about the need for and benefits of tree maintenance. Require certified tree professionals to perform major tree maintenance work.
- Promote use of trees as design element to unify and improve commercial areas.

**Goal 3. Enforce regulations.**

**Actions:**

- Inspect the installation of landscape and urban forestry work. Educate those responsible for enforcement about landscaping and horticulture inspection.

**Goal 4. Create a new landscape aesthetic in commercial and industrial areas.**

**Actions:**

- Large sites common in industrial and commercial areas may be suitable for differing levels of landscape treatments and maintenance. Use highly-maintained/irrigated landscapes with refined ornamental plantings only near buildings and site entrances; recreate natural plant communities with low-maintenance requirements at perimeters and areas away from buildings; use elements of both in areas between the two.
- Encourage retention or reestablishment of stands of native trees, especially evergreens and Oregon white oak, to enhance the pre-existing character of our natural environment, and to reconnect us to our regional landscape.

**Goal 5. Reestablish the urban forest on existing untreed commercial and industrial areas.**

**Actions:**

- Provide incentives for property owners to plant and care for trees and vegetation on their property, in particular on pre-existing parking lots.
- Encourage the use of trees and vegetation for bio-filtration of surface waters.

**Goal 6. Look at opportunities to create small parks in institutional areas.**



*Residential*

**Residential Management Unit**

*All residential development, from traditional single family to multi-family dwellings.*

**Description**

The majority of the land area in the city is dedicated to residential use. Single family homes on 5,000–7,000 sq. ft. lots comprise most of this management unit, although there are areas of single family homes with larger lot sizes. Multi-family dwellings are fewer in number and are distributed throughout the city at varying densities.

Residential areas generally have many more trees than other privately-owned property and landscaping is often in good condition. Residents take pride in their yards and gardens.

Generally, vegetation on private underdeveloped residential property is unregulated, although some areas are presently regulated. These include:

- situations which represent a hazard to the general public;
- trees afflicted with or susceptible to Dutch elm disease;
- situations involving powerline clearance;
- situations involving solar access;
- areas within environmental zones.

**Issues**

**Property owners responsible for urban forest.** While some areas of the urban forest are regulated and managed, its composition and health in residential areas ultimately depends on the actions of the private property owners and managers. A wide range of personal preferences is and will be evident and needs to be tolerated.

**Varying planting opportunities.** Lot size and housing density and type of housing development largely dictate planting opportunities. Different neighborhoods also present different planting opportunities.

**Education.** Educating property owners on the value, benefit and care of the urban forest and developing partnerships between private and public groups with a common interest in the urban forest is important. Management of this unit is based on the assumption that property owners will make good decisions if they understand the values and maintenance needs of the urban forest.

**Protecting mature trees.** Many of Portland's finest trees are found in the residential areas. As these trees age, they need protection and proper care. The Heritage Tree program is a voluntary program that only protects trees if they are in good condition and the property owner allows them to be listed.

**Views versus Trees.** With its hilly terrain, there are many opportunities for wonderful views of the mountains and hills of the valley from Portland's residential areas. Consequently, to enjoy the views, many people want to cut trees. From the valley and the flatter areas of the City, it is equally if not more important, to retain the trees on the hills for the same reason – to enjoy the views of the wooded hillsides. In a living urban forest, the views are constantly changing through the natural processes.

**Economics of maintenance.** The care and maintenance of trees and vegetation can be expensive. In many areas of the city, residents do not have the monetary resources to care for trees, both on the street and near their homes.

## Goals and Actions

**Goal 1. Increase forest canopy and density throughout the city, especially in residential areas lacking trees.**

### Actions:

- Utilize the expertise of Friends of Trees in organizing tree plantings and facilitating coordination between organizations interested in tree planting.
- Assist people on limited incomes in efforts to improve the urban forest on their properties.

- Assess canopy cover and identify potential planting opportunities in various neighborhoods, using aerial photographs or satellite data.
- Promote tree planting in tree-deficient areas through special programs; give high priority to funding tree planting projects in those areas. Coordinate with non-profit agencies to plant and care for trees.
- Promote educational outreach regarding benefits of trees and tree care through partnerships with private and public organizations, including, but not limited to: business and professional organizations, Friends of Trees, City of Portland Bureaus, neighborhood associations, the Urban Forestry Commission, the Oregon Urban and Community Forest Council, Portland State University and other educational institutions.
- Promote retaining existing large trees over planting new smaller ones.

**Goal 2. Improve the standard of care for trees on residential private property.**

**Actions:**

- Educate property owners about proper tree maintenance through private and public partnerships. Establish a program of tree care and landscape management clinics in the community, utilizing the combined resources of the Portland Parks and Recreation, the tree care industry, and educational and community organizations. Trees that receive proper care and maintenance from the beginning will enjoy good health as they mature.
- Initiate and promote a “No-Topping” campaign to alert the public to the danger and loss of value that results from topping and other inappropriate tree maintenance practices. Enlist the assistance of Plant Amnesty and Friends of Trees in organizing and implementing the campaign.
- Encourage the use of private certified arborists. Prepare and update regularly the list of International Society of Arboriculturists certified arborists in the four-county metropolitan region for distribution as requested.
- Provide resources that allow Parks’ Forestry Division inspectors to provide technical assistance and advice to homeowners to promote proper maintenance of the urban forest.



- Promote and distribute UFMP. Develop educational materials including a brief description of the UFMP, literature describing the role of the City in urban forestry, and a list of local resources in urban forestry.
- Provide educational brochures to area nurseries, associated professional organizations, neighborhood groups, property management agencies and individuals.
- Work with Oregon State Extension Service to establish an urban forestry component in the Master Gardener training program.
- Encourage the protection and care of the City's Heritage Trees.

**Goal 3. Promote the value of tree planting and tree care activities as a way of strengthening feelings of community, enhancing neighborhood identity, and retaining Portland's unique character as a Pacific Northwest city.**

**Actions:**

- Expand existing "Tree City USA" activities and Arbor Day activities. Establish an annual Tree-Friendly Neighborhood award and a Tree Professional Citizenship award to a group or individual who has demonstrated exemplary volunteer service to the community.
- Promote, coordinate and support community-building tree-related activities of City bureaus and local organizations, including the Office of Neighborhood Associations, the Police Bureaus's Community Policing Program, Friends of Trees, the local chapter of the International Society of Arboriculture, the National Arborists Association, the urban conservation program of Audubon, other members of the tree service industry, and the Oregon Urban and Community Forest Council.
- Encourage the planting of native trees to help retain the distinctive character of the region.
- Develop tools to assist neighborhood groups that want to:
  - perform sample inventories to assess planting opportunities,
  - plan a tree planting,
  - nominate a tree to be added to the "Heritage Tree" list,
  - develop a neighborhood tree tour or celebration.

- Promote the availability of Urban Forestry Commission's slide show and other educational programs to neighborhood groups and other service organizations.
- Discourage the planting and propagation of invasive non-natives, especially those on the Planning Bureau's List of Prohibited Species in Environmental Zones and other required landscape situations. Educate about those non-natives that naturalize and become nuisances, including, but not necessarily limited to: English ivy, clematis, Scot's broom, Himalayan blackberry, and holly.
- Educate property owners to recognize that the tree that is partially blocking their view is an important component of many other people's view. Property owners need to be aware that their trees are a part of the mosaic that is the urban forest and part of the visual landscape of the whole city. Incremental loss or degradation of the forest diminishes the value of the forest to the entire community.



*Parks and open space*

### **Parks and Open Spaces Management Unit**

*Public parks and open areas with developed recreation, highly structured or programmed areas.*

#### **Description**

Portland's parks, gardens, and open spaces provide a wide range of recreational opportunities. While the primary function of these parks is to provide active recreation, both locally and regionally, many parks are wooded and have large mature trees. These areas need to be maintained and enhanced.

Generally, the parks and open spaces which make up a portion of Portland's urban forest fall into the following categories: Metropolitan or Regional Parks, Neighborhood and Community Parks, Urban Parks, Community Gardens, Public Gardens, and Golf Courses.

*See Appendix 11 for information on these sub-units.*

Most parks have multiple uses and multiple management objectives. Issues, goals, and actions for parks and open spaces are highly dependent on the type of park involved, the predominate use experienced at that park, the size and ownership of the park, and other site specific factors.

## Issues

**Urban forest maintenance is inadequate.** Most tree maintenance in parks is limited to actively used areas, along trails, and in maintained lawn areas. Tree maintenance is based on a crisis or reactive basis rather than being handled in a systematic manner.

**Heavy recreational use.** Heavy use in and around the trees and vegetation impacts the health of landscape trees by compacting the soil, causing erosion and breakage of limbs.

**Tree replacement.** Many parks were established at the same time and consequently, trees are reaching maturity at the same time. There is currently no systematic plan to replace large old trees as they die and are removed. At present, most old trees are replaced with nursery-grown trees of the largest size practical.

Current annual levels of tree plantings in the parks – both new and replacement plantings, are inadequate. Fewer trees are planted than are removed. Currently, fewer than 300 trees are planted annually in the 232 parks managed by Portland Parks and Recreation. These trees are replacements for trees that must be removed or for plantings at new capital improvements.

**Native plants.** Many of Portland's parks have the few remaining stands of Douglas fir and other native trees. These need to be retained in order to maintain the landscape connection to the region and enhance Portland's sense of place.

**Community Involvement and Understanding.** Most residents do not understand urban forest issues; they are unaware of the value of trees. Many residents are not involved with local park management issues or with potential acquisition of park lands.

## Goals and Actions

**Goal 1. Initiate and maintain a systematic coordinated tree maintenance program for Parks that will sustain the Parks inventory of trees and provide an example of tree stewardship for others.**

### Actions:

- Determine methods to increase effectiveness of current maintenance.
- Determine number and causes of annual tree mortality.

- Develop a long-term, site-specific maintenance plan for the urban forest in park areas.
- Emphasize preventive maintenance to reduce reactive tree maintenance.
- Conduct a feasibility study to determine the desirability of a computer-based tree inventory system.
- Reduce the City's liability for hazard trees by continuing to educate Portland Parks and Recreation employees on hazard tree identification and evaluation. Offer workshop to other interested bureaus.

**Goal 2. Develop plan for annual tree replacement and additional tree planting.**

**Actions:**

- Encourage the use of native plants to reinforce and reestablish the regional identity.
- Assess conditions of existing recent plantings.
- Identify areas available for new tree planting.
- Work with local commercial nurseries to grow recommended species in sufficient size and quantity, especially native plants.
- Develop decision criteria to guide species selection between native, ornamental, and shade tree classifications.

**Goal 3. Encourage community participation in park development, design, and maintenance.**

**Actions:**

- Work with citizens and neighborhood associations to exchange information about local needs and proposed park improvements.
- Identify forested areas appropriate for public acquisition, possibly by the Portland Parks and Recreation, especially in areas of the City that are park-deficient.
- Involve local neighborhood associations in decisions related to urban forest management in local parks.

- Continue and expand volunteer programs in parks and public gardens which foster an appreciation of urban forests among residents and volunteers.
- Reinforce local community identity with parks and urban forests; integrate the urban forest into the local community development plans.
- Create tree parks including linear parks and "vest pocket" parks in areas that are park and tree deficient.
- Work with Parks' Community Garden program to plant fruit and nut trees.

### **Transportation Corridors and Rights of Way Management Unit**

*Major Highways; Local Commercial Streets; Light Rail Rights-Of-Way; Median Strips and Large Interchanges; Neighborhood and Residential Streets, Bike Paths and Pedestrian Trails*

#### **Description**

There are 1,700 miles of improved public roads, 131 miles of gravel roads, and about 75 miles of unimproved rights-of-way in the City. The public rights-of-way are transportation corridors for automobiles, trucks, transit, pedestrians, and bicycles. They also serve as corridors for public utilities.

These rights-of-way contain street trees and other landscaping elements that are important elements of the urban forest and vital to maintaining a livable community. Street trees make up a small, but highly visible and valuable, portion of the urban forest. Presently, there are estimated to be 200,000 street trees on the streets of Portland, but there is room for 150,000 more. Trees help tie the street improvements to adjacent improvements on private property and provide a sense of unity and character.

Removal or cutting portions of existing trees in the right-of-way is occasionally necessary to accommodate the safest, highest, and best use of the public right-of-way.

Transportation Corridors and Rights-of-Ways are subdivided into 8 sub-units that parallel the functional classifications of the *Transportation Element of the Comprehensive Plan*.



*Transportation*



The sub-units in the Transportation Corridors Management Unit are as follows:

- Regional Trafficways and Limited Access Corridors
- Major City Trafficways
- Minor City Trafficways
- Residential/Local Service Streets
- Rural Roads and Unimproved Streets
- Off-street Pedestrian and Bicycle Facilities
- Utility Corridors
- City Entrances/Major Focal Points

*Note: Information on Transportation sub-units is in Appendix 12.*

## **ISSUES FOR ALL TRANSPORTATION SUB-UNITS**

### **Safety and Transportation Issues**

- Clear sightlines to traffic signals and signs, at intersections, and around road curves must be maintained.
- Hazardous trees and limbs must be removed from the roadway.
- Seasonal tree pruning around overhead utility lines is necessary to ensure that these systems operate properly with minimal service disruptions from tree/wire conflicts.

### **Maintenance Issues**

- A regular maintenance schedule does not currently exist because property owners have the responsibility for street tree maintenance. Chapter 20.40.080 *Maintenance of Trees* specifically requires property owners to prune trees for sidewalk and street clearance.
- The City responds to tree emergencies such as wind-damaged trees, ice storms, accidents, and other hazardous situations created by downed trees.
- If trees are to be maintained by property owners, then they need to be informed of this responsibility and be educated on exactly what tree maintenance includes and what their obligations consist of.
- The following annual tree and landscape pruning is needed:
  - At street intersections to maintain clear sight lines to traffic control signs and devices.

- Around overhead utility lines to ensure that these systems operate properly with minimal service disruptions from tree / wire conflicts.
- Around and under street lights is essential to allow the street lighting system to operate properly and safely.
- In all sidewalks and street areas to maintain vertical and horizontal clearances.
- Construction and maintenance activities in transportation corridors should safeguard existing trees and root systems.

#### **New Planting Issues**

- Tree planting sites must take into account the position and size of the future fully matured tree and the potential conflicts with adjacent trees, power poles, traffic control devices, underground utilities, street lights, paved surfaces and other factors. Information on street trees is found in *Appendices 6 and 7*.

#### **Adjacent Land Uses Issues**

- Visibility of adjacent land uses may become adversely obstructed by street trees and landscaping.

#### **Private Streets**

- Creation of private streets reduces the City's ability to control and maintain the urban forest.

### **Goals and Actions**

#### **Goal 1. Maintain and enhance the urban forest in the Transportation Corridors while ensuring public safety.**

##### **Actions:**

- Establish Street Tree Study Group to study the benefits of the City accepting responsibility to maintain the trees and vegetation in the Transportation Corridors and Rights-of-Way.
- Plant and maintain street trees and other vegetation in the right-of-way that allows for safe sight distance and sign visibility for all users.
- Maximize tree planting opportunities in the public right-of-way to complement the streetscape of existing, improved streets and to be compatible with safe and effective transportation operations.

- In cooperation with the Urban Forestry Manager, develop planting standards for trees and landscaping at intersections that promote clear visibility of pedestrians, bicycles, motor vehicles, and traffic control signs and devices.
- Develop maintenance guidelines for city and property owners. Develop a plan for the removal and replacement of street trees.

**Goal 2. Ensure that all new street improvements protect and enhance the urban forest.**

**Actions:**

- Develop comprehensive street tree program that incorporates a mix of species and ages of trees.
- Select trees that will yield a mature tree with the desirable form and size relative to the scale of the streetscape created by both public improvements and the improvements on adjacent private property.
- Stress species diversity by using tree associations that are aesthetically harmonious and have similar environmental preferences and tolerances.
- Select trees that minimize the contribution of nuts, berries, and foliage to the street surface to minimize the need for high frequency street cleaning.
- Make all reasonable efforts during design and construction to preserve existing trees. Seek design solutions that will improve the survival rate and health of existing trees during both construction and future street use.
- Support right-of-way alignments that minimize impacts to the urban forest wherever practicable during the design and platting process for new land divisions. Where appropriate, protect existing tree clusters in the rights-of-way of new land divisions and/or plant new tree clusters.
- Develop design guidelines for tree planting that will improve environmental conditions and add aesthetic character to street corridors.
- Work with utilities and City Street Lighting to provide for and protect trees as well as to protect the utilities' interests during

installation and maintenance of utilities. Encourage utilities to place their facilities underground where it will benefit the trees.

- When appropriate, maximize space available for street trees by any of the following techniques: reduce the street pavement width, expand the right-of-way with additional dedications or easements, shift the roadway alignment within the street right-of-way, shift the sidewalk alignment in the right-of-way.
- Send "as-built" construction plans to the Urban Forestry Manager's office on all public street improvement projects that include planting of new street trees to update the street tree inventory.
- Select trees that are insect and disease resistant to minimize the need for pest management on street plantings.
- Encourage use of native trees, shrubs and landscaping when appropriate. Work with nurseries to grow these plants in sufficient quantities.
- In the downtown area and in all *Main Street* areas, require the installation and maintenance of grates in all tree wells to: protect pedestrians in these high volume areas from potential tripping hazards, promote better utilization of the sidewalk area, and protect the root soil from over compaction.
- Where feasible, acquire sidewalk easements on street improvement projects where the area needed for the street trees and sidewalks exceeds the available right-of-way.

**Goal 3. Expand the existing urban forest within the Transportation Corridor.**

**Actions:**

- Identify and assess planting opportunities within the right-of-way. Coordinate planting efforts with the local neighborhood associations and coalitions.

**Goal 4. Develop standards and specifications to simplify and clarify plantings and installations.**

**Actions:**

- Include information on minimum sizes, soil preparation, and non-traditional techniques such as clustering.

- Work with utility companies to consolidate lines and accommodate large trees.

**Goal 5. Coordinate care and management of the urban forest through the Urban Forestry Manager's office.**

**Actions:**

- Develop education programs:  
With input from other agencies, develop education programs relating to: tree selection and planting, pruning for safety and visibility, general tree maintenance, and other related topics. As needed and requested, provide formal classes to other city staff, neighborhood associations, contractors, consulting engineers, architects, and the general public.

- Work with property owners and neighborhood groups to:  
Support the development and implementation of comprehensive street tree planting projects and programs initiated by neighborhood associations, Friends of Trees and volunteer groups.

Encourage residents to plant trees in parking strips using the city tree spacing standards and to provide periodic maintenance for traffic control sign visibility and intersection visibility.

Permit tree plantings at intersections that promote clear visibility of pedestrians, bicycles, motor vehicles, and traffic control signs and devices.

- Work with PDOT, other City bureaus, and utility companies to:  
Establish and maintain partnerships with agencies and groups that are involved with or have an effect on promoting a diverse and healthy urban forest.

Coordinate all new plantings with PDOTs' Street Lighting Division and District Traffic Operations Engineers.

Continue work with PDOT on alternate sidewalk pavements that support root growth and can still safely function as pedestrian walkways.

Work with utilities and others to plant street trees as mitigation for their actions that harm street trees.



Utilize existing utility corridors to maximize planting opportunities.

Work with other bureaus and organizations on projects that provide mutual benefit: e.g. Improved water quality with BES, shading and solar access with the Energy Office.

Enforce tree regulations and requirements. Work with Bureau of Buildings on education and responsibility of inspectors and/or get enforcement authority for forestry inspectors.

- Improve tree management by:

Updating and expanding the list of approved tree species for planting in the public right-of-way.

For all approved street tree species, develop root space standards that will allow newly planted trees to reach maturity.

For all approved street tree species, develop vertical and horizontal space standards needed at maturity.

In cooperation with city bureaus, develop standards and guidelines for tree maintenance, including tree removal and replacement.

Develop tree planting specifications that consider larger planting areas, soil conditioners, and compaction specifications that will minimize sidewalk settlement and ensure healthy root growth.

Develop special planting standards for poor quality soils that call for the use of imported higher quality planting soil and state-of-art soil mixtures.

Continue to assess root control devices and planting practices that will minimize the need for frequent sidewalk repair.

Create and maintain a complete inventory of street trees, but only if the benefits of such an endeavor are justified.



*Realizing the vision*

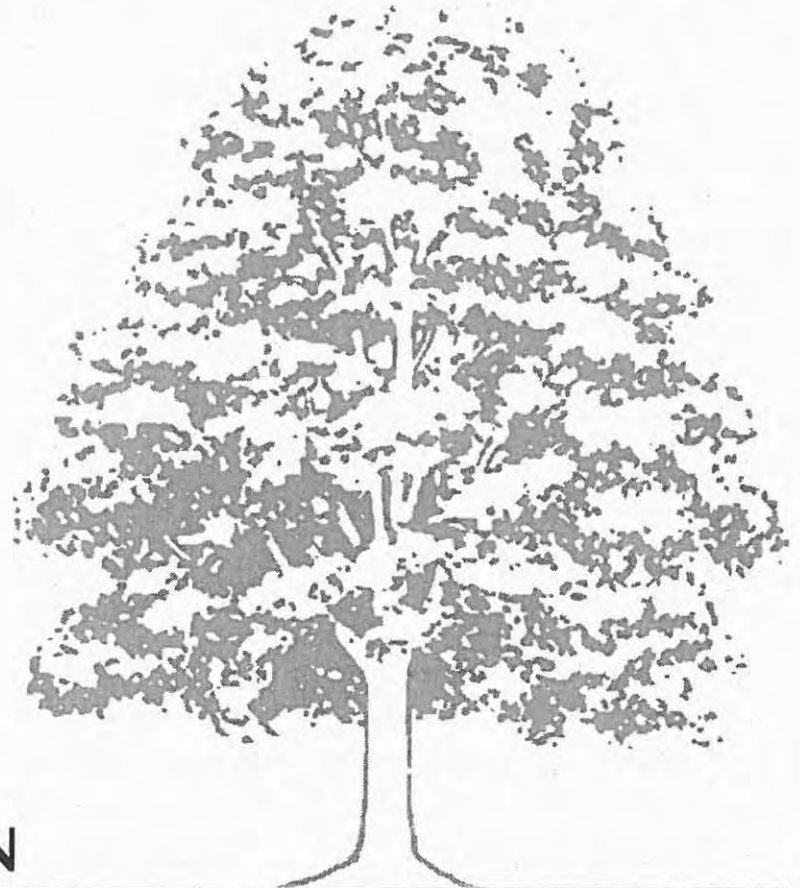
## **Summary**

The management units have specific characteristics that need certain management techniques and actions to maximize their contribution to the urban forest. These actions expand on the recommendations in Chapter Three.

Implementing these actions within the Management Units will provide the citizens of Portland with a sustainable urban forest that realizes the Vision Statement for Portland in the year 2015.

## APPENDICES

Tree Planting Potential Study and Five Year Planting Plan -	1
Planning for Development in the Urban Forest -	2
Landscaping for Wildlife Habitat -	3
Native Plants of Portland -	4
Historic and Heritage Trees -	5
Street Tree Planting and Maintenance Guidelines -	6
Recommended Street Trees -	7
Planting for Energy Conservation and Solar Access -	8
Solar Friendly Trees Report and Fact Sheet -	9
Environmental Zoning Summary -	10
Subunits - Parks and Open Space Management Unit -	11
Subunits - Transportation Corridors and Rights of Way Management Unit -	12
Title 20, Chapter 20.40 Street Trees and Other Public Tree Regulations -	13
Tree Cutting Ordinances #168534 and #168486 -	14



# Portland's URBAN FORESTRY MANAGEMENT PLAN

---



**APPENDIX 1:**  
**Tree Planting Potential Study and Five Year Planting Plan**

Prepared for: Portland General Electric  
Prepared by: Friends of Trees  
May, 1995  
DRAFT

**Executive Summary**

From November 1994 through May 1995, Friends of Trees conducted a study, sponsored by Portland General Electric, to:

- Identify types of tree and seedling planting opportunities in the Portland metropolitan area;
- Determine how many additional trees and seedlings could be planted on the land available;
- Develop a 5-year planting and education program;
- Calculate the amount of carbon dioxide (CO<sub>2</sub>) sequestered through this program and the cost per ton of CO<sub>2</sub> sequestered.

**RESEARCH PROCEDURES**

Friends of Trees utilized various resources and procedures to conduct this study. We distributed a tree planting potential survey to find possible planting projects and partners and obtained information and data from various City of Portland bureaus and Portland State University departments. We also formed a partnership with PSU's Center for Science Education for students to perform follow-up research on potential planting projects. Additionally, we consulted urban forest researchers with the U.S. Forest Service to help determine the costs and benefits of urban trees and related projects. We also



used the experience of Friends of Trees' staff members with past planting projects to assist in determining planting potential in natural areas and on Portland's streets.

#### RESEARCH FINDINGS

Based on the sources described above, we estimate that there is room to plant the following:

- 100,000 to 150,000 additional street trees throughout the City of Portland;
- Approximately 150,000 seedlings in parks and natural areas throughout the metro area; and
- At least 75,000 additional native and ornamental trees in yards throughout the City of Portland;
- For a total of 325,000 to 375,000 trees and seedlings.

We expect that as Friends of Trees continues to form partnerships with groups, agencies and organizations throughout the Portland metropolitan area, and we implement a wide variety of planting projects, people will become more aware of our efforts and will come forward with projects for which they would like our assistance. We therefore feel that these estimates of planting potential are conservative.



#### FIVE YEAR PLANTING & EDUCATION PROGRAM

The information gathered in this study has helped Friends of Trees develop a five-year planting program. In this program, we will involve more than 40,000 volunteers to:

- Plant 13,050 trees along streets which will sequester more than 9,000 metric tons of carbon dioxide at maturity;
- Plant 128,500 tree seedlings in parks and natural areas which will sequester more than 62,000 metric tons of carbon dioxide at maturity;
- Plant 1,250 trees in yards and school grounds which will sequester more than 2,100 metric tons of carbon dioxide at maturity;
- For a total of 144,250 trees and seedlings sequestering more than 73,000 metric tons of carbon dioxide at maturity at a cost of approximately \$31 per metric ton.



## **APPENDIX 2:**

### **PLANNING FOR DEVELOPMENT IN THE URBAN FOREST**

New development in any of the Management Units potentially threatens the condition and extent of the urban forest. Inadequate attention is typically given to the presence of existing vegetation during site planning and throughout the development phase. However, retention and protection of some of the existing vegetation on a site has important environmental and economic benefits.

This appendix outlines steps involved in tree preservation; summarizes common methods to minimize damage to trees during construction; and lists available resources to obtain more information. Some Certified Arborists are specially trained and experienced in tree preservation. The use of such qualified professionals during all aspects of site planning and development is highly recommended.

#### **Designing Development with the Landscape in Mind**

##### **Site Survey**

A qualified professional should be retained to review proposed site changes for potential impacts to the existing landscape. A site map should include: existing vegetation, elevation and proposed grade changes, existing utilities, and proposed structures to be built.

##### **Assessment**

A qualified professional can assist in determining which individual trees and areas of vegetation should be retained depending on individual tree species, location, and condition. Erosion control, slope stability, and esthetic impacts are factors to be measured.

##### **Conservation Plan**

Individual and groups of trees to be protected need to be marked on construction plans. Delineation of effective root zones is especially critical. Several methods exist to reduce construction impacts to trees. Plans for preservation must be developed in advance of construction and effectively communicated to the appropriate parties.

##### **Preservation Techniques**

Tree work completed during construction should be accomplished by a certified arborist and not the general contractor. Examples include: root inspections, pruning and root pruning.

##### **Monitoring during Construction**

Vigilant monitoring by qualified professionals is needed to protect trees during construction. Protection zones must be maintained to guard trees from fill, bark damage, compaction, root loss during grading, etc.

##### **Post Construction Care**

Following construction, additional landscaping must consider the requirements of the existing vegetation. Landscape professionals can assist with this design. Mature trees will need to be monitored on a continual basis for signs of stress and treated accordingly.

## CONSTRUCTION IMPACTS AND TREE PRESERVATION TECHNIQUES

Impact to Tree	Construction Activity	Methods and Treatments to Minimize Damage
<b>ROOT LOSS</b>	Stripping site of organic surface soil during mass grading	Restrict stripping of topsoil around trees. Any woody vegetation to be removed adjacent to trees to remain should be cut at ground level and not pulled out by equipment, or root injury to remaining trees may result.
	Lowering grade, scarifying, preparing subgrade for fills, structures	Use retaining walls with discontinuous footings to maintain natural grade as far as possible from trees. Excavate to finish grade by hand and cut exposed roots with a saw to avoid root wrenching and shattering by equipment, or cut with root pruning equipment. Spoil beyond cut face can be removed by equipment sitting outside the drip line of the tree.
	Subgrade preparation for pavement	Use paving materials requiring a minimum amount of excavation (e.g. reinforced concrete instead of asphalt). Design traffic patterns to avoid heavy loads adjacent to trees (heavy load bearing pavements require thicker base material and subgrade compaction). Specify minimum subgrade compaction under pavement within drip line.
	Excavation for footings, walls foundations	Design walls/structures with discontinuous footings, pier foundations. Excavate by hand. Avoid slab foundations, post and beam footings.
	Trenching for utilities, drainage	Coordinate utility trench locations with installation contractors. Consolidate utility trenches. Excavate trenches by hand in areas with roots larger than 11' diameter. Tunnel under woody roots rather than cutting them.
<b>WOUNDING TOP OF TREE</b>	Injury from equipment	Fence trees to enclose low branches and protect trunk. Report all damage promptly so arborist can treat appropriately.
	Pruning for vertical clearance for building and construction equipment	Prune to minimum height required prior to construction. Consider minimum height requirements of construction equipment and emergency vehicles over roads. All pruning should be performed by an arborist, not by construction personnel.



<b>DAMAGE TO ROOTS, STRESS FROM REDUCED ROOT SYSTEMS</b>	Compacted soils	Fence trees to keep traffic and storage out of root area. In areas of engineered fills, specify minimum compaction (usually 85%) if fill will not support a structure. Provide a storage yard and traffic areas for construction activity well away from trees. Protect soil surface from traffic compaction with thick mulch. Following construction, vertical mulch compacted areas.
	Spills, waste disposal (e.g. paint, oil, fuel)	Post notices on fences prohibiting dumping and disposal of waste around trees. Require immediate cleanup of accidental spills.
	Soil sterilants (herbicides) applied under pavement	Use herbicides safe for use around existing vegetation and follow directions on the label.
	Impervious pavement over soil surface	Utilize pervious paving materials. Install aeration vents in impervious paving
<b>INADE-QUATE SOIL MOISTURE</b>	Rechannelization of stream flow, redirecting runoff, lowering water table; lower grade	In some cases it may be possible to design systems to allow low flows through normal stream alignments and provide bypass into storm drains for peak flow conditions. Provide supplemental irrigation in similar volumes and seasonal distribution as would normally occur.
<b>EXCESS SOIL MOISTURE</b>	Underground flow backup, raising water table	Fills placed across drainage courses must have culverts placed at the bottom of the low flow so that water is not backed up before rising to the elevation of the culvert. Study the geotechnical report for ground water characteristics to see that walls and fills will not intercept underground flow.
	Lack of surface drainage away from tree	Where surface grades are to be modified, make sure that water will flow away from tree from the trunk, i.e. that the trunk is not at the lowest point. If the tree is placed in a well, drainage must be provided from the bottom of the well.
	Compacted soils, irrigation of exotic landscapes	Compacted soils have few macropores and many micropores. Core vent to improve drainage. Some species cannot tolerate frequent irrigation required to maintain lawns, flowers, and other shallow-rooted plants. Avoid landscaping under those trees, or utilize plants that do not require irrigation.

<b>INCREASED EXPOSURE</b>	Thinning stands, removal of undergrowth	Preserve species that perform poorly in single stands as groups or clusters of trees. Maintain the natural undergrowth.
	Reflected heat from surrounding hard surfaces	Minimize use of hard surfaces around trees. Monitor soil moisture needs where water use is expected to increase.
	Pruning	Avoid severe pruning where previously shaded bark would be exposed to sun. Where pruning is unavoidable, provide protection to bark from sun.

Source: *"A Technical Guide to Urban and Community Forestry in Washington, Oregon, and California"*. World Forestry Center, Portland, Oregon, and Robin Morgan, 1993.  
Table revised from page 39.

Further information in:

Tree City USA Bulletin No. 7. "How to Save Trees During Construction"

Tree City USA Bulletin No. 20 "A Systematic Approach to Building With Trees" The National Arbor Day Foundation, James R. Fazio, Editor.

## **APPENDIX 3:**

### **LANDSCAPING FOR WILDLIFE HABITAT**

The presence of wildlife in the city depends largely on the availability of habitat. All species require sources of food, water, and cover. In addition to parks and refuges, landscaping in residential yards and even institutional and industrial campuses can be designed to provide for wildlife. Habitat can be enhanced by providing for the animals needs as follows:

#### **Food**

Plant species that provide a food source. Many native plants are particularly useful and are quite beautiful as well. Examples are listed below. Some introduced plants provide food sources as well. Entire books are dedicated to plants that attract hummingbirds, butterflies, and songbirds. Some of these resources are also listed.

#### **Diversity**

Vegetation patterns that include a variety of trees, shrubs, and ground covers, and a mix of plant species are more useful at providing cover than lawns with single trees.

#### **Water**

Water is essential to all life. If possible, incorporate pools, or bird baths in the landscape. Provide water throughout the year and keep it clean.

#### **Pest and Weed Control**

Eliminate the use of harmful chemicals for pest and weed control. Indiscriminate use of pesticides can kill beneficial insects and reduce food sources for other species. Explore alternative methods of biological control if pests are a problem.

#### **Domestic Pets**

Keep domestic pests, especially cats, indoors. Cats kill song birds. Dogs can also be disruptive to wildlife.

Resources for more information:

*Birdscaping Your Garden.* George Adams, 1994.

*The Butterfly Book.* Donald and Lilian Stokes and Ernest Williams, 1991.

*The Hummingbird Garden.* Matthew Tekulsky, 1990.

*Your Backyard Wildlife Garden.* Marcus Schneck, 1992.

See list of plants on next page.

## **PLANTS FOR WILDLIFE FOOD AND SHELTER**

### **Trees**

Western Red Cedar  
Port Orford Cedar  
Western Juniper  
Ponderosa Pine  
Pacific Yew  
Madrone  
Pacific Dogwood  
Vine Maple  
Red Alder  
Paper Birch  
Mountain Ash  
Crabapples (fruiting varieties)

### **Shrubs**

Serviceberry  
Red Osier Dogwood  
Red Flowering Currant  
Nootka and Rugosa Roses  
Red Huckleberry  
Highbush Cranberry  
Elderberry  
Salmonberry  
Oregon Grape  
Salal  
Pyracantha  
Cotoneaster  
Evergreen Huckleberry

## APPENDIX 4: NATIVE PLANTS OF PORTLAND

This is a listing of the native trees and shrubs historically found in the City of Portland. The entire "Portland Plant List" list, available from the Bureau of Planning, includes all herbaceous ground covers. The Planning Bureau also maintains a list of "Nuisance" and "Prohibited" Plants.

In addition to the scientific and common names, the usual habitat type is indicated:

**Wetland (W)** includes all forms of wetlands found in Portland.

**Riparian (R)** includes the riparian areas along the Willamette River, Columbia River, and other streams in Portland.

**Forest (F)** refers to upland forested areas with little or no slope.

**Forested slopes (S)** refers to steeply sloping upland forests such as the west hills and various buttes found in Portland.

**Thicket (T)** refers to edges of forests and meadows and includes hedgerows and clumps of vegetation that may be found in meadows.

**Grass (G)** refers to open areas or meadows. It may also include clearings in forested areas.

**Rocky (R)** refers to rocky upland areas, and may include cliffs.

Scientific Name	Common Name	Habitat Type						
		W	R	F	S	T	G	R
<b>Trees</b>								
<i>Abies grandis</i>	Grand Fir	X	X	X	X			
<i>Acer macrophyllum</i>	Big-leaf Maple			X	X			
<i>Alnus rubra</i>	Red Alder		X	X	X			
<i>Arbutus menziesii</i>	Madrone			X				
<i>Cornus nuttallii</i>	Western Flowering Dogwood			X	X			
<i>Crataegus douglasii douglasii</i>	Black hawthorn (wetland form)	X	X					
<i>Crataegus douglasii suksdorfii</i>	Black Hawthorn (upland form)	X	X	X	X	X		
<i>Fraxinus latifolia</i>	Oregon Ash	X	X					
<i>Pinus ponderosa</i>	Ponderosa Pine			X	X			
<i>Populus trichocarpa</i>	Black Cottonwood	X	X					
<i>Prunus emarginata</i>	Bitter Chokecherry		X		X	X		
<i>Pseudotsuga menziesii</i>	Douglas Fir			X	X			
<i>Quercus garryana</i>	Garry Oak			X	X		X	



<i>Rhamnus purshiana</i>	Cascara		X	X	X			
<i>Salix fluviatilis</i>	Columbia River Willow	X	X					
<i>Salix lasiandra</i>	Pacific Willow	X	X					
<i>Salix piperi</i>	Piper's Willow	X	X					
<i>Salix rigida</i> var. <i>macrogemma</i>	Rigid Willow	X	X					
<i>Salix scouleriana</i>	Scouler Willow	X	X	X				
<i>Salix sessilifolia</i>	Soft-leaved Willow	X	X					
<i>Salix sitchensis</i>	Sitka Willow	X	X					
<i>Taxus brevifolia</i>	Western Yew, Pacific Yew		X	X	X			
<i>Thuja plicata</i>	Western Red Cedar	X	X	X	X			
<i>Tsuga heterophylla</i>	Western Hemlock		X	X	X			

Shrubs								
		W	R	F	S	T	G	R
<i>Acer circinatum</i>	Vine Maple			X	X		X	
<i>Amelanchier alnifolia</i>	Western Serviceberry			X	X	X		
<i>Arctostaphylos columbiana</i>	Hairy Manzanita							X
<i>Arctostaphylos uva-ursi</i>	Kinnikinnik							X
<i>Berberis aquifolium</i>	Tall Oregon grape			X	X			
<i>Berberis nervosa</i>	Dull Oregon grape				X	X		
<i>Ceanothus sanguineus</i>	Oregon Tea-tree			X	X	X	X	
<i>Ceanothus velutinus</i> <i>laevigatus</i>	Mountain balm			X		X	X	
<i>Cornus stolonifera</i> <i>occidentalis</i>	Red-osier Dogwood	X	X			X		
<i>Corylus cornuta</i>	Hazelnut			X	X	X		
<i>Holodiscus discolor</i>	Ocean-spray			X	X	X		
<i>Lonicera hispidula</i>	Hairy Honeysuckle				X	X		
<i>Menziesia ferruginea</i>	Fool's Huckleberry			X				
<i>Oemleria cerasiformis</i>	Indian Plum		X	X	X	X		
<i>Philadelphus lewisii</i>	Mockorange			X	X	X		
<i>Physocarpus capitatus</i>	Pacific Ninebark		X	X		X		
<i>Prunus virginiana</i>	Common Chokecherry		X	X		X		
<i>Pyrus fusca</i>	Western Crabapple		X	X		X		

<i>Rhododendron macrophyllum</i>	Western Rhododendron			X	X			
<i>Rhus diversiloba</i> *	Poison Oak *			X	X		X	
<i>Ribes bracteosum</i>	Blue Currant		X	X				
<i>Ribes divaricatum</i>	Straggly Gooseberry			X	X			
<i>Ribes laxiflorum</i>	Western Black Currant		X	X				
<i>Ribes lobbii</i>	Currant		X	X				
<i>Ribes sanguineum</i>	Red Currant		X	X	X	X	X	
<i>Ribes viscosissimum</i>	Sticky Currant		X	X				
<i>Rosa gymnocarpa</i>	Baldhip Rose			X	X			
<i>Rosa nutkana</i> v. <i>nutkana</i>	Nootka Rose				X			
<i>Rosa pisocarpa</i>	Swamp Rose		X		X			
<i>Rubus leucodermis</i>	Blackcap		X	X	X			
<i>Rubus parviflorus</i>	Thimbleberry		X	X	X			
<i>Rubus spectabilis</i>	Salmonberry		X					
<i>Rubus ursinus</i>	Pacific Blackberry	X	X	X	X	X	X	
<i>Sambucus cerulea</i>	Blue Elderberry		X	X				
<i>Sambucus racemosa</i>	Red Elderberry		X	X	X			
<i>Spiraea betulifolia</i> var. <i>lucida</i>	Shiny-leaved Spirea				X	X		
<i>Spirea douglasii</i>	Douglas's Spirea	X	X			X		
<i>Symphoricarpos albus</i>	Common Snowberry			X	X	X		
<i>Symphoricarpos mollis</i>	Creeping Snowberry			X		X		
<i>Vaccinium alaskaense</i>	Alaska Blueberry		X	X				
<i>Vaccinium membranaceum</i>	Big Huckleberry					X		
<i>Vaccinium ovatum</i>	Evergreen Huckleberry			X				
<i>Vaccinium parvifolium</i>	Red Huckleberry			X	X			
<i>Viburnum ellipticum</i>	Oregon Viburnum					X	X	

\* Indicates plant on the "Nuisance Plant List".

Source:

Portland Plant List, City of Portland, Bureau of Planning (Adopted 11/13/1991, Effective 12/13/1991, Amended effective 6/25/93) Ordinance No. 164838

Recommended Reading:

"Gardening with Native Plants of the Pacific Northwest" Arthur R. Kruckeberg. 1982. University of Washington Press.



## APPENDIX 5: HISTORIC AND HERITAGE TREES

Portland's six Historic Trees were declared Historic Landmarks by City Council between 1973 and 1993. In May of 1993 a new Heritage Tree Ordinance was adopted which facilitates the process of designating historic trees. The Urban Forestry Commission has primary responsibility for this section of the code. A sub-committee of the commission reviews nominations and potential trees are inspected by Forestry Division staff. Trees are recommended for Heritage Tree status based upon their condition, age, size, type, historical association, and horticultural value. Trees which meet the established criteria are presented to the City Council for adoption on a regular basis. Nominations should be referred to Parks and Recreation Forestry Division.

\* Indicates that a tree is privately owned.

### Historic Trees

1. The Farrell Sycamore *Platanus x acerifolia* S. W. Park and Main. The first historic tree recognized by Portland on October 3, 1973.
2. The Burrell Elm *Ulmus americana* at the YWCA on S.W. 10th, designated on March 13, 1975. \*

(Designated on January 11, 1993)

3. Tulip Poplar *Liriodendron tulipifera* N.E. 15th and Weidler \*
4. Oregon White Oak *Quercus garryana* 2137 S. E. 32nd Pl. \*
5. Cedar of Lebanon *Cedrus libani* 1425 S. W. 20th Ave. \*
6. Austrian Pine *Pinus nigra* 1425 S. W. 20th Ave.

### Heritage Trees (Designated January 26, 1994)

1. European Beech *Fagus sylvatica* 10115 N.E. Thompson St.
2. Oregon White Oak *Quercus garryana* 7168 N. Olin and Stafford Rd.
3. Northern Red Oak *Quercus rubra* 1961 S. W. Vista Ave. \*
4. Oregon White Oak *Quercus garryana* N.W. 23rd and Overton \*
5. Tulip Poplar *Liriodendron tulipifera* 2390 S.W. Madison St. \*
6. American Elm *Ulmus americana* 7821 S.E. 30th and Crystal Springs

(Designated March 23, 1994)

7. Swamp White Oak *Quercus bicolor* 19th and W. Burnside
  8. Cucumber Tree *Magnolia acuminata* Corner of N. W. 19th and Glisan
  9. American Sycamore *Platanus occidentalis* 4234 S. E. 33rd Place
  10. Purple Beech *Fagus sylvatica* 1579 S. E. Nehalem \*
  11. Tulip Tree *Liriodendron tulipifera* 3104 S. E. Gladstone \*
  12. Coulter Pine *Pinus coulteri* 5306 S. E. 37th St. \*
  13. Monterey Pine *Pinus radiata* 5330 S. E. 37th St. \*
  14. Oregon White Oak *Quercus garryana* 1815 N. Humbolt \*
- (Designated June 22, 1994)
15. Black Oak *Quercus velutina* S. E. Woodstock and Reed College Place \*

16. Oregon White Oak *Quercus garryana* 1224 S. E. Sellwood \*
17. River Birch *Betula nigra* Sellwood Park, near parking lot
18. Oregon White Oak *Quercus garryana* 825 S. E. Miller \*  
(Designated November 23, 1994)
19. Western Catalpa (two) *Catalpa speciosa* 2826 N. E. 24th St.
20. Wych Elm *Ulmus glabra* 4124 N Mississippi \*
21. Oregon White Oak *Quercus garryana* 5000 N. Willamette Blvd. \*
22. Big Leaf Maple *Acer macrophyllum* 6733 N. Greely Ave.
23. Silver Maple *Acer saccharinum* 2857 S. E. Carlton St. \*
24. Variegated Elm *Ulmus procera* 2120 S. E. 24th
25. Black Walnut *Juglans nigra* 7703 S. E. Martins
26. Mockernut Hickory *Carya tomentosa* 1609 S. E. Umatilla
27. Shellbark Hickory (two) *Carya laciniata* 143 S. E. 32nd St. \*
28. Black Walnut *Juglans nigra* Corner of S. W. Salmon and S. W. 14th St. \*
29. English Elm *Ulmus procera* 2363 N. W. Flanders St.
30. Southern Magnolia *Magnolia grandiflora* 2833 S. W. 2nd St. \*  
(Designated February 22, 1995)
31. Tulip Tree *Liriodendron tulipifera* 5450 S. E. 40th Ave. \*
32. Western Catalpa *Catalpa speciosa* 1124 S. E. 15th St.
33. London Plane *Platanus x acerifolia* 1816 S. E. 21st St. \*
34. Yellow Buckeye *Aesculus octandra* 3387 S. E. Tibbets
35. Western Catalpa *Catalpa speciosa* 2425 N. E. 23rd St.
36. Madrona *Arbutus menziesii* 2435 N. Wygant St.
37. Paper Birch *Betula papyrifera* 7025 N. Seward St. \*
38. Northern Red Oak *Quercus rubra* 2642 N. W. Lovejoy \*
39. Dutch Elm *Ulmus hollandica* 2330 N. W. Flanders



## **APPENDIX 6:**

### **STREET TREE PLANTING AND MAINTENANCE GUIDELINES**

#### **Application or Request**

Prior to planting a street tree, City ordinance requires that adjoining property owners or authorized representatives obtain a planting permit from the Forestry Division. This process allows the Forestry Division staff to do a site inspection to assure proper tree location and recommend an appropriate tree selection.

To obtain a permit contact; Portland Parks and Recreation Forestry Division, 10910 N. Denver, Portland, Oregon 97217 Phone # 823-4489 Fax # 823-4493.

#### **Location Guidelines**

- Planting trees in parking strips smaller than 3' is not recommended. Exceptions must be approved by the Forestry Division.
- Sidewalk cut outs or tree wells shall be a minimum of 4' by 4', or 3' by 5' where necessary to maintain required sidewalk width.
- Tree grates or other approved materials may be required in some areas. Sidewalk alterations require approval from the Sidewalk Department at 823-1711.
- In areas where sidewalks and or curbs have not yet been installed the tree planting plans shall consider the possible location of future walk or curb installation.
- You are required by law to call the utility locator service at 246-6699 before you dig to assure that all underground utilities have been located in the area you are planting in.

The following measurements are the city's standards for determining the location of street trees:

Depending on the species of tree selected and or special conditions these measurements may need to be altered. Trees shall not be planted closer than:

- 25' from the curb line of an intersection.
- 7' from alley margins and driveways.
- 5' from fire hydrants, underground utilities, and utility poles.
- 10' from directional traffic signs.
- 2' from property lines.
- 20' from stop or yield signs.
- 25' from street lights. This distance may be reduced to 15' if a narrow growing species is selected.
- 20' (or more) from adjacent trees. This distance will be determined by the mature spread of the tree species.

## **Tree Selection Guide**

The Forestry Division will provide a list of recommended street tree species upon request. If you want a tree that is not on this list, you must get approval from the Forestry Division. Use the following guidelines to help in your selection of an appropriate tree.

- Trees shall not have a mature height greater than 5' below those power lines the power companies are mandated to keep clear. Communication lines do not require this clearance however.
- The spacing of street trees will be determined by the species selected. The minimum spacing permitted is 20' apart. Trees shall be spaced equal to their usual growth spread at maturity.
- Tree selection should consider building setback. The crown of a tree at maturity should not be in conflict with neighboring structures.
- Tree selection should consider ordinance requirements for height clearances. As they grow, trees will need to be pruned to provide clearance of at least 7 1/2' over sidewalks, 11' over residential streets, and 14' over main arterial streets.
- Trees should be of sufficient size to assure survival. In neighborhoods, trees should be at least 8' tall with a caliper of at least 1 1/2". Sites along main arterials, around public buildings and surrounding commercial developments should use larger caliper trees of at least 2 1/2".

## **Method of Planting**

Following these recommendations will increase your tree's chance of survival and future health.

- The planting hole should be at least 1/3 larger than the root mass.
- The tree should be planted at the same depth as previously grown.
- The soil should be gently firmed up as the planting hole is filled to reduce settling.
- Whenever possible, the native soil should be used as back fill. If soil improvement is needed, an area at least three times the width of the root mass should be amended.
- If trees are planted in poorly drained soil or heavily urbanized conditions, some means of drainage and aeration should be provided.
- Where heat damage may occur a white wash solution applied to the trunk may be advisable. A solution of 1/3 latex and 2/3 lime-sulfur make an acceptable mix.
- If support is needed, it should only remain for 1 year. Support should be fastened in a manner as to not cause injury to the tree trunk or endanger public safety.

- Tree root impact on hard surfaces, lawns, and irrigation systems, etc. should be addressed during site planning. Most important to minimizing root problems the selection of appropriate tree species. Root pruning or the use of root barriers may be recommended in some situations. More information on root barriers is available from the Forestry Division.
- To aid in irrigation and moisture retention it is recommended that an earth berm be formed around the edge of the planting hole. A 2" layer of mulch should be used to cover the basin.
- If you are planting a balled tree, remove as much of the wire, string, and burlap as possible without damaging the root ball.

### **Establishment Care**

Following are recommendations to assure the establishment of newly planted trees. They are as essential to the tree's health and survival as the method in which it was planted.

- It is essential that newly planted trees be watered regularly for at least the first two years. The amount of water needed will depend on soil and weather conditions. Between the months of June and October we recommend deep root watering to a depth of 30". Start out with 15 gallons of water per tree per week and adjust as needed. During the remaining months of the year the tree's root zone should be monitored for dryness and watered as needed.
- Fertilization of newly planted trees is not generally recommended. However if additional nutrients are needed, liquid fertilizer is preferable. This should be applied by deep root watering to a depth of 30" through the months of May and June. Fertilizer should be applied evenly over an area two times the size of the planting hole. Follow the manufacturers directions for making the fertilizer solution.
- Trees should be monitored for any insect or disease problems that effect the health of the tree. If necessary, corrective action should be taken.
- Depending on the size and condition of the planting area and the vigor of the trees, a root pruning program may be advisable. Contact the Forestry Division for further information and a permit.

### **Standards for Pruning and Mature Tree Care**

National Arborists Association Standards for pruning and all aspects of tree care are to be followed for all trees located in the city right-of-way or easement. Permits are required from the Forestry Division for pruning and removal of trees. More information on proper arboricultural practice and how to hire a certified arborist is also available from the Forestry Division.

# DESIGN GUIDE FOR PUBLIC STREET IMPROVEMENTS

*Portland Office of Transportation, October, 1993, pp. 6-39 to 6-48.*

## TREE WELLS IN PUBLIC SIDEWALKS

### PURPOSE

To ensure that tree wells are designed and constructed in a manner that will promote tree growth, minimize future slab damage caused by tree roots, and provide adequate pedestrian passage on adjacent sidewalks.

### STANDARD PLAN REFERENCES

3-162, Tree Well Installation

### DESIGN CRITERIA

- **Minimum Clearance** -- All public sidewalks must provide for comfortable pedestrian passage by maintaining a minimum clear width of 5 feet. On arterial and commercial streets and all streets within the Central Business District, the minimum clear width is 6 feet. This minimum dimension is measured from the back of the curb to the outside edge of the sidewalk. If a tree well is installed, the minimum clear width is measured from the outside edge of the tree well to the outside edge of the sidewalk.
- **Insufficient Right-of-Way** -- If the public right-of-way has insufficient width behind the curb to accommodate both the sidewalk and the tree well, the abutting property owner may donate additional right-of-way or designate a permanent sidewalk easement. The sidewalk may then be constructed in this unobstructed additional area.
- **Tree Well Dimensions** -- Design sidewalk tree wells to be 4' x 4' or larger. Modification to 3' x 5' may be acceptable where needed to provide minimum sidewalk width. Approval by the City Forester is required for all wells smaller than 4' x 4'. Specify the engineering station location of the center of each tree well on the construction plans.
- **Tree Grates** -- Specify the installation of cast iron tree grates in the downtown area. Use only grates that can be altered to provide for growth of the tree trunk. Where tree grates are to be used to add to the usable sidewalk area, specify grates that meet requirements of the Americans with Disabilities Act. The grate opening dimension is limited to 1/2 inch in the direction parallel to pedestrian travel.
- **New Trees - Species Approval** -- City Forester approval is required. See the Street Trees subsection.

### DESIGN CONSIDERATIONS

Consider the long-term maintenance responsibility for trees and tree grates that rests with the abutting property owner. Maintenance includes, but is not limited to, tree watering, tree fertilizer applications, tree limb removal for horizontal and vertical clearances, tree grate

modifications to accommodate trunk growth, sidewalk concrete repairs, and litter removal in the tree grate area.

### **COMMON TROUBLE POINTS**

**Minimum Clearance:** Sidewalk clearances not considered in design.

**Tree Grate Support:** Insufficient construction details provided for grate frame installation in concrete sidewalk.

### **STREET TREES**

#### **PURPOSE**

To ensure that the construction plans provide for the protection of existing trees, removal of trees that are incompatible with planned improvements, and planting of new trees that are in harmony with other trees and improvements in the right-of-way.

#### **STANDARD PLAN REFERENCES**

Not applicable.

#### **DESIGN CRITERIA**

- **Tree Inventory** -- Locate and identify the diameter and species of all existing trees with a diameter of 6 inches or greater in the construction impact zone. Consider the construction impact zone as the full width of the right-of-way and the bordering 15 feet outside each right-of-way line. Specify the diameter of these trees as measured 4.5 feet above the ground (diameter at breast height, or DBH). Measure the "drip line" for each tree, since this gives an approximate indication of the extent of the tree root system. Show this data on the construction plans.
- **City Forester Design Review** -- Review the project design and proposed tree protection/removal plan with the City Forester. The City Forester may suggest design changes or construction practices that will protect the trees designated to be saved.
- **Root Exploration** -- If directed by the City Forester or the City Engineer, conduct exploratory root excavations to determine the extent of impact a tree may be subjected to during construction.
- **City Forester's Written Report** -- Obtain from the City Forester a written report with findings and recommendations relating to trees to be removed, trees to be saved, required design changes, and construction practices that will protect trees to be saved.
- **Remove Tree** -- Identify each tree to be removed by the contractor and mark **REMOVE** on the construction plans.



- **Save Tree** -- Identify each tree to be saved during construction and mark **SAVE** on the construction plans. Where trees are to be saved, include the following construction note on the plans:

***Tree root inspection required! Contact the Forestry Division of the Parks Bureau at 823-4489 prior to any excavation adjacent to trees. A tree inspection must be made before cutting any roots.***

- **New Trees - Species Approval** -- Obtain tree species approval from the City Forester for any trees that will be planted in the public right-of-way.
- **Street Light Clearance** -- Provide a minimum separation of 25 feet between trees and street light poles. With some tree species, a decrease in the minimum tree/pole separation distance may be allowed. Obtain approvals from both the City Forester and the Street Lighting Division before design.
- **Water Main Clearance** -- For new tree installations, maintain a minimum separation of 5 feet between new trees and existing water mains (center tree to center main). For each new tree planted within 10 feet of an existing main, install a root barrier. Specify the installation of a 4' x 8' galvanized steel sheet in a vertical position between the pipe and the root ball (vertical = 4', horizontal = 8').
- **Intersection Clearance** -- For new tree installations, maintain a minimum separation of 25 feet between a tree and the curb line of the intersection.
- **Other Clearances** -- For new tree installations, maintain a minimum separation of 5 feet between a tree and any of the following items: driveway wings, fire hydrants, water meter boxes, and utility poles.
- **Biobarriers** -- For new landscape plantings, the Design Engineer has the discretion to specify the use of root control fabrics.

## **DESIGN CONSIDERATIONS**

All trees in the public right-of-way are valuable assets to the citizens of Portland. Exercise extreme care in all design proposals to save and enhance these resources. Design street improvements so the contractor, exercising reasonable care, can construct the project without destroying trees that are designated to be saved.

Roadway alignment, fill slopes, excavations, soil compaction from construction equipment, and utility trenching may adversely impact existing trees. Evaluate the impacts on each existing tree and make an initial proposal on the disposition of each tree in the project construction impact zone. When in doubt, consult the arborist on your design team.

During the plan review phase of the project, the City Forester will be given a field check plan set. He will be asked to verify the disposition of trees in the construction impact zone according to his previously written report and agreements relating to the design of the street improvement.

### ***Trees on Adjacent Properties***

The following procedures are followed if trees need to be removed or severely trimmed that are in the right-of-way, adjacent to the project site, and front on private property not controlled by the developer.

- 1) The developer (or developer's designee) meets with or provides written notification to affected neighboring property owners. The purpose of the meeting or written notification is to inform the property owners of the effects the street improvements will have on trees fronting their property. If requested by the developer, the City Forester accompanies the developer or designee to any meetings with property owners.
- 2) The developer or designee asks the affected property owners to sign an "Acknowledgement of Tree(s) or Shrub(s) to be Removed" form before removing trees that are in conflict with the proposed street improvement. (See Exhibit 6-6.) If the signatures cannot be obtained, the developer documents discussions and/or written communications with the affected neighboring property owners. Each meeting or letter is documented, with copies provided for the City's project files.

### ***Construction Work***

The following procedures are followed when trees on the project are designated as **SAVE**.

- 1) Before construction, the developer conducts a preconstruction conference with all affected parties: Design Engineer, contractor, utility companies, and City staff. The City Forester and the City's construction inspector discuss tree protection procedures with the contractor and the utility companies.
- 2) During construction, the developer's contractor arranges for the City Forester and the construction inspector to be present on the construction site whenever work activities threaten any trees that are designated to be protected.

### ***Deferred Installation***

Installation of street trees in residential subdivisions, required as part of a land use action, may be deferred provided that a deed restriction/covenant is executed to require tree planting in conjunction with the construction of houses.

## **COMMON TROUBLE POINTS**

***Construction Damage:*** Construction activities that occur too close to existing trees, which can damage or eventually kill them. Proper protective actions need to be taken to protect existing trees. (See Exhibit 6-7.)

***Future Improvements:*** Failure to consider sidewalks and other improvements during initial design, resulting in tree removals in the future.



## **APPENDIX 7: RECOMMENDED STREET TREES**

Refer to *Appendix 5 - Street Tree Planting and Maintenance Guidelines* as you consider these possible street trees. Approval of a street tree will be made by an Urban Forestry inspector depending on specific site factors to assure that the selection is appropriate.

If power lines are present, trees must be selected that achieve mature height 5' to 10' below the lines. Do not confuse communication lines with power lines however.

Availability of some of these trees may be limited as the season progresses. In some cases different cultivars may be substituted.

Tree species not on this list may also be used depending upon approval of the inspector.

The following lists are for parking strips of various widths. Refer to the correct size of planting strip for your particular application.

## RECOMMENDED STREET TREES FOR PLANTING IN 3' TO 4' PARKING STRIPS

Tree Species	Height Spread	Structure	Foliage	Flowers, fruit, and other Special interest
<b>Trident Maple</b> <i>Acer buergeranum</i>	25' 20'	Oval to round	Glossy green turning yellow orange red	Exfoliating bark, adaptable to varied conditions
<b>Vine Maple</b> <i>Acer circinatum</i>	25' 10'	Upright spreading	Medium green turning bright orange and red	Northwest native maple, open delicate form, thrives in shade
<b>Amur Maple</b> <i>Acer ginnala</i>	20' 20'	Upright round	Green turning yellow to scarlet red	Small fragrant flowers followed by winged fruit
<b>Rocky Mountain Glow Maple</b> <i>Acer grandidentatum</i>	25' 15'	Oval	Dark green turning bright red	Requires well drained soil
<b>Paperbark Maple</b> <i>Acer griseum</i>	30' 20'	Round	Green with silver under, turning bright red orange	Interesting cinnamon brown under exfoliating bark
<b>Crimson Sentry Norway Maple</b> <i>Acer platanoides 'Crimson Sentry'</i>	25' 12'	Upright	Red turning maroon to bronze in fall	Smaller than most Norway maple cultivars
<b>Apple Serviceberry</b> <i>Amelanchier x grandiflora</i>	25' 20'	Round	Green turning yellow bronze	White flowers early, reddish black berries attract birds
<b>Pyramidal Serviceberry</b> <b>Amelanchier canadensis pyramidalis</b>	30' 20'	Very upright	Dark green turning brilliant red and orange	White flowers in spring, dark purple fruit is attractive to birds
<b>Allegheny Serviceberry</b> <i>Amelanchier laevis</i>	25' 15'	Upright and oval	Green turning orange in fall	White flowers in spring, purple blue fruit attractive to birds
<b>Glorybower Tree</b> <i>Clerodendrum trichotomum</i>	20' 20'	Round	Dark green	White flowers with interesting bright red and blue flowers
<b>Lavelle Hawthorn</b> <i>Crataegus x lavalleyi</i>	30' 20'	Upright	Dark glossy green turning bronze red	White flowers, red persistent fruit
<b>Crimson Cloud Hawthorn</b> <i>Crataegus laevigata 'Crimson Cloud'</i>	25' 18'	Oval	Glossy green	Flowers are bright red with white center, bright red fruit.



<b>Columnar Hawthorn</b> <i>Crataegus monogyna</i> 'Stricta'	30' 10'	Tightly upright	Green turning yellow	White flowers, small clusters of red fruit.
<b>Flowering Ash</b> <i>Fraxinus ornus</i>	30' 25'	Pyramidal to round	Medium green turning yellow	Fragrant creamy white flowers
<b>Golden Desert Ash</b> <i>Fraxinus oxycarpa aureopolia</i>	20' 18'	Round, compact	Green turns golden early	Unusual gold colored bark
<b>Goldenrain Tree</b> <i>Koelreuteria paniculata</i>	30' 20'	Round, open	Green turning yellow	Yellow flowers in summer, brown persistent fruits, tolerant of poor conditions
<b>Goldchain</b> <i>Laburnum x watereri</i> 'Vossi'	15' 15'	Upright vase	Green turning yellow	Long pendulous yellow flower clusters in May, pea like fruits are poisonous
<b>Centurion Crab</b> <i>Malus</i> 'Centurion'	25' 15'	Upright	Purple to bronze	Rose red flowers and red fruit, disease tolerant.
<b>Professor Sprenger Crab</b> <i>Malus</i> 'Professor Sprenger'	20' 20'	Upright, oval	Green	White flowers and orange fruit, resistant to most diseases
<b>Robinson Crab</b> <i>Malus</i> 'Robinson'	25' 25'	Upright, round	Red to bronze green	Deep pink flowers and red fruit, disease resistant .
<b>Columnar Siberian Crab</b> <i>Malus baccata</i> 'Columnaris'	30' 10'	Narrow, upright	Dense green	White flowers and yellow red fruit, resistant to rust.
<b>Tschonoskii Crab</b> <i>Malus tschonoski</i>	40' 30'	Broad conical	Dark green turning orange, purple, scarlet	White flowers and sparse green fruit
<b>Blireiana Plum</b> <i>Prunus x blireiana</i>	25' 20'	Round	Purple to reddish bronze	Bright pink, semidouble, fragrant flowers
<b>Newport Plum</b> <i>Prunus cerasifera</i> 'Newport'	20' 20'	Oval to round	Purplish red	Single pink flowers
<b>Japanese Tree Lilac</b> <i>Syringa reticulata</i>	25' 15'	Pyramidal	Green	White panicles and yellow brown fruit

## RECOMMENDED STREET TREES FOR PLANTING IN 4 1/2' TO 5 1/2' PARKING STRIPS

Tree Species	Height Spread	Structure	Foliage	Flowers, fruit, and other Special interest
<b>Queen Elizabeth Hedge Maple</b> <i>Acer campestre</i> 'Queen Elizabeth'	35' 30'	Upright, oval	Dark green turning yellow	Corky bark, tolerant of dry conditions
<b>Paperbark Maple</b> <i>Acer griseum</i>	30' 20'	Round	Green with silver under turning bright red orange	Interesting cinnamon brown under exfoliating bark
<b>Cleveland II Norway Maple</b> <i>Acer platanoides</i> 'Cleveland'	40' 25'	Upright	Medium green turning bright yellow	
<b>Parkway Norway Maple</b> <i>Acer platanoides</i> 'Columnar broad'	40' 25'	Oval, good central leader	Dark green turning yellow	
<b>Variegated Norway Maple</b> <i>Acer platanoides</i> 'Drummondii'	35' 25'	Broadly oval	Light green with white margins	
<b>Columnar Norway Maple- Compact</b> <i>Acer platanoides</i> 'Columnar-Compact'	35' 15'	Fastigate	Dark green turning yellow	Ascending branches, good for very narrow spaces
<b>Olmsted Columnar Norway Maple</b> <i>Acer platanoides columnar</i> 'Olmsted'	40' 20'	Upright	Dark green turning yellow	Also good for narrow spaces
<b>Armstrong Red Maple</b> <i>Acer rubrum</i> 'Armstrong'	45' 15'	Fastigate	Light green turning yellow orange red'	
<b>Gerling Red Maple</b> <i>Acer rubrum</i> 'Gerling'	35' 20'	Pyramidal	Green turning orange red	
<b>Pacific Sunset Maple</b> <i>Acer truncatum</i> x <i>A. platanoides</i> 'Warrenred'	30' 25'	Upright	Dark green turning orange red	
<b>Pyramidal European Hornbeam</b> <i>Carpinus betulus</i> 'Fastigiata'	35' 20'	Dense, upright pyramid to oval	Dark green turning yellow	Retains leaves into winter, small hard nutlets in clusters
<b>Chinese Dogwood</b> <i>Cornus kousa chinensis</i>	30' 30'	Round	Green turning red	White flowers and red pink fruit

<b>Lavelle Hawthorn</b> <i>Crataegus x lavallei</i>	30' 20'	Upright	Dark glossy green turning bronze red	White flowers, red persistent fruit
<b>Flowering Ash</b> <i>Fraxinus ornus</i>	30' 25'	Pyramidal to round	Medium green turning yellow	Fragrant creamy white flowers
<b>Sarasota Ginko</b> <i>Ginko biloba</i> 'Sarasota'	30' 30'	Round	Greenish gold turning yellow	
<b>Magnolia Kobus</b> <i>Magnolia kobus</i>	30' 20'	Round	Dark green	Deciduous with large white flowers early
<b>American Hophornbeam</b> <i>Ostrya virginiana</i>	35' 25'	Oval	Medium green turning yellow	Male catkins visible in winter, greenish white nutlets
<b>Columnar Sargent Cherry</b> <i>Prunus sargentii</i> 'Columnaris'	35' 15'	Columnar	Green turning orange red	Deep pink flowers
<b>Capital Pear</b> <i>Pyrus calleryana</i> 'Capital'	35' 12'	Columnar	Medium green turning reddish purple	White flowers in clusters, most narrow of flowering pears
<b>Chanticleer Pear</b> <i>Pyrus calleryana</i> 'Glens Form'	40' 15'	Pyramidal	Glossy green turning orange red	White flowers in clusters, good for narrow spaces
<b>Skyrocket Oak</b> <i>Quercus robur</i> 'Fastigiata'	45' 15'	Fastigate	Dark green turning yellow brown	Interesting oak for very narrow spaces
<b>Japanese Stewartia</b> <i>Stewartia pseudocamellia</i>	40' 20'	Pyramidal	Dark green turning dark red	White camellia like flowers, mottled bark
<b>Chancellor Linden</b> <i>Tilia cordata</i> 'Chancole'	35' 20'	Pyramidal	Dark green turning yellow	Fragrant yellow flowers attractive to bees
<b>Rancho Linden</b> <i>Tilia cordata</i> 'Rancho'	45' 20'	Pyramidal, upright	Dark green turning yellow	Yellow fragrant flowers attractive to bees

# RECOMMENDED STREET TREES FOR PLANTING IN 6' TO 8' PARKING STRIPS

Tree Species	Height Spread	Structure	Foliage	Flowers, fruit, and other Special interest
<b>Crimson King Norway Maple</b> <i>Acer platanoides</i> 'Crimson King'	40' 35'	Round	Deep purple turning reddish orange	
<b>Emerald Queen Norway Maple</b> <i>Acer platanoides</i> 'Emeral Queen'	50' 40'	Oval, dense	Dark Green to bright Yellow	
<b>Superform Maple</b> <i>Acer platanoides</i> 'Superform'	45' 40'	Oval	Medium green turning yellow	
<b>Globe Norway Maple</b> <i>Acer platanoides globosum</i>	15' 18'	Round	Medium green turning yellow	Appropriate for under power wires
<b>Embers Red Maple</b> <i>Acer rubrum</i> 'Embers'	40' 35'	Open	Green turning bright red	
<b>Red Sunset Maple</b> <i>Acer rubrum</i> 'Franksred'	45' 35'	Broad oval	Dark green turning red orange	
<b>October Glory Maple</b> <i>Acer rubrum</i> 'October Glory'	40' 35'	Broad oval	Medium green turning red to purple	
<b>Globe Sugar Maple</b> <i>Acer saccharum</i>	15' 20'	Round	Medium green to yellow and orange	Appropriate for under power wires
<b>European Hornbeam</b> <i>Carpinus betulus</i>	50' 35'	Oval to round	Dark green to golden yellow	Holds leaves into winter
<b>Hackberry</b> <i>Celtis occidentalis</i>	40 30	Oval	Dark green turning yellow	
<b>Katsura Tree</b> <i>Cercidiphyllum japonicum</i>	40' 35'	Oval	Blue green turning yellow to scarlet	
<b>Yellowwood</b> <i>Cladrastis lutea</i>	40' 35'	Round	Yellow to bright green turning orange to yellow	White fragrant clusters

<b>Tricolor Beech</b> <i>Fagus sylvatica</i> 'Roseo-Marginata'	40' 30'	Broad oval	Purple with light pink border	
<b>Autumn Purple Ash</b> <i>Fraxinus americana</i> 'Autumn Purple'	45' 40'	Round	Green turning red and purple	
<b>Skyline Ash</b> <i>Fraxinus americana</i> 'Skycole'	45' 35'	Oval	Medium green turning orange red	
<b>Marshall Ash</b> <i>Fraxinus pennsylvanica</i> 'Marshall'	50' 40'	Broad oval	Dark glossy green turning bright yellow	
<b>Urbanite Ash</b> <i>Fraxinus pennsylvanica</i> 'Urbanite'	50' 40'	Broad pyramidal	Lustrous green tuning bronze	
<b>Saratoga Ginko</b> <i>Ginko biloba</i> 'Saratoga'	30' 30'	Round	Green gold to yellow	
<b>Shademaster Honeylocust</b> <i>Gleditsia triacanthos</i> 'Shademaster'	45' 35'	Vase	Dark green turning yellow	
<b>Skyline Honeylocust</b> <i>Gleditsia triacanthos</i> 'Skyline'	50' 30'	Broad pyramidal	Medium green turning golden	
<b>Magnolia Kobus</b> <i>Magnolia kobus</i>	40' 30'	Round	Dark green	Evergreen leaves and white flowers
<b>Sourwood</b> <i>Oxydendrum arboreum</i>	50' 25'	Pyramidal	Green to brilliant scarlet	White flowers
<b>Macho Cork Tree</b> <i>Phellodendron amurense</i> 'Macho'	40' 30'	Broad vase	Medium green to yellow	
<b>Kwanzan Cherry (on 6' graft)</b> <i>Prunus serrulata</i> 'Kwanzan'	30' 20'	Vase	Dark green to Bronze and orange	Pink flowers
<b>Royal Burgandy Cherry</b> <i>Prunus serrulata</i> 'Royal Burgandy'	30' 20'	Vase	Purple red to red and orange	Pink flowers
<b>Scarlet Oak</b> <i>Quercus coccinea</i>	50' 40'	Broad oval	Glossy green turning scarlet	



<b>Skymaster Oak</b> <i>Quercus robur</i> 'Pyramich'	50' 25'	Pyramidal	Dark green turning yellow	
<b>Glenleven Linden</b> <i>Tilia cordata</i> 'Glenleven'	45' 30'	Pyramidal	Medium green turning yellow	
<b>Halka Zelkova</b> <i>Zelkova serrata</i> 'Halka'	45' 30'	Vase	Medium green turning yellow	

#### RECOMMENDED STREET TREES FOR PLANTING IN 8 1/2' AND LARGER PARKING STRIPS

Tree Species	Height Spread	Structure	Foliage	Flowers, fruit, and other Special interest
<b>Schwedler Norway Maple</b> <i>Acer platanoides</i> 'Schwedleri'	50' 45'	Round	Green turning yellow	
<b>Globe Norway Maple</b> <i>Acer platanoides globosum</i>	15' 18'	Round	Medium green turning yellow	
<b>Sycamore Maple</b> <i>Acer pseudoplatanus</i>	60' 50'	Wide spreading	Green turning yellow	
<b>Wineleaf Sycamore Maple</b> <i>Acer pseudoplatanus</i> 'Spaithi'	30' 50'	Pyramidal	Dark green	
<b>Red Maple</b> <i>Acer rubrum</i>	60' 50'	Oval	Medium green turning orange red	
<b>Sugar Maple</b> <i>Acer saccharum</i>	60' 45'	Oval	Green turning Bright yellow to orange	
<b>Red Horsechestnut</b> <i>Aesculus x carnea</i> 'Briotii'	60' 40'	Round	Dark green turning yellow	Red flowers
<b>Globe Serviceberry</b> <i>Amelanchier canadensis oblongifolia</i>	20' 20'	Round	Green turning bright yellow red	White flowers
<b>Catalpa</b> <i>Catalpa speciosa</i>	75' 50'	Round	Green turning yellow	White flowers

<b>Katsura Tree</b> <i>Cercidiphyllum japonicum</i>	40' 35'	Oval	Blue green turning yellow to scarlet	
<b>Red Bud</b> <i>Cercis canadensis</i>	20' 25'	Open spreading	Medium green turning yellow	Pink flowers
<b>Yellowwood</b> <i>Cladrastis lutea</i>	40' 35'	Round	Yellow to bright green turning orange to yellow	White fragrant clusters
<b>Purple Rivers Beech</b> <i>Fagus sylvatica</i> 'Riversi'	60' 40'	Oval	Deep purple turning bronze	
<b>Tricolor Beech</b> <i>Fagus sylvatica</i> 'Roseo-Marginata'	40' 30'	Broad oval	Purple with light pink border	
<b>Flame Ash</b> <i>Fraxinus oxycarpa</i> 'Flame'	35' 30'	Round	Green turning purple and red	
<b>Urbanite Ash</b> <i>Fraxinus pennsylvanica</i> 'Urbanite'	50' 40'	Broad pyramidal	Lustrous green tuning bronze	
<b>Summit Ash</b> <i>Fraxinus pennsylvanica lanceolata</i>	45' 25'	Pyramidal	Medium green turning yellow	
<b>Saratoga Ginko</b> <i>Ginko biloba</i> 'Saratoga'	30' 30'	Round	Green gold to yellow	
<b>Halka Honeylocust</b> <i>Gleditsia triacanthos</i> 'Christie'	55' 40'	Upright	Green turning yellow	
<b>Kentucky Coffee Tree</b> <i>Gymnocladus dioicus</i>	70' 40'	Open	Green	
<b>Moraine Sweetgum</b> <i>Liquidambar styraciflua</i> 'Moraine'	60' 30'	Oval	Dark green turning red purple	
<b>Sourwood</b> <i>Oxydendrum arboreum</i>	50' 25'	Pyramidal	Green to brilliant scarlet	White flowers
<b>Yoshino Chery</b> <i>Prunus x yedoensis</i>	30' 30'	Spreading	Green turning yellow	Pink or white flowers

<b>Kwanzan Cherry</b> (on 6' graft) <i>Prunus serrulata</i> 'Kwanzan'	30' 20'	Vase	Dark green to bronze and orange	Pink flowers
<b>Scarlet Oak</b> <i>Quercus coccinea</i>	50' 40'	Broad oval	Glossy green turning scarlet	
<b>Red Oak</b> <i>Quercus rubra</i>	70' 50'	Round	Green turning red	
<b>Halka Zelkova</b> <i>Zelkova serrata</i> 'Halka'	45' 30'	Vase	Medium green turning yellow	

## **APPENDIX 8:**

### **PLANTING FOR ENERGY CONSERVATION AND SOLAR ACCESS**

Properly selected and placed trees in the landscape can significantly reduce glare and solar radiation in the summer. Where air conditioning is used, shade can reduce cooling costs, and subsequent energy needs. Even without air conditioning, a shaded house will be more comfortable in the summer.

In winter months, deciduous trees that lose their leaves allow solar radiation to passively heat homes. Vegetation can also block or filter cold winter winds, which are often from the east in Portland. The effectiveness of windbreaks depends on the home's location, the climate, the building materials, and weatherization controls. Conifers or evergreen hedges are the best windbreaks.

In order to achieve a balance between desirable shade and access to light, carefully consider the qualities of the tree to be planted. "Solar Friendly" trees are those that have been selected based on the size of their leaves, the branching pattern and density, and when the tree gets and loses its leaves (foliar period). See *Appendix 9 - Solar Friendly Trees Report and Fact Sheet*.

Consider the following principles when planting for energy conservation:

#### **What to Shade**

Shade south and west sides of your house, particularly the windows. Most solar heat gain in a building comes through the windows. Shade the air conditioner for increased efficiency. Shade concrete driveways, parking areas and sidewalks and patios; these surfaces retain the heat from solar radiation.

#### **What to Plant**

Plant a tree that will provide for the maximum shade in the summer, while allowing for penetration of light in the winter. Consider tree height, canopy size and shape, compatibility with the surrounding landscape, potential wildlife benefits, and other aesthetic qualities of trees. Know the cultural requirements of the potential tree species. Many trees that are not appropriate as street trees can make a beautiful lawn specimen. Some deciduous trees have a particularly lovely winter silhouette or interesting bark patterns.

#### **Where to Plant**

Consider the spread of the canopy at maturity, and place the tree at least half that distance away from the house. At maturity, the tree should not interfere with the house or other structure. Similarly, plant to avoid canopy conflicts with street lights, utility wires, and other trees. Plant at least 6' from sidewalks and other hard surfaces to prevent damage. Plant to maintain visibility from your windows to the street and to your neighbors' houses. Trees are compatible with safe streets, but attention must be given to species selection and design.

Sources for more information:

Friends of Trees "Branching Out Program" Call Friends of Trees at 282-8846 for more information.

Tree City USA Bulletin No. 21 "How Trees can Save Energy" The National Arbor Day Foundation, James R. Fazio Editor.





APPENDIX 9:

SOLAR FRIENDLY TREES REPORT

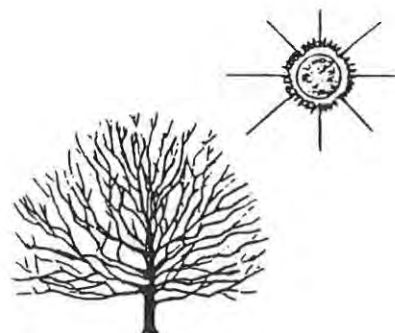
By  
Mariel J. Ames, AICP

Tree rankings prepared by members of the Solar Friendly Tree Committee. Final revisions to the rankings were made by the committee at their workshop in Salem on February 6, 1987, and through subsequent review.

Tree list compiled by Mariel Ames, Ames Associates for Conservation Management Services under contract to the City of Portland's Energy Office, Mike Lindberg, Commissioner.

Funding for this project was made available by the Bonneville Power Administration.

April 1987



## SOLAR FRIENDLY TREE REPORT

The following list is the result of an intensive process to determine those deciduous trees, all of which grow in the Willamette Valley, that are suitable for planting as solar friendly trees. The ranking classification was based on evaluating each tree on this list for crown density, time of leaf drop, time of leaf out, size and growth rate. A committee of tree experts from Portland, Salem, Eugene, and Corvallis ranked each tree with a numerical factor for each of the five criteria. Averages for each criterion were then added to produce the final numerical rank for each tree. The criteria for these rankings are included in the appendices.

I -- Solar Friendly Trees. These are the trees that had a ranking of less than 13. These are considered to be solar friendly trees based on the criteria established by the committee. A few trees, however, which had a ranking of 13 or over were discussed by the committee and designated as solar friendly after reviewing the photographs of bare branch patterns. Solar friendly trees — 251.

II -- Solar Unfriendly Trees. These are the trees that had a ranking of 13 or more. Based on the discussion at the workshop these are considered to be solar unfriendly trees. A few trees, however, with rankings of less than 13 were classified by the committee upon careful review as solar unfriendly trees due to some specific characteristic, such as seed pods that remain on all winter. Solar Unfriendly Trees— 116.

III -- Trees Not Ranked. These trees were not ranked by the committee. They will be included in the final report as trees which grow in the Willamette Valley but which have not been identified as either solar friendly or solar unfriendly. Either these trees are rare, or no one on the committee was familiar enough with the tree to give it a ranking. Trees not ranked — 37.

The climatic zone within which all these trees grow is defined as Zone 6 which extends from Clark County, Washington, down the Willamette Valley to Roseburg, Oregon. For a map of this zone see Appendix D.

Botanical Name	Common Name	Rank
<b>I — SOLAR FRIENDLY TREES</b>		
Acer buergianum	Trident Maple	11
A. campestre 'Queen Elizabeth'	Queen Elizabeth Maple	11
A. cappadocicum	Coliseum Maple	10.3

A. c. 'Rubrum'	Red Coliseum Maple	10.3
A. capillipes	Red Snake Bark Maple	11
A. circinatum	Vine Maple	9.9
A. davidii	David's Maple	11.5
A. ginnala 'flame'	Flame Maple	10
A. griseum	Paperbark Maple	11.5
A. japonicum	Fullmoon Maple	9.5
A. nigrum 'greencolumn'	Greencolumn Maple	11
A. palmatum	Japanese Maple	10.4
A. platanoides	Norway Maple	12
A. p. 'almira'	Almira Norway Maple	12
A. p. 'cavalier'	Cavalier Norway Maple	12
A. p. 'cleveland'	Cleveland II Norway Maple	11
A. p. 'crimson sentry'	Crimson Sentry Maple	12
A. p. 'columnare'	Columnar Norway Maple	11.8
A. p. 'crimson king'	Crimson King Norway Maple	11.3
A. p. 'deborah'	Deborah Maple	12
A. p. 'emerald queen'	Emerald Queen Norway Maple	13
A. p. 'globe'	Globe Norway Maple	11.3
A. p. 'jade glen'	Jade Glen Maple	12
A. p. 'olmsted'	Olmsted Norway Maple	11.8
A. p. 'royal red'	Royal Red Norway Maple	11.8
A. p. 'schwedleri'	Schwedler Norway Maple	11.6
A. p. 'silver variegated'	Silver Variegated Maple	12
A. pseudoplatanus	Sycamore Maple	12.3
A. p. atropurpureum 'spaethi'	Wineleaf Sycamore Maple	12
A. p. 'pyramidale'	Pyramidal Sycamore Maple	10.3
A. rubrum	Scarlet Maple	12.5
A. r. 'autumn flame'	Autumn Flame Maple	11
A. r. 'bowhall'	Bowhall Red Maple	12.1
A. r. 'gerling'	Gerling Red Maple	12.9
A. r. 'karpick'	Karpick Red Maple	12
A. r. 'morgan'	Morgan Red Maple	11.7
A. r. 'october glory'	October Glory Red Maple	12.5
A. r. 'red sunset'	Red Sunset Maple	12.8
A. r. 'scanlon'	Scanlon Red Maple	12.4
A. r. 'scarlet sentinel'	Scarlet Sentinel Maple	10
A. r. 'schlesinger'	Schlesinger Red Maple	11.9
A. rufinerve	Redvein Maple	12.5
A. saccharum 'bonfire maple'	Bonfire Maple	12
A. s. 'columnare'	Columnar Sugar Maple	12.7
A. s. 'commemoration'	Commemoration Maple	12
A. s. 'green mountain'	Green Mountain Sugar Maple	10.4
A. s. 'legacy'	Legacy Maple	12
A. truncatum	Truncate Maple	10.8
Aesculus carnea	Red Horsechestnut	12.5
A. hippocastanum 'baumannii'	Baumann's Horsechestnut	11.6
Ailanthus altissima	Tree-of-Heaven	12.3
Albizia julibrissin	Silk Tree Mimosa	10

Amelanchier canadensis	Serviceberry	10
A. laevis	Allegheny Serviceberry	10
Aralia elata	Japanese Aralia	10
A. spinosa	Devil's Walking Club	7.2
Betula jacquemontii	Jacquemontii Birch	13
B. papyrifera	Paper Birch	12.1
B. pendula 'alba'	European White Birch	12.1
B. p. 'Dalecarlica'	Cutleaf Weeping Birch	11.4
B. p. 'fastigiata'	Pyramidal White Birch	12.3
B. p. 'Youngii'	Young's Weeping Birch	10.1
Carpinus betulus 'globesun'	Globe European Hornbeam	12
C. b. 'quercifolia'	Oakleaf European Hornbeam	10
C. caroliniana	American Hornbeam	11.5
C. tschonoskii	Yeddo Hornbeam	11
Carya illinoensis	Pecan	10
C. ovata	Shagbark Hickory	10
Castanea sativa	European Chestnut	12.7
Catalpa bignoides	Southern Catalpa	10.7
C. bungei	Manchurian Catalpa	7
C. speciosa	Northern Catalpa	10.2
Celtis occidentalis	Common Hackberry	11.6
Cercidiphyllum japonicum	Katsura Tree	10.3
Cercis canadensis	Eastern Redbud	11
C. occidentalis	Western Redbud	11
Cladrastis lutea	American Yellowwood	11.1
Cornus controversa	Giant Dogwood	10.8
C. florida	Flowering Dogwood	10.6
C. kousa	Japanese Dogwood	11
C. nuttallii	Pacific Dogwood	11.3
Corylus maxima	Filbert	11.8
C. colurna	Turkish Hazel	12.8
Cotinus coggygria	Smoke Tree	8.8
Crataegus crus-galli 'inermis'	Thornless Cockspur Hawthorn	12
C. punctata 'ohio pioneer'	Ohio Pioneer Dotted Hawthorn	12.7
C. x. mordensis 'toba'	Toba Hawthorn	11
Davidia involucrata	Dovetree	11.7

<i>Diospyros virginiana</i>	Common Persimmon	9.2
<i>Elaeagnus angustifolia</i>	Russian Olive	12.1
<i>Ficus carica</i>	Common Fig	8.3
<i>Franklinia alatamaha</i>	Frankliniana	10
<i>Fraxinus americana</i>	White Ash	9
<i>F. a. 'autumn applause'</i>	Autumn Applause Ash	9
<i>F. a. 'autumn purple'</i>	Autumn Purple Ash	9
<i>F. a. 'rosehill'</i>	Rosehill Ash	10
<i>F. angustifolia 'dr. pirone'</i>	Dr. Pirone Narrowleaf Ash	11.8
<i>F. excelsior</i>	European Ash	11.3
<i>F. e. 'rancho'</i>	Rancho European Ash	12
<i>F. holotricha</i>		10.7
<i>F. latifolia</i>	Oregon Ash	11.3
<i>F. ornus</i>	Flowering Ash	12.1
<i>F. c. 'raywood'</i>	Raywood Ash	12.9
<i>F. o. aureaefolia</i>	GoldenDesert Ash	13.5
<i>F. pennsylvanica lanceolata</i>	Green Ash	11.3
<i>F. p. 'marshall'</i>	Marshall Ash	11
<i>F. p. 'summit'</i>	Summit Ash	9
<i>F. p. 'patmore'</i>	Patmore Ash	9
<i>F. p. 'emerald'</i>	Emerald Ash	10
<i>F. quadrangulata</i>	Blue Ash	10.5
<i>Gingko biloba</i>	Maidenhair Tree	8.4
<i>Gleditsia triacanthos</i>	Common Honeylocust	9.1
<i>G. t. inermis 'trueshade'</i>	Trueshade Honeylocust	8
<i>G. t. 'green arbor'</i>	Green Arbor Honeylocust	8
<i>G. t. 'halka'</i>	Halka Honeylocust	8
<i>G. t. 'imperial'</i>	Imperial Common Honeylocust	7.3
<i>G. t. 'moraine'</i>	Moraine Common Honeylocust	9.7
<i>G. t. 'shademaster'</i>	Shademaster Common Honeylocust	9.2
<i>G. t. 'skyline'</i>	Skyline Common Honeylocust	9.5
<i>G. t. 'summergold'</i>	Summergold Honeylocust	8
<i>G. t. 'sunburst'</i>	Sunburst Common Honeylocust	7.2
<i>Gymnocladus dioica</i>	Kentucky Coffee Tree	8.6
<i>Halesia carolina</i>	Carolina Silverbell	8
<i>H. monticola</i>	Mountain Silverbell	10.8
<i>Hovenia dulcis</i>	Japanese Raisin Tree	11
<i>Idesia polycarpa</i>	Idesia	9.7
<i>Juglans cinerea</i>	Butternut	7
<i>J. hindsii</i>	Hinds Blackwalnut	7
<i>J. nigra</i>	Blackwalnut	10.9



<i>J. regia</i>	English Walnut	9.7
<i>Koelreuteria paniculata</i>	Panicked Goldenrain Tree	11.2
<i>K. p. 'september goldenrain'</i>	September Goldenrain Tree	11
<i>Laburnum alpinum</i>	Scotch Laburnum	9
<i>L. anagyroides</i>	Goldenchain Laburnum	11.6
<i>Lagerstroemia indica</i>	Common Crapemyrtle	10.3
<i>Larix decidua</i>	European Larch	11.7
<i>L. laricina</i>	Eastern Larch (Tamarack)	7
<i>L. leptolopis</i>	Japanese Larch	9
<i>L. occidentalis</i>	Western Larch	10
<i>Liquidambar formosana</i>	Chinese Sweetgum	12
<i>L. orientalis</i>	Oriental Sweetgum	12.5
<i>L. styraciflua variegata</i>	Golden American Sweetgum	12.7
<i>Maackia amurensis</i>	Amur Maacki	11
<i>Magnolia acuminata</i>	Cucumbertree Magnolia	13.2
<i>M. campbelli</i>	Campbell Magnolia	12.5
<i>M. macrophylla</i>	Bigleaf Magnolia	10
<i>M. salicifolia</i>	Anise Magnolia	10
<i>M. sargentiana</i>	Sargent Magnolia	11.5
<i>M. soulangeana</i>	Saucer Magnolia	10.1
<i>M. stellata</i>	Star Magnolia	10.8
<i>M. veitchii</i>	Veitch Magnolia	9.8
<i>M. wilsoni</i>	Wilson Magnolia	8
<i>Malus arnoldiana</i>	Arnold Crabapple	11.5
<i>M. baccata</i>	Flowering Crabapple	12
<i>M. b. 'columnaris'</i>	Columnar Siberian Crabapple	11.5
<i>M. b. 'jackii'</i>	Jackii Crabapple	12
<i>M. 'david'</i>	David Crabapple	12
<i>M. 'liset'</i>	Liset Crabapple	12
<i>M. 'mary potter'</i>	Mary Potter Crabapple	11
<i>M. 'prairiefire'</i>	Prairiefire Crabapple	13
<i>M. 'red baron'</i>	Red Baron Crabapple	12
<i>M. 'royal ruby'</i>	Royal Ruby Crabapple	10
<i>M. sargentii</i>	Sargent Crabapple	11
<i>M. s. 'rosea'</i>	Sargent Pinkbud Crabapple	9.8
<i>M. s. 'rancho ruby'</i>	Rancho Ruby Sargent Crabapple	8
<i>M. selkirk</i>	Selkirk Crabapple	10
<i>M. tschonoskii</i>	Tschonoskii Crabapple	12
<i>M. 'van eseltine'</i>	Van Eseltine Crabapple	9.5
<i>M. 'white cascade'</i>	White Cascade Crabapple	13
<i>M. zumi 'calocarpa'</i>	Calocarpa Zumi Crabapple	10.5
<i>Metasequoia glyptostroboides</i>	Dawn Redwood	11.7

<i>Nyssa sylvatica</i>	Black Tupelo	11.4
<i>Oxydendrum arboreum</i>	Sourwood	9
<i>Paulownia tomentosa</i>	Royal Paulownia	11.5
<i>Phellodendron amurense</i>	Amur Corktree	10.7
<i>Populus tremuloides</i>	Quaking Aspen	11
<i>Prunus avium</i>	Mazzard Cherry	12.2
<i>P. a. 'plena'</i>	Double Mazzard Cherry	9
<i>P. a. 'scanlon'</i>	Scanlon Cherry	10.3
<i>P. blireiana</i>	Blireiana Plum	11.2
<i>P. cerasifera</i>	Myrobalan Plum	12
<i>P. c. atropurpurea</i>	Purple Plum	12
<i>P. c. 'newport'</i>	Newport Plum	12
<i>P. c. 'thundercloud'</i>	Thundercloud Plum	12.6
<i>P. c. Krauter 'vesuvius'</i>	Krauter Vesuvius Plum	10.7
<i>P. maackii</i>	Amur Chokecherry	11
<i>P. mume</i>	Japanese Apricot	12
<i>P. 'okame'</i>	Okame Cherry	10
<i>P. persica</i>	Peach varieties	11
<i>P. padus 'alberti'</i>	Albert Birdcherry	12
<i>P. p. 'bigflower'</i>	Bigflower European Birdcherry	12
<i>P. p. 'berg'</i>	Rancho European Birdcherry	12
<i>P. sargentii</i>	Sargent Cherry	11.5
<i>P. s. 'columnaris'</i>	Columnar Sargent Cherry	10.3
<i>P. s. 'rancho'</i>	Rancho Sargent Cherry	11.1
<i>P. serrula</i>	Birch Bark Cherry	11
<i>P. serrulata</i>	Oriental Cherry	10.5
<i>P. s. amanogawa</i>	Amanogawa Cherry	11
<i>P. s. kwanzan</i>	Kwanzan Oriental Cherry	11.2
<i>P. s. 'Mt. Fuji' or 'shirotae'</i>	Mt. Fuji Cherry	11
<i>P. subhirtella 'autumnalis'</i>	Autumn Flowering Cherry	10
<i>P. s. 'rosea'</i>	Whitcomb Flowering Cherry	10
<i>P. s. 'pendula plena rosea'</i>	Double Weeping Cherry	12
<i>P. s. 'yedoensis'</i>	Yoshino Cherry	12
<i>P. s. 'yedoensis akebono'</i>	Akebono Cherry	12
<i>Pterocarya stenoptera</i>	Chinese Wingnut	11
<i>P. fraxinifolia</i>	Caucasian Wingnut	11
<i>Pterosytrax hispida</i>	Fragrant Epaulette Tree	11.3
<i>Quercus coccinea</i>	Scarlet Oak	12.5
<i>Q. garryana</i>	Oregon White Oak	12.2
<i>Q. kelloggii</i>	California Black Oak	9.5
<i>Rhus glabra</i>	Smooth Sumac	7
<i>R. typhina</i>	Staghorn Sumac	8.6

Robinian pseudoacacia 'decaisne'	Decaisne Black Locust	13
R. hispida macrophylla	Smooth Roseacacia Locust	13
Salix discolor	Pussy Willow	11
Sambucus caerulea	Blue Elderberry	11.2
Sassafras albidum	Common Sassafras	10
Sophora japonica	Japanese Pagodatree	11.6
Sorbus alnifolia	Korean Mountain Ash	10
S. aucuparia	European Mountain Ash	12.4
S. a. fastigiata	Dwarf Mountain Ash	11
S. a. 'wilson'	Wilson Mountain Ash	11
S. cashmeriana	Kashmir Mountain Ash	11.5
S. tianshanica 'red cascade'	Red Cascade Mountain Ash	10
Stewartia koreana	Korean Stewartia	10.5
S. pseudo-camellia	Japanese Stewartia	12.2
S. monodelpha	Tall Stewartia	9.5
Styrax japonica	Japanese Snowbell	10.7
S. obassia	Fragrant Snowbell	9.6
Syringa reticulata	Japanese Tree Lilac	11.7
S. vulgaris	Common Lilac	9
Tamarix pentandra	Salt Cedar	9.5
Tilia cordata	Littleleaf Linden	11.9
T. c. 'greenspire'	Greenspire Littleleaf Linden	12.2
T. c. 'salem'	Salem Littleleaf Linden	11
T. c. 'rancho'	Rancho Littleleaf Linden	11.7
T. c. 'chancellor'	Chancellor Littleleaf Linden	12
T. c. 'june bride'	June Bride Littleleaf Linden	11
T. c. 'glenleven'	Glenleven Littleleaf Linden	12
T. c. 'olympic'	Olympic Littleleaf Linden	12
T. euchlora	Crimean Linden	11.8
T. e. 'redmond'	Redmond Crimean Linden	11.9
T. europea	European Linden	12
T. mongolica	Mongolian Linden	10.5
Ulmus glabra	Scotch Elm	11
U. g. 'camperdownii'	Camperdown Elm	12.9
U. pumila	Siberian Elm	12.9
Zelkova serrata	Japanese Zelkova	12.9
Z. s. 'halka'	Halka Zelkova	12
Z. s. 'green vase'	Green Vase Zelkova	12
Z. s. 'village green'	Village Green Zelkova	13

## II -- SOLAR UNFRIENDLY TREES

<i>Acer campestre</i>	Hedge Maple	12.1
<i>A. ginnala</i>	Amur Maple	12.2
<i>A. macrophyllum</i>	Bigleaf Maple	14.6
<i>A. negundo</i>	Box Elder	13
<i>A. platanoides</i> 'cleveland'	Cleveland Norway Maple	13.5
<i>A. p.</i> 'emerald lustre'	Emerald Lustre Maple	13
<i>A. p.</i> 'fassens black'	Fassens Black Norway Maple	12.8
<i>A. p.</i> 'summershade'	Summershade Norway Maple	13.2
<i>A. p.</i> 'superform'	Miller's Superform Norway Maple	13.5
<i>A. p.</i> 'royal crimson'	Royal Crimson Norway Maple	13.5
<i>A. rubrum</i> 'armstrong'	Armstrong Red Maple	13.2
<i>A. r.</i> 'armstrong II'	Armstrong II Red Maple	13.5
<i>A. r. x saccharinum</i> 'autumn blaze'	Autumn Blaze Maple	14
<i>A. r.</i> 'tilford'	Tilford Red Maple	13.3
<i>A. saccharum</i>	Sugar Maple	13.9
<i>A. s.</i> 'Newton sentry'	Newton Sentry Sugar Maple	13.5
<i>A. saccharinum</i>	Sugar Maple	13.2
<i>Aesculus carnea brioti</i>	Red Flowering Horsechestnut	11.9
<i>A. hippocastanum</i>	Common Horsechestnut	13.3
<i>Alnus glutinosa</i>	European Alder	12.5
<i>A. rhombifolia</i>	White Alder	14
<i>A. rubra</i>	Red Alder	13.3
<i>Betula nigra</i>	Red Birch	12.5
<i>B. nigra</i> 'heritage'	Heritage Birch	15
<i>Carpinus betulus</i>	European Hornbeam	12.9
<i>C. betulus</i> 'columnaris'	Columnar European Hornbeam	13.1
<i>C. b. fastigiata</i>	Pyramidal European Hornbeam	14
<i>Castanea mollissima</i>	Chinese Chestnut	13.4
<i>Cercis siliquastrum</i>	Judas Tree	15
<i>Crataegus</i> 'autumn glory'	Autumn Glory Hawthorn	14
<i>C. lavalleyi</i>	Lavelle Hawthorn	14.1
<i>C. mollis</i> 'sel #1	Downy Hawthorn (Sel #1)	14
<i>C. monogyna</i> 'stricta'	Pyramidal Singleseed Hawthorn	13.5
<i>C. oxycantha</i>	English Hawthorn	13.9
<i>C. phaenopyrum</i>	Washington Hawthorn	12.7
<i>C. x mordenensis</i> 'snowbird'	Snowbird Hawthorn	13
<i>C. viridis</i> 'winter king'	Winter King Hawthorn	15

<i>Fagus sylvatica</i>	European Beech	13.4
<i>F. s. 'fernleaf'</i>	Fernleaf European Beech	13.5
<i>F. s. 'golden'</i>	Golden European Beech	13.5
<i>F. s. 'dawyck'</i>	Dawyck European Beech	13.5
<i>F. s. 'roundleaf'</i>	Roundleaf European Beech	13.5
<i>F. s. 'tricolor'</i>	Tricolor European Beech	13.5
<i>Firmiana simplex</i>	Chinese Parasol Tree	13.5
<i>Fraxinus oxycarpa 'flame'</i>	Flame Ash	13.2
<i>Liquidambar styraciflua</i>	American Sweetgum	14.3
<i>L. s. 'festival'</i>	Festival Sweetgum	14
<i>Liriodendron tulipifera</i>	Tuliptree	13.6
<i>Magnolia dawsoniana</i>	Dawson Magnolia	14
<i>M. denudata</i>	Yulan Magnolia	13.5
<i>M. kobus</i>	Kobus Magnolia	13.7
<i>M. k. 'dr.merrill'</i>	Dr. Merrill Kobus Magnolia	14
<i>M. sprengeri</i>	Sprengeri Magnoli	14
<i>Malus 'adams'</i>	Adams Crabapple	13
<i>M. 'beverly'</i>	Beverly Crabapple	15
<i>M. 'bob white'</i>	Bob White Crabapple	14
<i>M. 'centurion'</i>	Centurion Crabapple	15
<i>M. 'donald wyman'</i>	Donald Wyman Crabapple	16
<i>M. floribunda</i>	Floribunda Crabapple	14
<i>M. 'keobil'</i>	Koebil Crabapple	13
<i>M. 'ormiston roy'</i>	Ormiston Roy Crabapple	14
<i>M. 'profusion'</i>	Profusion Crabapple	14
<i>M. 'red jewel'</i>	Red Jewel Crabapple	13
<i>M. 'robinson'</i>	Robinson Crabapple	17
<i>M. 'snowdrift'</i>	Snowdrift Crabapple	15
<i>M. 'white angel'</i>	White Angel Crabapple	13
<i>Melia azedarach</i>	China Berry	13
<i>M. a. umbraculiformis</i>	Umbrella Chinaberry	13
<i>Morus alba</i>	White Mulberry	13.2
<i>M. a. 'kingan'</i>	Fruitless Mulberry	13
<i>Parrotia persica</i>	Persian Parrotia	14.3
<i>Platanus acerifolia</i>	London Planetree	13.7
<i>P. occidentalis</i>	American Planetree	13.5
<i>P. racemosa</i>	California Planetree	14
<i>Populus alba</i>	White Poplar	13
<i>P. a. bolleana</i>	Bolleana White Poplar	14
<i>P. canadensis eugenei</i>	Carolina Poplar	15
<i>P. nigra</i>	Black Poplar	14.7



P. n. 'lombardy'	Lombardy Black Poplar	14.7
P. trichocarpa	California Poplar	13.8
Prunus cerasifera 'Mt. St. Helens'	Mt. St. Helens Plum	16.5
P. c. 'pissard'	Pissard Myrobalan Plum	13
P. virginiana 'canada red'	Canada Red Chokecherry	14
P. padus	European Birdcherry	13
Pyrus calleryana	Callery Pear	14.8
P. c. 'chanticleer'	Chanticleer Callery Pear	12.8
P. c. 'rancho'	Rancho Callery Pear	12.9
P. c. 'redspire'	Redspire Pear	16
P. c. 'aristocrat'	Aristocrat Pear	15
P. communis	Common Pear	13.8
Quercus alba	White Oak	13.3
Q. lobata	Valley Oak	14
Q. macrocarpa	Bur (Scrub) Oak	13.7
Q. palustris	Pin Oak	13.3
Q. phellos	Willow Oak	14.8
Q. robur	English Oak	14.6
Q. rubra	Northern Red Oak	13.7
Q. shumardi	Shumard Oak	14.4
Robinia pseudoacacia	Black Locust	11.6
R. p. ambigua	Flowering Globe Locust	13
R. p. umbraculifera	Globe Locust	13
R. p. 'inermis'	Globe Locust	15
Salix alba 'weeping gold'	Weeping Gold Weeping Willow	16
S. babylonica	Babylon Weeping Willow	16.2
S. matsudana	Hankow Willow	14.3
Sorbus aucuparia 'columbia queen'	Columbia Queen Mountainash	13
S. a. 'black hawk'	Blackhawk Mountainash	13
S. a. 'cherokee'	Cherokee Mountainash	13
S. thuringiaca 'fastigiata'	Oakleaf Mountainash	15
Tilia americana	American Linden	13.1
T. tomentosa	Silver Linden	13.5
T. platyphyllos	Bigleaf Linden	13.3
Ulmus americana	American Elm	13.3
U. carpinifolia	Smoothleaf Elm	16
U. parvifolia	Chinese Elm	13

# LIST III — TREES NOT RANKED

<i>Acer rubrum</i> 'shade king'	Shade King Red Maple
<i>A. r.</i> 'excelsior'	Excelsior Red Maple
<i>Amelanchier canadensis</i>	
<i>columnaris</i>	Upright Serviceberry
<i>A. c. oblongifolia</i>	Globe Serviceberry
<i>Aralia chinensis</i>	Chinese Aralia
<i>Fagus grandiflora</i>	American Beech
<i>Fraxinus bungeana</i>	Bunge Ash
<i>F. excelsior</i> 'lucerne'	Lucerne European Ash
<i>Laburnum watererii</i>	Waterer's Laburnum
<i>Liquidambar formosana</i>	Chinese Sweetgum
<i>Magnolia kobus borealis</i>	Borealis Magnolia
<i>M. tripetala</i>	Umbrella Magnolia
<i>Malus floribunda</i>	Floribunda Crab
<i>M.</i> 'hopa'	Hopa Crab
<i>M. hupensis</i>	Tea Crab
<i>M.</i> 'katherine'	
<i>M. micromalus</i>	Midget Crab
<i>Photinia villosa</i>	Oriental Photinia
<i>Platanus orientalis</i>	Oriental Planetree
<i>Populus deltoides</i>	Eastern Popular
<i>Prunus serrulata oh-nanden</i>	Nanden Cherry
<i>P. s.</i> 'shiro-fugen'	Shiro-fugen Cherry
<i>P. s.</i> 'shogetsu'	Moon Hanging Low By A Palm Tree
<i>P. s.</i> 'tai-haku'	Great White Cherry
<i>P. s.</i> 'ukon'	Ukon Cherry
<i>P. padus</i> 'purpurea'	Purpleleaf Birdcherry
<i>Pyrus calleryana</i> 'princess'	Princess Pear
<i>P. pryifolia</i>	Sand Pear
<i>Quercus douglasii</i>	Blue Oak
<i>Sassafras albidum</i>	Common Sassafras
<i>Sorbus aria</i>	White Beam Mountain Ash

<i>Tilia cordata</i> 'bicentennial'	Bicentennial Littleleaf Linden
<i>Ulmus hollandica</i>	Dutch Elm
<i>U. parvifolia</i> 'drake'	Chinese Elm
<i>U. p.</i> 'true green'	Chinese Elm
<i>U. procera</i>	English Elm
<i>Zelkova sinica</i>	Chinese Zelkova

#### Sources:

- . Solar Friendly Tree List, City of Portland, (n.d)
- . Solar Characteristics for Tree Species, City of Corvallis, (n.d.)
- . Solar Friendly Trees, City of Salem, (n.d.)
- . Portland Solar Access Vegetation Research Report. June, 1984.
- . Sunset Western Garden Book, 1985.
- . Solar Friendly Tree Committee, formed Dec. 11, 1986.

#### Appendices:

- A. Members serving on Solar Friendly Tree Committee.
- B. Participants in the Solar Friendly Tree Project Seminar, Dec. 11, 1986.
- C. Ranking classification chart.
- D. Climatic vegetation zone, Zone 6 map.

## RANKING CARD

	CROWN DENSITY*	LEAF DROP	LEAF OUT	AREA H X W	GROWTH RATE
Numerical Rankings	2. <u>Not Dense</u> (Less than 20% density)	1. <u>Early</u> (Early drop)	1. <u>Late</u> (Late leaf out)	1. <u>Small</u> (20'ht or less x wd).	1. <u>Slow</u> (Less than 12"/year)
"	4. <u>Med Dense</u> (20% -50% density)	2. <u>Midway</u> (Mid- drop)	2. <u>Midway</u> (Mid- leaf out)	2. <u>Medium</u> (21'-60'ht x width)	2. <u>Medium</u> (13" to 24"/year)
"	6. <u>Dense</u> (50% or more density)	3. <u>Late</u> (Late drop)	3. <u>Early</u> (Early leaf out)	3. <u>Large</u> (60'ht + x width*)	3. <u>Fast</u> (25"+/year)

Note: \* Crown density was given twice the numerical ranking of the other criteria, since it is the most significant factor in determining solar friendly qualities of a tree.



CITY OF  
**PORTLAND, OREGON**  
ENERGY OFFICE

Mike Lindberg, Commissioner  
Jeanne McCormick, Director  
Room 545, The Portland Building  
1120 S.W. Fifth Avenue  
Portland, Oregon 97204  
(503) 796-7222

PORTLAND SOLAR ACCESS RIGHTS ORDINANCES

FACT SHEET

BACKGROUND ON PORTLAND SOLAR RIGHTS PROJECT

The protection of solar access to ensure Portlanders the ability to use the sun as an energy source now and in the future is one of the objectives of the City's Energy Policy, adopted under the leadership of Mayor Neil Goldschmidt six years ago. The City of Portland's Energy Office worked for two years on the development of ordinances to provide property rights to Portlanders to protect their access to sunlight, in order to implement this important objective of the Energy Policy. The project, funded by the Bonneville Power Administration, the City of Portland and the Oregon Department of Energy, conducted state-of-the-art research on solar access issues. Research included an analysis of solar access protection in other jurisdictions, an economic feasibility study, public attitude survey and research on the effects of different types of vegetation on solar access. The latter work was done by Rob Thayer, Landscape Architect, University of California at Davis. The prime consultant for the City's work was Conservation Management Services, Inc., Mike McKeever, President. A 17-member citizen steering committee, led by Mary Lawrence, prepared the proposal over an 18-month period. A comprehensive package of solar access ordinances for residences was approved by the City's Energy and Planning Commissions and by the Portland City Council on November 20, 1985, and will go into effect on February 18, 1986.

SUMMARY OF SOLAR RIGHTS ORDINANCE PROVISIONS

1. New Residential Development Solar Access Design Standards

Most new residential subdivisions and Planned Unit Developments (high density multi-family not included) will be required to meet design standards to ensure solar access is provided to lots when they are platted. Legal protection of solar rights over time from shade from both buildings and trees will be provided. Substantial pre-existing vegetation is "grandfathered" and there are limited exceptions to the solar standards to preserve densities, two-story construction and other basic development features.

2. Solar Setback For Infill Building In Existing Neighborhoods

All new single-family construction on existing vacant lots in the City and exterior remodeling projects will be required to meet one of a series of "solar setback" standards designed to protect sunlight to properties to the north. The solar setback standards are based on limiting the shade from new



structures on adjacent properties to the shade that would be cast by a hypothetical eight foot, fourteen foot or twenty foot high fence built at the northern property line. The particular solar setback standard applied to any given lot is based on that lot's north-south lot width and slope. The solar setback standards have been designed to protect the ability to construct two-story houses on every lot in the City so long as they are located properly to minimize shade on neighboring properties.

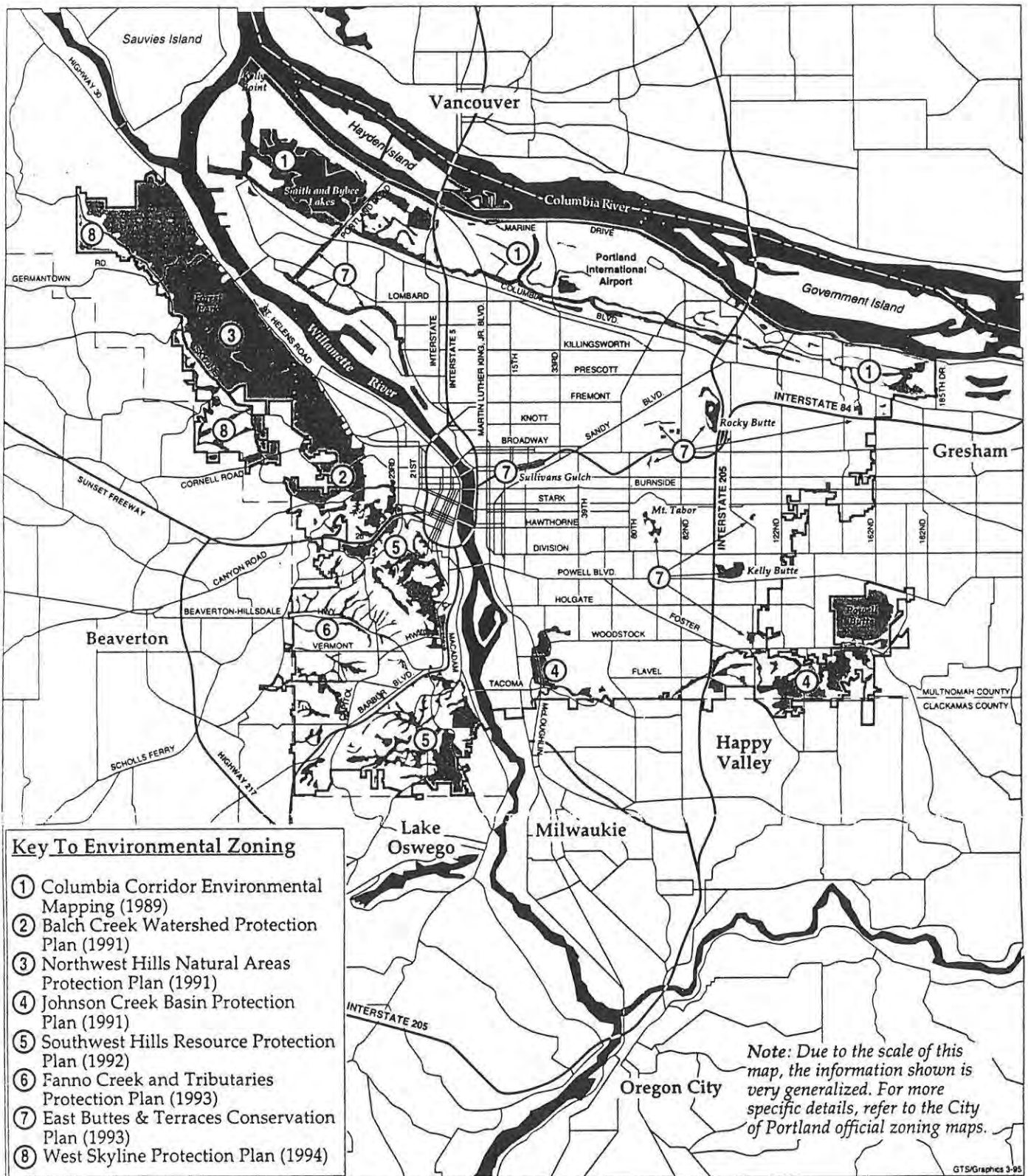
3. Solar Access Permit For Vegetation Shade Protection In Existing Residential Neighborhoods

People will be able to apply to the City for a solar access permit. The permit protects the user of solar energy from shade from trees planted on neighboring properties after the date the permit is awarded. Certain classes of deciduous trees found through research not to create significant shading problems in the winter are exempt from the solar access permit requirements. A solar access permit is a legally binding document which is filed with the title of both the solar owner and all property owners who must keep their future trees from shading the neighboring solar energy system.

FOR MORE INFORMATION contact Jeanne McCormick, Director, City Energy Office, 1120 SW Fifth, Room 545, Portland, Oregon 97204, phone (503) 796-7222.

**APPENDIX 10:  
ENVIRONMENTAL ZONING SUMMARY  
(by Plan Area, by (p) and (c) Overlay Acres)**

Plan Area/Adoption Date	(p) Acres	(c) Acres	Total
Columbia Corridor Plan (5/4/89)	1,198	1,769	2,967
Balch Creek Watershed Protection Plan (2/8/91)	290	420	710
Johnson Creek Basin Protection Plan (7/31/91)	252	1,543	1,795
Northwest Hills Natural Areas Plan (8/16/92)	5,097	620	5,717
Southwest Hills Resource Protection Plan (1/23/92)	388	2,023	2,911
East Buttes & Terraces Resource Conservation Plan (1993)	337	329	666
Fanno Creek & Tributaries Protection Plan (1993)	319	623	942
Skyline West Natural Areas Plan (1993)	204	413	617
<b>Total Acres</b>	<b>8,085</b>	<b>7,740</b>	<b>15,825</b>



North

Scale



1 Mile

March 1995  
Bureau of Planning  
City of Portland

City of Portland, Oregon  
with surrounding metropolitan areas

# ENVIRONMENTAL ZONING

**MAJOR PUBLICLY-OWNED PARK LAND OR REFUGE**  
**Acreeage with (p) and (c) Environmental Zoning\***  
**20 Largest Parks**

Park	E-Zone Plan	Acres Zoned (p) or (c)
1. Forest Park	(NWH)	4,700
2. Smith and Bybee Lakes	(EB)	1,867
3. Tryon Creek State Park (City portion)	(SWH)	471
4. Powell Butte Park	(EB)	400
5. Macleay Park	(BC)	240
6. Washington Park/Hoyt Arboretum	(FC)	220
7. Mt. Tabor Park	(EB)	175
8. East Moreland Golf Course (City-owned)	(JC)	119
9. Rocky Butte Park	(EB)	90
10. West Moreland Park	(JC)	42
11. Woods Park	(FC)	31
12. Kelly Point Park	(CC)	30
13. Rhododendron Garden/Crystal Springs Park	(JC)	30
14. Beggars Tick Marsh Wildlife Refuge	(EB)	25
15. Council Crest Park	(FC)	20
16. Gabriel Park	(FC)	9
17. Chimney Park	(EB)	8
18. Tideman-Johnson Park	(JC)	6
19. April-Hill Park	(FC)	5
20. Johnson Creek Park	(JC)	3
<b>Total Acres</b>		<b>8,491**</b>

\*All publicly-owned park land previously had an Open Space (OS) zone designation.

\*\*The 20 largest publicly-owned park land or refuge constitute 8,491 acres or 54% of all E-zoned land. All publicly-owned park land, refuge, and "other" open space (OS) designated land represents about 66 percent of all e-zoned area.

BC = Balch Creek Watershed Protection Plan

CC = Columbia Corridor Plan

EB = East Buttes and Terraces Resource  
Conservation Plan

FC = Fanno Creek and Tributaries Protection  
Plan

JC = Johnson Creek Basin Protection Plan

NWH = Northwest Hills Natural Areas Plan

SW = Skyline West Natural Areas Plan

SWH = Southwest Hills Resource Protection  
Plan

## ENVIRONMENTAL ZONING in the City of Portland

This sheet explains how and why the City protects natural resources, and some of the regulations used.

- The City's environmental zoning regulations implement state requirements. Statewide Planning Goal 5 directs the city to "conserve open space, protect natural and scenic resources."
- In 1981, after Portland's Comprehensive Plan was acknowledged by the Oregon Land Conservation and Development Commission (LCDC), additional requirements related to Goal 5 were added by the state. The City must address these as part of the Periodic Review of the Comprehensive Plan.
- Work on Periodic Review—essentially an update of the Comprehensive Plan—began in 1987. The City's eight Goal 5 plans cover different geographic areas. Work on five of the areas has been completed, with special zoning adopted by City Council. Work on the three remaining areas is expected to be completed by mid-1993.
- The Goal 5 administrative rule requires a three-step planning process:
  1. An inventory of resource sites and a determination of which to include for further analysis;
  2. A conflicting use analysis that examines the economic, social, environmental and energy (ESEE) consequences of resource protection; and
  3. Adoption of a program to protect identified resources which meet the ESEE test.
- The City applies two environmental overlay zones to natural resource areas:
  - ◊ Environmental Protection (p) has extremely strict approval criteria to ensure resource protection. Environmental Conservation (c) requires that development avoid damage to resources or mitigate where damage is unavoidable. Development at equivalent base zone density is permitted and encouraged. In both zones, an applicant must submit a site plan as part of an environmental review showing significant resources.
  - ◊ Examples of (p) or (c) resources include forested natural areas important as wildlife habitat, and drainage ways, steep slopes, or water bodies critical to erosion control and water quality.
- There are two types of required environmental-zone land use reviews:
  - ◊ Environmental reviews in the (c) zone are all Type II. They require notice to adjacent property owners and a hearing only if requested. All (c) zone reviews are Type II, unless associated with a large subdivision or conditional use, in which case it is a Type III review.
  - ◊ Type III review is required for development activities within the (p) zone. Type III automatically requires a hearing before the Land Use Hearings Officer. A pre-application conference is required for all Type II and III procedures in both zones.



- When completed, the environmental zones will cover approximately 15,825 acres, or about 17 percent of the city's 89,600 acres. Of these 15,825 acres:
  - ◊ 8,085 acres (52%) are zoned for Environmental Protection, and 7,740 (48%) are zoned for Environmental Conservation.
  - ◊ More than half (54%) of the e-zoned land is in public ownership, including Forest Park (4700 acres), Smith and Bybee Lakes (1867 acres), and Tryon Creek State Park (470 acres, portion with e-zone). Most of this land is zoned (p) and has an Open Space base zone.
  - ◊ Cumulatively, public and privately-owned open space land, such as cemeteries, golf courses, and private lakes, make up about two-thirds of all e-zoned areas.
- The Environmental Conservation (c) zone permits and encourages development at the base-zone density:
  - ◊ Less than 2 percent of e-zoned land is estimated to be previously "buildable" under the City's buildable lands inventory. For inventory purposes, the remainder is considered unbuildable because of steep slopes, hazardous soils, jurisdictional wetlands, and other factors. Since almost all the previously "buildable" land is in the least restrictive, (c) zone, development is allowed equivalent to what was previously permitted. Development is not prohibited. Potential housing loss on these lands is negligible because it is mitigated by regulations that allow clustering through planned unit development or transfer of development rights. In addition, where environmental zoning is applied to "buildable" land, it is generally applied to a portion of a site, leaving room for residential development outside of the protected area.
  - ◊ From 1989 to present, 174 of 2,665 land use reviews, or 6 percent, have been environmental. Of these e-zone reviews, three have been denied. About one-third would also have been subject to review under interim environmental regulations which the newer e-zones have replaced. As the city has continued to develop, increasingly more development has occurred on land with both physical constraints and environmental resource values. About 10 percent of current e-zone reviews are from other city bureaus for utility connections, right-of-way improvements, resource enhancement and water quality projects.
  - ◊ Of all environmental reviews, about 80 percent were Type II and 20 percent were Type III.
- The City's eight Goal 5 natural resource plans and City Council adoption dates are:
  - ◊ Columbia Corridor Plan (5/4/89), Balch Creek Watershed Protection Plan (2/8/91), Johnson Creek Basin Protection Plan (7/31/91), Northwest Hills Natural Areas Plan (8/16/92), Southwest Hills Resource Protection Plan (1/23/92), East Buttes and Terraces Resource Protection Plan (1993), Fanno Creek and Tributaries Protection Plan (1993), Skyline West Natural Areas Plan (1993).
  - ◊ State Goal 15 - Willamette River Greenway, requires a similar process for regulating river-related land uses. The City's Willamette River Greenway Plan established four greenway overlay zones. Natural resources are protected by the Natural River overlay zone.

Information about the e-zone regulations, application process, fees, maps, and timelines is available at the Permit Center (823-7526). Copies of adopted protection plans for each study area are available through the Planning Bureau (823-7700).

## APPENDIX 11:

### SUB-UNITS - PARKS AND OPEN SPACE MANAGEMENT UNIT

Type and Description	Urban Forest Issues and Goals
<b>Metropolitan and Regional Parks</b> Characterized by relatively large and significant features; these parks are used by city residents and out-of-town visitors. These are highly visible areas that have a strong impact on the image of the city. Examples include Washington Park and Mt. Tabor Park. Other regional parks are associated with river fronts and other water features.	<b>Issues:</b> Heavy use of programmed areas. Many large, mature trees that need more routine maintenance. Landscaped areas are mix of formal and natural, some are high maintenance areas.  <b>Goals:</b> Improve maintenance of existing trees. Use trees to frame scenic views from parks. Develop tree replacement plans that balance programmed uses and areas for large and native trees.
<b>Natural Areas and Trail Systems</b> Large areas such as Forest Park and linear systems such as the Springwater Corridor; these open spaces contain notable remnants of the natural landscape within the urban area. These parks provide for wildlife habitat, hiking, equestrian and bicycle trails. They also represent a significant portion of the urban forest canopy of the city.	<b>Issues:</b> Need for adequate maintenance of vegetation surrounding access points and trail systems. Invasive plant species displace more beneficial native plants. Opportunities for restoration plantings.  <b>Goals:</b> Develop landscape standards for parking areas and trails. Expand work to eradicate harmful invasive plant species. Plantings should emphasize native species and wildlife habitat.
<b>Neighborhood and Community Parks</b> Characterized by small parks ranging in size from 0.5 to 10 acres with play equipment, picnic facilities, ball fields, tennis courts, stadiums, community centers, swimming pools, athletic fields, and parking lots to serve residents in immediate and nearby neighborhoods. There are many such parks located throughout the city with available planting places. This category of park offers the greatest potential for improving and expanding the urban forest.	<b>Issues:</b> Inadequate funding for new plantings. Space for plantings must be balanced with programmed uses. Soil compaction is a problem in heavily uses areas. Many high maintenance areas.  <b>Goals:</b> Design planting areas to protect growing conditions. Plant large and native trees where possible to shade and screen parking lots and play areas. Use plantings to provide a focus for the neighborhood while blending with adjacent landscapes. Plant tall growing trees where possible to enhance the skyline view of the neighborhoods.

## APPENDIX 12:

### SUB-UNITS - TRANSPORTATION CORRIDORS AND RIGHTS-OF-WAY MANAGEMENT UNIT

The sub-units are based on the functional classifications of the city's street system from the *Transportation Element of the Comprehensive Plan*. These classifications dictate what types of automobile, truck, transit, bicycle, and pedestrian use should be emphasized on each street.

#### REGIONAL TRAFFICWAYS AND LIMITED ACCESS CORRIDORS

This classification includes transportation corridors that are characterized by high speed traffic, wide rights-of-way, and large interchanges where pedestrian and bicycle travel is either restricted or carefully controlled. Examples: Interstate Freeways, Light Rail Transit Corridors, Railroad Rights-of-Way.

##### General Issues:

Many of these limited-access facilities are identified as "Parkways" in the Transportation Element (TE) of the Comprehensive Plan [previously - Arterial Street Classification Plan (ASCP)]. The *Beautification Policy* of the TE calls for continuous and comprehensive landscape treatment on these Parkways. Highlights of the policy are:

- Use a **formal landscape** design pattern or a **natural landscape** design pattern depending upon the setting of the roadway.
- Design treatments are to consider: preservation of existing vegetation, topography, vistas, driver perceptions, transit operations, sight distance, abutting land uses, urban design criteria, sign controls, utilities, and street lights.
- Plant large street trees where appropriate. Eliminate overhead utilities or minimize on their visual impact.
- Encourage ODOT to provide landscaping and high level landscape maintenance on all parkways.

Note: The Interstate Freeway system is under the jurisdiction of the Oregon Department of Transportation (ODOT).

##### Safety Issues:

Trees larger than 6" in diameter are considered to be **fixed objects** and should be removed from the *Clear Zone*. The *Clear Zone* is that area adjacent to the edge of the pavement where the width is dependent upon highway speed, traffic volume, and roadside slope. *Clear Zone* varies from 10' to 100'. *Roadside Design Guide, AASHTO, 1989, pp. 4-14 to 4-15.*

Some roadways, such as interstate freeways, create a visually tiring experience because of long linear expanses of wide pavement, steady streams of traffic, and open areas that are void of

### **Portland Office of Transportation**

Refer to the *Beautification Policy* of the Transportation Element in the design and construction of all roadway projects.

To the maximum extent practicable, allow the utilization of all large planting areas outside the clear zone envelope for landscaping and tree planting.

Follow AASHTO standards for safe separation between trees and travel lanes.

Use plants appropriate for region and area.

Pursue ISTEA funds for landscaping projects .

### **MAJOR CITY TRAFFICWAYS**

This category includes Major City Traffic Streets, Major City Transit Streets, Major Truck Routes and Truck Districts. Streets are characterized by high volume traffic, bus stops, truck loading zones, limited on-street parking, and sidewalks configurations that vary according to land use patterns. Examples: Powell Blvd, Barbur Blvd, 82nd Avenue, Airport Way.

#### **General Issues:**

Many of these streets are identified as "Boulevards" in the Transportation Element of the Comprehensive Plan [previously - Arterial Street Classification Plan (ASCP)]. The *Beautification Policy* calls for continuous and comprehensive landscape treatment on these Boulevards. Highlights of the policy are as follows:

- Use a **formal landscape** design pattern in the higher density land use areas of the grid street system.
- Use a **natural landscape** design pattern in the lower density residential areas with curvilinear streets.
- Design treatments are to consider: preservation of existing vegetation, topography, vistas, driver perceptions, transit operations, sight distance, abutting land uses, urban design criteria, sign controls, utilities, and street lights.
- Plant large street trees where appropriate. Eliminate overhead utilities or minimize their visual impact.
- Encourage the Urban Forestry Manager and the Urban Forestry Commission to develop comprehensive design plans.

#### **Safety Issues:**

Traffic safety requirements dictate the need to maintain visibility for pedestrians, bicycles, motor vehicles, and signs and traffic signals.



## **MINOR CITY TRAFFICWAYS**

This category includes District Collectors, Neighborhood Collectors, and Minor Transit Streets. These streets are characterized by on-street parking, sidewalks, bus stops, truck loading zones, dense mixed land uses, and low travel speeds. Examples: E. Burnside, SE Woodstock, SW Vermont, SW Terwilliger.

### **General Issues:**

Includes those listed in Major Trafficways.

### **Safety Issues:**

Includes those listed in Major Trafficways.

Conflicts between street trees and traffic - especially busses and trucks at intersections.

### **Utility Issues:**

Includes those listed in Major Trafficways.

### **Pedestrian/Commercial Use Issues:**

Includes those listed in Major Trafficways.

### **Objectives:**

Includes those listed in Major City Trafficways.

### **Actions:**

Includes those listed in Major City Trafficways.

Plant trees that are open enough to allow visual access to store fronts, yet large and dense to provide shade for pedestrians.

Plant large street trees in mid-block - away from intersections and corners where bus stops and truck loading zones are apt to be located.

Use trees as unifying element within neighborhoods and districts.

## **RESIDENTIAL / LOCAL SERVICE STREETS**

This category includes the majority of the street system and represents 1,200 miles of fully improved streets. Improved residential streets are characterized with low traffic volumes, are predominately narrow, provide for on-street parking, and generally have sidewalks separated from the street with a planting strip. Residential streets serve as meeting places for residents and play areas for children.

### **General Issues:**

Residential streets are an integral part of the neighborhood's living environment.



## **RURAL ROADS AND UNIMPROVED STREETS**

This category includes a large number of former Multnomah County roads that now serve as major city trafficways, minor city trafficways and residential streets. The partially developed major and minor city trafficways currently in use have similar rural characteristics: open ditches, narrow shoulders, and no sidewalks. Also in this category are unimproved residential streets composed of about 131 miles of gravel roads and another 75 miles of unimproved rights-of-way. The majority of these roads will eventually be improved to urban standards with curbs, sidewalks, drainage systems, and landscaping. Examples: Many remnant roads in SE and SW.

### **General Issues:**

Future road improvements make it impractical to plant new street trees since most trees would not survive future road reconstruction projects because of road realignments (vertical and horizontal), excavations, fills and embankments, retaining walls and other necessary alterations.

Rural roads, because they lack curbs and adequate roadway width, are similar to urban state highways. The rural road design is subject to the same *Clear Zone* requirements that highways are. Trees larger than 6" in diameter are considered to be **fixed objects** and should be removed from the *Clear Zone*. The *Clear Zone* is that area adjacent to the edge of the pavement where the width is dependent upon highway speed, traffic volume, and roadside slope. *Clear Zone* varies from 10' to 100'. *Roadside Design Guide, AASHTO, 1989, pp.4-14 to 4-15.*

Existing roadside ditches need routine cleaning and maintenance to keep ditches open for the free flow of storm water. Trees in ditch areas seriously hamper maintenance work.

There are about 150 miles of residential streets that need to be improved to full city standards. The City has no fixed time table for these improvements to occur since individual street projects are initiated by property owners as Local Improvement Districts (LIDs).

### **Objectives:**

When roadways are improved to urban standards, create an urban streetscape that uses street trees to add character and to form a sense of unity between the street and the adjacent land uses.

### **Actions:**

On public street improvement projects, plant, where practicable, large broad-headed street trees in the planting strips between the curb and sidewalk, except near the approach to an intersection where traffic control signs could become obstructed.

In the design and construction of all residential street improvement projects, refer to the *Beautification Policy* of the Transportation Element of the City's Comprehensive Plan.

When possible, preserve existing trees on proposed street construction projects by changing the alignment of streets and sidewalks.

Where good planting opportunities exist, plant large trees and natives.

**Objectives:**

Encourage the use of specific tree species and tree spacing standards that will provide adequate separation from power lines.

Increase amount of vegetation, especially natives.

**Actions:**

Plant low growing natives under utility lines.

Monitor existing trees to ensure that the trees remain free from risk in the event of a utility failure.

Plant large natives at edge of ROW away from lines.

Plant trees so that the resulting mature canopy will be below utility lines.

**CITY ENTRANCES/MAJOR FOCAL POINTS**

Gateways to the city. Areas that provide comprehensive views of city from roads - often on major trafficway, seen by lots of people; view corridors.

**Issues:**

Some focal points provide cherished views for pedestrians, bicycle riders, photographers, and tourists. Generally, from a moving vehicle, viewing time is short.

**Objectives:**

Preserve existing views.

Use trees to present introductory views of city, set tone for entrance into city.

**Actions:**

Planting Opportunities: Frame and enhance views.

Provide backdrop for other views.

Protect focal points by limiting tree plantings that would obscure cherished views.

## **APPENDIX 13: TITLE 20**

### **PARKS AND RECREATION**

of Ordinance No. 130672  
passed by the Council April 2, 1970  
Effective May 15, 1970

#### **Chapter 20.40**

(Added by Ord. 134330; New Chapter  
substituted by 159490;  
Mar. 12, 1987.)

#### **STREET TREE AND OTHER PUBLIC TREE REGULATIONS**

##### **Sections:**

- 20.40.010 Purpose.
- 20.40.020 Definitions.
- 20.40.030 Urban Forestry Commission.
- 20.40.035 Technical Assistance.
- 20.40.040 Urban Forestry Master Plan.
- 20.40.045 Superintendent.
- 20.40.050 City Forester.
- 20.40.070 Planting of Trees.
- 20.40.080 Maintenance of Trees.
- 20.40.090 Removal of Trees.
- 20.40.100 Permit Requirements and  
Conditions.
- 20.40.105 Major Improvements.
- 20.40.110 New Subdivision.
- 20.40.120 Protection.
- 20.40.130 New Streets.
- 20.40.140 Liabilities and Responsibility  
for Costs.
- 20.40.150 Historic or Notable Trees.
- 20.40.160 Disposition of Wood from Trees.
- 20.40.170 Nuisances-Abatement  
Procedure.
- 20.40.180 Abatement by Owner,  
Administrative Review,  
Appeal to the Code Hearings  
Officer.
- 20.40.185 Administrative Review.
- 20.40.190 Abatement by the City.

**20.40.030 Urban Forestry Commission.**

**A.** The Urban Forestry Commission is hereby created. It shall consist of the nine members who have demonstrated an interest in the preservation of trees and the beautification of Portland, appointed by the Mayor in consultation with the Commissioner of Parks and Recreation and confirmed by the City Council. Members shall serve without compensation for terms of 4 years and may be reappointed. At least three members shall have experience and expertise in arboriculture, landscape architecture or urban forestry, one of whom shall be a member of the Board of Trustees of the Hoyt Arboretum. The remaining six members, insofar as possible, shall represent diverse regions or interests of the community. Two of the three members initially appointed with experience or expertise in arboriculture or urban forestry shall initially serve a term of 2 years. Two of the four members appointed from geographically diverse regions of the City shall initially serve a term of two years. The City Forester and the Commissioner of Parks and Recreation or his/her designee, and the City Engineer or his/her designee shall serve as ex-officio members of the Commission.

**B.** The Urban Forestry Commission shall elect its own chair and adopt such rules of procedure as it deems necessary to the conduct of its duties.

**C.** The Commission shall meet at least monthly and may meet more often.

**D.** The Commission shall:

1. Provide assistance in the development of the Urban Forestry Master Plan, submit the same to the City Council for approval, and review and update such plan periodically.

2. Advise the Forester, Superintendent and Bureau of Parks and Recreation Budget Advisory Committee on the preparation and contents of the Annual Forestry Unit budget request.

3. Review plans and policies developed pursuant to other City Code provisions which contain elements or which affect matters related to Urban Forestry and arboricultural concerns in the City and other matters brought forward by the Forester and others.

4. Prepare and submit to the Commissioner of Parks and Recreation an annual report which shall contain a section or sections specifically dealing with the relations with and concerns of the various City bureaus.

**20.40.035 Technical Assistance.**

**A.** The Forester shall assist the Forestry Commission in the discharge of its duties.

**B.** When requested by the Urban Forestry Commission and Commissioner In Charge, the City may retain the services of a professional review panel of not more than three members, either foresters, arboriculturists, landscape architects or some combination thereof to advise the Commission on the efficiency of proposed actions and planting schemes. At least one member of this panel should be very familiar with Portland. The Forester shall present a list of qualified names to the Forestry Commission for its review and selection. No member of the professional review panel shall serve if he/she has a conflict of interest.

**20.40.040 Urban Forestry Master Plan.**

**A.** The Urban Forestry Commission shall develop and establish a Comprehensive Urban Forestry Plan for the planting, maintenance and replacement of trees in parks, along streets or in other public areas. When a portion of such plan has been developed and established, it shall be submitted to the City Council for adoption prior to implementation. The Forester shall seek the advice of any bureau which will be affected by the plan.



such waiver, including, without limitation, requiring the planting of trees on the owner's private property.

C. It shall be unlawful for any person to plant or set out any tree or authorize or cause or procure any person to set out any tree in or upon any part of any street, park or public area without first obtaining from the Forester a written permit to do so and complying in all respects with the conditions set forth in such written permit and with the provisions of this Chapter. Such permit shall be receipted for in writing. All applications for such permit shall describe the work to be done and the variety, size and precise location of each tree to be planted. If the Forester has found that the proposed planting is in accord with the Plan or that trees proposed to be planted have a reasonable likelihood of prospering and such permit specifies the location, variety and grade of each tree and method of planting, including among other things the supplying of suitable soil, then he/she may grant a permit. The permit shall be valid only during the period of time stated in the permit.

D. Every person planting any tree under this Chapter shall conform to the City's Street Tree Standards.

E. The Council may establish, by ordinance, inspection fees as part of the tree permit process.

F. All trees required by this Section must be planted prior to the issuance of a certificate of occupancy. If the applicant files security with the City, which ensures that the trees will be installed, the trees may be deferred during the summer months and planted during the dormant period, in the discretion of the Forester. Any security filed under this Subsection must comply with the regulations for performance quarantees established in Title 33.

G. The Forester may require any property owner subject to this Section to identify street trees on the property deed, and

to note on such deed that the trees are subject to the regulations of this Chapter.

H. The Superintendent shall submit for review all tentative planting proposals in streets to the City Engineer for the purpose of protecting existing utilities and sewer branches. The City Engineer shall issue an appropriate permit for planting, barring any conflict with any known facility.

#### **20.40.080 Maintenance of Trees.**

A. The Forester may prune, control insects and disease and maintain or cause to be pruned, sprayed and maintained, all of the trees in the streets, parks and other public areas and those other trees on private property which the Forester determines it is in the public interest to maintain to control infestations of insects or disease or to maintain public safety.

B. It is the duty of every owner of property adjacent to which or in front of which any tree is standing on any street and of every owner of property upon which any tree is standing which projects into the street to maintain and prune such tree using proper arboricultural procedures, according to the requirements for tree branch clearance over street and sidewalk areas and signs as set forth in Titles 16 and 17 of the Code of the City of Portland. The Forester shall give with each permit printed standards for proper arboricultural procedures.

C. Every property owner shall be liable to any person who is injured or otherwise suffers damage by reason of the property owner's failure to maintain or prune trees as required by Titles 16, 17 and 20 of the Code of the City of Portland. Furthermore, every property owner shall be liable to the City of Portland for all expenses, including attorney fees, incurred by the City in defense of or paid by the City in settlement or satisfaction of any claim, demand, action or suit brought by reason of that property owner's failure to satisfy the obligations



the Forester may be conditioned on replacement with a new tree of approved variety if the Forester finds the replacement necessary to maintain an ornamental tree system on the street, block or portion thereof.

If approval by the Forester is so conditioned the tree removal permit shall contain such condition. Cost of replacement is the responsibility of the property owner. If the tree is not replaced in a timely manner, the Forester may plant or cause to be planted the approved tree or trees and assess the costs to the permittee and/or the property owner responsible for maintaining the tree under Section 20.40.080 of the Code of the City of Portland.

**20.40.100 Permit Requirements and Conditions.**

A. Any person desiring for any purpose to plant, remove, destroy, cut, prune or treat any tree in or upon any street, shall make application to the Forester on forms furnished by the City. Such application must state the number and kind of tree to be planted, removed, pruned or treated, the name of permittee and/or contractor, and the time by which the proposed work is to be done and such other information as may be required by the Forester. Any work done under such written permit must be performed in strict accordance with the terms and provisions of this Chapter. In issuing or denying a permit, the Forester shall apply all the standards as set forth in this Chapter and the objectives of the Street Tree Plan.

B. If the Forester refuses to issue any permit as required by this Chapter, he/she shall at once so notify the applicant, who may appeal to the Commission in writing within 10 days thereafter. The Commission shall proceed to hear and determine the appeal, calling upon the Forester to give his/her reasons. If a permit is again denied, the applicant may appeal to the City Council.

C. In case of emergency caused by a

tree being in a hazardous and dangerous condition, such tree may be removed by permission of any member of the Police or Fire Department. In the course of performing unexpected or emergency road or sewer maintenance activities, representatives of the City Engineer and/or City Traffic Engineer may trim and/or prune a tree as required for the performance of the immediate work.

**20.40.105 Major Improvements.**

When the City Engineer undertakes to plan or design major capital improvements to the road system, the Urban Forestry Commission shall be consulted through the Superintendent. The purpose of these consultations shall be to ensure that the beautification policies of the Arterial Streets Classification Policy are implemented to the maximum extent feasible.

**20.40.110 New Subdivision.** The Superintendent shall require the planting of street trees within the planting strips of any new subdivision in conformity with the Urban Forestry Master Plan. All such planting shall be done in accordance with the planting specifications governing the planting of trees in planting strips as provided by the Forester.

**20.40.120 Protection.**

A. It shall be unlawful for any person to attach or keep attached to any tree in or upon any public street, or to the guard or stake intended for the protection of such tree, any ropes, wires, chains or other device whatsoever, except that the same may be attached to any tree as support or protection thereof.

B. During the erection, repair, alteration or removal of any building or structure, it shall be unlawful for any tree to be injured or for any person in charge of such erection, repair, alteration or removal to leave any tree in or upon any street in the vicinity of such building or structure without a good and sufficient guard or protector as shall

to effect its removal, subject to the requirements of Subsection D of this Section.

C. It shall be unlawful for any person, without a prior written permit from the Forester, to remove, destroy, cut, prune, break, or injure any Heritage Tree, to injure, misuse or remove any device set for the protection of any Heritage Tree, or to cause or authorize or procure any person to do so. The Forester shall report to the Urban Forestry Commission all such permits issued.

D. No Heritage Tree shall be removed without the consent of the Urban Forestry Commission after a public hearing.

**20.40.160 Disposition of Wood from Trees.** All wood removed from trees located in either public rights-of-way or public areas shall be disposed of at the discretion of the Forester who has complete authority for the disposal of said wood and debris. In the event that the wood is given to the adjoining property owner, the property owner shall sign an agreement holding the City harmless.

If the Forester determines that the cost of storage or sale of the wood is not commercially feasible, he/she may cause such surplus wood to be donated to such groups or organizations as may be designated from time to time by the Superintendent of Parks. It shall be unlawful to possess or dispose of any wood from any tree that has been cut or pruned in violation of the provisions of this Chapter. Publicly financed and privately financed street improvements under permit from the City Engineer are excluded from this Section.

**20.40.170 Nuisances - Abatement Procedure.**

A. Any condition of any tree upon, abutting or fronting private property which is in violation of any of the provisions of this Chapter or any other applicable Chapter of the City Code, is hereby declared to be a nuisance. Except for those conditions which

this Chapter authorized the Forester to summarily abate, whenever the Forester has knowledge that such nuisance exists, he/she shall post upon the property liable for the abatement of the nuisance a notice directing the removal of the nuisance. The notice shall be substantially in the following form:

**NUISANCE ABATEMENT**

**Notice To Abate Nuisance**

To the owner, agent of owner and occupant of the following described real property:

\_\_\_\_\_  
in the City of Portland, Oregon.

You are hereby notified to remove and abate the nuisance existing on the above-described property within 15 days of the date of this notice, or show the Bureau of Parks of the City of Portland that no nuisance exists as provided in Section 20.40.180 of the Code of the City of Portland. The nuisance consists of:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
In the case of failure to remove the nuisance within the time set forth above, the City of Portland will cause the nuisance to be abated and charge the cost of abatement, plus overhead and civil penalty in the amount of \$80, against the property described above. The owner of the above-described property shall be personally liable for the costs of abatement, overhead and civil penalties.

Before planting, removing, destroying, cutting, pruning or treating any tree in or upon any street, you must obtain a permit from the City Forester.

Date: \_\_\_\_\_

where summary abatement is authorized, the Superintendent may cause the nuisance to be removed and abated.

**B.** Except as set forth in Section 20.40.205 whenever a nuisance is abated by the City, the Superintendent shall keep an accurate account of all expenses incurred, including an overhead charge of 26 percent for administration and a civil penalty of \$80 for each nuisance abated.

**C.** When the City has abated a nuisance maintained by any owner of real property, for each subsequent nuisance which is abated by the City within 2 consecutive calendar years concerning real property owned by the same person, an additional civil penalty of 50 percent (minimum of \$50) of the cost of abatement shall be added to the costs, charges and civil penalties provided for in Subsection B of this Section. The civil penalty shall be imposed without regard to whether the nuisances abated by the City involve the same real property or are of the same character.

**D.** The Superintendent shall, after completing the removal and abatement, file a statement of costs with the Auditor.

#### **20.40.195 Notice of Assessment.**

**A.** Upon receipt of the statement, the Auditor shall forthwith mail to the owner of the property therein mentioned a notice setting forth the amounts set forth in the statement and stating that the Council proposes to assess against the property the amounts set forth and that objections to the proposed assessment may be made in writing and filed with the Auditor on or before 20 days from the date of mailing such notice.

**B.** If objections are received on or before the expiration of such 20-day period, the Auditor shall refer the matter to the Forester for administrative review pursuant to Section 20.40.185.

**C.** Upon the conclusion of administrative review, or on the expiration of

the 20-day period, if no objections have been received, the matter of the proposed assessment shall be determined by the Council in the regular course of business. Any objections to the proposed assessment not resolved by administrative review shall be heard and determined at such time. An assessment for such costs, penalties and overhead expenses, or so much thereof as the Council determines is proper shall be made by ordinance and shall be entered in the docket of City liens, and upon such entry the same shall constitute a lien upon the property from which the nuisance was removed and abated, which lien shall be collected in all respects as provided for in Chapter 17.12 Assessments. An error in the name of the owner or in the use of a name other than that of the true owner of such property or the failure of the owner to receive notice of the assessment shall not render the assessment void but the same shall be a valid and existing lien against the property.

**20.40.200 Personal Liability of Owner.** The person who is the owner of the property at the time at which the notice required under Section 20.40.170 of this Code is posted shall be personally liable for the amount of the assessment including all interest, civil penalties and other charges.

**20.40.205 Cost of Abatement; Low Income, Elderly Persons.** (Amended by Ord. No. 168234, Oct. 26, 1994.)

**A.** Notwithstanding the other provisions of this Chapter, the cost of abating a nuisance shall be waived for low income, elderly persons if upon application it appears to the Superintendent that the conditions set forth in Subsection B are met.

**B.** Persons eligible for a waiver of nuisance abatement costs shall be over 62 years of age, and:

**1.** A person living alone, whose total income for the preceding calendar year did not



APPENDIX 14:

ORDINANCE NO **168534**

\*Amend City Code relating to Tree Cutting. (Ordinance; amend Code Section 20.42.040)

The City of Portland ordains:

Section 1. The Council finds:

1. The Council, by Ordinance 168486, adopted chapter 20.42 of the City Code, relating to tree cutting.
2. The Council did not intend to require a permit for tree cutting pursuant to chapter 20.42 in situations where the same activity is already regulated and reviewed by other provisions of the City Code.
3. An amendment to PCC 20.42.040 is necessary in order to clarify that lots or parcels which have been subject to environmental review through tentative plan approvals under Title 34 since 1981 are not subject to the requirements of chapter 20.42.

NOW, THEREFORE, the Council directs:

- a. PCC 20.42.040(3) is amended to add the following underlined language:

If a Development Application would require or result in tree cutting as defined in this Chapter, the applicant must comply with this Chapter, unless the cutting of the tree is itself regulated by Title 33 or 34. Trees on any lot or parcel which receives, or since 1981 has received, tentative plan approval under Title 34, are deemed to be regulated under Title 34, and are not subject to the requirements of this Chapter.

Section 2. The Council declares that an emergency exists in order to avoid uncertainty and confusion regarding the applicability of Chapter 20.42; therefore, this ordinance shall take effect immediately upon its adoption.

Passed by Council, FEB 22 1995

Barbara Clark  
Auditor of the City of  
Portland

By



Commissioner Charlie Hales  
HAuerbach  
February 13, 1995

Deputy

## Exhibit A

## TREE CUTTING

CHAPTER 20.42TREE CUTTING

- 20.42.010. Purpose
- 20.42.020. Definitions
- 20.42.030. Applicability
- 20.42.040. Tree Cutting Without Permits  
Prohibited; Land Use Permits.
- 20.42.050. Application for Permits.
- 20.42.060. Fees.
- 20.42.070. Notice of Tree Cutting Permit.
- 20.42.080. Review of Applications.
- 20.42.090. Appeal.
- 20.42.100. Tree Cutting on Developed Property.
- 20.42.110. Criteria for Issuance of Permits.
- 20.42.120. Evidence of Violation.
- 20.42.130. Mitigation Required.
- 20.42.140. Criminal Penalties.
- 20.42.150. Civil Penalties.
- 20.42.160. Nuisances.
- 20.42.170. Institution of Legal Proceedings.
- 20.42.180. Remedies Cumulative.
- 20.42.190. Severability.
- 20.42.200. Automatic Repeal of this Chapter.



(d) Cannot be further subdivided or partitioned pursuant to the Portland Zoning or Development Codes.

5. "Development Application" means any application filed under Title 33 or 34 of the City Code.

6. "Person" means any individual or legal entity.

7. "Tree" means any woody plant having a trunk 12" or more DBH. "Tree" does not include any plant on the Nuisance Plant List or the Prohibited Plant List of the Portland Plant List adopted by Ordinance 164838 and amended by Ordinances 166572 and 168154.

8. "Underdeveloped parcel" means all property which either:

(a) Does not have a single family dwelling on it; or

(b) Can be further partitioned or subdivided, whether there is a structure on the property or the property is vacant; or

(c) Is not located in a single family residential zone pursuant to City of Portland Zoning Maps; or

(d) Is not used exclusively for single family residential use.

#### **20.42.030 Applicability.**

1. These regulations are not land use regulations and are being adopted under the City's police power to regulate to protect the public health, safety and welfare.

2. The requirements of this Chapter do not apply to tree cutting which is reviewed pursuant to any other provision of this Code with the exception of Chapter 24.70, Clearing, Grading, and

5. Information concerning any proposed landscaping or planting or any new trees to replace the trees to be cut; and
6. Any other information reasonably required by the City.
7. The applicant's name, address and phone number.
8. The property owner's name, address and phone number, if different than the applicant's.

**20.42.060. Fees.**

The application shall be accompanied by a filing fee in the amount of \$35.00.

**20.42.070. Notice of Tree Cutting Permit.**

1. An applicant for a tree cutting permit shall post notice on the property in a location clearly visible from the street nearest the tree. The notice shall state that tree cutting permits are pending for trees on the property marked by a yellow plastic tagging tape, shall include the date of posting, and shall state that the tree cutting permits can be appealed within 14 days of the date of posting by filing a written notice of intent to appeal with the City of Portland Forester. The applicant shall mark each tree proposed to be cut by tying or attaching yellow plastic tagging tape around the trunk of the tree at 4.5 feet above mean ground level at the base of the trunk. The applicant shall file an affidavit of posting and marking once the property has been posted and the trees have been marked pursuant to this section. The tree cutting permit or permits shall not be issued for fourteen days from the date of filing of the affidavit of marking to allow for appeal. The

the fourteen day appeal period, the decision is final and the applicant may cut trees in accordance with the approval, subject to any conditions thereof.

2. An applicant for a tree cutting permit may appeal denial of the permit by filing a written notice of intent to appeal, along with a filing fee in the amount of \$100.00, within fourteen days of the date of denial.

3. The appeal shall be heard by the Urban Forestry Commission (UFC), who shall hold a public hearing on the appeal. The City shall send written notice of the hearing to the applicant, the appellant if different from the applicant, and to the recognized Neighborhood Coalition for the area in which the subject property is located, at least ten days in advance of the hearing. Appeal hearings may be scheduled as part of the UFC's regular meeting agenda, or at any special meeting called by the UFC for that purpose. Appeals may be heard either by the full Commission or by a subcommittee delegated by the full Commission. Appeals shall be heard not later than the first regular monthly meeting of the UFC after the expiration of the ten days required for notice to the Neighborhood Coalition, and in no event later than sixty days after the filing of the notice of intent to appeal, except that the applicant may request a hearing at a later time.

4. The UFC shall hear testimony from the City Forester, from the applicant, proponents and opponents, and shall conclude with rebuttal by the applicant. Any person may testify before the UFC. Following the close of the public testimony, the UFC shall determine, based upon the evidence and testimony in the

cutting permit:

1. Dead, Dying or Dangerous Trees: A tree cutting permit shall be issued if the applicant demonstrates that a tree is dead, dying or dangerous, except as provided by subsection (b) of this section.

(a) For the purposes of this section:

i) "Dead" means the tree is lifeless.

ii) "Dying" means the tree is in an advanced state of decline because it is diseased, infested by insects or rotting and cannot be saved by reasonable treatment or pruning, or must be removed to prevent spread of the infestation or disease to other trees.

iii) "Dangerous" means the condition or location of the tree presents a clear public safety hazard or a foreseeable danger of property damage to an existing structure and such hazard or danger cannot reasonably be alleviated by treatment or pruning.

(b) The City Forester may require the retention of dead or dying trees located in wetlands, natural areas, stream corridors, parks or open space areas, in order to provide for wildlife habitat and natural processes, unless the tree presents a potential hazard to persons or property.

2. Trees that are Not Dead, Dying or Dangerous: The City shall issue a tree cutting permit for a tree that is not dead, dying or dangerous if the applicant meets the following criteria:

(a) Removal of the tree will not have a significant negative impact on erosion, soil stability, soil structure, flow

will topple or otherwise fail and cause damage before a tree cutting permit could be obtained through the non-emergency process. "Immediate danger of collapse" does not include hazardous conditions that can be alleviated by pruning or treatment.

(b) Emergency tree cutting permits must be approved by the City Forester or designee. If an emergency situation arises at a time when the City Forester or designee is unavailable, and such emergency creates a significant likelihood that the tree will topple or otherwise fail before such officials become available, the tree owner may proceed with removal of the tree to the extent necessary to avoid the immediate hazard. Within seven days after such removal, the tree owner shall apply for a retroactive emergency tree cutting permit. If the evidence and information presented by the tree owner does not justify the emergency tree cutting standards set forth in PCC 20.42.110(3), the application shall be denied and the tree owner shall be subject to the penalties and to the mitigation requirements of this Chapter.

(c) Unless the emergency situation is apparent to a layperson, the City shall require the applicant to pay a fee in a sufficient amount to enable the City Forester to review the application. For the purposes of this section, an "emergency condition apparent to a layperson" means a tree that is cracked, split, leaning or physically damaged to the degree that it is clearly likely to fall and injure persons or property. To this end, it is advisable to photograph the condition of the tree as evidence of an emergency situation.



20.42.130. Mitigation Required.

1. Mitigation is required as a condition of a permit issued under Section 20.42.110 (2) (a) and (b), or if a tree is cut in violation of this Chapter. As soon as a violation is determined, the City shall notify the property owner in writing regarding the mitigation requirements of this section. Within thirty (30) days of the date of mailing of this notice, the property owner shall enter into a mitigation plan approved by the City. The mitigation plan for violations, and conditions of permits issued under PCC 20.42.110 (2) (a) and (b), shall provide for:

(a) Replacement of each tree cut with a substantially similar tree, taking into consideration site characteristics. If a replacement tree of the species of the tree cut is not reasonably available in the local commercial market, the City Forester may allow replacement with a different species of equivalent natural resource value. If a replacement tree of the size of the tree cut is not reasonably available on the local market or would not be viable, the City Forester shall require replacement with more than one tree. The number of replacement trees required shall be determined by dividing the estimated caliper of the tree cut by the caliper of the largest reasonably available or viable replacement trees. If this number of trees cannot be viably located on the subject property, the City Forester shall require one or more of the replacement trees to be planted on other property within the City.

(b) A replacement plan providing for the planting and maintenance of the replacement tree or trees. The replacement

**20.42.160. Nuisances.**

Cutting a tree in violation of this chapter is hereby declared to be a public nuisance, and may be abated by appropriate proceedings.

**20.42.170. Institution of Legal Proceedings.**

Upon request of the City Forester, or direction from Council, the City Attorney, acting in the name of the City, may institute and maintain an action in any court of competent jurisdiction to compel compliance with or to restrain by injunction the violation of any provision of this Chapter.

**20.42.180. Remedies Cumulative.**

The rights, remedies and penalties provided in this chapter are cumulative, are not mutually exclusive, and are in addition to any other rights, remedies and penalties available to the City under any other provision of law.

**20.42.190. Severability.**

If any provision of this Chapter, or its application to any person or circumstance, is held to be invalid, the remainder of this Chapter, or the application of the provision to other persons or circumstances, shall not be affected.

**20.42.200. Automatic Repeal of Chapter.**

This chapter 20.42 shall be automatically repealed on February 1, 1997, without the necessity of any further action by City Council.

