Public Street Tree Inventory Report for Central Falls, RI

PREPARED BY RIDEM DIVISION OF FOREST ENVIRONMENT
URBAN & COMMUNITY FORESTRY PROGRAM

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Executive Summary

This document reports the findings of the public street tree inventory conducted in the City of Central Falls, Rhode Island during June and July 2024 by the Rhode Island Urban and Community Forestry staff and a Rhode Island Tree Council volunteer.

Results

Number of trees: 476 trees were inventoried in the city's street rights-of-way.

Species diversity: 46 different species comprise the city's inventoried trees with cherry spp. (28.99%), honeylocust (9.45%), and American elm (8.61%) the most abundant.

Tree condition: Most trees, 43%, are in fair condition. 32% of the trees are in good condition, 11% are in poor condition, and 5% of trees are dead.

Tree size: 82% of inventoried trees have diameters less than or equal to 12 inches and 18% have diameters greater than or equal to 13 inches.

Tree concerns: The most frequent identified concern was pest/disease, followed by physical or mechanical damage and planted above root flare.

Maintenance actions: There are 93 trees that have been identified for priority action items. 2 require immediate pruning, 61 require a scheduled pruning, and 30 should be removed.

Recommendations

Removal of identified trees that pose a high risk to people and property should be a priority, followed by the pruning of certain trees that are at risk for limb failure.

Retain and maintain existing large and older trees where possible. Promote the importance and benefits of large maturing species and mature, properly maintained trees within the city.

Promote proper form of young trees through structural pruning. Structural pruning should occur every 3 years for the first 9-12 years.

Increase species diversity. Avoid choosing cherry when selecting tree species to plant in areas where a small maturing species is appropriate.

Contents

Introduction

The urban forest is an important natural resource that communities have an interest in protecting and preserving. Whether found along streets, in parks, or in less structured open spaces, urban trees contribute greatly to the quality of community life. Recent research has shown that urban trees offer many benefits including improved air quality, reduced storm water runoff, reduced psychological stress, and increased residential property values.

Undertaking a public tree inventory signifies a community's investment in and commitment to the current and future well-being not just of its trees, but of the community itself. Much like any natural resource, the urban forest needs to be conserved and managed. A public tree inventory is an important tool in managing and planning urban tree populations. Complete and up-to-date information about the diversity, condition, and size of trees included in a public tree inventory enables a community to care for the present urban forest as well as to plan intelligently for the future urban forest.

Inventory Methodology

Trees were inventoried between June 14th and July 19th, 2024. Trees included in the inventory were in the public right-of-way for city-maintained streets. This did not include any trees planted in public parks.

The inventory was conducted by Rhode Island's Urban & Community Forestry Program Staff.

Data was collected in a walking survey utilizing Accessible Urban Forest Inventory (AUTI) software by Forest Metrix.

Data collected includes the following:

1. **Species**: A drop down list containing tree species and their respective common and Latin names.
2. **Growing Space**: A drop down list containing descriptive options of the tree's growing space.
3. **Location:** Latitude and Longitude and address derived from internal GPS of the iPad.
4. **DBH:** Trunk diameter at breast height (approximately 4.5 feet above the ground) measured to the nearest inch.
5. **Height:** Tree height measured to the nearest foot.
6. **Condition:** A drop down list containing descriptive options of the general health condition of the tree recorded as Good, Fair, Poor, Dead, or Removed.
7. **Structure:** A drop down list containing descriptive options of common structural issues for the tree.
8. **Wire Conflict:** A check box to indicate a conflict with utility wires and the tree.
9. **Cultural Issues**: A drop down list containing common human-induced issues on the tree or site.
10. **Physical Issues**: A drop down list containing common naturally occurring physical issues on the tree.
11. **New Service**: A drop down list containing descriptive options of the tree's general maintenance needs and/or recommended corrective actions.
12. **Notes**: Any additional relevant information not included in the other fields.
13. **Pic**: A photograph of any relevant conditions of the tree or site.

Results

Species and Genera Distribution

476 total trees were inventoried in the city's rights-of-way. A total of 46 different species were inventoried. Figure 1 shows the distribution of species in the inventory. In the chart, 10 species that represent 73.11% of the total population are shown individually. There are 36 different species that compose the remaining 26.89% of the population and each represent less than 3% of the population. A listing of all species inventoried is in Appendix A.

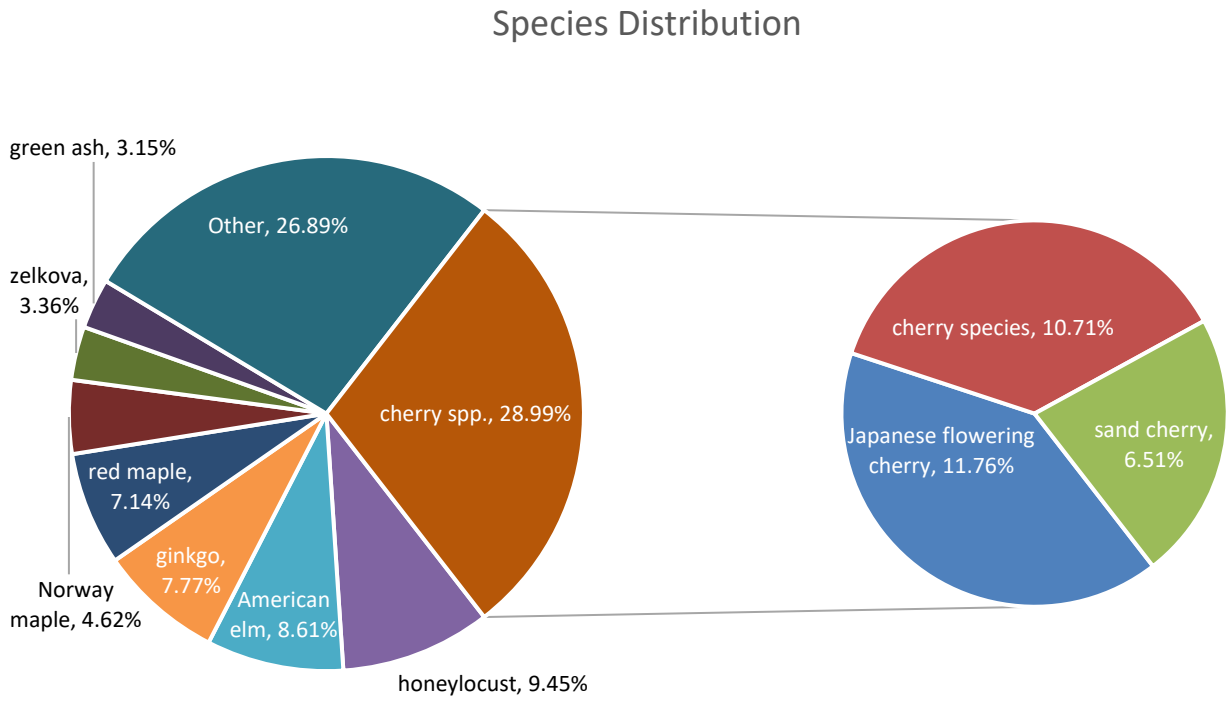


Figure 1 – Species Distribution

A widely accepted guideline among urban forest managers is that no single species should represent more than 10% of the total population and no single genus should represent more than 20% of the total population. This can prevent the catastrophic loss of trees due to an outbreak of insects or disease, like the story of Dutch elm disease or current outbreaks of Emerald Ash Borer. Species diversity is one sign of a healthy tree resource.

The cherry genus (28.99% of all trees) exceeded the 20% guidance and indicates that this genus is overrepresented in the population. Japanese flowering cherry (11.76% of all species) exceeds the 10% guideline and indicates that this species is sufficiently represented in the population. Honeylocust (9.45% of all species) is also sufficiently represented in the population.

Diameter Distribution (Relative Tree Age)

Surveyors measured the diameter at breast height (roughly 4.5 feet off the ground) for each tree to the nearest inch. Figure 2 shows the percentage of total population of trees in different diameter size classes for the city.

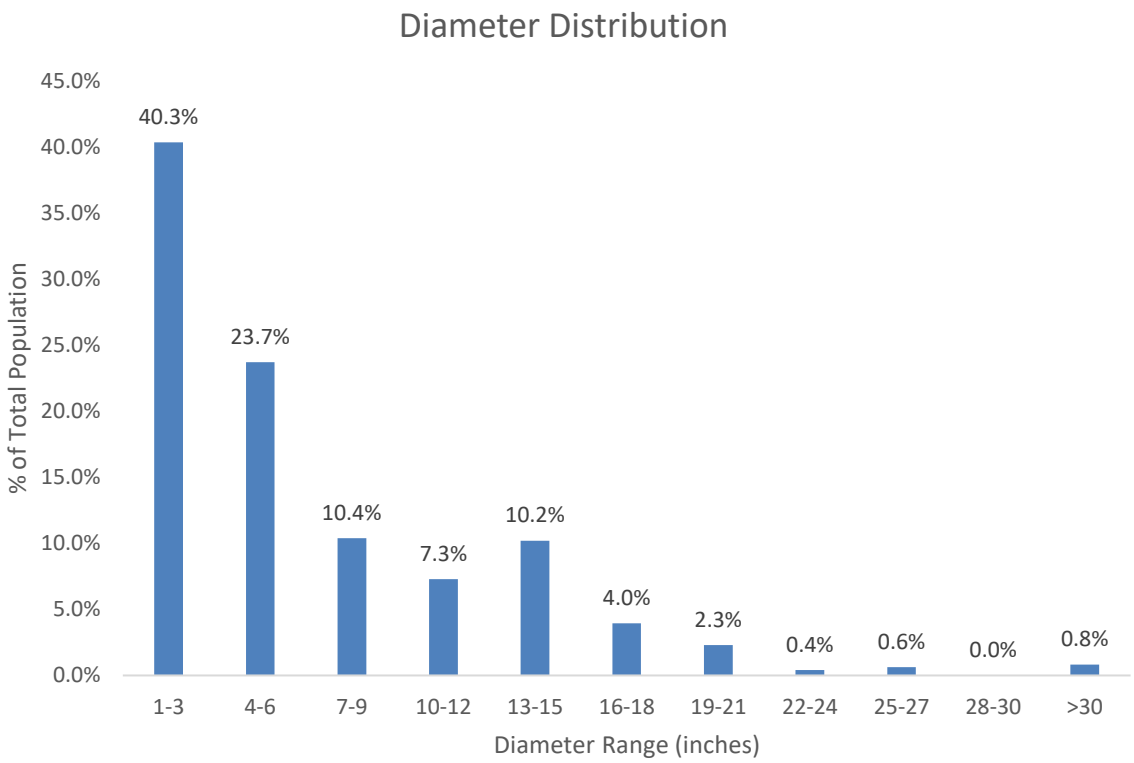


Figure 2 – Diameter Distribution

Tree diameter can be a valuable indicator of the benefits provided by street trees. Generally, trees increase in size with age, along with the magnitude of the benefits that the tree provides. An uneven-aged population is desirable for managing tree maintenance costs over time. There must be enough younger, smaller trees in the street tree population to account for the loss of trees over time and thereby maintain a sustainable urban forest.

While the diameter distribution for the city appears to indicate many smaller trees ready to grow into larger trees, the numbers must be tempered by the fact that about one quarter of the trees inventoried are cherry and that species' of that genus have small mature heights. These small maturing trees will not attain the larger diameters that large maturing species can reach. The environmental contributions of the trees increase as the trees increase in size. Therefore, small maturing trees such as cherries will not provide as many environmental benefits as large maturing trees, and any benefits that are realized will have a shorter effect duration.

Condition

Surveyors evaluated teach tree based on the tree's current overall outward appearance and assigned one of four condition classes: good, fair, poor, or dead. The condition class considers more than just the abundance of green leaves. Condition was based on visual observations of the trees' crown, trunk, and any visible roots. The percentage of total population of trees in each condition class is listed in Table 1.

Tree Condition	% of Population
Removed	8%
Dead	5%
Poor	11%
Fair	43%
Good	32%

Table 1 – Tree Condition

Indicators of stress such as the dieback of twigs and epicormic shoots along the trunk or branches can cause the condition rating to be less than 'Good'. Other factors including the presence of decay and cavities, depending on their extent, can also reduce the condition rating.

Tree Concerns

Surveyors recorded observations about each tree's general problems or concerns. A tree could have between 0 and 15 different concerns and there could be more than one concern recorded for each tree. The five most frequent problems or concerns are listed in Table 2

Concern	Count
Pest/disease	115
Physical or mechanical damage	91
Planted above root flare	77
Minor dieback	58
Bricks covering soil	30

Table 2 – Tree Condition

Trees in the urban environment can be affected by multiple stress factors, all which contribute to chronic stress, ultimately depleting the tree's vitality. Signs of pests and/or disease, such as herbivory damage, leaf or bark scaling, or fungi, was noted in 115 trees. This is a common occurrence in urban trees as pests are often attracted to already stressed trees. Physical damage was noted in 91 trees. Wounds in trees can open them to decay which further affects the longevity of the trees. Much of the physical damage noted in the inventory seemed to be from weed whackers or from vehicles or other objects striking the trunks or branches. There were 77 trees noted as being planted above the root flare. This means that the tree was planted too deeply. When this occurs, the tree's fine roots near the surface may suffocate and die or decay, leading to root failure. Minor dieback was noted in 58 trees and is a common response to stress when smaller twigs and branches are not getting the water and nutrients needed. Finally, bricks covering the soil was noted on 30 trees. In these instances, the bricks were covering all or most available soil space of the pit, which can limit water infiltration and increase soil compaction.

Maintenance Actions

Surveyors recorded recommendations for each tree's general maintenance needs and or corrective actions. These actions are based on a combination of the previously described Tree Concerns and the Condition Class of the tree. It is possible that there is more than one maintenance action recommended per tree. Priority should be given in the order listed in Table 3. The recommended actions should be taken within the constraints of the city's budget.

Maintenance Actions	Count	Explanation
Immediate Pruning	2	Prune soon to correct an immediate threat
Schedule Pruning	61	Clean out deadwood and improper branch structure
Training Pruning	86	Prune to improve future structure and/or form
Removal	30	Remove standing dead tree
Stump Removal	16	Remove stump

Table 2 – Priority listing of recommended maintenance actions

Recommendations

The purpose of this report is to provide city staff with a snapshot of the current structure and maintenance needs of the public street tree population. Based on the data collected and presented in this report, RI Urban and Community Forestry staff make the following recommendations that the city can use to craft a plan for managing public trees. Any recommendations in this report should be carried out in accordance with applicable City of Central Falls Code of Ordinances and conform to written specifications from the tree care standards provided in ANSI A300 and follow safety standards in ANSI Z133.

Pruning

Priority 1 – Pruning of high-risk branches. There were 2 trees identified as needing immediate pruning. These trees have branches that need to be removed before they fail and impact pedestrians or vehicles.

Priority 2 – Pruning of improper branch structure and deadwood. There were 61 trees over 20 feet in height identified as needing scheduled pruning to either improve branch structure and/or remove deadwood. There were 86 trees identified as needing training pruning. These 86 trees are under 20 feet in height and require pruning to establish proper branch structure as the trees mature.

Removals

Priority 1 – Removal of dead trees and stumps. There were 30 dead trees and 16 stumps identified.

Priority 2 – Removal of trees in poor condition. There were 60 trees identified as in poor condition. If a decision is made to not remove a tree, we recommend initiating risk mitigation activities and placing the tree on a monitoring list to watch for declining conditions.

Young Tree Establishment and Maintenance

With 64% of trees being 6 inches or less in diameter, attention should be paid to properly establish young trees. Young trees should be structurally pruned to promote proper form as street trees. Structural pruning should occur every 3 years for the first 9-12 years. Trees provide the most benefits as they reach maturity, but without early maintenance when the tree is young, such as training pruning, tree maintenance becomes significantly more expensive as the tree grows. Early and ongoing maintenance will help to retain the trees and maximize the ecosystem services provided by these high value members of the urban forest. More information about structural pruning is in Appendix B.

Take care to remove stakes and guys on trees no later than 1 year after installation. Surveyors noticed many young trees that still had stakes or ties attached to the trunk or branches. If left on too long these ties can girdle the tree which can lead to tree decline or death.

Finally, proper mulch application is vital to ensuring trees will grow well in the future. More information about proper mulching is in Appendix C.

Mature Tree Maintenance

In Central Falls, 18.3% of the public street trees are larger than 12 inches in diameter, and special care is needed to maintain and care for these larger trees. Some of the existing large trees in the city are

overmature and have dead limbs, decay in their trunks, or other problems that present a risk to the public.

The benefits that trees provide include stormwater runoff control, energy conservation, air quality improvement, and reduction of atmospheric carbon. These benefits can be quantified using approximate dollar amounts. The benefits of trees in Central Falls can be estimated using the i-Tree Design Tool. Compare the benefits provided by two mature trees of different sizes that are found in Central Falls in Figure 3.

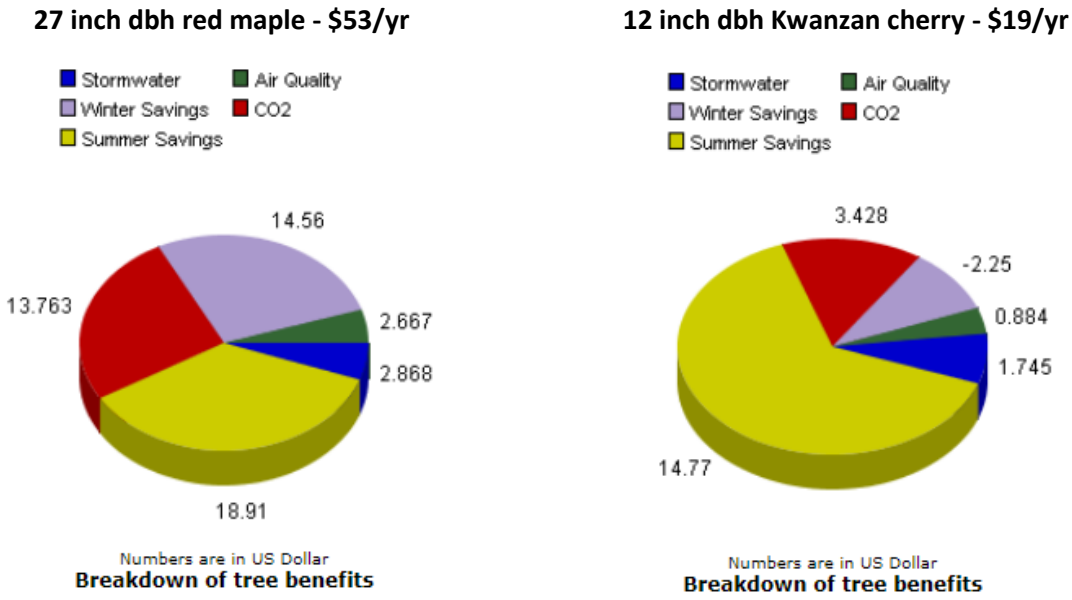


Figure 3 – comparison of total benefits provided by two different mature sized trees

Retain existing large trees where possible. Benefits and time are lost when older trees are removed and replaced with smaller and younger tree species, particularly small maturing trees. Promote the importance and benefits of large maturing species and mature trees within the city and manage accordingly.

Girdling Roots

While some tree species are more susceptible to developing girdling roots, the condition of the trees from the nursery may contribute to the development of girdling roots. This condition was noted in 14 trees. Symptoms of girdling roots include crown dieback and signs include the observation of crossing roots at ground level and a flattened area on the trunk near ground level. More symptoms and signs are described in this fact sheet made by the University of Massachusetts. In future plantings, reduce the occurrence of girdling roots by developing nursery specifications and inspecting trees before planting. Follow the recommended planting tips from Dr. Ed Gilman.

Tree Care by Adjacent Property Owners

Anecdotal evidence suggests that some public trees receive care or maintenance from adjacent property owners. Two practices that are often done improperly include mulching and pruning. Mulch is often

piled too high and too thickly against the trunk of the tree or is not provided at all. Pruning cuts were often made incorrectly and left stubs, which open the trees to decay.

The City of Central Falls could provide educational materials such as those described in Appendix B and C to homeowners and work with the Rhode Island Division of Forest Environment to put on workshops to instruct homeowners, local landscapers, and even local tree care companies about proper mulching and proper pruning. City staff or employees could also benefit from such workshops as either training for new employees or as a refresher for existing employees.

Planting

Based on the number of trees less than 6 inches dbh that are not cherry, it is evident that the city is trying to diversify the tree species in its urban forest. That effort should continue, and new tree plantings should avoid the use of cherry species. A list of suggested species is included in Appendix D and may complement the existing official list of species approved for use as street trees.

When new trees are planted it is important to follow proper planting practices. Please reference this guide for proper planting practices from Edward F. Gilman, Professor, Environmental Horticulture Department, IFAS, University of Florida.

Planting opportunities should be prioritized to plant large maturing trees in large tree pits without overhead wires. With or without overhead wires or other site limitations, select the largest maturing species that the planting site will accommodate.

One long-term management goal should be to increase the number of trees in the largest size categories. There should be plenty of young trees planted to eventually grow into the large size.

Inventory Maintenance

A tree inventory is a dynamic management tool. Updates to the inventory can be accomplished by entering data into the existing inventory when maintenance actions (pruning, removal, removing mulch, etc.) are completed, when tree inspections are done, or when new trees are planted. Letting this information get several years old without regular updates will reduce the accuracy of any reports and hamper the ability to plan for future maintenance activities.

The inventory data collected up to July 19, 2024 does not include all publicly owned trees. Trees in the parks were not inventoried. When city staff encounter trees not already in the inventory they should confirm if the tree is on city-maintained property and if so, add that tree to the inventory.

Appendix A – All Tree Species Inventoried (up to July 2024)

Latin Name	Common Name	Count	% of Population	Notes
Acer griseum	paperbark maple	2	0.42%	Total of all maple species is approximately 15% of the population. Norway maple is considered an invasive species.
Acer negundo	boxelder maple	1	0.21%	
Acer palmatum	Japanese maple	1	0.21%	
Acer platanoides	Norway maple	22	4.63%	
Acer pseudoplatanus	sycamore maple	2	0.42%	
Acer rubrum	red maple	34	7.16%	
Acer saccharinum	silver maple	1	0.21%	
Acer saccharum	sugar maple	6	1.26%	
Ailanthus altissima	tree of heaven	1	0.21%	Invasive species
Amelanchier canadensis	Canadian serviceberry	3	0.63%	
Amelanchier species	serviceberry spp.	2	0.42%	
Betula papyrifera	paper birch	14	2.95%	
Carpinus caroliniana	American hornbeam	2	0.42%	
Celtis occidentalis	hackberry	4	0.84%	
Cercis canadensis	eastern redbud	2	0.42%	
Cornus florida	flowering dogwood	2	0.42%	
Cornus mas	Corneliancherry dogwood	1	0.21%	
Cornus species	dogwood spp.	5	1.05%	
Crataegus species	hawthorn spp.	6	1.26%	
Crataegus viridis	green hawthorn	3	0.63%	
Fraxinus americana	white ash	1	0.21%	
Fraxinus pennsylvanica	green ash	15	3.16%	
Ginkgo biloba	gingko	37	7.79%	
Gleditsia triacanthos	honeylocust	45	9.47%	
Liquidambar styraciflua	sweetgum	5	1.05%	
Liriodendron tulipifera	tuliptree	3	0.63%	
Magnolia virginiana	sweetbay magnolia	1	0.21%	
Malus species	crabapple spp.	6	1.26%	
Metasequoia glyptostroboides	dawn redwood	8	1.68%	
Nyssa sylvatica	tupelo	2	0.42%	
Ostrya virginiana	hophornbeam	1	0.21%	
Prunus pumila	sand cherry	31	6.53%	Total of all cherry species is approximately 29% of the population.
Prunus serrulata	Japanese flowering cherry	56	11.79%	
Prunus species	cherry spp.	52	10.95%	
Pyrus calleryana	Callery pear	11	2.32%	Invasive species
Pyrus communis	common pear	7	1.47%	
Quercus coccinea	scarlet oak	3	0.63%	
Quercus palustris	pin oak	1	0.21%	
Quercus species	oak spp.	1	0.21%	
Syringa reticulata	Japanese tree lilac	1	0.21%	
Taxodium distichum	baldcypress	2	0.42%	
Thuja occidentalis	eastern arborvitae	1	0.21%	
Tilia cordata	littleleaf linden	14	2.95%	
Ulmus americana	American elm	41	8.63%	
Zelkova serrata	zelkova	16	3.37%	

Appendix B – Proper Young Tree Pruning

The below information was taken from a brochure produced by the International Society of Arboriculture (ISA) titled Pruning Young Trees. Further information can be found in the Illustrated Guide to Pruning.

Establishing a Strong Scaffold Structure

A good structure of primary branches should be established while the tree is young. These limbs, called scaffold branches, are a mature tree's framework. Properly trained young trees will develop a strong structure that requires less corrective pruning as they mature. The goal in training young trees is to establish a strong, central trunk with sturdy, well-spaced branches. This form mimics tree growth in forest settings where outward branching is limited by neighboring trees.

Trunk Development

For most young trees, maintain a single dominant leader growing upward. Do not prune back the tip of this leader or allow secondary branches to outgrow the main leader. Sometimes, a tree will develop double leaders known as co-dominant stems. Co-dominant stems can lead to structural weaknesses, so it is best to remove or shorten one of the stems while the tree is young.

A tree's secondary branches contribute to the development of a sturdy, well-tapered trunk. When numerous branches are being removed, it is preferable to retain some, at least temporarily, to promote trunk diameter growth.

Permanent Branch Selection

Most of the branches present on a young tree at planting will be pruned away at maturity to provide clearance for mowing, pedestrians, and/or vehicle traffic.

The height of the lowest permanent branch is determined by the tree's intended function and location in the landscape. The road facing side of a street tree may be raised to 16 feet to accommodate traffic. In most other situations, 8 feet of clearance is sufficient.

Branch spacing and balance, both vertically and radially, are important. The space between permanent branches should be approximately 3 percent of the tree's eventual height (for example, 1.5 feet for a tree that can grow to be 50 feet tall).

Narrow angles of attachment can enclose bark within a branch union. Such growth is called included bark, a condition that weakens the branch attachment and may lead to failure when the tree matures. Branches with weak attachments should be pruned while still small. Balance should be considered by retaining some branches in each direction radially, spreading from the center outward. Make sure one scaffold branch is not allowed to grow directly above another.

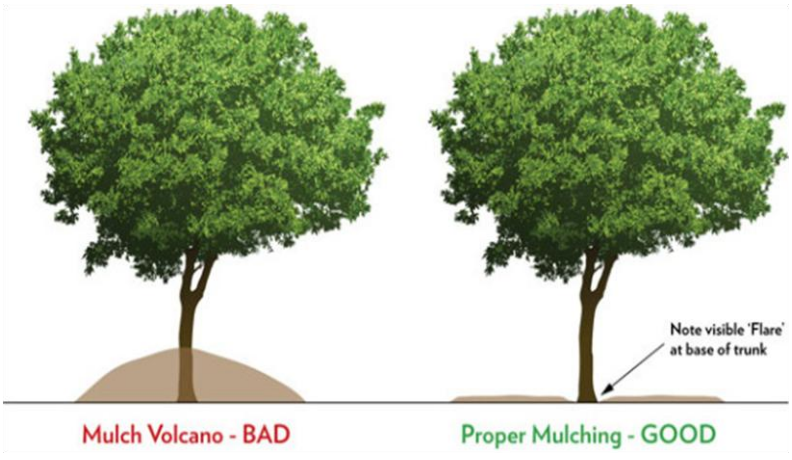
When pruning, do not remove too many branches. Leaves and their supporting branches are major sites of food production and storage. Eliminating too much of the canopy can "starve" the tree, reduce growth, and increase stress. No more than 25 percent of the crown should be removed in one pruning.

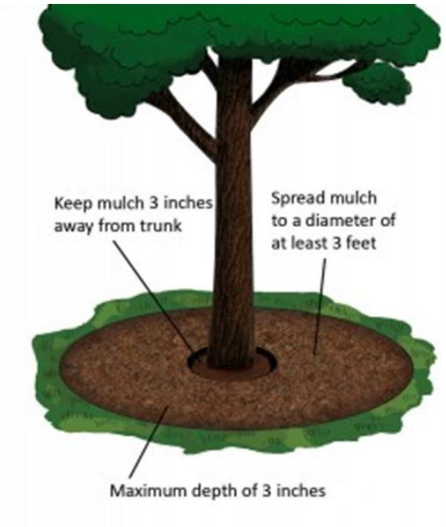
Appendix C – Proper Mulching

The below information was taken from a brochure produced by the International Society of Arboriculture (ISA) titled Proper Mulching Techniques.

Organic mulches include wood chips, pine needles, hardwood and softwood bark, cocoa hulls, leaves, compost mixes, and a variety of other products usually derived from plants. Organic mulches decompose in the landscape at different rates depending on the material, climate, and soil microorganisms present. Those that decompose faster must be replenished more often. Because the decomposition process improves soil quality and fertility, many arborists and other landscape professionals consider that characteristic a positive one, despite the added maintenance. The choice of mulch and the method of application can be important to the health of trees. The following are some guidelines to use when applying mulch:

- Determine whether soil drainage is adequate and if there are plants that may be affected by the choice of mulch. Most commonly available mulches work well in most landscapes. Some plants may benefit from the use of slightly acidifying mulch, such as pine bark.
- For well-drained sites, apply a 2-to-4-inch (5 to 10 cm) layer of mulch (less if poorly drained). Place mulch out to the edge of a tree's crown or beyond. Remember, if a tree had a say in the matter, its entire root system (which usually extends well beyond the drip line) would be mulched.
- If mulch is already present, check the depth. If sufficient mulch is present, break up any matted layers and refresh the appearance with a rake.
- If mulch is piled against the tree trunks, pull it back several inches/centimeters so that the base of the trunk is exposed.
- Composted wood chips can make good mulch, especially when they include some bark and leaves. Fresh wood chips also may be used around established trees and shrubs. Avoid using fine, non-composted wood chips, as soil nitrogen may be taken up by the roots as the wood chips decompose.





Appendix D – Suggested Tree Species for Planting

The following list of trees is suggested for planting in the street rights-of-way in Central Falls. Plant in places where there is sufficient space to allow for both root growth and crown growth.

Trees Suitable for Planting in Central Falls, RI, In Public Street Rights-of-Way				
Small Trees – plant under overhead power lines and/or areas with 4 – 6 feet between street curb and sidewalk				
Common name	Scientific name	Mature Height (ft.)	Mature Width (ft.)	evergreen/ deciduous
hedge maple*	*Acer cempestre*	25 - 35	25 - 35	deciduous
eastern redbud	*Cercis canadensis*	20 - 30	25 - 35	deciduous
Allegheny serviceberry	*Amelanchier laevis*	15 - 25	15 - 25	deciduous
thornless hawthorn	*Crataegus crus-galli* 'Inermis'	20 - 30	20 - 35	deciduous
Japanese tree lilac*	*Syringa reticulata*	20 - 35	15 - 25	deciduous

* = not native to RI

Trees Suitable for Planting in Central Falls, In Public Street Rights-of-Way				
Medium Trees – plant in areas with 6 – 8 feet between street curb and sidewalk, and no overhead power lines				
Common name	Scientific name	Mature Height (ft.)	Mature Width (ft.)	evergreen/ deciduous
red horse-chestnut*	*Aesculus x carnea*	30 - 40	30 - 40	deciduous
katsura tree*	*Cericidiphyllum japonicum*	40 - 60	20 - 30	deciduous
eastern red cedar	*Juniperus virginiana*	40 - 50	8 - 20	evergreen
black tupelo	*Nyssa sylvatica*	40 - 50	20 - 30	deciduous
hophornbeam	*Ostrya virginiana*	25 - 40	15 - 40	deciduous
hardy rubber-tree*	*Eucommia ulmoides*	40 - 60	30 - 50	deciduous

* = not native to RI

Trees Suitable for Planting in Central Falls, In Public Street Rights-of-Way				
Large Trees – plant in areas with > 8 feet between street curb and sidewalk, and no overhead power lines				
Common name	Scientific name	Mature Height (ft.)	Mature Width (ft.)	evergreen/ deciduous
ginkgo*†	*Ginkgo biloba*	50 - 80	50 - 60	deciduous
tuliptree	*Liriodendron tulipifera*	70 - 90	35 - 50	deciduous
London planetree*	*Platanus x acerifolia*	70 - 100	65 - 80	deciduous
northern red oak	*Quercus rubra*	60 - 75	60 - 75	deciduous
pin oak	*Quercus palustris*	60 - 75	40 - 50	deciduous
bald-cypress	*Taxodium distichum*	50 - 70	20 - 30	deciduous
American basswood	*Tilia americana*	60 - 80	30 - 60	deciduous

* = not native to RI † = select male trees only