PARKS AND RECREATION

Urban Forestry Management Plan

City of Washington, Missouri

2014

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Urban Forestry Management Plan

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The City of Washington, Missouri

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This Urban Forestry Management Plan has been assembled from information sources and authorities believed to be reliable and accurate. The intention of this document is to provide a structure for addressing problems and important issues that confront Urban Forestry. Master Planning allows the City to meet the future with a plan that emphasizes the most important issues facing the City and to focus on recommendations that address those issues.

This document currently reflects the latest information available, from sources public and private, representing the collective wisdom of experienced authorities, professionals, and technical advisors. No liability whatsoever will be borne by the author for technical exactitude or appropriateness of the included information, for errors or inaccuracies, nor for situations resulting from the use or misuse of any information contained herein.

INTRODUCTION

PURPOSE OF THE PLAN

The City of Washington's Urban Forestry Management Plan ("Plan") is a 30-year plan that provides a comprehensive strategic framework to focus and expand the City's Urban Forestry program to meet a range of policy, educational and management goals. The Plan is intended as a tool to explore community concerns and management conflicts, while offering a series of implementation actions based on extensive stakeholder and community outreach.

This Plan outlines the City of Washington's plan to integrate management of the many issues and opportunities posed by Washington's tree resource, and will serve as a road map to improve the City's urban tree management and stewardship in a coordinated, cooperative approach with City departments, committee's and private land owners.

As a strategic and forward-looking document, this Plan does not alter or supersede the requirements of the Washington Municipal Code, however, it does suggest modifications and expansions to City codes to improve long-term tree stewardship, and any proposed code revisions will be reviewed and considered through future public process.

Lastly, the Plan was prepared through a systematic and comprehensive review of existing City regulations, standards and other adopted plans, and discussions with key stakeholders. This is a unique, holistic urban forestry management plan for the City of Washington based on local needs and priorities, as determined through this process.

WHAT IS THE URBAN FOREST?

Stated simply, Washington's urban forest consists of all trees, woody shrubs and ground cover plant communities in the city on both public as well as private property, however, the primary scope of this plan is to focus on trees – the largest, longest-lived and more significant member of the landscape community. This urban forest includes street trees, park trees, forested parklands, trees on institutional campuses, and trees in many private ownership settings. The urban forest touches the lives of Washington's citizens every day. Whether it's enjoying a walk along the Rotary Riverfront Trail or drive along First Parkway, it is trees that comprise the urban forest and trees that make the experience magical.

WHY IS IT IMPORTANT?

It is nearly impossible to overstate the value of trees in our urban areas. Properly placed trees reduce energy consumption, filter pollutants, and slow flooding. They stabilize soil, enhance the ecological environment, and increase property values. Urban trees also provide an invaluable psychological relief from the concrete and asphalt of the City. The value of these benefits is immeasurable.

Water Quality & Stormwater Retention

Urban forests absorb rainfall, control surface water run-off, filter ground water and assist in ground water recharge. According to one study, 37,500 tons of sediment per square mile per year comes off of developing and developed landscapes, and urban trees could reduce this value by 95%.

Urban tree canopy significantly reduce flooding and soil erosion by slowing water runoff and holding on to soil. When raindrops are intercepted by a tree's canopy, the rate at which the rainwater hits the ground is significantly reduced. The slowed rainwater absorbs into the soil as it filters across vegetation and roots, reducing the amount of water that reaches the creeks and storm sewers. In addition, soil movement is reduced as a result of plant roots holding on to the soil. Without plant roots, soil has no ability to resist the erosive effect of rushing water.

Energy Savings & Carbon Capture

Trees reduce the demand for energy consumption by casting shade and blocking winds. By shading concrete and asphalt, trees reduce the absorbed and radiated heat that turns our cities into urban heat islands. Trees shade cars and houses, keeping them cooler in the summer months. And they block cold winter winds, allowing buildings and homes to remain warmer in the winter. These things reduce the demand for air conditioning or heating, which results in less energy being spent. Less energy expenditures mean fewer fossil fuels are burned and less carbon dioxide goes into the atmosphere, reducing the potential for global warming. Less global warming results in more stable temperatures and decreased demand for fossil fuel consumption. This cycle of energy conservation is perpetuated as trees and other urban plantings naturally reduce the demand for heating and cooling. The cycle is enhanced by carbon sequestering, because in addition to reducing the carbon emissions from energy consumption, trees sequester tremendous amounts of carbon from the atmosphere to carry out their process of photosynthesis.

Air Quality Improvements

Trees are beneficial as air filters as they absorb gaseous pollutants such as ozone, nitrogen oxides and sulfur dioxide; and they filter particulate matter such as dust, ash, pollen and smoke. Reductions in these pollutants results in improved public health and reduces the severity of ozone-induced asthmatic responses and other respiratory illnesses. Urban trees absorb carbon dioxide, a major greenhouse gas, at an

approximate rate of 230-lbs per year per tree. According to the U. S. Department of Agriculture, "one acre of forest absorbs six tons of carbon dioxide and puts out four tons of oxygen. This is enough to meet the annual needs of 18 people.

The Economics of Aesthetics

Improving aesthetics of our City has tangible economic benefits. Networks of natural areas and trails gives the City a reputation for being a good place to live and visit. Increased recreational and community activity attracts new businesses, fosters expressions of creativity and stimulates tourism. Due to the changing nature of business needs, businesses locate or re-locate based on a community's quality of life, including an abundance of open space, nearby recreation and pedestrian-friendly neighborhoods. Nationwide, easy access to parks and open space has become a new measure of community wealth – an important way to attract businesses and residents by guaranteeing both quality of life and economic health.

Aside from the potential price effect on residential property sales (3.7% - 7%), trees in retail settings increase shoppers' willingness to pay for goods and services by 12%. Shoppers also indicate that they are willing to drive farther and stay longer if a retail district is well-landscaped with trees. Also, respondents consistently reported greater willingness-to-pay values for goods and services in the landscaped mall at an overall rate of 8.8%.

Increases in land values or sale prices as a result of quality landscaping and the presence or retention of trees offers a secondary benefit to the local jurisdiction. The adjustments directly relate to additional revenue from sources such as real estate transfer taxes and property tax assessments.

Wildlife & Habitat

The urban forest, including the trees, canopy, understory, and woody and leaf debris, provides habitat, food and shelter for birds, insects, and other urban wildlife. If large, contiguous or linked, the urban forest provides a buffer from the built environment, while acting as a travel corridor, for wildlife. It also offers a critical environmental education resource for local students, bird watchers and nature enthusiast. While the urban forest provides an environmental structure for wildlife, challenges exist with providing and promoting native vegetation. "Urban sites rarely provide environmental and plant growth conditions found in the natural habitat. Increasingly advocacy for use of native plants in urban landscapes often overlooks the poor match between the plant material and the site". While the challenging conditions of an urban setting may cause stress or growing problems for certain native plants, others may thrive.

Health & Well-Being

Public spaces with trees receive more visitors, increasing the frequency of casual social interactions and strengthening the sense of community. Trees along transportation

corridors narrow a driver's field of vision, reducing traffic speeds and increasing pedestrian safety by providing a natural, physical barrier. Studies have found that urban highways lined with trees decrease driver stress, resulting in fewer incidents of road rage.

Trees foster safer, more sociable neighborhood environments and have been shown to reduce levels of crime, including domestic violence. Views of nature reduce the stress response of both body and mind when stressors of urban conditions are present. Hospital patients with window views of trees recover significantly faster and with fewer complications than comparable patients without access to such views.

Summary

With all of the benefits trees and landscaping provide, it is easy to see the need to protect and expand the City's urban forest. The City of Washington recognizes the importance of green areas and is making direct efforts to insure the continued development of this invaluable resource. Steps the City has taken include aggressive planting and maintenance programs on City property, providing educational opportunities for residents, and most importantly, enacting legislation which protects the existing urban forest and insures its continued expansion. This legislation allows Washington to move forward, knowing a better City environment will be left to all those who follow.

Keeping Washington beautiful, reducing pollution and erosion, conserving energy, and providing a calm, peaceful environment will require continual team effort, but together the City and its constituents can make it happen.

COMMUNITY ENGAGEMENT

INTRODUCTION

A sustainable urban forest is a community asset. Community appreciation for the benefits and needs of trees and engagement in planning, planting and caring for trees is essential to the long-term health of the asset. Citizen input and volunteer participation are critical to the success of City programs that support trees. Without the active support and engagement of the community, urban forestry programs cannot succeed. This section describes the ways the community is currently informed about and participates in stewardship of the urban forest.

PLAN DEVELOPMENT

Community engagement is a vital element of this Plan. With a significant number of City sponsored committee's, ad hoc committee's and local organizations working for the betterment of the City, Washington prides itself in having an engaged and motivated citizenry and a high degree of community-based activism and involvement. This planning project tapped into that existing network in several ways.

Comments and opinions from residents, along with industry and community stakeholders, shaped the direction of goals, objectives and strategy for the future of the Washington Urban Forestry program. Two primary methods of community outreach were used in the development of this plan:

- City Comprehensive Plan Process
- Parks and Recreation Comprehensive Master Plan Process

OUTREACH

The City has an important role in fostering resident's understanding of the environmental, economic, and community benefits of trees as well as proper tree selection, planting and care. City departments and committee's provide information through the City's website, brochures and special events.

VOLUNTEER OPPORTUNITES

Washington citizens volunteer many hours of support for the City's urban forestry programs each year. Civic groups are the major source of citizen involvement in tree planting and stewardship. Volunteers plant trees and maintain park vegetation in developed and forested parklands. In many cases, specific individuals stand out as

active volunteers and receive training in organizing and directing tree planting and maintenance projects.

Adopt-A-Park Program

Parks and Recreation Department is currently working on re-organizing the current Adopt-A-Park Program. It is the goal of the department to have individuals and/or organizations take a more active role in the maintenance and monitoring of Washington parks and trails.

Conservation Corps Program

The Parks and Recreation Department is currently working on developing the framework for the establishment of a Conservation Corps Program, which individuals, civic organizations, schools, and church's may volunteer on a single or ongoing basis to restore an increasing amount of forested parkland each year by removing invasive plants and re-establishing forest tree canopy and understory.

Flora Conservancy of Washington

The Parks and Recreation Department is currently working on developing the framework for the establishment of a Flora Conservancy Program, which individuals would assist staff in enhancing and maintaining landscaped beds, planters, and prairies throughout the parks and recreation system, as well as other City facilities on a weekly basis.

VISION & MISSION

VISION

The City of Washington embraces its urban forest as an integral part of the community's infrastructure, which contributes to the healthy lifestyle of its residents; connects and enhances natural areas and habitat; provides ecological services, such as cleansing the region's air, capturing stormwater and sequestering carbon; and contributions to the economic prosperity of the City.

The Urban Forestry program is vibrant, robust and held as a critical City service. The program draws strength from active, committed staff, committees and volunteers.

MISSION STATEMENT

"To Enhance, Protect and Manage our Urban Forest"

The Washington Parks and Recreation Department's urban Forestry Program strives to promote a safe, healthy, and diverse urban forest by preserving, managing and enhancing tree resources, while promoting active community participation through public education and outreach.

In cooperation with community residents and program stakeholders, the urban forestry program has outlined the following tenets to guide urban forestry management in Washington:

- **Inform** – Expand program awareness through innovative, visible outreach and education campaigns.
- **Protect** – Recognize the environmental, economic, cultural and social benefits offered by the urban forest and refine and implement policies to protect public tree resources, while seeking substantial participation from landowners to protect private trees.
- **Expand** – Enable growth of public and private tree resources to optimize the urban tree canopy through plantings, outreach and other incentives.
- **Manage** – Improve and institutionalize the care, maintenance and operating principles for the long-term viability of a mixed-aged, sustainable urban tree resource.
- **Partner** – Increase community, private sector and other City department's involvement in planning, management and funding of the urban forest.

GOALS & OBJECTIVES

INTRODUCTION

Defining specific goals of the Plan will help guide development and prioritization of the broad range of actions necessary to achieve our vision of a sustainable urban forest in Washington. The overarching goal of the Plan is to guide the city's efforts to recover the loss of tree canopy and enhance all tree-related benefits by recommending strategies and actions to improve the city's urban forest management in an equitable, economic, and sustainable manner.

CANOPY COVERAGE

A good measure of the health and value of an urban forest is the percentage of land within the city that has tree canopy cover. In order to measure success in canopy cover enhancement, canopy cover goals first must be established, which then will help the City of Washington to rally the community around a clear set of common targets. These goals also help to plan implementation steps that consider planting opportunity, planting limitations and other priorities specific to individual land-use types.

The City of Washington currently has a canopy cover of approximately nine (9%) percent which is way below the national average of twenty (25%) percent; St. Louis Regional average of thirty-three (33%) percent; and the U.S. Forest Service and City's goal of forty (40%) percent.

To achieve an overall goal of 40% canopy cover in 30 years, goals have been defined for each of the tree elements of the plan.

Tree Resources

- Understand the characteristics and complexity of Washington's urban forest.
- Maintain trees to promote health and longevity.
- Maximize canopy cover and optimize age and species diversity.
- Maximize the ecological and environmental benefits of the urban forest.

Management Framework

- Facilitate interdepartmental communication and cooperation to provide decision-makers the information they need.
- Develop and implement resource management tools.
- Preserve and protect existing trees, and encourage new tree planting throughout

the city by improving management of trees on private property.
- Model good stewardship in City practices.

Community Framework

- Enhance public awareness of the urban forest as a community resource.
- Engage the community in active stewardship of the urban forest.
- Promote citizen-government-business partnerships.

Achieving these goals will result in the following outcomes:

- Improved condition of the urban forest in terms of increased canopy, health, and diversity.
- Increased ecological service benefits such as storm water mitigation benefits.
- Clear policy framework to guide City actions.
- Consistent approach to urban forest management and public outreach among City departments and committee's.
- Improved management and accountability within City government.
- Equitable distribution of urban forest resources across the city.
- Engaged and informed community.

RECOMMENDED GOALS OF THE PLAN

Through public participation, input from the Urban Forestry Committee, Washington In Bloom Committee, Parks and Recreation Committee, and City staff, considerable time and emphasis has been placed on developing a comprehensive vision. Accordingly, seven (7) major goals and objectives emerged at priorities for the City of Washington.

1. **Preservation** and **Protection**

The City should continue to review and improve ordinances, guidelines, and policies regarding tree planting and tree and forest protection, and create or enact new legislation and policies as needed. These policies will serve as an official statement by the City regarding the importance and value of trees in the community.

2. **Enhancement** and **Restoration**

Washington's canopy cover has been estimated at only nine (9%) percent, and is disappearing in part, due to forest removal and lack of new and replacement tree planting on public and private properties. Without an adequate forest canopy cover, Washington will not realize the many tangible and intangible benefits trees provide, and the character of the City will ultimately suffer. It is the City's goal to achieve an average of forty (40%) percent canopy cover for the City.

3. Expansion

City should look at planting new trees, especially in areas such as entry corridors, parks, schools, industrial zones, subdivisions and watersheds. Planting efforts should also be considered for forest areas to ensure proper species balance and to fill in areas that have losses due to invasives, floods, and other natural causes. Detailed information about nearby structures, utility conflicts, sidewalks and other hardscapes, clear zones and may other factors such as species diversity must be considered prior to planting in order to ensure the right tree is planted in the right place.

4. Monitoring and Documentation

Upkeep and expansion of the tree inventory is required to better understand and plan appropriate management of the urban forest. The City shall track the trees that are planted or removed on public properties will ensure the forest assessment and urban canopy calculation stays reasonably up to date, and can help analyze expected changes to overall forest age, diversity, and health. Records of tree work can alert staff and the public how forest management efforts are paying off over time, and if adjustments to the rate, direction, or priorities of forest management are still on track with community goals. Noting the presence of disease or pests with early detection can be critical in containing threats to the overall forest. It is vital to monitor both the forest and the plan over time if the goals are to be met in a responsible manner.

5. Education and Outreach

A focused, extensive campaign is required to improve awareness of the program and reach new volunteers. Citizens, businesses, City staff and leaders, and developers need continued education and marketing targeted to increase their awareness of the benefits of trees. They need to be aware of the availability of City resources and the various ways they can become more involved in the urban forest management program and be a part of the solution.

6. Sustainability and Maintenance

This initiative relies on on-going, expanded coordination for the planning, care and replacement of City trees. Specific attention should be directed toward tree-induced street/sidewalk infrastructure damage, systematic pruning of trees, along with elevating the role planting/re-planting projects in parks and other City-owned property and rights-of-way to improve wildlife habitat, canopy, species diversity and age diversity.

7. **Organizational Development** and **Funding.**

Currently, the components of and resources for Washington's urban forest management program are decentralized in various departments. Critical to the program's success is adequate funding, a centralized focus and improved interdepartmental coordination and communication.

ORGANIZATIONAL OVERVIEW

URBAN FORESTRY PROGRAM HISTORY HIGHLIGHTS

The Washington community has a long history of citizens who have had the foresight to create a green city. The trees, landscapes and open spaces now enjoyed were preserved or planted by early settlers, individuals, garden clubs, civic and youth organizations, committees, and City staff. These individuals worked to enhance the livability of Washington through their donated land, money, time and expertise.

- In 1979, City Council established ordinances pertaining to Trees and Shrub clearances over streets and sidewalks; distances from street corners and fire plugs; removal; and permit to plant.

- In 2005, City Council established the Washington Urban Forestry Council along with the position of Community Forestry Manager. The purpose of the committee was to improve the overall health of community trees through the promotion of civic projects and education.

- In 2005, City Council established various ordinances related to the planting, maintenance and removal of trees, shrubs and other plants upon City property.

- In 2007, the Parks and Recreation Department received a Tree Resource Improvement and Maintenance (T.R.I.M.) grant through the Missouri Department of Conservation to conduct an Urban Forestry Management Plan (Park Tree Inventory Assessment, and Maintenance Program).

- Since the inception of the urban forestry program, Washington has been named a Tree City USA by the Arbor Day Foundation for nine consecutive years.

- In 2013, the Parks and Recreation Department created a new position and hired a Horticulturalist/Arborist, whose responsibilities would include the hands on technical expertise over all plant material located within City-owned property and public rights-of-way.

- In 2013, the Parks and Recreation Department developed the departments Tree Management Plan.

- In 2013, the City received the national Outstanding Achievement Award in Urban Forestry from the America In Bloom organization, for the Parks and Recreation Department's development and implementation of a Tree Management Plan,

which in part identified recommended trees and locations for planting.

- In 2014, the Parks and Recreation Department developed the Arboricultural and Horticultural Specifications Manual, whose purpose is to enable the City to maintain and manage all plant material located within City-owned property and public rights-of-way.

- In 2014, the City reviewed and updated all ordinances related to urban forestry.

- In 2014, the City received a Community Stewardship Grant from the Missouri Department of Conservation for the restoration and rehabilitation of habitats within Phoenix Park that can support plant and animal species native to the St. Louis Region

FUNCTIONAL OVERVIEW

The Washington urban forestry program is housed within the Washington Parks & Recreation Department. Currently, the Director of Parks and Recreation serves as the Community Forestry Manager who manages the urban forestry program, which serves more than 13,000 residents and has strong ties to the Public Works and Engineering departments, Urban Forestry Committee, Washington In Bloom Committee, and the Parks and Recreation Committee in an effort to facilitate a coordinated and cohesive response to urban tree management. Also, a full-time Parks and Recreation Department horticulturalist/arborist has provided significant assistance to the urban forestry program by taking the primary responsibility for the assessment and maintenance of trees. This has allowed the Community Forestry Manager to focus more energy toward management related issues.

The departments goal is to provide a safe, healthy, sustainable urban forest canopy on public land through the latest industry standards supported by the I.S.A. and by following best management practices (BMPs) for urban forestry, and to provide excellence in customer service regarding tree issues.

The Washington urban forestry program provides services in two major areas: management and maintenance.

Management

- Coordination with City departments and citizens to ensure activities affecting trees are managed consistently.
- Partnership development and grant writing to increase capacity and revenue in support of program objectives.
- Providing quality customer service and information for residents, contractors and developers regarding tree planting and tree care needs.
- Program/event coordination and planning to include management of tree

planting events and festivals, along with general community outreach.
- Enforcement and permit issuance for tree pruning, planting or removal of street and park trees.
- Review and enforcement of ordinances, guidelines, and plans.
- Development of management and operational plans, guidelines and policies.
- Develop cost-effective strategies and evaluation of current and future tree-related expenditures.

Maintenance

- Park and street tree assessments and maintain the tree inventory.
- Developing tree pruning and removal priority levels.
- Identification of needs such as insect and disease treatments and fertilization.
- Training of maintenance personnel and volunteers.
- Tree selection, purchasing, and planting.
- Emergency response.

As the urban forestry program is currently structured and staffed, the range and complexity of responsibilities exceeds the capacity of current staff. As such, responsibilities for the management of the urban forest fall to multiple City staff and volunteers, which require a heightened awareness of the importance of clear and constant communication, identifiable expectations and the enhancement of cross-training opportunities for staff. **However, the maintenance and care of the vast majority of the City's trees are the responsibilities of private property owners; this reality illustrates a major limitation to the City's overall efficacy in protecting and expanding urban tree resources. Unless and until an alternative arrangement for tree management is developed, public outreach and education will remain as the most powerful tools available to the City of Washington.**

Urban Forestry Committee

A citizen-based, advisory committee "Washington Urban Forestry Committee" assists the Parks and Recreation Department with the activities of the urban forestry program and advises staff and the City Council on matters relating to urban forestry. The committee consists of nine voting members and up to two ex-officio non-voting members.

Since its inception, the WUFC has served a vital role in advancing the benefits of urban forestry throughout the community and follows and adopts a mission consistent with the vision, mission and objectives noted in this Plan.

Washington In Bloom Committee

The Washington In Bloom Committee assists the Parks and Recreation Department

with the activities of the urban forestry program and assists staff on matters relating to urban forestry, beautification, historical and cultural, and environmental and natural resource management. The committee consists of a steering committee of six members.

Parks And Recreation Committee

The Parks and Recreation Committee assists the Parks and Recreation Department with the activities of the urban forestry program and advises staff and City Council on all matters relating to the parks and recreation system. The committee consists of nine voting members and up to two ex-officio non-voting members.

Relationship To Other Planning Documents

To supplement this Plan, seven community-based plans were reviewed for public views and comments, past policy direction and goals as they pertain to the protection and management of the urban forest.

- **Urban Forestry Management Plan (Park Tree Inventory, Assessment and Maintenance Program):** Prepared and adopted in 2007, this plan included a study and assessment of public park trees for the purpose of furthering the urban forestry program and obtaining current, professional arboricultural guidance for proper tree maintenance.

- **Parks and Recreation Comprehensive Master Plan:** Adopted in 2013, the Parks and Recreation Comprehensive Master Plan identifies philosophies and recommendations related to natural areas, open spaces, urban forestry, beautification, and maintenance operations that have had a direct bearing on the development of this Urban Forestry Management Plan.

- **Tree Management Plan:** Prepared in 2012 and adopted in 2013, outlines standards for the placement and type of trees to be planted within City-owned property and rights-of-way.

- **Turf Grass Management Plan:** Prepared in 2012 and adopted in 2013, outlines standards for the type of turf grass to be planted within City-owned property and rights-of-way, and the maintenance thereof.

- **Beautification Management Plan:** Prepared in 2012 and adopted in 2013, outlines standards for beautification and plant material to be planted within City-owned property and rights-of-way, and the maintenance thereof.

- **Natural Resource Management Plan:** Prepared in 2012 and adopted in 2013, provides a comprehensive framework to evaluate and guide all site operations

and maintenance activities of the City's parks and natural areas.

- **Arboricultural and Horticultural Specifications Manual:** Prepared in 2013 and adopted in 2014, enables policies which allow the City to maintain and manage all plant material located within City-owned property and rights-of-ways by specifying proper treatments. This involves all phases of arboricultural and horticultural work from planting to maintenance and removal.

Existing Regulations

Resulting from the City's planning and policy work previously noted, the Washington City Council has adopted a number of ordinances to provide tree protection. Specific urban forestry related regulations include the following:

- **Chapter 130 (Section 130.090, Article 5b, 5d, and 5e):** Prescribes policies on Vandalism of Park Property (Trees).
- **Chapter 210 (Section 210.420):** Prescribes standards for Plant and Landscape Material Distance from Street Corner.
- **Chapter 210 (Section 210.430):** Prescribes standards for Plant and Landscape Material Removal by City.
- **Chapter 210 (Section 210.440):** Prescribes standards for Permit to Plant Landscape and Plant Material.
- **Chapter 215 (Section 215.100):** Prescribes standards for Offensive Conditions and Vegetation.
- **Chapter 255 (Sections 255.010, 255.020, 255.030, 255.040, 255.050, 255.060, 255.070, 255.080, 255.090, 255.100, 255.110, 255,120, 255.130, 255.140, 255.150, 255.160, 255.170, and 255.1800):** Prescribes standards for Planting, Maintenance and Removal of Plant and Landscape Material on City-Owned Property or Public Rights-of-Way; Community Forestry Manager responsibilities; and Establishment of Urban Forestry Committee.

Taken together, these regulations have helped the City of Washington expand the scope of its urban forest, chiefly through its vegetation provisions, and promote sound management and care of existing trees. However, a number of improvements can still be made to the existing suite of ordinances to further improve their effectiveness.

OUR URBAN FOREST

INTRODUCTION

Washington's urban forest covers 13 square miles of publicly and privately-owned land within the city limits. The obvious differences between urban spaces, streetscapes, parklands, remnant forests and other land-use types create a collection of management units that together form Washington's urban forest ecosystem.

The following are the eight management units for the Urban Forestry Management Plan:

1. Single-Family Residential
2. Multi-Family Residential
3. Commercial/Mixed Use Areas
4. Downtown Washington
5. Transportation Corridors/Street Trees
6. Industrial Property
7. Developed Parks and Boulevards
8. Parks Natural Areas

1. SINGLE-FAMILY RESIDENTIAL

This element of the city's urban forest is found on private land and does not include the trees that may be growing along the adjacent street. The percentage of canopy cover within Washington's single-family neighborhoods varies widely. Some neighborhoods are characterized by large trees species while other neighborhoods have canopy cover characteristic of small tree species.

Because single-family properties occupy so much of Washington's land base, they also provide the greatest opportunity for increasing the city's overall tree canopy cover. This fact is all the more important as more trees are removed from privately-owned single family zoned property.

The City can do more to encourage tree planting and retention through education, tree planting programs, and expanding the scope of a tree protection ordinance to include trees on private property. City tree planting programs could add thousands of new plantings along residential streets.

Current Condition

Although there is no inventory, it is apparent from looking at trees on private property, that there is a wide spectrum of tree density, age, and sizes throughout Washington. Some areas are dense, while some areas have little mature canopy cover, especially in newer neighborhoods.

Issues/Opportunities

- Single-family residential property holds the greatest opportunity for tree canopy cover enhancement. Homeowners should be encouraged, perhaps via incentive programs, to plant additional trees on their property for their enjoyment and to benefit the overall community.

- Too many trees on single-family property are harmed by poor maintenance practices such as tree topping, girdling, volcano mulching, changing the soil grade, and lack of water. Likewise, too many tree care and landscape businesses do unprofessional work on trees and set a bad example for others. Very good public information on tree maintenance practices is available from the City through printed material, classes, and on City web sites.

2. MULTI-FAMILY RESIDENTIAL

Multi-Family residential properties tend to be located along major transportation corridors and adjacent to the downtown core. The amount of available tree planting space is limited in some multi-family developments.

Current Condition

Inventory doesn't currently exist for this category, and it is apparent from looking at multi-family properties, that they lack canopy coverage tree density, age, and size.

Issues/Opportunities

- Typically, much less tree space is available in multi-family developments than in single-family. The greatest opportunity for trees begins with design and the developer. Multi-family development design takes on many forms with some being much more conducive to planting of trees.

- Multi-family developments have high turnover rates. Even though multi-family tenants are not owners, and may not reside at one location very long, that does not mean that they can't be great tree advocates. The same level of interest afforded other residential groups needs to be afforded multi-family residents in order to gain their support.

- Develop a list of tree species that would thrive in the often smaller planting spaces found within this category.

- Work with condominium homeowner associations to educate these owners and encourage them to plant additional trees.

- Educate apartment building owners about the positive aspects of providing well-maintained trees and green spaces as part of their rental environment.

3. COMMERCIAL/MIXED USE AREAS

This category includes Washington's commercial developments along the major transportation corridors and in various commercial hubs. This unit includes the private property within these commercial areas as well as publicly owned and managed street trees.

Current Condition

Inventory doesn't currently exist for this category, and it is apparent from looking at multi-family properties, that they lack canopy coverage tree density, age, and size.

Issues/Opportunities

- The opportunity for tree plantings in this area is varied and generally more limited than in others. Historically, the majority of tree plantings in Commercial/Mixed use areas are street trees.

- It's not uncommon for some business owners to look at trees as a problem or nuisance rather than a benefit. Cleaning up fall leaves takes time. Trees must be well-sited and appropriate species selected for a successful commercial streetscape. However, repeated studies have shown that shoppers prefer tree-lined streets and parking lots. Opportunities to exist to work with business owners to better educate them about the value of trees in a commercial setting.

- This unit typically is associated with a high percentage of area given to building footprints and parking lots.

4. DOWNTOWN WASHINGTON

Trees in this unit are found in the City's urban core. Most of the trees in downtown Washington are located within the street Rights-Of-Way (ROW). In addition to limited planting space, the downtown environment can be especially harsh. It has very poor soils, poor drainage, a wind tunnel effect between buildings, and abuse from human activity. The national lifespan of an urban tree is 13 years, 6 to 7 years in the central business district.

Current Condition

Inventory doesn't currently exist for this category. Trees in downtown are frequently under stress due to limited planting space and other harsh conditions. Given these environmental stresses, the average tree in this unit is typically smaller than in other units and has a shorter lifespan. Changes in development and land-use patterns downtown can also be a challenge to tree preservation.

Issues/Opportunities

- Finding planting space in the downtown core will be a significant challenge. The availability of new planting sites for street trees is limited.

- It's not uncommon for business owners to have strong opinions about trees. Some business owners raise concerns about trees near their business blocking signs, creating debris or producing too much shade.

- Tree protection in downtown is very important because growing trees in the urban core is difficult. Growing trees to a large size in healthy condition is particularly challenging.

- A lot of the trees within downtown have grown into utility lines and will eventually need to be either trimmed or removed.

5. TRANSPORTATION CORRIDORS/STREET TREES

Most of the trees in this unit are located within the street Rights-Of-Way (ROW). In addition to limited planting space, the environment can be especially harsh. It has very poor soils, poor drainage, effects from exhaust and salt, and abuse from human activity.

Current Condition

Inventory doesn't currently exist for this category. Trees in this unit are frequently under stress due to limited planting space and other harsh conditions. Given these environmental stresses, the average tree in this unit is typically smaller than in other units and has a shorter lifespan.

Based on observations, the size distribution of street trees in residential areas has not changed much in the last ten years. A lot of the residential street trees in subdivisions have diameters of 5 inches or less and are relatively young. Many street trees in the downtown area are larger, with diameters of 6 to 20 inches, yet are young enough to provide benefits for many more years. With the exception of a few streets with mature plantings, private yards provide space and support the growth of many of the larger trees in residential neighborhoods.

Issues/Opportunities

- A number of issues threaten the viability of Washington's street trees. Most of the street trees in Washington were of the wrong species and planted in substandard planting strips and inappropriately under power lines. A number of these trees are now outgrowing their planting strip and need to be removed. Those under wires have been repeatedly topped, which is no longer an acceptable management practice. When street trees are removed, replacement may not be an option, due to incompatibility with current planting standards.

- Street trees have been planted by private citizens or the City, and are the responsibility of the abutting property owner to maintain. Many property owners are unaware of their responsibility to maintain street trees adjacent to their property, or are unable or unwilling to maintain those trees. City staff is frequently dispatched to prune or remove trees that pose a risk to pedestrian and motorists.

- An aggressive public education program can increase understanding and build support for a strong maintenance program as the most effective way to preserve our urban forest.

- Providing space within the limited ROW to plant trees is a major challenge. Trees must compete for space with sidewalks, underground utilities, overhead power lines, the desire to retain views, and a variety of street furniture, such as curb space for vehicles, traffic signs, etc. Additionally, many planting strips are too small to accommodate large trees and cannot be expanded.

6. INDUSTRIAL PROPERTY

The tree planting opportunities within the city's industrial areas vary widely but are generally fairly limited. A high percentage of property in industrial areas is needed for access, egress, and circulation space for large trucks and parking. These requirements also impact the opportunity for street tree plantings.

Current Condition

Inventory doesn't currently exist for this category. Trees in this unit are in compromised condition due to the harsh growing environment.

Issues/Opportunities

- Industrial areas are perhaps the biggest challenge to tree canopy enhancement. They are very harsh environments. Because trucks need access and egress, many ROW planting strips are not available for trees. As well, most businesses seem to maximize their available space for business purposes leaving very little land available for trees.

- Perhaps because trees aren't seen as a primary need in the industrial areas, tree maintenance is good in some locations while only fair to outright brutal in others. A campaign to educate business owners about proper tree maintenance might save many trees that would otherwise become victim to poor maintenance.

7. DEVELOPED PARKS AND BOULEVARDS

Washington Parks and Recreation has grown to over 16 parks on over 505 acres of property. Of this total approximately 240 acres are classified as "developed parklands". Developed properties have been developed for specific uses, are actively maintained, and are not in a natural state.

Specific recreation amenities found within this unit include sports fields, aquatic facilities, tennis courts, skate parks, community centers, trails, picnic facilities, play areas, maintained lawns, shrub beds, and other plantings, parking lots, boat launches and numerous other park amenities. These properties are also heavily used and replacement of assets due to use and sometimes abuse is not uncommon.

Current Condition

Limited inventory currently exist for this category, as only part of the City's parks have been inventory. The urban forest in this unit tends to be made up of individual or small groupings of trees rather than large stands such as would be found in a natural area. These trees need to be individually inventoried and managed. The size and species composition varies widely. Many of these trees are now of great size. Because the park system continues to grow, smaller trees also constitute a part of the standing tree inventory. Hazard tree mitigation is a high priority within this unit because many trees are relatively old and are located in high-use facilities.

Issues/Opportunities

- Currently, Parks lacks a single, well-defined plan for tree replacement. Trees are removed from some parks without replacement. A modest number of trees are planted each year within Parks' general fund programs. Still, these planting programs lack a coordinated plan that will ensure that trees removed from any park are ultimately replaced if so desired.

8. PARKS NATURAL AREAS

The property in this unit is in public ownership and includes Washington's true remnant forests typically located within parklands and undeveloped ROWs. These properties include established forests, riparian corridors, meadows, wetlands, and portions of parks that are in a natural state of varying ecosystems complexity and value.

Current Condition

Because this unit contains a variety of ecosystem types, the state of the forest cannot be easily defined. Although current inventory doesn't exist for this unit, the forest are predominantly deciduous trees native to the region, and have the greatest potential for storm water mitigation, enhancement of water quality, carbon sequestration, and wildlife habitat.

Issues/Opportunities

- Major invasive species need to be removed, and replanted with native species.
- The community must play a large role if urban remnant forests are to be restored and sustained in perpetuity.
- Parks owns and manages many acres of forests. Many homes are located above the forests, and in many cases would have dramatic views of water were it not for City-owned trees. Currently, under specific conditions, park trees may be pruned for private views but cannot be topped or removed solely for that purpose.

MAINTENANCE OPERATIONS

INTRODUCTION

Urban trees typically require maintenance. A comprehensive mature tree care program primarily centers on routine or preventive pruning, and the ability to provide fertilization, irrigation, insect and disease control, and cabling, and bracing when necessary. The goals are to promote health, provide safe and functioning public spaces, and maximize the environmental, social, and economic benefits of trees and understory.

Tree maintenance tasks and frequency vary depending on age, species, establishment, and site characteristics. Generally, the first three years of a tree's life, also known as the plant establishment period, are the most maintenance intensive. Establishment requires attention to tree selection, site preparation, planting, watering, staking, pruning, and mulching to assure their survival. Pruning, disease and insect management are critical throughout a tree's life.

The benefits and values of trees are maximized when trees reach maturity and become established in their growing location. To maintain this high level of benefits for a longer period, the City should commit to providing regular scheduled maintenance to its mature trees and prepare for non-routine arboriculture treatments as needed.

Routine Pruning Program

Routine Pruning should occur on a cyclical basis for the entire tree population once all priority maintenance removal and pruning activities have been completed. This activity is extremely beneficial for the overall health and longevity of all public trees. Through routine pruning, potentially serious problems can be avoided because the trees can be closely inspected during these pruning cycles. Proper decisions can be made on declining trees, and any trees that become potential hazards can be managed appropriately before any serious incidents occur. The Parks and Recreation Department should develop an organized, documented approach to cyclical tree maintenance that can be easily managed by City staff and properly trained volunteers, if budgetary issues are a concern.

Fertilization

Mature trees should not be placed on a scheduled fertilization program without a documented need. If soil analyses show a distinct and serious nutrient deficiency, or if the tree's root system or growing area has been damaged or contaminated, then the time and expense of fertilization may be worthwhile to save the tree.

The Parks Horticulturalist/Arborist can use his expertise to determine if and when public trees need fertilization and the appropriate fertilizer formulation and delivery method.

Irrigation

All trees need supplemental watering when there are drought conditions. Under drought conditions, the City, volunteers, and/or the abutting property owner would accomplish watering mature and young trees. This supplemental irrigation can be accomplished for trees with a water truck and hose and/or deep root watering lance, or with watering aids, such as a tree gator. Citizens and abutting business owners should be encouraged to water street trees frequently during the summer, even when there are not drought conditions.

Insect and Disease Control

Generally, mature trees do not have significant insect and disease problems if they are healthy and well-cared for. Some degree of insect infestation and disease incidence will always be present, as this is the norm for the natural world. However, trees in street and other highly urbanized settings can be predisposed to insect and disease problems since they are growing in unnatural and constrained environments. Therefore, it is prudent to include insect and disease monitoring as a routine part of the tree inspection program.

Emergency Response

An integral part of urban forest management must include an established procedure for emergency response. Individual tree-related emergencies, such as tree failures and large limb failures, are usually isolated events that can be effectively handled by having an emergency protocol for hazardous trees.

For large-scale storm events that result in substantial amounts of damage and debris from trees, a formal tree emergency protocol should be in place, outlining emergency response steps, safety standards, debris removal plans, public communication means, and contact lists.

Maintenance of Private Trees

While the City of Washington does have some influence on preserving trees on private property, ensuring that private citizens know what appropriate tree maintenance is can be a challenge as evidenced by the all too frequent topping practice still employed by some tree maintenance firms. Encouraging private citizens to preserve trees can also be a challenge given concerns with leaf drop, views, solar access, competing uses of space, and the cost of hiring professional tree care workers. Likewise, encouraging private homeowners to plant more trees can be a challenge for the same reasons.

Standards of Practice

City staff and their contractors follow industry standards as defined in the International Society of Arboriculture's (ISA) *Tree Pruning Guidelines* and/or those in the ANSI A300 pruning standards. It is suggested that City tree-crew personnel be trained, tested, and that the Parks Horticulturalist/Arborist be an I.S.A. "Certified Arborist".

In 2014, the Parks and Recreation Department produced an "Arboricultural and Horticultural Specifications Manual" for all City staff, contractors, and residents to follow in landscape, horticulture, and forestry operations. The manual provides significant information on the best practices for tree planting, maintenance, and construction.

TREE PLANTING RECOMMENDATIONS

Considering the ongoing land development and the City's goal to increase canopy cover, tree planting should be a major goal for the City. Not considering private property, the streets, parks and other public areas offer ample opportunities for new tree planting. Therefore, it is important to make sure this goal is carried out in the most effective way possible. The trees planted now will have a great impact on the City's future character and livability.

Given the ambitious goal of increasing the City's canopy cover, it is imperative that the Parks and Recreation Department develop a *Master Planting Plan*. Such a plan would detail the exact location of every available public tree/plant planting site within the City, provide information of the size and type of the growing space, indicate the presence of utilities, and ultimately assign an appropriate species to that site.

Trees and Climate Change

The debate may still be underway regarding how human actions may influence and impact the scope and timing of potential global warming and companion climate change. However, one thing we do know with greater certainty is that many plant species do not require a substantial change in their environmental conditions to be greatly affected. It is entirely possible that the species composition of Washington's urban forest in the future will include species that we currently do not or cannot grow. Urban foresters, landscape architects, horticulturalists, and park planners will need to be particularly attentive to changes and trends in the environment that may require them to make adjustments to our planting palettes. As well, changes in climate may also make it easier for invasive non-native species, flora and fauna, to find a new home to the detriment of our indigenous species.

Invasive Species

All natural systems change over time. If we want these changes to enhance the urban forest, they must be actively managed. Nationally-based studies repeatedly support the fact that the resource deteriorates when human intervention is not a proactive part of

the urban forest management. This decline can be seen in many of Washington's parks and natural areas where invasive species have taken over and are preventing native species from growing because historically these areas were considered "natural" and did not require maintenance. Proactive management is needed to keep our trees sustainable and in balance with other urban priorities.

Over the years many trees and shrub/ground cover species have been introduced to the Washington region only to see them become invasive, threatening the native species. Shrubs and ground covers such as burning bush and Wintercreeper, and other invasives like Japanese hops, garlic mustard, and bush honeysuckle threaten our forest floors and riparian corridors. Not only should we avoid planting these species, we should also support programs that will remove these invasive plants over time.

Trees and Views

Private views, or the potential for private views, often include publicly-owned trees. For some, there is value in seeing distant panoramas and for others their view out to the street is an important value that contributes to quality of life. For many, neighboring trees either frame a "territorial" view or are the view. Views are subjective and are defined by changing landscapes that often involve other property ownership.

Currently City of Washington policy on trees, clearly states that public and private trees can't be topped. However, the City policy is to permit view relief only if it can be accomplished through pruning that meets the City of Washington's arboricultural standards, and is performed by certified arboricultural contractors under the direction of the Community Forestry Manager.

TOOLS FOR INVENTORY AND ASSESSMENT

A common requirement for all resource managers is a thorough understanding of the resource itself. To that end, Washington needs better assessment tools to evaluate the condition, values, benefits, needs and opportunities associated with its urban forest. A more complete picture will help the City better plan and manage all tree-related work. The following are critical needs:

1. More complete and current tree risk assessment and inventory.
2. Better maintenance records with records linked to inventory data.
3. Better tools/models for determining value and benefits of the urban forest.

As previously stated, having a good understanding of the resource and its condition is always the first requirement of good resource management. In addition, detailed information on resources expended for maintenance would help staff better plan and budget work. The ability to assign value to the benefits of the forest would aid in creating a business case for valuing green infrastructure in the same way the City considers the capital investment and maintenance needs of its engineered infrastructure. In turn, this could lead to creative mechanisms for funding appropriate

levels of maintenance of the urban forest resource.

Tree Risk Assessment and Inventory

Through both the inventory and ongoing maintenance process, a Tree Risk Assessment should be made of all Public trees within the City. The following levels of assessment should be used.

1. Level 1 (Limited Visual) assessment shall be made by City personnel on a routine basis. This is a rapid assessment (drive-by) looking for trees with serious defects.

2. Level 2 (Basic) Visual inspection (360 degree) of the crown, trunk, and exposed roots from all sides shall be made by City personnel if deemed necessary after performing a Level 1 assessment.

3. Level 3 (Advanced) assessment should be made by the Parks Horticulturalist/Arborist as deemed necessary. A close look for defect conditions (loads, root rot, trunk decay, problems in the crown or other factors that require specialized training or equipment).

   The Horticulturalist/Arborist further needs to assess the likelihood of failure (Defects, loads, response growth etc.) by rating the likelihood of failure as 1) Improbable; 2) Possible; 3) Probable; and Imminent. He shall also assess the likelihood of impacting a target (Occupancy rate, and target protection area) by rating the likelihood of impact as 1) Very low; 2) Low, 3) Medium; and 4) High.

   He then shall assess the overall risk level by rating the risk as 1) Extreme; 2) High Risk; 3) Moderate; or 4) Low Risk.

Maintaining the Tree Inventory

The City's inventory should be updated on a regular basis to reflect new plantings, removals, and maintenance procedures performed. An accurate inventory is the best way for the City to monitor the progress and cost-efficiency of its tree care operations. The primary benefit of an accurate tree inventory is that the community can budget, plan, and anticipate tree-related problems and situation in the most cost-effective manner possible.

The best way to maintain the inventory is to commit to regular, routine data entry. The urban forestry staff has created a form for use in the field that contains similar data as the software program. This form is to be used to record new plantings, work histories, changes in tree conditions, and maintenance recommendations. On a daily, weekly, or monthly basis, the information collected should be entered into the inventory database.

It is further recommended that a thorough inventory be performed every ten years or more frequently if rapid changes in the urban forest occur, such as severe storms, serious insect and disease problems, or a dramatic increase in new tree planting.

TREE RESOURCE ASSESSMENT

The urban forest can be evaluated using many factors, including extent of tree canopy, species diversity, age, and health of trees. Washington's canopy cover is around nine (9%) percent. Shrinking canopy cover necessarily has the companion effect of reducing the value of environmental and ecological services of the urban forest. These facts underpin the importance of preserving Washington's existing trees.

Urban trees are under pressures not present in native forests and require active management intervention to sustain them. Urban trees lack some of the natural buffers and protection found in wild lands. In native forest, the correct combination of soil micro-organisms, understory plants, and ample seed source, number of trees and variance in topography, and stable hydrology all contribute to impede or stop extensive destruction due to diseases, insects, and invasive plants.

Tree selection in the urban environment is usually driven by site conditions that have been shaped by previous development and current land use much more so than to the natural conditions that sustain native forests.

Sites within the City that are well suited to the protection, planting and long-term management of native species common to our native forests are important to identify and to preserve.

Sites that have been significantly altered and constrained by development provide uniquely challenging opportunities for protection, planting, and long-term management of species biologically adapted-either by nature or by the horticultural industry- to thrive under the conditions presented.

Forest are not static, native forests undergo change through succession, and urban forests undergo change in reaction to impacts by humans with species selection requiring ongoing adaptation to optimize the potential of the site. Factors to consider beyond the visually obvious (size, shape, and aesthetic appeal) include:

- Horticultural requirements for drainage, soil conditions and solar exposure.
- Community interests and priorities.
- Habitat value for urban wildlife.
- Size of available space and location of buildings, paved surfaces and utilities.

Other pressures on trees in the urban environment are form development. These threats include land clearing to accommodate growth and views and tree removal to reduce conflicts between trees, power lines, and street signs and to provide sight lines along roadways.

INVENTORY & ASSESSMENT

INTRODUCTION

A comprehensive resource management plan must begin with a thorough understanding of the resource itself. This is accomplished through an inventory and assessment process. This process identifies the current state or condition of the resource and highlights both challenges and opportunities for future resource management.

Accordingly, the Parks and Recreation Department contracted with the Davey Resource Group to conduct an inventory and assessment of 1,201 (98.42% trees and 1.58% stumps) trees and stumps in nine (9) of Washington's public parks (Hillermann, Lakeview, Main, Krog, Optimist, Rennick, McLaughlin, Burger, and Lafayette) in 2007. Tree data were collected and analyzed, providing information on the species composition, relative size, health, and maintenance recommendations for the urban forest. This report also included recommendations on BMPs, and provided long-term planning strategies to improve maintenance efficiency and tree health.

Not all park trees were inventoried; however, this inventory does provide useful information for preliminary analysis on the state of Washington's public urban forest and for determining appropriate future tree planning and maintenance work plans. It should be understood, that because not all public trees were inventoried, the statistical calculations will understandably be somewhat skewed. The numbers and figures presented should be considered qualitative and indicative of general conditions and trends.

SPECIES COMPOSITION AND DIVERSITY

The science of arboriculture and urban forestry has changed drastically since the City of Washington's urban forest canopy was originally established. Urban foresters were not aware of the potential detriment of a monoculture of species or the importance and benefits of age diversity. Urban foresters have also learned that routine maintenance is essential to maintaining vigor and vitality in the development and enhancement of the urban forest.

While the U.S. Forest Service suggests cities should have no less than forty (40%) percent canopy cover, our urban forest consists of nine (9%) percent of tree canopy coverage. With a majority of the assessed park trees being planted at the same time and roughly the same species, our park species is in a critical stage. Renewal and maintenance is necessary to preserve and expand its beauty and benefits to our

community. In addition to maintaining the goal of at least forty (40%) percent canopy cover, there are two (2) key elements to preserving and enhancing the canopy: age diversity and species diversity.

Age Diversity

A healthy canopy is a lot like a healthy community, it benefits from trees of all ages just as a community benefits from having residents of all ages. If a balance between removals and replacements continues as the dying and declining trees are removed the City will move toward having a well age diversified urban forest within ten years.

Species Diversity

It is highly recommended that the City begin planting different species to increase its overall diversity, as urban forests compete with many other human needs in a built environment, such as buildings, homes, sidewalks, roads, size of tree lawns, and utility facilities. **It is important to put "the right tree in the right place" or the tree will either fail to thrive or create a myriad of side-effects that will be costly and detrimental to human habitation**. In our urban environment, we must choose to diversity rather than chancing devastation and deforestation as a result of a species monoculture. Maintaining healthy trees and planting different species are key aspects of preventing forest devastation.

The U. S. Forest Service recommends the urban forest be comprised of mostly species native to the region focusing on age, size, and species diversity. Research has proven to avoid species monoculture; the urban forest should have a species composition of no one species comprising more than ten (10%) percent of the planting population. Species diversity, wood type, wind resistance, and insect/disease resistance should be highly considered.

The overall Inventoried tree population in 2007 was comprised of seventy-one (71) species representing thirty-nine (39) genera:

- Maple = 22.76%
- Oak = 15.48%
- Ash = 9.14%
- Pine = 6.35%
- Elm = 5.67%
- Sycamore = 5.41%
- Baldcypress = 5.33%
- Pear = 4.99%
- Redbud 2.62%
- Tuliptree = 2.28%

As depicted above, only the Maple and Oak trees exceed the industry standard of 10% of the total trees inventoried within the parks system, which is recommended to reduce

the chance of exotic diseases or insects devastating the forest. Such problems have occurred in many communities with the loss of millions of American elms and currently exist with the infestation of the emerald ash borer attacking ash trees, where over 25 million ash trees have died in recent years. The City of Washington is not immune to these types of devastations; in fact urban trees are more susceptible to disease than those in a natural, undisturbed environment.

Size Class Distribution

Tree species have different life spans and mature at different diameters, heights, and crown spreads. This means that actual tree ages cannot be assumed from the diameters of trees. However, general classifications of size, such as small, medium, and large, can be used to describe the general characteristics of the urban forest. This is not a substitute for age classes, which can give the actual age and maturity of trees, but it can provide a general idea of the variability in Washington's tree population.

Of the total inventory, 32.23% = Small Trees, 57.53% = Medium Trees, and 10.24% = Large Trees. Therefore, the vast majority of park trees within Washington should be considered to be young to medium trees, as determined by their diameter class. The large distribution of younger to medium aged trees is still an asset to the urban forest that will, in most cases, appreciate in value as the tree grows in size. The total estimated, appraised value of the entire inventory is $3,058,175.88, giving each tree an average value of $2,587.29.

Normal recommendations in urban forestry management call for achieving, over time, an appropriate age mixture by removing and replanting a certain percentage of trees each year. A good ratio for an urban tree population is a 20/60/20 mix of small, medium and large trees, reflecting the percentage of trees in each size group and representing a uniform spread of tree ages from young to mature to over mature.

PRIORITY TREE MAINTENANCE RECOMMENDATIONS

When maintaining park trees, it must be realized that the potential for loss is an important factor in prioritizing treatments and making effective use of available funds. Monitoring the condition of significant trees and making efforts to maintain their health is essential. The loss of trees over time is an inevitable natural process. However, to control the decline, removal, and replacement of trees in a timely and cost-effective manner is the goal of the management process.

The highest priority maintenance recommendations that were identified in 2007 primarily pertained to protecting public safety. All pruning and removal maintenance recommendations were based on the existence of potential safety risks to the citizens of Washington and/or their property.

Other maintenance activities were identified, such as insect or disease treatments of fertilization; however, this information was not collected as part of the inventory. The

inventory identifies those maintenance activities that are of greatest importance to the overall management of the total tree population.

Tree Removals

Trees fail from natural causes, such as disease, insects, and weather conditions, and from physical injury due to vehicles, vandalism, poisoning, and root disturbances, among others. Trees recommended for removal in the 2007 inventory assessment were those that were potential safety risks or were in such poor condition that they were likely to fail or die within the next few years. Of the total trees inventoried, 79 or 6.59% of the inventoried trees were recommended for removal.

Priority Pruning

Priority pruning consists of the removal of dead, dying, weak, or otherwise hazardous branches on the main trunks, as well as those within the canopy area of trees. A tree recommended for Priority Pruning has some increased level of risk associated with the defective branch or tree part. Usually this translates into an increased risk or failure and the presence of a target (person or property). 193 or 16.07% of the inventoried trees in Washington were current candidates for Priority Pruning. All Priority Pruning recommendations were addressed to reduce risk of failure and the potential damage it may cause.

Routine and Training Pruning

Routine Pruning consists of the removal of dead, dying, diseased, interfering, objectionable, and weak branches on the main trunks, as well as those within the canopy area of trees. 527 or 43.88% of the inventoried trees in Washington were candidates for Routine Pruning, while 383 or 31.89% of the inventoried trees were candidates for Training Pruning. A systematic routine pruning cycle of all public trees was implemented to decrease the occurrence of potentially dangerous broken branches and large deadwood.

Trees requiring routine pruning generally do not present an immediate risk of hazard. This will allow the City to budget and schedule most of its tree maintenance projects in a cost-efficient and timely manner.

SWOT ANALYSIS

A Strengths, Weaknesses, Opportunities, and Threats (SWOT) assessment was also completed as a means to organize input and comments provided by the program affiliates and stakeholders, committees and City staff. The lists that follow off a synthesis of the range of insights, perspectives and opinions regarding the current and future state of the Washington Urban Forestry program; this information has helped inform the development of the program goals, objectives and specific action steps in this Plan. Please note that it is common for a specific issue to be identified in multiple,

even contradictory, sections of the SWOT matrix because different perspectives yield different perceptions.

STRENGTHS

- Technically trained and competent staff.
- Program linked with the Urban Forestry Committee and the Parks and Recreation Committee – Council-appointed committee's assisting the program and advocating on its behalf.
- Program linked with the Washington In Bloom Committee – Mayor appointed committee assisting the program and advocating on its behalf.
- Program can rely, in part, on the previously completed and adopted inventory and analysis.
- Program can rely, in part, on existing regulations.
- City has been designated a "Tree City USA" for nine (9) consecutive years, and received the Growth Award in 2014.
- Parks and Recreation Department has certified eight (8) parks as "Community Wildlife Habitats", through the National Wildlife Federation.
- City received the America In Bloom Outstanding Achievement Award for Urban Forestry in 2013 and 2014.
- Parks and Recreation Department has developed a "Tree Management Plan", "Beautification Plan", "Turf Management Plan", and a "Natural Resource Management Plan".
- Parks and Recreation Department has developed an "Arboricultural and Horticultural Specifications Manual".
- Parks and Recreation Department has received several grants.
- Urban Forestry program has developed and made available brochures, handouts, etc.) about tree planting, care, maintenance, etc.
- Strong and engaged group of local master gardeners and members of the garden club who care about the City and the role of trees.

WEAKNESSES

- Limited staff resources to meet the demands of program objectives, citizen communication and outside requests.
- Limited funding for program, with current budget tied to the General Fund.
- Current inventory and analysis doesn't cover all parks, nor does it consist of any other City-owned property or Rights-of-way.
- Public has limited awareness of and exposure to the Urban Forestry program, along with its functions, purpose or goals.
- Rudimentary information posted on program website; limited web presence.
- Due to demands on staff, there is limited enforcement/oversight of existing regulations; Program is largely complaint-driven.
- Private property owners are responsible for street tree care and management,

but often lack the knowledge, experience or resources to properly maintain them.
- The topping of trees by private land owners.
- Improper diversity and selection of trees by private land owners and City.
- Wrong selection of tree species in relationship to planting location by private land owners and City.
- Deferred maintenance, such as pruning and replacement, at City-owned sites.
- Fragmented philosophies and communication between the varying committees/staff/residents.
- Lack of tree species and age diversity.
- Only nine (9%) percent total tree canopy.

OPPORTUNITIES

- Washington is a diverse community with a range of groups/associations willing to help; Passionate, active citizenry.
- Strong and engaged group of local master gardeners and members of the garden club who care about the City and the role of trees.
- The City can lead through example, create Program momentum and set standards for tree care and maintenance.
- Coordination, communication and training can be improved to address consistency and enhance problem-solving and collaboration.
- Outside funding sources, such as federal, state, and private foundation grants, corporate sponsorships and donations may be available in limited fashion for urban forestry uses.
- Potential to develop street tree planting plan of trees along major corridors and subdivisions.
- Potential to develop tree planting plan of trees within existing parks, public facilities, and rights-of-way.
- Planting of trees to control species and age diversity, and increase canopy coverage.
- Revising the Land Development Code to address timing of planting, (with regard to overall site/infrastructure improvements), tree species, canopy coverage and tree pruning.

THREATS

- Vast number of committees and special groups competing for limited resources may fragment and cause loss of focus of Program objectives.
- Inflationary staff and equipment cost increases may affect the pace at which the Program expands to meet program objectives and/or manages operational and administrative challenges.
- Past budget shortfalls have led to deferred maintenance, such as pruning and replacement, at City-owned sites.
- General sense of tax fatigue may require creative solutions and strategies for

long-term funding.

- Changing maintenance and care practices of private landowners over time – less watering and pruning.
- Even-age and same-species tree stands may fail or decline at same time creating a substantial maintenance and operations burden.
- Small lot and infill development creates conflicting demands for the use of rights-of-way (i.e. utilities, line-of-sight clearance, planting distances) and leaves no interior space for the re-planting of large specimen trees, thereby limiting future canopy expansion.
- Unpruned young trees may become future City liability if structural pruning not addressed soon.
- The sense of Program accomplishment might wane due to the long timeframe needed to achieve the stated goal of increased canopy.
- The risk of punitive measures or over-regulating private property; Property rights and takings arguments.
- The potential of new pest/invasive breakouts requiring coordination with State and untested response protocols.
- Illegal, unwarranted and/or inappropriate removals and pruning on private lands.

Through the SWOT analysis, a wide range of issues and opportunities surfaced, and the significant findings can be summarized as follows:

The Program is led by a capable, technically-competent and energetic staff, whose focus is limited by a wide scope of program responsibilities. Residents of Washington can offer a wealth of insight, support and energy to renew and expand the program, while acting as a conduit to connect with their neighbors and friends about the importance, and proper care, of the urban forest. The Program can rely on existing ordinances as a framework for managing the urban forest, but revisions, clarifications and expansions to ordinance language should be considered, while balancing concerns regarding the over-regulation of private lands.

While uncertainty exists over future funding levels, the apparent public passion for trees is favorable to the successful implementation of this Plan. Focused and strenuous marketing and community outreach efforts must be made to connect with and educate private property owners of the value in managing their tree resources and to heighten the level of awareness of and care for the urban forest. This commitment to education and outreach must become a central tenet of future efforts and for any growth of the Urban Forestry program, and the placement of this theme as the leading element of the following Program Goals and Objectives further strengthens it importance.

IMPLEMENTATION STRATEGIES

OVERVIEW

This Plan identifies a broad range of goals and objectives that are intended to guide Washington toward the growth and management of a healthy, sustainable urban forest that will continue to enhance the quality of life for it residents. Building from this Plan's recommendations, the City of Washington will develop and implement specific site management plans, protocols, policies and initiatives to attain the stated goals and objectives. Such plans will necessarily be developed within the political and managerial structures of the City and should include a more refined and detailed assessment of budget, staffing, timelines and performance measures.

ACTION STEPS/ELEMENTS

The following pages list proposed action steps or elements that support or fulfill the goals and objectives identified in the previous section. While the Parks and Recreation Department primarily will be responsible for implementing this Plan, other stakeholders must also play significant roles to ensure success.

IMPLEMENTATION

Many of the recommendations in the Plan can be achieved within the next five (5) to ten (10) year's and others will require additional time for varying reasons. It is important to push forward on the goals and objectives that are achievable, while those items that require major effort can be worked on over time and as opportunities arise.

Tree maintenance, invasives removal, and new plantings are ongoing efforts that will never be complete due to the nature of trees and forests. Annual work plans for staff and volunteers will help guide these efforts. Actions that are policy oriented may be reasonably low cost in dollar terms, but could take many hours, weeks, or even years of staff time to become reality and general practice.

This Plan should be revisited every five (5) years to compare progress with stated goals and objective to determine if new actions are needed to continue movement towards goals. Park site master plans should also be consulted when determining forest management actions specific to each park.

The Plan will be most successful when it becomes a normal part of routine operations. Ensuring that the goals and policies of this Plan are shared with all City departments,

private landowners, and the general public is the best way to keep urban forest management a priority in the long term. These partnerships are also very helpful in implementing individual projects or policy adjustments.

Funding for implementation may come from a variety of sources, including public dollars, developer contributions, private donations, and grants. There is a limit on how many trees can by planted and watered in a given year, so funding may be better secured with relatively small annual amount that can be sustained well into the future rather than one or two big investments with not identified maintenance budget.

Urban forestry management is a long-term task. The City has major challenges to accomplish to preserve, protect, enhance, and sustain its forests, but with continued dedicated work by staff, committees, leaders, local businesses, and the general public, the goal of a healthy urban forest for Washington can be achieved.

ELEMENT 1 – URBAN FOREST PROTECTION AND PRESERVATION

Protection of existing trees and forested lands is a critical component of a management plan. Ensuring that trees which are already here are protected physically and legally will help sustain the canopy coverage, and prevent further degradation of the urban forest. Trees on public lands are generally well cared for and protected from loss by rule. In Washington, private land owners generally exhibit a high respect for and stewardship of trees. Washington currently has tree canopy coverage of nine (9%) percent, and had been losing tree coverage over time to land and infrastructure development. Staff and residents would like to avoid further loss of existing trees where possible.

There is a great commitment among City residents to preserve and protect natural areas. There are numerous methods to accomplish this, including the use of conservation easements, land acquisition, stronger requirements during site plan review and development inspections, fostering an ethos of stewardship on City projects, and further codifying the permanent protection of park lands.

New development and redevelopment of existing properties in the City present opportunities to either lose or expand the urban forest. The development process also includes the potential for the acquisition of environmentally significant properties and/or for their permanent protection through rezoning and the site planning process. The continued redevelopment of land within the City presents a unique opportunity to strengthen existing legal authority to meet community values.

The City has developed an Arboriculture and Horticultural Specifications Manual showing residents and land developers how to meet the intent of the City Code regarding the planting and maintenance on City-owned property and rights-of-way. The City would like to ensure the Arboriculture and Horticultural Specifications Manual follows the spirit of what we are attempting in urban forestry management efforts. Weaknesses that could result in urban forest degradation need to be tightened up.

One of the primary tools for ensuring that land being developed retains or creates desired canopy levels is the site planning process. Some areas that should be examined include:

Tactical Actions

1.1 Review and improve ordinances, guidelines, and policies regarding tree planting and tree and forest protection, and create or enact new legislation and policies as needed.

1.2 Review and revise the Subdivision and Land Development Regulations to require a higher degree of accountability for developers to preserve existing forests and plant new trees.

1.3 Investigate and establish Conservation Easements or other legal protections on existing and future City-owned lands to preserve lands in perpetuity.

1.4 Incorporate vacant City lots and/or other City lands that are unplanned for development into the parks and recreation system.

1.5 Pursue additional protection for park lands that requires either a supermajority or unanimous City Council vote before park lands are developed and/or sold.

1.6 Pursue land acquisition funding to purchase forested lands, especially for greenway development and to address existing riparian buffer gaps.

1.7 Develop approaches to protect larger tracks of privately held forest lands via conservation easements and acquisition or other means.

1.8 Coordinate with Washington School District to develop a strategy for management of forest stands on school property.

1.9 Develop stream buffer requirements, including a provision that requires the restoration or evolution by natural succession of vegetation within twenty-five (25') feet of the top of protected stream banks.

1.10 Develop and promote a nomination-based, voluntary heritage Tree program to recognize and protect unique, landmark or notable private trees.

1.11 Analyze City by entry corridor, parks, schools, zoning categories, and sub-watersheds to determine existing canopy coverage to compare with target canopy goals.

1.12 Promote tree-friendly development and land use practices by reviewing and reinforcing policies to preserve mature, significant trees and planning or appropriate replanting.

1.13 Promote stewardship of native plant communities on private and public property.

1.14 Prevent unnecessary tree removal on single-family residential lots through property owner education.

ELEMENT 2 – URBAN FOREST ENHANCEMENT AND RESTORATION

Protection or acquisition of natural areas as parkland or the planting of new trees is not enough to assure urban forest preservation. Natural areas undergo constant change and require active management to retain their functions and values, especially in an urban environment such as Washington where the demands of the built environment and development can place tremendous stresses on natural areas.

Many areas of the City that are forested today were farms and fields as recent as the mid-20th century. The trees and forests we see today are a mix of purposely planted areas and places that naturally vegetated once crops and animals were removed from the land. In that sense, residential development has led to increased tree coverage within the City limits.

The quality of the urban forest, in terms of species diversity, age, general health, and level of invasives, varies across the City. Some locations with high quality mature hardwood forests include Maples and Oaks. Most other forested areas in the City are somewhat degraded, most typically due to invasive species and vines that are preventing the trees from reaching their maximum potential. Improving the quality of the existing forests is critical to ensuring they remain healthy stands into the future.

Tactical Actions

2.1 Develop individual management plans for each City-owned property.

2.2 Ensure adequate planning, staff and budget to manage trees on acquisitions that bring forested lands into public management.

2.3 Work with utilities on planning and design to get the right tree in the right place, use directional boring rather than trenching where possible, and to end tree topping and tunneling.

2.4 Enhance and restore healthy forest canopy on vacant City lots and/or other City lands that are unplanned for development.

2.5 Achieve an average of forty (40%) percent canopy cover for the City.

2.6 Establish a riparian buffer restoration program.

2.7 Encourage forest species diversity to increase resistance to disease and pests, especially in development and redevelopment scenarios.

2.8 Plant native species where possible and use site adaptable trees otherwise.

ELEMENT 3 – EXPANSION

Planting is not the only step in establishing new trees. New plantings must be watered for their first year to ensure survivability, and maintained for years. New trees create the need for more staff work, and this must be accounted for in budgets and schedules, and with the assistance of volunteer groups.

Tactical Actions

3.1 Increase tree and shrub planting on City-owned property and rights-of-way, including parks, natural areas, riparian corridors, other City facilities.

3.2 Promote additional street tree plantings to maximize future tree canopy coverage, while considering infrastructure (i.e. utilities) limitations.

3.3 Achieve an average of forty (40%) percent canopy cover for the City.

3.4 Review new site development proposals to maximize tree planting and preservation opportunities.

3.5 Encourage plantings of new trees on private property through educational efforts and programs.

3.6 Continue tree planting programs in riparian areas for stream corridor management and health.

3.7 Expand trail standards to include vegetative plans for areas within and adjacent to trail corridors.

3.8 Co-locate trails and utilities where appropriate to limit creation of multiple cleared corridors in forested areas.

3.9 Work with utilities on identifying good locations for tree planting new utility corridors.

3.10 Plant trees on public property every Arbor Day as part of an annual celebration.

ELEMENT 4 – MONITORING FORESTS AND PLAN PROGRESS

Trees and forest are living entities and undergo constant change. Keeping up with these living resources requires constant monitoring to ensure management foals are attained. Trees can be added, removed, improved, moved, injured, or changed in other ways, all of which effect how the urban forest functions and their numerous benefits to quality of life.

Tracking the trees that are planted or removed on public properties will ensure the forest assessment and urban canopy calculation stays reasonably up to date, and can help analyze expected changes to overall forest age, diversity, and health. Records of tree work can alert staff and the public how forest management efforts are paying off over time, and if adjustments to the rate, direction, or priorities of forest management are still on track with community goals. Noting the presence of disease or pests with early detection can be critical in containing threats to the overall forest. It is vital to monitor both the forest and the plan over time if the goals are to be met in a responsible manner.

Tactical Actions

4.1 Conduct a complete public tree inventory every ten years.

4.2 Use a tree management software program to update the data, document maintenance work and costs, and create annual work plans.

4.3 Establish a methodology to track and maintain targeted healthy canopy coverage over time.

4.4 Track invasive species containment and removal efforts.

ELEMENT 5 – EDUCATION & OUTREACH AND PARTNERSHIPS

A critical element of any urban forest management plan is increasing citizen, staff and decision-maker understanding of the value of natural resources, the importance of fiscal support for proper resource management, and the necessity of educating current and future generations about the natural world. Increasing threats to our environment from global climate change, uncontrolled stormwater runoff, air and water pollution, and invasive plant species require that education become a major component of the City's efforts.

City staff has recognized that education is vital. Dedicated educational initiatives on all levels, and partnering with committees and other organizations, will be extremely helpful to the City in creating a sustainable environment.

The development of City program offerings around environmental education and stewardship should be enhanced and increased. Education of City staff on important sustainable best management practices must be take place. Further education of City decision-makers about synergy between many of these issues is critical to ensure that the best and most sustainable decisions are made into the future.

Tactical Actions

5.1 Continue public and citizen urban forestry outreach efforts through a wide variety of media outlets, special events, and publications to instill a sense of civic pride and gain more financial and political support for the urban forestry program.

5.2 Create a standardized educational program for orienting newly elected public officials to the City's urban forestry program, efforts, and goals.

5.3 Promote internal educational opportunities by increasing professional interaction, coordination, and communication between departments and staff regarding tree planting and maintenance principles and practices.

5.4 Incorporate environmental interpretation into public education efforts in parks.

5.5 Provide education about the benefits of native plants, the negative effects of invasive species and promote the concept of "Right Tree, Right Place".

5.6 Elevate the prominence of and expand content of the Program's web page.

5.7 Enhance partnership with local advocates (e.g. Garden Club, Master Gardeners, Master Naturalists, Schools, and Service Organizations).

5.8 Expand community-based volunteer and stewardship opportunities as a way to inform and engage residents about urban forestry issues, such as tree planting, tree care and management and expanding the Program's tree inventory

database.

5.9 Pursue programs for the planting of new trees on private property.

5.10 Host events and festivals to promote the benefits of trees, such as Arbor Day and Earth Day celebration, and recognize forestry community advocates and volunteers.

5.11 Maintain the Arbor Day Foundation's "Tree City USA" status and apply for the annual "Growth Award".

5.12 Maintain the America In Bloom organizations "Five Bloom" status.

5.13 Apply for the Missouri Arbor Award of Excellence, through the Missouri Department of Conservation and the Missouri Community Forestry Council.

5.13 Create a "Funds for the Forest" program as a means to collect donations to help implement the goals of this Plan.

ELEMENT 6 – SUSTAINABILITY, MANAGEMENT AND MAINTENANCE METHODS

As the Parks and Recreation Department has gained experience with various environmental and sustainability initiatives in the past few years, it has become necessary to codify certain practices and integrate sustainable maintenance and best management practices (BMPs) into the daily operations of City departments. This is an important step to ensure that the culture change toward sustainability within the organization reaches all levels of staff.

Tactical Actions

6.1 Establish a long-term tree care and management program for public trees and expand interdepartmental coordination to enhance urban forest and ecosystem health and function.

6.2 Coordinate with Public Works, Engineering and Building Departments to identify and address serious and persistent tree-related infrastructure conflicts, to include street, sidewalk and utility impacts along with maintenance and installation impacts within utility easements.

6.3 Maintain industry-appropriate storm and hazard tree response protocols.

6.4 Maintain, promote and apply industry-appropriate pruning and planting standards through staff and volunteer training and reference in City codes and outreach material.

6.5 Conduct a complete public tree inventory every ten years, and use a tree management software program to update the data, document maintenance work and costs, and create annual work plans.

6.6 Establish No-Mow Zones in riparian areas and other areas of parks to reduce erosion, fuel consumption and air emissions, and allowing natural revegetation to occur.

6.7 Mandate the use of current and accepted best management practices (BMPs) and arboriculture work standards in all maintenance activities.

6.8 Integrate sustainable maintenance methods through the EMS for tracking and management purposes.

6.9 Adopt industry BMPs as part of the Parks and Recreation Departmental Maintenance Standards and all City landscaping decisions and new City projects.

6.10 Update development codes to help ensure adequate forest canopy is preserved or replanted according to performance based standards.

6.11 Promote urban forest tree species diversity through planting recommended site adaptable trees and encouraging, but not limiting to, use of native tree species.

6.12 Adequately train City employees performing maintenance, encourage City staff to become Certified Arborists, and hire contractors who perform work to the highest industry standards.

ELEMENT 7 – ORGANIZATIONAL DEVELOPMENT & FUNDING

Currently, the components of and resources for Washington's urban forestry management program are decentralized in various areas. Critical to the program's success is adequate funding, a centralized focus and improved interdepartmental coordination and communication.

Tactical Actions

7.1 Centralize urban forest management responsibilities, staff, equipment, funding and resources. Proactive and efficient management requires task/issue identification and prioritization, expert guidance, internal review, external approval, and execution of the decision.

7.2 Encourage frequent, regular, and formalized interdepartmental coordination regarding urban forestry related projects and issues through the use of preconstruction meetings for public and private projects, staff meetings, interdepartmental project review mechanisms, and permit review and approval.

7.3 Maintain a list of and coordinate with municipal urban foresters and consulting arborist throughout the St. Louis Region and Missouri as a resource base for issues and opportunities.

7.4 Adequately train City employees performing maintenance, encourage City staff to become Certified Arborists, and hire contractors who perform work to the highest industry standards.

7.5 Hire additional forestry/horticultural staff to further refine and balance the workload.

7.6 Create a "Funds for the Forest" program as a means to collect donations to help implement the goals of this Plan.

7.7 Seek new and renewed funding sources, to include service fees, parks sales tax, capital improvement sales tax, grants, sponsorships and others, to support a comprehensive urban forestry program.

SUMMARY

The recommendations made in this Plan are to be considered and implemented over a period of thirty (30) years. The results of the Plan's implementation, in relation to the overarching goal and final measurable result of achieving an average of forty (40%) percent canopy cover for the City, may take the full thirty (30) years or more.

Trees are long-lived organisms. Planting trees today will provide benefits for future generations of residents. However, by having a systematic tree planting and maintenance programs in place, and by having adequate funding, staffing, regulations, and public education resources today, the future tree population and overall urban forest will be expanded and sustainable.

Washington has always valued its trees and forest, and always will. This Plan has been created to chart a future for those trees and forests, and to assist members of the community in realizing the future we envision. This Plan, like our forests, should be treated as a living entity, which is in need of a regular check-up, the occasional adjustment, and a healthy environment in which to grow.

The protection of the City's biodiversity and its natural resources through the management of the urban forest allows those forests to perform their natural functions of recharging ground water, protecting streams, reducing heat islands, providing shade and wildlife habitat, and sequestering carbon and other air pollutants. Urban Forests are an integral part of our urban green infrastructure, and this Plan ensures they remain a priority.

While there is a lot of work to be done to restore and enhance our urban forests to their maximum potential, the City of Washington's urban forests are in good overall condition. Efforts to expand the urban forest, especially along street and the developed areas of the City, will help ensure the contribution of our urban forest to the community's quality of life.

COMPLIMENTARY DOCUMENTS

1984	City of Washington Comprehensive Plan
1990	City of Washington Parks and Recreation Master Plan
2003	City of Washington Comprehensive Plan
2007	Forestry Management Plan
2012	Natural Resource & Environmental Management Plan
2012	Beautification Management Plan
2012	Turf Grass Management Plan
2012	Maintenance Operations Management Plan
2013	Tree Management Plan
2013	City of Washington Comprehensive Plan
2013	City of Washington Parks and Recreation Master Plan
2014	Arboricultural & Horticultural Specifications Manual
2014	Riverfront Management Plan

REFERENCES

National Recreation and Park Association (NRPA)
Missouri Park and Recreation Association (MPRA)
National Society for Park Resources
American Park and Recreation Society (APRS)
Missouri Department of Conservation
Missouri Department of Natural Resources
National Association of State Foresters
American National Standards Institute (ANSI)
National Wildlife Federation
United States Department of Agriculture – Forest Service
Environmental Protection Agency (EPA)
Audubon International
Arbor Day Foundation
America In Bloom
Urban and Community Forestry
Society of Municipal Arborists
Davey Resource Group
National Urban and Community Forestry Advisory Council
American Public Works Association (APWA)
International Society of Arboriculture (ISA)
Pennsylvania Horticultural Society
Environmental Services, Inc.
American Forests
City of Winter Park, Florida
City of Corvallis, Oregon
City of Portland, Oregon
City of Chesterfield, Missouri
City of Kirkwood, Missouri
City of Webster Groves, Missouri
City of St. Louis, Missouri
City of St. Peters, Missouri
City of Seattle, Washington
City of Bellevue, Washington
City of Vancouver, Washington
City of Omaha, Nebraska
City of Charlottesville, Virginia
Town of Leesburg, Virginia
City of Baltimore, Maryland
Howard County, Maryland