URBAN FOREST

MANAGEMENT PLAN

WILSONVILLE, OREGON

NOVEMBER | 2021

WILSONVILLE OREGON

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WILSONVILLE, OREGON

ACKNOWLEDGMENTS

A special “thank you” to community members and all who participated in this planning process. We appreciate your time and input.

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A VISION FOR WILSONVILLE'S URBAN FOREST

Healthy Trees, Healthy Wilsonville. Wilsonville's urban forest is a thriving and sustainable mix of tree and understory species and ages that creates a contiguous and healthy ecosystem that is valued and cared for by the City and all residents as an essential environmental, economic, and shared community asset that reinforces Wilsonville's identity and legacy as a forested, livable city.

WILSONVILLE URBAN FOREST MANAGEMENT PLAN MISSION STATEMENT

The City of Wilsonville, in partnership with the community and urban forestry consultants, completed this Urban Forest Management Plan in 2022. This Plan is a guide to maintain, protect, and enhance Wilsonville's already extensive tree canopy cover resource and the multitude of associated benefits. The Urban Forest Management Plan extends beyond maintenance and operational guidance to include a variety of long-term goals, strategies, and priorities to achieve optimal levels of urban forest management, sustainability, and equity in a comprehensive and systematic manner. Achieving the goals set forth in this Plan requires a shared commitment and partnership between the City and its community to sustain a thriving urban forest providing benefits to Wilsonville's environment, economy, and well-being for future generations.

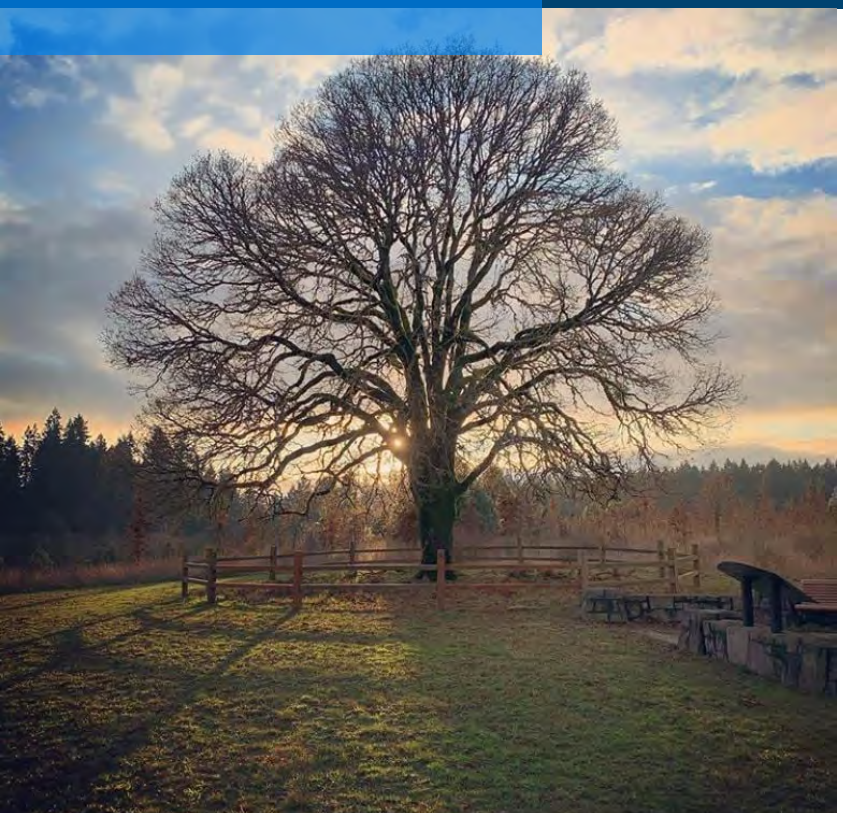

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Photo courtesy of Sandy Wilson, winner of the photo contest, November 2020

HEALTHY TREES, HEALTHY CITY

WILSONVILLE OREGON

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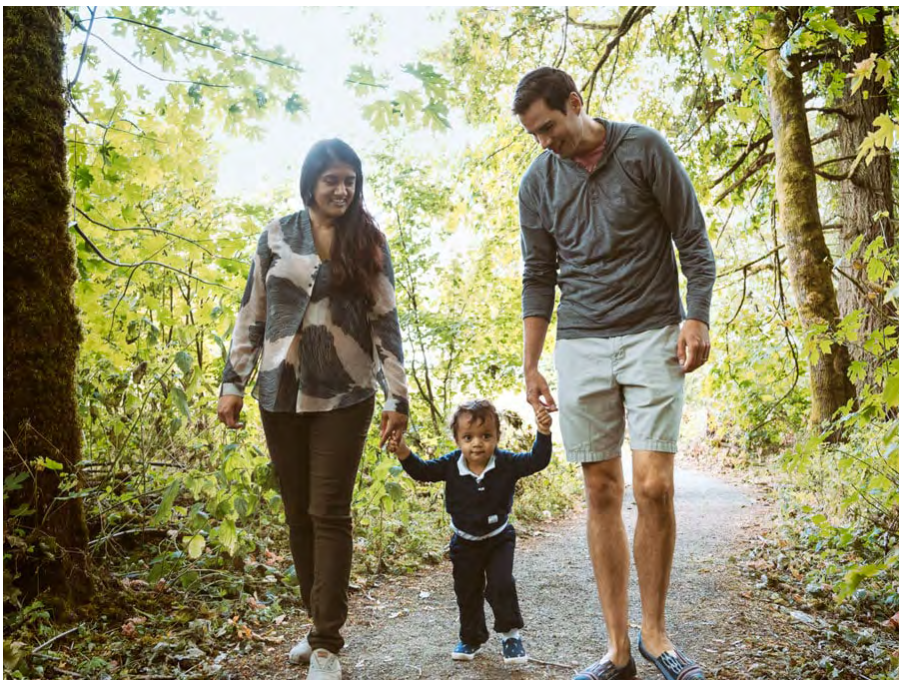
2021 Urban Forest Management Plan

EXECUTIVE SUMMARY



HEALTHY TREES, HEALTHY WILSONVILLE

Wilsonville's urban forest is a thriving and sustainable mix of tree and understory species and ages that creates a contiguous and healthy ecosystem that is valued and cared for by the City and all residents as an essential environmental, economic, and shared community asset that reinforces Wilsonville's identity and legacy as a forested, livable city.

Photo courtesy of "Rene", photo contest contestant, November 2020

WILSONVILLE'S URBAN FOREST TODAY

Wilsonville's urban forest is a thriving, constantly evolving blend of native and ornamental (or planted) trees located throughout the community that citizens cherish and which provides a unique sense of place rich with natural beauty defining Wilsonville's identity.

Wilsonville's location in the north Willamette Valley, along the banks of the Willamette River result in a beautiful landscape that blends mature native Oregon white oak specimens that have been incorporated into the fabric of the community with the planted trees that are part of the development of the city over the past 50 years. Together, these elements combine to create the City of Wilsonville's urban forest.

The numerous creeks traversing the City are lined with large stands of native coniferous trees, mostly Douglas-fir, that create unique wildlife habitat, shade creeks and provide picturesque backdrops to many of the community's neighborhoods. The planted trees are a unique mix of species that line streets, enhance parks and shade shopping and employment areas with canopy providing visual interest and seasonal beauty through a diverse mix of species. Many cultivated varieties of oak, maple, ash and linden, amongst others, come together to create the dynamic and evolving urban forest we know and appreciate today.

The City has a vibrant urban forest that continues to be created, modified, and removed primarily by people, and sustaining it will require ongoing human intervention. The goal of this intervention is a sustainable urban forest— an urban forest that optimizes the benefits of trees while meeting established safety and economic goals. Achieving this requires robust management, diverse funding, adequate staffing, effective policies, and maintenance actions consistent with best practices.

The urban forest offers many benefits, some of which are directly identifiable and quantifiable, and others that are experienced. Recognition of the role urban forests play in improving human health and well-being in addition to being critical climate change mitigators continues to increase.

An analysis of the total street and public tree population valued the ecosystem services and benefits at an estimated $35.5 million annually. The trees that have been inventoried in the City (25,950 trees) provide an annual value of over $1.9 million. Most notably, these inventoried trees prevent over 4.6 million gallons of stormwater runoff annually by intercepting precipitation. The function and structure of the inventoried tree population results in a replacement value of over $46.4 million as of 2020. The City's legacy of trees continues to grow and caring for this asset is an important part of maintaining a sustainable and vibrant city.

This Urban Forest Management Plan is the City's first of its kind. This Plan will set the stage for future actions and efforts that will ensure the long-term health, management and success of the trees that comprise the urban forest. In the Plan, two specific focus areas were analyzed, the Town Center area and the Charbonneau District. In Town Center, a recently adopted master plan (2020) envisions redevelopment of significant portions of the area. Redevelopment will be dependent on understanding the health and condition of the existing trees so the City can determine what to incorporate into the next generation of projects in the Town Center. In Charbonneau, the focus of the study area is the over 800 mature northern red oaks that line French Prairie Drive. These trees are a defining element of the Chabonneau community and have become very large, presenting challenges with existing infrastructure and improvements. Balancing the needs of this red oak population with the needs of the residents of the Charbonneau community is a focus of the Plan.

Over the past year, the community has experienced extreme weather events that are an indication of global climate change. Massive scale fire events in the area to the south over the summer of 2020 were followed by a devastating ice storm in the winter of 2020 that took a significant toll on the urban forest as a whole. Interns were hired in the summer of 2021 to update the citywide inventory of 2018 to determine what trends could be observed so that adjustments to the management of the City's urban forest could take place.

In August 2021, the interns completed a report about the update to the 2018 Street Tree Inventory. Many trees were destroyed, or damaged beyond recovery, during the winter storm, and the report provides a comprehensive analysis of the tree loss and insight into the characteristics of those trees that suffered damage. Results from the updated Street Tree Inventory provide a unique opportunity to quantify and assess the resilience and vulnerability of Wilsonville's urban forest.

PUBLIC ENGAGEMENT PROCESS

Prior to the development of the City of Wilsonville's Urban Forest Management Plan, the Program Manager of the City's Natural Resources Program and supporting staff worked with City departments, partners, and the community to identify the needs of the urban forest. To inform the Plan, a series of meetings and interviews were conducted with 13 City staff representing three departments and six divisions for a comprehensive understanding of urban forest management workflows, strengths, challenges, and priorities. In addition, traditional and non-conventional stakeholder engagement occurred throughout the planning process.

The public engagement sessions consisted of virtual public meetings, two online surveys (~100 participants), news articles, social media posts, content sharing on *Let's Talk, Wilsonville!*, and a photo contest where nearly 90 photos from the public were submitted.

Feedback received through these efforts was used to produce a draft Plan with a shared vision for the urban forest. The team then shared draft goals, strategies, and actions with City staff, key stakeholders, and the citizens of Wilsonville to ensure initial input was accurately captured. The team received specific feedback related to managing the urban forest for extreme weather events such as the February 2021 ice storm, consistent and inclusive outreach to all neighborhood groups, and tree preservation and removal guidance in the project's focus areas of Town Center and Charbonneau.

Action priorities were developed to provide technical guidance for City departments that are relevant, accessible, and tangible to the community.

MANAGING THE URBAN FOREST

The urban forest is comprised of trees across the City landscapes with varying ownership, maintenance responsibility, and authority. The table below provides an overview of the tree types and respective maintenance responsibility.

Table 1. Trees comprising the urban forest and the maintenance responsibility

	Tree Type	Public Trees	Street Trees	Private Trees	**Maintenance Responsibility**
Locations	**Definition**	Trees maintained by the City	Trees in the public right-of-way	Private property trees	City (C) or Property Owner (P)
Public Parks & Open Space		X	O	O	C
Rights-of-Way		/	X	O	C/P
Public Properties		X	O	O	C
Private Property		O	O	X	C/P (City oversight on development)

X = Yes; O = No; / = Partly or Some

Primarily, the City maintains public trees within public parks and open space, on public properties, and some trees within the public rights-of-way. The City only oversees private trees for development projects. In most cases, private property owners maintain street trees in the public rights-of-way and on private property. Currently, the City has an inventory consisting of street and public trees. This shared responsibility demonstrates the need for coordinated efforts and cooperation guided by the Urban Forest Management Plan.

The City has a diversity of existing policies, programs, regulations, and incentives that are used to manage Wilsonville's urban forest. Three City departments are engaged in Wilsonville's urban forest planning effort to provide important expertise, perspective, and resources to this commitment. The management of the City's public tree population is funded by nearly $272,000 (2020) and is overseen by experienced and qualified personnel. The City urban forestry team within the Community Development Department, Public Works, and Parks and Recreation departments plants and cares for public and City-owned street trees, provides free trees for residents through partnering organizations, protects and restores forested parklands, manages public park and open space trees on over 1,500 acres, regulates the removal of trees, and promotes stewardship of the urban forest. Interdepartmental coordination is essential for effective management and consistent delivery of urban forestry programs.

Wilsonville's urban forest is a diverse ecosystem consisting of young and mature trees of varying species, function, and associated benefits.

Figure 1. Map of trees inventoried in Wilsonville

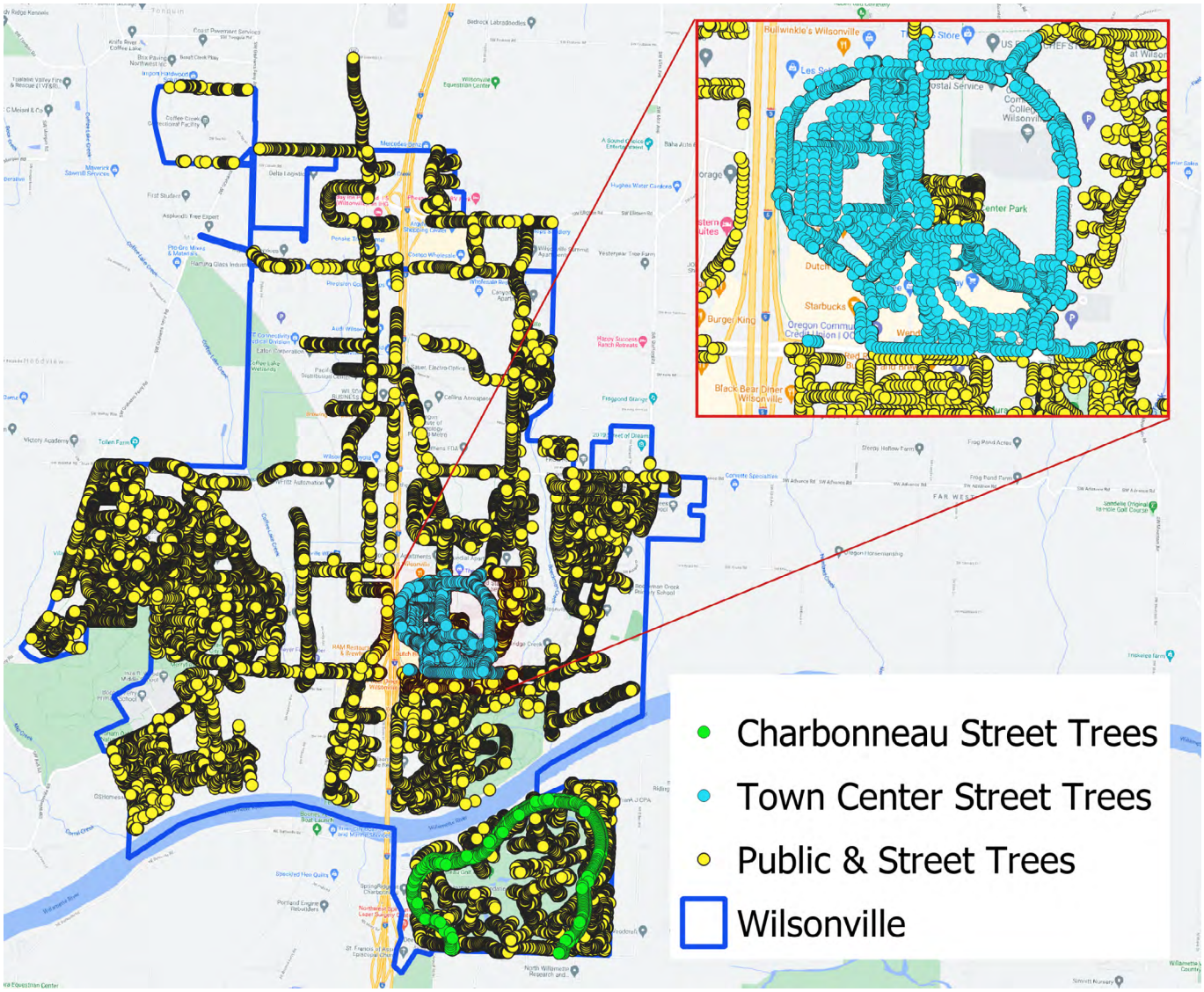
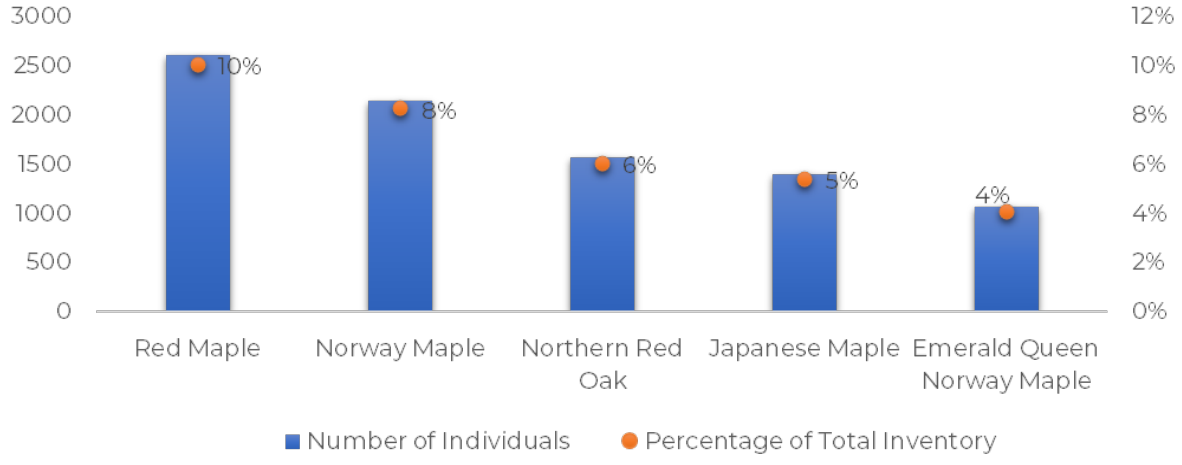


Figure 2. Most common street and public trees in Wilsonville



PLANNING THE URBAN FOREST

The planning process consisted of two phases; the needs assessment summarized in the Research Summary and the goal and action framework in this Urban Forest Management Plan. The first phase establishes a baseline from which short- and long-term strategies can be developed and monitored over time. The needs of the urban forest and the programs that manage it were evaluated through an audit of existing conditions and operations to establish a baseline from which progress can be measured. This diligent approach to Wilsonville's urban forest management gauges the City's readiness and available resources to achieve optimal levels of urban forest management and sustainability. Through this phased approach, a comprehensive understanding was gathered of the urban forest, the programs that manage it, and the community that benefits from and shapes it to inform strategic goals and actions.

The main tenets of this Plan focus on ensuring public safety, increasing operational efficiencies, facilitating short- and long-term sustainable urban forest planning, validating budgets and programs, ensuring equitable distribution of green resources and services, and standardizing methodology for asset management of the urban forest.

The Urban Forest Management Plan adheres to the following guiding principles:

- Recognize that the trees of the urban forest are more than aesthetic enhancements.
- Recognize trees as the backbone of the urban ecosystem and an essential part of the community's green infrastructure.
- Promote the health and growth of the urban forest by following scientifically established best management practices for tree selection, planting, watering, and pruning.
- Promote a robust urban forest through policies and practices that reduce its vulnerability to known diseases or pest infestations, and future threats, including the anticipated effects of climate change.
- Engage in a continuous process of long-range planning for the growth and maintenance of the urban forest.
- Promote public appreciation of the urban forest through educational outreach programs.
- Support local businesses, institutions, organizations, and individuals in their efforts to grow and maintain the urban forest through community education.
- Proceed in a manner that is inclusive and transparent.

URBAN FOREST MANAGEMENT PLAN GOAL FRAMEWORK

The City's project team consisting of Wilsonville Community Development Department's Natural Resources Program staff and urban forestry consultants developed a set of diverse, comprehensive goals to guide urban forestry work. These goals were informed by an inclusive engagement process with the community and stakeholders undertaken throughout the planning process. The results of these efforts are a series of urban forestry goals to address the resource, the programs, and the people.

Urban Forest Management Plan Vision

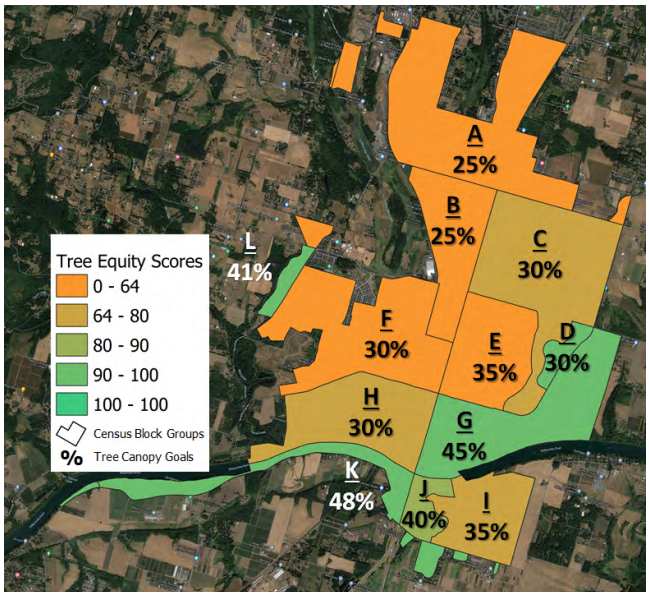
Healthy Trees, Healthy Wilsonville. Wilsonville's urban forest is a thriving and sustainable mix of tree and understory species and ages that creates a contiguous and healthy ecosystem that is valued and cared for by the City and all residents as an essential environmental, economic, and shared community asset that reinforces Wilsonville's identity and legacy as a forested, livable city.

Supporting the Vision: Wilsonville's Tree Canopy and Equity Goal

Tree canopy is a valuable component of Wilsonville's urban ecosystem and expanding the urban forest is part of the solution to the City's social, environmental, and economic concerns— it is integral to enhancing public health programs, increasing land values and local tax bases, providing job training and employment opportunities, reducing costs of city services, increasing public safety, improving air quality, offsetting carbon emissions, managing stormwater runoff, and conserving energy. To achieve the vision for the urban forest, the City has established a goal to increase its tree canopy coverage by 6 percent— up from 30 percent currently— over a 25-year timespan or "36 percent by 2046" ("36 by 46").

To reach this goal, approximately 27,000 new trees need to be planted over the 25-year timeframe while preserving the City's existing urban tree canopy cover. The goal of 36 percent canopy and 27,000 new trees is based on a variety of factors including species diversity, urban forest benefits, maintenance responsibility, and an equitable distribution of tree canopy. In turn, the 27,000 trees will add annual benefits of nearly $351,000 and improve tree equity across the City, bringing all Census Block Groups to a Tree Equity Score of at least 75 (out of 100) according to the American Forests' Tree Equity Score Tool (TES, TreeEquityScore.org). This Citywide goal to increase tree canopy cover and tree equity is initially based on the amalgamation of Tree Equity Scores for each of the Census Block Groups (CBGs) in Wilsonville. The CBGs in Wilsonville do not encompass the entire City land area. Therefore, this Plan recommends the City conduct further analyses such as a high-resolution Urban Tree Canopy assessment to refine the data and finalize tree canopy and equity goals (Action MP.03).

Figure 3. Tree Equity Scores for Wilsonville's Census Block Groups were used to establish the City's 36% canopy goal



Urban Forest Management Plan Goals

Supporting the vision and the overarching canopy goal of 36 percent canopy by the year 2046 are a series of urban forestry goals. These strategic goals were derived from the outcomes of the planning effort involving

City staff and stakeholder engagement and extensive analyses of the urban forest. The following items are not listed by any particular priority or order.

1

TREE MANAGEMENT POLICY (MP):

The City's urban forest policies are the foundation for preserving the environmental benefits, management, and character of Wilsonville's urban forest.

2

CAPACITY, TRAINING, AND AUTHORITY (CT):

Wilsonville has the capacity and expertise to provide optimal levels of service for sound urban forest management.

3

ASSESSMENTS AND PLANS (AP):

A thorough understanding of the urban forest ensures data-driven decisions, sustainable and comprehensive planning, and amplified tree benefits.

4

COMMUNITY ENGAGEMENT (CE):

Sustainable urban forest management and equity is achieved through a partnership with the City and its residents resulting in improved well-being, human health, and local economies.

5

GREEN ASSET MANAGEMENT (GA):

Wilsonville proactively manages the public trees, continues to grow and expand a healthy canopy, effectively mitigates storm damage, maintains public safety, and optimizes urban forest benefits.

Strategic actions were developed in each goal area to reach desired outcomes. Tree Management Policy actions address collaboration, strengthening of policies, sustaining canopy and achieving planting targets, and stewardship of the resource. Capacity actions relate to planning, training, and service levels and actions to address the Assessments and Plans goal, which include inventories, assessments, and plans to inform management. Community Engagement actions include a focus on enhancing community engagement through outreach, education, and partnerships. Green Asset Management actions address programs and services to effectively manage the urban forest for the long-term.

Photo courtesy of Susan Reep, UFMP photo contest contestant, November 2020

ACTION AGENDA

The action agenda outlines the steps that the City of Wilsonville and community partners will take to implement the Urban Forest Management Plan over a 25-year planning horizon. The action agenda was informed by the inclusive engagement process consisting of key stakeholders and the public at large. Departmental work plans for Plan implementation will provide additional details on those aspects of the urban forest that each department can manage. For example, the Community Development Department is responsible for ensuring street trees are planted as part of a Capital Improvement Project or a development project and the Public Works Department oversees the replanting and maintenance of City-owned street trees.

City government will continue to perform key ongoing, urban forestry work including:

- Planting trees within Wilsonville and administering the City's tree-related policies to support a Citywide tree canopy goal.
- Developing plans and strategies to manage the urban forest on City of Wilsonville natural landscapes and properties.
- Removing invasive plants from Wilsonville's forested areas.
- Coordinating departmental work and collaborating on urban forestry Citywide efforts.
- Updating initiatives and regulations in support of Wilsonville's urban forest.

The actions provided in the Plan build on the ongoing work and will be the focus of implementation throughout the 25-year horizon. Successful completion of all actions in this Plan will require additional staffing and resources that should be secured using the supporting studies such as the Funding Mechanisms and Existing and Potential Urban Forestry Partners in the appendices.

City departments will continue to support urban forestry efforts with available funding. The action items listed in the Plan could help expedite the recovery of Wilsonville's most vulnerable communities by increasing tree canopy cover and urban forestry services but the urban forestry planning team is aware of the challenging times ahead. As economic recovery takes place following the 2020 pandemic and additional funding becomes available, the urban forestry planning team recommends that new funding be prioritized toward the following efforts:

- Ongoing funding for tree and natural area crews to maintain the urban forest.
- Continuing to perform urban forest assessments to inform management.
- Leverage existing planning, outreach, partners, and engagement efforts in focus areas to achieve common goals.

> "Urban trees and forests are considered integral to the sustainability of cities as a whole. Yet, sustainable urban forests are not born, they are made. They do not arise at random, but result from a community wide commitment to their creation and management."
> **CLARK et al., 1997, *A Model of Urban Forest Sustainability***

HEALTHY TREES, HEALTHY CITY: CALL TO ACTION

Urban forests are an important green infrastructure asset for communities across Oregon. However, the capacity of urban forests to support healthy and resilient cities is constrained and challenged by stressors such as climate change impacts including extreme weather events, urban development pressures, altered soils, exotic tree pests and diseases, and invasive species. Now more than ever there is a critical need to sustain large, healthy, genetically appropriate trees on public and private land through long-term planning and budgeting, inclusive decision-making, and strategic policy development that supports adaptive management. Thus, comprehensive urban forest support must extend well beyond tree planting initiatives.

Management of urban forests is often considered the sole responsibility of municipal governments. In reality, responsibility should also be shared by private citizens, community groups, and other partners. All of these groups have important roles to play. Successful management frameworks must recognize that the urban forest is part of a complex system that includes the built environment, and is influenced by human activities and policies and practices that shape Wilsonville's urban areas. Furthermore, decision-making must be made in the context of future uncertainty associated with climate change. Wilsonville's Urban Forest Management Plan ("Plan") provides the framework and road map for efficient, sustainable, and equitable urban forestry practices.

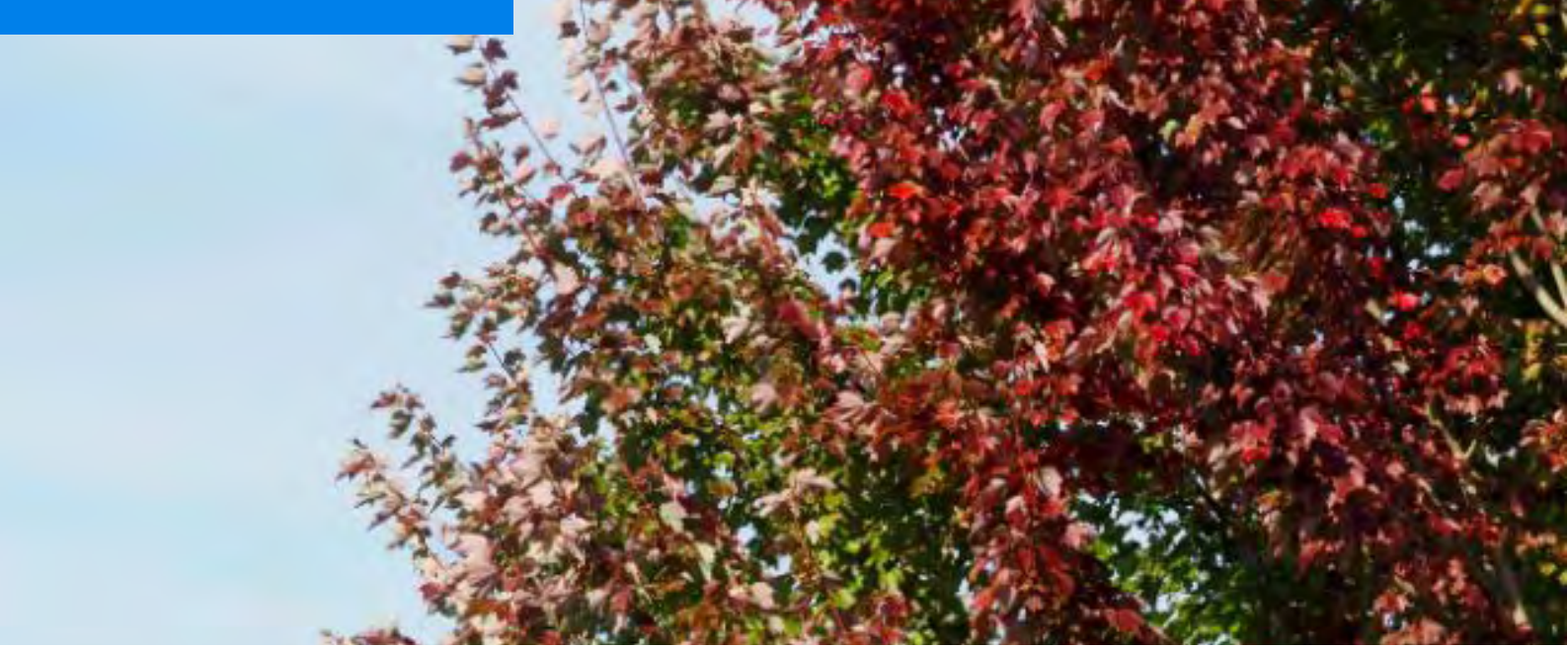
This coordinated planning effort— led by the City's staff, stakeholders, and consultants— included an updated inventory of public trees in the Town Center and Charbonneau focus areas to inform management, tree maintenance and removal priorities, tree replacement strategies, and policies and procedures for tree preservation. This Plan also provides specific guidance relating to the urban forest and extreme weather events.

In February of 2021, the City experienced a winter storm causing thousands of power outages, hundreds of downed trees and limbs, and property damage. The City and the community quickly jumped to its feet by clearing roads, removing tree debris, and restoring power. From this event, the City's Emergency Management Program strengthened its protocols relating to City trees and this Plan provides additional guidance for the City to be even more prepared and resilient to extreme weather events (see Appendix I).

In the update to the 2018 Street Tree Inventory, data was gathered about the current condition and status of Wilsonville's street trees. One of the more concerning findings was the number of trees damaged by the ice storm or subsequently removed because of the event, which included 1,100 trees or 4% of the trees inventoried in 2018. Tree species that suffered the most storm damage included paper birch, cherry plum, silver birch, Raywood ash, and scarlet oak.

This planning effort consisted of ongoing community engagement through press releases, public surveys, newsletters, community meetings, photo contests, website content, and social media to educate and gather viewpoints and feedback as it relates to the trees in Wilsonville. From these engagement activities, the vision for the urban forest was identified, key concerns were uncovered, strategies were developed, and a shared commitment to the urban forest resource was fostered.

From this shared commitment between the City and property owners, the vision and goals for Wilsonville's urban forest can be achieved. Reaching and sustaining the urban forest vision will require ongoing monitoring, analysis, and reporting of this Plan to keep urban forest partners involved and focused on accomplishing the actions. The Plan should be a living document that is updated as changes occur to the resource and other planning efforts. As the Plan is updated, it should continue to serve as a road map with strategic priorities and recommended actions to assist the City and stakeholders in their efforts to grow, protect, and sustain a healthy urban forest for all residents and future generations.



URBAN FOREST

MANAGEMENT PLAN

HEALTHY TREES, HEALTHY CITY

WILSONVILLE
OREGON

PLANIT GEO™
mapping a greener future

EXECUTIVE SUMMARY

INTRODUCTION AND BACKGROUND

The City of Wilsonville, in spearheading this Urban Forest Management Plan (UFMP or Plan), recognizes its trees as one of its most valuable resources and shows that it is dedicated to the preservation, proper maintenance, and continued enhancement of their urban forest. The trees throughout Wilsonville are an asset that bring value and benefits to the community: increased property values, heightened environmental benefits and enhanced quality of life are just a few examples of the benefits that the urban forest provides for all of Wilsonville's community members. Implementation of this Urban Forest Management Plan is an excellent opportunity to strengthen the City's urban forest through proper management of this valuable resource.

As is the case with most urban areas, the trees that make up the urban forest in Wilsonville suffer from the severity of urban life, including pests and diseases, the current and changing climate, air pollution, compacted soils, limited growing spaces, and limited resources. In order to overcome such harsh conditions for the City's trees and reap the benefits of these most valuable assets, the care of the urban forest must be strategically and efficiently planned and cared for.

This Plan aligns with the City's Comprehensive Plan updated in 2020 by recommending adequate tree management levels, potential increases in staffing and funding, applying input from the community, and recommending changes to tree-related policy. Adequate tree management includes efficient and effective tree care, bolstered tree plantings to maintain age and species diversity in the public tree population, the preservation and enhancement of canopy coverage Citywide to enhance the character and aesthetics of neighborhoods, and exemplary stewardship of the forest from all who live and work in Wilsonville. The Plan must be regarded as both a long-range policy guide and a living document that will respond to changing conditions over its life. It requires a close partnership between policy makers, staff, and the community. Adoption of this Plan enables the City to accomplish these objectives.

Photo Courtesy of Friends of Trees

DEFINING THE URBAN FOREST

> "Urban forestry can be defined as the art, science, and technology of managing trees and forest resources in and around community ecosystems for the physiological, sociological, economic, and aesthetic benefits trees provide to society."
> **HELMS, 1998**

Any inhabited area that has trees and vegetation is considered a community forest though more urbanized communities often refer to this resource as an urban forest. Based on Wilsonville's population density, tree population, and the public interaction with and received benefits from trees, Wilsonville's resource is referred interchangeably as an urban and community forest in this Plan. The Plan focuses on the City-owned trees in public rights-of-way, trees in public parks, and street trees maintained by adjacent property owners but also has implications for the trees on private property and attention to these are addressed through community outreach and education efforts.

The concept of urban and community forest management developed in the 1960s out of the death and devastation of the elm tree population throughout the United States due to Dutch Elm disease. The discipline of urban forestry strongly advocates for species and age diversity in a city's tree population so that the elm tree devastation of the 1960s does not happen again. Unfortunately, native and invasive pests and diseases continue to spread.

During the last three decades, urban forestry has evolved as researchers and practitioners learn more about the structure and function of trees and their unique role in providing environmental, economic, and social benefits to urban areas. Urban forestry provides each of these benefits in differing circumstances—as infrastructure, as part of design and development, and as efficient and productive providers of economic development.

Residents traditionally have indicated that they consider the trees in the community a priority. In urban environments, street and park trees are sometimes the only day-to-day interaction with nature that many residents may enjoy. As Wilsonville continues to grow, the urban forest needs a strong advocate. This will happen with the education and support of the City's constituency, staff, and elected officials informed by an approved Urban Forest Management Plan. The urban forest is unique in the array of benefits it provides to the community, and a management plan effectively collects and showcases these values.

While a management plan is useful in helping educate and ensure future viability, it also establishes useful parameters for the daily operations and care of the urban forest. A fresh look at all urban forestry-related policies currently in place brings into focus what is necessary for day- to-day activities to ensure long-term viability and safety of the urban forest.

BENEFITS OF THE URBAN FOREST

The quality of life of the citizens in any community depends on the urban forest, as trees make a vital and affordable contribution to the sense of community, pedestrian-friendly neighborhoods, surface temperatures, and air quality. Wilsonville's Community Development Department and supporting departments are critical to meeting the City's commitment to climate change mitigation and adaptation, carbon sequestration, stormwater reduction, wildlife habitat enhancement, and water conservation. Trees are one of the few infrastructure investments that, if properly maintained, will grow in value over time. The Plan provides an assessment of these benefits and services and the actions necessary to sustain and enhance them.

Note: The following data was derived from the Alliance for Community Trees.

Clean the Air and Breathe Easier

Shade trees reduce pollution and return oxygen to the atmosphere. In addition to carbon dioxide, trees' leaves or needles absorb pollutants, such as ozone, nitrogen dioxide, sulfur dioxide, and some particulate matter.

Save Energy and Lower Energy Costs for Buildings

As natural screens, trees can insulate homes and businesses from extreme temperatures, keep properties cool, and reduce air conditioning utility bills. A 20 percent canopy of deciduous trees over a house results in annual cooling savings of 8 to 18 percent and annual heating savings of 2 to 8 percent. By planting shade trees on sunny exposures, residents and businesses can save up to 50 percent on hot-day energy bills.

Positively Influence Climate to Ensure Sustainability

Trees absorb carbon dioxide and store carbon in wood, which helps to reduce greenhouse gases. Carbon emissions from vehicles, industries, and power plants are a primary contributor to increased air temperatures in metropolitan areas. Trees in the United States store 700 million tons of carbon valued at $14 billion with an annual carbon sequestration rate of 22.8 million tons per year valued at $460 million annually.

Reduce the Need for Street Maintenance

Shaded streets last longer and require far less pavement maintenance, reducing long- term costs. Canopy diminishes pavement fatigue, cracking, rutting, and other damage. A study from University of California at Davis found that 20 percent shade cover on a street improves pavement condition by 11 percent, which is a 60 percent savings for resurfacing over 30 years.

Raise Property Values

Trees are sound investments, for businesses and residents alike, and their value increases as they grow. Sustainable landscapes can increase property values up to 37 percent. The value of trees appreciates over time, because the benefits grow as they do. For businesses, trees have added value, including higher revenues. Shoppers seek out leafy promenades that frame storefronts. Research shows that shoppers spend more—between 9 and 12 percent more—on products in tree-lined business districts.

Conserve Water and Soil

A tree's fibrous roots, extending into the soil, are premier pollution filtration and soil erosion prevention systems. Intensely urbanized areas are covered with a large number of impermeable surfaces. In contrast to an impervious hardscape, a healthy urban forest can reduce annual storm water runoff up to 7 percent. Highly efficient trees also utilize or absorb toxic substances such as lead, zinc, copper, and biological contaminants. One study estimated that eliminating the need for additional local stormwater filtration systems would result in savings exceeding $2 billion.

Cooler Pavement Diminishes Urban Heat Islands

Broad canopy trees lower temperatures by shading buildings, asphalt, and concrete. They deflect radiation from the sun and release moisture into the air. The urban heat island effect is the resulting higher temperature of areas dominated by buildings, roads, and sidewalks. Cities are often 5° to 10°F hotter than undeveloped areas, because hot pavement and buildings have replaced cool vegetated land. In addition, high temperatures increase the volatility of automobile oil and oil within the asphalt itself, releasing the fumes into the atmosphere. Shade trees can reduce asphalt temperatures by as much as 36°F, which diminishes the fumes and improves air quality.

Protect Wildlife and Restore Ecosystems

Planting and protecting trees can provide habitat for hundreds of birds and small animals. Urbanization and the destruction of valuable ecosystems have led to the decline of many species. Adding trees, particularly native trees, provides valuable habitat for wildlife.

Build Safe Communities and Decrease Crime

Police and crime prevention experts agree that trees and landscaping cut the incidence of theft, vandalism, and violence by enhancing neighborhoods. Thriving trees on well-maintained streets indicate pride of ownership. Public housing residents with nearby trees and natural landscapes reported 25 percent fewer acts of domestic aggression and violence. Apartment buildings with high levels of greenery had 52 percent fewer crimes than those without any trees. Buildings with medium amounts of greenery had 42 percent fewer crimes.

Calm Traffic and Make Neighborhoods Safer and Quieter

People drive more slowly and carefully through tree-lined streets, because trees create the illusion of narrower streets. One study found a 46 percent decrease in crash rates across urban arterial and highway sites after landscape improvements were installed. The presence of trees in a suburban landscape reduced the cruising speed of drivers by an average of 3 miles per hour. Faster drivers and slower drivers both drove at decreased speeds in the presence of trees. Trees reduce noise pollution, buffering as much as half of urban noise. By absorbing sounds, a belt of trees 100 feet wide and 50 feet tall can reduce highway noise by 6 to 10 decibels. Buffers composed of trees and shrubs can reduce 50 percent of noise.

Reduce Stress and Improve the Quality of Life

Neighborhoods with generous canopies of trees are uplifting and good for public health. Greater contact with natural environments correlates with lower levels of stress, improving performance. Students' concentration levels go up when they are able to look out onto a green landscape. Studies show that children with attention deficit disorder function better after activities in green settings. A green environment impacts worker productivity. Workers without views of nature from their desks claimed 23 percent more sick days than workers with views of nature. Residents of areas with the highest levels of greenery were 3 times as likely to be physically active and 40 percent less likely to be overweight than residents living in the least green settings.

KEY ISSUES FACING URBAN FORESTS

The City of Wilsonville has a unique urban form and character. Its size, layout, and development density influence the landscape and has created a charming and livable city. Wilsonville's citizens show pride in their city, and their neighborhoods are well cared for. The City's climate is ideal for a wide range of plants and street trees and many of the City's streets and landscapes exhibit a unique and rich planting character. Some of the City's historic neighborhoods and its newest developments have a rich urban forest that illustrates Wilsonville's commitment to be a tree-filled city guided by a strategic plan.

Cities around the world, and specifically in the Willamette River Valley face dramatically intensifying extreme weather and climate impacts including drought, frequent storms, flooding, and an increase in sustained high temperatures. In many instances, these impacts are already exceeding the designed capacity of city infrastructure to protect the health and safety of residents, businesses, and neighborhoods, which in turn threatens the fiscal viability of cities and regions. Urban trees can play a significant role in making cities resilient to weather and climate extremes, and in protecting human and ecosystem health and safety. To do so, trees must be consciously selected, planted and managed as the central component of an urban forest where individual trees are managed as part of a greater system with the purpose of improving the urban environment and enhancing benefits.

Yet the ability of urban trees and urban forests to achieve desired benefits is often drastically limited due to poor maintenance and management stemming from insufficient municipal budgets, lacking urban forest management systems and programs, limited training of tree care professionals, and a lack of enforcement of tree-management best practices to support tree health. Consequently, long-term tree health is compromised in many cities, resulting in limiting the beneficial functions of trees, leaving trees more susceptible to pests and disease, and leading to premature tree death. The impact of this is compounded for disadvantaged communities. As stated by Jad Daley, president and CEO of American Forests, "The single greatest threat from climate change to people in cities is extreme heat."

In turn, urban trees face multiple challenges to surviving and thriving. Trees that die years prematurely will not create the root systems and canopies needed to reach their benefit potential and maximize their return on investment. Planting and maintaining an urban forest that exists in concert with other green infrastructure must include management by trained individuals, the use of tree inventory data, an understanding of baseline conditions and forecasted environmental changes, collaboration among departments to mainstream urban forest management, a community with a shared vision for the urban forest, and a roadmap for management provided in a plan.

These issues are exacerbated in lower income communities with limited resources. The City needs a comprehensive plan to preserve and expand the urban forest which results in an equitable distribution of tree canopy, associated benefits, and urban forestry opportunities. The City, its partners, and the community support a plan for the urban forest that sustains the resource and provides benefits to all who live, work, and recreate in the City.

To address these challenges, the Urban Forest Management Plan offers Wilsonville an opportunity to study, evaluate, and plan for improving urban forest management toward the goal of supporting human and ecosystem health and well-being. The urgency of protecting the urban forest has risen sharply as drought, pests, disease, climate impacts and budget cuts lead to rapidly rising tree mortality. To address and reverse tree die-off and the loss of ecosystem benefits, Wilsonville needs a robust system of professional management and resident engagement for the care and expansion of the urban forest.

WILSONVILLE'S URBAN FORESTRY BACKGROUND

Located just south of the Portland metro area and along the banks of the Willamette River, Wilsonville started as a small farming community but has quickly grown to become an important bridge between its urban neighbors to the north and a gateway to the agriculturally rich Willamette Valley to the south. The Willamette Valley region of Oregon is an area known for its natural beauty and agricultural history. As such, the City is focused on preserving the natural environment while supporting sustainability through a range of strategies such as the Comprehensive Plan and this Urban Forest Management Plan, in an effort to grow and improve the health of the urban forest.

Regarding maintenance of the City's urban forest, it is a shared responsibility between Wilsonville property owners and the Public Works and Parks and Recreation departments to maintain trees on City streets, parks, and maintained facilities. Wilsonville's Community Development Department, leading this Plan effort, contributes to public health, safety, and quality of life for residents and visitors of the City by managing the urban forest. Management of the urban forest by City departments is mobilized through long-range planning and enforcement of municipal code relating to tree preservation and protection by the Community Development Department. The Public Works and Parks and Recreation departments support long-range urban forest planning by reviewing Capital Improvement Projects and development plans.

Guided by the Tree Preservation and Protection ordinance (Section 4.600), the City is responsible for the care of trees in public spaces and property owners maintain street trees though the urban forest extends beyond these areas. The preservation and growth of the Citywide urban forest canopy across public and private boundaries should be a shared commitment guided by the Urban Forest Management Plan. This Plan is the next step for the urban forestry program as the City continues to grow and evolve.

Existing City plans and efforts impact and influence Wilsonville's urban forest. The City has been recognized as a Tree City USA community for 23 years and has shown a dedication to maintaining and caring for their urban forest through their planting efforts and the care of its trees.

Table 2. City Staff involved in the planning process

Community Development	Admin	Planning	Natural Resources
Parks and Recreation	Parks Maintenance		
Public Works	Admin	Facilities	Roads & Stormwater

Elements of urban forest management are woven into the framework of City operations and the understanding of the importance of trees in an urban setting was exemplified in this planning effort. A total of 13 City staff representing three departments and six divisions participated in the development of the Urban Forest Management Plan due to their interactions with public trees within their respective programs. Other divisions involved in public tree management though not included in the planning exercises include Engineering, Building, and Parks Planning. Through this effort, City staff contributed ideas, discussed resource needs, identified efficiencies, and formulated strategies relating to their activities involving public trees. By engaging staff involved in the management and care of Wilsonville's trees the Plan was developed to mainstream urban forest management across departments to improve workflows and achieve common goals.

WILSONVILLE'S URBAN FOREST FOCUS AREAS

Two focus areas in the City were identified for closer evaluation as part of the planning effort— Town Center and Charbonneau. The City recognizes there are other focus areas and that there may be new focus areas in the future, but Town Center is experiencing redevelopment and Charbonneau has an aging population of oak trees making these areas a priority as part of this Plan. The two focus areas, Charbonneau and Town Center, were originally developed in the 1970s and 80's, respectively, and provide unique opportunities and challenges when looking at Wilsonville's urban forest. As part of the Urban Forest Management Plan project, an inventory of existing trees was completed by Certified Arborists accredited by the International Society of Arboriculture to plot the location of trees, identify the species, measure the size, assess the condition, note observations, and assign a recommended maintenance task if necessary for all trees in Town Center and along French Prairie Road in Charbonneau. The detailed assessment of these trees provided the information to develop specific actions for these focus areas.

Town Center

Town Center provides a mix of commercial and residential uses and a centrally located park. It is central to the City and serves as the heart and hub of the community at the I-5 juncture. Town Center is primarily local commercial retail and services unlike other similarly-zoned areas in the City. In 2019, the City adopted a new plan for Town Center. The goals in the Town Center plan included environmental stewardship, harmonious design, mixed uses, safe access and connectivity, community gathering places, and economic prosperity. The future vision for this focus area is described in the Town Center Plan which recognizes the creative use of landscaping including trees.

Source: Wilsonville Town Center Plan

The Urban Forest Management Plan provides an opportunity to take a closer look at the urban forest in Town Center and provide recommendations for improving its aesthetics and long-term viability. To inform the Plan, a detailed visual survey was completed for all trees in Town Center that would be suitable candidates for retention as part of redevelopment of the area. To support this effort, additional studies and analyses were completed providing guidance for tree removals, tree replacements, and tree preservation in Town Center as described in Appendix D and E.

The urban forest management actions specific to Town Center's trees are provided in the Urban Forest Management for City Focus Areas section though the following provides an overview of recommendations.

- Continue to inventory and monitor all public trees in the focus area.
- Prioritize tree maintenance and removals based on need and available resources.
- Preserve existing trees through sound policies, education, and enforcement. Use Appendix D to support tree preservation decisions.
- Develop a strategy to replace the trees recommended for removal. Use Appendix E for tree replacement guidance.
- Plant trees based on the site requirements and desired function and design using the Citywide Recommended Tree List in Appendix A.
- Continue to engage members of the community for input, feedback, and stewardship.
- Plant and preserve the urban forest to sustain the associated benefits that are shared by all in the focus area.

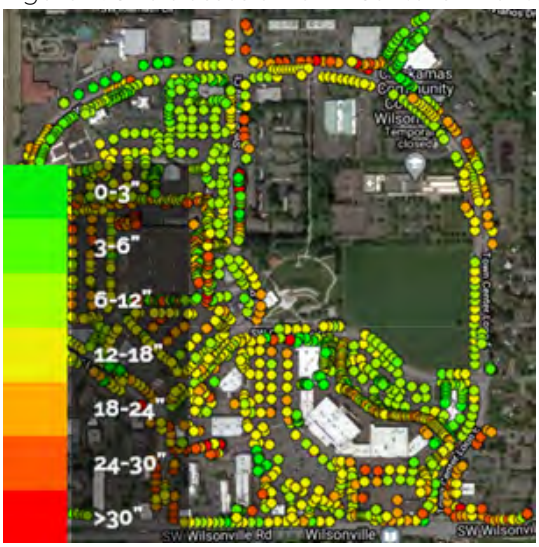
Key Findings for Town Center's Trees

Note: the following data summaries are based on the July 2020 tree inventory. These values and summaries may differ from existing conditions due to the February 2021 storm and other variables. For larger detailed maps, see Appendix D.

Total Trees Inventoried: 1,449

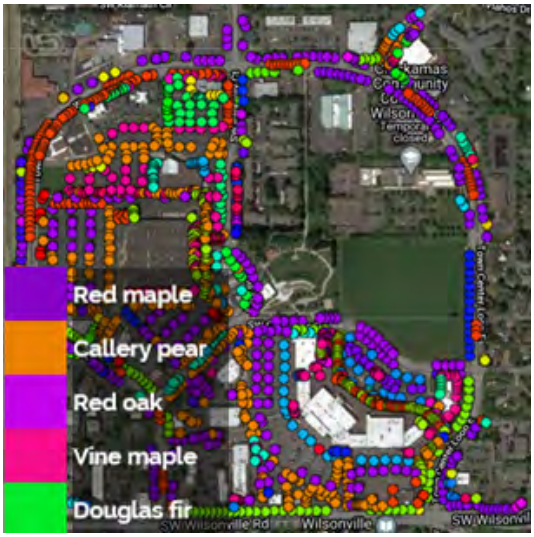
Tree Size Classes	
0-3 inches	7%
3-6 inches	11%
6-12 inches	28%
12-18 inches	34%
18-24 inches	14%
24-30 inches	5%
>30 inches	1%

Figure 4. Size classes of Town Center's inventoried trees



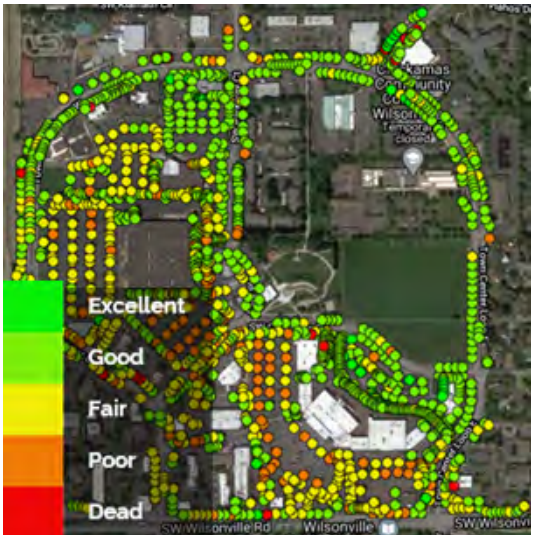
Tree Species (Top 5)	
Red maple	20%
Callery pear	19%
Red oak	11%
Vine maple	6%
Douglas fir	6%

Figure 5. Tree species in Town Center



Tree Condition	
Excellent	3%
Good	55%
Fair	31%
Poor	8%
Dead	2%

Figure 6. Condition of Town Center's trees



Charbonneau

Charbonneau, located south of the Willamette River, is one of Oregon's earliest planned communities. Within Charbonneau there is a small commercial district, 27-hole golf course, and a variety of housing types. The age, condition, and types of street trees in this community are the primary focus, as well as their relationship to the livability and aesthetics of the area.

The goals and actions in this Plan place emphasis along French Prairie Road in Charbonneau, which has over 800 mature northern red oak (*Quercus rubra*) trees in various states of health and beginning to cause damage to infrastructure in the form of decorative walls, sidewalks, paths, and home foundations. These street trees are primarily maintained by the City while other trees within the community are maintained by the HOA and Country Club. In 2014, the Charbonneau Consolidated Improvement Plan identified four utilities

Source: 2014 Charbonneau Consolidated Improvement Plan

in the community that are deficient— sewer, storm, streets, and water. The Plan provides key data and considerations for trees such as trees to preserve and recommended trees for planting as installations and repairs are planned for utilities. Understanding the health and condition of the northern red oaks informs decision-making criteria that can guide the review of tree removal requests. This Plan provides a comprehensive look at these trees, informed by an updated tree inventory, and the best way to manage them over time to avoid problems while maintaining their place in the community. Specific recommendations to address management of Charbonneau's trees are provided in the Plan's actions and supporting appendices.

The urban forest management actions specific to Charbonneau's trees are provided in the Urban Forest Management for City Focus Areas section though the following provides an overview of recommendations.

- Continue to inventory and monitor all public trees in the focus area.
- Prioritize tree maintenance and removals based on need and available resources.
- Develop a strategy to replace the aging oaks before and after removals. See Action AP.03, Appendix D, and Appendix E for guidance.
- The City should utilize tree inventory management software such as TreePlotter or the City's Cartegraph system to refine the data and prioritize removals and replacements within Charbonneau. Changes made to the urban forest should be tracked within these programs.
- Plant trees based on the site requirements and desired function and design using the Citywide Recommended Tree List in Appendix A.
- Continue to engage members of the community for input, feedback, and stewardship.
- Plant and preserve the urban forest to sustain the associated benefits that are shared by all in the focus area. All trees along French Prairie Road should be preserved unless they pose a risk— as defined by industry standards and City protocols— that cannot be mitigated without removal. Appendix G, "Trees and Hardscape Conflicts Solutions Workbook" provides guidance on evaluating trees, infrastructure, and the conflict(s) to make a decision that is consistent and transparent.

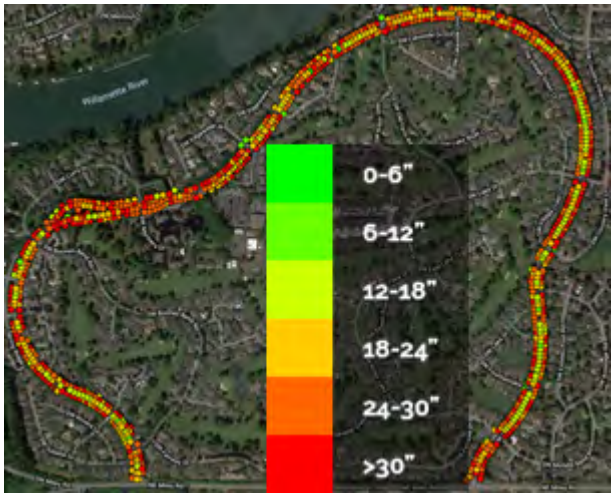
Key Findings for Charbonneau's Trees

Note: the following data summaries are based on the July 2020 tree inventory. These values and summaries may differ from existing conditions due to the February 2021 storm and other variables. For larger detailed maps, see Appendix D.

Total Trees Inventoried: 916

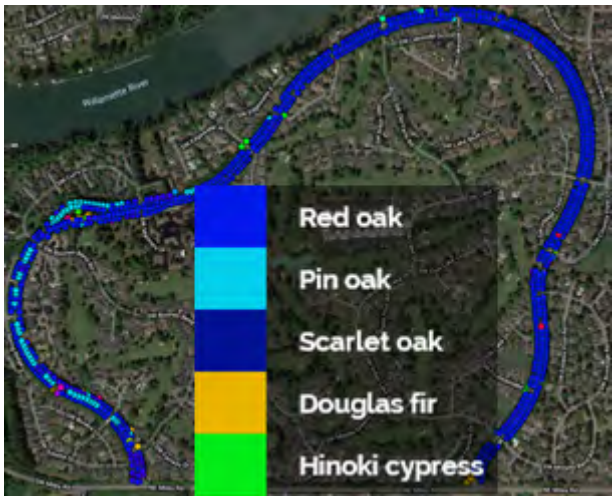
Tree Size Classes	
0-6 inches	0.3%
6-12 inches	3%
12-18 inches	12%
18-24 inches	22%
24-30 inches	32%
>30 inches	30%

Figure 7. Size classes of Charbonneau's inventoried trees



Tree Species (Top 5)	
Red oak	80%
Pin oak	7%
Scarlet oak	5%
Douglas fir	3%
Hinoki cypress	2%

Figure 8. Tree species in Charbonneau



Tree Condition	
Excellent	0.3%
Good	71%
Fair	25%
Poor	2%
Dead	1%

Figure 9. Condition of Charbonneau's trees

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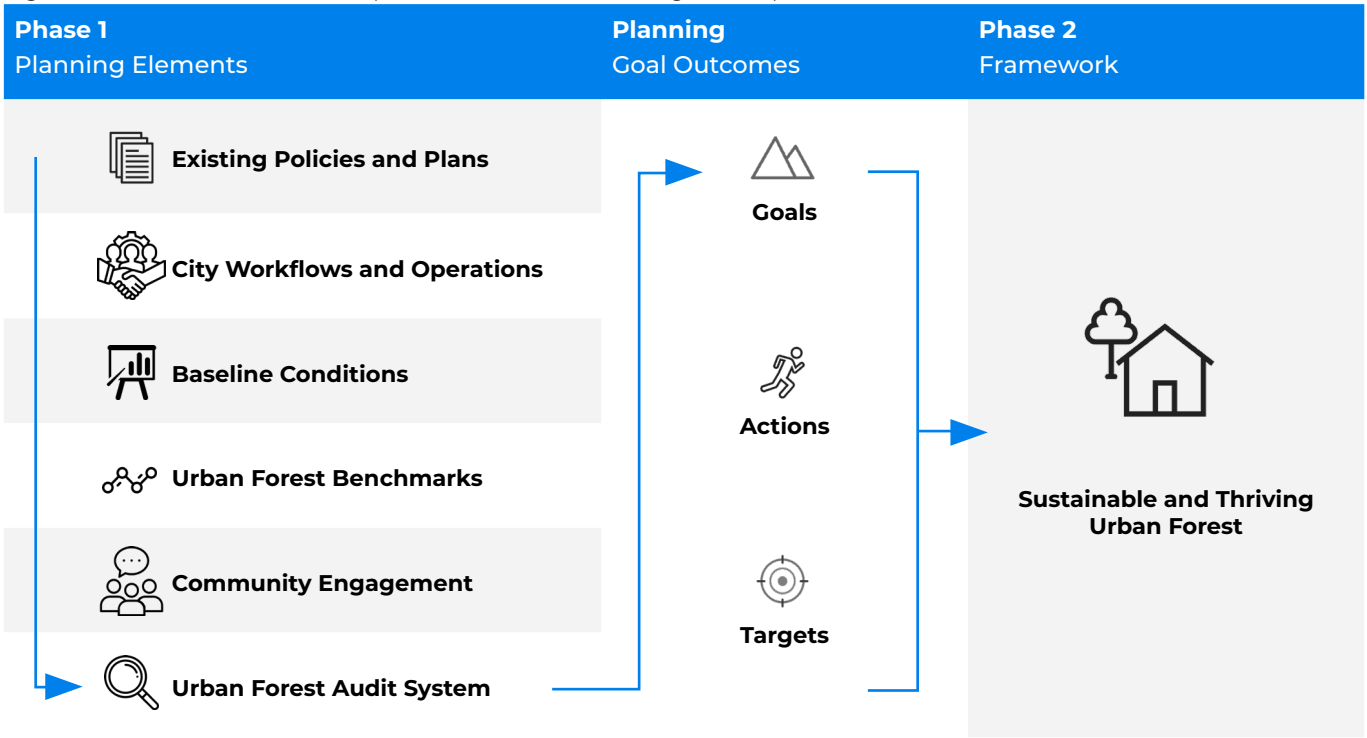
OVERVIEW OF RESEARCH

Development of the Research Summary

The systematic evaluation of the City of Wilsonville's urban forest management processes, resources, staffing, structure, and policies was conducted by completing the six planning elements: 1) Existing Policies and Plans, 2) City Workflows and Operations, 3) Baseline Conditions, 4) Urban Forest Benchmarks, 5) Community Engagement, and 6) Urban Forest Audit System. The outcomes from these planning elements were detailed in the **Research Summary to the Urban Forest Management Plan**— a comprehensive summary document that details the baseline assessment from which goals and actions were developed for this **Urban Forest Management Plan**. Additional information regarding the methodology, findings, and interpretations of the planning elements are provided in the Research Summary. The following section provides a high-level overview of these planning elements.

Figure 10. Framework to develop the urban forest management plan



EXISTING POLICIES AND PLANS FINDINGS

The purpose of this element— Existing Policies and Plans— is to gauge the City's commitment and readiness for urban forest sustainability. Evaluating the alignment and efficacy of existing policies and plans ensures a strong connection among the programs that manage the urban forest and the projects and initiatives that support them. Proper alignment of urban forestry program recommendations reduces the risk of wasting resources and enables success of key projects that support urban forestry goals. Plans cannot live in isolation, therefore, cross-examining various plans and documents may bring to light projects or initiatives that are potentially a misplacement of resources and time.

A total of 39 documents and resources were reviewed and indexed as part of the information discovery process and 218 references to urban forestry were identified. These documents included:

Primary Documents

- **Comprehensive Plan**: The City's official policy guide for future development-related decisions. It is general and long-range in nature and provides a picture of how the community wishes to develop over the next 15 to 20 years. The plan discusses the importance of tree protection, scenic value, wildlife corridors, and other aspects of urban forestry.
- **Approved Budget FY 2020-2021:** The budget document is the blueprint for financial and policy decisions implemented during each fiscal year. It also includes the staffing structure, budgets, and activities relating to City departments with a role in urban forest management.
- **City Code**: Chapters 4 and 8 of the Wilsonville City Code address tree preservation, public safety, benefits of the urban forest, tree planting, topping, arborist credentials, and the City Tree Fund, among other items.
- **Town Center Plan:** A plan for modernizing and improving Town Center. The document contains references to the importance of an UFMP in creating a more vibrant Town Center through plantings, increases tree health, and natural design elements.
- **Charbonneau Consolidated Improvement Plan:** This plan provides information regarding important tree issues in Charbonneau, including tree root damage, removals, and ADA compliance.

Supporting Documents

- Council Goals Work Plan
- Stormwater & Surface Water Design and Construction Standards
- Stormwater Master Plan
- Natural Hazard Mitigation Plan
- Parks and Recreation Master Plan
- Integrated Pest Management (IPM) Plan
- Urban Renewal Plan

CITY WORKFLOWS AND OPERATIONS FINDINGS

To gather an understanding of the departments and programs managing and influencing the public trees in Wilsonville, a series of meetings were held in 2020. A total of three different departments or offices were represented at the meetings and a total of 13 City staff members participated. The departments or offices represented include:

1. Community Development (CD)
2. Public Works (PW)
3. Parks and Recreation (PR)

Over the course of these meetings, recurring issues and resource needs were identified. The following provides an overview of these trends that supported the development of this Plan:

Table 3. Summary of the City staff meetings

MEETING THEMES	RECURRING NEEDS
A) Landscape and Maintenance	• The programs managing the urban forest could be supported by documentation of ISA Best Management Practices (BMPs) and American National Standards Institute's (ANSI) Standards along with standard operating procedures (SOP). • To address the sidewalk issues, the grant program for sidewalks could be expanded which would include more frequent and systematic assessments of sidewalks (data available in Cartegraph) along with the guidance for alternative solutions to sidewalk repair/ replacement.
B) City Code and Policies	• To support the in-house tree maintenance program, a plan to phase out the dying oaks in Charbonneau should be established along with the resources to implement. • Ensure significant trees in Town Center that are worthy of preservation are retained and incorporated into the Town Center Plan. Potential exists for using a tiered priority system based on a combination of factors such as tree size, location (land use, growing space type) species, proximity trees and relative canopy cover, growing space, longevity, function, maintenance regimen, planned development, etc.
C) Planning, Design, and Development	• Guidelines relating to the types of replacement tree species, planting goals or benchmarks by park, and watering protocols could improve efficiencies and support Citywide urban forestry efforts. These updates to the program would require additional resources and improved tracking of trees in parks and the associated maintenance and pest/disease monitoring and treatments. • To support a comprehensive tree maintenance program as recommended through industry standards, the Plan could include a budget and staffing case study as well as case studies to evaluate potential tree pruning rotations and costs of deferred maintenance.
D) Data and Information Technology	• Improvements could be made by completing an entire inventory of trees in maintained areas, especially where trees abut private property.
E) Community Outreach and Education	• The current tree maintenance program is effective but there needs to be some clarifications of responsibility shared with the community. • Similar to trees, the sidewalk repair/replacement responsibility needs to be shared with the community. Information is shared through the sidewalk program but messaging and frequency could improve. Especially as sidewalk issues continue to rise for streets developed in the 1980's and 1990's.

BASELINE CONDITIONS FINDINGS

To identify the existing conditions of the urban forest from which goals and actions can be measured, an analysis of existing tree-related datasets was completed as part of the evaluation process. These datasets included the 2018 City-wide tree inventory as well as the 2020 Town Center and Charbonneau focus area inventories.

2018 and 2020 Public Street Tree Inventories

The 2018 and 2020 public street tree survey data was used to assess tree abundance, distribution, composition, size classes, and functional benefit. The urban forestry consultants for this Plan analyzed the datasets to confirm the findings and these findings are summarized below to inform Plan recommendations. An overview of ecosystem services and benefits is provided in the following section. For the complete analysis and summary, see the Research Summary document developed as part of this planning effort.

*Table 4. Overview of the 2018 and 2020 public street tree analysis**

25,954	Street trees	**9%**	Focus area trees
24%	Coniferous	**76%**	Deciduous
104	Unique genera	**313**	Unique tree species
29%	Maple (*Acer*) trees	**9%**	Oak (*Quercus*) trees
1,138	Trees with sidewalk damage	**3,195**	Trees with utility conflicts
48%	Trees in the 0-6”-inch class	**2%**	Trees in the >30”-inch class
1,446	Public trees in Town Center	**916**	Public trees in Charbonneau

** An update to the inventory was completed in September 2021 following completion of this Plan’s analysis and should be utilized in conjunction with the data provided in the table above.*

URBAN FOREST BENCHMARKS FINDINGS

The following summary provides an overview of the urban forest benchmarking results based on the analysis of two datasets; Arbor Day Foundation’s 2019 Tree City USA database and the Municipal Tree Care and Management in the United States – a 2014 Urban and Community Forestry Census of Tree Activities by R. Hauer and W. Peterson. For a complete summary of the benchmarking research findings, see the Research Summary document developed as part of this planning effort.

Table 5. Summary of Tree City USA benchmarking research results

2019 Tree City USA - Wilsonville		2019 Tree City USA - Regional	
$263k	Tree management budget	**$149k**	Average budget
$10.42	Per capita forestry budget	**$7.00**	Average per capita budget
$83k	Tree maintenance budget	**$51k**	Average maintenance budget
$7k	Tree planting/care budget	**$24k**	Average planting/care budget
110	Trees pruned	**804**	Average trees pruned
19	Trees removed	**66**	Average trees removed
40	Trees planted	**836**	Average trees planted

Table 6. Summary of the 2014 Community Forestry Census benchmarking research results

2014 Census - Wilsonville		2014 Census - Population Group	
$263k	Forestry program budget (est.)	**$344k**	Average forestry budget
0.14%	Of total budget for forestry	**0.63%**	Average forestry budget compared to total budget
26k	Estimated public trees	**26k**	Average count of public trees
$9.67	Budget per public tree	**$13.31**	Average budget per public tree
$10.42	Budget per capita	**$9.75**	Average budget per capita
1.02	Public trees per capita	**0.83**	Average public trees per capita
3,243	Public trees per staff	**5,967**	Average public trees per staff
212	Acres of parks and open space	**388**	Average acres of parks and open space

COMMUNITY ENGAGEMENT FINDINGS

A series of 33 questions directly related to Wilsonville's existing urban forest, the resources to manage it, and the management activities were drafted to gather community perceptions and viewpoints. The survey was shared online via the City's communications channels and nearly 100 City residents responded. Following the web surveys, public meetings were conducted online to share the UFMP process, framework, and next steps. Citizen feedback was incorporated into various aspects of recommendations, goals, and observations in the UFMP. Selected questions from the surveys and a brief synopsis of observations are included below. For a comprehensive summary, see the Research Summary document developed as part of this planning effort.

Table 7. Overview of public survey results gathered in August and December 2020

95	Total responses	**65%**	Feel there should be more canopy coverage
25%	Think urban forest health has declined in the last 10 years	**77%**	Think the City is doing good to very good when it comes to managing public trees
49%	Said tree maintenance and hazard trees are the most urgent issue	**42%**	Feel the City is not planting enough trees
42%	Unsure of who manages ROW trees	**72%**	Support a City-wide Canopy Goal
72%	Concerned about sidewalk damage	**72%**	Desire more trees in commercial areas
22%	Feel that current tree risk management is poor	**50%**	Desire community orchards and fruit gleaning
61%	Think pruning is the highest priority for Charbonneau	**56%**	Think Town Center needs more species diversity
89%	Feel that trees positively impact community physical and mental health	**94%**	Support a tree protection ordinance

Top Trends in Survey Comments

- Concerns regarding trees and sidewalk damage
- Increased tree plantings and species diversity
- Efforts to reduce tree risk
- Increased pruning and maintenance on large trees in Charbonneau
- Increased planting spaces for trees in Town Center
- Creation of a City-wide canopy goal
- Tree protection during development
- Improve tree species diversity
- Education and training
- Need for a planting plan

Public Photo Contest

In October 2020, a photo contest was announced inviting community members to share urban forestry related photos on the *Let's Talk, Wilsonville!* website, on social media using hashtags, or through email. A total of 85 photos were received from 15 participants. The top three photos were voted on and used in the cover photos of this Plan. The winners included Sandy Wilson, Steve Harrell, and Zach Herrmann.

News Articles

Figure 11. Article in Boones Ferry Messenger about the Plan (Sept. 2020)

City Seeks Community Input to Develop Urban Forestry Plan

Wilsonville's urban forest includes all trees, both native and planted, that contribute to our seasonal beauty and livability.

Whether it is a majestic 200-year old Oregon white oak or a young flowering cherry, trees greatly contribute to our sense of place and quality of life. Trees help clean the air, conserve soil and water, reduce heating and cooling costs and bring nature close to home. If maintained, Wilsonville's urban forest is a valuable asset that will continue to add to the health of our community for generations to come.

The City is developing an Urban Forest Management Plan ("Plan") with PlanIT Geo's urban forestry consultants. This Plan is identifying an integrated approach to preserving, sustaining, diversifying, and regenerating Wilsonville's urban forest. Goals and actions will be developed for urban forest management City-wide, with special focus on Charbonneau and Town Center.

Urban Forestry Mgmt. Plan Survey & Public Meeting
Throughout September
LetsTalkWilsonville.com

Through virtual public meetings and online surveys on "Let's Talk, Wilsonville!," the City is listening to community viewpoints. A survey is available at LetsTalkWilsonville.com to gauge public opinion on urban forestry topics. On Sept. 15, a virtual community meeting is being held to provide an interactive forum for community stakeholders to participate directly in the planning process.

Everyone benefits from the proper care and enhancement of Wilsonville's urban forest. With the community, the City is developing a strategic plan to sustain trees, maintain public safety, establish a sustainable and resilient urban forest and strengthen and create new partnerships. A plan is expected for the City Council's consideration by Spring 2021

For more information, visit LetsTalkWilsonville.com. If you have questions or comments, contact Kerry Rappold, Natural Resources Program Manager, at 503-570-1570, rappold@ci.wilsonville.or.us.

Figure 12. Photo contest announcement in Boones Ferry Messenger (Oct. 2020)

Photo Contest: Celebrate our City's Beautiful Urban Forest ... and Win!

To celebrate Wilsonville's urban forest, submit an original photo that includes a Wilsonville tree. Post your photo on Instagram using the hashtag #Wilsonvilletrees or submit your photo online at LetsTalkWilsonville.com/ufmp by Oct. 30 at 5 pm.

The Urban Forest Management Plan (UFMP) project team is judging eligible entries and selecting. three winning photos by Nov. 13.

Winners will each receive a prize, and their photos may also be included in the City's Urban Forest Management Plan. The contest is free of charge, and entrants can submit multiple photos.

Learn more about the UFMP and see complete contest rules at LetsTalkWilsonville.com/ufmp.

Figure 13. Photo contestant winner - Sandy Wilson

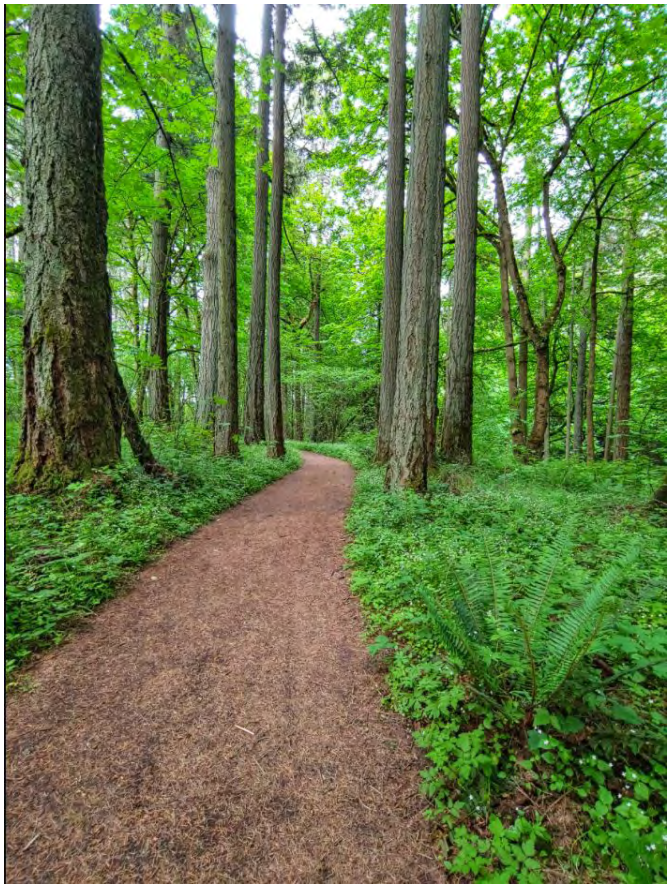


Figure 14. Photo contestant winner - Zach Hermann

Figure 15. Photo contestant winner - Steve Harrell

URBAN FOREST AUDIT SYSTEM

To develop this Plan, 39 documents, plans, and resources were gathered and reviewed by applying the U.S. Forest Service's Urban Forest Sustainability and Management Audit's Discovery Matrix. This process enables the development of key criteria and indicators for urban forest management and planning (J. Clark, 1997; A. Kenney, 2011). The matrix within this audit includes a total of 11 urban forest categories, each containing a multitude of supporting elements. All resources were reviewed to identify references to any of these categories and supporting elements. Examples of the elements supporting the Management Policy and Ordinances category include (but not limited to) climate change, no net loss, risk management, canopy goals, tree protection, and human health. Based on the review of resources, a total of 60 resources mention one or more elements within this Management Policy and Ordinances category. There are a total 219 instances where the 39 resources reference the 11 categories and supporting elements. The number of resources referencing elements of urban forest sustainability and management demonstrate Wilsonville's readiness for changes driven by this Plan. Strategies and recommendations in this Plan align and/or complement components of these supporting resources. For a complete list of categories, elements, and supporting resources, see the Research Summary document developed as part of this planning effort.

According to the Urban Forest Sustainability and Management Audit of Wilsonville's urban forest completed in 2020, the City is at a management and sustainability level of 62 percent. This ranking is to be expected of a city in the process of elevating their urban forestry program from a base level to a more advanced and sustainable level. While all areas of urban forestry require improvement under the guidance of an urban forestry program manager, significant improvements could be made in the Funding/Accounting, Inventories, Plans, Risk Management, Disaster Planning, and Green Asset Evaluation categories — all of which are below the City's overall audit score of 62 percent.

Based on the audit of 126 subcategories (11 primary categories), Wilsonville is achieving "Adopted Common Practice" for 53 (41 percent) of these. 49 subcategories (38 percent) are "In Development". Applying the multipliers of 2 for

Adopted Practice and 1 for In Development results in a total score of 157 out of 254 possible points, or 62 percent (detailed in the following table). A complete breakdown of rankings by subcategory/category is available in the Research Summary.

Table 8. Outcomes of the urban forest auditing process for Wilsonville

#	DESCRIPTION	SOC* (% ACHIEVED)	BASE** (% ACHIEVED)	OVERALL RATING	OVERALL (% ACHIEVED)
1	Management Policy, Ordinances	75%	67%	20	71%
2	Professional Capacity and Training	83%	NA	10	63%
3	Funding and Accounting	75%	NA	7	58%
4	Decision, Management Authority	75%	50%	5	63%
5	Inventories	NA	31%	12	46%
6	Urban Forest Management Plans	NA	33%	12	50%
7	Risk Management	67%	50%	11	61%
8	Disaster Planning	NA	50%	6	43%
9	Standards and BMPs***	50%	75%	38	63%
10	Community	50%	NA	25	89%
11	Green Asset Evaluation	NA	NA	11	55%
TOTAL		**68%**	**51%**	**157**	**62%**

**Standard of Care (SOC) elements represent the minimum group of urban forestry management "best practices" that a municipality should consider for implementation. SOC refers to the degree of prudence and caution required of an individual who is under a duty of care (i.e., legal obligation of the controlling authority, owner, or manager) to minimize risk. Neither state, regional, nor national minimum management components have been established for SOC but these are interim recommendations for consideration. (NA = not applicable)*

***Base Practices (BP) elements represent additional urban forest management activities or components that may effectively expand a program beyond the SOC group (see footnote above). These elements are typically precursors to other "non-core" elements in the category. (NA = not applicable)*

****Best Management Practices (BMPs)*

The information provided in the table above describe the current conditions of Wilsonville's urban forest, the programs that manage it, and the community framework. As recommended in the Plan's actions, the City should use this framework to evaluate implementation progress, report successes, and inform changes to Plan actions.

SUMMARY OF FINDINGS

Table 9. Conclusions to the Urban Forestry Program Evaluation planning elements

ELEMENT	CONCLUSION
1) Existing Policies and Plans	The City has a strong framework of policies and plans that allude to or reference urban forestry, but a strategic Urban Forest Management Plan is needed to connect these elements. The City should implement actions in this Plan to update policies and inform existing and ongoing City plans.
2) City Workflows and Operations	Multiple City departments support the development of more well-defined roles for ongoing urban forestry operations and management. More cohesive planning and management will improve efficiencies, provide support, and improve the levels of service provided to City residents. Departments currently coordinate tree maintenance in parks and streetscapes effectively within the constraints of resources and rely on residents to care for trees in the Right-of-Way adjacent to their property.
3) Baseline Conditions	The City has several tree-related datasets to support the Urban Forest Management Plan, but should consider a regular and comprehensive inventory of street trees and trees in maintained areas of parks. The City public tree population would benefit from increased species and age diversity driven by a strategic planting and management as outlined in the Plan.
4) Urban Forest Benchmarks	The City should evaluate its staffing levels and responsibilities to better manage the public tree population at levels consistent with industry standards and cities of similar population size. The budget for urban forest management should align with the recommended actions in this Plan. Wilsonville should also consider developing a science-based citywide tree canopy goal, a common urban forestry benchmark, from which progress can be measured.
5) Community Engagement	The City's residents expressed the importance of tree protection during development and infrastructure construction to preserve the environmental, economic, and social benefits provided by trees. Residents support a healthy and resilient urban forest maintained through proper planting, species selection, invasive management, tree maintenance, and stewardship opportunities.
6) Urban forest Audit System	Overall, the City scored 62 percent based on the U.S. Forest Service's Urban Forest Audit system that evaluates 11 categories of urban forest management and sustainability. A low scoring was anticipated since the City is taking purposeful steps in elevating their urban forest management program. Implementation of actions in this Plan will improve the City's ranking and frequent auditing exercises should be conducted to measure progress and adjust strategies in an adaptive management approach.

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URBAN FOREST MANAGEMENT PLAN FRAMEWORK

Understanding the benefits and functions of the urban forest, the City has developed this Urban Forest Management Plan.

> "Without a plan, the governments and individuals responsible for taking care of an urban forest will not be effective in meeting the true needs of the trees and the community. A plan establishes a clear set of priorities and objectives related to the goal of maintaining a productive and beneficial community forest."
> **AMERICAN PUBLIC WORKS ASSOCIATION, 2007**

PLAN PURPOSE

Many city planning and management actions, especially those that occur during redevelopment, have a large impact on the character and condition of the urban forest. A thriving and well-maintained public tree population provides a wide variety of benefits to the community. A healthy urban forest contributes to the economic vitality of Wilsonville, provides environmental stability, and provides a better quality of life. Care for the natural environment by the City, contractors, citizens, and volunteers is necessary to maintain and enhance the quality and benefits of the urban forest to which all residents are entitled.

Wilsonville's Urban Forest Management Plan is a crucial planning effort to build a more sustainable resource, a healthy community, and progression towards carbon neutrality. Tree planting is one of the few tangible actions the City can directly take to address non-source specific pollution in Wilsonville and this management plan supports strategic planning for continued plantings resulting in long-lasting benefits.

When making improvements to the urban forest, efforts should be prioritized to improve environmental justice, equity, access, and levels of service for underserved and vulnerable areas. These considerations may include additional tree plantings for an equitable distribution of urban forest cover and benefits, intensive tree management, diverse outreach approaches, and unique stewardship programs.

This strategic plan for Wilsonville's urban forest strengthens City Code, policies, ordinances, standards, practices, and procedures; analyzes staffing structures and authority; identifies opportunities for sustained and diversified funding; provides guidance for routine and systematic inventories and assessments; identifies tree maintenance efficiencies and planting/canopy goals and priorities; addresses storm, disaster, and risk management needs; and bolsters community outreach, education, and engagement.

To help ensure Wilsonville's urban forest will continue to prosper, the City has developed this long-term Plan to account for the needs of trees in the urban environment with an emphasis on the community focus areas of Charbonneau and Town Center. To develop and maintain desired urban forest resource and program conditions, necessary management actions need to be executed in a timely manner. This Plan provides actions for management to maximize the benefits of the urban forest within the confines of available resources. This Plan assists the City in improving urban forest management practices by:

- Establishing a baseline assessment of the urban forest resource, resources for management, and the community engagement framework.
- Providing analyses of urban forest management criteria resulting in goals and strategic actions to advance the City's levels of service.

- Providing the criteria for achieving goals of sustainable urban forest management in a phased approach based on available resources.
- Serving as a living document by providing the framework and guidance for adaptive management.

The Guiding Principles of the Urban Forest Management Plan

The Urban Forest Management Plan will adhere to the following guiding principles:

- Recognize that the trees of the urban forest are more than aesthetic enhancements.
- Recognize trees as the backbone of the urban ecosystem and an essential part of the community's green infrastructure.
- Promote the health and growth of the urban forest by following scientifically established best management practices for tree selection, planting, watering, and pruning.
- Promote a robust urban forest through policies and practices that reduce its vulnerability to known diseases or pest infestations, and future threats, including the anticipated effects of climate change.
- Engage in a continuous process of long-range planning for the growth and maintenance of the urban forest.
- Promote public appreciation of the urban forest through educational outreach programs.
- Support local businesses, institutions, organizations, and individuals in their efforts to grow and maintain the urban forest through community education.
- Proceed in a manner that is inclusive and transparent.

PLAN APPROACH

The optimal approach to managing an urban forest is to develop an organized, proactive program using information to set goals and measure progress. This information is utilized to establish priorities, plan strategically, draft cost-effective budgets, and ultimately minimize the need for costly, reactive solutions to crises or urgent risk mitigation. Based on the results of the **Research Summary**, incremental steps to achieve these improvements described above were developed that can be applied as the City continues to progress.

To develop Wilsonville's Urban Forest Management Plan, a systematic evaluation was conducted as a baseline assessment to inform the Plan's goals and actions. The goals of the Plan focus on preserving, maintaining, and enhancing the urban forest to ultimately benefit the residents of Wilsonville. The framework for this Plan supports the urban forestry vision:

Healthy Trees, Healthy Wilsonville: Wilsonville's urban forest is a thriving and sustainable mix of tree and understory species and ages that creates a contiguous and healthy ecosystem that is valued and cared for by the City and all residents as an essential environmental, economic, and shared community asset that reinforces Wilsonville's identity and legacy as a forested, livable city.

Source: City of Wilsonville Facebook

The Plan provides the goals, actions, and targets for Citywide management of the urban forest resource with an emphasis on the community focus areas of Charbonneau and Town Center. In this section, the Citywide urban forestry goals are presented followed by specific action items for the Charbonneau and Town Center focus areas. These action items are integrated into the Citywide urban forestry actions and also separated into individual summaries for direct implementation to benefit the focus areas.

Goals

Goals supporting the urban forest vision are provided based on strengths and opportunities identified during the development of the Research Summary. Each goal is supported by actions and targets the City and partners will use to attain the goal.

Actions

Actions are Specific, Measurable, Achievable, Relevant, and Time-bound to be implemented to acquire the goals of each planning theme. These actions include recommended timeframes or "target year(s)" beginning upon plan adoption and the lead department or partner(s) for implementation. Each action is rated based on the priority, level of effort and/or resources required, and the efficacy of the action.

Targets

Targets are performance standards and measurable values of specific indicators that enable monitoring of the actions to determine attainment of the actions and goals.

Evaluation

Using the Urban Forest Audit System described in the Research Summary and the Plan targets, implementation progress and success can be evaluated and annually reported. The evaluation using the Audit provides the information necessary for adaptive management.

Co-benefits of Plan Implementation

Each action is accompanied by a graphic depiction of co-benefits, illustrating added value that comes with achieving that action and respective goal. For example, a neighborhood with dense tree canopied streets and landscape may have cooler summer temperatures that lead to fewer heat illnesses reported. Each action impacts four different co-benefits at various levels; the greatest relative level of impact is indicated by the presence of one or more of the following graphics in the Plan's action tables:

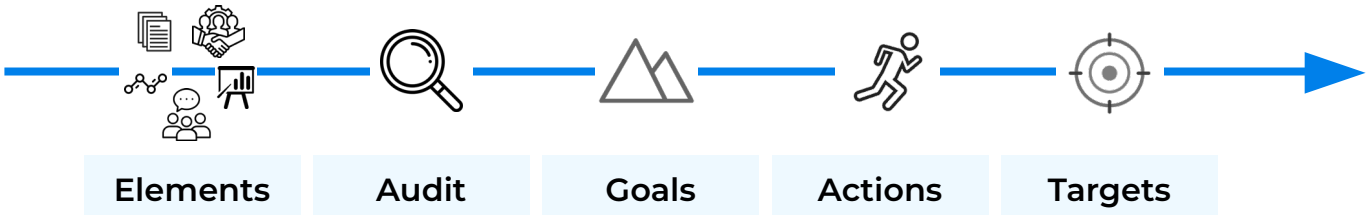
Community – actions that engage the public.

Equity – opportunities to satisfy essential needs and achieve full potential.

Human Health – provides physical benefits to local residents.

Natural Environment – benefits of air quality, water quality, and habitat.

GOAL AND ACTION FRAMEWORK



Results from the planning elements were used to complete the Urban Forest Audit of Wilsonville's urban forest and the programs that manage it. The City's strengths and opportunities were systematically evaluated to inform the Plan's goals, actions, and evaluation criteria for adaptive management. The goals in the Plan are consistent with the categories in the Urban Forest Audit system.

Table 10. Goals for Wilsonville's urban forest

GOAL THEME	AUDIT SCORE*	GOAL DESCRIPTION
Tree Management Policy (MP)	67% avg.	The City's urban forest policies are the foundation for preserving the environmental benefits, management, and character of Wilsonville's urban forest.
Capacity, Training, and Authority (CT)	63% avg.	Wilsonville has the capacity and expertise to provide optimal levels of service for sound urban forest management.
Assessments and Plans (AP)	48% avg.	A thorough understanding of the urban forest ensures data-driven decisions, sustainable and comprehensive planning, and amplified tree benefits.
Community Engagement (CE)	89% avg.	Sustainable urban forest management and equity is achieved through a partnership with the City and its residents resulting in improved well-being, human health, and local economies.
Green Asset Management (GA)	53% avg.	Wilsonville proactively manages the public trees, continues to grow and expand a healthy canopy, effectively mitigates storm damage, maintains public safety, and optimizes urban forest benefits.

**Based on the 2021 evaluation of Wilsonville's urban forestry asset, programs, and community framework. Tree Management Policy includes Management Policy and Ordinances (71%) and Standards and BMPs (63%)— an average of 67%. Capacity, Training, and Authority includes Capacity and Training (63%) and Decision and Management Authority (63%)— an average of 63%. Assessments and Plans includes Inventories (46%) and Urban Forest Management Plans (50%)— an average of 48%. Green Asset Management includes the Risk Management (61%), Disaster Planning (43%), and Green Asset Management (55%) audit categories— an average of 53%*

APPENDICES AND SUPPORTING STUDIES

To guide implementation of the actions in this Urban Forest Management Plan a series of appendices and supporting studies were completed. The need for these resources was uncovered during the planning stages. The research, City staff meetings, tree assessments, and community engagement informed the comprehensive audit system that identified Wilsonville's strengths and opportunities as it relates to the urban forest. It is recommended the City departments utilize these resources to implement actions and integrate them into daily operations and workflows where applicable. These resources include:

Appendix A. Citywide Recommended Tree List: Provides a series of recommended trees for various planting scenarios. The list is organized by tree stature, function, requirements, and climate resiliency. It is intended to be used for strategic replanting of Town Center, Charbonneau, and elsewhere throughout City-managed areas.

Appendix B. Tree Canopy Goal Setting Guidance: Guidance for setting a tree canopy goal for the City was established for the City to review, refine, and adopt. This ground-up approach looks at what is feasible by zoning type or Census Block Groups, the number of trees required, and the associated urban forest benefits and services provided by the trees once established. Canopy goals inform planting strategies, policies, maintenance, and outreach efforts. They provide a baseline and target to guide the urban forestry program and can only be achieved with a shared commitment from the community.

Appendix C. Tree Planting Prioritization Guidance: To support the recommended canopy goal, guidance for prioritizing tree plantings is provided. A series of themes are detailed in maps to demonstrate the approach for prioritization, securing funding and grants, planting, and post-planting care.

Appendix D. Preservation of Trees in Focus Areas: Based on the tree inventory, tiers of tree preservation were established for the trees in Town Center. Preservation tiers are based on the location, size, health, species, benefits, and other tree attributes that should be supported by policies as Town Center continues to grow and change.

Appendix E. Tree Removals and Replacements in Focus Areas: Using the inventory data, trees that require removal were assigned a recommended replacement species to sustain the associated benefits and services trees provide to Town Center and the City as a whole. Replacement species are based on tree diversity goals, resiliency to changing climates, site conditions, and other parameters that should be considered when replanting Town Center's urban forest.

Appendix F. Funding Mechanisms: To support the implementation of actions in this Plan, a matrix of funding mechanisms is provided that describe the funding option, requirements, considerations, and limitations. The City should have a diverse portfolio of funding sources to be sustainable and achieve the vision of the urban forest.

Appendix G. Trees and Hardscape Conflicts Solutions Workbook: Existing trees in the landscape share limited space with other City infrastructure. As such, the assets are competing for space which may result in conflicts between trees and hardscape. This workbook provides the decision matrix to assess the tree(s), the site(s), and the conflict(s) in a transparent and consistent manner. In addition, alternative solutions for tree and hardscape conflicts are provided for the City to consider for established trees and future tree plantings.

Appendix H. Existing and Potential Urban Forestry Partners: Achieving and sustaining the vision for the urban forest requires a diverse network of partners implementing programs and activities that share a common goal. In this resource, a series of existing and potential partners and programs are provided for the City to evaluate to establish or strengthen its network of community tree stewards.

Appendix I. Storm and Disaster Management Guidance: The effects of climate change are ever more felt after the 2021 winter storm in Wilsonville. This resource provides guidance on the preparation, response, and recovery efforts relating to storms and extreme weather events.

CITY OF WILSONVILLE URBAN FORESTRY GOALS

Wilsonville's Tree Canopy and Equity Goal: 36 by 46

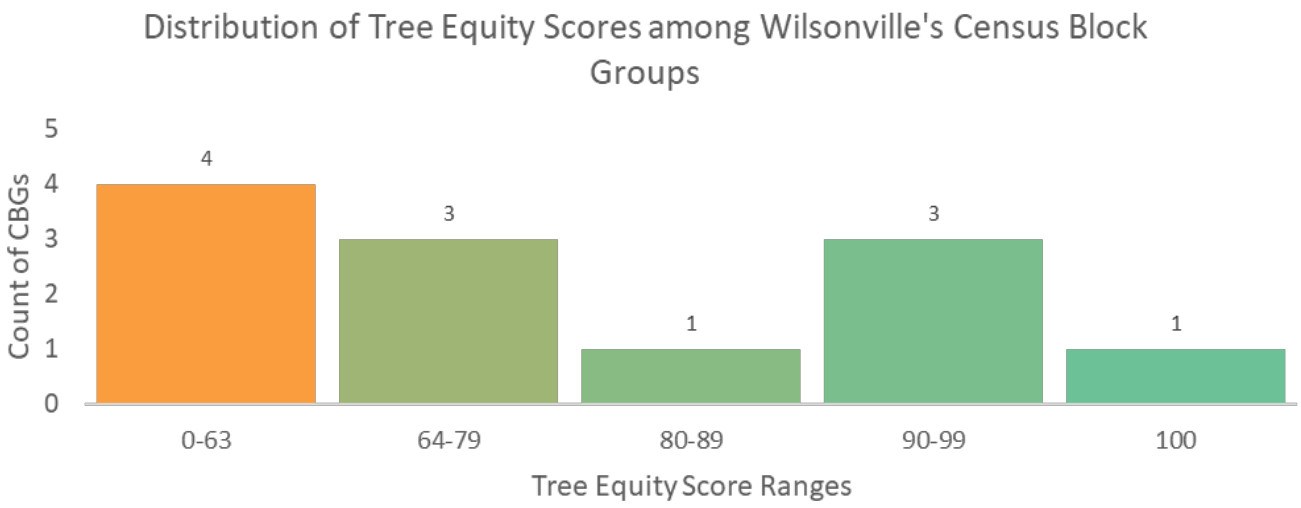
Urbanization creates significant changes in land use and land cover, affecting the structure, pattern, and function of ecosystems. The public is increasingly concerned about how these changes influence daily life and affect the sustainability of "quality of life" for future generations. Improving air quality, cooling urban heat islands, building resiliency against storms, and reducing stormwater runoff are challenges facing the City of Wilsonville. Rapid growth in Wilsonville (29 percent increase from 2010 to 2018, City source), is accelerating these problems. The problems need solutions as the City tries to protect and restore environmental quality while enhancing economic opportunity.

Tree canopy is a valuable component of Wilsonville's urban ecosystem. Thus, expanding the urban forest is part of the solution to the City's social, environmental, and economic problems— it is integral to enhancing public health programs, increasing land values and local tax bases, providing job training and employment opportunities, reducing costs of city services, increasing public safety, improving air quality, offsetting carbon emissions, managing stormwater runoff, and conserving energy.

With this understanding, the City evaluated the feasibility of creating a canopy goal. Currently, 30 percent of Wilsonville's land area is covered by tree canopy when viewed from above. This value provides a baseline metric that forms the foundation of the strategies in the Plan. To achieve the vision for the urban forest, the City has established a goal to increase its tree canopy coverage by 6 percent over a 25-year timespan— "36 by 46". To reach this goal, approximately 27,000 new trees need to be planted over the 25-year timeframe while preserving the City's existing urban tree canopy cover. The goal of 36 percent canopy and 27,000 new trees is based on a variety of factors including species diversity, urban forest benefits, and an equitable distribution of tree canopy.

Regarding tree canopy equity, trees are generally sparse in socioeconomically disadvantaged neighborhoods and more prominent in wealthier neighborhoods. Focused on addressing this inequity, the American Forests organization created the Tree Equity Score (TES, TreeEquityScore.org) tool that measures tree equity across 150,000 U.S. neighborhoods and 486 municipalities in urban areas. Each community's TES indicates whether there are enough trees for everyone to experience the health, economic, and climate benefits that trees provide. The scores are based on how much tree canopy and surface temperature align with income, employment, race, age, and health factors. A 0- to-100-point system makes it easy to understand how a community is doing. With the knowledge the score provides, Wilsonville's community leaders, tree advocates, and residents alike can address climate change and public health through the lens of social equity, attract new resources, factor the scores into technical decisions, guide implementation of the Urban Forest Management Plan, and track progress toward achieving tree equity. A score of 100 represents tree equity.

Figure 16. Summary of Tree Equity Scores by City Census Block Groups



The Tree Equity Score for the City of Wilsonville is currently at a score of 77 out of 100. This score is based on a combination of metrics for 12 Census Block Groups (CBG) comprising the City (refer to figure below). As shown in the figure below, only one of the CBGs is attaining tree equity with a score of 100 and three CBGs are just below the optimal score. The majority (four) of CBGs though, are in the 0-63 Tree Equity Score range.

To improve tree equity and the associated benefits of more tree canopy cover, a goal was established for each Census Block Group to have a Tree Equity Score of at least 75. To achieve this, a total of 27,000 new trees need to be planted across the City which would increase the tree canopy cover from 30 percent to 36 percent. The City should be strategic in planting new trees to address the CBGs with the lowest TES while maintaining existing tree canopy cover across Wilsonville.

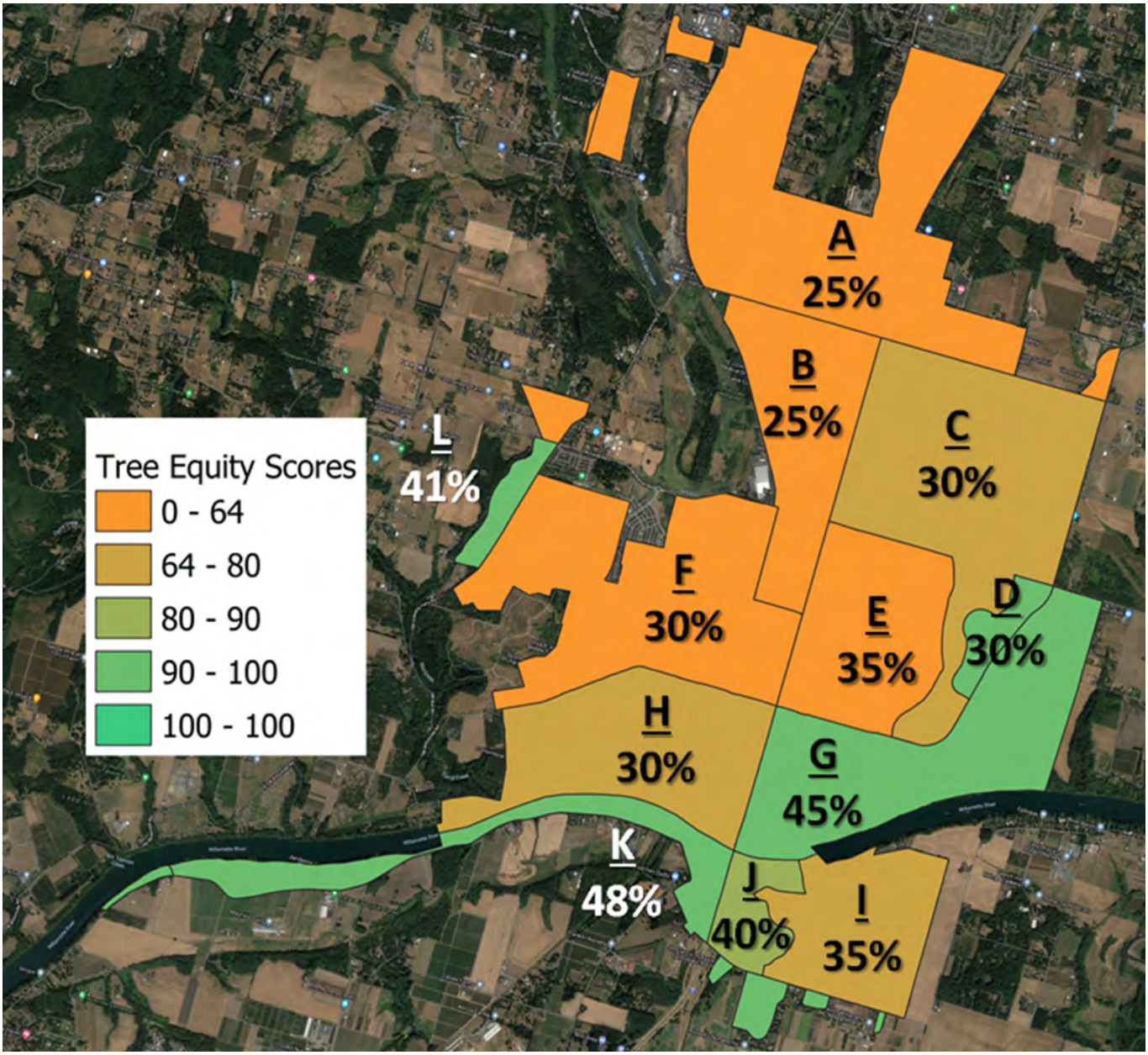
The following provides recommended canopy goals and planting targets for Wilsonville to achieve 36 percent tree canopy cover and improve the Tree Equity Scores for its Census Block Groups.

Table 11. Number of trees to reach the recommended tree canopy goal by Census Block Group and Citywide

#*	Census Block Group	Tree Equity Score	Current Canopy	Canopy Goal	# of Trees	Trees per Year
A	CBG 410670321101	62	17%	25%	6,745	270
B	CBG 410050227071	61	13%	25%	4,559	182
C	CBG 410050244001	77	29%	30%	666	27
D	CBG 410050244002	97	30%	30%	0	0
E	CBG 410050244003	60	24%	35%	3,694	148
F	CBG 410050227072	56	16%	30%	8,732	349
G	CBG 410050227101	96	44%	45%	500	20
H	CBG 410050227082	72	27%	30%	1,148	46
I	CBG 410050228002	74	31%	35%	1,084	43
J	CBG 410050228001	88	38%	40%	167	7
K	CBG 410050228003	99	48%	48%	0	0
L	CBG 410050227081	100	41%	41%	0	0
	Citywide	**77**	**30%**	**36%**	**27,295**	**1,092**

**See Figure 17 below for a map displaying the reference letters in Table 11 and the canopy goal.*

Figure 17. Map displaying Tree Equity Scores, canopy goals, and table reference letters for Census Block Groups



Planting 27,000 trees in the City will result in substantial increases to tree canopy cover and associated environmental, economic, and social benefits. Based on the Tree Equity Score tool, it is estimated these new trees will bring an added annual ecosystem service value of $350,633 once fully implemented. Planting trees that grow to large-canopied specimens at maturity and are healthy will sequester over 360 tons of carbon, 0.3 tons of carbon monoxide, 0.3 tons of sulfur dioxide, and 5.9 tons of ozone annually— all pollutants contributing to the greenhouse gas effect and changing climate. In addition, the 27,000 trees will reduce particulate matter by 1.7 tons (PM10) and 0.4 tons (PM2.5) annually and prevent the runoff of 15,117,774 gallons of stormwater each year.

Table 12. Summary of ecosystem benefits from planting 27,000 trees and reaching 36 percent canopy cover

Carbon Sequestered 362.0 tons	**Carbon Monoxide** 0.3 tons	**Nitrogen Dioxide** 1.0 tons
Sulfur Dioxide 0.3 tons	**PM10 Pollution** 1.7 tons	**PM2.5 Pollution** 0.4 tons
Ozone 5.9 tons	**Runoff Avoided** 15,117,774 gallons	**Rain Interception** 40,950,102 gallons

It is the responsibility of the City, its partners, and the community to review the recommendations in this report and the Urban Forest Management Plan to formally adopt tree canopy goals and strategies. Additional analyses of possible planting area and potential planting priorities should be conducted to support goal development. In addition, the City should utilize the Recommended Master Tree List, Tree Maintenance Manuals, Tree Ordinance Revision Recommendations, and other studies supporting the Plan and this Report. The TES and canopy goals will be refined, and aligned more closely to the City limits, with the completion of a high-resolution urban tree canopy (UTC) assessment (Action MP.03).

Urban Forest Management Goals

The following series of urban forestry goals to address the resource, the programs, and the people and are not listed by any particular priority or order.

1

TREE MANAGEMENT POLICY (MP):

The City's urban forest policies are the foundation for preserving the environmental benefits, management, and character of Wilsonville's urban forest.

2

CAPACITY, TRAINING, AND AUTHORITY (CT):

Wilsonville has the capacity and expertise to provide optimal levels of service for sound urban forest management.

3

ASSESSMENTS AND PLANS (AP):

A thorough understanding of the urban forest ensures data-driven decisions, sustainable and comprehensive planning, and amplified tree benefits.

4

COMMUNITY ENGAGEMENT (CE):

Sustainable urban forest management and equity is achieved through a partnership with the City and its residents resulting in improved well-being, human health, and local economies.

5

GREEN ASSET MANAGEMENT (GA):

Wilsonville proactively manages the public trees, continues to grow and expand a healthy canopy, effectively mitigates storm damage, maintains public safety, and optimizes urban forest benefits.

Action and Target Framework

Table 13. Framework and description of urban forestry actions

PRIORITY	EFFORT	ACTION # & ORDER	ACTION DESCRIPTION	CO-BENEFITS**	LEAD* & TARGET YEAR
1-3 ranking of action importance indicated by cell color (3 cells = highest priority)	1-3 ranking of resources required indicated by cell color (3 cells = highest level of effort)	Action number with a reference to the Urban Forest Audit categories. Number to indicate overall order of implementation	Description of the action for the respective goal	Additional benefits to Wilsonville. Up to 3 dots ("●") possible. More dots, greater impact. C=Community, H= Human Health E=Equity N=Natural Environment	Implementer lead and collaborator. Calendar year(s) to implement

Table 14. Example framework of the urban forestry actions

PRIORITY	EFFORT	ACTION # ORDER	TREE MANAGEMENT POLICY (MP) ACTIONS	CO-BENEFITS**	LEAD* & TARGET YEAR
		MP.01 11	Support canopy goals in Town Center with effective tree preservation policies (i.e., City Code 4.600 - 4.640.20). Use Appendix B-E as guidance.	● ● ● ● ● ● ● ● C H E N	**CD**, PW 2021

Table 15. Example framework of the urban forestry action targets

ACTION TARGET 1	ACTION TARGET 2	ACTION TARGET 3
An intermediate target leading to final target aligned with action "target year" and desired outcome	An intermediate target leading to final target aligned with action "target year" and desired outcome	**Targets in bold font and goal color are the primary target to measure success of implementing the corresponding action**

**Lead: CD-Community Development Department; PR- Parks and Recreation Department; PW-Public Works Department*

***Co-Benefits: C = Community; E = Equity; H = Human Health; N = Natural Environment*

Acronyms: ANSI-American National Standards Institute, BMPs-Best Management Practices, ISA-International Society of Arboriculture, SOP-Standard Operating Procedure, UFMP-Urban Forest Management Plan

GOAL 1

TREE MANAGEMENT POLICY (MP)

The City's urban forest policies are the foundation for preserving the environmental benefits, management, and character of Wilsonville's urban forest.

URBAN FOREST AUDIT:

Management Policy and Ordinances at 71% Attainment (2021)
Standards and Best Management Practices at 63% Attainment (2021)

STRENGTHS:

Chapter 4.600 of City Code describes the policies and requirements for tree preservation and protection and City Code section 4.176 (Planning and Land Development Ordinance) describes the landscaping standards for development. In addition, the City has the Charbonneau Tree Preservation Program primarily for the care and enhancement of the large oak trees in the neighborhood.

OPPORTUNITIES:

Policies relating to urban forestry can be updated with current industry standards and best practices to support tree preservation Citywide and specifically in Town Center. A high-resolution tree canopy assessment can identify the location and extent of the urban forest resource in terms of canopy cover and the opportunities available for planting more trees. This data can guide policies, planning and development requirements, planting strategies, and baseline assessments.

PURPOSE:

- Support: An urban forestry program implementing actions without the appropriate support from policy and ordinances is at risk of using resources and time inefficiently and may lack the enforcement necessary for permanent improvements. A weak or outdated framework of policy and ordinances for urban forest management jeopardizes the success of key projects that support this Plan.

- Connections: Alignment of policy and ordinances ensures a strong connection among the urban forestry program's high-level strategic goals, and the projects and initiatives that support these goals.

- Holistic: Programs cannot live in isolation. Therefore, cross-examining and aligning various plans, policies, and ordinances brings to light any projects or initiatives that are a misplacement of resources.

TREE MANAGEMENT POLICY (MP) ACTIONS

Table 16. Tree Management Policy actions

PRIORITY	EFFORT	ACTION # ORDER	TREE MANAGEMENT POLICY (MP) ACTIONS	CO-BENEFITS**	LEAD* & TARGET YEAR
		MP.01 11	Support canopy goals in Town Center with effective tree preservation policies (i.e., City Code 4.600 - 4.640.20). Use Appendix B-E as guidance.	C H E N	**CD**, PW 2022
		MP.02 15	Strengthen storm and disaster preparations, mitigations, recovery strategies, and protocols (see Appendix I).	C H E N	**CD**, PR, PW 2022
		MP.03 27	Complete a comprehensive high-resolution urban tree canopy (UTC) assessment using industry recommended protocols to measure progress towards canopy goals and tree equity.	C H E N	**CD**, PW 2025
		MP.04 30	Develop a tree manual for planners, developers, homeowners, and tree care companies that includes tree-related policies, guidelines, best practices, and standards.	C H E N	**CD** 2026

**Lead*: CD-Community Development Department; PR- Parks and Recreation Department; PW-Public Works Department

***Co-Benefits*: C = Community; E = Equity; H = Human Health; N = Natural Environment

Acronyms: ANSI-American National Standards Institute, BMPs-Best Management Practices, ISA-International Society of Arboriculture, SOP-Standard Operating Procedure, UFMP-Urban Forest Management Plan

TREE MANAGEMENT POLICY (MP) TARGETS

Table 17. Tree Management Policy action targets

ACTION TARGET 1	ACTION TARGET 2	ACTION TARGET 3
MP.01: Guidance in Appendix B-E of the UFMP is reviewed and incorporated accordingly (Year 1)	**MP.01: Tree preservation policies are enforced in Town Center (Year 1)**	MP.01: The City has staffing levels to adequately monitor development projects and enforce tree preservation policies to achieve canopy goals in Town Center (Year 25)
MP.02: Appendix I is reviewed and a strategy is developed (Year 1)	**MP.02: A plan or manual detailing storm and disaster preparation, response, and mitigation is updated (Year 2)**	MP.02: The plan or manual is actively utilized and reduces costs of storm response. The urban forest is more resilient (Year 25)
MP.03: A decision on in-house or consultant-led tree canopy assessment is determined (Year 3)	MP.03: A budget proposal is prepared if needed (Year 4)	**MP.03: An urban tree canopy assessment is completed and canopy goals are established, supported by Master Tree Planting Plans (Year 5)**
MP.04: A statement of need and an outline for the tree manual(s) is prepared (Year 4)	MP.04: A decision on in-house or consultant-led manual is determined (Year 5)	**MP.04: Tree manual(s) developed to support goals of a healthy and sustainable urban forest (Year 6)**

Targets in bold font and colored by goal color are the primary target to measure success of implementing the corresponding action.

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GOAL 2

CAPACITY, TRAINING, AUTHORITY (CT)

Wilsonville has the capacity and expertise to provide optimal levels of service for sound urban forest management.

URBAN FOREST AUDIT:
Capacity and Training at 63% Attainment (2021)
Authority at 63% Attainment (2021)

STRENGTHS:
The Community Development Department and Natural Resources Program along with the Parks and Public Works departments have a robust team of certified, qualified, and trained staff for the management of the urban forest. Supporting this team is the framework established to utilize certified consultants and contractors as needed. City staff maintain certifications and continue to expand skillsets and offer trainings and presentations relating to the City's urban forest.

OPPORTUNITIES:
It is recommended the City consider consolidating programs to reduce inefficiencies and improve cohesive planning and management of the public trees. The City should continue to support in-house and outsourced training as it relates to tree maintenance, safety, risk, and other needs. The City should update Standard Operating Procedures (SOPs) as changes occur such as increasing staffing to support more frequent public tree pruning as recommended by industry standards.

PURPOSE:

- Quality: The complexity of urban forests requires adept personnel for its appropriate care, growth, and resiliency. A city with quality staff reduces the variance of quality in service.
- Efficiency: A City with adequate staffing levels who are appropriately trained can meet the needs of the community timely and effectively. Staff with an understanding and training in processes affecting the urban forest can align efforts to achieve common goals.
- Safety: Safe practice of arboriculture and urban forestry is critical for City staff, contractors, and the public to reduce the potential risk of public hazards.
- Service: This Plan evaluates tree maintenance responsibilities in public areas to achieve targets of improved urban forest health.

CAPACITY, TRAINING, AUTHORITY (CT) ACTIONS

Table 18. Capacity, Training, Authority actions

PRIORITY	EFFORT	ACTION # ORDER	CAPACITY, TRAINING, AUTHORITY (CT) ACTIONS	CO-BENEFITS**	LEAD* & TARGET YEAR
		**CT.01** 1	Establish an urban forestry working group with regular meetings to monitor progress of implementing actions. Finalize lead implementers.	● ● ● ● ● ● ● ● ● ● ● ● C H E N	**CD**, PR, PW 2022
		**CT.02** 13	Maintain International Society of Arboriculture (ISA) Certified Arborist certifications and other credentials such as ISA Tree Risk Assessment Qualification (TRAQ).	● ● ● ● ● ● ● ● C H E N	**PW**, PR, CD 2022
		**CT.03** 18	Educate and train City staff to adhere to Best Management Practices, including industry research, science, and technology through various platforms, for the maintenance of all City trees. Provide education to the public for the proper care of trees on private property.	● ● ● ● ● ● ● ● C H E N	**CD**, PR, PW 2023

**Lead: CD-Community Development Department; PR- Parks and Recreation Department; PW-Public Works Department*

***Co-Benefits: C = Community; E = Equity; H = Human Health; N = Natural Environment*

Acronyms: ANSI-American National Standards Institute, BMPs-Best Management Practices, ISA-International Society of Arboriculture, SOP-Standard Operating Procedure, UFMP-Urban Forest Management Plan

CAPACITY, TRAINING, AUTHORITY (CT) TARGETS

Table 19. Capacity, Training, Authority action targets

ACTION TARGET 1	ACTION TARGET 2	ACTION TARGET 3
CT.01: Necessary representation and skillsets of members needed is determined, outreach conducted (Year 1)	**CT.01: Urban forestry working group established and regular meetings scheduled (Year 1)**	CT.01: The UFMP is actively implemented, monitored, reported, and revised by the working group (Year 2-25)
CT.02: A needs assessment identifies necessary training and certifications of all staff (Year 1)	**CT.02: Necessary certifications and credentials are maintained (Year 2)**	CT.02: All City staff involved in urban forestry activities have the appropriate and recommended training and certifications (Year 25)
CT.03: Training needs are identified (Year 2)	**CT.03: City staff are trained on BMPs and public is informed of proper tree care (Year 3)**	CT.03: BMPs are implemented for all public trees and less malpractice on private trees occurs (Year 10)

Targets in bold font and colored by goal color are the primary target to measure success of implementing the corresponding action.

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GOAL 3

ASSESSMENT AND PLANS (AP)

A thorough understanding of the urban forest ensures data-driven decisions, sustainable and comprehensive planning, and amplified tree benefits.

URBAN FOREST AUDIT:

Inventories at 46% Attainment (2021)

Urban Forest Management Plans at 50% Attainment (2021)

STRENGTHS:

The City has a comprehensive inventory of public trees along streetscapes and in maintained areas of parks housed in an asset management program. Tree management staff routinely utilize the database for prioritizing and scheduling maintenance and conduct physical assessments of City-owned trees. In addition to assessments, the City has a Parks and Recreation Master Plan, stormwater management plans, Urban Renewal Strategic Plan, plans for City focus areas such as Town Center and Charbonneau, and recognizes trees as vital assets in the Comprehensive Plan.

OPPORTUNITIES:

The City should continue to manage and update the inventory database as changes to the public tree population occur. To support the focus areas of Charbonneau and Town Center, a Master Tree planting Plan would provide the strategies for preserving existing trees and replacing removed trees to maintain and grow a sustainable urban forest. Other related City plans should be updated with information relating to the Urban Forest Management Plan, as necessary, and the Urban Forest Management Plan should be routinely evaluated and adapted as the resource and programs change over time.

PURPOSE:

- Informed Management: An inventory of Wilsonville's valuable assets—public trees—provides the data for informed management and resource decisions.
- Measured: An understanding of the population of trees provides baseline information from which progress and change resulting from this Plan and an urban forestry program can be measured for adaptive management.
- Value: The inventory of public trees provides information that can be used to quantify the ecosystem services and benefits provided to Wilsonville's residents, environment, and economy.
- Inclusivity: The urban forest is comprised of public and private trees spanning a multitude of ecosystems and land uses. Plans for trees across these landscapes ensures all aspects of urban forestry are included in a cohesive, strategic manner.

ASSESSMENTS AND PLANS (AP) ACTIONS

Table 20. Assessment and Plans actions

PRIORITY	EFFORT	ACTION # ORDER	ASSESSMENTS AND PLANS (AP) ACTIONS	CO-BENEFITS**	LEAD* & TARGET YEAR
▰▰▰	▱▰▰	**AP.01** 4	Maintain an inventory of public trees Citywide and within Focus Areas and update as maintenance and new plantings occur. Monitor tree loss and gain through annual tree removal and planting permit reporting.	● ● ● ● ● ● ● ● C H E N	**PW**, CD Annually
▰▰▰	▱▰▰	**AP.02** 16	Utilize Appendix A-E to develop a Master Tree Planting Plan for Town Center, aligned with the local and Citywide canopy goals. Preserve existing trees in Town Center to the extent possible by using guidance provided in Appendix D.	● ● ● ● ● ● ● ● ● ● ● ● C H E N	**CD**, PW 2023
▰▰▰	▱▱▰	**AP.03** 17	Utilize Appendix A-E to develop a Master Tree Planting Plan for Charbonneau's aging oak (*Quercus*) population, aligned with the local and Citywide canopy goals.	● ● ● ● ● ● ● ● ● ● ● ● C H E N	**CD**, PW 2023
▰▰▰	▱▰▰	**AP.04** 20	Complete an urban forest audit using similar criteria as the 2020 audit completed for the UFMP to evaluate improvements in urban forest management and adapt strategies. As needed, modify existing actions and develop new actions to continue to achieve goals of the UFMP.	● ● ● ● ● ● ● ● ● ● ● ● C H E N	**CD** 2026
▱▰▰	▰▰▰	**AP.05** 26	Utilize Appendix G to develop a Trees and Construction Operations Plan for alternative solutions to conflicts between public trees and infrastructure/construction.	● ● ● ● ● ● ● ● C H E N	**CD**, PW 2026
▱▰▰	▱▱▰	**AP.06** 27	Quantify the ecosystem benefits and appropriate appraisal values to conduct a cost-benefit analyses of public trees. This informs maintenance and planting recommendations and raises public awareness of urban forest benefits. For example, explore the cost effectiveness and safe use of utilizing urban forest biomass on City properties.	● ● ● ● ● ● ● ● C H E N	**CD** 2028

**Lead: CD-Community Development Department; PR- Parks and Recreation Department; PW-Public Works Department*

***Co-Benefits: C = Community; E = Equity; H = Human Health; N = Natural Environment*

Acronyms: ANSI-American National Standards Institute, BMPs-Best Management Practices, ISA-International Society of Arboriculture, SOP-Standard Operating Procedure, UFMP-Urban Forest Management Plan

ASSESSMENTS AND PLANS (AP) TARGETS

Table 21. Assessment and Plans action targets

ACTION TARGET 1	ACTION TARGET 2	ACTION TARGET 3
AP.01: Tree database updated to reflect changes to the public tree population (Year 1-10)	AP.01: Tree database updated to reflect changes to the public tree population (Year 10)	AP.01: All public trees in a maintained database. Includes sample inventories of all forested public space (Year 25)
AP.02: The Citywide Recommended Tree List in Appendix A is adopted (Year 1)	AP.02: Strategic planning for the preservation of trees in Town Center using Appendix D is completed (Year 2)	**AP.02: A Master Tree Planting Plan for Town Center is developed (Year 3)**
AP.03: The Citywide Recommended Tree List in Appendix A is adopted (Year 1)	AP.03: Strategic planning for the oaks in Charbonneau is completed using the 2020 inventory and UFMP guidance (Year 2)	**AP.03: A Master Tree Planting Plan for Charbonneau's aging oak population is developed (Year 3)**
AP.04: An updated urban forest audit is completed (Year 4)	AP.04: UFMP actions and strategies are updated based on the 2023 audit (Year 5)	AP.04: An updated urban forest audit is completed (Year 6)
AP.05: Alternative solutions provided in Appendix G of the UFMP are reviewed (Year 4)	AP.05: Alternative solutions and best practices are approved (Year 5)	**AP.05: A Trees and Construction Operations Plan is completed (Year 6)**
AP.06: Using the tree database, changes to the public tree population are measured (Year 3-6)	AP.06: The ecosystem benefits and appraisal values of public trees is quantified (Year 7)	**AP.06: A cost-benefit analysis is completed informing planting, maintenance, and biomass utilization options (Year 8)**

Targets in bold font and colored by goal color are the primary target to measure success of implementing the corresponding action.

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GOAL 4

COMMUNITY ENGAGEMENT (CE)

Sustainable urban forest management and equity is achieved through a partnership with the City and its residents resulting in improved well-being, human health, and local economies.

URBAN FOREST AUDIT:
Community at 89% Attainment (2021)

STRENGTHS:
The City has a strong partnership with neighborhood and regional organizations for the planting and care of trees. Urban forestry related information is available on the City's website and the City utilizes an outreach website for keeping residents engaged. The City also has a successful Tree Fund program for homeowner mitigation plantings. Wilsonville has maintained Arbor Day Foundation's Tree City USA status for 23 years (as of June 2021) and received numerous "Growth Awards" for outstanding urban forestry projects. In addition, the City manages a Heritage Tree Program recognizing significant trees throughout Wilsonville.

OPPORTUNITIES:
Existing partnerships should be maintained and opportunities for non-conventional partnerships should be explored for representation of all neighborhoods and demographics in Wilsonville. Urban forestry related events, workshops, and training for the public should be held in coordination with partners as funding allows and the City should strive to diversify and expand the number of volunteers for community tree stewardship. Under the current capacity these efforts are difficult to pursue therefore, the City should explore the feasibility of a volunteer coordinator for urban forestry and other related efforts.

PURPOSE:

- Inclusivity: Residential property contains a large portion of the City's total tree canopy cover. Sustaining Wilsonville's urban forest requires residential collaboration and feedback and fostering long-term relationships to improve outcomes.
- Transparency: Program and funding transparency are essential in building resilient community partnerships.
- Resourcefulness: Public participation and insight provide resourceful and impactful urban forest program growth.
- Community: Active participation in nature-related efforts foster community pride and ownership, and breaks down walls, helping bring communities closer together as they become closer to nature.

COMMUNITY ENGAGEMENT (CE) ACTIONS

Table 22. Community Engagement actions

PRIORITY	EFFORT	ACTION # ORDER	COMMUNITY ENGAGEMENT (CE) ACTIONS	CO-BENEFITS**	LEAD* & TARGET YEAR
		CE.01 2	Update the City's website and materials based on information from the Plan. On a regular basis, share informative urban forestry and tree-related content to a social media, City website, and other communication platforms. Prioritize citizen service requests and update the City website with frequently asked questions and resources.	C H E N	**CD** 2022
		CE.02 5	As funding permits, conduct annual urban forestry events, or partner-events—especially involving youth and HOAs—relating to tree planting and pruning to increase capacity for the care of public trees led by citizen tree stewards. Prioritize areas with lower urban tree canopy and other considerations such as underserved communities.	C H E N	**CD**, PR Annually
		CE.03 6	Continue to track and annually report urban forestry activities of all partners and continue to maintain Arbor Day Tree City USA designation. Data will support future budget requests.	C H E N	**CD**, PR, PW Annually
		CE.04 7	Continue to strengthen partnerships with civic groups, volunteers, institutions, neighborhoods, and non-profit organizations. Clarify tree maintenance authority and responsibilities among entities such as Homeowners Associations (HOAs), utilities, and special districts in a Standard Operating Procedure (SOP). Provide resources to private landholders on an as-needed basis.	C H E N	**CD** Annually
		CE.05 8	As funding permits, provide information and educational workshops and materials about the proper tree species for given sites and conditions. Increase public outreach and notification of current and future pest/disease concerns and what they can do to support and sustain the urban tree canopy.	C H E N	**CD** Annually
		CE.06 10	Continue to utilize the City Tree Fund for homeowner mitigation plantings. Increased awareness and support of urban forestry in the City will increase City Tree Fund contributions allowing the City to reevaluate mitigation amount ($100 currently).	C H E N	**CD** 2022

**Lead: CD-Community Development Department; PR- Parks and Recreation Department; PW-Public Works Department*

***Co-Benefits: C = Community; E = Equity; H = Human Health; N = Natural Environment*

Acronyms: ANSI-American National Standards Institute, BMPs-Best Management Practices, ISA-International Society of Arboriculture, SOP-Standard Operating Procedure, UFMP-Urban Forest Management Plan

COMMUNITY ENGAGEMENT (CE) TARGETS

Table 23. Community Engagement action targets

ACTION TARGET 1	ACTION TARGET 2	ACTION TARGET 3
CE.01: A community outreach strategy is aligned with other City efforts with consistent messaging (Year 1)	**CE.01: Information from the UFMP is shared on a multitude of City platforms for the public (Year 1)**	CE.01: Citizen service requests are reviewed and the City website is updated with FAQs (Year 1)
CE.02: A list of existing and potential events, partners, and subject matter is prepared (Year 1 -25)	CE.02: Regular meetings with City partners are done to align efforts and resources (Year 1-25)	**CE.02: Events are held to raise awareness and build a community of stewards aligned with needs identified in surveys and audits (Year 1-25)**
CE.03: Appropriate urban forestry activities are tracked and reported and Tree City USA award is received (Year 1-25)	CE.03: Appropriate urban forestry activities are tracked and reported and Tree City USA award is received (Year 1-25)	**CE.03: City acquires Arbor Day Foundation's Growth Awards and Sterling Tree City status and other industry recognition (Year 25)**
CE.04: A list of existing and potential partners and programs is managed utilizing Appendix H in the UFMP (Year 1-25)	CE.04: SOPs are reviewed and updated regularly as needed, information for urban and rural forest management available for private landholders (Year 1-25)	**CE.04: Partnerships represent all neighborhoods, demographics, and cultures in the City (Year 10)**
CE.05: Materials and information to address priority concerns are prepared and shared (Year 1-25)	CE.05: Based on public surveys and tracking, residents of the City actively plant appropriate tree species and monitor for pest/disease concerns (Year 10)	**CE.05: The urban forest is more resilient to climate change and tree pests and diseases (Year 25)**
CE.06: City Tree Fund is utilized (Year 1)	CE.06: City Tree Fund contributions are reevaluated as demand increases (Year 10)	**CE.06: A shared partnership between the City and the community achieves local and Citywide canopy goals (Year 25)**

Targets in bold font and colored by goal color are the primary target to measure success of implementing the corresponding action.

COMMUNITY ENGAGEMENT (CE) ACTIONS CONTINUED

Table 22. Community Engagement actions (continued)

PRIORITY	EFFORT	ACTION # ORDER	COMMUNITY ENGAGEMENT (CE) ACTIONS	CO-BENEFITS**	LEAD* & TARGET YEAR
		CE.07 12	Support and sustain partnerships with local and regional participatory organizations (see Appendix H). Encourage and support horizontal volunteer collaboration between organizations. Increase the number of community volunteers annually.	C H E N	**CD**, PR, PW Annually
		CE.08 15	Develop strategies to remove barriers to participation for all community members. Barriers to address include ADA communications compliance, internet availability, language, cultures, location, and transportation. Utilize partnerships with neighborhood organizations (see Appendix H).	C H E N	**CD**, PR, PW 2022, Annually
		CE.09 19	Recognize exemplary urban forest stewards and volunteers representing youth, residents, organizations, and business owners. Consider a tree donation or use of the City Tree Fund framework for costs associated with this program.	C H E N	**CD** 2023, Annually
		CE.10 23	Conduct biannual community surveys to gauge public viewpoints and receive feedback on implementation of the UFMP, and program success. Survey responses should inform future urban forest decision making.	C H E N	**CD** 2024, Bi-Annually
		CE.11 24	Establish non-conventional partnerships that serve single and/or multiple City neighborhoods. At minimum, all neighborhoods should be represented in partnerships.	C H E N	**CD**, PR, PW 2025

**Lead: CD-Community Development Department; PR- Parks and Recreation Department; PW-Public Works Department*

***Co-Benefits: C = Community; E = Equity; H = Human Health; N = Natural Environment*

Acronyms: ANSI-American National Standards Institute, BMPs-Best Management Practices, ISA-International Society of Arboriculture, SOP-Standard Operating Procedure, UFMP-Urban Forest Management Plan

COMMUNITY ENGAGEMENT (CE) TARGETS CONTINUED

Table 23. Community Engagement action targets (continued)

ACTION TARGET 1	ACTION TARGET 2	ACTION TARGET 3
CE.07: A list of existing and potential partners and programs is managed utilizing Appendix H in the UFMP. (Year 1-25)	**CE.07: Annual increase in the number of volunteers, hours, and diversity (Year 1-25)**	CE.07: Annual increase in the number of volunteers, hours, and diversity (Year 1-25)
CE.08: Strategies to remove barriers are developed (Year 2)	CE.08: Annual increase in the number of volunteers, hours, and diversity (Year 3-25)	CE.08: Annual increase in the number of volunteers, hours, and diversity (Year 3-25)
CE.09: The framework for a recognition program is developed (Year 2)	**CE.09: The recognition program is launched (Year 3)**	CE.09: The recognition program continues to grow with participants from various sectors to support the City's urban forest (Year 4-25)
CE.10: A strategy for community surveys is prepared (Year 3)	**CE.10: A community survey is shared to gather viewpoints and feedback that informs urban forest management (Year 4)**	CE.10: Ongoing surveys conducted every 2 years, survey input is appropriately addressed (Year 5-25)
CE.11: A list of existing and potential partners and programs is managed utilizing Appendix H in the UFMP (Year 3)	CE.11: Outreach and meetings with potential partners are conducted (Year 4)	**CE.11: Non-conventional partnerships are established that represent all City neighborhoods (Year 5)**

Targets in bold font and colored by goal color are the primary target to measure success of implementing the corresponding action.

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GOAL 5

GREEN ASSET MANAGEMENT (GA)

Wilsonville proactively manages the public trees, continues to grow and expand a healthy canopy, effectively mitigates storm damage, maintains public safety, and optimizes urban forest benefits.

URBAN FOREST AUDIT:

Green Asset Management at 55% Attainment (2021)
Risk Management at 61% Attainment (2021)
Disaster Planning at 43% Attainment (2021)

STRENGTHS:

City departments manage public trees along streetscapes and in parks, implement industry best management practices and standards, and conduct pest management practices as funding allows. Current tree planting regimen considers diversity of species and age. Certain City-owned trees are given fertilizer injections and treated for pests such as aphids.

OPPORTUNITIES:

Most public tree pruning is performed by adjacent property owners and is reactionary and seldom proactive. The City should explore costs and staffing requirements to prune City-owned street trees on a recommended rotation to improve tree health, reduce risk, and improve efficiencies. HOAs conducting tree maintenance in their respective neighborhoods can support this evaluation and effort. Consideration for staffing requirements to achieve tree canopy cover goals should also be made. Large oak trees are outgrowing their space or impeding hardscape in areas such as Charbonneau and a strategic replanting strategy should be developed and aligned with canopy goals. Wilsonville should explore strategies to address storm preparation, response, and recovery as it relates to the urban forest and expand its pest management program to maintain a healthy and sustainable urban forest.

PURPOSE:

- Efficiency: Alignment of operations improves workflows, encourages resourcefulness, and reduces conflicts. Routine systematic tree maintenance reduces surges of maintenance and removal demands, identifies issues before they become more expensive, and optimizes available time and resources.

- Safety: Appropriate management of green assets reduces the risk of tree failures as well as person and property damage. Utilizing industry standards and best practices reduces on-the-job incidents to the extent possible.

- Sustainability: Managing urban forests as City assets will support stormwater management, climate resiliency, and human health goals. Appropriate maintenance and planting will support a healthy, long-lived urban tree canopy equitably distributed across a city.

- Proactive: Routine maintenance reduces future costs. Planting the urban forest with the appropriate species also reduces future costs, conflicts, and climate change impacts.

GREEN ASSET MANAGEMENT (GA) ACTIONS

Table 24. Green Asset Management actions

PRIORITY	EFFORT	ACTION # ORDER	GREEN ASSET MANAGEMENT (GA) ACTIONS	CO-BENEFITS**	LEAD* & TARGET YEAR
		GA.01 3	Use Citywide tree inventory data and best available science for long-term planning and management of existing and future tree pests and diseases impacting the City's urban forest and trees specific to Focus Areas.	C H E N	**CD** 2022
		GA.02 9	Prioritize and mitigate risk trees as well as young and large tree maintenance based on updated inventory data and resources. Continue to inform adjacent property owner(s) of tree maintenance or removal responsibilities using established protocols.	C H E N	**CD**, PR, PW Annually
		GA.03 22	Develop a more strategic approach to tree species and site selection to ensure their resilience and optimize ecosystem service provision of Wilsonville's urban forest. Use Appendix A as guidance.	C H E N	**CD**, PR, PW 2024
		GA.04 23	In conjunction with watershed goals, green stormwater infrastructure plans, and other planning efforts, evaluate staffing resources required to effectively plant and maintain trees aligned with canopy goals and provide post-planting care.	C H E N	**CD**, PR, PW 2024

*Lead: CD-Community Development Department; PR- Parks and Recreation Department; PW-Public Works Department

**Co-Benefits: C = Community; E = Equity; H = Human Health; N = Natural Environment

Acronyms: ANSI-American National Standards Institute, BMPs-Best Management Practices, ISA-International Society of Arboriculture, SOP-Standard Operating Procedure, UFMP-Urban Forest Management Plan

GREEN ASSET MANAGEMENT (GA) TARGETS

Table 25. Green Asset Management action targets

ACTION TARGET 1	ACTION TARGET 2	ACTION TARGET 3
GA.01: Tree database updated to reflect changes to the public tree population and analyzed for potential risks (Year 1)	GA.01: A plan is in place for managing tree pests and diseases in an integrated approach aligned with the Master Tree Planting Plan resulting from actions AP.02 and AP.03 (Year 10)	GA.01: The urban forest is more resilient to climate change and tree pests and diseases (Year 25)
GA.02: A maintained tree database informs routine and risk tree maintenance (Year 1-25)	**GA.02: Tree maintenance responsibility is understood by the public observed in surveys and less service requests (Year 10)**	GA.02: The public tree population is actively managed to reduce tree risk and all street trees are pruned on an appropriate rotation (Year 25)
GA.03: The Citywide Recommended Tree List in Appendix A is adopted (Year 1)	GA.03: A maintained tree database informs tree species and locations for planting (Year 3)	**GA.03: A Citywide Master Tree Planting Plan is developed in line with Focus Area planting plans (Year 4)**
GA.04: City and partner programs and efforts are documented (Year 3)	**GA.04: Coordination meetings are held to effectively develop planting targets and canopy goals (Year 4)**	GA.04: A shared commitment achieves local and Citywide tree canopy goals with staffing to properly maintain the growing urban forest (Year 25)

Targets in bold font and colored by goal color are the primary target to measure success of implementing the corresponding action.

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URBAN FOREST MANAGEMENT FOR CITY FOCUS AREAS

In addition to the Citywide urban forest management actions, strategic actions were developed for the City's focus areas of Charbonneau and Town Center. These actions are integrated into the Citywide actions and summarized below for direct implementation to improve the management, sustainability, and community framework of trees in these focus areas.

SPECIFIC ACTIONS FOR THE URBAN FOREST IN CITY FOCUS AREAS

Table 26. Urban forestry actions specific to City Focus Areas

ACTION #*	FOCUS AREA	ACTIONS	TARGET YEARS
MP.01	Town Center	Support canopy goals in Town Center with effective tree preservation policies (i.e., City Code 4.600 - 4.640.20). Use Appendix B-E as guidance.	2022
MP.03	Charbonneau Town Center	Complete a comprehensive high-resolution urban tree canopy (UTC) assessment using industry recommended protocols to measure progress towards canopy goals and tree equity.	2025
MP.04	Charbonneau Town Center	Develop a tree manual for planners, developers, homeowners, and tree care companies that includes tree-related policies, guidelines, best practices, and standards.	2026
AP.01	Charbonneau Town Center	Maintain an inventory of public trees Citywide and within Focus Areas and update as maintenance and new plantings occur. Monitor tree loss and gain through annual tree removal and planting permit reporting.	Annually
AP.02	Town Center	Utilize Appendix A-E to develop a Master Tree Planting Plan for Town Center, aligned with the local and Citywide canopy goals. Preserve existing trees in Town Center to the extent possible by using guidance provided in Appendix D.	2023
AP.03	Charbonneau	Utilize Appendix A-E to develop a Master Tree Planting Plan for Charbonneau's aging oak (*Quercus*) population, aligned with the local and Citywide canopy goals.	2023
CE.01	Charbonneau Town Center	Update the City's website and materials based on information from the Plan. On a regular basis, share informative urban forestry and tree-related content to a social media, City website, and other communication platforms. Prioritize citizen service requests and update the City website with frequently asked questions and resources.	2022
CE.02	Charbonneau Town Center	As funding permits, conduct annual urban forestry events, or partner-events—especially involving youth and HOAs—relating to tree planting and pruning to increase capacity for the care of public trees led by citizen tree stewards. Prioritize areas with lower urban tree canopy and other considerations such as underserved communities.	Annually
CE.03	Charbonneau Town Center	Continue to track and annually report urban forestry activities of all partners and continue to maintain Arbor Day Tree City USA designation. Data will support future budget requests.	Annually
CE.04	Charbonneau Town Center	Continue to strengthen partnerships with civic groups, volunteers, institutions, neighborhoods, and non-profit organizations. Clarify tree maintenance authority and responsibilities among entities such as Homeowners Associations (HOAs), utilities, and special districts in a Standard Operating Procedure (SOP). Provide resources to private landholders on an as-needed basis.	Annually

** MP = Tree Management Policy goal; AP = Assessments and Plans goal; CE = Community Engagement goal; GA = Green Asset Management goal*

Acronyms: ADA = Americans with Disabilities Act

Table 26. Urban forestry actions specific to City Focus Areas (continued)

ACTION #*	FOCUS AREA	ACTIONS	TARGET YEARS
CE.05	Charbonneau Town Center	As funding permits, provide information and educational workshops and materials about the proper tree species for given sites and conditions. Increase public outreach and notification of current and future pest/disease concerns and what they can do to support and sustain the urban tree canopy.	Annually
CE.06	Charbonneau Town Center	Continue to utilize the City Tree Fund for homeowner mitigation plantings. Increased awareness and support of urban forestry in the City will increase City Tree Fund contributions allowing the City to reevaluate mitigation amount ($100 currently).	2022
CE.07	Charbonneau Town Center	Support and sustain partnerships with local and regional participatory organizations (see Appendix H). Encourage and support horizontal volunteer collaboration between organizations. Increase the number of community volunteers annually.	Annually
CE.08	Charbonneau Town Center	Develop strategies to remove barriers to participation for all community members. Barriers to address include ADA communications compliance, internet availability, language, cultures, location, and transportation. Utilize partnerships with neighborhood organizations (see Appendix H).	2022, Annually
CE.09	Charbonneau Town Center	Recognize exemplary urban forest stewards and volunteers representing youth, residents, organizations, and business owners. Consider a tree donation or use of the City Tree Fund framework for costs associated with this program.	2023, Annually
CE.10	Charbonneau Town Center	Conduct biannual community surveys to gauge public viewpoints and receive feedback on implementation of the UFMP, and program success. Survey responses should inform future urban forest decision making.	2024, Bi-Annually
CE.11	Charbonneau Town Center	Establish non-conventional partnerships that serve single and/or multiple City neighborhoods. At minimum, all neighborhoods should be represented in partnerships.	2025
GA.01	Charbonneau Town Center	Use Citywide tree inventory data and best available science for long-term planning and management of existing and future tree pests and diseases impacting the City's urban forest and trees specific to Focus Areas.	2022
GA.02	Charbonneau Town Center	Prioritize and mitigate risk trees as well as young and large tree maintenance based on updated inventory data and resources. Continue to inform adjacent property owner(s) of tree maintenance or removal responsibilities using established protocols.	Annually

** MP = Tree Management Policy goal; AP = Assessments and Plans goal; CE = Community Engagement goal; GA = Green Asset Management goal*

Acronyms: ADA = Americans with Disabilities Act

GOAL AND ACTION SUMMARY

Urban trees are regarded as assets similar to other infrastructure investments. Protecting the asset and ensuring a healthy and sustainable urban forest requires sound and deliberate management guided by strategic goals and actions. This Urban Forest Management Plan was developed to establish the protocols, outcomes, and services related to Wilsonville's urban forest over a long-term 25-year planning horizon. The actions presented in the previous section are ordered by goal theme though the City may find it advantageous to order by priority or other action attribute (see the Goal and Action Framework worksheet as part of the UFMP project). The table below provides the actions in order of priority and the key considerations for implementing the respective action.

Table 27. Summary of urban forest management actions by priority and rationale

	ACTION #	KEY CONSIDERATIONS OR RATIONALE
HIGHEST PRIORITY	MP.01	Effective policies ensure long-term urban forest sustainability.
	MP.03	Equal access to green spaces and an equitable distribution of tree canopy provides social, economic, and environmental benefits.
	CT.01	Coordinating implementation of the UFMP enables success.
	CT.02	Staff training reduces costs and improves production, safety, levels of service, and the urban forest.
	AP.01	Inventories inform maintenance, resource needs, planting, and ecosystem benefits.
	AP.02	A strategic plan for planting can achieve canopy goals, sustainability, and equity.
	AP.03	A strategic plan for planting can achieve canopy goals, sustainability, and equity.
	AP.04	Evaluations enable adaptive management.
	CE.03	A city must demonstrate that it cares about its urban forest.
	CE.04	Partnerships enable efficient achievement of shared goals.
MEDIUM PRIORITY	CT.03	A well-managed urban forest is sustainable, resilient, lower risk, and beneficial.
	CT.04	Effective policies ensure long-term urban forest sustainability.
	AP.05	A plan to address tree and hardscape conflicts resolves issues, is consistent, transparent, and achieves common goals.
	AP.06	An understanding of benefits, services, and value can be conveyed to the public and inform management.
	CE.01	Readily available information raises awareness and increases support to achieve common goals.
	CE.02	A community that participates in stewardship takes ownership and provides support.
	CE.06	The community expresses strong interest in supporting urban forestry goals but may be financially constrained.
	CE.07	Partnerships enable efficient achievement of shared goals.
	CE.08	A community that participates in stewardship takes ownership and provides support.
	CE.09	A city must demonstrate it cares about its urban forest and the individuals caring for it.
	CE.10	Gathering feedback and input from the community informs future strategies, messaging, and resource needs.
	CE.11	Partnerships enable efficient achievement of shared goals.
	GA.01	A well-managed urban forest is sustainable, resilient, lower risk, and beneficial.
	GA.02	A well-managed urban forest is sustainable, resilient, lower risk, and beneficial.
	GA.03	A well-managed urban forest is sustainable, resilient, lower risk, and beneficial.
	GA.04	A diverse urban forest is resilient to tree pests and diseases and climate change but must be planted according to tree and site requirements, timing, and desired function.
	GA.05	Partnerships and coordination enable efficient achievement of shared goals.

Table 27. Summary of urban forest management actions by priority and rationale (continued)

	ACTION #	KEY CONSIDERATIONS OR RATIONALE
LOWER PRIORITY	MP.02	A systematic approach to risk assessments and mitigation will reduce risk and improve the urban forest.
	MP.04	A well-managed urban forest is sustainable, resilient, lower risk, and beneficial.
	CE.05	Readily available information raises awareness and increases support to achieve common goals.

IMPLEMENTATION GUIDANCE

The framework of the goals and actions in the Urban Forest Management Plan provides the City of Wilsonville with the means to measure progress and adapt to an everchanging environment and availability of resources. Each of the five goals align with the U.S. Forest Service's Urban Forest Audit System and the actions are intended to guide the City towards improvements in ranking for each of the 126 elements within the 11 categories of urban forest management. As actions are implemented, the City may conduct new iterations of the Urban Forest Audit to gauge success, evaluate progress, and adjust accordingly.

As part of the project, an interactive worksheet of goals, actions, and targets was provided to enable the City's implementers to sort actions by order, priority, effort, goal theme, implementation year, and other action attributes. It is recommended the City establish an urban forestry working group to manage Plan implementation and monitoring. This team should coordinate the implementation of actions with the respective partners or collaborators. For the Plan, actions were provided by goal theme though the City may find it advantageous to view the actions by recommended order, priority, level of effort, or target year.

MONITORING PLAN

This Urban Forest Management Plan will be updated and revised periodically to reflect changes in the urban forest resource structure and function, to incorporate changes in industry standards, to consider community response, and to measure the progress of the urban forest partners in implementing the recommendations and reaching the established goals. This process should be implemented by an Urban Forest Working Group (UFMP Action CT.01) using the Evaluate, Monitor, Report, and Revise methodology.

Knowing how the City of Wilsonville and its partners are doing will require a continual process of evaluation. This section presents examples of how to monitor, analyze, and revise the Plan, which will keep stakeholders informed of the status of the urban forest program. To monitor progress toward implementing the Plan recommendations, an evaluation similar to the U.S. Forest Service's Urban Forest Audit conducted to develop the initial Plan should be completed. This evaluation will identify progress and shortfalls compared to the baseline audit.

In addition, a report card could be created based on outcomes of the audit and distributed to the public every two to three years. This will measure the progress toward implementing the Plan recommendations. The following example provides a suggested reporting structure to measure success toward accomplishing each goal. Other indicators to measure progress may need to be developed to ensure a thorough and accurate evaluation.

Evaluate

The Urban Forest Audit System provides a framework for routine evaluations of the urban forest, the programs that manage it, and the community that shapes and benefits from it. The Research Summary to this Urban Forest Management Plan provides the guidance for completing the audit. It is recommended the City Project Team or the Urban Forest Working Group complete a bi-annual audit to inform any alterations to actions and strategies.

This audit system consists of 11 categories of urban forest management, sustainability, and community. Within the 11 categories are approximately 130 elements. Each element was ranked or scored based on the consultants' evaluations in 2021 for the Urban Forest Management Plan. The City Project team or Urban Forest Working Group should complete an update to this ranking bi-annually to inform Plan reporting, monitoring, and revision as described in the following sections.

Monitor

Measuring accomplishment of the actions will require ongoing analysis. The outcomes of the Urban Forest Audit System in the "Evaluate" section can be used to monitor change over time. These benchmark values should be tracked, and a state of the urban forest report should be prepared and distributed to the public every 5 to 10 years. Analysis may include an updated street tree inventory, i-Tree benefits analyses, or urban tree canopy assessments. The state of the urban forest report should include the benchmark values as reported in the Plan and the Urban Forest Audit System as of 2021, so that the City can measure and compare changes to the urban forest. The report should reflect changes to the audit system that are measured.

Wilsonville's Urban Forest Benchmark Values

Table 28. Wilsonville's urban forest benchmark values

URBAN TREE CANOPY (UTC) COVER (2021)	
UTC	Unknown
Recommended Canopy Goal	To be determined
Total Number of Trees to Plant for Canopy Goal	To be determined
ESTIMATED TREE COUNT	
Total Public Trees Managed	Unknown
Public Trees Inventoried	25,950
Total Public Trees (streets, parks, natural areas)	Unknown
TREE SPECIES DIVERSITY (SPECIES EXCEEDING 10%)	
Public Trees (2020)	Red Maple (10%)
TREE BENEFITS	
Citywide (Public Trees)	2020: $35.5 million (annual est.)
Inventoried Public Trees (25,950)	2020: $1.9 million (annual) 2020: $46.4 million (structural value)
Focus Areas (Town Center & Charbonneau)	2020: $280,000 (annual)
TREE AND BUDGET DISTRIBUTION (2019)	
Public Trees per Capita	1.02
Budget per Capita	$10.42
Budget per Public Tree	$9.67
Total Public (managed) Trees per Staff	3,243 (of inventoried trees)
MANAGEMENT ACTIVITIES (2019)	
City-owned Street Trees Pruned	110
City-owned Street Trees Removed	19
City-owned Street Trees Planted	40
Number of Volunteers and/or Hours	Unknown
Privately-maintained Street Trees Pruned/Removed	Unknown/Unknown

Table 28. Wilsonville's urban forest benchmark values (continued)

URBAN FOREST AUDIT SYSTEM (TOTAL SCORE OF 2021: 62%)	
Management Policy and Ordinances	71%
Professional Capacity and Training	63%
Funding and Accounting	58%
Decision and Mangaement Authority	63%
Inventories	46%
Urban Forest management Plans	50%
Risk Management	61%
Disaster Planning	43%
Standards and Best Management Practices	63%
Community	89%
Green Asset Evaluation	55%

REPORT

Based on the evaluation of Plan implementation progress, the City Project Team or Urban Forest Working Group should track, record, and report, as practical or necessary, on the metrics described below that are measures or indicators of success for each goal and supporting actions.

Table 29. Evaluation, monitoring, and reporting techniques to achieve the urban forestry goals

1	**TREE MANAGEMENT POLICY (MP):** The City's urban forest policies are the foundation for preserving the environmental benefits, management, and character of Wilsonville's urban forest. • List existing and potential partners. • List all City and partner-led planning efforts. • Describe related planning efforts. • List opportunities to align efforts with Town Center and Charbonneau. • List opportunities to align efforts with other neighborhoods. • Establish a Citywide canopy goal and local planting targets. • List recommended changes to City Code, policies, and manuals. • List audit score and actions/targets achieved, ongoing, and not started.
2	**CAPACITY, TRAINING, AND AUTHORITY (CT):** Wilsonville has the capacity and expertise to provide optimal levels of service for sound urban forest management. • List the team members assembled to implement and monitor the Plan. • List the existing staff and supporting departments and partners. • Describe existing and needed certifications, qualifications, and training. • Describe changes in levels of service based on citizen service requests. • Report the number of unattended tree maintenance and service requests. • Report the number trees preserved and planted through development.

3

ASSESSMENTS AND PLANS (AP):

A thorough understanding of the urban forest ensures data-driven decisions, sustainable and comprehensive planning, and amplified tree benefits.

- Report the number of trees inventoried.
- Report the number of public trees planted and removed.
- Report the number of trees assessed for risk.
- Report the progress of the Charbonneau Tree Preservation Program.
- Report the value of the entire urban forest and public tree population.
- List the priority planting areas, canopy goals, and recommended species.
- Report the assessment and planning efforts of partners.
- Describe the high-value conservation and preservation areas.
- List audit score and actions/targets achieved, ongoing, and not started.

4

COMMUNITY ENGAGEMENT (CE):

Sustainable urban forest management and equity is achieved through a partnership with the City and its residents resulting in improved well-being, human health, and local economies.

- List the existing and potential outreach platforms and initiatives.
- List existing and potential partners.
- Report the number of planting events and trees planted.
- Report the history of Tree City USA and supporting awards.
- Report the number of volunteers, events, and volunteer hours.
- Report the number of private tree plantings as feasible.
- Report the number of trainings, workshops, and attendees.
- Report the results of public surveys.
- Recognize exemplary urban forest stewards.
- List audit score and actions/targets achieved, ongoing, and not started.

5

GREEN ASSET MANAGEMENT (GA):

Wilsonville proactively manages the public trees, continues to grow and expand a healthy canopy, effectively mitigates storm damage, maintains public safety, and optimizes urban forest benefits.

- Report the number of public trees pruned, removed, and planted.
- Report the number of trees managed for pests and diseases.
- Report the number of trees planted in stormwater management projects.
- Report progress towards canopy goals and tree planting targets.
- Report the volume of woody biomass utilized.
- Report the condition, structure, and diversity of the public trees.
- List audit score and actions/targets achieved, ongoing, and not started.

OTHER

BUDGET AND FUNDING TO SUPPORT UFMP GOALS:

City resources enable comprehensive urban forest management for the preservation and enhancement of tree benefits.

- Report the proportion of public trees to tree management staff.
- Report the proportion of budget to the total public tree population.
- Report the proportion of public trees to the City population.
- Report the number of volunteer hours.
- Report the number of trainings and conferences attended.
- List the unfunded urban forestry needs.
- Report the budget, partner funding, permit revenue, and donations.
- List audit score and actions/targets achieved, ongoing, and not started.

REVISE

Completion of this Plan is the first step towards meeting the vision for Wilsonville's urban forest. Continual monitoring, analysis, and reporting will help to keep urban forest partners involved and focused on accomplishing the actions. Plans are typically revised every 10 to 15 years; however, the Plan will need formal revision to respond and adapt to changes as they develop. Formal revision of the Plan should coincide with the update of the City's Comprehensive Plan, Focus Area Plans, Parks and Recreation Master Plan, Urban Renewal Strategic Plan, Town Center Plan, Charbonneau Consolidated Improvement Plan, and other relevant planning efforts. Recommendations and goals of each should be compared. Revisions to the Plan should occur with major events, such as newly discovered pests or diseases, changes in program budget and resources, or significant changes to industry standards or legal codes.

Figure 18. Example of the plan implementation, evaluation, and revision process

ACT AND REPORT	EVALUATE AND REVISE	ACT AND REPORT	EVALUATE AND REVISE
Years 1-5	*Year 5*	*Years 6-10*	*Year 10*
Annual Action Plans and Reports	Urban Forest Audit and Plan Amendments	Annual Action Plans and Reports	Urban Forest Audit and Plan Update
Monthly Activities and Annual Report	Updated Benchmarks and P lan Actions	Monthly Activities and Annual Report	Updated Benchmarks and Plan Actions

CONCLUSION

Photo courtesy of Zach Herrmann, winner of the UFMP photo contest, November 2020

Trees are an integral part of the community and the ecological systems in which they exist. They provide significant economic, social, and ecological benefits, such as carbon sequestration, reduction of urban heat islands, energy savings, reduction of stormwater runoff, improvement of water quality, enhancement of human health and wellness, and increase the value of properties. Planting and maintaining trees help Wilsonville become more sustainable and reduce the negative impacts on the ecosystem from urban development. Trees are as necessary as water, infrastructure, and energy to sustaining healthy communities. The health of the urban forest is directly linked to the health of the region.

The goal framework in Wilsonville's Urban Forest Management Plan is based on outcomes of the audit system and in alignment with existing plans to allow the City to incrementally implement actions, effectively monitor progress, and efficiently adapt in an everchanging environment. Successful implementation of actions in this Plan will bring Wilsonville to a higher level of service that is more equitably distributed across the City resulting in a sustainable and thriving urban forest that benefits all residents and future generations.

Wilsonville's trees, forests, and other natural resources are recognized as integral to sustaining life and health for all City residents. A healthy, thriving, and sustainable urban forest should be a community priority, to be thoughtfully managed and cared for by partnerships between the City and its residents to maximize public safety and benefits that include a thriving ecosystem, vibrant economy, improved human health, and livable communities shared by all who live, work, and play in Wilsonville. James Clark, emphasizes the importance of an Urban Forest Management Plan in A Model of Urban Forest Sustainability (1997):

> **"Urban trees and forests are considered integral to the sustainability of cities as a whole. Yet, sustainable urban forests are not born, they are made. They do not arise at random, but result from a community wide commitment to their creation and management."**
> **CLARK, 1997**

As stated in this quote, an effective urban forestry program supported by the City's passion for the natural environment and associated benefits will lead Wilsonville to a more sustainable and thriving urban forest.

Photo courtesy of Susan Reep, UFMP photo contest contestant, November 2020

APPENDICES

APPENDIX A

CITYWIDE RECOMMENDED TREE LIST ..... B

APPENDIX B

TREE CANOPY GOAL SETTING GUIDANCE ..... J

APPENDIX C

TREE PLANTING PRIORITIZATION GUIDANCE ..... N

APPENDIX D

PRESERVATION OF TREES IN FOCUS AREAS ..... P

APPENDIX E

TREE REMOVALS AND REPLACEMENTS IN FOCUS AREAS ..... AA

APPENDIX F

FUNDING MECHANISMS ..... AO

APPENDIX G

TREES AND HARDSCAPE CONFLICTS SOLUTIONS WORKBOOK ..... AQ

APPENDIX H

EXISTING AND POTENTIAL URBAN FORESTRY PARTNERS ..... AY

APPENDIX I

STORM AND DISASTER MANAGEMENT GUIDANCE ..... AZ

APPENDIX A. CITYWIDE RECOMMENDED TREE LIST

See the Wilsonville, OR Master Street Tree List spreadsheet for further information.

Table 30. Citywide recommended tree list (abbreviated)

Small-Statured Trees

TREE TYPE	COMMON NAME	SCIENTIFIC NAME	HEIGHT X WIDTH (FT)	FEATURES	SISTER CLIMATE CITY TREE?
Cherry	Bird Cherry	*Prunus avium* 'Lapins' STARKRIMSON SWEET	15 x 15	Flowers, fruit, wildlife	
Crabapple	Tschonoskii Crabapple	*Malus tschonoskii*	30 x 15	Wildlife, flowers, fall color	Y
Crape Myrtle	Tuscarora Crape Myrtle	*Lagerstroemia* 'Tuscarora'	20 x 20	Flowers, fall color, unique bark	Y
Crape Myrtle	Muskogee Crape Myrtle	*Lagerstroemia* 'Muskogee'	20 x 20	Flowers, fall color, unique bark	Y
Crape Myrtle	Natchez Crape Myrtle	*Lagerstroemia* 'Natchez'	20 x 20	Flowers, fall color, unique bark	Y
Dogwood	Milky Way Dogwood	*Cornus kousa* 'Milky Way'	20 x 20	Flowers, wildlife	
Dogwood	Venus® Dogwood	*Cornus elwinortonii* 'KN30-8'	25 x 20	Wildlife, flowers, fall color	
Dogwood	Starlight® Dogwood	*Cornus elwinortonii* 'KN4-43'	30 x 20	Wildlife, flowers, fall color	
Hawthorn	Lavalle Hawthorn	*Crataegus X lavalleei*	25 x 20	Wildlife, flowers, fall color	
Madrone	Strawberry Tree	*Arbutus unedo*	15 x 15	Evergreen, showy fruit	Y
Maple	Paperbark Maple	*Acer griseum*	30 x 25	unique bark, fall color	
Maple	Cretan Maple	*Acer sempervirens*	20 x 20	Semi evergreen	
Persian Ironwood	Ruby Vase® Persian Ironwood	*Parrotia persica* 'Ruby Vase'	35 x 20	Fall color, unique bark	
Redbud	Eastern Redbud	*Cercis canadensis*	30 x 30	Flowers, fall color	Y
Redbud	Western Redbud	*Cercis occidentalis*	30 x 30	Flowers, fall color	
Redbud	Merlot Redbud	*Cercis canadensis* 'Merlot'	15 x 15	Flowers	
Snowbell	Pink Chimes Japanese Snowbell	*Styrax japonicus* 'Pink Chimes'	25 x 20	Flowers	
Snowbell	Emerald Pagoda Japanese Snowbell	*Styrax japonicus* 'Emerald Pagoda'	25 x 20	Flowers	
Snowbell	Snow Charm® Japanese Snowbell	*Styrax japonicus* 'JFS-E'	25 x 20	Flowers	
Snowbell	Bigleaf Snowbell	*Styrax obassia*	25 x 20	Flowers	

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Medium-Statured Trees

TREE TYPE	COMMON NAME	SCIENTIFIC NAME	HEIGHT X WIDTH (FT)	FEATURES	SISTER CLIMATE CITY TREE?
Beech	Dawyck Purple Beech	Fagus sylvatica 'Dawyck Purple'	50 x 15	Unique foliage, unique bark	
Birch	Dura-Heat® River Birch	*Betula nigra 'BNMTF'*	45 x 35	Unique bark	
Cascara	Cascara	Frangula purshiana	30 x 25	Native, wildlife, fall color	
Chitalpa	Chitalpa	X Chitalpa tashkentensis 'Pink Dawn'	30 x 30	Flowers	
Cork Tree	His Majesty Cork Tree	Phellodendron amurense 'His Majesty'	40 x 35	Fall color, unique bark	
Cork Tree	Eyestopper® Cork Tree	Phellodendron amurense 'Longenecker'	40 x 35	Fall color, unique bark	
Dogwood	Pacific Dogwood	Cornus nuttallii	40 x 25	Flower, fall color	
Dogwood	Eddie's White Wonder Dogwood	Cornus 'Eddie's White Wonder'	35 x 20	Wildlife, flowers, fall color	
Dogwood	June Snow® Giant Dogwood	*Cornus controversa 'June Snow-JFS'*	40 x 30	Wildlife, flowers, fall color	
Fringtree	Chinese Fringetree	*Chionanthus retusus*	20 x 25	Wildlife, flowers, unique bark	Y
Ginkgo biloba	Saratoga Ginkgo Biloba	*Ginkgo Biloba 'Saratoga'*	35 x 25	Fall color	
Ginkgo biloba	Halka Ginkgo Biloba	*Ginkgo Biloba 'Halka'*	40 x 35	Fall color	
Ginkgo biloba	Fairmount Ginkgo Biloba	Ginkgo biloba 'Fairmount'	45 x 25	Fall color	
Ginkgo biloba	Shangri-La Ginkgo Biloba	*Ginkgo Biloba 'Shangri-La'*	45 x 35	Fall color	
Goldenrain Tree	Goldenrain Tree	*Koelreuteria paniculata*	30 x 25	Flowers, fall color, unique bark	Y
Hardy Rubber Tree	Hardy Rubber Tree	*Eucommia ulmoides*	40 x 40	Form	
Hophornbeam	American Hophornbeam	*Ostrya virginiana*	30 x 25	Fall color	
Hornbeam	Emerald Avenue European Hornbeam	*Carpinus betulus 'JFS-KW1CB'*	40 x 30	Fall color	
Hornbeam	American Hornbeam	*Carpinus caroliniana*	35 x 35	Fall color, unique bark	
Hornbeam	Palisade® American Hornbeam	*Carpinus caroliniana 'CCSQU'*	30 x 15	Fall color	

Medium-Statured Trees (continued)

TREE TYPE	COMMON NAME	SCIENTIFIC NAME	HEIGHT X WIDTH (FT)	FEATURES	SISTER CLIMATE CITY TREE?
Hornbeam	Rising Fire American Hornbeam	*Carpinus caroliniana* 'Uxbridge'	30 x 15	Fall color	
Hornbeam	Firespire® American Hornbeam	*Carpinus caroliniana* 'J.N. Upright'	30 x 25	Fall color, unique bark	
Hornbeam	Native Flame® American Hornbeam	*Carpinus caroliniana* 'JFS-KW6'	30 x 25	Fall color, unique bark	
Hornbeam	European Hornbeam	*Carpinus betulus*	40 x 25	Fall color	Y
Hornbeam	Pyramidal European Hornbeam	*Carpinus betulus* 'Fastigiata'	40 x 25	Fall color	
Horsechestnut	California Buckeye	*Aesculus californica*	30 x 40	Flowers	
Japanese Raisintree	Japanese Raisintree	*Hovenia dulcis*	35 x 25	Wildlife, flowers	
Linden	Summer Sprite® Linden	*Tilia cordata* 'Halka'	20 x 15	Fall color	Y
Linden	Harvest Gold Littleleaf Linden	*Tilia* 'Harvest Gold'	35 x 25	Fall color	Y
Linden	Silver Linden	*Tilia tomentosa* 'Sterling'	45 x 35	Fall color	
Maackia	Amur Maackia	*Maackia amurensis*	30 x 25	Flowers, fall color, unique bark	
Magnolia	Victoria Southern Magnolia	*Magnolia grandiflora* 'Victoria'	30 x 20	Evergreen, flowers	Y
Magnolia	Galaxy Magnolia	*Magnolia* 'Galaxy'	30 x 20	Flowers	Y
Magnolia	Elizabeth Magnolia	*Magnolia* 'Elizabeth'	30 x 20	Flowers	
Magnolia	Sweetbay Magnolia	*Magnolia virginiana*	30 x 20	Evergreen, flowers	
Maple	Rocky Mountain Glow Maple	*Acer grandidentatum* 'Schmidt'	25 x 15	Fall color	
Oak	Bambooleaf Oak	*Quercus myrsinifolia*	35 x 25	Evergreen, wildlife	
Oak	Silverleaf Oak	*Quercus hypoleucoides*	50 x 35	Evergreen, wildlife	
Oak	Forest Green® Oak	*Quercus frainetto* 'Schmidt'	55 x 30	Wildlife	Y
Osage-orange	White Shield Osage-orange	*Maclura pomifera* 'White Shield'	35 x 35	Fall color	
Persian Ironwood	Vanessa Persian Ironwood	*Parrotia persica* 'Vanessa'	35 x 20	Fall color, unique bark	
Pine	Limber Pine	*Pinus flexilis* 'Vanderwolf's Pyramid'	35 x 15	Evergreen	
Redbud	Forest Pansy Redbud	*Cercis canadensis* 'Forest Pansy'	30 x 35	Flowers, unique foliage	
Silverbell	Carolina Silverbell	*Halesia carolina*	40 x 35	Flowers, fall color	

Medium-Statured Trees (continued)

TREE TYPE	COMMON NAME	SCIENTIFIC NAME	HEIGHT X WIDTH (FT)	FEATURES	SISTER CLIMATE CITY TREE?
Tree Lilac	Ivory Silk Japanese Tree Lilac	*Syringa reticulata* 'Ivory Silk'	20 x 15	Flowers, unique bark	Y
Tree Lilac	Summer Charm® Tree Lilac	*Syringa pekinensis* 'DTR 124'	20 x 20	Flowers, unique bark	
Tree Lilac	China Snow® Tree Lilac	*Syringa pekinensis* 'Morton'	20 x 20	Flowers, unique bark	
Tree Lilac	Great Wall® Tree Lilac	*Syringa pekinensis* 'WFH2'	20 x 20	Flowers, unique bark	
Tree Lilac	Beijing Gold® Tree Lilac	*Syringa pekinensis* 'Zhang Zhiming'	20 x 20	Flowers, unique bark	
Tupelo	Gum Drop® Tupelo	*Nyssa sylvatica* 'JFS-PN Legacy1'	30 x 20	Fall color	
Tupelo	Afterburner® Black Tupelo	*Nyssa sylvatica* 'David Odom'	40 x 25	Wildlife, fall color	Y
Tupelo	Wildfire Black Tupelo	*Nyssa sylvatica* 'Wildfire'	40 x 25	Wildlife, fall color	
Tupelo	Black Tupelo	*Nyssa sylvatica* 'Firestarter'	40 x 25	Wildlife, fall color	
Tupelo	Red Rage® Black Tupelo	*Nyssa sylvatica* 'Haymanred'	40 x 25	Wildlife, fall color	
Tupelo	Sheri's Cloud Black Tupelo	*Nyssa sylvatica* 'Sheri's Cloud'	40 x 25	Wildlife, fall color	
Yellowwood	American Yellowwood	*Cladrastis kentukea*	40 x 40	Flowers, fall color	
Zelkova	City Sprite® Japanese Zelkova	*Zelkova serrata* 'JFS-KW1'	25 x 20	Fall color	Y

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Large-Statured Trees

TREE TYPE	COMMON NAME	SCIENTIFIC NAME	HEIGHT X WIDTH (FT)	FEATURES	SISTER CLIMATE CITY TREE?
Beech	Roble Beech	*Nothofagus obliqua*	100 x 50	Wildlife	
Beech	Fernleaf Beech	*Fagus sylvatica* 'Asplenifolia'	60 x 50	Unique leaf	
Beech	Rivers Purple Beech	*Fagus sylvatica* 'Riversii'	60 x 50	Unique leaf, unique bark	
Beech	Copper Beech	*Fagus sylvatica* 'Atropurpurea'	60 x 50	Unique leaf	
Beech	Japanese Chinquapin	*Castanopsis cuspidata*	50 x 30	Wildlife, flowers, evergreen	
Beech	Tricolor Beech	*Fagus sylvatica* 'Roseomarginata'	40 x 30	Unique foliage, unique bark	
Birch	Heritage® River Birch	*Betula nigra* 'Heritage'	45 x 35	Unique bark	
Catalpa	Chinese Catalpa	*Catalpa ovata*	25 x 25	Flowers	
Catalpa	Hybrid Catalpa	*Catalpa xerubescens* 'Purpurea'	45 x 45	Wildlife, flowers	
Catalpa	Northern Catalpa	*Catalpa speciosa*	50 x 30	Wildlife, flowers	
Chestnut	Spanish Chestnut	*Castanea sativa*	70 x 50	Wildlife	
Coastal Redwood	Coast Redwood	*Sequoia sempervirens*	100 x 30	Evergreen, unique bark	
Cypress	Baker Cypress	*Cupressus bakeri*	50 x 35	Evergreen, unique bark	
Cypress	Bald Cypress	*Taxodium distichum*	65 x 30	Fall color	
Cypress	Shawnee Brave® Bald Cypress	*Taxodium distichum* 'Mickelson'	50 x 20	Fall color	
Dawn Redwood	Dawn Redwood	*Metasequoia glyptostroboides*	75 x 30	Fall color	
Douglas-Fir	Douglas-Fir	*Pseudotsuga menziesii*	100 x 30	Native, evergreen, wildlife	
Dove-Tree	Dove-Tree	*Davidia involucrata*	50 x 30	Fall color	
Elm	Triumph Elm	*Ulmus* 'Morton Glossy'	55 x 45	Fall color	
Elm	Accolade® Elm	*Ulmus* 'Morton'	60 x 50	Fall color	Y
Elm	Valley Forge American Elm	*Ulmus americana* 'Valley Forge'	65 x 55	Fall color	Y
Elm	Jefferson American Elm	*Ulmus americana* 'Jefferson'	65 x 55	Fall color	
Elm	Princeton American Elm	*Ulmus americana* 'Princeton'	65 x 55	Fall color	
Elm	Patriot Elm	*Ulmus* 'Patriot'	50 x 40	Fall color	
Elm	Emerald Sunshine® Elm	*Ulmus propinqua* 'JFS-Bierbach'	35 x 25	Fall color, unique bark	Y
Elm	Frontier Elm	*Ulmus carpinifolia x U. parvofolia* 'Frontier'	40 x 30	Fall color, unique bark	Y
False Cedar	Incense Cedar	*Calocedrus decurrens*	60 x 20	Evergreen	
False Cedar	Sekkan Sugi Japanese Cedar	*Cryptomeria japonica* 'Sekkan Sugi'	50 x 15	Evergreen	

Large-Statured Trees (continued)

TREE TYPE	COMMON NAME	SCIENTIFIC NAME	HEIGHT X WIDTH (FT)	FEATURES	SISTER CLIMATE CITY TREE?
False Cedar	Western Redcedar	*Thuja plicata*	70 x 25	Native, evergreen, wildlife, unique bark	
Filbert	Turkish Filbert	*Corylus colurna*	50 x 30	Wildlife	
Fir	Grand Fir	*Abies grandis*	80 x 25	Native, evergreen, wildlife	
Fir	Spanish Fir	*Abies pinsapo*	50 x 30	Evergreen	
Giant Sequoia	Giant Sequoia	*Sequoiadendron giganteum*	80 x 50	Evergreen, unique bark	
Ginkgo biloba	Princeton Sentry Ginkgo	*Ginkgo biloba* 'Princeton Sentry'	50 x 30	Unique leaf, fall color	Y
Ginkgo biloba	Emperor Ginkgo biloba	*Ginkgo biloba* 'Emperor'	50 x 40	Fall color	
Ginkgo biloba	Presidential Gold® Ginkgo biloba	*Ginkgo biloba* 'The President'	50 x 40	Fall color	
Ginkgo biloba	Autumn Gold Ginkgo Biloba	*Ginkgo Biloba* 'Autumn Gold'	45 x 35	Fall color	Y
Ginkgo biloba	Golden Colonade® Ginkgo Biloba	*Ginkgo Biloba* 'JFS-UGA2'	40 x 25	Fall color	
Ginkgo biloba	Magyar Ginkgo Biloba	*Ginkgo Biloba* 'Magyar'	45 x 35	Fall color	
Hackberry	Hackberry	*Celtis occidentalis*	50 x 45	Wildlife, fall color, unique bark	Y
Hemlock	Western Hemlock	*Tsuga heterophylla*	80 x 30	Native, evergreen	
Honeylocust	Halka® Honeylocust	*Gleditsia triacanthos* 'Christie'	45 x 40	Fall color	
Honeylocust	Shademaster Honeylocust	*Gleditsia triacanthos* 'Shademaster'	45 x 40	Fall color	
Honeylocust	Skyline® Honeylocust	*Gleditsia triacanthos* 'Skycole'	45 x 40	Fall color	
Horsechestnut	Red Horsechestnut	*Aesculus x carnea*	40 x 35	Flowers, wildlife	Y
Japanese Pagodatree	Japanese Pagodatree	*Styphnolobium japonicum*	65 x 40	Wildlife, flowers	
Katsura	Katsura	*Cercidiphyllum japonicum*	50 x 30	Fall color	
Kentucky Coffeetree	Kentucky Coffeetree	*Gymnocladus dioicus*	60 x 40	Fall color	Y
Kentucky Coffeetree	Espresso™ Kentucky Coffeetree	*Gymnocladus dioicus* 'Espresso-JFS'	60 x 40	Fall color	Y
Kentucky Coffeetree	True North™ Kentucky Coffeetree	*Gymnocladus dioicus* 'UMNSynergy'	60 x 40	Fall color	Y
Linden	Greenspire® Littleleaf Linden	*Tilia cordata* 'PNI 6025'	50 x 40	Fall color	Y
Linden	Redmond American Linden	*Tilia americana* 'Redmond'	45 x 35	Fall color	Y
London Planetree	Exclamation™ London Planetree	*Platanus xacerifolia* 'Morton Circle'	55 x 40	Unique bark	

Large-Statured Trees (continued)

TREE TYPE	COMMON NAME	SCIENTIFIC NAME	HEIGHT X WIDTH (FT)	FEATURES	SISTER CLIMATE CITY TREE?
London Planetree	Bloodgood London Planetree	*Platanus x acerifolia* 'Bloodgood'	55 x 40	Unique bark	
London Planetree	Columbia London Planetree	*Platanus x acerifolia* 'Columbia'	55 x 40	Unique bark	
London Planetree	Yarwood London Planetree	*Platanus x acerifolia* 'Yarwood'	55 x 40	Unique bark	
London Planetree	Liberty London Planetree	*Platanus x acerifolia* 'Liberty'	55 x 40	Unique bark	
Madrone	Pacific Madrone	*Arbutus menziesii*	80 x 25	Evergreen, flowers, unique bark	
Magnolia	Cucumber Magnolia	*Magnolia acuminata*	50 x 40	Flowers, unique leaf	
Maple	Autumn Blaze Maple	*Acer x freemanii* 'Jeffersred'	55 x 40	Fall color	
Maple	Scarlet Sentinel Maple	*Acer rubrum* 'Scarsen' *Acer x freemanii* 'Scarsen'	45 x 25	Fall color	
Maple	Bigleaf Maple	*Acer macrophyllum*	75 x 75	Fall color	
Maple	October Glory Red Maple	*Acer rubrum* 'October Glory'	50 x 40	Fall color	Y
Maple	Red Sunset Maple	*Acer rubrum* 'Franksred' *RED SUNSET*	50 x 40	Fall color	Y
Maple	Hedge Maple	*Acer campestre*	35 x 35	Unique leaf	
Maple	Armstrong Red Maple	*Acer rubrum* 'Armstrong'	70 x 15	Fall color	Y
Maple	Green Column Black Maple	*Acer saccharum subsp. nigrum* 'Green Column'	70 x 30	Fall color	
Maple	Queen Elizabeth Hedge Maple	*Acer campestre* 'Evelyn'	35 x 35	Fall color	
Myrtle	Oregon Myrtle	*Umbellularia californica*	60 x 60	Evergreen, wildlife	
Oak	Blue Oak	*Quercus douglasii*	70 x 45	Wildlife	
Oak	Coast Live Oak	*Quercus agrifolia*	80 x 35	Evergreen, wildlife	Y
Oak	Interior Live Oak	*Quercus wislizenii*	50 x 40	Evergreen, wildlife	
Oak	Cork Oak	*Quercus suber*	60 x 60	Evergreen, wildlife	Y
Oak	Sawtooth Oak	*Quercus acutissima*	50 x 40	Wildlife	Y
Oak	Holly Oak	*Quercus ilex*	50 x 50	Evergreen, wildlife	Y
Oak	California Black Oak	*Quercus kelloggii*	60 x 45	Wildlife, fall color	
Oak	Willow Oak	*Quercus phellos*	50 x 40	Wildlife, fall color	
Oak	Bur Oak	*Quercus macrocarpa*	70 x 45	Wildlife	

Large-Statured Trees (continued)

TREE TYPE	COMMON NAME	SCIENTIFIC NAME	HEIGHT X WIDTH (FT)	FEATURES	SISTER CLIMATE CITY TREE?
Oak	Chinkapin Oak	*Quercus muehlenbergii*	50 x 45	Wildlife	
Oak	Red Oak	*Quercus rubra*	50 x 45	Wildlife, fall color	Y
Oak	Shumard Oak	*Quercus shumardii*	75 x 55	Wildlife, fall color	Y
Oak	Canyon Live Oak	*Quercus chrysolepis*	55 x 30	Evergreen, wildlife	
Oak	Canby Oak	*Quercus canbyi*	45 x 40	Evergreen, wildlife	
Oak	Hungarian Oak	*Quercus frainetto*	100 x 60	Wildlife, fall color	Y
Oak	Valley Oak	*Quercus lobata*	50 x 40	Wildlife	Y
Oak	Southern Live Oak	*Quercus virginiana*	70 x 70	Evergreen, wildlife	
Oak	Swamp White Oak	*Quercus bicolor*	60 x 50	Wildlife	
Oak	Oregon White Oak	*Quercus garryana*	65 x 45	Native, wildlife	
Oak	Oracle Oak	*Quercus ×morehus*	50 x 30	Wildlife	
Oak	Monterrey Oak	*Quercus polymorpha*	55 x 50	Evergreen, wildlife	
Oak	Scarlet Oak	*Quercus coccinea*	60 x 45	Wildlife, fall color	
Pine	Willamette Valley Ponderosa	*Pinus ponderosa x benthamiana*	150 x 30	Unique bark, evergreen	
Pine	Deodar Cedar	*Cedrus deodara*	50 x 40	Evergreen	
Pine	Cedar of Lebanon	*Cedrus libani*	60 x 60	Evergreen	
Pine	Atlas Cedar	*Cedrus atlantica*	60 x 40	Evergreen	
Pine	Bosnian Pine	*Pinus heldreichii (Pinus leucodermis)*	65 x 30	Evergreen, wildlife	
Pistache	Chinese Pistache	*Pistachia chinensis*	30 x 25	Fall color	Y
Tanoak	Tanoak	*Notholithocarpus densiflorus*	40 x 30	Evergreen	
Tuliptree	Tuliptree	*Liriodendron tulipifera*	70 x 40	Fall color	Y
Walnut	English Walnut	*Juglans regia* 'Carpathian'	50 x 50	Wildlife, unique bark	
Zelkova	Wireless® Japanese Zelkova	*Zelkova serrata* 'Schmidtlow'	25 x 30	Fall color	Y
Zelkova	Village Green® Japanese Zelkova	*Zelkova serrata* 'Village Green'	40 x 30	Fall color, unique bark	Y
Zelkova	Green Vase® Japanese Zelkova	*Zelkova serrata* 'Green Vase'	40 x 30	Fall color, unique bark	Y

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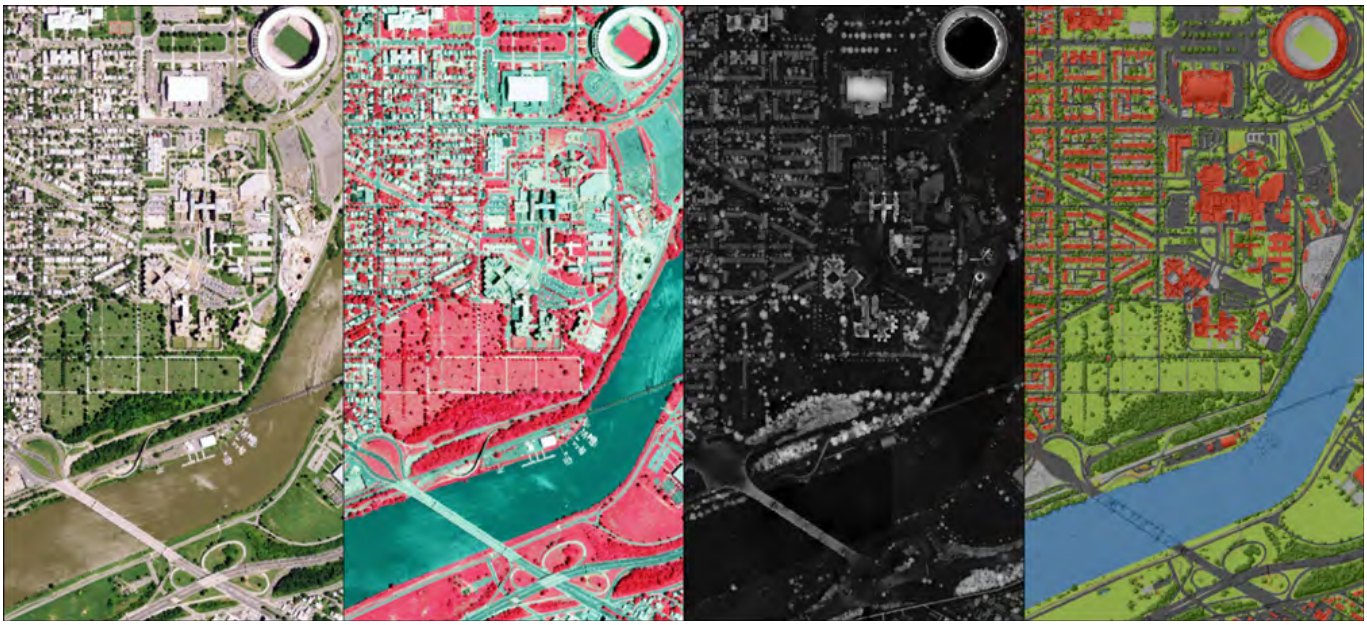
APPENDIX B. TREE CANOPY GOAL SETTING GUIDANCE

It is recommended the City of Wilsonville conduct a high-resolution Tree Canopy Assessment (TCA)—often referred to as an Urban Tree Canopy (UTC) assessment— for a baseline assessment of the Citywide urban forest across all boundaries. This assessment would identify the extent of land cover types such as tree canopy, vegetative plantable space (grass or turf), impervious surfaces (parking lots, driveways, sidewalks), and other desired land cover. It is recommended the City analyze these land cover types by neighborhood, ownership type, and land use among other planning boundaries to develop local canopy goals. In addition, the City should coordinate the planning and goal setting with neighborhood organizations and partners to develop the most feasible and supported strategies. These analyses and strategies should be conducted in addition to the Tree Equity Score analysis completed as part of the Urban Forest Management Plan.

About Urban Tree Canopy Assessments



Like other valued assets, urban trees require proper planning and management to withstand pressures from development, drought, fire, pests/diseases, storms, and pollution. This entails natural resource staff (municipal/private/nonprofit/academia), various plans, and tree protection codes, regulations, or ordinances. Progressive cities like Wilsonville can leverage technologies like i-Tree, multispectral imagery, LiDAR, and Tree Canopy Assessments to fuel their advocacy efforts, develop green infrastructure protection strategies, and inform management and master plans.

Tree canopy assessments provide a top-down view of land cover types across various spatial scales. The City can hire consultants or conduct an assessment in-house using GIS technologies to establish an accurate baseline of tree canopy extent and available planting areas across various geopolitical and planning boundaries, identify locations that would benefit from increased tree plantings to address environmental and health issues, and provide GIS data, decision support tools, and report content including methods, findings, maps, and broad recommendations. The process and outcomes would support land cover and land development strategies that protect and enhance tree canopy, benefiting generations to come.

The City should acquire the deliverables in a number of formats that seamlessly translate into the success of the City's urban forest planning, modeling, and implementation to facilitate ongoing community conversations and support the development of plans, policies, recommendations, and management objectives with the City's many partners.

A canopy cover assessment and analysis for Wilsonville would:

- Establish a known, documented, and accurate baseline of the City's tree canopy on public and private lands using the latest technologies and assessment methodologies.
- Integrate with the City's street and park tree inventory data to describe the urban forest's composition and structure.
- Inform urban forestry, conservation, and green infrastructure planning processes.

Setting Canopy Goals

To guide urban forestry efforts and raise awareness, communities with this data often set tree canopy cover goals based on the existing tree canopy cover amount and the aim to provide an equitable distribution of canopy cover and associated benefits. For Wilsonville, the planning consultants conducted an analysis of tree equity and developed draft canopy goals to raise the Tree Equity Score (TreeEquityScore.org) of all Census Block Groups in Wilsonville to at least a score of 75 out of 100. This section provides the guidance to establish recommended tree canopy goal tiers, refine the Tree Equity Score goal, and adopt a Citywide canopy goal once the UTC assessment is completed. Tree canopy goals can be accomplished by implementing actions in the City's Urban Forest Management Plan though supporting analyses and strategies should be developed from the UTC assessment. Appendix C provides tree planting prioritization guidance to support implementation of tree canopy goals that Wilsonville establishes. Progress towards these canopy goals should be tracked, measured, and shared to guide urban forest management and maintain community interest and support.

Canopy Goals - Purpose and Approach

Across the U.S. cities are setting goals— some based on careful study of current canopy, community needs, and availability of planting space, other base their goals on the principle that more trees are better than fewer, set ambitious campaign goals, then work to mobilize efforts to meet it. Generally, the U.S. Forest Service recommends canopy cover of 40-60 percent in northwestern communities and in 1997, the American Forests organization established a benchmark of 40 percent after analyzing the tree canopy in dozens of cities from 1992 to 1997 and working closely with the research community. While incredibly valuable and groundbreaking at the time, technology and research have significantly evolved over the past 20 years, leading to a consensus that more nuanced approaches to canopy goal setting are necessary. Supporting this statement, U.S. Forest Service Research Forester Greg McPherson of the Pacific Southwest Research Station adds, "Tree canopy cover targets are difficult to specify broadly because the opportunities to create canopy are highly variable among cities, even within a climatic region or land use class."

Tree canopy targets are best developed for specific cities and should consider constraints to creating canopy such as:

- Development densities (i.e., dense development patterns with more impervious surfaces have less opportunity for cover);
- Land use patterns (i.e., residential areas may have more opportunity for canopy than commercial areas, but canopy cover tends to be less in residential areas of disadvantaged communities versus wealthy ones);
- Ordinances (i.e., parking lot shade ordinances promote cover over some impervious areas); and
- Climate (i.e., canopy cover in desert cities is often less than tropical cities).

Within those parameters, quantifiable data can be used so a tree canopy goal achieves specific objectives, such as reaching the canopy percentage necessary to reduce urban heat island temperatures to a specific range, or to reduce stormwater runoff by a projected amount. According to a national analysis by U.S. Forest Service researchers, a 40-60 percent urban tree canopy is attainable under ideal conditions in forested states. Twenty percent in grassland cities and 15 percent in desert cities are realistic baseline targets, with higher percentages possible through greater investment and prioritization.

It is important to note, however, that urban tree canopy percentage is just one of many criteria to consider. A robust tree canopy comprised of largely invasive species, for example, is not a healthy urban forest. Age and species diversity, condition of trees and equitable distribution across income levels, to name a few, should also be considered (Leahy, American Forests, 2017).

Citywide and Zoning Type Tree Canopy Goals

The following presents the recommended approach to canopy goal setting though the City and partners should evaluate and refine these for approval by staff and City Council.

For the City of Wilsonville, the development of canopy goals should be driven by tree canopy cover data and findings from the 2021 Urban Forest Management Plan such as benchmarking research, analysis of existing and potential resources, City input, and community feedback.

Goals to preserve and increase tree canopy throughout the City should be based on a combination of criteria—most notably, ownership type. Ownership type refers to the public land managed by the City and the private land managed by property owners or other entities. In Wilsonville, the City maintains public trees within public parks and open space, on public properties, and some trees within the public rights-of-way. The City only oversees private trees for development projects. In most cases, private property owners maintain street trees in the public rights-of-way and on private property. The UTC assessment would identify the amount of tree canopy and available planting space by these ownership types. Often times with these studies, it is found that the majority of tree canopy as well as the potential space for new trees exists on residential land. This general trend along with the shared maintenance responsibility demonstrates the need for coordinated efforts and cooperation when establishing tree canopy goals. In the urban forest management industry, it is generally recommended the city lead 60 percent of the required tree plantings to reach a canopy goal and the property owners and city partners lead the other 40 percent of required plantings.

Using this integrated approach, the City of Wilsonville can establish an ambitious and achievable canopy goal. The City must increase canopy by planting the appropriate number of trees per year based on calculations that can be provided as part of the UTC assessment. These tree plantings should be conducted through shared partnerships between the City, stakeholders, and the residents of Wilsonville. Most likely, the UTC assessment will show the residential property and parklands have the most existing tree canopy as well as the most opportunity (space) for planting new trees. Achieving a canopy goal would provide additional ecosystem services and benefits that can be calculated based on industry research and practices. Considerations when calculating these benefits include:

- A no-net-loss strategy, meaning the number of trees removed on private property or through development are replaced.
- Trees that mature into large canopy-bearing trees are planted wherever feasible.
- Includes City-led, partner, volunteer, and private tree plantings.
- Assumes a potential for young tree mortality post-planting.

The following provides a calculated process for establishing canopy goals for Wilsonville:

The amount of tree canopy cover and available planting space should be analyzed and summarized by an applicable planning geography such as City Zoning Type, Council District, or Focus Area. Using Zoning Type as an example, a percentage of total possible planting area (vegetative and impervious) to be planted should be assigned to each Zoning Type based on the total amount of plantable space, the existing canopy, limitations of the Zoning Type, available resources, and other City needs. This approach realizes the unique opportunities, limitations, extent, resources, and characteristics found among various city zoning classes. Canopy goals and planting targets must

not be standardized across the City, they should be specific to the area. This method was applied and summarized in the following table as an example for the City to review and adopt upon completion of an Urban Tree Canopy Assessment.

Table 31. Example of the zoning types and possible planting area to establish canopy goals

ZONING TYPE	TOTAL POSSIBLE PLANTING AREA (%)	% OF TOTAL POSSIBLE PLANTING AREA TO BE PLANTED
Agriculture	42%	6%
City Property	45%	25%
Commercial	38%	33%
Downtown	4%	15%
Industrial	37%	20%
Mixed Use	35%	10%
Parkland	50%	30%
Residential	43%	24%
Right-of-Way	16%	10%

Using software such as PlanIT Geo's TreePlotter CANOPY software application, GIS, and Microsoft Excel, the number of trees required to achieve the planting target can be calculated based on total land area of the Zoning Type, existing tree canopy percent and acreage, total available planting area, and plantable space target. To calculate total added benefits, the U.S. Forest Service's i-Tree research and suite of tools can be utilized. The following table summarizes the example results of this recommended approach.

Table 32. Example tree canopy goals and planting targets by Zoning Type

ZONING TYPE	TOTAL POSSIBLE PLANTING AREA (%)	% OF TOTAL POSSIBLE PLANTING AREA TO BE PLANTED	TREE CANOPY GOAL	NO. TREES TO REACH GOAL	ANNUAL ADDED ECOSYSTEM BENEFITS
Agriculture	42%	6%	40%	459	$5,207
City Property	20%	25%	12%	569	$6,456
Commercial	39%	33%	18%	5,588	$63,372
Downtown	4%	15%	6%	14	$164
Industrial	49%	20%	16%	15,002	$170,126
Mixed Use	21%	10%	24%	1,263	$14,324
Parkland	50%	30%	50%	2,626	$29,775
Residential	43%	24%	32%	5,460	$61,918
Right-of-Way	36%	20%	30%	3,000	$34,500
TOTAL				**33,981**	**$385,842**

Once the City has established planting targets and the number of trees required to achieve the targets by Zoning Type or other planning boundary, the total Citywide tree canopy goal will be discovered. This ground up approach establishes feasible canopy goals based on local constraints and opportunities rather than creating a lofty Citywide goal that does not fully understand the planting demands at a local level.

APPENDIX C. TREE PLANTING PRIORITIZATION GUIDANCE

Tree planting is critical to the health and longevity of Wilsonville's urban forest. However, tree planting should be methodically planned with a specific purpose in mind. One of the best ways to do this is to define and adopt an official planting strategy to be included in a planting strategy. The first step in developing a planting strategy is to define the goals. Often times, this goal aligns with a citywide tree canopy cover goal and the timeframe to achieve it.

Key Considerations for a Tree Planting Plan

A planting strategy is crucial to urban forest sustainability and should be based on data, available resources, partnerships, and community input. Some of the more common goals that define a planting strategy include:

- **Equitable Distribution**. With this goal, priority of planting is given to areas determined to be the most in need based on the goal of an even distribution of benefits trees provide to all residents. Beyond equal distribution, an area defined to be "in-need" is determined locally and can be a combination of priorities or focused on one specific priority.

- **Areas of Predicted Future Canopy Loss**. Older neighborhoods with a more established tree canopy can anticipate significant losses in future years. One method to planning future planting efforts is to target these replanting areas now to aid in a less drastic succession of trees over time.

- **Benefits-Based Plantings**. Areas that have a specific issue like poor air or water quality, or a large percentage of older residents sensitive to heat stress, may work to plant trees based on the anticipated benefits in years to come.

- **Regular, Methodical Planting in Concert with Cyclical Tree Care Efforts**. Planting may be most effective if it follows the City's inventory, and pruning and removal cycle of care. Regular methodical planting can also be considered a worthy goal.

- **Species Diversity**. Planting strategies should not only identify where to plant but also what is being planted. Species diversity in Wilsonville is currently an issue, with high levels of oaks and maples. A policy on this issue should be included in the strategy.

- **Partners in Planting**. Wilsonville's planting strategy should also include who is doing the planting. This work can be done by City partners, neighborhood groups, developers, and other interested parties, thus allowing the City to focus on specialized care (pruning, removals, assessments).

Utilizing Urban Tree Canopy Assessment Data for Planting Priorities

Once the City finalizes local and Citywide tree canopy goals, it is recommended to establish priority areas based on a variety of themes and community needs. The City should integrate priorities established from the Tree Equity Score goal (all CBGs with a TES of 75 or greater) with other themes such as ownership type (public and private), areas of low existing tree canopy, and greatest amount of available planting space. Other themes may address air quality, stormwater reduction, and water quality. Others may evaluate opportunities to address disadvantaged areas, densely populated regions, and human health factors such as asthma cases, median age, and mental health. In any planting prioritization scenario, the scale may include U.S. Census Bureau Census Blocks, Zoning Type, Focus Areas, and Citywide. Priority planting areas should be established based on input from City partners and members of the community. They should also include a combination of themes to achieve the goal of growing a healthy and equitable urban forest.

A series of recommended prioritization techniques is provided that should be considered once an Urban Tree Canopy (UTC) assessment is completed.

- Planning areas with the most opportunity. This approach may include areas with less than the average Citywide tree canopy cover and greater than average total possible planting area.

- Census Blocks where trees can mitigate air quality issues. Street and rights-of-way corridors typically have higher concentrations of particulate matter. Trees can be planted along roads to absorb vehicle exhaust and reduce pollution. This approach would analyze areas with the highest percent of road surface area. Higher concentrations of road surfaces may indicate poor air quality.

- Tree planting in Census Blocks to reduce stormwater runoff. Trees can be integrated to help manage stormwater, specifically when targeting impervious surfaces. This approach may utilize data such as available planting area on impervious surfaces and available planting areas within 100 feet of all surface water bodies.

- Tree planting in underserved or disadvantaged Census Blocks. Tree canopy is positively correlated with higher median income. Planting trees in lower income communities can support environmental equity. This approach would utilize Census Bureau data such as the percentage of residents living below the poverty level.

- Tree plantings to offset population density. Larger numbers of people will benefit from the ecosystem services that increased tree canopy coverage can provide.

- Tree plantings to improve human health. Planting trees can be a cost-effective way of improving a city's overall public health. Health reports with information about the reported asthma cases and mental health concerns can be utilized to target tree planting efforts.

Suggested policies on planting and tree preservation are provided in Wilsonville's Urban Forest Management Plan. These policies include references to aging canopy to emphasize that every tree the City removes must be replaced, and to ensure that annual inventory work includes cataloging future planting sites, and expediting tree planting work as planting funds become available. Further analysis is also recommended to analyze the impact of development (losses, canopy saved, replacement plantings in developments). Results of that analysis will further define an effective planting program.

Larger trees provide more services to the community. They intercept more stormwater, remove more air pollution, provide more energy savings, and sequester more carbon. However, it is important to understand that this increase in services is exponential. For this reason, preservation of large trees should be a higher priority for communities than planting alone. Therefore, Wilsonville should utilize the guidance provided in Appendix D and Appendix E regarding tree preservation and replacement for Town Center's trees and apply this methodology Citywide.

Wilsonville's vision for the urban forest should be to maintain and enhance the services trees provide to residents. Therefore, prioritizing care for existing trees (over planting new trees) is critical for a healthy community.

APPENDIX D. PRESERVATION OF TREES IN FOCUS AREAS

To inform the urban forestry goals and strategies specific to Town Center and Charbonneau, a comprehensive inventory of trees was completed by International Society of Arboriculture (ISA) Certified Arborists. Using TreePlotter inventory management software and the City's desired set of attributes, each tree in Town Center and Charbonneau was inventoried, mapped, and assigned attributes for fields such as: Location (Lat/Long), Address, Land Use, Growing Space, Tree Common Name, Tree Scientific Name, Diameter at Breast Height (measured at 4.5 feet above grade), Height, Condition, Observations, Maintenance Need, and Date Added.

Example of a tree recommended for preservation in Town Center (tier 1)

Figure 19. Map displaying the size classes of trees inventoried in Town Center

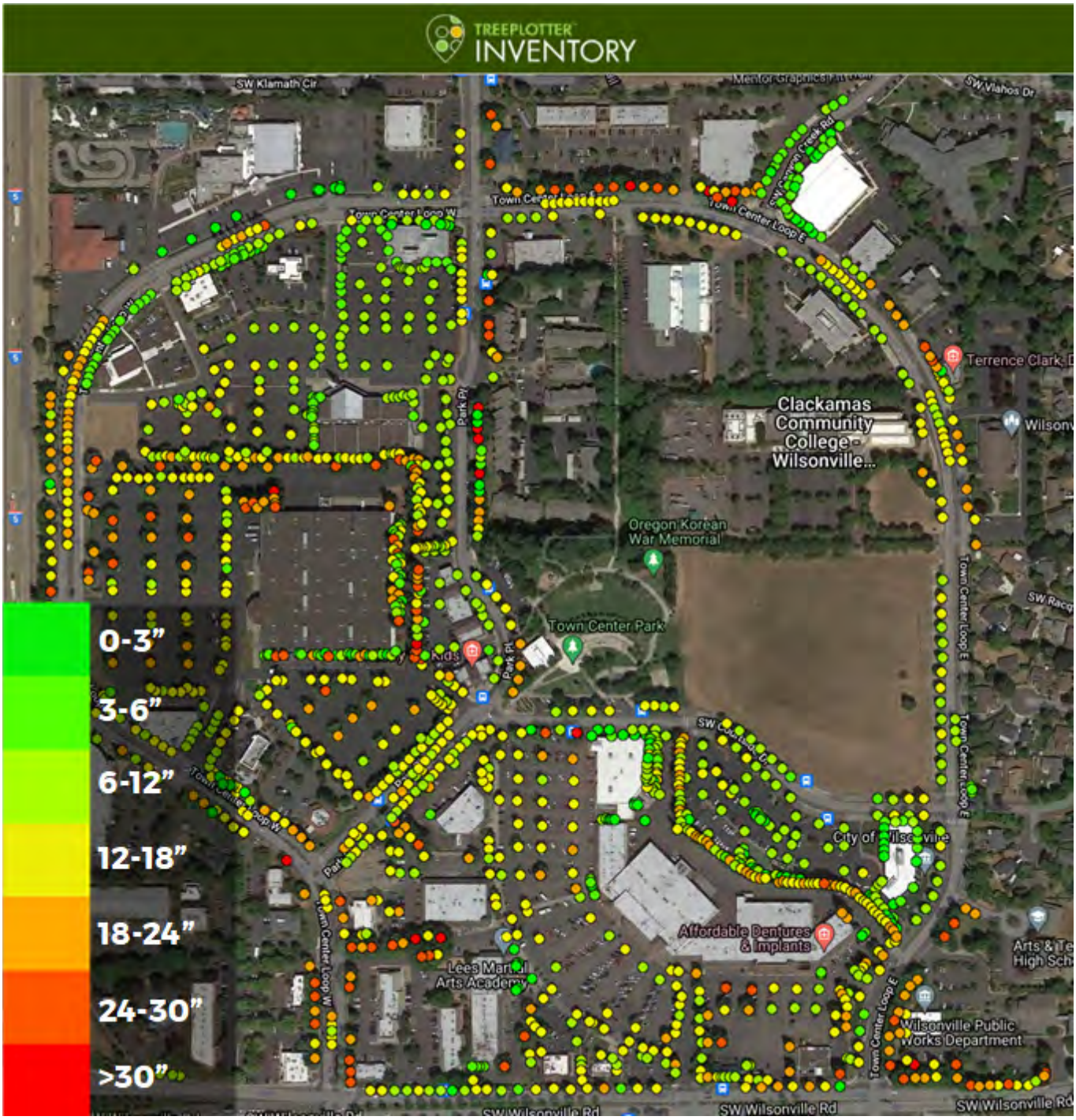


Figure 20. Map displaying the most common tree species inventoried in Town Center

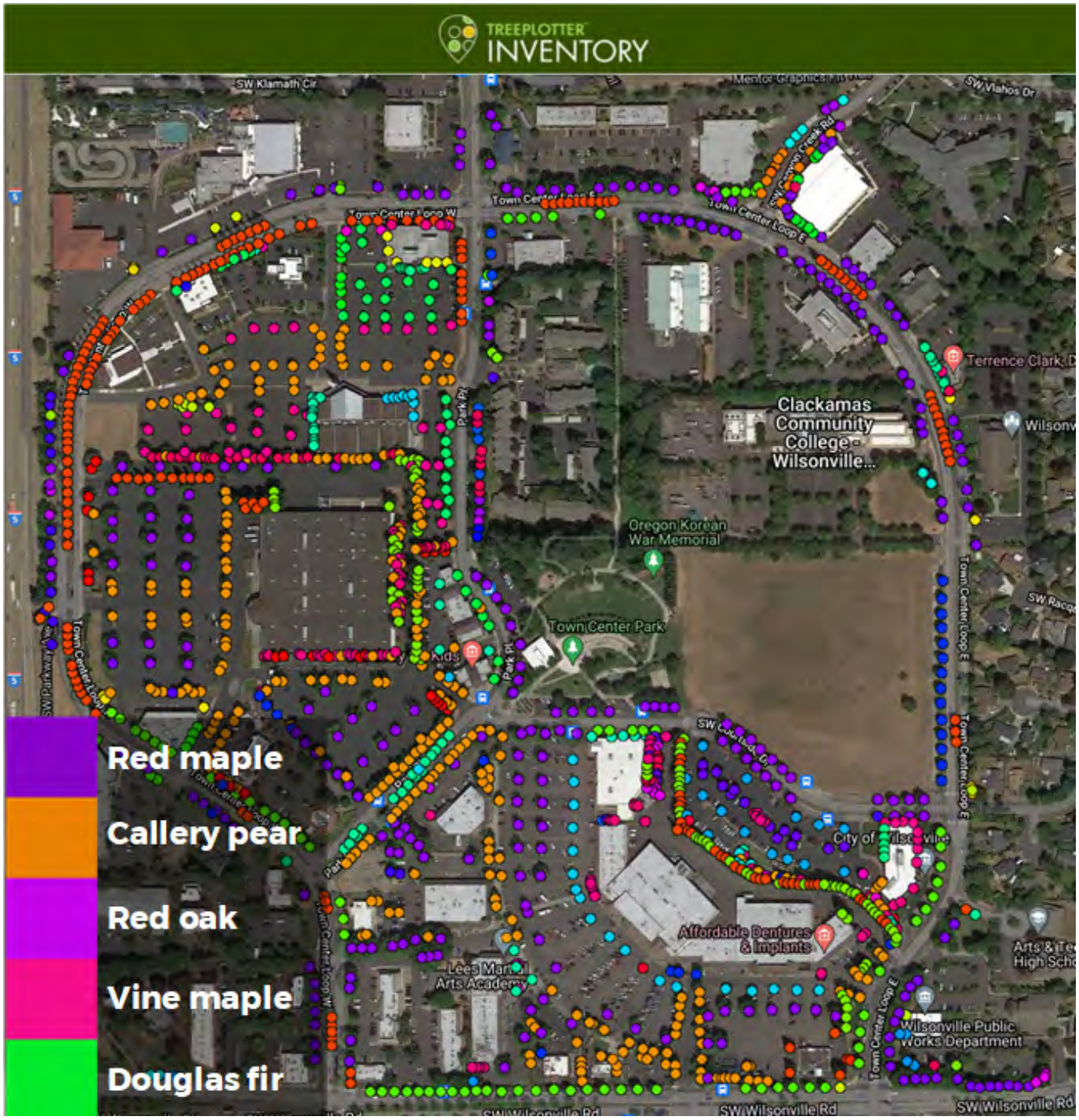


Figure 21. Map displaying the condition of trees inventoried in Town Center

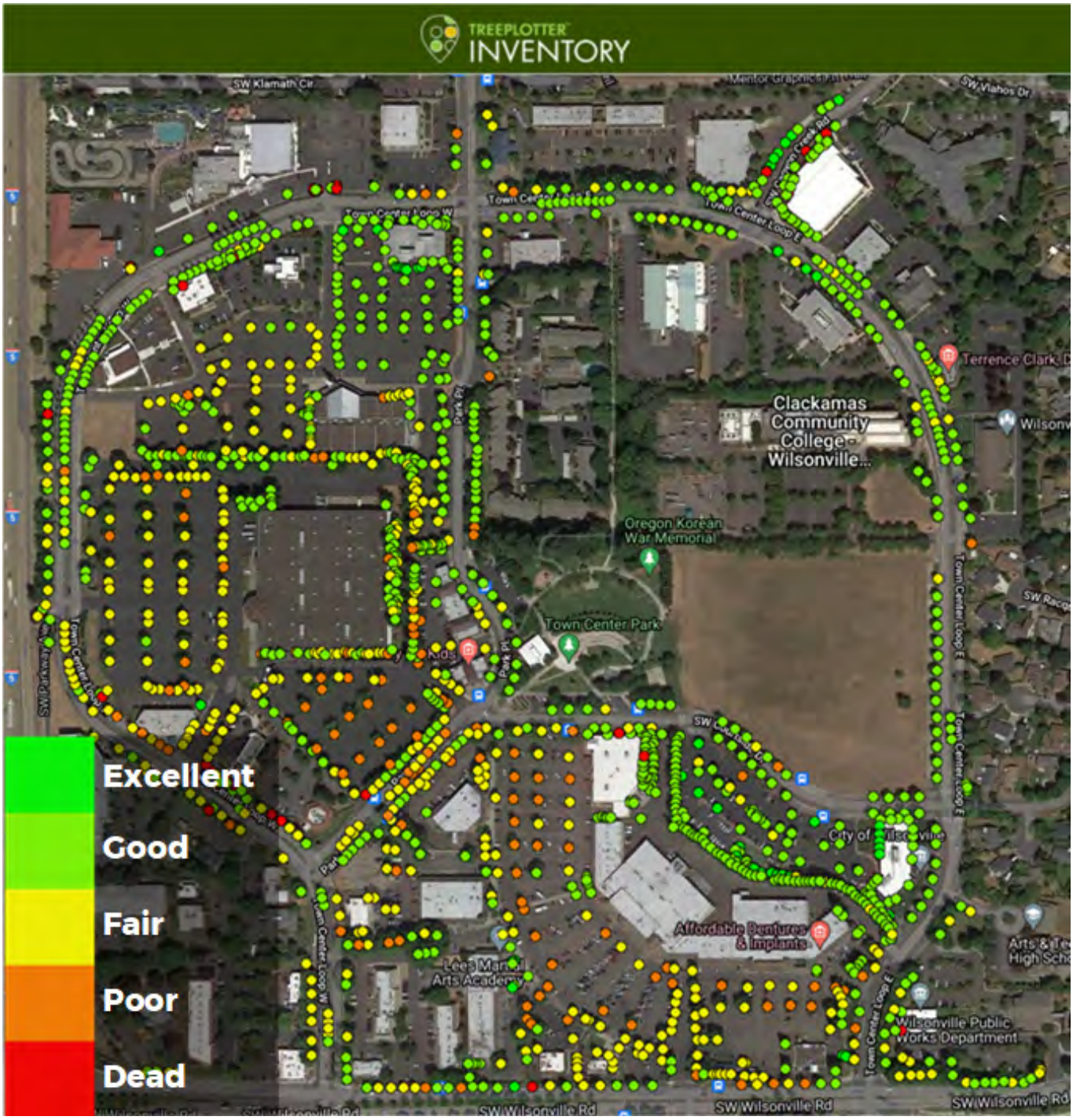


Figure 22. Map displaying the size classes of trees inventoried in Charbonneau

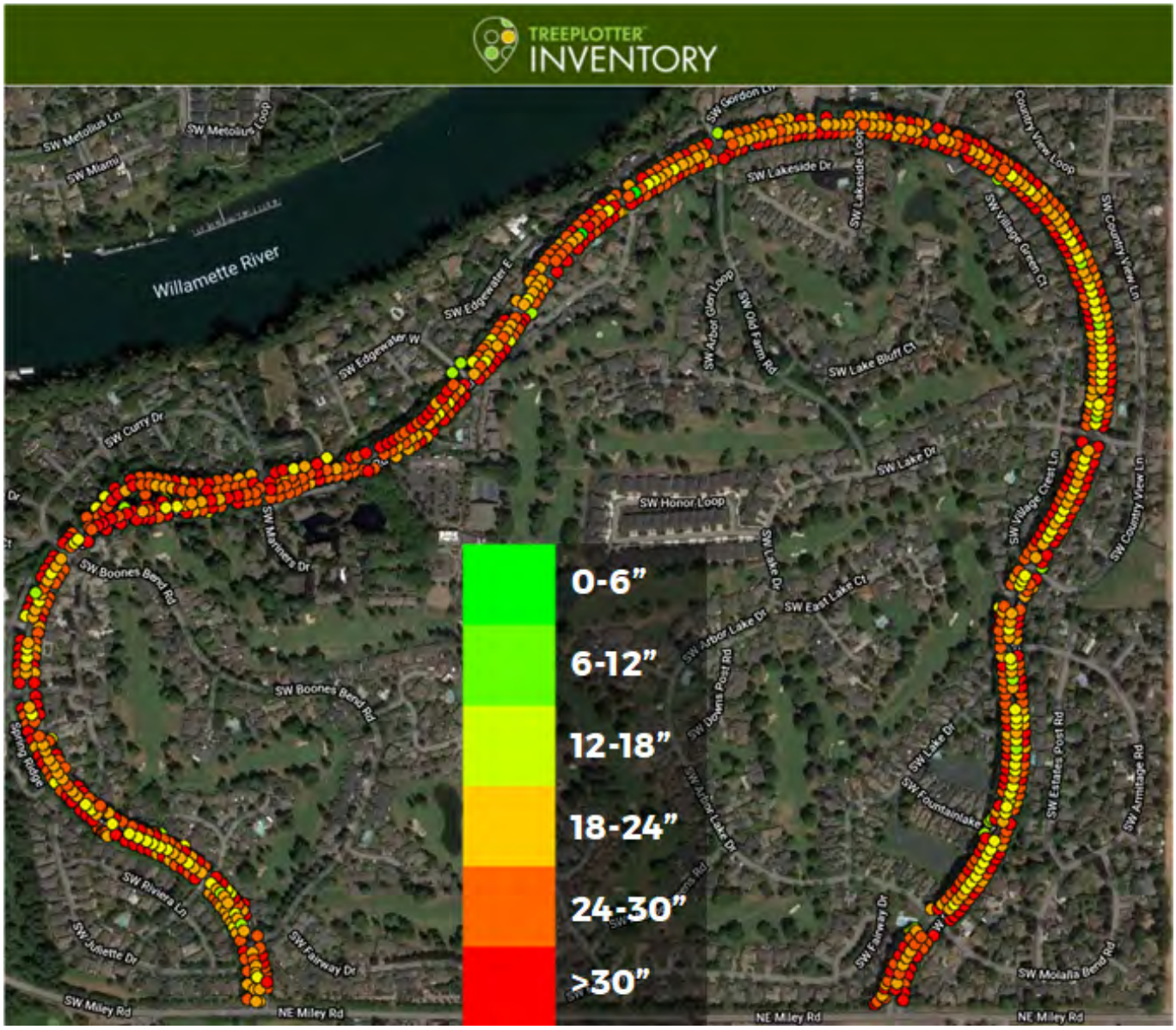


Figure 23. Map displaying the most common tree species inventoried in Charbonneau

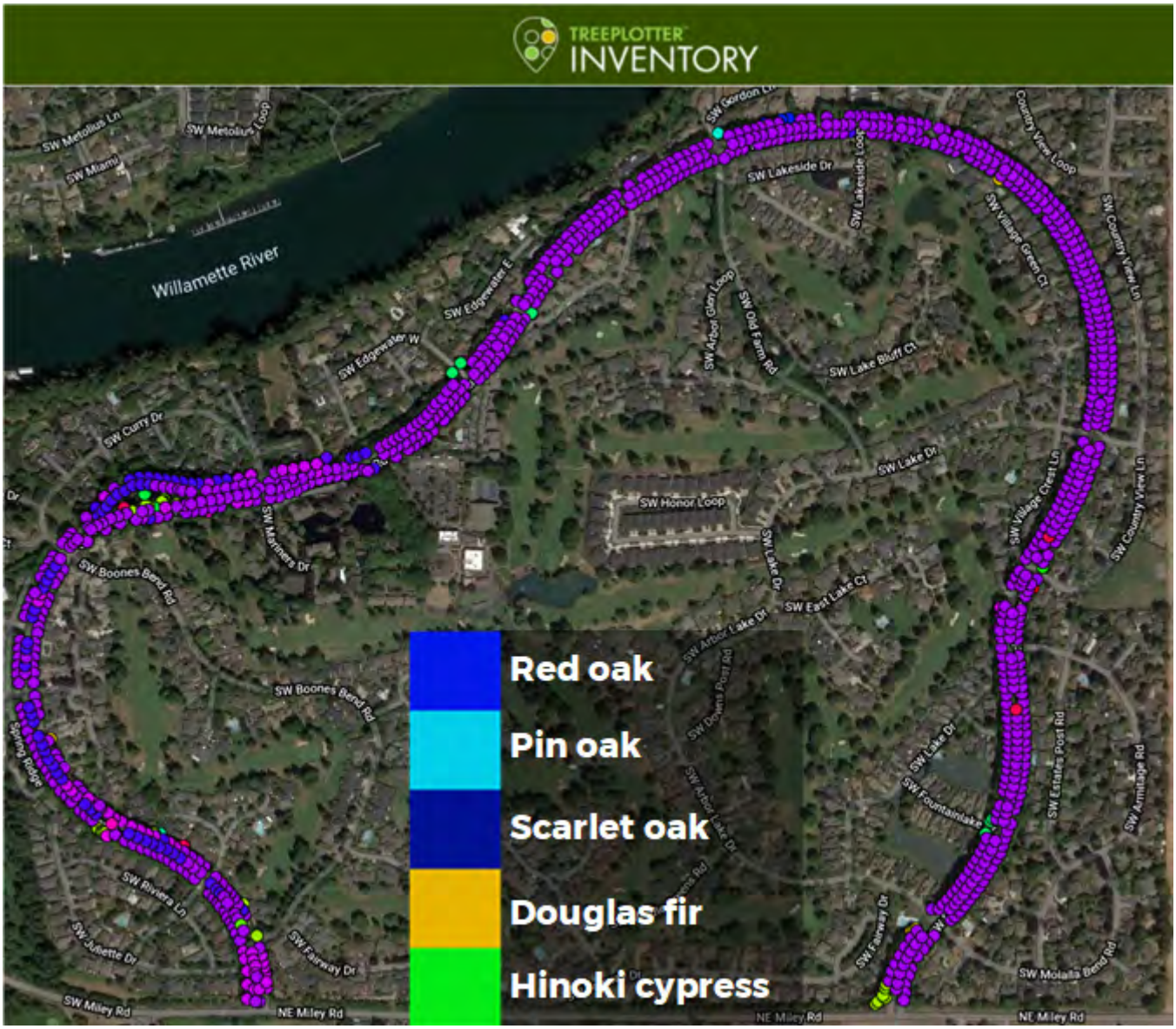
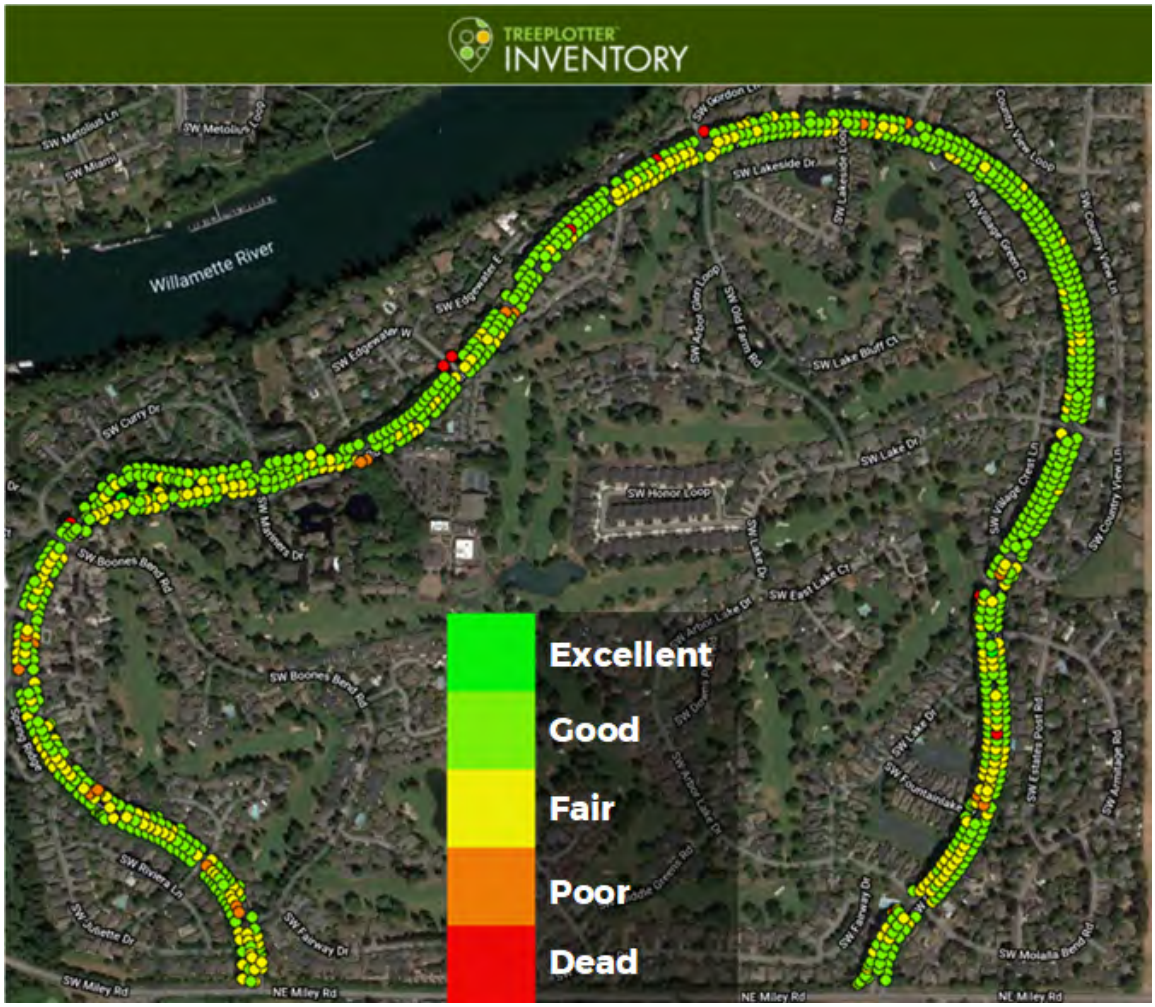


Figure 24. Map displaying the condition of trees inventoried in Charbonneau



Trees for Preservation in Town Center

From the data collected, criteria for tree preservation were established and tiers for preservation were set. Considerations for these tiers included condition, size, location, function, performance, and observations. Based on these considerations, the following tree preservation tiers were established:

Table 33. Tree preservation tiers for Town Center

TIER #	TIER NAME	TIER DESCRIPTION	TREE COUNT
1	Gold: Best Trees	Largest healthy trees	11 trees
2A	Silver (A): Large, Healthy, Spacious Contributing Trees	Large (24-30") healthy trees in large growing space providing more than the average (>$145 annual ecosystem benefits)	12 trees
2B	Silver (B): Large Contributing Trees	Trees providing more annual benefits than the average ($145) and 24-30" in DBH	12 trees
2C	Silver (C): Large and Healthy Trees	Trees 24-30" in DBH in good condition	23 trees
3	Bronze: High Performers	Tree species with high Relative Performance Indices (RPI) (Japanese maples, red oaks) in good condition with no concerning observations	19 trees
4	Tin: Healthy Trees	All trees in good condition and no concerning observations	427 trees
TOTAL			**504 Trees**

Trees to be preserved by tier are provided as a GIS file and as a custom map URL in the City's TreePlotter application here: https://pg-cloud.com/WilsonvilleOR/?scenario=TC-All-Tiers-Trees

The tree preservation tiers established require additional information, studies, and considerations before implementing. Tree preservation cannot be given a broad brush approach. Planned redevelopment in Town Center will have an impact on tree preservation. It is for this reason among others that the preservation of trees was classified into multiple tiers. Tier 1 and Tier 2(A-C) should be given the highest priority due to the size, location, condition, and associated ecosystem benefits of the trees in these tiers. Tier 3 and Tier 4 should be evaluated on a case-by-case basis as these are trees that are recommended for preservation though there is an understanding that other projects, plans, goals, and desired functions exist in the focus areas. Trees in question should be assessed to determine the health, quality, size, life expectancy, and function before deciding on preservation or removal. Tree preservation recommendations are provided in order to sustain and enhance the urban forest while aligning with Citywide goals for more canopy cover and tree equity (see Appendix B).

Figure 25. Map displaying all recommended trees for preservation in Town Center (2021)

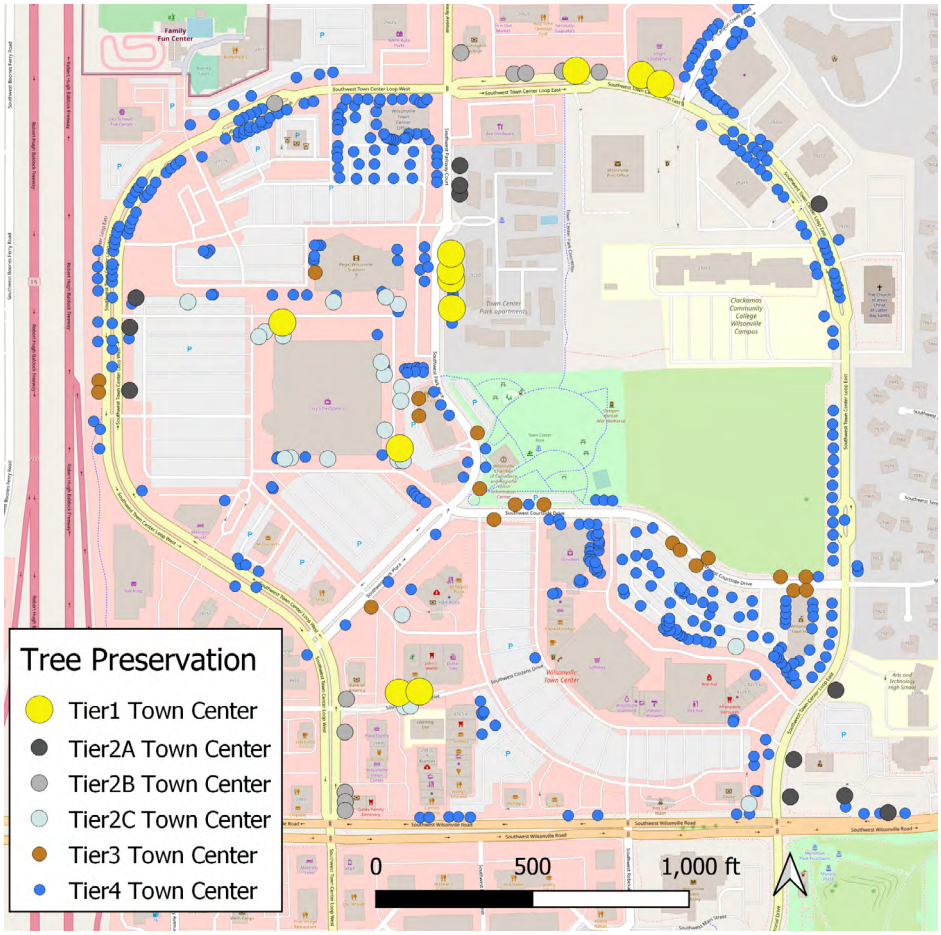


*Table 34. Annual ecosystem benefits and services of trees in preservation tiers for Town Center**

OVERALL	ENERGY SAVINGS	AIR QUALITY	PROPERTY VALUE	CARBON SERVICES	STORMWATER
$45,385	$2,166	$689	$32,988	$966	$5,392
Annually	34k kWh	354 lbs	Added value	64k lbs C seq.	500k gallons

** kWh = kilowatt hours; lbs = pounds; k = 1,000; C = carbon; seq. = sequestration*

Characteristics of the Trees for Preservation in Town Center

Figure 26. Top ten tree species in Town Center tree preservation tiers

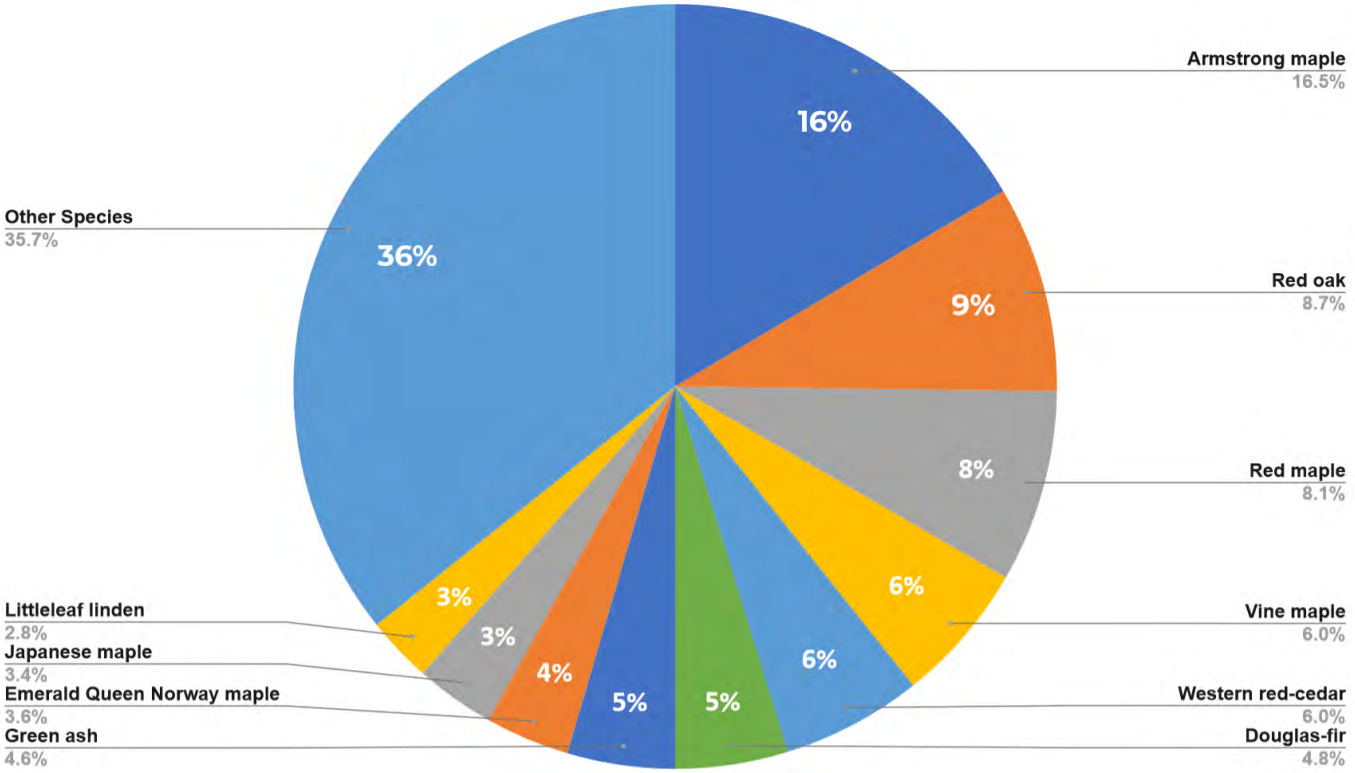
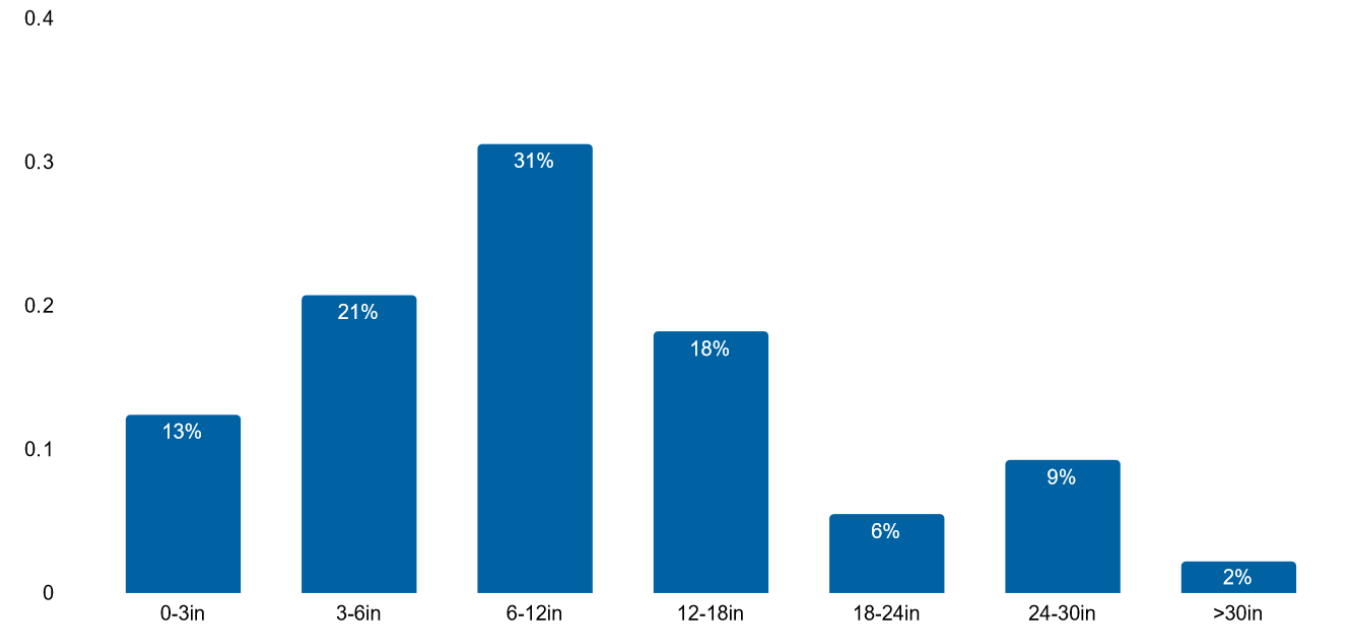


Figure 27. Size classes of Town Center tree preservation trees



Trees for Preservation in Charbonneau

From the data collected, criteria for tree preservation were established and tiers for preservation were set. Considerations for these tiers included condition, size, location, function, performance, and observations. Based on these considerations, the following tree preservation tiers were established:

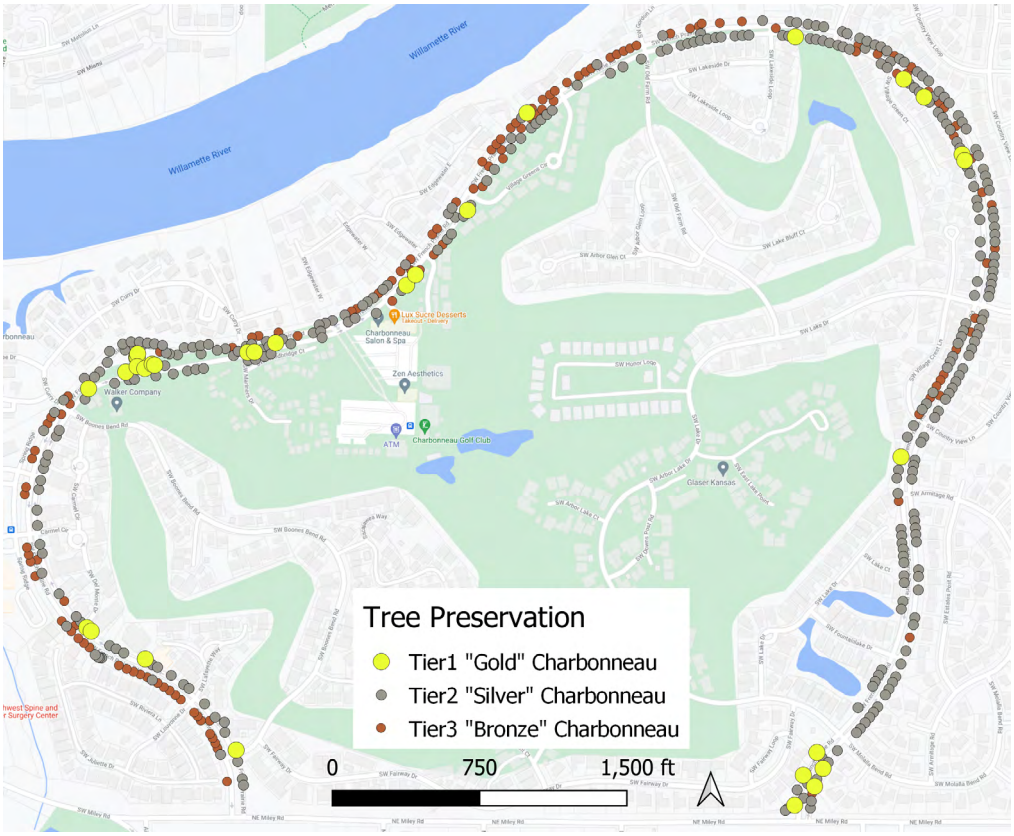
Table 35. Tree preservation tiers for Charbonneau

TIER #	TIER NAME	TIER DESCRIPTION	TREE COUNT
1	Gold: Best Trees	Greater than 24" in good condition with no sidewalk damage	31 trees
2	Silver (A): Large, Healthy, Spacious Contributing Trees	Greater than 24" in good condition	307 trees
3	Bronze: Good Conditioned Trees Conflicting Hardscape	All tree sizes in good condition with sidewalk damage for preservation review	126 trees
TOTAL			**464 TREES**

Trees to be preserved by tier are provided as a GIS file and as a custom map URL in the City's TreePlotter application here: https://pg-cloud.com/WilsonvilleOR/?scenario=Charbonneau-All-Preservation-Tiers.

The tree preservation tiers established require additional information, studies, and considerations before implementing. Tree preservation cannot be given a broad brush approach therefore, multiple tiers for preservation were created. Tier 1 and Tier 2(A-C) should be given the highest priority due to the size, location, condition, and associated ecosystem benefits of the trees in these tiers. Tier 3 and Tier 4 should be evaluated on a case-by-case basis as these are trees that are recommended for preservation though there is an understanding that other projects, plans, goals, and desired functions exist in the focus areas. Trees in question should be assessed to determine the health, quality, size, life expectancy, and function before deciding on preservation or removal. Tree preservation recommendations are provided in order to sustain and enhance the urban forest while aligning with Citywide goals for more canopy cover and tree equity (see Appendix B).

Figure 28. Trees for preservation in Charbonneau



Ecosystem Benefits and Services of the Trees to Preserve in Charbonneau

Table 36. Annual ecosystem benefits and services of trees in preservation tiers for Charbonneau

OVERALL	ENERGY SAVINGS	AIR QUALITY	PROPERTY VALUE	CARBON SERVICES	STORMWATER
$45,385	$6,237	$2,797	$44,255	$2,260	$16,848
Annually	98k kWh	1,376 lbs	Added value	129k lbs C seq.	1.6M gallons

Characteristics of the Trees for Preservation in Charbonneau

Figure 29. Count of trees for preseration in Charbonneau by Preservation Tier

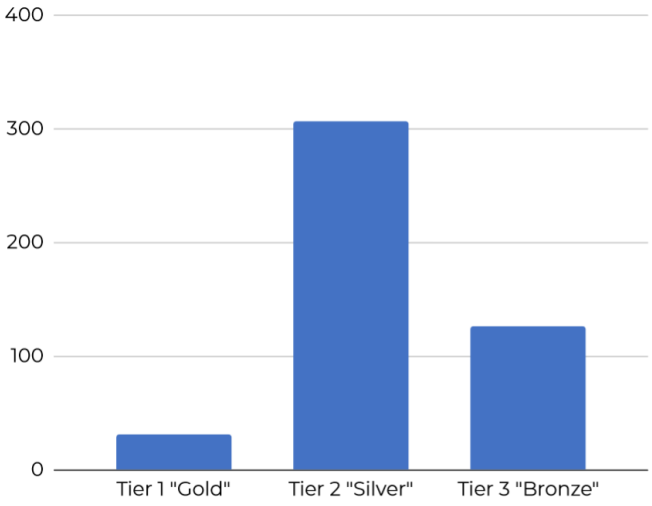


Figure 30. Tree species for preservation in Charbonneau

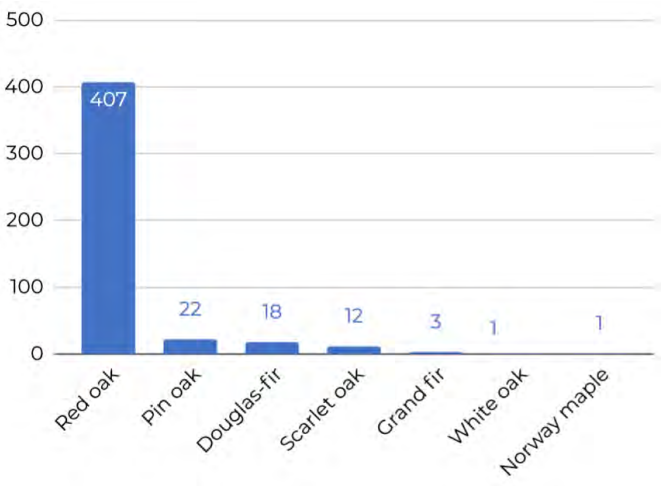


Figure 31. Diameter class of trees recommended for preservation in Charbonneau

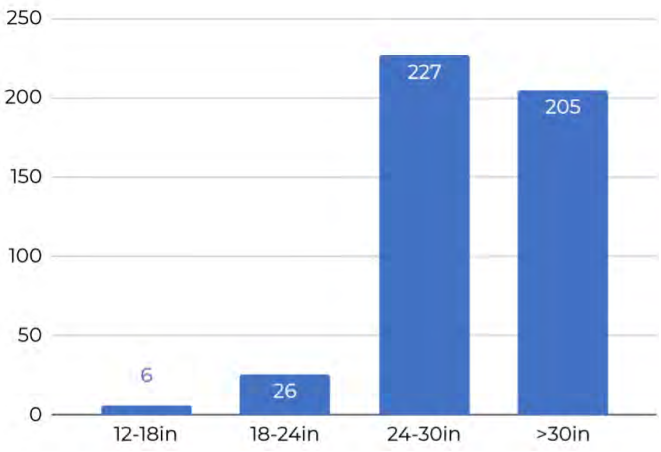
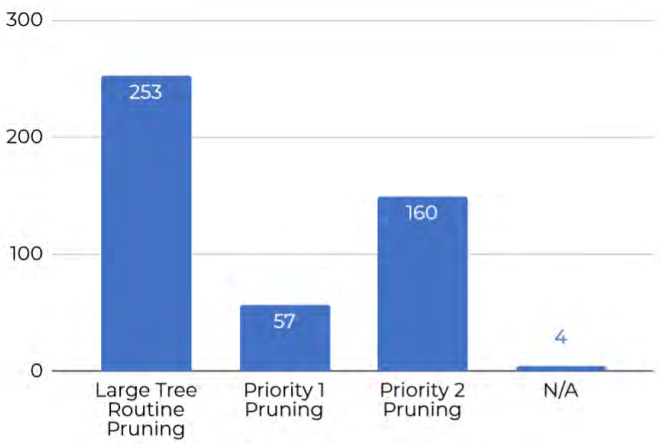


Figure 32. Maintenance needs of trees for preservation in Charbonneau



APPENDIX E. TREE REMOVALS AND REPLACEMENTS IN FOCUS AREAS

Urban trees, especially those in Town Center and Charbonneau, provide benefits and services to the residents, visitors, business owners, and the entire City of Wilsonville. They shade the parking lots, cool the sidewalks, support design, and provide ecological functions that should be sustained as Town Center and Charbonneau grow and change. Strategically replanting the urban forest in Town Center and Charbonneau is just as important as preserving existing trees to ensure these benefits continue to serve the neighborhood for generations.

Overview of Town Center Tree Removals

Based on an analysis of the 2020 tree inventory, there are trees in Town Center that were identified as needing removed. As of the inventory, a total of 9 trees are recommended for Priority 1 Removal and 67 trees for Priority 2 Removal. In addition, 26 inventory points indicated the tree was removed and a stump remains. Including the priority removals and locations with tree stumps, a total of 102 sites have the potential for a new tree to be planted.

To inform the replacement trees for trees removed, an analysis of climate change projections was completed. This process was conducted to ensure the recommended tree replacements are suitable for a changing climate in Wilsonville. The analyses utilized the Climate Change and Forest Trees in the Pacific Northwest, A Vulnerability Assessment and Recommended Actions for National Forests (USDA Forest Service, Warren Devine, et al., 2012) study and the University of Maryland's Center for Environmental Science's 60-year Contemporary Climatic Analogs for 540 North American Urban Areas study to forecast what Wilsonville's climate will be and identify suitable tree species for replanting.

The following provides a summary of the analyses, findings, and recommendations for replanting in Town Center:

Summary of Trees for Removal in Town Center

To view all trees recommended for removal in Town Center, use the following link https://pg-cloud.com/WilsonvilleOR/?scenario=TownCenterReplacementTrees.

Figure 33. Map showing the location of trees for removal in Town Center and the size classes

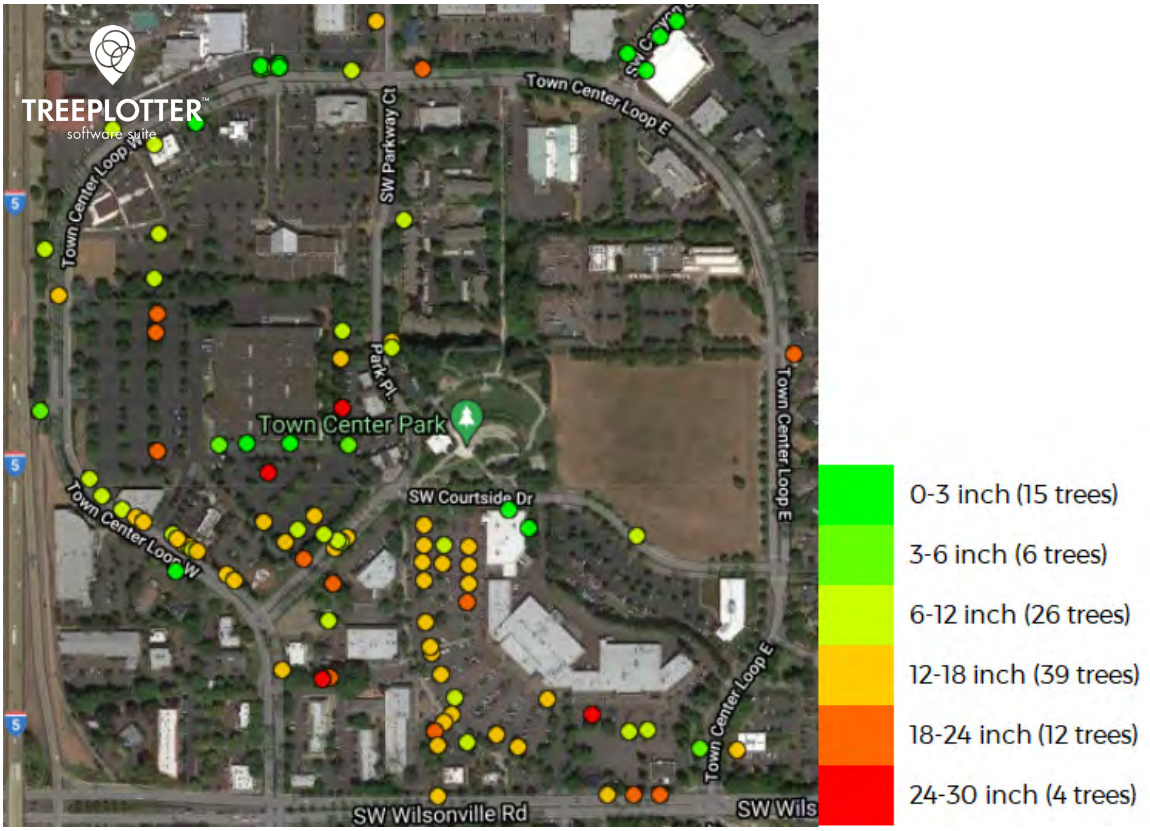


Table 37. Tree species recommended for removal in Town Center

COMMON NAME	COUNT	% OF TOTAL REMOVALS
Red oak	31	30%
Callery pear	18	18%
Emerald Queen Norway maple	12	12%
Kwanzan cherry	5	5%
Japanese cherry spp	4	4%
Dwarf Albert spruce	4	4%
Vine maple	4	4%
Scots pine	3	3%
Red Maple	2	2%
Pacific willow	2	2%
Top 10	**85**	**83%**
Other Species	17	17%
TOTAL	**102**	**100%**

Table 38. Summary of the status of the replanting sites in Town Center

STATUS	COUNT	% OF TOTAL REMOVALS
Alive	70	69%
Removed	24	24%
Dead	5	5%
Stump	3	3%
TOTAL	**102**	**100%**

Figure 34. Condition of trees recommended for removal in Town Center

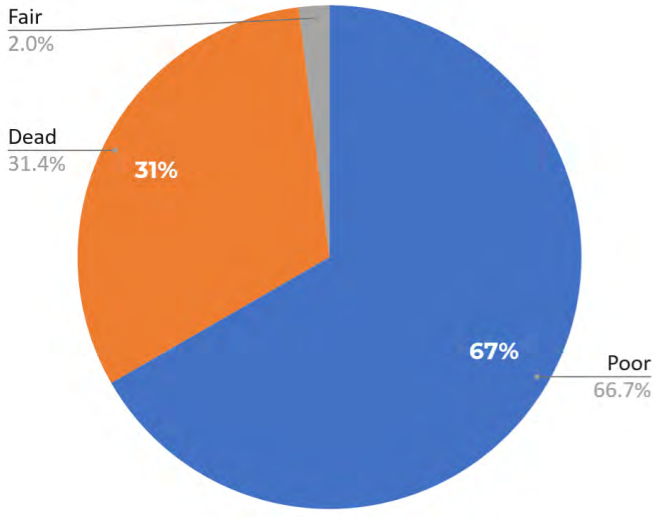
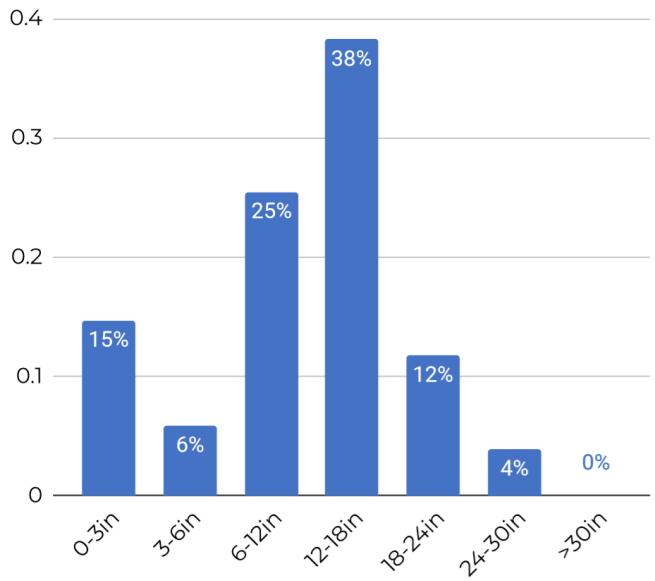


Figure 35. Diameter of recommended tree removals in Town Center



Note, the responsibility to address the trees recommended for removal vary between the City, adjacent property owner, HOA, or other. It is recommended the City evaluate these trees for removal and determine the best approach to address the concerns. For example, the City can prioritize removals for City-owned trees whereas the privately-maintained trees would require outreach and education. In some cities, a cost-share program is utilized where the city and the adjacent property owner share the cost of maintenance or removal of street trees. The recommended removals in focus areas provides the City with information to consider during redevelopment. Trees that are recommended for removal can be omitted from tree preservation consideration. Where feasible, trees should be replanted. View the Town Center Trees for Removal and Replacement section for consideration.

Overview of Charbonneau Tree Removals

Based on an analysis of the 2020 tree inventory, there are trees in Charbonneau that were identified as needing removed. As of the inventory, a total of 8 trees are recommended for Priority 1 or Priority 2 Removal, 23 trees in poor condition, and 20 trees in poor condition and causing sidewalk damage. Based on these recommendations, a total of 51 sites have the potential for a new tree to be planted.

To inform the replacement trees for trees removed, an analysis of climate change projections was completed. This process was conducted to ensure the recommended tree replacements are suitable for a changing climate in Wilsonville. The analyses utilized the Climate Change and Forest Trees in the Pacific Northwest, A Vulnerability Assessment and Recommended Actions for National Forests (USDA Forest Service, Warren Devine, et al., 2012) study and the University of Maryland's Center for Environmental Science's 60-year Contemporary Climatic Analogs for 540 North American Urban Areas study to forecast what Wilsonville's climate will be and identify suitable tree species for replanting.

The following provides a summary of the analyses, findings, and recommendations for replanting in Charbonneau:

Summary of Trees for Removal in Charbonneau

To view all trees recommended for removal in Charbonneau, use the following link https://pg-cloud.com/WilsonvilleOR/?scenario=Charbonneau-Tree-Removals.

Figure 36. Map showing the location of trees for removal in Charbonneau and the size classes

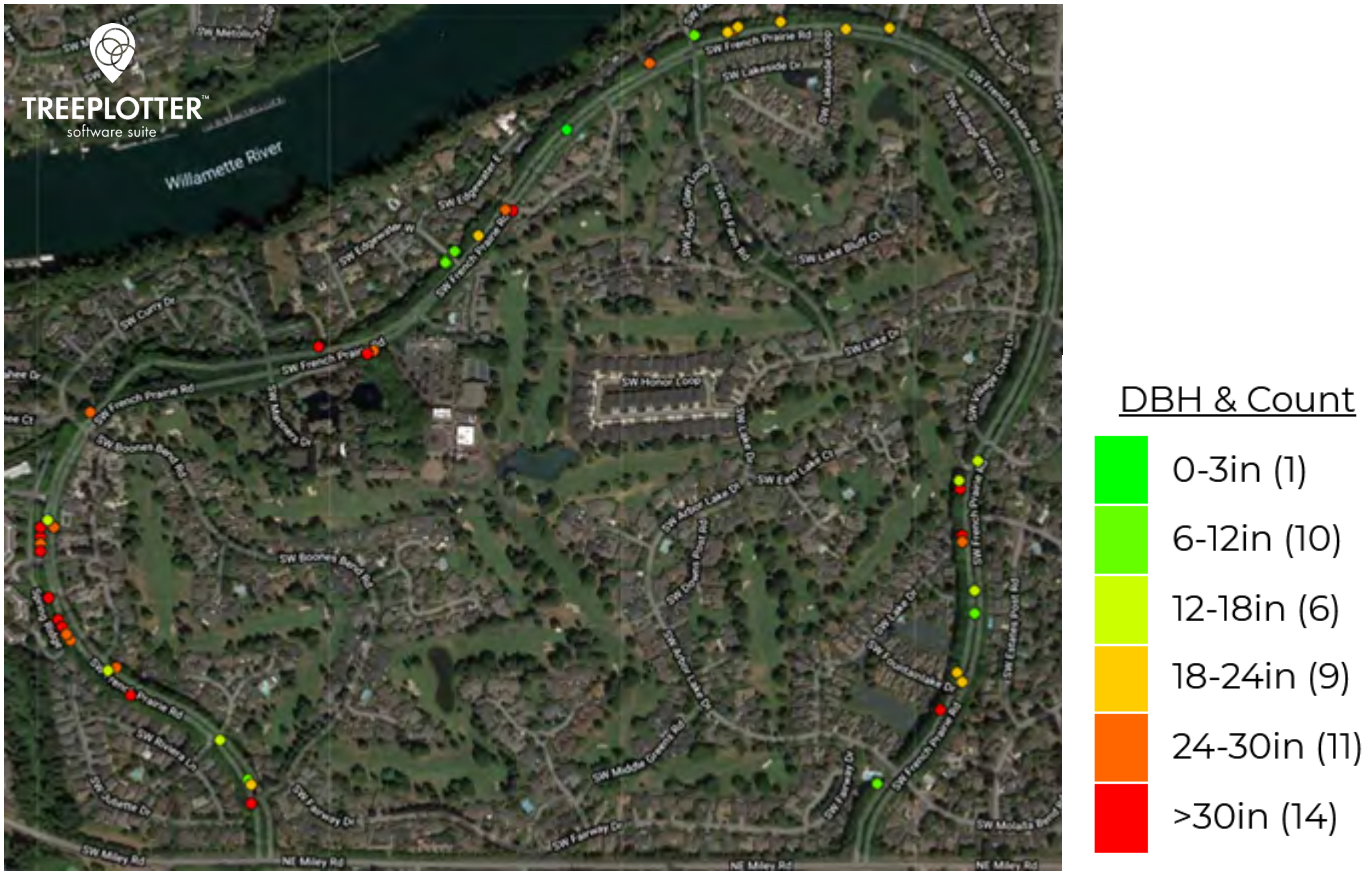


Figure 37. Count of trees by removal category - Charbonneau

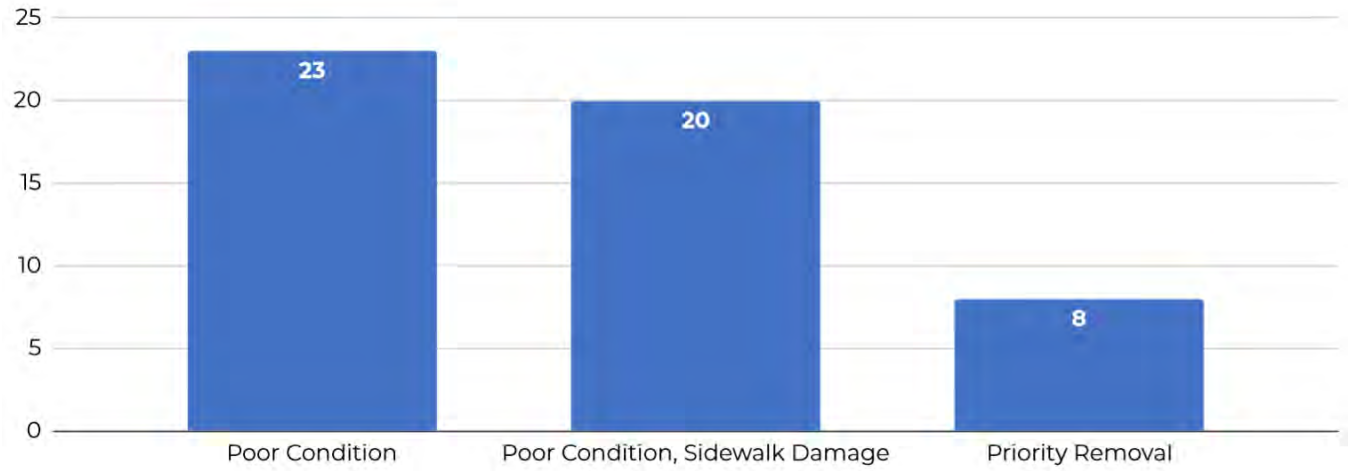
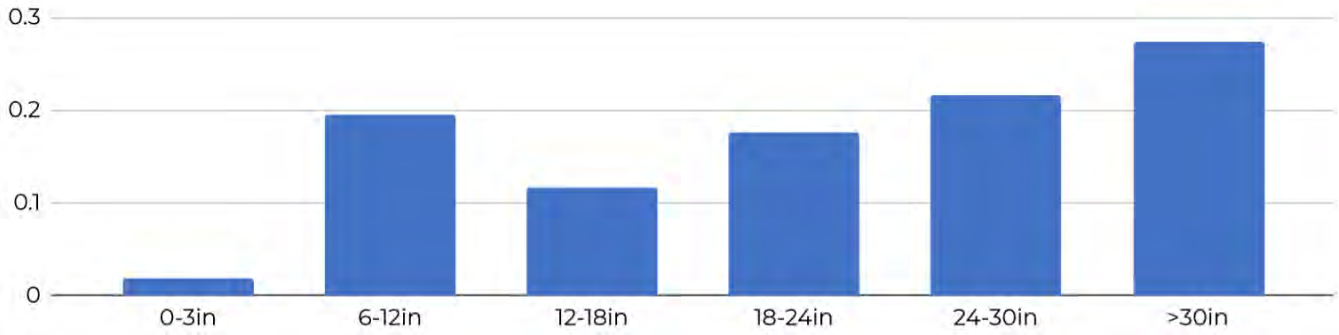


Table 39. Summary of tree species recommended for removal in Charbonneau

COMMON NAME	COUNT	% WITHIN
Red oak	33	65%
Hinoki falsecypress	6	12%
Pin oak	4	8%
Scarlet oak	2	4%
Scots pine	2	4%
Japanese red pine	1	2%
Norway maple	1	2%
Colorado blue spruce	1	2%
English oak	1	2%
TOTAL	**51**	**100%**

Figure 38. Diameter class of trees recommended for removal in Charbonneau



Note, the responsibility to address the trees recommended for removal vary between the City, adjacent property owner, HOA, or other. It is recommended the City evaluate these trees for removal and determine the best approach to address the concerns. For example, the City can prioritize removals for City-owned trees whereas the privately-maintained trees would require outreach and education. In some cities, a cost-share program is utilized where the city and the adjacent property owner share the cost of maintenance or removal of street trees. The recommended removals in focus areas provides the City with information to consider during redevelopment. Trees that are recommended for removal can be omitted from tree preservation consideration. Where feasible, trees should be replanted. View the Charbonneau Trees for Removal and Replacement section for consideration.

Considerations for the Recommended Replacement Tree Species

Recommended Citywide Tree Species List – 2021 Urban Forest Management Plan

See Appendix A.

City of Wilsonville's Existing Tree Species List

Table 40. City of Wilsonville's existing tree species list

GREATER THAN 50' HEIGHT	
Common Name	**Scientific Name**
Oregon white oak	*Quercus garryana*
Red oak	*Quercus rubra borealis*
Bigleaf maple	*Acer macrophylum*
Green column black maple	*Acer nigrum*
White ash	*Fraxinus americana*
Marshall seedless green ash	*Fraxinus pennsylvanica*
Scarlet oak	*Quercus coccinea*
Pin oak	*Quercus palustris*
American linden	*Tilia americana*

UNDER 50' HEIGHT	
Common Name	**Scientific Name**
Red Sunset maple	*Acer rubrum*
Pacific dogwood	*Cornus nuttallii*
Honeylocust	*Gleditsia triacanthos*
Bradford pear	*Pyrus calleryana* 'Bradford'
Littleleaf linden	*Tilia cordata*
Flame ash	*Fraxinus oxycarpa*

Friends of Trees "Climate Trees for the 21st Century" Study

Table 41. List of recommended trees from Friends of Trees "Climate Trees for the 21st Century" study

TIER 1	
Common Name	**Notes**
Oregon white oak	Heat and drought tolerant
Silver linden	Heat and drought tolerant
Red horsechestnut	Heat and drought tolerant
European hornbeam	Heat and drought tolerant
Atlas cedar	Require large planting space
Incense cedar	Require large planting space
Giant sequoia	Require large planting space
Deodar cedar	Require large planting space
Valley ponderosa	Require large planting space
Douglas fir	Require large planting space
Sawtooth oak	Heat and drought tolerant, hard to find
Hungarian oak	Heat and drought tolerant, hard to find
Shumards oak	Heat and drought tolerant, hard to find
Burr oak	Heat and drought tolerant, hard to find

Table 41. List of recommended trees from Friends of Trees "Climate Trees for the 21st Century" study (continued)

TIER 2	
Common Name	**Notes**
California black oak	Western US street trees not on OR tree lists
Canyon live oak	Western US street trees not on OR tree lists
Oregon myrtle	Western US street trees not on OR tree lists
Coast live oak	Western US street trees not on OR tree lists
Interior live oak	Western US street trees not on OR tree lists
Blue oak	Western US street trees not on OR tree lists
Valley oak	Western US street trees not on OR tree lists
Chitalpa	Western US street trees not on OR tree lists
Crapemyrtle	Western US street trees not on OR tree lists
Cork oak	Western US street trees not on OR tree lists
Holly oak	Western US street trees not on OR tree lists
Silverleaf oak	Western US street trees not on OR tree lists
Oracle oak	Western US street trees not on OR tree lists
Cedar of Lebanon	Western US street trees not on OR tree lists
Spanish fir	Western US street trees not on OR tree lists
Chinese pistache	Western US street trees not on OR tree lists
Strawberry tree	Western US street trees not on OR tree lists
Southern live oak	Western US street trees not on OR tree lists
TIER 3	
Common Name	**Notes**
California buckeye	Heat and drought tolerant, not typical street tree
Madrone	Heat and drought tolerant, not typical street tree
Japanese chinquapin	Heat and drought tolerant, not typical street tree
Cretan maple	Heat and drought tolerant, not typical street tree
Western redbud	Heat and drought tolerant, not typical street tree

To view the study, visit https://friendsoftrees.org/blog/climate-trees-trees-for-the-21st-century-part-2/.

City of Wilsonville's Public Works and Planning Tree Species List

Table 42. Wilsonville Public Works and Planning tree species list

Common Name	Botanical Name
Small Street Trees	
Rocky Mtn Glow Maple	*Acer grandidentatum* 'Schmidt'
Paperbark Maple	*Acer griseum*
Merlot Redbud	*Cercis canadensis* 'Merlot'
Milky Way dogwood	*Cornus kousa* 'Milky Way'
Ruby Vase Persian Ironwood	*Parrotia persica* 'Ruby Vase'
Cascara	*Rhamnus purshiana*
Pink Chimes Japanese Snowbell	*Styrax japonica* 'Pink Chimes'
Medium Street Trees	
Rocky Mtn Glow Maple	*Acer grandidentatum* 'Schmidt'
Emerald Avenue European Hornbeam	*Carpinus betulus* 'JFS-KW1CB'
American Hornbeam	*Carpinus caroliniana*
Forest Pansy Redbud	*Cercis canadensis* 'Forest Pansy'
Eddies White Wonder dogwood	*Corus* 'Eddie's White Wonder'
Dawyck Purple Beech	*Fagus sylvatica* 'Dawyck Purple'
Wildfire Black Tupelo	*Nyssa sylvatica* 'Wildfire'
American Hophornbeam	*Ostrya virginiana*
Persian Ironwood	*Parrotia persica*
Forest Green Oak	*Quercus frainetto* 'Schmidt'
Silverleaf Oak	*Quercus hypoleucoides*
Summer Sprite Linden	*Tilia cordata* 'Halka'
Sterling Silver Linden	*Tilia tomentosa* 'Sterling'
Large Street Trees	
Hedge Maple	*Acer campestre*
Queen Elizabeth Hedge Maple	*Acer campestre* 'Evelyn'
Armstrong Red Maple	*Acer rubrum* 'Armstrong'
October Glory Red Maple	*Acer rubrum* 'October Glory'
Scarlet Sentinel Maple	*Acer rubrum* 'Scarsen'
Autumn Blaze Maple	*Acer x freemanii* 'Jeffersred'
Heritage River Birch	*Betula nigra* 'Heritage'
Rivers Purple Beech	*Faguas sylvatica* 'Riversii'
Tricolor Beech	*Fagus sylvatica* 'Roseomarginata'
Autumn Gold Ginkgo	*Ginkgo biloba* 'Autumn Gold'
Golden Colonnade Ginkgo	*Ginkgo biloba* 'JFS-UGA2'
Magyar Ginkgo	*Ginkgo biloba* 'Magyar'
Princeton Sentry Ginkgo	*Ginkgo biloba* 'Princeton Sentry'
Kentucky Coffeetree	*Gymnocladus dioicus*
Espresso Kentucky Coffeetree	*Gymnocladus dioicus* 'Espresso'
Exclamation London Plane Tree	*Platanus x acerifolia* 'Exclamation'

Table 42. Wilsonville Public Works and Planning tree species list (continued)

Common Name	Botanical Name
Large Street Trees	
Swamp White Oak	*Quercus bicolor*
Scarlet Oak	*Quercus coccinea*
Burr Oak	*Quercus macrocarpa*
Willow Oak	*Quercus phellos*
Jefferson Elm	*Ulmus americana* 'Jefferson'
Frontier Elm	*Ulmus carpinifolia* x *U. parvofolia* 'Frontier'
Triumph Elm	*Ulmus* 'Morton Glossy'
Green Vase Zelkova	*Zelkova serrata* 'Green Vase'
Village Green zelkova	*Zelkova serrata* 'Village Green'

Town Center Trees for Removal and Replacement

Table 43. List of trees for removal in Town Center and the recommended replacement species

ID	STATUS	EXISTING TREE COMMON NAME	PROPOSED REPLACEMENT (COMMON NAME)	PROPOSED REPLACEMENT (SCIENTIFIC NAME)	ALTERNATIVE (COMMON NAME)
939	Stump	Lodgepole pine (east OR)	Willamette Valley Ponderosa	*Pinus ponderosa x benthamiana*	Scarlet Oak
986	Alive	Red Maple	Hungarian Oak	*Quercus frainetto*	Oregon White Oak
1050	Alive	Emerald Queen Norway maple	Hackberry	*Celtis occidentalis*	Honeylocust
1076	Removed	balsam poplar	European Hornbeam	*Carpinus betulus*	Green Column Black Maple
1086	Removed	Callery pear	Dura-Heat® River Birch	*Betula nigra* 'BNMTF'	Oregon White Oak
1093	Removed	western red-cedar	Hackberry	*Celtis occidentalis*	Honeylocust
1097	Removed	black tupelo	Afterburner® Black Tupelo	*Nyssa sylvatica* 'David Odom'	Green Column Black Maple
1122	Alive	red oak	European Hornbeam	*Carpinus betulus*	Green Column Black Maple
1169	Alive	red oak	Red Oak	*Quercus rubra*	Oregon White Oak
1177	Stump	Japanese stewartia	Autumn Gold Ginkgo Biloba	*Ginkgo Biloba* 'Autumn Gold'	Green Column Black Maple
1220	Alive	Japanese cherry spp	Lavalle Hawthorn	*Crataegus X lavalleei*	Pacific Dogwood
1221	Alive	Japanese cherry spp	Lavalle Hawthorn	*Crataegus X lavalleei*	Pacific Dogwood
1222	Alive	Japanese cherry spp	Strawberry Tree	*Arbutus unedo*	Bird Cherry
1224	Alive	Japanese cherry spp	Strawberry Tree	*Arbutus unedo*	Bird Cherry
1227	Removed	Callery pear	Oregon White Oak	*Quercus garryana*	Red Oak
1266	Alive	Emerald Queen Norway maple	Ruby Vase® Persian Ironwood	*Parrotia persica* 'Inge'	Honeylocust
1268	Alive	Emerald Queen Norway maple	Vanessa Persian Ironwood	*Parrotia persica 'Vanessa'*	Honeylocust

Table 43. List of trees for removal in Town Center and the recommended replacement species (continued)

ID	STATUS	EXISTING TREE COMMON NAME	PROPOSED REPLACEMENT (COMMON NAME)	PROPOSED REPLACEMENT (SCIENTIFIC NAME)	ALTERNATIVE (COMMON NAME)
1270	Alive	Emerald Queen Norway maple	Pyramidal European Hornbeam	*Carpinus betulus* 'Fastigiata'	Honeylocust
1278	Removed	Emerald Queen Norway maple	Sawtooth Oak	*Quercus acutissima*	Red Oak
1299	Alive	Emerald Queen Norway maple	Katsura	*Cercidiphyllum japonicum*	Honeylocust
1335	Dead	Emerald Queen Norway maple	Turkish Filbert	*Corylus colurna*	Honeylocust
1336	Dead	Emerald Queen Norway maple	Turkish Filbert	*Corylus colurna*	Honeylocust
1340	Removed	Callery pear	Ivory Silk Japanese Tree Lilac	*Syringa reticulata* 'Ivory Silk'	Bigleaf Maple
1341	Removed	Callery pear	Ivory Silk Japanese Tree Lilac	*Syringa reticulata* 'Ivory Silk'	Bigleaf Maple
1342	Removed	Callery pear	Ivory Silk Japanese Tree Lilac	*Syringa reticulata* 'Ivory Silk'	Bigleaf Maple
1343	Removed	Callery pear	Ivory Silk Japanese Tree Lilac	*Syringa reticulata* 'Ivory Silk'	Bigleaf Maple
1344	Removed	Callery pear	Ivory Silk Japanese Tree Lilac	*Syringa reticulata* 'Ivory Silk'	Bigleaf Maple
1345	Removed	Callery pear	Ivory Silk Japanese Tree Lilac	*Syringa reticulata* 'Ivory Silk'	Bigleaf Maple
1347	Removed	Callery pear	Emerald Pagoda Japanese Snowbell	*Styrax japonicus* 'Emerald Pagoda'	Pacific Dogwood
1355	Removed	Oregon ash	Harvest Gold Littleleaf Linden	*Tilia* 'Harvest Gold'	Red Sunset Maple
1365	Alive	Emerald Queen Norway maple	Afterburner® Black Tupelo	*Nyssa sylvatica* 'David Odom'	Honeylocust
1367	Alive	Emerald Queen Norway maple	Afterburner® Black Tupelo	*Nyssa sylvatica* 'David Odom'	Honeylocust
1369	Alive	Emerald Queen Norway maple	Afterburner® Black Tupelo	*Nyssa sylvatica* 'David Odom'	Honeylocust
1370	Alive	Emerald Queen Norway maple	Afterburner® Black Tupelo	*Nyssa sylvatica* 'David Odom'	Honeylocust
1372	Dead	Colorado blue spruce	Douglas Fir	*Pseudotsuga menziesii*	Willamette Valley Ponderosa
1382	Removed	European mountain-ash	Oregon White Oak	*Quercus garryana*	Bur Oak
1398	Dead	domestic apple	None	None	None
1422	Alive	Armstrong maple	Green Column Black Maple	*Acer saccharum sub. nigrum* 'Green Column'	Firespire® American Hornbeam
1430	Removed	cherry (ornamental)	Strawberry Tree	*Arbutus unedo*	Lavalle Hawthorn
1455	Alive	purple-leaf plum	Tschonoskii Crabapple	*Malus tschonoskii*	Bird Cherry
1463	Alive	Pacific willow	Bur Oak	*Quercus macrocarpa*	Red Oak
1465	Alive	Pacific willow	Bur Oak	*Quercus macrocarpa*	Red Oak
1494	Removed	Scots pine	Willamette Valley Ponderosa	*Pinus ponderosa x benthamiana*	Limber Pine

Table 43. List of trees for removal in Town Center and the recommended replacement species (continued)

ID	STATUS	EXISTING TREE COMMON NAME	PROPOSED REPLACEMENT (COMMON NAME)	PROPOSED REPLACEMENT (SCIENTIFIC NAME)	ALTERNATIVE (COMMON NAME)
1505	Stump	paper birch	Green Column Black Maple	*Acer saccharum sub. nigrum* 'Green Column'	Firespire® American Hornbeam
1515	Removed	Red Maple	None	None	None
1516	Removed	Scots pine	None	None	None
1517	Removed	Scots pine	None	None	None
1518	Removed	dwarf Albert spruce	Natchez Crape Myrtle	*Lagerstroemia* 'Natchez'	Pacific Dogwood
1519	Removed	dwarf Albert spruce	None	None	None
1520	Removed	dwarf Albert spruce	None	None	None
1521	Removed	dwarf Albert spruce	Muskogee Crape Myrtle	*Lagerstroemia* 'Muskogee'	Pacific Dogwood
1525	Alive	red oak	Kentucky Coffeetree	*Gymnocladus dioicus*	Honeylocust
1532	Alive	red oak	Kentucky Coffeetree	*Gymnocladus dioicus*	Honeylocust
1534	Alive	red oak	Hackberry	*Celtis occidentalis*	Honeylocust
1537	Alive	red oak	Hackberry	*Celtis occidentalis*	Honeylocust
1549	Alive	Callery pear	Interior Live Oak	*Quercus wislizenii*	Honeylocust
1551	Alive	red oak	Interior Live Oak	*Quercus wislizenii*	Honeylocust
1553	Alive	red oak	Interior Live Oak	*Quercus wislizenii*	Red Oak
1556	Alive	Callery pear	Oregon White Oak	*Quercus garryana*	Scarlet Oak
1557	Alive	Norway maple	Afterburner® Black Tupelo	*Nyssa sylvatica* 'David Odom'	Green Column Black Maple
1580	Alive	Kwanzan cherry	Tschonoskii Crabapple	*Malus tschonoskii*	Bird Cherry
1582	Alive	red oak	Interior Live Oak	*Quercus wislizenii*	Scarlet Oak
1589	Alive	red oak	California Black Oak	*Quercus kelloggii*	Red Oak
1596	Alive	red oak	California Black Oak	*Quercus kelloggii*	Red Oak
1649	Alive	red oak	California Black Oak	*Quercus kelloggii*	Scarlet Oak
1652	Alive	red oak	Canby Oak	*Quercus canbyi*	Scarlet Oak
1664	Alive	red oak	Canby Oak	*Quercus canbyi*	Honeylocust
1679	Alive	red oak	Canby Oak	*Quercus canbyi*	Honeylocust
1681	Alive	red oak	Canby Oak	*Quercus canbyi*	Honeylocust
1767	Alive	Callery pear	Chinese Pistache	*Pistachia chinensis*	Pacific Dogwood
1775	Alive	Callery pear	Chinese Pistache	*Pistachia chinensis*	Pacific Dogwood
1776	Alive	red oak	California Black Oak	*Quercus kelloggii*	Honeylocust
1778	Alive	red oak	California Black Oak	*Quercus kelloggii*	Honeylocust
1779	Alive	Callery pear	Chinese Pistache	*Pistachia chinensis*	Pacific Dogwood
1810	Alive	red oak	Red Oak	*Quercus rubra*	Scarlet Oak
1822	Alive	vine maple	Cretan Maple	*Acer sempervirens*	Pacific Dogwood
1831	Alive	vine maple	Muskogee Crape Myrtle	*Lagerstroemia* 'Muskogee'	Pacific Dogwood
1850	Alive	vine maple	Muskogee Crape Myrtle	*Lagerstroemia* 'Muskogee'	Pacific Dogwood

Table 43. List of trees for removal in Town Center and the recommended replacement species (continued)

ID	STATUS	EXISTING TREE COMMON NAME	PROPOSED REPLACEMENT (COMMON NAME)	PROPOSED REPLACEMENT (SCIENTIFIC NAME)	ALTERNATIVE (COMMON NAME)
1882	Alive	Callery pear	Oregon White Oak	*Quercus garryana*	Redmond American Linden
1893	Alive	Callery pear	Oregon White Oak	*Quercus garryana*	Redmond American Linden
1906	Alive	Douglas- fir	Douglas Fir	*Pseudotsuga menziesii*	Oregon White Oak
1931	Alive	Callery pear	Canyon Live Oak	*Quercus chrysolepis*	Oregon White Oak
2040	Alive	thornless honeylocust	None	None	None
2077	Alive	Callery pear	Deodar Cedar	*Cedrus deodara*	Honeylocust
2084	Alive	red oak	California Black Oak	*Quercus kelloggii*	Red Oak
2086	Alive	red oak	California Black Oak	*Quercus kelloggii*	Red Oak
2087	Alive	red oak	California Black Oak	*Quercus kelloggii*	Red Oak
2089	Alive	red oak	California Black Oak	*Quercus kelloggii*	Red Oak
2093	Alive	Kwanzan cherry	Tschonoskii Crabapple	*Malus tschonoskii*	Bird Cherry
2094	Alive	Kwanzan cherry	Strawberry Tree	*Arbutus unedo*	Pacific Dogwood
2109	Alive	Kwanzan cherry	Tschonoskii Crabapple	*Malus tschonoskii*	Bird Cherry
2111	Alive	Kwanzan cherry	Strawberry Tree	*Arbutus unedo*	Pacific Dogwood
2119	Alive	red oak	Pyramidal European Hornbeam	*Carpinus betulus* 'Fastigiata'	Honeylocust
2121	Alive	red oak	Pyramidal European Hornbeam	*Carpinus betulus* 'Fastigiata'	Honeylocust
2125	Alive	red oak	Amur Maackia	*Maackia amurensis*	Honeylocust
2127	Alive	red oak	Amur Maackia	*Maackia amurensis*	Honeylocust
2128	Alive	red oak	Oregon White Oak	*Quercus garryana*	Red Oak
2129	Alive	red oak	Amur Maackia	*Maackia amurensis*	Honeylocust
2140	Alive	pin oak	Amur Maackia	*Maackia amurensis*	Honeylocust
2149	Alive	red oak	Oregon White Oak	*Quercus garryana*	Red Oak
2151	Alive	red oak	Oregon White Oak	*Quercus garryana*	Red Oak
2202	Dead	vine maple	Tschonoskii Crabapple	*Malus tschonoskii*	Pacific Dogwood

Table 44. Count of recommended replacement trees in Town Center by species

ID	COUNT
California Black Oak	9
Oregon White Oak	8
None	7
Afterburner® Black Tupelo	6
Ivory Silk Japanese Tree Lilac	6
Strawberry Tree	5
Tschonoskii Crabapple	5
Amur Maackia	4
Canby Oak	4
Hackberry	4
Interior Live Oak	4
Chinese Pistache	3
Muskogee Crape Myrtle	3
Pyramidal European Hornbeam	3
Bur Oak	2
Douglas Fir	2
European Hornbeam	2
Green Column Black Maple	2
Kentucky Coffeetree	2
Lavalle Hawthorn	2
Red Oak	2
Turkish Filbert	2
Willamette Valley Ponderosa	2
Autumn Gold Ginkgo Biloba	1
Canyon Live Oak	1
Cretan Maple	1
Deodar Cedar	1
Dura-Heat® River Birch	1
Emerald Pagoda Japanese Snowbell	1
Harvest Gold Littleleaf Linden	1
Hungarian Oak	1
Katsura	1
Natchez Crape Myrtle	1
Ruby Vase® Persian Ironwood	1
Sawtooth Oak	1
Vanessa Persian Ironwood	1
TOTAL	**102**

Charbonneau Trees for Removal and Replacement

Table 45. List of trees for removal in Charbonneau and the recommended replacement species

ID	STATUS	EXISTING TREE COMMON NAME	DBH RANGE	CAUSE FOR REMOVAL	PROPOSED REPLACEMENT (COMMON NAME)
8	Removed	Colorado blue spruce	6-12in	*Poor Condition*	Dawn redwood
11	Alive	Scots pine	>30in	*Priority Removal*	Dawn redwood
12	Removed	Scots pine	12-18in	*Poor Condition*	Dawn redwood
16	Alive	Norway maple	18-24in	*Poor Condition, Sidewalk Damage*	Autumn Blaze maple
53	Removed	Japanese red pine	6-12in	Poor Condition	Willamette Valley ponderosa
63	Removed	Hinoki falsecypress	6-12in	*Poor Condition*	Deodar cedar
64	Removed	Hinoki falsecypress	6-12in	*Poor Condition*	Deodar cedar
65	Removed	Hinoki falsecypress	6-12in	*Poor Condition*	Deodar cedar
66	Removed	Hinoki falsecypress	6-12in	*Poor Condition*	Deodar cedar
68	Removed	Hinoki falsecypress	6-12in	*Poor Condition*	Deodar cedar
69	Removed	Hinoki falsecypress	6-12in	*Poor Condition*	Deodar cedar
96	Alive	red oak	>30in	*Priority Removal*	Oregon white oak
100	Alive	red oak	18-24in	*Poor Condition*	Valley oak
118	Alive	red oak	24-30in	*Poor Condition, Sidewalk Damage*	Hungarian oak
119	Alive	red oak	>30in	*Poor Condition, Sidewalk Damage*	Shumard oak
349	Alive	red oak	>30in	*Poor Condition*	Bur oak
383	Alive	red oak	18-24in	*Priority Removal*	Chinkapin oak
394	Alive	red oak	18-24in	*Poor Condition, Sidewalk Damage*	Swamp white oak
398	Alive	red oak	24-30in	*Poor Condition, Sidewalk Damage*	Monterrey oak
399	Alive	red oak	18-24in	*Poor Condition, Sidewalk Damage*	Southern live oak
408	Removed	red oak	24-30in	*Poor Condition, Sidewalk Damage*	Canby oak
435	Alive	red oak	18-24in	*Poor Condition, Sidewalk Damage*	Coast live oak
459	Alive	red oak	18-24in	*Poor Condition*	Chinese pistache
469	Removed	red oak	6-12in	*Poor Condition*	Wireless Japanese zelkova
472	Alive	red oak	12-18in	Priority Removal	Kentucky coffeetree
484	Alive	red oak	12-18in	Poor Condition	Kentucky coffeetree
551	Alive	red oak	18-24in	Poor Condition	Kentucky coffeetree
586	Removed	red oak	0-3in	Poor Condition	Bigleaf maple
597	Alive	red oak	24-30in	Priority Removal	Shademaster honeylocust
640	Alive	scarlet oak	>30in	Poor Condition, Sidewalk Damage	Oregon white oak
676	Removed	red oak	24-30in	Poor Condition	Valley oak
688	Alive	red oak	>30in	Poor Condition, Sidewalk Damage	Hungarian oak
689	Alive	red oak	>30in	Poor Condition, Sidewalk Damage	Shumard oak

Table 45. List of trees for removal in Charbonneau and the recommended replacement species (continued)

ID	STATUS	EXISTING TREE COMMON NAME	DBH RANGE	CAUSE FOR REMOVAL	PROPOSED REPLACEMENT (COMMON NAME)
690	Alive	red oak	24-30in	Poor Condition, Sidewalk Damage	Bur oak
691	Alive	red oak	>30in	Poor Condition, Sidewalk Damage	Chinkapin oak
701	Alive	red oak	24-30in	Poor Condition, Sidewalk Damage	Coast live oak
736	Alive	red oak	24-30in	Poor Condition	Oregon white oak
759	Alive	scarlet oak	>30in	Poor Condition, Sidewalk Damage	Valley oak
795	Alive	red oak	>30in	Poor Condition, Sidewalk Damage	Hungarian oak
807	Alive	pin oak	12-18in	Priority Removal	Shumard oak
814	Alive	English oak	6-12in	Priority Removal	Bur oak
815	Alive	red oak	18-24in	Priority Removal	Chinkapin oak
838	Alive	pin oak	12-18in	Poor Condition	Swamp white oak
856	Alive	pin oak	12-18in	Poor Condition	Monterrey oak
912	Alive	pin oak	24-30in	Poor Condition	Southern live oak
913	Alive	red oak	>30in	Poor Condition	Canby oak
914	Alive	red oak	24-30in	Poor Condition	Coast live oak

Table 46. Recommended replacement tree species for removals in Charbonneau

ID	COUNT
Deodar cedar	6
Bur oak	3
Canby oak	3
Chinkapin oak	3
Coast live oak	3
Dawn redwood	3
Hungarian oak	3
Kentucky coffeetree	3
Monterrey oak	3
Oregon white oak	3
Shumard oak	3
Southern live oak	3
Swamp white oak	3
Valley oak	3
Autumn Blaze maple	1
Bigleaf maple	1
Chinese pistache	1
Shademaster honeylocust	1
Willamette Valley ponderosa	1
Wireless Japanese zelkova	1
TOTAL	**51**

APPENDIX F. FUNDING MECHANISMS

Table 47. Financing options for Wilsonville's urban forest management programs

FINANCING OPTIONS	ATTRIBUTES	PROCESS	OPPORTUNITIES	CHALLENGES
FEASIBLE OPTIONS				
Special Assessment Districts	Special assessment for landscaping, open space improvements, acquisition, and maintenance.	City agency / property owners initiate via petition, City agency administers; based on benefits calculated in engineer's report; >50% of property owners in proposed district must approve via (mail) ballot.	Citywide district possible for all street trees; individual districts more feasible in areas with many trees, high maintenance needs, and/or political support.	Typically funds more than just street trees.
Parcel Tax	Assessment levied independent of property value, can be equal amount per parcel or dependent on lot size.	2/3 of voters (not just property owners) must approve via election ballot.	Tax can be directly related to program costs; maintenance taxes deductible for property owners.	2/3 voter approval; potential competition from other services (e.g., schools); flat tax distributes cost inequitably.
General Obligation (GO) Bond	Low-interest loan for capital projects; repaid by levying tax revenue.	2/3 voter approval required.	Frequently used tool in municipal government.	Funding provided for set period; maintenance ineligible for funding.
Stormwater Utility	Urban forests mitigate storm-water runoff. A portion of the stormwater management fee can be earmarked for urban forestry.	A stormwater fee that is collected from every developed property parcel in the City to support the stormwater management program.	Additional funding to urban forestry and incentive to property owners to plant trees as a Best Management Practice.	Establishing a stormwater utility. Planting trees needs to be in a "Stormwater Utility Fee Credit Manual."
Partnerships	Non-profits, corporate partners, grant funding; for tree planting and establishment.	Various, depends on City's processes.	Decrease costs, increase capacity, develop a tree steward organization and program.	Union resistance, sustainable funding stream required.

Table 47. Financing options for Wilsonville's urban forest management programs (continued)

FINANCING OPTIONS	ATTRIBUTES	PROCESS	OPPORTUNITIES	CHALLENGES
ADDITIONAL OPTIONS				
Pest Control Fee	A fee for forestry related services such as pest control and replanting.	A forestry fee specific to pest control added to the public service utility billing as a levy.	Opportunity to offset costs of managing and recovering from tree pests and diseases.	Increased fee may require voter approval. The City must analyze pest control costs to establish the appropriate fee amount.
Tree Work and Land Development Permit Fees	An increase in fees for registered tree care companies, the Tree Work Permit Application, and development fees.	City assesses the actual costs of managing permits, reviews and inspections and applies an applicable fee. Updates to City ordinances may be required.	Additional fees may be directly applied to urban forest management.	Increasing the fees may require election ballots and/or updates to City ordinances.
General Fund	City's primary funding pool for wide range of municipal services.	Annual budget via City's legislative process.	History of funding for tree planting and establishment.	Not a guaranteed source or amount of funding; funds at risk if budget shortfalls arise.
Carbon Offsets	A cap-and-trade program in Wilsonville would create a cap on greenhouse gas emissions trading options.	OR Climate Action Plan advocate for a state Carbon Investment Fund program. The City should be involved in designing project (i.e., tree planting) requirements and tracking.	Oregon's cap and trade system provide economic incentive to drive more "natural climate solutions."	A large quantity of trees must be planted to qualify as a carbon offset and the trees must be properly managed to ensure long-term survival and carbon storage.
Parking Benefit District (PBD)	Revenue from parking meters for range of right-of-way improvements and maintenance.	Enacted via local ordinance specifying boundaries, rates, use of funds; City administers with input from advisory committee.	No ballot approval required; visitors bear burden over residents; revenue can be expended beyond district boundaries.	Adjustments will need to be made based to the agency overseeing excess meter revenue; typically funds more than trees.

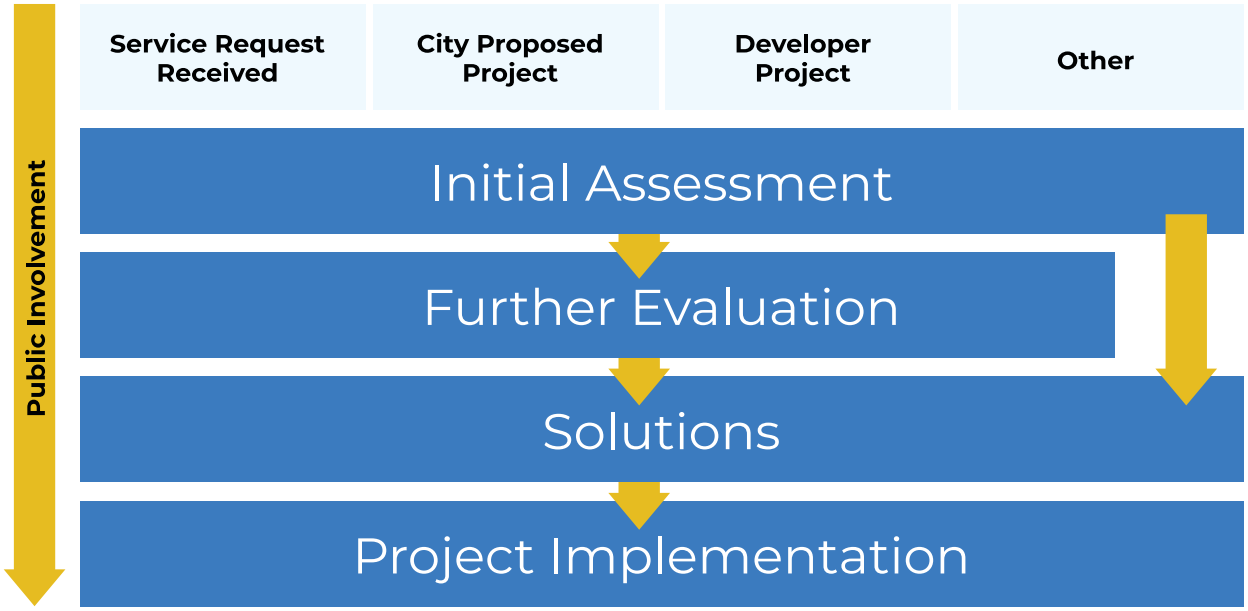
APPENDIX G. TREES AND HARDSCAPE CONFLICTS SOLUTIONS WORK-BOOK

Decision Matrix

The development of Wilsonville's Urban Forest Management Plan identified the need to clarify the decision process to address tree and sidewalk or construction conflicts. A clear decision matrix can help to reduce inter- and inner-department uncertainty and establish or adhere to consistency and fairness. The City's departments have standard operating procedures and checklists for evaluating conflicts at a project site, but these traditionally have not been available to the public. To make the decision process around the retention or removal of trees more transparent and consistent, a clarified process, decision matrix, and solution toolkit should be developed to highlight the key decision points.

Proposed Decision Matrix for Tree and Construction/Sidewalk Conflicts

Figure 39. Proposed decision matrix for tree and construction conflicts



Initial Assessment

The following applies to tree removals, tree removal permit applications, and proposed projects.

The initial assessment of trees, sidewalks (or other infrastructure), and site at the location of concern provides consistency and predictability by collecting the appropriate information. It is recommended to have urban forestry staff involved in the initial assessment process and/or a City staff member with an International Society of Arboriculture Certified Arborist accreditation.

- Tree Preservation Potential. What is the tree quality or health, and is it worth preserving? Is the tree part of the City's Significant Tree Program (if applicable)?
- Tree Mitigation Exploration. If the request to remove the tree is a result of infrastructure damage and the tree exhibits poor health or vigor, can the tree's health or vigor be mitigated by any means other than removal?
- Public Safety Risk. Is the tree a potential hazard that cannot be mitigated by any means other than removal? This includes any tree or tree part that poses a high risk of damage to persons or property located in public places. Use the International Society of Arboriculture's tree risk evaluation standards.
- Initial Assessment Timing. It is recommended that the initial assessment be conducted within 3-4 weeks of receiving a permit application for removal. If the assessment is required due to a proposed project, the assessment should occur no later than 30% design or equivalent of design effort (e.g., during the Environmental Assessment period).

- Tracking. Continue tracking street tree removal permit applications in the City's asset management software or similar program.

- For an example Initial Assessment Checklist, see the Example Initial Assessment Checklist further below.

Initial Tree Decision

If the tree removal permit application was made due to the condition of the tree or other reason not relating to the damage or impediment of infrastructure such as sidewalk, the City Forester or representative may conduct the initial tree decision. If infrastructure is part of the assessment and/or the tree removal application was initiated for a proposed project, the City Engineer or appropriate staff should also be part of the initial tree decision. The appropriate staff will visit the tree and/or proposed project location and assess the tree (and sidewalk, if applicable) conditions. The following actions will result from the assessment:

- Remove Tree. The tree removal permit application was made not as a result of the tree impacting or damaging infrastructure and the tree is identified as unhealthy or unsafe with no remediation possible.

  - Remove the tree and consider the "no net loss" policy of replacing the tree. Some cities implement a 2:1 replacement to removal ratio. The replacement policy should be based on City Code, the Zoning Ordinance, and City guidelines. Replacement of trees can occur on site, same street, or City-approved location. A fee in-lieu should also be considered as an option as described in City Code.

  - Removal of the tree should be prioritized based on other work orders, the risk assessment of the tree, and other factors.

  - For street trees, the removal permit application, decision, work order, tree information, and tree removal information should be tracked in the City's asset management software or similar program.

- Retain Tree. Based on the assessment, the tree is not in decline or the issues can be remediated. Alternatively, if the tree in question is part of a Significant or Heritage Tree Program, the tree may be preserved depending on the tree condition and presence of hazards or risks as described in the City policies and manuals.

  - Document the decision, inform the property owner or project developer.

  - Conduct the remediation activity to the tree if needed.

  - Prioritize and track this information in City's asset management or similar program.

  - Conduct follow-ups with the property owner and monitor the tree if necessary.

- Remove Tree and Replace Sidewalk. The permit application or proposed project identifies a tree that is causing sidewalk conflicts and the tree has been deemed unhealthy and no remediation is possible. The City should reference City Code as to what is defined as unhealthy or hazardous. Note, both tree removal and sidewalk repair are the responsibility of the adjacent property owner.

  - Remove the tree and consider the "no net loss" policy of replacing the tree. Some cities implement a 2:1 replacement to removal ratio. The requirement to replace the tree will be the City and City Forester's discretion. The replacement policy should be based on City Code, the Zoning Ordinance, and the City guidelines. Replacement of trees can occur on site, same street, or City-approved location. A fee in-lieu should also be considered as an option as described in City Code.

  - If a City-owned tree, removal of the tree should be prioritized based on other work orders, the risk assessment of the tree, and other factors.

  - For street trees, the permit application, decision, work order, tree information, and tree removal information should be tracked in the City's asset management program, tree inventory software, or similar.

  - Adjacent property owner replaces the sidewalk using appropriate design standards and materials and consider designing according to standards that will protect any replacement trees and provide ample soil volume and root space for the new or existing trees.

- Retain Tree and Maintain Sidewalk. A tree in question is in conflict with infrastructure and the assessment determined that the tree is to be retained and the infrastructure (i.e., sidewalk) is to be corrected (by the adjacent property owner). The sidewalk will be of standard width and a tree pit of standard width (at minimum) can be installed or retained.

  - Coordinate with the adjacent property owner the timing and approach for maintaining the sidewalk. Some cities offer incentives or funding to support sidewalk maintenance when the issue causing the sidewalk

damage has been identified to be caused by a street tree. Be sure to inform the property owner of alternative sidewalk amendments such as width reduction, alternative materials, among other solutions.

- If any root pruning is needed to amend the sidewalk, urban forestry staff and/or a Certified Arborist hired by the property owner or a certified consultant/contractor hired by the City should evaluate to determine the appropriate root pruning, branch pruning, soil amendments, and other maintenance required.

- Documentation in City asset management program or similar software as stated before is recommended.

- Evaluate Tree and/or Sidewalk Further. During the initial tree decision, it is not appropriate for extensive explorations of pavement, soils, or tree root systems. There are limitations to the initial assessment and decision. The purpose of the initial assessment is to identify where these future actions are required so that the appropriate schedule and funding can be determined.

  - Documentation in City asset management program or similar software as stated before is recommended.

Further Evaluation

The team conducting further evaluation may include an arborist, landscape architect, engineer, or other professionals with expertise relevant to the project details and situation. In addition to collecting information about the trees and infrastructure (i.e., sidewalk) the following additional items may be considered:

Level of impact, future risks, cost/benefit, anticipated sidewalk maintenance if the tree is kept, public/environmental benefit, community values, policy guidance, neighborhood context, historic districts, planned construction, funding forecasts.

Solutions

The following best practices and approaches are provided as examples. The City should review and update these as new or improved practices and materials emerge.

- If Tree Removed, Obtain Valuation. If the tree must be removed, the City should provide guidelines to replace the removed tree. Guidelines should be based on City Code, the Zoning Ordinance, and the City guidelines. Ideally, the tree would be replaced at the same location if the site is suitable for trees in the first place. If not possible, the City should have a procedure in place for the relocation of replacement trees.

- If Tree is Retained, Determine Management Approach. Since the initial assessment offered the opportunity to closely examine the tree and the site, future management approaches and decisions should be discussed and documented. These include future tree replacement species for when the tree does over mature and decline or conduct corrective actions to provide clearance for pedestrians, vehicles, utilities, and signs.

- Identify Potential Sidewalk Solutions. The Alternative Solutions Toolkit Overview section provides information and resources regarding sidewalk solution options. Information gathered during the initial assessment and subsequent site visits will support the selection of options that should be presented to the property owner, developer, or City staff to ensure goals of sidewalk repair and tree preservation are kept.

- Identify Opportunities to Improve Conditions for New Trees. When trees are planted by the City, the appropriate tree species for the location should be determined and the City should adhere to best practices in site and tree pit preparation to provide enough soil volume to support tree root growth and minimize future pavement damage by roots. If a tree is being planted at or near where the tree removal request was made, an evaluation of why the request was made should be considered. This may include such things as inadequate soil volume, insufficient growing space, tree leaf litter, messy fruit, poor structure, allergies, screening of shade-intolerant garden or landscape vegetation, or a combination of factors.

Project Implementation

Whether the sidewalk repair is occurring at a location where the tree is retained or removed, the sidewalk must adhere to the Americans with Disabilities Act (ADA) requirements and City standards and is the responsibility of the adjacent property owner. Tree repaving projects, curb and gutter repairs, and other Capital Projects should also adhere to this evaluation process. Policy in Wilsonville describes City staff's responsibility for maintenance, removal or remediation of City-owned trees or in the case of a public safety hazard. Most trees in the right-of-way are the responsibility of the adjacent property owners. Regarding tree maintenance, mitigation, or removal of City-owned trees, the City should involve the public by:

- Providing a public notice prior to the initial tree assessment.

- Share the results of the initial assessment.

- Share the solution decision.

Example Initial Assessment Checklist for Tree Conflicts

This resource can be adapted for the City of Wilsonville to make decisions regarding tree removals and tree and hardscape (i.e., sidewalks) conflicts.

INITIAL ASSESSMENT CHECKLIST

[CITY LOGO]

[City of ####] Trees and Sidewalks Operations Plan
Initial Street Tree and Sidewalk Assessment Checklist

DATE
Prepared By:

The purpose of this document is to outline INITIAL ASSESSMENT for locations where sidewalk work is located within the dripline of an existing street tree.

Project Location/Address	
Tree Species/Diameter	
Street Classification/Type	
Tree Asset Inventory ID	
Sidewalk Segment #	
Is this assessment along a corridor project?	

An [ENGINEER] and [ARBORIST] will look at the site and assess the condition of the sidewalk and the tree.
If the tree has the following characteristics, it should be removed/replaced pursuant to SMC 15.43.030 (C): The City's policy is to retain and preserve street trees whenever possible. Accordingly, street tree removal shall not be permitted unless the Director determines that a street tree:

1. Is a hazardous tree;
2. Poses a public safety hazard;
3. Is in such a condition of poor health or poor vigor that removal is justified; or
4. Cannot be successfully retained, due to public or private construction or development conflicts.

Initial Assessment

1. **Is the tree healthy and worthy of preservation?**
   - □ **Yes**
   - □ **No**
   - **Describe:**_____
2. **Poor Health – Is this tree in a condition of poor health or poor vigor that cannot be mitigated by any means other than removal?**
   - □ **Yes**
   - □ **No**
   - **Describe:**_____
3. **Hazardous Tree— Defined in [CITY CODE CITATION] any tree or tree part that poses a high risk of damage to persons using, or property located in the public place, as determined by the [AUTHORITY] according to the tree hazard evaluation standards established by the International Society of Arboriculture.**
   - □ **Yes**
   - □ **No**
   - **Describe:**_____
4. **Minimum Standards—Is there enough space for a [6 foot wide sidewalk and a 5 foot wide] planting strip?**

□ **Yes**
□ **No**
Describe:_____

5. **Public Safety Hazard—Does the tree present a public safety hazard that cannot be mitigated by any means other than removal?**
   - Does the tree location obstruct the visibility for pedestrians, cyclists, and/or cars at an intersection?
   - Is the tree impacting a curb ramp such that it no longer meets City of [CITY] ADA requirements?
   - Is the tree potentially impacting private property?
     □ **Yes**
     □ **No**

Use this space to draw a sketch of the location. Identify existing clearances from nearby infrastructure.

Recommendation for this tree:

□ ***–Remove Tree / Replace Sidewalk***
A tree is identified to be removed if it is not healthy or if it is hazardous as identified in the Street Tree Ordinance.

□ ***–Keep Tree and Maintain Sidewalk***
A tree will be kept and the sidewalk will be maintained if a sidewalk of standard width and a tree pit of standard width (at a minimum) can be installed or retained around a healthy tree.

□ ***–Evaluate Sidewalk and/or Tree Further***
[DEPARTMENT] views trees and sidewalks as important public infrastructure assets. [DEPARTMENT] intends to keep healthy trees and have accessible sidewalks. If standard widths cannot be met then [DEPARTMENT] will take the time and resources to evaluate if alternative approaches (such as sidewalk width reduction, alternative sidewalk materials, adjustments to the tree pit and/or tree root pruning) can be used to retain a tree and provide an accessible sidewalk at problem locations.

NEXT STEPS

If Tree is REMOVED –Replace the removed tree with the minimum 2:1 replacement ratio. Identify if the replacement trees can be located in the same location or on the same street as the removed tree. If not, replacements should be planted as close to the removal as geographically feasible. Identify the estimated cost to remove the tree(s), repair the sidewalk, and plant replacement trees.

If Tree is KEPT –Estimate the cost of the sidewalk repair that would achieve the desired lifecycle for the repair. Estimate sidewalk and tree maintenance needs/costs and any maintenance to the tree that is being retained (e.g., root pruning, branch pruning, soil amendments).

If EVALUATE Further – Use Tree and Sidewalk Evaluation Form (IN DEVELOPMENT) and/or the tree risk assessment should follow ISA TRAQ guidelines:
http://www.isa-arbor.com/education/onlineresources/basictreeriskassessmentform.aspx

Arborist	**Engineer**
Title	**Tile**
Date	**Date**

Alternative Solutions Toolkit Overview

MATERIAL

PAVING AND OTHER SURFACE MATERIALS

These materials can be used to create a walkable surface or to delineate space for people and/or the tree.

DESIGN

INFRASTRUCTURE-BASED DESIGN SOLUTIONS

These design considerations can be employed to support a tree and/or sidewalk.

ROOT

ROOTZONE-BASED MATERIALS

These tools can support tree health and guide tree growth below ground.

TREE

TREE-BASED SOLUTIONS

These solutions are focused on tree selection and tree maintenance.

Table 48. Description of possible alternative solutions for tree and construction conflicts.

TOOL TYPE	TOOLS	PRO-ACTIVE	RESPON-SIVE	COST	EXPECTED USEFUL LIFE MONTH/YEAR/DECADE/CENTURY
Material	**Paving and Other Surface Materials**				
	Asphalt	**P**	**R**	$-$$$	**M** **Y** **D** C
	Expansion Joints	**P**	**R**	$	**M** **Y** D C
	Pavers	**P**	**R**	$$-$$$	**M** **Y** **D** C
	Pervious Concrete	**P**	**R**	$$$-$$$$	**M** **Y** **D** C
	Reinforced or Thicker Slab	**P**	**R**	$$-$$$	**M** **Y** **D** C
	Rockery / Wall	**P**	R	$$-$$$$	**M** **Y** **D** C
	Beveling	P	**R**	$-$$	**M** **Y** D C
	Porous Asphalt	**P**	**R**	$-$$$	**M** **Y** **D** C
	Shims	P	**R**	$	**M** **Y** D C
	Tree Guards and Tree Rails	**P**	**R**	$$-$$$	**M** **Y** **D** C
	Decomposed Granite	**P**	**R**	$-$$	**M** **Y** D C
	Mudjacking (Concrete Leveling)	P	**R**	$$-$$$$	**M** **Y** **D** C
Design	**Infrastructure-Based Design Solutions**				
	Monolithic Sidewalk	**P**	**R**	$$$	**M** **Y** **D** **C**
	Pavement Thickness	P	**R**	$$$	**M** **Y** **D** C
	Tree Pit Sizing	**P**	**R**	$	**M** **Y** **D** C
	Bridging	P	**R**	$$$$	**M** **Y** **D** C
	Curb Bulbs	**P**	**R**	$$$-$$$$	**M** **Y** **D** **C**
	Curb Realignment	**P**	**R**	$$$-$$$$	**M** **Y** **D** **C**
	Curving or Offset Sidewalk	**P**	**R**	$$-$$$	**M** **Y** **D** **C**
	Easement	**P**	**R**	$-$$$	**M** **Y** **D** **C**
	Suspended Pavement Systems	**P**	R	$$$-$$$$	**M** **Y** **D** C
	Lowered Sites	**P**	R	$$$-$$$$	**M** **Y** **D** C
	Soil Volume	**P**	**R**	$-$$$	**M** **Y** **D** **C**

TOOL TYPE	TOOLS	PRO-ACTIVE	RESPON-SIVE	COST	EXPECTED USEFUL LIFE MONTH/YEAR/DECADE/CENTURY
Root	**Rootzone-Based Materials**				
	Mulch	**P**	**R**	$	**M** **Y** D C
	Root Barriers	**P**	**R**	$	**M** **Y** **D** C
	Continuous Trenches	**P**	**R**	$$$	**M** **Y** **D** C
	Foam Underlay	**P**	**R**	$-$$	**M** **Y** D C
	Modified Gravel Layer	**P**	**R**	$	**M** **Y** **D** C
	Root Paths	**P**	R	$-$$	**M** **Y** **D** C
	Soil Modification	**P**	**R**	$-$$	**M** **Y** **D** C
	Steel Plates	P	**R**	$$-$$$	**M** **Y** **D** C
	Structural Soils	**P**	R	$$-$$$	**M** **Y** **D** C
	Subsurface Aeration / Irration	**P**	**R**	$$	**M** **Y** D C
Tree	**Tree-Based Solutions**				
	City Forestry Street Tree List	**P**	R	$	**M** **Y** **D** C
	Corrective Pruning	**P**	**R**	$-$$	**M** **Y** D C
	Root Pruning	P	**R**	$-$$	**M** **Y** D C

*General cost notes:

- Sidewalk material costs, when given in linear feet, assume 6-foot sidewalk width
- Costs are planning-level costs and will vary for actual construction
- Costs do not include design, permitting, or other “soft” costs
- Costs not included in tool costs but which would be necessary with use of some solutions include:
  - Drainage structure and connection
  - Curb ramps

Figure 40. Example of alternative solutions for tree and construction conflicts

Decomposed Granite

Mudjacking

Bridging

Bulbouts

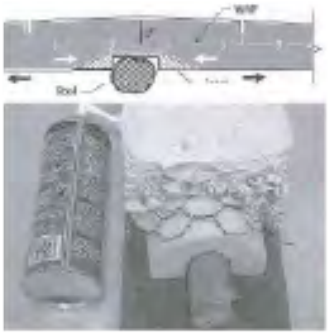
Curb Realignment

Easement

Suspended Pavement

Root Barriers

Foam Underlay



Mod. Gravel Layer

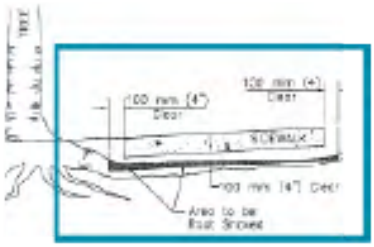
Structural Soils

Root Paths

Corrective Pruning

Root Pruning

Root Shaving

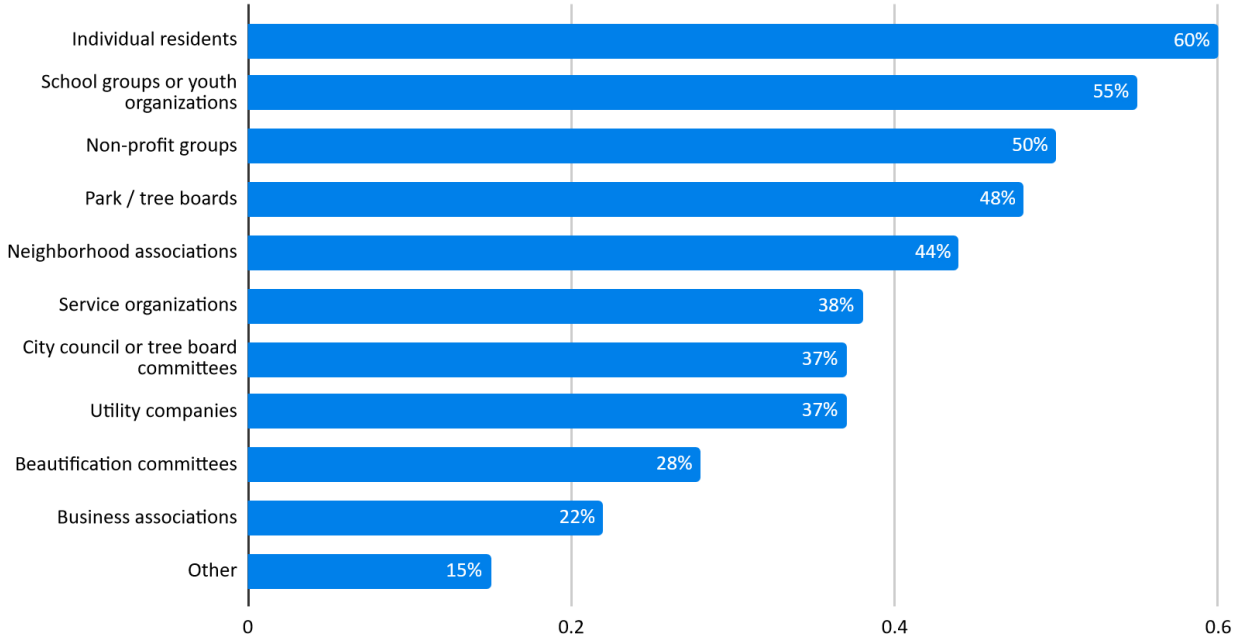


Source of Material Examples & Images:

APPENDIX H. EXISTING AND POTENTIAL URBAN FORESTRY PARTNERS

To manage a sustainable and thriving urban forest a network of supporting partnerships is necessary. With the diverse land ownership types, the extent of social and environmental pressures, and the wide variety of available funds and other resources, planting and the care of urban forests is extremely challenging. Success is increasingly reliant on different interest groups sharing a common ambition, working together in partnership, and leveraging their respective strengths. Urban forestry needs to be delivered at a strategic scale if it is to provide a full range of environmental, social, and economic benefits to the residents of Wilsonville. Therefore, there needs to be an effective and integrated working relationship across public, private, voluntary, and community sectors-with contributions of land, skills, and finance from the widest possible range of partners. This section provides an overview of the importance of partnerships from which the City can utilize as it strives to achieve the goals of the Urban Forest Management Plan.

Figure 41. Groups that support tree care or management based on a survey of 317 communities (Hauer et al. 2014)



The City of Wilsonville may evaluate its current partnership network and the groups listed in the figure above to identify areas for improvement. As shown in the figure, a large portion of urban forestry support comes from the individual residents though there are many unique city organizations to also consider. The City should utilize its existing network of partners to strengthen existing partnerships and identify new opportunities. Using the outcomes of the Urban Forest Management Plan and the goals for community engagement within it will provide the City's urban forestry program and partners with the tools, data, and information necessary to secure these partnerships. The following list is meant to serve as a starting point for consideration of traditional and non-traditional partners in urban forestry. As part of the Urban Forest Management Plan project, a document listing the groups by category is provided. The following list provides the overview of sectors that should be more closely reviewed with the supporting document to identify potential partners and areas where partnerships could be strengthened.

- Nonprofits/NGOs
- Wilsonville Area Organizations/Clubs
- Businesses
- Schools
- Government Organizations – County
- Government Organizations - State
- Government Organizations - Federal
- Healthcare
- Native American Tribes

APPENDIX I. STORM AND DISASTER MANAGEMENT GUIDANCE

Resources

https://www.fs.usda.gov/naspf/sites/default/files/naspf/pdf/sotuf.pdf

https://www.fs.usda.gov/ccrc/topics/urban-forests

https://www.ci.wilsonville.or.us/sites/default/files/fileattachments/public_works/page/1101/wilsonville_addendum.pdf

https://drive.google.com/drive/u/3/folders/1fyFSmr3LwYO1Q8wxU1AlASNuJttDj5RC

http://www.gicinc.org/storm_mit.htm

Guidance

Preparation – Planning and Warning Activities

1. Install and utilize early warning systems such as the National Weather Service, local news stations, local police and fire departments
2. Maintain the current disaster response plan, verify the following components are included:
    A. Identify individual/departmental roles
        1) Establish an official Tree Care Manager (both for management of the urban forest resource and as the point of contact for storm mitigation efforts)
        2) Build a storm mitigation team
        3) As assigned in the City's EOP and Debris Management Plans, the Public Works Director or similar is the disaster control supervisor.
            a) Has overall direction for storm clean-up efforts
            b) Makes decisions relating to storm clean-up efforts and advises on the need for outside assistance (contractors, other Public Works divisions)
            c) Is responsible for decisions relative to abandoning other divisional responsibilities in favor of storm damage clean-up efforts
            d) Works with City Communications Director for alerting media as to the progress and problems associated with the storm
            e) Coordinates with Natural Resources Director to prioritize response efforts
    B. Contacts for additional support
        1) National level tree service firms
        2) Smaller, local tree service firms
        3) Utility specialists
3. Create a more resilient urban forest
    A. Regular tree risk assessments
        1) ISA Level 1 or 2 – annually

a) Dedicated line-item budget for assessments

2) Systematic risk-reduction removals/pruning

b) Lightning protection systems for high-value/significant trees

3) Post-storm event level 1 assessments

B. Planting considerations for storm damage resistance

1) Ice Storm Susceptibility of Common Tree Species (see Table 50 for susceptibility ratings of trees within the City's Recommended Tree List, Appendix A)

a) Susceptible: Siberian elm, American elm, honeylocust, common hackberry, Bradford pear, American linden, black cherry, black locust, silver maple, pin oak, green ash

b) Intermediate: White ash, red maple, northern red oak, yellow poplar, sycamore, eastern white pine, sugar maple

c) Resistant: Yellow birch, shagbark hickory, hawthorn, horsechestnut, American hophornbeam, spruce, eastern hemlock, arborvitae, baldcypress, Norway maple, catalpa, ginkgo, sweetgum, white oak, swamp white oak, littleleaf linden, silver linden, Kentucky coffeetree, black walnut, ironwood, beech

d) Species that retain foliage into the fall (more susceptible to autumnal ice storms): European white birch, sweetgum, magnolia variety (Magnolia x soulangiana), scarlet oak, pin oak, English oak, weeping willow

e) Species that leaf out early (susceptible to early spring ice storms): Boxelder, yellow poplar, European mountain ash, Siberian elm

C. Climate change considerations

1) Warmer winter temperatures

2) Increased pest/disease due to more favorable conditions

3) Increased winter precipitation

a) More snow and ice loading

b) Flooding

4) Decreased summer precipitation

a) Drought stress

5) More frequent and intense extreme weather events

6) Mitigation

a) Reducing greenhouse gas emissions

- Allocate resources to trees that mitigate emissions
  - Large hardwoods
- Maintaining tree canopy

b) Promote energy efficiency

- Strategically planting trees around buildings
- Increase stormwater infiltration
- Using wood vs steel in construction projects

7) Adaptation

a) Planting a diverse mix of pest-tolerant, well-adapted, low-maintenance, long-lived, and drought-resistant trees ensures greater resilience

- Species type
- Species to avoid

b) Planting small groves of especially water-tolerant species in areas receiving peak volumes of stormwater runoff reduces flooding and pollutant transport

c) Establishing and adhering to regular maintenance cycles

- Pruning young trees properly promotes strong branch attachments that are less vulnerable

d) Distribute urban forest benefits equitably

- Underserved populations will be disproportionately impacted by climate change – focusing on these demographic areas with urban forest solutions can help

Response – Immediate Activities during and after Natural Disasters

1. Storm damage response: IT IS RECOMMENDED THE CITY OF WILSONVILLE REFER TO THE EMERGENCY OPERATIONS PLAN, NATURAL HAZARDS MITIGATION PLAN, AND THE DEBRIS MANAGEMENT PLAN FOR STORM RESPONSE GUIDANCE. THE FOLLOWING PROVIDES GENERAL INFORMATION FOR THE CITY TO CONSIDER WHEN UPDATING THE AFOREMENTIONED PLANS.

A. Funding

1) Sources of assistance

a) State forestry/natural resources

b) Federal disaster relief

c) USDA Forest Service

B. Emergency plans and contracts

1) Tree damage response. CITY OF WILSONVILLE ONLY RESPONDS TO STREET TREES WITHIN THE PUBLIC RIGHTS-OF-WAY AND TREES WITHIN CITY-OWNED PROPERTY. CITY CANNOT ASSESS, CLEAR, FELL, OR REMOVE TREES ON PRIVATE PROPERTY AFTER AN EVENT.

a) Priority streets/corridors for first response

- CLASS I: First, all life-threatening situations within street rights-of-way and City-owned property should be given priority. The City Fire and Police Department request technical assistance for City staff to address the concern(s) under their supervision and directions. Supervisors should make an on-site visit to determine the severity of the damage in the event of multiple hazardous situations. Crews should remedy the situation to a point where it is no longer life threatening before proceeding to the next location. Final clean up should wait until all life threatening situations are resolved and all streets have been cleared.
- CLASS II: Second, all major City-owned property damage instances should be remedied to a point where the crisis is abated. Supervisors should personally inspect and determine the priority of the tree management program responses. Again, final clean up at those sites should wait until all streets and specialized areas are cleaned up.

- CLASS III: Third, preferential streets (considered to be all main thoroughfares) should be cleared of fallen trees and debris. State and county highway departments may be called to clear U.S., state and county routes. Because the specialized forestry skills required to abate life threatening and property damage situations would be utilized immediately, the street clearance work (in case of widespread and severe damage) may not be undertaken by tree management program personnel until sometime well after the storm has passed. In this situation, the tree manager should recommend to the Public Works Director that other public works crews be considered to assist in street clearance work. immediate supervision of these supplementary crews would be under the direction of their respective divisions.

2) Cleanup

a) Debris disposal

- The Public Works develops a budget for normal disposal costs associated with yearly tree maintenance tasks. Major tree debris disposal will require additional funding which may be authorized by the City Manager.

b) Damage Assessment

- The Department of Public Works should immediately issue a press release detailing the magnitude of the storm and the expected clean up time. Provide direction to the Community as to how to properly handle / dispose of their debris.
- A critical tool to assist any emergency response is a current tree inventory of all publicly owned trees. Using the inventory, the City can determine the actual damage to the urban forest. Accurate damage (in dollars) can be assessed and submitted for potential reimbursements. Specific costs can be developed for the repair of the urban forest (pruning, removal, cabling, and rodding).

3) Use i-Tree storm for predictions

4) FEMA contacts/expectations

C. Participate in the USDA Forest Service's Urban Forest Strike Team training curriculum.

Recovery – Activities to Regain or Improve upon Pre-disaster Conditions

1. Tree planting
   A. Align with a tree planting strategy that provides guidance on priority areas, tree species selection, post-planting care, and routine maintenance.
   B. Align planting with urban tree canopy goals
   C. Utilize the Citywide Recommended Tree List (Appendix A) and Table 50.
2. Tree care
   A. Conduct young tree training to prevent future maintenance issues, improve structural integrity, and reduce future costs
   B. Conduct routine programmed pruning of established trees in the public tree population to reduce the risk of storm damage
   C. Inventory, assess, and monitor trees to prioritize maintenance and for information useful in prioritizing storm response

D. Implement plant health care for trees affected by pests and diseases. Implement an Integrated Pest Management program for prevention, treatment, and recovery due to pests and diseases

3. Training
   A. Provide or support tree maintenance, planting, and risk assessment training for City staff and community partners
   B. Stay current on research relating to storm disaster prevention, response, and recovery
4. Celebrations
   A. Continue to build support for the urban forest through events and programs such as the Arbor Day celebration, Tree City USA recognition, recognition programs for community tree stewards, memorial tree programs, and the Heritage Tree Program

Implementing and Adapting the 2021 Winter Storm Tree Response Plan

In response to the 2021 winter storm event, the City established and implemented the Winter Storm Tree Response Plan. The following actions were provided by the City and should be updated with the guidance provided in the previous section.

Figure 42. Overview of Wilsonville's 2021 winter storm tree response plan

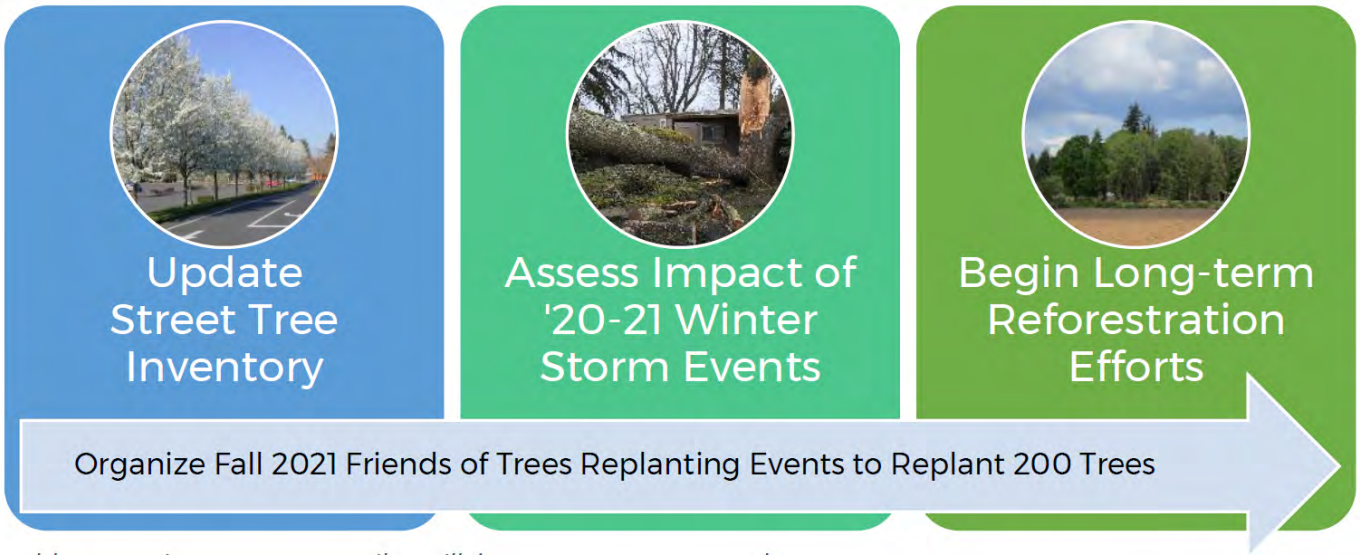


Table 49. Actions to support Wilsonville's storm tree response plan

ASSESSMENT/DATABASE		
STATUS	**ACTION**	**LEAD***
X	Gather preliminary impressions of impact to street trees, assets on public property, Significant Resource Overlay Zone (SROZ).	CD, PWD, PRD
	Hire two interns to update asset management database (Cartegraph) - focus on street trees, then assets on public property.	PWD
	Update asset management database (Cartegraph) - Data sources: physical assessment, permit applications, community requests for debris pick-up, calls to PW and PRD for hazardous removal, etc.	CD, PWD, PRD
	Assess impact to SROZ, residential lots with SROZ, Homeowners Associations (HOAs) with SROZ and natural areas.	CD/NR
	Reconnect with and involve HOAs in assessment effort.	CD
	Determine level of impact (compare initial inventory to assessment data).	CD, PWD, PRD
	Categorize trees (removed, needs removal, needs further assessment, needs pruning, no action needed).	CD, PWD, PRD
	Use emergency arborist contracts to assess trees in "needs further assessment" category; move to other categories.	CD, PWD, PRD
	Update UFMP with new inventory data.	CD/NR
PERMIT/MITIGATION PROCESSING		
STATUS	**ACTION**	**LEAD***
	Continue processing submitted permits and emergency tree forms.	CD
	Continue advising residents/owners on best course of action.	CD
REPLANTING EVENTS		
STATUS	**ACTION**	**LEAD***
	Partner with Friends of Trees (FOT) for replanting; Neighborhood Trees Program for street trees; possibly Greenspaces Program in parks/open spaces/natural areas.	CD, PW, PRD
	Plan and execute two replanting days with FOT; first wave of replacement = those who sign-up, are willing, in permit process (100 trees per day, replant 200 trees. Cost = $285 per tree— owner pays $35, City pays $250— $50,000 total paid by PWD and Tree Fund).	CD, PW, PRD
	Use "best tree, best location" replanting method; be aware of potential utility conflicts.	
	Assess effect of replanting effort - compare new plantings with updated inventory.	CD, PW, PRD
	Identify areas still needing replanting - hardest hit, low level replanting, etc.	CD, PW, PRD
	Assess need for future planting events.	CD, PW, PRD

Table 49. Actions to support Wilsonville's storm tree response plan (continued)

OUTREACH/EDUCATION		
STATUS	**ACTION**	**LEAD***
	Share information about best practices for damage assessment, salvage, proper pruning, tree first aid in BFM, on website, etc.	CD, ADM
	Share best practices information with HOAs.	CD, ADM
	Based on asset management update, reach out to owners of "needs removal" trees to initiate emergency removal process.	CD
	Share information about replanting program and best practices.	CD, ADM
	Consider direct mailing of information on best practices.	CD, ADM
	Reconnect with HOAs to assist in replanting.	CD
	Connect with commercial property owners to provide information about permitting and mitigation best practices.	CD
LONG-TERM REFORESTATION		
STATUS	**ACTION**	**LEAD***
	Identify long-term reforestation plan	CD, PW, PR
RESOURCE LINKS		
How to Make Trees Storm Resistant (TCUSA Bulletin No. 75)		
Tree First Aid After A Storm (ODF)		
Can These Trees Be Saved? (ODF)		
An Oregon Homeowner's Guide to Tree Care		
Wilsonville Street Tree List (most recent revision, Appendix A, and Table 50)		

*Lead = City Departments or Divisions: CD = Community Development; PW = Public Works Department; PR = Parks and Recreation Department; ADM = Administrative

*Table 50. Trees in the City's Recommended Tree Species List (Appendix A) and storm susceptibility**

COMMON NAME	SCIENTIFIC NAME	STORM SUSCEPTIBILITY
Dawyck Purple Beech	*Fagus sylvatica* 'Dawyck Purple'	**Resistant**
Roble Beech	*Nothofagus obliqua*	**Resistant**
Fernleaf Beech	*Fagus sylvatica* 'Asplenifolia'	**Resistant**
Rivers Purple Beech	*Fagus sylvatica* 'Riversii'	**Resistant**
Copper Beech	*Fagus sylvatica* 'Atropurpurea'	**Resistant**
Japanese Chinquapin	*Castanopsis cuspidata*	**Resistant**
Tricolor Beech	*Fagus sylvatica* 'Roseomarginata'	**Resistant**
Chinese Catalpa	*Catalpa ovata*	**Resistant**
Hybrid Catalpa	*Catalpa xerubescens* 'Purpurea'	**Resistant**
Northern Catalpa	*Catalpa speciosa*	**Resistant**
Natchez Crape Myrtle	*Lagerstroemia* 'Natchez'	**Resistant**
Bald Cypress	*Taxodium distichum*	**Resistant**

Table 50. Trees in the City's Recommended Tree Species List (Appendix A) and storm susceptibility (continued)*

COMMON NAME	SCIENTIFIC NAME	STORM SUSCEPTIBILITY
Shawnee Brave® Bald Cypress	*Taxodium distichum* 'Mickelson'	**Resistant**
Saratoga Ginkgo Biloba	*Ginkgo Biloba* 'Saratoga'	**Resistant**
Halka Ginkgo Biloba	*Ginkgo Biloba* 'Halka'	**Resistant**
Fairmount Ginkgo Biloba	*Ginkgo biloba* 'Fairmount'	**Resistant**
Shangri-La Ginkgo Biloba	*Ginkgo Biloba* 'Shangri-La'	**Resistant**
Princeton Sentry Ginkgo	*Ginkgo biloba* 'Princeton Sentry'	**Resistant**
Emperor Ginkgo biloba	*Ginkgo biloba* 'Emperor'	**Resistant**
Presidential Gold® Ginkgo biloba	*Ginkgo biloba* 'The President'	**Resistant**
Autumn Gold Ginkgo Biloba	*Ginkgo Biloba* 'Autumn Gold'	**Resistant**
Golden Colonade® Ginkgo Biloba	*Ginkgo Biloba* 'JFS-UGA2'	**Resistant**
Magyar Ginkgo Biloba	*Ginkgo Biloba* 'Magyar'	**Resistant**
Lavalle Hawthorn	*Crataegus X lavalleei*	**Resistant**
Western Hemlock	*Tsuga heterophylla*	**Resistant**
American Hophornbeam	*Ostrya virginiana*	**Resistant**
California Buckeye	*Aesculus californica*	**Resistant**
Red Horsechestnut	*Aesculus x carnea*	**Resistant**
Kentucky Coffeetree	*Gymnocladus dioicus*	**Resistant**
Espresso™ Kentucky Coffeetree	*Gymnocladus dioicus* 'Espresso-JFS'	**Resistant**
True North™ Kentucky Coffee-tree	*Gymnocladus dioicus* 'UMNSynergy'	**Resistant**
Harvest Gold Littleleaf Linden	*Tilia* 'Harvest Gold'	**Resistant**
Silver Linden	*Tilia tomentosa* 'Sterling'	**Resistant**
Greenspire® Littleleaf Linden	*Tilia cordata* 'PNI 6025'	**Resistant**
Coast Live Oak	*Quercus agrifolia*	**Resistant**
Interior Live Oak	*Quercus wislizenii*	**Resistant**
Holly Oak	*Quercus ilex*	**Resistant**
California Black Oak	*Quercus kelloggii*	**Resistant**
Bur Oak	*Quercus macrocarpa*	**Resistant**
Canyon Live Oak	*Quercus chrysolepis*	**Resistant**
Southern Live Oak	*Quercus virginiana*	**Resistant**
Swamp White Oak	*Quercus bicolor*	**Resistant**
Oregon White Oak	*Quercus garryana*	**Resistant**
Gum Drop® Tupelo	*Nyssa sylvatica* 'JFS-PN Legacy1'	**Resistant**
Afterburner® Black Tupelo	*Nyssa sylvatica* 'David Odom'	**Resistant**
Wildfire Black Tupelo	*Nyssa sylvatica* 'Wildfire'	**Resistant**
Black Tupelo	*Nyssa sylvatica* 'Firestarter'	**Resistant**

Table 50. Trees in the City's Recommended Tree Species List (Appendix A) and storm susceptibility (continued)*

COMMON NAME	SCIENTIFIC NAME	STORM SUSCEPTIBILITY
Red Rage® Black Tupelo	*Nyssa sylvatica* 'Haymanred'	**Resistant**
Sheri's Cloud Black Tupelo	*Nyssa sylvatica* 'Sheri's Cloud'	**Resistant**
English Walnut	*Juglans regia* 'Carpathian'	**Resistant**
Tuscarora Crape Myrtle	*Lagerstroemia* 'Tuscarora'	**Intermediate**
Muskogee Crape Myrtle	*Lagerstroemia* 'Muskogee'	**Intermediate**
Exclamation™ London Plane-tree	*Platanus xacerifolia* 'Morton Circle'	**Intermediate**
Bloodgood London Planetree	*Platanus x acerifolia* 'Bloodgood'	**Intermediate**
Columbia London Planetree	*Platanus x acerifolia* 'Columbia'	**Intermediate**
Yarwood London Planetree	*Platanus x acerifolia* 'Yarwood'	**Intermediate**
Liberty London Planetree	*Platanus x acerifolia* 'Liberty'	**Intermediate**
October Glory Red Maple	*Acer rubrum* 'October Glory'	**Intermediate**
Red Sunset Maple	*Acer rubrum* 'Franksred' REDSUNSET	**Intermediate**
Armstrong Red Maple	*Acer rubrum* 'Armstrong'	**Intermediate**
Bambooleaf Oak	*Quercus myrsinifolia*	**Intermediate**
Silverleaf Oak	*Quercus hypoleucoides*	**Intermediate**
Forest Green® Oak	*Quercus frainetto* 'Schmidt'	**Intermediate**
Blue Oak	*Quercus douglasii*	**Intermediate**
Cork Oak	*Quercus suber*	**Intermediate**
Sawtooth Oak	*Quercus acutissima*	**Intermediate**
Willow Oak	*Quercus phellos*	**Intermediate**
Chinkapin Oak	*Quercus muehlenbergii*	**Intermediate**
Red Oak	*Quercus rubra*	**Intermediate**
Shumard Oak	*Quercus shumardii*	**Intermediate**
Canby Oak	*Quercus canbyi*	**Intermediate**
Hungarian Oak	*Quercus frainetto*	**Intermediate**
Valley Oak	*Quercus lobata*	**Intermediate**
Oracle Oak	*Quercus ×morehus*	**Intermediate**
Monterrey Oak	*Quercus polymorpha*	**Intermediate**
City Sprite® Japanese Zelkova	*Zelkova serrata* 'JFS-KW1'	**Intermediate**
Wireless® Japanese Zelkova	*Zelkova serrata* 'Schmidtlow'	**Intermediate**
Village Green® Japanese Zelko-va	*Zelkova serrata* 'Village Green'	**Intermediate**
Green Vase® Japanese Zelkova	*Zelkova serrata* 'Green Vase'	**Intermediate**
Scarlet Oak	*Quercus coccinea*	**Intermediate, Late Fall Foli-age**
Tuliptree	*Liriodendron tulipifera*	**Intermediate, Early Spring Foliage**

Table 50. Trees in the City's Recommended Tree Species List (Appendix A) and storm susceptibility (continued)*

COMMON NAME	SCIENTIFIC NAME	STORM SUSCEPTIBILITY
Valley Forge American Elm	*Ulmus americana* 'Valley Forge'	**Susceptible**
Jefferson American Elm	*Ulmus americana* 'Jefferson'	**Susceptible**
Princeton American Elm	*Ulmus americana* 'Princeton'	**Susceptible**
Hackberry	*Celtis occidentalis*	**Susceptible**
Halka® Honeylocust	*Gleditsia triacanthos* 'Christie'	**Susceptible**
Shademaster Honeylocust	*Gleditsia triacanthos* 'Shademaster'	**Susceptible**
Skyline® Honeylocust	*Gleditsia triacanthos* 'Skycole'	**Susceptible**
Redmond American Linden	*Tilia americana* 'Redmond'	**Susceptible**
Willamette Valley Ponderosa	*Pinus ponderosa* x *benthamiana*	**Susceptible**

* Storm Susceptibility ratings are based on USDA Forest Service and University of FL Institute of Food and Agricultural Sciences research. Rating does not guarantee susceptibility or resistance to any listed species.

URBAN FOREST

MANAGEMENT PLAN

WILSONVILLE, OREGON

OCTOBER 2021

HEALTHY TREES, HEALTHY CITY

WILSONVILLE OREGON

PLANIT GEO™
mapping a greener future

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