CITY OF RENTON, WASHINGTON

URBAN FOREST MANAGEMENT PLAN 2022-2032

ROOTED IN RENTON

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Mayor

Armondo Pavone

Chief Administrative Officer

Ed VanValey

City Council

Ryan McIrvin, City Council President

James Alberson

Valerie O'Halloran

Ruth Pérez

Edward Prince

Carmen Rivera

Kim-Khánh Văn

Judith Subia, City Council Liaison

Parks Commission

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Cynthia Burns

Al Dieckman

Larry Reymann

Timothy J. Searing

Troy Wigestrand

Marlene Winter

Planning Commission

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Charles Seil, Vice Chair

Josephine Bayan, Secretary

Dana Rochex

David Fleetwood

James Alberson

Kevin Poole

Mara Fiksdal

Sunayana Kannur

Executive Services (ES)

Maryjane Van Cleave, Communications & Engagement Director

David Neubert, Communications Manager

Sheila Cowley, Communications Specialist 1

City Attorney

Shane Moloney

Community & Economic Development (CED)

Chip Vincent, Administrator

Angie Mathias, Long Range Planning Manager

Human Resources & Risk Management (HR&RM)

Ellen Bradley-Mak, Administrator

Parks and Recreation (PR)

Kelly Beymer, Administrator

Erica Schmitz, Parks Planning and Natural Resources Director

Ian Gray, Urban Forestry & Natural Resources Manager

Public Works (PW)

Martin Pastucha, Administrator

Collaborative Team Members

Angelea Weihs, Associate Planner (CED Planning Division)

Cailín Hunsaker, Parks & Trails Director (PR Parks & Trails Division)

Drey Hicks, Neighborhood Program Coordinator (ES Communications & Engagement Division)

Gary Del Rosario, GIS Analyst 2 (ES Information Technology Division)

Joseph Farah, Utility Engineering Manager (PW Utilities Division)

Kelsey Urban, Risk Manager (HR&RM)

Patrick Zellner, Street Maintenance Manager (PW Maintenance Services Division)

Vanessa Dolbee, Planning Director (CED Planning Division)

Vangie Garcia, Transportation Planning Manager (PW Transportation Engineering Division)

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ROOTED IN RENTON

CITY OF RENTON, WASHINGTON

URBAN FOREST MANAGEMENT PLAN

10-YEAR UPDATE

JANUARY 2022

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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 an urban forest. Renton's Urban Forest Management Plan focuses on the City-owned trees in public rights-of-way, natural areas, and parks, 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. In fact, there are very few areas of urban management and its various departments that aren't affected and benefited by the urban forest.

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 Renton 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 via an approved Urban Forest Management Plan. The urban forest is unique in the array of benefits it provides to the community, and a plan will effectively collect and showcase these values.

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

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URBAN FOREST MANAGEMENT PLAN EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

The City of Renton is dedicated to building a thriving urban forest for a healthy and vibrant place to live, work, and play. The nearly 117,000 City street, park, and natural area trees throughout Renton are an asset that bring value and benefits to the community. Furthermore, trees on private property provide added benefits. Together, these public and private trees constitute an "urban forest". This resource provides environmental benefits, adds to property values, and contributes to an enhanced quality of life for all of Renton's residents.

Realizing the urban forest is a valued asset, the City of Renton's Community Services Department at the time, led by the Urban Forestry & Natural Resources team, invested in a collaborative planning process to update its 2009 Urban Forest Management Plan to provide the framework for the Urban Forestry Program over the next 10 years. This Plan will serve as a road map to support the long-term dedication to maintain and enhance the urban forest. The Plan will provide an integrated approach to preserving, sustaining, diversifying, and regenerating Renton's urban forest into the future. By conducting an in-depth review of existing City codes, policies, and plans regarding the urban forest as well as gathering input from the community, the goals, objectives, strategies, actions, and monitoring techniques will be developed for urban forest management Citywide. Participation from the community is instrumental to the development of this Plan.

This forward-looking plan provides mission and vision statements, goals, and objectives. It builds upon foundations in the Renton Comprehensive Plan, the Parks, Recreation and Natural Areas Plan, Business Plans, and neighborhood plans. The aim is to ensure the safety, well-being, and economic future of Renton's citizens, as well as preserving the sustainability of the urban forest. The Urban Forest Management Plan proposes steps to protect trees, forestry assets (which are actual City assets), and the health of Renton's citizens through urban forestry services. Criteria for prioritizing resources to achieve best value and best management practice have been used in the development of the listed improvements with short-term, medium-term, and long-term timeframes. For Renton to remain "ahead of the curve" the City must proactively engage in planning for regular planting of new trees and maintaining existing trees that is guided by the urban forest vision and tree canopy cover goals. The City of Renton Urban Forestry Program is dedicated to this vital resource and implementation of the Urban Forest Management Plan in an effort to sustain and enhance it for all neighborhoods and future generations.

PLANNING APPROACH

The purpose of the 10-year Urban Forest Management Plan is to answer the fundamental components of adaptive management: what do we have, what do we want, how do we get what we want, and how are we doing. Developing the Plan required input from City staff, stakeholders, residents, data sources, thoughtful analysis, a coordinated vision, and time.

WHAT DO WE HAVE?

The first step of the process is to complete a baseline assessment of the urban forest, the resources to manage it, and the people that influence and benefit from it. The six elements completed in planning process provide the foundation for setting goals and measuring progress.

WHAT DO WE WANT?

The Plan is shaped by knowing what the urban forest needs, the resources required to manage it, and what the community wants. This was informed by public engagement through websites and social media, public surveys, presentations, staff interviews, and development of the urban forest vision and supporting goals.

HOW ARE WE DOING?

The City needs to continually monitor progress towards the vision and goals. The Urban Forest Management Plan includes guidance for implementing actions. The planning approach for this Plan provides the framework for continual monitoring and evaluation of efforts using the U.S. Forest Service's Urban Forest Audit System. Updates to this audit will inform any necessary changes to strategies in an adaptive management approach.

HOW TO GET WHAT WE WANT?

The goal, action, and target framework lay out the road map to achieve a shared vision that supports the needs of all members of the community. Actions are strategic, measurable, attainable, realistic, and time-bound (SMART) and have been developed through extensive research, data analyses, stakeholder consultations, community engagement, benchmarking research, and gap analyses during the planning process.

KEY FINDINGS

STATE OF THE URBAN FOREST

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

- 27,456 public street, park, or Maplewood Golf Course trees
- 89,528 natural area trees
- 116,984 total public trees
- 29.3% canopy (up 0.6% from 2010)
- Tree Equity Score of 83 out of 100
- 90 unique genera, *Acer* most common (27%)
- 281 unique species, bigleaf maple most common (15%)
- Public trees provide $220,000 in annual ecosystem benefits and services
- Public trees have a replacement value of $122.6 million

THE URBAN FORESTRY PROGRAM

- Parks and Recreation Department's Parks Planning and Natural Resources Division
- 2.50 full-time employees (2021)
- 48% of public trees are in fair condition (2021)
- 22% of street trees need clearance pruning, 19% need structural pruning (2021)
- $8.13 budget per public tree (2021)
- 1.15 public trees per capita (2021)
- Urban Forest Audit: 65% overall
- Challenges include sustainable management, program efficiencies, risk tree management, and tree policies/regulations/enforcement
- A 7-year pruning cycle requires 3,922 trees pruned per year at a cost of approximately $706,011 annually
- Initial cost of an in-house arborist crew and fleet is $581,780 with an annual cost of $270,698
- Tree Planting Initiative recommends 30% canopy by 2032 (5,250 total trees) and 33% by 2042 (18,852 total trees). 60% of plantings should be City-led or approximately 315 trees per year for the 30% canopy goal and 570 trees per year for the 33% canopy goal.

COMMUNITY VIEWPOINTS AND PRIORITIES

- 38% feel the health of the urban forest has declined in the last 10 years
- 44% support increasing overall funding to the Urban Forestry Program for tree planting and maintenance initiatives
- 8% support increasing the funding to the Urban Forestry Program for tree planting and maintenance initiatives by redistributing the current program funding
- 47% support the additional funding be used for proactive street tree pruning

URBAN FOREST MANAGEMENT GOALS AND OBJECTIVES

GOAL 1: Proactively manage public trees, continue to grow and expand a healthy canopy, maintain public safety, and optimize urban forest benefits.

Objectives

1.1 Make data-driven management decisions.
1.2 Sustainably manage the public tree population.
1.3 Establish a strategy for increasing tree canopy cover through City and public efforts.
1.4 Effectively manage tree risk.

GOAL 2: Achieve environmental justice through a partnership with the City and its residents to improve well-being, human health, local economies, and urban forest sustainability.

Objectives

2.1 Create an urban forestry public outreach program that addresses all communities.
2.2 Increase capacity through trained citizens.

GOAL 3: Strengthen policies for preserving the environmental benefits, management, and the character of Renton's urban forest.

Objectives

3.1 Strengthen policies for protecting the urban forest.
3.2 Improve workflows and operations for sustainable urban forest management.

URBAN FOREST MANAGEMENT PLAN FRAMEWORK

VISION

Renton's urban and community forest will be healthy, diverse, and sustainable, reinforcing the City's strong commitment to community trees. This strong commitment to trees will benefit the well-being of Renton's residents and set an example for other Urban Forestry programs in the region.

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.

CALL TO ACTION

The urban forest is an important green infrastructure asset for neighborhoods across Renton. However, the capacity of urban forests to support healthy and resilient communities is constrained and challenged by stressors such as climate change impacts, urban development pressures, altered soils, invasive species, and resource shortages. Now more than ever there is a critical need to sustain large, healthy, genetically appropriate trees and shrubs 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 Renton's urban forest should be a shared priority among its citizens, community groups, institutions, and City departments. 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 Renton. Furthermore, decision-making must be made in the context of future uncertainty associated with climate change. With this understanding, along with the input from staff and residents of Renton, the following priority strategies for implementing the City's Urban Forest Management Plan were developed:

KEY STRATEGIES

The planning process identified 22 strategies following development of the program goals and objectives. Five strategies were identified as being of higher priority that will position Renton as a leader in urban forestry across the state and perhaps the nation and will guide the City towards a sustainable urban forest than others.

7-Year Pruning Cycle Program

One of the more critical strategies identified was the need for an improved public tree pruning program on a recommended 7-year rotation. The strategy requires additional funding and the creation of an in-house arborist crew. Feedback from the community and City staff expressed support for the structure of this strategy.

Tree Planting Initiative

To grow an urban forest that is sustainable and resilient to climate change, pests and diseases, and urban development pressures, a strategic planting initiative guided by short- and long-term canopy goals and planting targets are needed. The Plan contains the guidance for finalizing canopy goals, identifying priority planting areas, and developing the tree planting initiative.

Tree Stewards Program

A shared commitment to the urban forest and vision is essential to the long-term success and impact of the Plan. A community of tree stewards will increase Urban Forestry Program capacity and support the Tree Planting Initiative along with other programs and services.

No-Net-Loss

Perhaps more important than tree canopy cover goals and planting initiatives is the foundation of sound policies to preserve the existing urban forest. With this key strategy, tree replacement, retention, removal, mitigation, and enforcement protocols are solidified. In addition, alternative solutions to tree and sidewalk conflicts are explored and guidance for formally adopting a decision checklist and solutions toolkit is provided.

Enforce Tree Regulations

Throughout the planning effort, concerns were expressed and identified relating to the protection of trees from construction damage, illegal removals, maintenance malpractice. The actions supporting this strategy expand the enforcement efforts by increasing capacity as well as community education to prevent instances from occurring in the first place.

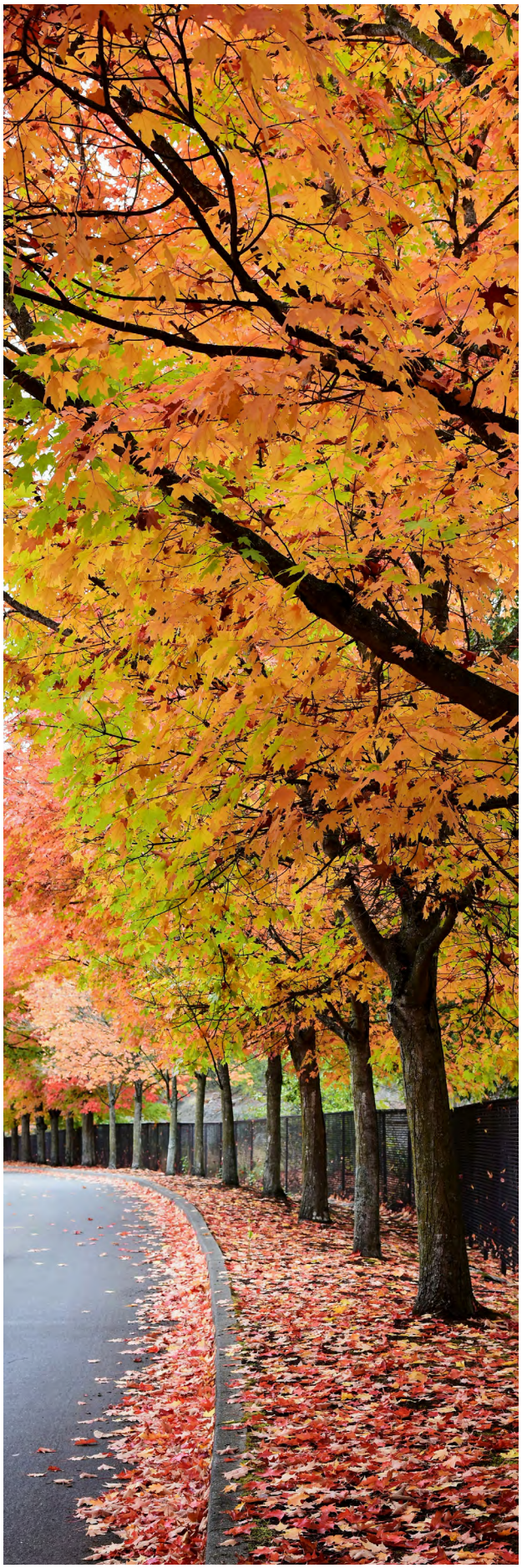
RENTON'S URBAN FOREST MANAGEMENT PLAN -2022-2032-

VISION

Renton's urban and community forest will be healthy, diverse, and sustainable, reinforcing the City's strong commitment to community trees. This strong commitment to trees will benefit the well-being of Renton's residents and set an example for other Urban Forestry programs in the region.

MISSION

The City of Renton will grow a thriving urban forest through strategic management, diverse partnerships, and a strong commitment to protect and enhance the community's natural resources.



PLAN PURPOSE AND FRAMEWORK

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.

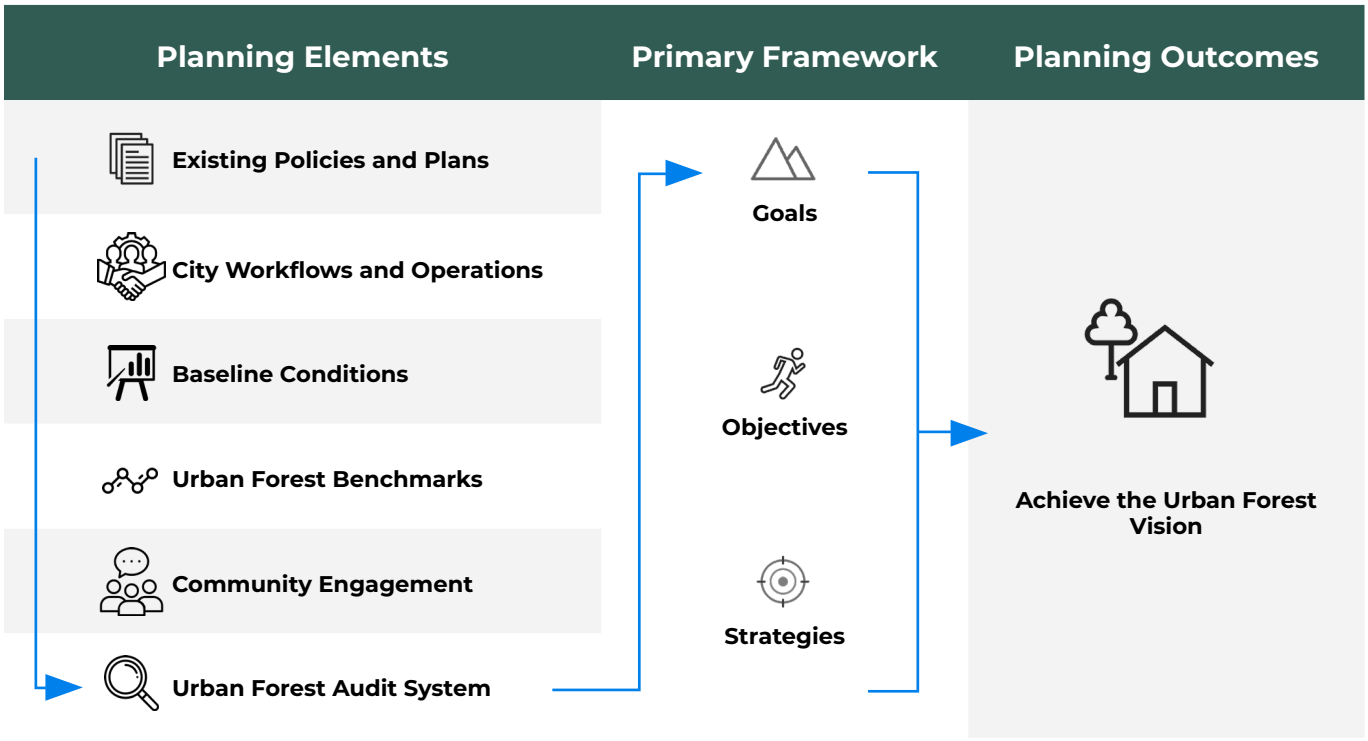
The planning process consisted of two phases; the needs assessment conducted as part of the planning process and the development of goals, objectives, and strategies in the Urban Forest Management Plan. The first phase establishes a baseline from which short- and long-term strategies can be developed 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 for measuring progress. This diligent approach to Renton's urban forest management gauges the City's readiness and available resources to achieve optimal levels of urban forest management and sustainability. Through this iterative 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.

In adhering to best management practice as framed by the eight guiding principles listed on page 'V', the urban forest stands a chance of being a sustainable and resilient resource. This will require an integrated ecosystem management approach. That system is based on the recognition that the urban forest is a resource which should be viewed as a tangible asset which confers broad benefits to all citizens of the City of Renton and compliments the biodiversity values of the surrounding natural environment. Urban forests face unprecedented challenges in a warming environment with ever expanding development needs. In order to preserve the urban forest and the myriad benefits conferred, the residents of Renton will need to be vigilant and remain committed to sound environmental standards which will ensure that generations to come will enjoy the same. If Renton is to be a leader and environmental champion, the stewardship of its green infrastructure and the fundamental role played by trees in that ecology is paramount. This ten-year Urban Forest Management Plan is an important piece of that larger mission. All community stakeholders should be involved in bringing this to fruition and safeguarding the future of trees in our neighborhoods.

PLANNING APPROACH

The systematic evaluation of the City of Renton'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 City's project team evaluated the outcomes and findings of these planning elements and the urban forestry consultants revised these based on feedback to provide a comprehensive analysis that informs the baseline assessment and recommendations for the Urban Forest Management Plan.

Figure 1. Framework of the Urban Forest Management Plan



PRIMARY 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**

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 can be 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, incremental steps to achieve these improvements were developed that can be applied as the City continues to progress.

The goals of the Urban Forest Management Plan focus on preserving, maintaining, and enhancing the urban forest to ultimately benefit the residents of Renton. The framework for this Plan supports the urban forestry vision:

Renton's urban and community forest will be healthy, diverse, and sustainable, reinforcing the City's strong commitment to community trees. This strong commitment to trees will benefit the well-being of Renton's residents and set an example for other Urban Forestry programs in the region.

Goals

Goals supporting the urban forest vision are provided based on strengths and opportunities identified during the planning process. Each goal is supported by objectives and strategies the City and partners will use to attain the goal.

Objectives

Objectives define the steps to attain the identified goals.

Strategies

Strategies and actions are specific, measurable, attainable, realistic, and time-bound.

Recommendations

As information and findings are detailed in each of the Plan's sections, a discussion of recommendations is included to support the goals, objectives, and strategies.

Evaluation

Using the Urban Forest Audit System and the Implementation Schedule, progress and success can be evaluated and annually reported. The evaluation using the audit provides the information necessary for adaptive management.

INTRODUCTION

A healthy urban forest supports the City of Renton's goals of balancing economic vitality with environmental equity and social well-being by enhancing public green space, increasing city attractiveness and livability, and fostering civic pride. Studies show that trees and other vegetation filter pollutants, increase property values, attract visitors, improve health and promote community unity through events like Arbor Day.

The Renton Urban Forest Management Plan ("Plan") update is the collaborative effort from City departments to create a proactive work plan that guides the City's urban forestry and natural resource management programs. This Plan builds upon existing programs and establishes the focus and direction for the next 10 years.

The state of Renton's urban forest, from the downtown core to new and existing commercial and residential districts, has been reviewed. Interaction between different City departments in recent years was key to developing appropriate strategies to incorporate the varied priorities affected by trees in the urban landscape. Nearly all departments in the City interact with the Urban Forestry Program, benefit from the urban forest, or are impacted in some way.

To ensure the program's vision and mission statements, various issues and opportunities were reviewed— from public safety to current tree regulations— to accurately capture public concerns with trees and vegetation.

The intention of this Plan is to create a road map for the future of the Urban Forestry Program. The previous plan suggested creating an Inter-departmental Team over the course of the 10-year plan. This was never implemented. To realize the maximum benefits afforded by the urban forest and make the community a great place to live, work and play, a more consistent approach is needed.

There is a need for continued work on the forestry ordinance. The Plan proposes a new Tree Planting Initiative (TPI) to be more proactive and equitable about replacing trees that are lost and to preserve and enhance tree canopy cover equitably. Best management practices also point to the need for a Tree Risk Plan (TRP) and ideally an in-house arborist crew.

Although the urban forest provides a broad range of ecosystem services— direct and indirect benefits provided to the City, its citizens, the region, and the planet— we tend to take the benefits for granted because they are not assigned a dollar value. That is changing and many of the benefits are not only tangible but measurable. Local cities, state, and national sources continue to increasingly find great value in urban forests.

Unfortunately, these green assets are often overlooked in the land development process and destroyed for a fraction of their larger economic and ecosystem values. It is critical to bear in mind that long-term management of these natural assets brings a higher return than their elimination or the upfront maintenance costs. The fact is that trees— "green infrastructure"— increase in value over time, unlike gray infrastructure like roads, poles, pipes, and sidewalks. Figure 2 below begins to highlight the benefits of trees in communities, emphasizing the role they play in maintaining community health, well-being, safety, environments, and local economies.

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, energy savings, and air quality. Trees are one of the few infrastructure investments that grow in value over time.

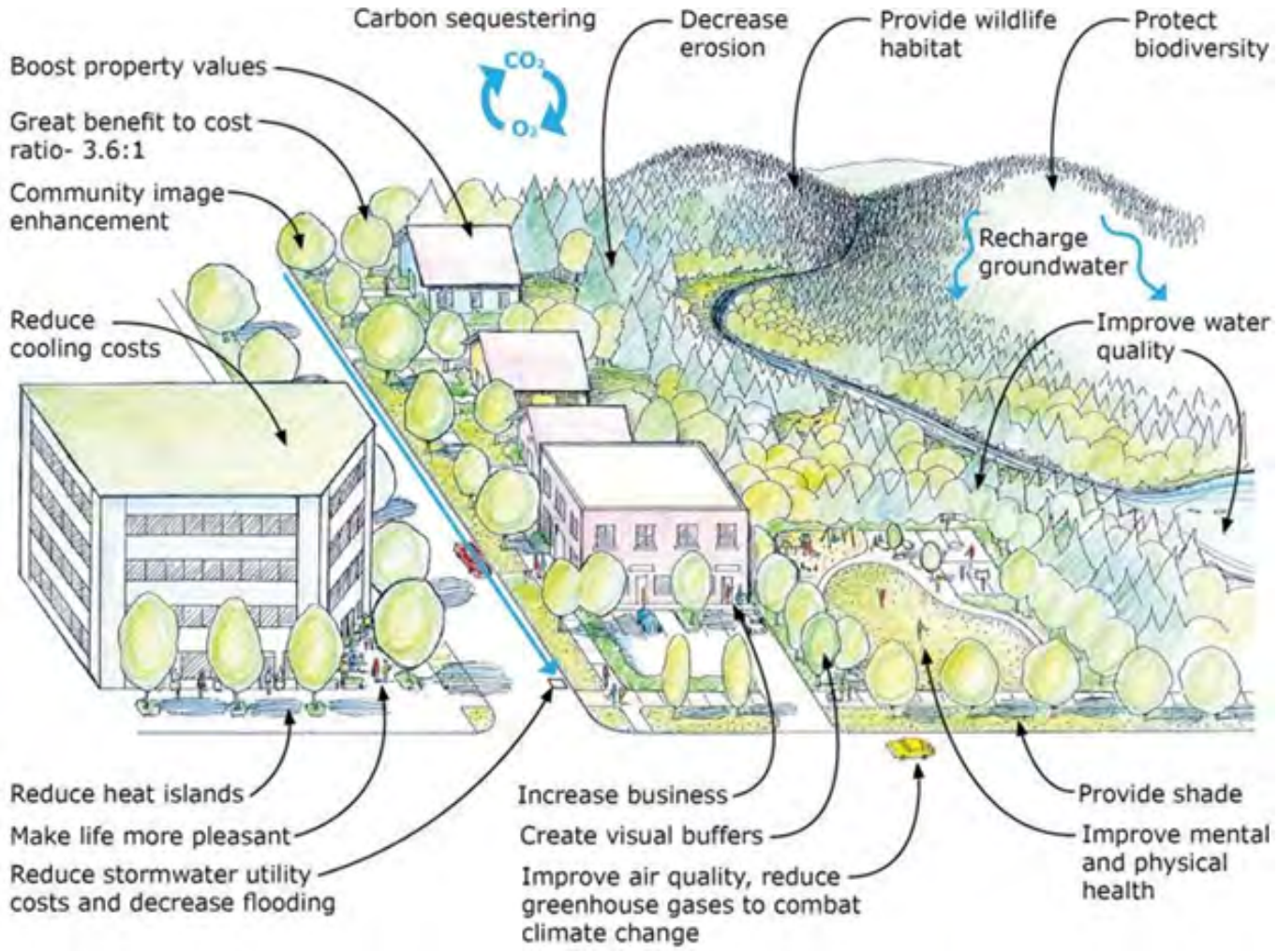


Figure 2. Overview of the ecosystem benefits and services provided by trees in communities (Source: City of Renton)

Tree canopy is a valuable component of Renton's urban ecosystem. Trees in urban settings are important to improving urban life, as well as human physical and emotional well-being. Research suggests that human beings have an innate affiliation to natural settings, a concept described as biophilia (Kellert and Wilson 1993). Studies link access to living trees, outdoor air, and natural light to increased employee and student productivity, faster hospital recoveries, less crime, and an overall reduction in stress and anxiety. Thus, expanding the urban forest is part of the solution to Renton'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, mitigating water shortages, and conserving energy. The following data was derived from Alliance for Community Trees.[1]

1. Alliance for Community Trees. 2011. Benefits of trees and urban forests: A research list. www.actrees.org

REDUCE STRESS AND IMPROVE THE QUALITY OF LIFE

Neighborhoods with generous canopies of trees are 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% 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% less likely to be overweight than residents living in the least green settings.

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% 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% on hotday 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% shade cover on a street improves pavement condition by 11%, which is a 60% 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%. 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. A study by Donovan & Butry in 2008 shows trees increase value to the home they reside but also contribute to increased property values of adjacent homes and properties. As an additional benefit, increased property values resulting from trees lead to quicker home sales (Wolf 2007).

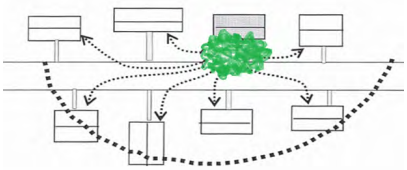


Figure 3. The street tree pictured adds $7,593 to the price of the house it fronts and $7,098 to the seven houses within 100 feet, giving a total value of $14,691. The dotted line represents the tree's 100-ft radius sphere of influence. (Donovan & Butry, 2008)

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 stormwater runoff up to 7%. 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 of 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% fewer acts of domestic aggression and violence. Apartment buildings with high levels of greenery had 52% fewer crimes than those without any trees. Buildings with medium amounts of greenery had 42% 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% 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% of noise.

A comprehensive analysis of the ecosystem services and benefits provided by the trees inventoried in 2020 are provided in the Value and Benefits of the Public Tree Population section.

HISTORICAL BACKGROUND

FIRST WAS THE FOREST.

The Duwamish were the first people known to inhabit the present-day location of the City of Renton. At that time, dense stands of old-growth trees, including Douglas fir, western red cedar, and western hemlock, blanketed the hills above fertile river valleys. The land was abundant with natural resources. Trees were harvested in limited quantities to build longhouses and large dugout canoes.

LUMBER AND COAL HARVESTING.

Renton's first white settler, Henry Tobin, came to this area in 1853 with business interests in lumber. After his neighbor discovered coal the following year, Tobin, Dr. R.H. Bigelow, and two other early settlers formed the Duwamish Coal Company and built a sawmill at the junction of the Cedar and Black Rivers. Timber from the mill was used to shore up coal-mine tunnels. The mill burned during the Indian War of 1855, temporarily halting mining operations. More white settlers arrived in the 1860s and began clearing trees, often by burning, to open land for farming and dairy. New coal seams were discovered in outlying areas and Renton's rivers provided important shipping connections from Lake Washington to Seattle and beyond. The small settlement near the lake became an important stopover for lodging, food, and supplies. Significant coal discoveries in Renton in the 1870s changed the farming community into a rugged mining town. Active logging operations resumed with the opening of the Parker sawmill. The timber was again used to support mine shafts, but also to construct homes and businesses.

THE CITY OF RENTON IS BORN.

Erasmus Smithers filed the first square-mile plat of the town of Renton in 1875. The town was named in honor of Captain William Renton, the most successful lumber merchant of the time who heavily financed Renton's early coal industry. The City of Renton incorporated in 1901 with a population of approximately 1,300.

Additional transportation improvements and industrial establishments spurred growth throughout the 20th century. The most dramatic growth period occurred with the influx of wartime industry workers at Boeing and PACCAR between 1940 and 1950, when the population rose from 4,500 to over 16,000. Forest clearing continued to make way for the airport, industrial areas, commercial centers, and housing.

URBAN FORESTRY'S EARLY BEGINNINGS IN RENTON.

Early urban forestry in Renton included tree planting funded by various federal grants and maintained by the Public Works Department. No formal maintenance program was in place during the years prior to 1980. Trees were managed and maintained on a reactive, emergency basis. During the early 1980s a Street Tree Committee was formed to address many urban tree issues. They offered recommendations to City Council and developed regulations for planting and maintaining trees. Mature trees in the downtown business district growing in small sidewalk cut-outs resulted in damage to the sidewalks. A street tree ordinance was drafted but never adopted.

In 1982, Renton's Parks Department took over responsibility for trees in the downtown area from Public Works. The Parks Department spearheaded and established a routine vegetation management program that included improved standards for evaluations, street tree pruning, removals, and replacements.

In the 1980s and 1990s, tree maintenance reverted to the improper practice of rounding-over trees (a form of topping) to keep large-maturing sizes in scale with buildings and overhangs. Tree removal and sidewalk replacement was an expensive result of trees that became too large in limited planting spaces. Unregulated tree planting in neighborhoods was customary. Residential streets, planted mainly with ornamental cherry and purple leaf plum trees, were eventually topped by residents. Public Works struggled with the resulting "bushy" trees. Street sweeping proved difficult and both vehicles and trees were needlessly damaged. Public safety was also being compromised by trees blocking streetlights. The conflict between nature and civilization was apparent. Nearly every City department and many residents were affected by a lack of proper tree planning and design during this period and struggled to find an effective solution to public safety issues.

In the 1990s, the City's aggressive program of acquiring additional natural areas provided important watershed and wildlife habitat. However, development pressures resulted in encroachments, unauthorized use, and trash disposal by both private residents and developers within natural areas. Besides topping in such areas, whole tree removal was occurring without City authorization. Natural area lands were being partially occupied by a few residents, mostly because they were not aware of property line locations. Discarded yard waste and house plants contributed to the establishment of invasive plants such as ivy.

URBAN FORESTRY AWAKENING DURING THE 1990s.

In 1992, a tree ordinance was again proposed but was never brought to City Council for adoption and never resurrected again. The problems that had been occurring with trees in the built environment, the lack of good design standards and unregulated maintenance continued unabated.

Protecting the public has been a paramount concern of City departments despite some of the controversy that has ensued. It often takes an incident to occur before a hazard is recognized. In 1997, 65 mature bigleaf maples along Maple Valley Highway were removed by the City after several tree limbs fell, temporarily closing the highway and the Maplewood Golf Course main entrance.

After careful assessment of their condition, it was determined that the maples posed a significant risk to public safety. While there was public outcry at their removal, many local residents praised the City for being proactive.

In 1998, a Beautification Program was adopted by City Council. City leaders recognized that trees were an important and integral part of the community consistent with City goals. The plan included urban forestry components such as a tree ordinance (not completed), public education and awareness, a tree inventory, a tree management policy, an adopt-a-park program, marketing plan, and a method for measuring performance.

THE 21ST CENTURY.

By 2000, the City of Renton's population grew to 50,052 and to over 80,000 in 2009. Through a series of annexations, Renton's boundaries have expanded to 22.3 square-miles. Rapid development has replaced the old growth forests of the past. Subsequently, an awareness of the pace of development, loss of City trees, salmon recovery, and better water quality both locally and regionally have driven an interest in urban forest conservation, enhancement, and programming. Tree maintenance continued to be shared by Public Works and the Community Services Departments. Public Works regularly maintained trees in neighborhoods where branches interfered with sweeper trucks during the winter.

Otherwise, most of the street trees were maintained by Public Works crews on a reactive basis following calls or complaints. Community Services crews provided more frequent maintenance of trees in the downtown core, collaborating with Public Works on tree and sidewalk conflicts and tree plantings in sidewalk openings. Storm damage to trees was coordinated citywide by the Public Works Department with Community Services providing support. Tree maintenance service contracts issued by the Community Services Department required tree work performed by International Society of Arboriculture (ISA) Certified Arborists to assure proper maintenance to City trees. The Beautification Program continued to move forward and in 2002 Renton's first City Forester was hired under the title, Parks Maintenance Manager, and worked in the Community Services Department.

2002 TO 2009.

Staff training in arboriculture and introduction to proper tree and vegetation management to Community Services and Public Works staff. Elimination of all rounding-over (topping) of public trees.

- Cooperative partnerships with Puget Sound Energy (PSE) to reduce tree and electric wire conflicts. On Park Avenue, ash trees were removed by PSE and PSE donated "wire- friendly" trees.
- In 2003, the City's began inventorying its public trees.
- Eliminated planting large maturing trees in small sidewalk cut-out sections. Utilizing larger 4 x 8 foot cut-out sections and planting smaller-maturing trees.
- Completed a city-wide tree inventory and assessment for street trees, park trees and trees in natural areas. Street trees and park trees were located using global positioning satellite (GPS) coordinates and integrated into the City's graphic information system (GIS).
- Budgeting in the Capital Improvement Program for Forestry Program Development and Tree Maintenance.
- Adopted Tree Retention [Protection] Regulations for new development.
- Renton's first certified arborist trained in 2006 under the ISA certification program.
- Added tree-related policies to the City's Comprehensive Plan that regulated street trees along new or reconstructed streets and the landscape of new property developments.
- City staff from multiple departments met to form the Urban and Community Forest Task Force, hired consultants and initiated the process for preparation of the Renton Urban and Community Forestry Development Plan.
- Presentations to elected officials and organizations of the Renton Urban and Community Forestry Development Plan.

RECOGNITION.

In 2008, for the first time, the City of Renton achieved Tree City USA status for efforts in urban forestry programming. This award is given annually by the National Arbor Day Foundation in cooperation with the National Association of State Foresters and the USDA Forest Service. Renton can now place Tree City USA signs at community entrances to show visitors that Renton cares about its environment and is dedicated to preserving a quality lifestyle. The annual Tree City USA award presentation and Arbor Day celebration offer excellent publicity opportunities—reaching large numbers of people with information about tree care and conservation. Becoming a Tree City USA, Renton now qualifies to receive awards of state and federal agency grants.

In 2009, the Maplewood Golf Course became Washington's second municipal golf course to be designated a "Certified Audubon Cooperative Sanctuary" by Audubon International.

2009 TO PRESENT.

- The City completed its first ever high-resolution urban tree canopy assessment in 2011 finding 28.6% of the City is covered by the canopy of trees when viewed from above.
- In 2018, the City updated its tree canopy assessment finding the urban forest covers 29.3% of Renton— up 0.7% in six years (2011 and 2017 imagery used).
- The Urban Forest Inventory and Resource Analysis Summary Report was completed in 2021.
- This document updates the 10-year urban forest management plan through 2032.
- Renton has been a Tree City USA recipient for 14 years, including 11 Growth Awards in the process.

ROOTED IN RENTON

CURRENT STATE OF RENTON'S URBAN FOREST

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, reducing stormwater runoff, and building resiliency against pests, diseases, climate change, and storm events are challenges facing the City of Renton. Rapid growth in Renton, with a population of over 107 thousand people, is accelerating these problems. The problems need solutions as the City tries to protect and restore environmental quality while enhancing economic opportunity.

Renton is a vibrant city that will continue to grow. As it grows, it should also continue to invest in its tree canopy. This is no easy task, given financial constraints and trends toward higher density development that may put space for trees at a premium. The challenge ahead is to better integrate the green infrastructure with the gray infrastructure by increasing tree planting, providing adequate space for trees, and designing plantings to maximize net benefits over the long term, thereby perpetuating a resource that is both functional and sustainable.

To make informed decisions about its tree canopy and the strategies to preserve and enhance it, analyses of the urban forest were completed as part of the planning process. These analyses look at the various types of landscapes that comprise the urban forest along with the ownership type and the maintenance responsibility. These various landscapes are depicted in Figure 4 on the following page.

The most extensive data on the Citywide urban forest was gathered from two urban tree canopy assessments in 2011 and 2018. The Citywide urban forest is measured with these high-resolution urban tree canopy (UTC) assessments using various imagery and GIS processes. The primary goal of this type of assessment is to identify a baseline and benchmark of the City's tree canopy and analyze the land cover class across a range of geographic boundaries. This analysis identifies areas for tree canopy preservation as well as the opportunities for new urban tree canopy cover.

A bottom-up assessment of Renton's urban forest was also completed using the City's updated public tree inventory database. This dataset focuses on the trees that are the City's responsibility to maintain and are located along streetscapes within the public right-of-way, in public parks, and on public properties. Based on these datasets, Renton has a total of 27,456 public trees along streets, in parks, and in the Maplewood Golf Course, and a total of 89,528 trees in natural areas.

Figure 4. Depiction of the various types of landscapes that comprise Renton's urban forest

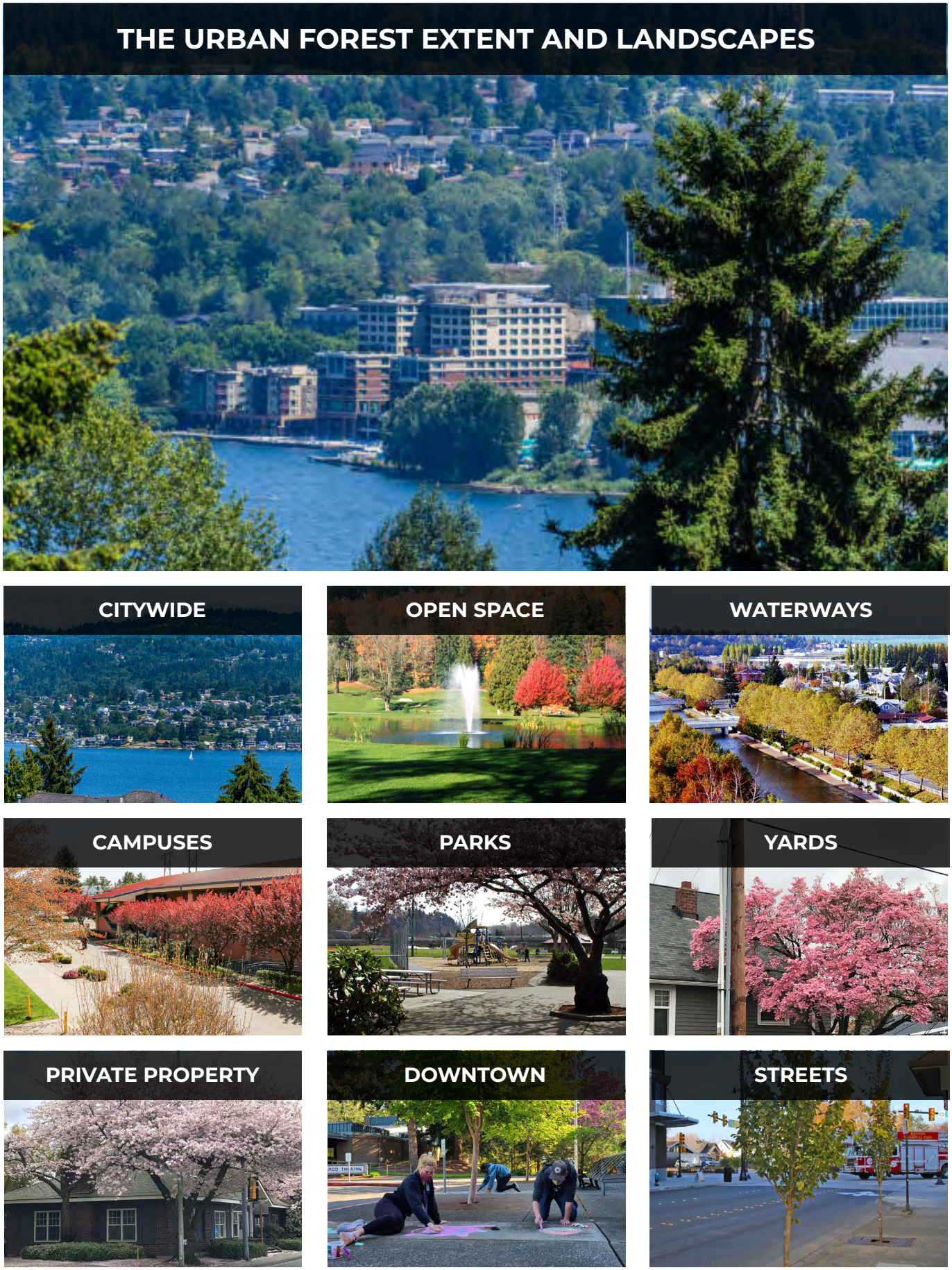


Figure 5. Maintenance responsibility of trees comprising Renton's urban forest

URBAN TREE CANOPY COVER

The analysis of Renton's urban forest begins at the largest scale, the urban tree canopy cover. Renton's 2018 Urban Tree Canopy Assessment utilized 2017 high-resolution imagery to evaluate the extent of and opportunities for tree canopy cover. Currently, 29.3% of the City's land area is covered by the canopy of trees across public and private boundaries. Another way to look at the extent of this resource— of the 14,935 total land acres in Renton, 4,382 acres are covered by tree canopy— equivalent to the area of over 3,300 NFL-sized football fields.

The assessment also identified areas for potential new tree canopy—tree planting—and a total of 20% (3,030 acres) of Renton's land area is either grass, low-lying shrubs, or impervious surfaces.

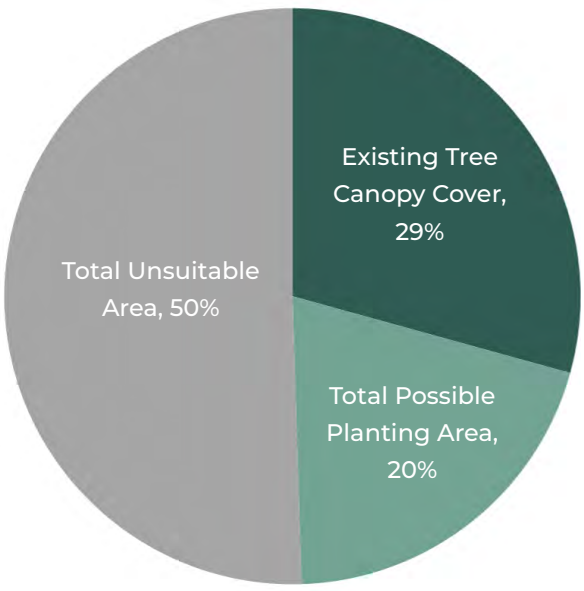


Figure 6. Renton's 2018 Tree Canopy Assessment results

Tree Canopy and Vegetative Area for Possible Tree Plantings (2018)

Figure 7. Map displaying Renton's tree canopy and vegetative area for possible tree plantings (2018)

The tree canopy assessment was further analyzed to identify areas with more or less tree cover and areas where there are potential opportunities for more canopy to exist. The charts below summarize these metrics by Community Planning Areas and Zoning Type followed by analyses of canopy cover change from 2010 to 2017.

Existing Tree Canopy Cover (%) by Community Planning Area

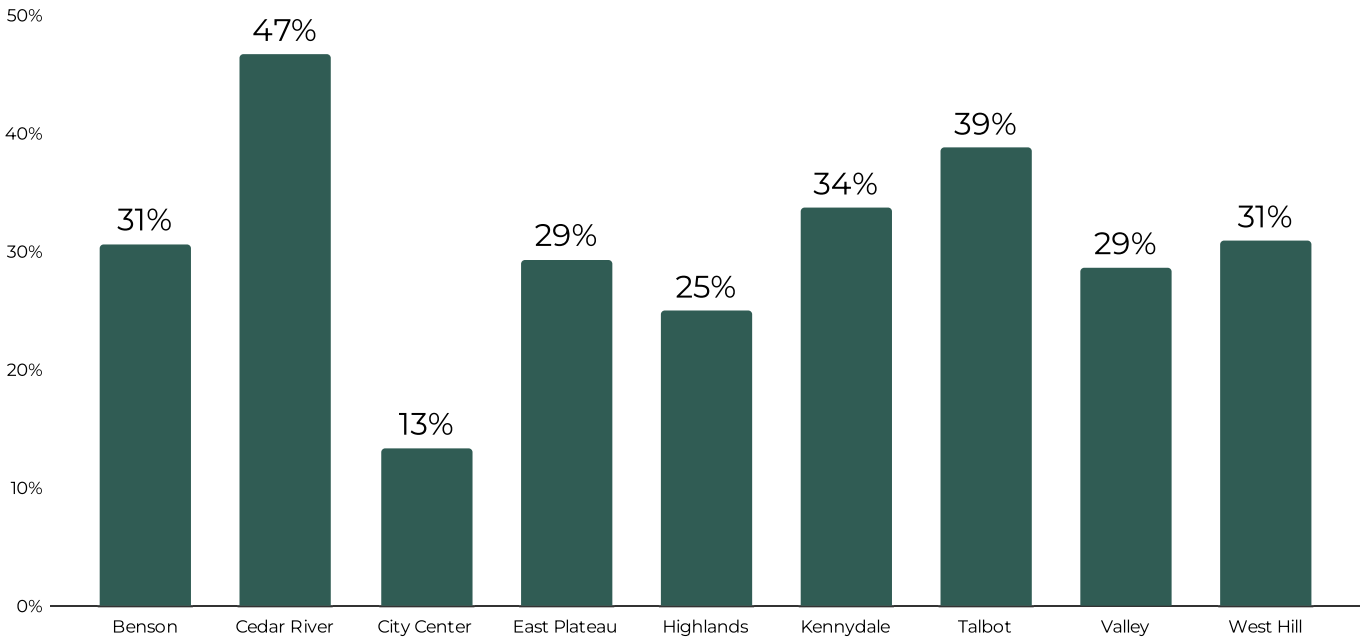


Figure 8. Existing tree canopy cover by Community Planning Area

Existing Tree Canopy Cover (%) by Zoning Type

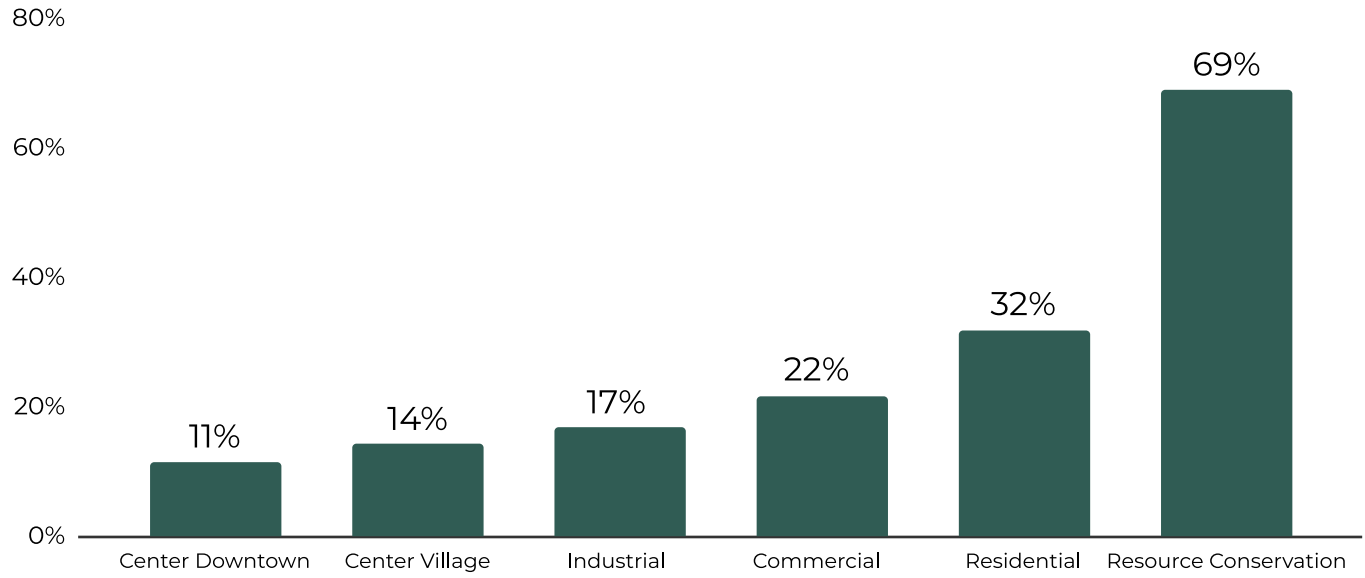


Figure 9. Existing tree canopy cover by Zoning Type (consolidated classifications)

URBAN TREE CANOPY COVER CHANGE

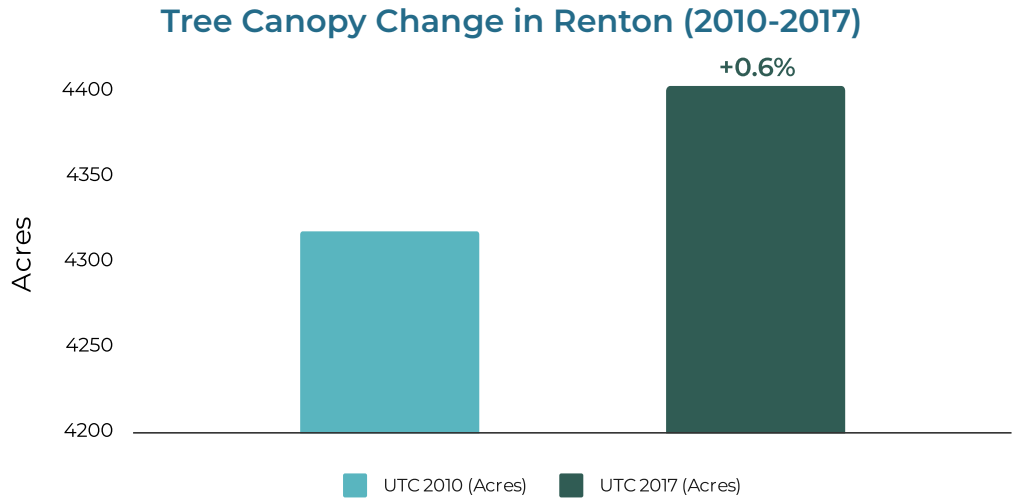


Figure 10. Citywide tree canopy cover change

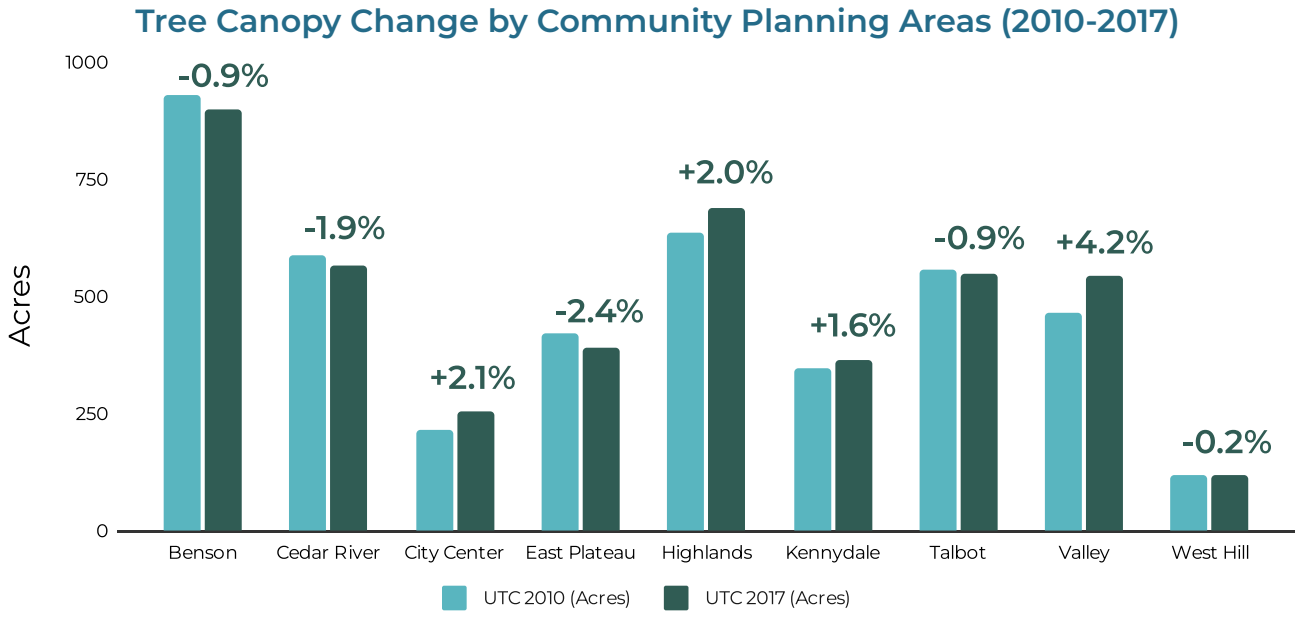


Figure 11. Tree canopy cover change by Community Planning Area

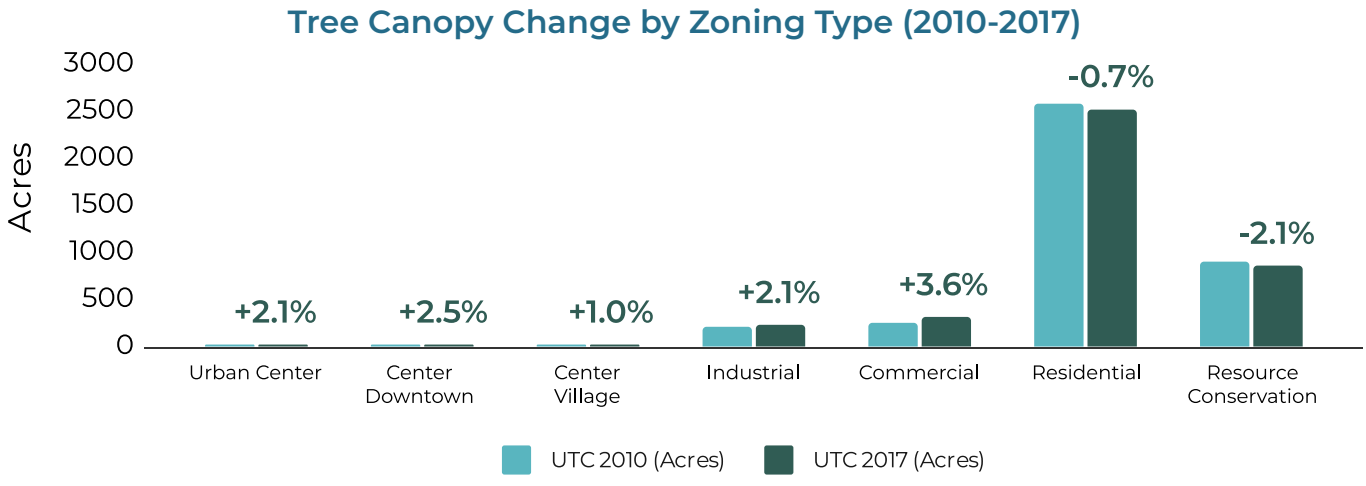


Figure 12. Tree canopy cover change by Zoning Type (consolidated classifications)

Results

The Citywide tree canopy cover based on 2017 imagery is 29.3% meaning of the 14,935 total land acres in Renton, there are 4,382 acres covered by tree canopy when viewed from above. The 2018 assessment also identified possible planting areas, those areas that are grass and low-lying shrubs and impervious areas such as parking lots that could theoretically be spaces for new trees. The combination of these possible planting areas is referred to as Total Possible Planting Area or Total PPA. Citywide, the Total PPA is comprised of 18% (2,714 acres) vegetative planting area and 2% (316 acres) impervious planting area.

At a finer scale, tree canopy cover across Community Planning Areas varies between 13% in City Center to 47% in Cedar River. Across Zoning Types, the tree canopy varies but resembles a similar distribution among the types of zoning classes found in other community studies. For example, the Resource Conservation Zoning Type has the highest amount of tree canopy cover compared to its total land area with 69%. The Residential Zoning Type canopy cover is less than half the amount of Resource Conservation but is the second highest of the Zoning Types with 32% tree canopy cover. It should be noted that while Residential has the second highest percentage of tree canopy, it holds the highest amount of actual canopy cover acres with 2,510 acres of canopy whereas Resource Conservation has 863 acres of canopy cover.

When comparing canopy cover from the two assessments (2011 assessment using 2010 imagery and 2018 assessment using 2017 imagery), it was found that the canopy cover Citywide has increased by 0.6% in the seven-year timespan. This change from 28.7% in 2010 to 29.3% in 2017 was further analyzed by Community Planning Area, Zoning Type, and all other geographies included in the study. Across the Community Planning Areas, the greatest amount of canopy loss between the two time periods was experienced in East Plateau (2.4% decrease) and the highest amount of canopy gain was observed in Valley (4.2% increase). Between 2010 and 2017, City Center experienced a 2.1% growth in canopy. Observing canopy cover change across Zoning Types, the greatest loss of canopy was observed in the Resource Conservation Zoning Type (2.1% decrease) and the greatest increase in canopy was found in the Commercial Zoning Type (3.6% increase).

Discussion/Recommendations

To inform localized urban forest management, the tree canopy metrics were summarized by various planning boundaries including Land Use, Zoning Type, Community Planning Areas, Watersheds, Census Block Groups, and Catchments. With finer scale analyses of the existing tree canopy and possible planting area compared to historical cover amounts (2010) in Community Planning Areas and Zoning Types, urban forest management strategies can be developed to support the Plan's vision. For example, the Commercial Zoning Type experienced a 3.6% increase in tree canopy cover, likely due to planning and development requirements and the City's tree ordinance requiring tree preservation and planting. Also, the overall canopy cover increase is largely attributable to the annexation of the Benson planning area.

Further analyses of existing canopy cover, possible planting space, tree equity (in the following section), and factors influencing changes were conducted to inform the canopy cover goals presented in the Tree Planting Initiative and Tree Canopy Cover Goals sections.

Comprehensive reports were prepared for the 2011 and 2018 tree canopy assessments where additional details regarding canopy cover, possible planting space, canopy cover change, and ecosystem benefits are provided.

URBAN TREE EQUITY

Figure 13. Example of canopy cover differences in two Renton neighborhoods

The surface temperatures during a heat wave can vary dramatically by city and by neighborhood. A big reason for the difference across city neighborhoods is shade and the canopy of trees that line some sidewalks but not others. Through analyses and local assessments, it is observed that a city's wealthier areas zoned for single-family homes typically attract more city services, like wide sidewalks and trees. As time progresses, that disparity becomes more than a matter of aesthetics. Research shows shade and water evaporation from trees can lower surrounding air temperatures by six degrees or more. While it is well known that shade from a tree can help keep the ground temperatures cooler, as climate change continues to affect the region, the stakes are likely to get higher. In certain cases that shade could be the difference between life and death, especially for the sick, elderly, and disabled people. Studies show that just an extra degree during a heat wave increase mortality 2-3 percent (Dr. Feinstein, Sustainability and Resilience Policy Director, SPUR, 2021).

Many areas lack adequate tree canopy perhaps due to a series of consecutive policies championed by local authorities, codification through federal actions, and decisions to disinvest in neighborhoods where people of color resided as regions grew rapidly in population and infrastructure. A pattern was created that is replete in the urban studies literature (J. Wolch et al 2005).

Other possible factors may include the competition for limited physical space, and the increasing dominance of private real estate in driving development processes and occupying areas with pavement that might otherwise contain green space.

Specifically in Renton, trees are generally sparse in socioeconomically disadvantaged areas and more prominent in wealthier neighborhoods. The tree canopy and associated benefits of the urban forest are not equally shared and experienced by all communities. Whatever the cause for canopy disparity, the purpose of this tree equity study is to state the baseline conditions, identify priorities, and establish goals for increasing tree canopy cover equitably while overcoming and contending with urban planning and development, the effects of climate change, exotic tree pests and diseases, limited resources, and other factors.

Focused on addressing this canopy cover 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, Renton'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 2022 Urban Forest Management Plan, and track progress toward achieving tree equity. A score of 100 represents tree equity.

Tree Equity Scores by Census Block Groups (TreeEquityScore.org)

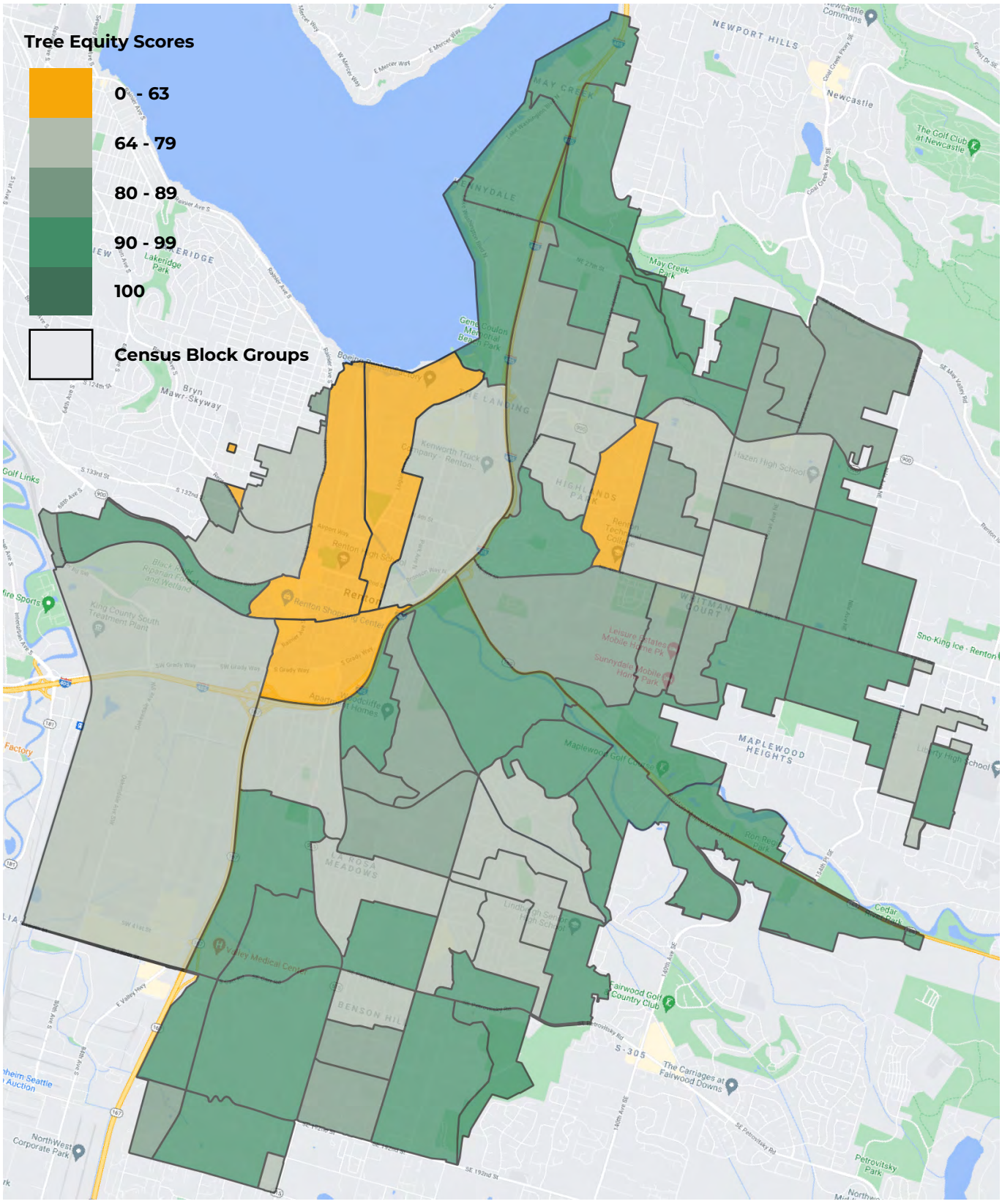


Figure 14. Map displaying the Tree Equity Scores by Census Block Groups in Renton, WA (TreeEquityScore.org)

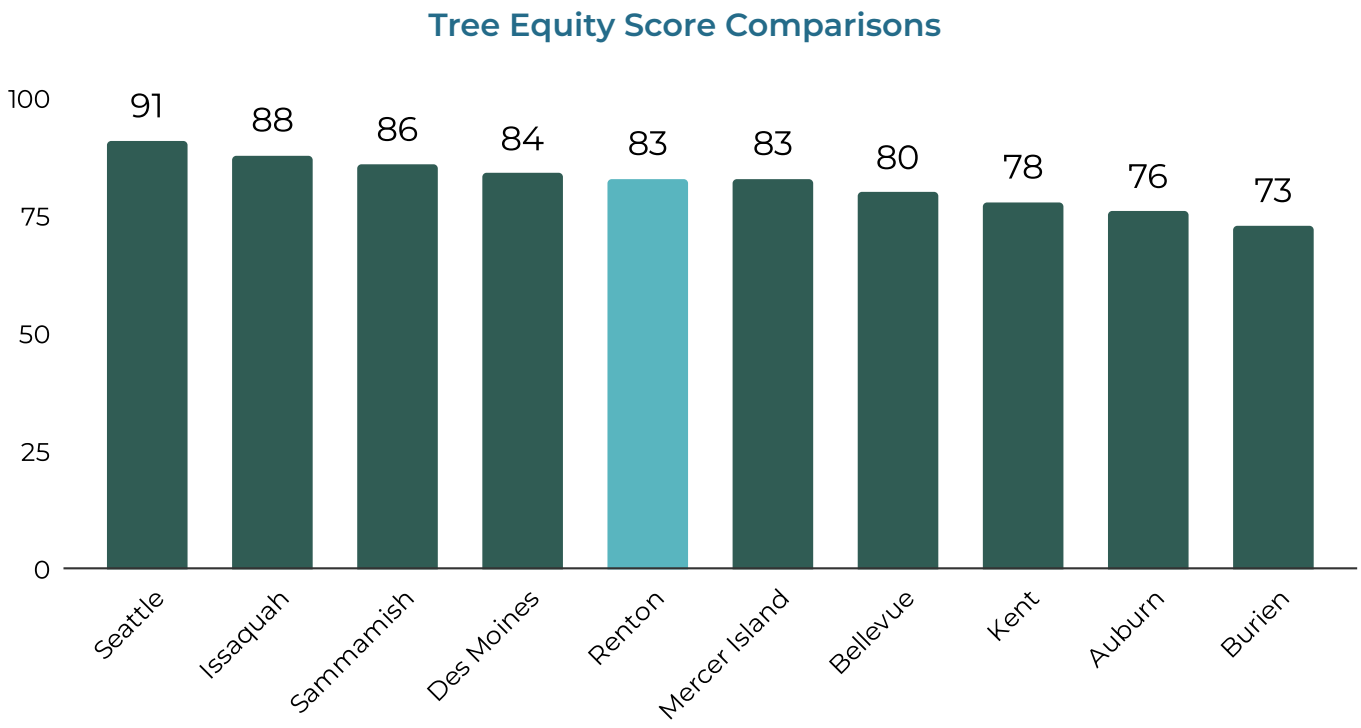


Figure 15. Comparison of Tree Equity Scores for cities near Renton, WA

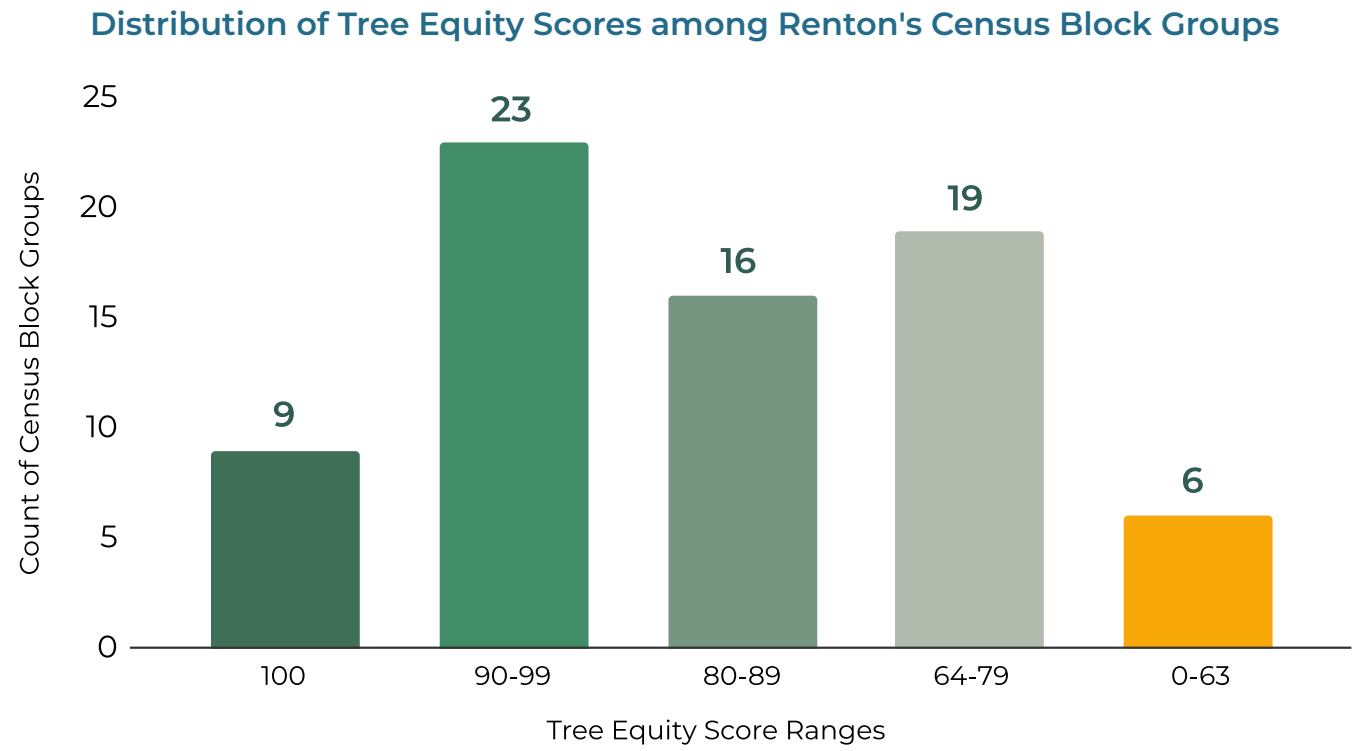


Figure 16. Count of Census Block Groups for each Tree Equity Score range

Results

Based on the criteria evaluated for each Census Block Group in Renton, the Citywide Tree Equity Score is currently at a score of 83 out of 100. This score is based on a combination of metrics for 73 Census Block Groups (CBG) comprising the City (refer to Figure 14). Compared to nine other cities in the region, Renton's TES is slightly above the average of 81 but ranks fifth out of the ten total cities used in the study. As shown in the previous figure (Figure 16), only nine of the CBGs are attaining complete tree equity with a score of 100 and six CBGs have a TES less than 63. The majority (23 or 31%) of CBGs have a TES between 90 and 99.

Discussion/Recommendations

In the past few years, regional partners are increasingly acknowledging and confronting the past practices, current perceptions, and accelerating progress to ensure that communities, landscapes, and policies are more intentional about enhancing historically disinvested areas. Ambitious goals to increase tree canopy in areas of greatest need are drafted for the City's review and adoption. These goals will grow a more equitable urban forest that provides cooling, public health, habitat, energy saving, and other benefits. In addition, the City should commit to plant and maintain trees, update and align policies and procedures to grow and protect public and private trees, and engage the citizens of Renton to become advocates and stewards of the City's urban forest.

Although the City will oversee and monitor these canopy goals, the effort will inevitably require extensive support from all City departments, community-based organizations, and others aiming to prepare for a changing climate. As a first step, this Plan provides guidance to prioritize resilient, climate-appropriate trees, preserve and conserve mature trees, and properly manage resources to ensure that trees thrive in the urban environment. The cooperation of the City, partners, organizations, property owners, and others is instrumental to meeting these goals, and the Tree Planting Initiative and Tree Canopy Cover Goals sections provide the approach to formally establish a tree canopy goal that will guide this shared commitment.

A shared commitment to tree canopy cover and equity goals will lessen the tensions that exist between gray and green infrastructure in Renton. The opportunities and challenges for advancing an equity-centered approach to expanding tree canopy are innumerable, though the adoption and implementation of tree canopy goals is an immediate opportunity to advance such approaches.

An urban tree canopy goal that addresses equity will need to demonstrate its value to enable community members to do more than they ultimately would have been able to accomplish without it. Disinvested communities in the region want more equitable policies, living-wage jobs, higher household incomes, safer neighborhoods, affordable housing, a more usable and connected urban network, pedestrian infrastructure, more frequent transit service, better funding for schools, and specific initiatives to engage youth and families, among other things.

Showing the value of an equity-based tree program and canopy goal that helps to advance these well-known needs will create an immediate and Citywide constituency for making Renton more sustainable through actions at the neighborhood level. The Citywide and local-level canopy goals aim to address these concerns and opportunities.

Structure of the Public Tree Population

For an understanding of the urban forest that is directly managed by the City, analyses of public tree inventory datasets were completed. Tree composition data is essential since the types of trees present in a community greatly affect the amount of benefits produced, tree maintenance activities, budgets, planting goals, canopy connectivity, and the City's ability to respond to threats from invasive pests and diseases.

Table 1. Distributing of public trees by Site Design

Site Design	Count	%
Street	11,309	39%
Park	8,008	27%
Unimproved Right-of-Way	6,068	21%
Natural Area	2,134	7%
Parking Lot	826	3%
City Building	817	3%
Not Available	127	0%
TOTAL	**29,289**	**100%**

Results

The public tree population is comprised of street and park trees. Of the total 29,289 public trees with Site Design values, there are 11,309 street trees, over 6,000 trees in unimproved right-of-way, more than 8,000 park trees in maintained areas, 2,134 trees in natural areas, and 817 trees on City properties. The inventory database does not include the 89,528 total natural area trees or trees in unmaintained areas of public parks.

Discussion/Recommendations

The extent and distribution of public trees across the City impacts the structure of the maintenance program and the demand for services. To manage the urban forest for health and public safety, it is recommended street trees be pruned on a 7-year cycle meaning each street tree is pruned within a 7-year timeframe to address clearance issues, structural defects, diseased/decayed/damaged/dying limbs, and other routine maintenance. Currently, the City primarily contracts pruning and removals with approximately 350 trees pruned by contractors and 400 trees pruned by the Urban Forester, Inspecting Arborist, or Parks & Trails crews. Approximately 300 trees are removed annually. With 750 trees pruned each year, the City is on a pruning rotation of approximately 37 years for all 27,456 public trees (street, park, golf course trees) or 15 years for only the street tree population.

Table 2. Public tree genera diversity (top 10)

Genus	Count	%
Acer	8,010	27%
Pseudotsuga	3,133	11%
Populus	2,932	10%
Alnus	2,203	8%
Thuja	2,004	7%
Prunus	1,775	6%
Pyrus	988	3%
Salix	953	3%
Fraxinus	847	3%
Pinus	809	3%
Other species	5,642	19%
TOTAL	**29,289**	**100%**

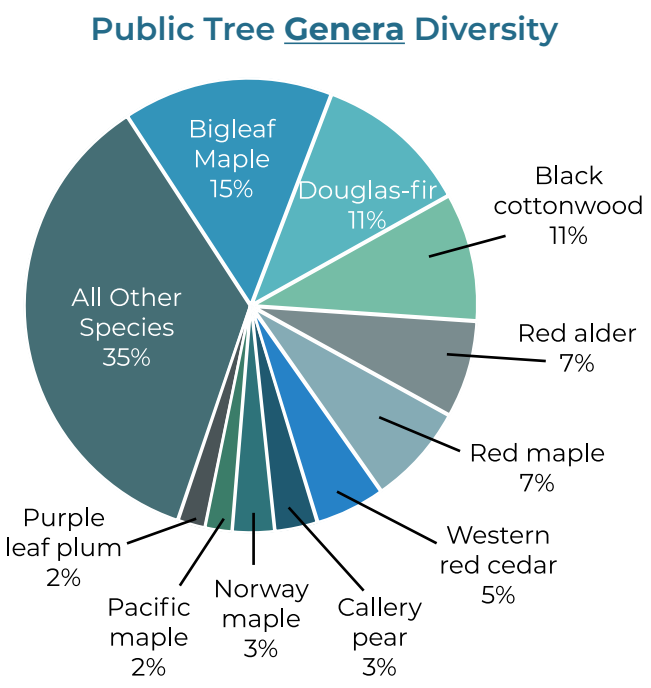


Figure 17. Public tree genera diversity

Acer → maples

Pseudotsuga → Douglas-firs

Populus → cottonwoods

Alnus → alders

Thuja → red cedars

Prunus → plums, cherries, peaches, others

Pyrus → pears

Salix → willows

Fraxinus → ash trees

Pinus → pines

The following provides a summary of the top ten species identified during the 2021 tree inventory data analysis. Note the values differ slightly from the 2021 Urban Forest Inventory and Resource Analysis Summary Report due to everchanging conditions and routine maintenance.

Table 3. Public tree species diversity (top 10)

Common Name	Count	%
Bigleaf maple	4,322	15%
Douglas-fir	3,132	11%
Black cottonwood	2,771	9%
Red alder	2,198	8%
Red maple	1,920	7%
Western red cedar	1,529	5%
Callery pear	977	3%
Norway maple	870	3%
Pacific willow	693	2%
Purple leaf plum	650	2%
Other species	10,245	35%
TOTAL	**29,307**	**100%**

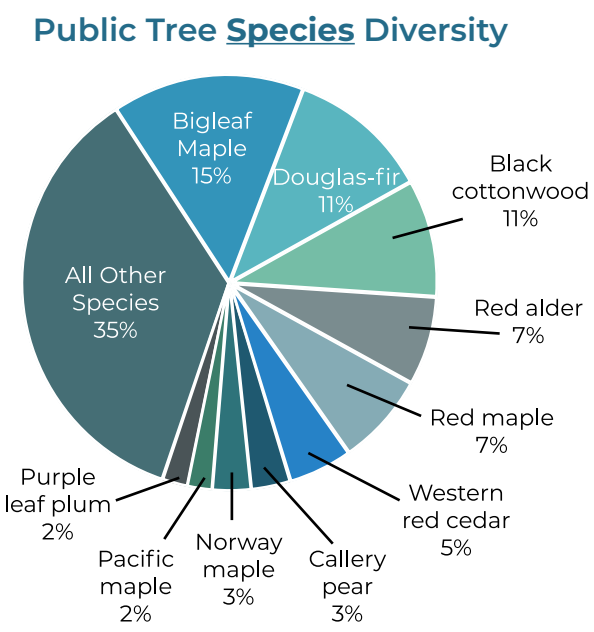
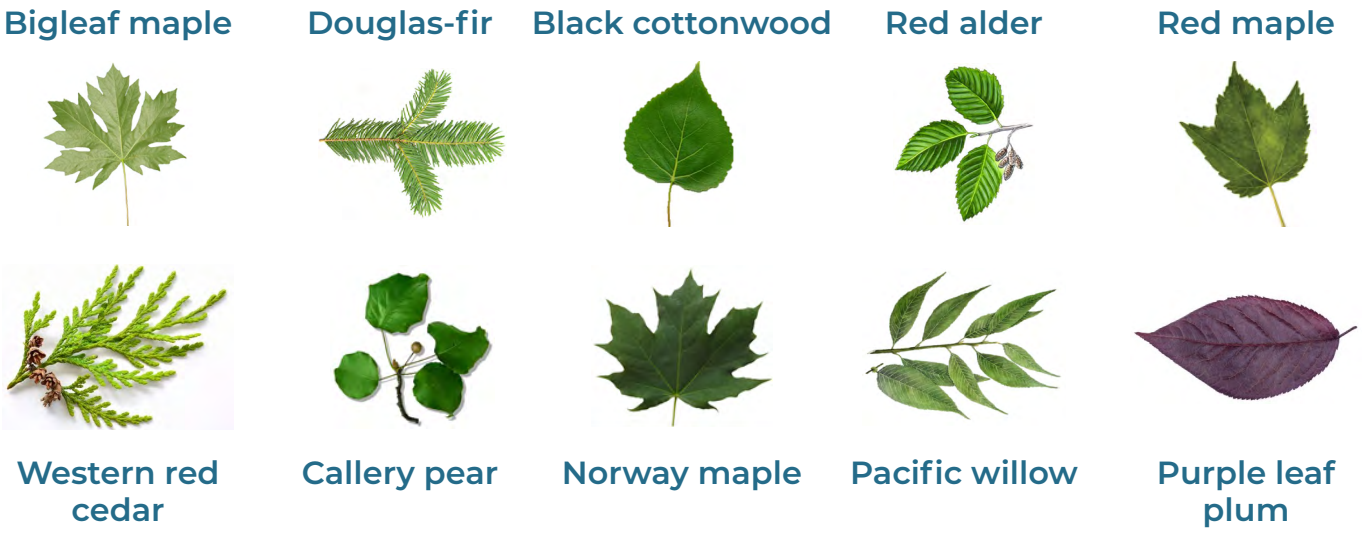


Figure 18. Public tree species diversity

Figure 19. Leaf profiles of the most common public trees (not to scale)



Results

Based on the inventory data there exists a total of 90 unique genera with the top five comprised of *Acer* (27%), *Pseudotsuga* (11%), *Populus* (10%), *Alnus* (8%), and *Thuja* (7%). The top five genera make up 63% (18,282 trees) of the 29,296 total live trees recorded in the 2021 inventory update.

Regarding species diversity, there exists a total of 281 unique tree species. The top ten species comprise 65% of the inventory consisting of bigleaf maple (15%), Douglas-fir (11%), black cottonwood (9%), red alder (8%), red maple (7%), western red cedar (5%), callery pear (3%), Norway maple (3%), pacific willow (2%), and purple leaf plum (2%).

The composition of a tree population should follow the 10-20-30 Rule for species diversity—a single species should represent no more than 10% of the community forest, a single genus no more than 20%, and a single family no more than 30%. Based on this rule, bigleaf maple (*Acer macrophyllum*) and Douglas-fir (*Pseudotsuga menziesii*) exceed the recommended 10% maximum for a single species in a population, comprising a combined 26% of the inventoried tree population. Regarding the genus threshold, maples (*Acer*) exceed the recommended 20% maximum for a single genus in a population, comprising 27% of the inventoried trees.

Discussion/Recommendations

Bigleaf maple dominates the tree population at 15%. After bigleaf maple, Douglas-fir makes up the second highest portion at 11%. For a sustainable and resilient urban forest, Douglas-fir, bigleaf maples, and maples in general, should be limited in new tree installations.

As a result of the large quantity of *Acer* (maple) in the City's population, along with its susceptibility to Asian longhorned beetle (ALB, *Anoplophora glabripennis*), verticillium wilt, and granulate ambrosia beetle (*Xylosandrus crassiusculus*), the planting of *Acer* should be limited to minimize the potential for loss in the event that these pests appear in the City's urban forest. Regarding the second most prominent specices, Douglas-fir faces Rhabdocline needlecast, Swiss needlecast, and twig blight which all affect the condition and performance of the trees if not addressed. Therefore, this species should be limited in new plantings.

Low species diversity (large proportion of the population consisting of trees of the same species) can lead to severe losses in the event of species-specific epidemics such as the devasting results of Dutch elm disease (DED, *Ophiostoma novo-ulmi*) and more recently, emerald ash borer (EAB, *Agrilus planipennis*). Asian longhorned beetle is a major threat to Renton's urban forest, over 25% of the tree population is comprised of trees in the *Acer* (maple)

genus. Tree species diversity is crucial to the resilience of the community forest from these and future unknown threats.

The Tree Planting Initiative section provides the guidance for strategic planning and planting of the urban forest to reduce susceptibility and maintain sustainability.

PUBLIC TREE POPULATION SIZE CLASS DISTRIBUTION (RELATIVE AGE)

The distribution of tree ages influences the structure of the urban forest as well as the present and future costs to the City or property owners. An uneven-age urban forest offers continued flow of benefits and a more uniform workflow allowing managers to more accurately allocate annual maintenance funds. The inventoried trees were categorized into the following diameter size classes: young trees (0-6 inches DBH or diameter at breast height measured at 4.5 feet), established (7-12 inches DBH), maturing (13-18 and 19-24 inches DBH), and mature trees (25-30 and >30 inches). Since tree species have different lifespans and mature at different diameters, heights, and crown spreads, actual tree age cannot be determined from diameter size class alone. However, general classifications of size can be extrapolated into relative age classes.

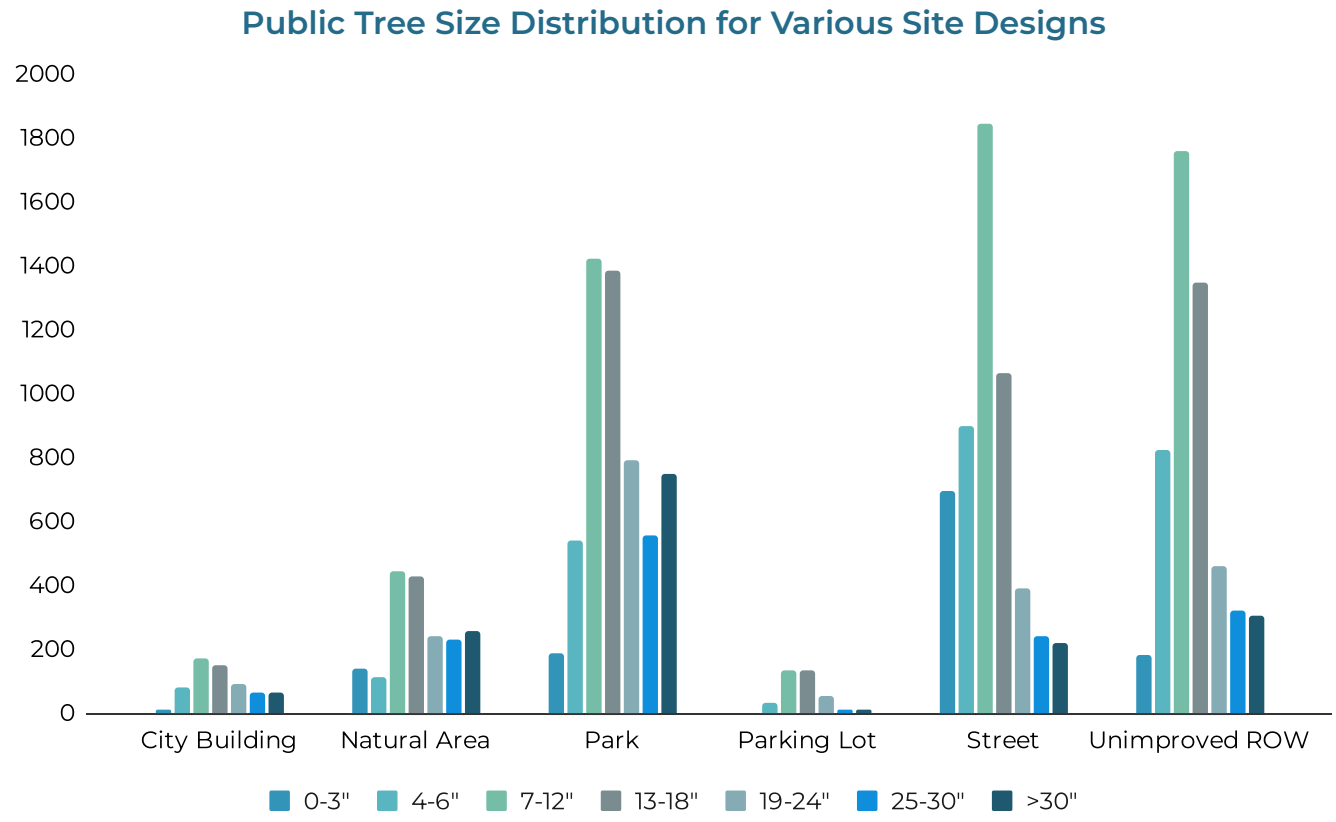


Figure 20. Distribution by Diameter (DBH) class within site design classifications

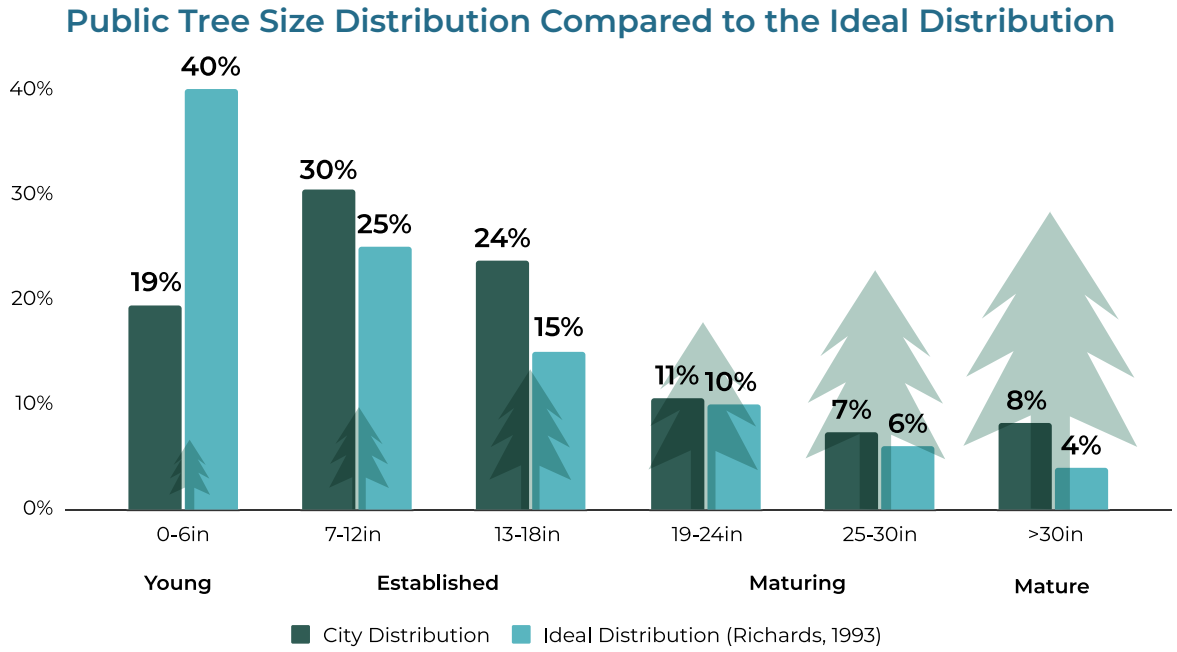


Figure 21. Distribution of public trees by diameter (DBH) class compared to the ideal distribution

Results

The diameter classes were chosen so that the tree population could be analyzed according to Richards' ideal distribution (1983).[2] Based on the analysis, the distribution trends towards less ideal; young trees comprise less than half the recommended distribution with 19% instead of 40%. Renton's distribution of trees in the 7-12-inch and 13-18-inch size classes exceed the ideal distribution but the trees 19 inches or greater in diameter closely resemble the ideal distribution.

Discussion/Recommendations

Richards proposed an ideal diameter size class distribution for street trees based on observations of well-adapted trees. Richards' ideal distribution suggests that the largest fraction of trees (approximately 40% of the population) should be young (less than 8 inches DBH), while a smaller fraction (approximately 10%) should be in the large-diameter size class (greater than 24 inches DBH). A tree population with an ideal distribution would have an abundance of newly planted and young trees, and lower numbers of established, maturing, and mature trees.

In the public tree population, Renton has too few young trees and an overabundance of established trees (7-18 inches in diameter) and a slightly overabundant population of mature trees (>25 inches in diameter) suggesting an overly maturing tree population. A goal for Renton's urban forest should be to have an uneven-aged distribution of trees at the street, park, and Citywide levels. An aging tree population poses a potential increase in maintenance and removal demands and may leave a void in tree canopy and associated benefits if tree planting levels are not elevated. The City is below the threshold for young trees and it will also suffer a loss of ecosystem services that were provided by the mature trees if tree plantings do not increase.

Table 4. Summary of Renton's tree size distribution compared to the ideal distribution

0-6in	**LOW**
7-12in	**HIGH**
13-18in	**HIGH**
19-24in	**IDEAL**
25-30	**IDEAL**
>30in	**HIGH**

It is recommended that Renton support a strong planting and maintenance program to ensure that young, healthy trees are in place to fill in gaps in tree canopy and replace older declining trees. The City must promote tree preservation and proactive tree care to ensure the long-term survival of older trees. Additionally, tree planting and tree care will allow the distribution to normalize over time.

2. Richards, N. A. 1983. "Diversity and Stability in a Street Tree Population." Urban Ecology 7(2):159–171.

The distribution of individual tree ages within a tree population influences present and future costs as well as the flow of benefits. An ideal age/size distribution in the tree population allows managers to allocate annual maintenance costs uniformly over many years and assures continuity in overall tree canopy coverage and associated benefits which are often dependent on the growing space of individual trees (e.g., open grown versus restricted growing areas).

As stated earlier, the City's public tree maintenance program is influenced by the size classes and relative age, among other factors. The City should support the tree canopy cover goals recommended in this Plan to increase the number of new trees in the 0-6-inch range, strengthen tree regulations to protect the medium to large trees, and proactively remove and replace the declining large trees that pose potential risks as they approach senescence.

VALUE AND BENEFITS OF THE PUBLIC TREE POPULATION

The urban forest plays an important role in supporting and improving the quality of life in communities. A tree's shade and beauty contribute to a community's quality of life and soften the often hard appearance of urban landscapes and streetscapes. When properly maintained, trees provide communities abundant environmental, economic, and social benefits that far exceed the time and money invested in planting, pruning, protection, and removal.

Not only do the trees growing along the public streets constitute a valuable community resource, they are actual City assets. They provide numerous tangible and intangible benefits such as pollution control, energy reduction, stormwater management, property value increases, wildlife habitat, education, and aesthetics.

Benefit Analysis of Renton's Public Trees

The services and benefits of trees in the urban and suburban setting were once considered to be unquantifiable. However, by using extensive scientific studies and practical research, these benefits can now be confidently calculated using tree inventory information. Tree benefit values for the City of Renton's trees are summarized in this Plan using the findings from Renton's Urban Forest Inventory & Resource Analysis Summary Report, which was published in January of 2021, and calculated using the U.S. Forest Service's i-Tree's Streets and i-Tree Eco applications. The results of Renton's tree inventory provide insight into the overall health of the City's public trees and the management activities needed to maintain and increase the benefits of trees into the future.

The 2021 inventory report calculated benefits for 116,994 trees representing three main tree populations in Renton: street and park trees (public rights-of-way and landscaped parks), natural areas (various forest types such as wetlands, steep hillsides, and riparian), and the Maplewood Golf Course (owned and maintained by the City of Renton). The following sections summarize the benefits of these tree populations analyzed in the 2021 report.

To identify the dollar value provided and returned to the community, the City's tree inventory data were formatted for use in the i-Tree Canopy and i-Tree Eco benefit-cost assessment tools. These applications analyze an inventoried tree population's structure to estimate the costs and benefits of that tree population. The assessment tools create annual benefit reports that demonstrate the value the City's trees provide.

Table 5. Summary of ecosystem services, benefits, and values of Renton's public treessize distribution compared to the ideal distribution

Tree Population	Method	Total # of Trees	Annual Benefits per Tree ($)	Annual Benefits per Capita ($)*	Total Annual Benefits	Replacement Value
Stree and Tree Parks	i-Tree ECO	25,772	$2.34	$0.66	$60,147	$30,600,000
Natural Area Trees	i-Tree Canopy	89,528	$1.73	$1.52	$155,141	$90,000,000
Maplewood Golf Course	Extrapolated	1,694	$2.34	$0.04	$3,964	$2,000,000
TOTAL		**116,994**	**$1.88**	**$2.22**	**$219,252**	**$122,600,000**

** Annual Benefits per Capita ($) based on an estimated population of 90,000 people at the time of the study*

Stormwater: Presents reductions in annual stormwater runoff due to rainfall interception by trees measured in gallons.

Air Quality: Quantifies the air pollutants (ozone [O3], nitrogen dioxide [NO2], sulfur dioxide [SO2], particulate matter less than 10 micrometers in diameter [PM10]) deposited on tree surfaces, and reduced emissions from power plants (NO2, PM10, volatile organic compounds [VOCs], SO2) due to reduced electricity use in pounds. The potential negative effects of trees on air quality due to biogenic volatile organic compounds (BVOC) emissions is also reported.

Energy: Presents the contribution of the urban forest towards conserving energy in terms of reduced natural gas use in the winter (measured in therms [thm]) and reduced electricity use for air conditioning in the summer (measured in Megawatt-hours ([MWh]).

Aesthetic/Other Benefits: Shows the tangible and intangible benefits of trees reflected by increases in property values (in dollars).

Carbon Stored: Tallies all of the carbon dioxide (CO2) stored in the urban forest over the life of its trees as a result of sequestration. Carbon stored is measured in pounds.

Carbon Sequestered: Presents annual reductions in atmospheric CO2 due to sequestration by trees and reduced emissions from power plants due to reductions in energy use. This is measured pounds and has been translated to tons for this report. The model accounts for CO2 released as trees die and decompose and CO2 released during the care and maintenance of trees.

Importance Value (IV): IVs are calculated for species that comprise more than 1% of the population. The Streets IV is the mean of three relative values (percentage of total trees, percentage of total leaf area, and percentage of canopy cover) and can range from 0 to 100, with an IV of 100 suggesting total reliance on one species. IVs offer valuable information about a community's reliance on certain species to provide functional benefits. For example, a species might represent 10% of a population but have an IV of 25% due to its substantial benefits, indicating that the loss of those trees would be more significant than just their population percentage would suggest.

Replacement Value: Replacement values are estimates of the full cost of replacing trees in their current condition, should they be removed for some reason. Replacement values are based on the Council of Tree and Landscape Appraisers (CTLA) Guide for Plant Appraisal, which uses a trunk formula methodology.

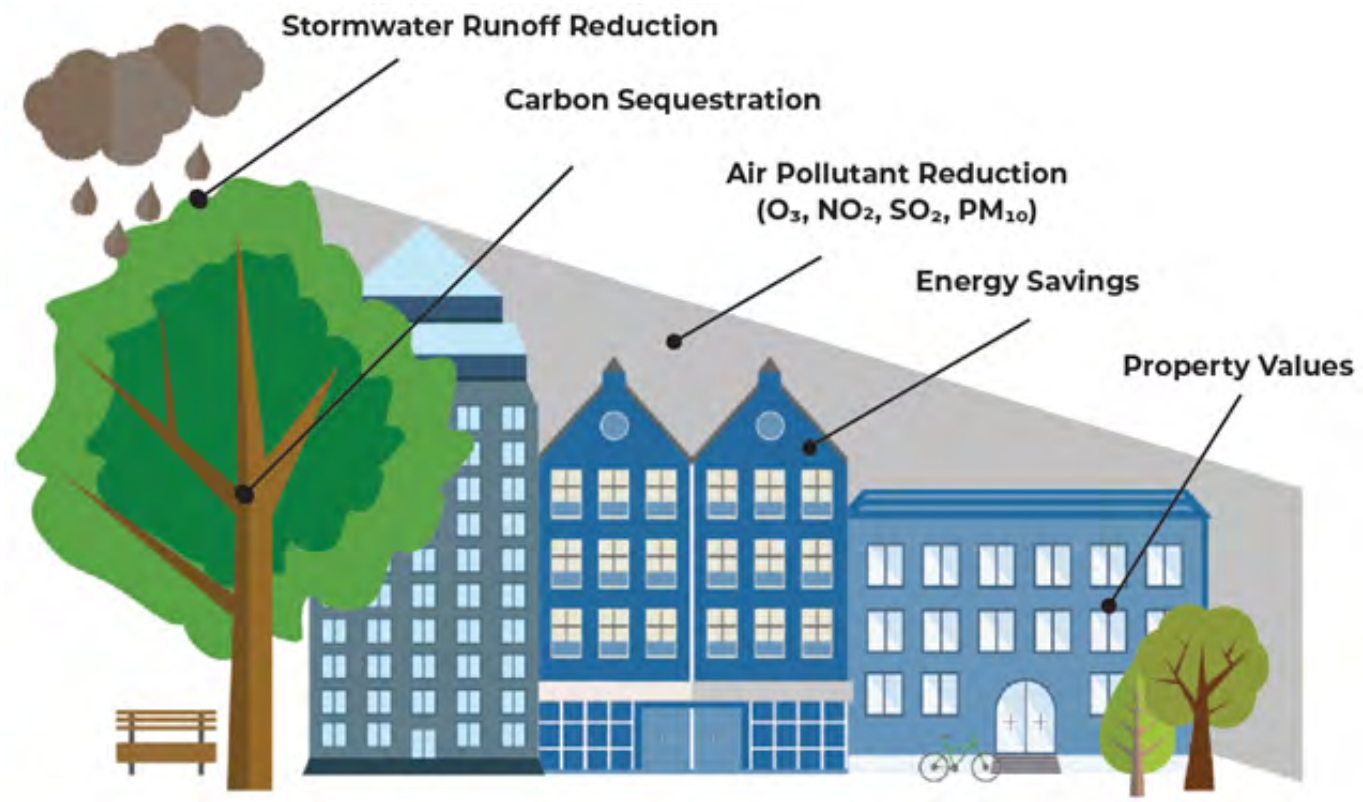


Figure 22. Illustration of the benefits and services provided by public trees

Street and Park Tree Benefits

A total of 25,772 trees were inventoried as part of the inventory covering Renton's streets and parks. The tree inventory data was processed using i-Tree ECO, which estimated that these areas have 654.7 acres of canopy cover. The annual benefits provided by these trees is over $60,000 and the total replacement value is nearly $3 million.

*Table 6. Summary of the annual benefits provided by Renton's public trees**

Benefits	Total ($)	Quantity	Annual $/tree	Annual $/capita
Avoided Stormwater	$18,948.62	13,846,782 gal	$0.74	$0.21
Carbon Sequestered	$24,124.00	141.5 tons	$0.94	$0.27
Air Quality	$17,074.35	5,549.33 lbs	$0.66	$0.19
Carbon Stored	$2,287,708 (lifetime)	13,414 tons		
Total Annual Benefit	**$60,146.97**	**$1.88**	**$2.34**	**$0.67**

**Distribution of benefits per tree and per capita based on 25,772 trees and a population of ~90,000 people*

Natural Area Tree Benefits

Renton has approximately 854 acres of natural areas, with an estimated 89,528 trees covering 84% of that acreage (721 acres). These trees provide the same ecosystem benefits of street and park trees; however, they are not typically in conflict with the built environment and therefore they are maintained less often and left to live longer lives. As such, i-Tree Canopy does not calculate a monetary value for avoided stormwater because stormwater in natural areas is more likely to flow into streams and wetlands than city stormwater drains.

Table 7. Summary of the benefits and services of trees in natural areas

Benefits	Total ($)	Quantity
Avoided Stormwater	N/A	461,306.84 gallons
Carbon Stored	$3,687,700.00	216,221.31 tons
Carbon Sequestered	$146,840.00	860.97 tons
Air Quality	$8,301.00	48,356.65 lbs
TOTAL	**$3,842,841**	

Maplewood Golf Course Tree Benefits

As a part of Renton's *Urban Forest Inventory & Resource Analysis Summary Report*, 1,684 trees were inventoried and analyzed. The benefits for these trees were extrapolated from the average annual benefits provided by Renton's street and park trees. It was estimated the trees inventoried on Maplewood Golf Course provide $3,964 in annual environmental benefits and have a replacement value of $2,000,000.

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RENTON'S URBAN FORESTRY PROGRAM

CURRENT URBAN FOREST MANAGEMENT CHALLENGES

OVERVIEW

The City of Renton has a unique urban form and character. Its size, layout, and development density influence the landscape and has created a charming and livable city. Renton'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 Renton's potential to be an even greater tree-filled city guided by a strategic plan— a city that can be truly 'ahead of the curve'.

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 maintained as part of a greater system with the purpose of improving the urban environment and enhancing the benefits of that ecosystem.

Yet the ability of Renton's trees to achieve the desired maximum return of benefits is limited due to poor maintenance and management stemming from insufficient municipal budgets, underdeveloped 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 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 in Renton. 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 in Renton 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.

CHALLENGES IN MAINTAINING AND MANAGING PUBLIC TREES

There are a total of 27,456 public street and park trees and 89,528 natural area trees in Renton that are the responsibility of the City to maintain and manage. In 2009, the Community Services Department maintained 1,000 street trees within the downtown core and all park trees with the goal of pruning trees on a five-year cycle. Maintenance was split between City staff for routine care and private contractors for larger trees and more technical arboriculture work. The Public Works Street Division maintained the public right-of-way by responding to tree clearance issues and downed limbs from any of the 3,200 trees in the right-of-way at the time.

Sustainable Management – Pruning Cycles

Today, the Urban Forestry Program manages and administers general forestry maintenance contracts for public tree planting, trimming, removals, consultancy, watering, and inspections and the Public Works Street Division continues to prune trees for clearance and address downed limbs in the public right-of-way. Parks & Trails crews also manage many tree issues on an as needed basis within park areas and along trails. This structure provides a more holistic approach to public tree management by extending maintenance beyond the downtown core trees but the budgets inhibit efficient proactive management and compromise sustainability. One measure of sustainable management is the number of years it takes to prune all public trees, also referred to as the pruning cycle. Currently, the City is on an approximate 37-year pruning cycle compared to the recommended 7-year cycle. The impact of deferred maintenance is seen in the condition of the inventoried public tree population with nearly half rated as fair in condition and only a third in good condition. Compounding the issue, both the Parks & Trails Division and the Public Works Street Division have limited in resources and have extensive demands to meet in regards to parks and trails maintenance and sidewalk repairs & replacements, respectively.

Program Efficiencies

Having public tree maintenance responsibilities shared across departments can utilize limited resources efficiently but only if the workflows are clear and understood. An example where the workflow is complicated and inefficient lies within tree clearance issues for both public and private trees impacted the right-of-way. These tree issues are received through Renton Responds, staff observations, calls, or through Verra Mobility (the City's traffic signal company). If the clearance issue is the result of a tree branch, Public Works Transportation Maintenance address the issue if it is a minor branch, or the issue is sent to code compliance for private trees and to Urban Forestry for public trees. For minor public tree clearance issues, Urban Forestry will sometimes address the problem with a pole saw from the ground, but the number of requests continue to backlog and Urban Forestry had to build a dedicated worklist and contract for less urgent tree clearance work of both public and private trees. For private trees, Code Compliance could require the property owner to remedy the issue but for single private trees the process and burden is onerous— the resident would need to pay for a right-of-way use permit in addition to the cost of trimming, so it is often avoided and instead the tree is queued and eventually addressed but results in significant backlogs.

Risk Tree Management

One of the unique challenges of managing Renton's urban forest stems in part from the nature of trees in the Pacific Northwest – trees grow exceptionally tall. Small pockets of remnant stands of second growth trees can still be seen even today at the edge of new developments. They can be more prone to branch failures than other tree species during storms. In addition to large tree size, the prevalence of particular species in the urban forest population presents more opportunities for possible damages and consequences as a result of the failure of a tree or tree part. Other native species like bigleaf maples and black cottonwoods can also be problematic as they are also large trees and are prone to decay. They comprise a large proportion of the public tree population, especially in natural areas. There are also large specimen trees like pin oaks, tulip trees, cedars, and sycamores on city streets which require thoughtful management.

Tree Related Policies and Regulations

Trees can be found mentioned in several City codes, regulations, and plans. Regulations to guide tree planting and maintenance are limited and do not sufficiently address the concerns of many City staff and the public. For example, there are limited regulations about planting trees near street lights though section 4-4-070F.2 of Renton Municipal Code provides some guidelines for planting near objects in the right-of-way, additional detailed language could address concerns. Removing trees during construction of subdivisions became a problem after 2000 when the City experienced a period of rapid development. An emergency rule was invoked in late 2006 followed by adoption of the tree retention regulation in 2007 to deal with loss of canopy cover in new development. Legislation affecting the City of Renton is not only local in nature. Other state and federal legislation impacts trees in the city directly or indirectly. One of these is the Evergreen Communities Act which passed the State Legislature in 2008. This act specifically benefits urban forestry across the state for local jurisdictions.

Regulations exist for planting, pruning, and removing street trees. A new Street Tree Regulation has been developed to provide guidance on maintenance and planting. Additional regulations will be incorporated into the Renton Municipal Code to improve tree protection and preservation. Regulations include plan review for street tree planting, pruning and removal; spacing guidelines and tree species selection for street trees; permits for land use, clearing and tree removal; and hazardous tree mitigation. Though significant improvements have been made, there still exist some inconsistencies or gaps in the policies and regulations for Renton's trees.

Tree Retention Requirements

When calculating tree retention density requirements on residential parcels, credit is given for every six (6) inches of tree diameter at breast height (DBH) for larger trees retained, as opposed to 1 for 1 replacement or retention. The upside is that for correcting violations by replanting, every inch of diameter must be replaced. For infrastructure projects however, the replacement value is 1 for 1. This does not quickly replace the diameter of larger trees lost due to infrastructure projects. Also, the main elements for tree preservation are retention density and landmark size (trees greater than 30 inches DBH)*. Industry recommendations and benchmarking research in other cities show a landmark tree size classification should be reduced to at least 24 inches DBH (Swiecki, et al. 1991).

Tree Removal Permits

All permitting for tree removals is coordinated through the Community and Economic Development Department. As is often the case for municipalities with less stringent tree preservation ordinances, tree value lost after removal for development is not always sufficiently captured in replacement tree planting. Urban Forestry divisions are not always looped in consistently during the design, land use and construction permitting process. In Renton however, this improved after the tree ordinances were reviewed in 2019 and the Urban Forestry Division was more explicitly included in both land use discussion and construction permitting. Many cities require removal permits for any tree over six (6) inches DBH, and removals are not granted unless the tree is dead, diseased, structurally compromised, exceeded growth space, is less important than planned infrastructure, or poses an unacceptably high level of risk. Lost tree value can be recouped in the permitting process and is highly recommended and desired by the City, but, would likely require a full-time development review arborist.

Tree Protection during Construction

Currently, Best Management Practices (BMPs) for protecting trees on construction sites are inconsistently adhered to by contractors and the monitoring of tree protection zones (TPZ) is insufficient due to poor understanding of the BMPs on the part of the contractors and the inability for the City's inspection team to provide 24/7 oversite on all development projects.

**Public (SEPA exempt) utilities and public ROW expansions are exempt from tree density; however, street trees are required per RMC 4-4-070, landscaping. Thus far, the proposed tree ordinance does not intend to apply the proposed tree credit system to public ROW trees.*

Alternative Solutions to Tree and Sidewalk Conflicts

Many municipalities habitually apply linear streetscape designs which limit retrofits and alternative solutions to tree and sidewalk conflicts. Renton has made some use of flexible design, however these types of designs could be considered more often. Flexible design would allow more sidewalks to meander around trees, parcels could be developed around healthy existing trees, and additional right-of-way easements/frontages could be obtained rather than blindly applying the 'safe streets' or ADA retrofit designs. The Urban Forestry Program is actively discussing potential changes to Code and regulations with Community & Economic Development.

ADDRESSING THE CHALLENGES

These issues and challenges recognized in Renton are exacerbated in disadvantaged areas of communities with limited resources. The City needs this 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 10-year Update offers Renton 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, Renton needs a robust system of professional management of public trees and improved support of resident engagement in the care and expansion of the urban forest, both public and private.

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 more equitable distribution of urban forest cover and benefits, intensive tree management, diverse outreach approaches, and unique stewardship programs.

Renton's Urban Forest Management Plan is a crucial planning effort to build a more sustainable resource and a healthy community, among other core urban forest management elements. This strategic plan for Renton's urban forest aims to help guide how the City might think about strengthening 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 strengthens community outreach, education, and engagement.

PROGRAMS MANAGING RENTON'S URBAN FOREST

PROGRAM ORGANIZATION

Renton's urban forest is managed by the Parks Planning and Natural Resources Division in the Parks and Recreation Department (previously referred to as the Community Services Department). This division is dedicated to the health and protection of the environmental resources, public safety, and community education for all to enjoy the 711 acres of natural areas, 27,456 public trees along streets, in parks and the golf course and 89,528 trees in natural areas. In addition, the Division provides landscaping and maintenance within the right-of-way and on facility grounds at 50 locations. The Urban Forestry Program within the Division is focused on programming, inventory data collection and management, tree planting, training, tree inspections, arboriculture related support for tree code enforcement, volunteer restoration projects, arboriculture related support for site plan reviews, and events like Arbor Day and Earth Day. These essential duties and responsibilities are overseen by the Urban Forestry and Natural Resources Manager and supported by a contracted inspecting arborist, a part-time administrative person, and a part-time supervisor.

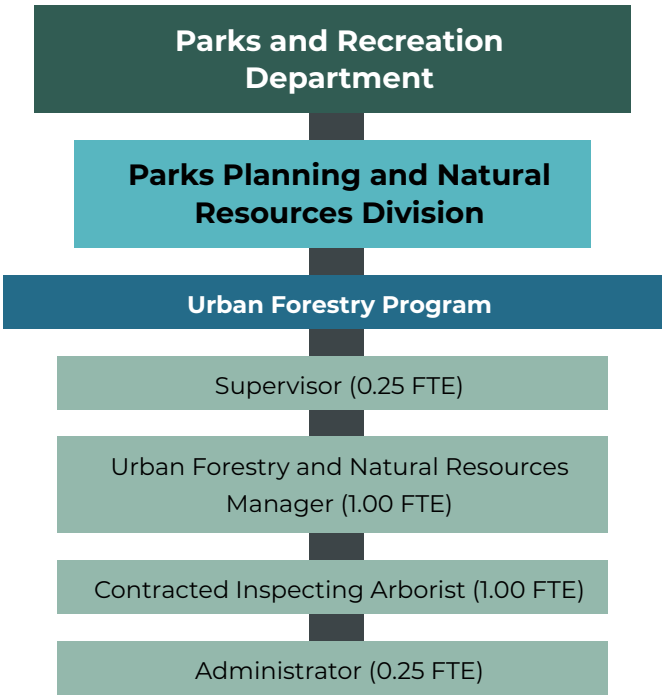


Figure 23. Structure of Renton's Urban Forestry Program

INTERDEPARTMENTAL MANAGEMENT OF TREES

There are a wide range of management activities necessary to maintain an urban forest and many of these overlap between city departments and divisions. The overlap is often based on the location of a tree on publicly managed land or on private property. In the City of Renton, public trees on streets, in parks, and in natural areas are the responsibility of the Urban Forestry Program. Trees on private property fall under the Department of Community and Economic Development's (CED) Planning Division, and trees in the public space are managed or supported by the Parks Planning and Natural Resources Division, Parks & Trails Division, Public Works Maintenance, and Public Works Transportation Systems. The CED Planning Division oversees private property development, ordinance enforcement, and zoning, with trees on private property assigned to this department. Likewise, Parks Planning and Development and Public Works manage public space infrastructure such as streets and sidewalks, and street trees

are organized within these departments. While organizing tree management in this manner is a natural fit for the responsibilities of each department or division, it does not necessarily coincide with the expertise and skills of each department, nor does it orchestrate a holistic management of the urban forest. As such, it is important to review the current structure of the Renton urban forest for its benefits and tree management limitations, and to explore if alternative management structures may improve City efficiency and ultimately, lead toward a safer and sustainable urban forest.

PARKS PLANNING AND NATURAL RESOURCES URBAN FORESTRY PROGRAM

The Urban Forestry Program is responsible for the direct management of 27,456 street, park, and golf course trees and 89,528 trees in natural areas. Trees located along streets are referred as street trees. These trees are found between the sidewalk and curb in a planting strip or in sidewalk cut-outs. Street trees are also found within the street right-of-way where no street exists (dedicated right-of-way), where no sidewalk and curb exists (unimproved right-of-way), and in some alleys. Street trees require permission to prune, remove, or otherwise treat however, property owners can water and mulch street trees without permission and the City encourages these activities for a healthy tree population. These regulations for planting, pruning, and removing street trees did not always exist. Previously, many street trees were poorly or improperly maintained, tree removals were made without notice, and poor tree selection and placement happened when planting. The Street Tree Regulation was developed to address these concerns and to provide guidance. Regulations include the following:

- Plan review for street tree planting, pruning and removal
- Spacing guidelines and tree species selection for street trees
- Permits for land use, clearing and tree removal
- Hazardous tree mitigation

The Urban Forestry Program manages the application for Arbor Day Tree City USA awards and Arbor Day/Earth Day celebrations. The City has received the Tree City USA award for 14 years and is eligible to submit applications for Arbor Day Foundation's Growth Award, which has been awarded for 11 consecutive years. The Growth Award recognizes Tree City USA communities that demonstrate higher levels of tree care and community engagement. The Urban Forestry Program also oversees the permitting process that receives requests for street tree pruning, removal, inspection, or other requests. The tree(s) associated with a request is identified in the City's asset management software and inspections are conducted by the Urban Forestry Program's contracted Inspecting Arborist or other qualified personnel. The maintenance or removal of street trees as requested through the permitting process are staged and prioritized by the City or addressed by the adjacent property owner. In addition to service requests, the Urban Forestry Program also conducts proactive pruning of street and park trees.

Previously, the street trees were managed by the Community Services Department and the Public Works Street Division. The Community Services Department maintained approximately 1,000 street trees within the downtown core and all park trees on a five-year pruning cycle using staff and private contractors. Private contractors were mostly utilized for larger trees and more technical work. The Public Works Street Division was responsible for 3,200 trees within the City right-of-way with maintenance occurring on a reactive basis meaning staff responded to clearance issues or downed limbs or trees.

Program Budget

Today, the public street and park trees are managed by the Urban Forestry Program with an overall budget of $951,000 (2021). Of the total investment, 26% is attributed to administration ($250,000), 17% to consulting arborist inspection services ($157,000), 14% to contract pruning ($134,000), and 11% to professional services ($100,000— only in recent years for inventory and management plan updates, otherwise it would be spent on pruning, removal, and planting) and contract landscape watering ($100,000). The remaining 22% ($210,000) is used for tree removals ($85,000), storm damage on-call / debris clean up ($70,000), tree planting ($35,000), purchasing trees and planting supplies ($15,000), and pest management ($5,000).

Table 8. Annual investments in the management of street and park trees

Investments (2021)	Percent Allocated	Total ($)	$/tree	$/capita	Funding Source*
Purchasing Trees & Related Planting Supplies	2%	$15,000	$0.55	$0.15	FIL
Planting Trees	4%	$35,000	$1.27	$0.34	OP
Contract Pruning	14%	$134,000	$4.88	$1.32	OP
Pest Management	1%	$5,000	$0.18	$0.05	OP
Removal	9%	$85,000	$3.10	$0.84	OP
Storm Damage On-Call / Debris Clean Up	7%	$70,000	$2.55	$0.69	OP
Professional Services**	11%	$100,000	$3.64	$0.99	OP
Contract Landscape Watering	11%	$100,000	$3.64	$0.99	CON
Consulting Arborist Inspection Services	17%	$157,000	$5.72	$1.55	CON
Administration+	26%	$250,000	$9.11	$2.46	W&B
Total Annual Benefit	**$60,146.97**	**$1.88**	**$2.34**	**$0.67**	

**Funding Source Descriptions*:

FIL → Fee-in-Lieu fund – separate fund, use restricted to capitalizable purchases for tree planting (ref. RMC 9-13).

OP → Forestry Operating / Maintenance – total maintenance operating funds budget is $425,000.

CON → Externally Contracted Services – funds with separate dedicated budgets; inspection and irrigation.

W&B → Wages and Benefits – estimated, separate from Forestry maintenance budget fund. Based on Urban Forestry Manager at 100%, Parks Planning & Natural Resources Director at 25%, and Support Staff at 10%.

***Professional Services*:

Years 2020, 2021, and 2023 for tree inventory update, management plan update, and LiDAR canopy cover study which would otherwise normally be spent on pruning, removals, and planting.

****Note*:

Budget does not include the tree-related work of the Parks & Trails crews— funded through a separate budget.

+Administration: See Table 9 for summary of 2022 Administration costs.

2022 Program Administration Costs

Based on a November 2021 analysis, the administration costs for the 2022 Urban Forestry Program are provided in the table below:

*Table 9. Summary of the 2022 budget for the Urban Forestry Program's Administration**

Title	2022 Salary	2022 Benefits	2022 Total
Urban Forestry & Natural Resources Manager (100%)	$130,957	$55,251	$186,208
Parks Planning & Natural Resources Director (25%)	$39,290	$18,262	$57,551
Administrative Secretary 1 (10%)	$7,776	$4,775	$12,550
TOTAL	**$178,002**	**$78,287**	**$256,309**

**Details and Assumptions*:

- *The percentages assigned to each of the staff represent the amount of time and budget attributed to urban forestry.*
- *The Urban Forestry & Natural Resources Manager and the Administrative Secretary's benefits remain the same from 2021 to 2022.*
- *The Parks Planning & Natural Resources Director benefits were adjusted (increased) to a full family's cost as a conservative measure.*
- *A 4% salary increase across the board for non-represented staff at the beginning of 2022.*
- *A 4% salary increase for AFSCME to mirror the non-represented increase.*

Service Requests for Street, Park, and Natural Area Trees

When a service request for a street, park, or natural area tree is received through Renton Responds or through other channels, the Urban Forestry Program uses the house and street address for locating trees and to check if they are in the City's tree inventory database. This location information is collected in Renton Responds and is used for public and private tree inspections. The Urban Forestry Program's contracted Inspecting Arborist inspects trees and evaluates the tree in terms of general condition and any obvious problems. Prescriptions for treatment are entered into a work order database only for public trees using a prioritization procedure. Actual maintenance can take upwards of a year or longer to occur, depending on the urgency of the risk posed by the tree. Following an inspection, a response is emailed, or other communications used, to relay information of any action to be taken by either the City or by the property owner. Some of the more frequent private tree issues encountered include dangerous trees on adjacent property, inspection of trees from Community and Economic Development Department staff requests (code compliance, permit applications and development regulations), and providing general information to property owners about adjacent city trees.

Risk Tree Management

The City has actively managed risk trees for over 12 years with a concerted effort beginning in 2009. At that time, the City recognized the need to develop a long-range plan for the maintenance of the urban forest. To that end, more management information regarding Renton's urban forest would be required and the City's first public tree inventory was created. This inventory was updated in 2020. With this data, the City's Urban Forestry Program drafted the first specified risk tree management plan for Renton's public trees. The Risk Tree Management Plan draft is provided in Appendix E and adopting the plan is a strategy in this Urban Forest Management Plan. Regularly updated tree inventory data will help create inspections lists and a more proactive inspection rotation for species with a riskier failure profile and lower recorded condition ratings.

Mainstreaming Urban Forest Management

To ensure sustainability and interdepartmental coordination, a 'green team' could be established to coordinate efforts across the City. This would enable unified messaging, consistent workflows, improved efficiencies, strengthened and frequent communication, and improved knowledge transfer. This team may consist of members of the Collaborative Team for the Urban Forest Management Plan project among others key staff. This idea as part of the previous urban forest plan in 2009 but never came to fruition.

URBAN FOREST BENCHMARK COMPARISONS

Urban forest benchmarking research provides an understanding of the level of effort and capacity necessary to satisfy the City's adopted goals, identifies industry trends and best practices, enables the creation of realistic goals, and provides the metrics for measuring change.

Benchmarking Data Sources

Several data sources were reviewed and compiled to paint a picture of how Renton measures up against industry standards and communities of a similar size or geographic location and how its own operations have changed over time.

Phase 1 of the benchmarking process uses the Arbor Day Foundation's Tree City USA 2019 dataset and compares statistics provided by the City of Renton to other regional cities that also participate in the Tree City USA program. Using this dataset helps better understand how Renton's urban forestry budget and activities compare to relevant cities. Relevant cities are determined by 1) proximity (nationwide), 2) proximity (statewide), 3) population size (nationwide), 4) population size (statewide), and finally 5) within 200 miles and most similar population size (best match). The Tree City USA dataset is largely focused on: urban forestry budgets, per capita funding information, and volunteer hours. The data further describes the number of trees planted, removed, and pruned by City staff. This data is useful in determining adequacy of urban forestry program funding as well as understanding workloads of those City employees involved in urban forestry operations.

Phase 2 of benchmarking involves comparing Renton's urban forestry operations to findings from an in-depth study conducted by researchers Richard Hauer and Ward Peterson (2014). In this study, researchers interviewed urban forestry programs in various regions across the U.S. and among varying population classes. Specific study focus areas include: community and staff profiles, funding, tree management policy and planning, volunteers and partnerships, contracting tree care activities, community tree populations, tree operations and management, and assistance programs. Data from this study was compared to data obtained from the City of Renton for the purposes of determining program health as compared to accurate data across a range of scales and locations. View the 2014 study by Hauer et al. at https://www.uwsp.edu/cnr/Pages/Forestry---MTCUS.aspx.

Phase 3 of benchmarking is comprised of presenting the above information to the City and making clarifications in order to ensure the highest quality analysis. This phase also includes internal quality controls to ensure data comparisons are as accurate as possible. In this phase, data discrepancies and caveats are identified to ensure relevant and compatible comparisons are made. Information gathered during this process informed the development of realistic and attainable goals and strategies in the City's Urban Forest Management Plan.

Understanding the urban forest policies, management approaches, budgets, and programs of comparable communities and nationwide averages provides comparative data to benchmark the City's performance, present and future. While existing tree data describe the current conditions, benchmarks offer guidance to bring Renton's urban forestry policies and practices into alignment with similar-sized cities in Washington and nationwide, enhancing urban forest management. A summary of research into policies and actions of these cities follows.

Data Descriptions, Discrepancies, and Limitations

The benchmarking research is based on data reported by communities to the agencies summarizing the metrics. For the Tree City USA and 2014 Urban and Community Forestry Census records, the method for reporting budgets and activities may vary among communities since each community forestry program is unique. The reporting methodology for budgets, staffing, and activities may differ resulting in less accurate comparisons. Some communities may only report staffing numbers based on the primary program while others may include supporting departments, contractors, and technical service providers. These differences in reporting would also affect the budget comparisons. In addition, the methods for reporting activities for each community may vary. Some communities may only report on the in-house activities conducted by the lead department whereas other communities may report on activities conducted by supporting departments, utility companies, and other sources. Since the historical reporting methods for Renton are unknown, the values used in the comparison study are based on 2019 Tree City USA records and 2021-2022 budgets. Due to the number of discrepancies and the limitations of this analysis, the benchmarking research is meant to serve as an initial starting point in developing the Urban Forest Management Plan. The metrics are not meant to imply overall management effectiveness. Interpretations for each metric were provided and used to guide goals and strategies within the Urban Forest Management Plan. It is recommended the City verify and finalize benchmarking values in order to measure Plan implementation progress and inform reporting.

Table 10. Arbor Day Foundation Tree City USA communities examined during the benchmarking research

City	State	Population	Proximity (miles
Renton	**Washington**	**102,153**	**0**
Yakima	Washington	94,440	100
Everett	Washington	111,215	35
Bellingham	Washington	90,110	89
Kirkland	Washington	89,557	13
Auburn	Washington	81,720	12
Kent	Washington	129,600	5
Bellevue	Washington	145,300	9
Redmond	Washington	65,860	14
Shoreline	Washington	55,730	20
Olympia	Washington	51,600	46
Burien	Washington	50,997	6
Lacey	Washington	50,170	42
Tacoma	Washington	216,279	19
Bothell	Washington	46,657	19
Edmonds	Washington	42,170	24
Bremerton	Washington	41,235	22
Issaquah	Washington	39,378	9
Lynnwood	Washington	38,511	23
Longview	Washington	38,100	98
Wenatchee	Washington	34,329	87
Snoqualmine	Washington	13,752	19
TOTAL		**1,628,863**	**713**
Average		**74,039**	**32**

Table 11. Summary of phase 1 benchmarking research results (Tree City USA dataset)

2019 Tree City USA - Renton		2019 Tree City USA - Regional	
$925k	(Urban) Forestry budget	**$800k**	Average budget
$9.06	Per capita forestry budget	**$10.42**	Average per capita budget
$647k	Tree planting, initial care, maintenance, and removal budget	**$630k**	Average maintenance budget
$278k	Program management budget	**$121k**	Average planting/care budget
357	Trees pruned	**1,025**	Average trees pruned
298	Trees removed	**130**	Average trees removed
129	Trees planted	**1,695**	Average trees planted

Table 12. Summary of phase 2 benchmarking research results (2014 Census, Hauer et al.)

2014 Census - Renton		2014 Census - Population Group (100-250k)	
$925k	(Urban) Forestry program budget (2021)	**$1.4M**	Average forestry budget
0.20%	Of total budget for forestry	**0.52%**	Of total budget for forestry
117k	Estimated public trees	**74k**	Average count of public trees
$7.91	Budget per tree	**$44.85**	Average budget per public tree
1.23	Public trees per capita	**0.51**	Average public trees per capita
47k	Public trees per staff	**14k**	Average public trees per staff
711	Acres of parks and open space	**1,284**	Average acres of parks and open space
$126M	Value of public trees	**$98M**	Average value of public trees

URBAN FOREST AUDIT

To develop this Plan, nearly 40 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 matrix includes a total of 11 urban forest categories, each containing a multitude of supporting elements. All resources were reviewed to identify references regarding each of the categories and supporting elements. There are a total 275 instances where the 40 resources reference the 11 categories and supporting elements. The number of resources referencing elements of urban forest sustainability and management demonstrate Renton's readiness for changes driven by this Plan. Recommendations in this Plan align with components of these supporting resources. For a complete list of categories, elements, rankings, and supporting resources, see Appendix D.

Based on the analysis of findings from the project planning and research, Renton scored a 65% in terms of urban forest sustainability and management as defined by the U.S. Forest Service, partners, and planning consultants. The City of Renton scored relatively high when compared to other urban forestry audits completed by the consultants for other communities of similar size. Overall, the City scored highest in the Decision and Management Authority, Community, Professional Capacity and Training, and Inventory categories — all of which are above 75%. The Urban Forest Management Plan provides the guidance to maintain these strengths and to address shortcomings as opportunities.

Based on the audit of 129 subcategories (11 primary categories), Renton is achieving "Adopted Common Practice" for 53 (42%) of these. 59 subcategories (23%) are "In Development". Applying the multipliers of 2 for Adopted Practice and 1 for In Development results in a total score of 165 out of 254 possible points, or 65% (detailed in the following table).

Table 13. Outcomes of the urban forest auditing process for Renton, WA

#	Description	SOC* (% Achieved)	Base** (% Achieved)	Overall Rating	Overall (% Achieved)
1	Management Policy, Ordinances	75%	50%	18	64%
2	Professional Capacity and Training	100%	NA	13	81%
3	Funding and Accounting	75%	NA	7	58%
4	Decision, Management Authority	100%	50%	7	88%
5	Inventories	NA	63%	20	77%
6	Urban Forest Management Plans	NA	25%	11	46%
7	Risk Management	100%	50%	15	83%
8	Disaster Planning	NA	67%	6	43%
9	Standards and BMPs***	75%	56%	33	55%
10	Community	100%	NA	24	86%
11	Green Asset Evaluation	NA	NA	11	55%
TOTAL		**89%**	**51%**	**165**	**65%**

**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)*

Discussion

The main purpose of the urban forest audit is to apply the research and findings gathered throughout the planning effort to inform the Plan's goals, objectives, and strategies. This audit or "gap analysis" enables the Urban Forestry Program to control different aspects of its program with data. This gap analysis identified the shortcomings that the Urban Forestry Program should overcome and by quantifying them, the program can make improvements. It also enables effective monitoring of Plan strategies in that the audit categories and elements can be revisited at key intervals in the Plan implementation process to measure progress and adapt strategies accordingly.

The information provided in the table above describe the current conditions of Renton's urban forest, the programs that manage it, and the community framework. As recommended in the Plan's monitoring methods, the City should use this framework to evaluate implementation progress, report successes, and inform changes to Plan actions. Many of the urban forest audit elements were given a rating of "In Development" as they previously did not exist but are addressed in this Urban Forest Management Plan. This means that the City is already well underway in advancing its program and its Urban Forest Audit score.

PROGRAM NEEDS

PUBLIC TREE MAINTENANCE

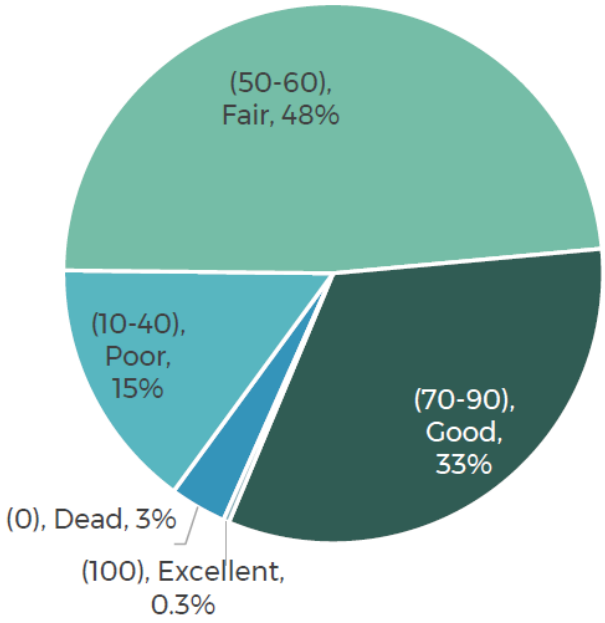
Urban forest management priorities should in part be determined by the current maintenance practices and how well they support program goals and the Plan's goals. Some maintenance practices are specific to local climate conditions and number of trees to manage. Others, such as maintaining an optimal pruning cycle are relatively consistent for all tree management programs. As such, the City's pruning cycle can be used to identify funding and staffing needs.

Current Public Tree Condition and Maintenance Needs

Tree characteristics and outside forces affect the management needs for urban trees. An analysis of the condition and maintenance requirements enables managers to plan the urban forest, prioritize maintenance, and target outreach to property owners and the community as a whole. Tree condition indicates how well trees are managed and how well they perform given site-specific conditions. Tree maintenance needs are inventoried for public safety reasons and for the health and longevity of the trees. Understanding the maintenance needs assists tree managers in establishing daily work plans.

The condition of individual trees was catalogued in the City's inventory database in numerical values. Dead trees were given a rating of "0", poor condition trees a rating of 10-40, fair condition given 50-60, good condition with a rating of 70-90, and trees in excellent condition were given a rating of 100. Several factors are considered when assigning a condition value to a tree, including root characteristics, branch structure, trunk, canopy, foliage condition, and the presence of pests.

Public Tree Condition



Public Tree Maintenance Needs by Site Design

Table 14. Public tree maintenance needs by Site Design based on an analysis of August 2021 inventory data

Parking Lot (242 Trees)		Street (3,578 Trees)		Unimproved ROW (1,712 Trees)	
Structural Prune	25%	Clearance Prune	22%	Crown Cleaning	29%
Clearance Prune	23%	Structural Prune	19%	Tree Removal	21%
Thinning Prune	17%	Thinning Prune	18%	Other	12%
Other Maintenance	35%	Other Maintenance	40%	Other Maintenance	29%
City Building (113 Trees)		**Park (2,777 Trees)**		**Natural Area (765 Trees)**	
Crown Cleaning	32%	Crown Cleaning	28%	Add Mulch	36%
Clearance Prune	29%	Thinning Prune	18%	Crown Cleaning	21%
Tree Removal	12%	Add Mulch	16%	Structural Prune	13%
Other Maintenance	27%	Other Maintenance	38%	Other Maintenance	31%

Nearly half of the public tree population with a condition rating is in the "Fair" condition class with a numerical value of 50 through 60. With 48% of trees in fair condition, it perhaps is an indicator of less than optimal tree maintenance, poor tree species for a given site, insufficient monitoring or plant health care, natural and human-caused defects, a maturing public tree population, or a combination of factors.

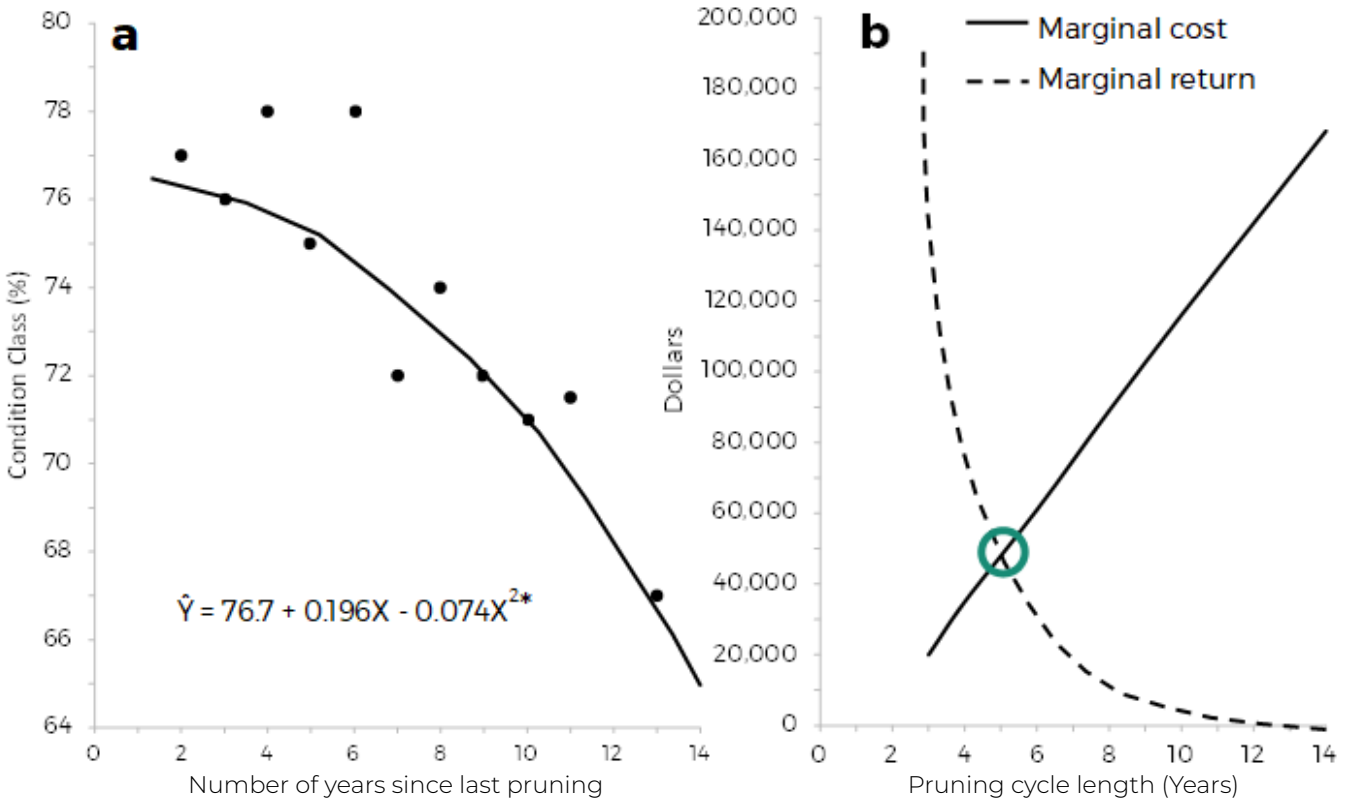
Across all Site Designs— the type of site in which trees are planted and growing— 22% of trees require crown cleaning, a pruning practice that addresses dead, dying, decayed, diseased, and damaged limbs. This type of maintenance can be more effectively managed with overall reduced costs if the public trees were pruned on a shorter cycle.

Identifying Optimal Pruning Cycles

A study (Miller et al. 2015[3]) was conducted for Milwaukee, Wisconsin to determine the optimum pruning cycle by comparing the marginal cost of pruning to its marginal return. For example, a portion of Milwaukee was inventoried to record tree condition and calculate tree value. Since condition class influences tree value, the date of last pruning and average condition class for each work unit inventoried was subjected to regression analysis. This analysis determines the relationship between pruning and condition class (see Figure 24 below). Marginal costs were calculated based on the loss of tree value, using condition classes, for each one-year extension of the pruning cycle. Marginal returns are the savings in pruning costs for each one-year extension of the pruning cycle. For Milwaukee, the relationship between marginal cost and return indicates that the optimum pruning cycle for the city is five years, assuming the management goal is to provide the highest-value tree population for dollars expended.

Optimal Pruning Cycles and Costs of Deferred Maintenance

Figure 24. a) Relationship between pruning cycle length (number of years since last pruning) and condition class rating. Asterisk (*) indicates regression is significant at the 0.05 level. b) Marginal cost (loss of tree value) and marginal return (savings in pruning costs) for pruning cycle lengths. For this study, the optimal pruning cycle is where marginal costs and marginal returns intersect— at 5 years. Figure recreated from Miller and Sylvester (1981). - The Costs of Maintaining and Not Maintaining the Urban Forest: A Review of the Urban Forestry and Arboriculture Literature (Jess Vogt, Richard J. Hauer, and Burnell C. Fischer, 2015)



3. Miller, R. W., Hauer, R. J., & Werner, L. P. (2015). Urban Forestry: Planning and Managing Urban Greenspaces, Third Edition.

An Optimal Pruning Cycle for Renton's Public Trees

As illustrated in the 2015 study for Milwaukee (Figure 24), a 5- to 7-year pruning cycle is the optimal intersection of efficiency and safety. If each public tree were to be maintained within a 5- to 7-year window, research shows the trees would be in a safer condition while limiting city expenses. Based on the analysis (Figure 24), a pruning cycle on a shorter timeframe has a higher cost to a city but does not correlate to a proportional increase in safety. Conversely, a longer timeframe lowers costs to a city, but also decreases tree safety.

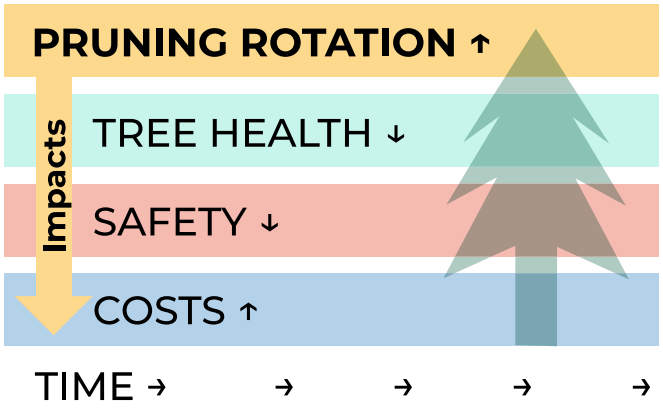


Figure 25. As the years between street tree pruning increases, tree health and safety decrease and costs increase

For Renton specifically, the pruning of public trees is on an estimated 37-year cycle based on an estimated 750 trees pruned per year and a total of 27,456 public street, park, and golf course trees (excludes 89,528 trees in natural areas). Numerous studies have shown the detrimental effects a delayed pruning cycle can have on a community's tree population as well as the increased risks to public safety. Not pruning street trees or pruning on such a long rotation is referred to as deferred maintenance. The costs for deferred maintenance have been closely examined by researchers. Prolonged deferred maintenance has a triple negative effect on costs— it reduces the health and sustainability of the urban forest, it costs the residents and adjacent property owners as the associated benefits of trees are diminished as tree health declines, and costs the City in terms of increased callouts and liability management.

Maintenance can be linked to tree success both at the beginning and end of its lifespan. Early in a tree's life, during the establishment and immature (i.e., juvenile) phases, maintenance must be adequate to ensure early survival and establishment in the urban landscape. Presumably, any post-planting maintenance performed on a tree that improves its chances of survival to maturity or lengthens the time that tree spends in its mature phase (where benefits are produced in the greatest amount) increases the monetary value of that tree. The cost of not maintaining trees early in life may translate to greater maintenance costs down the road; this is deferring maintenance (and its costs) to the future in order to save on maintenance costs today. Later in a tree's life, maintenance may aim to extend the tree's lifespan or prevent tree failure. In this way, late-stage maintenance can defer removal costs. If maintenance does prolong a tree's useful life (i.e., delays the onset of senescence and a tree's removal), it increases the amount of benefits it produces over its lifespan. Alternatively, removing the low-hanging limbs on an aging tree can prevent these limbs from failing and damaging people or property, and thereby avoid subsequent repair- or liability-related costs. Tree pruning to remove high-risk limbs and removal of the entire tree can be considered a type of maintenance that potentially saves money due to avoided litigation costs. With a complete inventory of the public tree population, the City should determine the costs and optimal schedule for pruning all public trees, specifically street trees, on a rotation.

The following analysis is based on determining what funding may be needed to maintain the entire public tree population on a 7-year pruning cycle, to create a baseline for the City to measure its progression towards a sustainable urban forest.

Based on a market comparison of the costs of program pruning, guidance for implementing programmed pruning is provided for street, park, and golf course trees (27,456 trees as of 2021).

Recommended Public Tree Pruning Rotation

Table 15. Current and recommended maintenance regimen for Renton's public tree population (street, park, golf course trees)

	Public Street, Park, and Golf Course Trees (2021)	
Total Tree Count	**27,456 trees (2021)**	
	Annual Budget	Tree Count
Current Cycle (~37 Years)	$134,000	750
	per year	trees per year
20-Year Cycle	$247,104	1,373
	$113,104 more cost	623 more trees
10-Year Cycle	$494,208	2,746
	$360,208 more cost	1,196 more trees
7-Year Cycle	$706,011	3,922
	per year	tree per year
2 FTE In-House Arborist Crew (7.5-Year Cycle)	**4,176 hours (2,088 each) per year**	**3,654 trees per year**
Cycle Gap between 37-Year & 7-Year Cycle	**$572,011 more per year**	**3,172 more trees**

Table 16. Assumptions for estimating the additional costs to effectively maintain the public tree population

Renton Estimate	Industry Average	Lowest Cost Estimate	Highest Cost Estimate
$179/tree	$180/tree	$70.35/tree	$200/tree
3,172 more trees	3,172 more trees	3,172 more trees	3,172 more trees
$566,782	$571,011	$233,170	$634,457

The tables above provide a summary of the costs to support programmed pruning of the public tree population. It should be noted that there are assumptions to the estimated costs for public tree maintenance. Table 15 above uses the estimated maintenance cost of $180 per tree based on market research and the City's annual pruning budget ($134,000) and number of trees pruned (750). Also, the market research on costs for street tree maintenance found that the estimates are based on existing grid pruning programs that have been implemented for a number of years. The City of Renton largely has not been maintaining street trees on a recommended rotation. Therefore, the per tree cost for grid pruning in Renton may be greater in the first rotation due to deferred maintenance causing increased maintenance needs and associated time. For this study, the cost estimates detailed above are used and summarized in Table 16 for a 7-year rotational programmed pruning cycle compared to the current cycle and budget. The table includes intermediate cycles for consideration and include 20- and 10-year cycle estimates and all scenarios assume every public tree needs to be pruned at some point.

A recommended programmed pruning cycle is typically five to seven years depending on the city's size, number of trees, types of trees, history of programmed pruning, available funding, staffing resources, and other factors. For this study, a rotation of seven years is recommended.

Based on the local costs and industry estimates, the costs to prune one-seventh of the public street, park, and golf course tree population (27,456 trees) would increase by $572,011. This requires the pruning of 3,922 trees annually—3,172 more trees than the current average. It should be noted that the costs associated with programmed pruning do not include the costs for tree removals among other management activities.

Alternatively, if the City were to secure an in-house arborist crew, it is estimated a two-person (FTE) crew would be able to prune approximately 3,654 trees annually (based on working hours and average pruning time per tree). For two full-time arborists the costs for salary and fringe benefits equate to approximately $168,000 annually (not including costs for fleet, operation and maintenance, or gear). This Plan recognizes the need for increased staffing in order to reach optimal pruning rotations. The Urban Forestry Program Staffing to Support Sustainable Management section details the necessary staff and added costs.

To summarize the analysis and calculations, 27,456 trees are along streets, in maintained areas of parks, or on the Maplewood Golf Course. A 7-year pruning cycle requires 3,922 trees to be pruned annually. Using the industry average of $180 per tree, the City would need a total annual budget of $706,011 to maintain this pruning rotation if it were to contract tree pruning, but with a two-person (FTE) in-house arborist crew, a 7.5-year pruning cycle can be achieved. The cost estimates for pruning do not account for the maintenance and management of the 89,528 trees in natural areas that occurs primarily along the wildland-urban interface and trails in the form of storm damage cleanup and removals.

Priority Maintenance Corridors

A complete overhaul of the public tree maintenance budget and the necessary staff to support a 7-year pruning rotation should be implemented using a phased approach. It is recommended the City identify priority roadways and neighborhoods for public tree maintenance based on density of trees in the rights-of-way, condition and maintenance history of trees, frequency of disadvantaged communities (e.g., lower than median income, housing value, and other factors), planned roadway construction, density of tree species requiring frequent maintenance, among other factors.

The following map provides an example of the potential priority street corridors for the City to consider to incrementally implement the 7-year pruning rotation. These corridors can also be the starting point for establishing the framework of the in-house arborist crew. The priority streets were identified using the public tree inventory dataset, the Tree Equity Scores of Census Block Groups, and the tree canopy cover within each Community Planning Area.

All Community Planning Areas except for Cedar River and Kennydale have Census Block Groups with a Tree Equity Score that is less than the recommended 80 out of 100. A total of 19 priority street corridors were identified. Based on this prioritization, approximately 2,626 trees would be maintained in the first cycle of proactive maintenance with 1,027 trees in City Center, 497 trees in Cedar River, 313 trees in Kennydale, 308 trees in Highlands, 197 trees in East Plateau, 194 trees in Valley, 40 trees in Benson, 35 trees in West Hill, and 15 trees in Talbot (Table 17). Given the large number of trees in City Center's priority streets, the Urban Forestry Program may decide to address only the trees in City Center rather than address all trees across Community Planning Areas until adequate funding is secured. Tree maintenance should be addressed in these areas first— as funding permits— until adequate funding is secured and the in-house arborist crew is established.

Recommended Public Tree Pruning Rotation

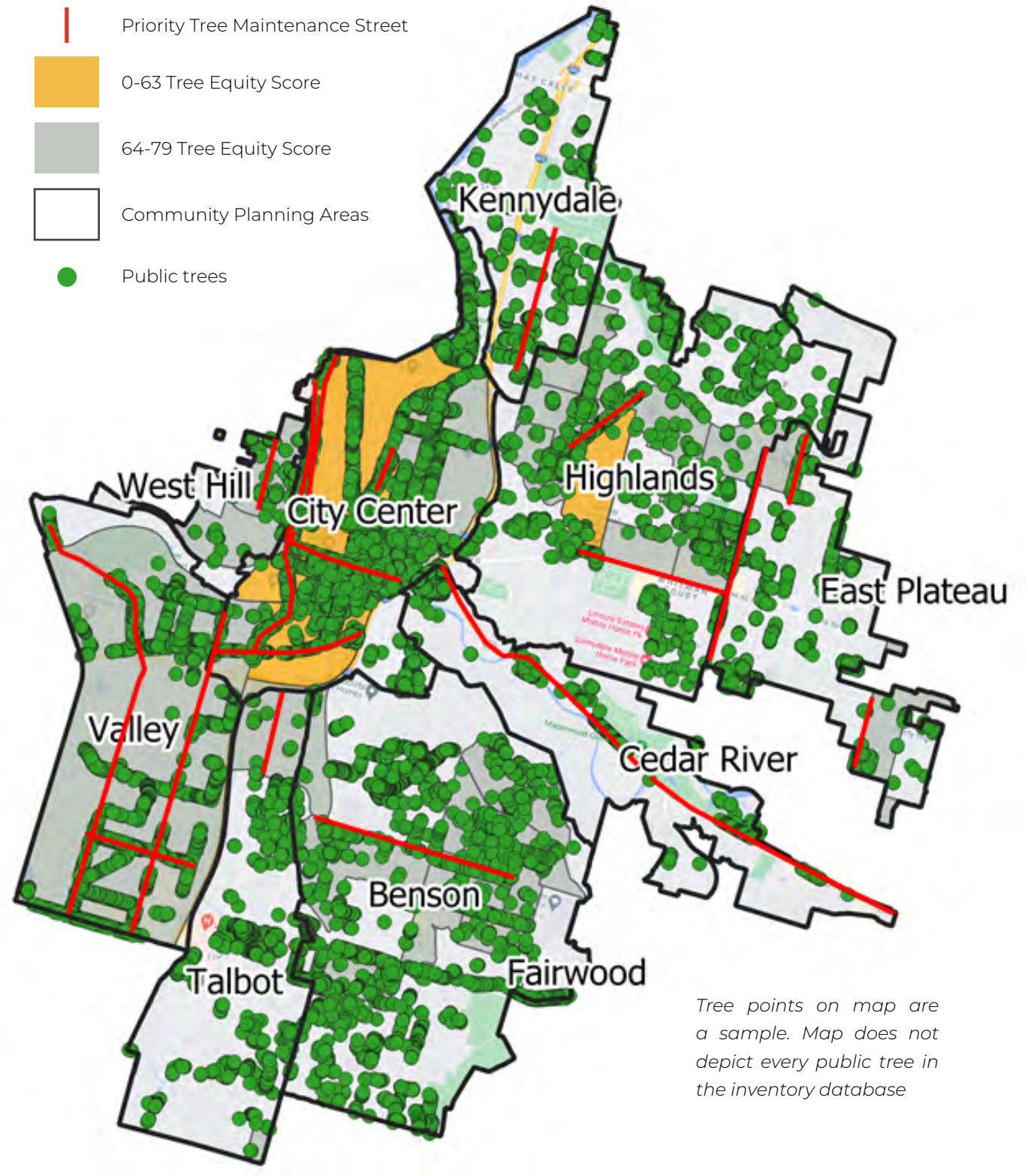


Figure 26. Recommended priority tree maintenance by street corridor and planning area

Table 17. Recommended streets for priority tree maintenance by Community Planning Area

Community Planning Area	Priority Street Corridor	Tree Count
Valley	SW 34th St Oakesdale Ave SW Lind Ave SW	108 trees 26 trees 60 trees
Talbot	Shattuck Ave S	15 trees
Benson	SE 164th St	40 trees
Cedar River	(No low TES areas) Maple Valley Hwy	497 trees
East Plateau	Hoquiam Ave NE 156th Ave SE Duvall Ave NE	86 trees 19 trees 92 trees
Highlands	NE Sunset Blvd NE 4th St	154 trees 154 trees
Kennydale	(No low TES areas) Aberdeen Ave NE	313 trees
West Hill	Stevens Ave NW	35 trees
City Center	W Perimeter Rd Logan Ave N S Grady Way Rainier Ave N Rainier Ave S 2 2nd St	380 trees 281 trees 113 trees 33 trees 125 trees 95 trees
Tree Count Total		**2,626 trees**

Public Tree Maintenance Recommendations

The Urban Forestry Program should continue to maintain its inventory of public trees to prioritize tree maintenance and removals and to inform future tree plantings. Nearly half of the public tree population's overall health is in fair condition and only a third is in good condition. Shortening the pruning cycle for all public trees would likely improve the condition of the trees, reduce clearance issues, and improve public safety. A 7-year pruning cycle is the optimal rotation. A shorter timeframe has a higher cost to a city but does not correlate to a proportional increase in safety. Conversely, a longer timeframe lowers costs to a city, but also decreases tree health, public safety, and depletes urban forest ecosystem benefits. A 7-year pruning cycle would require the pruning of 3,922 trees per year— an increase of 3,172 trees compared to Renton's current average number of trees pruned annually. The total annual budget required for a 7-year pruning cycle is estimated at $706,011 if contracted and does not include the maintenance and management of trees in natural areas. An in-house arborist crew of two full-time employees would cost the City $168,000 annually for salary and fringe benefits (not including fleet, gear, or operations and maintenance costs) and the staff would be able to prune the 27,456 street, park, and golf course trees on a 7.5-year cycle. It is recommended the City make incrementally progress towards a 7-year pruning cycle by prioritizing street corridors in each of the City's Community Planning Areas and prune as many trees as the budget allows.

URBAN FORESTRY PROGRAM STAFFING TO SUPPORT SUSTAINABLE MANAGEMENT

When it comes to program staffing, many cities struggle with the issue of being understaffed. The programs may be fulfilling their duties within the limited staffing and resources but they are not performing services that fully capture sustainable urban forest management. Determining and maintaining optimal staffing levels is critical to a program's efficiency. Optimal staffing depends on several factors including number of public trees, authority and responsibility defined in municipal code, internal and external expectations, customer service (i.e., the public), operations, and existing programs. The concept of being understaffed also plays a critical role in employees' behaviors, attitudes, and directly affects individual productivity. If a program is understaffed, it typically encounters excess overtime, morale issues, absenteeism, employee burnout, and have a difficulty with relief coverage and training requirements.

One of the most effective techniques for a city to utilize in determining the optimal staffing level is to complete an area workload assessment by looking at the number of public trees managed divided by the total number of staff and using the ratio as a comparison to industry standards and averages for communities of similar size. The following section provides this analysis and a recommendation for optimal staffing.

Urban Forestry Program Staffing Levels Compared to Industry Recommendations

The number of staff available to perform annual tree maintenance, inspections, and ordinance / policy enforcement is a critical element of a sustainable forest. To measure whether staffing is at a level where sustainable management can occur, the ratio of staff to the number of public trees is often used. Based on research and industry standards, the optimal ratio for public tree maintenance is 1 staff for every 2,000 trees. A less aggressive ratio of 1 staff for every 10,000 trees is also found in the research. But, according to the 2014 Urban and Community Forestry Census of Tree Activities (Hauer et al. 2014), communities with a population between 100,000 to 249,000 people have an average of 11.8 full-time employees for urban forest management (tree maintenance and all other services). Communities with a population of 50,000 to 99,999 people have an average of 6.3 full-time employees.

For Renton, assuming all tree maintenance would be done in-house rather than contracted, the Urban Forestry Program's arborist crew should contain at least two staff (1 staff for every 10,000 trees managed of 27,456 street and park trees). Currently, the Urban Forestry Program has a total of 2.50 full-time employees consisting of the full-time Urban Forestry and Natural Resources Manager (1.00), a full-time Contracted Inspecting Arborist (1.00), a part-time Supervisor (0.25), and a part-time Administrator (0.25). It is assumed the City would still need to contract very large tree removals.

Alternatively, the City may continue to contract tree maintenance and removals but supplement the program with one arborist crew on a less rigorous tree pruning cycle. With the contracted tree maintenance budget and one arborist crew, the public tree population (street and park trees) could be pruned on a 7-year rotation. This would require a total of two arborists though it is recommended a crew supervisor and a seasonal staff member also be considered in the future. The estimated costs for salaries, fleet/equipment, operation and maintenance, and gear are provided in the following table.

Table 18. Estimated staff and associated costs to maintain public trees on a 7-year rotation

Recommended Staff	Hours per Staff	Cost per Hr per FTE	# of New Staff	Total Cost	Estimated Cost per Staff
B) Arborist	2,088	$40.23	2	$168,000	$84,000
Subtotal	**--**	**--**	***2***	***$168,000***	***$84,000***
Equipment	**Hours**	**Cost/Unit**	**# of Units**	**Total Cost**	**Annual Cost**
F350 or equivalent pickup *with dump bed, flasher kit, extended cab, HD tow kit*	1	$60,000	1	$60,000	--
F350 Pickup hours (O&M)	1,000	$16.94	1,000	--	$16,940
Vermeer 1800 brush chipper *with winch*	1	$55,000	1	$55,000	--
Chipper hours (O&M)	1,000	$16.94	1,000	--	$16,940
Terex High Ranger bucket truck *with 60+ foot boom length*	1	$250,000	1	$250,000	--
Bucket truck hours (O&M)	1,000	$16.94	1,000	--	$16,940
Mid-size Vermeer stump grinder *SC 382 or equivalent*	1	$30,000	1	$30,000	
Stump grinder hours (O&M)	1,000	$16.94	1,000	--	$16,940
Heavy duty equipment trailer *Capable of hauling trees or stump grinder*	1	$10,000	1	$10,000	
Equipment trailer hours (O&M)	1,000	$16.94	1,000	--	$16,940
Watering rig (500+ gal) *Palettized or tow-behind, with pump and hose reels*	1	$2,000	1	$2,000	
Watering rig hours (O&M)	1,000	$16.94	1,000	--	$16,940
Subtotal	**--**	**--**	**--**	***$410,000***	***$101,640***
Gear	**Hours**	**Cost/Unit**	**# of Units**	**Total Cost**	**Annual Cost**
PPE	--	$200	2	$400	$150
Uniforms	--	$250	2	$500	$188
Chainsaw	--	$800	2	$1,600	$400
Rake	--	$25	2	$50	$13
Shove	--	$25	2	$50	$13
Brush Bucket	--	$40	2	$80	$20
Cart	--	$50	2	$100	$25
Other (e.g. blower)	--	$500	2	$1,000	$250
Subtotal	**--**	**--**	***16***	***$3,780***	***$1,058***
TOTAL COST				**$581,780**	
ANNUAL COST					**$270,698**

Table 19. Summary of costs

Line Item	Cost
Annual Staff Cost	$168,000
Vehicle and Equipment Purchase	$410,780
Annual Operating Costs (supplies, clothing, equipment, rental, etc.)	$102,698
Annual Training, Certifications, and Membership Costs	$2,000

Urban Forestry Program Staffing Recommendations

Based on the needs of Renton's public tree population, industry standards, and benchmarking research of analogous communities, it is recommended the City secure an in-house arborist crew of two arborists and consider supporting the crew with a crew supervisor and seasonal technician in the future. This recommendation is in alignment with the Task Force's recommendation in the 2009 Urban and Community Forestry Development Plan. This would enable the City to prune the public street and park tree population on a 7-year rotation (3,900 trees per year). With an in-house crew, the budget for contracted tree maintenance and removals should be focused on annual large tree removals (300 per year on average) and other contracted services outside of routine tree maintenance.

The estimated initial cost for an in-house arborist crew including fleet, equipment, and gear is $581,780 with an annual cost of $270,698 (plus an additional $2,000 for annual trainings, certifications, and membership costs). The annual cost accounts for salary and fringe benefits, equipment operation and maintenance (O&M) costs, and gear replacement.

The 2009 Task Force agreed on the importance of a dedicated full-time city arborist crew. The greatest advantages of an in-house crew are in relation to emergency storm damage response and accomplishing tree work for other emergency situations when contract crews are unavailable. The arborist crew would prune all street and park trees on a 7-year rotation and would also be responsible for the management of all trees on public grounds— street, park, properties, and natural areas. Other City crews could supplement the arborist crews for special projects such as pruning trees along sweeper routes in the winter using Public Works staff . The arborist crew would provide support for other nontree related activities whenever their equipment might be needed such as assisting Public Works with installing banners or backing-up other City departments such as Parks & Trails crews when needed.

The Funding Mechanisms section of the Plan provides considerations for funding the in-house arborist crew. It is recommended the City explore feasible near-term feasible such as using approximately 75% of the operating budget to fund the two new FTEs and converting the inspecting arborist contract ($157,000) to a further FTE. The City's ARPA (American Rescue Plan Act, 2021) funds could potentially support the fleet for the arborist crew. As shown in the table below, to achieve a 7-year pruning cycle for public trees, the City can deploy an in-house arborist crew of two full-time employees and reduce costs compared to contracting all programmed pruning.

Table 20. Comparison of in-house and contracted pruning for a 7-year public tree pruning cycle

	In-House Arborist Crew	Contracted	Difference
Annual Public Tree Pruning (~3,900 trees/year)	$272,698	$705,960	($433,262)

Program Budget Final Recommendations

In the Urban Forest Management Plan, guidance for proactively pruning public trees on a 7-year cycle, establishing an in-house arborist crew, finalizing tree canopy goals, and achieving planting targets is provided. To accomplish these recommendations that improve overall urban forest sustainability and tree equity across neighborhoods, the City should evaluate its current and necessary budgets for the Urban Forestry Program. The following table outlines the potential costs and the budget necessary to support full implementation of the Plan:

Table 21. Summary of the current and future Urban Forestry Program services and budgets

Line Item	Current Annual Budget	Future Annual Budget	Future Budget Notes
Purchasing Trees & Related Planting Supplies	$15,000	$85,500	570 trees per year at $150/tree
Planting Trees	$35,000	--	Led in-house
Contract Pruning	$134,000	$134,000	Contractor support
Pest Management	$5,000	$5,000	Continued management
Removal	$85,000	$85,000	Contractor-led
Storm Damage On-Call / Debris Clean Up	$70,000	$70,000	In-house support
Professional Services	$100,000	$100,000	May reduce until new services needed (e.g., updated inventory and management plan)
Contract Landscape Watering	$100,000	$100,000	Continued management
Consulting Arborist Inspection Services	$157,000	$157,000	Continued management
Administration	$250,000	$256,309	Adjusted for 2022 (see Table 9)
In-House Arborist Crew Annual Cost	--	$272,698	~3,900 trees pruned/year, includes salary, fringe, and O&M Costs
Totals	**$951,000**	**$1,265,507**	**$314,507 increase from 2021**

The table above summarizes the 2021 Urban Forestry Program budget and services compared to the recommended budget for planting, in-house maintenance, and all other services listed. To achieve the long-term tree canopy goal of 33%, a total of 570 City-led plantings are needed which can be completed in-house with the new arborist crew. Given the in-house arborist crew would prune approximately 3,900 public trees per year for a 7-year pruning cycle, it is likely the Contract Pruning budget could be reduced and the rate of removals will likely decrease due to enhanced maintenance. In addition, the Professional Services budget may decrease until updated services are needed such as an updated public tree inventory and updates to this management plan. Lastly, the Contract Landscape Watering budget may decrease since it is recommended the City purchase a watering rig for the in-house arborist crew. With the budgets listed in the table above, there is an overall budget increase in the amount of $314,507, but as stated earlier, the amount of increase may be reduced by adjusting budgets of particular line items.

WORKFLOWS AND STANDARD OPERATING PROCEDURES

Consistent protocols are needed for impervious surface conflicts, sidewalks specifically, along with budgetary considerations. Poor historic tree species selection, the growth of the trees, and the size of some planting sites has resulted in multiple locations around the City where the infrastructure conflict is a result of the trees outgrowing their space causing surface upheaval and basal flare. Currently, neither Urban Forestry nor Public Works has the means in terms of staffing or resources to deal with replacing all the trees and sidewalks on their own, but the mandate by the Americans with Disabilities Act (ADA) to eliminate all sidewalk hazards remains. Updated protocols between Public Works, Parks & Trails crews, and the Urban Forestry Program are needed where the conflict is addressed using a joint approach. Updated protocols would require a dedicated fund.

The City of Renton Walkway Program provides for the removal and replacement of existing curb and gutter, sidewalks, and curb ramps, where such facilities have deteriorated or have been damaged and is also responsible for new installations. There are many older neighborhoods with damaged or deteriorated infrastructure or lacking curb ramps up to current ADA standards. These deficiencies are being addressed by this program to provide safe and convenient non-motorized facilities for pedestrians but the funding averages $250,000 which is less than adequate to fully comply with ADA requirements. More recent assessments of meeting needs for compliance are substantial. Impacts of other infrastructure upgrades, such as widening lanes for buses, which impact street trees should be more thoughtfully planned and designed. It is not a sustainable practice to simply remove mature trees and replant on a one for one basis.

The management practice to actively address hazards within the public right-of-way by repairing sidewalks and removing and replacing trees as needed is important to provide mobility throughout the City and maintain canopy cover. Often, root pruning is the main approach to preserve a tree and fix a sidewalk, but this practice comes with the potential to impact tree health and tree longevity. If a tree cannot be safely preserved after root pruning, it requires removal. However, alternative materials and methods are becoming more common to repair sidewalk issues in lieu of tree removal. New sidewalk materials and technologies can be used that reinforce the structural integrity of concrete to allow tree roots to grow underneath sidewalks and increase useful longevity like suspended pavement systems and structural soils. In some cases, tree planting areas can be expanded to allow more growing space like meandering sidewalks, bulb-outs, or increased tree well sizes. All of these methods should be within the solutions “toolbox” before tree removal is allowed, but they are not all currently codified as available City options and agreed upon by City staff as acceptable City standards. Therefore, Appendix B, provides the draft framework for tree and sidewalk conflicts and alternative solutions for the City to consider.

Recommendations for Tree and Sidewalk Conflicts

The City should formally adopt the decision checklist and protocols provided in Appendix B and include alternative solutions in design guidelines and standards. Alternative solutions may offer cost savings in some instances though generally, the City’s Walkway Program is underfunded. In most Washington cities that are responsible for sidewalk repair and replacement, funding comes from the General Fund or through a ballot-approved Sales and Use Tax. Sales tax rates for funding sidewalk programs average 0.2%. In Seattle, the responsibility is placed on the adjacent property owner but the “Levy to Move Seattle” was approved by voters in 2015 to help fund sidewalk maintenance and improvement projects. In addition to local funds, Seattle also seeks state or federal grants. Grant funding may be available for sidewalk repair but is not a consistent long-term option. One local example of a grant to fund the program is in Sumner where Sound Transit is funding sidewalk replacements as part of their station access improvement grant, costing approximately $1.4 million.

Other funding options or mechanisms include special citywide assessments, bonds, improvement districts, gas tax, or tax incremental financing. In Cheney, a voter-approved tax on electrical and natural gas services funds maintenance of residential streets and sidewalks. The 4% electric and natural gas tax generates roughly $380,000 annually. Whenever new development triggers frontage improvements there are opportunities for improved street tree planting and would be an appropriate time to levy enhanced use fees.

The City should explore these options such as the Sales and Use Tax option if General Funding is not available to fully cover sidewalk repair and replacement per ADA requirements. The alternative is to place the responsibility of sidewalk repair and replacement on the adjacent property owner. This option may not sit well with property owners and would likely require a permitting system. An example is in Seattle again where it is the property owner's responsibility unless the sidewalk damage is caused by City infrastructure such as a City-owned tree or sewer line. In this scenario, the City takes the responsibility for making the repairs.

Source: City of Renton, WA 2009 Urban and Community Forestry Development Plan

TREE CANOPY COVER GOALS

To guide efforts towards the urban forest vision, communities with tree canopy assessment 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 Renton, the planning consultants conducted an analysis of tree canopy cover data and Tree Equity Scores (TreeEquityScore.org) to develop draft canopy goals that would increase canopy cover and address tree equity. This section provides the guidance to refine the goals, establish incremental targets, and formally adopt a Citywide canopy goal that is shared by the City, its partners, and all property owners within Renton. 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% in northwestern communities and in 1997, the American Forests organization established a benchmark of 40% 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% urban tree canopy is attainable under ideal conditions in forested states. 20% in grassland cities and 15% 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).

City and Zoning Type Tree Canopy Goals

The following presents the proposed canopy goals though the City and partners should evaluate and refine these for approval by staff and City Council.

For the City of Renton, the development of canopy goals was driven by tree canopy cover data, benchmarking research, Tree Equity Scores, analysis of existing and potential resources, City input, and community feedback.

Using this integrated approach, the City of Renton's ambitious and achievable goal is **33% tree canopy cover in 20 years (2042)**, with an intermediate goal of **30% by 2032**. To achieve this, the City must preserve the existing canopy and increase its coverage by four percent, **up from 29%,** and plant approximately 950 trees annually or a total of 19,000 trees. These new trees would collectively grow the canopy throughout the City to an area equivalent to nearly 415 football fields and would provide additional ecosystem services and benefits in the amount of approximately

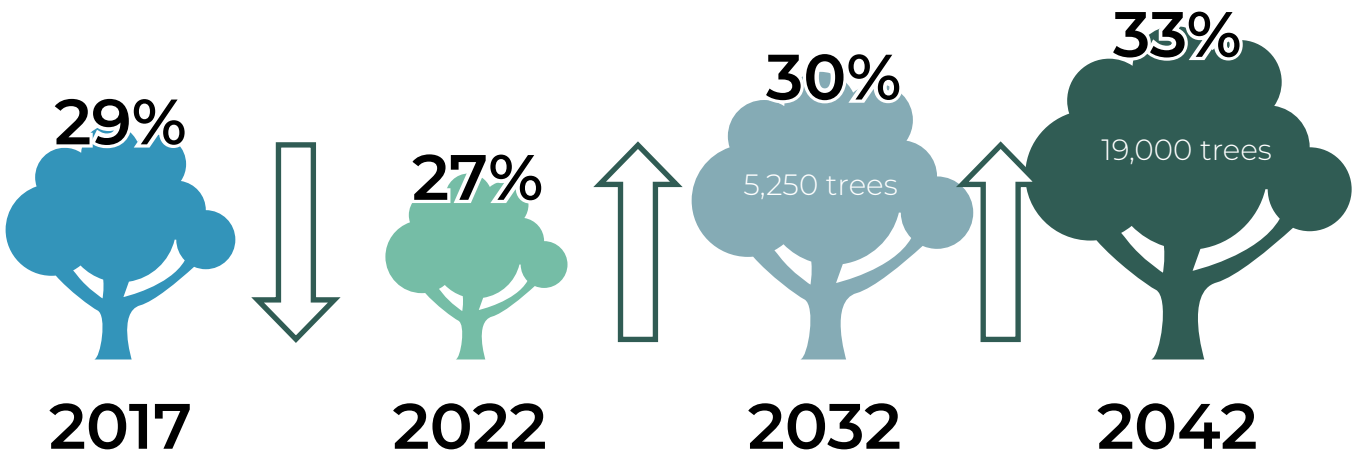
$215,000 annually. These calculations and estimates are based on industry research and practices though there are some assumptions including;

- A no-net-loss strategy, meaning the number of public trees removed along with removals on private property or through development are replaced.
- Trees that mature into large canopy-bearing trees are planted wherever feasible. Calculations use an average tree canopy diameter of 40 feet equating to a surface area of 1,257 square feet.
- Includes City-led, partner, volunteer, and private tree plantings. In this study and canopy goal scenario, **it is recommended the City plant 60% of the necessary trees or approximately 570 trees per year**.
- The City only has approximately 1,700 public street planting sites available as of the 2021 inventory so new planting sites will need to be created by converting impervious surfaces to planting sites and/or planting in parks and natural areas.
- Assumes a potential for young tree mortality post-planting.

Within the framework of this Urban Forest Management Plan 10-year Update, an intermediate tree canopy cover goal after year 10 was also drafted. By the end of the year 2032, if the City as a whole were to plant 525 trees each year for 10 years, a total of 5,250 trees would be planted resulting in an increase in canopy to 30%, up from 29% currently. Again, using the 60-40 split regarding tree planting numbers and allocation, the City would plant 3,150 trees in 10 years. The overall added benefit from City-, partner-, and community-led plantings after year 10 is estimated at nearly $60,000 annually once the trees are all established. To achieve these goals, the existing tree canopy must be preserved through policy enforcement, property owner education, proper tree maintenance, pest and disease management, soil conservation/protection, and urban forestry oversight on site designs and plans.

Proposed Tree Canopy Cover Goals

Figure 27. Renton's 10-year and 20-year canopy goals



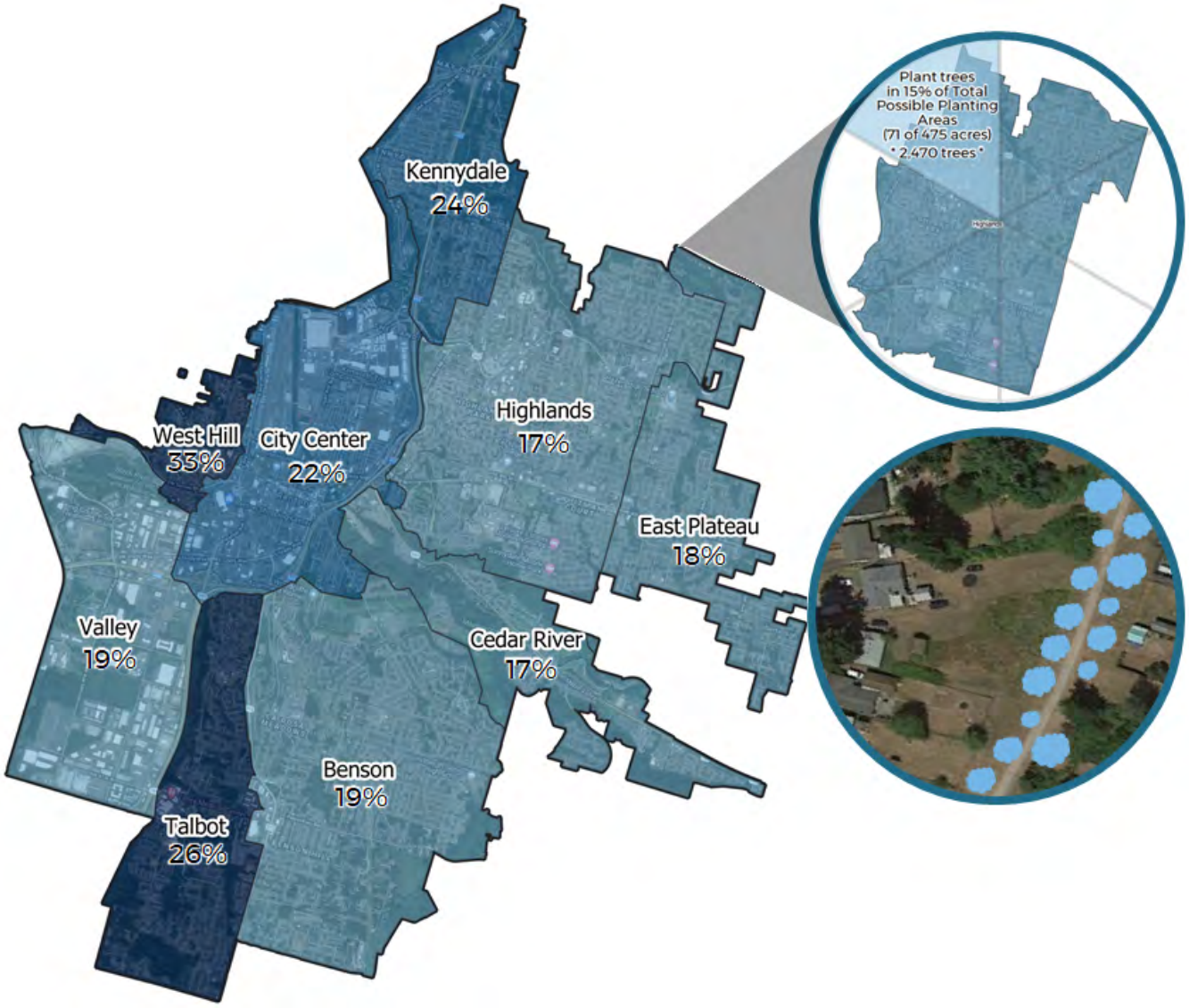
The following provides the calculated process of establishing the 20-year canopy goal for Renton: The amount of tree canopy cover and available planting space was analyzed by City Zoning Type and Community Planning Area. A percentage of total possible planting area (vegetative and impervious) to be planted was assigned to each Zoning Type and Community Planning Area based on the total amount of plantable space, the existing canopy, limitations of the Zoning Type/Planning Area, available resources, and other City needs. This approach realizes the unique opportunities, limitations, extent, resources, and characteristics found among various city zoning classes and planning areas. 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.

Table 22. Long-term tree canopy goals (by 2042) and planting targets by Community Planning Area

Community Planning Area	Total Possible Planting Area (%)	% of Total Possible Planting Area to be Planted	Modeled Canopy % (% of total PPA)	Number of Trees to Reach Goal	Annual Added (Net) Eco-Benefits ($)
Benson	19%	15%	33%	2,868	$32,525
Cedar River	17%	15%	49%	1,094	$12,407
City Center	22%	20%	18%	2,933	$33,262
East Plateau	18%	20%	33%	1,666	$18,891
Highlands	17%	15%	28%	2,470	$28,011
Kennydale	24%	20%	38%	1,795	$20,360
Talbot	26%	20%	44%	2,578	$29,233
Valley	19%	20%	33%	2,570	$29,148
West Hill	33%	20%	38%	877	$9,947
Totals			**33%**	**18,852**	**$213,783**

Planting Targets to Identify Canopy Goals

Figure 28. Map displaying the Possible Planting Area by Community Planning Area and an example of PPA planting targets in Highlands



Priority Planting Areas to Achieve Canopy Goals and Tree Equity

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. Themes may include ownership type (public and private), areas of low existing tree canopy, Tree Equity Scores (TreeEquityScore.org), and greatest amount of available planting space while 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 Block Groups, Zoning Type, Community Planning Areas, and Citywide.

Using the 2018 Tree Canopy Assessment, the regional TreePlotter CANOPY software application (pg-cloud.com/KingCD-Cities), and analyses in a Geographic Information System (GIS), a series of recommended prioritization techniques is provided. The description of the prioritization techniques and scenarios is provided below followed by a series of corresponding priority maps.

- Census Block Groups (CBGs) with the greatest possible planting area. CBGs with the highest percent of total area available for possible planting. Includes vegetative and impervious possible planting areas.
- CBGs with low amounts of tree canopy cover. CBGs with the lowest percentage of existing tree canopy cover.
- Tree planting in Census Blocks to reduce stormwater runoff. Trees can be integrated to help manage stormwater, specifically when targeting impervious surfaces. This indicator uses available planting area on impervious surfaces and available planting areas within 100 feet of all surface water bodies.
- Tree planting in neighborhoods with high populations of minorities. Tree canopy is negatively correlated with the percentage of minority residents. Planting trees in communities with higher percentages of minority residents can support environmental equity.
- Tree planting in neighborhoods with underserved populations. Tree canopy is positively correlated with higher median income. Planting trees in lower income communities can support environmental equity. CBG suitability is based on the percentage of residents living below the poverty level.

View the maps on the following pages for examples of the listed planting priority techniques.

Priority Planting Areas: Addressing Available Planting Space

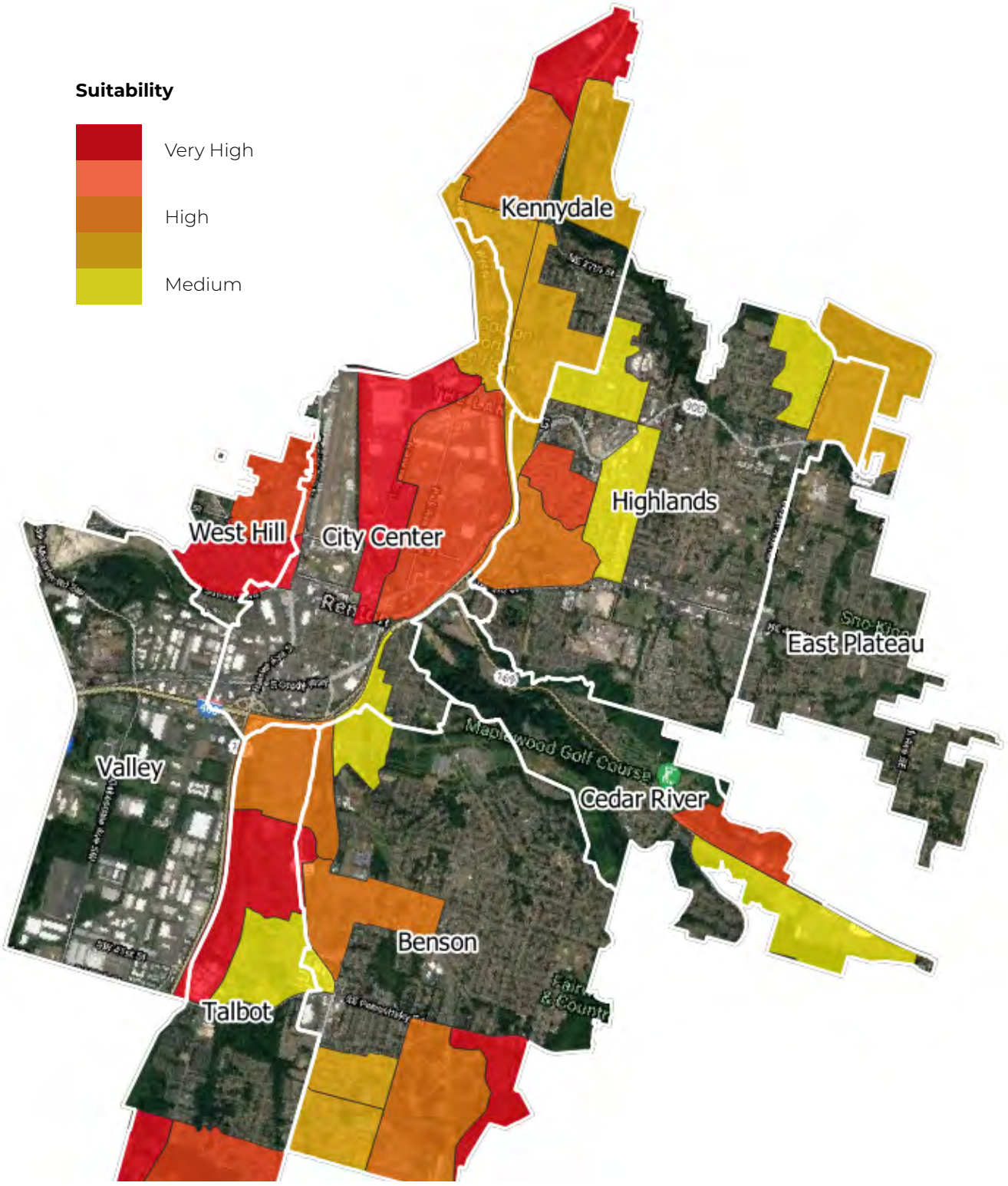


Figure 29. Map displaying the Census Block Groups most suitable for trees due to high possible planting area

Priority Planting Areas: Addressing Low Existing Tree Canopy Cover

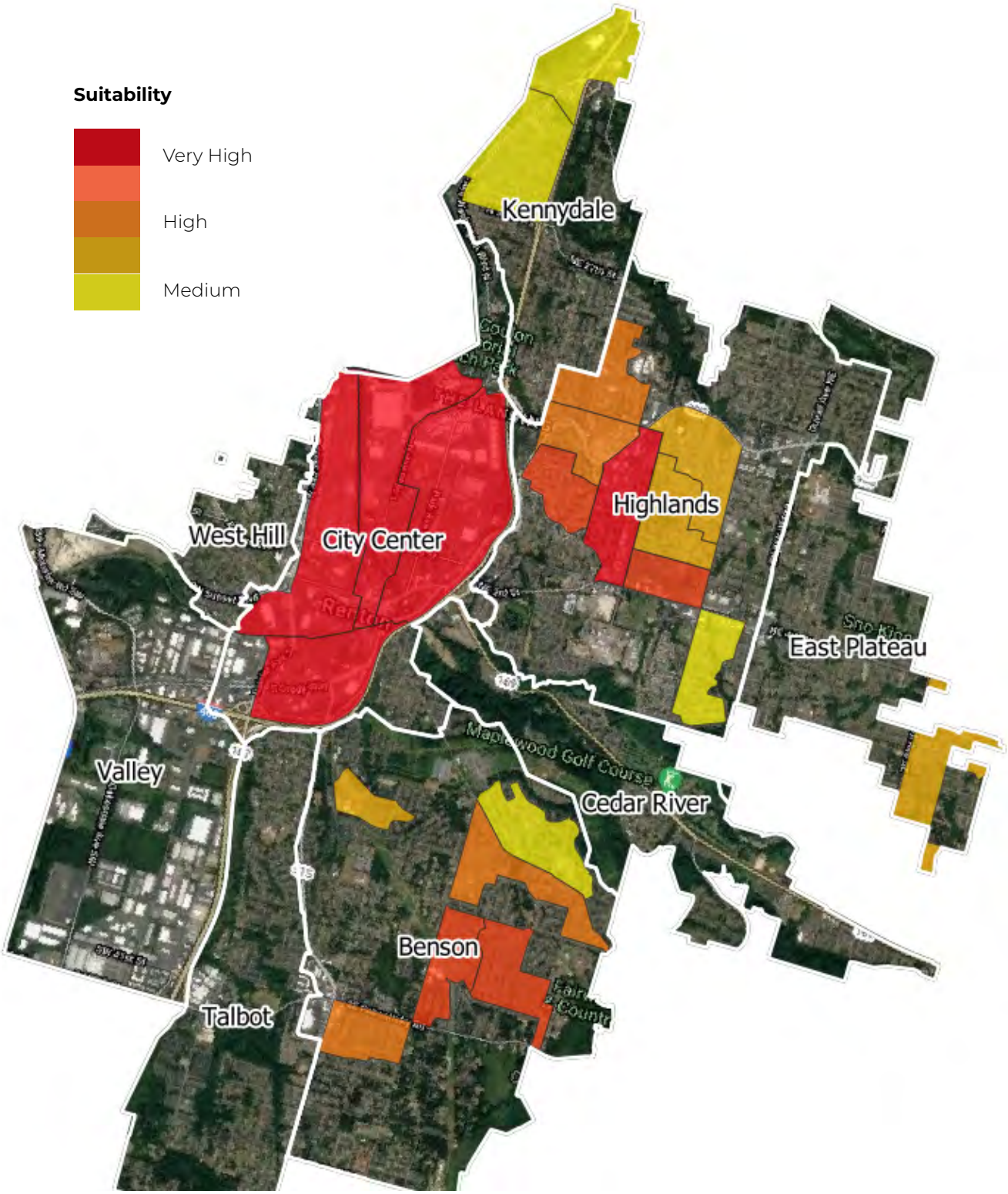


Figure 30. Map displaying the Census Block Groups with the lowest existing tree canopy cover

Priority Planting Areas: Addressing Stormwater Runoff

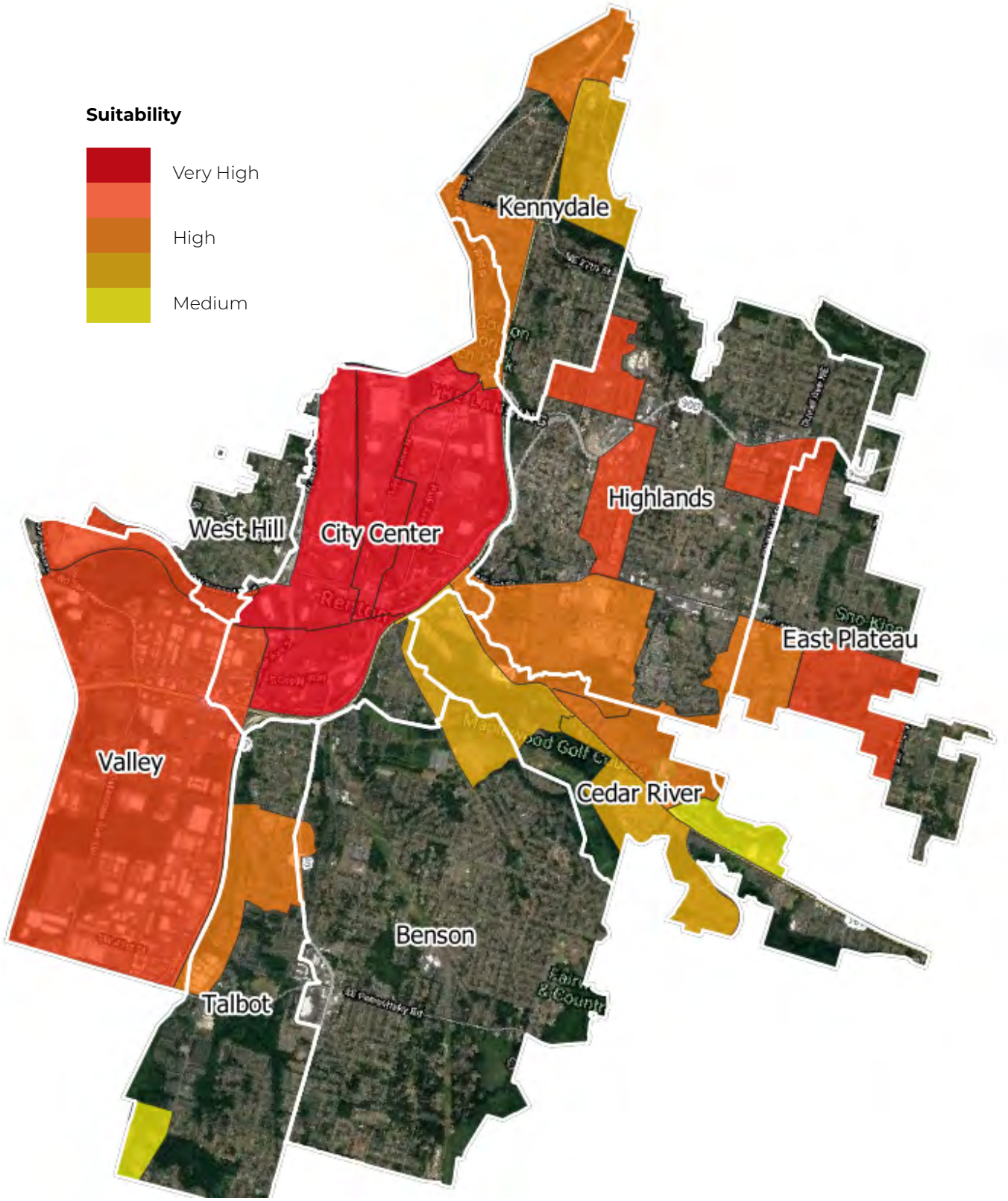


Figure 31. Map displaying Census Block Groups most suitable for tree plantings to address stormwater runoff

Priority Planting Areas: Addressing Tree Cover in Minority Neighborhoods

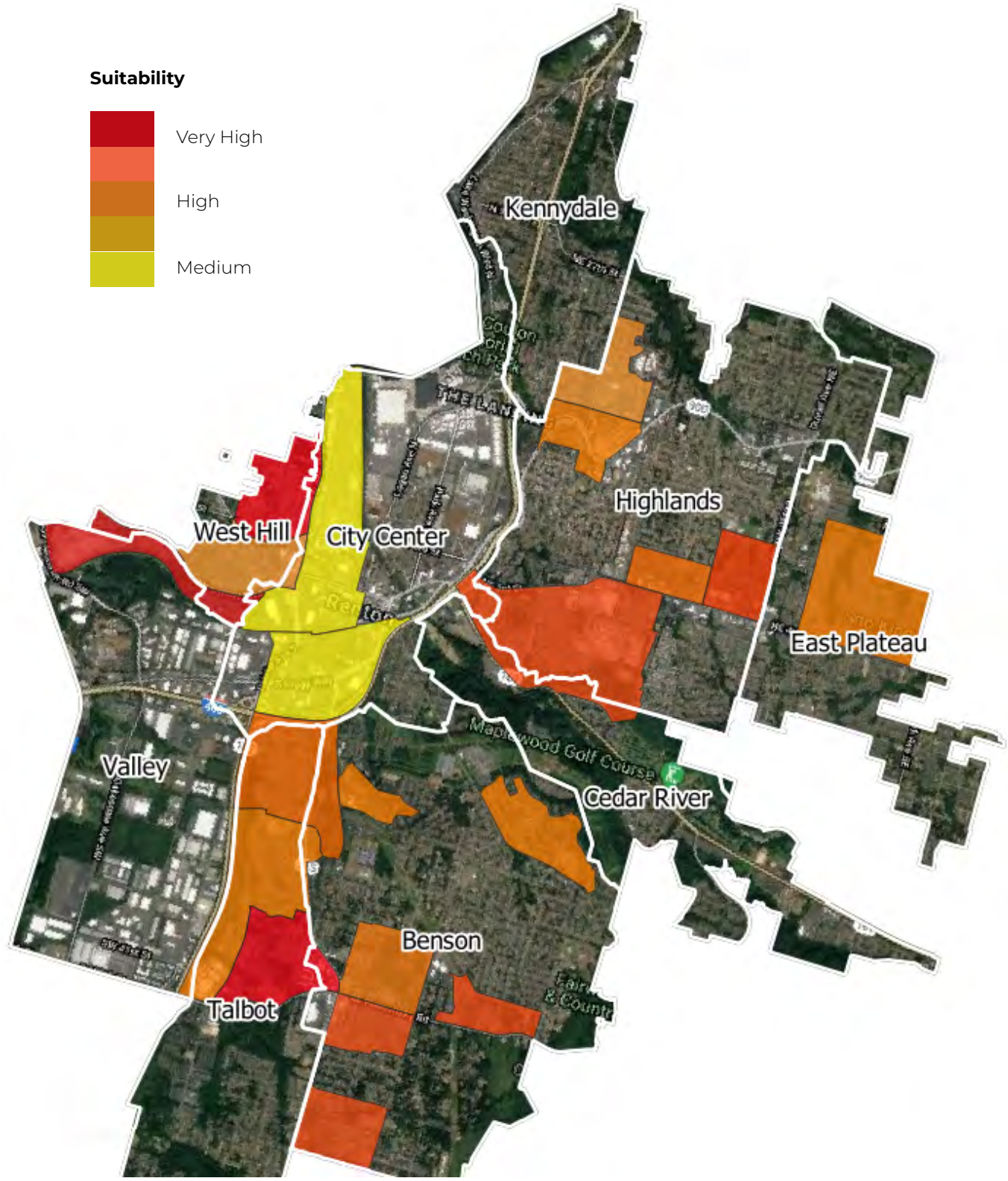


Figure 32. Map displaying higher concentrations of minority populations for increasing tree canopy cover

Priority Planting Areas: Addressing Tree Cover in Underserved Neighborhoods

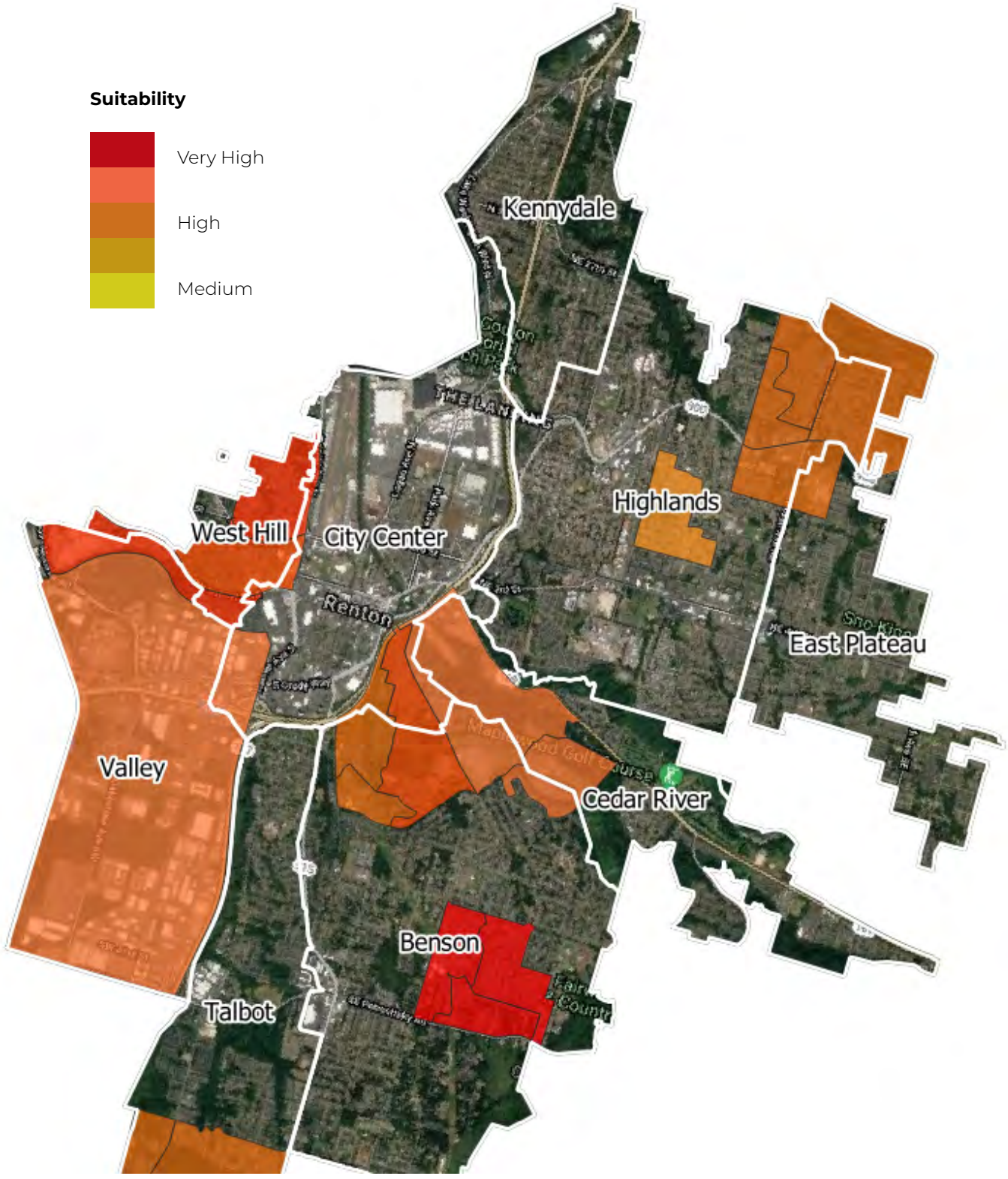


Figure 33. Map displaying Census Block Groups with underserved populations for increasing tree canopy cover

Recommendations for Tree Canopy Cover Goals

Cities around the world are using tree canopy goals, usually in the form of percent tree canopy cover, to guide urban forest management and meaningfully improve the livability of their communities. Urban tree canopy (UTC) is ideal for goal setting because it can represent the complex distribution and benefits of an urban forest within a single metric. Urban tree canopy goals must walk a careful line of ambition, inspiration, and practicality.

Measuring, tracking, and improving urban tree canopies is an essential component of sustainable urban living. As the world's population continues to urbanize the value of healthy UTC is only going up. Unfortunately, the global urban canopy trend is moving in the opposite direction. A worldwide analysis showed urban forest cover on average is slightly, but significantly decreasing. The United States is also losing urban tree canopy, to the tune of 175,000 acres or 36 million trees a year. That represents a loss of $96 million in tree benefits a year, and those benefits, like heat reduction and public health improvements, are growing in necessity.

Urban tree canopies are in perpetual motion as growth and regeneration push against destructive forces, both natural and anthropogenic. These include development expansion, old age, disease, pests, and fire. Reversing this course starts with knowing the extent of the urban tree canopy and then establishing a goal for growth. "By knowing the amount of and direction in which urban tree cover is moving, urban forest management plans can be developed to provide desired levels of urban tree cover and forest benefits for current and future generations." (Nowak, et al. 2018)

For Renton, before setting and adopting a tree canopy cover goal, the current coverage must be understood using the latest Urban Tree Canopy assessment. The 2018 UTC assessment provides the baseline data for the urban forestry consultants and the City to establish recommended canopy goals and tree planting priorities or targets.

Based on the assessment data, City input, community feedback, and benchmarking research the recommended tree canopy goals for the City of Renton are provided in the following table:

Table 23. Summary of the recommended tree canopy goals and planting targets for Renton

	Goal Metric	Current Canopy (2017)	Short-Term Canopy Goal	Long-Term Canopy Goal
	Canopy %	29%	30%	33%
	Goal Year	--	2032	2042
Total Trees to Reach Goal	**City-Led**	--	**3,150**	**11,400**
	Public-Led	--	**2,100**	**7,600**
	Total Trees	--	*5,250*	*19,000*
Total Trees per Year to Reach	**City-Led**	--	**315**	**570**
	Public-Led	--	**210**	**380**
	Total Trees per Year	--	*525*	*950*
	Future Added Benefits	--	$60,000	$215,000

UTC assessments should be a periodic process and research recommends conducted follow up assessments every 5 to 8 years to track canopy change, assess performance, and adapt priorities to changing needs and budgets. Tree planting priority areas should be revisited annually and informed by the public, new data, analysis, available resources, and other factors.

TREE PLANTING INITIATIVE

Tree planting is critical to the health and longevity of Renton'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 initiative guided by 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.

An effective tree planting initiative and program address three main questions: where to plant, what to plant, and how to plant? It is important to develop an overall planting strategy where the initial planting efforts are concentrated on streets and areas with the greatest need for improvement. Tree species and planting location designations are significant components of a municipal tree care program because of the long-term impact of these decisions. Success of a continuing tree planting program will be judged by the health of the trees after planting and the amount of money spent on planting and maintaining the new trees. With a small amount of planning, healthy trees with greater life expectancy can be established with minimal up-front investment and relatively minor maintenance costs.

This Tree Planting Initiative provides guidelines for the implementation of an organized and comprehensive tree planting strategy that results in the prioritization of tree planting locations and the expansion of Renton's urban tree canopy within the confines of available resources. Information on suitable planting locations in the City is provided in the previous section and general recommendations on choosing suitable trees for each site follow.

Where to Plant

There are numerous opportunities to plant more trees on public property in the City of Renton. Historically, the locations of new tree plantings on City-owned rights-of-way in Renton have been based on constituent requests, the replacement of dead or dying trees (where feasible), and project-specific plantings (e.g., streetscape improvement projects). With the updated tree inventory, City managers now also know the exact location of additional planting sites that are available throughout the City. Renton's street and park tree inventory includes 1,789 available planting sites as of January 2021. Moreover, the development of a prioritization scheme based on canopy data allows the City to begin significant tree planting efforts in high priority areas of the City.

According to the January 2021 inventory analysis report, the current stocking level is 93.5%, based on a total 27,561 suitable planting sites, including 25,772 trees, 1,315 vacant sites, and 474 stumps. "Stocking" is a traditional forestry term used to measure the density and distribution of trees. In this case it means that, of the total number of available planting sites identified in the tree inventory along the public right-of-way, 93.5% currently have a tree present. Note that this value only considers the currently available planting areas along the street right-of-way, and not impervious surfaces that could become planting locations. Moreover, this value does not incorporate potential planting locations in parks or other civic spaces. Of the total public trees in the inventory, 724 trees were recommended for removal (in 2021 inventory analysis report). These recommended removals represent a future increase in total number of potential planting sites. An important benchmark in maintaining a sustainable urban forest is to keep it at least 90% stocked, such that no more than 10% of the existing planting sites remain vacant. The City should make every effort to budget for tree planting in the future to maintain the urban forest at least 90% stocked and to continue increasing its canopy.

Planting locations throughout the City were identified and prioritized as part of the urban tree canopy analysis (Priority Planting Areas to Achieve Canopy Goals and Tree Equity Section). Potential planting locations included all viable areas of the City that were classified as grass/open space, impervious (parking lots), and bare ground in the urban tree canopy analysis.

Tree Planting Parameters

Trees are an important part of the City, but they must coexist with various other aspects of the built environment. To provide ample space for a growing tree while also maintaining public safety and protecting other City infrastructure, the City should use the following minimum guidelines when choosing new planting locations:

- New tree wells in existing sidewalks provide a minimum of 18 square feet of open soil (ex. a 3' x 6' tree well).
- New tree wells in new sidewalks should provide a minimum of 36 square feet of open soil (ex. a 6' x 6' tree well), and at least 1,000 gross cubic feet of soil value space for each tree, providing any soil volume under paved surfaces through suspended pavements or structural cells.
- To reduce infrastructure conflicts and maintain visibility and access to important public safety features, trees should be planted a minimum of:
    - 20 feet away from any intersection, crosswalk, or stop sign;
    - 5 feet away from any fire hydrant or utility pole;
    - 10 feet from any streetlight;
    - 3 feet from any driveway or walkway; and
    - 1 foot away from any underground utilities (ex. gas and water).
    - The width of the sidewalk must also be taken into account, as per American with Disabilities Act (ADA) regulations a 3 foot sidewalk width must remain.
    - Trees must be spaced out in such a way that they have room to grow. Trees are spaced at least 20 feet on center (i.e., measured trunk to trunk).

What to Plant

The City must determine which tree species will be planted in each specific site. The phrase "right tree, right place" is the most important concept in planting. Many factors must be considered in choosing a species for a site that maximizes the health and survivability of the tree, and the benefits provided by that tree. Trees in urban environments must withstand particularly challenging conditions, such as high temperatures, drought, flooding, air pollution, soil salt, and limited growing space both above and below ground. Trees have different characteristics suitable for different landscapes, sites, and microclimates. It is recommended that all characteristics be recognized, including, but not limited to, the desired function (e.g., seasonal flowering, shade canopy, wind resistance), mature size and shape for the intended location, soil conditions, root structure, maintenance requirements, potential pest problems, and survivability in the face of climate change. Equally important to selecting the right tree is choosing the right spot to plant it. Blocking an unsightly view or creating shade may be a priority, but it is important to also consider how a tree may impact existing structures and utilities as it grows taller, wider, and deeper. For example, if the tree's canopy, at maturity, will reach overhead utility lines, it is best to choose another tree or a different location. Taking the time to consider location before planting can prevent power disturbances and improper utility pruning practices.

Historically, there has been some mismatch of tree species selection with available planting sites in Renton. There are some large growing trees under power lines, and there are some small growing trees planted in sites suitable for larger trees. Large trees in small spaces can damage sidewalks and curbs, require severe pruning for overhead utility lines and street clearance, and often have a much shorter service life due to the restricted growing area. Small trees in large spaces limit the use of mature shade trees on public streets. It is well known that larger growing trees

provide the most environmental and economic benefits, and appropriate areas to plant them rarely exist in older, well developed communities. Proactive planning should be made to plant the "right tree in the right place" in the vacant sites, considering available growing space, presence of utilities, and traffic and pedestrian clearance issues, while obtaining the desired aesthetic effects and function of the street tree. Planting the proper type of tree for each planting area will result in a more effective, healthy, and attractive urban forest.

Tree Species Diversity

At the scale of the entire urban forest, species diversity in new plantings should be of major importance. Planting a variety of species can decrease the impact of species-specific pests and diseases by limiting the number of susceptible trees in a population. Moreover, planting a wide variety of tree species can help limit the impacts from physical events, as different tree species react differently to stress. Species diversity helps withstand urban forest impacts from drought, ice, flooding, strong storms, and wind. As stated in the Structure of the Public Tree Population section, at the genus level, maples (Acer) account for 27% of the total public tree population and bigleaf maples and Douglas-firs exceed the 10% threshold with 15% and 11% respectively. The dangers of planting monocultures have proven to be devastating. One of Renton's goals should be to increase species diversity throughout the City, such that no species represents more than 10% and that no one genus comprises more than 20% of the population. Consideration should be given to large trees that provide shade, are aesthetically pleasing, and provide food or habitat for native insects and wildlife. Although the City should consider focusing efforts on planting species that are native to the region, particularly in the face of climate change, the wider effort should focus on urban-tolerant and/or wind-resistant species, regardless of origin.

Tree Species Selection

Matching a species to its favored climatic and soil conditions is the most important task when planning for a maintainable and survivable landscape. Plants that are well matched to their environmental conditions are much more likely to resist pathogens, insect pests, and severe storm damage and will therefore require less maintenance overall and be more likely to survive. In addition to considering site characteristics (such as climate, precipitation, native vegetation, availability of space) and soil characteristics (such as soil texture, structure, drainage, pH, water availability, and road salt), specific physical tree features must also be scrutinized to ensure public safety. Some considerations for street trees are the amount of litter dropped by mature trees, the maintenance required, and public acceptance.

In the face of climate change, plummeting insect populations, and mass extinctions, the City should focus efforts on planting species indigenous to the region. Planting species that are native to the region whenever possible will provide additional benefits to the ecosystem at large. Above all, given the tough growing conditions in an urban environment, tree species should be selected for their durability and low maintenance requirements. These attributes are highly dependent on site characteristics as well as species characteristics.

How to Plant

The steps taken to properly plant trees must continue to be clearly outlined for City crews and/or contractors performing the work. Planting oversight and/or post planting inspections must continue to be performed to ensure that the work meets the guidelines set forth by the City. The tree planting methodology outlined in this section is supported by industry standards and best practices, including the American National Standards Institute (ANSI) Z60.1-2014 American Standard for Nursery Stock, and the American National Standards Institute (ANSI): Standard A300. Standard Practices for Tree, Shrub and other Woody Plant Maintenance.

These standards and best practices detail the methods and protocols for selecting healthy planting stock, handling trees during transport and planting, preparing the planting site, planting the tree, mulching, and young tree pruning.

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, planting priorities are assigned to areas determined to be the most in need based on the goal of an even distribution of benefits provided by trees. 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. It is recommended the City utilize the guidance provided in the Tree Canopy Cover Goals section to identify areas of low tree equity that are most suitable for planting.

- **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, in that trees are planted where they are removed. 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 Renton can quickly become an issue if data is not used to make decisions on the types of trees to plant. Neighborhood-level and Citywide planting plans should detail how biodiversity will be maintained with short- and long-term strategies.

- **Inventory-Driven Plantings.** In addition to tree canopy assessment data or data pertaining to the spatial location of existing tree canopy and possible planting space, a city may also utilize or conduct inventories of available public planting spaces. Often times, these types of inventories identify planting spaces based on criteria such as minimum width, distance from existing tree, distance from intersection, among others. Most planting space inventories catalogue the relative size of the growing space (small, medium, large).

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

Future tree plantings should focus on maintaining or increasing species diversity and reducing reliance on any particular species.

Renton's public tree population is primarily in fair or better condition with over 280 distinct species. The City should continue to focus resources on preserving existing and mature trees to promote health, strong structure, and tree longevity. Structural and training pruning for young trees will maximize the value of this resource, reduce long-term maintenance costs, reduce risk, reduce storm damage, and ensure that as trees mature, they provide the greatest possible benefits over time.

Tree Planting Recommendations

- Increase genus and species diversity in new and replacement tree plantings to reduce reliance on abundant groups. At a minimum, strive for no species representing more than 10% of the overall population and no genus representing more than 20% of the overall population.

- Use available planting sites to improve diversity, increase benefits, and further distribute the age distribution of street and park trees.

- Prioritize planting replacement trees for those trees that have previously been removed.
- Identify additional planting sites for trees and use the largest stature tree possible where space allows.
- Prioritize successional planting of important species, as determined by relative performance index (RPI) and the relative age distribution.
- Species that are adequately represented by established age distributions but lack recent plantings should receive priority care.
- Prioritize structural pruning for young trees and ensure maintenance plans and associated budgets are prepared as trees become established.
- Regularly inspect trees to identify and mitigate structural and correctable defects to reduce the likelihood of tree and branch failure.
- Consider opportunities to further support wildlife habitat and pollinators when making decisions on the species of tree(s) to plant.
- Create or update a recommended master tree list for City projects and to provide as a recommendation to the public for private property plantings. Include attributes such as tree size at maturity, primary feature, soil requirements, space requirements, recommended location(s), native/nonnative classification, description, and any concerns.
- Consider preparedness planning for invasive pests and deleterious effects of climate change including wildfire, stormwater, and extreme weather events.

POST-PLANTING CARE AND YOUNG TREE MAINTENANCE

The urban forest within Renton plays a significant role in maintaining the health and vitality of urban life. It provides a wealth of benefits to neighborhoods and residents through the reduction of energy consumption, the removal of pollutants from the air and water, reduction in stormwater flows, increased valuation of private property, increased worker productivity, reduction in stress and violent crime, as well as providing recreational opportunities and aesthetic diversity. At the same time stresses from the urban environment including air pollution, damage by vehicles, increased impervious surface, soil compaction, and maintenance neglect reduce the diversity and magnitude of these benefits and may lead to tree-related problems.

The inherently close interaction between people and trees in the City requires active and diligent management of the urban and community tree and forest resources to ensure public safety. To enhance tree canopy and associated benefits, trees need to be properly planted and maintained.

The City of Renton can use the following information to make any updates to tree policies.

Tree Maintenance Best Practices

The following provides an overview of tree maintenance best practices. It is not intended to be an extensive or comprehensive summary of best practices. All tree maintenance practices should follow the American National Standards Institute's (ANSI) A300 Standards (Parts 1-10).

Reasons for Tree Pruning

1. *Pruning for Safety*
   Involves removing branches that could fall and cause injury or property damage, trimming branches that interfere with lines of sight on streets or driveways, and removing branches that grow into utility lines. Safety pruning can be largely avoided by carefully choosing species that will not grow beyond the space available to them and have strength and form characteristics that are suited to the site.

2. *Pruning for Health*
   Involves removing diseased or insect-infested wood, thinning the crown to increase airflow and reduce some pest problems, and removing crossing and rubbing branches. Pruning can best be used to encourage trees to develop a strong structure and reduce the likelihood of damage during severe weather. Removing broken or damaged limbs encourages wound closure.

3. *Pruning for Form*
   Improves the structure of trees and removes branches that are more likely to fail. Branches that are poorly attached may be broken off by wind and accumulation of snow and ice. Branches removed by such natural forces often result in large, ragged wounds that rarely seal.

4. *Pruning for Aesthetics*
   Involves enhancing the natural form and character of trees or stimulating flower production.

   To reduce the need for pruning it is best to consider a tree's natural form. It is very difficult to impose an unnatural form on a tree without a commitment to constant care.

Common Types of Tree Pruning

1. *Crown Cleaning*
   Consists of the selective removal of dead, dying, diseased, and weak branches from a tree's crown. No more than 25% of the live crown should be removed in any one year, even for young trees.

2. *Crown Thinning*
   Primarily for hardwoods, thinning is the selective removal of branches to increase light penetration and air movement throughout the crown of a tree. The intent is to maintain or develop a tree's structure and form. To avoid unnecessary stress and prevent excessive production of epicormic sprouts, no more than one-quarter of the living crown should be removed at a time. If it is necessary to remove more, it should be done over successive years.

   Branches with strong U-shaped angles of attachment should be retained. Branches with narrow, V-shaped angles of attachment often form included bark and should be removed.

3. *Crown Raising*
   The practice of removing branches from the bottom of the crown of a tree to provide clearance for pedestrians, vehicles, buildings, lines of site, or to develop a clear stem for timber production. After pruning, the ratio of the living crown to total tree height should be at least two-thirds. On young trees temporary branches may be retained along the stem to encourage taper and protect trees from vandalism and sunscald.

4. *Crown Reduction*
   Most often used when a tree has grown too large for its permitted space. This method, sometimes called drop crotch pruning, is preferred to topping because it results in a more natural appearance, increases the time before pruning is needed again, and minimizes stress (see drop crotch cuts in the next section). Crown reduction pruning, a method of last resort, often results in large pruning wounds.

Figure 34. Examples of the types of tree pruning

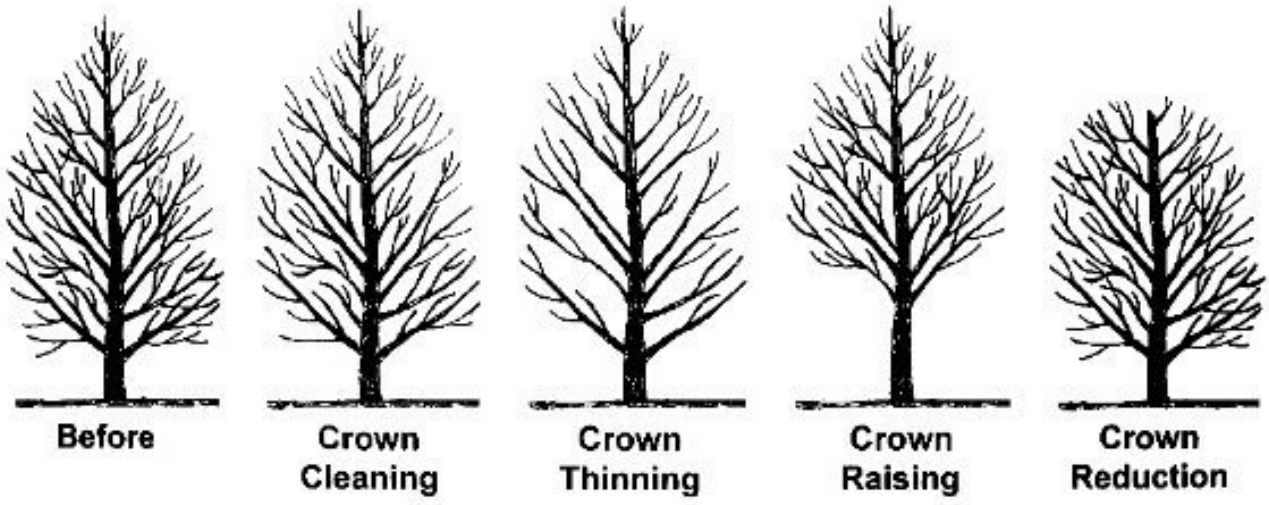


Image source: Arbor Day Foundation

Tree Pruning Cuts

Pruning cuts should be made so that only branch tissue is removed and stem tissue is not damaged. To find the proper place to cut a branch, look for the branch collar that grows from the stem tissue at the underside of the base of the branch. On the upper surface, there is usually a branch bark ridge that runs parallel to the branch angle, along the stem of the tree. A proper pruning cut does not damage either the branch bark ridge or the branch collar. A proper cut begins just outside the branch bark ridge and angles down away from the stem of the tree, avoiding injury to the branch collar.

Figure 35. Types of pruning cuts and the proper branch cutting technique

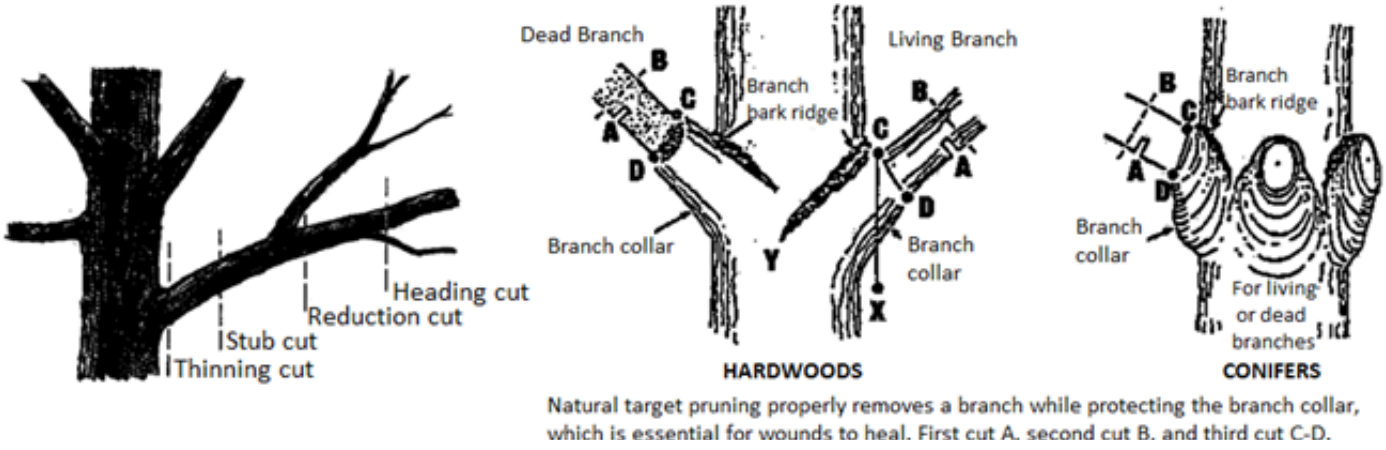


Image source: Pennsylvania State University Urban Forestry Extension

Utility Tree Maintenance Best Practices

Utility Tree Pruning Overview

The City should work with the utility companies to ensure proper pruning practices are followed and that open communication between the company, the city, and the public are maintained. The International Society of Arboriculture provides guidelines for maintaining trees near power lines (*Best Management Practices – Utility Pruning of Trees*, G. Kempter).

Maintaining power lines free of tree growth is based on a consistent, planned trimming cycle of the utility vegetation management company. This approach improves electric service to all the customers who get their power from that line. A sensible approach to trimming trees means having a thorough maintenance plan that improves the safety and reliability of electric service to residents. Residents and the City staff should not attempt to trim any vegetation growing near or on any overhead power lines.

Utility Tree Maintenance Techniques

1. *Directional Pruning*
   Removes entire branches and limbs to the main trunk of the tree and future growth is directed away from the power lines. Reduction cuts are used for removing these branches and limbs and should be pruned properly back to a lateral branch that is at least one-third the diameter of the branch being removed. This allows for good wound closure and protects apical dominance and reduces sprouts.

   Avoid topping or rounding over trees. This removes more foliage than directional pruning, increases the number of tree wounds, stresses the tree, causes unstable decay, and increases water sprouts.

2. *Right Tree Right Place*
   Selecting the right tree for the site can reduce potential safety hazards and improve the reliability of the electric service. Smaller trees near power lines do not need to be excessively pruned and do not lose their natural form.

3. *Recommended Trees*
   Trees potentially suitable for planting adjacent to power lines should be shorter and slow growing to prevent clearance issues.

Figure 36. Example of trees directionally pruned for clearance from power lines

Photo source: Pennsylvania State University Urban Forestry Extension

Young Tree Maintenance Best Practices

Proper pruning is essential in developing a tree with a strong structure and desirable form. Trees that receive the appropriate pruning measures while they are young will require less corrective pruning as they mature.

Young Tree Maintenance Techniques

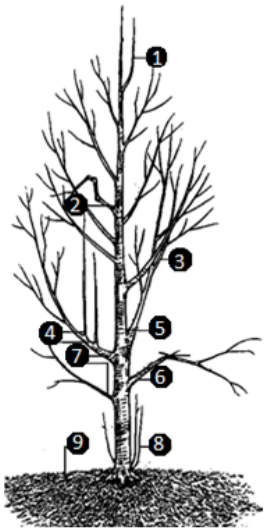
1. *Consider the Nature Form and Desired Growth*
   Accentuate the natural branching habit of a tree and correct any structural problems over time, if needed, to not stress the tree.

2. *Pruning in 1-2 Years after Planting*
   Prune as little as possible after planting to ensure there are enough temporary branches to produce food for new growth of roots, trunk, and branches. Prune only dead, broken, malformed, or diseased branches. Remove codominant leaders to maintain one dominant trunk. Prune for clearance if absolutely necessary. Keep size of branch removed to less than one inch in diameter.

3. *Pruning 2-3 Years after Planting*
   Prune any dead, broken, malformed, or diseased branches. Remove any suckers from the base of the tree. Next, determine the permanent branch structure by considering:

   - Remove, thin, or cut back any competing leaders
   - Remove crossing or rubbing branches, keep the branch that maintains the natural form
   - Thin excessively crowded branches but do not lions-tail
   - Remove branches with narrow angles between the branch and trunk (consider species)
   - Remove branches to maintain well-spaced branches along the trunk. Ideal mature trees will have lateral branches that are 18-24 inches apart (depending on species)
   - Avoid pruning near time of bud break
   - Prune flowering trees after flowering

Figure 37. Example of branches to be pruned for newly planted trees to promote good structure



1. Prune competing leader
2. Prune malformed branches
3. Remove crossing branches
4. Remove water sprouts
5. Remove branches with poor angles
6. Prune broken or damaged branches
7. Prune temporary branches over time
8. Remove suckers
9. Apply 2-3” of mulch

Photo source: Pennsylvania State University Urban Forestry Extension

Tree Planting Best Practices

The following provides an overview of best practices that should be considered and followed before during and after planting trees.

- Trees to be planted should be selected from an approved tree planting list developed to maintain and enhance species diversity that are suitable for the Renton, WA Plant Hardiness Zone and changing climates.
- Planting material will conform to the latest version of the American Standard for Nursery Stock (American National Standards Institute [ANSI] Z60.1). Trees to be planted should be of standard quality or better, and should be true to name and type of their species variety.
- Trees should not be planted in tree lawns less than 2 feet in width or in planting pits less than 5 feet long by 5 feet wide.
- Trees should not be planted within 50 feet of any major intersection, or within 20 feet of a fire hydrant, a driveway, or a pole supporting a light.
- The burlap and twine from balled-and-burlap trees should be removed from the tree and the tree pit. Wire tree baskets may remain on the root ball, but the top one-third should be clipped and removed from the planting hole.
- Mulch should be placed around trees in a minimum 3-foot circle and 3-inch depth to protect trees from lawnmower damage and competition from turf; mulch will be kept away from tree trunks.
- Newly planted trees should be irrigated weekly during droughts in the growing season for three years.

Tree Irrigation Considerations and Best Practices:

- Current limiting factor is budget for watering newly planted trees.
- With dry and increasingly hot summers this is a critical requirement for new tree establishment.
- Establishing new trees requires 4-5 years of supplemental irrigation during the summer months.
- 400 trees currently (2021) costs $100,000, so every 100 new trees planted requires an additional $25,000.
- Development of a certain size or where frontage improvements trigger tree planting should be required to install permanent in-ground irrigation systems.

FUNDING MECHANISMS

Urban forests are an essential component of a municipality's infrastructure. Well-managed urban forests boost community livability and build resilience through a myriad of ecosystem services. However, the budgets afforded to urban forestry programs do not always represent this "essential" status and forestry managers often need to work with budgets that are below their needs. Urban forestry budgets are also prone to large swings in need, as is currently being observed with the emerald ash borer causing spikes in tree removal demand. It can also be difficult to finance singular, capital intensive projects, like a public tree inventory, that provide critical data for forest planning and management.

The general fund has long been the core of urban forestry program funding across the county and it remains a stable and popular option today (making up 72% of urban forestry funding in 2014).

The general fund is also beholden to many other community needs and it is often stretched thin to meet all these demands. The best strategy for overcoming these budgetary challenges is to leverage a variety of sources, both public and private, to supplement allocations from the general fund. A diverse portfolio of funding streams allows urban forestry programs to weather resource restrictions and provide higher levels of service, like advancing from reactive to proactive maintenance cycles and implementing the Urban Forest Management Plan.

Street Tree Fund

According to section 9-13-8.B.3 Tree Removal of Renton's Municipal Code, in lieu of planting replacement trees, and at the sole discretion of the City arborist, the permittee for a tree removal request may contribute to the City's tree fund a dollar amount equal to the value of the replacement trees, including installation costs. These fees along with Routine Vegetation Management Permit fees ($105 plus a 3% technology fee), building permit fees received, tree removal mitigation fees, and stormwater fees could all contribute to a general tree maintenance operating fund.

Stormwater Utility

Stormwater management has been a growing financial burden for many communities across the country, even before the effects of climate change have begun to take hold. To pay for the increasing costs, cities have been implementing user fees for stormwater management services. These charges are called stormwater fees or stormwater utility fees because they are modeled after the way municipalities have historically billed residents for other utility services like water and sewer. Stormwater fees provide local governments with a stable source of revenue to pay for their growing stormwater management costs, Urban forests are a well-documented complement to grey infrastructure for treating and mitigating stormwater. Therefore, many communities include urban forestry in stormwater fee payouts. Stormwater taxes that are assessed based on a property's impervious surface area also provide additional motivation for owners to plant and maintain trees to minimize their fees or receive credits to their utility bill.

Requirements for a Comprehensive Street Tree Program

Different communities use different methods to calculate what to charge for the stormwater services they provide. Due to the complexity of creating a stormwater utility structure that is outside of the scope of urban forest management planning, the following explanation provides a simplified overview of a common fee calculation process that addresses the most important elements other methods share.

Many stormwater fees are based on the amount of impervious cover a property contains. Roofs, driveways, patios, and parking lots all usually count towards the total, but public sidewalks and roadways are not factored in. Properties with more impervious cover generate more stormwater runoff which puts a greater demand on the municipal stormwater system, compared to properties with less impervious cover. Because properties with lots of impervious surface require more stormwater service, they pay larger stormwater fees.

Municipalities use different approaches to estimate the impervious cover on each of the residential, commercial, and institutional properties their stormwater management system serves. In some instances, they will visit properties to take measurements in the field but, more often, they use aerial imagery and computer software to calculate coverages using in-house information technology staff or consultants. Municipalities often calculate a representative value to represent the runoff from their residential properties. They do this by carefully measuring the impervious cover from a sample of typical single-family residential parcels to determine a median area measured in square feet. This value is called an ERU, short for Equivalent Residential Unit.

The ERU essentially represents a base billing unit. Properties with very little impervious cover may be charged some fraction of an ERU, whereas properties with lots of impervious cover may be charged multiple ERUs. Municipalities take many factors into account when setting their base ERU billing rate, but the basic process involves two steps:

1. Adding up the impervious cover totals for each of the properties in their community and dividing this number by the ERU size they calculated earlier to determine the total number of ERUs in their service area and then,

2. Dividing their estimated annual stormwater budget by the total number of ERUs to reveal how much they need to charge per ERU to cover their annual stormwater costs. The nationwide average stormwater fee for single-family residential properties is currently $5.85 monthly (Campbell, 2019).

The national average stormwater utility fee for single-family residential properties is based on a 2019 survey of 1,716 stormwater utility programs across 40 U.S. states and the District of Columbia. As of 2016, there are a total of 122 municipalities in the State of Washington that have a stormwater utility (Campbell, 2019).

The City of Renton has an established stormwater utility and bills properties stormwater fees based on their land use and level of imperviousness. Whether a portion of the annual amount received therein could be used for funding part of the Urban Forestry program might be worth exploring. Tree planting, tree maintenance, and plant health care all contribute to sustaining and enhancing tree canopy cover in the City— which research shows tree canopy reduces stormwater runoff volume in communities.

Special Assessment Districts

Many properties in Renton are included in unique special financing districts of different types, especially in newer or redeveloping areas of the City. These districts are ordinarily initiated by the developer of a property, but are approved by City Council. The purposes of these districts may include financing of public improvements, ongoing maintenance and operations, or a combination. In general, these districts either serve to reimburse the developer for public improvements they are required to provide or to augment public facilities and services which might not otherwise be available to most City residents. Most districts obtain their revenue via a property tax, although some may also charge fees or collect assessments. Residential districts have an eventual time limit for debt service, but in some cases they may operate more or less in perpetuity to provide maintenance and/or services.

In Renton, several special assessment districts may be considered, including Business Improvement Districts (BIDs), General Improvement Districts (GIDs), Special Improvement Maintenance Districts (SIMDs), and Local Improvement Districts (LIDs). Others include water districts, fire protection districts, sanitation districts, and parks and recreation districts.

Focusing on areas with higher concentrations of street trees or maintenance needs, such as business districts, may capture property owners who are more willing to pay for tree care. This approach may be more politically palatable and could potentially lead to a citywide special assessment district where existing districts could be consolidated and organized into separate benefit zones, each with its own budget.

Requirements for a Comprehensive Street Tree Program

Special assessments are usually calculated per linear foot, based on the idea that benefits to property owners are directly related to street frontage. In some cases, special assessments include additional metrics such as building and/or lot square footage to account for the added benefit associated with larger buildings that have more occupants.

Parcel Tax

A parcel tax is a special tax levied for the provision of special benefits. Revenues from special taxes must be used for the specific purpose for which they are intended, so a parcel tax would create a dedicated funding stream for street trees. Similar to a special assessment, a parcel tax cannot be based on the value of property; however, the amount levied on each parcel does not need to be directly related to the benefits provided. Cities have the flexibility to levy parcel taxes as they see fit, but they are typically based on lot square footage or levied as a flat tax, with the same amount per parcel.

Parcel taxes are designed to encompass entire cities and therefore, are good candidates for a citywide street tree program, as opposed to the district-level approach that often occurs under special assessments. Parcel taxes typically fund more than just street trees. For example, a tree maintenance tax per parcel may include provisions for the maintenance of parks and open space and improvements to recreation facilities.

A parcel tax requires strong public support, as it must be approved by voters, rather than just the majority of property owners, as with a special assessment. Because a parcel tax must be voted on in a general election, rather than via mail-in ballot, it is likely to receive heightened political attention. However, general elections capture the votes of renters, who may be more apt to approve a tax borne by property owners.

Requirements for a Comprehensive Street Tree Program

A parcel tax for urban forestry operations and maintenance (O&M) may be levied as a flat tax, or it may be based on lot size (square footage). This study evaluated the parcel tax amount required to finance a City-operated street tree program according to both approaches.

Renton currently has approximately 27,276 parcels Citywide. In the case of a flat parcel tax, the City would need to levy approximately $28 per parcel per year to cover the full costs of the public tree maintenance program that follows a 7-year pruning cycle. To fund the tree maintenance and the in-house arborist crew, a flat parcel tax of approximately $44 per parcel per year is required.

Renton's parcels total approximately 660 million square feet. To annually fund the public tree maintenance 7-year pruning cycle, a parcel tax levied according to lot size would translate to an annual tax of $0.00117 per square foot and $0.00182 to fund the tree maintenance and in-house arborist crew annually. For a typical 2,500-square foot lot (25 feet wide and 100 feet deep), a parcel tax based on lot size would amount to $2.93 to fund tree maintenance annually or $4.55 to fund annual tree maintenance and the in-house arborist crew.

Another approach to consider is the average parcel lot area of 24,128 square feet ($28.22 - $43.91 per year) or classifications of parcels by counts within area (square feet) ranges.

Considerations and adjustments to these numbers must be made for properties with multiple right-of-way trees, HOA-managed trees, and maintenance responsibility stated in plat plans.

Table 24. Parcel tax options and provisions for Renton's Urban Forestry Program

Metric	Annual Tree Maintenance for 7-Year Cycle	Tree Maintenance and In-House Arborist Crew
# of Parcels	27,276	27,276
Recommended Budget	$774,000	$1,199,682
Flat Tax (budget by parcel)	$28	$44
Parcel Square Feet (sq. ft.)	656,665,036	656,665,036
Tax by Lot Size	$0.00117	$0.00182
Typical Parcel (2,500 sq. ft.) Annual Tax	$2.93	$4.55
Average Parcel Size (sq. ft.)	24,128	24,128
Average Parcel Size Annual Tax	$28.22	$43.91

General Obligation Bonds

Local governments commonly use General Obligation (GO) bonds to fund the construction and improvement of projects involving real property (e.g., buildings, infrastructure and parks). GO bonds typically carry low interest rates, making them attractive for capital projects, which may include tree planting. However, funding is available for discrete projects, often over a limited time rather than an extended period. In addition, ongoing maintenance is ineligible for GO bond funding pursuant to federal tax law. Washington cities may pay debt service from GO bonds through property taxes (in proportion to the estimated value of the goods or transaction concerned), where assessments are based on property value. As a result, the issuance of GO bonds requires majority voter approval.

GO bonds may be a tool for financing the planting of street trees in Renton as part of a larger package of capital improvements, as bonds are typically issued for large amounts. For example, voters may approve a Road Repair and Street Safety Bond, with funds designated for streetscape and street safety improvements that included street tree planting. GO bonds may include tree planting among streetscape improvements through street enhancement programs such as “complete streets” programs. However, these bonds may allocate funding for street tree planting to the streets program, rather than the City’s Urban Forestry Program. A bond specifically focused on a major street tree planting effort may be appropriate in the future.

Requirements for a Comprehensive Street Tree Program

Because GO bonds only fund capital costs, they could only be used to finance tree planting and establishment activities under a comprehensive city-operated street tree program.

Additional Financing Options

Parking Benefit District

Parking Benefit Districts (PBDs) generate revenue within a special district for improvements and services related to streets, streetscapes, and landscapes. Because revenue derives from parking meters, visitors to PBDs fund the majority of improvements. As a result, local governments may create PBDs via ordinance without requiring a vote of property owners, setting them apart from other special assessment districts. Although only commercial areas with parking meters provide revenue, improvements may be implemented beyond PBD boundaries. The ordinance that creates the PBD determines the share of revenue that must be applied to improvements within the district, known as the “local return” portion. A committee of residents, property owners, and business owners advises the local agency administering the PBD on how to expend revenue. Adjustments to City policy regarding the agency receiving excess meter revenue may be required to enable the use of this financing option for a street tree program.

While activities may include street tree planting and maintenance, a PBD is likely to cover other improvements related to neighborhood beautification. It is possible to create a dedicated funding stream for improvements, including street tree planting, sidewalk maintenance, and the installation of street furniture and light fixtures. This may present an opportunity to finance a portion of Renton's public tree maintenance costs; however, this strategy requires additional analysis to determine the likely amount of revenue to be generated for street trees, along with the potential for adding parking meters in new areas of the City.

General Fund

Renton's General Fund has historically funded a share of street tree planting, establishment, and maintenance activities through the Capital Improvement Plan (CIP). However, appropriations have not kept pace with the needs of urban forest management to keep it sustainable. Because the General Fund is not a dedicated funding stream with a consistent budget amount, and is subject to changing economic conditions and political support, the General Fund is a volatile funding source. Nonessential services are the first target for cuts when expenditures exceed revenues, and there is no guarantee that one year's appropriations will equal the next, as the City's current funding for public trees demonstrates. Given the current status, reliance on Renton's General Fund is not ideal for long-term planning of a program that will require a substantial commitment of resources (e.g., new staff, funding for partners).

A mixed General Fund and Special Assessment model is often considered an appropriate compromise but can lead to decreases in General Fund budget allocations over time, as the assessment bears a large share of the burden of maintenance.

Partnerships

A number of opportunities for partnerships exist to help implement a public tree program in Renton and cover a portion of the costs. Continued collaboration with the Green Cities Partnership, WA Department of Natural Resources, community groups, and corporations would advance the City's planting agenda, particularly if Urban Forestry does not have the resources to conduct all the work.

Many communities across the country partner with local non-profit organizations (NPOs) that conduct tree planting. Based on conclusions from the needs assessment conducted as part of the Plan, a non-profit organization devoted to the planting and stewardship of public and private trees in Renton does not exist. The Plan provides recommendations and action steps to pursue in an effort to establish additional partners and support from entities such as NPOs.

Public agencies, such as the U.S. Forest Service and regional air quality management districts, may also provide grant funding, although these are typically one-time contributions rather than a sustainable funding source. As an alternative or addition to NPOs and public agencies, corporate partnerships may present an opportunity for financing a share of Renton's street tree planting and maintenance activities. Communities often establish adopt-a-tree programs and a corresponding fund that accepts donations for street tree activities, but a formal corporate partnership program could be a component of corporate social responsibility programs, particularly for Renton-based businesses. In particular, large goals like increasing the City's tree canopy may attract corporate partners interested in environmental stewardship and a positive public image. Emphasizing the benefits of street trees, such as clean air and water, may expand the pool of funders to areas like public health. For example, large health or fitness corporations may contribute substantial funds for projects and programs that promote increased access to trails for fitness purposes. Development of a corporate partnership program would likely require significant fundraising and outreach efforts on Urban Forestry's part and may place the City in competition with NPOs with highly organized fundraising programs based in Renton such as conservancies and park foundations. Some funders may prefer to contribute to NPOs, and therefore, it may benefit the City to partner closely with the NPO or support the establishment of an NPO. Ideally, corporate contributions would be consistent so that the City could rely on a sustainable funding stream.

Table 25. Summary of financing options for Renton's urban forest

Financing Options	Attributes	Process	Opportunities	Challenges
Feasible Options				
Tree Fund	Routine Vegetation Management Permit fees ($100), building permit fees received, tree removal mitigation fees, and stormwater fees could all contribute to a general tree maintenance operating fund.	Enforcement of the Code generates monies from restitution. Building permit and stormwater fees would need evaluated and adjusted to accommodate supporting a Tree Fund.	Monitoring Code violations would generate revenue for the Tree Fund. Potential use of funds for tree maintenance. The City is growing and revenue from fees could benefit the Tree Fund.	Forestry staffing levels are inadequate to monitor Code violations. Fees would need evaluated, adjusted, and approved. Funds used for tree maintenance do not directly affect all contributors to the fee programs.
Stormwater Utility	A fee to manage stormwater based on impervious area.	A fee from all developed parcels to support the stormwater program.	Trees reduce stormwater volumes. Planting trees could qualify property owners a credit.	An extensive analysis for the appropriate utility fee structure is required.
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.
Additional Options				
Parking Benefit District (PBD)	Revenue from parking meters for range of right-of-way improvements.	Enacted via local ordinance specifying boundaries, rates, use of funds; City administers with committee input.	No ballot approval required; visitors bear burden over residents.	Typically funds more than trees.
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 of funding; no guaranteed funding amount; funds at risk if budget shortfalls.
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.

Financing Options	Attributes	Process	Opportunities	Challenges
Additional Options				
Carbon Offsets	The WA Climate Commitment Act (May 2021) creates a "cap and invest" program with a statewide cap on greenhouse gas emissions and auctions or allocates emissions allowances which supports climate resiliency programs.	The WA Department of Ecology is developing the program and regulations. House Bill 1216 (HB1216) promotes urban forestry programs that will be facilitated through the WA Department of Natural Resources.	WA is only the second state to pass an economy-wide carbon cap program, after CA. In CA, projects must plant at least 1,000 trees as offset projects to enable the sale of carbon credits. WA may adopt similar requirements. Also, HB1216 presents opportunities.	Many trees (5,000+) must be planted to cover costs of an offset program. Creates two types of street trees, offset program trees require higher oversight. Does not support tree maintenance.
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.

COMMUNITY ENGAGEMENT

The urban forest is a resource that benefits and belongs to the City's residents. In order to care for it, the passion that is so frequently used to talk about trees can be harnessed to build stewardship around Renton's trees. Approximately 71% of Renton's tree canopy is located on either residential (32%), commercial (22%), or industrial (17%) land (see the Urban Tree Canopy Cover section). Thus, success in improving or maintaining tree canopy must include not only the municipal government, but also a populace that understands the value of trees and tree canopy to the community and the environment and how to plant and care for trees.

Engagement to Inform the Plan

Throughout the development of the Urban Forest Management Plan, engagement opportunities and activities were held to gather feedback and input that would inform the vision, goals, and strategies. The engagement sessions launched with a project website (RentonForestryPlan.com) where information about the Plan and supporting studies was provided along with upcoming engagement events and other project information.

During the development of the Plan, the residents of Renton were invited to share their "Rooted in Renton Tree Story" using an interactive mapping feature on the project website to map the location of their favorite park, favorite tree, tree story, potential planting site, and/or tree issue. A total of 10 stories were mapped and eight photos shared. The favorite trees included sugar maples for their fall color, a Akebono cherry, the City's largest London planetree, a higan cherry, and a 67-inch tulip tree in Tonkin Park. Tree stories captured the benefits of cottonwoods providing food and habitat for birds and wildlife, the history of Nishiwaki's gift of the Taiwan cryptomeria in Liberty Park, a success story resulting from tree regulations with the replacement of a horse chestnut tree that was removed in error by a contractor of which the City was reimbursed, and the Yoshino cherry planted in memorial.

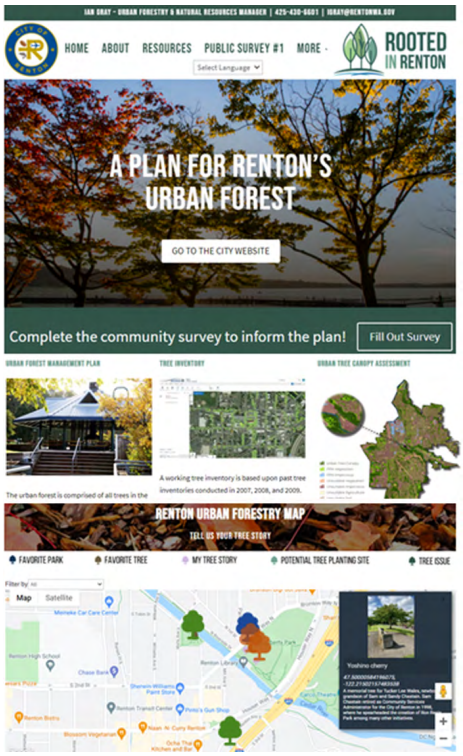


Figure 38. Renton's Urban Forest Management Plan project website (RentonForestryPlan.com)

In addition to the interactive map, two online surveys were hosted on the project website in July and September 2021. The first survey gathered 123 responses and focused on identifying viewpoints and perceptions relating to the urban forest cover, health, benefits, and programs. The second survey's primary objectives were to gather input on developing the Plan's goals, strategies, and future programs. A total of 64 responses were received.

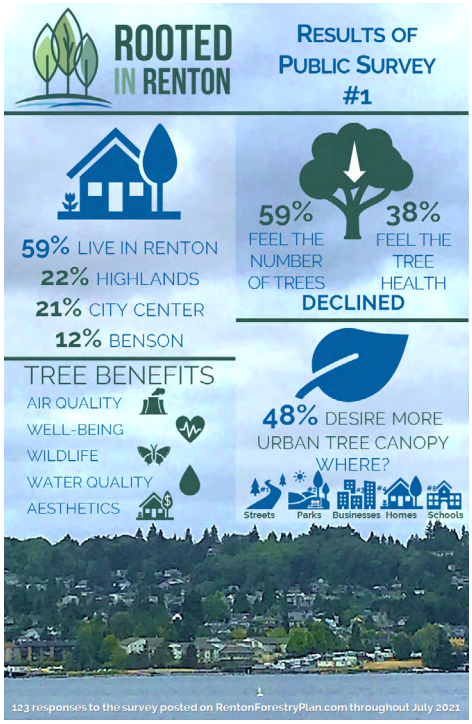


Figure 39. Infographic summarizing the first public survey

Public Survey #1

There were 123 responses to the first survey and respondents primarily live in Renton (55%) and own a home (82%) or live and work in the City (17%) and reside in the Highlands (22%), City Center (17%), or Benson (13%) neighborhoods. Respondents were primarily white/Caucasian (76%) in the 35-44 (27%) or 55-64 (23%) age class and trees are present in their normal routine such as daily commutes, park visits, and street trees.

The majority of respondents have planted, maintained, watered, and pruned trees and feel there should be drastically more canopy coverage (41%) or slightly more (38%) because they feel the number of trees has decreased in the past 10 years (59%) as well as the overall health (38%). The primary concern for tree-related issues is the sidewalk and pavement cracking due to roots. New plantings should be focused in all areas of the City such as right-of-way, parks, private property, commercial, schools, and subdivisions. Respondents feel that the greatest benefit of trees is their ability to improve air and water quality and quality of life, along with the aesthetic value and benefits to wildlife.

Public Survey #2

The second survey received 64 responses primarily from City Center (19%), Benson (18%), or Highlands (17%), and respondents were in the 35-44 year old age class (30%) or the 65 and older age class (28%), and own a home in Renton (86%). Of the respondents, 44% support adding more funding to the Program's budget than what is already in place for tree planting and maintenance initiatives. 34% desire the additional funding to be used in neighborhoods with low tree canopy cover and 47% support more City funding for an improved proactive pruning program for all street trees.

To further gauge the public's opinion on priorities, each respondent had a theoretical $100 to spend on five potential services: tree removals and replacements; planting in public parks; street tree plantings; Tree Preservation Ordinance enforcement; and removal and replacement of trees that are dead, dying, or undesirable species. The majority of respondents would allocate $5 to $24 towards each of the five services except for street tree planting where the majority would allocate $25 to $49 of their $100.

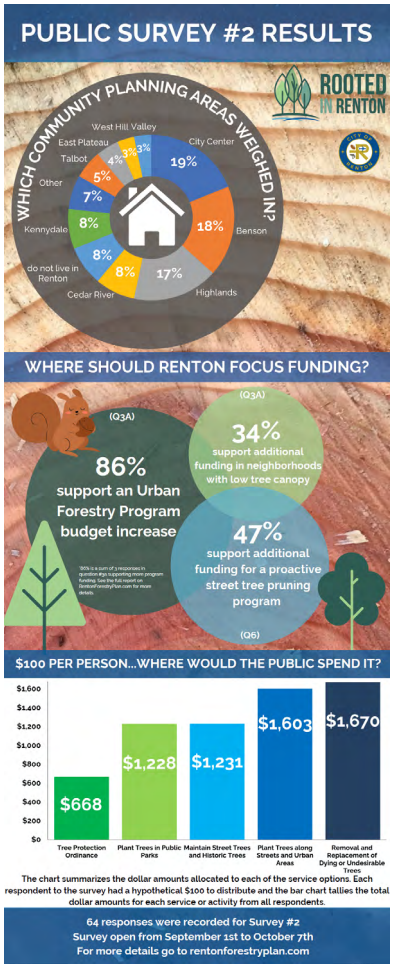


Figure 40. Infographic summarizing the second public survey

75% of respondents view planting more trees in public areas as a priority and 69% would like to see additional trees be set aside in tree preservation tracts, retained, or replanted after developing forested land. The primary opportunities for the City to address in relation to citizen priorities is public tree planting to increase tree canopy (31%), maintenance (31%), planting in underrepresented neighborhoods (30%), and addressing sidewalk cracking due to roots (30%).

Engagement to Implement the Plan

There are multiple ways to engage the public to improve the care of and expanse of local tree canopy. First, topics or messages must be defined, prioritized, and limited in number. More effective communication occurs through choosing a few strong messages and repeating them over and over. After messages are chosen, avenues of targeted communication to deliver those messages can be determined and implemented. Important topics and messages that should be considered for Renton are as follows:

- **Current Canopy Extent and Value of Renton's Trees.** The message should present the current canopy level and benefits the canopy provides. This is typically the first message to send out to the public, as all other messages should connect back to this one. This can also be a way to "roll out" the Urban Forest Management Plan to the public. Include information such as why Renton needs tree canopy, what the current canopy level is, and the plans to improve the management of the trees that comprise the canopy. Educating local business owners on the impact that a shady commercial district can have on sales and educating property owners about the impact that trees have on property values are other useful methods for boosting the desire for increased canopy along main thoroughfares and neighborhood streets while also engaging the public. The important value of mature trees could be also highlighted, as people often do not realize that the large tree they have is a value to their property, the community, wildlife, and the environment.

- **How You Can Get Involved.** What are the next steps you want people to take? The City should decide the answer and insert this "ask" in every outreach piece or effort. The City could organize a tree giveaway (usually saplings) at Arbor Day for people to plant on private property. Or the City could create an Adopt-A-Tree program, whereby residents sign up to take care of a street tree, including providing regular water and mulch. Another option for getting the community involved is to create a Heritage Tree Program where residents are encouraged to find and nominate the largest or otherwise significant trees in the City. Lastly, citizens can donate funds or volunteer at a tree planting event.

- **Tree Threats.** Public and private trees can die, decline, or become safety risks as a result of insect and disease infestation as well as inadequate maintenance. With education, the residents of Renton can become aware of the common threats to the tree canopy and what they can do to help. The City should provide education on existing tree pest and disease concerns and what the City is doing about these threats on public land, and options for management on their own land. Since the majority of the trees that comprise the City's urban tree canopy are on private property, it is vital for the City to educate the public on how to detect insect and disease threats, provide information about management and treatment options, and relay the importance of reforestation in the event trees are removed. Informing residents about tree removals and other significant tree work is essential for maintaining the City's relationship with the community. When an established public tree has to be removed, the City should continue its current practice of notifying abutting or adjacent property owners of the pending removal.

- **General Tree Care Education for Property Owners.** There are several actions people take that are detrimental to trees at all stages of life, including improper mulching and pruning. Easy tips and tidbits of information to share with residents for trees on their own properties can help improve tree maintenance and increase tree health and survival rates. Some examples include:

- Demonstrate how to properly mulch a tree. Too often mulch is placed around tree trunks in a "mulch volcano", which is extremely detrimental to the tree. A simple message of how to mulch properly can improve tree health and longevity.
- Provide guidance on how and when to prune trees. Incorrect pruning can lead to poor tree structure or wounds that may never heal.
- Explain proper tree planting and tree care techniques. This could be especially helpful for homeowners who are considering planting a tree in their yard but are unsure where to start.
- Encourage recycling or composting leaves on-site.

Use Multiple Avenues of Communication

There are numerous avenues to convey urban forestry messages and accomplishments of the program to the residents, such as:

- **Social Media.** Social media sites such as Facebook, Instagram, and Twitter can create buzz and promote involvement in the current urban forestry activities occurring locally. To reach even more people, the City should consider coordinating with allied community gardens, non-profits, educational institutions, and business to get messages posted on their social media sites as well.
- **Website.** The City of Renton's Urban Forestry webpage contains important information about the urban forestry program, including details about tree planting, the tree inventory, tree regulations, among other things. The website should be maintained regularly to make sure information is up to date. The project website for the Urban Forest Management Plan (RentonForestryPlan.com) can also be maintained going forward to continue outreach and education.
- **Presentations to City leadership and local business and neighborhood groups.** Identify key audiences, partners, and potential champions for the urban forestry program. Making short presentations at regular or special meetings where they are relieves individuals from having to go to yet another meeting in the evenings. Initial outreach could be based on letting the audience know about Renton's urban forest and the work called for in this Plan. Be sure to have an "ask" at the end of the presentation. What do you want them to do next? This work often unearths new partners and funding sources that can otherwise go untapped.
- **Do a survey.** Once a year, create a short online survey to identify what urban forestry issues people in Renton are concerned or care about. The survey can also be used to gauge people's reactions to new urban forest management procedures and regulations, and their willingness to participate in volunteer work or to donate funds or other resources. Questions about public trees and tree canopy can be part of the annual public survey.
- **Cultivate partnerships for communication.** Partnerships can be initiated with organizations that can help promote, enhance, and preserve Renton's urban forest. Organizations can include local businesses, local utilities, regional non-profits, homeowner associations, neighborhood associations, and schools and other educational institutions. Other audiences to engage can include youth groups, landscape architect firms, faith-based groups, and nurseries and landscape contractors. Actions that can be taken by each partner should be defined before approaching them for support.
- **Encourage Renton Technical College to become a Tree Campus USA.** The College is not yet a Tree Campus, USA. If they were to pursue this distinction and join the City's Tree City, USA legacy, then two powerful entities would be supporting Renton's urban forest. One standard the College would need to achieve annually is for students to participate in one or more Service Learning Projects. These projects are

intended to provide an opportunity to engage the student population with trees. College students could help the City's Urban Forestry Program perform many tasks, such as tree planting, tree care, and public outreach.

- **Publish and promote an annual State of the Urban Forest Report.** An annual "State of the Urban Forest Report" can be produced using updated tree inventory data, tree planting statistics, i-Tree tools, and other program information. It should provide information on the number and condition of public trees, as well as maintenance, planting, and management accomplishments. It should also present a summary of the current year's annual work plan and identify emerging issues and budget or resource needs.

- **Add signage to the landscape.** Signs placed in high traffic areas can spark interest in trees and the urban forest. Something as simple as species name or a notable fact about a tree can encourage people to learn more and to get more involved.

- **Create Story Maps.** The story about Renton's urban forest, the programs that manage it, and the community that shapes and benefits from it can be told through maps that illuminate and contextualize the story. Maps are the visual representation of where events happen. As such, maps and stories complement each other, and story maps serve as an integrated presentation. Story maps use geography as a means of organizing and presenting information. They tell the story of a place, event, issue, trend, or pattern in a geographic context. They combine interactive maps with other rich content—text, photos, illustrations, video, and audio—within intuitive user experiences. Content may include the Urban Tree Canopy Assessment, the tree inventory and 2021 analysis summary report, programs and events, and content from the Urban Forest Management Plan such as tree canopy goals, ecosystem benefits, and the urban forest vision, goals, objectives, and strategies.

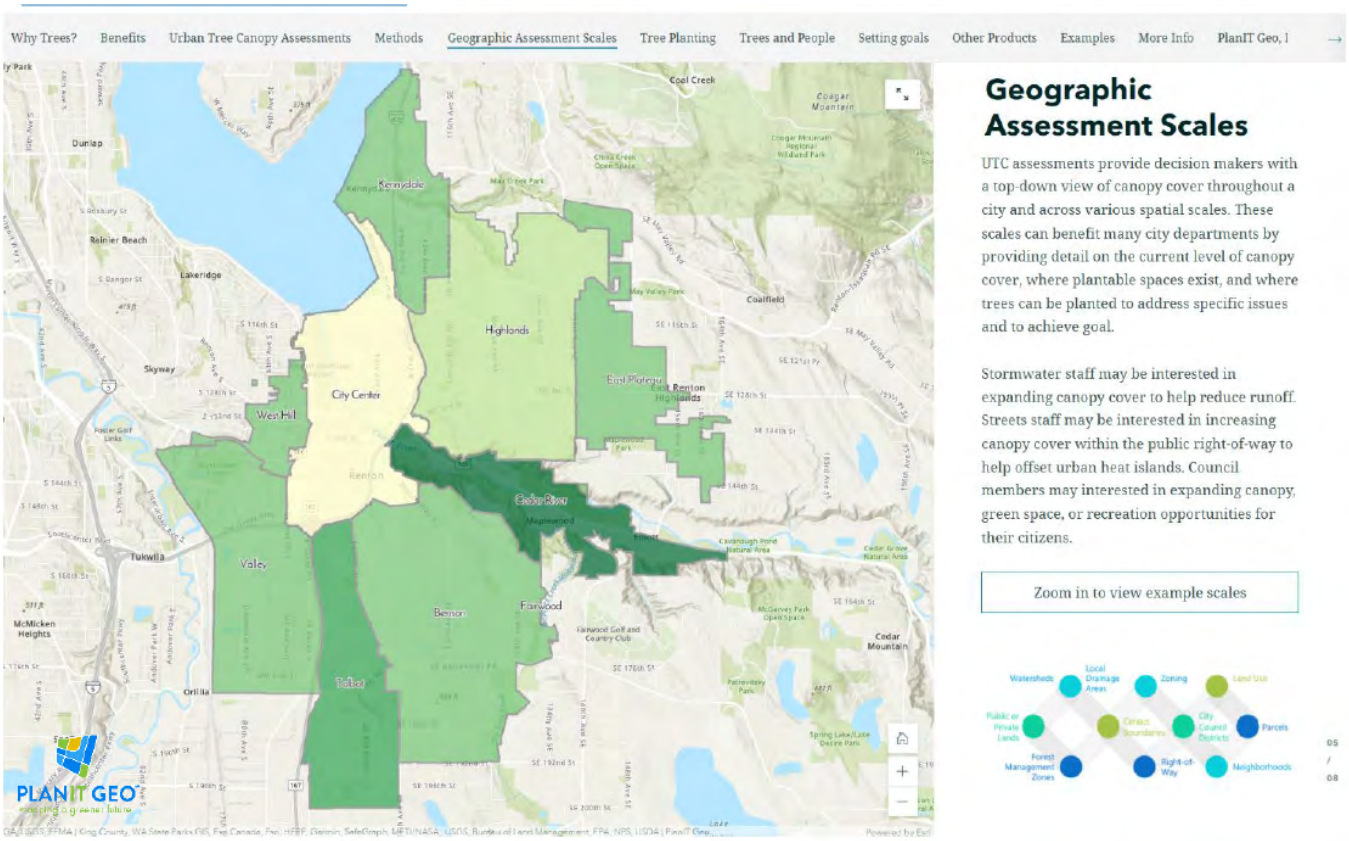


Figure 41. Story maps can visualize urban forest stories, maps, and data for the public

Create a Volunteer Corps

Consider implementing a "Young Tree Care" volunteer program to assist with new tree planting and new tree care such as watering, mulching, and pruning. This type of program is more involved than an "Adopt-A-Tree" program, as the young tree care volunteers are specially trained to care for young trees and to serve as advocates and educators within their networks. As such, this type of program involves initial and continuing training, frequent mentoring, and overall coordination of the process and volunteers. It also provides yet another engagement opportunity and encourages partnership opportunities with a variety of groups, such as neighborhood associations, master gardeners, scout troops, church affiliated groups, youth groups, high school community service programs, and others to accomplish new and young tree care tasks.

Trees to include in a "Young Tree Care" program are generally less than 6 inches in diameter. These younger trees sometimes have branch structures that can lead to potential problems as the tree ages, such as codominant leaders, multiple limbs attaching at the same point on the trunk or crossing/interfering limbs. If these problems are not corrected, they may worsen as the tree grows, which increases risk and creates potential liability. With direction from City staff, young tree care volunteers could be trained to carry out the young tree training program. Beyond pruning, young trees need watering and mulching to become established, and may require fertilization and other Plant Health Care (PHC) treatments until they reach maturity. This program can create "tree stewards" for Renton and be modeled after similar and successful programs like those found in other municipalities such as the Tacoma Tree Foundation's Tree Stewards or in other states such as Portland's Neighborhood Tree Stewards.

The "tree stewards" or a volunteer corps could also be used to support the urban forest management program in other ways. Volunteers could develop and/or staff Arbor Day and Earth Day events, post and manage tree messages on social media, help update the inventory, and/or locate planting sites in neighborhoods.

Explore Partnerships

Establish partnerships to fund and accomplish the young tree training program and some mature tree care activities. For instance, the utility companies may support tree growth regulator applications for trees under their lines; businesses or developers may pay into a fund to "adopt" or maintain trees in parks, commercial areas, and newly built streets; residents may help water mature street trees during times of drought.

The City should continue to maintain and strengthen partnerships with agencies and organizations that provide technical service and grant opportunities. For example, the WA Department of Natural Resources Urban and Community Forestry Program provides Community Forestry Assistance Grants, King County has set an ambitious goal of planting three million trees by 2025 to mitigate climate change, and Washington State University Extension Forestry in the Puget Sound Region offers technical support. These partners among many other local, regional, and national partners can support Renton in implementing the Urban Forest Management Plan.

Public Education

Public education is one of the true keys to reaching the goals of an urban forestry program. Only by educating the public, City officials, developers, and contractors working within City limits will a community be able to achieve urban forest protection and planting goals. Ordinances and guidelines alone will not guarantee success since builders, contractors, and others often have their own priorities and agendas, and trees and ordinances are often nothing more than a nuisance to them.

Cooperation from all concerned parties can be improved by requesting various community stakeholders, such as City Council members and neighborhood groups, to attend educational sessions to learn about the current state of Renton's urban forest, plans for urban forest management and planting, and the importance of all of it to the future of the community.

To gain support for Renton's Urban Forestry Program, various public outreach campaigns aimed at educating the residents of Renton should be established. Where there is understanding and acceptance of the Urban Forestry Program as a whole, there will be increased support for the planting portion of the program. Based on examples of public relations efforts by urban foresters in other communities, the following types of activities are suggested for the City to undertake:

- Hold a seminar or public meeting to discuss the tree inventory project, its results, and its importance for the City.
- Develop monthly evening or weekend seminars related to tree care and landscaping; bring in guest experts from various disciplines in the green industry.
- Write a monthly "Tree Talk" article for local newspapers or social media.
- Develop a Tree Care door hanger brochure to go to each residence where new trees are planted; educating residents about proper tree care could help eliminate trunk damage and improper mulching and pruning of new trees.
- The City could start giving away one-gallon tree seedlings to any volunteers who get involved with City projects. This is a great reward and a way to spread the word about trees. Renton could capitalize on the idea and attach the same Tree Care door hanger brochure or a different informational brochure to each of these trees.

- Co-host tree planting programs with the local garden club, local non-profits, or groups.
- Map the locations of fruit-bearing trees in the City and coordinate with groups that harvest the fruit for homeless and food insecure organizations.
- Embrace story telling within the urban treescape. Connect the trees to the history of the area through complementary art, placards, or signage. Consider establishing tree walks that highlight some of Renton's greatest tree specimens and provides tree identification training.
- Encourage citizen science activities that involve the urban forest. For example, the Nature Conservancy's "Healthy Trees Healthy Cities" app can be used to monitor tree health and check trees for pests. Local professors and non-profit groups that work with citizen science may be able to help plan projects and recruit citizen scientists.
- Expand the annual Arbor Day celebration to help it become a community tradition. The Arbor Day celebration could be further developed as an all-day Saturday event, preferably held in a popular park/public space setting in the City. Expanding on short programs on planting and pruning trees and including children's programs about trees can help increase public interest in the City's tree programs. Additionally, the City could invite contractors to conduct demonstrations on tree planting, trimming, landscaping, and species selection. Organizers could also set up booths with tree information. Refer to the National Arbor Day Foundation (ArborDay.org) for publications that provide great Arbor Day ideas to assist in planning of this event.

Establish a Tree Committee

Forming a Community Tree Advisory Committee (TAC)— also referred to as a tree commission, tree board, urban forestry commission, beautification committee, environmental advisory committee, community forestry commission, among others depending on the jurisdiction— is one step Renton can take to sustain an urban forestry program and increase community engagement. The powers and responsibilities of a Tree Advisory Committee are based on Washington statutes and are assumed by the local government. By forming and empowering a tree committee, Renton can place the responsibility for important community decisions in the hands of unpaid volunteers with designated powers. The formation of the committee can be a crucial element in developing broad-based support for community trees and ensuring long-term success and growth of Renton's Urban Forestry Program.

Proposed Responsibilities of the Tree Advisory Committee

The Tree Advisory Committee should reflect the values and standards of the community and should help champion an urban forestry effort. The recommended roles and responsibilities of Renton's Tree Committee may include the following:

- Reduce involvement of a municipal council for tree-related matters.
- Administer tree removal appeals processes.
- Advise community leaders and staff on administering the urban forest.
- Stimulate and organize tree planting and maintenance.
- Participate in a Landmark Trees Program.
- Support urban forest inventories, management plans, and ordinances.
- Settle community disputes caused by tree removal, planting, or maintenance.

Additional guidance and information for considering a Tree Advisory Committee is provided in Appendix C.

Environmental Justice

The equitable distribution of resources is a key driver of environmental justice. This Urban Forest Management Plan aims to grow the urban forest and address the fact that existing canopy resources and associated benefits are unequally distributed. Urban tree canopy expansion and maintenance requires a financial investment on the part of the City, primarily from tax dollars. As a result, tree canopy coverage tends to be larger and more established in wealthier neighborhoods, and tree canopies are often less than ideal in communities that are economically disadvantaged. Along with funding, community support for the urban forest and this Plan are necessary to succeed. Communication should begin months before a tree planting starts and should build trust between the entity spearheading the tree plantings and the community the tree planting is taking place in. Connecting with trusted community leaders to introduce the idea of an expanded tree canopy, holding outreach events at an earlier stage in the plan, and taking local opinion into account when it comes to tree species selection can develop a partnership, rooted in trust, with the area's residents. But a big part of keeping that trust is staying consistent through action. Following up with these communities to hear and address any concerns while consistently maintaining the new plantings will help ensure a fully developed urban forest. The framework of the Urban Forest Management Plan guarantees the presence of environmental justice principles in Renton's Urban Forestry Program.

The Tree Planting Initiative and Citywide tree canopy cover goals to be finalized by the City will address community equity and environmental justice by identifying areas in most need of tree canopy cover, tree plantings, and urban forestry services. And, as the City expands its network of partners, all populations within a neighborhood will be better represented.

Support the City's Volunteer Coordinator

To streamline community education and engagement across the City's programs and projects that influence the natural environment (i.e., Urban Forestry, stormwater, recycling, among others) and to achieve goals of the Urban Forest Management Plan, the Parks and Recreation Department's volunteer coordinator ("Recreation Program Coordinator") should be supported with partnerships, organizations, the potential Tree Advisory Committee, and adjunct staff support. The management of volunteers, events, messaging, partnerships, and programs will build support for the Urban Forestry Program through volunteers and ensure all demographics and cultures have an equal opportunity to experience and discuss the City's urban forest.

Community Engagement Recommendations

Outreach and engagement with the community of Renton begins with clear messaging and information gathered from the Urban Forest Management Plan. To make a greater impact and to fully recognize all communities in Renton, it is recommended the City identify a local non-profit community organization with a mission that supports the urban forest. In addition to a community partner, a City Tree Committee adds capacity and creates more advocates for the Urban Forestry Program. Lastly, a community of tree stewards that are trained in tree planting and post-planting care will increase Urban Forestry Program capacity and build support for long-lasting impacts.

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GOALS AND STRATEGIES FOR A SUSTAINABLE URBAN FOREST

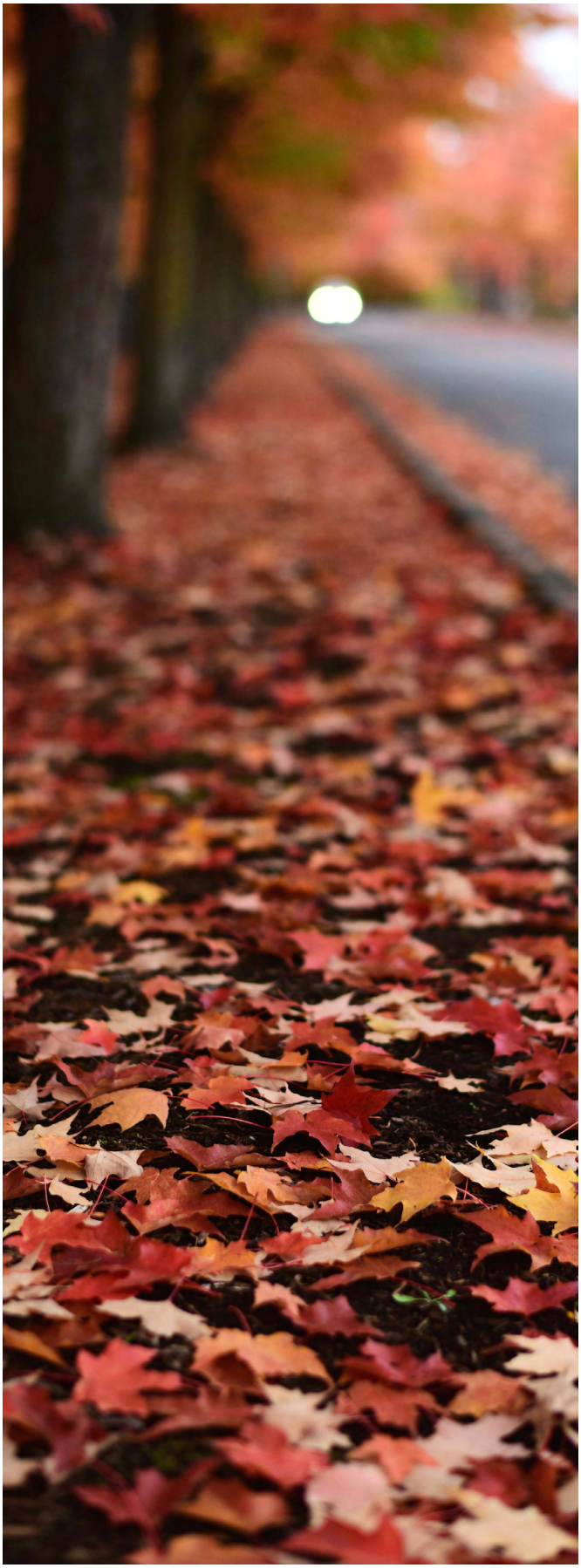
URBAN FORESTRY GOALS, OBJECTIVES, AND STRATEGIES

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 Renton 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 community.

Through research, staff interviews, data analyses, benchmarking research, community engagement, and urban forest auditing, the City identified three specific goals with each having several objectives to accomplish each goal. The objectives were further divided into strategies. The Current State of Renton's Urban Forest and Renton's Urban Forestry Program sections provide the context, discussions, and recommendations that led to the development of the goal-objective-strategy framework.

The Implementation Schedule in Appendix A breaks down the strategies into actions and tasks which are proposed to occur over a ten-year period. Through this process, the Urban Forest Management Plan can be followed each year to culminate into the vision for Renton's urban forest.

GOALS, OBJECTIVES, AND STRATEGIES



GOAL 1

Proactively manage public trees, continue to grow and expand a healthy canopy, maintain public safety, and optimize urban forest benefits.

Objectives

1.1 Make data-driven management decisions.

Strategies

1.1A Maintain the public tree inventory

1.1B Utilize current and future canopy assessments

1.2 Sustainably manage the public tree population.

Strategies

1.2A Establish an interdepartmental green team

1.2B Establish and implement a 7-year pruning cycle program

1.2C Improve workflows for tree clearance issues

1.2D Ensure newly planted trees receive post-planting care and young tree training

1.3 Establish a strategy for increasing tree canopy cover through City and public efforts.

Strategies

1.3A Formally establish the Tree Planting Initiative

1.3B Increase Citywide tree canopy cover

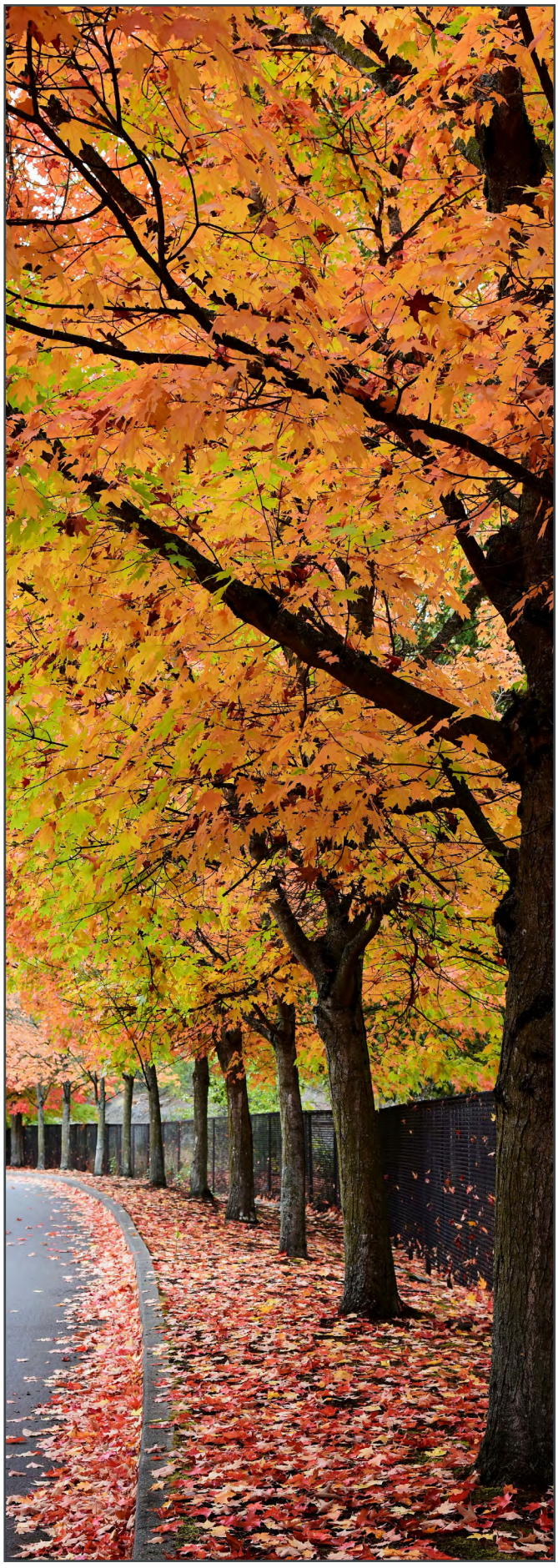
1.3C Grow a sustainable and resilient urban forest

1.4 Effectively manage tree risk.

Strategies

1.4A Adopt the Risk Tree Management Plan

1.4B Institute a formal rotation for risk tree inspections



GOAL 2

Achieve environmental justice through a partnership with the City and its residents to improve well-being, human health, local economies, and urban forest sustainability.

Objectives

2.1 Create an urban forestry public outreach program that addresses all communities.

Strategies

2.1A Maintain Tree City USA recognition

2.1B Maintain active communications with diverse audiences

2.1C Provide education and training workshops

2.1D Implement program services through the lens of environmental justice

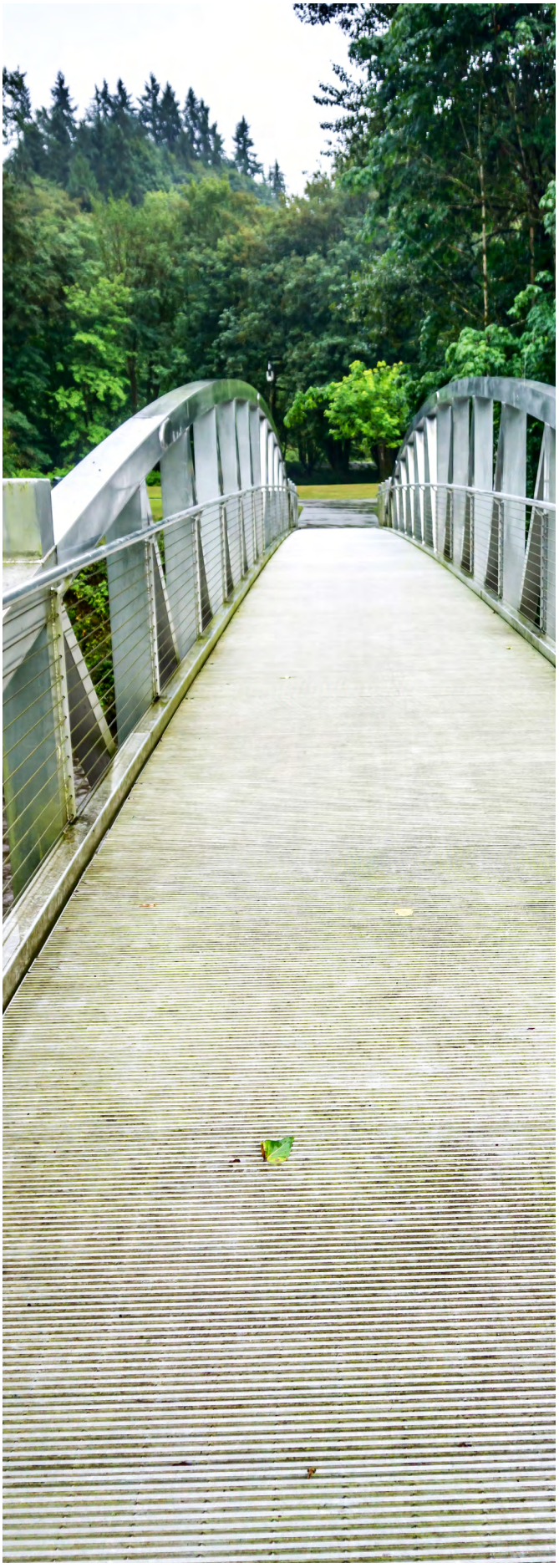
2.2 Increase capacity through trained citizens

Strategies

2.2A Create a volunteer corps or tree stewards program

2.2B Establish a Community Tree Advisory Committee

2.2C Effectively manage volunteers and events



GOAL 3

Strengthen policies for preserving the environmental benefits, management, and the character of Renton's urban forest.

Objectives

3.1 Strengthen policies for protecting the urban forest.

Strategies

3.1A Protect trees during public construction projects

3.1B Apply a no-net-loss approach to tree canopy cover

3.1C Use tree canopy assessment data for tree management policies

3.1D Update and strengthen tree ordinances

3.2 Improve workflows and operations for sustainable urban forest management.

Strategies

3.2A Enforce tree regulations

3.2B Engage more consistently in all tree removal permit requests

KEY STRATEGIES

The planning process identified 22 strategies following development of the program goals and objectives. This rich number of strategies will position Renton as a leader in urban forestry across the state and perhaps the nation and will guide the City towards a sustainable urban forest. There were five significant strategies identified as being of higher priority than others. These were predicated upon resolving public safety issues, inefficiencies, community engagement, policy gaps, and urban forest sustainability.

Key Strategies

7-year pruning cycle program
The Tree Planting Initiative
Tree Stewards Program
No-net-loss
Enforce tree regulations

7-Year Pruning Cycle Program

One of the more critical strategies identified was the need for an improved public tree pruning program on a recommended 7-year rotation. The strategy requires additional funding and the creation of an in-house arborist crew. Feedback from the community and City staff expressed support for the structure of this strategy.

Tree Planting Initiative

To grow an urban forest that is sustainable and resilient to climate change, pests and diseases, and urban development pressures, a strategic planting initiative guided by short- and long-term canopy goals and planting targets is needed. The Plan contains the guidance for finalizing canopy goals, identifying priority planting areas, and developing the tree planting initiative.

Tree Stewards Program

A shared commitment to the urban forest and vision is essential to the long-term success and impact of the Plan. A community of tree stewards will increase Urban Forestry Program capacity and support the Tree Planting Initiative along with other programs and services.

No-Net-Loss

Perhaps more important than tree canopy cover goals and planting initiatives is the foundation of sound policies to preserve the existing urban forest. With this key strategy, tree replacement, retention, removal, mitigation, and enforcement protocols are solidified. In addition, alternative solutions to tree and sidewalk conflicts are explored and guidance for formally adopting a decision checklist and solutions toolkit is provided.

Enforce Tree Regulations

Throughout the planning effort, concerns were expressed and identified relating to the protection of trees from construction damage, illegal removals, and maintenance malpractice. The actions supporting this strategy expand the enforcement efforts by increasing capacity as well as community education to prevent instances from occurring in the first place.

EVALUATION

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 the City Collaborative Team (or similar) using the Evaluate, Monitor, Report, and Revise methodology.

Knowing how the City of Renton 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 actions. 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 U.S. Forest Service's 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 deliverables to this Urban Forest Management Plan project include guidance for completing the audit. It is recommended the City Collaborative Team (or similar) 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 2022 for the Urban Forest Management Plan. The City Collaborative Team (or similar) 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 2 to 5 years. Analysis may include an updated public 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.

Renton's Urban Forest Benchmark Values

Table 26. Renton's urban forest benchmark values

Urban Tree Canopy (UTC) Cover (2017)	
UTC	29.3%
Recommended Canopy Goal (short-term)	30% by 2032
Recommended Canopy Goal (long-term)	33% 2042
Total Number of Trees to Plant (short-term)	5,250 (525 trees per year)
Total Number of Trees to Plant (long-term)	19,000 (950 trees per year)
City-led Plantings to Reach Canopy Goals	315 trees/year for 30% canopy
(60% of total plantings)	570 trees/year for 33% canopy
Public Tree Counts (2021)	
Total Public Trees Managed	116,984
Public Street/Park/Golf Course Trees (inventoried)	27,456
Public Natural Area Trees (sampled)	89,528
Tree Species Diversity (species exceeding 10%)	
Public Trees (2021)	Bigleaf maple (15%), Douglas-fir (11%)
Tree Benefits	
Citywide (UTC Assessment)	2017: $2.4 million (annual)
Inventoried Public Trees	2021: $220,000 (annual)
Inventoried Public Trees Replacement Value	2021: $122.6 million
Tree and Budget Distribution (2021)	
Public Trees per Capita	1.15
Budget per Capita, Budget per Tree	$9.37, $8.13
Urban Forestry Program FTEs	2.50
Total Public Trees per Staff	46,800
Management Activities (2020)	
Public Trees Pruned	758
Public Trees Removed	247
Public Trees Planted	200
Trees Watered	400/week
Trees Inspected	3,700
Completed Work Orders	1,000+
Number of Volunteers and/or Hours	TBD
Urban Forest Audit System (Total Score of 2021): 65%	
Management Policy and Ordinances	64%
Professional Capacity and Training	81%
Funding and Accounting	58%
Decision and Management Authority	88%
Inventories	77%
Urban Forest Management Plans	46%
Risk Management	83%
Disaster Planning	43%
Standards and Best Management Practices	55%
Community	86%
Green Asset Evaluation	55%
Public Perception (2021)	
Health of the urban forest in the past 10 years	38% feel the health has declined
Count of trees in the urban forest in the past 10 years	59% feel the number has declined
Amount of urban tree canopy cover	48% want drastically more canopy

Report

Based on the evaluation of Plan implementation progress, the City Collaborative Team (or similar) should track, record, and report on the metrics described below that are measures or indicators of success for each goal and supporting actions. Note, the series of urban forestry goals to address the resource, the programs, and the people and are not listed in any particular priority or order.

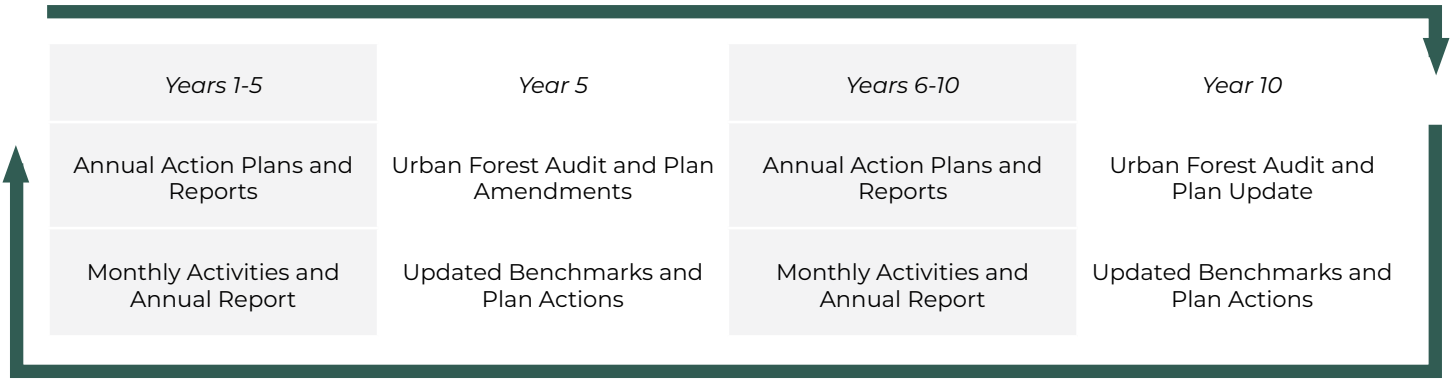
Table 27. Evaluation, monitoring, and reporting techniques to achieve the urban forestry goals

1	**GREEN ASSET MANAGEMENT:** Proactively manage public trees, continue to grow and expand a healthy canopy, maintain public safety, and optimize urban forest benefits. • Report the ecosystem benefits of the inventoried tree population. • 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.
2	**COMMUNITY ENGAGEMENT:** Achieve environmental justice through a partnership with the City and its residents to improve well-being, human health, local economies, and urban forest sustainability. • 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/count 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.
3	**TREE MANAGEMENT POLICY:** Strengthen policies for preserving the environmental benefits, management, and the character of Renton's urban forest. • List existing and potential partners. • List all City and partner-led planning efforts. • Describe related planning efforts. • 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.

Revise

Completion of this Plan is a critical step towards meeting the vision for Renton'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; hence, 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 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 42. Example of the plan implementation, evaluation, and revision process



IMPLEMENTATION SCHEDULE

The Appendix contains the Implementation Schedule which is the yearly program for the next ten years. It takes the strategies, shown under the goals and objectives, and subdivides each strategy into actions and tasks. In addition, the Implementation Schedule shows a budget estimate with a total by year. The Schedule is the main piece of the Plan that can be easily adapted to changing conditions, providing more or less activity in any given year. The Implementation Schedule will be used by City staff to guide activities occurring in the current year and to plan for succeeding budget years. It provides the reader with information on how each program strategy is to be accomplished.

SUMMARY AND CONCLUSION

Renton has a rich forestry history that strongly influenced the City's early development. Today, with all of the original vegetation gone, the urban forest plays an important role in making life richer for Renton citizens and visitors, and attracting new businesses. To resolve many of the issues with the built and the natural environments experienced today, this Urban Forest Management Plan is timely. With dedication, Renton's urban forest will once again provide the value of the historic landscape. The Urban Forest Management Plan is a roadmap for a strategic approach to manage Renton's urban forest. The Plan contains goals and supporting actions that are critical to the long-term vitality of the forest. However, in order for the Urban Forest Management Plan to actually have an impact on the forest resource, it requires stewardship and financial resources to begin implementation. Further, it needs to be institutionalized as a document requiring implementation with a sense of urgency to get things started. Completion of the Urban Forest Management Plan clearly demonstrates that City leadership understands that a healthy urban forest is critical to guaranteeing the long-term health and vitality of the community, and that it is not a luxury but an absolute necessity. In order to accomplish the goals, the approach to overall implementation should adhere to the guiding principles of the Plan:

- 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.

APPENDICES

APPENDIX A. IMPLEMENATION SCHEDULE

A 10-YEAR ANNUAL WORK PLAN TO ACHIEVE THE URBAN FOREST VISION AND GOALS. B

APPENDIX B. SOLUTIONS WORKBOOK AND POSSIBLE GUIDELINES FOR TREE AND SIDEWALK CONFLICTS

A DECISION CHECKLIST AND SOLUTIONS KIT FOR CONSIDERATION IN DEALING WITH TREE AND HARDSCAPE CONFLICTS. SUPPORTS TREE PRESERVATION AND CANOPY GOALS ALONG WITH CITY ADA REQUIREMENTS. H

APPENDIX C. GUIDANCE TO DEVELOP A TREE ADVISORY COMMITTEE

TO INCREASE URBAN FORESTRY PROGRAM CAPACITY AND SUPPORT, THE GUIDANCE FOR ESTABLISHING A VOLUNTEER COMMITTEE OF TREE ADVOCATES IS PROVIDED. Q

APPENDIX D. 2021 URBAN FOREST AUDIT SYSTEM RESULTS

TO INFORM THE DEVELOPMENT OF THE PLAN'S GOALS, OBJECTIVES, AND STRATEGIES, THE U.S. FOREST SERVICE'S URBAN FOREST SUSTAINABILITY AND MANAGEMENT AUDIT SYSTEM WAS IMPLEMENTED. THIS EVALUATION OR AUDIT IDENTIFIES THE CITY'S URBAN FOREST MANAGEMENT STRENGTHS AND OPPORTUNITIES AND PROVIDES A FRAMEWORK FOR MONITORING PLAN IMPLEMENTATION AND SUCCESS. T

APPENDIX E. RISK TREE MANAGEMENT PLAN

THE DRAFT STRATEGY TO MANAGE TREE RISK AND PUBLIC SAFETY IS INCLUDED FOR CITY CONSIDERATION AND ADOPTION. AA

APPENDIX F. URBAN FOREST PEST READY ASSESSMENT

THE STATE OF WA DEVELOPED THE URBAN FOREST PEST READINESS PLAYBOOK AND INCLUDES AN ASSESSMENT WORKSHEET TO GAUGE AND PREPARE COMMUNITIES FOR POTENTIAL TREE PEST OUTBREAKS. COMPLETING THE ASSESSMENT WORKSHEET IS A PLAN ACTION (ACTION #1.5A.5) AND COMPLETING IT WILL CLOSE THE GAP IN READINESS AND RESPONSE CAPABILITIES.. AJ

APPENDIX G. REFERENCES

PROVIDES A LIST OF THE RESOURCES, RESEARCH, AND STUDIES REFERENCED IN AND SUPPORTING THE PLAN IN THE ORDER THEY ARE PROVIDED.. AN

APPENDIX A. IMPLEMENTATION SCHEDULE

Strategies and Actions	YR 2022	YR 2023	YR 2024	YR 2025	YR 2026	YR 2027	YR 2028	YR 2029	YR 2030	YR 2031
1.1 Make data-driven management decisions										
1.1A Maintain the public tree inventory										
Action 1.1A.1 Track all maintenance history of public trees										
Action 1.1A.2 Add newly planted trees to the inventory										
Action 1.1A.3 Quantify the ecosystem benefits of the public trees										
Action 1.1A.4 Monitor and assess the public tree population for risk and tree pests/diseases										
1.1B Utilize current and future canopy assessments										
Action 1.1B.1 Plant trees based on themes such as low tree canopy cover, low tree equity, and environmental conditions										
Action 1.1B.2 Update policies and design guidelines to preserve existing tree canopy cover										
Action 1.1B.3 Prepare scope of work and RFP for updated canopy assessment										
Action 1.1B.4 Execute contract and complete the canopy assessment			$10,000					$10,000		
Action 1.1B.5 Refine canopy goals and planting priorities										
1.2 Sustainably manage the public tree population										
1.2A Establish an interdepartmental green team										
Action 1.2A.1 Identify key members										
Action 1.2A.2 Finalize members, meeting intervals, team objectives										
Action 1.2A.3 Meet regularly to address workflows, communications, knowledge sharing										
Action 1.2A.4 Tree managing staff should engage in City department planning such as updates to the City's comprehensive plan										
1.2B Establish and implement a 7-year pruning cycle program										
Action 1.2B.1 Finalize the annual costs for a 7-year pruning cycle										
Action 1.2B.2 Finalize the annual costs for the in-house arborist crew										
Action 1.2B.3 Finalize the framework for the pruning program (City grids, priority areas, in-house vs. contracted)										
Action 1.2B.4 Submit budget request for pruning program										
Action 1.2B.5 Submit budget request for in-house arborist crew										
Annual staff cost		$168,000	$168,000	$168,000	$168,000	$168,000	$168,000	$168,000	$168,000	$168,000
Vehicle and equipment purchase		$410,000								
Annual operating costs		$102,698	$102,698	$102,698	$102,698	$102,698	$102,698	$102,698	$102,698	$102,698
Annual training, certifications, and membership costs		$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000
Action 1.2B.6 Prune 3,654 public trees annually and adjust as the population grows	$134,000									

Strategies and Actions	YR 2022	YR 2023	YR 2024	YR 2025	YR 2026	YR 2027	YR 2028	YR 2029	YR 2030	YR 2031
1.2C Improve workflows for tree clearance issues										
Action 1.2C.1 Document existing workflows and procedures										
Action 1.2C.2 Identify inefficiencies and resource needs										
Action 1.2C.3 Increase public education on private tree right-of-way encroachment										
Action 1.2C.4 Formalize standard operating procedures between departments										
Action 1.2C.5 Utilize in-house arborist crew for all public tree clearance requests										
1.2D Ensure newly planted trees receive post-planting care and young tree training										
Action 1.2D.1 Establish maintenance plans for new plantings										
Action 1.2D.2 Plant trees using the right tree, right place approach										
Action 1.2D.3 Educate the public and gather local community input on public tree plantings										
Action 1.2D.4 Acquire commitments from the local community and property owners to water new trees										
Action 1.2D.5 Utilize the newly developed community tree steward program										
1.3 Establish a strategy for increasing tree canopy cover through City and public efforts										
1.3A Formally establish the Tree Planting Initiative										
Action 1.3A.1 Finalize tree canopy goals and priority planting areas and themes										
Action 1.3A.2 Establish a Citywide tree planting plan and strategies		$6,000								
Action 1.3A.3 Identify local community partners for planting, maintenance, and funding										
1.3B Increase Citywide tree canopy cover										
Action 1.3B.1 Increase tree canopy cover with City-led plantings (570 trees per year, $150 per tree)	$50,000	$85,500	$85,500	$85,500	$85,500	$85,500	$85,500	$85,500	$85,500	$85,500
Action 1.3B.2 Increase tree canopy cover through partnerships and property owner-led plantings (380 trees per year)										
1.3C Grow a sustainable and resilient urban forest										
Action 1.3C.1 Monitor and analyze the inventory for species diversity										
Action 1.3C.2 Update a Recommended Tree List for City-led projects										
Action 1.3C.3 Work with local nurseries to expand tree species options										
Action 1.3C.4 Strengthen storm and disaster preparations, mitigations, and recovery strategies, protocols, and mechanisms										
Action 1.3C.5 Complete the WA Urban Forest Pest Readiness Playbook Assessment (UFMP Appendix F)										

Strategies and Actions	YR 2022	YR 2023	YR 2024	YR 2025	YR 2026	YR 2027	YR 2028	YR 2029	YR 2030	YR 2031
2.1 Create an urban forestry public outreach program that addresses all communities										
2.1A Maintain Tree City USA recognition										
Action 2.1A.1 Maintain accurate records for the application	■	■	■	■	■	■	■	■	■	■
Action 2.1A.2 Submit annual application	■	■	■	■	■	■	■	■	■	■
Action 2.1A.3 Arbor Day Celebration and Proclamation	■	■	■	■	■	■	■	■	■	■
Action 2.1A.4 Submit application for Tree City USA Growth Award	■	■	■	■	■	■	■	■	■	■
Action 2.1A.5 Acquire 10 Growth Awards for Sterling Tree City USA status										■
2.1B Maintain active communications with diverse audiences										
Action 2. 1B.1 Develop a community outreach plan with collaboration from City departments	■									■
Action 2.1B.2 Formalize messaging for various audiences (property owners, developers, HOAs, youth, tree companies)	■									
Action 2.1B.3 Update the City's website with UFMP information	■									
Action 2.1B.4 At least quarterly, share information and updates	■	■	■	■	■	■	■	■	■	■
Action 2.1B.5 Gather feedback and input using public surveys to inform future messaging		■		■		■		■		■
2.1C Provide education and training workshops										
Action 2.1C.1 Use the outreach plan (Action 2.1B.1) to finalize topics, audiences, approach		■								
Action 2.1C.2 Identify existing resources and tools for workshops		■								
Action 2.1C.3 Identify and collaborate with community partners		■								
Action 2.1C.4 Support youth education of environmental topics, engage schools with Arbor Day events				■	■	■	■	■	■	■
Action 2.1C.4 Lead or support at least one training or education material annually			$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000
2.1D Implement program services through the lens of environmental justice										
Action 2.1D.1 Identify local community groups and partners to represent all neighborhoods		■								
Action 2.1D.2 Identify low canopy neighborhoods for targeted engagement			■							
Action 2.1D.3 Explore with partners the 3-30-300 rule for community greening				■						
Action 2.1D.4 Develop strategies to remove barriers to participation for all community members					■	■	■	■	■	■

Barriers to address include ADA communications compliance, internet access, languages, transportation

Strategies and Actions	YR 2022	YR 2023	YR 2024	YR 2025	YR 2026	YR 2027	YR 2028	YR 2029	YR 2030	YR 2031
2.2 Increase capacity through trained citizens										
2.2A Create a volunteer corps or tree stewards program										
Action 2.2A.1 Identify a local community partner to support urban forestry and the tree stewards program			■							
Action 2.2A.2 Establish a training curriculum and gather available resources			■							
View an example Tree Steward Manual here https://treesvirginia.org/images/pdfs/2020TreeStewardManualver03.pdf										
Action 2.2A.3 Announce the program and set up an online or in-person training event				■	■	■	■	■	■	■
2.2B Establish a Community Tree Advisory Committee										
Action 2.2B.1 Organize interested citizens and outline challenges and opportunities				■						
Action 2.2B.2 Hold informal meetings with concerned citizens and local officials				■						
Action 2.2B.3 Meet with the City Attorney to finalize the framework					■					
Action 2.2B.4 Finalize the powers, authority, and responsibilities					■					
Action 2.2B.5 Draft the ordinance and the staff report for adopting the ordinance					■					
Action 2.2B.6 Seek the Council's approval of the ordinance at a public hearing					■					
2.2C Effectively manage volunteers and event										
Action 2.2C.1 Identify needs and interests from multiple departments										
Action 2.2C.2 Work with the City's Volunteer Coordinator to strengthen the outreach plan (Action 2.1B.1)			■							
Action 2.2C.3 Identify opportunities to increase capacity for the Volunteer Coordinator (e.g., seasonal, Tree Committee, volunteers)	■	■	■	■	■	■	■	■	■	■
3.1 Strengthen policies for protecting the urban forest										
3.1A Protect trees during public construction projects										
Action 3.1A.1 Continue to review tree and sidewalk conflicts	■	■	■	■	■	■	■	■	■	■
Action 3.1A.2 Update and standardize construction design standards (4-4-130.H.9) to include requirements of ANSI A300 Construction Management Standard - Part 5		■								
Action 3.1A.3 Perform construction project inspections to ensure proper tree protection requirements are implemented and maintained	■	■	■	■	■	■	■	■	■	■
Action 3.1A.4 Establish a fee schedule for violation of Tree Protection Zones (TPZ)			■							
Action 3.1A.5 Add definition to support role of Urban Forestry Program provided to Code Compliance			■	■	■	■	■	■	■	■

Strategies and Actions	YR 2022	YR 2023	YR 2024	YR 2025	YR 2026	YR 2027	YR 2028	YR 2029	YR 2030	YR 2031
3.1B Apply a no-net-loss approach to tree canopy cover										
Action 3.1B.1 Update the 1 to 1 tree replacement requirement for CIP or infrastructure projects with the same requirements as residential parcels requiring every inch be replaced		■								
Action 3.1B.2 Require 30% tree retention include best specimen trees, especially landmark trees, and the percentage is calculated prior to roadway overlay		■								
Action 3.1B.3 Amend landmark trees minimum diameter to 24 inches or greater		■								
Action 3.1B.4 Require a permit for the removal of any trees greater than 6 inches DBH for development projects		■								
Action 3.1B.5 Add alternative solutions for tree and sidewalk conflicts to include low impact design (LID) options for surface water mitigation			■							
Action 3.1B.6 Develop a fee-in-lieu of payment for the value of any trees removed from the development site and not planted back into the landscape			■							
Action 3.1B.7 Update the method for tree value calculation using CTLA trunk-formula method or increase the inch fee to $250 per inch			■							
3.1C Use tree canopy assessment data for tree management policies										
Action 3.1C.1 Evaluate causes for canopy loss from the 2010 and 2017 assessments, specifically the loss on Resource Conservation land (-2.1%)	■									
Action 3.1C.2 Update policies to include long-term and intermediate Citywide and local canopy goals	■									
3.1D Update and strengthen tree ordinances										
Action 3.1D.1 Prepare or modify a report that proposes necessary Code updates and additions	■	■							■	
Action 3.1D.2 Coordinate with Planning Department and others to prepare new Code docket items	■	■							■	
Action 3.1D.3 Share with the public the adopted changes to tree-related Code3.2 Improve workflows and operations for sustainable urban forest management		■	■							

Strategies and Actions	YR 2022	YR 2023	YR 2024	YR 2025	YR 2026	YR 2027	YR 2028	YR 2029	YR 2030	YR 2031
3.2 Improve workflows and operations for sustainable urban forest management										
3.2A Enforce tree regulations										
Action 3.2A.1 Enforce tree protection during construction, inspect Tree Protection Zones, inspect tree retentions	■	■	■	■	■	■	■	■	■	■
Action 3.2A.2 Continue to support the contracted Inspecting Arborist or utilize potential in-house arborist crew	■	■	■	■	■	■	■	■	■	■
Action 3.2A.3 Update contractor business license requirements		■								
Require a Renton Tree Regulations competency test		■								
Require Certificate of Insurance		■								
Fine for no business license is increased to $1,000		■								
Tree code violations result in loss of license		■								
Action 3.2A.4 Consolidate tree-related policies, guidelines, best practices, and standards into a tree manual for multiple audiences.							■			
3.2B Engage more consistently in all tree removal permit requests										
Action 3.2B.1 Evaluate the feasibility of tree removal permitting to be managed by Urban Forestry		■								
Action 3.2B.2 Explore the costs and funding mechanisms for a full-time development review arboristGreen Asset Management Goal Costs			■							
Green Asset Management Goal Costs	$184,000	$774,198	$368,198	$358,198	$358,198	$358,198	$358,198	$368,198	$358,198	$358,198
Community Engagement Goal Costs	$0	$0	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000
Tree Policy Goal Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Costs	$184,00	$774,198	$370,198	$360,198	$360,198	$360,198	$360,198	$370,198	$360,198	$360,198

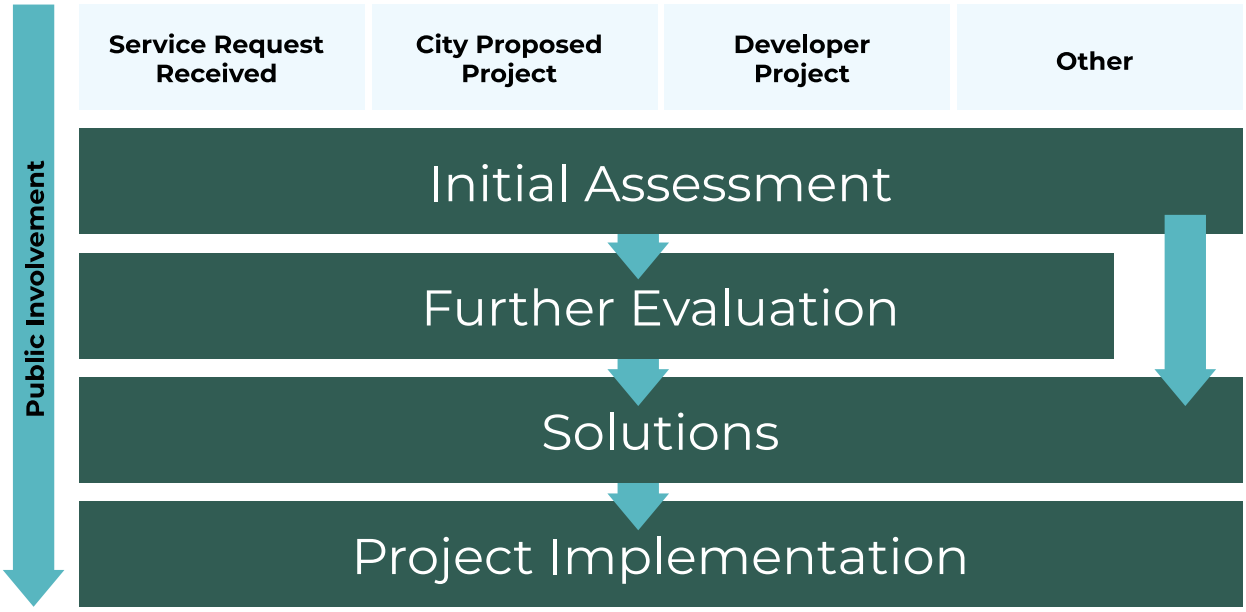
APPENDIX B. SOLUTIONS WORKBOOK AND POSSIBLE GUIDELINES FOR TREE AND SIDEWALK CONFLICTS

Decision Matrix

The development of Renton'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 43. Proposed decision matrix for tree and construction conflicts



Initial Assessment

The following applies to tree removal requests and proposed projects.

The initial assessment of trees, sidewalks (or other infrastructure), and site at the service request location or project location provides consistency and predictability by collecting the appropriate information. It is recommended to have the Urban Forestry Program 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 designated as a significant tree or Landmark Tree?
- 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 service request 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. Consider tracking service requests in the City's asset 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 request 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 Urban Forester or representative may conduct the initial tree decision. If infrastructure is part of the assessment and/or the tree removal request 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 request 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. 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.
  - The service request, decision, work order, tree information, and tree removal information should be tracked in the City's asset 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 designated as a Landmark Tree or significant tree, 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 the asset software or similar program.
  - Conduct follow-ups with the property owner and monitor the tree if necessary.
- Remove Tree and Replace Sidewalk. The service request 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.
  - 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 Urban Forester's discretion. The replacement policy should be based on City Code. 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.
  - The service request, decision, work order, tree information, and tree removal information should be tracked in the City's tree inventory software or similar program.
  - Replace 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. The sidewalk will be of standard width and a tree pit of standard width (at minimum) can be installed or retained.
  - Coordinate with Public Works the timing and approach for maintaining the sidewalk. Be sure to consider alternative sidewalk amendments such as width reduction, alternative materials, among other solutions.
  - If any root pruning is needed to amend the sidewalk, the Urban Forester and/or a Certified Arborist hired by the City should evaluate to determine the appropriate root pruning, branch pruning, soil amendments, and other maintenance required.
  - Documentation in City's asset 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's asset 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. 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 City staff to ensure goals of sidewalk r epair 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 City. Tree repaving projects, curb and gutter repairs, and other Capital Projects should also adhere to this evaluation process. All matters relating to the removal or remediation of the tree will be conducted by the City unless the responsibility of tree maintenance in public rights-of-way changes. Regarding tree maintenance, mitigation, or removal, 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

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 <u>INITIAL ASSESSMENT</u> 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 28. 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 44. Example of alternative solutions for tree and construction conflicts

Decomposed Granite

Mudjacking

Bridging

Bulbouts

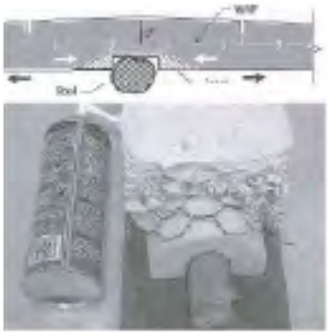
Curb Realignment

Easement

Suspended Pavement

Root Barriers

Foam Underlay



Mod. Gravel Layer

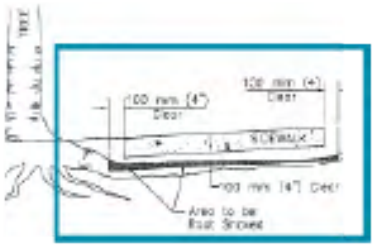
Structural Soils

Root Paths

Corrective Pruning

Root Pruning

Root Shaving



Source of Material Examples & Images:

APPENDIX C. GUIDANCE TO DEVELOP A TREE ADVISORY COMMITTEE

To increase the capacity and voice for residents in managing the trees in Renton, guidance is provided for the City to consider the benefits of establishing a Community Tree Advisory Committee. This document provides specific recommendations and considerations for the City of Renton.

Overview

Forming a Community Tree Advisory Committee (TAC)— also referred to as a tree commission, tree board, urban forestry commission, beautification committee, environmental advisory committee, community forestry commission, among others depending on the jurisdiction— is one step Renton can take to create and sustain an urban forestry program. The powers and responsibilities of a Tree Advisory Committee are based on Washington statutes and are assumed by the local government. By forming and empowering a tree committee, Renton can provide an opportunity for important community decisions to include the perspectives of the communities of Renton. The formation of the TAC can be a crucial element in developing broad-based support for community trees and ensuring long-term success and growth of Renton's urban forestry program.

Proposed Responsibilities of the Tree Advisory Committee

The Tree Advisory Committee should reflect the values and standards of the community and should help champion urban forestry efforts. The recommended roles and responsibilities of Renton's TAC could include the following:

- Periodic review of Urban Forestry Program activities.
- Participate in an advisory capacity for tree removal appeals processes.
- Act as a sounding board for administrative issues in urban forest management.
- Stimulate and help organize volunteer tree planting and maintenance events.
- Assist with a possible 'Heritage' or 'Historic' trees program.
- Support urban forest management generally in an advisory capacity.
- Help identify, facilitate and recommend solutions to tree-related community disputes.

The proposed responsibilities of the TAC would be customized to suit the task, but Renton ordinances creating either the Senior Citizen Advisory Group or the Equity Commission could serve as useful references.

Formation of the Tree Advisory Committee

Formation of the Tree Advisory Committee and development of a comprehensive urban forestry program usually take place together. The creation of Renton's TAC is recommended at this stage due to the opportunities that have arisen during the development of the City's current Urban Forest Management Plan (UFMP). The UFMP project began in May 2021 and is anticipated to be completed by February 2022 and throughout this planning effort, community members and organizations have been educated and engaged to support the development of the UFMP. This public engagement has increased awareness of and support for the City's urban forestry efforts. The engaged community members may now be interested in actively participating on the TAC.

Renton's citizens who have been active in public engagement activities for the Urban Forest Management Plan can provide valuable insight on a TAC. The requirements relating to membership of committees are identified in the City of Renton municipal code Title II Commissions and Boards. Members shall be appointed by the mayor and approved by City Council. It is recommended that the City of Renton identify and explore specific sectors of the community to recruit diverse members of various backgrounds and experiences.

The following steps are recommended for Renton to organize citizens and form the Tree Advisory Committee:

- Hold informal meetings with concerned citizens and local officials to discuss ideas and plans. Discuss with the City Attorney's office legal requirements to establish a Tree Advisory Committee.
- Organize interested citizens and informally outline opportunities for a TAC to address and advise on specific occurrences or situations (such as tree failures, tree preservation, tree removals, tree removal permit denials, pruning, sidewalk damage, or tree planting) that have caused community conflict or liability. Describe benefits that are expected to result from an organized tree program (such as lower community liability, higher real estate values, more attractive commercial areas, healthier trees, and increased community fellowship).
- Contact other communities with Tree Advisory Committees or other experts, such as the Washington Community Forest Council, Extension Forestry, and the State of Washington Urban and Community Forestry program for advice and support.
- Liaise with Forestry Staff. It can be the case that a staff member sits on the committee in a non-voting capacity– this provides an important link to the municipal process.
- Identify and agree upon the powers, authority, and responsibilities of the TAC, through meetings with municipal council members, officials, and the City Attorney's office.
- Involve community members through public hearings and other opportunities for public participation and response.
- Develop or rewrite the ordinance that legally establishes the TAC and defines its authority and powers.
- Seek the council's approval of the ordinance at a public hearing according to the City's procedures.

Establishment of the Tree Advisory Committee by Ordinance

Municipal ordinances establishing and empowering Tree Advisory Committees could contain the following sections:

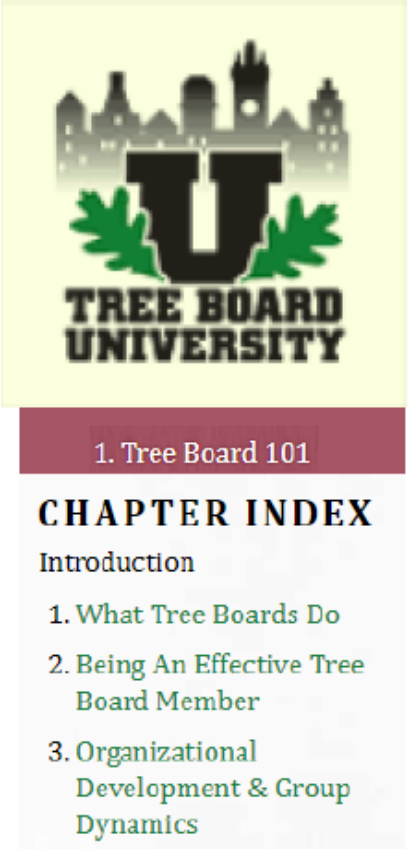
- Number of committee members,
- Experience or expertise required of members,
- Place of residence,
- Compensation, if any,
- Length of terms,
- Rotation of terms,
- Vacancies,
- Advisory duties,
- Primary focus areas.

Additionally, ordinances establishing Tree Advisory Committees can:

- Mandate a municipal arborist or forester position,
- Mandate and outline the creation of a municipal forestry master plan,
- Outline required standards and guidelines for tree planting and maintenance.

Supporting the Tree Advisory Committee

- Consider training members through the Arbor Day Foundation's Tree Board University.
  o An online training course consisting of eight courses:
  1) Tree Board 101
  2) Partnerships and Collaboration
  3) Engaging in the Political Process
  4) Community Forestry Planning
  5) Communications and Marketing
  6) Financing, Budgeting, Grants, Fundraising
  7) Getting Things Done
  8) Moving Forward
- Utilize additional resources such as the Arbor Day Foundation's Tree Board flier.
- Keep the Tree Advisory Committee informed of the progress in implementing the Urban Forest Management Plan.
- Consider including a member(s) on the Urban Forest Management Plan implementation team.
- Upon establishment the TAC should establish By-Laws to instill cooperation and success.
- Keep the TAC current on urban forestry research, technology, tools, and ideas.
- Communicate programs, events, strengths, challenges, and opportunities.



Summary

A Tree Advisory Committee for Renton's urban forest can have a great impact on a community's appearance and image as well as its public safety and comfort. Tree committees can help champion comprehensive and expert programming to manage and sustain public trees. They can help facilitate the provision of long-term, stable community involvement for a valuable, long-lived resource. By forming the Tree Advisory Committee in Renton, the attractiveness of the community and its quality of life and environment might be enhanced and further sustained.

APPENDIX D. 2021 URBAN FOREST AUDIT SYSTEM RESULTS

Urban Forest Audit Scoring Key

Not Practiced (0)	In Development (1)	Adopted Practice (2)

Management Policy

Category	Component Evaluated	Description or Critera for Evaluation
1.00	**Approved Policy Statements**	**Written policy statements approved by a governing body.**
1.01	Climate Change (Sustainability) Also referred to as Sustainability. With reference to urban trees.	Addresses the long-term health and productivity of the natural resource.
1.02	No Net Loss	Can refer to trees, basal area, or canopy.
1.03	Risk Management	Should reference: ANSI A300 Part 9, ISA BMP, and prioritization funding mechanisms.
1.04	Tree Canopy Goals	Overall community/campus goal, or by designated "zone".
1.05	Tree Protection	Construction and/or landscape maintenance.
1.06	Utility	Utility pruning, planting, and installation policy (e.g. boring vs. trenching).
1.07	Human Health – Physical & Psychological	Recognizes and addresses the human health benefits of the natural resource (e.g., exercise, air quality, stress management, shade).
1.08	Wildlife Diversity/Habitat/Protection	Could also include Urban Heat Island (UHI) policies.
1.09	Performance Monitoring	Mammals, birds, or reptiles.
1.10	Ordinance (Private)	Tree protection and management for trees on private property.
1.11	Ordinance (Public)	Tree protection and management for public trees.
1.12	Development Standards	US Green Building Council's LEED® rating systems (or similar internationally) LEED v4 BD+C (Sustainable Sites) LEED 4 ND (Neighborhood Pattern & Design, Green Infrastructure) ASLA's SITES® Rating System
1.13	High-Conservation Value Forests	Programs or policies for identification, acquisition, and/or protection of groups of trees or forests that provide unique public benefits.
1.14	Urban Interface (WUI)	Programs or policies that improve management of the urban interface for fire and/or invasive species.

Capacity and Training

Category	Component Evaluated	Description or Critera for Evaluation
2.00	**Professional Management**	**Provision for professional consultation.**
2.01	Certified Arborist - Staff	International Society of Arboriculture
2.02	Certified Arborist - Contracted	International Society of Arboriculture
2.03	Certified Arborist - Other Resource	International Society of Arboriculture
2.04	Other Professional - Advising/directing UF management	This could be a professional in an allied field like Landscape Architecture.
2.05	Municipal Forestry Institute	Graduate of Society of Municipal Arborist's MFI program or similar
2.06	USFS Urban Forestry Institute or similar	Attendance at USFS UFI or similar
2.07	Campus/city arborist – ISA CA instructor for CEUs	Arborist routinely provides ISA CEU presentations/workshops.
2.08	Tree Board University or similar	On-line training modules from Oregon U&CF for Tree Board/Advisory Council or similar
2.09	Organizational Communications	Process, procedures, and protocol for cross-professional communications within the organization (all departments "touching" trees).

Funding and Accounting

Category	Component Evaluated	Description or Critera for Evaluation
3.00	**Urban Forestry Budget**	
3.01	Budgeted Annually	Budget authorized/required for tree board, tree maintenance, and/or tree planting.
3.02	Contingency Budget Process	A protocol is in place to prioritize urban forestry management activities during budget shortfalls; e.g. during times of limited funding for: 1) risk management, 2) young tree care, 3) mulching.
3.03	Funding Calculated from Community Attribute	Budget in terms of per capita, per tree, or for performance (e.g. per tree weighted by size class or age.
3.04	Funding Based on Performance Monitoring	Budget connected with/based on ecosystem service (ES) monitoring and performance.
3.05	Urban Forestry Line Item	Is the budget specific to urban forest management?
3.06	Green Asset Accounting	Maintain green infrastructure data in the "unaudited supplementary disclosure of an entity's comprehensive annual financial report (CAFR)". GASB 34 implementation for municipalities.

Authority

Category	Component Evaluated	Description or Critera for Evaluation
4.00	**Authority**	
4.01	Urban Forest Manager	Professional urban forest manager with authority over the program and day-to-day activity. Including designated budget line item.
4.02	Staff Authority	Designated staff with authority over the program and day-to-day activity. Including designated line item.
4.03	Communication Protocol	Established protocol and mechanism(s) for communication among all members of the urban forest management "community" in your municipality or organization (e.g. manager, department under control, advisory board, finance, field operations, public, NGOs, business community, developers).
4.04	Tree Board, Commission, or Advisory Council	Establishes a board for public participation (advisory or with authority).

Inventories

Category	Component Evaluated	Description or Critera for Evaluation
5.00	**Inventories and Assessments**	
5.01	Canopy Inventory (UTC)	Periodic (≤5 year) canopy inventory and assessment. Public & private.
5.02	Ecosystem Services	Recent (≤5 year) ecosystem services (ES) inventory & assessment? Public: 100% or street trees; Public & Private: Sample; or Campus. Or, are ES calculated annually or biennially based on partial re-inventory and projected growth as a monitoring tool.
5.03	Public Trees ↓	↓ Evaulate below ↓
5.04	Street Trees	Is there a recent (5 year) inventory?
5.05	Parks/Riparian Areas	Is there a recent (5 year) inventory?
5.06	Other Public Trees	Public facility landscaped areas, Industrial parks, green space.
5.07	Continuous inventory on a cycle (≤5 years; i.e. panel)	Partial re-inventory to support continuous forest inventory, growth projections, and the calculation of ecosystem services for the purpose of long-term monitoring of urban forest management performance (e.g. carbon or leaf surface).

Category	Component Evaluated	Description or Critera for Evaluation
5.08	Private Trees ↓	↓ Evaluate below ↓
5.09	Campus (Educational)	Is there a recent (5 year) inventory?
5.10	Corporate	Is there a recent (5 year) inventory?
5.11	Other Private Property	Is there a recent (5 year) inventory?
5.12	Continuous inventory on a cycle (≤5 years; i.e. panel), inventory software	Partial re-inventory to support continuous forest inventory, growth projections, and the calculation of ecosystem services for the purpose of long-term monitoring of urban forest management performance (e.g. carbon or leaf surface).
5.13	Green Stormwater Infrastructure (GSI)	BMP stormwater mitigation practices and locations (e.g. Washington DC)
5.14	Spatial	Inventory data includes Lat/Long (i.e. GIS). Should address the spatial relationship between the natural resource and people (i.e. residents, visitors, activities) that would help manage the resource for benefits associated with proximity (air quality, recreation, stress mitigation, improved educational opportunity).
5.15	Maintenance and Planting Records Maintained	Planting details (nursery, species, size, cost, contractor, etc.) maintained with inventory or as separate database or recordkeeping system. Also pruning and removal histories.

Plans

Category	Component Evaluated	Description or Critera for Evaluation
6.00	**Management Planning Activities**	
6.01	Annual Maintenance Calendar	An annual calendar that defines typical activity by season. To support scheduling.
6.02	Public Trees ↓	↓ Evaluate below ↓
6.03	Street Tree Management	Is there a recent (5 year) plan for street trees?
6.04	Parks/Riparian Area Management	Is there a recent (5 year) plan ?
6.05	Other Public Trees	Public facility landscaped areas, Industrial parks, green space.
6.06	Private Trees ↓	↓ Evaluate below ↓
6.07	Campus (Educational)	Is there a recent (5 year) plan for Campus trees?
6.08	Corporate	Is there a recent (5 year) plan?
6.09	Other Private Property	Is there a recent (5 year) plan?
6.10	Green Infrastructure	Is there a plan for green infrastructure (i.e. nodes & linkages)? Large-scale projects.
6.11	Other Written Plans	Other natural resource plans (e.g. tree canopy). May be a component of another plan.
6.12	Tree Planting	Is there a recent (3 year) tree planting plan?). May be a component of another plan.
6.13	UF as Part of a Comprehensive Plan	Is any UF management plan referenced in the comprehensive plan (i.e. county or municipality) or master plan (i.e. Campus)?
6.14	Urban Forest Planning and Management Criteria and Performance Indicators	Criteria and indicators based on *A Model of Urban Forest Sustainability* (Clark, J.R., Matheny, N.P., Cross, G., and Wake, V. 1997 Journal of Arboriculture.) or on work of W.A. Kenney, P.J.E. van Wassenaer, and A.L. Satel in *Criteria and indicators for strategic urban forest planning and management*. (2011)

Risk Management

Category	Component Evaluated	Description or Critera for Evaluation
7.00	**Risk Management Activities**	
7.01	TRAQ Attained	At least one staff or consultant is TRAQ.
7.02	Annual Level 1 (ANSI A300 Part 9 & ISA BMP)	All trees in high occupancy areas visited annually.
7.03	Mitigation Prioritization	A protocol for prioritizing mitigation following Level 1 and Level 2 assessments. Reflects the controlling agency's threshold for risk.
7.04	Occupancy Areas Mapped	Has TRAQ staff/consultant discussed/mapped occupancy levels with controlling authority?
7.05	Recordkeeping, Reporting, and Communications	A process has been put in place to maintain records on requests, inspections, evaluations, and mitigation of risk; and on the communications among the managers related to those risk assessments.
7.06	Standard of Care Adopted	Controlling authority has adopted a Standard of Care (SOC) or risk management policy.
7.07	Tree Risk Specification	Is there a written specification that meets requirements of ANSI A300 (Part 9)? And, has it been discussed with the controlling authority with relevance to the controlling authority's threshold for acceptable risk?
7.08	Urban Tree Risk Management	The community has prepared and follows a comprehensive program for urban tree risk management.
7.09	Invasive Management	Plan to address and manage invasive: plants, insects, and disease.

Disaster Planning

Category	Component Evaluated	Description or Critera for Evaluation
8.00	**Disaster Planning Activities**	
8.01	Response/Recovery Mechanism	Staff knowledge of the municipality's protocol for requesting disaster resources through the county or state with access to mutual aid and EMAC.
8.02	Urban Forestry as part of the County Disaster Plan	The UF plan (8.3) is incorporated into the county/municipal disaster plan; specifically in reference to debris management and risk mitigation.
8.03	Urban Forestry Disaster Plan	A separate/specific plan within the urban forestry management program (i.e. who to call, priorities).
8.04	Pre-disaster Contracts	Contracts are in place for critical needs.
8.05	Mitigation Plan	A mitigation plan has been developed for pre-disaster, recovery, and post-disaster.
8.06	EMAC Mission Ready Packages (MRP)	Municipality has published disaster resources with state EM and participates in inter-state Mutual Aid to support Urban Forest Strike Teams (UFST).
8.07	Urban Forest Strike Team	Participation in the UFST project.

Risk Management

Category	Component Evaluated	Description or Critera for Evaluation
9.00	**ANSI Standard & BMP Activities**	
9.01	ANSI Standards	Reference and adherence to ANSI Standards for arboricultural practices (A300), safety (Z133), or Nursery Stock (ANSI Z60.1) (any or all).
9.02	Ages/Diameter Distribution	Specific management for the development of an age-diverse tree population
9.03	Arborist Standards	Standards of practice for arborists (i.e. Certification).
9.04	Best Management Practices (BMPs)	Establishes or references tree maintenance BMPs (i.e. written comprehensive standards & standards).
9.05	Fertilization and Mulching	Fertilization or mulching standards required for conserved & planted trees.
9.06	Lightning Protection Systems	BMP written to the ANSI A300 Standard.
9.07	Planting	Planting and transplanting standards required/specified.
9.08	Pruning	Pruning standards required for conserved & planted trees.
9.09	Removal	Infrastructure damage, stump grinding, etc.
9.10	Support Systems (Guying and Bracing)	BMP written to the ANSI A300 Standard.
9.11	Tree Risk	Tree risk assessment procedures; ISA BMP or equivalent.
9.12	Construction Management Standards	Written standards for: tree protection, trenching/boring in CRZs, pre-construction mulching, root or limb pruning, watering (any or all).
9.13	Design Standards	Standards for design that specifically require trees; standards for tree placement (i.e. location), soil treatment, and/or drainage.
9.14	Genus/Species Diversity	Suggests or requires diversity of plant material.
9.15	Green Stormwater Infrastructure (GSI)	BMPs for site level GI practices like rain gardens and swales. Small-scale projects.
9.16	Inventory Data Collection	Community has adopted or developed applicable standards for local urban tree inventory data collection to support QA/QC.
9.17	Minimum Planting Volume	Minimum required root zone volume.
9.18	Minimum Tree Size	Minimum caliper for tree replacements, and/or minimum size of existing trees to receive tree density or canopy credit.
9.19	Root Protection Zone (CRZ)	Defines adequate root protection zone; Critical Root Zone (CRZ).
9.20	Safety	Safety logs, trainings, reference to ANSI Z133 Safety Standard
9.21	Topping	Prohibits topping or other internodal cuts (public & private).
9.22	Tree Species List	Identifies and publishes a list of the most desirable, recommended, and/or preferred species (may include native and non-native species); alternatively, a list of species prohibited.
9.23	Tree Quality Standards	Written standards for tree selection at nursery in addition to Z60.1.
9.24	Utility Right-of-Way (ROW) Management	Requirements for planting, pruning, and/or removal of trees within a utility ROW.
9.25	Urban Agriculture	Enabled urban food forestry practices.
9.26	Wood Utilization	Larger diameter material is processed for wood products.
9.27	Third-party forest products certification compliance	Examples: American Tree Farm System (ATFS), Forest Stewardship Council™ (FSC®)
9.28	Energy generation	Local or regional use of chips or other woody debris for co-generation facilities.
9.29	Composting of Leaf and/or Other Woody Debris	Leaves and small woody debris are captured and used on-site or processed by someone by composting for reuse.
9.30	Watering Standards	

Community

Category	Component Evaluated	Description or Critera for Evaluation
10.00	**Activities that Build Community**	
10.01	Social Media Website or Similar	Does your community/campus use social media platforms or similar to document and publicize your urban forestry program, activity, or events?
10.02	Education	The urban forest is used as an educational laboratory for class activity; Kids in the Woods, PLT, high school, or college level.
10.03	Private Property Tree Program	Does your community sponsor this program locally?
10.04	Tree Inventory and Management Software	Public access to the community tree resource via an on-line mapping program (i.e. any Web Map Service; WMS).
10.05	Public Perception	Is public management consistent with private property requirements for tree protections and care? Does the Campus/public tree management reflect neighborhood norms?
10.06	Recognition Programs	Programs that raise awareness of trees or that use trees to connect the community to significant events or activities.
10.07	Arbor Day Celebration	Whether or not associated with Tree City USA.
10.08	Arboretum designation	Internal or third party arboretum designation.
10.09	Significant trees	For example: size, history.
10.10	Memorial/Honorarium	Tree planting or tree care programs than honor/memorialize individuals, organizations, or events.
10.11	Social Media	Does your community/campus make use of Twitter, Facebook, Blogs for internal or external outreach?
10.12	Active Communications	Press releases, regular news articles (print), “State of the Urban Forest” reports, periodic analysis of threats and opportunities.
10.13	Tree Care	Are volunteers trained and used for basic tree care (e.g. mulching, pruning, planting).
10.14	Tree Campus USA®, Tree City USA®, Tree Line USA®	Community/campus meets current qualifications for any of these programs.
10.15	Volunteer Opportunities	Ad hoc or scheduled. Any/all age groups. Tree Campus USA student activities.

Green Asset Evaluation

Category	Component Evaluated	Description or Critera for Evaluation
11.00	**Observed Outcomes (Activity, Health)**	
11.01	Deadwood	Look for evidence of periodic or ad-hoc deadwood removal (i.e. lack of dead limbs ≥ 2" in the trees or on the ground).
11.02	Genus Diversity	No genera exceed **20%** of population; make specific observations for *Acer*, *Quercus*, *Fraxinus*, *Ulmus* and other local species of concern.
11.03	Mature Tree Care	Mature trees are retained in the landscape, and are of acceptable risk; i.e. veteran tree management.
11.04	Mulching	Evidence of adequate (i.e. spatial extent, depth, and material) roots zone mulching for all age classes.
11.05	Planting Site Volume Optimization	Are species & sites matched for optimization of above ground canopy; right tree in the right spot concept.
11.06	Rooting Volume Optimization	Are species & sites matched for optimization for below ground rooting volume; right tree in the right spot concept.
11.07	Species Diversity	No species/cultivars exceed **10%** of population; make specific observations for *Acer*, *Quercus*, *Fraxinus*, *Ulmus* and other local genera of concern. Also evaluate the role of regionally local native species.
11.08	Soil Compaction	Observe evidence of soil compaction by users or staff during maintenance. Include "desire" lines and construction activity at time of evaluation.
11.09	Tree Health	Rate the overall tree health in all size (age) classes; look for crown dieback, decay, foliage density & color.
11.10	Young Tree Pruning	Look for evidence of periodic (e.g. every 3 years to year 9) structural pruning (e.g. subordination cuts, dominant central leader, co-dominant stems lower that 20').

APPENDIX E. RISK TREE MANAGEMENT PLAN

CITY OF RENTON, WASHINGTON

COMMUNITY SERVICES DEPARTMENT

URBAN FORESTRY & NATURAL RESOURCES

AUGUST 2020

TREE RISK MANAGEMENT PLAN

Introduction

Trees are a valuable asset to the community of Renton, beautifying our city and linking us to the natural environment. They also provide other benefits such as purifying our air, reducing energy consumption and costs, and reducing storm water runoff. However, a structurally defective tree in the urban setting can present a safety risk to people and property. Dying and defective trees can also increase wildfire risks - less of a concern in the South Puget Sound but one to be aware of in a changing climate.

Figure 1. An Oak tree in Maplewood Park dropped a 70' foot long 2' foot diameter branch during a hot day on an afternoon in late July of 2020

City of Renton Forestry is responsible for managing trees located on city street rights-of-way (street trees), parks, natural areas and city owned property. One of these responsibilities includes reducing the risks trees can pose to people and property. This is accomplished by identifying and evaluating defective city trees, assessing and quantifying the safety risks and taking the appropriate actions to reduce these risks. The City of Renton Urban Forestry Management Plan defines this process as Hazard Tree Management. Renton's urban forest has grown since the first management plan in 2011 and there have been advances and changes in arboriculture; some as simple as dropping the terminology including "hazard" in favor of "risk". This document is part of a new update to this management process and is redefined as a Tree Risk Management Plan.

The purpose of this document is to inform the public of the City's Tree Risk Management Plan. This plan provides guidelines, procedures and practices in the management of city trees that may present a safety risk to people and property.

Risk Tree Management in Renton

History

The city has actively managed risk trees for over 12 years with a concerted effort beginning in 2009. At that time, the city recognized the need to develop a long-range plan for the maintenance of the urban forest. To that end, more management information regarding Renton's urban forest would be required and the city's first public tree inventory was created. This inventory was updated in 2020. This document is the city's first specified risk tree management plan.

In 2011, the city published and City Council officially adopted the City of Renton Community and Urban Forest Development Plan. This plan did not include risk tree management specifically, but one of four major stated goals included increasing public safety by better management of the urban forest. Best management practice recommends clear definitions of tree hazards and use of International Society of Arboriculture (ISA) evaluation processes and forms for assessing risk trees. A risk plan should also explain a process of designating certain trees as "Monitor" trees; trees to be evaluated for tree risks once per year and after storm events.

This process could serve the city well and the current City Forester recognized the need for a comprehensive risk tree management plan. There are new standards and tools for assessing risk trees and Renton's urban forest is growing and aging. New assessment technologies such as resistance drill testing and sonic imaging could become part of the City Forester's toolkit to assess decay pockets and the internal structural integrity of trees.

The ISA has developed the new Tree Risk Assessment methodology, which differed from past evaluation techniques

and has been standardized in the tree care industry. These changes and challenges in managing Renton's urban forest, advancements in technology and arboricultural practices, and the forestry program's continuing efforts to provide the best urban forestry management services for the city brings us to today and the 2020 Tree Risk Management Plan.

Renton's Logging Legacy and 'Tall Trees' in the Pacific Northwest

One of the unique challenges of managing Renton's urban forest stems in part from the nature of trees in the Pacific Northwest - they grow tall here. Captain Renton, the city's namesake, made his fortune from timber harvested in the area, especially Douglas Fir trees. Small pockets of remnant stands of second growth trees can still be seen even today at the edge of new developments. They can be more prone to branch failures than other tree species during storms. In addition to large tree size, the prevalence of particular species in the urban forest population presents more opportunities for possible damages and consequences as a result of the failure of a tree or tree part. Other native species like Big Leaf Maples and Black Cottonwoods can also be problematic as they are also large trees and are prone to decay. They comprise a large proportion of the public tree population, especially in natural areas. We also see large specimen trees like Pin Oaks, Tulip Trees, Cedars and Sycamores on city streets which require thoughtful management.

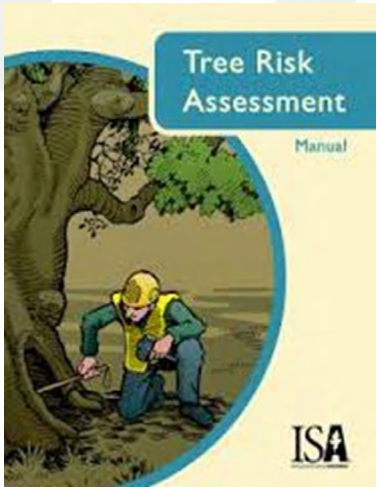
Figure 2. Typical group of 'urban' Douglas Fir trees on NE Sunset Blvd.

Therein lies the challenge and one of the justifications for a clearly defined tree risk management strategy. The result is that maintaining healthy tree populations requires more intensive management versus less "problematic" trees. This more intensive management comes at little higher cost to the community as well as accepting a little higher degree of tree related risk.

Practices

Beyond adopted city policy, best management practice for risk trees should be no exception. The City of Renton Urban and Community Forestry Development Plan adopted by City Council established improving public safety as an important goal. The following procedures have been developed to guide the city in the implementation of the Tree Risk Management Plan in the next iteration of the city's 10-year urban forest management plan in 2021.

Risk Tree



A potential risk tree will be evaluated by the City Forester. The tree will be evaluated using the International Society of Arboriculture's (ISA) Tree Risk Assessment Methodology (www.isa-arbor.com). This is the industry standard for evaluating a risk tree. It includes evaluating potential targets of a tree failure, defects in the tree that may fail, the probability the defect(s) may fail and finally the potential consequences if the defective tree part fails. The culmination of the assessment results in a Risk Rating; Low, Moderate, High or Severe. Other factors that are considered in determining the risk include; the occupancy rate of a target in the impact zone, whether a tree a strong or weak-wooded tree species, the possible exposure of the tree to strong wind events, a history of failures, topography and wildfire risk in a potential future wildfire control area.

A risk tree is defined by the following industry terms.

- A Risk Tree is a tree with a defect present that has a likelihood of failure of Probable or Imminent, a target occupancy rate greater than Rare and/or located in a moderate or high wildfire risk area as determined by the City Forester.

City Tree

The city is responsible for managing all trees located on public property. These include trees located on city street right-of- ways (street trees), parks natural areas and other city properties. However, trees are living, growing organisms that do not adhere to our people-made boundaries. A small young tree beginning its life clearly on a property, grows in diameter with age and may grow over a property line. In these cases of "border trees", is it the city's or the private property owner's responsibility to manage the tree? The following guidelines define a City Tree and the responsibility for management of city/private property border trees.

Figure 3. Example of a "border tree".

- The city will review the management responsibility of any tree with at least half of its trunk diameter measured at 4.5 feet above grade located on a city right-of-way, easement or property.
    - If necessary, a professional survey will be performed to provide clarification.
    - In cases where there is clearly mutual responsibility, the city will work with the property owner to reach a mutually acceptable arrangement.

Risk Trees Located on Private Property

There are trees located on private property that may pose an unacceptable risk to city property or the right-of- way. If the city identifies a risk tree on private property or is informed of a risk tree on private property, the following guidelines and collaboration with Code Compliance will direct city action.

- A risk tree located on private property, as determined by the City Forester, will be mitigated by the property owner or the city through a code compliance notice and order process as defined in the City of Renton Code.
    - In general, it includes a process of notifying the property owner and agreeing on mitigation strategy within a given time frame.

Tree Removal

In a natural setting trees die or fall creating space for a new tree to grow in its place. In the urban setting, it is people that must manage this process. Dead, diseased or declining trees need to be removed when they become an unacceptable risk. People must plant trees to replace removed trees. The city values all trees, however at a certain point tree removal may be the best management practice to reduce risks to people and property, protect the urban forest from insect pests and disease, unacceptable wildfire risks and introduce renewal by planting replacement trees. The following tree removal guidelines will help direct public tree removal decisions in the City of Renton.

- A city tree will only be removed if it is an imminent threat to public safety , dead, dying, diseased, surpassed its service life, or in conflict with a more important city project as determined by the City Forester
- Tree Removal Notification Process
    - Written notice is sent to adjacent property owners and residents of impending tree work
    - If needed, a tree removal notice stating the removal reasons will be posted by the City Forester on the tree prior to the scheduled removal.
    - If necessary, the City Forester will notify the Community Services Administrator, the Mayor and City Council when a tree deemed of particular importance by the City Forester is removed.

Figure 4. "Renewal of the urban forest". Replacement tree planting in the downtown core.

Identification of Risk Trees

There are two ways Risk Trees are identified by the city; random observation and periodic inspections.

Figure 5. Conks (fungal fruiting bodies) like the one pictured here are an indicator of decay working in the tree. In this case, the Ganoderma fungus decayed the base of this aspen resulting in the tree failing.

The primary way risk trees are identified is through the city's periodic tree pruning and inventory programs. The goal is that each year 1/6th of the city's trees in a particular geographic area or planning district are pruned. Prior to the actual pruning, City Forestry performs a basic walk around inspection of trees in the scheduled area. Through this inspection process Risk Trees may be identified. Further, as the pruning work is being completed on a tree, problems may be identified by the pruner and it is their responsibility to notify City Forestry for further evaluation. The City may also periodically perform a complete inventory of city trees or a special project that may reveal a Risk Tree.

There are cases where a city staff person, by chance observation, identifies a potential risk tree during their normal work activities. A city forestry crew or contractor may be pruning a tree and identify a problem. A city staff person may notice a problem with a tree. The inspection of a request for service from the public may reveal a potential risk tree.

How Risk Trees are Managed

Once a potential Risk Tree is identified the following procedures are implemented.

1. A Tree Risk Assessment is scheduled for the tree of concern.
2. The tree receives a Basic Tree Risk Assessment resulting in one of three of the outcomes.
    a. Arboricultural treatments to mitigate the risks of defective tree part(s) will be scheduled and completed, up to and including complete tree removal.

b. The tree will be scheduled for an advanced tree risk assessment.
c. The tree will be placed on the Risk Tree Monitoring Program.

Tree Risk Assessment

As described above, an International Society of Arboriculture (ISA) Tree Risk Assessment is the industry standard for assessing risk trees and quantifying tree risk. In addition to detailing the methodology for performing a Tree Risk Assessment, the ISA qualifies arborists to perform a Tree Risk Assessment (https://www.isa-arbor.com/certification/becomequalified/becomequalified). This includes a training and testing program whereby upon the successful completion of the program, an arborist is given the designation of Tree Risk Assessment Qualified. All Tree Risk Assessments performed as part of this program are performed by ISA Tree Risk Assessment Qualified arborists.

Tree Risk Mitigation Arboricultural Treatments & Practices

Tree Pruning

Figure 6. To safely retain this Oak tree, reduction pruning and cabling was performed to reduce the risk of further failure.

The city's standard tree pruning specifications include the pruning of defective branches that may pose an unacceptable risk of failing. A tree pruner will be directed to prune the defective branch(s) from the tree and as a result reduce the risks of these defective branches failing. In some cases, a more aggressive pruning practice called "Reduction" pruning may be specified. Reduction pruning includes the arboriculturally correct practice of pruning the terminal portions of scaffold and lateral branches to shorten the length of the branches, spread of the tree, and height of the tree. This treatment is used in cases where there may be significant root or trunk defects, or multiple scaffold branch defects. Shortening the length of branches and/or the height of the tree increases the amount of force that is required to break a tree part and as a result reduces the probability and risk the tree part will fail. For large specimen trees which still retain ecosystem value should they be stabilized despite damage suffered, additional mitigation strategies like cabling and bracing may be considered.

Advanced Tree Risk Assessment

A Basic Tree Risk Assessment is the first assessment performed after a potential risk tree is identified. The basic assessment is completed from the ground and is primarily a visual assessment. If the City Forester finds it is needed, then an Advanced Tree Risk Assessment will be performed on the tree. This may include an inspection with an aerial lift truck and possibly the use of advanced diagnostic tools such as a Resistograph and a Tomograph.

Reistograph & Tomograph Uses

Decay is very common in trees and particularly in older trees. The amount of decay in a tree part or more importantly the amount of soundwood around a decayed tree part is the most important variable in assessing the probability that a decayed tree part may fail. The Resistograph and Tomograph are two tools used to measure soundwood and decay present in a tree part. Both of these tools provide more information for assessing the risk a tree part may fail. The findings these tools provide do not provide the "end all" answer to what management treatment should be taken. They do provide more information for the assessor to quantify failure risk and the final management decision to be taken is a culmination of the findings of these tests and other conditions present with the tree.

Figure 7. Tomograph measurements being taken on a tree in Jones Park, Renton, Washington.

Resistograph

A Resistograph drills into the wood of a tree part and measures and records the resistance being applied on the drill bit as it drills into the tree part. The result is a visual measurement of the "sound" and "unsound" wood where the tree part was drilled.

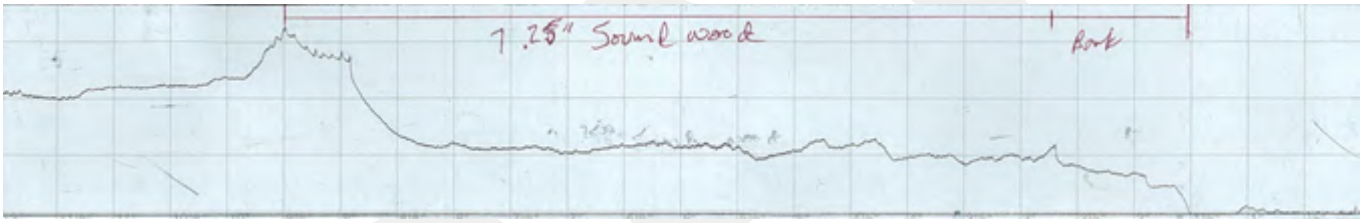


Figure 8. Resistograph tape showing the thickness of sound wood.

Tomograph

A Tomograph uses soundwaves to measure the "soundness" of a tree part. Unlike the Resistograph, the Tomograph provides a graphic representation of the "soundness" of the wood around the whole tree part measured, is a more accurate measure and provides more information with which to make a probability of failure judgement.

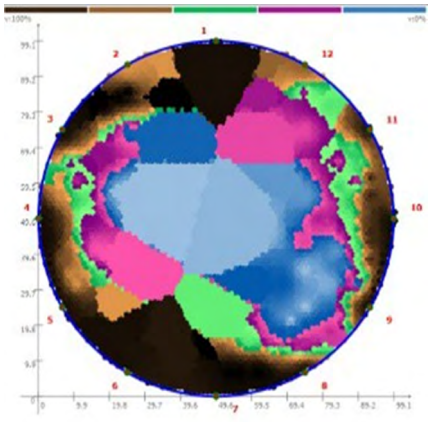


Figure 9. Tomograph chart illustrating the "soundness" of the tree part measured.

Risk Tree Monitoring Program

Risk Trees that have an ISA Risk Rating of Moderate or higher, even after arboricultural treatments have been completed, will be assigned to the city's Risk Tree Monitoring Program. Using the city's computerized tree inventory, each of these trees will be designated as Risk Monitor trees. Each of these trees will receive a Tree Risk Assessment every year. The findings of the annual assessment will direct further action such as arboricultural treatments, advanced tree risk assessment, retention on the Tree Risk Monitoring Program or if the condition of the tree warrants, removal.

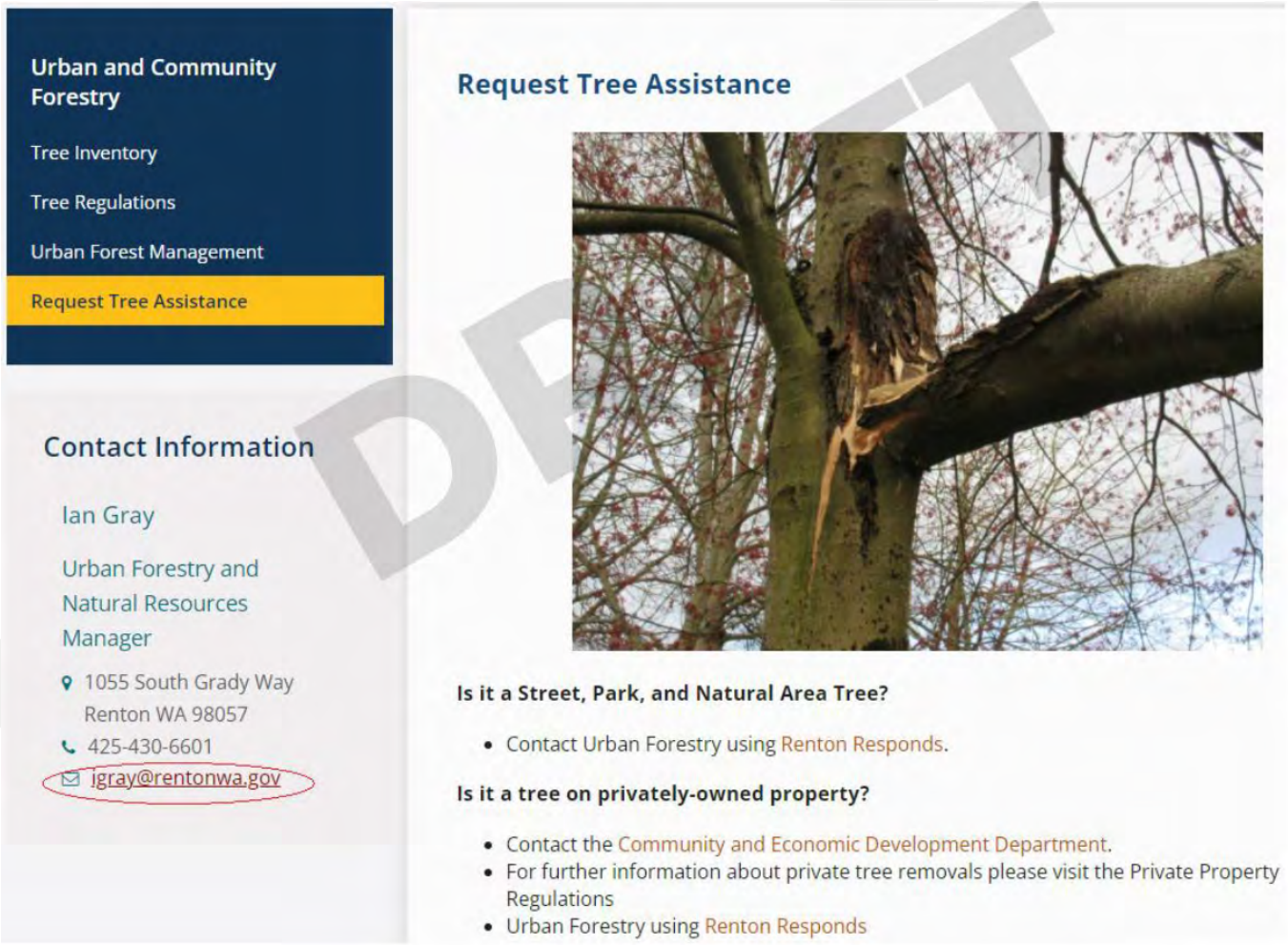
Tree Removal

Ultimately a tree may have declined or may have been damaged to a point that removal and planting a new tree is the best management decision.

How Can You Help?

If you see a tree that you believe may pose a risk to public safety report your concern to City Forestry in the following ways. Be prepared to provide the address and general location of the tree of concern. The tree will be inspected by City Forestry and inform you of the findings.

- Call the Forestry Division at (425) 430-6601 to report your concern.
- Post a request to the city via the Renton Responds app.
- Send the City Forester an email via the City's website by going to: (www.rentonwa.gov/urbanforestry) and navigate down to the "Request Tree Assistance".



References & Acknowledgements

- Andrew G. Pleninger (Consulting Arborist, Aspen Tree Service) and Ben Carlsen (Natural Resource Manager, City of Aspen): coauthors of the original document from which this risk plan was adapted.
- International Society of Arboriculture, Champlain, IL. Publication illustrations on pages 3 & 5.
- Photos on cover page and in figures 1,2,4,6 & 7 courtesy of Ian Gray, Renton Urban Forestry & Natural Resources Manager, August 2020.
- Photos in figures 3 &5 courtesy of Ben Carlsen and Andrew Pleninger.

APPENDIX F. URBAN FOREST PEST READY ASSESSMENT

The Washington State Urban Forest Pest Readiness Playbook provides a set of actions that towns, cities, counties, and urban forestry programs should take to address the threat of forest pests. The purpose of the playbook is to close a gap in readiness and response capabilities between community leaders managing urban forests and state and federal responders. After using the playbook a city should have an understanding of your program's preparedness, documentation of what is known, and a path forward for improving pest readiness capabilities.

Initial funding for the Urban Forest Pest Readiness Playbook was provided by U.S. Department of Agriculture Animal and Plant Health Inspection Service Plant Protection and Quarantine.

The resource is available at www.invasivespecies.wa.gov and an interactive worksheet was provided as part of the Urban Forest Management Plan Project. The following provides the framework of the Urban Forest Pest Ready Assessment section of the playbook. The playbook should be utilized during and after completing the assessment to develop actions specific to the evaluation.

Table 29. Urban Forest Pest Ready Assessment from the WA State Urban Forest Pest Readiness Playbook

Urban Forest Pest Ready Assessment

Understanding Risk

#	Question	Yes	Points	No/Not Sure?
Tree Resources				
1a	Has your community ever conducted a tree canopy analysis?	☐	1	See Action 6 in the Playbook
1b	Has your city ever performed or does your city currently have a tree-by-tree inventory containing data on individual trees' species, sizes, conditions, and locations?	☐	3	
1c	Is the inventory less than 10 years old?	☐	1	
1d	Is the inventory less than 5 years old?	☐	1	
1e	Does your inventory data include all or a significant majority of all managed street and park trees?	☐	2	
1f	Is your inventory held in a geospatial database with location data?	☐	2	
1g	Is your data able to be shared with others outside your organization?	☐	2	
Pests of Concern				
2	Have you identified priority pest species that are a concern for your community based on an understanding of common tree species in your urban canopy?	☐	1	See Action 3 in the Playbook
Risk Analysis				
3	Have you considered neighboring jurisdictions and/or nearby natural resource economies like agriculture and forestry as part of your assessment of priority pests?	☐	1	See Action 7 in the Playbook
Pest Pathways				
	Do you have an understanding of local hot spots for pest introduction to your community including (check yes if no hot spots exist):			
4a	Locations where there is an influx of new residents or popular destinations for out-of-state visitors	☐	1	See Action 4 in Playbook
	Transportation corridors and storage facilities for commercial movement of forest and agriculture products	☐	1	
	Commercial ports (check yes if there are no commercial posts)	☐	1	

#	Question	Yes	Points	No/Not Sure?
4b	Have you documented the locations and supplementary information about size of these pest introduction hot spots?	☐	1	See Action 4 in the Playbook
4c	Has your community identified trees or locations that are particularly pest vulnerable?	☐	1	
Pest Prevention				
5a	Does your city staff use Best Management Practices to prevent the spread and introduction of pests?	☐	1	See Action 13 in the Playbook
5b	Do you or partners provide training for local contractors on tree care or Best Management Practices to prevent the spread and introductions of pests?	☐	1	
Actions 3, 4, 6, 7, 13				
Understanding risk subtotal			0	of 21

Capacity to Support a Response

#	Question	Yes	Points	No/Not Sure?
Emergency Preparedness				
1	Do you have one or more staff that have been trained in Incident Command Systems (ICS)?	☐	1	See Action 18 in the Playbook
Response Experience				
2a	Have you participated in an invasive forest pest response in the last ~20 years?	☐	1	See Action 17 & 20 in the Playbook
2b	Do you know the basic components of a pest response that a lead action entity would run in the event of a pest confirmation?	☐	2	
Know Who to Call				
3	Have you integrated the contact information for USDA-APHISPPQ, USDA Forest Service, Washington Invasive Species Council, Washington Department of Natural Resources, Washington Department of Agriculture and/or Washington State University into your own systems so that a team member can easily know who to call if a pest is detected in your area?	☐	2	See Detection & Reporting Section in the Playbook
Supporting Organizations				
4a	Have you worked with Washington Invasive Species Council, Washington State Department of Agriculture, or Washington State Department of Natural Resources state agency staff in the past to support your program (could include training, consultation, workshops, grants, one-on-one discussions)?	☐	1	See Playbook overview
4b	Do you know which partners and stakeholders to engage in order to garner support for a response?	☐	1	See Action 9 in the Playbook
Sufficient Funding				
5	Do you know what funding options, both internal and external, are available to you to respond to a pest?	☐	1	See Action 5 in the Playbook
Tree Management				
	Are you actively enhancing your managed street trees, parks, and natural areas:			
6	To prevent invasive species establishment	☐	1	See Action 16 & 19 in the Playbook
	To diversity tree plantings	☐	1	
	To restore areas after significant tree removal (for example removal of damaged trees, invasive trees, hazard trees, or a forest pest response)	☐	1	
Actions 5, 9, 16, 17, 18, 19. 20				
Capacity to Support a Response subtotal			0	of 12

Ability to Expedite Informed Decision-Making

#	Question	Yes	Points	No/Not Sure?
Urban Forestry Staff				
1a	Do you have a staff person(s) or department(s) responsible for urban tree management?	☐	1	See Action 1 in the Playbook
1b	Would you consider most of your non-urban forestry-related departments to be informed on how their work impacts your urban forests?	☐	1	
Local Authority				
	Do you have any urban forestry management:			
2a	Plan(s)	☐	1	See Action 2 in the Playbook
	Policies	☐	1	
	City Code	☐	2	
2b	Does your urban forestry management plan, policy, or codes include information on pest management?	☐	3	See Action 12 of the Playbook
Permitting Processes				
3	Are you familiar with permitting processes regarding (+1 for at least 4 of 7): · Public involvement/notices · Environmental and water quality · Endangered species · Property access requirements · Pesticide registrations and applicator licenses · Plant quarantine compliance · Waste management practices · Historical site/archaeological permitting	☐	1	See Action 8 & 15 in the Playbook
Leadership				
4	Do you have elected officials currently serving that have demonstrated concern for urban forest pests or invested in urban forest pest-related initiatives?	☐	3	See Action 11 in the Playbook
Actions 1, 2, 8, 11, 12, 15				
Ability to Expedite Informed Decision-Making subtotal		☐	0	of 13

Community Support to Expand Your Impact

#	Question	Yes	Points	No/Not Sure?
Diverse Team				
1a	Do you have experience bringing together diverse groups of stakeholders across departments and topics?	☐	1	See Action 9 in the Playbook
	Do you have access to people with the following expertise or role involved in this assessment (+1 for each category filled):			
1b	Tree or urban forest expert	☐	1	
	City planner	☐	1	
	Tree care professional or other community stakeholders	☐	1	
Messaging				
2	Do you know the appropriate messaging and languages/ channels/ forums to use when communicating with the populations and neighborhoods most likely to be impacted by a pest detection?	☐	1	See Action 10 in the Playbook
Public Awareness				
3	Do you have information in public outreach materials that you distribute that covers the issues and risk of urban forest pests?	☐	1	See Action 10 in the Playbook

#	Question	Yes	Points	No/Not Sure?
Early Detection				
4	Do you promote the implementation of and recruitment to early pest detection network (such as Master Gardeners, Washington Pest Watch)?	☐	2	See Action 14 in the Playbook
Actions 9, 10, 14				
Community Support subtotal			0	of 8

Urban Forest Pest Ready Scorecard	Subtotal	Total	Benchmark
Understanding Risk	0	of 21	12
Capacity to Support a Response	0	of 12	8
Ability to Expedite Informd Decision-Making	0	of 13	7
Community Support to Expand Your Impact	0	of 8	5

APPENDIX G. REFERENCES

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CITY OF RENTON, WASHINGTON

RESOLUTION NO. 4462

A RESOLUTION OF THE CITY OF RENTON, WASHINGTON, ADOPTING THE CITY OF RENTON URBAN FOREST MANAGEMENT PLAN 2022-2032.

WHEREAS, the Growth Management Act encourages planning for open space and recreational needs of a community to be integrated with planning for other needs; and

WHEREAS, the City of Renton Urban Forest Management Plan 2022-2032 (the "Plan") is compatible with the intent of the City's adopted Comprehensive Plan; and

WHEREAS, the City began the update process for the Plan in April of 2021; and

WHEREAS, the Plan has been developed with extensive community outreach in conjunction with residents, property owners, stakeholders, local businesses, community partners, public and private agencies and institutions, and non-profit organizations; and

WHEREAS, urban forests provide environmental benefits, opportunities for recreation, community connections, natural resources and habitat, offering places for quiet reflection, and experiencing nature; and

WHEREAS, the Plan is a comprehensive update of the 2009 Urban and Community Forestry Development Plan and therefore supersedes and replaces the 2009 plan. It represents a collaborative effort between the Parks and Recreation and Community and Economic Development Departments with support from all City departments, and reflects the public's desire to provide the opportunity for the community to connect to, participate in, support, and encourage a healthy environment and active lifestyle; and

WHEREAS, the Plan creates a 10 year vision for trees on public property in the City of Renton – the urban forest; describes current and future needs; and identifies policies,

RESOLUTION NO. 4462

implementation strategies, and a maintenance program to enhance and sustain trees as a critical piece of green infrastructure for a livable community; and

WHEREAS, updating and adopting the Plan maintains the City's status as an Arbor Day Foundation 'Tree City USA;' and

WHEREAS, the Plan was developed in conjunction with citizen feedback and a collaborative team; and

WHEREAS, this matter was duly referred to the Parks Commission, Planning Commission, and Planning & Development Committee for investigation, study, and review; and

WHEREAS, the Planning Commission held a public hearing on December 1, 2021, considered all relevant matters, and heard all parties in support or opposition, and subsequently forwarded a recommendation to the City Council; and

WHEREAS, the Plan was subject to a State Environmental Procedure Act (SEPA) review pursuant to Chapter 43.21C RCW and successfully passed a Washington State Department of Commerce 60-day review;

NOW THEREFORE, THE CITY COUNCIL OF THE CITY OF RENTON, WASHINGTON, DO RESOLVE AS FOLLOWS:

SECTION I. The City Council hereby adopts the Plan, attached hereto as Exhibit A and incorporated by this reference, and directs the Administration to draw up a work program to begin implementing the Plan. The Plan shall remain in full force and effect until further revised, amended, and modified as provided by law.

RESOLUTION NO. 4462

PASSED BY THE CITY COUNCIL this 14th day of February, 2022.

Jason A. Seth, City Clerk

APPROVED BY THE MAYOR this 14th day of February, 2022.

Armando Pavone, Mayor

Approved as to form:

Shane Moloney, City Attorney

RES-P&R:1901:2/7/2022

CITY OF RENTON SEAL INCORPORATED SEPT. 6, 1901

ROOTED IN RENTON

RENTON, WA

URBAN FOREST MANAGEMENT PLAN

10-YEAR UPDATE

JANUARY 2022

CITY OF RENTON