Village of Oak Park

Urban Forest Management Plan

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OVERVIEW OF OAK PARK'S URBAN FOREST MANAGEMENT PLAN

Oak Park, Illinois currently manages 18,526 trees throughout its Village parkways and rights of way, as well as on Village-owned properties. In 2014, the Village completed a comprehensive inventory of all Village parkway, ROW, and Village-owned property trees and over the past 8 years, the Village has annually updated a portion of their existing inventory data in advance of the cyclical pruning schedule. This on-going comprehensive inventory update project is now culminating in the development of this Urban Forest Management Plan (UFMP) which will detail how these trees will be managed for the benefit of the Village of Oak Park over the next 20 years, with a focus which begins in 2023, and projects out to 2043. As will be discussed later in this UFMP, there are many environmental benefits of a vigorous urban forest, and this document will help to guide the Village's actions and investments in the tree population in order to ensure that Oak Park and its residents continue to take advantage of these benefits.

In terms of the condition of the Urban Forest in Oak Park, there are both strengths and opportunities for improvement. An enormous strength is that the Village has a well-established and robust Urban Forestry program and a long implemented cyclical pruning program, therefore the Village's tree population has been maintained at a very high level of care. Another strength is the fact that there are 131 species represented in the tree population which is exceptional diversity for a municipal population of Oak Park' size. The Maple genus, however, makes up nearly 22% of the population which is over double the recommended 10% threshold for a genus, and this statistic certainly leaves room for improvement. Another strength is the fact that the stocking density in the Village is very high, which creates an opportunity for the Village to focus on a multi-layered canopy using shade tolerant new plantings in open planting spaces when growing space might be limited due to mature adjacent trees. Additionally, the overall condition of the population as a whole is above average and this presents another strength and a trend that should be commended and strived to be improved upon. Another opportunity for improvement is found in using the tree inventory to locate trees that are identified as being in poor condition or with poor structure, and maintenance for these trees can be prioritized. That said, the current budget being applied towards forestry management activities should likely be larger. At approximately $1,308,823 per year, this is enough to fulfill current, necessary needs, but even a modest increase in budget would allow Oak Park to accomplish much more. This Plan will explore opportunities to fund forestry activities in more unconventional ways than standard governmental & tax funding.

In order to enhance the Urban Forestry program so it will create long term benefits to the community while reducing costs, the following Urban Forest Management Plan will address each one of these strengths and challenges, and create goals and milestones for each. Below is a broad view of the direct goals to come in the 2023-2043 period. Further detail is given in the body of the Plan, with separate sections detailing specific Urban Forestry activities, and how we propose they are achieved, along with standards and Best Management Practices for each.

An urban forestry program has been created in this Plan which attempts to achieve the greatest benefit for the community, based on the available data we have from the inventory, as well as input from stakeholders and residents of the Village of Oak Park.

However, all plans are subject to change based on new information, budgets, or other unforeseen circumstances. For this reason, it is asked that readers consider that this plan is to be an evolving document, and goals and strategies will be updated to fit new circumstances as needed.

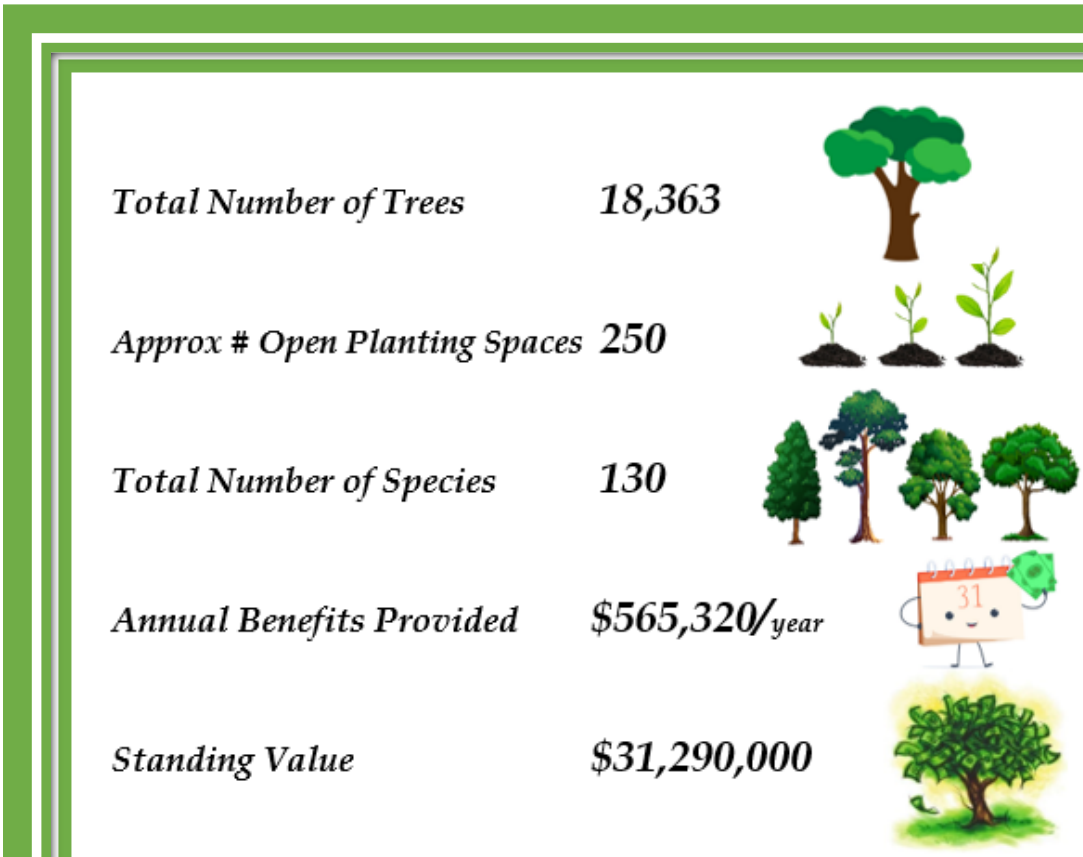
This Plan should be reviewed periodically, at which point the Village, and its residents, business owners, and other stakeholders will have an opportunity to provide input and help improve the Plan during those annual reviews. These strategies and goals are not absolute, but rather serve as guideposts to mark the road to success.

MISSION STATEMENT

It shall be the mission of this Urban Forest Management Plan to outline goals, budgets, and Arboricultural Best Management Practices for the management of the Urban Forest in the Village of Oak Park, Illinois to increase canopy cover, maximize the benefits trees provide while minimizing cost, mitigate against climate change, ensure tree equity throughout the community, and create a program to manage the Urban Forest Resource for the greatest public good in a manner that is both financially and programmatically sustainable, while maintaining flexibility for future adaptive management.

OAK PARK'S URBAN FOREST: AT A GLANCE…

Total Number of Trees	*18,363*
Approx # Open Planting Spaces	*250*
Total Number of Species	*130*
Annual Benefits Provided	*$565,320/year*
Standing Value	*$31,290,000*



DIRECT GOALS

Listed below are the direct goals of this Urban Forest Management Plan (herein referred to as "UFMP", or "the Plan"), as well as a brief discussion of how they shall be met. Direct goals are those which this plan addresses very explicitly in describing pruning, removal, planting, and other activities. Every attempt was made to make these goals realistic and achievable, so they do not place an undue burden on the Village of Oak Park, its residents, or its resources. Instead, the direct goals of this UFMP are to save money and provide greater benefits over time through proactive, as opposed to reactive, management. The Plan is also meant to be adaptive: New concepts, the introduction of new pests or pathogens, or changing climate (both social and meteorological) may all change the way the Urban Forest is viewed.

The Plan is intended to be reviewed periodically by the Oak Park Village Board, Forestry Superintendent, Forestry staff, Community Design Commission, and any other stakeholders. The review process should include evaluation of progress made towards these goals. Goals may be altered after the review, as conditions warrant. This UFMP is written with the understanding that organizations, stakeholders, and residents change over time, and therefore its goals require a degree of flexibility. Since trees represent a long term (50-80 year) commitment, this UFMP is intended to provide guidance and continuity through those changes, while also adapting to them as the need arises.

Create a Needs Analysis for the Current Tree Population

Every tree population today is the result of decades of past management decisions. Over time, we increase our overall level of knowledge, skill, and efficiency in managing trees. Based on that new knowledge, we sometimes discover that decisions made decades ago may appear in retrospect to have been inappropriate, even though they seemed like a good idea at the time. It is the goal of this Plan to assess the current state of the Village of Oak Park's Urban Forest and examine its overall strengths and benefits, as well as look for opportunities for improvement to inform future decisions.

Each aspect of Oak Park's tree data has been analyzed: How many trees, what condition they are in, how old they are, and more were all examined to create goals to improve the tree population for the benefit of the organization, its residents, and other stakeholders. Specific goals in terms of planting, removals, pruning, budgets, personnel, and maintenance are all addressed by acknowledging both strengths and opportunities, and suggesting how they might be used to the Village's advantage. These strengths and opportunities will be the guiding principles for the management strategies and specific goals outlined in each section below. To

avoid repeating past mistakes, the Plan shall also attempt to leave room for adaptive management, so the plan may be changed when appropriate.

Establish Goals in Order to Enhance Strengths and Realize Opportunities

In order to accomplish anything, goals are necessary to help guide organizations through the process. Establishing or enhancing a highly functional forestry program will require a series of attainable goals to in order to be achieved. This UFMP seeks to accomplish those goals within a realistic budget and attainable timespan. As stated previously, goals are intended to change over time as the Village's capacity to manage the resource may increase or be reduced.

In each section of the Plan related to direct goals, language has been included which incorporate both a budget and a time frame in which those goals can be accomplished. The overarching goal will be to have Oak Park use this UFMP to create an even more sustainable and adaptable forestry program over the time period of the Plan.

This program will include tree planting, tree maintenance, and tree removal for Oak Park's Urban Forest, so that the tree population will be healthy, and provide the greatest benefits and least risk to the community while maximizing benefits and minimizing risk. To learn more about the budgets, see the individual goals in each section below, or turn to the budget table on page 78.

Review and Update Village Ordinances for Enforcement of Tree Policies

Periodic review of municipal code can help to identify areas in the ordinances governing trees in Oak Park that may be in need of improvement. These ordinances are meant to reinforce proper practices while discouraging improper practices and care, and are not meant to be overly punitive, but rather to encourage the community to engage in proper tree care practices for the benefit of all parties. These ordinances are common industry regulations, such as enforcing rules about what trees cannot be planted because they are low quality or invasive species, or defining exactly what trees are the Village's and the homeowner's responsibility, among other things. The goal of these ordinances is to create a tree population and canopy cover which is diverse, healthy, and improving, providing the greatest benefit to the Village and its residents over the long term.

Further Enhance Exceptional Overall Diversity by 2043 Through Tree Planting

Tree species diversity is one of the most important concepts in Urban Forestry today. The reason pests and diseases like Emerald Ash Borer (EAB) and Dutch Elm Disease were so devastating is that there were too many Ash and Elm trees. When EAB arrived, many communities' Ash population was 20% or more, resulting in mass tree loss. This can be avoided by planting a greater diversity of tree species, so that when new pests or pathogens are introduced, we only lose small amounts

of specific tree species. Diversity leads to stability, and stability leads to reduced costs and increased benefits over time.

An achievable "Diversity Vision" has been created for 2043 which will see the tree population become far more diverse than it is at present. The current population includes 131 individual species and the diversity vision included in the Plan aims to reduce the number of trees that are over-represented and/or lower quality species while also seeking to increase the number of species that are under-represented or not present in the tree population.

Not only will trees be planted which are underrepresented or not present in the current population, a goal will be that they will be planted in such a manner that selects the right tree for the right site. A direct goal will be to create a tree planting program where trees are matched to existing sites for the next 20+ years. Currently, Oak Park plants approximately 300-350 trees each year, and this plan seeks to maintain or perhaps slightly decrease that number to keep the Village at a nearly full stocking capacity. Going forward, a nearly full stocking capacity will allow the Village to replace removed trees at a nearly 1:1 ratio when space permits. To learn more about tree planting and reforestation, turn to pages 61-65.

Maintain, Review, & Update an Unapproved Species List

The urban environment is a difficult place for a tree to live. Between road salts, urban pollutants, limited soil, and other challenges, not all trees will thrive in the urban environment. Trees which have very weak wood, which are known invasive species, which produce messy or foul-smelling fruits, or which create a public nuisance should also be avoided when possible. Included in this Plan is an unapproved species list which details specific trees which may not be planted on boulevards, in parks, and on Village-owned properties. The Forestry Superintendent or their designee will review the list periodically to ensure that it is being maintained in accordance with the latest information on specific trees. For more information on what species cannot be planted on Oak Park ROWs, see the Unapproved Species list in Appendix A.

Manage Tree Removals

For public safety, or to prevent the spread of tree pests and pathogens, sometimes tree removal is unavoidable. Cost projections for tree removals have been made based on the number, age, and condition of trees in Oak Park for the next 20 years, so that long term budgeting projections can be made. Also included are ANSI and ISA safety standards, as well as suggested bid specifications to ensure the Village is hiring qualified contractors who will be held to the highest industry standards. For more information on Oak Park's proposed tree removal program, turn to page 57.

Sustain and Adjust Cycle Pruning Program

Properly pruned trees establish faster, grow quicker, and live longer lives than trees which are not pruned, or improperly pruned. Since large trees provide the greatest benefits to the community, pruning is a critical part of the Urban Forestry program in Oak Park. The Village currently has a 3 zone cycle pruning program, but is exploring the option of returning to a 4 year program to ensure that tree work contractors can manage the workload. Additionally, in-house pruning will be done by Oak Park staff when necessary as well as for ornamentals and smaller trees, likely less than 10" DBH. Cost projections and other details will be discussed in the Tree Pruning section of this plan. Currently, the Village prunes approximately 6,100 trees each year and this plan discusses the option to decrease that number closer to 4,800 over the course of this plan.

As Oak Park adjusts its budgets and capacity for in-house tree pruning, the pruning program will be made even more robust. This adjusted program would ensure that all trees on public property are pruned at a minimum every 4 years, increasing tree health and vigor while reducing costs associated with storm damage and tree failure. For more information on tree pruning and maintenance, turn to pages 65-70.

Maintain an Accurate Tree Inventory on an Annual Basis

Managing an urban forest requires a clear understanding of the trees, their ages, conditions, and locations, so that Village crews and contractors can perform work on these trees. A stem-by-stem tree inventory update was completed in 2014. This inventory resulted in an unbiased assessment of all the trees on public ROWs and Village-owned properties in the Village and this maintained data will continue to guide the forestry program throughout the next 20 years. The Village has contracted with a Forestry Consultant to annually update a portion of the inventory data in advance of the cycle pruning schedule.

All inventories are a snapshot in time. With 18,526 trees on Village ROWs and properties, the tree inventory should continue to be maintained at a high level of accuracy so that it doesn't become out of date. It is recommended that the inventory continue to be updated periodically by a Forestry Consultant, to keep the information at its most current on a Village-wide scale. Maintaining this tree data at a high level is vital in the execution of this Management Plan.

Proper Mulching of All New Plantings

As noted above, the urban environment is a difficult place for a tree to become established and to live a long, healthy life. Proper mulching can significantly increase a tree's ability to do this. Mulch helps to conserve water during the summer by preventing it from evaporating from the soil. It also helps

prevent weeds from growing around the tree and competing for water and nutrients, and keeps lawn equipment such as weed whips away from the trunk where they can damage the tree. All new Village plantings will be properly mulched at the time of planting by the planting contractor.

Another intended outcome of this initiative will be to educate residents about proper mulching care, and notify them when poor mulching techniques are being used. Of particular concern is the practice known as "Volcano Mulching" which has the opposite effect of proper mulching and can severely damage a tree over time. The Village has recognized the need to mitigate improper mulching and has invested in using a contractor to utilize an air spade to perform 126 root collar excavations in 2022. Whether in-house or using contractors, the Village would like to explore the opportunity to continue and grow this program. For more information on proper mulching, turn to page 71.

Incorporation of Best Management Practices in Tree Care Operations

"Best Management Practices" is a term which means being on the cutting edge of your industry. All contractors working for the Village should be compliant with the latest industry Best Management Practices, based on the appendices in this report. The ANSI and ISA Best Management Practices shall be integral parts of any Request for Proposal (RFP) or bid documents when seeking qualified contractors. Full text of all referenced standards shall be made available to all Village employees and contractors performing tree care operations. Public outreach and education shall be performed by the Village of Oak Park Forestry Department, ensuring that residents understand these practices as well. This UFMP will also be placed in the public domain for all residents to use as a reference.

Utilization and Maintenance of a Tree Risk Assessment Policy

Trees create great benefits, but they may also pose various degrees of risk. Tree limb failure can have catastrophic effects on people or property, and trees need to be well-managed and healthy to avoid that risk. A risk assessment policy is in place for the Village of Oak Park and is referenced in this Plan. This policy aids in identifying, documenting, and designating for removal or mitigation, trees which may pose a threat to public safety in a timely manner. This reduces the overall level of risk posed by trees, as well as exposure to liability from tree related incidents. Basic risk assessment language is included in this document, and the Tree Risk Assessment Policy is discussed in more detail on pages 73-77, and the ISA Basic Risk Assessment Form can be found in Appendix F. This policy should be reviewed and adjusted as any circumstances change.

Continued Utilization and Maintenance of a Storm Response Policy

Since storms are inevitable, they must be a consideration in any municipal management regime and a decision-making variable in managing municipal tree populations. Urban Forest Management should

always include strategies for building a resilient forest and a resilient community. The Village has a Standard Operating Procedure in place which guides storm damage cleanup response with regards to trees. Additionally, United States Forest Service's *Community Forest Storm Mitigation – A Guide for Communities* which was published in the latter half of 2021 can also be a reference for the Village to enhance its storm response policy.

Increase Total Urban Tree Canopy Cover from 47.68% to 50%

Tree canopy is important to the community because more and larger trees provide greater benefits such as decreased heating and cooling costs, pollution reduction, and increased storm water uptake. Tree lined streets are more attractive to homebuyers and potential new businesses, which increases home values, home ownership, and tax revenue. All of these factors benefit the community, so a direct goal will be to increase tree canopy in the Village of Oak Park. Currently, Oak Park contains 47.68% tree canopy coverage, compared to other land cover types, which is a commendable percentage compared to similar sized communities in the Chicagoland area.

Increases in tree canopy also come with increases in total benefits provided to the community. Based on data from the Chicago Region Trees Initiatives, we believe that an increase to 50% canopy cover is a realistic goal for Oak Park by 2043. This will be accomplished by increasing the number of trees on publicly owned property, as well as improving tree care allowing trees to live longer, become larger, and create more canopy cover.

Tree planting on private property will also be encouraged through public-private partnerships with local organizations and businesses. As we will show in the detailed portions of this Plan, these are real benefits that will help Oak Park Residents save money. For more information on Urban Tree Canopy, tree benefits, and other such information, turn to pages 35-39.

Mitigate Climate Change Effects

A proactive and effective strategy to mitigate a changing climate is to plant more trees, and in fact the United States Environmental Protection Agency lists tree planting as one of the more effective solutions to mitigate climate change through absorption of carbon dioxide (https://www.epa.gov/heatislands/using-trees-and-vegetation-reduce-heat-islands). Outside of their aesthetic value, trees have a great variety of environmental benefits, specifically offsetting climate change by producing a cooling effect in urban heat islands, and flood abatement by absorbing stormwater that otherwise would run off. Trees also act as long-term sinks for carbon

dioxide, where carbon from the atmosphere becomes "sequestered" in the tree's woody parts like the trunk and limbs as a result of photosynthesis, which is how trees create energy to grow.

Increasing tree canopy creates greater sinks for carbon dioxide, reduces localized heating from the urban heat island effect, and reduces environmental issues stemming from flooding. It also provides great habitat for birds, pollinators, and other beneficial wildlife that can enhance the urban environment. This will all be examined at several different points throughout this UFMP, in terms of examining the hard dollar benefits trees provide, looking at where trees can be planted to maximize their effect on heat islands and flooding, and looking at what species could be planted in the future as we are subject to higher average temperatures. For more information on using trees to mitigate climate change, turn to pages 51-56.

Maintain Wildlife Management Policy

As mentioned above, trees often serve as habitats for birds, pollinators, and other wildlife. The Village's complies with the Migratory Bird Treaty Act which prohibits the disturbance of birds, eggs, or nests of a wide variety of species. Presently, the Village will remove hornets' nests if they are active and located at a height that they are a threat to people, for example a nest that would be close to someone's head while walking on the sidewalk or a nest in a location where it could be hit with a car door or trunk. The great majority pose no safety hazard and are left untouched. The Village will also inspect for squirrel nests prior to performing tree work and will try to avoid disturbing nests unless it is unavoidable due to a high risk tree situation.

Tree Preservation during Construction

Sometimes trees can become damaged by construction activities, costing the Village money, and eliminating the benefit the tree had to the community. A basic tree assessment should be conducted prior to the issuance of a permit for construction activities. A tree protection zone must be established and maintained during construction and the Village should monitor construction activities to ensure local ordinances are adhered to. Removal of public trees for construction purposes is generally disallowed and shall be only at the discretion of the Village and will require prior written approval by Oak Park during site planning. Please refer to Oak Park's Zoning Ordinance 11.10 for details on the protection of significant trees on private property during construction.

Additionally, the Village is dedicated to supplying drinking water that exceeds all state and federal standards. With the issue of lead in drinking water becoming a concern for many municipalities, the

Village is anticipating that the quantity of lead service line replacements will increase significantly in the next few years. A direct goal of this Urban Forest Management Plan is to aim to preserve Village and significant private trees during all excavation and construction activities.

Increase Awareness of the Urban Forest in the Village of Oak Park, and Engage Stakeholders

The Village recognizes the value of engaging the community concerning Village forestry activities and improving public education opportunities and involvement with regards to the urban forest. One reason for the establishment and enhancement of an Urban Forestry program in Oak Park is to improve the lives of the residents, business owners, and other stakeholders who want to see the Village be a healthier, happier community. In order to make this happen, Oak Park will explore the possibility of looking for partners in the community to provide support for establishing a more robust public involvement program. Oak Park staff will plan to reach out to local garden clubs, philanthropic organization, residents, and business owners to make the forestry program innovative and community based. In this manner, residents and business owners in Oak Park can take ownership of this important and beneficial resource, and allow it to work for them, their families, businesses, and the good of the whole Village. For more on these innovative programs, and how you can get involved, turn to pages 17-20.

Maintain High Stocking Density at 98-99%

Currently, there are approximately 250 open planting spaces on Oak Park's streets, and the stocking density is very good at approximately 99%. While 100% stocking density might be possible to achieve over the 20 year scope of this plan, it is not actually always desirable, but we do believe that 99% stocking density is attainable and will reap benefits. This plan seeks to increase the overall number of trees by creating a multilayered canopy, consisting of large canopy trees with medium sized trees and smaller ornamentals growing beneath them. By using this approach, and also finding areas where new trees would be welcome in the landscape, the number of trees in Oak Park can be increased.

Explore and Enhance Funding Strategies

With unprecedented amount of federal dollars that may potentially become available to urban forestry programs in municipalities through the Inflation Reduction Act, the prospects for alternative funding sources in the Village are significant. The Village should plan to seek an array of grant funding opportunities from both government agencies as well as non-profit conservation organizations. To help enhance the Village's grant strategy, the Village can use this UFMP to identify Oak Park's long- and short-term forestry goals (programmatic and financial), the strengths and

weaknesses of the urban forest, and its forestry related resources, since if this historic funding opportunity materializes, the options of where grant dollars can be spent could be extraordinary.

The Village might also explore the possibility of establishing a community-based foundation to help provide alternative funding for urban forestry endeavors. With many Oak Park residents passionate about the Village's urban forest, a charitable tree foundation could provide 'buy-in' for community members.

Define Trees as Critical Stormwater Infrastructure

Green infrastructure is rapidly becoming recognized as being just as important as grey infrastructure in many ways. Chief among these green infrastructure components are trees, and specifically the stormwater mitigation effects they provide. A mature tree can intercept or otherwise mitigate over 5,000 gallons of avoided runoff every year. On a population scale, Oak Park's tree population of 18,526 trees is responsible for intercepting or avoiding over 4.5 million gallons of stormwater runoff each year. The loss of this resource due to storm damage, insect or pathogen invasion, or other such damage would have a critical impact on the local stormwater infrastructure. For this reason, a direct goal of this Management Plan will be to define trees as critical stormwater infrastructure, and that these assets should be compensated for when lost to unforeseeable events.

Sustainability and Climate Ready Oak Park

On Aug. 1, 2022, the Village Board adopted **Climate Ready Oak Park**, a comprehensive and long-range plan developed in response to the global climate crisis. The plan offers an ambitious vision, concrete commitments and actions that can be undertaken by all community members and organizations. A key goal to this vision is to establish and implement an urban forestry plan for the Village based on tree health and maturity, carbon sequestration and storage analysis, urban heat islands analysis, and existing distribution of tree cover. The plan should equitably distribute tree cover, increase tree cover along major thoroughfares and any areas with below average coverage, increase overall canopy and carbon storage, ensure sufficient species diversity to be resilient to invasive pests and climate change, plant larger maturing trees appropriate to the site, and promote sustainable maintenance in Oak Park and neighboring communities. Some examples of sustainable maintenance include proper mulching, tree health monitoring, and nesting bird practices.

Continued Use of American Forests Tree Equity Scores for Planting Prioritization

A map of tree cover in any municipality in the United States is too often a map of race and income and Oak Park has been striving to change this trend within Village boundaries by using Tree Equity Scores derived from metrics developed by an organization known as American Forests. Tree Equity Scores are ranked from 0-100 and are based on an evaluation of data including a neighborhood's existing tree canopy, population density, income, employment, surface temperature, race, age, and health. Trees are critical infrastructure that every person in every neighborhood deserves, and trees can help address damaging environmental inequities like air pollution. The Village presently uses Tree Equity Scores to prioritize plantings in areas with lower scores.

Increase In-House Staffing to Reduce Reliance on Contracted Forestry Work

Over the past 2-3 decades, the Forestry Department in Oak Park has become increasingly reliant on contracted work particularly for cycle pruning and a goal of this plan is to change that trend. The department currently functions with a Forestry Crew Chief and 2 Forestry Technicians and ideally the goal would be to increase that to 4 Forestry Technicians. These job titles are classified either as a Forestry Technician I for individuals with lower experience or Forestry Technician II for individuals with higher experience.

Additional Goals

There are no strategic timelines set forth here for these programs. As the direct goals of the Urban Forestry program in Oak Park are met or exceeded, these are goals to be discussed by the Village of Oak Park staff as time and budgets become available. We believe that many of these programs represent some of the most progressive Urban Forestry policies in the current climate, and that they should all be seriously considered for implementation.

The Arborist Registered Apprenticeship Program – Openlands

The Arborist Registered Apprenticeship (ARA) is 3-year, paid job training opportunity for individuals looking for a career in arboriculture. Openlands, the program sponsor, administers the program in partnership with the Department of Labor and local workforce development agencies. Openlands also coordinates with tree care companies and industry professionals across the Chicago region to provide training, create viable career pathways, and improve recruitment, retention and diversity in urban forestry. Program participants are provided hands-on job training and experience, while gaining credentials and knowledge on the many opportunities for arborists. By providing entry-level job opportunities, the ARA program is training the next generation of urban forestry professionals. Combatting climate change should

simultaneously build resilient infrastructure, improve community health and safety, and create economic opportunities for all people. Through the ARA, Chicago can lead and establish a career pipeline for all communities to access green jobs.

The Village might explore the possibility of partnering with the apprenticeship program is order to recruit arborist apprentices that can benefit from on-the-job training while also helping the Village's goal of increasing skilled in-house staffing.

Public Education and Outreach

It is suggested that Oak Park hold several annual tree education sessions, possibly to coincide with annual Spring and Fall planting cycles. These sessions may be taught by the Forestry Superintendent, other forestry staff, and/or Forestry Consultant, or other such qualified parties, and cover tree watering, fertilization, pruning, and the basics of how to spot insects and diseases.

An Arbor Day celebration is an example of one such outreach event where trees could be planted and education sessions run. The Village has been an active organizer of annual Arbor Day observations, but is considering revamping and enhancing the program to incorporate more education programs and hands on experiences with local schools or other entities. In addition, basic tree care pamphlets can be made available at Public Works and Park District offices. An Arbor Day celebration is an example of one such outreach event where trees could be planted and education sessions run.

Collaboration to Create an Oak Park Propagation Nursery

Consideration should be given to the establishment of a small propagation nursery in collaboration with Park District of Oak Park or Forest Preserve District of Cook County (FPDCC). The Village along with Park District of Oak Park, and the cooperation of FPDCC, can grow a share of its own trees, using much smaller trees obtained from wholesale nurseries at a fraction of the cost of a full-sized tree. Small trees can be purchased wholesale, and then grown to maturity on FPDCC land. This propagation nursery might be used as a test site for various species of trees that may be tolerant of climate change.

Such programs have been successfully instituted in other communities, and represents a quality investment that results in cost savings over the long term. Trees can be purchased when small, or donated from residents, and grown to plantable size on available land through collaboration.

We would recommend that the Village work with the Forestry Consultant, Park District, local nurserymen, FPDCC, and other strategic partners in order to explore this concept, and begin the planning phase in 2025, with the goal of having a functional nursery by 2030. The amount of time required for the care of young trees is minimal, and at an average cost of $250-$300 per 2" DBH tree wholesale, the Village could save a

significant amount of money in their tree planting program by pursuing this goal. In addition, unlike a community garden, local residents could assist with the care of these nursery trees, at the Village's and FPDCC's discretion.

Maintain and Enhance Contract Growing Program

One of the keys to a successful Tree Planting Program is the availability of high-quality nursery stock from local sources. Incorporated with the UFMP for the Village is a diversity vision for 2033 that includes a great variety and diversity of different trees. An unapproved species list has also been developed, which lists tree species that are prohibited for planting on public property. Having this information is an advantage for the Village, in that the future composition of the urban forest in terms of species is generally already known. It is believed that a comprehensive tree planting plan will be an important part of this process as well.

This knowledge, however, does not guarantee the availability of those specific trees when the time arrives to fill a particular site, which is a condition that a contract growing arrangement can solve. The Village currently has a working relationship with a local nursery and has effectively utilized contract growing agreements to successfully implement biannual planting cycles. By continuing this program, the Village will not have to compete with the landscape industry, other local organizations responsible for tree planting, or local retailers. Trees are ordered in annual increments. Each year, Oak Park will purchase the trees previously ordered for that year and place an order for the following year. This gives the supplying nursery time to procure, plant, and bring the agreed upon trees to the size and branching habit specified.

This already successful program could be expanded to include other nurseries as well, at the discretion of the Village. Supplying nurseries should be located within a specified distance from the Village, to ensure climatic zone compatibility and reduced transportation costs and planting stock exposure to the elements. Nurseries should be of sufficient production capacity to furnish all trees ordered in advance by the Village, as well as possible increases when necessary. Nurseries should be chosen not only on their capacity to produce stock, but to meet quality, form, and health standards as specified by the Village. The nursery should allow tagging by the Forestry Superintendent or other representative as well.

Trees should be evaluated one year after planting and assessed for health and survival. Responsibility for replacement of trees that have not survived the one-year guarantee period is divided equally between the supplier, the planter, and the Village. Trees that are dug or balled improperly will be replaced by the nursery. Trees improperly handled or planted are replaced by the planter. Trees that do not survive because of lack of maintenance are replaced by the Village.

Private Property Tree Planting Education Programs

Tree planting on private property is actually a direct goal of this Urban Forest Management Plan, as noted above. Though the Village has no formal jurisdiction to plant trees on private property, the benefits of tree planting on private property are substantial in terms of increased canopy cover, energy savings, storm water benefits, and other benefits. The Village should consider encouraging residents and business owners to plant trees on their property, using the tools available at their disposal. Partnering with local nurseries to create a program where residents can purchase trees from that nursery at a reduced price may also be a way to encourage tree planting on private property.

Another idea which has been successfully implemented is having the Village purchase trees from a wholesale nursery at wholesale prices, and then have an annual tree sale to local residents. The Village resells the trees at a slight markup from the wholesale cost, but still less than retail, and uses the proceeds to fund its forestry initiatives. Such programs would encourage tree planting on private property by reducing tree costs to the residents.

There are many ways to think creatively about how to encourage tree planting on private property, and no single solution which is universally applicable. We encourage the Village to explore such opportunities to build tree canopy throughout its entire land area.

Wood Utilization Program

As an especially long term goal, the Village has expressed interest in exploring the option of recycling urban wood. As the UFMP recommendations take effect, a considerable amount of removed tree material will be generated that may be suitable for use as urban timber. Urban timber is defined as saw logs generated from urban tree removal operations. Larger and longer logs are suitable for dimensional lumber production, and smaller material may be used to produce many other products. Forming strategic partnerships with local sawmills, woodworkers, and carpenters would be an important early goal of this program, while creating a market for the finished goods will be an ongoing goal. Some Midwest communities that are active members and log suppliers for the Urban Wood Network include Glen Ellyn, IL, Ann Arbor, MI, and Stoughton, WI.

Urban timber can be utilized to mill wood into a large variety of products including dimensional lumber, fine furniture, and artisan pieces. In order to successfully upcycle urban timber into usable lumber, several steps must be followed in order to produce logs suitable for milling. Urban timber production will include specifications for tree removal operations that will produce saw logs of the proper dimension and quality. Specifications for the construction of public buildings that require a specified amount of upcycled, local urban timber may qualify for LEED certification points, and raising awareness of the benefits of the urban forest in general, creating a saleable product that can serve as a revenue stream. A sample Urban Timber Harvesting specification in Appendix K.

Strategic Partnerships

Strategic partnerships are a very effective means of getting forestry projects funded when tax funding may present a shortfall, or when additional volunteer labor may be of benefit. These typically involve either public-private partnerships or partnering with other public entities. Typically, the organizations seen participating in these programs include local garden clubs, park districts, non-profits, public institutions, and other such groups. This will be an ongoing goal, and continuing partnerships with new organizations shall always be sought.

Cook County Forest Preserve District

The Forest Preserve District of Cook County is an organization which manages 70,000 acres of natural areas, trails, and other projects in Cook County. Several preserves are located very close to Oak Park. FPDCC would be a valuable partner in collaborating with the Village to use FPDCC land to create a propagation nursery. They have a great wealth of knowledge and are worth reaching out to for partnership in accomplishing the goals of this plan.

Metropolitan Water Reclamation District

MWRD strives to protect businesses, homes and neighborhoods from flood damages, clean wastewater entering our plants and manage water as a vital resource for the area. As one of the primary goals of this UFMP is to define trees as critical stormwater infrastructure, MWRD is a very logical partner. They can be an outlet for disposing of wood chips when needed and they also give away oak and other seedling trees every year as part of their efforts, and using this resource as a source of trees would be welcome.

Park District of Oak Park

Park District of Oak Park may be able to coordinate environmental projects going forward including the creation of educational and outreach programs for residents to learn how to properly care for their own trees. This type of program might focus on trees, tree care, education, and other environmental initiatives.

Openlands

OpenLands is a highly diverse NPO in the Chicagoland area which focuses on many aspects of ecology in the urban and suburban environment such as natural areas, urban forestry, wetland conservation, and other such topics. The Village may consider partnering with Openlands to participate in the Arborist Registered Apprenticeship (ARA) program. They also offer trainings and volunteerism efforts, such as the TreeKeepers program, which educates residents on the care of young trees, tree biology, and the like.

Chicago Region Trees Initiative

CRTI is actually an amalgamation of many groups acting together as a driving force for establishing the importance of urban forestry in the Chicagoland area and abroad. CRTI has several working groups which handle topics such as forest composition, risk management, communications, etc. They partner with local organizations to get tasks accomplished and publicized.

Morton Arboretum

The Morton Arboretum, aside from being a wonderful place to visit to learn about trees, also has significant educational and operational resources available. They offer educational programs, volunteer education, and a whole host of other services which can make this plan a success.

Illinois Department of Natural Resources

The IDNR's mission is to protect, perpetuate, restore, conserve, and manage the forest and related resources of Illinois, both public and private. To that end, they have an abundance of resources, staff, and a network of partners which can help Oak Park accomplish the goals laid out in this plan, including funding for such things as tree planting or local education and outreach.

Illinois Arborist Association

The mission of the Illinois Arborist Association is to "Foster interest, establish standards, exchange professional ideas and pursue scientific research in Arboriculture." IAA is a professional organization made up of certified arborists from throughout the state of Illinois. The association strives to further the education of certified arborists and can serve as a valuable resource to reach the goals of this plan.

WCMC - Suburban Tree Consortium (STC)

The mission of the STC is to maintain and improve the urban forest within the Chicago metropolitan region, thereby enhancing the quality of life for the region's residents, by fostering cooperation and communication at the municipal level; supporting cost-effective means of acquiring and installing trees; and offering technical assistance and information regarding municipal forestry. As a current member of the STC, the Village may look to the organization for resources to achieve this plan's goals.

ArbNet

ArbNet is an interactive, collaborative, international community of arboreta and tree-focused professionals. ArbNet facilitates the sharing of knowledge, experience, and other resources to help arboreta meet their institutional goals and works to raise professional standards through the ArbNet Arboretum Accreditation Program, of which the Village holds the Level 2 Arboretum Accreditation.

Urban Wood Network – Illinois Chapter

The Urban Wood Network was developed in 2017 to formally unite unique urban wood industry groups and efforts under the common mission of growing professional and consumer confidence in the urban wood industry through information, collaboration, and connection. Since the early 2000's, the founding groups behind the Urban Wood Network program have worked diligently to unite, promote, and demonstrate urban wood utilization. Now the ever-growing network of urban wood industry professionals and state-specific chapters are provided access to consistent messaging/marketing tools and a useful platform for collective experience, support, and connectivity to help the industry thrive.

West Cook Wild Ones

Since 2013, Wild Ones West Cook has been sharing information with the community about how important their landscaping choices are. Their activities include providing educational monthly programs about our native ecosystems, native gardening, and other related topics to the public; hosting a native plant sales, which helps people get ethically sourced and sustainably grown plants from local growers at a great price; collaborating with and supporting other local environmental organizations; developing online and print resources; and sponsoring conferences where we have nationally recognized speakers present.

Garden Club of Oak Park & River Forest

The Garden Club of Oak Park & River Forest promotes an interest in gardening and the beautification of the landscape in the community. The Garden Club is active in the community and in partnership with local organizations it contributes to the beauty of Oak Park through donations and volunteer service. Trees are an essential part of gardening, and spreading the word about the importance of trees can be accomplished through local volunteers like those at the Garden Club and may serve as a resource for education and other environmental initiatives.

Local school districts

Urban Forestry is by and large a fairly unknown profession, but there are many aspects of STEM concepts that go into it: GIS Mapping, chemistry, physics, biology, and math are all essential facets of Arboriculture. A relationship with local districts could be a reciprocal relationship, where students could engage in study projects based around trees, citizen science, and volunteerism, and Village staff or urban forestry consultants could provide guest lectures to the students in any of these areas and develop interest in or even promote careers in the green industry.

Oak Park Public Library

The Library is a place where people congregate and learn. As such this would be a first rate location to advertise opportunities for education about urban forestry, as well as stocking and showcasing books related to urban forestry and its related disciplines.

Illinois Public Works Mutual Aid Network (IPWMAN)

It is the mission of IPWMAN, in the spirit of intergovernmental cooperation, to develop and maintain a statewide network of public works related agencies whose principal purpose is to provide mutual aid response and recovery assistance to each other when confronted with natural or man-made emergencies and disasters. A partnership with IPWMAN can be an important resource following storms or to dispose of wood for mulch purposes. They also can be a resource for mutual aid should we be hit by a storm that exceeds our in-house and contractor resources.

Personnel

In order to streamline Urban Forestry Operations, tasks will be assigned to various staff and contractors/consultants.

Forestry Superintendent

The Forestry Superintendent is responsible for implementing forestry programs with the approval and cooperation of governmental jurisdictions in Oak Park. This position will seek bids from qualified Tree Care Contractors to complete the work approved by the various agencies, as well as maintain the tree inventory when possible, and act as a representative for public concerns. The duties of the Forestry Superintendent may be delegated to the Forestry Crew Chief or the Forestry Consultant, however, with regards to the consultant, the Village will ensure that no conflict of interest exists in doing so.

Forestry Crew Chief

The crew chief is a working supervisor and assistant to the Forestry Superintendent who can make decisions regarding forestry programs and day to day operations. The crew chief prioritizes work and directly supervises Forestry Staff.

Forestry Division Staff

Forestry Division Staff are tasked with the day to day, in-house operations related to the Urban Forest. Over the course of this plan, a goal will be to increase staffing to include a crew chief and 4 full-time Forestry Technicians. Ideally, as the workload capacity for forestry staff grows, an objective will be to have in-house staff prune all trees smaller than 10" DBH.

Tree Care Contractors

Tree Care Contractors are responsible for performing work identified by the Forestry Superintendent or their designee, in a timely, safe, and expeditious manner. The Tree Care Contractor must have at least one International Society of Arboriculture Certified Arborist on site when work is being performed. The contractors will also guide and participate in the performance of Tree Trimming, Pruning, Removal, and Plant Health Care operations. Other operations, such as Tree Planting, Tree Watering, and Tree Mulching do not have to be performed under the direct supervision of a Certified Arborist.

Forestry Consultant

The Forestry Consultant is responsible for impartially assessing the tree population on a periodic basis, at the discretion of the Forestry Superintendent or their designee. The Forestry Consultant communicates the needs of the trees to the Forestry Superintendent or their designee so that individual needs in terms of tree planting, removal, and maintenance can be performed. The Forestry Consultant may also function as the Forestry Superintendent during periods of the Forestry Superintendent's absence at the request of the Village.

Sustainability Division

The Forestry Division works with the Sustainability Division to help meet goals of the Climate Ready Oak Park plan, to collaborate with local partners, and to share information and grant opportunities.

Public Works Director/Deputy Public Works Director

The Public Works Director, the Deputy Public Works Director, or their designee can exercise authority related to decision-making concerning the pruning or removal of Parkway Trees.

Planning & Engineering Division/Neighborhood Services/Development Services

Designated Village staff will exercise authority related to enforcing the existing and proposed changes to the Village Code and Ordinances as referenced by this document, particularly with regards to tree preservation during construction activities. The Neighborhood Services Department handles inspections and the Development Services Department handles permits and planning.

Community Design Commission

Presently, a forestry advisory role is part of the Community Design Commission's duties. This group serves as an advisory board and one of its roles is to promote public outreach and welcome public input on tree related issues. In this manner, residents in Oak Park can take ownership of this important and beneficial resource, and allow it to work for them, their families, businesses, and the good of the whole Village.

State of the Urban Forest

Using the updated tree inventory data for the Village of Oak Park, it was determined that there are, at present, a total of 18,526 trees on Village Owned parkways and rights-of-way, along with approximately 250 open planting spaces that are currently recorded. The charts and statistics in this portion of the Management Plan illustrate that the tree population in Oak Park can be characterized as being in overall above average condition and the stocking density is very good at 98-99%. The species diversity in Oak Park is excellent with 131 individual species represented. Based on the following data in the Management Plan, the Village of Oak Park will be equipped to use this valuable information to address short-term concerns, long term management considerations, and overall planning objectives.

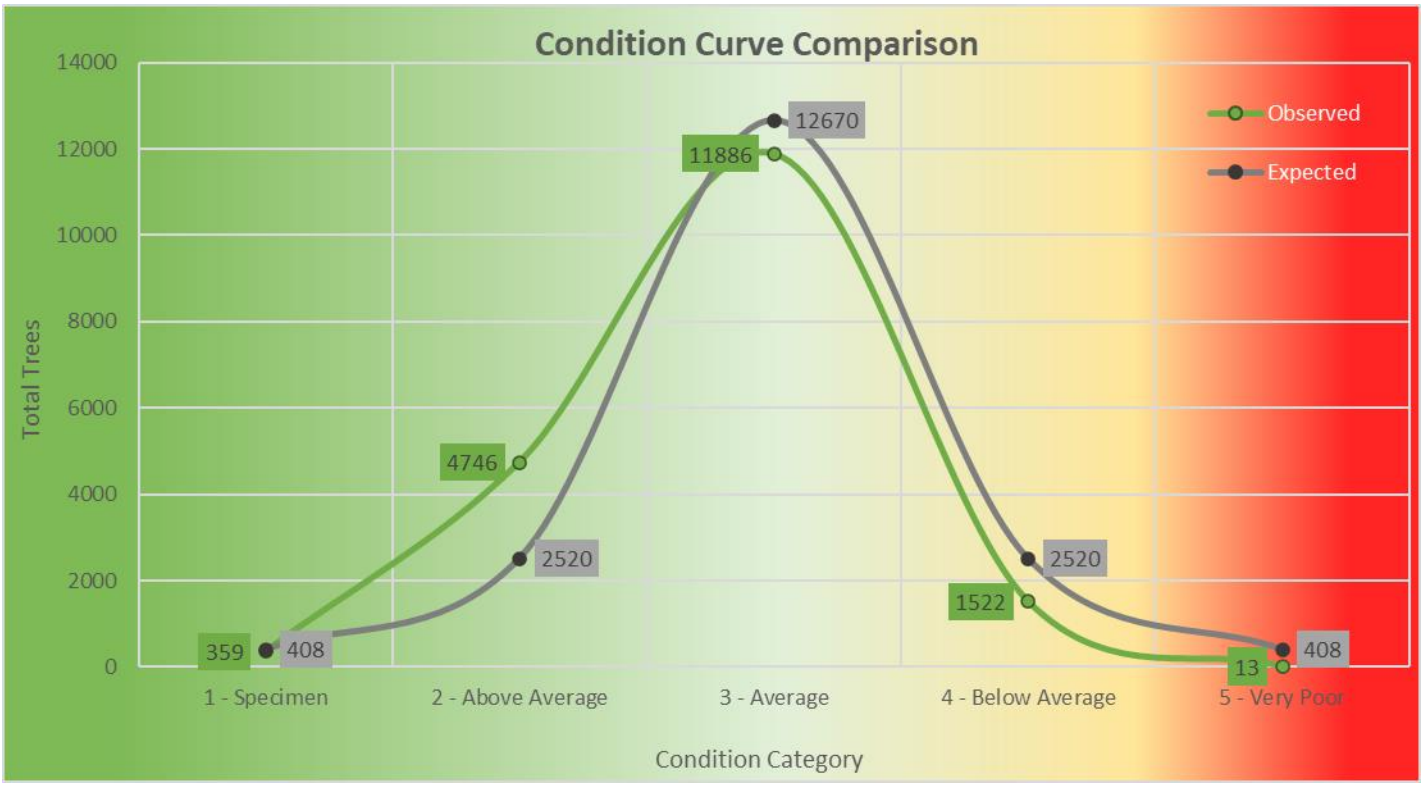
Basic Statistics – Village ROW and Village-Owned Property Trees

	2014	2022	2023
Total Trees	18,744	18,363	18,526
Total Stumps	376	117	105
Total Species	129	130	131
Total Diameter Inches	291,199"	266,048	270,799"
Average Tree Diameter	11.09"	14.49"	14.62"
Average Tree Height	24.90'	32.43'	32.24'
Average Crown Spread	21.43'	24.55'	24.57'
Total Crown Volume	NA	314,140,145 cu ft	316,973,524 cu ft
Average Crown Volume	NA	17,107 cu ft	17,110 cu ft
Average Tree Condition	3.02 (Average)	2.81 (Well Above Average)	2.79 (Well Above Average)
Average Tree Structure	3.01 (Average)	2.93 (Above Average)	2.92 (Above Average)

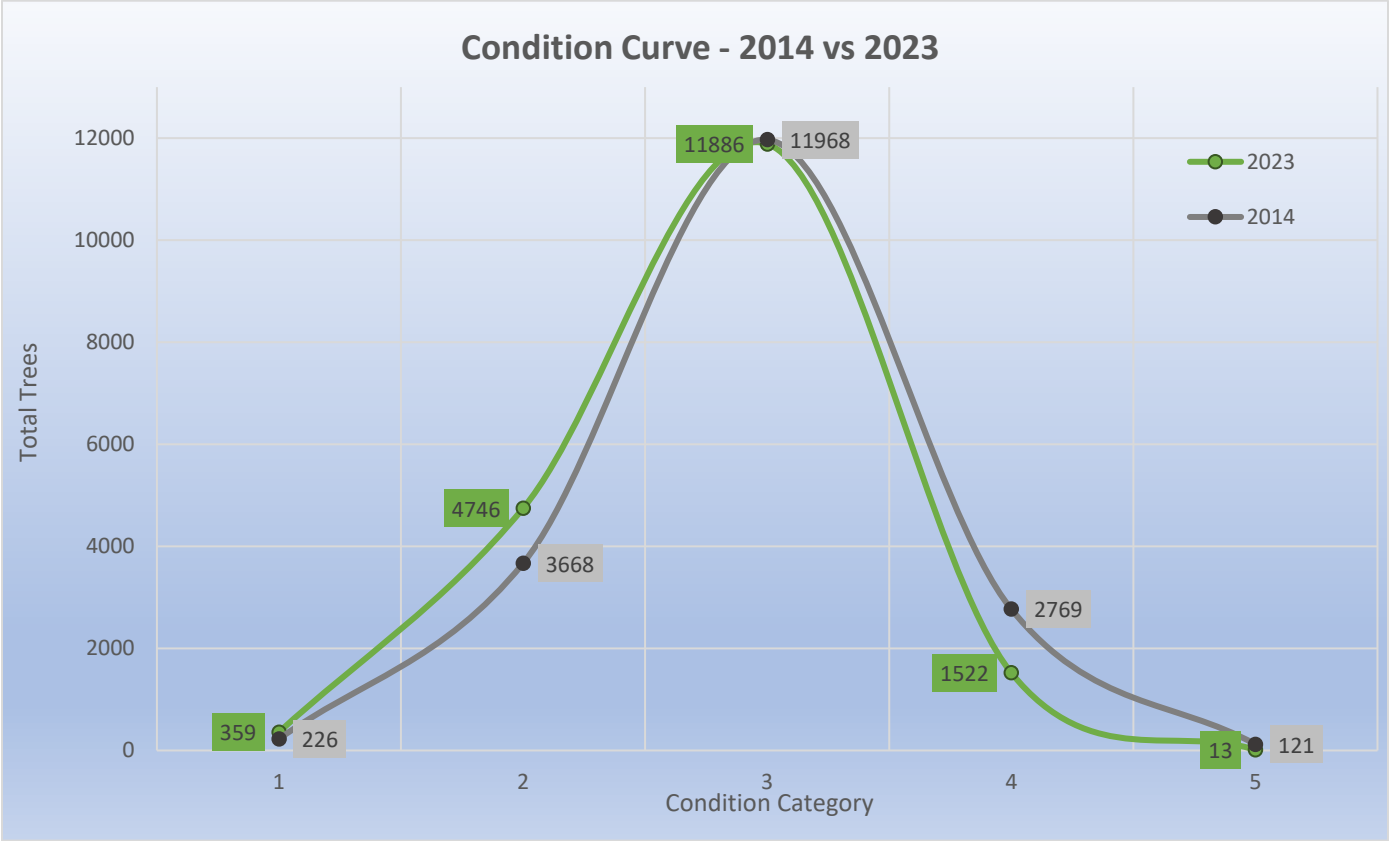
Condition Statistics

During the tree inventory and update, the condition of each tree was rated using a 1-5 rating system. The rating criteria is as follows:

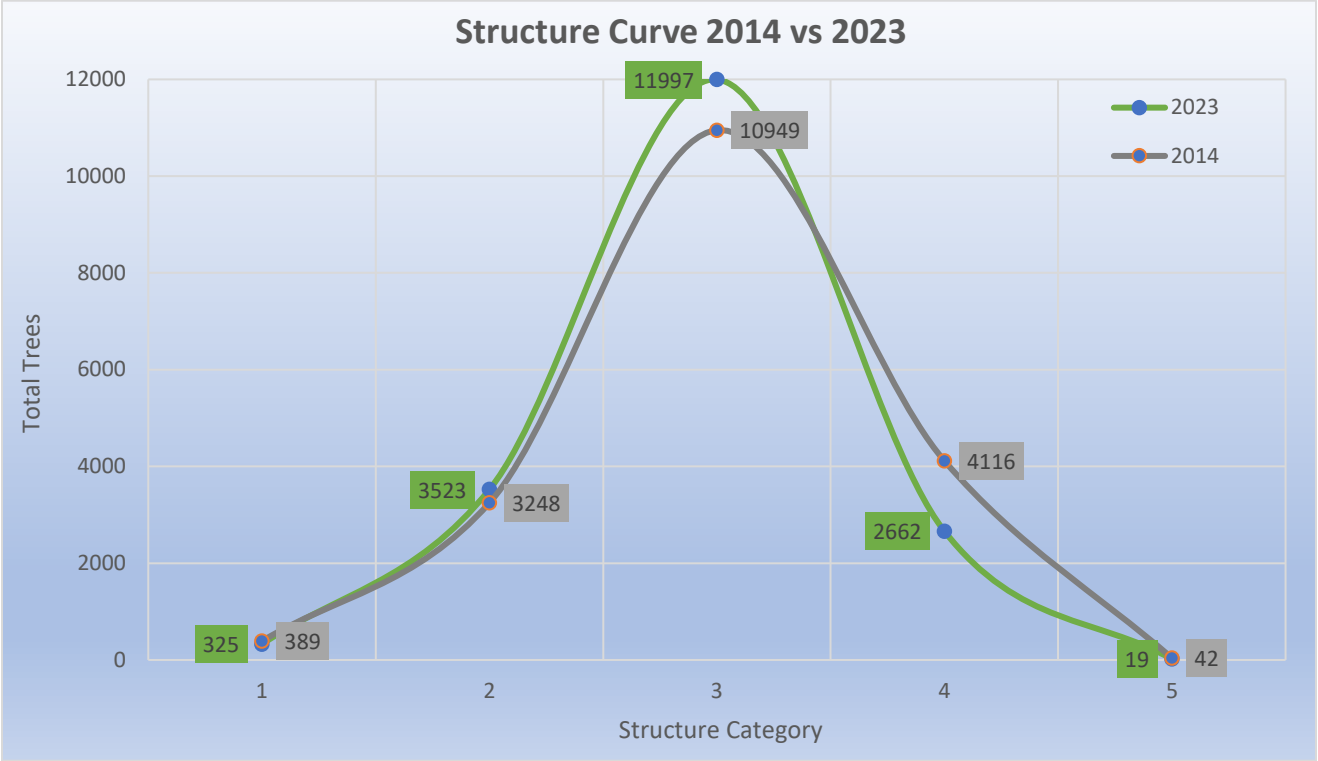
Condition 1	**Specimen** – Tree has no observable defects, wounds, diseases, and has perfect form for the species. Since younger trees are generally trouble free, a condition 1 tree must by the Forestry Consultant's definition be a minimum of 16" DBH. These are legacy trees, and as such are rare.
Condition 2	**Above Average** – Tree may have a small amount of deadwood, or a very limited number of minor defects. The overall form of the tree must be good, and consistent for the species. These trees, by the Forestry Consultant's definition, must be a minimum of 8" DBH.
Condition 3	**Average** – Tree has moderate amounts of deadwood, wounds, or other defects, but is generally healthy. A wide variety of forms is acceptable for this group, which is meant to define the middle ground around which better or worse trees can be defined.
Condition 4	**Below Average** – Tree has defects, deadwood, wounds, disease, etc. which are likely to cause a need for removal. Very poor form or architecture can put an otherwise healthy tree in this category as well.
Condition 5	**Very Poor** – Tree must be removed. Defects are too far advanced for the tree to be reasonably saved. Like condition 1 trees, these are rare, as generally trees approaching this level are removed before they deteriorate to this level.



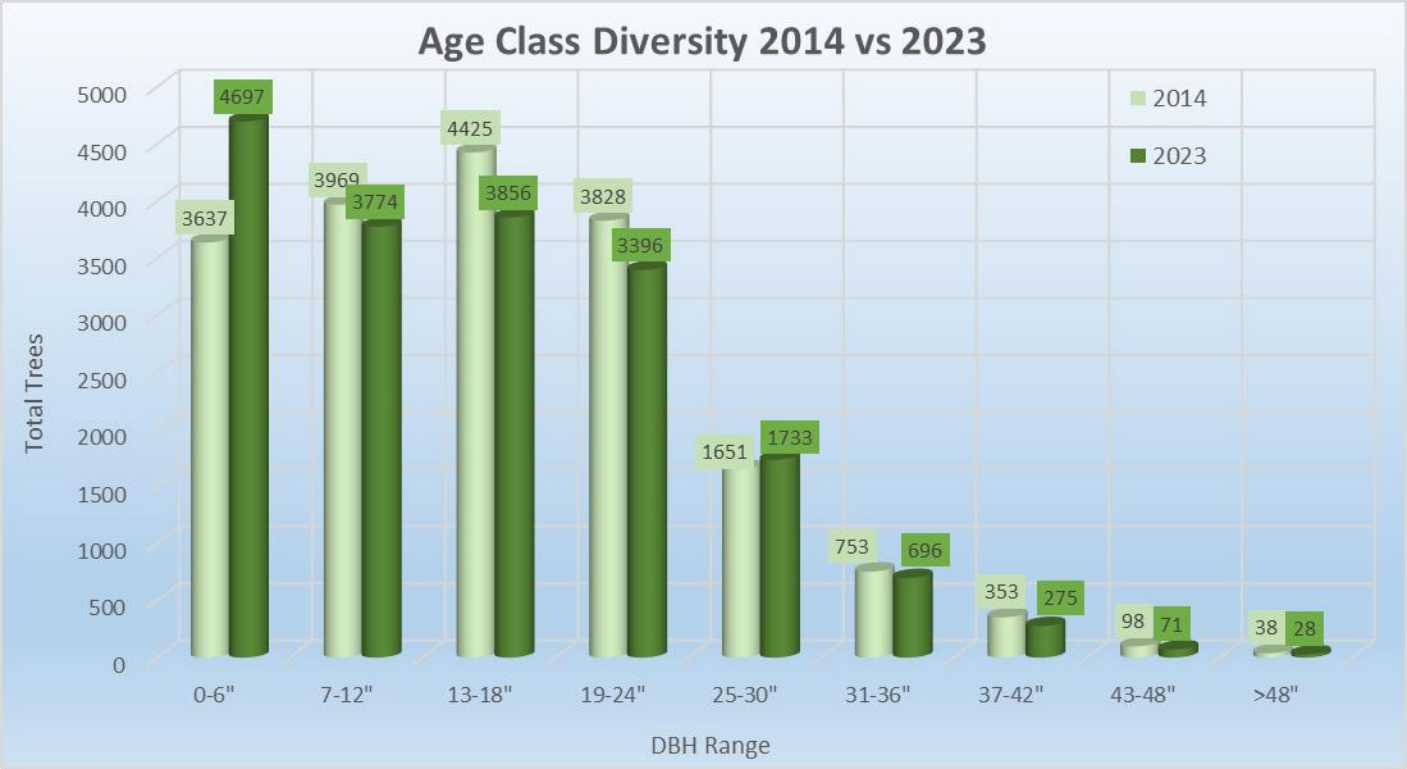
The above curve represents the distribution of trees in each of the categories enumerated above. As stated in the collection parameters section, deviations from the expected normal standard distribution can serve as a useful tool in analyzing the overall health of a tree population, and for this reason, we have included a theoretical curve representing a normal distribution so that comparisons can readily be made. Normal standard distribution, other known as a bell curve, is based on the calculation that approximately 68% of the population will fall into the average (Condition 3) category, approximately 14% will fall into the above average (Condition 2) or below average (Condition 4) categories, and approximately 2% will fall into the specimen (Condition 1) or very poor (Condition 5) categories. The green line with green labels represents what we observed in the field, and the grey line with grey labels is the predicted normal distribution. The average tree condition for a parkway tree in Oak Park is 2.79 for all trees which is well above average indicating an overall vigorous and well-maintained tree population.



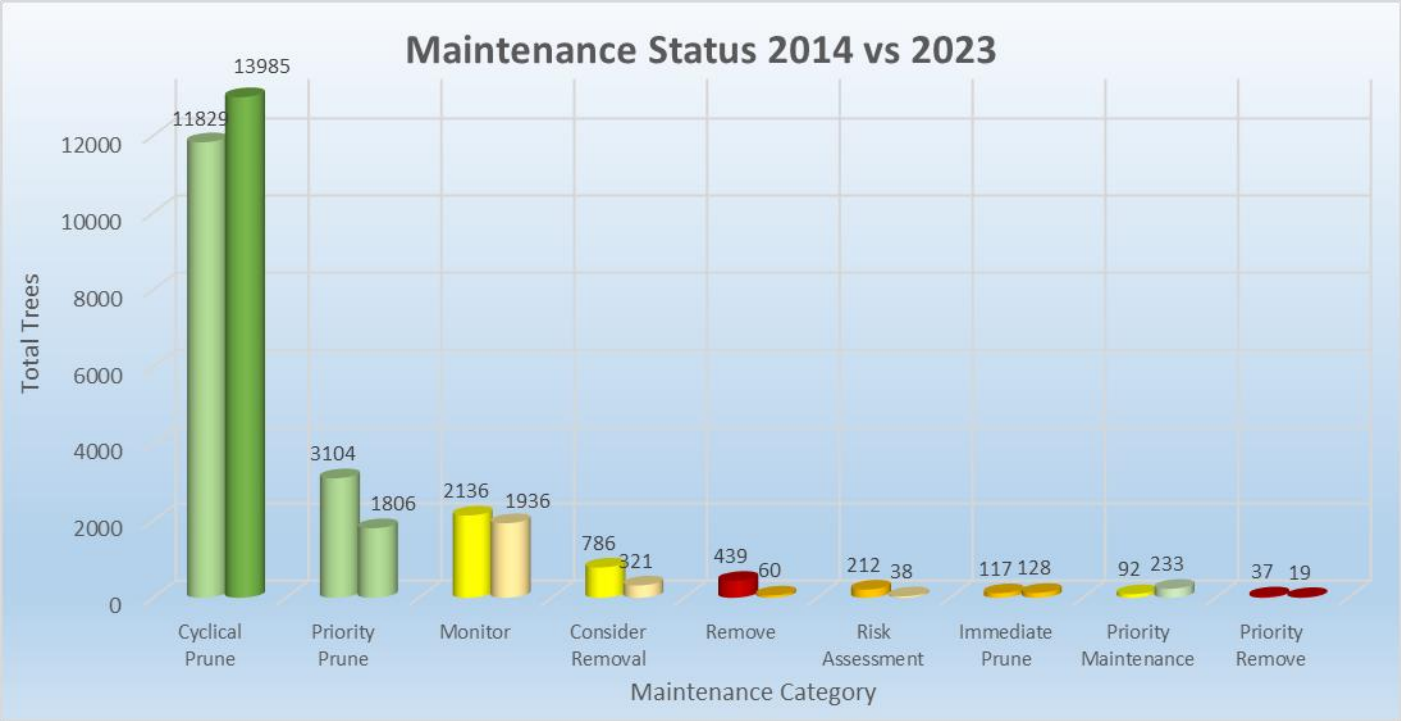
For purposes of comparison, we have included the condition curve from the original 2014 inventory along with the 2023 condition curve as a means of benchmarking how successful the forestry program has been over the past several years, and as illustrated, there have been significant changes since 2014, all very positive.



Tree structure was also evaluated, independently of the Condition of the tree. This was necessary in large part because trees with poor architecture must be prioritized for removal above those with good structure, which may remain for a longer period of time without posing a risk. Typically, the tree condition and tree structure are linked, which is to say that finding a healthy tree with poor structure is rare. The opposite can be more common however, such as an Elm tree with excellent structure which is declining due to DED. However, for many trees, condition and structure have a natural tendency to be the same number. By and large, the pattern observed for tree structure was very similar to that seen with tree condition, and for largely the same reasons as those noted above. An excellent standard of care, and utilization of the tree data will continue to increase the overall quality of tree architecture in Oak Park.



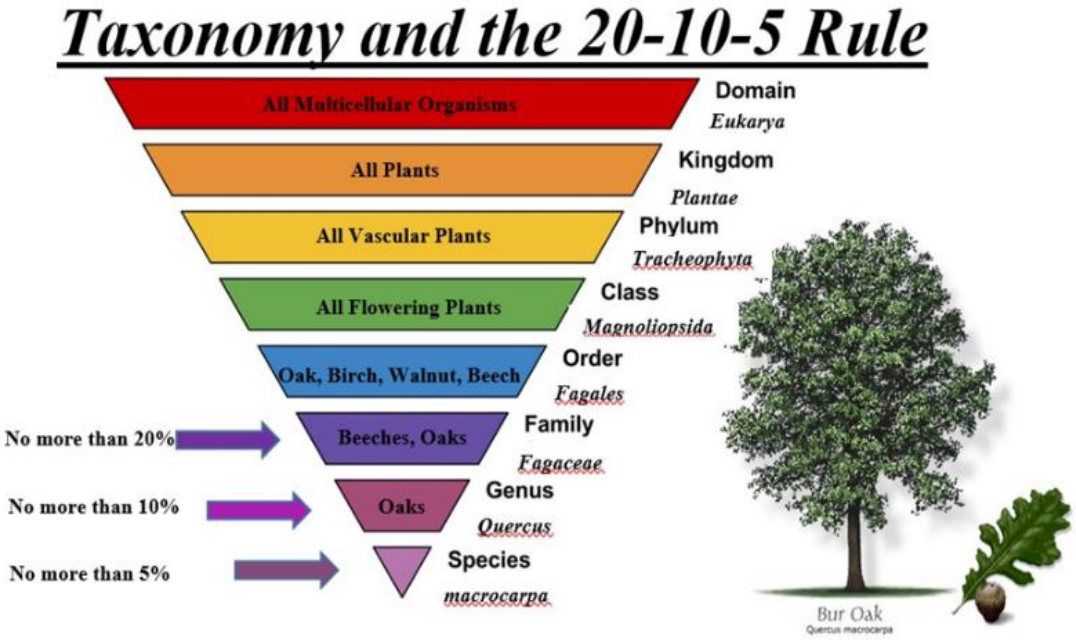
As can be seen from the above chart, much work has been done in Oak Park in the past 8 years. The number of young trees is the 1-6" DBH has increased dramatically, from 3,637 to 4,697 and this is primarily due to the reforestation that has occurred due to mass removal of Ash trees. The remaining age classes have all experienced rather modest decreases in number and this is primarily due to the removal of under-performing, over-mature, or high risk trees. It should be mentioned that the number of trees in the 30"+ categories are often lower due to the natural senescence and ensuing decline of trees on urban parkways. A fairly equal number of trees in each age classification is, within reason, desirable and indicative of a consistent focus on tree planting and tree maintenance in the Village over the years, and shows that the right trees are being planted in the correct locations. As the younger population matures and moves into the next higher category and new trees are planted replacing older, removed trees, the Village has an opportunity, over time, to bring the tree age classes in Oak Park to a more balanced level.



The graph above details the maintenance recommendations of the tree population. As has been discussed in previous update reports, this graph illustrates the high level of tree care that exists in Oak Park with nearly all categories having reduced numbers with the exception of Cyclical Prune, which is the default category, and Immediate Prune and Priority Maintenance, which have seen an uptick. We applaud the Village for its commitment to this high level of care and its role as steward to an exemplary urban forest.

Diversity Analysis

Taxonomy is the method by which scientists classify plants, animals, and other life forms into distinct categories. A species is unique. There is only one type in that category, such as Bur Oak (*Quercus macrocarpa*), which refers to only one specific type of tree. A genus, however, is a group that may contain multiple species. All Oak trees, for instance, are in the genus *Quercus*. The further down the taxonomic ladder you go, the more similar things become.



The more similar tree species are to each other, the higher the likelihood that an insect or pathogen can exploit every species of that genus. Emerald Ash Borer is a classic example of this, as it affected every tree species in the ash genus. The most effective prevention of tree loss we have is to limit the number of trees planted that a new pest or pathogen can affect. While diversity at the species level is important, it is also important to achieve diversity on the genus and family levels, so that a large selection of trees are planted.

The "20-10-5" rule for Oak Park's future tree plantings is recommended, which states that no more than 20% of any one family, 10% of any one genus, and 5% of any one species shall be planted during any one planting cycle. It will also be a long-term direct goal of the forestry program to have the tree population as a whole in compliance with the 20-10-5 Rule, although it may not be possible by the 2043 date used in this document. This level of taxonomic diversity is consistent with today's arboricultural industry standards (see above graphic).

The old paradigm of urban forestry was to create tree lined streets and parks in which every tree was the same type, shape, age, and height. This was thought to produce a uniform appearance. Urban foresters have now learned that once a pest or pathogen is introduced into a monoculture planting such as this, an epicenter of infestation is created that may cause serious damage, both ecologically and financially. Diversity in the urban forest helps to prevent and reduce the impacts of pests and

pathogens. There are three aspects of diversity in the urban forest. We will examine these in detail, below.

Taxonomic (Species) Diversity

Why is it important to plant a diverse set of trees at the species, Genus, and Family levels? Simply put, it is to ensure that we will not fall victim to mass tree loss from pests and pathogens in the future. The reason Emerald Ash Borer (EAB) was such a devastating expense for many municipalities was because their tree populations were composed of over 20% Ash trees. When these trees died and had to be removed, those municipalities lost 20% of their trees.

This comes with the obvious expense of having to remove these trees and replace them. But it also comes with hidden expenses as well, namely the loss of the ecological services that those trees provided: Homes cost more to heat and cool, storm water infrastructure falls under heavier pressure, and increases in pollutants and greenhouse gases may be observed. For all of these reasons, a more diverse group of trees needs to be planted, such that we are never at risk of losing more than 5-10% of our trees at any given time due to a pest or pathogen.

As will be discussed in further detail below, the tree population in Oak Park is by far dominated by species of Maples. In decreasing numbers, the remaining top 5 include Oaks, Elms, Lindens, and Hackberries.

Spatial Diversity

Spatial diversity is the concept of mixing tree species over the whole geographic area. The easiest way to slow the spread of any new pest or pathogen is to increase the distance between potential host trees. Every pest or disease, such as EAB or Dutch Elm Disease (DED), has a limited area to which it can spread in a given time frame. The more difficult it is to get to the next host tree, the less of a problem the pest or pathogen becomes, and the easier quarantine becomes.

In addition to the functional benefits provided by increasing spatial diversity, organizations which have implemented diverse planting over the past several decades have demonstrated that such diversity yields an arboretum-like landscape that is both functional and aesthetically pleasing. At present, the Spatial Diversity in Oak Park is moderate primarily due to the significant number of Maples. During the tree planting planning phase, extra care should be taken to ensure that new plantings are done in a manner that yields a highly spatially diverse tree population, and creation of areas of low spatial diversity (monocultures) will be avoided.

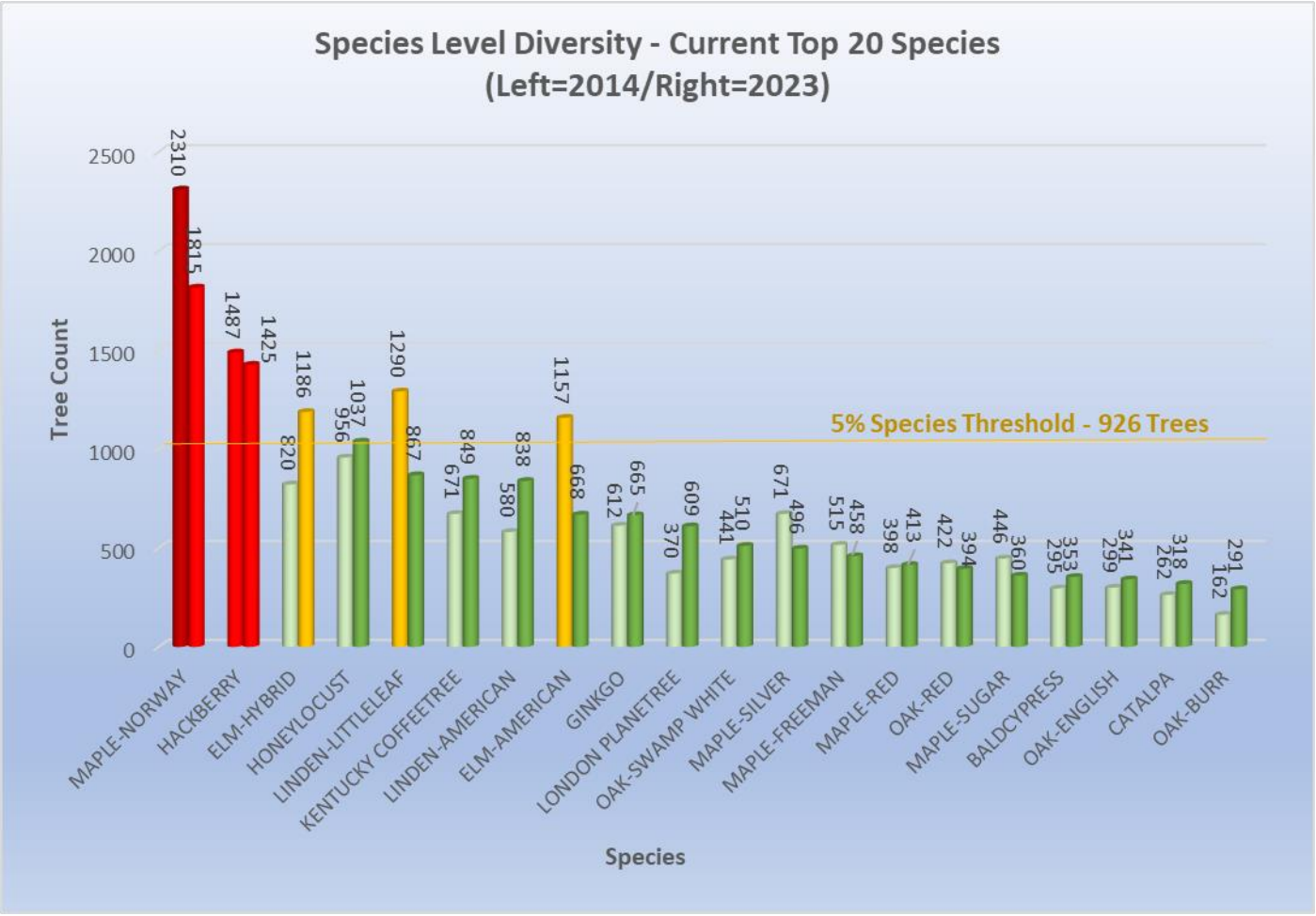
Age-Class Diversity

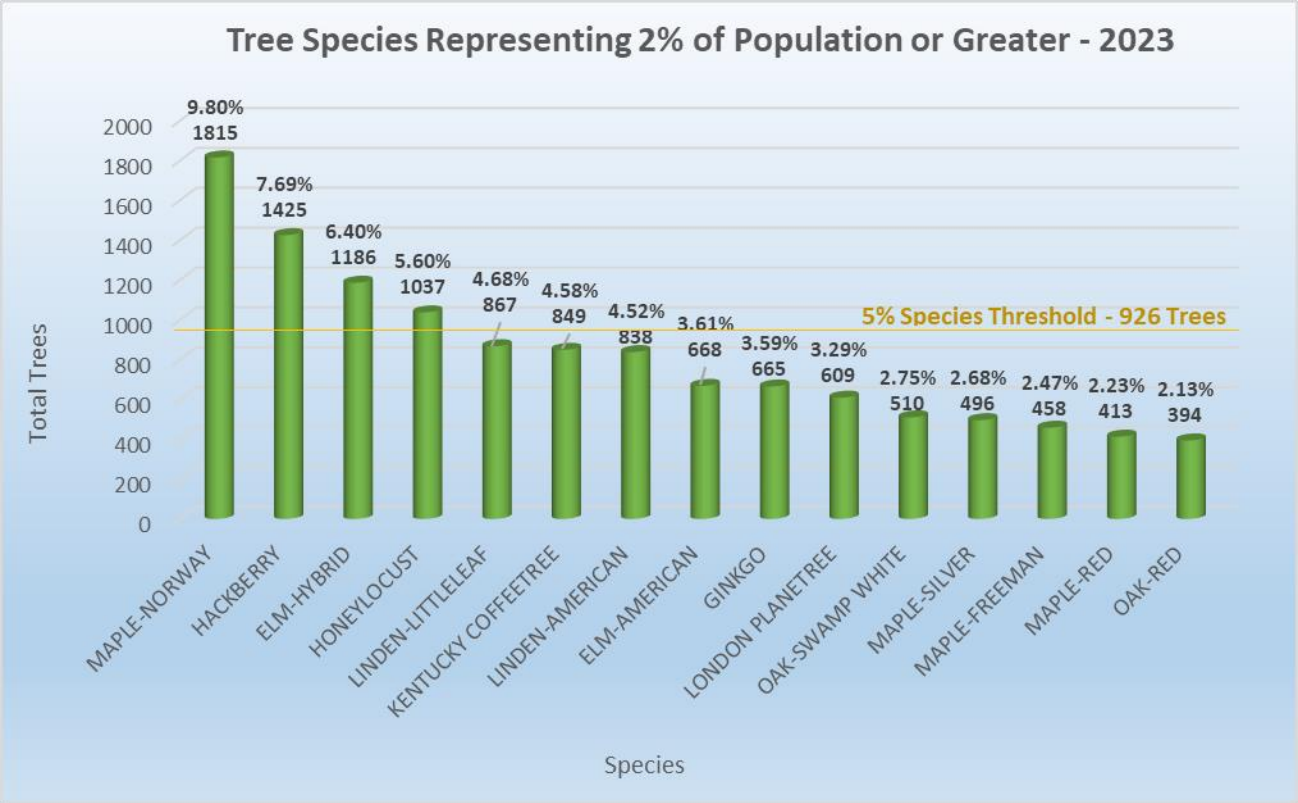
Age-class diversity is also an important consideration. A healthy natural forest has trees of many ages. Young, intermediate, and mature trees allow for regeneration, replacement and vigor in the overall forest community. A mixture of tree species, locations, and ages will lead to great diversity, which insulates a natural forest against pest and pathogen outbreaks. The Urban Forest is no different. The outdated urban forestry paradigm promoted even-aged tree plantings, so that all trees were approximately the same size and age. However, once these trees begin to decline, most will

require removal and replanting simultaneously. This can leave an entire street segment or neighborhood without shade and aesthetics for a long time.

The current approach of the urban forestry community is to strategically plant trees on streets or in neighborhoods over a longer timeframe. With this strategy, trees will grow to maturity in different stages, and decline at different times. When declining trees are eventually removed, there will always be a variety of age classes and tree sizes on a block or in a neighborhood. This reduces the pressure to plant trees in an area immediately after tree removal, helping to manage costs. A mixed age-class planting ensures that mature trees are always present in a neighborhood. It also will allow for strategic planting of smaller or medium sized trees.

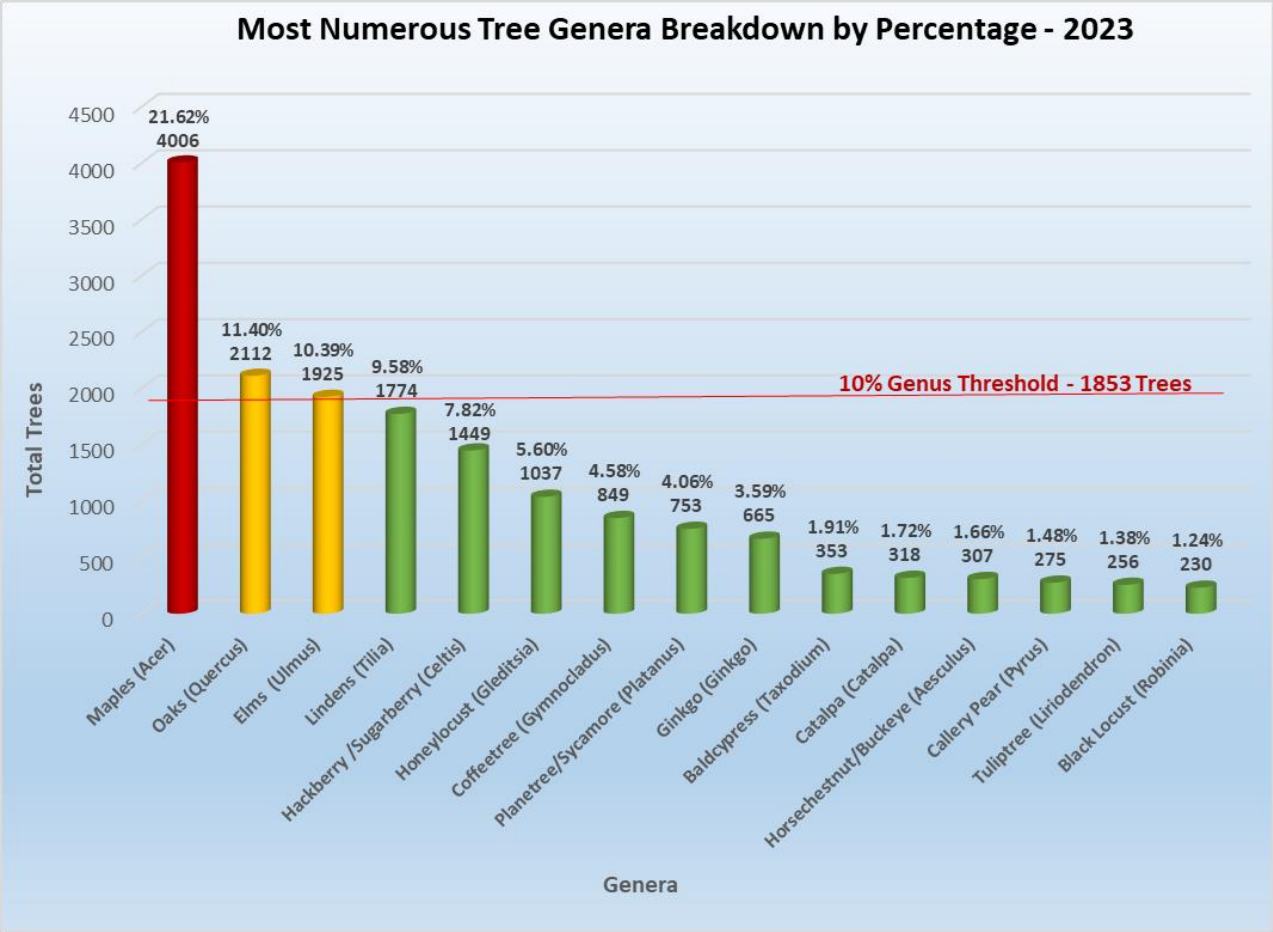
An additional benefit of mixed-age plantings is the ability to plant shade-loving trees as well as sun-loving trees. When a street or neighborhood is newly planted with trees of the same age, all the trees are essentially in full sun. This reduces the ability to plant shade-loving trees, as they have a tendency to dry out in the summer sun. With mixed-age stands, shade-tolerant trees may be planted underneath the canopy of larger, mature trees. This approach will be used for future tree removal and replacement and help to create an Urban Forest that has mature trees, middle aged trees, and young trees in similar quantities.





The most common tree in the Village's inventory remains the Norway Maple at 1,815 individuals represented. That said, that number is down 495 trees from 2014's 2,310 trees, so the Village is working on reducing the number of poor condition Norway Maples on its Parkways. Hackberry, Hybrid Elm, and Honeylocust are still exceeding their species limits, however these numbers do not represent a significant need for concern at this time. Future activities should focus on removing older and poor condition representatives of these species, as well as reduced planting from these same genera. As discussed in previous inventory update reports and as we will briefly analyze below, focus should continue to be placed on planting underrepresented species.

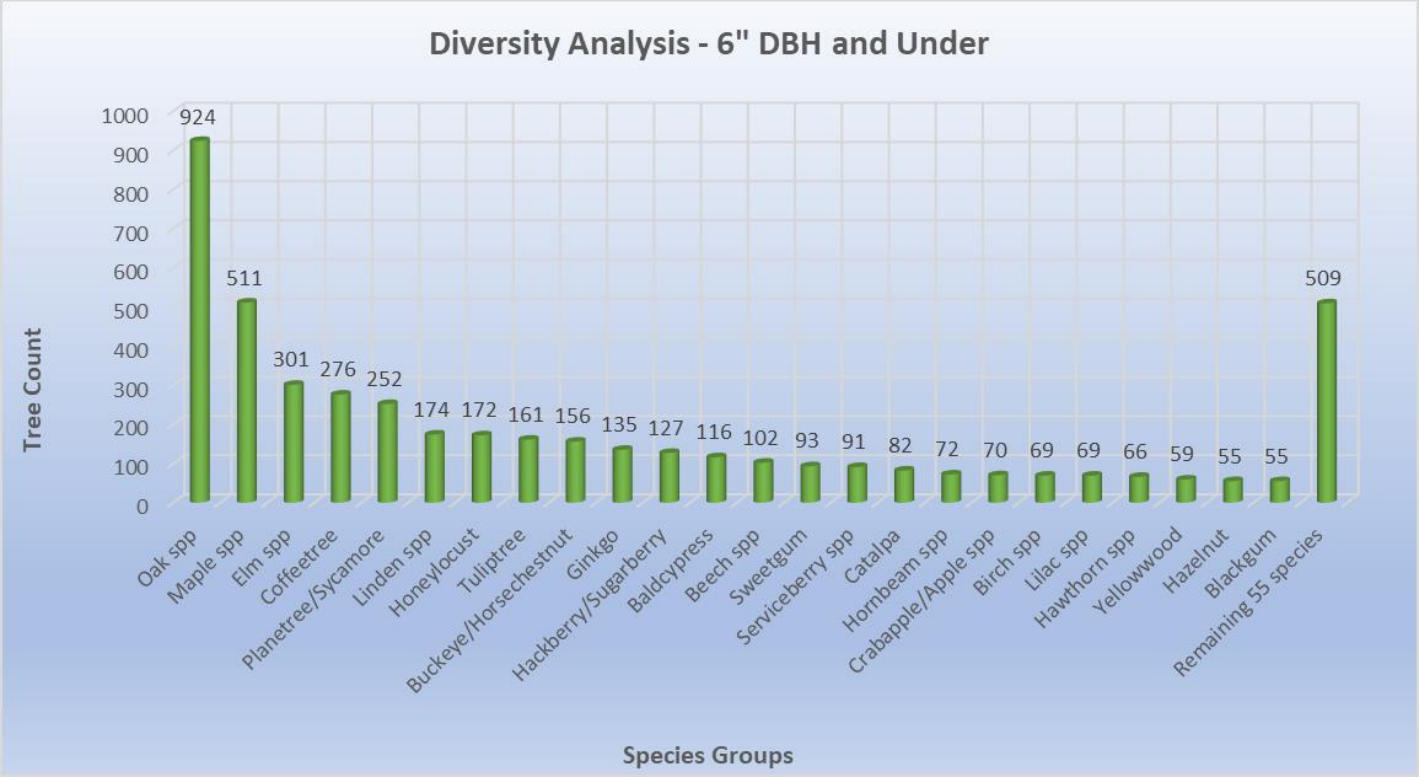
This Urban Forest Management Plan will lay out strategies to even further improve diversity, and we will examine the specific species recommended in the "Future of the Urban Forest" Section below.



Discussion of Genus level diversity is likely the most important discussion we can have because most pests and pathogens affect tree populations at this level. Rarely are do such things affect only a specific species, or a whole Family. The Acer (Maple) genus is the dominant genus, having nearly twice the number of trees as the second ranking genus. This percentage is just under 22%, and we would ideally like to see this number closer to 10% so that future pest and pathogen introductions do not impact such a large cross section of the tree population.

Oaks and Elms are currently exceeding their genus level thresholds, however not by much. Oaks warrant a brief discussion as well. Oaks are generally considered to be underplanted in Illinois, as urbanization has reduced our native Oak populations down to a critical level. With this in mind, we do not consider the overplanting of Oaks to be of concern, unless their numbers become far too high, or the diversity of plantings too low. Oak Park has neither problem but should make sure to monitor how many Oaks it is planting, and make sure they are planting a wide variety of Oaks. Selections such as Scarlet Oak, Shumard Oak, Shingle Oak, Chinquapin Oak, Black Oak, and Hill's Oak are all underrepresented, and could add to the overall diversity of Oaks in the Village. Lindens, which have exceeded the 10% threshold in years past, are now at under 10%. As the Village continues removing underperforming and/or poor condition Lindens, while limiting the planting of new Linden trees, we expect these numbers to continue to trend in a positive direction.

Hackberries should be monitored, as they are within about 400 trees of hitting their recommended genus threshold. All other genera of trees are well below their 10% threshold, and these are the genera that should be the focus of new planting efforts. Since 2014, there have been increases in the number of Planetrees, Hybrid Elms, and Kentucky Coffeetrees throughout the Village as Ash, American Elm, and Maple trees have been removed, however the Village should continue to focus on continuing to diversify its new planting selections. Oak Park has taken an important step by investing in a Planting Plan and we encourage Oak Park to attempt to heed the species recommendations outlined in this plan.



The chart above illustrates the impressive diversity in the tree population among the more recently planted trees (6" DBH and under). Many of these young trees are high quality species that do much to enrich the overall resiliency of Oak Park's tree population. The "remaining 55 species" represented at the far right side of the above graph include Golden Raintree, Amur Maackia, Zelkova, Osage Orange, Ironwood, Yellowwood, Cherry spp, Ironwood, Aspen, Pagodatree, Amur Corktree, Hardy Rubbertree, Dawn Redwood, and Katsura all of which are high quality species as well. This commitment to diversity is commendable and should set an example for other municipal entities to emulate.

i-Tree Eco Report / Urban Tree Canopy Assessment

i-Tree is a state-of-the-art, peer-reviewed software suite from the USDA Forest Service that provides Urban Forestry analysis and benefits assessment tools. The i-Tree tools help communities of all sizes to strengthen their forest management and advocacy efforts by quantifying the structure of trees and forests, and the environmental services that trees provide. Visit https://www.itreetools.org/tools/i-tree-eco for more information.

The i-Tree suite calculates hard dollar values that trees provide to communities. Trees provide "ecological services" that save homeowners money, such as in heating and cooling costs, where large trees help shade houses in the summer, saving on air conditioning and electricity bills, and provide windbreaks during the winter, saving on heating and natural gas costs. They also provide CO2 uptake, reducing the effects of climate change, as well as air quality improvements by the absorption of urban pollutants. Trees also absorb stormwater, which reduces strain on stormwater infrastructure, and saves money in replacement costs. Finally, trees can contribute up to 15% of the total value of a property, so they have monetary aesthetic benefits as well.

Using the data from the tree inventory, an i-Tree Eco report has been prepared for the Village of Oak Park. Below you will find reports on the Net annual benefits of the tree population, replacement values, and breakdown of benefits per species. The results of these analyses are below, and full tables and the i-Tree Eco Report are available. Since 2019 was the baseline for the Climate Ready Oak Park plan, the Village's 2019 i-Tree Eco analysis can be found in Appendix L for comparison purposes.

2023 i-Tree Eco Analysis Results

- Number of trees: 18,526
- Tree Cover: 271 acres
- Most common species of trees: Norway maple, Northern hackberry, elm spp
- Percentage of trees less than 6" (15.2 cm) diameter: 26.0%
- Pollution Removal: 9,028 tons/year ($314,000/year)
- Carbon Storage: 9,927 tons ($1,690,000)
- Carbon Sequestration: 235 tons ($40,100/year)
- Oxygen Production: 626.8 tons/year
- Avoided Runoff: 614,800 cubic feet/year ($41,100/year)
- Building energy savings: $70,600/year
- Carbon Avoided: 150.5 tons/year ($25,700/year)
- Replacement values: $29,600,000

To summarize all of these values together, we have created the following summary table:

Annual Values	
Benefits to Residents	$96,200/year
Benefits to Environment	$469,120/year
SUBTOTAL (Each Year)	**$565,320/year**
Standing Values	
As a Commodity	$29,600,000
As an Ecological Resource	$1,690,000
SUBTOTAL	**$31,290,000**

As can be seen from the above tables, the tree population in the Village of Oak Park currently provides approximately $565,320 in benefits every year, directly related to trees and their effect on homes, businesses, and the environment. It should be noted that the annual budget for all forestry activities recommended in this plan, projected for the calendar year 2023, will total approximately $1,297,523 per year, so the benefits from the tree population are worth nearly ½ what the cost put into them is. We will examine this further below. In addition, the total standing value as a commodity and an ecological resource of the whole tree population is $31,290,000.

These benefits can be viewed as "income" to Oak Park's residents, and so long as the trees are well maintained, they will continue to provide these benefits, and more. As trees grow, they also increase their benefits! For example, a 3" diameter tree provides less than $50/year in benefits, whereas as 20" tree can provide up to $500 per year. The goal is to increase benefits even more, where the tree population pays for itself and even yields "profits"!

The replacement value of trees was also calculated. Currently, the standing value of all trees in the Village of Oak Park population is $29,600,000. This value is calculated using the industry standard reference, the *9th Edition Guide to Tree and Landscape Appraisal*, which is published by the Council of Tree and Landscape Appraisers.

The goal of this Urban Forest Management Plan is to create a tree population which maximizes all of these ecological services to Oak Park residents by increasing the number of trees in Village, and how long they live, while minimizing costs in order to create a healthy, well maintained, and vibrant tree population.

Below are several examples of Ecological Services provided by trees:

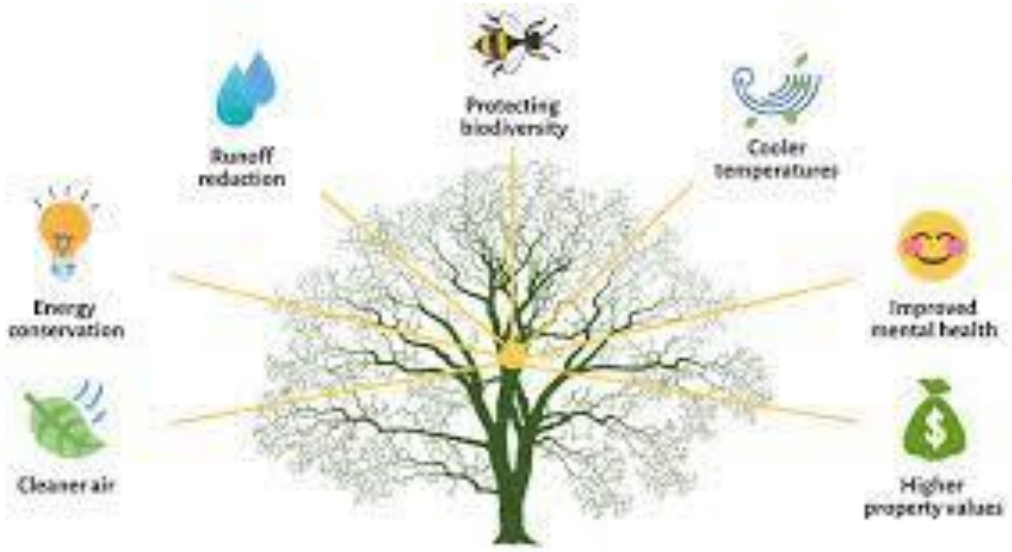
Energy Savings: During the summer when temperatures are warm, trees create shade, and temperatures are cooler in the shade. Cooler temperatures cause air conditioners to have to work less, which reduces the amount of energy a household uses. During the winter when temperatures are cold, winter winds cool your home quickly. Trees act as windbreaks, causing heating systems to use less natural gas, saving energy and money.

Carbon Dioxide (CO2): The amount of CO2 which is put into the atmosphere each year has a direct correlation with global climate change. That change causes more severe storms, greater drought conditions, and many other costly outcomes. Reducing CO2 from our atmosphere lessens these effects. Trees uptake CO2 and act as a carbon sink, putting carbon into long term storage in its woody tissues, removing it from our atmosphere, creating a net benefit to society, and saving money.

Air Quality: Industrial processes and vehicle emissions put pollutants into our air. These pollutants can cause or worsen health conditions such as heart disease, asthma, and lung disease. In addition, these pollutants can mix with water in the atmosphere and create nitric and sulfuric acid, causing acid rain, which can destroy fisheries and contaminate water supplies. Trees absorb these compounds with their leaves and other tissues, and prevent them from remaining in the atmosphere. Reductions in these pollutants results in overall better health, reducing the cost of healthcare to society, and saving communities money.

Storm water: The cost of delivering fresh water to homes, as well as removing and treating wastewater and storm water is considerable. One of the greatest costs comes when these systems are overwhelmed, such as during flooding, which can cause millions of dollars of damage to homes and vehicles, or when these systems need to be replaced. Fortunately, trees take water from the soil and put it back into the atmosphere through the process of transpiration. Therefore, the more trees an organization has, the less flooding is an issue, and the less strain is put on storm water infrastructure, resulting in fewer repairs and replacements. In addition, tree canopy slows rainfall's effects on flooding by "intercepting" it with leaves and branches, delaying how quickly rainfall can become floodwater. All of this adds up to savings for an organization.

Aesthetic/Economic: Up to 15% of the value of a property can be attributed to its trees and other landscaping. Tree lined streets are much more appealing to homebuyers than streets devoid of trees, resulting in increased home sales, and therefore increased tax revenue, or increased tax revenue with which to fund initiatives relating to trees, attract new businesses, etc.



Urban Tree Canopy Assessment

Based on data available from the US Forest Service and Morton Arboretum, the total Urban Tree Canopy of Oak Park can be determined. This is expressed as the percent of the Village covered by tree canopy from an aerial view. This assessment included 7 total land cover types, including trees, grass and shrub, bare soil, water, buildings, roads/railroads, and other paved surfaces. The result of this tree canopy assessment was that Oak Park contains 47.68% total tree canopy. The map of the canopy assessment appears on the next page.

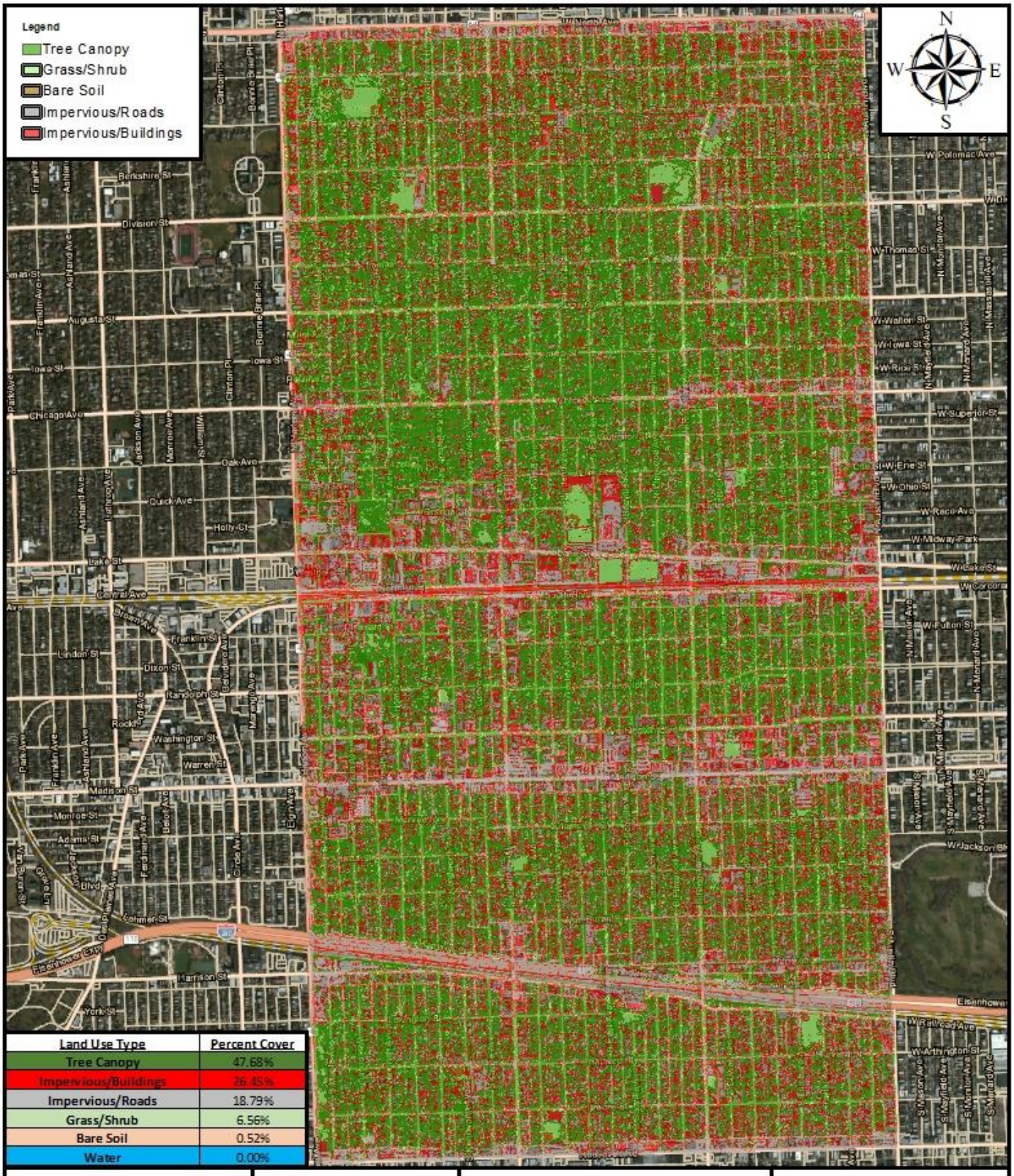
Land Use Type	Percent Cover
Tree Canopy	47.68%
Impervious/Buildings	26.45%
Impervious/Roads	18.79%
Grass/Shrub	6.56%
Bare Soil	0.52%
Water	0.00%

The tree inventory itself was only conducted on publicly owned land such as parkways, ROWs, and Village-owned properties, etc. Detailed information on each tree is not included in this assessment, only total coverage. Aerial images were used to estimate how much tree and other land cover types were in the Village using a software which is similar to Google Earth or other aerial imagery viewers.

The goal is to increase the total tree canopy in Oak Park to 50% by 2043. This goal has been estimated by analyzing data from many different urban tree populations in the Chicago and Northwest Indiana regions, and is based on preliminary data from the Chicago Region Trees Initiative's (CRTI) Forest Composition Workgroup.

We believe this is an attainable goal over this time period. Oak Park as a whole has an overall considerable amount of tree canopy, and it is above average compared to other similar communities of Northeastern Illinois. The goal set is a modest, but reasonable, increase, which will still yield beneficial results.

This will be accomplished through increasing the number of trees in the parks, municipal campuses, schools, and on the parkways. It will also be accomplished by maintaining the existing tree population in a proactive fashion, by further enhancing the Urban Forestry program in Oak Park. This will ensure that existing trees will live longer as they are given appropriate care. Tree planting and maintenance will also be encouraged on private property, by incentivizing residents and business owners to plant trees through public-private partnerships. Outreach and education will also be provided to residents through events such as Arbor Day and Earth Day celebrations. This goal will be monitored by using aerial imagery analysis like the analysis presented below. Every 10 years, the imagery will be assessed, and a new canopy cover percentage will be calculated for Oak Park.



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URBAN TREE CANOPY LAND COVER TYPES OAK PARK, IL

1 inch = 1,750 feet

0 420 840 1,680 2,520 Feet

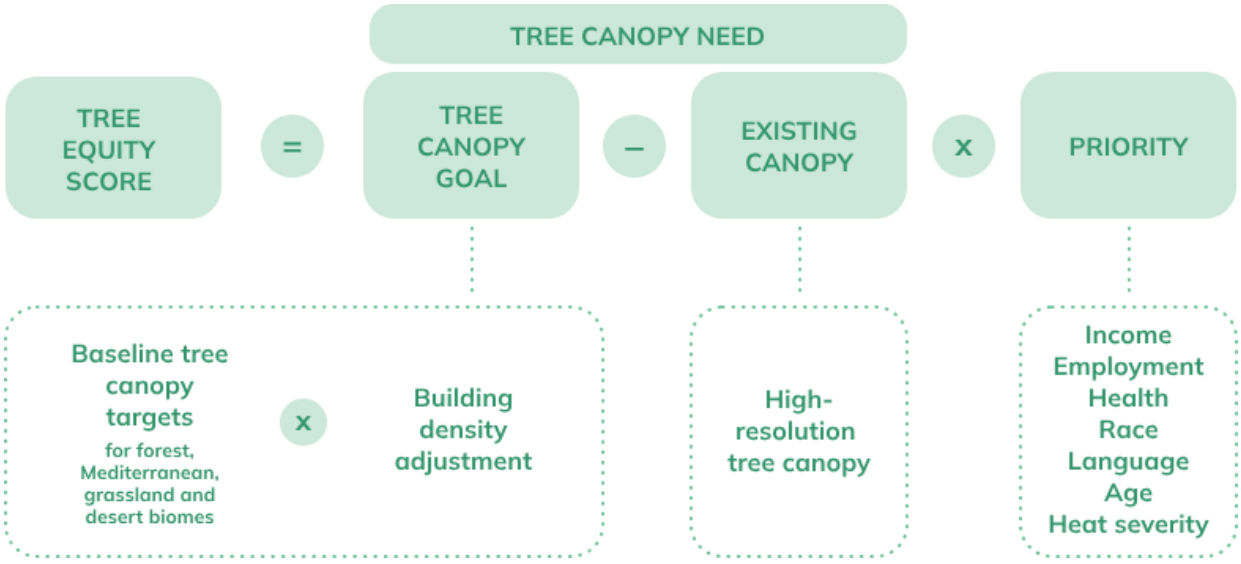
Created On : 12/18/2021

Tree Equity Scores

Tree Equity Score measures how well the benefits of trees are reaching communities living on low-incomes, communities of color and others disproportionately impacted by extreme heat and other environmental hazards.

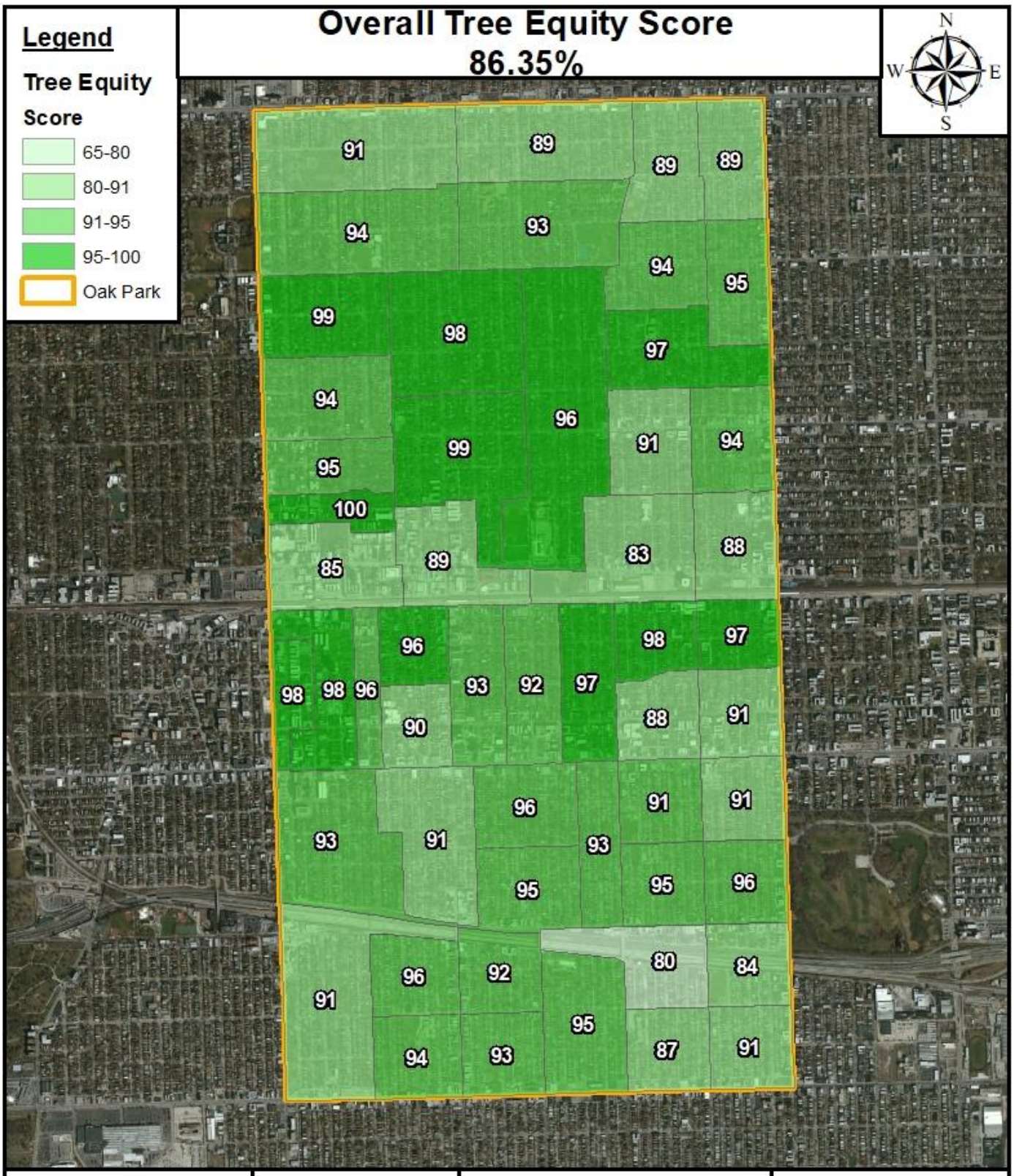
Tree Equity Score is a nationwide, block group-level score ranging from 0-100 that highlights inequitable access to trees. The lower the score, the greater priority for tree planting. A score of 100 means the block group has met a minimum standard for tree cover appropriate for the area's natural biome and built environment.

Achieving Tree Equity in cities provides numerous benefits to public health, water, air quality, climate and community wellbeing. The tree canopy benefits measures utilize the power of i-Tree Landscape and research funded by American Forests on job creation.



As shown on the map below, Oak Park's Overall Tree Equity Score is 86.35% and no census tract throughout the Village has a Tree Equity Score of less than 80. These are overall remarkable numbers for which the Village should be commended.

There are also maps included below which evaluate both income levels and home values in comparison to average tree conditions and average number of trees per acre in those census blocks. The data does show that higher income and home value areas have trees that are in better condition and have more trees per acre. The likely reason for this is that there are more young trees in the lower income and home value zones and a map illustrating the percentage of trees 8" DBH and under is included as well. Since trees under 8" cannot, by definition, be rated as better than average (2 or 1), this artificially increases the number of condition 3 (average) trees and pushes the mean in that direction. Additionally, the areas that would be expected as having a higher income level would also have larger lot sizes. There are some areas with smaller homes where the lot widths are narrow enough that there sometimes isn't physical space to put a tree which explains the disparity in the trees per acre analysis.



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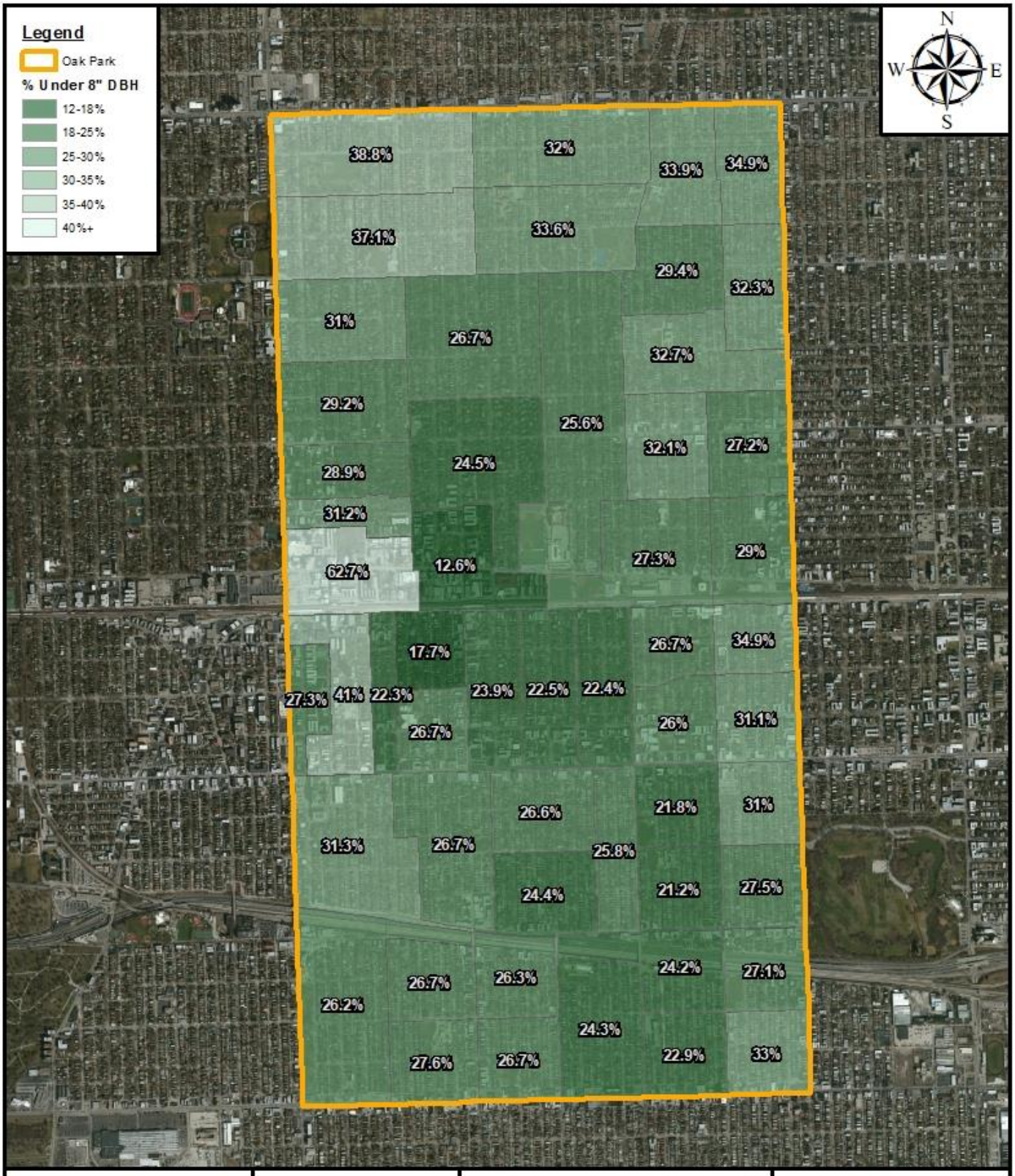
TREE EQUITY SCORE
VILLAGE OF OAK PARK
COOK COUNTY, IL

1 inch = 2,000 feet
0 475950 1,900 2,850
Feet

Created On : 8/05/2023



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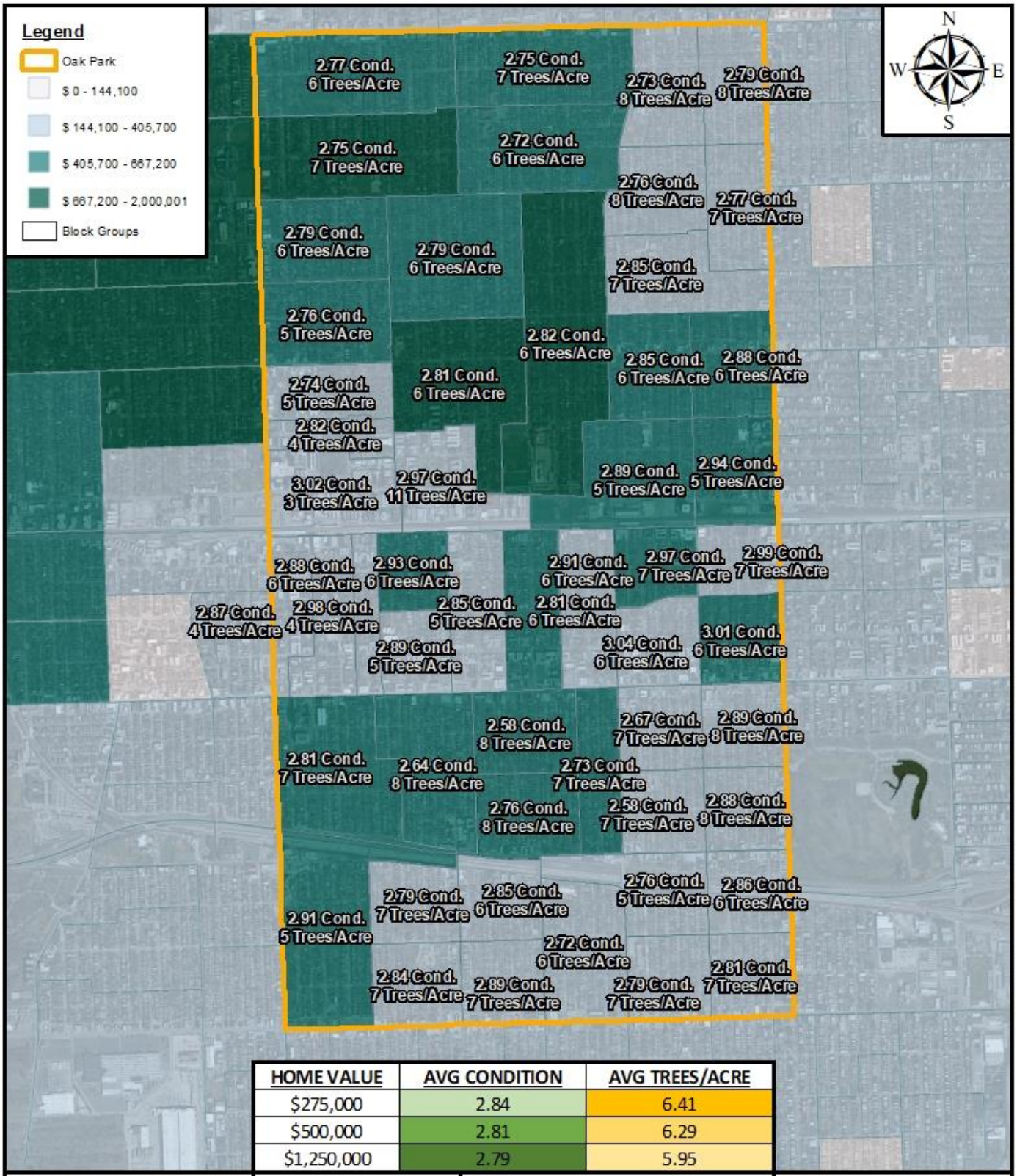
PERCENT UNDER 8"
VILLAGE OF OAK PARK
COOK COUNTY, IL

1 inch = 2,000 feet
0 475950 1,900 2,850
Feet

Created On : 8/19/2023



HOME VALUE	AVG CONDITION	AVG TREES/ACRE
$275,000	2.84	6.41
$500,000	2.81	6.29
$1,250,000	2.79	5.95

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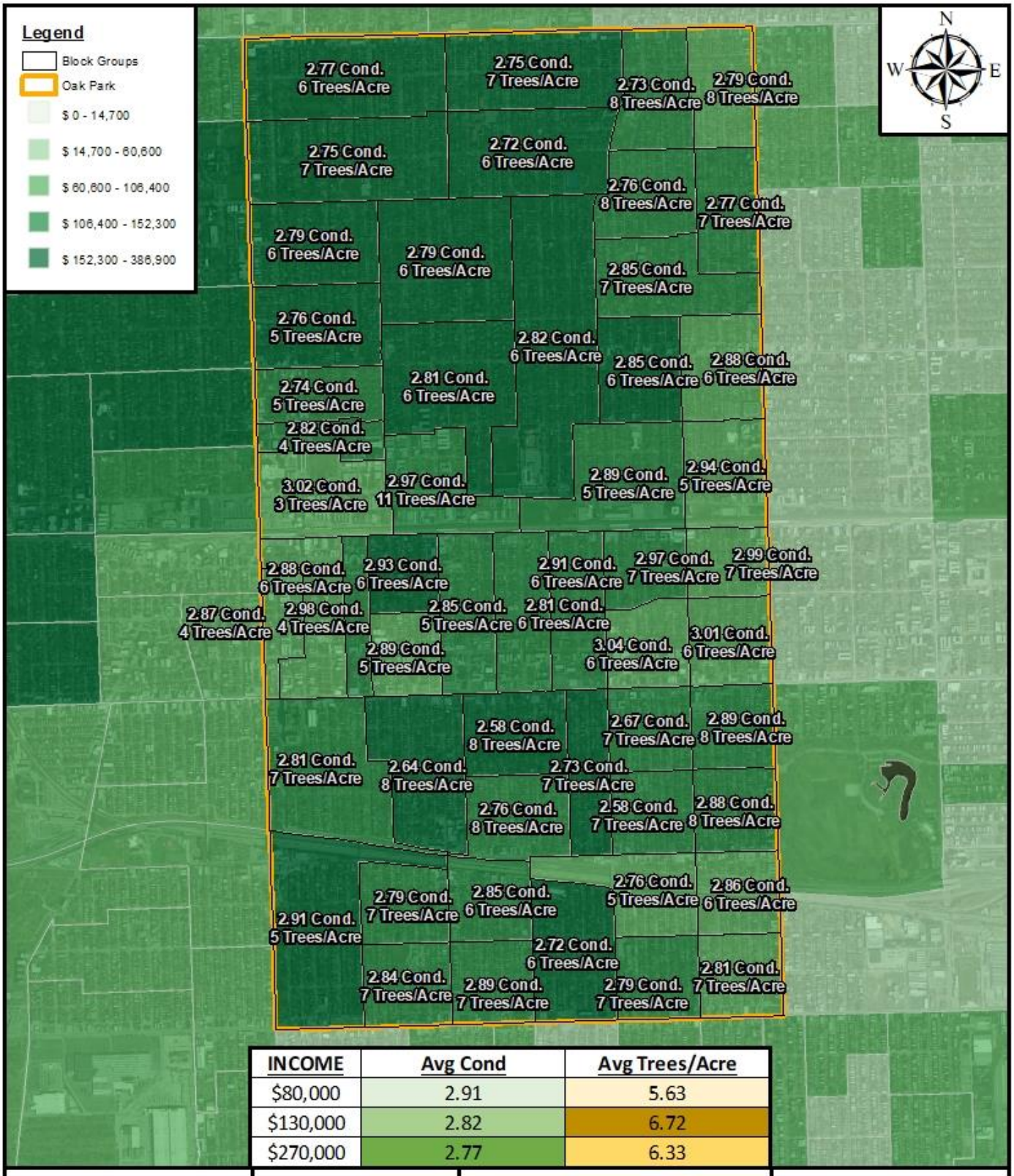
HOME VALUE / TREES
VILLAGE OF OAK PARK
COOK COUNTY, IL

1 inch = 2,000 feet
0 475950 1,900 2,850
Feet

Created On : 8/19/2023



INCOME	Avg Cond	Avg Trees/Acre
$80,000	2.91	5.63
$130,000	2.82	6.72
$270,000	2.77	6.33

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INCOME AND TREES
VILLAGE OF OAK PARK
COOK COUNTY, IL

1 inch = 2,000 feet
0 475950 1,900 2,850
Feet

Created On : 8/19/2023

The Future of the Urban Forest

In this section, a vision of what the tree population of Oak Park could become by 2043 was created, and compared with the current population. Using the existing data, and the diversity vision, we will then define exactly how Oak Park can move from where it is now to where it could be.

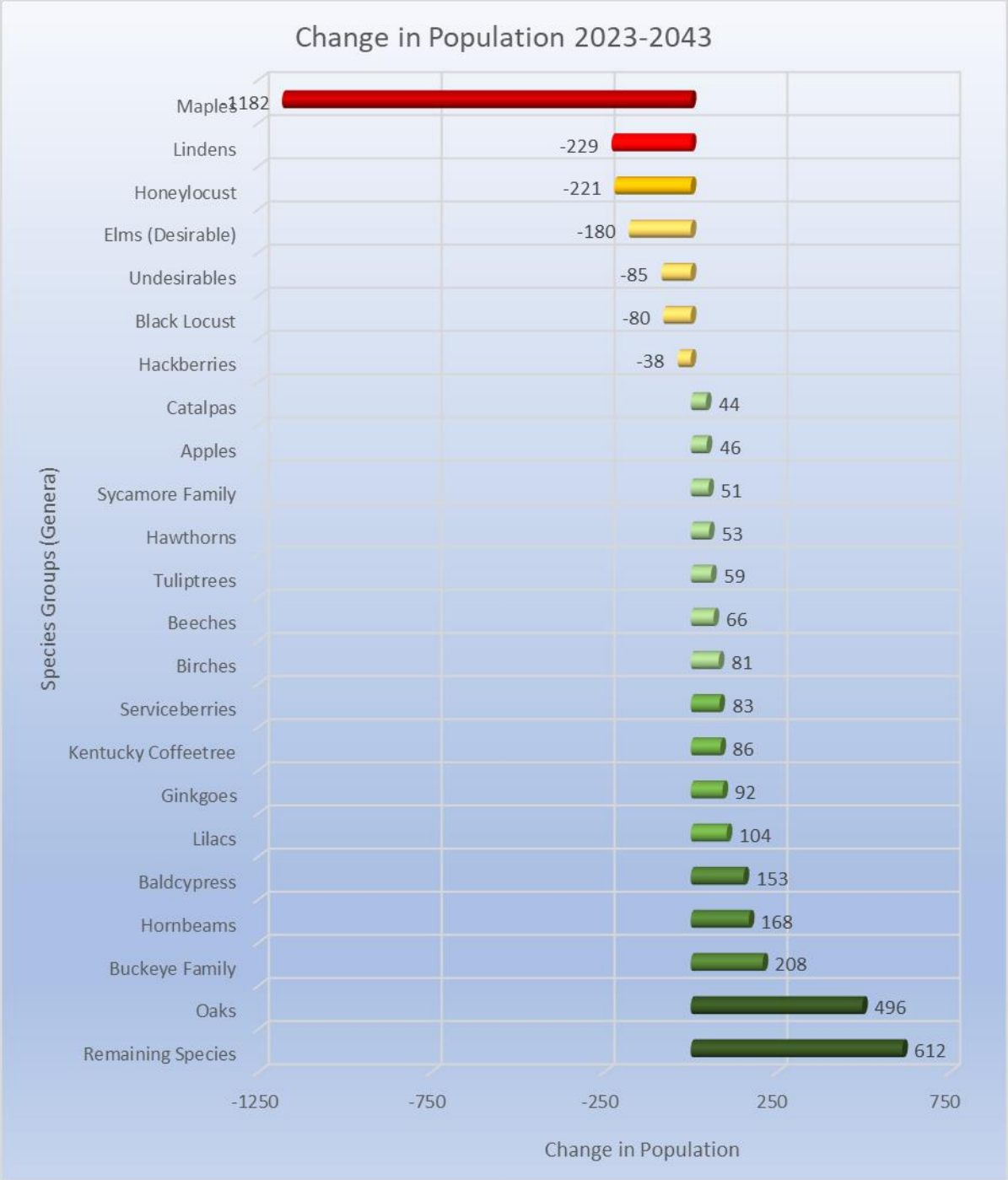
	Plant in Abundance
	Plant in Limited Quantities
	Maintain Existing Population
	Reduce Population Size

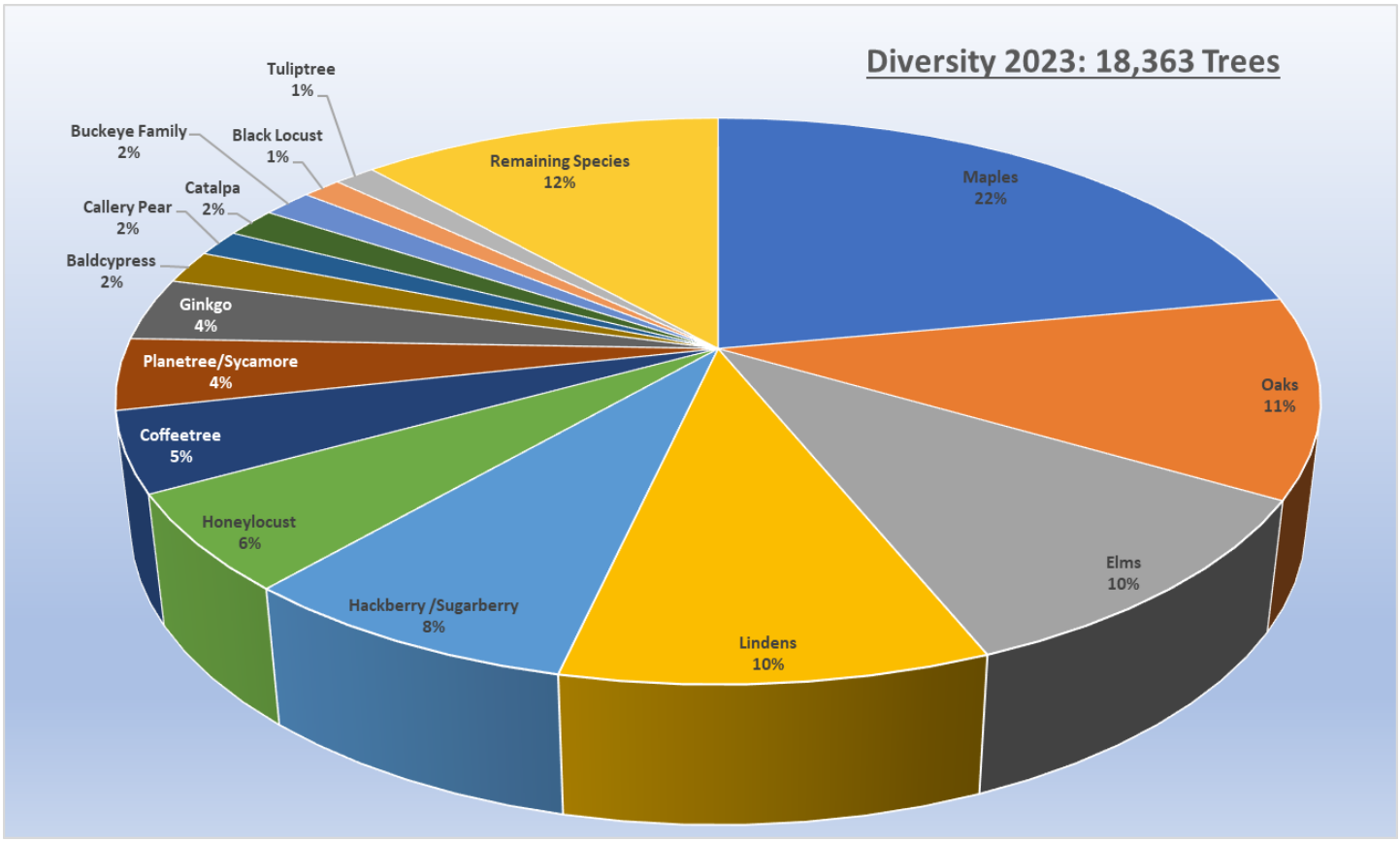
Change in Species Composition 2023 – 2043

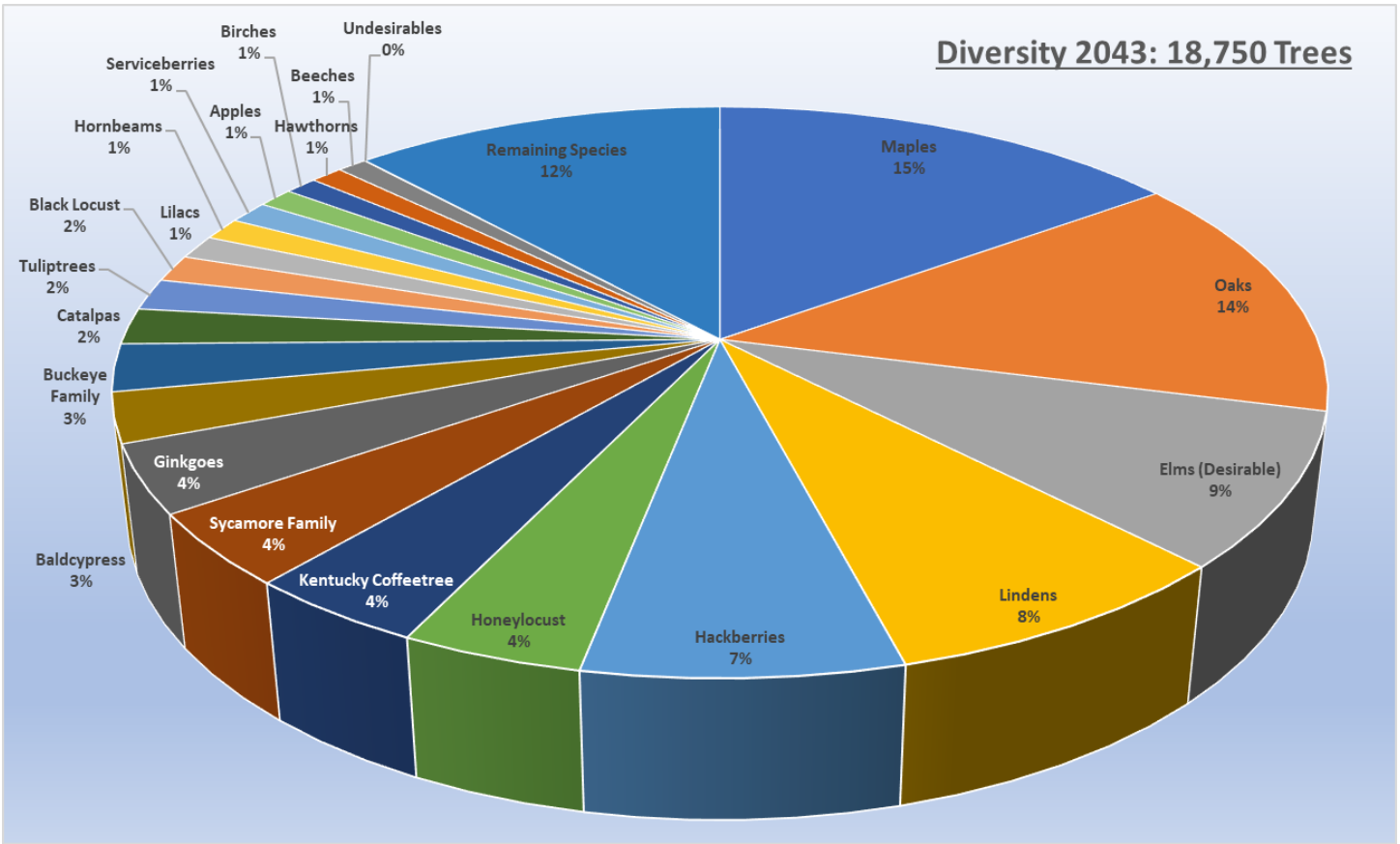
The full calculations for this change in diversity were performed by hand, not using automated software. Local knowledge of the trees, their conditions, what is growing well and what isn't were all used, and yielded this very customized forest composition change list. These goals are meant as general guideposts, and not absolutes. Be aware that this Plan, and the species composition goals, are meant to be adaptively managed over time, and as new information becomes available. It should also be mentioned for clarity that the category considered as "Undesirables" are species such as Ailanthus, Boxelder, Buckthorn, Cottonwood, Siberian Elm, Mulberry, Russian Olive, and Willow which are generally aggressively spreading and/or have weak-wooded characteristics that make them undesirable in the urban landscape.

SPECIES	COUNT 2023	COUNT 2043	SPECIES	COUNT 2023	COUNT 2043	SPECIES	COUNT 2023	COUNT 2043
MAPLE-NORWAY	1854	800	BLACKGUM	51	125	EASTERN REDCEDAR	7	25
HACKBERRY-COMMON	1432	1350	YELLOWWOOD	48	125	SMOKETREE	7	25
ELM-HYBRID	1171	1250	ALDER-SPP	43	80	HACKBERRY-SOUTHERN	6	50
HONEYLOCUST	1021	800	ELM-SIBERIAN	43	0	PINE-SCOTCH	6	15
LINDEN-LITTLELEAF	883	700	BEECH-AMERICAN	42	60	POPLAR-WHITE	6	5
KENTUCKY COFFEETREE	839	925	ASPEN	38	60	MULBERRY-SPP	6	0
LINDEN-AMERICAN	834	700	OAK-BLACK	34	75	MAPLE-PAPERBARK	5	40
ELM-AMERICAN	676	400	IRONWOOD	33	125	BIRCH-SPP	5	25
GINKGO	658	750	AMERICAN REDBUD	31	100	COTTONWOOD	5	0
LONDON PLANETREE	605	700	OAK-WHITE	31	50	ELM-CHINESE	4	15
MAPLE-FREEMAN	598	700	HORNBEAM-EUROPEAN	29	100	SUMAC	4	15
MAPLE-SILVER	510	100	PAGODA TREE	29	50	HICKBARK-SHAGBARK	4	30
OAK-SWAMP WHITE	503	500	DOGWOOD-SPP	28	70	YEW	3	3
MAPLE-RED	418	400	BIRCH-WHITE	27	50	AMUR MAACKIA	3	40
OAK-RED	397	400	PLUM-SPP	27	20	MAPLE-HEDGE	3	40
MAPLE-SUGAR	365	400	HARDY RUBBERTREE	24	40	HAWTHORN-COCKSPUR	3	40
OAK-ENGLISH	349	400	ZELKOVA	24	75	DOUGLAS FIR	3	25
BALDCYPRESS	347	500	OAK-SHUMARD	23	75	MAGNOLIA-SHRUB	3	20
CATALPA	306	350	BUCKEYE-YELLOW	22	75	PEACH	3	3
OAK-BURR	285	325	SPRUCE-BLUE	21	20	ELM-RED	3	0
PEAR-CALLERY	278	50	OAK-SCARLETT	21	75	HONEYSUCKLE	3	0
TULIPTREE	241	300	MAGNOLIA-TREE	21	40	LARCH	2	25
BLACK LOCUST	230	150	CHERRY-PURPLE LEAF	20	10	GOLDEN RAINTREE	2	10
OAK-CHINKQUAPIN	211	275	MAPLE-AMUR	20	10	ASH-BLACK	2	1
MAPLE-MIYABEI	192	250	POPLAR-SPP	19	20	UNKNOWN	2	0
APPLE-CRAB SPP	166	200	OSAGE ORANGE	18	30	ASH-EUROPEAN	1	1
LILAC-TREE	154	250	WALNUT-BLACK	18	10	HICKORY-BITTERNUT	1	20
HORSECHESTNUT	148	175	PINE-AUSTRIAN	16	10	HICKORY-SPP	1	20
SYCAMORE	144	100	CHERRY-SPP	14	25	FIR-CONCOLOR	1	20
HAWTHORN-SPP	134	150	ASH-BLUE	14	5	FIR-SPP	1	10
HAZELNUT-TREE	123	75	ASH-GREEN	12	5	HEMLOCK-EASTERN	1	10
SERVICEBERRY-SPP	117	200	ELM-ENGLISH	11	20	MAPLE-SPP	1	10
BUCKEYE-OHIO	114	175	ELM-SPP	10	10	SPRUCE-NORWAY	1	10
OAK-PIN	113	100	MAPLE-JAPANESE	10	10	ELDERBERRY	1	0
ASH-WHITE	113	60	SPRUCE-SPP	10	10	AILANTHUS	1	0
OAK-SHINGLE	108	175	ARBOR VITAE	10	15	BUCKTHORN	1	0
SWEETGUM	98	150	ROSE OF SHARON	10	15	RUSSIAN OLIVE	1	0
BIRCH-RIVER	87	125	OAK-BEBB	10	40	TAMARISK	1	0
AMUR CORKTREE	83	50	OAK-SPP	9	100	WILLOW-SPP	1	0
BEECH-EUROPEAN	77	125	BOXELDER	9	0	LINDEN-SILVER	0	50
MAPLE-BLACK	66	100	APPLE-EDIBLE	8	8	DOGWOOD-CORNELIAN	0	25
KATSURA	65	75	VIBURNUM	8	20	PERSIMMMON	0	15
LINDEN-SPP	62	100	BUCKEYE-RED	8	75	PERSIAN IRONWOOD	0	20
HORNBEAM-AMERICAN	53	150	PINE-WHITE	8	5	HYDRANGEA-PEEGEE	0	15
DAWN REDWOOD	52	70	LILAC-SHRUB	7	15	DOGWOOD-PAGODA	0	15

Change in Species Composition 2023 – 2043



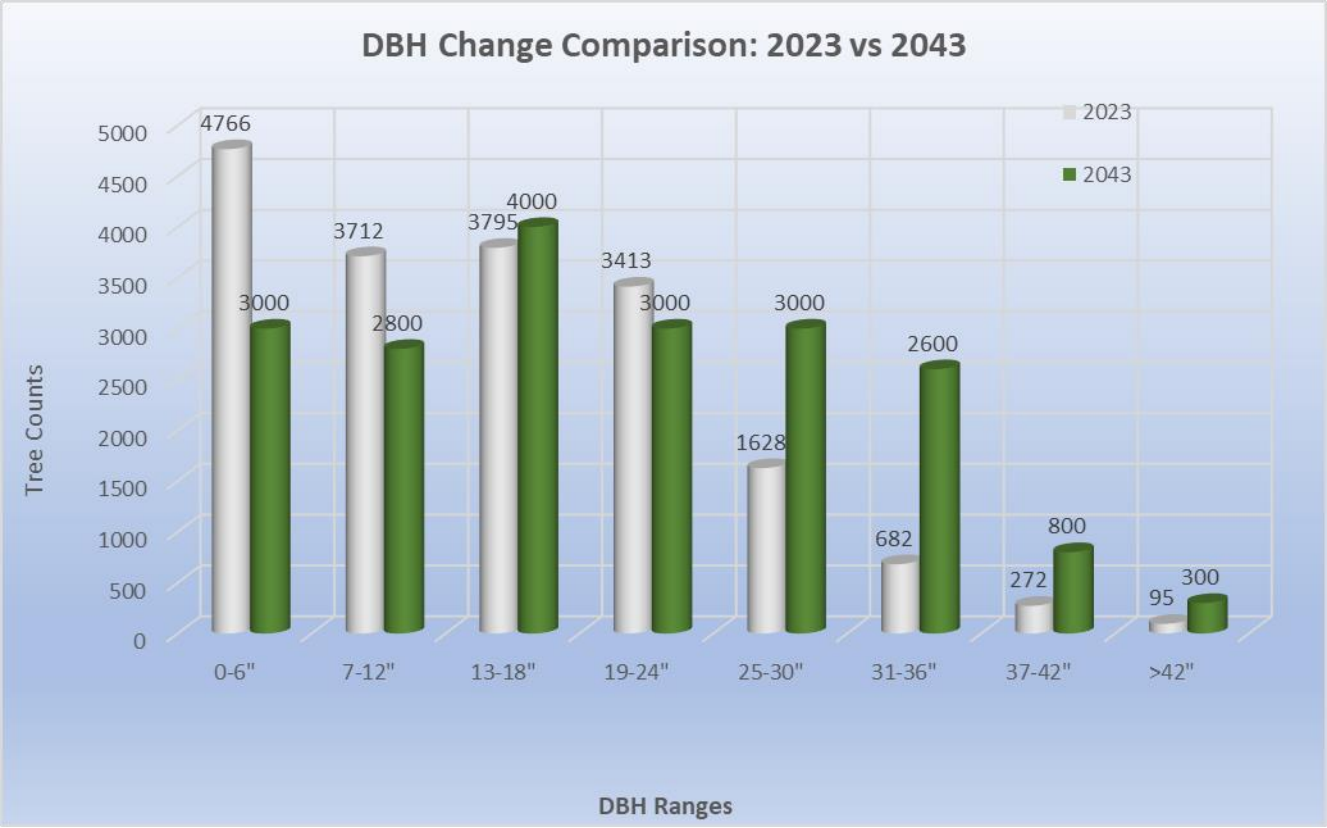

Diversity 2023: 18,363 Trees
Maples 22%
Oaks 11%
Elms 10%
Lindens 10%
Hackberry /Sugarberry 8%
Honeylocust 6%
Coffeetree 5%
Planetree/Sycamore 4%
Ginkgo 4%
Baldcypress 2%
Callery Pear 2%
Catalpa 2%
Buckeye Family 2%
Black Locust 1%
Tuliptree 1%
Remaining Species 12%


Diversity 2043: 18,750 Trees
Maples 15%
Oaks 14%
Elms (Desirable) 9%
Lindens 8%
Hackberries 7%
Honeylocust 4%
Kentucky Coffeetree 4%
Sycamore Family 4%
Ginkgoes 4%
Baldcypress 3%
Buckeye Family 3%
Catalpas 2%
Tuliptrees 2%
Black Locust 2%
Lilacs 1%
Hornbeams 1%
Serviceberries 1%
Birches 1%
Undesirables 0%
Beeches 1%
Apples 1%
Hawthorns 1%
Remaining Species 12%

As can be seen from the above several pages of charts showing the change in species composition over the next 20 years, there will be an overall move away from the overrepresented or low quality species discussed above, and a variety of different species, those which are underrepresented or not present in the tree population, will be planted. This will lead to an overall increase from 18,526 to approximately 18,750 trees total on the Village's ROWs, along with a maintenance of a high level of diversity near a total of 131 species. This will result in a more robust and resilient Urban Forest which is resistant to pest and pathogen outbreaks. It will also ensure the continued certification of the Village with its Level II Arboretum Accreditation through the Morton Arboretum's ArbNet Certification program, which requires a minimum of 100 species.

The Benefits of Larger, Healthier Trees

Larger trees provide greater benefits to the community: They create more shade to offset cooling costs, absorb more storm water, create greater buffers against cool winter winds for heating costs, and absorb and sequester more carbon than smaller trees do. For the 2023-2043 vision of the tree population, a variety of methods were used to arrive at a reasonable age-class distribution. We used the current population structure and anticipated high rates of survival based on new planting practices which would involve a "right tree/right site" approach, as well as increased survivorship of existing trees due to better management and care practices. Predicted growth, survivorship, and eventual tree losses are based on current species composition and future plantings and removals. This allowed the creation of a vision of what the tree population, including species and size, will look like 20 years from now.



It can be seen from the above chart that the existing tree population (grey bars) shows a predominantly younger tree population with gradual decreases in numbers of trees in the larger age class categories. The projected age class chart shows a decrease in the smaller age class categories over the course of this Plan as the trees currently in this category will mature to move the next range, and also projects more trees surviving into the older age classes, where they will provide the greatest benefits in terms of ecological services to the community. The table to the right shows this data in a tabular format.

	2022	2027	2032
0-6"	4766	3000	3000
7-12"	3712	4300	2800
13-18"	3795	3400	4000
19-24"	3413	3300	3000
25-30"	1628	3000	3000
31-36"	682	1200	2600
37-42"	272	500	800
>42"	95	150	300

This was based on the fact that enhanced levels of care for existing trees would enable them to survive longer. The graph and table show a general expectation of how the changes in tree diameters might change over the next 20 years based on the methods to be applied in this Urban Forest Management Plan. The numbers themselves were projected by hand, based on our prior experience, and the methods detailed below. If these projections hold, Oak Park could see a 42% increase in annual benefits of $237,434 up from $565,320 to $802,754. Standing values of the tree population could increase 46%, or $14,393,400, from their current level of $31,290,000 to approximately $45,683,400.

For projections of future age classes of trees, a ½" per year growth rate was roughly estimated by assuming that it would take an average tree 10 years to go from one age class to the next (6" = appx 10 years growth). Also used were the number of trees to be planted and removed annually, as calculated below in the Tree Planting and Tree Removal sections. These numbers were arrived at based on all the above, as well as the best professional opinion of the Forestry Consultant. As time goes by, these projections will likely change. These are rough estimates for the purposes of this Plan.

The overall increase in size of the tree population and diameters of the individual trees will yield a much greater dollar figure when it comes to the ecological services provided, and provide residents with a greater sense of being in an arboretum-like setting when they are enjoying the urban forest.

Return on Investment

Return On Investment (ROI) for an individual tree is strongly favorable over the life of a tree in terms of investment in planting, care, and removal versus the ecological benefits the tree provides. As we strive to justify the expenditures on trees and tree care, it is important that organizations and their staff are aware of this.

Below, we have provided an ROI calculation sheet. This sheet breaks the lifetime of an average tree down into three phases, based on the anticipated costs of pruning in the budgets sections below. These phases are the young (3-12" DBH), mature (13-24" DBH), and full grown (25-36") ranges shown below.

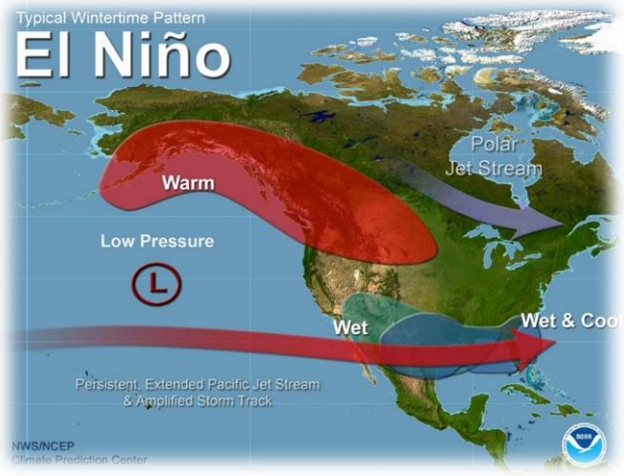
Data was taken from the i-Tree algorithm, and applied towards the average benefits provided by a typical tree at each of these life stages, and multiplies it out over the 20 year period each phase accounts for. We also looked at costs for planting, watering, routine maintenance, emergency maintenance, and eventual removal of that tree over 60 years. The sample calculations are pictured below.

Initial Purchase and Installation	$575	$575
Pruning 15x Over 60 yr Lifetime	15 @ $75/prune	$1,125
Emergency Maintenance	1 @ $250	$250
Eventual Cost of Removal	$850	$850
SUBTOTAL		**$2,800**
Annual Benefits	$30.78/yr @ 60 years	$1,847
Replacement Value	$1,610	$1,160
Carbon Storage	$92	$92
SUBTOTAL		**$3,099**
Return on Investment		**10.68%**

Trees and Climate Change

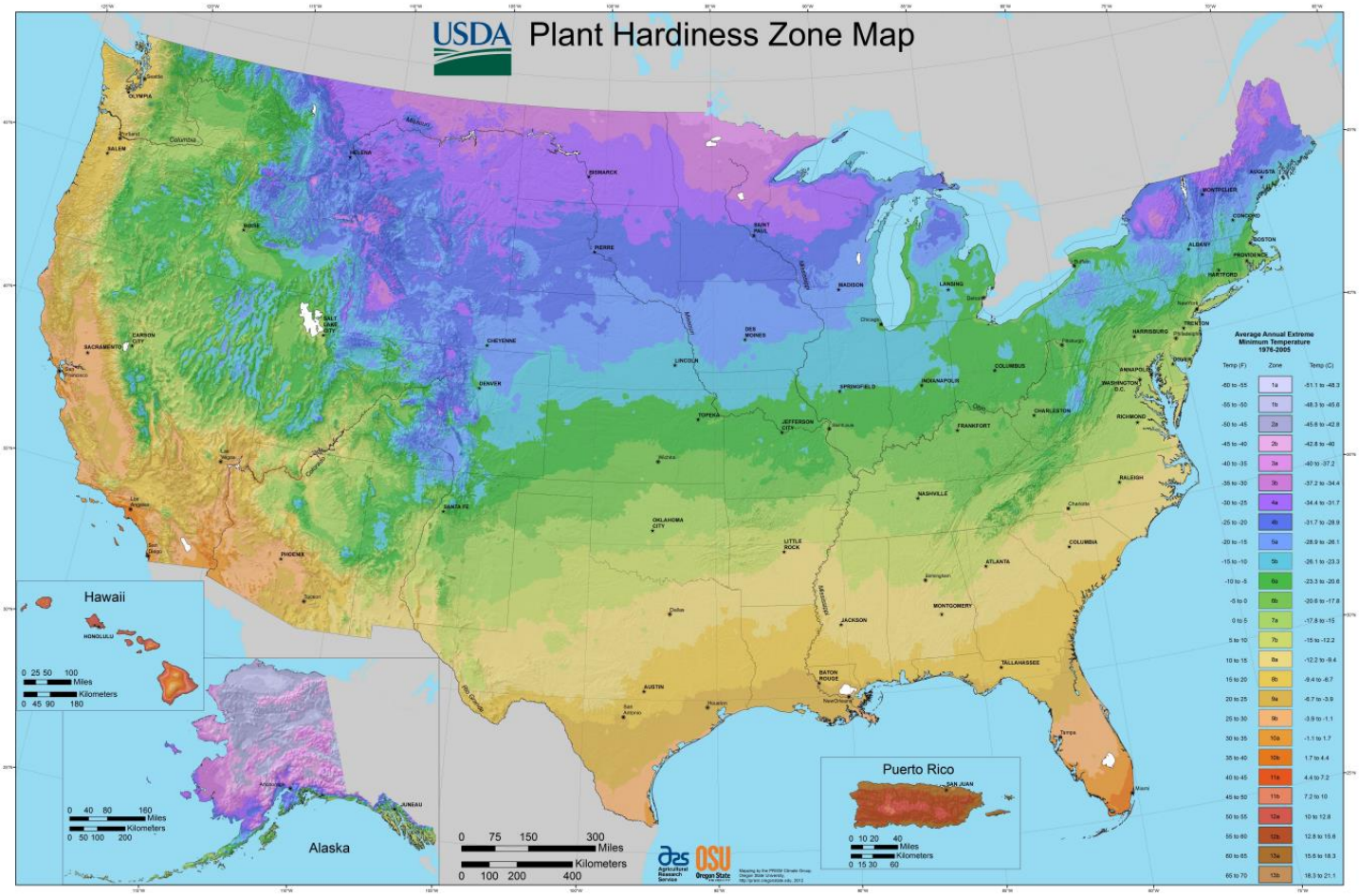
According to the United States Environmental Protection Agency, National Oceanic and Atmospheric Administration, Metropolitan Mayors Caucus, and a variety of other national and international reputable scientific and humanities-oriented sources, climate change will cause significant suffering over the coming hundreds to thousands of years. Increases in carbon dioxide, methane, and other greenhouse gasses in the atmosphere trap heat from the sun and will create a generally warming climate. Though it should be said that "climate change" means more than just warming trends.

Though the general trend will be towards a warmer climate, the transition process will be very chaotic, and will be one of more "extremes": hotter summers, colder winters, worse storm seasons, and the like will be the trend for quite some time before the full effects of a warming trend are realized. This is due to the immense complexity of the planet's climate, and all of the "teleconnections" which exist. Teleconnections are effects on one part of the planet from a corresponding change in another part. The most "famous" of these is the "El Nino" phenomenon, where changing ocean temperatures near the Galapagos islands strongly influences the amount of rainfall or drought in all North America. But there are literally dozens of these known teleconnections across the globe, and changing climate impacts all of them.



All of the organizations involved with changing climate and the carbon dioxide inputs that drive it have the same message: planting more trees, particularly in areas predisposed to changes in climate, will aid in pulling CO2 from the atmosphere and reducing the impact of climate change. So the number of trees we are planting is important, both on public as well as private land. But the types of trees we are planting matters as well. The US Forest Service is already starting programs of planting climate sensitive tree species outside of their historic natural ranges in anticipation of an overall warmer climate (https://www.fs.usda.gov/ccrc/story/helping-forests-keep-pace-climate-change).

When it comes to tree planting in anticipation of climate change for urban environments in our area, we need to be careful, however. While the general trend is towards warming, the "extremes" side of this makes for a difficult decision. While summers may be warmer and support trees which are adapted to warmer conditions overall, our winters will still reach down into the -30° F and even colder range for extended periods. And cold weather is the limiting factor for what can be planted in an area. See the USDA Hardiness Zone map on the following page for a more detailed explanation. It shows the **coldest** temperatures which can be expected in an area, not the **warmest** ones. So before we start planting trees in northern Illinois that are more native to southern Illinois, we must understand that we need to plan for the coldest temperature, not the warmest per se.



All of that said, we should start planting trees now at least on a somewhat experimental basis that will be more tolerant of a warmer climate. Below are some suggestions of trees which the Village could plant which are just outside of our climate region, and may be successful over the coming 30 years or so, depending how effective we are at combatting climate change using other methods:

Southern Catalpa (*Catalpa bignoniodes*)	**Southern Hackberry** (*Celtis laevigata*)	**Swamp Chestnut Oak** (*Quercus michauxii*)	**Cherrybark Oak** (*Quercus pagoda*)
Water Hickory (*Carya aquaticca*)	**Pecan Hickory** (*Carya illinoiensis*)	**Sourwood** (*Oxydendrum arborea*)	**Mimosa Tree** (*Albizia julibrissin*)
Carolina Silverbell (*Halesia Carolina*)	**Crapemyrtle spp** (*Lagerstroemia spp*)	**Flowering Dogwood** (*Cornus florida*)	**Sweetbay Magnolia** (*Magnolia virginiana*)
Southern Magnolia (*Magnolia grandiflora*)	**American Holly** (*Ilex opaca*)	**Oklahoma Redbud** (*Cercis reniformis*)	**Ornamental Cherries** (*Prunus spp*)

All of these species grow in Illinois, just not in our part of the state, per se. And some are certainly more risky than others. Crape Myrtle for instance is barely tolerant of the climate in southern Illinois, while Southern Hackberry can already be planted here with reliable success. But nonetheless they are good species to keep on our radar for experimental plantings.

Positive Tree Benefits for the Environment

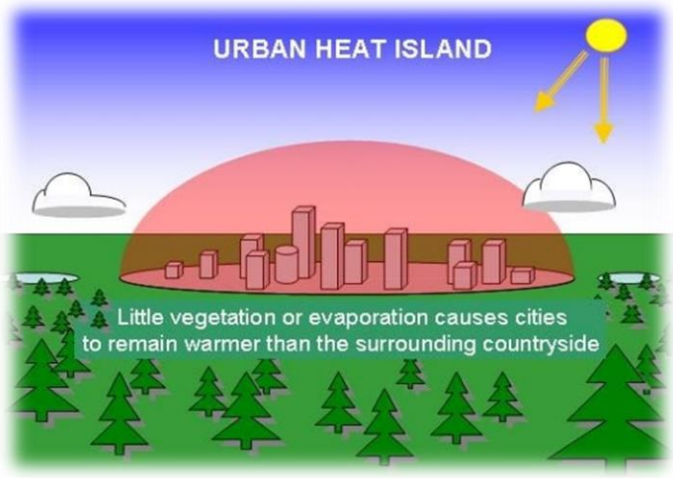
When it comes to trees and climate change, let's move on to some of the immensely positive benefits that trees provide. Here, we are focusing on 2 topics, those being the climate change and the urban heat island effect, as well as flooding prevention and stormwater benefits, since this was one of the primary goals of this plan, and also some of the more important benefits trees provide.

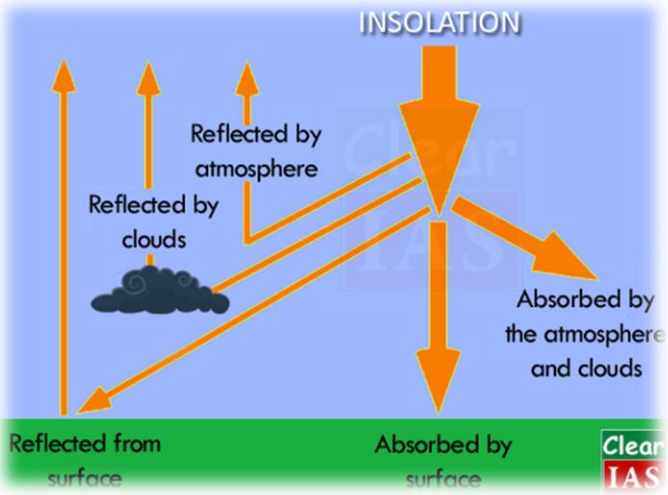
Climate Change / Urban Heat Island Mitigation

First, let's define a few terms: **Climate Change** is change in the climate, both human-induced as well as naturally occurring, that disrupts what we perceive to be the normal operation of climate. It should be noted here that climate is different than weather. Weather is the day-to-day meteorology such as rain on Tuesday and sunny on Wednesday. Climate is what the long-term averages are for an area, such as average June temperatures in the mid 70's with 2-3 inches of rain. The term **Global Warming** has been misapplied many times when speaking about climate change. Yes, increases in carbon dioxide emissions lead in general to a warmer climate, which comes with very specific problems. But the climate change we are seeing currently is one of extremes: higher highs, lower lows, more severe storms, etc. The important part is that during this process of change, year to year weather becomes more unpredictable as the climate changes to generally a warmer one.

The **Urban Heat Island Effect** is a separate but related issue. Trees and other green plants contain chlorophyll, a naturally occurring compound which is custom built by nature for absorbing the sun's energy and converting it to sugars by photosynthesis. And what energy the sun has. The amount of energy from the sun hitting the Earth at any given time is approximately 1,350 Watts per square meter, which is a LOT of energy to absorb. When an area has fewer plants, and a lot of asphalt and other dark surfaces, this produces a lot of heat.

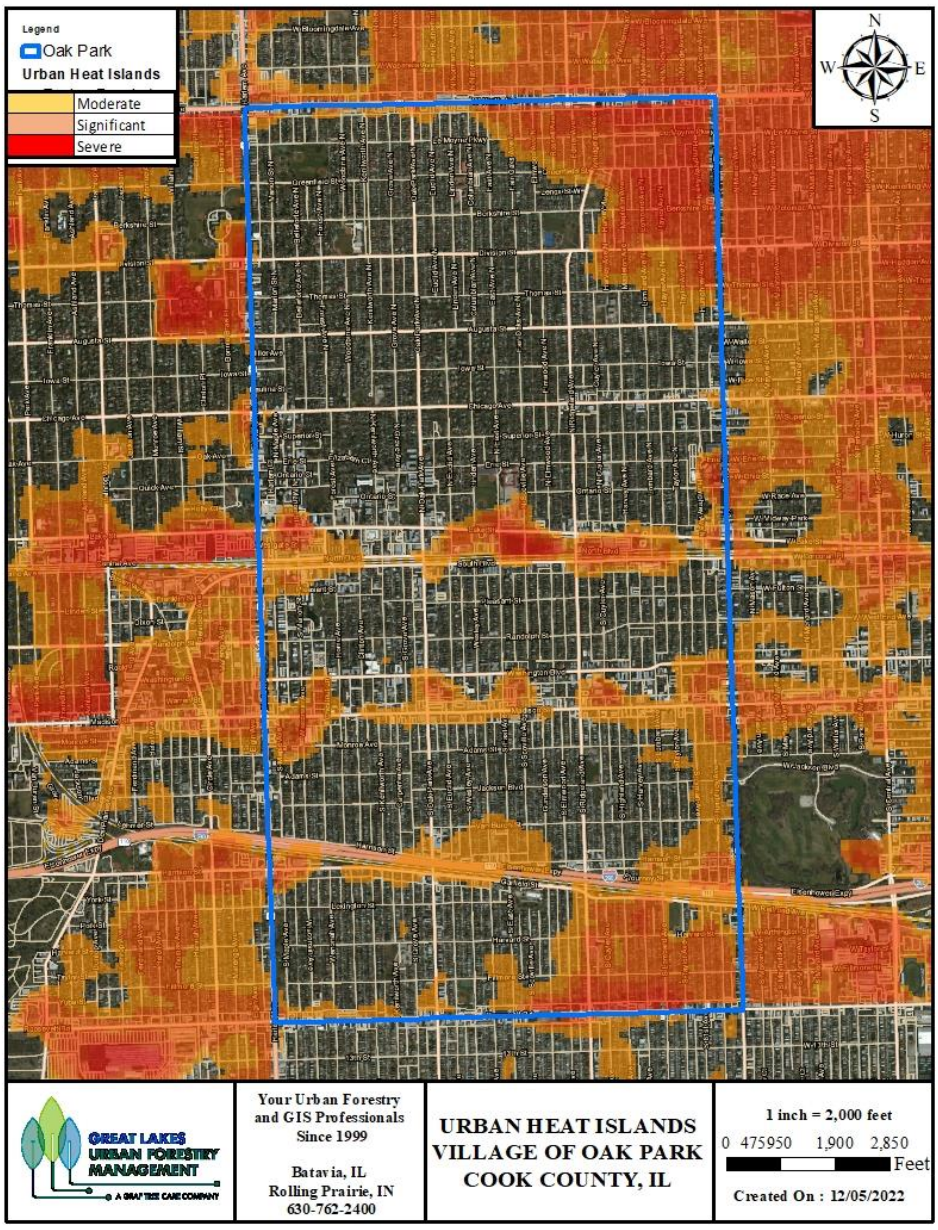
Think about it, if you wear a dark shirt when the sun is shining, you feel hotter than if you were wearing a white shirt. That is because different colors absorb things differently, and light colors reflect light while dark colors absorb it, and absorbing more light leads to more heat. So asphalt and other urban surfaces create local heating above normal atmospheric heating.





All of this is of course just scratching the surface of a set of very complex issues. But essentially, when we have a generally warming climate, combined with this urban heat island effect, it can dramatically raise temperatures in urban areas, leading to a variety of issues. This is where trees become a major factor in making things better. Not only do they absorb carbon dioxide from the atmosphere, which helps to reduce the effects of climate change, but especially in urban areas, if we can plant trees over areas of asphalt and dark surfaces, this will keep the sun from hitting those surfaces, and instead direct the sun's energy to photosynthesis in the tree's leaves. The combined effects of these things will lead to reductions in warming.

For the Village of Oak Park, below is a map of the urban heat island areas. The darker red or orange areas represent greater heat island effects, but do not represent specific "degree based" deviations, and areas of no shading mean no deviation from long term averages:

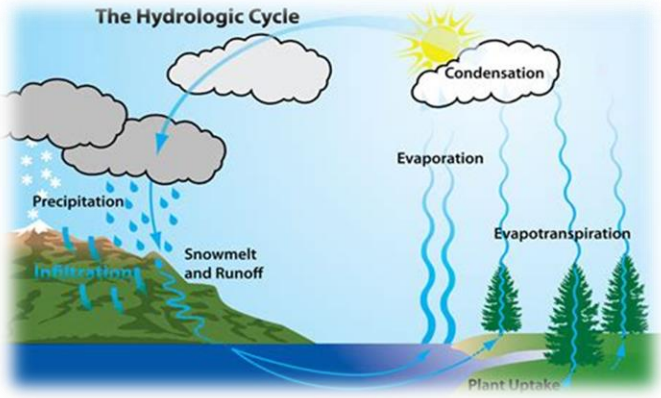


As can be seen from this map, the greatest heat island effects are often found along the transportation corridors, as well as other areas where greenspace is lower overall. These are the areas where tree planting will create the greatest cooling effects.

Planting trees not just on Village owned property, but also educating and encouraging residents and business owners to plant trees on their own property is a long-term goal of this management plan, and one of the big reasons is to offset the effects of climate change and the urban heat island effect. It should also be remembered that the climate is global, and there are no walls that separate cities, states, countries, etc. So, when one area warms, it has effects on the whole climate system. Conversely, when an area has more trees and vegetation planted, those benefits do not just stay confined to that area but benefit the whole planet. Trees are truly an example of acting locally and impacting globally.

Reduction in Flooding / Storm Effects

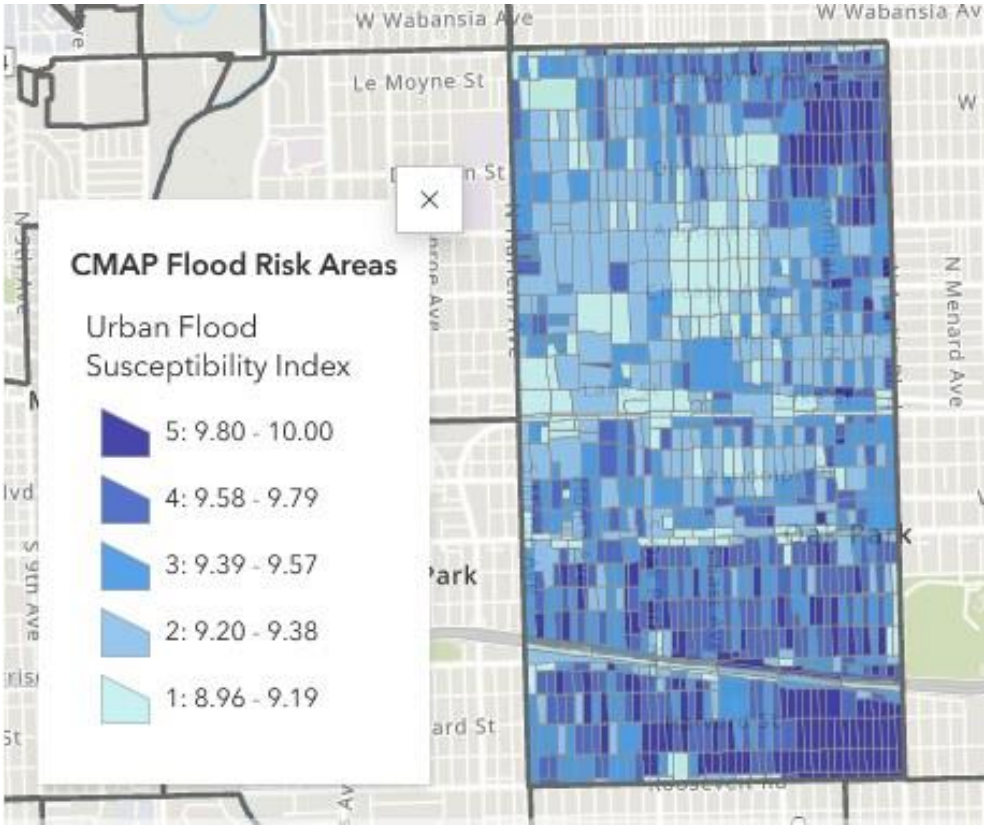
Once again, let's define a few terms here. First, the Earth has what is called a **Hydrologic Cycle**, which is pictured in a simple form to the right. All of the water that has ever existed on Earth was here when the Earth first formed around 5 billion years ago and has simply been recycled ever since then. Water stored in the oceans and lakes evaporates into the atmosphere where it forms clouds, and then rains down, either into the ocean to start again, or over land, where things get more complicated. When rain falls over land, several different things can happen to it that determine what happens next in the cycle.



If the rain falls onto the soil surface, some of that water **percolates** into the soil where it moves as groundwater (water under the soil surface). However, when there is so much rain that the soil becomes saturated like a wet sponge that cannot hold any more water, then any additional rainfall becomes **runoff**, which "runs off" over the top of the land surface. This is what we traditionally call **floodwater**.

When an area floods, the consequences can be enormous in terms of economic impact and the impact to humans and wildlife. And there is another side of this story as well. Most communities have what is called **stormwater infrastructure** to handle this water. Storm drains are things we all see regularly which are meant to handle this water. But those systems are expensive to maintain, and the more water they handle, the more often they need repair or replacing. So what can we do to reduce this floodwater? Plant more trees.

Trees do something called **transpiration**, which effectively means that their roots soak up excess water in the soil, and they release it through their leaves back to the atmosphere. So the more trees we plant, the greater the reduction in flooding, and the less our stormwater infrastructure is taxed, and the less economic and social suffering there has to be as a result of flooding. On the following page is a map showing flood prone areas in Oak Park:



Oak Park has an overall high risk of urban flooding. This includes overland flooding, surface ponding, seepage, and basement sewer backups. The areas shown as darkest blue have a relatively higher risk of urban flooding. The areas with the most urban flooding risk are the northeast corner of the village, and south of Madison Street. This is similar to the areas with low tree canopy cover and high impervious surface. This may not mean that these areas experience more flooding, but that they include several risk factors which make them more likely to flood than others. The areas shown as lightest blue have a relatively lower risk of urban flooding. The areas are concentrated mainly in north-central Oak Park.

Since the FEMA's National Flood Insurance Program begun in 1973, "100-year flood events" (flood events that have a 1% chance of occurring in a given year) have increased in frequency on average every 40 years. Our region is expected to face a 20-25% increase in rainfall under the current global greenhouse gas emissions forecast. This rain is expected to occur in shorter bursts and more extreme events between potentially longer drought periods.

Tree planting throughout the Village in general will help to intercept some precipitation as well as transpire extra water out of the soil which can help to alleviate some of the inundation into the infrastructure. In particular, there are trees which are naturally adapted to growing in wetter soils, and these trees can really move a lot of water out of the ground, especially as they age. A mature tree can move as much as 5,000 gallons or more of water per year out of the system. Multiply that by thousands of trees, and you can see how quickly this adds up to a big difference. (https://www.epa.gov/sites/default/files/2015-11/documents/stormwater2streettrees.pdf)

Tree Removals

The first step towards attaining Oak Park's forestry goals will be to remove trees which are diseased, dying, or present a hazard. At present, there are 85 trees which have been called for removal based on the inventory data. Many municipal inventories reveal between 1-2% of the tree population requiring some form of removal annually making Oak Park's removal statistics below average. With a current population of 18,526 and a projected growth to approximately 18,750 in 2043, it would be expected that there would be approximately 300 removals required each year, which is an estimate based on averages over the last 5 years.

In order to attain the goals set forth in the Diversity Standards, the background rate of tree removal should be matched or slightly outpaced by planting numbers. Going forward, reevaluation of the tree population on an annual or semiannual basis by the Forestry Superintendent, their designee, the or Forestry Consultant will help to specify which trees require removal. These numbers are meant to be placeholders for budget calculations and diversity standards. This does not require that 300 trees be removed each year, this is simply a projection based on the existing inventory data and typical statistics.

For purposes of projection, costs have been estimated using the rates per diameter inch in the table below for tree removal along with the flat rate for stump grinding, which is based on current market pricing. Rates may be found lower than this in a competitive bid process or using in-house labor. As is the case with all cost projections for this Plan, no cost increase is assumed for the first 5 years, and a 3% annual cost increase is assumed thereafter. This is also a conservative estimate based on the Consumer Price Index. In addition, for trees in year 10 and beyond, these are anticipated averages of trees to be removed. Exact numbers of trees to be removed may be more or less.

0-11" $3.31/inch
11-18" $8.27/inch
18-24" $12.13/inch
24-30" $14.33/inch
30+" $18.74/inch
Stump grinding costs are $275/stump

Milestones	2023	2024	2025	2026	2027	2028-2033
Trees Removed	300	300	300	300	300	300/year avg
Diameter Inches	3,600"	3,600"	3,600"	3,600"	3,600"	3,600"
Notes	Parkway & Private Tree Removal, Storm Cleanup, Stumping	Parkway & Private Tree Removal, Storm Cleanup, Stumping	Parkway & Private Tree Removal, Storm Cleanup, Stumping	Parkway & Private Tree Removal, Storm Cleanup, Stumping	Parkway & Private Tree Removal, Storm Cleanup, Stumping	Parkway & Private Tree Removal, Storm Cleanup, Stumping
Removal Cost (2023)	$255,000	$255,000	$265,000	$275,000	$285,000	$300,000
Removal Cost (CPI)	$255,000	$255,000	$265,000	$275,000	$285,000	$345,000

Tree Removal Activities

Safe Removal of a Tree to an Appropriate Flush Cut

Tree removal can be dangerous, but when performed by professionals is very safe. Therefore, all tree removal activities on Oak Park's public property shall be performed under the guidance of a Certified Arborist or Arborist Trainee. This may be the supervision of the Forestry Superintendent, or a staff Certified Arborist alongside a contractor. The safe removal of a tree involves the safe removal and lowering of all portions of the tree according to all relevant ANSI standards and Best Management Practices. The stump must be flush cut such that the highest portion of the cut is no greater than two inches from the highest part of the ground surface to prevent a tripping hazard on public property.

Stump Grinding

Within a reasonable amount of time following the removal, stumps and surface roots should be removed using an approved stump grinding machine, such that the stump is ground to a minimum depth of 8 inches, and no surface roots are visible. If the site is to be planted with a new tree, that depth should be increased to 12 inches below the soil surface. This will ensure that a new tree may be successfully planted, and that no re-sprouting will occur from the old stump. The depths to which the stump must be ground may be altered by the Village of Oak Park depending on needs for specific circumstances or contracts. Until such time as the planting space is fully restored, the stump hole should be filled and compacted to ground level using the debris resulting from the stump removal.

Planting Site Restoration

Once the tree has been safely removed and the stump has been ground out, the open planting space must be fully restored if a tree is not scheduled to be planted in or adjacent to the old hole. Site restoration consists of removing the stump chips from the hole, filling it with a quality mineral topsoil, tamping down to match the surrounding grade, and spreading grass seed over the top of the topsoil. This will ensure that grass grows back to restore the aesthetics and function of the parkway, and prevent tripping hazards from the removal scar.

Reasons for Tree Removal

Removal of trees on public spaces is an unavoidable reality of managing large tree populations. When the trunk, branches or roots fail, a standing tree can cause personal injury or property damage, and even small dead trees can be an eyesore and reduce property values. Old trees can hold great sentimental value, and many people become attached to them. However, there are times when their presence creates a public hazard, and it is at those times that action must be taken to ensure public safety. It's also important to remember that the removal of a tree today is the promise of a new tree for tomorrow!

Removal of trees on Village of Oak Park public property shall always be at the discretion of the Forestry Superintendent or their designee and/or Forestry Consultant. Trees will never be removed without a sound reason from the Village or Forestry Consultant. Residents may request a tree to be

removed for reasons NOT covered below, and these requests will be reviewed by the Forestry Superintendent or Forestry Consultant. Removal requests may be granted and paid for under the annual forestry budget. However, trees with a greater need for removal based on public safety will always hold a higher priority. Under no circumstances will the Village of Oak Park be responsible for trees which are not in the right of way.

Dead or Dying

If a tree is biologically dead or nearly dead, it will require removal. Trees which are standing dead, have approximately 50% dead crown or greater, or have less than approximately 40% structurally sound wood in the cross-section of the trunk shall be removed as expediently as practical. These determinations shall be at the discretion of the Forestry Superintendent, their designee, or the Forestry Consultant.

Diseased or Infested

Diseases are caused by viral, fungal, or bacterial pathogens. Infestations are caused by insects or other small animals. Dutch Elm Disease and Oak Wilt, for example, are fungal diseases that kill Elm and Oak trees when they are infected. Emerald Ash Borer is an insect which kills Ash trees by infesting them. The prompt removal of diseased or infested trees limits the exposure of other nearby trees. The removal of 1 tree may save dozens of others. Trees deemed to be diseased or infested by the Forestry Superintendent, their designee, or the Forestry Consultant shall be removed as expediently as possible in order to slow the spread of such insects and diseases.

High or Extreme Risk

"Tree Risk" is the potential of a tree or tree part to impact a nearby person or piece of property and cause property damage or personal injury. This topic is of great interest in Arboriculture today, and insurance companies are becoming increasingly involved in the process of assessing and managing the risk posed by trees. Litigation involving trees is a perennial concern for public entities. All public trees in Oak Park were assessed for a basic level of risk during the initial inventory, and a number of trees were found to be at elevated or substantial risk levels. If such risk can only be safely mitigated by tree removal, as opposed to pruning or other measures, then their timely removal is critical because of potential exposure of the public or property to potential harm.

The Forestry Superintendent, Forestry Consultant or any other TRAQ Qualified Risk Assessor must assess the tree and use the TRAQ concepts and matrices to document the details of the situation, prior to scheduling for removal, if necessary. Often, risk can be mitigated by removing a portion of the tree, or other corrective measures. If the entire tree is deemed to be at high or extreme risk of failure, however, the entire tree shall be removed as soon as possible as a means of reducing its residual risk to zero.

Emergency / Storm Damage Removals

A tree shall be removed if it has been severely damaged and/or compromised by lightning, wind, or other such weather event. "Storm-damaged" shall be generally defined as a tree which has lost 33% or more of its crown, has a large crack or other wound in the trunk, has a lean of greater than ten degrees from vertical, has sustained a lightning strike, or other such issues directly related to storm events. The Forestry Superintendent, their designee, or the Forestry Consultant shall determine the need for removal of a tree in these cases, although in an emergency situation such as a tree impacting a person, vehicle, home, power lines, or other such emergency, the Village may perform any actions necessary to abate public hazards so long as they are in compliance with all relevant Arboricultural standards and practices.

Damage from Construction or Vehicle Strike

The Forestry Superintendent, their designee, or the Forestry Consultant shall assess trees that have been impacted by a vehicle strike or piece of construction equipment. 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 in order to maintain public safety. That decision will be based on the best professional judgement of the Forestry Consultant, their designee, or the Forestry Superintendent.

Planned Development

Occasionally, tree removal may be necessary due to planned development adjacent to existing Village trees. If it is determined by the Forestry Superintendent, or their designee, that tree preservation Best Management Practices as references in Village documents, would not be sufficient to protect an existing tree from catastrophic damage due to planned development, the tree may be scheduled for removal, at the Forestry Superintendent or their designee's discretion and restitutional value will be appraised and required from the developer.

Reasonable Resident Request

If a tree has non-terminal pest or pathogen issues, moderately poor structure or is in somewhat poor condition, a resident may request the removal of the tree. Such requests will be reviewed by the Forestry Superintendent and/or Forestry Consultant, and evaluated on a case-by-case basis. If the tree shows significant potential to decline or pose a threat in the near term, the Village may agree to the removal within the next five years. Note that young and/or healthy trees will generally not be considered eligible for this program. Priority will always be given to trees in danger of threatening public safety.

Interference with Utility or Signage

A tree shall be removed if it is interfering with the function or visibility of official traffic control devices or has impacted above or belowground utilities in a manner that cannot be mitigated by pruning or other measures. In these cases, it is likely that no new tree will be planted in these sites.

Overplanted, Underperforming, or Invasive

No healthy tree shall be removed for the sole reason of having been overplanted. As a result of this UFMP, Oak Park will be enhancing their use of industry best management practices for diversity in the urban forest, with the goal of building a diverse urban forest. Overplanted species listed as being in poor condition will be reviewed to assess further decline or recovery. Those trees in noticeable decline shall be removed at the discretion of the Forestry Superintendent, their designee, and/or Forestry Consultant. This will be used as a preventative measure so that these trees do not continue to decline to a point where they become hazardous, and not used as a reason to remove an otherwise healthy tree. Additionally, species that have proven to have invasive qualities shall be prioritized for removal, particularly if they are in poor condition.

Basic Village Tree Removal Requirements and Standards

For more details on Oak Park's standards, refer to the Village's Arboricultural Specifications Manual. For a more detailed view of the specific ANSI and ISA standards, please see Appendix G.

Village of Oak Park

1. All personnel directly involved with process of chainsaw operation, climbing, bucket truck operation, and rigging limbs shall be provided with sufficient training and experience to perform such duties while employed by the Village of Oak Park, as either Public Works and Forestry staff, or performing work as a contractor employed by the Village.
2. Only qualified utility arborists may perform tree removal operations within ten feet of an electric utility line. Village of Oak Park employees or contractors may complete the process of trunk removal and stump grinding only if the remaining portion of the tree is greater than ten feet from a transmission line.
3. The Village will not remove healthy trees in order to meet diversity goals, unless the tree poses a risk to persons or property.
4. The Village of Oak Park shall not perform or assist, programmatically or financially, with the removal of trees on private property unless public safety is threatened, as described in Village ordinance 25-1-7.

Tree Planting

Whereas tree removal is necessary to promote public safety, planting of new trees must happen in order to increase our diversity and canopy cover. At present, the Village of Oak Park has approximately 250 open planting spaces on its parkways. As a means of attaining the goals of

increasing canopy cover to 50%, maintaining stocking density, and improving overall diversity, this plan calls for the consistent planting of trees over the coming 20 years. These trees will be planted by Village staff and/or contractors. This plan has a direct goal of planting trees where they have the best chances to establish and thrive based on their specific sites and species requirements.

A key goal of this Plan will be that the planting program will replace trees identified as requiring removal and also to begin planting in open spaces on the Village's parkways. This plan anticipates plantings to generally match (or slightly outpace) removals by a 1 to 1 ratio. Additionally, the Village currently uses American Forests Tree Equity Scores to prioritize plantings in areas with lower scores.

For the costs of planting, $575 per tree (installed) can be used and watering for the first growing season has also been factored in. This is a conservative estimate based on retail costs, and likely the Village may be able to perform planting at a more favorable rate. We examine money saving proposals in further detail in the Strategic Partnerships section.

Milestones	2023	2024	2025	2026	2027	2028-2033
Trees Planted/Watered	300	300	300	300	300	300/year avg
Planting/Watering (2023)	$172,500	$172,500	$172,500	$172,500	$172,500	$172,500
Planting Cost (CPI)	$172,500	$172,500	$172,500	$172,500	$172,500	$198,375

The Importance of Planning Your Tree Planting

Right Tree in the Right Site

The field of Urban Forestry has an unfortunate history of not planning carefully for tree planting. Whatever was readily available, inexpensive, urban tolerant, and grew fast was seen as desirable, and often planning of tree plantings was left to developers or nurseries and plantsmen. With our history of invasive insects and diseases in the Midwest region, and knowing these will only get worse in the future, it is more crucial than ever that we have a process to plan our tree plantings.

This process should involve assessing each site to be planted in much the same way we would assess a tree, except that in this case, we look for factors such as available above and below ground growing space, how much light the tree receives, amount of soil moisture present, and possibly other factors such as soil pH and texture. Once this information is collected, planting sites can be matched with trees which are well suited to those sites. Matching the right tree to the right site like this will result in trees which establish faster, grow more vigorously, live longer, and provide far greater benefits. Even a simpler version of this process is better than nothing. When you have your species list for each site assembled, it makes bidding nurseries and plantsmen easier since you already have a plan in hand.

Playing an active role in your tree planting planning also allows for meeting diversity standards such as the taxonomic, spatial, and age class diversity principles outlined above and attempts to get the tree population into compliance with the "20-10-5 Rule". Being targeted about species selection also allows the use of species which are slightly more difficult to find appropriate sites for. We anticipate that over the timeline of this plan, that nearly all open spaces will be planted.

The success of a tree depends on where and how it is planted. The Forestry Superintendent or Urban Forestry Consultant should assess planting sites before trees are purchased and installed each year, to ensure the correct tree is being planted for the correct site. Each tree planted represents a 25-75+ year commitment, and this planning helps to increase the benefits the community can reap from this commitment. A list of unapproved species appears in Appendix A.

Nursery Stock Procurement

Nursery stock quality is yet another aspect of planning which can help a tree establish, survive, and thrive to provide great benefits to the community. The Forestry Superintendent, their designee, or the Urban Forestry consultant should inspect and select every tree which is to be planted on Village property to minimize the possibility of installing lower quality nursery stock. Specifications should be for material no smaller than 1.75" caliper, with good form for the species, planted as balled and burlapped.

Currently, the industry is recovering from a nursery stock shortage due to high demand to replace Ash trees lost to Emerald Ash Borer, which impacted the availability of some species. We strongly recommend not to accept substitutions in the requested species lists, as many nurseries are still attempting to substitute overplanted trees for some of the higher diversity species which may still be difficult to obtain. It is recommended to have an approved substitution prepared for each requested tree species.

Tree Transport and Planting

Proper transport and planting procedures determine a tree's success after planting. Even healthy trees from the field, if improperly transported, may dry out during transport, or have structural damage to root balls incurred. When it comes time to plant, trees planted too deeply will suffer from root compaction and trunk decay.

Trees planted without properly dug holes may suffer from stunting. Trees planted without proper removal of packaging materials may develop girdling roots. Trees planted too high may have surface root desiccation. Trees with improper trunk protection may suffer from trunk wounds or girdling of the entire trunk. The standards and Best Management Practices for tree transport and planting are detailed later in this section, as well as Appendix H.

Tree Spacing and Visibility Requirements

Minimum tree spacing between large, medium, or small sized deciduous shade trees should be appropriate for the species and conform to local standards. In Oak Park, spacing is generally accepted as no less than 35 feet between plantings, with some exceptions for open spaces or smaller trees. This

will allow trees to grow to their full potential without heavy competition for water and nutrients with neighboring trees, and without limited space for crown growth.

In addition, no tree should be planted within 15 feet of a driveway, 25' from an intersection or traffic control device, 10' from a crosswalk, or 10' from an above ground utility pole or lamp. Trees may be planted under aboveground powerlines, but must be a small mature height species. Evergreen species are generally not acceptable for street trees, as they can obscure views of the road and may lead to accidents. Evergreens are acceptable for parks, schools, municipal campuses, and waterways.

Watering

Watering of newly planted trees is essential to their establishment, growth, and survival, particularly during the first 2 years of their lives. The Village includes weekly watering in its budget for newly planted trees during the first growing season using contracted labor. The responsibility for supplemental watering may also be taken on by the property owners. It is highly recommended that when a tree site is selected for planting, that a basic letter or informational pamphlet be provided to property owners describing how much water to give a tree, and when it should be given, particularly during extended hot, dry periods. Such simple information can make the difference between a tree dying from drought stress, a tree dying from overwatering, and a happy, healthy tree.

Challenges of Urban Plantings

Urban planting sites are a difficult environment for a tree to thrive in, and based on long term data, it is expected that 5-10% of new plantings fail each planting cycle. The Village's contracts for tree planting should include a one to two-year replacement warranty for any new trees that fail to thrive in their new environment. Urban tree plantings can pose an uphill battle in many ways, due to limited soil volume, salt runoff, airborne pollutants, and other factors. New planting mortality is to be expected, despite best efforts to prevent such an outcome, but the planning measures outlined above will help to mitigate annual new planting mortality.

Tree Planting Requirements and Standards

For more details on Oak Park's standards, refer to the Village's Arboricultural Specifications Manual.

Village of Oak Park

1. Planting sites shall be determined and monitored using the Village's tree inventory, in conjunction with staff and Forestry Consultant input.
2. New planting sites should based on distances listed in the Village's Arboricultural Specifications Manual.
3. Choice of species for planting should be done so according to the Village's taxonomic, spatial, and age-class diversity goals. A diverse and resilient urban forest minimizes exposure to financial, environmental, and health risks while maximizing aesthetics, environmental benefits, and ecosystem services to its residents.

4. All planting stock shall be grown within 150 miles of the Village/planting site.
5. Acceptable nursery stock shall conform to the following standards:
   - **A.** Minimum of 1.75-inch caliper, measured at six inches from the trunk flare
   - **B.** Root ball conforms to ANSI Z60.1 Standards for Nursery Stock
   - **C.** Less than 10% deadwood in the crown
   - **D.** Architecture consistent for the species, cultivar, or variety in question
   - **E.** No included bark or other such narrow branch attachments, unless consistent with species or variety
   - **F.** Free of pests or pathogens
   - **G.** Not on the unapproved species list for the Village of Oak Park
6. Planting and digging of certain species shall only occur at certain times of year, in accordance with nursery industry best management practices and professional judgement. These times are subject to the professional opinions of both the Village of Oak Park and its approved contractors.
7. JULIE, or another similar utility locating service shall be contacted, and all utilities located a minimum of three days before planting is scheduled to begin.
8. It is recommended that a minimum of a one-year replacement guarantee be extended from approved nurseries and plantsmen for all new plantings rated to hardiness zone five or lower.
9. A goal of this plan will be to revise the contractor's planting procedures to make sure the root collar is visible and at or slightly above grade after planting.

Tree Pruning

When maintaining a tree population for its greatest benefits and lowest risk, tree pruning is one of the most cost-effective maintenance activities which can be performed. Pruning provides several important services for a tree: it reduces the risk of failure, provides clearance for utilities or other structures, reduces wind resistance and wind damage, maintains overall tree health, and improves overall aesthetics.

For purposes of these projections, budgets are based on the proposed 4 zone cycle pruning program. The Village currently operates under a 3 zone program, however the program has proven to be ineffective in that the pruning contractor has not be successful in completing the necessary work. For the current population of 18,526 trees and with an estimated 18,750 trees in 2043, approximately 4,600-4700 trees will need to be pruned annually for a 4 year cycle. Ideally, the in-house crew would prune all trees 1-10" in diameter. The focus would first be on dormant season pruning of Oaks and Elms 6-10" diameter in size. Depending upon staffing, the in-house crew would then try to prune as

many other non-Oaks and Elms as possible. If staffing increases, the Village would plan start to prune as many other smaller diameter trees as possible. The UFMP, when reviewed and updated periodically, will reflect the current status of the cycle pruning program.

For cost estimates associated with these activities, several assumptions were made:

The budget projection charts below are based on actual pruning costs provided by the Village. Consistent with other budget tables, a 3% annual CPI increase was added after the first 5 years.

Milestones	2023	2024	2025	2026	2027	2028-2033
Trees Pruned	4600	4625	4650	4675	4700	4750/yr average
Notes	4,600 Cycle Prunes	4,625 Cycle Prunes	4,650 Cycle Prunes	4,675 Cycle Prunes	4,700 Cycle Prunes	4,750 Cycle Prunes in Perpetuity
Cost (2023)	$400,000	$400,000	$400,000	$400,000	$400,000	$425,000
Cost (CPI)	$400,000	$400,000	$400,000	$400,000	$400,000	$488,750

Provided below is a series of estimates based on the change in composition of the Urban Forest over time. As larger underperforming trees are removed and smaller trees planted in their place, the size breakdown of the Urban Forest will change. Given this expected change in the average size of trees, we have included several breakdowns below estimating costs as the composition of the Urban Forest changes. Please note these are estimates, and should be reviewed periodically to ensure accuracy.

2023 Cycle Pruning Cost Breakdown – Pruning 4,600 Trees/Year by 2023

	Total Trees	Avg %	Cost/Tree	Pruned/year	Cost/year
0-4" DBH	3350	18.11%	$22.00	838	$ 18,425.00
5-6" DBH	1275	6.89%	$26.00	319	$ 8,287.50
7-12" DBH	3725	20.14%	$44.00	931	$ 40,975.00
12-20" DBH	5100	27.57%	$92.00	1275	$ 117,300.00
21-30"+ DBH	3800	20.54%	$130.00	950	$ 123,500.00
31"+ DBH	1250	6.76%	$185.00	313	$ 57,812.50
					$ 366,300.00

2028 Cycle Pruning Cost Breakdown – Pruning 4,650 Trees/Year by 2028

	Total Trees	Avg %	Cost/Tree	Pruned/year	Cost/year
0-4" DBH	3300	17.60%	$22.00	825	$ 18,150.00
5-6" DBH	1300	6.93%	$26.00	325	$ 8,450.00
7-12" DBH	3950	21.07%	$44.00	950	$ 41,800.00
12-20" DBH	5200	27.73%	$92.00	1300	$ 119,600.00
21-30"+ DBH	3850	20.53%	$130.00	963	$ 125,125.00
31"+ DBH	1150	6.13%	$185.00	288	$ 53,187.50
					$ 366,312.50

2033 Cost Cycle Pruning Breakdown – Pruning 4,750 Trees/Year by 2033

	Total Trees	Avg %	Cost/Tree	Pruned/year	Cost/year
0-4" DBH	3250	17.11%	$22.00	813	$ 17,875.00
5-6" DBH	1350	7.11%	$26.00	338	$ 8,775.00
7-12" DBH	4000	21.05%	$44.00	1000	$ 44,000.00
12-20" DBH	5300	27.89%	$92.00	1325	$ 121,900.00
21-30"+ DBH	3900	20.53%	$130.00	975	$ 126,750.00
31"+ DBH	1200	6.32%	$185.00	300	$ 55,500.00
					$ 374,800.00

Pruning Activities

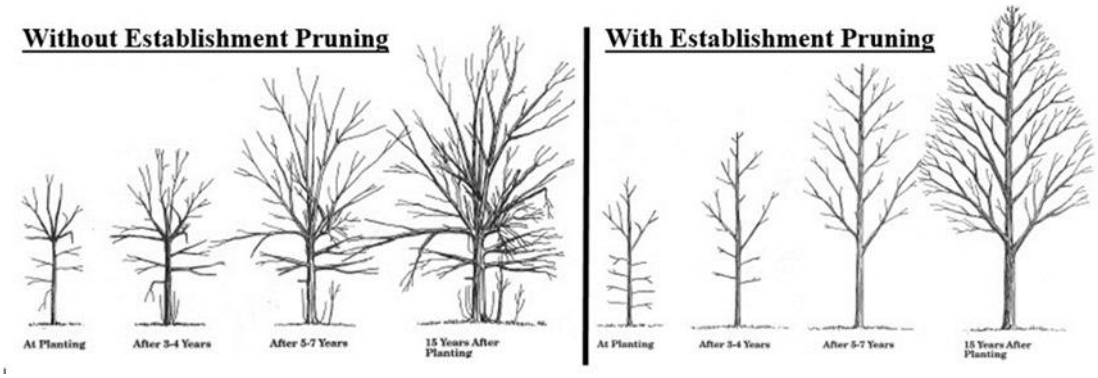
Maintenance and Improvement of a Cycle Pruning Program

With approximately 18,750 parkway trees total by 2043, this would mean that over a 4 year period, approximately 4,700 trees would require pruning each year. As noted above, the number of trees as well as their overall sizes will be changing over that time period, so adaptive management of the tree pruning program should be anticipated. We believe this is a realistic goal based on communications with Village staff.

Though tree pruning may seem expensive, the cost of maintaining trees is significantly less than the costs associated with trees damaging property or injuring residents. The benefits trees provide when healthy and well maintained can be prolonged and significantly increased, as shown in the projections above. A cycle pruning program is the hallmark of an effective forestry program, and it is important that Oak Park continues to budget for this essential expense.

Pruning of Young Trees

For the purposes of this Plan, a young tree is considered to be under 12" DBH. Young trees are still trying to acclimate to their sites. The pruning of young trees has different goals and outcomes than the pruning of larger, mature trees. Standard nursery stock has been meticulously pruned for four to ten years to have a single trunk, and the specific branching patterns which are considered common to the various tree species. Without proper establishment pruning, these trees might have multiple trunks, poor branch structure, and overall poor form and architecture. Pruning of young trees to establish proper form is one of the most cost-effective maintenance activities which can be performed. It is an inexpensive task that does not require a great time commitment, and saves thousands of dollars in pruning and maintenance costs later in the tree's life.



Pruning of Mature Trees

A mature tree, for the purposes of this Plan, is considered to be greater than 12" in diameter. Mature trees are established in and acclimated to their sites. The pressure these trees face from their environment generally comes from above-ground factors such as pests, pathogens, man-made structures, other trees, windstorms or lightning strikes, as well as some below ground factors like girdling roots, limited soil volume, or poor soil quality. Pruning is performed to mitigate the above-ground issues, as well as balance out any below ground issues when possible. Natural aging and limb dieback are additional reasons these trees are pruned.

Pruning of mature trees may mitigate a short-term risk, such as after a storm, or pruning may be done to maintain a tree's long-term health and structure. In the wild, trees lose limbs frequently. This is called self-pruning. Allowing trees to self-prune over time is not advisable in an urban setting. Safety factors may arise, and the process of self-pruning may bring up aesthetic issues in an urban environment. It is recommended that mature public trees be pruned by professional Certified Arborists, and done in accordance with industry Best Management Practices and accepted ISA and ANSI standards.

Private Property Trees

The Village of Oak Park is generally not responsible for the pruning of trees located on private property unless public safety is threatened as described in Village Ordinance 25-1-7. In other exceptional cases, the Village reserves the right to prune portions of trees overhanging public property, but is under no legal obligation to do so, and will perform such pruning at the discretion of the Forestry Superintendent, their designee, and/or Forestry Consultant.

Reasons for Pruning

Establishment Pruning

Establishment pruning of newly planted trees is the single most cost-saving measure in tree care, as it establishes good form and branch structure for the life of the tree. Establishment pruning should be performed a minimum of one time prior to the tree reaching six inches in diameter. Once established, the tree will only require periodic cycle pruning to maintain an appropriate form for the urban forest and to maintain health and keep the tree free of dead limbs.

Cycle Pruning

A Best Management Practice in Urban Forestry is that trees should be pruned on a cyclical basis as preventative maintenance. A general guideline is that a proactive cycle pruning program should be no more than seven years, ensuring every tree is pruned once every seven years. Once a tree reaches a timeframe of seven or more years without pruning, the maintenance becomes more reactive than proactive. Cycle pruning ensures that dead branches, storm damaged limbs, or unsightly growth are removed before becoming hazardous or bad for the health of the tree. Cyclical pruning also ensures the proper leaf to stem ratio, which provides structural support for the tree. It also ensures that pruning stays relatively inexpensive, as severe issues do not have time to develop. Cycle pruning is a maintenance activity which if performed regularly, actually needs to be performed less often!

Emergency / Storm Damage Pruning

Emergency pruning is nearly always necessary to mitigate severe risk after storm events, such as limbs which have fallen and are blocking traffic, have impacted a structure, are interfering with a utility, or are hanging and in imminent danger of doing any of the above. Emergency and Storm Damage Pruning should be conducted at the discretion of the Village, with the best interests of the public in mind. This is one of the few occasions on which the recommendations of this Plan may be temporarily suspended. When life or property are in imminent danger due to conditions associated with a downed tree or tree part, the Village may take whatever remedial action is practical and reasonable to mitigate such imminent risk.

Sanitation Pruning

When a tree has been diagnosed as having been diseased or infested with a pest or disease, sanitation pruning may be employed to maintain the tree while removing the diseased or infested portions. This technique is only effective when the host tree is infected/infested with certain pests and pathogens, and only in a localized area of the tree. With more widespread cases of disease or insect infestation, removal will be the most cost-effective and safest option to avoid endangering other nearby trees, as these pests and diseases tend to spread, particularly when there is more of the same species nearby.

Removal of High Risk Limbs

At times, a tree as a whole may not pose a high risk, but a single limb may have defects that make it hazardous. At these times, the removal of such limbs or parts may render the tree to be low risk again, without causing permanent damage to the tree.

Tree Pruning Requirements and Standards

For more details on Oak Park's standards, refer to the Village's Arboricultural Specifications Manual.

Village of Oak Park

1. All activities directly related to the operation of a chainsaw, bucket truck, limb rigging, or tree climbing shall be performed by a qualified employee, or under the supervision of a certified arborist or arborist trainee.

2. No pruning or maintenance activity that takes place within ten feet of a power transmission line shall be accomplished by a Village of Oak Park employee unless certified as a qualified Utility Arborist.
3. No heading, pollarding, topping, or espalier pruning shall be conducted on Village-owned trees, and no wound dressings shall be used under any circumstances, without a permit and prior written approval of the Village of Oak Park, with the exception of using wound dressing for Oaks and Elms requiring pruning during the growing season.
4. The need for pruning and maintenance of individual trees and parkways shall be at the discretion of the Village of Oak Park and its designated contractors.

Other General Maintenance

Maintenance Activities

Retaining a Consultant

The task of establishing or enhancing a robust Urban Forestry program can be difficult! There may be many new challenges and learning curves, contracts to renegotiate, bid documents to create, resident concerns to manage, and other responsibilities which may require the assistance of a professional. Although the Village employs full-time Certified Arborists, it has also used the services of a forestry consultant for many years.

The Forestry Consultant is equipped to be involved in sourcing and interviewing contractors and vendors for tree pruning, removal, and planting operations, assisting in maintaining the tree inventory, training Village staff on tree health and risk assessments, assisting in explaining policies to homeowners, preparing contract and bid specifications, and teaching residents how to help the Village in caring for their trees. The importance of this early relationship cannot be overstated, no matter how large or small the organization.

Chemical Applications

Trees, like people, sometimes contract pests and pathogens. Often these pests and pathogens can be controlled with a simple chemical application just as illnesses in humans can be controlled with medication. This practice is called Plant Health Care. When financially practical, chemical control for common pests or pathogens may be utilized as a preventative or curative method, and increase the aesthetics and benefits of the tree population.

At present, the Village performs limited PHC treatments partially due to the Village's Integrated Pest Management (IPM) plan. The Village has $20K budgeted for parkway tree health and these funds would be used to manage spongy moth if needed, but can be reallocated for root collar excavations. This will be discussed further below.

Residents of Oak Park may perform chemical applications on the parkway trees, such as treatment for Emerald Ash Borer, Dutch Elm Disease, Apple Scab, or other common disorders. Village will not bear any financial responsibility associated with the costs of such treatments, and it is recommended that treatments be performed by a Certified Arborist who holds a valid Pesticide Applicators license.

Such an allowance would be strictly informational, to allow the Village to be aware of chemical treatments occurring on trees that it owns. Such work may be denied or revoked for utilizing unqualified contractors, potentially hazardous chemicals, or any other reason at the discretion of the Village. Additionally, trees being treated by residents may still be removed at the discretion of the Village for any of the reasons listed above.

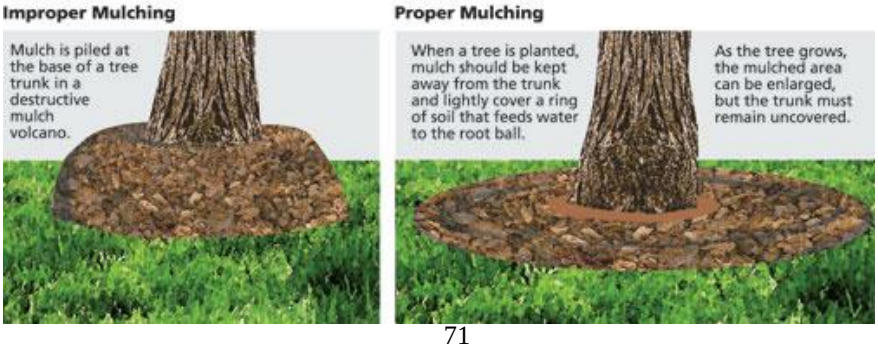
Water Management

The importance of water in the establishment, growth, and survivorship of trees cannot be overstated. Most trees adapted to our climate zone (USDA Zone 5b) are also adapted to the amount of moisture we have in an average year. However, younger trees with less expansive root systems are susceptible to prolonged drought. Young trees need supplemental watering, which is an essential maintenance activity and can prevent newly planted tree mortality.

As we anticipate a significant number of additional trees being planted over the course of the next 20 years, this concept becomes very important. The Village currently is in the second year of a three year watering contract where each newly planted tree is watered weekly during it's first growing season, a period of approximately 24 weeks. After the first growing season, the Village may look to rely on residents to take over watering tasks. Upon receiving a newly planted tree on the parkway in front of their homes, residents should be supplied with an informational pamphlet or letter which explains how often to water their new tree during the first 2-3 years. It is also suggested that the Village, acting in conjunction with the Forestry Consultant, hold basic tree maintenance classes open to all residents.

Mulch

Proper application of mulch is a necessary and cost-effective maintenance activity. Mulch has many benefits, including reducing weed growth in the root zone, protecting the tree trunk and root flare from lawn maintenance equipment, allowing water to move into the soil, reducing evaporation and drought stress, and creating a naturally fertile soil environment. Turf grass typical of parkways competes for water and nutrients, and mulch reduces this competition.



But not all mulching is beneficial. The practice known as "Volcano Mulching" is the practice of piling mulch or soil against the trunk in excess of 3" deep. This causes moisture build up against the trunk, and can cause decay of the trunk tissue, and possibly death. Material such as crushed limestone, red volcanic rock, or rubber pellets can alter the soil chemistry in an undesirable way, and cause dieback or tree death. The Village has recognized the need to mitigate improper mulching and has invested in using a contractor to utilize an air spade to perform 126 root collar excavations in 2022. If funds dedicated for tree health are not used to manage spongy moth, the budget could be transferred to the root collar excavation (RCE) program. The Village has also recently purchased an air spade to use in-house to perform root collar excavations and has also used a contractor in the fall of 2023 to perform root collar excavations on small trees in parts of the Village with a higher urban heat island effect. These areas were selected based upon the map in this UFMP. The Village is planning to further develop and implement the RCE program in 2024. Whether in-house or using contractors, the Village will explore the opportunity to continue and grow this program.

Fortunately, mulch is a commodity most communities can get for free so long as they are pruning and removing trees each year. Due to space limitations a marshalling yard for wood chips cannot be established in Village limits easily. The Village does have a program where chips are made available for free to residents. Residents can submit requests for chips, and as chips are created they will be delivered to residents on a first come-first served basis. This program works well for both the Village and its residents, as the Village is not tasked with disposing of the chips and the residents get a free resource.

In Oak Park, all newly planted trees are mulched at the time of planting and after the first growing season, wood chips are re-applied by the Village. A goal for Oak Park should be to mulch all trees 12" DBH and smaller, but for now, mulch for all newly planted trees, and preventing volcano mulching should be a primary concern.

Tree Preservation and Management During Construction

In many municipalities, ordinances exist to protect trees and shrubs from construction activities. The intent of these ordinances is to protect the benefits those trees and shrubs provide to the community. Trees and shrubs may be privately owned but are also community resources that provide benefits such as aesthetics, storm water benefits, energy savings, carbon sequestration and increased property values. Therefore, tree and shrub protection and preservation during construction represents an investment in the community! Ensuring the protection and preservation of these trees while minimizing burdens to businesses, developers, and residents is essential to a healthy urban forest.

Tree protection and preservation during periods of construction involves protecting trees from damage caused by construction activities. This damage includes physical and chemical damage to the trunk, branches, and roots. Damage may be caused by equipment such as backhoes, skid steers, or other appendage-type equipment. The effects of damage to the visible above ground portions of the tree can be obvious, as when branches are broken. But hidden effects such as root compaction or improper grading may not become evident for years until the tree begins to die back. The standards set forth below and in Appendix J are industry standards with a proven record of success.

Oak Park Tree Preservation Requirements and Standards

The Village document titled "Mandatory Tree Protection Specifications" details the Oak Park's tree protection requirements for Village trees including standards on the following:

1. Tree protection fencing requirements and installation instructions
2. Root protection requirements based on DBH
3. Root pruning specifications
4. Crown pruning specifications to allow equipment access
5. Details on fines imposed for violations

If the Forestry Superintendent or their designee determines that there would not be sufficient protection of an existing Village tree from catastrophic damage due to planned development, the tree may be scheduled for removal, at the Forestry Superintendent or their designee's discretion and the tree's restitution value will be appraised and required from the developer.

Additionally, Oak Park's Zoning Ordinance 11.10, details requirements for the protection of significant trees on private property during construction.

DRAFT Tree Risk Assessment Policy

Trees provide ecosystem and aesthetic benefits, but all trees also pose some degree of risk. Determining the acceptable level of risk, along with effectively managing that risk, is a key priority for urban forestry operations. As a tree manager, the Village of Oak Park always must always assume some degree of risk. It is up to the Village to track that risk to ultimately decide how to take steps to mitigate trees which pose such risk in a manner which is responsible both economically as well as in the interest of public safety.

Levels of Risk Assessment – An Overview

These Risk Assessment Levels are based on the International Society of Arboriculture's (ISA) Tree Risk Assessment Qualification (TRAQ) protocols, as well as the ANSI A300 Part 9 (Tree Risk Assessment) Standards. The TRAQ forms can be found in Appendix F at the end of this report.

Level 1 Assessment

Also called a "limited visual assessment", whereby a tree has a basic analysis of obvious physical defects and condition. The assessor walks or drives by the tree, assesses it quickly for defects,

evaluates the risk posed by the subject tree, and reports the results of the assessment to the tree owner. Often, prior to a recommendation, a more detailed (Level 2 or Level 3) assessment will be required to gather additional data.

Level 2 Assessment

A Level 2 Assessment, also called a "basic assessment", is a report detailing the information collected during a detailed visual inspection of the tree and the surrounding site. Such an inspection requires a 360 degree walk around, and may include the use of simple tools, such as binoculars, magnifying lenses, mallets, probes, and trowels or shovels. The goal is to get a more complete picture of the tree in its environment, as well as previous histories of failures, and a root to branch evaluation of not only the tree but also potential "targets" which falling tree limbs may impact. Targets are things such as structures, people, vehicles, or other things which may be damaged or injured by trees.

Level 3 Assessment

A Level 3 Assessment, also called an "advanced assessment", provides detailed information about specific tree parts, targets, and risk associated with each potential interaction. By definition, it requires specialized equipment known as "advanced tools", such as bucket trucks, resistance drills, sonic tomographs, and other such equipment. This is the most detailed and time-intensive type of assessment, and is typically only performed when a decision to retain or remove a tree is very difficult, as would be the case for a high quality tree near a potential target that has significant defects, the extent of which are not known, but must become known before making a decision.

Considerations in Assessing Risk

The following are meant for the reader to gain additional insight into the TRAQ process. Once again, TRAQ inspections were not performed on Village trees during the inventory data collection, but this information will help the reader understand the terminology better, and help inform staff and residents as to how and why these inspections are performed.

Likelihood of Tree Part Failure

Like it sounds, this is a process of determining how likely a tree part is to fail, and then how likely that failure is to impact a target. Likelihood of failure is an assessment of the tree's defects, and the load on those defects, like weight, gravity, ice, or wind. The parts impacted are generally the roots, root plate, trunk, branches, or potentially whole tree failure at multiple points.

Likelihood of Tree Failure Impacting a Target

Determining the likelihood of impacting a target is figuring out the occupancy rate, or the amount of time that targets (particularly people or high value property) are within the fall zone. A large tree in

the middle of a field could fail with little impact, but that same tree in a playground might have serious consequences. In many roadways, motor traffic is present day and night. All of the Village's inventoried 18,526 trees are in rights-of-way adjacent to roads. where failure of a tree not only impacts motorists, but it also has a potential effect on pedestrian traffic and utilities within right-of-way also.

Consequences of a Tree Failure Impacting a Target

The potential consequences of the tree failure impacting a target are a cumulative function of both the "value" of the target (person vs car) and the consequences to that target if the tree fails. Whereas the previous step was concerned with occupancy rates, this step looks at the consequences of the impact, and assumes that the target is always present. To follow with the above example, it is assumed that if a parkway tree were to fail, that a car, utility line, and person are all underneath it at the time of failure, and the consequences to those targets is evaluated. Consequences are generally considered to be "minor" for targets that can be easily replaced or repaired, and step up through 4 levels with the highest level being "severe", which would constitute severe injury to a person, or even a fatality (see below).

Weather

Every tree, no matter how healthy, can fail from wind, lightning strikes, ice loading or soil saturation. "Normal" weather can cause tree or tree part failures for trees which have existing defects, like deadwood, cavities, or poor architecture. Extreme weather events, by contrast, can cause the failure of perfectly healthy trees. For all Tree Risk Assessments, Risk should be assessed assuming "normal" weather conditions.

Though it should be noted that "normal" weather conditions for northeastern Illinois do include gusty winds, thunderstorms, snow, and even an occasional ice storm. It is the extremes of these events that should be considered abnormal.

Village of Oak Park Draft Tree Risk Assessment Policy

The Village of Oak Park has created this policy to maintain an acceptable level of risk from its tree population(s). In order to maintain a high level of public safety, while mitigating undue burden, the Village shall adopt the following risk assessment protocols:

1. The Village of Oak Park maintains a tree inventory detailing the species, size, and condition of all trees on Village Parkways, as well as a basic level of risk posed by each tree. This UFMP recommends that the trees listed as being in elevated risk categories during the initial inventory be audited on an ad hoc basis. During these audits, the Forestry Superintendent and/or Forestry Consultant should inspect these trees and identify trees potentially posing an unacceptable level of risk. Such trees identified shall either be scheduled for a more detailed risk assessment (Level 2 or 3), or shall be mitigated, either by pruning, bracing, or removal, as soon as practical following the assessment.

2. During subsequent years, staff shall perform limited visual assessments on a systematic basis. The zones not included in the annual reinventory are subject to a Level 1 drive by inspection which rotates between zones being completed in either dormant or in leaf season. Trees which may appear to present an elevated risk level shall be scheduled for a more detailed risk assessment (Level 2 or 3), or shall be mitigated, either by pruning, bracing, or removal, as soon as practical following the assessment.
3. Upon notification from a resident of a concern about a potentially high-risk tree, the Forestry Superintendent, their designee, and/or the Urban Forestry Consultant perform a Level 1 limited visual inspection within (14) business days of the notification by the resident. If a Level 2 or Level 3 Risk Assessment is required based on that inspection, it shall be performed within an additional (14) business days. A decision shall be made by the Forestry Superintendent, their designee, and/or the Forestry Consultant as to what the appropriate mitigation measures are, if any.
4. All trees determined to be in need of mitigating actions (removal, pruning, etc.) should be documented in writing by the Forestry Superintendent, their designee, and/or the Urban Forestry Consultant. The documentation shall include the date the assessment was performed, the species, size, and condition of the tree, and a brief narrative detailing which parts of the tree are likely to fail, the likelihood of failure, the likelihood of impacting a target, the consequences of tree or tree part failure, and the overall tree risk rating, per the ISA's TRAQ system of risk assessment.
5. A minimum branch diameter of three (3) inches, by ocular estimate, shall be the standard to which this risk assessment policy applies. Assessing all branches smaller than three inches represents an undue burden to the Village.

TRAQ Forms can be found in Appendix F at the end of this report.

TRAQ Tree Risk Assessment Matrices

Likelihood of Tree Failure Impacting Target

Likelihood of Tree Failure	Likelihood of Impacting Target			
	Very Low	**Low**	**Medium**	**High**
Imminent	Unlikely	Somewhat Likely	Likely	Very Likely
Probable	Unlikely	Unlikely	Somewhat Likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat Likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Risk Rating Matrix

Likelihood of Failure and Impact	Consequences			
	Negligible	**Minor**	**Significant**	**Severe**
Very Likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat Likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low

Projected Budget

The budget numbers below, as mentioned several times through this Urban Forest Management Plan, are projections based on current industry rates for the services listed. Based on input from Village staff, the budget projection begins this year with a dollar amount that is currently within their current annual budget for tree related expenses. From there, generally the budget increases slightly each year, and projects through 2033, at which time, including CPI, the budget will have increased approximately 27% from the current level of approximately $1,297,523 in 2023 to approximately $1,649,583 by 2033. This represents a necessary budget increase for such an increase in values of the Urban Forest.

REMOVALS	**Milestones**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028-2033**
	Trees Removed	300	300	300	300	300	300/year avg
	Diameter Inches	3,600"	3,600"	3,600"	3,600"	3,600"	3,600"
	Notes	Parkway & Private Tree Removal, Storm Cleanup, Stumping	Parkway & Private Tree Removal, Storm Cleanup, Stumping	Parkway & Private Tree Removal, Storm Cleanup, Stumping	Parkway & Private Tree Removal, Storm Cleanup, Stumping	Parkway & Private Tree Removal, Storm Cleanup, Stumping	Parkway & Private Tree Removal, Storm Cleanup, Stumping
	Removal Cost (2023)	$255,000	$255,000	$265,000	$275,000	$285,000	$300,000
	Removal Cost (CPI)	$255,000	$255,000	$265,000	$275,000	$285,000	$345,000

PLANTINGS/ WATERING	**Milestones**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028-2033**
	Trees Planted/Watered	300	300	300	300	300	300/year avg
	Planting/Watering (2023)	$172,500	$172,500	$172,500	$172,500	$172,500	$172,500
	Planting Cost (CPI)	$172,500	$172,500	$172,500	$172,500	$172,500	$198,375

PRUNING	**Milestones**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028-2033**
	Trees Pruned	4600	4625	4650	4675	4700	4750/yr average
	Notes	4,600 Cycle Prunes	4,625 Cycle Prunes	4,650 Cycle Prunes	4,675 Cycle Prunes	4,700 Cycle Prunes	4,750 Cycle Prunes in Perpetuity
	Cost (2023)	$400,000	$400,000	$400,000	$400,000	$400,000	$425,000
	Cost (CPI)	$400,000	$400,000	$400,000	$400,000	$400,000	$488,750

MISC MAINTENANCE EXPENSES	**Milestones**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028-2033**
	Notes	Inventory Updates / General Consulting / PHC & RCE / Refuse Disposal	Inventory Updates / General Consulting / PHC & RCE / Refuse Disposal	Inventory Updates / General Consulting / PHC & RCE / Refuse Disposal	Inventory Updates / General Consulting / PHC & RCE / Refuse Disposal	Inventory Updates / General Consulting / PHC & RCE / Refuse Disposal	Inventory Updates / General Consulting / PHC & RCE / Refuse Disposal
	Cost (2023)	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000
	Cost (CPI)	$50,000	$50,000	$50,000	$50,000	$50,000	$57,500

FORESTRY STAFF SALARIES & BENEFITS	**Milestones**	2023	2024	2025	2026	2027	2028-2033
	Notes	Salaries, OT, Insurance, Pensions, Etc	Salaries, OT, Insurance, Pensions, Etc	Salaries, OT, Insurance, Pensions, Etc	Salaries, OT, Insurance, Pensions, Etc	Salaries, OT, Insurance, Pensions, Etc	Salaries, OT, Insurance, Pensions, Etc
	Cost (2023)	$420,023	$432,624	$445,602	$458,970	$472,740	$486,920
	Cost (CPI)	$420,023	$432,624	$445,602	$458,970	$472,740	$559,958

TOTALS	**TOTALS - 2023 $**	**$1,297,523**	**$1,310,124**	**$1,333,102**	**$1,356,470**	**$1,380,240**	**$1,434,420**
	TOTALS - CPI 3%	**$1,297,523**	**$1,310,124**	**$1,333,102**	**$1,356,470**	**$1,380,240**	**$1,649,583**

Summary / Conclusion

By creating this Urban Forest Management Plan, the Village of Oak Park has taken an important step in investing in their urban forest's future by creating both shorter and longer term goals that will serve as milestones. These are all goals which, as they are undertaken, will help strengthen the urban forestry program in Oak Park, maximizing the benefits that trees provide to the community and minimizing cost and risk. There are many local partners we have suggested, as well as many yet to be discovered, who can help along the way and actually can become promoters of the urban forestry program in Oak Park. The more public support and engagement this program receives, the better it will be equipped to tackle difficult situations in the future.

A 2043 Vision for Oak Park's urban forestry program includes:

- increased tree diversity

- high stocking levels

- improved tree structure/condition of our urban forest

- increased canopy cover

- equitable tree care for all Oak Park residents, and

- increased community awareness of the value of urban forestry

Certainly, none of this can be done without funding streams and innovative thinking along the way. As the budget projections and i-Tree reporting demonstrates, the return on investment for the forestry program in Oak Park is good at approximately 50% the projected budget costs invested and this will certainly improve as the canopy cover increases as the tree population matures. As we bring information like this to light, that the forestry program yields dividends and doesn't just cost money, the more people will become interested and engaged in promoting these efforts.

Great Lakes Urban Forestry Management thanks the Village of Oak Park, its residents, and its stakeholders, which have made this endeavor possible. It has been a pleasure to work with the Village on this inventory update, and to update the Urban Forest Management Plan. We look forward to continuing to assist the Village in their Urban Forestry endeavors.

Glossary of Terms

Aerial Device: Any piece of equipment expressly intended to elevate a human worker above the level at which they typically stand with their feet on the ground surface. Can include but is not limited to bucket trucks, scissor lifts, etc.

Aggressive: A floral or faunal organism which is native (endemic) to the United States or northern Indiana, but which is known to outcompete other more desirable organisms

Arborist: An individual engaged in the profession of arboriculture who is educated, trained and licensed to provide for or supervise the management of trees and other woody plants

Arborist Trainee: Any person working under the direct supervision of an Arborist or Certified Arborist

Balled and Burlapped: A tree, shrub, or other plant prepared for transplanting by allowing the roots to remain covered by a ball of soil around which canvas or burlap is tied and secured with a basket.

Bare Root: Harvested plants from which the soil or growing medium has been removed

Best Management Practices (BMP): Methods or techniques found to be the most effective and practical means in achieving an objective while making the optimum use of resources.

Caliper: Standard nurseryman's measure of tree diameter (size). Caliper measurement of the trunk shall be taken six inches above the ground up to and including four-inch caliper size. If the caliper at six inches above the ground exceeds four inches, the caliper should be measured at 12 inches above the ground.

Certified Arborist: An individual who has sufficient experience in the field of Arboriculture, and has been certified by the International Society of Arboriculture as being a Certified Arborist

Branch Collar: The branch collar is the point where a branch joins the trunk or another branch. This is the area the arborist chooses to make a proper cut.

Climbing Line: Any rope or other such material explicitly intended for bearing the weight of a human being

Collected Plants: Trees or shrubs which have been sourced from private property for the intent of transplanting elsewhere

Compacted Soil: A high-density soil lacking structure and porosity, characterized by restricted water infiltration and percolation (drainage), and limited root penetration

Consumer Price Index: an index of the variation in prices paid by typical consumers for retail goods and other items

Containerized: A tree, shrub, or other plant prepared for transplanting, or grown in, a solid-walled container such as plastic pots or wooden boxes

Contracted Staff: People working for the Village as part of an independently owned and operated private company which performs work for the Village, but who are not directly employed by the Village

Controlling Authority: An agency, organization, or corporate entity with the legal authority and/or obligation to manage individual trees or tree populations

Crew Leader: Any personnel who has by direction or implication been chosen to lead a team of In-House or Contracted Staff

Crown: The upper part of a tree, measured from the lowest branch, including all branches and foliage

Critical Root Zone (CRZ): The minimum volume of roots necessary for a tree to have health and stability

Cycle Pruning: The process of routine maintenance pruning of trees, not related to storm damage or other hazard or emergency related pruning, that occurs on a set and predictable time scale set forth by the Village

Deadwood: Wood on a tree or shrub which is no longer biologically living and becomes brittle or prone to failure

Decline/Declining: Trees or shrubs which are experiencing symptoms of a general decline in health due to age, pest, or pathogen related issues

Desirable: A Tree or other plant whose characteristics are sought after due to ecology, aesthetics, or public safety

Diameter or DBH: Diameter at Breast Height. A standard forestry measure of tree diameter (size), measured at 4.5′ above ground level on the uphill side of a tree using a Diameter Tape or Biltmore Stick

Digging Machine(s): Any piece of mechanical equipment whose express purpose is to remove soil and plants from their current locations

Diseased: The status of a tree which has been negatively impacted by a pathogen, bacterial, fungal, viral, or similar lower life forms

Drip Line: The soil surface delineated by the branch spread of a single plant or group of plants

Drought: A period of two weeks or greater, during which there is less than one inch of rainfall, when the average daytime temperature during that same period exceeds 75 degrees Fahrenheit.

Dutch Elm Disease: A fungal pathogen which causes the decline and death of specific species of Elm trees.

Dying: A tree which is in the process of biological death due to senescence, disease, infestation, or other such malady from which there is very little to no hope of long-term survival

EAB: Emerald Ash Borer. An invasive beetle pest which affects all Ash trees.

Establishment Pruning: The pruning of a young tree in order to establish proper form and branching habit.

Established Trees: Those trees which have been permanently planted for a period of no less than 6 months, and which have permanent roots established in the soil

Failure (tree failure): Breakage of stem or branches, or loss of mechanical support in the root system

Feeder Root: Any portion of the below ground portions of the tree whose purpose is to absorb water and nutrients

Floodplain: Land which has been determined to be periodically inundated with water from a nearby moving or static water body, such as a lake or river. Determined by the Federal Emergency Management Agency

Flush Cut: Either a pruning cut or final cut to remove a stump, for which the maximum acceptable distance from the ground or the branch bark ridge shall be no greater than 2 inches.

Full-Time: An employee who has regular employment through the Village and whose work hours exceed 36 hours in a week, and who is employed year-round.

Fungal: Any group of spore-producing organisms feeding on organic matter, including molds, yeast, mushrooms, and toadstools.

Grade: The level or pitch of a certain piece of land, as defined by the trees or shrubs which inhabit it

Hardscape: The nonliving or man-made fixtures of a planned outdoor area, such as sidewalks, retaining walls, street lamps, etc.

Hazard: A known and documented state of imperiling public safety

Healthy Tree: Any tree which is successfully adapting to its environment, and shows no signs of disease, pests, pathogens, or other such maladies, as determined by the Village or Forestry Consultant(s)

Host: An organism which is susceptible to a known pest or pathogen

Infested: The status of a tree which has been negatively impacted by pests

In-House Staff: Staff directly employed by the Village of Oak Park, on either a full-time or Part-Time Basis

Invasive: A floral or faunal organism which is not native (endemic) to the United States or northern Indiana

Job Site: Any geographic location where a person or persons will be performing activities related to the care and maintenance of Village of Oak Park property

J.U.L.I.E. (811): The Illinois underground utility locating service

Liner Nursery: A privately owned plant propagation facility which specializes in the growth of small trees which are intended to be planted for growth into a full form

Managed: A tree or shrub which is in an area of the Village which is routinely mowed and managed. Not a wild forest grown tree or shrub, or area containing such trees and shrubs

Manufacturer's Recommendations: Any expressly written instruction manual for a given piece of equipment that details how said equipment is supposed to be managed or maintained

Mineral Soil: Any substrate which is composed of a variety of rocks and minerals in various states of decomposition, leading to the development of a substance on which living plants may live

Mitigation: The process of diminishing risk

Monoculture: A population of trees in close proximity to one another which is comprised of 3 species or less of trees and shrubs which is prone to pest or pathogen outbreak

Natural Resources: Flora, fauna, and other such living and non-living parts of the environment which the Village of Oak Park maintains

Nursery Stock: Woody Perennials which are of a "Tree Form" growth habit and are supplied by a nursery contractor for planting. Not established trees.

Park District Property: Land which, by deed or title, belongs to the Village of Oak Park

Parkway Tree: Any woody plant within a Publicly Owned right-of-way, or any other property owned or managed by the Village of Oak Park

Part-Time: An employee who has regular employment through the Village and whose work hours are less than 36 hours in a week, and who is employed year-round.

Pathogen: A fungus, virus, or other such microscopic organism which causes decline or death of trees

Pest: An insect or other macrofaunal organism which causes decline or death of trees

Private Property: Land which, by deed or title, does not belong to the Village of Oak Park

Public Safety: The welfare and protection of the general public

Reforestation: The process by which trees are planted to replace trees which have been removed

Rigging Line: Any rope or other such material explicitly intended for bearing the weight of a tree limb. Not to be used for supporting a human being.

Right-of-Way (ROW): The publicly owned land on which a road, drainage ditch, trail, or other public access is built

Risk: A situation involving potential exposure to danger or endangering public safety

Root Protection Zone (RPZ): The area on the ground surrounding a tree in which excavation, compaction, and other construction-related activities should be avoided or mitigated

Saddle: A piece of equipment expressly intended to hold a human being above ground level with the assistance of a rope or other such device

Sanitation Pruning: The removal of tree limbs that have become diseased or infested, in order to prevent the spread of disease or infestation from spreading throughout the rest of the tree e.g., Dutch Elm Disease, Black Knot Fungus, etc.

Seasonal Employees: Those employees retained by the Village for less than 6 months out of the calendar or budget year

Shrub: Any woody perennial which has a multi-stemmed growth habit not consistent with being considered a tree. Can be subject to interpretation by Oak Park Staff.

Sound Wood: Structurally sound, non-decayed, non-compromised wood in the trunk or Scaffold Branches

Staff: Those employees retained by the Village on a full-time basis with benefits provided

Structural Root: Any portion of the below ground portions of the tree whose purpose is to stabilize the plant against the forces of wind and gravity

TRAQ: Tree Risk Assessment Qualification. The International Society of Arboriculture's formal status of an individual who is qualified to assess the risk that trees may bring to the general public

Tree Protection Zone (TPZ): The area surrounding a tree in which excavation and other construction-related activities should be avoided.

Tree Risk: The likelihood and consequences of failure of a tree or tree parts

Tree Risk Assessment: A systematic process used to identify, analyze, and evaluate tree risk

Underperforming: Trees which have systematic health and vigor issues resulting in poor health, architecture, or other such maladies as determined by Village staff

Undesirable: A tree which is not desired in the landscape due to ecological, aesthetic, or public safety reasons, as determined by Oak Park Staff.

Unmanaged: A tree or shrub which is in an area of the Village of Oak Park which is not routinely mowed and managed. A wild forest grown tree or shrub, or area containing such trees and shrubs.

Urban Wood: Any tree or other woody perennial material which has been harvested for the sole purpose of long term storage in the form of furniture, recreational material, etc. Differentiated from "Reclaimed Wood"

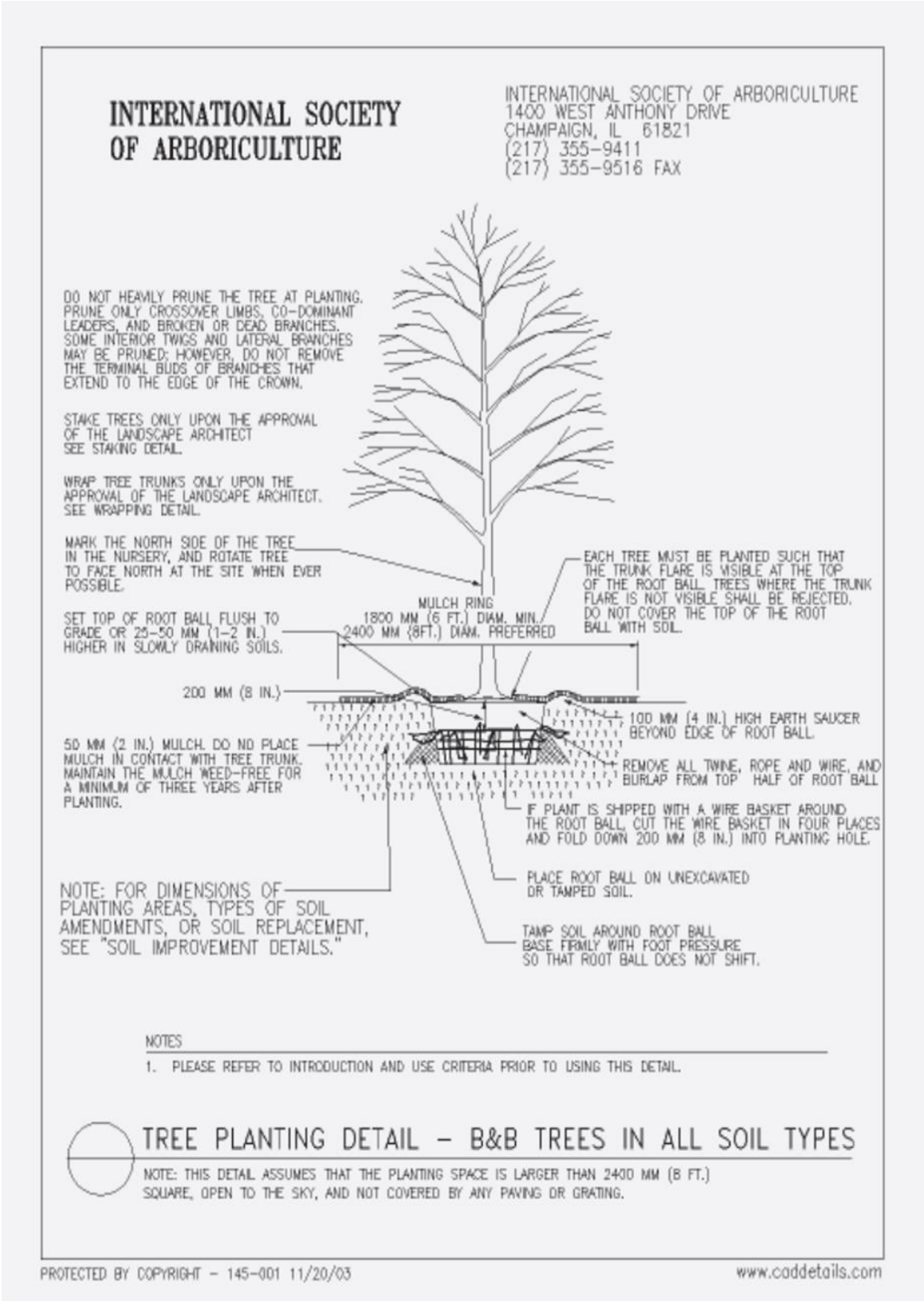
Utility Arborist: A person explicitly trained in the management of trees and other plants in relation to energized power lines. Someone who is licensed to work with conflicts between trees and such energized power lines.

Appendix A: Unapproved Species

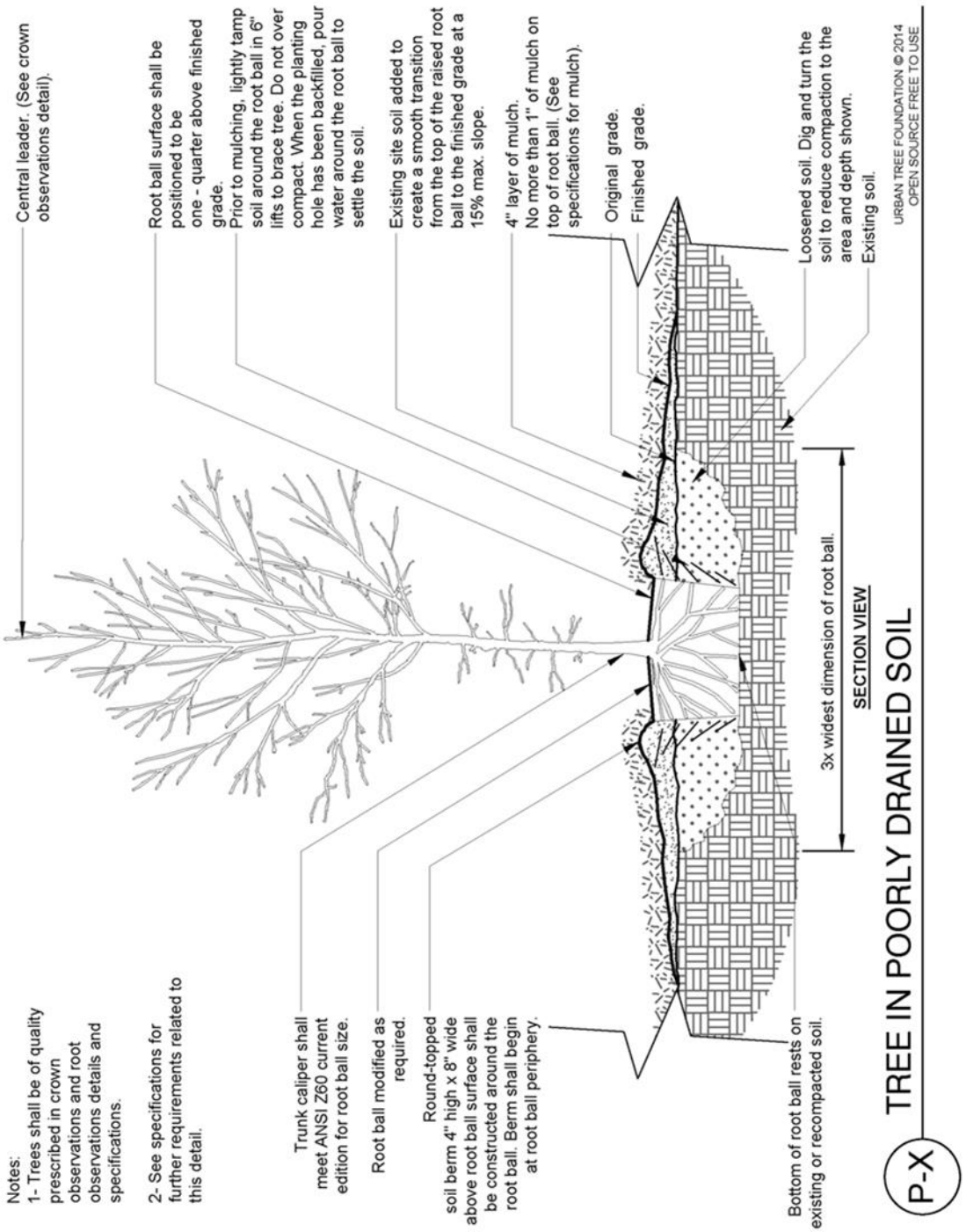
Species not appearing on this list can be disallowed by consensus of designated staff, acting under the supervision of the Forestry Superintendent and/or Forestry Consultant.

NOT APPROVED
AILANTHUS
AMUR CORKTREE
ASH-SPP
BOXELDER
BUCKTHORN
BURNING BUSH
CHERRY-BLACK/PIN
COTTONWOOD
ELM-AMERICAN
ELM-SIBERIAN
HONEYSUCKLE
MAPLE-NORWAY
MAPLE-SILVER
MULBERRY-SPP
PEAR-CALLERY
POPLAR-SPP
POPLAR-WHITE
PRINCESS TREE
RUSSIAN OLIVE
WALNUT-ANY
WILLOW-SPP

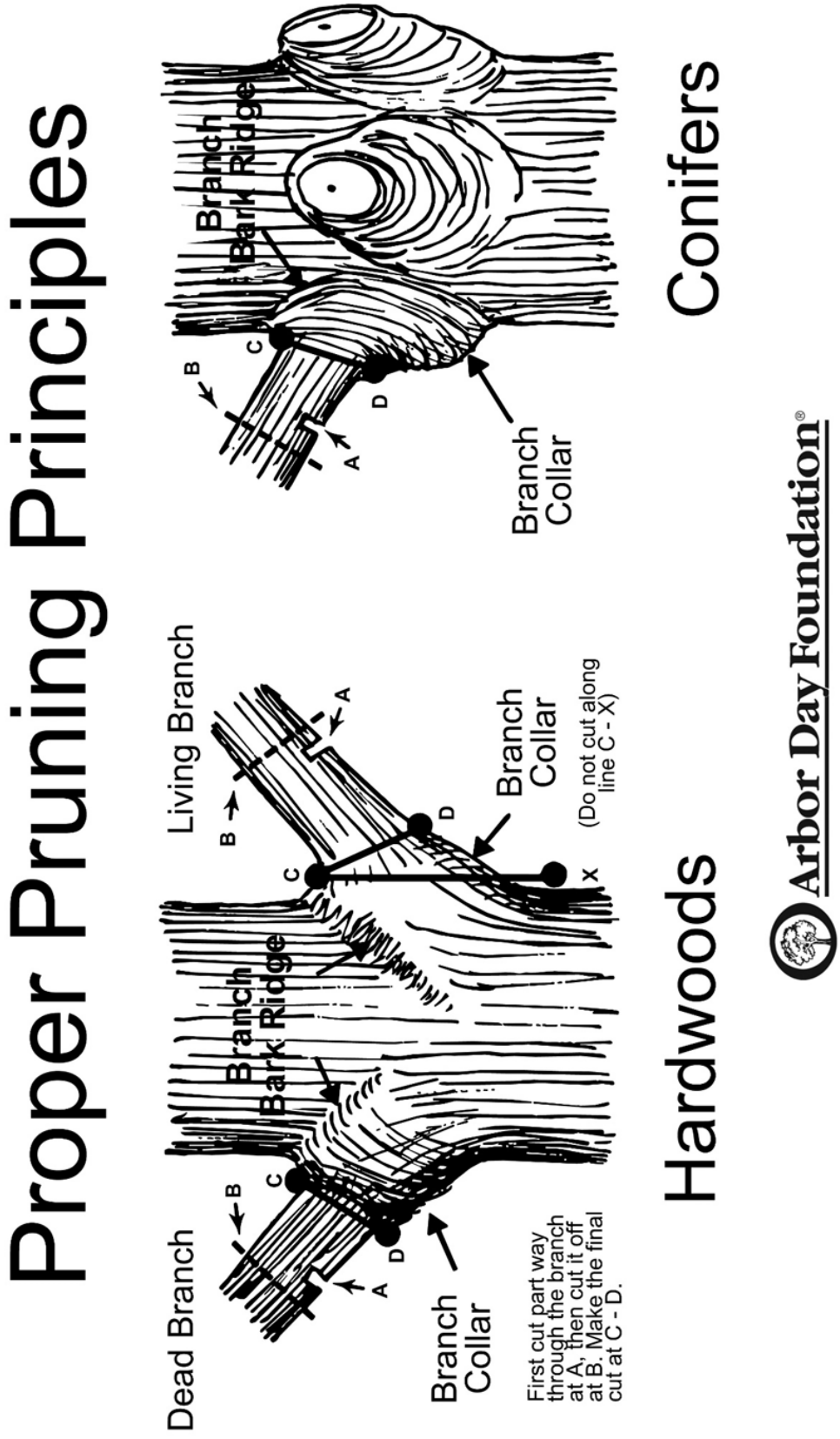
Appendix B: Balled and Burlapped Planting Detail



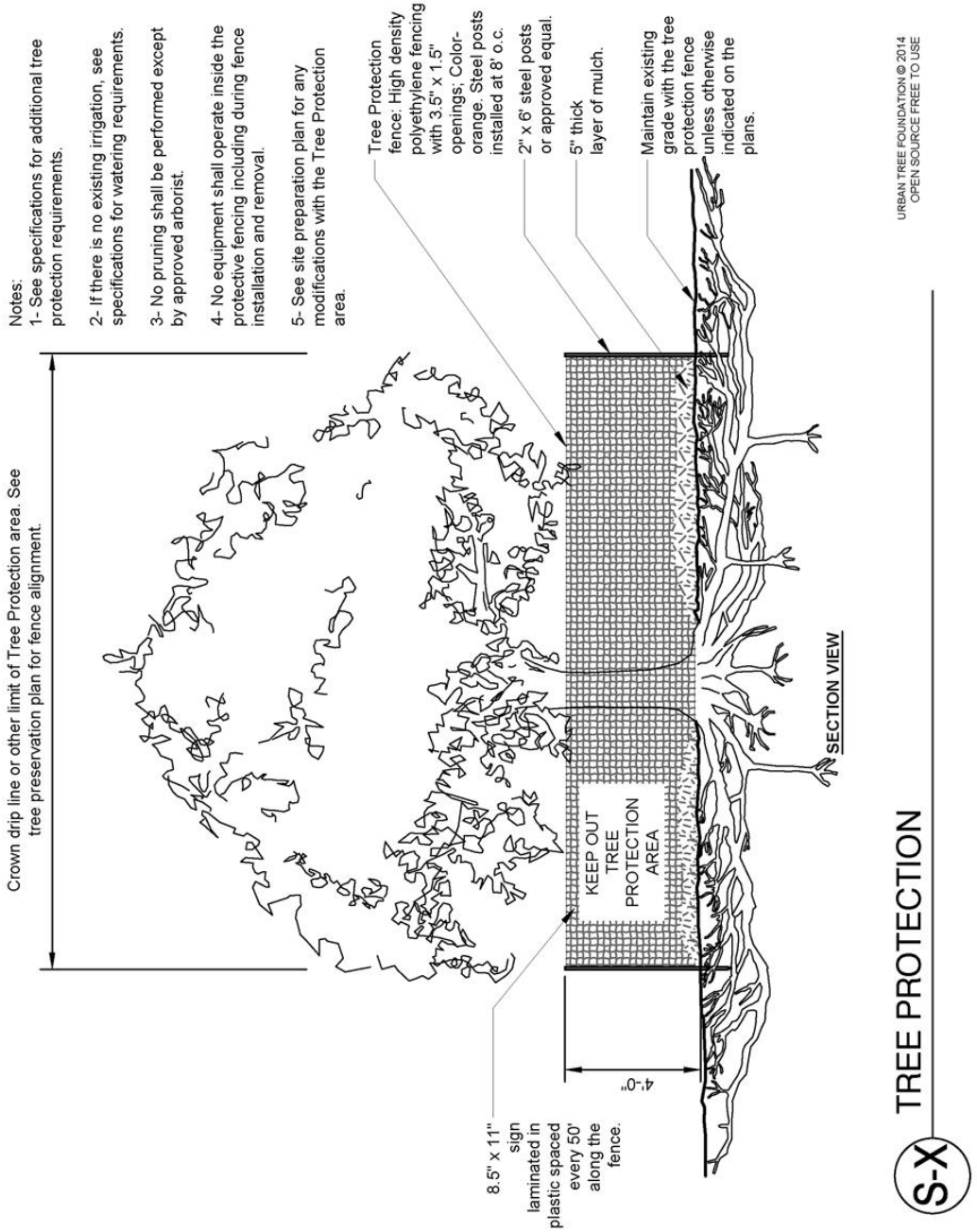
Appendix C: Containerized Planting Detail



Appendix D: Tree Pruning Detail



Appendix E: Tree Protection Detail



Appendix F: ISA Tree Risk Assessment Form (TRAQ Level 2-Basic)

ISA Basic Tree Risk Assessment Form

Client _____ Date _____ Time _____
Address/Tree location _____ Tree no. _____ Sheet _____ of _____
Tree species _____ dbh _____ Height _____ Crown spread dia. _____
Assessor(s) _____ Time frame _____ Tools used _____

Target Assessment

Target number	Target description	Target zone: Target within drip line	Target zone: Target within 1 x Ht.	Target zone: Target within 1.5 x Ht.	Occupancy rate (1 – rare, 2 – occasional, 3 – frequent, 4 – constant)	Practical to move target?	Restriction practical?
1							
2							
3							
4							

Site Factors

History of failures _____ **Topography** Flat ☐ Slope ☐ _____% **Aspect** _____
Site changes None ☐ Grade change ☐ Site clearing ☐ Changed soil hydrology ☐ Root cuts ☐ Describe _____
Soil conditions Limited volume ☐ Saturated ☐ Shallow ☐ Compacted ☐ Pavement over roots ☐ _____% Describe _____
Prevailing wind direction _____ **Common weather** Strong winds ☐ Ice ☐ Snow ☐ Heavy rain ☐ Describe _____

Tree Health and Species Profile

Vigor Low ☐ Normal ☐ High ☐ **Foliage** None (seasonal) ☐ None (dead) ☐ Normal _____% Chlorotic _____% Necrotic _____%
Pests _____ **Abiotic** _____
Species failure profile Branches ☐ Trunk ☐ Roots ☐ Describe _____

Load Factors

Wind exposure Protected ☐ Partial ☐ Full ☐ Wind funneling ☐ _____ **Relative crown size** Small ☐ Medium ☐ Large ☐
Crown density Sparse ☐ Normal ☐ Dense ☐ **Interior branches** Few ☐ Normal ☐ Dense ☐ **Vines/Mistletoe/Moss** ☐ _____
Recent or planned change in load factors _____

Tree Defects and Conditions Affecting the Likelihood of Failure

— Crown and Branches —

Unbalanced crown ☐ LCR _____%
Dead twigs/branches ☐ ____% overall Max. dia. _____
Broken/Hangers Number _____ Max. dia. _____
Over-extended branches ☐
Pruning history
Crown cleaned ☐ Thinned ☐ Raised ☐
Reduced ☐ Topped ☐ Lion-tailed ☐
Flush cuts ☐ Other _____

Cracks ☐ _____ Lightning damage ☐
Codominant ☐ _____ Included bark ☐
Weak attachments ☐ _____ Cavity/Nest hole ____% circ.
Previous branch failures ☐ _____ Similar branches present ☐
Dead/Missing bark ☐ Cankers/Galls/Burls ☐ Sapwood damage/decay ☐
Conks ☐ Heartwood decay ☐ _____
Response growth _____

Main concern(s) _____

Load on defect N/A ☐ Minor ☐ Moderate ☐ Significant ☐ _____
Likelihood of failure Improbable ☐ Possible ☐ Probable ☐ Imminent ☐ _____

— Trunk —

Dead/Missing bark ☐ Abnormal bark texture/color ☐
Codominant stems ☐ Included bark ☐ Cracks ☐
Sapwood damage/decay ☐ Cankers/Galls/Burls ☐ Sap ooze ☐
Lightning damage ☐ Heartwood decay ☐ Conks/Mushrooms ☐
Cavity/Nest hole _____% circ. Depth _____ Poor taper ☐
Lean _____° Corrected? _____
Response growth _____
Main concern(s) _____

Load on defect N/A ☐ Minor ☐ Moderate ☐ Significant ☐
Likelihood of failure
Improbable ☐ Possible ☐ Probable ☐ Imminent ☐

— Roots and Root Collar —

Collar buried/Not visible ☐ Depth _____ Stem girdling ☐
Dead ☐ Decay ☐ Conks/Mushrooms ☐
Ooze ☐ Cavity ☐ _____% circ.
Cracks ☐ Cut/Damaged roots ☐ Distance from trunk _____
Root plate lifting ☐ Soil weakness ☐
Response growth _____
Main concern(s) _____

Load on defect N/A ☐ Minor ☐ Moderate ☐ Significant ☐
Likelihood of failure
Improbable ☐ Possible ☐ Probable ☐ Imminent ☐

Page 1 of 2

Risk Categorization

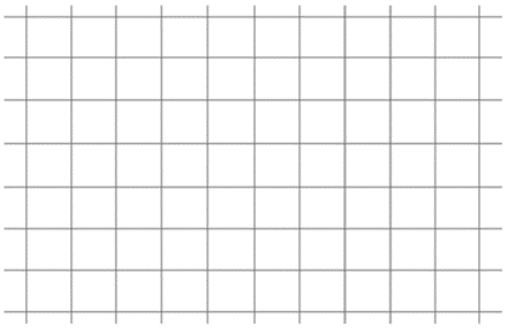
Condition number	Tree part	Conditions of concern	Part size	Fall distance	Target number	Target protection	Likelihood: Failure: Improbable	Failure: Possible	Failure: Probable	Failure: Imminent	Impact: Very low	Impact: Low	Impact: Medium	Impact: High	Failure & Impact (from Matrix 1): Unlikely	Somewhat	Likely	Very likely	Consequences: Negligible	Minor	Significant	Severe	Risk rating of part (from Matrix 2)
1																							
2																							
3																							
4																							

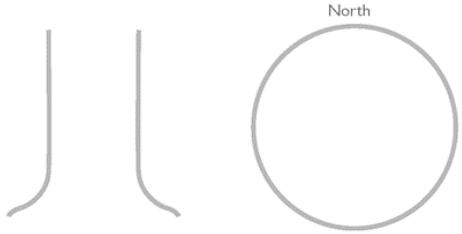
Matrix 1. Likelihood matrix.

Likelihood of Failure	Likelihood of Impacting Target			
	Very low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Matrix 2. Risk rating matrix.

Likelihood of Failure & Impact	Consequences of Failure			
	Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low





Notes, explanations, descriptions _____

_____

_____

_____

_____

Mitigation options _____ **Residual risk** _____

_____ **Residual risk** _____

_____ **Residual risk** _____

_____ **Residual risk** _____

Overall tree risk rating Low ☐ Moderate ☐ High ☐ Extreme ☐ **Work priority** 1 ☐ 2 ☐ 3 ☐ 4 ☐

Overall residual risk Low ☐ Moderate ☐ High ☐ Extreme ☐ **Recommended inspection interval** _____

Data ☐Final ☐Preliminary **Advanced assessment needed** ☐No ☐Yes-Type/Reason _____

Inspection limitations ☐None ☐Visibility ☐Access ☐Vines ☐Root collar buried Describe _____

Appendix G: ANSI Z133.1 Standards – Applies to All Sections

All of the ANSI Z133.1 safety standards shall apply to all tree care operations outlined in the Urban Forest Management Plan. Listed below is a basic overview of the standard, and it is not verbatim. A full text of this manual will be made available to all Village of Oak Park employees and contractors involved with tree care operations.

1. All tools and equipment utilized during tree care operations, including those not specifically mentioned below, shall be inspected and maintained by qualified personnel in accordance with the manufacturer's care instructions.
2. All staff shall be trained in the proper use, inspection, and maintenance of said equipment.
3. Certified arborists or arborist trainees shall conduct job briefings daily prior to tree care operations of any kind and the information shall be communicated to all workers.
4. All activities performed on any job site for any activity outlined in this Urban Forest Management Plan shall comply with all applicable OSHA guidelines and standards.
5. Traffic and pedestrian control shall be established around the job site prior to the beginning of tree care operations.
6. Emergency contact information and a safety kit conforming to the ANSI Z308.1 standards shall be made available to all workers. All employees shall have basic instruction on the use of CPR and First Aid.
7. Personal Protective Equipment (PPE) shall be required when there is a reasonable probability of injury or illness on the job site. Such a determination will be made by the Certified Arborist or Arborist Trainee prior to the beginning of tree care operations each day, and PPE shall be made available. PPE shall be well-maintained in accordance with the manufacturer's requirements.
8. Head protection shall conform to ANSI Z89.1, face and eye protection shall conform to ANSI Z87.1, respiratory protection shall comply with ANSI Z88.2, and leg protection shall always be worn when using a chainsaw.
9. Flammable liquids shall be kept a minimum of ten feet from open sources of flame or high heat and shall be stored in approved containers.
10. All Village staff and contractors working near electrical hazards shall be qualified to do so and shall be educated in the full ANSI standards for Electrical Hazards and Line Clearance.
11. Vehicles and mobile equipment shall be inspected and maintained by qualified personnel in accordance with the manufacturer's requirements and shall be equipped with all standard safety devices, decals, and instructions, and shall be operated within all federal, state, and local motor vehicle codes and ordinances.

12. Aerial devices shall be inspected and maintained by qualified personnel in accordance with the manufacturer's requirements, and shall be equipped with all standard safety devices, decals, and instructions.

13. Aerial devices shall be stabilized by wheel chocks, outriggers, or stabilizers as necessary for the device, and shall never be used to lift, hoist, or lower logs or equipment unless specifically designed to do so.

14. Aerial devices shall be equipped with fall protection devices and permanent load ratings, both in accordance with ANSI/SIA 92.2 or 92.5, as applicable to the specific aerial device.

15. No aerial device shall be allowed to make contact with electrical conductors, and minimum safe distances shall be maintained in accordance with the ANSIZ133.1 Standard.

16. All brush chippers shall be inspected and maintained by qualified personnel in accordance with the manufacturer's requirements, and shall be equipped with all standard safety devices, decals, and instructions.

17. Sprayers and related plant health care equipment shall be inspected and maintained by qualified personnel in accordance with the manufacturer's requirements, and shall be equipped with all standard safety devices, decals, and instructions

18. Sprayer tanks or other similar enclosed spaces shall not be entered unless performed through a confined-space entry plan in accordance with OSHA 1910.46 Requirements, including air-quality testing, training, and PPE.

19. Chain saws and other similar portable power tools shall not be operated unless the manufacturer's safety devices are in proper working order. Such safety devices shall not be removed or modified.

20. Forestry staff shall have a minimum of two points of attachment to the 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.

21. A visual hazard assessment, including a root collar inspection, shall 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 shall be within visual or voice communication at all times during arboricultural operations that are in excess of 12 feet from the ground surface.

22. All ropes, saddles, carabiners, and other similar climbing equipment shall be: a) approved for use in the tree care industry by the manufacturer, b) have a minimum breaking strength or load capacity of 5,000 lbs., c) be inspected before each use, d) Equipment shall be removed from service when it shows signs of excessive wear or deterioration.

23. All pruning, removal, and rigging operations shall 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 shall be established to determine when the employee aloft will safely drop tree parts or tools.

24. Any tree parts which cannot be safely dropped or controlled from aloft shall have a separate rigging line tied to them to help control their fall. The tree shall 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 shall be implemented.

25. All equipment utilized in rigging shall meet the load ratings for the limb being rigged, and a qualified employee, trained in proper rigging procedure shall determine the rigging procedure and equipment to be utilized. Any equipment which has been damaged or overloaded shall be removed from service.

26. When felling (removing) a tree, a crew leader shall make the determination of what equipment is necessary, and how many crew members are to be directly involved in drop zone operations. A well-established escape route shall be planned for involved workers prior to the beginning of felling operations. Any non-involved workers shall be beyond twice the height of the trunk or tree being removed during felling operations.

27. Notches shall be used on all trees and trunks greater than five inches in diameter during felling operations, and should conform to the standards set forth in the ANSIZ133.1 Standard.

28. Loose clothing, ropes, lanyards, and saddles shall not be worn during any tree care activity where the risk of entanglement with tools or machinery is possible, particularly with brush chippers.

Appendix H: Tree Planting Standards (ANSI/ISA BMP)

ANSI Z60.1

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

ANSI A300 – Part 6

1. Planting sites and work sites shall 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 shall be notified immediately.
2. Location of utilities, obstructions, and other such hazards above and below ground shall be taken into account prior to planting and transplanting operations. These include, but are not limited to, gas, electric, sewer, communication, drainage, and signage.
3. The following shall be taken into consideration prior to transport and planting: Requirements of individual trees, compass orientation of field-grown trees, site feasibility assessments, soil assessment, and drainage assessment.
4. Tools for planting and transplanting shall be properly labelled or purchased for their intended use, and be maintained in accordance with the manufacturer's recommendations
5. The system used to move and store the plant shall minimize desiccation and other damage to the crown, trunk or rootball, and the health and vigor of the plant shall be maintained during these periods.

6. The hole to be dug for all new plantings shall be a minimum of 150% larger than the rootball or container diameter, as deep as the root flare of the tree to be planted, and shall have sides from which soil has been loosened in order to aid in root penetration.
7. For balled and burlapped trees, all rootball supporting materials shall be removed from the upper third of the rootball, and removed from the planting hole prior to final backfilling.
8. Prior to planting, container root balls shall be managed by approved methods such as, shaving the root ball, slicing the root ball, and redirecting or removing encircling roots.
9. Backfill shall comprise of either the same soil created when the hole was excavated, or a similarly amended mixture to meet a specific objective, and shall be applied in a layered fashion to reduce future settling and prevent air pockets.
10. Mulch shall 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.
11. Support systems such as guy-wires or stakes shall not be installed except where needed.

ISA BMP Manual – Tree Planting

1. Timing of planting shall be determined based on the species, and the best professional opinion of the employees of or contractors working for the Village of Oak Park.
2. All employees and contractors employed by or working for the Village of Oak Park shall be familiar with the following types of planting types, and when it is appropriate to use each:
   A. **Bare-Root:** Field-grown, and dug without soil during the dormant season
   B. **Ball and Burlap:** Field grown and packaged with a soil ball, using burlap, twine, and a retaining basket of some kind
   C. **Tree Spade:** Transplanted using a mechanical tree spade to hold the soil ball during transport
   D. **In-Ground Fabric Bag:** Field grown with the root mass contained in a semi-permeable fabric bag
   E. **Container Grown:** Grown above ground in containers of various shapes, sizes, and materials
3. Trees packaged with root balls must have their root collar visible at the soil surface. Trees with deeper structural roots will not perform well when transplanted, and should be avoided when selecting nursery stock.

4. Trees with root balls shall be handled by the ball, not the stem, to ensure no damage occurs to the root-soil interface or to the stem itself**.**
5. Trees with leaves shall be transported with a fabric tarp to minimize desiccation, and have had their root balls wetted prior to transport.
6. Sites shall be tested for drainage, nutrient levels, and pH prior to planting (or prior to species selection, if possible).
7. Container stock shall be removed from its container. For balled and burlapped trees, wrappings shall be left on until the tree is in the hole; wrapping shall 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.
8. As soil is added, wet and tamp each layer down to ensure good moisture and reduction of air bubbles.
9. 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 to have the tree attempt to heal these above-ground wounds.
10. The use of trunk wrap may be considered in areas with harsh winters, specifically on trees with thin bark, such as London Planetree and certain Maple species.

Appendix I: Tree Pruning Standards (ANSI/ISA BMP)

ANSI A300 - Part 1

1. A designated Arborist or Arborist Trainee shall visually inspect each tree before beginning work. If any condition is observed above and beyond the original scope of work, said condition shall be reported to the controlling authority before any work begins.
2. Pruning cuts which remove a branch at its point of origin shall be made close to the trunk or parent branch without cutting into the branch-bark collar or leaving a stub.
3. Pruning cuts made to reduce the length of a limb or parent stem shall be made at a slight angle relative to the remaining stem, and not damage the remaining stem. If pruning to a lateral branch, the lateral should be large enough to assume the terminal role.
4. Final cuts shall be made such that the result is a flat surface, with the adjacent bark firmly attached.
5. A minimal amount of the foliage shall be removed during an annual growing season, depending on the tree species, size, age, and condition. If more frequent pruning due to utilities, vistas, or health considerations is necessary, removal of the tree should be considered as an alternative to pruning.

ISA BMP Manual

1. All employees or contractors directly involved with the pruning of trees shall be familiar with the following pruning types and how they are to be used in conjunction with one another:
    1. **Pruning to manage Health and Risk**: Selective removal of dead, diseased, detached, cracked, and broken branches
    2. **Pruning to Raise:** Selective removal of branches to provide vertical clearance
    3. **Pruning to Reduce:** Selective removal of branches and stems to decrease the height or spread of a tree or shrub
    4. **Structural Pruning: Selective** removal of live branches and stems to influence the orientation, spacing, growth rate, strength of attachment, and ultimate size of branches and stems
    5. **Pruning to Restore:** Selective removal of branches, sprouts, and stubs from trees and shrubs which have been topped, severely headed, vandalized, lion-tailed, storm damaged, or otherwise damaged
2. Every effort shall be made to time pruning of individual tree species to be done in accordance with best management practices for the tree species in question. All pruning work shall be done so at the discretion of the Village of Oak Park and its approved contractors.

Appendix J: Tree Protection (ANSI/ISA BMP)

ANSI A300 – Part 5

1. Tree management plans and specifications for tree management shall be written and administered by a certified arborist qualified in the management of trees and shrubs during site planning, development, and construction. Such activities may include, but are not limited to: demolition, grading, building construction, walkway or roadway construction, excavation, trenching and boring, or other such activity which has the potential to negatively impact trees.
2. The management of trees and shrubs shall be incorporated into the following phases of the site development process:
   A. Planning
   B. Design
   C. Pre-Construction
   D. Construction
   E. Landscape
   F. Post-Construction
3. During the Planning phase, an assessment of tree and shrub resources on the site shall be performed by a certified arborist. The assessment shall identify the species, condition, and size of each tree and shall be incorporated into the site design. Trees to be retained or protected shall appear on site design maps. Trees on neighboring property which could also be impacted should also be considered.
4. During the design phase, a tree management report shall be developed for trees to be conserved on the site, and shall be included in the construction plans and specifications, which may include, but are not limited to:
   A. Trees to be retained
   B. Tree and Root Protection Zones
   C. Tree Protection Zone barriers
   D. Tree Protection plans
   E. Soil erosion control
   F. Soil compaction controls
   G. Staging and storage areas
   H. Other relevant on-site activities

5. Grading and demolition plans shall include all trees to be retained and removed, as well as the tree protection plans for working around trees to be retained. Plans shall also include equipment routes for avoiding the TPZ. Consequences for non-compliance shall be specified.
6. During the pre-construction phase, all tree protection plans shall be effectively communicated to all parties involved with the site development, and tree protection zone barriers shall be in place prior to the beginning of any construction activities.
7. The TPZ shall be delineated around all trees to be protected during construction, and shall be based on the size, species, and condition of the tree and its root system. Six to 18 times the diameter of the tree is generally considered to be acceptable. Deviations from this diameter may be made at the discretion of a certified arborist. Activities which could damage tree roots or compact soil should be avoided in the TPZ
8. Fencing or other visible barriers to the TPZ shall be installed prior to site clearing, grading, and demolition, and maintained throughout the construction and landscaping phase. When this is not feasible, alternate methods may be considered.
9. During the construction phase, compliance with tree protection plans shall be monitored by a certified arborist, and any damage to tree barriers or trees, or non-compliance shall be reported to the project manager or owner, or other controlling authority.
10. When removing vegetation or pavement during demolition, equipment used adjacent to the TPZ shall be specified to avoid damage to the tree and the surrounding soil, and soil protection measures shall be in place prior to vehicle or heavy traffic in or near the TPZ.
11. Storage or disposal of construction materials or hazardous materials shall not occur in the TPZ.
12. Fill within the TPZ shall not be permitted without mitigation to allow for proper air and water availability to existing roots. If fill cannot be avoided in the TPZ, compaction of fill shall be avoided, and consideration shall be given to a permanent well installation to protect the tree and its roots.
13. During the landscape, irrigation, and lighting phase, levels of compliance shall be documented and reported by a certified arborist. Non-compliance shall be reported to the project manager.
14. During the post-construction phase, a remedial and long-term maintenance plan shall be specified for existing and new landscaping, to ensure success of preservation efforts and newly planted landscaping.
15. Pruning shall be considered to reduce wind sail when necessary. It should not be considered to compensate for root loss.
16. Mulch shall be applied to as much of the tree protection zone as possible, in order to create a favorable soil environment for root recovery after construction activities.

ISA BMP Manual

1. A cost-benefit analysis shall be conducted during the planning phase. In some cases, money may be better invested in tree planting post-construction.
2. The species and age of tree shall be evaluated by a certified arborist, so that trees in good condition with desirable characteristics are preserved, but those in poor condition or with undesirable characteristics are not.
3. A tree inventory and tree management report shall be conducted during the planning phase, and a certified arborist shall work closely with developers to ensure best management practices are being met for both parties.
4. Effort shall be made to retain groups of trees, such that there is a wind and solar buffer around the highest quality trees if possible.
5. The Critical Root Zone (CRZ) is the area around the tree trunk where roots essential for tree health and stability are located. A Tree Protection Zone (TPZ) is an arborist-defined area around the tree which should include the CRZ, as well as additional area to ensure future stability and growth. The TPZ is subject to the professional opinion of the certified arborist.
6. An attempt shall also be made to preserve native soil for landscape planting as native soil with horizons and development is preferred over fill or black dirt.
7. If a sufficient TPZ cannot be established, a 6-12" layer of hardwood mulch, 3/4-inch plywood mat over a four-inch layer of hardwood mulch, or other such measures shall be temporarily installed over the CRZ in order to prevent root and soil compaction.
8. Trunk protection shall be installed on trees very close to construction activities, and should consist of 2x4 or 2x6 planks, strapped snugly to the tree trunk with wire or other strapping, preferably with a closed-cell foam between the trunk and the planks.
9. When roots over one inch cannot be avoided, they shall be pruned, not left torn or crushed. Acceptable methods of pruning are:
    A. Excavation using supersonic air tools, pressurized water, or hand tools, followed by selective root cutting
    B. Cutting through the soil along a predetermined line with a tool designed to cut roots
    C. Mechanically excavating the soil and selectively pruning remaining roots.
10. Wells, tree islands, retaining walls, and other such structures or strategies shall be considered as alternatives to any cut/fill work in the CRZ or TPZ.
11. Monitoring shall take place during construction and post-construction phases, and any non-compliance should be reported to the proper controlling authority right away, so that timely remediation or mitigation efforts may be undertaken.

Appendix K: Urban Timber Harvesting

Log Removal Specification for Urban Timber Harvesting

This tree removal standard shall not take precedence over applicable industry safe work practices and shall be implemented by a qualified arborist, urban forest manager, and /or practitioner who, through related training or on-the-job experience, or both, are familiar with the standards, practices and hazards of recovering urban forest products and the equipment used in such operations. Additionally:

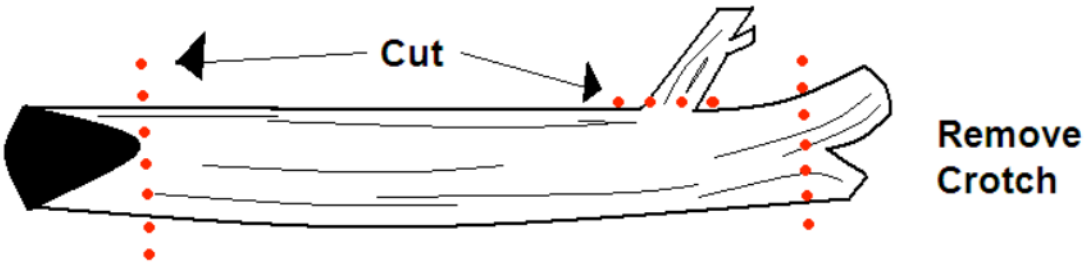
- Logs shall be felled to obtain minimum 8', 10', or 12' lengths with an additional 6" of trim on each log to a minimum diameter of 11" inside the bark. Maximum log length shall be 20'6".

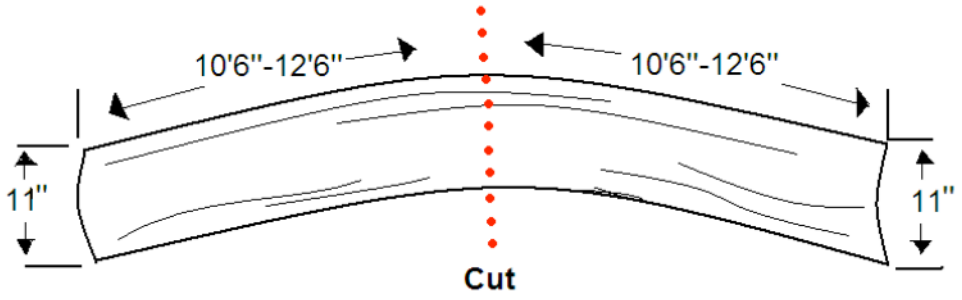
- If a tree must be removed in sections, every effort should be made to retain the lowest log, at the longest possible length that can be safely felled.

- Branches should be trimmed flush with the bole/trunk, root flares should be trimmed flush with the bole/trunk, and the ends of the log should be square.

- Logs shall be flush cut with no crotches or splits. All obvious defects such as decay, large holes, and rot shall be removed.

- Logs with significant sweep shall be cut in order to eliminate as much sweep as possible while yielding the longest possible straight logs to ensure logs are flush for proper milling.





Appendix L: 2019 i-Tree Eco Analysis

- Number of trees: 17,992
- Tree Cover: 180.7 acres
- Most common species of trees: Norway maple, Northern hackberry, elm spp
- Percentage of trees less than 6" (15.2 cm) diameter: 26.3%
- Pollution Removal: 4,571 tons/year ($237,000/year)
- Carbon Storage: 11,050 tons ($1,880,000)
- Carbon Sequestration: 171.7 tons ($29,300/year)
- Oxygen Production: 457.9 tons/year
- Avoided Runoff: 413,500 cubic feet/year ($27,600/year)
- Building energy savings: N/A – data not collected
- Avoided carbon emissions: N/A – data not collected
- Structural values: $26,100,000