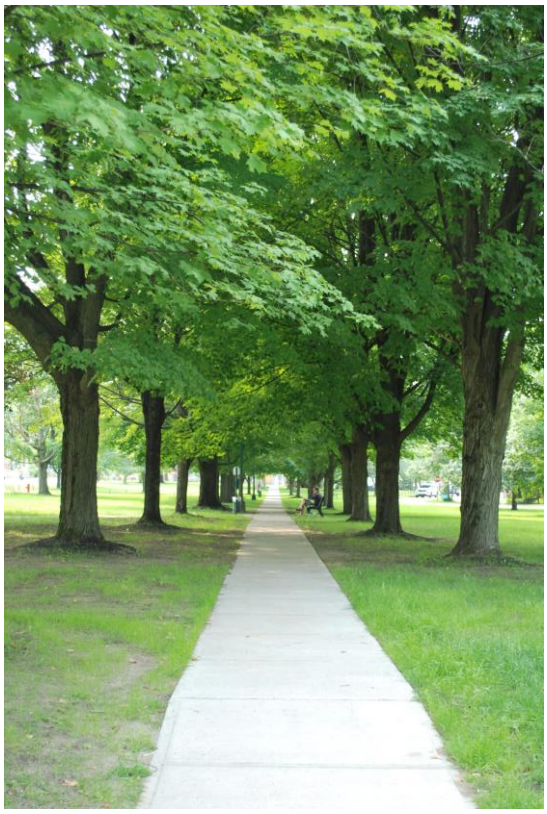


Arsenal Green Center Walk - Village of Malone

TREE MANAGEMENT PLAN

Village of Malone, New York

ABSTRACT
This document contains suggestions and ideas for the continued stewardship of the community forest in the Village of Malone, New York.

ArborPro Inc.
Yorba Linda CA
January 2022

Contents

List of Figures

List of Tables

List of Appendices

The Village of Malone applied for and was awarded a grant to conduct a tree inventory and create a tree management plan from the Department of Environmental Conservation Division of Lands and Forests' Urban and Community Forestry Program. The Urban and Community Forestry Program works to increase public awareness of the importance of trees and help communities develop and implement comprehensive tree management plans to create healthy forests while enhancing quality of life".

The Village of Malone would like to thank all the various people and departments involved in putting together the information to secure the grant for the project.

Village of Malone Board of Trustees
Andrea M. Dumas, Mayor
C. Archie McKee, Trustee
Norman Bonner, Trustee
Brain Langdon, Trustee
Matthew Boyea, Trustee

Franklin County Soil & Water
Kristin Ballou – District Forester

Executive Summary

This plan was developed for the Village of Malone, New York by ArborPro, Inc., with a focus on the short- and long-term maintenance needs of all inventoried trees. ArborPro conducted a tree inventory to better understand the current state of the Urban Forest and to create a framework for future tree care and maintenance planning. This Community Forest Management Plan was developed by analyzing tree inventory data in relation to the Village's current and future Urban Forestry goals. In addition to maintenance and planning needs, this report will address the economic, environmental, and social benefits that trees provide to the Village of Malone.

Significant Findings from the Inventory

The August 2021 tree inventory included trees, stumps and vacant sites within Village public street rights-of-way (ROW). A total of 1,984 sites were recorded during the inventory which included 1,426trees (72.2%), 63 stumps (3.1%), and 495 vacant sites (24.7%). Analysis of the tree inventory found:

1. The five most common species found in Malone are: sugar maple (363 trees: 18.2%), Norway maple (145 trees: 7.3%), red maple (122 trees: 6.1%), crimson king maple (81 trees: 4.1%) and white pine (66 trees:3.3%).
2. The three most common young trees (6" dbh and under DBH) are: common lilac (22 trees), sugar maple (22 trees), and Norway maple (20 trees).
3. The three most common mature trees (25" dbh and over DBH) are: sugar maple (201 trees), red maple (30 trees), and white pine (12 trees).
4. A total of 58 distinct species of trees were recorded during the inventory.
5. 60% of Malone's tree population is in 'Fair' or better condition.
6. Trees provide approximately $10,300 in annual environmental benefits.
7. Total Environmental Benefits
    - Tree Cover: 15.89 acres.
    - Stormwater Interception: valued at $3,000/year.
    - Carbon Sequestration: valued at $3,000/year.
    - Pollution Removal: $3,800/year.
    - Carbon Storage: $248,000.
8. Total replacement cost for all trees is $5,100,000.

Tree Maintenance Needs

Maintenance recommendations recorded during the tree inventory were removal (5.0%), pruning (72.0%), stump removal (2.0%), and planting (21.0%).

While tree maintenance can be very costly and time consuming, the benefits that trees provide justify the expense. Proper pruning and regular maintenance help ensure that trees are providing maximum benefits throughout their life span. In addition to maximizing benefits, regular maintenance mitigates tree related risk by removing hazardous limbs, reduces future storm damage clean-up, removes limb conflicts on sidewalks and roadways, improves the overall appearance of urban trees and promotes proper growth patterns in young trees. Trees that pose the highest risk (Priority 1 removals and prunes) should be addressed first to properly mitigate risk and prioritize maintenance. After all Priority 1 maintenance has been completed, the Priority 2 prunes and removals should be addressed.

Several high-risk trees (Priority 1 Prune and Removal) were recorded during the inventory that should be pruned or removed immediately to promote public safety.

Table 1: Maintenance Table

Tree Removal	Priority 1 Removal = 91 trees
	Priority 2 Removal = 53 trees
Priority Pruning	Priority 1 Prune = 75 trees
	Priority 2 Prune = 125 trees
Routine Pruning	Routine Prune = 997 trees
	Training Prune = 85 trees

In addition to high priority maintenance and risk mitigation, the Village of Malone would greatly benefit from a routine pruning cycle. The length of this cycle may vary depending on budget and tree maintenance needs, but a five-year cycle is recommended for established trees. For young trees, a three-year young tree training cycle is recommended to improve the structure, and longevity of newly planted trees. Based on inventory data, at least 200 trees should be pruned each year during the routine pruning cycle and at least 28 trees should be structurally pruned each year during the young tree training cycle.

Maintaining a proactive pruning and tree training cycle means that young trees are inspected and pruned, if necessary, every three years while established trees are pruned every five years again when necessary. Proper tree training will reduce structural defects and maintenance needs as trees mature and become established. Investing the time and money to address these issues while trees are young will reduce future pruning costs and help ensure the longevity of newly planted trees.

In addition to regular maintenance, tree planting is an important part of a comprehensive tree management plan. Adding new trees to the landscape is necessary to promote canopy growth, offset loss of trees due to natural mortality and other causes, and to increase biodiversity.

Introduction

With the guidance and assistance of the New York State Department of Environmental Conservation, through its Round 15 Urban and Community Forestry Grant, and continued support and knowledgeable input from Franklin County Soil and Water, the Village of Malone has been afforded an opportunity to contract with an ArborPro, Inc., Certified Arborist to conduct a tree inventory and develop the following Community Forest Management Plan for all Village owned and maintained trees within the Village right-of-way.

The inventory, consisting of the number of trees, tree species, tree diameter, crown condition, maintenance recommendations, GPS locations of trees and street addresses, and location of possible planting sites has provided the information needed to develop this Community Forest Management Plan, specific to the Village of Malone.

This project has provided the steppingstone needed for the Village of Malone to plan for tree maintenance, removal, and replacement, as well as establish new plantings, which will lead to a healthier community forest. Any work that may lead to improvement of this resource will be of great benefit to the citizens and businesses located in the Village of Malone. A tree lined street improves the beauty of a village potentially improving tourism and economics for local businesses.

Concerns about the health of village trees and the public safety issues associated with trees declining or failing have been expressed to the village on numerous occasions. Typically, the only maintenance conducted has been when a failure happens. Public safety issues can be addressed with the identification trees of low health and vigor, and the many benefits of maintaining and planting trees can now be realized with the guidance determined by the gathered inventory and this Management Plan.

New York State Route 11, which runs through the Village of Malone and is the only road traveling east to west across the northern part of the state, is heavily traveled which can lead to high levels of pollution for residents from car or truck exhaust fumes, as well as contributing to elevated noise levels.

This Plan will be utilized to guide the Village in the procedures necessary to achieve significant environmental benefits such as improved water and air quality, noise reduction, and an improved wildlife habitat. Healthy trees are an asset to the Village not only for our residents but for visitors from surrounding communities who use Village area parks for recreation.

Healthy trees improve the air quality, while providing shade, privacy, block noise, reduce surface water runoff, reduce windspeed and create an ecosystem for birds and other mammals. Village residents may even realize energy savings, enhanced aesthetics, and increased property values from either the establishment of new trees or the maintenance of existing ones, as outlined within in this Community Forest Management Plan. These benefits will lead to an improved quality of life throughout the village.

The Village of Malone encompasses approximately 2,012 acres and spans 3.14 square miles. There are 25 miles of streets, 30 miles of sidewalk and 3 parks totaling 84 acres. The Village has multiple parks which host AYSO, Little League and school sports and there is one school district that includes 3 elementary schools, one middle school and one high school.

A portion of the Town of Malone is considered a potential Environmental Justice area which encompasses approximately half of the Village of Malone. Although there is some variation in the tree populations throughout the Village with regards to age, species, and population size; the community forests being targeted in this project share a common thread, a component of aging trees and a lack of diversity.

This inventory and management plan will allow the Village of Malone to use the collected information to develop financial plans to fund and install new plantings, while increasing the diversity of the overall tree population. In addition to maturing trees and vacant planting locations, another noticeable component of the community forest is a younger age class that has been established in recent years.

This inventory will allow the Village to plan for maintenance of its investments and ensure economic, social, and environmental benefits to be realized well into the future. Furthermore, the collected information provides this community the opportunity to be proactive when invasive diseases or insects, such as the emerald ash borer, threaten the municipal tree population.

The Village of Malone Department of Public Works crews will maintain the inventory records and preform maintenance, such as young tree training, structural pruning and removal, as outlined in this plan. The records will be updated as new trees are planted, older/diseased trees are removed, and as trees are maintained. The Community Forest Management Plan will be invaluable as we look to the future of this community, its resiliency, and environmental benefits of our collective Community Urban Forest.

As this Management Plan is executed, the community as a whole will become more knowledgeable about their trees as the Village shares information related to pruning, removal and planting and as experts from Franklin County Soil and Water share their knowledge during tree related discussions and at the FCSW and Village of Malone Annual Arbor Day Event hosted yearly at the end of April.

Rebahka Scaccia
Village of Malone, New York
November 2021

Approach to Tree Management

The best approach to successfully managing a community forest is to implement a proactive, organized program to set goals and monitor progress. The first steps in this process are to complete a tree inventory and to prioritize maintenance functions and goals to guide short- and long-term planning. These tools can be utilized to establish tree care priorities, generate strategic planting plans, draft cost-effective budgets based on projected needs, and ultimately reduce to a minimum the need for costly, reactive solutions to emergency situations.

In August of 2021, the Village of Malone worked with ArborPro to conduct a comprehensive tree inventory and develop a Tree Management Plan. This plan considers the size characteristics, condition, and species distribution of the inventoried trees and provides a prioritized system for the maintenance of all trees within the survey area.
The following tasks were completed:

- Inventory of trees, stumps, and vacant sites in Village right of ways
- Analysis of tree inventory data
- Development of a plan that prioritizes the recommended tree maintenance
- Identify vacant planting sites and suggest a planting strategy

Tree maintenance plan addresses:

- **Results of the Inventory**
- **Benefits of a healthy Urban Forest**
- **Prioritization of tree maintenance**
- **Short- and long-term goals**

Trees are an important part of a community's green infrastructure, as essential as roads, bridges, or sewer mains. But trees, unlike other types of infrastructure perform better and gain value over time. They are the only infrastructure that improves with age. A tree management plan, like a stormwater, street, or sewer management plan, protects the important infrastructure on which we depend. The tree management plan outlines how Malone will protect and care for one component of its green infrastructure – its trees. The management plan is divided into four sections:

- Section 1: Highlights and Results of Inventory Data
- Section 2: Benefits of a Healthy Urban Forest
- Section 3: Tree Management
- Section 4: Planting Strategy

Section 1: Highlights and Results of Inventory Data

In August of 2021, ArborPro, Inc. assigned an Inventory Arborist to inventory trees and vacant sites along Village street rights-of-way. A total of 1,984 sites were collected which included 1,426 trees, 63 stumps, and 495 vacant sites. Table 2 shows a breakdown of the top 5 streets with trees.

Table 2: Top 5 Streets

Street	Count
Duane Street	324
Webster Street	110
West Main Street	79
Elm Street	76
Fort Covington Street	76

Methods of Data Collection

Tree inventory data were collected using ArborPro's proprietary software. The software, ArborPro version 3.5.1, is loaded on pen-based tablets and is equipped with geographic information systems (GIS) and uses aerial imagery and global position system (GPS).

The following data fields were collected at each tree location:

Address		Parkway Type
Condition		Parkway Size
Clearance		Recommended Maintenance
Height		Species
Notes		Tree Diameter
Observations		GPS Locaction

Assessment of Tree Inventory Data

Inventory arborists use professional judgement based on experience and industry standards to determine maintenance recommendations. Data analysis is then used to summarize and make inferences and conclusions about the state of the inventoried community forest. Understanding and recognizing trends will help guide short- and long-term management planning. The following criteria of the inventoried tree population are summarized in this section of the management plan:

- Size characteristics
- Tree condition
- Species and genus distribution

Size Characteristics

The general size of a tree provides insight into the age and value of the tree as well as the overall age of the urban forest. There are two industry-wide recognized size characteristics, height and diameter at breast height. While height is self-explanatory, diameter at breast height (DBH) is determined by the diameter (in inches) of the tree at 4.5 feet above grade. DBH range distribution can be used to analyze the relative age distribution of an urban forest. This allows the village to adjust the planting plans to ensure that there are enough young trees to replace aging and over-mature trees. It is important that all age classes are adequately represented throughout the urban forest to ensure a healthy, vibrant tree canopy for future generations. Figures 1, and 2 illustrate the distribution of trees by diameter and height class for the total inventory.

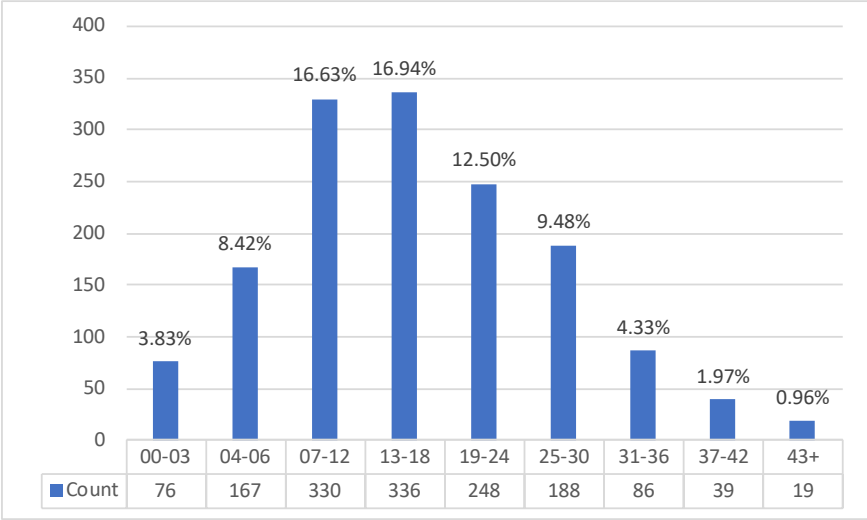


Figure 1 Diameter class distribution

DBH range distribution can be used as a proxy to analyze the relative age distribution of an urban forest. Due to the lack of data regarding the DBH growth rate of various species in any given location, utilizing DBH as proxy for age is one approach. It is understood that while the age/diameter relationship is generally consistent within a species the relationship is not the same for all species. There are many factors affecting DBH growth rate and while not ideal, it is a metric from which age can be inferred.

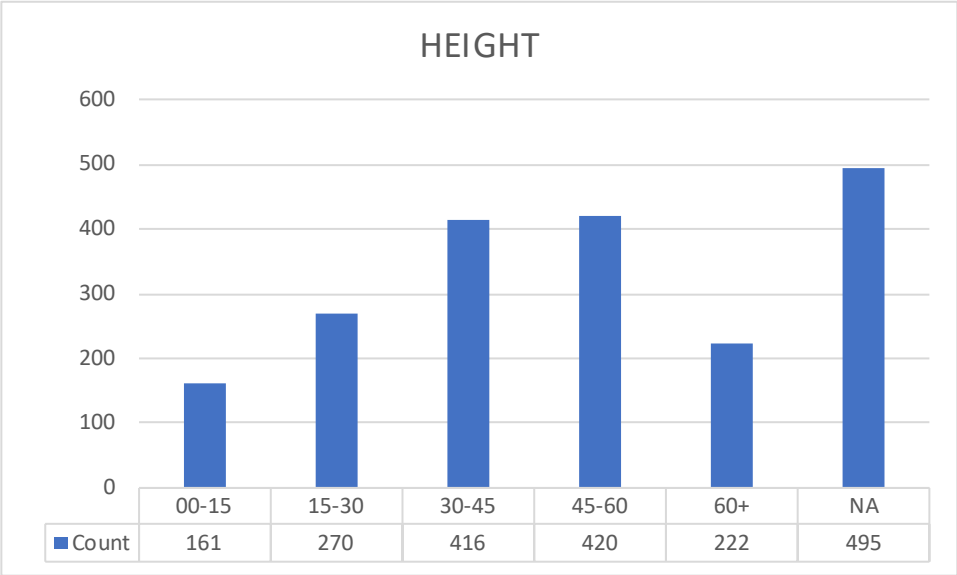


Figure 2: Height Class Distribution

Discussion

As can be seen by the above graphs, Malone has a distribution of size classes trending to the mature ranges throughout the village. The diameter distribution heavily favors semi-mature to mature trees with a lesser number of young trees. While this is not ideal, newly planted young trees will grow over time and will provide a healthy mature canopy if properly managed. ArborPro recommends planting new trees to further improve canopy cover and air quality and optimize the age class distribution.

Tree Condition

Tree condition is not necessarily about desirability but is a subjective, qualitative, representation of overall health, vigor, and structure. Likewise, appearance is not a complete indication of overall condition. Table 3 and Figure 4 show the number of trees recorded in each condition as well as the percentage of the total population that they represent.

Table 3: Tree Condition

CONDITION	COUNT	PERCENTAGE
Good	397	20.01%
Fair	792	39.92%
Poor	192	9.68%
Dead	45	2.27%
Stump	63	3.18%
Vacancy	495	24.95%
Totals	1,984	100.00%

Good – The tree has no major structural problems; no significant damage from diseases or pests; no significant mechanical damage; a full, balanced crown, and normal twig condition and vigor for its species. Trees in this category are considered to be 80-90% healthy.

Fair – The tree may exhibit the following characteristics: minor structural problems and/or mechanical damage; significant damage from non-fatal or disfiguring diseases; minor crown imbalance or thin crown; minor structural imbalance; or stunted growth compared to adjacent trees. Trees in this category are considered to be 60-80% healthy.

Poor – The tree can appear healthy but may have structural defects. This classification also includes healthy trees that have unbalanced structures or have been topped. Trees in this category may also have severe mechanical damage, decay, severe crown dieback or poor vigor/failure to thrive. Trees in this category are considered to be 40-60% healthy.

Dead – This category refers only to trees that are completely dead. Trees in advanced states of decline but still alive are generally recorded as poor or critical but not dead.

Stump – Stumps that interfere with pedestrian traffic or pose a tripping hazard. Stumps are not included in dead tree count.

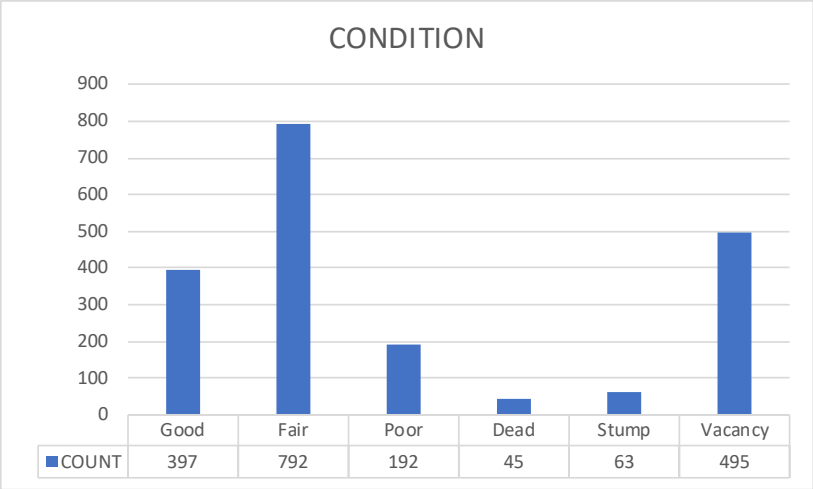


Figure 3: Tree Condition

Discussion

Most trees in Malone (83%) were observed to be in either 'Fair' or better condition at the time of the inventory. This number excludes stumps and vacant sites and is used to compare only the actual trees recorded in the inventory. Therefore, the overall health and condition of the Village's trees would be rated as Good. However, around 13.0% of the Village's trees are in poor condition and another 3% are dead. Figure 4 shows the maintenance recommendations by condition.

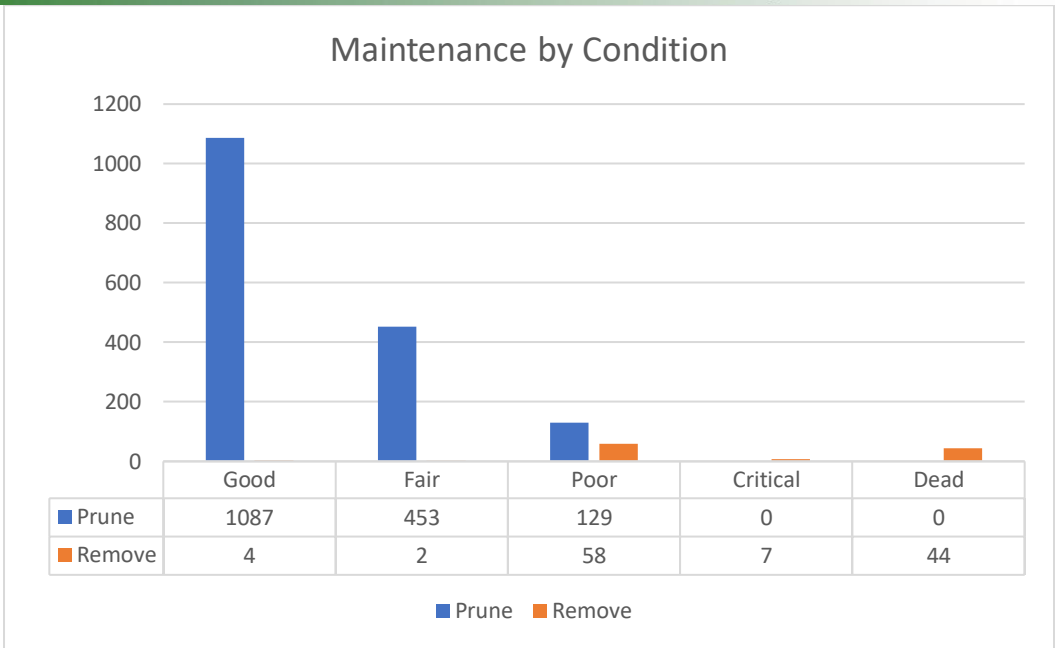


Figure 4 Maintenance Recommendations by Condition

Species and Genus Distribution

Understanding species and genus distribution is important when determining which species should be planted and which ones are currently overrepresented in the urban forest. Biodiversity is extremely important to the overall health and longevity of a tree population. The accepted guideline for urban biodiversity is the 10-20-30 rule. This means that no species should represent more than 10%, no genus should represent more than 20% and no family should represent more than 30% of the total tree population. Figure 5 shows the distribution of genera representing 2% or more of the total tree population.

Photo 1: Raymond Street

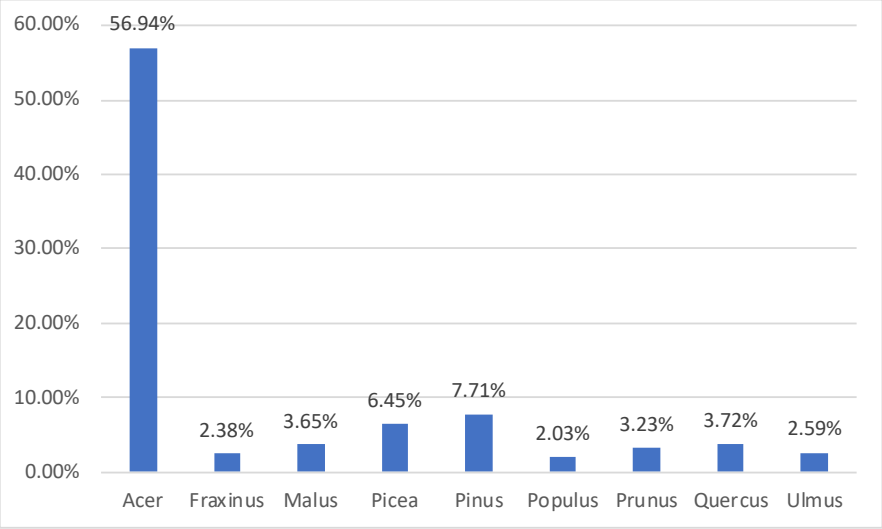


Figure 5: Genera > 2%

Table 4 and Figure 6 contain the top 10 most common trees in Malone by count of the total tree population. A full species frequency report can be found in Appendix A.

Table 4: Top 10 Species

TOP 10	Species	Count
1	Sugar Maple	363
2	Norway Maple	145
3	Red Maple	122
4	Crimson King Maple	81
5	White Pine	66
6	Box Elder	59
7	Crabapple Species	48
8	Colorado Blue Spruc	47
9	Norway Spruce	37
10	Red Oak	34

Discussion

The Village of Malone maintains 58 distinct species of urban trees. The distribution of these trees across species, genus, and family shows a considerable dependency on the Maple (Acer) family and could be improved over time. ArborPro recommends the Village discontinue the planting of Maples as they exceed the recommended 20% threshold for a particular genera and the 30% recommendation for family. While it is common for municipalities to have an excess of certain species, it leaves Malone susceptible to future outbreaks of insects and diseases. This risk can be mitigated by analyzing the current list of species being planted by the Village and focusing on species that do well in the area and actively promote biodiversity in the landscape.

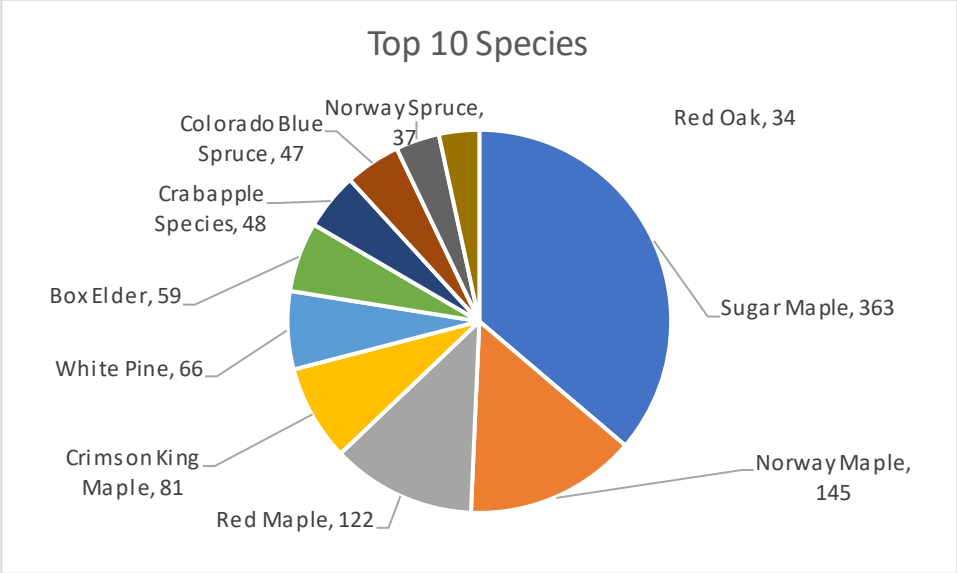


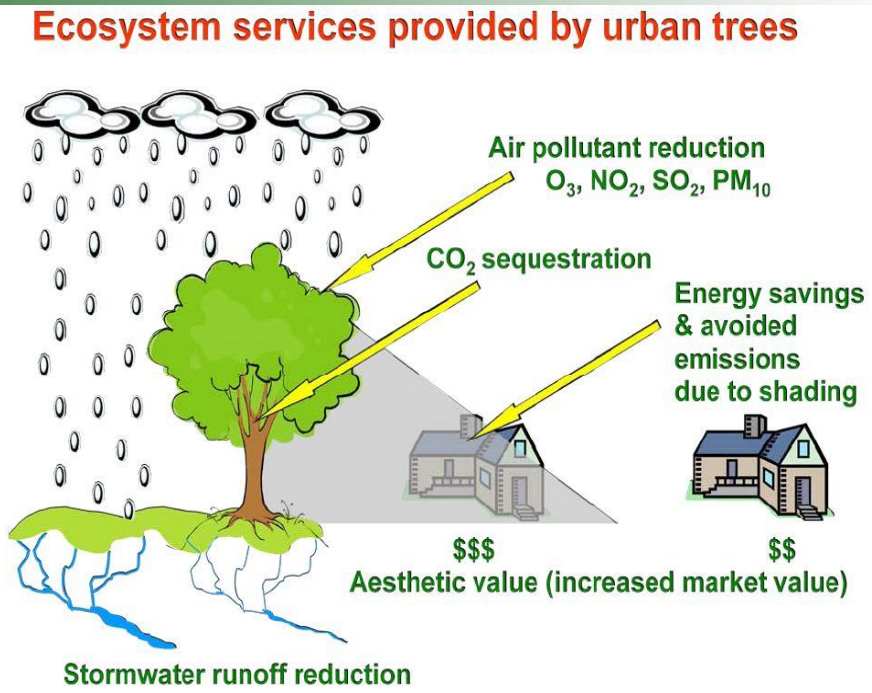
Figure 6: Top 10 Species

Section 2: Benefits of a Healthy Urban Forest

Trees provide a host of environmental, social, and economic benefits in urban areas. When properly maintained, trees can reduce pollution, improve mental health, and lower energy costs. It is important to understand the benefits trees provide as they can offset the cost associated with tree maintenance. A properly implemented tree maintenance program will maximize tree benefits in the urban setting, allowing trees to provide benefits that meet or exceed the time and money invested in maintenance activities.

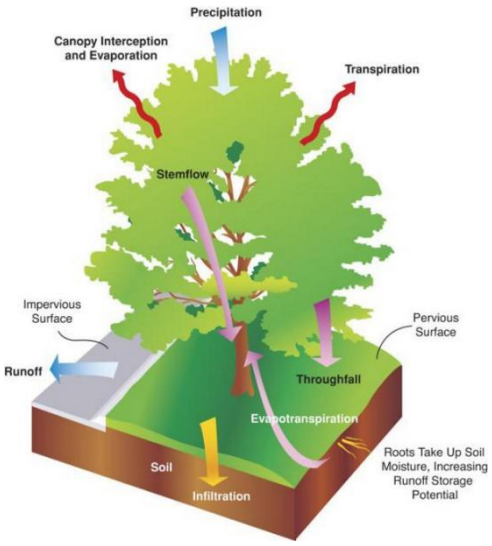
Photo 2:Autumn Arsenal Green

The i-Tree Eco 6 application was used to quantify the benefits provided by Malone's trees. This application uses growth and benefit models designed around predominant urban trees to calculate the specific benefits that trees provide in dollar amounts. The benefits calculated by i-Tree Eco 6 include air quality improvements, carbon dioxide (CO_2) reduction, carbon dioxide (CO_2) storage and stormwater control. It creates annual benefit reports that demonstrate the value urban trees provide to the surrounding community.



Air Quality

Trees improve air quality by removing several pollutants from the atmosphere, including ozone, nitrogen dioxide, and particulate matter totaling 629 pounds. The estimated value of pollutants removed by the inventoried tree population each year is $3,800.



Carbon Dioxide Sequestration

It is well known that trees absorb carbon dioxide and release oxygen into the atmosphere as a product of photosynthesis. Carbon absorbed during this process is ultimately stored in the wood of trees. The amount of carbon sequestered by the inventoried tree population is 17.6 tons and is valued at $3,000 annually.

Carbon Dioxide Storage

Carbon absorbed during the photosynthesis process is ultimately stored in the wood of trees. The amount of carbon stored by the inventoried tree population is 1.45 thousand tons and is valued at $248,000.

Stormwater Control

Trees reduce the costs associated with diverting stormwater by intercepting rainfall before it hits the ground and enters the storm runoff system. This greatly reduces the strain placed on public stormwater runoff systems and can represent a significant monetary savings by reducing the amount of infrastructure needed to divert stormwater throughout the village. The estimated savings for the Village in the management of stormwater runoff is 45,000 cubic feet diverted at a savings of $3,000 annually.

Total Replacement Value

In addition to Environmental Benefits, the Village can consider the Total Replacement Value for its urban forest. Total Replacement Value is the amount of money it would take to completely replace the existing urban forest with trees of the same size. While this is a scenario that will likely never happen, it gives the Village a specific dollar value of its trees in their current state. Replacement value differs from Environmental Benefits in that it shows how much the trees are worth instead of the dollar values that they provide in benefits. For example, a mature sugar maple could provide $2,100 in environmental benefits by reducing stormwater runoff, improving air quality, etc. but the total cost of replacing an 18" DBH sugar maple would be $24,270. According to i-Tree Eco 6, the total replacement cost for the Village Malone's trees is $5,100,000.

Photo 3:Fall Color Rec Park

Section 3: Tree Management

The purpose of this tree management plan is to provide a framework for the short- and long-term maintenance of Malone's urban trees. It is also meant to complement and enhance the existing maintenance program. The main goal of this five-year program is to reduce risk by prioritizing maintenance while establishing a proactive pruning schedule.

It is also important to recognize that the tree inventory data provides a snapshot of the current conditions of the Village's trees. Prioritized tree maintenance will help reduce the overall risk of tree related catastrophes. However, it is important to note that conditions can change drastically, and routine maintenance should be coupled with the identification and monitoring of trees that may become hazardous in the future. The focus of this report is to identify and mitigate the trees that were deemed maintenance prioritizations at the time of the inventory while planning for the future through proactive maintenance.

Table 5:Recommended Maintenance

Maintenance	Count	Percentage
Priority 1 Removal	91	4.59%
Priority 1 Prune	75	3.78%
Priority 2 Removal	53	2.67%
Priority 2 Prune	125	6.30%
Large Routine Prune	872	43.95%
Small Routine Prune	125	6.30%
Plant Tree	495	24.95%
Training Prune	85	4.28%
Stump Removal	63	3.18%

Recommended Maintenance and Tree Risk

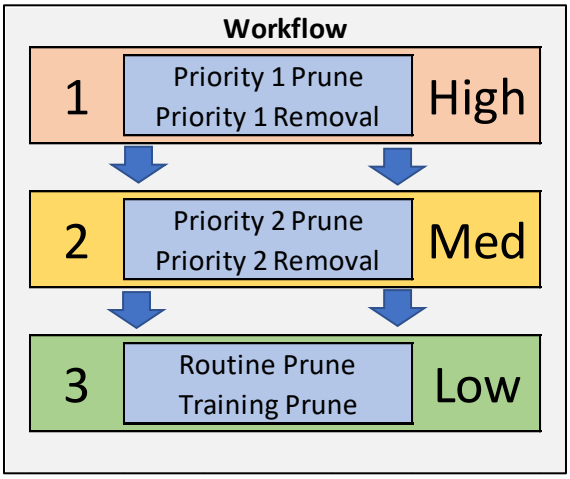
Below is a description and summary of the maintenance recommendations for the entire inventory. As the names imply, Priority 1 pruning and removals pose the highest risk and should be dealt with first. Priority 2 pruning and removals should be considered after all Priority 1 pruning and removal has been completed. The remaining trees will be considered as either routine pruning or young tree training activities that can be proactively pruned on a five-year and three-year basis respectively. Following is a description for each maintenance recommendation.

Priority 1 Prune - Trees that require priority 1 pruning are recommended for trimming to remove hazardous deadwood, hangers, or broken branches. These trees have broken or hanging limbs, hazardous deadwood, and dead, dying, or diseased limbs or leaders greater than four inches in diameter. The number of trees in this category is unrelated to the previous chart. There are dead and poor trees that are small in size and not considered a priority one removal.

Priority 1 Removal - Trees designated for removal that have defects which cannot be cost-effectively or practically treated. Most trees in this category have a large percentage of dead crown and pose an elevated level of risk for failure. Any hazards that cannot be mitigated with pruning that could be seen as potential dangers to persons or property and seen as potential liabilities would be in this category. Large dead and dying trees that are high liability risks are included in this category.

Priority 2 Prune - Trees that require priority 2 pruning are recommended for trimming to remove deadwood, correct structural problems, or resolve clearance issues. These trees do not pose as much risk as "Priority 1" trees.

Priority 2 Removal - Trees that should be removed but do not pose a liability as great as the Priority 1 trees will be identified here. This category would need attention as soon as "Priority 1" trees are removed.



Large Routine Prune - These trees require routine horticultural pruning to correct structural problems or growth patterns, which would eventually obstruct traffic or interfere with utility wires or buildings. Trees in this category are large enough to require bucket truck access or manual climbing.

Small Routine Prune - These trees require routine horticultural pruning to correct structural problems or growth patterns, which would eventually obstruct traffic or interfere with utility wires or buildings. Trees in this category are small enough to be pruned from the ground with a pole pruner.

Training Prune - Young, large-growing trees that are still small must be pruned to correct or eliminate weak, interfering, or objectionable branches in order to minimize future maintenance requirements. These trees, up to 12 feet in height, can be worked with a pole-pruner by a person standing on the ground.

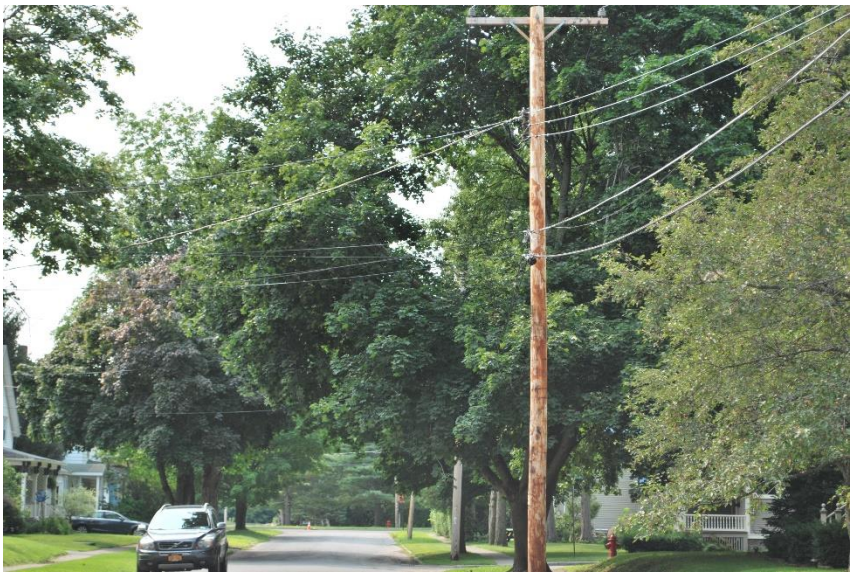


Photo 4:Lawrence Ave.

Stump Removal – Stumps that interfere with pedestrian traffic and pose a tripping hazard, typically located in high use areas.

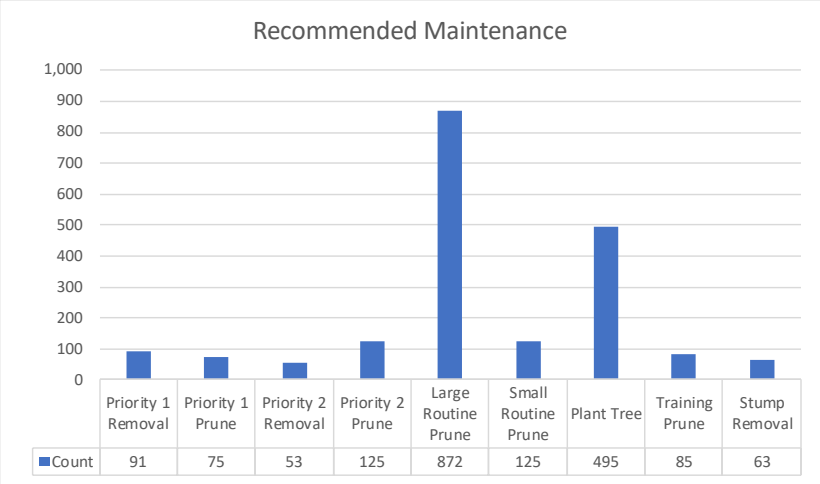


Figure 7: Recommend Maintenance

Priority and Proactive Maintenance

Not all communities are able to implement a proactive maintenance schedule and often rely on an on-demand response to hazardous or urgent situations. **However, a proactive program systematically reduces risk while improving the overall health of urban trees**. A proactive program will also help stabilize maintenance budgets and improve long-term planning.

In this plan, we chose to use a five-year cycle for routine tree trimming and a three-year cycle for young tree training. As previously explained, this involves pruning each tree every five years while conducting structural pruning on young trees every three years. These activities are considered proactive maintenance while trees in the Priority 1 and 2 categories are priority maintenance.

Priority Maintenance

Identifying and prioritizing the maintenance of a tree population allows tree work to be assigned based on observed risk. Once prioritized, the work can be approached systematically to mitigate risk by addressing the highest priority trees first. In this plan, all trees designated as Priority 1 prunes and removals will be considered first. Priority 2 prunes and removals will be considered after all Priority 1 trees have been addressed. Trees in the Routine Prune and Training Prune category will be entered into the proactive maintenance schedule discussed previously.

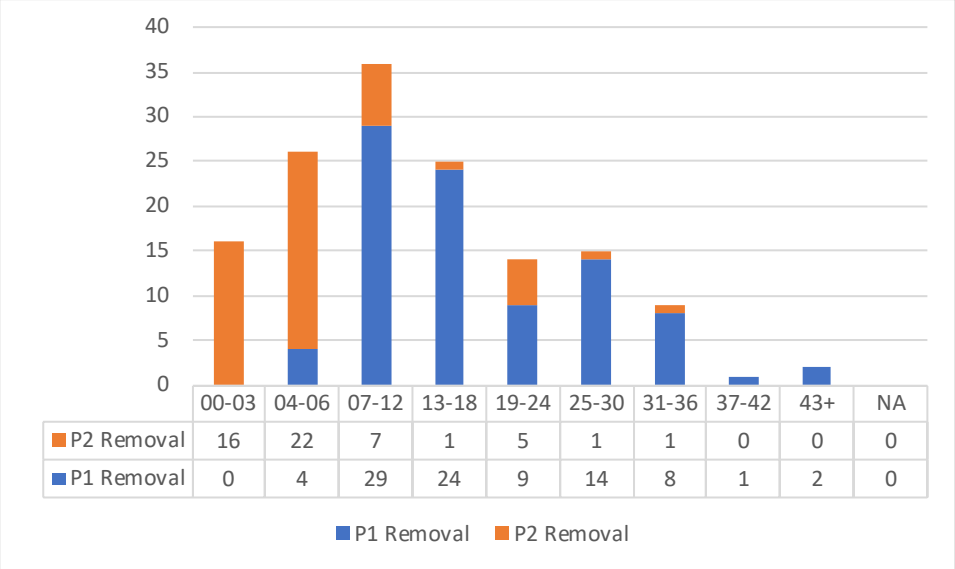
Priority Removals

While tree removal is often a last resort, there are situations where it cannot be avoided. In parks and other high-use areas, creating a safe environment is more important than preserving hazard trees that may have a social or cultural significance.

Trees in the Priority 1 Removal category pose a risk that cannot be mitigated through pruning. It is recommended that these trees be removed in the first year of the five-year maintenance plan. The inventory found a total of 91 trees that were assessed to be Priority 1 Removals.

Priority 2 Removals do not pose significant risk to people or property and should be addressed after all Priority 1 Removals have been completed. It is recommended that these trees be removed in the second year of the five-year maintenance plan. The inventory found a total of 53 Priority 2 Removals

Figure 8 shows a breakdown of Priority 1 and Priority 2 removals by diameter class.



	00-03	04-06	07-12	13-18	19-24	25-30	31-36	37-42	43+	NA
P2 Removal	16	22	7	1	5	1	1	0	0	0
P1 Removal	0	4	29	24	9	14	8	1	2	0

Figure 8: Priority 1 and 2 removals by Diameter Class

Priority Pruning

Trees in the Priority 1 Prune category pose a high risk to public safety that can be mitigated through pruning. It is recommended that these trees be pruned in the first year of the five-year maintenance plan or sooner if possible. The inventory found a total of 75 Priority 1 Prunes.

Trees in the Priority 2 Prune category pose a limited risk to public safety that can mitigated through pruning. It is recommended that these trees be pruned in the first and second year of the five-year maintenance plan. The inventory found a total of 125 Priority 2 Prunes.

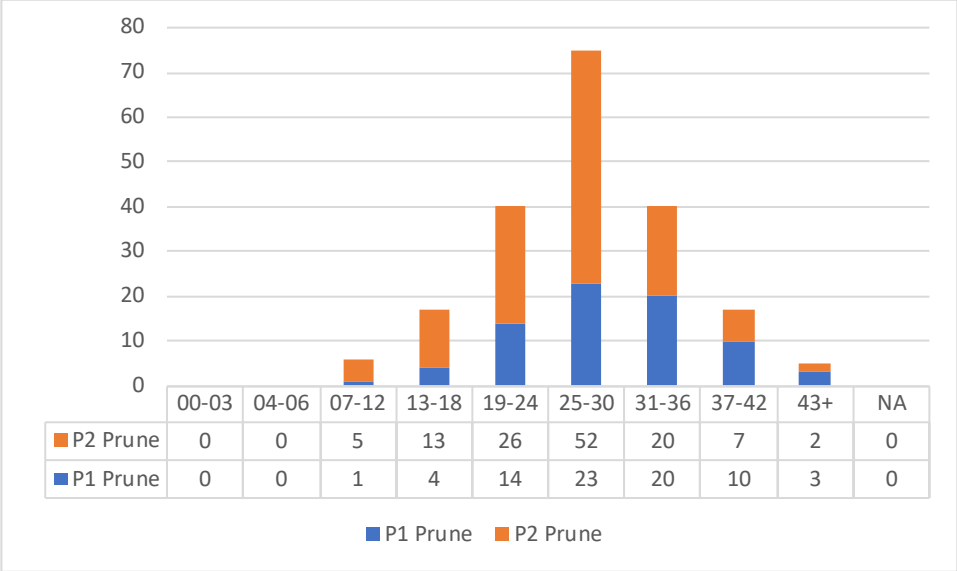


Figure 9:Priority 1 and 2 Prunes by Diameter Class

Proactive Maintenance

Proactive tree maintenance requires that trees are systematically managed over time. To accomplish this, trees are placed in a pruning cycle in which tree health and form are routinely addressed. While it may be costly to implement a routine pruning cycle, it will reduce both risk and maintenance costs over time. Maintaining a routine pruning cycle will allow the City to address minor maintenance needs on a regular basis. Over time this will reduce the number of emergency situations and will allow the City to regularly monitor potential problem trees.

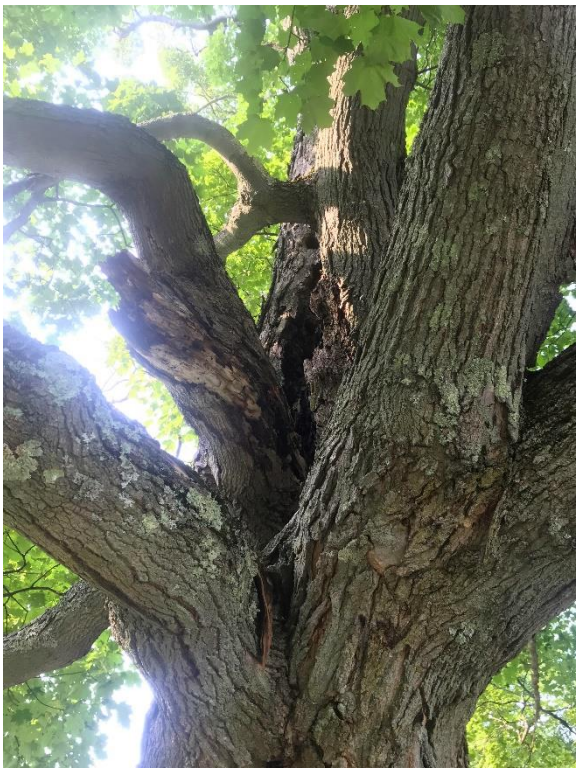


Photo 5:Priority 1 Prune

Routine Pruning Cycle

The routine pruning cycle includes all trees that were entered as a Large Routine Prune or Small Routine Prune during the inventory. These trees pose little to no risk and could benefit from regular pruning to mitigate tree related risk by removing hazardous limbs, reduce future storm damage clean-up, remove limb conflicts on sidewalks and roadways, improve the overall appearance of urban trees and promote proper growth patterns in young trees. The length of a routine pruning cycle depends on the size of the tree population and ArborPro recommends a five-year cycle for the trees included in the

inventory. This means that approximately one-fifth of the tree population will need to be pruned each year. This number will fluctuate as trees are removed, priority maintenance is completed, and young trees grow into maturity. This report and five-year maintenance plan will only consider trees in the Routine Prune category at the time of the inventory for the routine pruning cycle.

The 2021 tree inventory found a total of 997 trees that would benefit from routine pruning. This means that approximately 200 trees (one-fifth of the total population) will need to be pruned each year, starting in year two of the five-year maintenance plan. Figure 10 shows a breakdown of the number of Routine Prunes by diameter class.

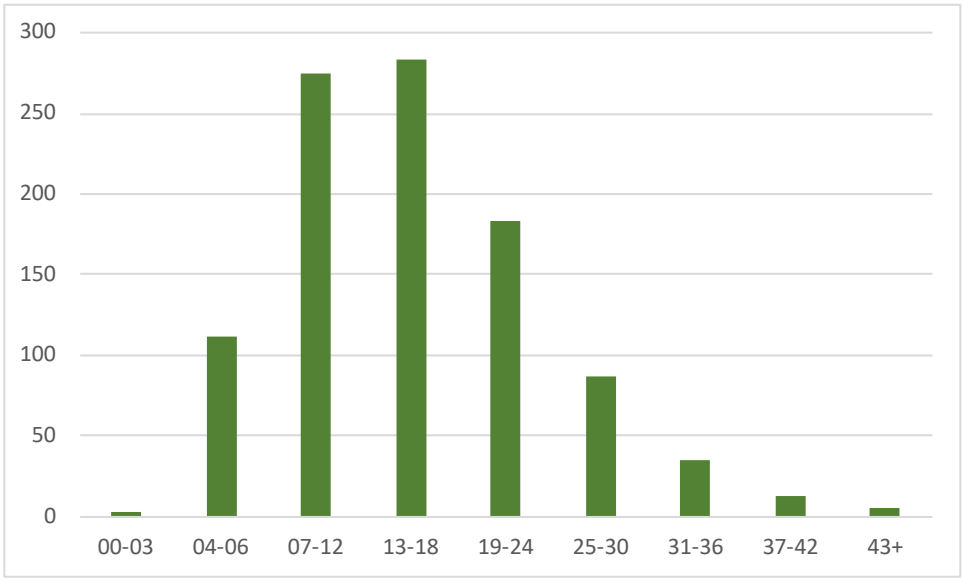


Figure 10: Large and Small Routine Prunes by Diameter Class

Young Tree Training Cycle

It is also important to remember that older, more mature trees provide the most benefits to the community. The Village must promote tree preservation and proactive tree care to ensure older trees survive as long as possible. One of Malone's objectives is to have an uneven-aged distribution of trees throughout the Village. ArborPro recommends that Malone support a strong planting and maintenance program to ensure that young, healthy trees are in place to fill in gaps in tree canopy and provide for gradual succession of older trees. Tree planting and tree care will allow the distribution to normalize over time.

Trees included in the Young Tree Training Cycle are typically less than 8 inches DBH and will benefit from structural pruning. Young trees tend to have higher growth rate and therefore require

Planting trees is necessary to increase canopy cover and to replace trees lost to natural causes (expected to be 1–3% per year)

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a shorter pruning cycle than mature trees. For this reason, ArborPro recommends a three-year cycle for young tree training.

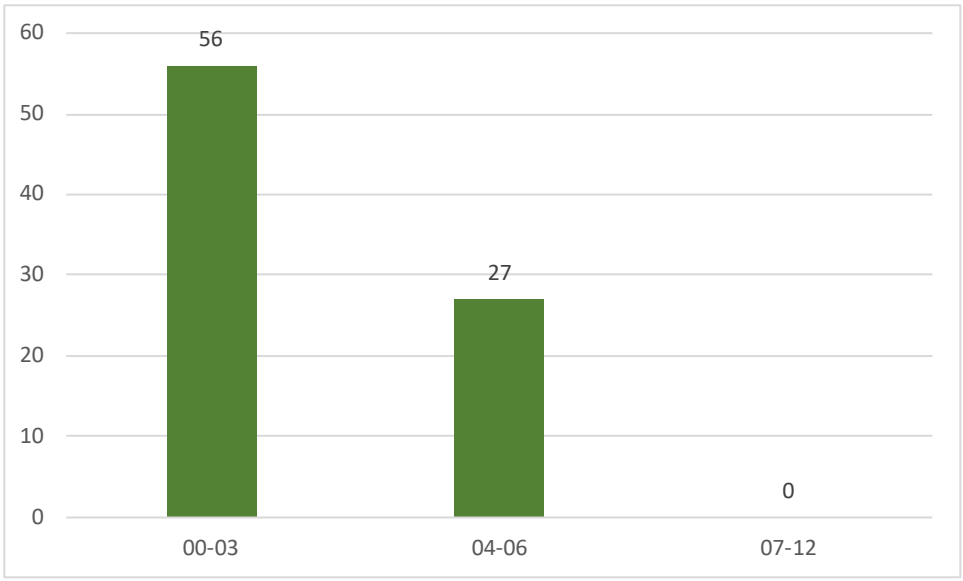

Figure 11: Young Tree Training Cycle

The three-year young tree training cycle should begin on year three or sooner of the maintenance plan and will only include existing young trees for the sake of this management plan. One-third of young trees should be structurally pruned each year. The number of trees in the training cycle will fluctuate as new trees are planted and as older plantings become established and no longer require training. Therefore, the amount of money spent and the number of trees in the training cycle will not remain constant.

The inventory has a total of 83 trees under 8 inches DBH that would benefit from structural pruning. This means that approximately 28 trees (one-third of the total population) should be trained each year beginning in year three of the five-year maintenance plan. However, if budget allows, the young tree training cycle could be moved to year one to benefit all the recently planted trees.

Importance of Tree Maintenance

Trees are naturally occurring, organic organisms and are often treated as though they do not need human assistance to thrive. While this may be true in undisturbed forests, it is certainly not true for urban trees. Urban trees require regular maintenance to maximize the benefits they provide. When maintenance is neglected, trees can pose a serious risk to people and property. Trees in poor health also represent a liability to the agencies tasked to maintain them. In addition, trees in urban environments are subject to many more stressors than trees in forests or rural areas. Urban trees grow in restricted spaces, are exposed to pollutants and are subject to soil compaction and can be easily damaged by mowers or other maintenance activities.

Proactive pruning and hazard mitigation greatly reduce the risk of tree failure and subsequent damage. In addition, proactive maintenance will prolong the life of a tree and reduce future maintenance costs. A well-maintained urban forest will be less susceptible to disease and disaster. Trees that are regularly pruned and maintained will not be as prone to disease as trees that have been neglected. When trees are pruned on a regular basis and removed when they become diseased or hazardous, it eliminates some of the pathways for potential pests and diseases. Many of these pests and diseases attack stressed trees. Therefore, a well-maintained urban forest will be less likely to succumb to pest infestations. In addition, species selection is an important part of maintaining a healthy urban forest. Careful species selection will increase biodiversity and reduce the risk of a catastrophic pest infestation. Most pests have preferred hosts so increasing biodiversity will limit the number of species that are susceptible to individual pests.

While it is impossible to predict when a natural disaster will strike, a level of disaster preparedness can be achieved through regular maintenance. Trees that have been pruned to remove dead or hanging limbs will be less likely to experience branch failure in high winds, thus reducing storm damage clean-up. Also, removing diseased or declining trees from the landscape will reduce the risk of whole tree failure in major storm events.

The importance of urban tree maintenance cannot be understated. A well-maintained urban forest will provide maximum benefits to the community while reducing the inherent risk of tree failure.

Tree Risk Assessment

Assessing risk related to tree failure is an essential part of maintaining a healthy, safe urban forest. While trees are not inherently dangerous, urban trees pose a higher risk of damage to persons or property due to their proximity to potential targets. A target is anything that can be damaged by falling limbs or whole tree failure such as people, houses, fences, vehicles, etc. The basic concept of risk assessment is to weigh the potential of failure against the presence and frequency of targets. For example, a tree in the middle of an abandoned field does not pose the same risk as a similar tree on the corner of a busy intersection.

The ultimate goal of a tree risk assessment is to determine whether tree related risk can be mitigated by pruning or if the tree must be removed. This assessment is based on the overall condition of the tree, the location of the tree relative to targets, and obvious signs of defects. Defects can range from root damage to large pockets of decay and will help determine whether the risk can be mitigated, or the tree should be removed.

The International Society of Aboriculture (ISA) is an excellent resource for information related to Tree Risk Assessment. The ISA has three basic levels of risk assessment and recommends defining the scope of work prior to choosing which method best fits the situation. The three levels of risk assessment are:

- Level 1: limited visual inspection

- Level 2: Basic
- Level 3: Advanced

A Level 1 visual inspection is often referred to as a "windshield assessment" because it can be done while driving through a survey area. Level 1 inspections are used only to find obvious risks. Data in this plan is the result of a Level 1 assessment.

A Level 2 basic inspection involves a 360-degree, on-site inspection using only limited tools such as a sounding hammer. This level of inspection requires a qualified arborist to look for external defects and surrounding targets to evaluate risk. In addition to providing more in-depth analysis, Level 2 assessments are an affordable way to assess risk on a large population of trees.

A Level 3 advanced inspection involves using specialized tools and expert opinions to collect detailed information on specific trees. These assessments are often done on high value trees or in areas with heavy traffic that pose significant risk to public safety. Level 3 inspections are costly and time consuming and should only be used when a determination cannot be accurately made using a Level 1 or 2 assessment.

A level 1 risk assessment was conducted as a component of the inventory. Maintenance recommendations were made based on the assessment.

The basis for the risk rating is based on the presence of a target (people or property that can be impacted by a tree or tree part failure). In a level 1 risk rating the objective is to identify the presence of a target. Tree part and tree size are also a component of the risk rating. The bigger the part the higher the risk.

A large branch with decay that is growing over a park bench could be considered a high risk. That same branch if growing opposite the bench in an area that people rarely go could be considered a medium risk.

Low risk trees have no target or are the tree and its parts are so small that the likelihood of damage is minimal.

Tree condition is not a reliable metric to determine risk. Many poor condition trees pose a low risk because of the targets while good condition trees may have a condition that warrants a high risk rating, and that rating can be modified once mitigating action (such as pruning) is complete.

It should be noted that in general tree populations are safe. The likelihood of being injured by a tree is extremely low. One study in the United Kingdom concluded that changing the way trees are managed would not result in significant risk reduction.[1]

[1] Common Sense Risk Management, National Tree Safety Group.

Table 6: Risk Rating

Category	Count	% of Population
Low	991	49.95%
Medium	401	20.21%
High	86	4.33%
Hazard	11	0.55%
NA	495	24.95%
Total	1984	100.00%

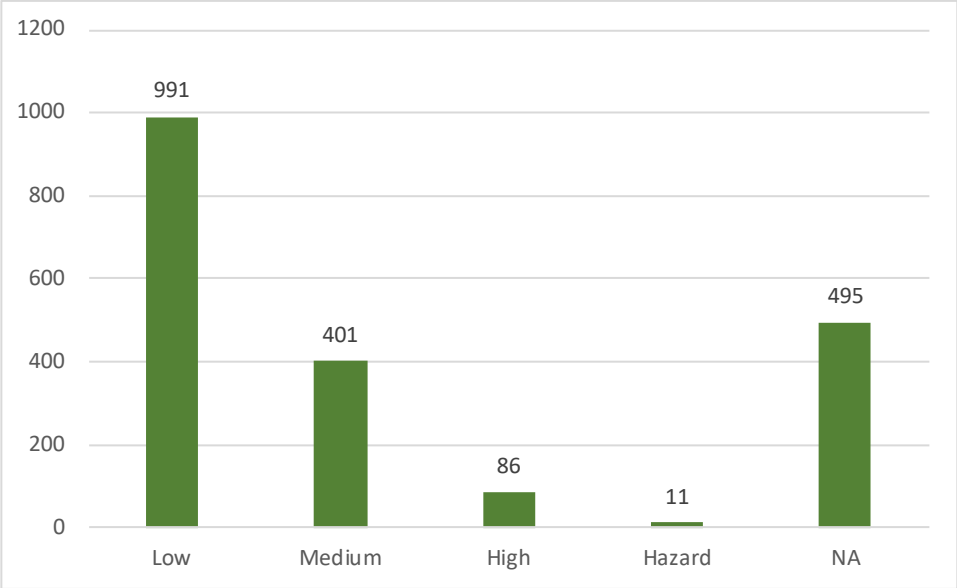

Figure 12:Risk Rating

Importance of Updating Inventory Data

Trees are living organisms that change with time. Inventory data, however, is static and will not reflect the current state of an Urban Forest unless it is continually updated. Whenever a tree is removed, inspected, pruned, or planted it should be updated in the inventory. If inventory data is not properly maintained, it will quickly become obsolete and will ultimately be of little use. Significant time and money have been invested in surveying the Village of Malone's trees. The only way to protect this investment is to continually update the inventory. The Department of Public works seems like a logical choice to be tasked with updating the inventory. Updates should be entered soon after they occur.

The inventory can be updated using a spreadsheet program. There are many features in spreadsheets that allow filtering by species, condition, or recommended maintenance. It is possible to add a column to track work dates etc. The inventory can also be updated using ArborPro's flagship software Enterprise 2.0. All of Malone's data is in the program and ready to be updated, assign work and print reports for distribution.

Vacant Sites and Tree Planting

During the inventory, a total of 495 vacant sites were recorded in areas that were suitable for planting new trees. Vacant sites were broken down into three categories based on the size of planting space. Vacant sites are classified by size to aid in the selection of appropriate species for those sites. For example, a large growing tree is not a good choice for a small site because of potential infrastructure conflicts and a smaller site with reduced rooting space will prevent a large tree from reaching its largest size. Conversely a small maturing tree planted in a space that would accommodate a large tree could be considered wasted space.

- Small Vacant Site – 4'to 6' planting space or any vacant site under electric utilities
- Medium Vacant Site – 6' to 8' planting space
- Large Vacant Site – 8'+ planting space

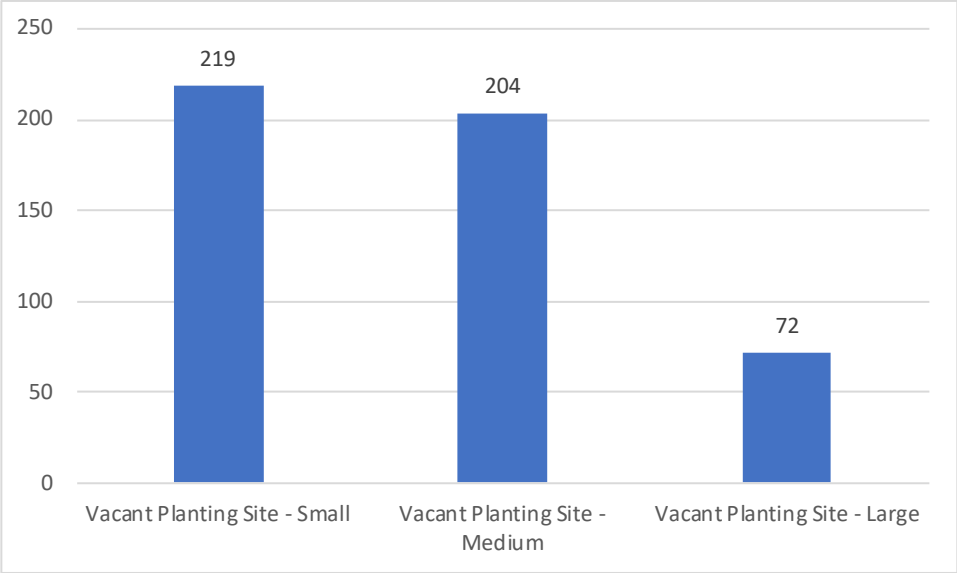

Figure 13:Vacant Planting Sites

The number of trees planted each year depends on budgeting and may vary from year to year. However, ArborPro recommends planting at least 50 trees per year to offset loss of trees due to natural mortality while gradually increasing canopy cover and biodiversity. To increase biodiversity, trees should be carefully selected and planted in areas suitable for that species. For example, planting a pin oak directly under power lines will only create problems in the future. As the trees grow into the power lines, they will require severe pruning or topping to prevent them from impacting the lines. The result will be a tree that is visually unappealing and in poor health.

ArborPro recorded a total of 495 vacant sites during the inventory. This indicates that roughly 25% of the Village of Malone's tree sites can be planted. If 50 trees are planted each year, the Village will annually increase the total tree population by roughly 3%. At this rate, it will take approximately 10 years to fill all the vacant sites. The investment associated with planting new trees will depend on tree size and local labor costs. Using a $200.00 per site planting cost will require budgeting $10,000 per year for planting. In addition, each tree planted will increase the amount needed for annual maintenance. Five years after planting the budget will need to increase by $1,500.00 annually. Ten years after planting that amount will double and fifteen years after planting that amount triples. Planning for the budget increases is important so the trees can be properly maintained.

Tree planting locations should focus on areas with the least amount of canopy and move into more canopied sections of the village as the vacant planting sites are filled. Tree and stump removal also represent locations where new trees can be planted as the budget permits.

Photo 6:Arbor day 3rd Street Park

Tree Planting

Tree planting is an important part of maintaining and cultivating a healthy urban forest. Newly planted trees will become the foundation of the urban tree canopy as older trees start to die and are removed from the landscape. The tree canopy is all of the tree parts that cover the ground when viewed from above. However, tree planting is only a worthwhile activity when trees are properly selected, properly planted, and properly cared for as they become established. If trees are not properly planted and cared for, they will only become a future problem and will not provide the benefits associated with healthy, mature trees.

When planting new trees:

- Consider the purpose of the tree that is being planted. For instance, is the tree to be a screen to block undesirable views, or is it for aesthetics to beautify a particular area?

- Assess the site conditions and note any growth limitations or space requirements (ex. overhead utilities, proximity to buildings, existing tree canopy, etc.).
- Select the best species for the site conditions
- Ensure that the tree is properly planted and have a plan in place for follow-up tree care.
- Monitor and record how newly planted species react to the site conditions and incorporate this information into future planting plans.

Tips for Planting Trees

To ensure that newly planted trees will survive the planting process:

- When possible, the DEC forester should be included in the selection, purchase, and inspection of trees. If it can be arranged the DEC forester can also be present on planting days to offer advice and encouragement.
- Handle trees with care during the transportation process. Avoid any damage to the trunk or branches when loading and unloading.
- Avoid storing trees for lengthy periods before planting and make sure the root ball is moist if they are not being immediately planted.
- Dig the hole 2 to 3 times the size of the root ball using hand tools when possible. When augers are used the sides of the hole can become compacted and will negatively affect root growth.
- Fill the hole with native soil when possible. If the native soil is undesirable, add soil amendments to improve soil structure. Gently tamp down the soil and add water to promote a proper mixture of air, water, and soil.
- Stake trees for the first year of growth to protect against wind and provide a barrier against mechanical damage from mowing.
- Add a thin layer of mulch, making sure not to let mulch build up around the trunk. Over mulching is extremely common and will do irreversible damage in the long run.

Newly Planted Tree Maintenance

Proper young tree maintenance is just as important as proper planting techniques. If trees are not cared for after planting, there is little chance that they will survive and become established. Newly planted trees will require maintenance for several years after planting.

Water

Watering newly planted trees is the most important key to their survival. It will typically take at least two months of watering for a new tree to become established. The time of year and species of tree will dictate how much water should be applied after this period, but the general rule is to keep soil moist in order to promote root growth.

Mulching

Applying mulch to newly planted trees has many benefits. Mulch will help retain soil moisture and regulate temperatures around the root ball. However, over mulching will have devastating effects on the long-term health of a tree so it is extremely important to avoid piling mulch around the trunk. Spread 3 to 4 inches of mulch around newly planted trees while ensuring the root flare is visible and mulch is not touching the trunk.

Caring for Established Young Trees

Trees will take a few years to become established after planting. The general rule is that trees take a year for each inch in caliper when planted to become established. For example, if you are planting a 2-inch caliper tree (caliper is the diameter at 6 inches above ground) it will take 2 years for the roots to become fully established. Established trees still require regular watering and will need structural pruning as they begin to grow. Structural pruning is done to establish a central leader, remove dead or diseased branches, remove crossing limbs, and to create an overall structure that will benefit the tree into maturity.

Community Outreach

The data collected and analyzed to develop this plan provides significant insight into the Village of Malone's tree population. While this information can be used to better maintain the urban tree population, it is also very useful when developing a community outreach plan. The ability to quantify tree data and present the information to the public is an invaluable resource.

Photo 7:Stroll under trees

Tree inventory data can be used to quantify and justify the budgetary needs associated with maintaining urban trees. This is an excellent way to show the community how much it costs to properly maintain the trees in public parks and open spaces. The data can also help illustrate the costs associated with tree planting and the benefits these trees will provide in the future. Species data can be used to guide tree species selection and to help educate the public on the benefits of biodiversity.

Understanding biodiversity is key to maintaining a healthy, pest-resistant urban tree canopy. When the public is educated on the benefits of biodiversity and species selection it will encourage them to put more thought into species selection on private property. Information in this plan can also be used to educate the public about invasive pests and the threat that they pose to urban trees.

Providing information on potential and existing threats such as the Asian Long Horned Borer will help give the community a better understanding of how and why these trees are being managed. A well-informed community will be more supportive of proactive tree management and will have a better understanding of the benefits trees provide.

There are a variety of ways to present information to the public. As technology advances it is becoming easier to engage the community and present information in a meaningful, easy to use platform. The Community Viewer offered with ArborPro's Tree Management Software is an excellent way to present tree inventory data to the public. Community Viewer allows residents to see general information about Malone's tree population on their smartphone or any web enabled device.

Hosting events such as an Arbor Day celebration is another way to involve the community. Planning volunteer tree plantings to coincide with these events allows community members to develop a connection with specific trees and parks. Local and state websites provide a useful outlet for articles, information, and educational materials to be presented to entire communities.

The key to all these tools is public awareness. To effectively implement a community outreach program, the public will first need to be aware of its existence. Once the community is aware of the benefits urban trees provide it will be much easier to foster an understanding of the key role trees play in everyday life.

Maintenance Cycle

Utilizing data from the tree inventory, ArborPro developed an annual maintenance schedule detailing the number and type of tasks to be completed each year. Budget projections were made by using average cost of tree work based on diameter class. These costs are not specific to the Village of Malone, they only represent average costs based on industry knowledge and experience.

Maintenance Plan

This summary will include all tree data collected during the inventory. It represents the total cost of maintaining all inventoried trees. A summary of the maintenance schedule is presented here and the complete table of estimated costs for this five-year plan can be found in Appendix C.

The breakdown of cost for all priority maintenance is:

Table 7: Priority Maintenance

Maintenance	Cost
Priority 1 Removal	$46,165
Priority 1 Prune	$19,780
Priority 2 Removal	$8,607
Priority 2 Prune	$27,995
Total	**$102,547**

The recurring cost of proactive maintenance is:

Maintenance	Cost per Year
Routine Prune	$28,025
Young Tree Training	$780
Total	**$28,805**

To implement this maintenance schedule the budget should be no less than $70,595 for Year One, $20,282 for Year Two, $15,065 for Year Three, $28,805 for Year Four, $25,720 for Year Five.

Properly managing urban trees requires planning, communication, public support, and adequate funding. For these reasons, it is complicated and can only be accomplished through a well-defined vision for the future. The combination of priority and proactive maintenance detailed in this Tree Management Plan will create a framework for short- and long-term management that will help ensure a healthy, vibrant tree canopy for future generations. The Village must balance the needs of its residents with a knowledge and understanding of tree management to create a safe, enjoyable experience for everyone.

There are two tools that can be used to determine the locations of the above maintenance. For instance, if the locations of Priority One removals need to be identified these can be sorted on the recommended maintenance column of the excel spreadsheets. Furthermore, those records can be filtered by species or size if desired. Using this tool will provide the basic information about the item searched for.

The Village has access to ArborPro's tree management software Enterprise 2.0. The same searches can be performed using our software. The advantage of using the software is the addition of a map showing tree locations. Work lists can be created, and records can be updated quickly and easily.

All the information entered in Enterprise 2.0 can be exported to excel spreadsheets as needed. A great feature of Enterprise is the community viewer. Maps can be created and shared with others without the worry of inadvertent data corruption.

Priority 1 Removal	00"-03"	$25	0	$0	0	$0	0	$0	0	$0	0	$0	$0
	04"-06"	$105	4	$420	0	$0	0	$0	0	$0	0	$0	$420
	07"-12"	$220	29	$6,380	0	$0	0	$0	0	$0	0	$0	$6,380
	13"-18"	$355	24	$8,520	0	$0	0	$0	0	$0	0	$0	$8,520
	19"-24"	$525	9	$4,725	0	$0	0	$0	0	$0	0	$0	$4,725
	25"-30"	$845	14	$11,830	0	$0	0	$0	0	$0	0	$0	$11,830
	31"-36"	$1,140	8	$9,120	0	$0	0	$0	0	$0	0	$0	$9,120
	37"-42"	$1,470	1	$1,470	0	$0	0	$0	0	$0	0	$0	$1,470
	43+	$1,850	2	$3,700	0	$0	0	$0	0	$0	0	$0	$3,700
Total			**91**	**$46,165**	**0**	**$0**	**0**	**$0**	**$0**	**$0**	**0**	**$0**	**$46,165**
Priority 2 Removal	00"-03"	$25	0	$0	8	$200	8	$200	0	$0	0	$0	$400
	04"-06"	$105	0	$0	11	$1,155	11	$1,155	0	$0	0	$0	$2,310
	07"-12"	$220	0	$0	4	$880	5	$1,100	0	$0	0	$0	$1,980
	13"-18"	$355	0	$0	1	$355	0	$0	0	$0	0	$0	$355
	19"-24"	$525	0	$2	3	$1,575	0	$0	0	$0	0	$0	$1,577
	25"-30"	$845	0	$0	1	$845	0	$0	0	$0	0	$0	$845
	31"-36"	$1,140	0	$0	1	$1,140	0	$0	0	$0	0	$0	$1,140
	37"-42"	$1,470	0	$0	0	$0	0	$0	0	$0	0	$0	$0
	43+	$1,850	0	$0	0	$0	0	$0	0	$0	0	$0	$0
Total			**0**	**$2**	**29**	**$6,150**	**24**	**$2,455**	**0**	**$0**	**0**	**$0**	**$8,607**
Stump Removal	00"-03"	$25	1	$25	0	$0	0	$0	0	$0	0	$0	$25
	04"-06"	$25	2	$50	0	$0	0	$0	0	$0	0	$0	$50
	07"-12"	$25	13	$325	0	$0	0	$0	0	$0	0	$0	$325
	13"-18"	$40	9	$360	0	$0	0	$0	0	$0	0	$0	$360
	19"-24"	$60	11	$660	0	$0	0	$0	0	$0	0	$0	$660
	25"-30"	$85	10	$850	0	$0	0	$0	0	$0	0	$0	$850
	31"-36"	$110	2	$220	0	$0	0	$0	0	$0	0	$0	$220
	37"-42"	$130	8	$1,040	0	$0	0	$0	0	$0	0	$0	$1,040
	43+	$160	7	$1,120	0	$0	0	$0	0	$0	0	$0	$1,120
Total			**63**	**$4,650**	**0**	**$0**	**0**	**$0**	**0**	**$0**	**0**	**$0**	**$4,650**
Priority 1 Prune	00"-03"	$20	0	$0	0	$0	0	$0	0	$0	0	$0	$0
	04"-06"	$30	0	$0	0	$0	0	$0	0	$0	0	$0	$0
	07"-12"	$75	1	$75	0	$0	0	$0	0	$0	0	$0	$75
	13"-18"	$120	4	$480	0	$0	0	$0	0	$0	0	$0	$480
	19"-24"	$170	14	$2,380	0	$0	0	$0	0	$0	0	$0	$2,380
	25"-30"	$225	23	$5,175	0	$0	0	$0	0	$0	0	$0	$5,175
	31"-36"	$305	20	$6,100	0	$0	0	$0	0	$0	0	$0	$6,100
	37"-42"	$380	10	$3,800	0	$0	0	$0	0	$0	0	$0	$3,800
	43+	$590	3	$1,770	0	$0	0	$0	0	$0	0	$0	$1,770
Total			**75**	**$19,780**	**0**	**$0**	**0**	**$0**	**0**	**$0**	**0**	**$0**	**$19,780**
Priority 2 Prune	00"-03"	$20	0	$0	0	$0	0	$0	0	$0	0	$0	$0
	04"-06"	$30	0	$0	0	$0	0	$0	0	$0	0	$0	$0
	07"-12"	$75	0	$0	2	$150	3	$225	0	$0	0	$0	$375
	13"-18"	$120	0	$0	6	$720	7	$840	0	$0	0	$0	$1,560
	19"-24"	$170	0	$0	13	$2,210	13	$2,210	0	$0	0	$0	$4,420
	25"-30"	$225	0	$0	26	$5,850	26	$5,850	0	$0	0	$0	$11,700
	31"-36"	$305	0	$0	10	$3,050	10	$3,050	0	$0	0	$0	$6,100
	37"-42"	$380	0	$0	3	$1,140	4	$1,520	0	$0	0	$0	$2,660
	43+	$590	0	$0	0	$0	2	$1,180	0	$0	0	$0	$1,180
Total			**0**	**$0**	**60**	**$13,120**	**65**	**$14,875**	**0**	**$0**	**0**	**$0**	**$27,995**
Routine Prune	00"-03"	$20	0	$0	0	$0	0	$0	3	$60	0	$0	$60
	04"-06"	$30	0	$0	0	$0	0	$0	22	$660	22	$660	$1,320
	07"-12"	$75	0	$0	0	$0	0	$0	55	$4,125	55	$4,125	$8,250
	13"-18"	$120	0	$0	0	$0	0	$0	57	$6,840	57	$6,840	$13,680
	19"-24"	$170	0	$0	0	$0	0	$0	37	$6,290	37	$6,290	$12,580
	25"-30"	$225	0	$0	0	$0	0	$0	17	$3,825	17	$3,825	$7,650
	31"-36"	$305	0	$0	0	$0	0	$0	7	$2,135	7	$2,135	$4,270
	37"-42"	$380	0	$0	0	$0	0	$0	3	$1,140	3	$1,140	$2,280
	43+	$590	0	$0	0	$0	0	$0	5	$2,950	0	$0	$2,950
Total			**0**	**$0**	**0**	**$0**	**0**	**$0**	**206**	**$28,025**	**198**	**$25,015**	**$53,040**
Young Tree Training	00"-03"	$20	35	$700	35	$700	18	$360	18	$360	18	$360	$2,480
	04"-06"	$30	8	$240	8	$240	9	$270	9	$270	9	$270	$1,290
	07"-12"	$75	2	$150	1	$75	0	$0	2	$150	1	$75	$450
Total			**45**	**$1,090**	**44**	**$1,015**		**$630**	**29**	**$780**	**28**	**$705**	**$4,220**
Cost Grand Total				**$71,687**		**$20,285**		**$17,960**		**$28,805**		**$25,720**	**$164,457**

Figure 14:Maintenance Table and 5 Year Budget

Appendix A – Species Distribution

Botanical Name	Common Name	COUNT	Percentage
Abies balsamea	Balsam Fir	6	0.30%
Acer negundo	Box Elder	59	2.95%
Acer platanoides	Norway Maple	145	7.26%
Acer platanoides 'Crimson King'	Crimson King Maple	81	4.05%
Acer rubrum	Red Maple	122	6.11%
Acer saccharinum	Silver Maple	25	1.25%
Acer saccharum	Sugar Maple	363	18.17%
Acer x freemanii	Freeman Maple	17	0.85%
Aesculus hippocastanum	Common Horsechestnut	1	0.05%
Betula nigra	River Birch	1	0.05%
Betula papyrifera	Paper Birch	1	0.05%
Betula pendula	European White Birch	2	0.10%
Betula populifolia	Gray Birch	10	0.50%
Crataegus crus-galli	Cockspur Thorn	2	0.10%
Crataegus phaenopyrum	Washington Hawthorn	1	0.05%
Elaeagnus angustifolia	Russian Olive	4	0.20%
Fraxinus americana	White Ash	16	0.80%
Fraxinus pennsylvanica	Green Ash	18	0.90%
Ginkgo biloba	Maidenhair Tree	1	0.05%
Gleditsia triacanthos f. inermis	Thornless Honey Locust	4	0.20%
Juglans nigra	Black Walnut	6	0.30%
Juniperus chinensis	Chinese Juniper	2	0.10%
Juniperus virginiana	Eastern Red Cedar	1	0.05%
Malus species	Crabapple Species	48	2.40%
Malus tschonoskii	Pillar Crabapple	4	0.20%
Other Tree	Other Tree	3	0.15%
Picea abies	Norway Spruce	37	1.85%
Picea pungens f. glauca	Colorado Blue Spruce	47	2.35%
Picea rubens	Red Spruce	1	0.05%
Picea species	Spruce Species	7	0.35%
Pinus banksiana	Jack Pine	1	0.05%
Pinus resinosa	Red Pine	13	0.65%
Pinus strobus	White Pine	66	3.30%
Pinus sylvestris	Scotch Pine	30	1.50%
Populus deltoides	Cottonwood	14	0.70%
Populus grandidentata	Bigtooth Aspen	15	0.75%
Prunus avium	Sweet Cherry	16	0.80%

Botanical Name	Common Name	COUNT	Percentage
Prunus serotina	Eastern Black Cherry	27	1.35%
Prunus serrulata	Japanese Flowering Cherry	2	0.10%
Prunus species	Stone Fruit Species	1	0.05%
Pseudotsuga menziesii	Douglas Fir	3	0.15%
Pyrus calleryana	Ornamental Pear	5	0.25%
Quercus palustris	Pin Oak	5	0.25%
Quercus robur	English Oak	14	0.70%
Quercus rubra	Red Oak	34	1.70%
Robinia pseudoacacia	Black Locust	17	0.85%
Salix alba	White Willow	4	0.20%
Salix species	Willow Species	1	0.05%
Sorbus americana	American Mountain Ash	2	0.10%
Stump	Stump	63	3.15%
Syringa reticulata	Japanese Tree Lilac	2	0.10%
Syringa vulgaris	Common Lilac	23	1.15%
Thuja occidentalis	American Arborvitae	33	1.65%
Tilia americana	American Linden	6	0.30%
Tilia cordata	Littleleaf Linden	20	1.00%
Ulmus americana	American Elm	1	0.05%
Ulmus pumila	Siberian Elm	11	0.55%
Ulmus rubra	Slippery Elm	22	1.10%
Ulmus species	Elm Species	3	0.15%
Vacant Planting Site - Large	Vacant Planting Site - Large	72	3.60%
Vacant Planting Site - Medium	Vacant Planting Site - Medium	204	10.21%
Vacant Planting Site - Small	Vacant Planting Site - Small	219	10.96%

Appendix B – Suggested Species

Many thanks to Kristin Ballou, District Forester, Franklin County Soil & Water Conservation District for providing the recommended species lists.

The table below contains a listing of native tree species in the Adirondack region of upstate New York.

Scientific Name	Common Name
Abies balsamea	balsam fir
Acer negundo var. negundo	box-elder, ash-leaved maple
Acer nigrum	black maple
Acer pensylvanicum	striped maple
Acer rubrum × A. saccharinum = A. ×freemanii	Freeman's maple
Acer rubrum var. rubrum	common red maple
Acer saccharinum	silver maple
Acer saccharum	sugar maple
Acer spicatum	mountain maple
Amelanchier arborea	downy shadbush
Amelanchier bartramiana	mountain shadbush
Amelanchier canadensis var. canadensis	coastal shadbush
Amelanchier humilis	low shadbush
Amelanchier intermedia	intermediate shadbush
Amelanchier laevis	smooth shadbush
Amelanchier sanguinea	round-leaved shadbush
Betula alleghaniensis	yellow birch
Betula cordifolia	mountain paper birch
Betula cordifolia × B. populifolia = B. ×caerulea	blue birch
Betula lenta	black birch
Betula nigra	river birch
Betula papyrifera	paper birch
Betula populifolia	gray birch
Carpinus caroliniana ssp. virginiana	musclewood, ironwood, American hornbeam
Carya cordiformis	bitternut hickory
Carya glabra	pignut hickory
Carya ovata	shagbark hickory
Carya tomentosa	mockernut hickory
Castanea dentata	American chestnut
Celtis occidentalis	northern hackberry
Cornus alternifolia	pagoda dogwood, alternate-leaved dogwood
Cornus amomum ssp. amomum	silky dogwood
Cornus florida	flowering dogwood

Crataegus biltmoreana	Biltmore hawthorn
Crataegus brainerdii	Brainerd's hawthorn
Crataegus chrysocarpa var. chrysocarpa	common fireberry hawthorn
Crataegus coccinea var. coccinea	scarlet hawthorn
Crataegus coccinea var. pringlei	Pringle's hawthorn
Crataegus intricata	entangled hawthorn
Crataegus irrasa	New York hawthorn
Crataegus macrosperma	large-seeded hawthorn
Crataegus pruinosa	frosted hawthorn
Crataegus punctata	dotted hawthorn
Crataegus scabrida	rough hawthorn
Crataegus submollis	northern downy hawthorn
Crataegus succulenta var. succulenta	succulent hawthorn
Diospyros virginiana	persimmon
Fagus grandifolia	American beech
Fraxinus americana	white ash
Fraxinus nigra	black ash
Fraxinus pennsylvanica	green ash
Ilex opaca var. opaca	American holly
Juglans cinerea	butternut
Juglans nigra	black walnut
Juniperus virginiana var. virginiana	eastern red cedar
Larix laricina	tamarack
Liquidambar styraciflua	sweet-gum
Liriodendron tulipifera	tulip tree, tulip poplar, yellow poplar
Morus rubra	red mulberry
Nyssa sylvatica	black-gum, sour-gum
Ostrya virginiana	hop hornbeam, ironwood
Picea glauca	white spruce
Picea mariana	black spruce
Picea rubens	red spruce
Pinus banksiana	jack pine
Pinus echinata	short-leaved pine
Pinus resinosa	red pine
Pinus rigida	pitch pine
Pinus strobus	white pine
Pinus virginiana	Virginia pine
Platanus occidentalis	eastern sycamore
Populus balsamifera	balsam poplar

Populus deltoides ssp. deltoides	eastern cottonwood
Populus grandidentata	big-toothed aspen
Populus heterophylla	swamp cottonwood
Populus tremuloides	trembling aspen, quaking aspen
Prunus pensylvanica	pin cherry, fire cherry
Prunus serotina var. serotina	wild black cherry
Ptelea trifoliata var. trifoliata	hop-tree, wafer-ash
Quercus alba	white oak
Quercus bicolor	swamp white oak
Quercus coccinea	scarlet oak
Quercus ilicifolia	scrub oak, bear oak
Quercus macrocarpa	bur oak
Quercus montana	chestnut oak
Quercus muehlenbergii	yellow oak, chinquapin oak
Quercus palustris	pin oak
Quercus prinoides	dwarf chestnut oak
Quercus rubra	northern red oak
Quercus stellata	post oak
Quercus velutina	black oak
Rhus typhina	stag-horn sumac
Salix nigra	black willow
Sorbus americana	American mountain-ash
Sorbus decora	northern mountain-ash
Thuja occidentalis	northern white cedar, arbor vitae
Tilia americana var. americana	American basswood
Tsuga canadensis	eastern hemlock
Ulmus americana	American elm
Ulmus rubra	slippery elm
Ulmus thomasii	rock elm