APPENDIX 48
Urban Forestry Management Plan
Summary Report

Introduction

The purpose of this Report is to summarize urban forestry principles, benefits, existing conditions, issues and the public outreach results from Gresham's Urban Forestry Management Plan (UFMP). The Gresham City Council adopted the UFMP on July 19, 2011. This Report summarizes the factual information that is the basis for the Urban Forestry Management Plan Goals and Policies found in Section 10.014.3 of Volume 2 of the Community Development Plan.

In 2009, City Council directed staff to help carry out Gresham Community Development Plan goal 10.014.2 to "Protect and enhance the environmental and aesthetic contribution of trees and other vegetation" and action measure 19 of this goal to "Develop an Urban Forestry Management Plan and ultimately implement a citywide urban forestry management program." This goal and action measure was adopted by the Council in September 2004.

The Urban Forestry Management Plan (UFMP) was developed by the City of Gresham through a two year planning process. Public involvement included outreach to residents and property owners, stakeholders, elected officials, multiple City departments and monthly collaboration with the Urban Forestry Subcommittee (UFS). Over the two year planning effort staff conducted the following major tasks:

- Researched and analyzed issues related to urban forestry
- Conducted public outreach, including an online survey
- Identified solutions and approaches to address identified issues/concerns
- Drafted the UFMP document

The UFMP provides a comprehensive, sustainable and integrated approach to the management of trees in Gresham as well as guidance for future decisions related to trees in Gresham's urban forest. The UFS with input from the public and City staff offers the following vision for Gresham's urban forest:

> *Gresham's trees are recognized as integral to the quality of the City's urban character and natural environments. A healthy urban forest remains a longstanding community priority and will be thoughtfully managed in a way to maximize a range of public benefits including a thriving ecosystem, a vibrant economy and a livable community.*

Urban Forestry Guiding Principles

The following principles were developed in collaboration with City Council, the Urban Forestry Subcommittee, Natural Resources and Sustainability Committee, the public and City staff. They were used as guidelines for the process and structure of the Urban Forestry Management Plan, and can also be used for future implementation of the UFMP.

Principle 1. Tree regulations should be easily understood by the public and implementable by City Staff, and should be consistent with other City codes and practices.

Principle 2. The City should seek out and collaborate with tree partners throughout the community to complete action items. These partners could include: residents, business owners, the nursery and tree industry, watershed councils, neighborhood associations, developers, schools, nonprofits (Friends of Trees), adjacent municipalities and other stakeholders.

Principle 3. An adaptive management approach, where resource managers can incorporate new findings into best practices, should be taken with regard to the urban forest.

Principle 4. A long-term approach should be taken to planning and maintaining Gresham's trees.

Principle 5. The benefits of the urban forest should be used to inform and support other City planning goals, and the urban forest should be a recognized asset in Gresham's Community Development Plan. Other City planning goals may include:

- Defining a sense of place
- Promoting aesthetics
- Creating walkable neighborhoods
- Improving community health
- Improving traffic safety
- Advancing air, water and conservation goals

Principle 6. Healthy trees make neighborhoods more livable by creating quality streetscapes, neighborhoods and parks; by softening the built environment; and fostering safer and more sociable neighborhoods.

Principle 7. Design standards should incorporate the philosophy "Make the place right for trees and pick the right trees for the place."

Together, the vision and guiding principles provide the policy framework for the Urban Forestry Management Plan.

What is the Urban Forest?

Urban Forestry is the study and management of a city's trees, consisting of those along streets and trails, within parks and natural areas, and on other public and private property.
An American Planning Association report defines urban forestry as *"a planned and programmatic approach to the development and maintenance of the urban forest, including all elements of green infrastructure within the community, in an effort to optimize the resulting benefits in social, environmental, public health, economic and aesthetic terms."* [1]

Gresham's urban forest consists of both public and private trees. These trees are located within specific urban environments that have particular physical characteristics, provide various

[1] Planning Advisory Service Report Number 555: Planning the Urban Forest: Ecology, Economy, and Community Development, James C. Schwab (American Planning Association, 2009), p. 3

benefits and serve different needs. The health and quality of trees on both public and private land depends on the knowledge, skills and involvement of the owners and managers.

Public trees can be highly visible and valuable components of the urban forest. Public tree owners include the City, School Districts, Metro, and Multnomah County. Public trees are located in following areas of the city:

- Parks, public plazas and trails
- Natural areas and stream corridors in publicly owned open space
- Street medians
- Civic institutions such as schools, City Hall, and fire stations
- Vegetated public stormwater facilities such as ponds and wetlands

Although generally located within public street rights-of-way, like sidewalks, private property owners are the caretakers of trees located along the sides of streets. About 70 percent of the Gresham urban forest is located on private property. Private property owners are the chief stewards of trees located on private lands in a variety of environments:

- Residential areas including both single-family and multifamily landscapes
- Commercial and industrial areas
- Parking lots
- Golf courses
- Along stream corridors on private property
- Privately owned undeveloped land

Why is it Important?

Trees affect the community and local economy in many ways. According to Dr. Robert Young, a nationally renowned urban forestry expert from the University of Oregon, trees provide a range of public benefits; can make a considerable contribution to public service cost reductions; and are a sound investment in the delivery of municipal goods and services such as clean air and water, parks, recreation, tourism, energy conservation, stormwater retention and walkable streets.

The City of Gresham covers a land area of about 23 square miles and includes natural features that are important to the local community and to the region, such as Johnson Creek, Fairview Creek and the buttes.

A resource of this size and scale requires careful management to ensure its preservation, restoration and enhancement. While Gresham has a long history of protecting the natural environment, the development of an Urban Forestry Management Plan is the City's most comprehensive approach to establishing long-term, proactive management of the entire urban forest.

Trees in urban and natural settings require different types of management. Urban forest management goals such as increasing tree canopy, adopting best management practices and providing educational opportunities must be balanced with other community priorities. For the sake of efficiency and cost-effectiveness, the Urban Forestry Management Plan attempts to

integrate management of the many issues and opportunities presented by Gresham's natural systems, tree resources, public infrastructure and urban development.

Benefits of the Urban Forest

Trees, especially as part of a regional and urban "green infrastructure" system, help create a better quality of life. Specifically, the retention of trees in historically wooded areas and the establishment of trees along street corridors help to soften urban development, screen unattractive areas, block wind, cool streets and buildings, reduce stormwater run-off, filter noise and air pollution, and promote soil stability. This "green infrastructure" provides important ecological and social functions that translate into direct cost-savings to local governments and indirect stimulation of the local economy.[2]

Urban forests require comprehensive management to ensure healthy vegetation over time, and community-wide support is essential to supplement public management efforts. The goal of a sustainable urban forest is to maintain a maximum level of net economic, community and environmental benefits over time. In other words, long-term management of natural assets brings a higher return than their short-term elimination.[3]

Economic Benefits

Healthy mature trees are a major economic asset for attracting and retaining residents, businesses and visitors. Money spent on trees is a good investment and adds to the overall value of the community.[4]

Many Pacific Northwest communities are quantifying the benefits of trees so they can evaluate how growing their tree canopy can stimulate the local economy. For instance, the City of Vancouver, Washington, calculates that for every dollar spent on tree planting and maintenance, the City receives a 250 percent return on investment in terms of total services provided by those trees at maturity. In other words, for every $1 spent on a community's urban forestry program, the City receives about $2.50 in tree benefits.[5]

Specific economic benefits of the urban forest include:

- **Increased Property Values**
  - Trees add to property values and have been shown to increase the resale value of a home 3 to 7 percent.[6]
  - Studies report that landscaping speeds the sale of a home by four to six weeks.[7]
  - Street trees positively influence the price of neighboring houses within a 100-foot radius.[8]

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[2] Vancouver Urban Forestry Management Plan, 2007. p.7.
[3] Renton Urban and Community Forestry Development Plan, 2009, p. 13.
[4] According to a national urban forestry expert in an excerpt from "Planting the Living City", Dr. Robert Young and Dr. Greg McPherson, 2010. (in review)
[5] International Society of Arboriculture, Pacific Northwest Chapter 76. Western Washington and Oregon community tree guide: benefits, costs, and strategic planting, Silverton, OR. McPherson, E.G., S.E. Maco, J.R. Simpson, P.J. Peper, Q. Xiao, A.M. VanDerZanden, and N. Bell, 2002.
[6] Alliance for Community Trees: The Value of Trees Fact Sheet located at www.actrees.org/files/resources/ValueofTrees_ FactSheet.pdf
[7] Ibid.

- **Maintenance of Economic Stability Citywide**
  - Trees also enhance commercial and retail district appeal, offering higher occupancy and rental/lease rates and contributing to community economic stability.
  - Tree-lined streets create more enjoyable shopping experiences, bringing more dollars into the community.

    A study conducted by the University of Washington showed that consumers were willing to pay 9 percent more in small cities and 12 percent more in large cities for equivalent goods and services in business districts having trees.[9]

  - Trees reduce the necessary size and costs of conventional infrastructure, such as stormwater pipes and ponds, by soaking up and storing water run-off in their leaves, trunks and root systems.
  - Trees contribute to reduced air pollution by absorbing gaseous pollutants such as ozone, nitrogen oxides and sulfur dioxide, leading to reduced healthcare-related costs.
  - Trees increase the life of pavement along our public rights-of-way. Tree shade increases pavement life by 40 to 60 percent based on reduced daily heating and cooling (expansion/contraction).[10]
  - Trees contribute to regional tourism that involves outdoor recreation.
  - Urban forests help moderate global climate change and can be a cost-effective method of greenhouse gas reduction. Trees remove carbon dioxide from the atmosphere and then store it in the tree structure (roots, trunk, branches and leaves), in a process called carbon sequestration.
  - The cost of planting and maintaining trees to remove a metric ton of carbon can be as low as $5.[11]

Community Benefits

Trees are place-makers that are vital to livability and give a community visual character, unity and identity. Trees preserve and enhance quality of life by offering a sense of place and the opportunity to embrace nature.

In 1990, the Gresham City Council recognized the importance of trees to community well-being by passing an ordinance to protect “significant trees.” Since then, more than 50 trees have been adopted as trees of significance to the City. The Urban Forestry Management Plan is an opportunity to strengthen the community’s past efforts to protect significant trees and Gresham’s forested buttes, and to maintain Tree City USA status.

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[8] Landscape and Urban Planning. Trees in the city: valuing street trees in Portland. p. 77-83. Geoffrey H. Donnovan and D.T. Butry, 2010.
[9] Main Street News, The Monthly Journal of the National Trust Main Street Center, Trees Mean Business: City Trees and the Retail Streetscape, Kathleen Wolf, Ph.D., University of Washington, No. 263 August 2009.
[10] Ibid.
[11] City of Gresham Inventory of Greenhouse Gas Emissions and Recommended Reduction Strategies Report, 2010.

Specific community benefits of the urban forest include:

- **Improve Safety, Personal Health and Enjoyment**
  Trees enhance public health and safety by providing a natural physical barrier along transportation corridors, reducing traffic speeds by narrowing drivers' field of vision, and creating walkable neighborhoods.
    - Trees and landscaping lower crime primarily by bringing people together outdoors, increasing surveillance and discouraging criminals.[12]
    - Trees placed at the street bring speeds down 7 to 8 mph.[13]
    - Trees provide a sense of enclosure, allowing pedestrians to feel fully separated from traffic.
    - Trees stabilize hillsides by supporting the soil with their root systems and breaking the fall of raindrops with their leaves.
    - Street trees create pedestrian-friendly streets, increasing the attractiveness of walking and active living.

  Trees are important to human health and help purify air by absorbing pollutants.
    - 100 trees remove 5 tons of carbon dioxide and up to 1,000 pounds of pollutants (including 400 pounds of ozone and 300 pounds of particulates) per year.[14]
    - Trees can provide edible fruit, supporting the local food movement.
    - Trees cool air by giving shade and releasing moisture.

- **Enhance the Aesthetics of the Community and its Neighborhoods**
    - Healthy mature trees establish the community's character and identity, which strengthen ties among neighbors.
    - Trees increase the attractiveness of neighborhoods and build neighborhood pride. Regional neighborhood examples include: Irvington, Ladd's Addition, Laurelhurst, Eastmoreland, Lake Oswego's First Addition and the Villebois Community in Wilsonville.
    - Trees soften severe building lines and large expanses of pavement, making urban environments more pleasant.
    - Trees improve community appeal, attracting businesses, shoppers and homeowners.

Environmental Benefits

A healthy urban forest contributes valuable ecosystem services for watershed protection, reducing flood potential and stream erosion while improving water quality. More trees are capable of removing a greater percentage of toxins from the air, thereby decreasing air pollution.

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[12] Environment and Crime in the Inner City: Does Vegetation Reduce Crime? Environment and Behavior, 33(3), 343-367, Kuo, F.E., and Sullivan, W.C. (2001)
[13] Glatting, Jackson, Walkable Communities, Inc.: Urban Street Trees: 22 Benefits and Specific Applications, Dan Burden, 2006.
[14] McPherson et. al. 1999.

Specific environmental benefits of the urban forest include:

- **Protect Air and Water Quality, Reduce Flooding and Enhance Wildlife Habitat**
  - Trees improve ecological and watershed health.
  - Trees reduce air pollution by absorbing gaseous pollutants such as ozone, nitrogen oxide and sulfur dioxide; they also filter particulate matter such as dust, ash, pollen and smoke – which contributes to improved public health.
  - Trees reduce the amount of water-borne pollutants that reach streams and rivers.
  - 100 mature trees intercept about 250,000 gallons of rainwater per year, reducing stormwater run-off and providing clean water.
  - Street trees 32 feet tall can reduce stormwater run-off by 327 gallons per year.
  - Trees provide habitat for birds and other wildlife, even in urban areas.

- **Energy Conservation**
  Trees conserve resources by reducing energy costs, both in summer and winter.
  - Trees provide cooling shade in the summer and buffer the wind in the winter. For example, trees cool cities by reducing heat generated by buildings and paved surfaces
  - Trees planted within 20 feet of any side of a home provide insulation benefits in the winter.
  - Trees within 60 feet of the west side of a home can reduce electricity used for air conditioning in the summer.
  - If properly placed, a tree with a 25-foot diameter crown reduces annual heating and cooling costs of a typical residence by 8 to 12 percent.[15]
  - Temperature differentials of 5 to 15 degrees are felt when walking along tree-canopied streets.[16]

Existing Conditions

The urban forest is one reflection of the city's health, well-being and livability. Many residents and business owners who live and work in Gresham enjoy the iconic backdrop of forested buttes. However, some neighborhoods are more treed than others; residents complain when neighbors remove trees on or near their properties; property owners, including the City, struggle with the consequences of not planting the right tree in the right place; and the street corridors that connect business districts and neighborhoods often lack trees.

Without ongoing maintenance, Gresham's publicly owned trees are not as healthy and vigorous as they could be. Consequently, trees grow slower, die faster and are much more susceptible to injuries and diseases that require premature removal. Urban forests support a dynamic mix of people, wildlife and trees. The current state of Gresham's forest is described in the following sections:

- Trees in the Urban Environment
- Tree Canopy
- Assessment Needs

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[15] Center for Urban Horticulture, University of Washington, Kathleen Wolf, Ph.D., November 1998.
[16] Glatting Jackson, Walkable Communities, Inc.: Urban Street Trees: 22 Benefits and Specific Applications, Dan Burden, 2006.

Trees in the Urban Environment

The urban forest lives and grows in the built and natural environment where both are constantly evolving over time due to changing demographic, development, climatic and technological circumstances.[17] About 55 percent of Gresham's land base is privately owned and includes land-use types that range from residential to commercial and industrial. About 10 percent of Gresham's land base includes street right-of-way.

While some of the city enjoys proximity to nearby forested buttes, parks and green corridors, there are other neighborhoods that are defined by scattered stands of tall Douglas-fir trees. Some neighborhoods to the north have little mature tree canopy. Regardless of location, there are opportunities throughout the city to plant new trees and enhance tree canopy.

Gresham requires trees in new multifamily, commercial and industrial developments. However, specific tree provisions vary for industrial, Downtown, Civic Neighborhood, Rockwood, Station Centers, residential multifamily, single-family attached, commercial and parking lot landscapes in the City.

Tree Canopy

Tree canopy cover is defined as the amount of land that falls under the shade of a tree. It is one of the most-common metrics that communities use, as shown in Table 1, to evaluate the health of urban forests and their associated benefits.

Many communities set aspirational tree canopy goals, such as those shown below, to prioritize City investments that will create the greatest tree canopy gain. Tree canopy goals assist in understanding:

- Current canopy cover and canopy gain and loss
- Impacts of development and redevelopment
- Planting potential
- Baseline data to monitor progress against canopy-cover goals

Table 1 shows some Portland Metropolitan and Northwest regional communities that have established aspirational tree canopy goals.

A 2006 study managed by the Johnson Creek Watershed Council recommended that Gresham develop a preferred level of canopy coverage to ensure higher protection of tree canopy and to better meet local water quality and natural resource goals. [18]

Gresham's tree canopy has three major landscape features: One is the urban landscape – the areas of the City where living, working, shopping and playing take place. The second is the natural area landscape – the areas of the City where streams and wetlands provide clean water, flood mitigation and wildlife and plant habitat. The third is the street right-of-way landscape – the

[17] Planning Advisory Service Report Number 555: Planning the Urban Forest: Ecology, Economy, and Community Development, James C. Schwab (American Planning Association, 2009), p. 43.
[18] Gresham Code Review Project prepared by the Johnson Creek Watershed Council, Lori Faha, P.E. Water Resources Engineer, 2006.

medians and planter areas lining the City's streets. A description of the canopy associated with these three major landscapes follows.

Table 1. Regional Canopy Coverage and Targets

	Portland, OR	Tigard, OR	Vancouver, WA	Bellevue, WA	Seattle, WA
Current Canopy	26.3%	24.5%	19.7%	36%	18%
Target Canopy	33%	40% by 2047	28%	40%	30%

Source: Regional Urban Forestry Goals compiled by Gresham City staff

Urban Canopy

Maps 1 and 2 illustrate the City's tree canopy. Both maps show the City limits, neighborhood boundaries and the new communities of Pleasant Valley, Springwater and Kelley Creek Headwaters. Map 1 shows the areas of the City that are shaded by trees (and large shrubs) based on aerial orthophotographs taken in 2007. Map 2 converts the shading to a percentage of each neighborhood's total area, with darker shading indicating a higher percentage of canopy.

The City's canopy, when measured in 2007, was 28.1 percent. Map 1 illustrates that the heaviest canopy coverage is concentrated on the butte areas, such as Gresham Butte, and along stream corridors. This map also shows that the canopy is more dispersed in the developed parts of the city (the white areas of the map). Additionally, this map can help determine where there may be gaps or deficiencies in the canopy.

Table 2 shows canopy cover throughout the City and for seven land-use categories within the urban forest that include: single-family residential, commercial/multifamily, industrial, mixed-use centers, developed parks, natural areas and rights-of-way.

Table 2. Current Canopy Cover Citywide and by Land-Use Category

Land Use Category	Total Acres	Current Canopy
Residential/SFR	6,247	26%
Commercial/MF	1,895	17%
Industrial	2,516	14%
Mixed-Use Centers	896	16%
Developed Parks	352	36%
Right-of-Way	*2,332*	*10%*
Subtotal		**22%**
Natural Areas	*2,753*	*72%*
Total Citywide	**16,991**	**28%**

Source: City of Gresham, 2011. Note: SFR= Single-Family; MF = Multifamily; Mixed-Use Centers includes regional and town centers; Developed Parks includes currently

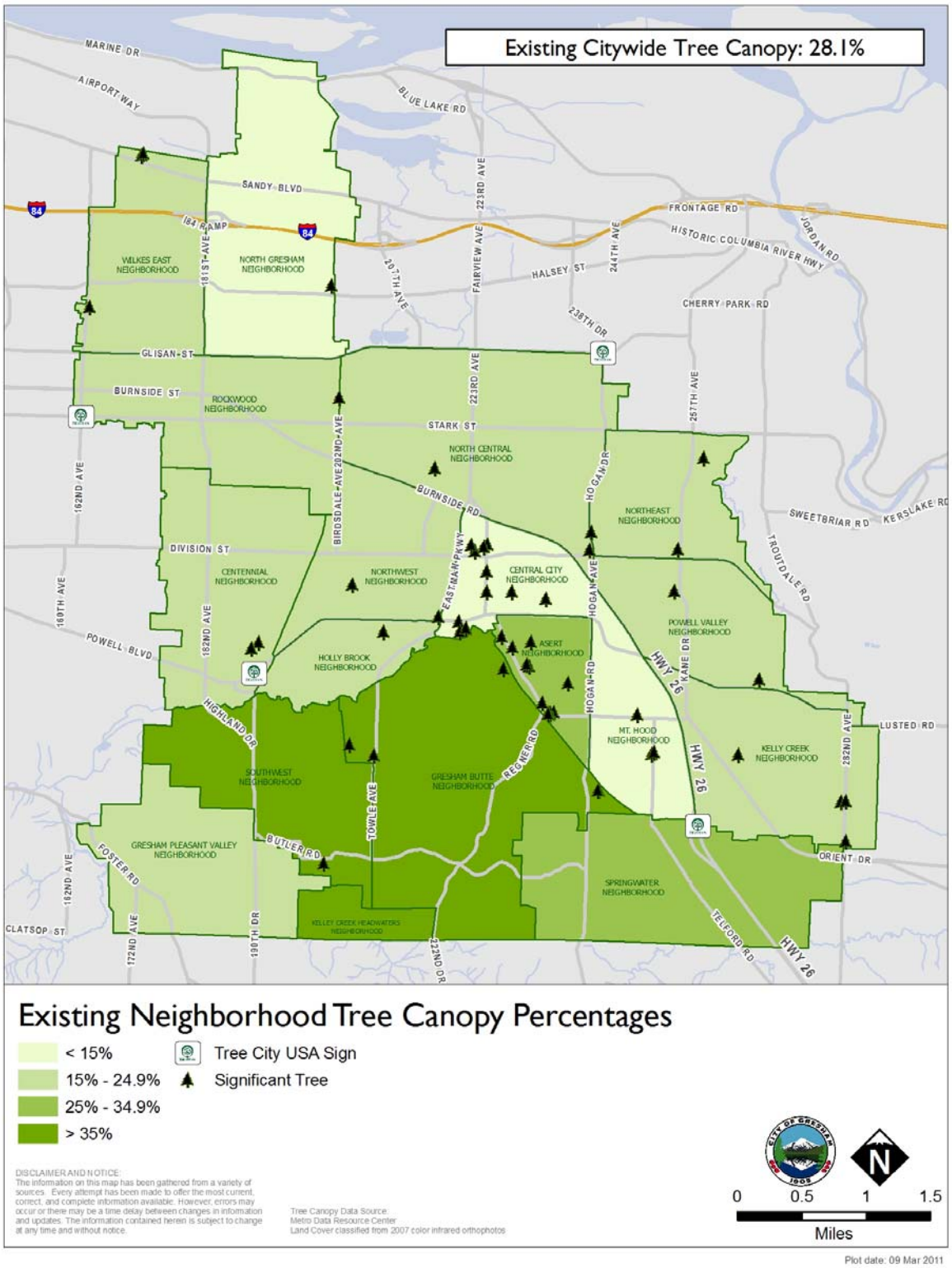
developed parks and park areas owned by the City to be developed as neighborhood or community parks in the future.

It is important to note how Gresham's forested buttes and dense riparian corridors heavily influence the citywide canopy coverage figure of 28 percent. For example, Map 1 illustrates how the Gresham Butte and Kelley Creek Headwaters neighborhoods both contain approximately 70 percent canopy cover within their boundaries. By removing the natural areas within these two neighborhoods, as well as other publicly designated natural areas citywide (i.e. Habitat Conservation Areas), the 28 percent citywide canopy coverage figure is reduced to approximately 22 percent, as shown in Table 2.

Map 1. Gresham's Existing Tree Canopy by Neighborhood

Source: City of Gresham GIS, 2009, based on 2007 data and aerial photographs from Metro.

Map 2. Gresham's Existing Tree Canopy by Neighborhood



Source: City of Gresham GIS, 2009, based on 2007 data and aerial photographs from Metro.

Natural Area Canopy

Gresham is one of many communities now working to regain "ecosystem services" historically provided by healthy urban forests and streams, an effort that involves protecting and expanding the tree canopy – particularly in riparian areas where dense thickets of trees once stood. Metro-area communities are starting to understand that augmenting a City's flood-control infrastructure with robust riparian forests and natural areas is a cost-efficient way of handling run-off, as some mature, native trees can take up as much as 400 gallons of water per day.

Equally important, the City of Gresham is obligated to respond to regional, state and federal water quality and habitat protection laws. A significant portion of the City's reforestation efforts are directly tied to its obligations under the federal Clean Water Act, which includes reporting on how Gresham meets the tree canopy shade targets established in its 2008 Temperature TMDL 3 Implementation Plan. That plan aims to increase shading over streams to reduce stream temperature.

The Oregon Department of Environmental Quality (DEQ) currently requires annual reporting from Gresham, and beginning in 2013 it will provide data at five- and ten-year intervals.

- **Annual reporting intervals:** The City is required to submit annual reports detailing how it has worked toward addressing all the TMDL pollutant parameters, including the number of riparian restoration sites planted.

- **Five-year reporting intervals**: Vegetation in active restoration sites will be monitored to assess the impact of City planting plans and maintenance strategies on tree canopy densities and growth rates.

- **Ten-year reporting intervals:** The City will collect field data to confirm shade estimates derived from aerial-image analysis, and will then use that information to monitor and quantify tree canopy development, health and progress towards meeting tree canopy goals in riparian areas.

In 2008, the City's Temperature TMDL [19]Implementation Plan identified three important categories of riparian areas, which include:

- Where the City should not plant trees due to physical constraints
- Where there is a reasonable chance that the City will be able to plant trees
- Where other plant communities would be more appropriate than trees, such as wetlands, water quality facilities, power-line easements and developed park areas

The Temperature TMDL Implementation Plan includes figures that illustrate areas within riparian zones where no tree planting can occur, such as:

- Transportation infrastructure such as paved right-of way with required visual sight distances
- Hardscapes such as buildings, parking lots and large recreational trails
- Utility and gas line corridors
- Access easements

[19] TMDL stands for Total Maximum Daily Load and is a measurement of pollutant load into a water body.

The Temperature TMDL Implementation Plan also shows constrained planting sites within riparian zones where planting may be limited to small, shorter tree species. These include the following areas:

- Wetlands
- Water quality facilities
- Power line corridors with height restrictions
- Developed parks

Because Gresham needs riparian shade to keep streams cool for salmonids, City staff worked with the Oregon Department of Environmental Quality to identify appropriate native tree and shrub communities to be planted streamside. These tree and shrub communities also improve water quality and aquatic habitat conditions. Tree and shrub lists are provided in the Gresham Community Development Code (Section 5.0411 – Table 5.0411 (D)), which also identifies appropriate plant species for specific moisture and soil types.

Public and City-owned land restoration efforts adhere to these tree species lists unless site constraints suggest tall shade trees would be inappropriate. Private streamside landowners are also given these recommended tree and shrub species lists when they express an interest in restoring their riparian lands.

Right-of-Way Canopy

There are more than 300 miles of public streets in Gresham. Right-of-way locations with trees and other vegetation include:

- 0.23 acres of hardscaped medians (29 total)
- 6.24 acres of vegetated medians (112 total, three of which are irrigated)
- 0.05 acres of vegetated mini circles (7 total)
- 52.7 acres of maintenance areas, including roadside mowing, weed abatement and planter strip areas
- 493 tree wells

Tree canopy located within the right-of-way is described further in this section and primarily includes trees within or along:

- Medians
- Streets
- Green Streets

Medians

Median trees are considered any tree located in the center median of a Gresham street. Landscaped medians on Eastman Parkway, Division Street and Powell Boulevard are the only irrigated medians. The Eastman Parkway medians were installed in the 1980s and, as of 2006, 33 trees and more than 1,000 shrubs were installed at a cost of $26,500. In 2002, trees and shrubs were installed in the Division Street medians as an innovative approach for traffic-calming. Total cost: $126,000.

In 2007, about $700,000 was spent to install a variety of tree and shrub species within the Powell Boulevard medians and planter strips. The City is required to show how it is reducing pollution in its creeks over time and the 2,500 linear feet of median swales along Powell Boulevard help to achieve this by:

- Managing run-off from five acres of pavement; and
- Reducing run-off to Johnson Creek by more than 4 million gallons per year.

Streets

Street trees are those planted in or immediately adjacent to the public right of way. These often grow in a planter strip between the curb and sidewalk, but in cases where there is no planter strip, street trees may be planted on the private land side of a sidewalk. In Gresham, as in most Oregon municipalities, responsibility to care for and maintain all street trees located in the public right-of-way belongs to adjacent property owners. Street trees that are not properly maintained can become a hazard to property owners, pedestrians and neighbors. Routine maintenance helps keep neighborhoods clean, accessible and safe.

An inventory of street trees by tree type, quantity, size and condition has not been completed. Because street trees are located in the right-of-way, tree removal or planting activities within these areas are regulated by the City. For new development, City Code typically requires one tree to be planted every 30 feet, of the type specified in the City's Recommended Street Tree List found online at GreshamOregon.gov/UrbanForestryPlan.

Green Streets

Over the last few years, Gresham has applied Green Street elements to a number of large arterials, transforming impervious street surface into landscaped green spaces that:

- Capture stormwater run-off;
- Allow water to soak into the ground; and
- Let plants and soil filter pollutants.

These landscaped areas include trees, shrubs and other plant materials.

Green streets convert stormwater into a resource that replenishes groundwater supplies. They also create attractive streetscapes and urban green spaces, provide natural habitat and help connect neighborhoods, schools, parks and business districts. Green streets are an innovative, effective way to restore watershed health, protecting water quality in rivers and streams, and managing stormwater from impervious surfaces. They can also be more cost-efficient than new storm sewer pipes or large regional treatment facilities.

Green streets are one technique for developing in a green and sustainable manner. The planting and preserving of trees is another cost-effective green and sustainable development technique.

Need for Assessment

Assessing the health of public trees is a best practice for protecting and enhancing the public's investment in trees. Assessments can provide information about maintenance needs, tree replacement strategies and new planting opportunities. Assessments can reveal planting locations and methods that result in the healthiest trees and successful planting outcomes. Many communities have developed a Public Property Tree Inventory and Assessment Report. This report does not assess trees on private property, focusing instead on trees on City-owned lands.

A tree inventory is the first step in a tree-health assessment and fundamental to a long-term maintenance program for public trees. Public trees are catalogued for location, species, stem diameter, health and appraised value. Data from a public tree inventory addresses the following:

- Quantification, composition and location
- Quality, health and condition
- Effect on property values
- Calculation of environmental benefits
- Maintenance needs and management plan
- Risk-management goals
- New tree planting opportunities

Over time, municipal tree inventories change as trees grow, new trees are planted, others are pruned and some removed. A tree inventory should be considered a dynamic process – one that managers can use to increase the value of Gresham's urban forest resource. Many communities often start by conducting a street tree inventory with the help of local neighborhood associations.

Inventories provide important information about the current level of species diversity and encourage greater tree diversity. Reliance on too many of one species or genus has proven costly in the past when an insect or disease epidemic has sickened an entire city's tree population consisting of one species or genus of a tree. Researchers recommend the 30:20:10 rule: no more than 30 percent from any family; no more than 20 percent from any genus; and no more than 10 percent of any species.

Public Participation

Community outreach was a key component in the development of this plan. Feedback from residents, along with urban forestry and business stakeholders, shaped the direction of Goals and Actions. Five primary methods of public participation were employed in the development of this plan from 2009 to 2011. These methods included a survey, community forums, focus groups, interviews and Urban Forestry Subcommittee and Natural Resources and Sustainability Committee meetings.

Urban Forestry Survey

In collaboration with staff, the Urban Forestry Subcommittee, Natural Resources and Sustainability Committee and Planning Commission, an online survey was developed to gauge residents' opinions and insights about urban forestry in Gresham.

It was available online from February to May 2010. A paper copy of the survey was also available during this time. There were 162 respondents from 16 Gresham neighborhoods. About 80 percent of the respondents were Gresham residents and 40 percent were Gresham business owners.

Appendix G of the Urban Forestry Management Plan includes a complete summary of the online survey findings. Key findings include:

- Fifty percent of respondents observed a citywide tree decline by neighborhood
- Air quality, wildlife habitat and livable neighborhoods ranked highest among tree benefits
- Requirements for retention and replanting in new developments ranked highest among desired future urban forestry programs and services
- Incentive and sidewalk repair programs were strongly suggested by respondents
- Respondents noted the following challenges to Gresham's urban forest:
    - Tree removal during development
    - Tree removal by residents and/or property owners without a tree removal permit
    - Spread of invasive plant species
    - Lack of knowledge
    - Enforcement
    - Poor tree choice

The survey helped the City formulate solutions to a range of recognized tree issues and to develop new urban forestry goals, policies and action measures.

Community Forums

Six community forums were held during the planning process:

- September 29, 2009 – Urban Forestry Issues
- March 13, 2010 – Tree Forum on the Benefits of Trees
- May 26, 2010 – Urban Forestry Goals and Policies
- August 2, 2010 – Urban Forestry Actions
- February 22, 2011 – Existing Tree Code Regulations
- April 19, 2011 – Draft Urban Forestry Management Plan Open House

All forums were hosted at City Hall and designed to elicit important feedback from the community about urban forestry issues, benefits, Goals, Action Items and existing tree regulations. Publicity in advance of the forums included public notices to interested parties, website postings, social media and newspaper articles. Participants were given an opportunity to provide direct feedback on this Urban Forestry Management Plan's executive summary, seven chapters and the appendices.

Summary responses from all six meetings are provided in Appendix H of the UFMP.

Focus Groups and Interviews

Four focus groups were also held during the planning process. These included:

- May 27, 2010 – Developer Focus Group
- June 23, 2010 – Community Focus Group
- July 27, 2010 – Johnson Creek Watershed Council Focus Group
- February 23, 2011 – Business Focus Group

Three focus group interviews were conducted with members of the business community including a retail shopping center developer, a Downtown restaurant owner and a West Gresham retail garden center owner.

Summary responses from all focus group sessions are provided in Appendix H of the UFMP.

Summary of Issues

Like Gresham, many cities in the Pacific Northwest are growing and have experienced a significant decline in their urban forests over the past two decades. Cities are faced with the challenge of balancing development pressures while trying to improve their urban forests. This section describes a wide range of community concerns about current tree management on public and private property.

Generally, the Gresham community values and enjoys trees. However, there have been situations where trees have been either removed or topped (an improper maintenance practice) for blocking views and sunlight or dropping leaves or fruit. While shoppers appreciate tree-lined business districts, business owners often have maintenance and sign-visibility concerns. Issues identified during the Research and Analysis phase of the project are detailed in the November 2009 Urban Forestry Issues and Opportunities White Paper, included in Appendix J of the UFMP.

A number of issues were identified as part of the public involvement program using feedback from several stakeholders and community members. The following is a list of current challenges to Gresham's urban forest. These collective challenges are organized within the following eight topic areas and not necessarily listed in order of importance.

Effects of Urbanization

Large-scale removal of trees as the city develops can have negative impacts on the city's environment, public operations and livability. Trees make cities livable, and urbanization without tree protection can negatively affect community livability or sense of place, and cause:

- Tree canopy loss
- Loss of wildlife habitat
- Increases in air and water pollutants
- Increases in atmospheric greenhouse gas
- Increases in stormwater management costs and other infrastructure costs

A key issue from past development is the replacement of existing urban tree canopy cover with impervious surfaces such as paved roads, parking lots and rooftops. The expansion of impervious surfaces from housing and transportation causes additional heat build-up in urban areas, which can increase tree mortality and negatively impact wildlife. The lack of trees in these areas also can increase the cost of maintaining roads, cooling buildings and managing stormwater, and lessen a community's overall appeal.

Tree Canopy

A significant challenge is maintaining and expanding tree canopy, which is the area of ground that is directly underneath a tree. Tree canopy is one of the most common metrics communities use to evaluate the health of their urban forests. Current tree cover in Gresham is estimated at 28 percent.

In 2001, American Forests, a nonprofit partner of the U.S. Forest Service, conducted a regional ecosystem analysis and discovered that between 1972 and 2000, the Portland Metro Area lost 22 percent of its heavy canopy cover.[20] Additional data confirms that over the last 15 years, naturally forested areas of the Pacific Northwest have lost 25 percent of their tree canopy cover while impervious surfaces increased about 20 percent.[21] Figures 1 through 2 show aerial examples of tree canopy that has been replaced, in some cases almost entirely, by impervious surfaces in commercial and residential projects located in Gresham.

These changes in land cover, coupled with the City's desire to transition into a more sustainable future, are important reasons why the City should examine how to best preserve the existing natural canopy and manage newly planted trees.

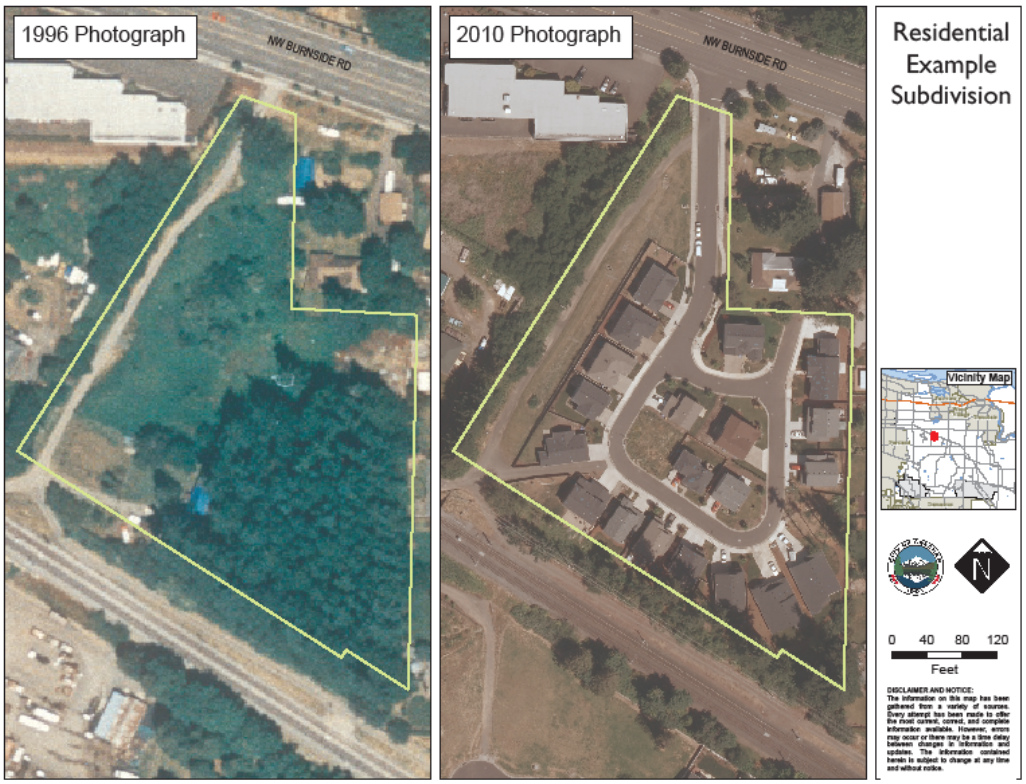
[20] Regional Ecosystem Analysis for the Willamette/Lower Columbia Region of Northwest Oregon and Southwestern Washington State: Calculating the Value of Nature. (American Forests and USDA Forest Service, 2001) p. 10 and City of Vancouver Urban Forestry Management Plan, 2007.

[21] www.planning.org/research/forestry/index.htm

Figure 1. Commercial tree canopy change in Gresham from 1996 to 2010

Source: City of Gresham GIS staff

Figure 2. Residential tree canopy change in Gresham from 1996 to 2010



Source: City of Gresham GIS staff

Lack of a Shared Community Vision for Trees

Trees benefit many users of the urban forest, each with his or her personally developed sense of the right balance between development and tree preservation. The lack of a community-based visioning process for the urban forest has resulted in an uncoordinated system of tree regulations and management practices, or inconsistent enforcement of regulations and missed opportunities for community involvement in the protection, improvement and expansion of the city's tree canopy.

For instance, other than the riparian shade-management program, the City does not have a program or management practices in place to identify what areas are deficient in tree canopy. Additionally, no tracking mechanisms currently exist to identify where public trees are removed or could be planted. Without a centralized municipal urban forestry program it is difficult to have a focused mission to achieve a shared vision for urban forestry.

A shared vision for the urban forest, for example, could use tree canopy as a measure of tree health. Over the past few decades, increasing commercial and residential development has lead to a reduction in canopy cover, which has contributed to an increase in the costs of water quality infrastructure, street maintenance and building cooling.

Lack of Stewardship Opportunities and Outreach on the Value of Trees

Trees in the urban environment are a valuable resource that benefits visitors, landowners, business owners and residents. Education, stewardship opportunities and outreach efforts are ways to increase awareness within the business community and among residents. While the AmeriCorps stewardship outreach program has engaged a number of streamside landowners over the last 10 years, the City does not have a concerted outreach effort in place specifically to preserve, protect and improve the City's urban tree resources.

Gaps exist in education, stewardship and outreach, which include a lack of knowledge about sustainable landscape practices and limited partnerships to build on the City's outreach efforts.

With better outreach and stewardship opportunities, the community can better realize the benefits of the urban forest.

Infrastructure and Resource Conflicts

Tree placement and type can conflict with infrastructure and other valued resources. Conflicts identified include:

- **Sidewalks**. Tree roots may buckle infrastructure when planted in constrained sidewalk areas.
- **Power lines/light poles**. Trees may interfere with overhead power lines and light poles.
- **Solar panels**. Trees can potentially block sunlight needed for solar-panel operation.
- **Shading gardens**. Depending on placement, mature trees can limit the amount of sun received by neighboring gardens.
- **Streets and commercial signs**. Trees can obstruct drivers' or customers' view of road or business signs.
- **Roof gutters and downspouts**. Leaf litter may clog downspout pipes.
- **City storm sewers and drains**. Storm sewers and drains often clog with leaves or pine needles, requiring maintenance crews to clean them to prevent flooding.
- **Views**. Trees on residential and commercial properties may interfere with adjacent property owners' desired views.

The City does not have a program in place to address conflicts such as tree roots lifting sidewalks in the right-of-way or on residential property. Better coordination of infrastructure layers and tree placement may be one way that City staff and developers can avoid these potential conflicts during the pre-construction phase.

Maintenance

Routine maintenance of trees can greatly increase the health and longevity of the tree canopy and help minimize conflicts. The City's codes do not address maintenance, and the City's management practices on maintenance are not well coordinated.

Barriers to implementing both ongoing and periodic preventative maintenance programs for public and private property include:

- Lack of clearly defined roles for citizens and City staff
- Lack of requirements and incentives for maintenance on private property
- Lack of knowledge about sustainable landscaping practices
- Lack of central oversight for vegetation management of public trees

With the exception of the Streamside Property Outreach and Fee for Service programs, private property owners receive little guidance about how to maintain healthy trees or which practices to avoid. (Tree-topping, for example, renders a tree vulnerable to disease.) Lack of adequate funding and resources for tree maintenance, irrigation and inspection also prevent the City and property owners from implementing a more proactive approach to tree maintenance on public and private property.

Tree Selection and Placement (Right Tree in the Right Place)

Selecting and planting the right tree species and providing for variety is critical for the health and survivability of tree canopy. An urban forest diverse in both tree age and tree species is more resilient and ensures that no single event, pest or disease wipes out a significant portion of the city's trees at any one time.

Similarly, many trees were or continue to be planted in constrained right-of-way planting strips diminishing tree health and survivability. When trees are required, such as trees in commercial parking lots, the right trees should be chosen to provide shade, and to avoid negative consequences such as fruit falling on cars.

Like many cities across the Portland Metropolitan Area, Gresham is growing and continually faces the challenge of balancing urban growth with environmental protection. Trees in urban areas are less resilient than trees in natural areas because they lack sufficient space and irrigation.

Tree-placement issues include sidewalk and power line conflicts. Because of the narrowness of many street planting strips in Gresham, property owners are occasionally forced to remove a maturing tree or replace a sidewalk damaged by tree roots, at significant expense. Similarly, planting trees underneath power lines can result in tree-topping. Planting the "wrong tree in the wrong place," creates potential public safety hazards: trees weakened by topping, fires and power outages resulting from branch interference with high-voltage transmission lines.

Development Code

The City has a number of tree regulations establishing a framework for tree preservation, planting and care. Gresham's existing tree code is located in Section 9.1000 of the Gresham Community Development Code (CDC). These Code sections are designed to retain existing trees along public rights-of-way, on public lands and on multifamily, commercial and industrial property.

However, many residents and developers agree that these regulations are ineffective and difficult to interpret, and that they produce inconsistent delivery of urban forestry programs and services.

The following is a documented list of concerns with the Development Code's tree regulations:

- *Lack of clarity in tree-protection standards*. For instance, while some provisions require landscaping plans in parking lots, others do not. There is also not a clear Code protocol to follow to coordinate street tree placement with the placement of other infrastructure such as driveways and streetlights.

- *Outdated tree provisions are scattered throughout the Code, parts of which are more than 20 years old*. The Code has had minimal updates over the years and is considered user-unfriendly by many within the development community. This has resulted in interpretation inconsistencies that have affected public and private projects.
- *Limited Code compliance measures*. Currently, Gresham's Code Compliance Division does not have a clearly defined Code enforcement process for tree issues and lacks resources to properly administer and translate Code requirements on the ground.
- *Inconsistent tree removal and replacement process*. The tree Code provides limited language to specify replacement and mitigation requirements, resulting in concerns that the benefits offered by trees – and especially by mature trees – may be permanently lost with removal. Limited code language exists to support the City's tree fund mitigation tool.
- *Limited protections for large-canopy trees with high community value*. Studies show that large trees have significantly more value than smaller trees. In Gresham, that has raised questions about whether the City's current minimum size for regulated trees is too small.

Several of the Development Code issues discussed in this section are expanded upon in the November 2009 Urban Forestry Issues and Opportunities White Paper, included in Appendix J of the UFMP. The Development Code issues described in the White Paper are organized under three headings: 1) standards related to tree regulations; 2) Code compliance; and 3) public tree management.