



City of Winter Park



Urban Forest Management Plan

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This draft Urban Forest Management Plan has been developed and is recommended by the City of Winter Park Tree Team. Dru Dennison's efforts in writing and developing the initial drafts of the document are acknowledged.

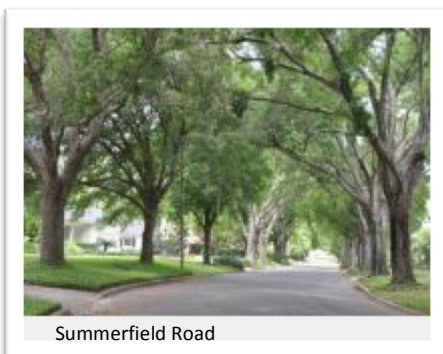
OUR TREES - YESTERDAY AND TODAY



Long before Winter Park founders Oliver Chase and Loring Chapman stepped foot on land we now call Winter Park, our city was already home to its first trees – pines. Pines were so prevalent in this area during the 1800s that the main canals that currently join our lakes were built to ship logs to the city's first saw mill on Lake Virginia. Log transportation needs are long gone and now those canals serve us for our leisure boating needs between our chain of lakes.

As Winter Park began establishment in 1882 and officially incorporated into the "Town of Winter Park" in 1887, more and more northerners found refuge from the harsh winters and made Winter Park their home. The warm Florida climate was conducive to growing citrus. Slowly but surely our pine forest became prolific with citrus groves as a lucrative business for its northern settlers.

In December 1894, the town experienced "The Big Freeze" where temperatures dropped to 24 degrees. In February 1895, a second freeze hit at 17 degrees killing all of the crops of oranges and all the trees as well. It wasn't until 1911-1912 that the first prosperous orange crop reappeared in Winter Park.



Yesterday's pine and orange trees transitioned into today's oak trees. In the 50s and 60s, laurel oaks (*quercus laurifolia*) began sprouting throughout the town. Laurel oaks were widely available at the nurseries, known to grow fast and bear attractive leaves, therefore providing the canopy we enjoy and treasure today.

In addition to The Big Freeze, another act of Mother Nature that forever changed our urban forest was the hurricanes of 2004. Over 8,000 trees were destroyed in those series of storms and Winter Park is still feeling the impact of that natural occurrence.

Even with the natural effects of Mother Nature and time, we are still able to enjoy the benefits of approximately 75,000 - 85,000 trees in our rights of way, parks and on private property, with the city's rights of way being the most visible and home to the thousands of laurel and live oaks (*quercus virginiana*) that beautifully line our city streets and neighborhoods.

A healthy population for trees and people should always include diversity in age and species. This Urban Forest Management Plan will help ensure the longevity, vitality, healthy growth and management of one of Winter Park's most treasured assets – its trees.

BENEFITS OF A HEALTHY URBAN FOREST

Before discussing an urban forest management plan, one must first understand what an urban forest is. An urban forest, as defined by “American Forests”, is an ecosystem composed of trees and other vegetation that provide environmental, economic and social benefits. This includes street and yard trees, vegetation within parks and along public rights of way and waterways.

More than 80 percent of Americans live in an urban environment. In an urban forest many of those benefits of trees are directly related to humans, in fact, there are numerous studies that have proven trees provide economic, social, and environmental benefits to our daily lives. Urban trees are a vital part of a functioning ecosystem.

Trees provide the following benefits to an urban environment:

- Create shade and protection from weather
- Improve air quality by helping to filter pollution
- Provide areas for recreation and solace
- Protect water quality by filtering pollutants
- Absorbing stormwater runoff
- Moderate local climate by mitigating urban heat islands
- Reduce summer cooling and winter heating costs, thereby reducing energy demands from buildings
- Reduce the carbon footprint
- Provide food/habitat for wildlife
- Buffer noise/wind/land use changes
- Increase real estate value
- Traffic calming
- Aid in crime reduction
- Increase economic activity
- Assist in healing processes by providing calmness and tranquility

Given the identified benefits of trees mentioned above, it is appropriate that a community put in place an urban forest management plan designed to protect and ensure a healthy and thriving urban forest.

WHAT IS AN URBAN FOREST MANAGEMENT PLAN?



The purpose of an urban forest management plan is to:

- provide a framework for ensuring that the trees and forests of the city are appropriately cared for according to community goals
- provide guidelines when making decisions about trees and the green infrastructure which contributes to the city ecosystem based upon scientific research and identified industry standards
- help improve and coordinate management of trees and tree canopy
- direct the practices for tree planting, removals, canopy development, utility line clearance, roadway and street sign clearance, and parks tree maintenance
- provide equitable forest benefits including recreation, education, improved human and environmental health, and monetary savings generated by maintaining a healthy tree canopy
- justify budget requirements to maintain and sustain a healthy urban forest now and for future generations

An urban forest management plan is a holistic approach to enhancing and managing the entire urban forest and the community in which we live. This document will change and evolve as environmental factors that affect the urban forest are identified, conditions changes, and research progresses. Much like the urban forest itself, this plan is a renewable resource.

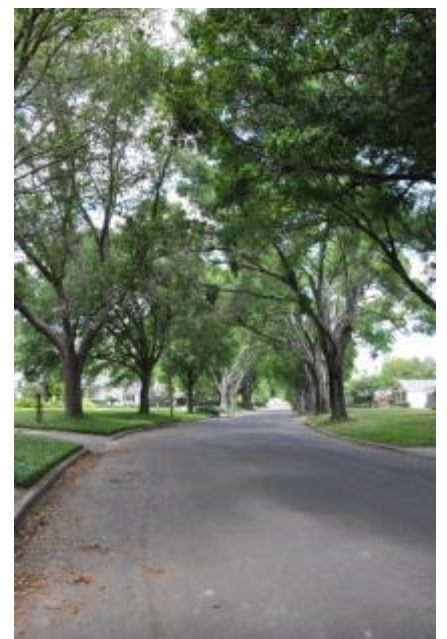
OUR URBAN FOREST MANAGEMENT PLAN

MISSION

Strategically maintain Winter Park's urban forest through utilizing best management practices, and scientific research to maintain existing trees and replace and plant a variety of species over time to create a renewable and sustainable forest for today and future generations.

Key goals:

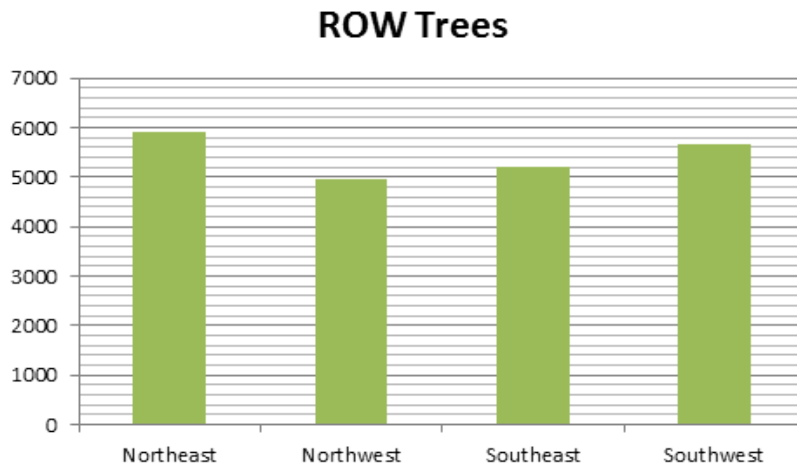
- Preserve and protect existing tree canopy
- Reduce risk, prevent injuries to people and damage to their property
- Mitigate tree hazards in public areas
- Enhance and restore forest quality through species and age diversity
- Maintain and plant trees to coexist with urban services
- Expand forested areas
- Create appropriate infrastructure areas to allow for sufficient space for mature trees to grow
- Provide community outreach and education
- Promote interdepartmental coordination on the care of city trees



OUR URBAN FOREST

In 2005, the city hired ArborPro, Inc., a full service urban forestry and software consulting company to perform an inventory of right of way (ROW) trees. The survey found:

- there are approximately 25,500 ROW trees
- ROW trees are fairly evenly dispersed in each quadrant
- condition of the trees within each quadrant is fairly consistent: reaching the end of useful life and are beginning to decline
- almost half of the ROW trees were two oak species:
 1. 29 percent laurel oak
 2. 20 percent live oak



Laurel oaks are the prominent trees located in our ROW. Laurel oaks have a life span of approximately 50-70 years depending upon site conditions (streets, pavement, sidewalks, etc.) and other environmental factors. The laurel oaks in Winter Park:

- are predominately between 20" to 50" diameter at breast height (DBH) - measured at 4 ½ feet above the ground
- are between 45-60 years of age (middle-aged to maturing/declining)

Based on the 2005 survey and an increasing demand of removal of dead/dying ROW trees, an additional study was requested during the summer of 2012 to:

- perform a risk assessment on a sample of 300 ROW trees, 75 trees per quadrant
- provide an assessment tool
- prescribe treatment for each tree in accordance with ANSI A300 standards and ISA Best Management Practices

The study was awarded to Mr. Chuck Lippi, Board Certified Master Arborist, president/owner of Advanced Tree Care, Inc. City arborists' agree the trees selected for risk assessment were consistent with the other trees in the ROW.

The tree assessments were conducted in accordance with:

- *ANSI A300 Standards on Tree Risk Assessment*
- *Best Management Practice on Tree Risk Assessment* as recommended by two leading arboricultural researchers: DR. Ed Gilman, University of Florida and Dr. Kim Coder, University of Georgia.

Each tree received:

- “Level 2 Basic Assessment” which includes a detailed visual inspection of the tree and its surroundings and a sound testing of the lower trunk and root flares with a rubber mallet.
- measurement on the Clark-Matheny rating system which identifies three characteristics:
 1. probability of failure
 2. size of the tree part that may fail
 3. target (person or property) that could be injured or damaged if the tree failed
- A fourth characteristic, tree species, was added to Winter Park’s rating model. Each tree identified in the study was then measured on the 14-point risk assessment and a specific treatment was prescribed.

As the city works toward building an inventory for purposes of prioritizing and planning work, each of the city’s arborists will use the 14-point rating scale and categories to assess trees. (*See appendix for Mr. Lippi’s full report.*)

The results of the study found:

- the tree population is reaching maturity
- the tree population is exhibiting signs of increased decay
- weak branch structure leads to leading to higher failure rates
- 45 percent of the trees in the sample contained extensive decay, which is much higher than most surveys in other communities.

Because our trees are in a declining and maturing state, leaving the decay and weak branch structure accelerates the demise of the tree and introduces risk to humans, therefore pruning is suggested. The rating system for ROW tree removals and pruning is provided in greater detail in the appendix.

THE IMPORTANCE OF DIVERSITY

The science of arboriculture and urban forestry has changed drastically since the City of Winter Park's urban forest canopy was originally established in the mid-1900s. 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 United States Forest Service suggests cities should have no less than 40 percent canopy cover (private and public trees), our urban forest consists of nearly 50 percent tree canopy coverage. With a majority of trees being planted at the same time and roughly the same species (laurel and live oaks), our tree canopy 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 40 percent canopy cover, there are two key elements to preserving and enhancing the canopy: age diversity and species diversity.

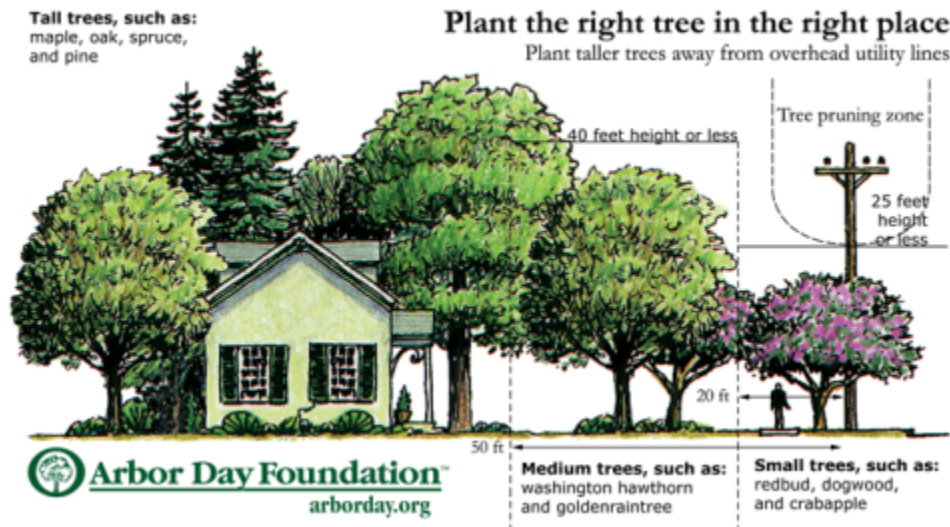
Age Diversity

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. Luckily, Winter Park has always placed high in importance the planting of new trees. Trees from both the ROW and private property contribute to the beauty of the canopy. The city provides giveaway trees and has offered many opportunities for residents and children to learn about planting trees through programs like the Arbor Day, Trees for Peace, Run for the Trees, and Earth Day. The city has also partnered with good neighbors, such as the Winter Park Live Oak Fund that helped replant over 700 ROW trees after the 2004 hurricanes. In addition, the city has aggressively replanted ROW trees in each of the four quadrants within the city between 2009-2012. All of these efforts have prepared us well to continue to build on establishing an evenly distributed age to the canopy.

In addition to actively replacing trees on the city's ROW, the city maintains an ordinance 2895-12 that requires tree removals on private property be replanted. The ordinance was recently modified and requires the following:

- Removal of trees determined by the city to be dead, hazardous or beyond recovery requires replacement with one approved shade tree having a minimum caliper of 3"
- Removal of healthy trees having a DBH of at least 9" and less than 19" requires replacement with one approved shade tree having a minimum caliper of 3"
- Removal of healthy trees having a DBH of 19" or greater requires a replacement with two approved shade trees having a minimum caliper of 3"

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

Urban forests compete with many other human needs in a built environment, such as buildings, homes, sidewalks, roads, size of planting strip, 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. The United States Forest Service recommends the urban forest be comprised of mostly species native to the region focusing on age, size, and species diversity. United States Forest Service research has proven to avoid species monoculture, the urban forest should have a species composition of no one species comprising more than 10 percent of the population. Species diversity, wood type, wind resistance, and insect/disease resistance should be considered.

The potential for deforestation can be detrimental and in epidemic proportions in urban environments due to insect and disease infestations. Historically many cities have experienced deforestation at different levels. For example,

- Denver, Colo., was nearly deforested in 1948 due to Dutch elm disease
- The City of Winnipeg, Manitoba spends \$3 million annually just to combat the deadly Dutch Elm Disease
- Emerald Ash Borer was the killer of millions of ash trees in Minnesota and Michigan

The City of Winter Park is not immune to these types of deforestations, in fact urban trees are more susceptible to disease than those in a natural, undisturbed environment. The following are examples of the most common diseases that can be a threat to the city’s trees:



- **Hypoxylon Canker** is a secondary fungus that causes cankers and eventually death of oak and other hardwood trees. Relatively healthy trees are not invaded by the fungus; however the fungus is known to be

present in many healthy trees and lies dormant in the inner bark. The hypoxylon fungus will readily infect the sapwood of a tree that has been damaged, stressed, or weakened. Hyxpoxyton is considered a weak pathogen in that it is not aggressive enough to invade healthy trees. Several trees are weakened and stressed within the City of Winter Park and many trees have been diagnosed with hypoxylon canker and removed. There is no known control or cure for the disease.

- **Oak Wilt** is yet another disease that threatens many areas of the country by killing oak trees. It was identified in the early 1940's and has been verified in 24 states. Oak wilt is killing oak trees, including live oaks at an epidemic rate in central Texas and occurs in South Carolina. Oak wilt is caused by a fungal pathogen which invades the water conducting tissues. It is a potential future threat to Florida, but to date the disease has not been identified in the state. According to the University of Florida there is great concern regarding oak wilt since live oak, laurel oak, shumard oak, and willow oak are high risk species. All of these trees exist in the City of Winter Park and comprise over 50 percent of our species.
- **Sudden Oak Death** has recently been introduced and is capable of causing symptoms from leaf spots, to bleeding cankers, to plant death. It is at this time restricted to coastal areas, but has the potential to spread. Several host species can be attacked by sudden oak death. In 2002 sudden oak death had 29 host species; in 2008 there were 45 host species noted and as of 2012 up to 100 species could be affected. The fungus can spread by movement of infected host material, infested soil, irrigation water, and wind-blown rain. Because this is a new pathogen, the best option in controlling spread of this disease is preventing the introduction and establishment of the pathogen in new areas. Currently only foliar dieback disease has occurred in Florida and no oaks have died from sudden oak death in Florida.
- **Laurel Wilt** has caused serious damage to red bay, avocado, and other trees in the laurel family in Florida as well as other southern states. Laurel wilt continues to expand at a rapid pace in Florida. This disease was first detected in the United States in 2002 and in Florida in 2005. In July of 2011, Laurel wilt had been identified in only a few counties, but today it is a widespread killer of the native red bay.

(See appendix for additional discussion regarding tree diseases and insect infestations associated with species monocultures)

In urban areas, foresters must choose to diversify 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.

EXAMPLES OF ALTERNATIVE SPECIES TO ESTABLISH A DIVERSE CANOPY* <i>*This is not a complete list, only examples of alternative species, not all species listed are suitable street trees</i>		
Canopy Shade Trees	Medium Trees	Understory Trees
Trees with a mature height of 50 -70 + feet that cannot be planted under overhead electric utility facilities and must have a minimum of 6' planting strip.	Trees with a mature height at 30-45 feet and can be managed if planted near overhead electric utility facilities and must have a minimum of 4' planting strip.	Trees with a mature height of 15 to 25 feet tall that can be maintained under overhead electric utility facilities and must have a minimum of a 3' planting strip.
<ul style="list-style-type: none"> • Cultivars of live oak • Cathedral • Highrise • Parkside • Millennium • Nuttall Oak • Shumard Oak • Willow Oak • Sand Live Oak • Swamp Chestnut Oak • Bald Cypress • Ash • Red Maple (cultivars) • Sweetgum • Southern Magnolia (cultivars) • Winged Elm • Sycamore • Tulip Poplar • Pine (Longleaf, Slash) 	<ul style="list-style-type: none"> • Riverbirch (Duraheat) • Sweet Bay Magnolia • Chinese Elm (Drake, Allee) • Little Gem Magnolia • Southern Red Cedar • Redbud • Bracken's Brown Beauty Magnolia 	<ul style="list-style-type: none"> • Flatwoods Plum • Chickasaw Plum • Eagleston Holly • Yaupon Holly • Dahoon Holly • Pear (cultivars) • Cherry (cultivars) • Crepe Myrtle • Japanese Blueberry • Weavers White • Flowering Dogwood • Golden Trumpet • Fringe Tree • Loquat • Walter's Viburnum • Purple Glory Tree

Invasive species as noted by the Florida Exotic Pest Plant Council (FLEPPC) shall be removed on a regular basis if they exist on city property. Private property owners will be required to remove exotic species on their property at their expense. See the website for the most recent list of exotic species <http://www.fleppc.org/>.

MAINTAINING TREES IN THE RIGHTS OF WAY



Right of way trees (ROW) are trees planted close to the road, generally between the sidewalk and the road on city property. According to the existing city code 58-296, the adjacent property owner is responsible for the maintenance and care of the tree. This portion of the ordinance has remained in place for many years, while other sections have been modified.

Two factors, the 2004 hurricanes and the acquisition of the electric utility system, encouraged a more thorough evaluation of pruning and management of its trees.

Prior to the 2004 hurricanes, the city's forestry crews were able to supplement the work of residents by courtesy pruning to:

- lift the canopy
- clear for line-of-sight
- dead wooding trees
- remove hazardous trees

While the urban forest was beginning to see signs of aging, the hurricanes caused much damage and increased the rate of aging and decay for many trees.

The damage from the hurricanes, combined with an increased work load and multiple years of non-growth budgets, limited the city's forestry crews ability to continue to provide pruning of ROW trees, as a courtesy to the residents, causing further deterioration. Forestry staff has been primarily focused on hazard mitigation and dead tree removal. Because the city provided pruning, as a courtesy for the residents, for many years in the past and the city has planted many trees within the ROW in recent years, many residents are unclear about their responsibility to maintain trees adjacent to their property. According to current code, the adjacent property owner is responsible for the maintenance and care of the tree.

In addition, after acquiring the electric utility system, the city became hands-on on the day-to-day management of its tree trimming especially around power lines. Recently, the city has enhanced its arborists' knowledge bank and team to better understand and manage its urban forest. It can now use the combined experience and education of staff to address the appropriate prescriptions for its maturing trees.

Removal of dead/diseased trees

Trees throughout the ROW and in city parks and facilities are assessed for risk and prioritized for removal. Currently, trees are identified for evaluation by concerned residents, business owners, or city employees. The trees are being assessed and prioritized based on the scientific criteria previously identified. A value is identified for each tree ranging from highest risk to lowest risk. The trees with the highest risk rating are prioritized to the top of the removal list.

The scientific approach to evaluating the trees helps determine the value of pruning vs. removal. It is often better for the canopy, budget and overall quality of the urban forest to remove and replant verses pruning, then later removing. Removal of diseased trees is sometimes recommended rather than pruning to prevent spread of the disease and fight the inevitable. In addition, pruning is recommended due to budget restrictions and aesthetic purposes.

Pruning and dead wooding

As previously mentioned, city code calls for the adjacent property owner to maintain the ROW trees, however, currently the city will remove dangerous or potentially hazardous limbs from trees in the ROW. The remainder of the tree is left unpruned and is the responsibility of the adjacent property owner to prune and maintain.

There are several benefits to the city potentially taking responsibility for ROW tree maintenance:

- Consistency in treatment and maintenance of the trees would be accomplished by establishing a maintenance cycle and a pruning program consistent with ANSI A300 and ISA Best Management Practices
- Improve the health and longevity of the trees and reduce potential hazards
- Implementation of a pruning policy for small trees. Routinely pruning a small tree will result in the following:
 - correct structural problems
 - reduce/eliminate co-dominant leaders, unbalanced crowns, rubbing/crossing branches
 - remove dead branches
 - correct growth patterns which have the potential to obstruct line of sight, interfere with overhead electric utilities, or even buildings and other structures
 - maintenance of trees conducted under supervision of certified arborists

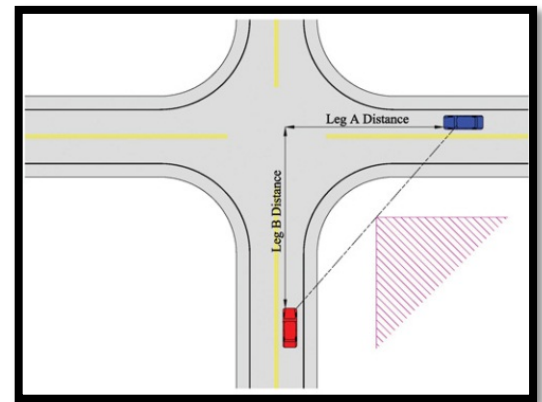
Maintenance of ROW trees is no small task and certainly comes with significant costs. While budget will be discussed in a later section, it is important to note that the city's current forestry budget does not include funding for maintenance of ROW trees.

CLEARING VEGETATION (*tree limbs, branches, leaves*)

In addition to standard ROW maintenance, it is necessary in an urban environment to prune the trees to coexist with modern day conveniences such as electric lines and roadways. To protect the trees as much as possible and to minimize the impact on the trees health related to the pruning, all trees are pruned according to ISA Best Management Practices and ANSI A300 Standards. Each tree is different, therefore, each tree requires a different prescription as to how it will be pruned.

Street Tree Clearance

In order for fire trucks, garbage trucks and general delivery trucks to safely pass through the streets of Winter Park, limb heights are required to be above 13'6" and for a clear triangular line of sight (see graphic to the right). Similarly, the city code also mandates a clearance of 8' above sidewalks. In both cases, ISA Best Management Practices and ANSI A300 Standards are utilized to properly prune the tree. As a result, there will be situations where the tree will be pruned closely to the standards set and at other times it may require removing the limb at the trunk. Each tree will be handled individually and the minimum cut necessary will be made to provide a safe clearance while utilizing proper arboricultural pruning methods.



Triangular line of sight

Utility Line Clearance



The city has a municipal owned electric utility where overhead power lines are forced to coexist with lush tree canopies. A standard function of an above ground utility operation is to clear conflicts within a safe distance of the utility lines in order to keep utility employees and people safe, minimize interruption of service and equipment failures as a result of limb or small animal conflict. Most electric utility companies (investor- or municipal-owned) in the United States including Florida operate under specific clearance guidelines of 10 feet.

Winter Park does not prune based strictly on a given distance from the electric equipment, but rather considers the individual tree and equipment that are in conflict and makes the minimum cut necessary and prunes in accordance with ANSI A300 Standards and ISA Best Management Practices. Decisions are also based on safety of the utility workers and residents, and the potential for power failure. Electric line clearance is currently on an approximately three year schedule (depending on species).

In addition to pruning to eliminate conflict, the Electric Utility Department recently proposed a program to the City Commission to underground its overhead primary (7,200 volts) wires within a 12-20 year period.

Placing electric overhead wires underground will eliminate conflicts between electric facilities and trees and will significantly reduce and ultimately eliminate the electric system's need to prune trees. Seventy five undergrounding projects have been identified and prioritized based on the following quantitative criteria:

Criteria	Point System			
Tree density per mile of primary conductor	0-40 points based on ranking of tree density			
Visibility of overhead electric facilities	arterial roads <i>20 points</i>	collector roads <i>15 points</i>	other local roads <i>10 points</i>	rear lots <i>0 points</i>
Type of construction	3-phase mainline feeder <i>20 points</i>	3-phase non-mainline feeder <i>10 points</i>	2-phase lateral <i>5 points</i>	Single-phase lateral <i>2 points</i>
Electric System reliability experience	Poor reliability <i>20 points</i>	Average reliability <i>10 points</i>		Good reliability <i>0 points</i>

Using the above criteria each line segment that makes up a project is evaluated and is weighted by length and the points are summarized by project. The project with the most points is ranked number one in priority for undergrounding. The application of the above criteria results in assigning the highest priority for undergrounding to the overhead line segments with the most tree conflicts, serving the most customers (construction type), with the most visibility, and experiencing the worst reliability. The full list is available on the city's website cityofwinterpark.org > Departments > Electric Utility > [Electric Undergrounding Priority List](#)

During the interim period, i.e. until undergrounding is complete, the electric department will adhere to the following standards with regard to pruning trees in conflict with overhead electric facilities:

1. On a tree by tree basis, prune trees to the minimum clearance necessary for safe and reliable operation of the electric system, while maintaining proper pruning techniques as identified by ANSI A300 Standards and ISA Best Management Practices" Utility Pruning of Trees" ISA pruning standards. If a line is scheduled for undergrounding in less than 5 years, prune as follows:
 - a. If a line is scheduled for undergrounding in less than 3 years, line clearance pruning will be carried out only if absolutely required.
 - b. Coordinate line clearance pruning such that lines that are scheduled for undergrounding in the 3-5 year timeframe be scheduled for only one pruning.
 - c. Coordinate line clearance pruning such that lines that are scheduled for undergrounding in the 5-8 year timeframe be scheduled for only two prunings,
 - d. Electric lines that are scheduled for underground after 8 years will be pruned approximately every 3 years to achieve electric system reliability and in accordance with ANSI A300 Standards and ISA Best Management Practices.
2. In addition to line clearance pruning, the removal and replacement of declining trees will be coordinated with the undergrounding program.

FUNDING

Historically, arboriculture functions have been separated into three sections:

1. Forestry Division
2. Code Enforcement Division
3. Electric Utility Department

Each division or department was responsible for their individual tasks, but there was little coordination among teams. In 2011, an internal tree team was created to begin developing strategies to manage the growing needs of the urban forest from a better coordinated approach. The team consisted of members from forestry, code enforcement, electric and administration. Many changes have been implemented as a result of the tree team's work, the most significant being the reorganization of the individual divisions to a single division and the development of the electric undergrounding master plan. From this report, policy decisions are expected and additional operating adjustments are also anticipated.

Development of a budget and work plan that supports the recommendations of this plan are critical to its success.

Budget

Below is a chart of city resources spent on the various arbor tasks. Funding for electric utility pruning comes from electric utility revenues while the forestry and code enforcement functions are funded with General Fund resources. On average, over the last five years, the city collectively has spent just over \$1.5 million on tree care.

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Forestry Division	930,184.19	898,656.71	1,078,982.18	1,071,361.76	1,072,138.18	984,404.73	904,184.09	978,363.68	744,323.83	1,040,076.94
Code Enforcement				48,500.00	58,193.00	61,066.00	28,870.00	37,850.00	52,000.00	52,000.00
Electric Tree Maint.	*	133,261.15	605,065.43	605,744.28	559,327.84	533,075.85	549,302.57	521,941.81	574,844.79	509,342.15
	930,184.19	1,031,917.86	1,684,047.61	1,725,606.04	1,689,659.02	1,578,546.58	1,482,356.66	1,538,155.49	1,371,168.62	1,601,419.09
		* Partial Year								

Fees collected for private tree removals have been used to offset the cost of planting, education, and in 2012 and 2013, to assist with dead tree removal.

Summary of Activity for Tree Preservation Fund (TREEFD)						
	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Beginning balance	186,776.51	396,867.92	439,832.33	493,489.60	499,246.54	286,693.17
Revenues:						
Grant funds	133,950.31		18,000.00			
Tree removal compensation	148,106.00	71,059.38	44,799.75	53,933.50	(5,854.25)	11,555.00
Donations (mostly payments from residents wanting to upgrade the size of replacement trees they were required to plant)	7,332.57	5,470.00	25,825.00	1,442.25	125.00	14,601.81
	289,388.88	76,529.38	88,624.75	55,375.75	(5,729.25)	26,156.81
Expenses:						
Grounds maintenance	3,161.60					
Promotional activities		5,362.60		50.00		
General operating supplies	76,135.87	28,202.37	34,967.48	49,568.81	106,824.12	97,990.54
Transfer to General Fund for removal of dead trees					100,000.00	99,999.96
	79,297.47	33,564.97	34,967.48	49,618.81	206,824.12	197,990.50
Ending balance	396,867.92	439,832.33	493,489.60	499,246.54	286,693.17	114,859.48

Currently within the General Fund Forestry Division, the following services are provided:

- Planting and watering of new trees
- Tree evaluation/demand trimming
- Emergency tree work (both in-house and contracted)
- Parks and other city property tree care and maintenance
- Contracted ROW - dead tree removal, street tree clearance
- Special projects (holiday decorations, etc.) and educational opportunities (Arbor Day, Trees for Peace, etc.)

To consider the additional costs associated with full maintenance for the ROW trees, the Tree Risk Assessment study performed by Mr. Lippi, was used to extrapolate the findings of that report over the estimated entire ROW canopy of approximately 25,000 trees. His findings were specific to laurel oak, which represent approximately 29 percent of the canopy.

To identify the cost for the remainder of the ROW maintenance, costs were reduced by 15 percent for live oaks (20 percent of the species) and 50 percent for other remaining species (51 percent of the species).

	ROW Tree Removal				
	Priority 1	Priority 2	Priority 3	Estimated Total	
ROW Maintenance Laurel Oak (29%)	73,000	299,000	353,000	\$ 725,000	
ROW Maintenance Live Oak (20%)	42,000	174,000	205,000	\$ 421,000	
ROW Maintenance All Other (51%)	63,000	260,000	307,000	\$ 630,000	
	\$ 178,000	\$ 733,000	\$ 865,000	\$ 1,776,000	
	ROW Tree Pruning				
	Priority 1	Priority 2	Large Tree	Small Tree	Estimated Total
ROW Maintenance Laurel Oak (29%)	267,000	467,000	1,261,000	62,000	\$ 2,057,000
ROW Maintenance Live Oak (20%)	155,000	271,000	732,000	36,000	\$ 1,194,000
ROW Maintenance All Other (51%)	232,000	407,000	1,098,000	54,000	\$ 1,791,000
	\$ 654,000	\$ 1,145,000	\$ 3,091,000	\$ 152,000	\$ 5,042,000

(See appendix for ROW tree removal & pruning priority levels)

The total costs to complete a full cycle of maintenance of the ROW trees, based on their current condition, and is estimated at just over \$6.8 million. Below are three potential options while there are several options that could be considered:

- Continue operating with existing resources
 - Hypothetically, this would equate to a 24-year pruning cycle, however, to actually complete the pruning cycle would be difficult because high priorities would continue to dictate how the budget is spent.
- Enforce the existing code
 - In this scenario residents would be forced to maintain the trees more aggressively. Any work not completed by the residents would be completed by the city and a lien would be placed on the property (similar to the lot clean up procedure).
- Include ROW tree maintenance as standard city services
 - This would require additional funding and resources.

URBAN FOREST MANAGEMENT POLICIES

ROW Tree Maintenance

- All ROW Trees will be pruned in accordance with city code 59-298, ANSI A300 and ISA Best Management Practices for street clearance to include lifting the canopy on the roadway and sidewalks and triangular line of site clearance for traffic signs and devices.
- The City, at the discretion of its Urban Forestry Manager or designee, using the identified risk assessment tool will prune and remove trees from ROW as necessary to mitigate hazards and reduce risk to the community.
- The City will implement routine maintenance pruning for small trees to establish proper growth and structure thereby reducing future maintenance costs.
- The City's Urban Forestry Manager or designee will work with neighborhoods that want to maintain their ROW trees more frequently than prescribed by the City to coordinate efforts with their private contractor to create efficiencies and minimize cost to the neighborhood.

Electric Utility Vegetation Management

- The City will prune trees in conflict with electric utility line in accordance with City of Winter Park Utility Vegetation Management Guidelines, ANSI A300 and ISA Best Management Practices
- The City, at the discretion of its Urban Forestry Manager or designee, will make final decisions regarding prescribed treatment of the area based on safety, mitigation of hazards and reduction of risk where tree limbs and/or brush are conflicting with electric lines.
- Continue to underground electric utility lines in accordance with the Undergrounding Master Plan.

Planting Practices

- Where possible, the City will replant a variety of shade tree species near the place of a removal in the city ROW. If there is a conflict, such as a power line, sidewalk, etc. consider replanting an appropriately sized tree near the removal site "Right Tree, Right Place"
- The City will only plant canopy shade trees in planting areas of 6' or more.
- The City will coordinate with the adjacent property owner regarding replanting
 - The property owner may select a tree from list of trees that are available to the City, grow with success in this region, and is "Right Tree, Right Place"
 - The property owner may decline a replacement tree
- Property owners will be encouraged to take responsibility for watering and nurturing the tree with oversight and assistance from City staff.
- The City will continue to plant and replace trees in City Parks and other public spaces



- The City will continue to require replanting of private trees as outlined in City Code 59-286

Species Diversification

- The City will work to maintain a 50 percent canopy cover which is 10 percent above the United States Forest Service suggestion that cities should have no less than 40 percent canopy cover (private and public trees).
- The City will continue to implement species and age diversity in city-owned park land and public spaces.
- The City will Utilize Arbor Day and other tree giveaways to introduce under represented species in an effort to diversify and offer special planting opportunities for residents and businesses willing to diversify.

Evaluation

- Immediately upon adoption and annually, set realistic expectations for residents regarding work expected to be preformed
- Annually evaluate operational efficiencies and make adjustments as necessary
- Annually evaluate costs and make recommendation for budget
- In five years, evaluate the impact of diversification and make adjustments as necessary
- At the conclusion of the first full maintenance cycle, evaluate condition of the urban forest and prepare for a more routine maintenance program.

CONCLUSION

From the very first day our city founders stepped foot on Winter Park land, this community has always valued its trees and its urban forest. The Urban Forest Management Plan (UFMP) has been created to chart a future for a healthy urban forest and to assist members of the community to keep it healthy and thriving for years to come. The UFMP, like the urban forest, is as a living document that will continue to grow and adapt to the community's ever-changing needs.

The protection of the city's natural resources through the management of the urban forest allows its natural functions of recharging ground water, protecting streams, reducing heat islands, providing shade and wildlife habitat, and sequestering carbon and other pollutants, to flourish. The UFMP ensures the priority and importance of the safety of the city's residents and its tree canopy's green infrastructure.

Winter Park was established 1882 and now after 130 years of transformation and growth, the City of Winter Park's urban forest requires the attention of its community to properly and strategically restore, revitalize and enhance it to its maximum potential.

City staff and the citizens of our community can use this UFMP to accomplish its mission to "strategically maintain Winter Park's urban forest through utilizing best management practices, and scientific research to maintain existing trees and replace and plant a variety of species over time to create a renewable and sustainable forest for today and future generations."

APPENDIX

ADDITIONAL TREE DISEASES AND INSECT INFESTATION EXAMPLES

- **Chestnut Blight** defoliated much of the northeastern United States in the early 1900's by the infestation and attack on the American chestnut. The American chestnut comprised nearly 50% of the eastern hardwood forest. Many foresters believed that the American chestnut was the perfect tree. It was used for lumber, source of food for humans and wildlife, and furniture to name a few. It was first observed in 1904 in a New York zoo; and by 1940 the American chestnut had been destroyed as a commercial species. The fungus spread up to 50 miles a year wiping out American chestnuts in its native range. The American chestnut still sprouts from old stumps, but it is short lived as the disease attacks before it can become mature. It will be several hundred years before the American chestnut could thrive again.
- **Dutch Elm Disease (DED)** was first found in the United States in the 1930's in Ohio. It was a major epidemic from the 1930's to 1960's killing hundreds of thousands of elms. New Haven "The Elm City" became nearly treeless, the disease continued to spread reaching Detroit in 1950, Chicago in 1960, and Minneapolis by 1970. Denver was practically deforested in 1948 due to Dutch elm disease that attacked American elms. Denver, much like the City of Winter Park wanted a beautiful, uniform tree canopy quickly and started aggressively planting American Elms in 1904. The American elm was the predominant shade tree of choice throughout the Midwest. It was planted in yards, along streets, and in parks reaching from New England west to Colorado and north to Canada. Minnesota had about 140 million elms by 1950. Dutch elm disease has spread over 50% of the American elm population and has been reported in all states except the desert southwest. The largest surviving urban forest of elm trees in North America is believed to be in the city of Winnipeg, Manitoba where close to 200,000 elms remain. The City of Winnipeg spends \$3 million annually to aggressively combat the disease. They continue to lose 1500-4000 elms per year to Dutch elm disease. Minnesota lost 8,000 diseased elms in 2004 and 3800 in 2003. The American elms that were lost thirty years ago were replanted with ash, honey locust, linden, and maples. What we have found is that these trees often times have problems too.
- **The Bronze Birch Borer** has negatively affected the urban landscape and forests by attacking all native and introduced birch species including white birch and river birch especially in the Northeastern United States, Midwest, and Canada. Records from the late 1800's describe widespread damage. Today the bronze birch borer often contributes to mortality of woodland birch during severe drought or other stress. Silvicultural (silviculture is the practice of managing the establishment of growth, composition, health, and quality forest to meet diverse needs and values) practices that increase stand health and vigor should reduce bronze birch borer attacks, as is the case with most insect/disease infestations.
- More recently the **Emerald Ash Borer** has adversely impacted many ash trees in cities in the Midwest including Minneapolis, MN. Minneapolis has lost several thousand ash trees due to the Emerald ash borer. Michigan replanted ash after losing elms in the 1960's. Now, Michigan has lost 7 million ash trees to the Emerald ash borer.

ROW TREE REMOVAL & PRUNING PRIORITY LEVELS

Trees that were marked for some form of maintenance received one of the following descriptive classifications. All work should follow ANSI A300 Pruning Standards 6:

ROW tree removal priority level

Priority 1 Removal Trees designated for removal have defects that cannot be cost-effectively or practically treated. The majorities of the trees in this category have a large percentage of dead crowns, decay and/or pose an elevated level or risk for failure. Any hazards that could be seen as potential dangers to persons or property and seen as potential liabilities to the client would be in this category. Large dead and dying trees that are high liability risks are included in this category. These trees are the first ones that should be removed.

Priority 2 Removal Trees that should be removed but do not pose a liability as great as the first priority will be identified here. This category would need attention as soon as “Priority 1” trees are removed and “Priority 1 Prune” is done.

Priority 3 Removal Trees that should be removed, but pose minimal liability to persons or property, will be identified in this category.

ROW tree pruning priority level

Priority 1 Prune Trees that require priority one pruning are recommended for trimming to remove hazardous deadwood, hangers, or broken branches. These trees have broken or hanging limbs, hazardous deadwood, and dead, dying, or diseased limbs or leaders greater than four inches in diameter.

Priority 2 Prune These trees have dead, dying, diseased, or weakened branches between two and four inches in diameter and are potential safety hazards.

Large Tree Routine Prune These trees require routine pruning to correct structural problems, shorten sprawling branches with excessive end weight, remove dead branches or vines, or correct growth patterns which would eventually obstruct traffic or interfere with utility wires or buildings. End weight reduction pruning is considered part of “Routine” pruning. Trees in this category are large enough to require bucket truck access or manual climbing.

Small Tree Routine Prune These trees require routine pruning to correct structural problems, remove dead branches or vines, or correct growth patterns which would eventually obstruct traffic or interfere with utility wires or buildings. Trees in this category are small enough to use a ladder or pole saw.

Training Prune These are generally smaller trees that can benefit from early structural pruning that will improve the structure by reducing or eliminating co-dominant leaders, unbalanced crowns and other structural problems.

RISK ASSESSMENT FORM

Address:

Tree #:

Species:

Size:

Health condition (decay fungi, sparse foliage, declining)
excellent, good, fair, poor, dead

Structural Condition (co-dominant leaders, dead branches, decay/cavities)
excellent, good, fair, poor

1. **Probability of failure** of the tree or part of the tree
(1=low probability, 2=moderate probability, 3=moderate to high probability, 4=high probability)
2. **Size of the tree part** that may fail
(1=smaller branch, 2=large branch, 3=entire tree)
3. **Target** (person or property) that could be injured or damaged if the tree failed
(1=low target value, 2=moderately occupied or valued target, 3=moderate to high target value, 4=high target value such as busy street, occupied home, playground)
4. **Tree species**
(1=strong, decay and wind resistant species such as live oak, 2=moderate decay and wind resistance such as sweet gum, 3=weaker, decay prone species such as laurel oak)

Hazard Score:

Work Priority Rating:

Urgency/Overhead Utility/Notes:

Date:

Name: