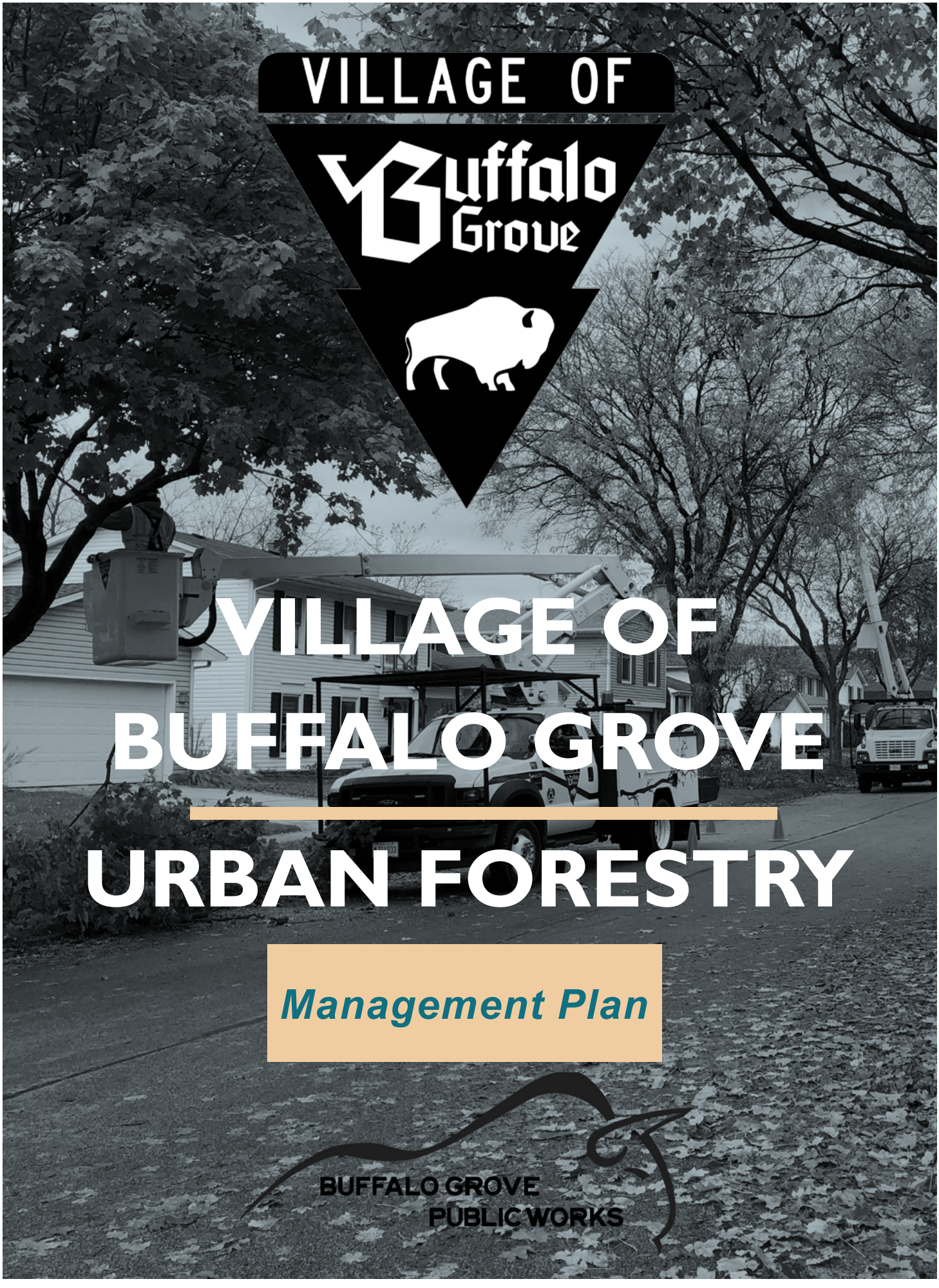

VILLAGE OF BUFFALO GROVE

URBAN FORESTRY

Management Plan

BUFFALO GROVE
PUBLIC WORKS

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MISSION STATEMENT

The mission of the Village Urban Forestry Program is to proactively manage the municipal urban forest in a professional, arboricultural, and cost-effective manner; providing innovative and effective services to our residents that are designed to preserve and improve the health, safety and natural beauty of our urban forest.

"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."

- U.S. Department of Agriculture

1. INTRODUCTION

What is an urban forest?

The urban forest of Buffalo Grove contains the trees, plants of the understory, and the ecosystem services that they provide. Our urban forest extends across the rights-of-way, natural areas, public property, parks, and private properties throughout the Village. This includes all trees along streets and in yards.

Buffalo Grove's urban forest is a considerable asset that provides economic, ecological, and social benefits. It aids in defining the character of the Village. This natural asset cleans our air and water, reduces stormwater runoff, supports the public health of Buffalo Grove, and creates spaces for our residents to enjoy.

The development of a community is a slow and on-going process. As the Village grows and becomes established, it begins to develop a unique character that is defined by subjective qualities. One such quality is community appearance. This is the product of a relationship established between man-made objects and nature which is fresh and aesthetically appealing. The presence of trees along the streets of a village tends to soften the formal street and building lines bringing a more natural and satisfying beauty. This is accomplished through a planned urban forestry program.

Concerned residents, elected officials, and Buffalo Grove staff have recognized the need to protect these valuable assets with a progressive, long-range, urban forest maintenance program. An information-based management program is possible with a continually updated inventory of all plant material maintained by the Village. Our inventory data draws attention to immediate tree problems and provides the basis for designing a long-term urban forestry management plan. The plan allows for accurate budgetary projections and the most effective use of existing tree care funds and available personnel.

"The urban forest is the ecosystem containing all of the trees, plants, and associated animals in the urban environment, both in and around the city."

- Roger Sands – Forestry in a Global Context

2. HISTORY

The First 100 Years –1847-1947

Buffalo Grove began as an active, small community centered around education, farming, and religion. St Mary's Church was built in 1852 and St Mary's School was built by 1855. Buffalo Grove was growing with the addition of the Firnbach Tavern and the Weidner General Store in 1899. Now, Buffalo Grove provided education, shopping, and worship. If more choices were needed there were larger towns close to Buffalo Grove: Arlington Heights, Half Day, Libertyville, and Wheeling. Chicago was also close enough for fun or for business. Families of Buffalo Grove could travel to the city via car or wagon right down Milwaukee Avenue.

After WWII – Buffalo Grove Grows

With fewer than 200 residents in 1945, Buffalo Grove was still a small dairy community at the end of WWII. This would change exponentially in over the next 20 years. The community grew began to grow very quickly for a variety of reasons:

- As farmers retired, their children did not want to continue the farming legacy.
- VA (Veteran's Administration) loans were available after soldiers returned from WWII and the Korean War. People could now afford housing more than ever before.
- Chicago commuting was made easier with the addition of new highways.
- It was easier to build inexpensive housing quickly with new methods of construction.

Buffalo Grove changed into a growing suburb in just ten years as the above factors combined to change the community. In 1958, Al Frank built the first housing development. Buffalo Grove soon grew to a community of six schools and a park district with a population over 11,000 by 1970.

1970 - Present

Throughout the 1970's and 80's, Buffalo Grove continued to grow. In both Cook and Lake Counties, new houses were consistently developed. Buffalo Grove's population continued to expand to over 40,000 by the early 2000's.

Buffalo Grove Urban Forest

Urban Forestry in many respects has its roots in the Chicago area. Large scale plans to preserve existing trees, provide for continuous greenbelts and plant trees in parks and parkways have dominated development of the area since the early 1900's. Chicago and surrounding communities have produced most of the progressive urban forestry programs.

An aggressive tree maintenance program and parkway tree planting program was established and has remained productive and cost effective in Buffalo Grove for many years.

The Village Forester guides the Forestry Section staff in the management of the urban forest in the Village. The Village Forester and all forestry operations are located administratively and operationally in the Public Works Department Forestry Section. The Village Forester is the Forestry and Grounds Manager of Public Works Operations. The Forestry and Grounds Section is supervised by the Forestry and Grounds Manager and consists of six full time crew members charged with the maintenance and upkeep of the urban forest.

Detailed records of most urban forest management activities and practices characterize the forestry program. These records are updated live as the activities are completed each day using asset management software. Public Works has been using Cartegraph as our asset management software since 2015. These activities include tree maintenance work such as removal, planting, pruning, watering, storm damage pick-ups, inspections, and administrative activities. The record keeping has facilitated detailed planning and budgeting for the maintenance of the Village urban forest.

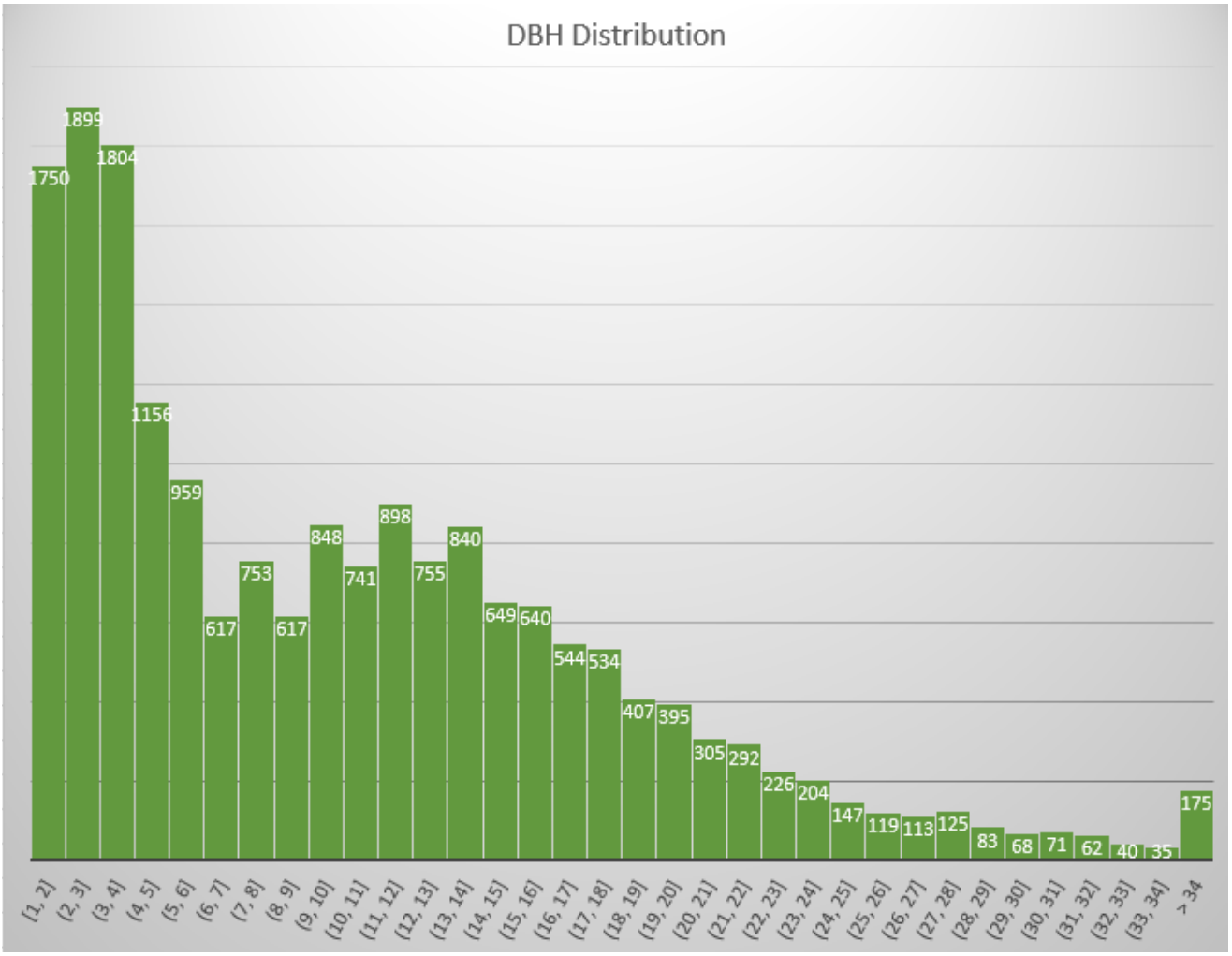
> "A people without the knowledge of their past history, origin, and culture is like a tree without roots."
>
> - Marcus Garvey

3. TREE INVENTORY ASSESSMENT

There are currently 20,406 trees comprised of 190 different species of trees.

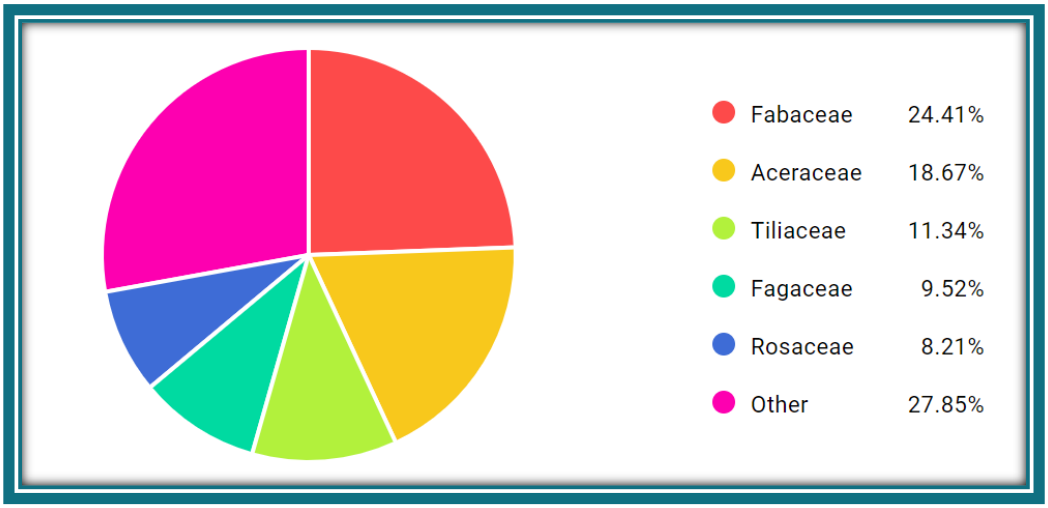
Diameter at Breast Height (DBH) Distribution

Buffalo Grove has maintained a tree inventory for over 30 years. All Village trees have been inventoried and inspected within the last five years. Each tree in the inventory is updated and inspected every time work is scheduled to be done by a contractor or when tree maintenance is completed by Forestry staff. Currently, the average diameter of the Village trees is 10.34 inches.

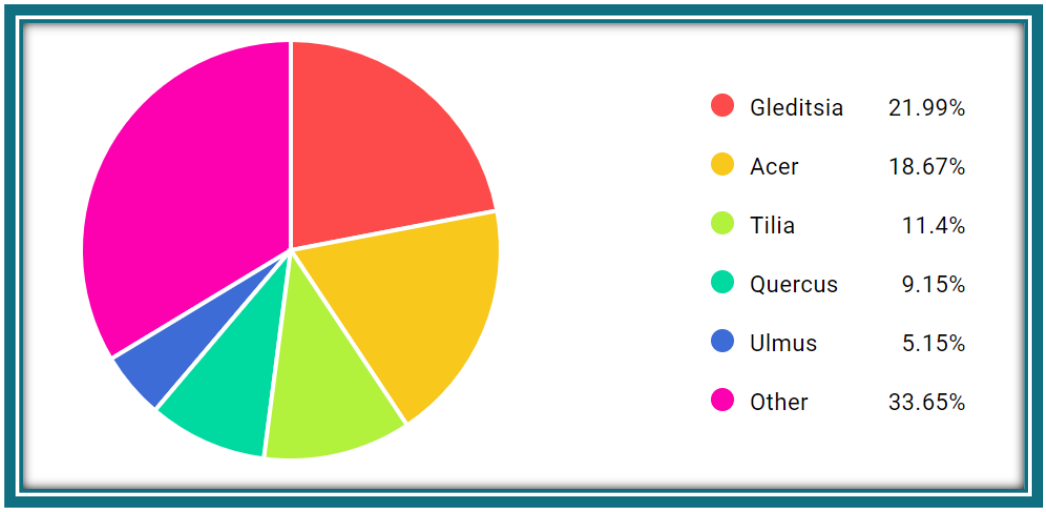


The average diameter of Buffalo Grove trees has decreased significantly in the last ten years due to the removal of Ash trees which made up 35% of our overall tree population.

Tree Family Distribution



Tree Genus Distribution



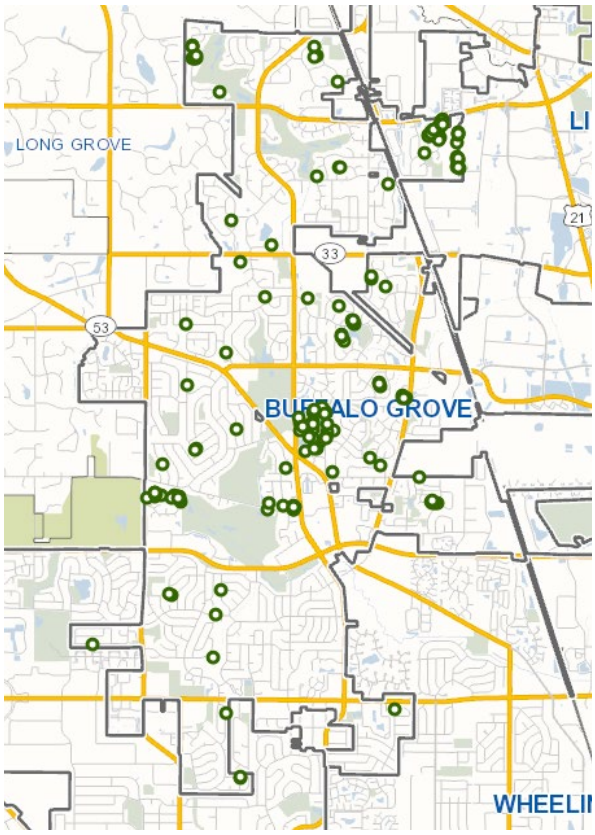
The Honey Locust is currently the most dominant tree in our Village inventory. As a general recommendation, the 5-10-20 rule is a guideline to reduce the risk of catastrophic tree loss due to pests. The rule suggests an urban tree population should include no more than 5% of any one species, 10% of any one genus, or 20% of any family.The impact of Dutch Elm Disease in the 1970's and 1980's illustrates the devastating impact a pest problem can have on a species that is over planted. In more recent years, Buffalo Grove has seen a natural disaster devestation when over 30% of our tree canopy was lost due to Emerald Ash Borer (EAB).

Tree Species Distribution (Top 5)

Honey Locust	4324	22.28%
Norway Maple	1572	8.10%
Littleleaf Linden	1243	6.41%
Silver Maple	922	4.75%
Common Hackberry	810	4.17%

In the last decade, the Village has refrained from planting any Honey Locust or Maple trees in our tree replacement program. The Village Ordinance **16.50.120 – Landscaping** does not allow Honey Locust and most Maple species to be planted and these trees are not on our approved list of trees for new development due to current populations within the Village.

Ash Trees and Emerald Ash Borer

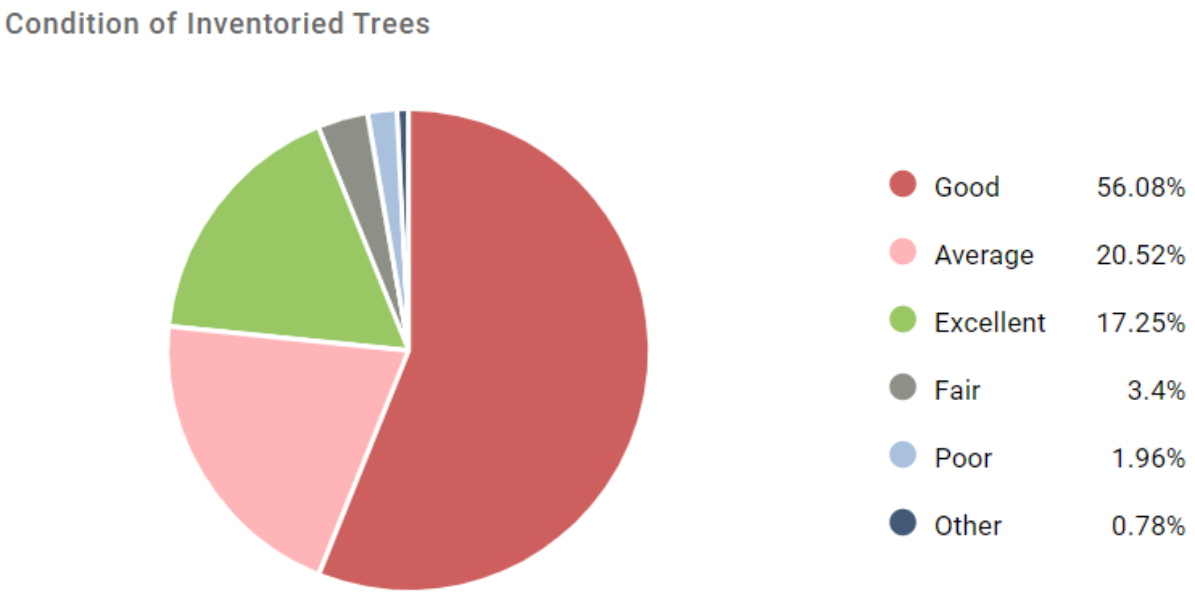


Ash Locations Remaining in Village (170 Trees)

The Village removed approximately 7,000 Ash trees that made up over 30% of our urban canopy over a decade ago after Emerald Ash Borer (EAB) was discovered in Buffalo Grove. The majority of these trees were removed between 2013 and 2015. Today 170 Ash trees remain in the Village Parkways. These trees have been and continue to be treated by residents at their expense.


Adult Emerald Ash Borer (EAB)

Condition



Most of our trees are currently in an average or above average condition. The older trees of our Cook County area of the Village have begun to decline as they near the end of their service life. In the last five years, we have begun to mitigate many of our hazardous trees in the Cook County section of the Village. Many of the trees in this area are made up of Silver Maple and Siberian Elm. As these species age, they become more susceptible to storm damage and create more reactive work for Public Works. Inspecting these trees each year is important to lowering the potential hazards and keeping our residents and streets safe.

Tree Valuation

Tree valuation is based upon the replacement costs involved in the replacement of a parkway tree. To calculate the asset valuation of the Buffalo Grove urban forest the Village staff uses a cost of $150.00 per diameter inch at breast height. The asset valuation of the urban forest has been calculated at approximately 31 million dollars. There are many other guides used to evaluate the trees' worth and might be considered when determining the value. The value of 31 million dollars seems to be on the low end of the parameter.

4. TREE TRIMMING

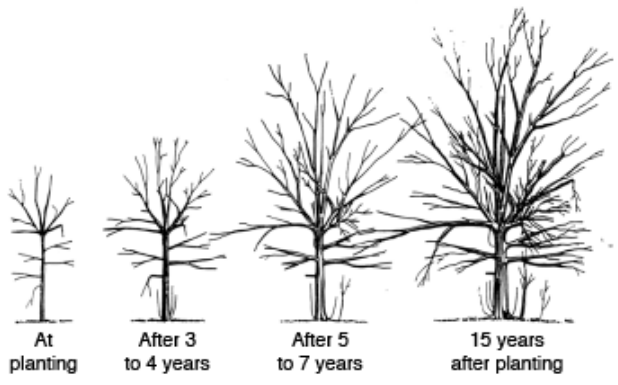
A major benchmark in urban forestry is the maintenance of the more mature trees and a five-year rotational trimming program. Pruning rotations longer than a five-year program have proven to affect the health and aesthetic value of the tree. This is due to the poor condition of the trees when the pruning cycle is longer than the recommended period. Longer periods between cycle trimming can result in:

- Decreased tree value and condition.
- Increased service requests.
- Increased Village liability due to the greater risk for tree related accidents.
- Increased number and severity of storm related damage.
- An overall less efficient urban forestry program due to the increased service requests.
- Increased trimming costs in future years due to more work being required on each tree.

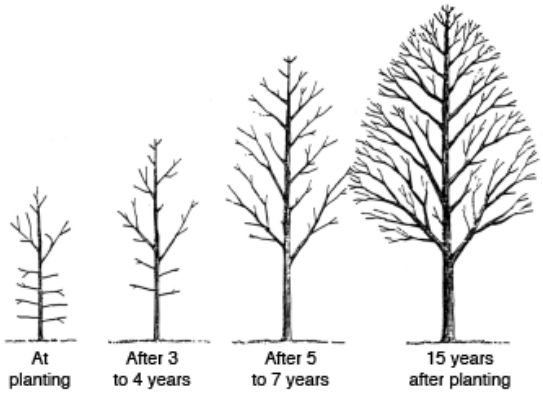
As our young urban forest matures it will require more time to maintain. As this trend develops contractual services or additional Village personnel and equipment will be needed to maintain the five-year trimming cycle. The forestry staff will continue to evaluate contract tree trimming to supplement village crews.

Young Tree Pruning

In general, a tree that is less than eight inches at Diameter and Breast Height (DBH) is a young tree. Pruning young trees as they establish and acclimate to the parkway, helps prevent poor branch structure and multiple trunks. The Forestry Section currently prunes young trees to remove broken and undesirable limbs. This activity is inexpensive as it does not require many man-hours of maintenance. The Village attempts to trim our young trees on a shorter cycle (every two to three years) to encourage proper growth and shape the future canopy. There are currently 8,938 trees under eight inches DBH.



Without Young Tree Pruning

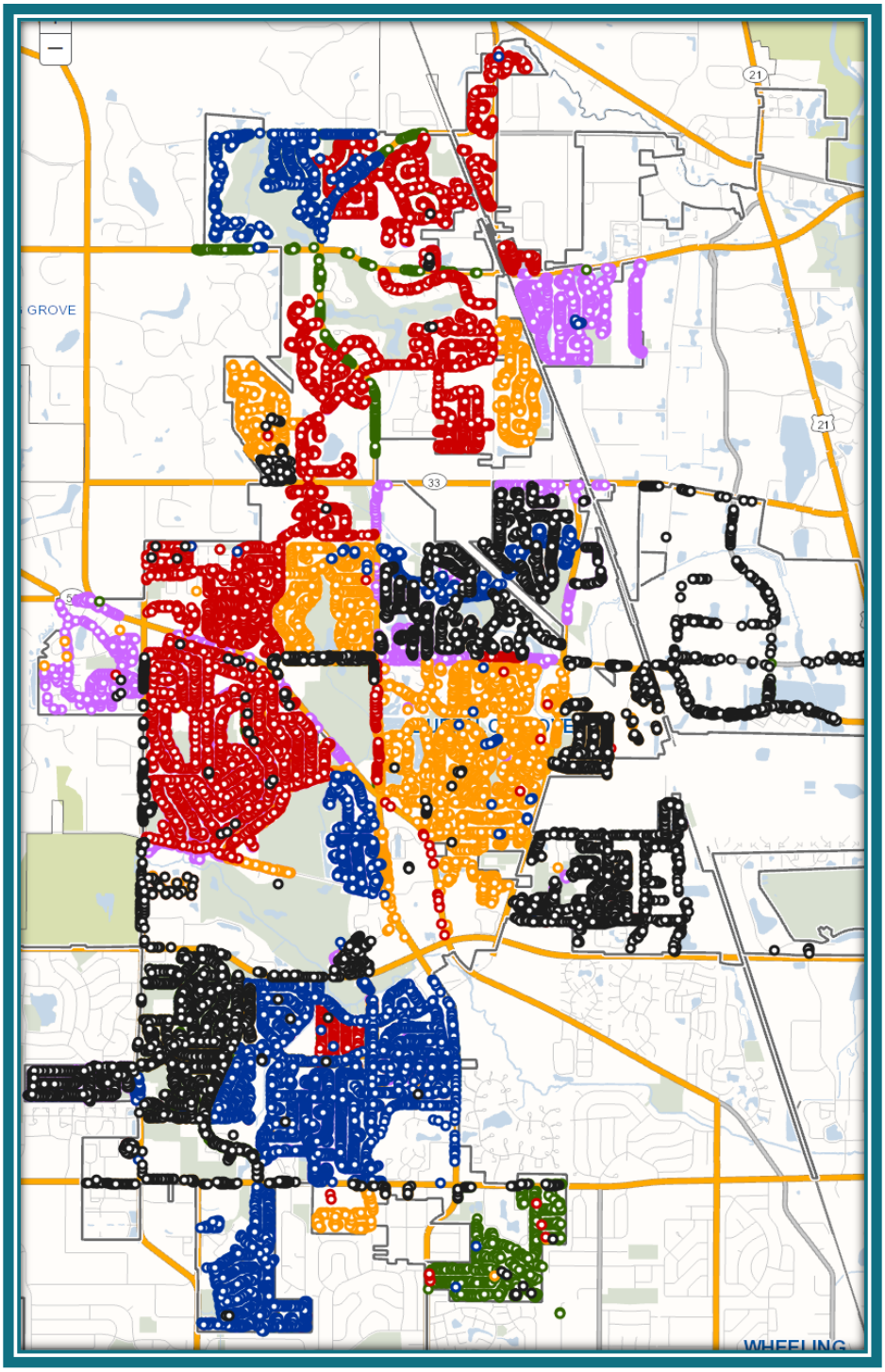


With Young Tree Pruning

Mature Tree Pruning

Trees greater than eight inches at Diameter and Breast Height (DBH), depending on the species, are considered mature trees. By this stage in their life, these trees are now acclimated and are established in their planting site locations. However, these trees still face many challenges. Some of the challenges are from storm damage such as winds, lightning, and heavy snow. Other challenges are comprised of man-made structures such as the proximity to traffic signals, street signs, light poles, and roadway clearance. There are also the challenges of pests and pathogens in the area as well.

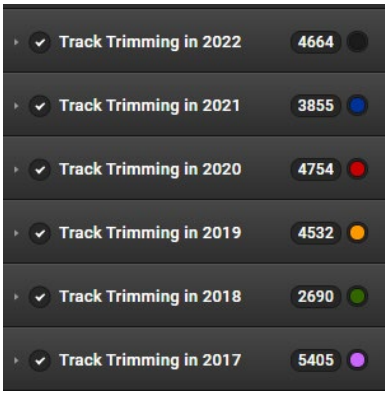
Pruning helps improve the long-term health and structure while mitigating short-term risk. In a natural forest setting, trees drop limbs due to wind and disease; this is considered self-pruning. Not pruning trees and just allowing these trees to self-prune is not an option in an urban environment such as the Village of Buffalo Grove.



Trees Trimmed (Past Six Years)

The Village must continue the five-year rotation cycle to maintain the quality of the urban forest. This will not only require yearly incremental increases but require a substantial increase in contractual service or manpower and equipment due to the increase in tree population and the increase in the tree size as the younger trees mature.

All Village Trees have been trimmed at least one time in the last six years. Currently, Buffalo Grove is now on a five-year cycle, as there is contractual trimming of 4,100 trees scheduled in 2023.



Color Key Last Six Years

"You have to touch a tree and feel it."

Dr. Alex Shigo

Types of Tree Pruning

Medium Prune

- This operation of tree pruning shall consist of the total removal of those dead or living branches as may menace the future health, strength and attractiveness of the tree.
- Properly remove all dead and dying branches of ¼ inch and over in diameter.
- Remove all broken branches or any loose branches lodged in the tree.
- Remove all dead and live stubs of previously broken or poorly cut branches.
- Remove any live branches that interfere with the tree's structural strength and healthful development, which will include:
    - Branches that rub and abrade a more significant branch.
    - Branches of weak structure that are not important to the framework of the tree.
    - Branches that, if allowed to grow, would wedge apart the junction of more significant branches.
    - Branches with twigs and foliage obstructing the development of more important branches.
    - Branches forming multiple leaders in a single leader type tree.
    - Branches near the end of a limb that will produce more weight or offer more resistance to wind that the limb is likely to support.
    - Undesirable sucker and sprout growths.
    - Selective removal to one or more developing leaders where multiple branch growth exists near the end of broken or stubbed limbs.
    - Removal of branches that project too far outward beyond an otherwise symmetrical form.
    - Removal or severance of any exposed roots that restrict or act in a girdling manner and prevent proper expansion and growth of other major roots or restrict the base of the tree trunk.
- All final cuts shall be made just outside the branch collar. Extremely deep cuts that produce excessively wide wounds or weaken the tree shall not be made.

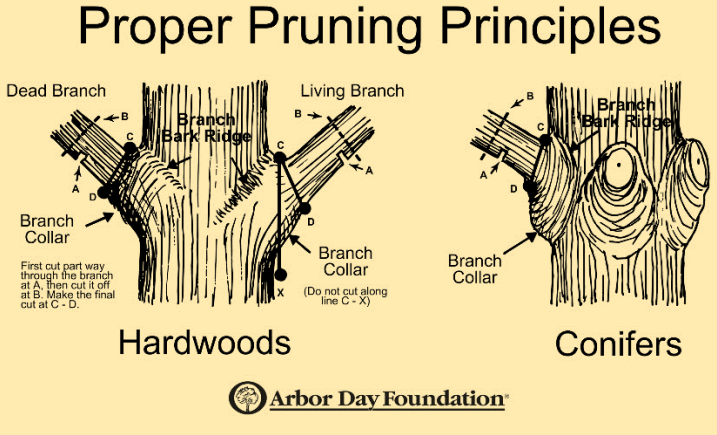
Safety Prune

- This operation of tree trimming shall consist of the minimum performance necessary to correct one or more extreme and undesirable conditions existing within a tree that may be hazardous to persons or property.
- Remove all dead and dying branches of 2 inches or more in diameter.
- Remove all broken or loose branches 2 inches or more in diameter.
- Reduce the length or branches that extend excessively beyond the perimeter of an otherwise symmetrical form.
- Cut back ends of branches and reduce weight where excessive overburden appears likely to result in breakage of supporting limbs. Such cutting back shall not include the removal of any live, healthy branches in excess of 6 inches in diameter unless a specific consent if given by the Village Forester.

Pruning Standards to Develop a Canopy

Pruning will be done to improve trunk and branch structure, to remove low limbs for vehicular and pedestrian clearance, to thin the canopy to allow for needed airflow and light penetration, and to maintain tree health. Although we are concerned with aesthetics the appearance of the trees will be secondary to health and structure concerns.

All pruning procedures are to be done by trained personnel using approved techniques as described in ANSI A300-1995 Standards. Pruning is to be completed by workers trained in compliance with ANSI Z-133.1 safety regulations as required by OSHA (Occupational Safety and Health Administration). All personnel are to wear Personal Protective Equipment (PPE), hard hat, hearing protection, eye protection, safety toed shoes, and 9-layer chaps when working on the ground with a chain saw. Tools needed for pruning procedures are, sharp hand pruners, pole saw, hand saw, chain saw, and hydraulic saws.



Branch removal and/or limb removal should be made so as not to leave any jagged edges or torn bark. The correct location is just beyond the branch collar or shoulder. Large or heavy limbs should be removed using three cuts. The first cut undercuts the limb one to two feet from the branch collar 1/3 of the way through the branch. The second cut is the top cut, which is made slightly further out on the limb than the undercut; this allows the limb to drop off smoothly to the ground. The third and final cut is next to the branch collar without cutting into the branch collar.

DBH 0" – 6"

Trees pruned in this size are new trees that will be trained to grow in a manner to form a complete canopy. Removal of branches that are dead, crossing limbs that would cause future structural hazards, and removal of lower limbs to raise the crown to provide clearance for traffic signs, pedestrian and vehicular traffic depending on the height and variety of the tree. At this size it is recommended to remove any codominant leaders or stems. This will prevent any further structural hazards such as weak crotches or branches with included bark. At no time shall a codominant leader or stem be removed if more than forty percent of the foliage is removed. Thinning of the crown shall include the following, dead or broken limbs, two limbs crossing or touching each other, or limbs growing back towards the center of the crown. Thinning increases light penetration and air movement into and through the crown of the tree. All sucker growth and water sprouts shall be removed also. Trees will be trimmed to a clearance height of 6' – 12' depending on the variety of the tree.

DBH 6" – 12"

Trees in this size require identification of the lowest permanent branching structure to enhance a structurally strong tree. Limbs may need to be removed to raise the crown to provide clearances for traffic signs, pedestrian and vehicular traffic. Any new codominant stems or leaders shall be removed or shortened to maintain a well-formed tree. Branches with v-crotches or weak crotches shall be removed or pruned to prevent future hazards. Thinning of crown shall include the following, dead/dying or broken limbs, two limbs crossing or touching each other, or limbs growing back towards the center of the crown. Thinning increases light penetration and air movement into and through the tree beneficial to tree health. All sucker growth and water sprouts shall be removed also. Trees will be trimmed to a clearance height of 6' – 12' depending on the variety of the tree.

DBH 12" – 20"

Trees pruned in this size require limbs to be removed to raise the crown to provide clearance for traffic signs, or pedestrian and vehicular traffic. Any new codominant stems or branches shall be removed or shortened to maintain a well-formed canopy. Limbs with weak crotches shall be removed to prevent future hazards. Thinning of crown shall include the following, removing dead/dying or broken branches, two limbs crossing or touching each other, and limbs growing back towards the center of the crown. All sucker growth and water sprouts shall be removed. Trees will be trimmed to a clearance height of 12' – 16'depending on the variety of the tree.

DBH 20” – 28”

Trees pruned in this size require limbs to be removed to raise the crown to provide for clearance for traffic signs, or pedestrian and vehicular traffic. The canopy of the tree is usually trained at this time and not much structural trimming will be necessary. Limbs with weak crotches shall be removed to prevent future hazards. Thinning of the crown shall include the following, removing dead/dying or broken branches, two limbs crossing or touching each other, and limbs growing back towards the center of the crown. All sucker growth and water sprouts shall be removed. Trees will be trimmed to a clearance height of 12’ - 16’ or above depending on the variety of the tree.

DBH 28” – 36”

Trees this size are mature trees that usually require only thinning of the crown including removal of dead/dying or broken limbs, two limbs crossing each other or touching, and limbs growing towards the center of the crown. Limbs with weak crotches will be removed to prevent future hazards. All suckers and water sprouts will be removed also. Trees will be trimmed to a clearance height of 16’ or above depending on the variety of the tree.

DBH 36”and Above

Trees this size are mature trees that usually require only thinning of the crown including removal of dead/dying or broken branches, two limbs crossing or touching each other, and limbs growing towards the center of the crown. Limbs with weak crotches will be removed to prevent future hazards. All suckers and water sprouts will be removed also. Trees will be trimmed to a clearance height of 16’ or above depending on the variety of the tree.

Standards and Requirements for Tree Trimming

- All activities directly related to the operation of a chainsaw, bucket truck, limb rigging, or tree climbing will be performed by a qualified employee, or under the supervision of a Certified Arborist or Arborist Trainee.
- The need for pruning and maintenance of individual trees and parkways will be at the discretion of the Village and its designated contractors.
- Cleanup of branches, logs or any other debris resulting from any tree pruning or removing shall be promptly and properly accomplished. The work area shall be always kept safe until the cleanup operation is completed. Under no condition shall the accumulation of brush, branches, logs or other debris be allowed upon a public property in such a manner as to result in a public hazard.
- The use of climbing spurs or spike shoes in the act of pruning trees is prohibited.
- Under no condition shall it be considered proper to leave any severed or partially cut branches in the upper portion of any tree being worked on after the tree workers leave the scene of the operation.
- Whenever large tree sections are being cut in a treetop that may endanger the public or property, such sections shall be secured by ropes and be rigged safely in a controlled manner.
- Unless the tree work area is totally barricaded or otherwise kept safe while pruning or removing trees, at least one responsible tree worker shall serve to always coordinate safe operations on the ground when work operations are in progress.
- Excavations resulting from tree or shrub removal must be promptly filled into normal ground level with clean earth, the fill properly compacted, and free of debris.
- Public trees or utility poles shall not be used as an anchor for winch trucks in the process of removing other trees.
- When removing a tree, the act of cutting tree roots and then leaving the work scene with a standing tree having little or no support is prohibited.
- No pruning or maintenance activity that takes place within ten feet of a power transmission line will be performed by a Village employee unless certified as a qualified Utility Arborist.
- No cabling, bracing or other support systems will be installed in Village owned trees, either by the Village, its residents or any contractors.
- No heading, pollarding or espalier pruning will be conducted on Village owned trees, and no wound dressings will be used under any circumstances.

5. TREE PLANTING

Planting

Today, tree planting is almost exclusively achieved by using a contractor. The contractor installs trees according to Village specifications and provides for a one-year warranty period. Forestry personnel monitor the contractor's activity during planting and inspect the trees after planting is complete. Trees are inspected again after the following growing season to determine if they warrant replacement under the nursery guarantees.

The best time to plant a tree was 20 years ago.
The second-best time to plant a tree is now.

- Chinese Proverb

Master Planting Plan

The following criteria should be considered in the overall master-planting program to guide the future direction of planting. Some major considerations in that plan could be:

- Evaluation of the current composition of the urban forest and the impact of current and future plantings on species composition. Select species based on 20-10-5 Rule and how it applies to current Family, Genus, and Species composition throughout the Village.
- Matching tree species to the site based upon the soil characteristics and the species tolerances for the given conditions.
- Planting specifications and species composition in a particular area or street based on the street infrastructure (parkway width, above and underground utilities and historical or existing planting).
- Develop an evaluation method to determine what species are currently doing well within the Village and an emphasis on their use based upon this evaluation.

The goal of this plan would be to present species choices that have compatible growth form and tolerances for the existing sites, blend with the historic species and the future species composition and complement the existing infrastructure conditions.

Parkway and Street Tree Design

The zone along the sides of streets where trees, landscaping and sidewalks can be located is referred to as the parkway. Design of the parkway (planting area) where trees can be located is just as important as the street tree design. Space where street trees can be planted must provide adequate space for growth and development. Parkways can be designed in four basic styles.

Parkway Design

- Curbside Parkway: Located between a detached sidewalk and curb. At least 4 feet is required if trees are to be planted in this area. Wider spaces are preferred and should be provided wherever possible.
- Boundary Parkway: Located behind a sidewalk between the property line and sidewalk. Street trees should be planted 3-7 feet behind the sidewalk.
- Sidewalk Parkway: Located as part of the sidewalk where the walk extends from the curb to the building. The walk must be wide enough to allow the tree to be set back at least 30” from the face of the curb and 5 feet from the building.
- Undefined Parkway: Located in areas that do not have a sidewalk. The location of trees should consider the future installation of a sidewalk. Street trees planted in undefined parkways should be located 4-5 feet behind the curb.

Street Tree Design

- Street trees should be used in an assertive architectural fashion to reinforce and connect the spaces and corridors created by buildings and other features. Tree plantings should be on the grand public scale rather than be intimate and private. Large canopies should interconnect to enclose and unify space. Heavy pedestrian and vehicular traffic should continue below unhindered.
- The importance of street trees to define, reinforce, or create spaces is incidental to their fundamental value for spatial arrangement in urban design.
- Street tree design objectives should:
    - reinforce and extend spatial quality of the Village.
    - be deployed to define and direct use.
    - organize architectural spaces.
    - create spatial rhythms to heighten the experience of moving through outdoor spaces.
    - reinforce the lineal form of streets.
    - enhance urban elements, not hide them.
    - be utilized not as decoration, but as living building material.
    - not be an antidote to the city, but rather an extension of the city.
    - link and extend; not separate.
    - restore desirability to urban living.

Standards and Requirements for Tree Planting

- Trees and shrubs should not be dug, balled and bur lapped or moved with a tree spade during the active growth period unless the ball is large enough to insure survival.
- Plant material shall be handled in a manner to cause the least amount of damage during the planting process.
- Bare root plants shall have their roots either covered with a moist tarp or mulch while they are being transported to and being held at the planting site.
- Evergreen trees with an excessively bushy form of growth shall have the boughs tied up with rope or twine during transporting and planting to avoid damage to the foliage and branches. After planting, the boughs should be released.
- Balled and bur lapped, and container plants shall always be handled by the soil ball. Under no circumstance should they be dragged, lifted or pulled by the trunk or foliage parts in a manner that will loosen the roots in the ball.
- In cases where trees or shrubs are loose in a soil ball, the ball shall be secured with twine or burlap before transporting to the planting site.
- On the job site, plants should be handled, secured or covered to prevent damage from wind or vibration. Plants should never be thrown or bounced off a truck or loader to the ground.
- Plant material shall be planted the day it is taken to the planting site, or it should be watered or covered and placed in a shady area to prevent dehydration.
- Any abrasions of the bark or broken limbs or branches caused in the planting operation should be treated or corrected immediately.
- In cases where trees are apt to have their trunks scarred during the planting operation, the trunks should be protected with wrap or padding.
- Excavated plant pits that will be left open when work is not in progress or pose an immediate and considerable hazard to traffic shall be adequately barricaded with qualified warning devices.
- All twine or rope and plant labels secured around the trunk shall be removed after planting is completed.
- Trees or shrubs that have their soil balls secured in a wire basket shall have the entire basket removed after the plant is placed and centered in the pit and before back filling occurs.
- Cleanup of any soil, branches or other debris resulting from any tree or shrub planting shall be promptly accomplished. The work area shall be always kept safe until the cleanup operation is completed. Under no condition shall the accumulation of soil, branches or other debris be allowed upon a public property in such a manner as to result in a public hazard.

- Notwithstanding the foregoing provisions, no planting, fence, or other obstruction to vision shall be maintained on a dedicated right-of-way, alley, other public ground, or other property if it is detrimental to the public's health, safety, or welfare.
- Planting and digging of certain species will only occur at certain times of year in accordance with nursery industry best management practices and professional judgement. These times and species are listed in a table below but are subject to the professional opinions of both the Village and its approved contractors.
- Residents will not be permitted to plant trees on the Village ROW even if purchased independently. Any unauthorized plantings are subject to removal by the Village.
- JULIE will be contacted, and all utilities located a minimum of two days before planting is scheduled to begin.
- A minimum one-year replacement guarantee will be provided by approved nurseries and plantsmen for all new plantings rated to hardiness Zone 5 or lower.

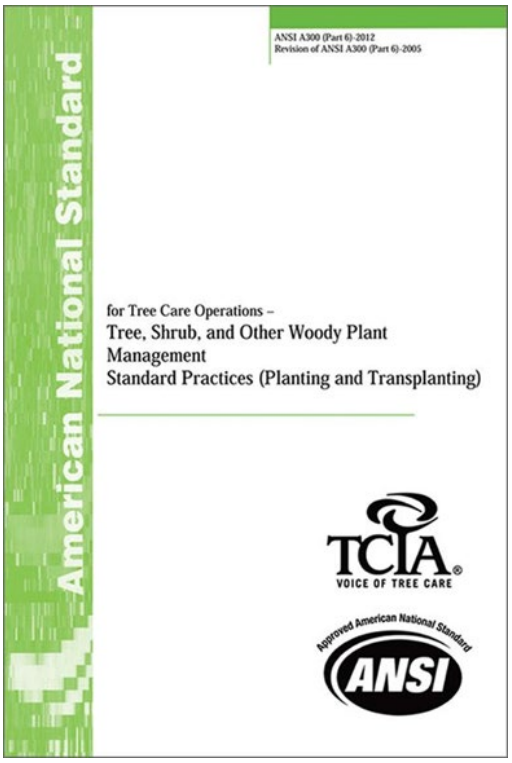
American National Standards Institute ANSI Z60.1

- All root ball and container sizes for all balled and burlapped stock will conform to the Z60.1 standards for width and depth and encompass enough of the fibrous root system as necessary for the full recovery of the plant upon installation.
- All bare root stock will conform to ANSI Z60.1 standards for minimum root spread.
- All containerized stock will conform to ANSI Z60.1 standards for plant and container size, as specified by the Village, and will be healthy, vigorous, well-rooted and established in the container in which it is growing. The root system will reach the sides of the container but will not have excessive growth encircling the inside of the container.
- All collected plants (those grown on unmanaged land) will be designated and considered to be nursery-grown stock when they have been successfully reestablished in a nursery row and grown under regular nursery cultural practices for a minimum of two growing seasons.
- The trunk or stem of the plant will be in the center of the ball or container, with a 10% overall variance in location.
- The use of digging machines, in both the packaging and installation of trees, is considered an acceptable nursery practice.

"A people without children would face a hopeless future; a country without trees is almost as helpless."

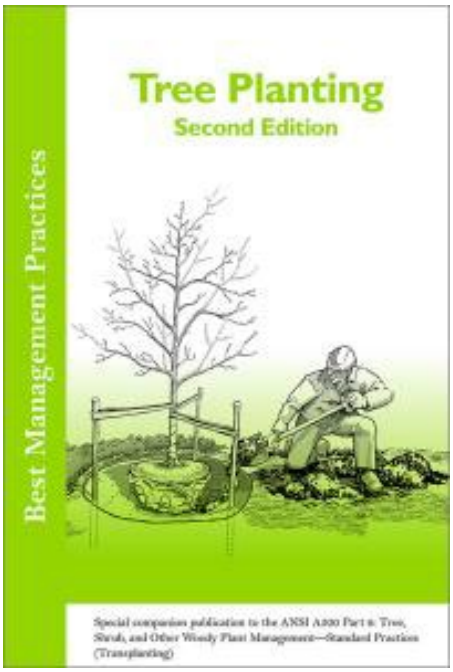
- Theodore Roosevelt

American National Standards Institute ANSI A300 Part Six



- Planting sites and work sites will be inspected for hazards by the Village prior to the beginning of work each day. If portions of the work site are outside of the original scope of work, the controlling authority will be notified immediately.
- Location of utilities, obstructions and other hazards above and below ground will be considered prior to planting and transplanting operations. These include, but are not limited to, gas, electric, sewer, communication, drainage and signage.
- The following criteria will be considered prior to transport and planting: requirements of individual trees, compass orientation of field-grown trees, site feasibility assessments, soil assessment and drainage assessment.
- Tools for planting and transplanting will be properly labeled or purchased for their intended use and be maintained in accordance with the manufacturer's recommendations.
- The system used to move and store the plant will minimize desiccation and other damage to the crown, trunk or root ball and the health and vigor of the plant will be maintained during these periods.
- The hole to be dug for all new plantings will be a minimum of 150% larger than the root ball or container diameter, as deep as the root flare of the tree to be planted and will have sides from which soil has been loosened in order to aid in root penetration.
- For balled and burlapped trees, all root ball supporting materials will be removed from the upper third of the root ball and removed from the planting hole prior to final backfilling.
- Prior to planting, container root balls will be managed by approved methods such as shaving the root ball, slicing the root ball and redirecting or removing encircling roots.
- Backfill will comprise of either the same soil created during excavation of the planting hole or a similarly amended mixture to meet a specific objective and will be applied in layers to reduce future settling and prevent air pockets.
- Mulch will be applied at a depth of two to four inches near, but not touching, the trunk of the tree, and extending to the perimeter of the planting.
- Support systems such as guywires or stakes will not be installed except where needed.

International Society of Arboriculture (ISA) Best Management Practices Manual – Tree Planting



Timing of planting will be determined based on the species and the best professional opinion of the employees of or contractors working for the Village.

- All employees and contractors employed by or working for the Village will be familiar with the following planting types, and when it is appropriate to use each:
    - Bare-Root: Field-grown and dug without soil during the dormant season.
    - Ball and Burlap: Field grown and packaged with a soil ball using burlap, twine and a retaining basket of some kind.
    - Tree Spade: Transplanted using a mechanical tree spade to hold the soil ball during transport.
    - In-Ground Fabric Bag: Field grown with the root mass contained in a semi-permeable fabric bag.
    - Container Grown: Grown above ground in containers of various shapes, sizes and materials.
- Trees packaged with root balls must have their first structural root within two inches of the soil surface. Trees with deeper structural roots will not perform well when transplanted and should be avoided when selecting nursery stock.
- Trees with root balls will be handled by the ball, not the stem, to ensure no damage occurs to the root-soil interface or to the stem itself.
- Trees with leaves will be transported with a fabric tarp to minimize desiccation and have had their root balls wetted prior to transport.
- Sites will be tested for drainage, nutrient levels and pH prior to planting or prior to species selection, if possible.
- Container stock will be removed from its container. For balled and burlapped trees, wrappings will be left on until the tree is in the hole; wrapping will then be removed from the third to fourth of the wire basket and burlap from the top of the ball. For all types, ensure any encircling (girdling) roots are removed and root ball is shaved as necessary.
- As soil is added, wet and tamp each layer down to ensure good moisture and reduction of air bubbles.
- Do not prune trees at time of planting, unless to remove dead, dying, diseased or cracked branches, as it may take away from root development as the tree attempts to heal these above-ground wounds.

Tree Selection, Planting, and Maintenance

The following trees **shall not be allowed** for planting in parkways as they are considered **unacceptable species** for planting:

- Ash
  - Blue
  - Common
  - Green
  - White
- Box Elder
- Cherry
  - Black
  - Pin
- Cottonwood
- Eastern Redcedar
- Elms
  - American
  - Chinese
  - Siberian
- European Buckthorn
- Fir
  - All Species
- Hemlock
- Honey Locust
  - All Species (This has been determined by current population in the tree inventory and using the 20-10-5 Rule of Taxonomy)
- Maple
  - All Species (This has been determined by current population in the tree inventory and using the 20-10-5 Rule of Taxonomy)
- Mulberry
- Pear
  - All Species
- Pine
  - All Species
- Poplar
  - All Species
- Spruce
  - All Species
- Walnut
  - All Species
- Willow
  - All Species

Trees **allowed** to be planted in Village parkways shall be selected from the tree species listed below, unless in the opinion of the Village Forester the tree will not survive, be a nuisance in the location or locations indicated, or result in an over-population of a species in the area. The following is a list of trees which **may be approved** and not necessarily a recommendation:

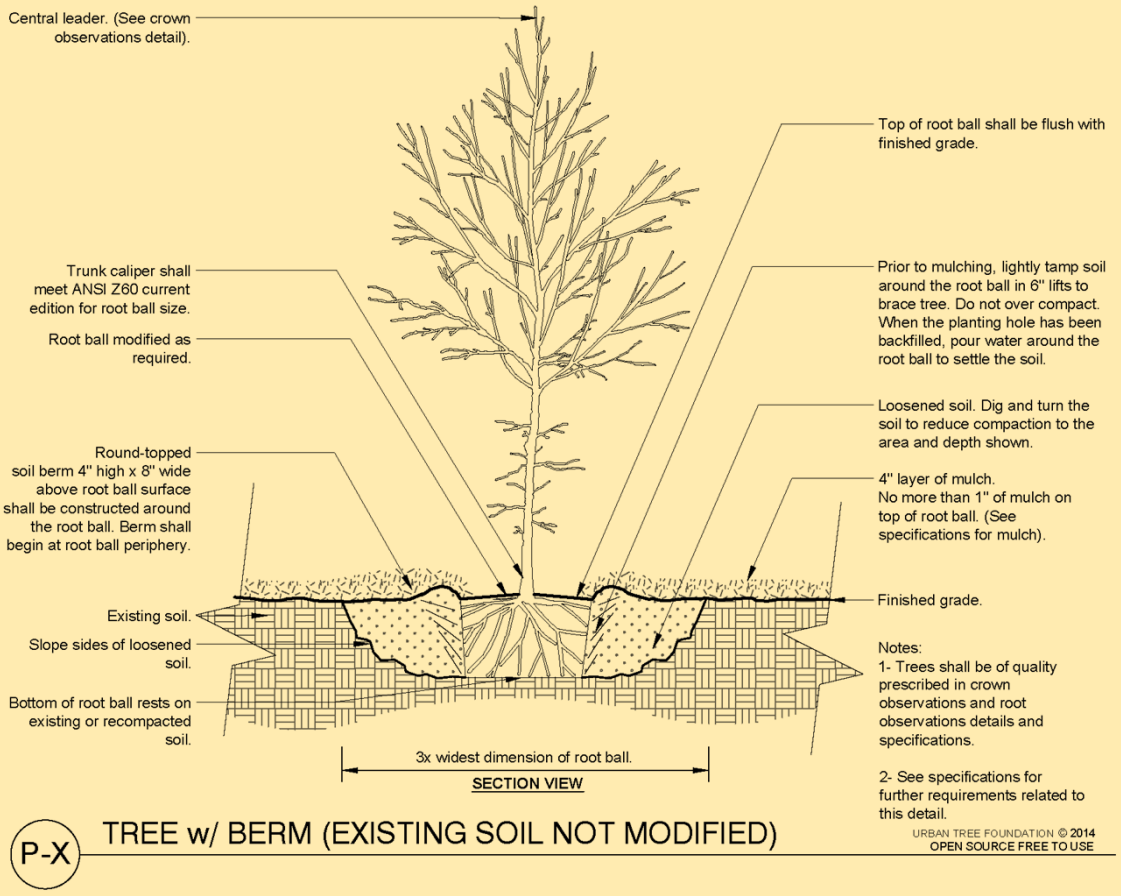
- Hornbeam
  - American
  - European
- Redbud
- Yellowwood
- Turkish Filbert
- Thornless Cockspur Hawthorn
- Hardy Rubber-Tree
- Ginkgo
  - Autumn Gold
  - Magyar
- Espresso Kentucky Coffeetree
- Tuliptree
- Amur Maackia
- Crabapple
  - Golden Raindrops
  - Adams
  - Coralburst
  - Royal Raindrops
  - Red Jewel
- Dawn Redwood
- Black Tupelo
- London Planetree Exclamation
- Oak
  - Swamp White
  - Shingle Oak
  - Bur Oak
  - Chinkapin Oak
  - Northern Red Oak
- Japanese Tree Lilac Ivory Silk
- Bald Cypress
- Linden
  - American
  - Little Leaf
  - Silver
- Buckeye
  - Ohio
  - Yellow
- Katsura
- European Beech
- Ironwood
- Zelkova
  - Green Vase
  - Musashino
- Sweetgum
  - Moraine
  - Worplesdon
- Magnolia
- Pagodatree
- Elm
  - Frontier
  - Accolade
  - Princeton
  - Valley Forge
  - Triumph
  - Regal

Certain species listed above may have special requirements that must be provided by the developer, contractor or personnel planting the species in order to ensure the trees survive in a healthy condition. These requirements sometimes include well-drained soils, acid soils, or other conditions. It is the individual planting the tree who is responsible for noting what measures, if any, will be taken to ensure compatibility with each planting species proposed and what modifications, if any, are proposed to provide existing conditions in order to ensure final conditions which are compatible with each proposed species.

All crippled, deformed and physically damaged trees, regardless of species shall be removed and replaced if an inspection by the Village Forester indicates recovery and normal development cannot be expected. All trees infected with non-curable disease that will result in deformation, death, and infection of other trees, shall be removed and replaced with healthy species.

Variety in Planting - Diversification of tree species selection is desired to be as great as possible. For every linear mile, and succeeding mile or fraction thereof, of parkway in a development, a minimum of eight (8) different species is required. Deviation from the above will be considered only after approval by the Village Forester.

An approved master tree-planting schedule shall be submitted and must be approved by the Village Forester.



6. TREE REMOVAL

Removal Policy

Removal of trees within the Village Right of Ways (ROW) and Village properties will always be at the discretion of the Village in the best interest of the public. A standing tree can cause great harm or even fatality, when the trunk, branches or roots fail. Small dead trees can also be an eyesore, reducing property values. There are times when the presence of a mature tree creates a public hazard. Old trees can hold great sentimental value, and many people become attached to these neighborhood icons; however, while it may be difficult emotionally to remove these trees, there are several health and safety reasons to do so. Tree removal will be conducted based on the best available data collected by in-house Forestry staff. Trees will not be removed in order to fill illogical removal quotas or based on a residential removal request with no evidence of a need for tree removal.

Reasons for Tree Removal

Hazardous / High Risk Trees

Structurally unsound trees that may fail under stress from high winds, snow or ice loads can be a threat to public safety. These high-risk trees are reported by the Forestry Section, other Public Works staff, or residents. Hazardous trees are removed immediately when they appear to be a threat to public safety.

Tree fell during a storm on July 12, 2017.

Storm Damage Removals

Trees damaged from wind, ice, heavy snow, or lightning will be removed if damage is significant. Trees that have lost 30% or more of their crown from high winds or heavy snow or ice will be scheduled for removal. Trees leaning more than 10 degrees or show a large crack in the trunk after a high wind will be scheduled for removal.

Infested or Diseased Trees

The tree is infected with an epidemic insect or disease where the recommended control is not applicable, and removal is the recommended practice to prevent transmission.

Diseased trees are caused by bacterial, fungal, and viral pathogens present. Small animals and insects can cause tree infestations such as Emerald Ash Borer. Emerald Ash Borer is an insect that kills Ash trees when they are heavily infested. Elm trees are killed when infested with Dutch Elm Disease, which is a fungal disease.

Removal of trees infested and or diseased helps limit possible exposures to surrounding trees. In this case, dozens of trees may be saved by the removal of just one tree.

Dying or Dead Trees

Trees with crowns showing over 50% deadwood, showing major decay or structural problems are hazardous and are in poor condition. These trees scheduled for removal by in-house or contracted staff as are removed as soon as practical.

Construction or Vehicle Damage

In general, elements of the Village's infrastructure are aging and will need replacement. Renewal of the Village infrastructure could have major impacts on the health and safety of its trees in the future.

Damage to trees during construction produces negative long-term tree health impacts. Trees seldom die immediately following construction. Root system damage and soil compaction usually causes a slow decline in tree health. Losses of street trees can occur when street rehab projects damage the root system of many trees.

Safety issues may develop when the potential for tree failure increases after large roots are severed during construction.

The Village will assess trees that have been impacted by a large piece of construction equipment or a vehicle strike. If the tree has suffered physical damage or extreme root compaction and is likely to decline and become high risk, it will be scheduled for removal. Village staff will determine if removal is necessary based on their best professional judgement.

Standards and Requirements for Tree Removal

- All Forestry staff directly involved in chainsaw operation, climbing, bucket truck operation and rigging limbs will have sufficient training and experience to perform such duties while employed by the Village.
- Only qualified utility arborists may perform tree removal operations within ten feet of an electric utility line. Village Forestry staff may complete trunk removal and stump grinding only if the remaining portion of the tree is greater than ten feet from a transmission line.
- The Village of Buffalo Grove will not perform or assist, programmatically or financially, with the removal of trees on private property. If a private tree falls into the ROW, the portion of the tree impacting the ROW will be removed to the property line(s) by Village staff.
- All removal of public trees shall be done in a manner so that the remaining stumps will be at least 8 inches below ground level unless special exemption is granted by the Village Forester.

American National Standards Institute ANSI Z133.1 Arboriculture Safety Standards

- All tools and equipment utilized for tree care operations, including those not specifically mentioned below, will be inspected and maintained by qualified personnel in accordance with the manufacturer's care instructions.
- All staff will be trained in the proper use, inspection and maintenance of tools and equipment utilized for tree care operations.
- Certified Arborists or Arborist Trainees will conduct job briefings daily prior to tree care operations of any kind and the information will be communicated to all workers.
- All activities performed on any job site for any activity outlined in this Plan will comply with all applicable OSHA (Occupational Safety and Health Administration) guidelines and standards.
- Traffic and pedestrian control will be established around a job site prior to the beginning of tree care operations.
- Emergency contact information and a safety kit conforming to the ANSI Z308.1 standards will be made available to all workers. All employees will have basic instruction on the use of CPR and First Aid.
- Personal Protective Equipment (PPE) will be required when there is a reasonable probability of injury or illness on the job site as determined by the Certified Arborist or Arborist Trainee prior to the beginning of tree care operations each day. PPE will be made available and will be well-maintained in accordance with the manufacturer's requirements.
- Head protection will conform to ANSI Z89.1, face and eye protection will conform to ANSI Z87.1, respiratory protection will comply with ANSI Z88.2, leg protection will always be worn when using a chainsaw.
- Flammable liquids will be kept a minimum of ten feet from open sources of flame or high heat and will be stored in approved containers.
- All Village staff and contractors working near electrical hazards will be qualified to do so and will be educated on ANSI standards for Electrical Hazards and Line Clearance.
- Vehicles and mobile equipment will be inspected and maintained by qualified personnel in accordance with the manufacturer's requirements and will be equipped with all

standard safety devices, decals and instructions, and will be operated in accordance with all federal, state and local motor vehicle codes and ordinances.

- Aerial devices will be inspected and maintained by qualified personnel in accordance with the manufacturer's requirements, and will be equipped with all standard safety devices, decals and instructions.
- Aerial devices will be stabilized by wheel chocks, outriggers or stabilizers as necessary for the device, and will never be used to lift, hoist or lower logs or equipment unless specifically designed to do so.
- Aerial devices will be equipped with fall protection devices and permanent load ratings, in accordance with ANSI/SIA 92.2 or 92.5, as applicable to the specific aerial device.
- No aerial device will be allowed to contact electrical conductors, and minimum safe distances will be maintained in accordance with the ANSIZ133.1 standard.
- All brush chippers will be inspected and maintained by qualified personnel in accordance with the manufacturer's requirements, and will be equipped with all standard safety devices, decals and instructions.
- Sprayers and related plant health care equipment will be inspected and maintained by qualified personnel in accordance with the manufacturer's requirements, and will be equipped with all standard safety devices, decals and instructions.
- Sprayer tanks or other similar enclosed spaces will not be entered unless performed in accordance with a confined-space entry plan in compliance with OSHA (Occupational Safety and Health Administration) 1910.46 requirements, including air-quality testing, training and PPE.
- Chain saws and other similar portable power tools will not be operated unless the manufacturer's safety devices are in proper working order. Manufacturer's safety devices will not be removed or modified.
- Forestry staff will have a minimum of two points of attachment to a tree or aerial device while operating a chainsaw at all times, unless the hazard posed by the second point of attachment poses a greater hazard than utilizing one point of attachment.
- A visual hazard assessment, including a root collar inspection, will be performed by a Certified Arborist or Arborist Trainee prior to climbing, entering or performing work in or on any tree, and a second crew member will be always within visual or voice communication during arboricultural operations that are in excess of 12 feet from the ground surface.
- All ropes, saddles, carabiners and other similar climbing equipment will be:
    - approved for use in the tree care industry by the manufacturer,
    - have a minimum breaking strength or load capacity of 5,000 pounds,
    - be inspected before each use and
    - equipment will be removed from service when it shows signs of excessive wear or deterioration.

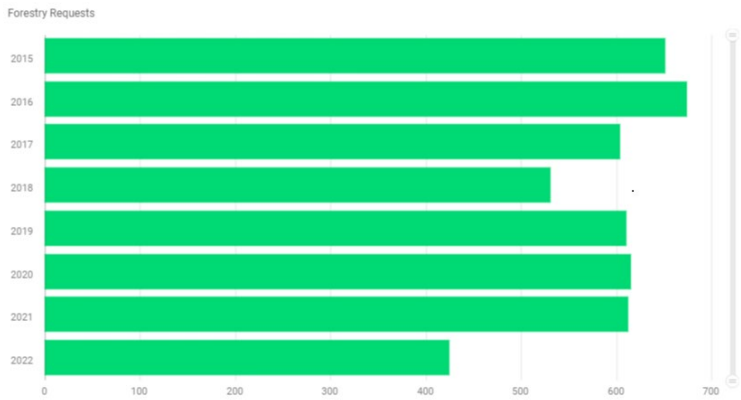
- No work will be performed from a ladder or other similar support device unless the employee is tied in or has a minimum of two points of attachment to the tree.
- All pruning, removal and rigging operations will have a designated drop zone where limbs, trunks and tools can be dropped from aloft without impacting pedestrians or passersby. A visual or verbal communication system between the employee aloft and the employee(s) on the ground will be established to determine when the employee aloft can safely drop tree parts or tools.
- Any tree parts which cannot be safely dropped or controlled from aloft will have a separate rigging line tied to them to help control their fall. The tree will be inspected for structural stability prior to the establishment of a rigging system in the tree. When trees appear to have defects that could jeopardize the ability to safely use a rigging system to drop or control a limb, an alternate plan will be implemented.
- All equipment utilized in rigging will meet the load ratings for the limb being rigged, and a qualified employee, trained in proper rigging procedure will determine the rigging procedure and equipment to be utilized. Any equipment that has been damaged or overloaded will be removed from service. When removing a tree, a crew leader will determine what equipment is necessary and how many crew members will be directly involved in drop zone operations. A well-established escape route will be planned prior to the beginning of removal operations. Any non-involved workers will be away from the drop zone at a distance of twice the height of the trunk or tree being removed.

- Notches will be used on all trees and trunks greater than five inches in diameter during removal operations and should conform to the standards of ANSIZ133.1 Standard.
- Loose clothing, ropes, lanyards and saddles will not be worn during any tree care activity where the risk of entanglement with tools or machinery is possible, particularly with brush chippers.

7. PUBLIC INVOLVEMENT AND INTERACTIONS

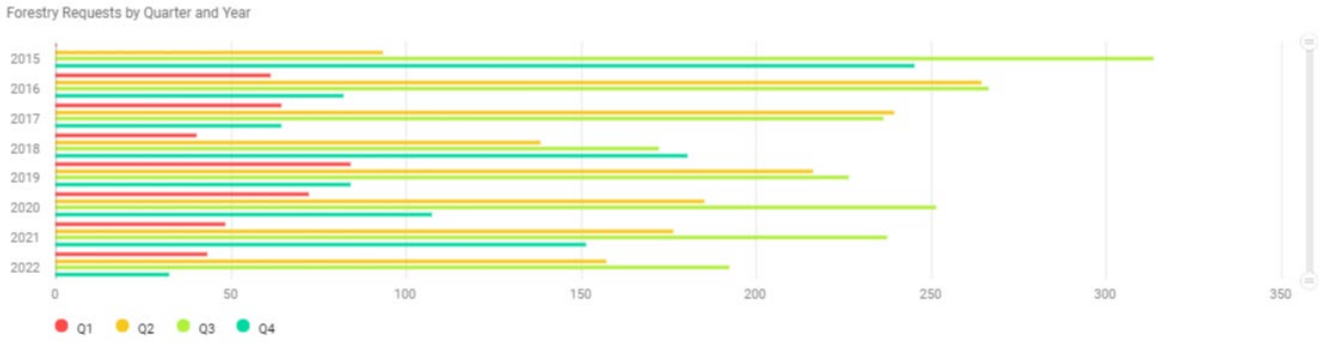
Resident Requests

The most consistent contact the Forestry Section has with the public is through resident requests. All requests from phone calls and emails to PW and even using the BG Connect App are all driven through our asset management software, Cartegraph. This system directly ties any resident request to specific assets such as trees.



The Forestry section has averaged over 589 requests each year since 2015.

The greatest number of work order requests are received during the growing season when trees are in full leaf.



High winds and severe storms can affect the urban forest and generate large numbers of requests within a short period. These requests are prioritized by level of importance and addressed in that order. During storm cleanup the Forestry Section may handle numerous requests in a matter of days.

The goal of the Forestry Section is to respond to these calls within one to three days and the cleanup to be completed within two to three weeks after the storm, depending on the extent of damage in the neighborhoods.

Resident Contact

A large portion of the urban forest exists on private property. The Forestry Section frequently advises residents in the selection, planting, and removal and care of private trees.

8. STANDARDS FOR PROTECTION AND PRESERVATION

General Standards

The following specifications are intended to prevent unnecessary damage and destruction to trees.

- Authorization must be given by the Village Forester before anyone attaches or installs any metal materials, signs, cables, wires or other things foreign to the natural structure of the tree, excavates into the critical root zone within the drip line of a tree or treats the soil within the root zone with a soil sterilant.
- All site and landscape plans involving should show all existing trees. Trees to be protected and saved and trees to be removed should be indicated on the plans. Every effort should be made to preserve all “Key Trees” and “Significant Trees”.
- Trees to be saved should be marked prominently.
- Curb cuts should not be closer than 5 feet from the trunk of the tree. Paving or asphalting should not be done closer than 2½ feet from the tree trunk.
- New sidewalks, paving or asphalting must allow breathing space for tree roots. The following should be used as a guideline. For trees up to 4 inches in trunk caliper, 25 square feet of porous area is needed. For each additional 2 inches of tree caliper, 10 more square feet are needed.
- Where grade change is required, the same area must be provided either by construction of a dry well where the level is to be raised or by building a retaining wall where the level is to be lowered.
- Avoid cutting surface roots wherever possible. Sidewalks and paving levels should be contoured sufficiently to avoid such cutting.
- Excavation involving root cuts should be done rapidly. Make smooth, flush cuts on tree roots. Backfill before the roots have a chance to dry out, and water the tree immediately.
- Where many roots must be removed, prune branches out of the top of the tree to restore a proper top to root balance.
- If trees are in full leaf during the construction phase, supply supplemental irrigation.

Existing Ordinances

The Landscape Ordinance is contained in the Development Ordinance Title 16. Most issues related to planting and development of undeveloped areas are addressed in Section 16.50.120 of this ordinance. The Municipal Code 12.20.090 deals with practices and procedures for the planting, maintenance and removal of existing trees including elm trees infected with Dutch Elm Disease and Emerald Ash Borer.

Protection of Existing Trees

- All developers with sites containing any trees four (4) inches in diameter or greater, calipered at four and one-half feet (4 1/2') above the highest ground level, shall prepare a Tree Survey which shall certify the locations of all such trees and the species of each. Each tree which is required to be certified shall be tagged with an inventory number, mapped on the Concept Plan, and a written evaluation and rating of the tree's condition shall be submitted and shall include a description of the rating system and process used in the evaluation at the time of Concept Plan submittal. A Tree Preservation Plan shall be submitted showing such existing "Key Trees" and "Significant Trees" as identified during the preparation of the Tree Survey. All "Key Trees" and "Significant Trees" must be clearly identified in the required Tree Survey and shown on all Subdivision Engineering and Site development plans. All "Key Trees" and 80% of the "Significant Trees" will be preserved.
- The Village Forester shall review the developer's proposed methodology for saving or removing "Key Trees" and "Significant Trees". If, in the opinion of the Village Forester, the developer has not provided for necessary precautions in preserving "Key Trees" and "Significant Trees", the Village Forester will advise the Village Engineer that the developer has not provided for the protection of "Key Trees" and "Significant Trees" and recommend that Preliminary Plan approval not be granted until such time as the developer satisfactorily amends his plans for the preservation of such existing trees. If the developer, Village Forester and the Village Engineer cannot agree on a satisfactory plan, the developer can appeal the decision to the Corporate Authorities. Based on the review and approval of the Corporate Authorities the Village Forester may grant relief from the preservation requirements for "Key Trees" and "Significant Trees".
- The developer shall make every possible effort to save and protect all "Key Trees" and 80% of the "Significant Trees". All grading and construction equipment shall be forbidden from encroaching within the trees' 'critical root zone' (drip line). Materials detrimental to trees survivability shall not be dumped or stored within the trees' 'critical root zone' (drip line) or at any higher location draining toward the trees.

- Where trees are to be saved, provision shall be made for erection of temporary fencing at the periphery of the 'critical root zone' (drip line) to keep construction from killing the tree or from compacting soil and damaging shallow feeder roots. At a minimum, all provisions of Section 201.05 of the "SSR & BC", latest edition, shall be followed. All "Key Trees" and "Significant Trees" removed will be replaced at the following ratio:
    - Key Tree – shall be replaced with two (2) inches for every inch of removal. The minimum size for replacement trees shall be six (6) inches in caliper.
    - Significant Tree – shall be replaced with two (2) inches for every inch of removal. The minimum size replacement trees shall be four (4) inches in caliper.

  All replacement trees shall be guaranteed for a period of three (3) years. A replacement plan shall be submitted to the Village Forester for review and approval prior to granting the requested relief.
- In Lieu of installing replacement tree(s), the developer may compensate the Village of Buffalo Grove with a cash payment at the required replacement value. The required replacement value shall be calculated using the following method:
    - The Village will calculate the sum of inch diameter of "Key Trees" and "Significant Trees" removed multiplied by 2.
    - The Village will obtain three (3) prices from local landscapers for the purchase and planting of the sum of inch diameter of "Key Trees" and "Significant Trees" removed multiplied by 2.
    - The Village will invoice the developer for the calculated replacement value.
    - The funds collected shall be allocated to the Village Tree Replacement Program and used solely for the purpose of purchasing and planting new and replacement trees within the Village of Buffalo Grove.
- The care and protection of all plant materials specified to be preserved shall, at a minimum, follow the requirements of Section 201.06 of the "SSR & BC".

Chemical Application Standards

The Forestry Section has an integrated Pest Management Policy. Sensitivity to environmental issues and awareness of the impact and risks of pesticide use is the Section's greatest concern.

The Forestry Section maintains records of all pesticide use by village crews. These records contain information on the type of pesticide used, location, reason and weather conditions. Weather conditions are essential when a concern about pesticide drift or phytotoxicity arise and is noted on the report.

State and federal regulations regarding the use and disposal of pesticides will more than likely become more stringent in the future. The Forestry Section must continue to monitor the costs of pesticide use in-house and evaluate the most sustainable cost-effective procedure to continue an in-house program or outsource the activity.

When applicable and practicable, chemical control for common pathogens or pests may be utilized as a curative or preventative method. In general, removal of the tree may cost significantly less than to chemically treat a tree. In rare circumstances, the Village may decide to chemically treat trees. Residents must notify the Village Arborist before they attempt to treat their parkway trees. Chemical treatment may be allowed by residents at their own expense, if treatments are performed by a Certified Arborist or staff member with an Illinois Pesticide Applicator license.

The following specifications pertain to the spray application of fertilizers or pesticides to the above ground portions of trees.

- The pesticide applicator should know and understand the characteristics of those spray materials used by either himself or his employees and be aware of those recommendations stipulated by the manufacturer.
- Village of Buffalo Grove residents may perform chemical applications on parkway trees, such as treatment for EAB, DED, Apple Scab or other common maladies with prior permission from the Village. The Village will not bear any financial responsibility associated with the costs of such treatments, and treatments must be performed by a Certified Arborist who holds an Illinois Pesticide Applicators license. Additionally, trees being treated by residents may still be removed at the discretion of the Village for any of the reasons stated above. The Village may deny or revoke permission for chemical treatment of parkway trees if an unqualified contractor is utilized, if potentially hazardous chemicals are involved or for any other reason at the discretion of the Village.
- Ineffectual control, damage, injury or death to plants, animals or persons resulting from the use of spray materials exceeding the limitation of the manufacturer's guarantee shall be considered the responsibility of the licensed operator.

- Spray machines should provide a spray coverage to all portions of the infested or infected tree being treated or it shall be considered inadequate to perform such operation.
- Spray equipment shall be kept clean and in good working order. The Village Forester or his representative may inspect same at any time and take samples of spray materials being applied.
- Operation with dirty tanks or equipment or unsanitary, unsafe methods of washing out or draining of same in public sewers and gutters is prohibited.
- No spray application shall be carried out when there is sufficient wind to make pesticide control ineffectual or create a hazard to persons, plants or property.
- No spraying of pesticides shall be done when air temperature is less than 40 degrees Fahrenheit. Exception: Certain growth regulators may be applied at lower temperatures.
- All spray machines other than pump-up hand sprayers must have agitators capable of always maintaining a uniform spray suspension when spray application is in progress.
- Adequate precautions shall be taken in all phases of spray application concerning factors of toxicity, phytotoxicity, chemical reaction or residual action pertaining to any spray materials used.
- Applicators applying chemical pesticides to public trees shall adhere to all federal and state laws and regulations pertaining to pesticides and their application.

9. AWARDS AND PROGRAMS

Buffalo Grove was designated a Tree City USA by the National Arbor Day Foundation for the 33rd consecutive year in 2021. The Village has actively participated in the Tree City USA program to improve the recognition of the importance of trees to the residents of Buffalo Grove.

A Growth Award, also given by the National Arbor Day Foundation (NADF) was presented to the Village three times in 1992, 2001 and 2002. This award recognizes consistent urban forestry program improvements.

10. EDUCATION AND DEVELOPMENT

The Village Forester/Forestry and Grounds Manager is a member of the International Society of Arboriculture, Illinois Arborist Association, and Society of Municipal Arborists and is also an ISA Certified Arborist, Municipal Specialist, and Tree Risk Assessment Qualified (TRAQ).

Forestry staff have adequate avenues to pursue additional educational opportunities. Training is available for improving skills related to arboriculture, such as certification programs, trimming, rigging, and integrated pest management classes. Five other Village employees, three of whom are in Forestry are ISA Certified Arborists. The ISA Certified Arborists in Forestry are also Municipal Specialists and one of them is also Tree Risk Assessment Qualified.

Job skills for use in other areas of Public Works are also available such as the Illinois Roads Scholar Program and Illinois Public Service Institute.

11. NEEDS AND GOALS

Maintenance Needs and Costs

- Buffalo Grove is gradually increasing its parkway tree population. As planted trees mature, additional budget increases will be needed to maintain the larger tree population.
- Most of the current tree population in Buffalo Grove is young and vigorous. The low removal rate and low cost of rotational tree pruning is partly due to the young population.
- The hazard evaluation and removal program will produce a short-term increase in funds needed for removal of these trees. Increased maintenance costs (pruning, removal, service requests, hardscape damage etc.) will occur in the next 10 to 20 years as the current tree population matures.

Long Term Goals

Three long-term goals that will continue to raise the quality of the Urban Forestry Program in Buffalo Grove are presented in the table below. Specific objectives developed in this management plan that will help achieve these goals are given. Time frames and need for additional budget input beyond current levels is projected.

Many of the objectives outlined in this table and report are part of activities already ongoing in the Urban Forestry Program in Buffalo Grove.

Goal 1

Continue to increase public education on the economic and environmental benefits of trees and increase public support and involvement in the Urban Forestry Program.

- Provide educational material to the Public and School age children on the environmental and economic benefits of trees. This can be done Arbor Day events, Public Works Open House, Farmer's Market Booth, National Night Out, and various other random events that come up through the year. This is an ongoing, annual goal for Forestry Staff.
- Continue to apply for, obtain and publicize Tree City USA, the Growth Award and other related awards. This is an ongoing, annual goal for Forestry Staff.

Goal 2

Continue to increase the safety, health and stocking level of the Urban Forest through the protection and maintenance of parkway trees with cost-effective, modern arboricultural practices.

- Increase species diversity of parkway trees by limiting of overstocked species.
- Continue annual survey of traffic control sign clearance.
- Update tree inventory using Cartegraph Asset Management Software. Tree inventory will be updated as we inspect trees prior to our cycle trimming program. Approximately, 20% of the trees are inventoried each year on a five-year cycle trimming program.
- Continue five-year cycle pruning program.
- Maintain master tree planting plan for the Village.
- Update tree ordinance as needed.
- Review and update Performance Standard manual to reflect latest industry standards.
- Continue the hazard survey for high risk, large diameter tree species.
- Continue to participate in research and professional urban forestry activities.
- Mulch all trees:
    - on Village Properties (not within a naturalized area) by the end of 2023
        - Pace and Metra
        - Fire Stations
        - Retention/Detentions
    - on ROW's all main road medians and parkways throughout the Village by the end of 2024
        - Arlington Heights Rd
        - Aptakisic Rd
        - Buffalo Grove Rd
        - Deerfield Rd
        - Dundee Rd
        - Half Day Rd
        - Milwaukee Rd
        - Old McHenry Rd
        - Weiland Rd

Goal 3

Develop administrative support for the protection and maintenance of urban trees, and budget enhancement to meet future demands on the Urban Forestry Program.

- Maintain formal agreements for maintenance of trees located on state and county right-of-way.
- Increase awareness for the protection of trees during construction.
- Substantiate future budgetary needs to meet increased maintenance needs.
- Apply for and obtain federal and state grants and other methods for funding to maintain urban reforestation.
- Update the Urban Forestry Management Plan as needed.

12. CONCLUSION

Improvements in the protection of trees during construction, tree species selection, planting practices, pruning techniques, insect and disease management and evaluation of the safety aspects of managing the urban forest have come about in the past three decades. Many of these improvements have been implemented through the urban forestry program in the Village.

A professional, cost-effective urban forestry program is functioning in the Village. Further refinement of the program based upon the current resource conditions and projections of future trends, techniques and practices must be reviewed regularly. A commitment to the implementation of the defined goals and objectives will be needed to continue to maintain, preserve, and expand the valuable urban forestry resource in Buffalo Grove.

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