# *City of Shawano*
# *Urban Forestry Plan & Tree Inventory Analysis*

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# EXECUTIVE SUMMARY

The urban forest of Shawano provides a multitude of aesthetic, economical, and environmental benefits to citizens, businesses, and visitors alike. Beyond shade and beauty, trees also have practical benefits; provide public services and monetary value. Unlike other public infrastructure components, properly planted and maintained trees increase in value over time.

To help ascertain the state of Shawano's urban forest, Bluestem Forestry Consulting Inc. completed a public tree inventory along street rights-of-way, as well as at Woodlawn Cemetery and 22 parks during 2020. A list of parks can be found in the tree inventory database. This document reports the findings of the tree inventory and makes specific, prioritized recommendations for managing the urban forest resource beginning in 2021 and establishes a routine schedule of maintenance activities beginning in 2023 based upon inventory findings, current staffing, budgets, EAB concerns and tree circumstances. The specific trees and actions to complete per year corresponding to Attachment 1 have been provided to the City in a separate tree inventory database. Important points of the inventory and current tree management program include:

- *A total of 2,555 trees, 217 planting sites and 12 stumps were inventoried. 988 of these are street trees, 666 are found at Woodlawn Cemetery and 901 are park trees.*

- *An inventory conducted in 2004 found a total of 2,611 trees and 160 planting sites. At that time, 920 trees were street trees, 749 were at Woodlawn Cemetery and 942 were growing in parks.*

- *A total of 212 (8.3%) trees are green, black, blue or white ash and are susceptible to Emerald Ash Borer. Shawano plans to chemically treat the best of these ash for preservation in the population. This plan specifies that larger ash in excellent and good condition be treated for retention in the population. This task will be completed by staff once one member receives their pesticide application license.*

- *There are 136 trees recommended for removal for safety reasons. This is 4.9% of total maintenance needs. A typical first-time inventory averages removals between 3-10%. This is a very manageable and low number indicating that Shawano has taken necessary steps to improve their urban forest since 2004.*

- *One hundred forty trees should be pruned for safety reasons or for cleaning/dead branches (5.0% of total inventoried population). A typical inventory averages 3-7% safety prune. Pruning of these trees needs completed within two years. In addition, this plan recommends a Signiant increase in routine pruning of all trees. Currently, 30-40 trees are pruned annually. This plan recommends 250+ be pruned annually to improve safety and health.*

- *Ideally, the forest should be comprised of not more than 5% of any one species and 10% of any one genus. SIx genuses are over-represented in Shawano's public tree population. These are (in order of population size): maple, oak, spruce, ash, pine and crabapple . Limited species distribution could result in a population crash if an insect or disease were to attack any one particular species.*

- *More staff time and money needs to be spent on forestry duties. This plan recommends 64 work days on average per year need to be devoted to forestry activities to maintain the urban forest properly and healthily. One activity that could really reap future benefits is small tree pruning. This saves time and money as the trees age and mature and greatly improves tree health. Contact costs per year vary from $50,750 in 2021, $37,580 in 2022 and averages $8,000 annually thereafter.*

- *The overall population of public trees in Shawano are faring well. A total of 85.4% of all trees are in excellent, good or fair health.*

# STATEMENT OF PURPOSE AND SCOPE

The purpose of having an urban forest management plan is to ensure that the citizens of Shawano will enjoy the benefits of trees through proper arboricultural techniques and management practices.

The development of a long-range urban forestry maintenance and management plan based on current research and inventory results will provide the foundation for an ongoing program that will result in a healthier and safer community. In particular, a management program can be used to monitor trees for safety risks on a continual basis, will help reduce storm damage, allow work to be executed more efficiently, and establish and prioritize annual budgets.

This plan focuses on existing conditions that require immediate attention, while developing a routine forestry program that will help protect and preserve the City-managed trees in a cost-effective and efficient manner.

In addition, this plan will provide management options that will allow the City to mitigate the disruption to its urban forest caused by Emerald Ash Borer (EAB). EAB was confirmed in Shawano this summer (2020). Taking a systematic approach to ash reduction will allow the City to minimize costs and distribute them over a manageable time period, as well as lessen the social and economic impact that such an infestation will have on the quality of life in the community.

City Administration, the Shawano Tree Advisory Committee, Department of Public Works and Shawano Municipal Utilities in addition to assistance from other departments will be responsible for implementing this program, inventory updating and seeing that program provisions are carried out. They are also charged with a plan revision at the end of this five year plan duration.

# TREE INVENTORY

The first and most important step in managing a community's urban forest resource is to conduct a tree inventory. A tree inventory is the process of counting, characterizing, and recording information about the public trees that make up the publicly owned urban forest. It is a useful tool that documents important information related to the trees.

Documentation is useful for identifying trees a community is responsible for maintaining. This information can then be used to identify areas of susceptibility (i.e. high ash component), low diversity (species and/or age), and future planting opportunities. The information can also be used to document a risk assessment program where trees prone to failure are identified and can be preemptively managed. Additionally, in the case of an accident, being able to produce a risk assessment and work history log indicates the community's active role in maintaining safe trees. The ultimate goal of an inventory is to provide information essential for developing a community urban forest management plan that provides direction for urban forestry initiatives.

Bluestem Forestry Consulting Inc. completed a public tree inventory along street rights-of-way, Woodlawn Cemetery and at 22 parks during 2020. Wooded, high density park areas and unmaintained street right-of-way areas were not inventoried.

The following data was collected: GPS coordinates, address, street/park name, side street, species, condition, diameter, prioritized maintenance needs, growing space, overhead electric utility, defects, condition percentage, date and

miscellaneous comments. An ID # was assigned to each tree and an appraised dollar value for each tree was calculated using inventory data. A definition of inventory terminology including condition ratings and maintenance recommendations can be found in the following sections as well as on the MS Excel database. Data was delivered to Shawano as an MS Excel database as well as an ArcView shapefile.

## Species Composition and Diversity

Over seventy-five different species were identified within the Shawano urban forest. This is a good number of species. Six genera are over-represented. Ideally, the forest should be comprised of not more than 5% of any one species and 10% of any one genus. For illustration, maple is considered a genus and includes each different species of maple. Each type of maple such as sugar maple is considered a species. Limited species distribution could result in a population crash if an insect or disease were to attack any one particular species.

Similar to Dutch elm disease which destroyed American elms in the 1970-1980's, the emerald ash borer (EAB) is fatal to ash trees. The inventory identified 212 ash trees (8.3% of its public tree population), all of which are threatened by EAB. These figures do not include private ash trees. The Asian Longhorned beetle (ALB) is a threat to America's hardwood trees and particularly maple. There is not a cure or treatment for ALB and it currently infests areas in Massachusetts, New York and Ohio. Maple comprises 35.0% of all public trees in Shawano and ALB is another reason to diversify the forest.

The most common trees growing in Shawano are:

| TOP TEN SPECIES SUMMARY TABLE | | |
|---|---|---|
| Species and/or Cultivar | Count | Percentage of Total Population |
| Red Maple | 312 | 12.2% |
| Silver Maple | 177 | 6.9% |
| Crabapple | 175 | 6.8% |
| Sugar Maple | 168 | 6.6% |
| Eastern White Pine | 145 | 5.7% |
| Green Ash | 135 | 5.3% |
| Black Oak | 129 | 5.0% |
| Norway Maple | 127 | 5.0% |
| Colorado Blue Spruce | 123 | 4.8% |
| Arborvitae/White Cedar | 117 | 4.6% |
| Other (63 other species represented) | 947 | 37.1% |

Genus and species that are over the 10% genus and 5% species recommendations are:

| SPECIES/GENUS OVER RECOMMENDED LIMITS<br>5% of any one species, 10% of any one family | | |
|---|---|---|
| **Species/Family** | **Count** | **Percentage of Total Population** |
| Maple Genus (Acer) | 895 | 35.0% |
| Red Maple | 312 | 12.2% |
| Silver Maple | 177 | 6.9% |
| Sugar Maple | 168 | 6.6% |
| Norway Maple | 127 | 5.0% |
| Oak (Quercus) | 257 | 10.0% |
| Black Oak | 129 | 5.0% |
| Spruce (Picea) | 248 | 9.7% |
| Ash Genus (Fraxinus) | 212 | 8.3% |
| Green Ash | 135 | 5.3% |
| Pine (Pinus) | 193 | 7.6% |
| Eastern White Pine | 145 | 5.7% |
| Crabapple | 175 | 6.8% |

## Size Distribution

To optimize the value and benefit of the urban forest, an uneven-aged population is desired to allow allocation of annual maintenance costs uniformly over many years and to assure continuity in the overall tree canopy. A desirable distribution in a community's forest is to have a high proportion of young trees to offset establishment and age related mortality, as the percentage of older trees declines with age. This "ideal", uneven distribution suggests the largest fraction of trees (40% of the total) should be young, with diameters less than 8" in DBH, while only 10% should be in the large diameter classes (>25" DBH).

As the table below illustrates, Shawano' size distribution is incredibly equal between size classes. While this is an interesting fact, ideally, the forest would be more weighted to younger and middle-aged age classes with fewer large trees. However, it is preferable to have Shawano's size distribution than one either heavily weighted to small trees or heavily weighted to overly large trees.

The average diameter of trees in Shawano is 17.2". Maintenance on older/larger trees is more time consuming than small trees. On average, a 25" diameter tree may take an experienced crew up to 2-3 hours to properly prune and it will require large equipment such as a bucket truck and multiple crew members. It is critical to recognize that Shawano has the proper equipment and staffing levels to complete most prunes and removals in-house, but that the time required to complete routine maintenance will grow as the trees do.

Pruning small diameter trees is one of the most beneficial maintenance activities for trees. There are many reasons to prune young trees including making trees more structurally sound and more storm resistant resulting fewer crew call-outs and it often results in lower maintenance costs in the future because you are removing fewer large branches as the tree matures. Shawano has an outstanding opportunity to care for its trees while they are young, saving time and money now and long into the future. The chart below illustrates the current tree size distribution in Shawano:

**SIZE DISTRIBUTION**

| Existing | dbh* | Ideal** |
|---|---|---|
| 25.6% | 0-8" | 40.0% |
| 26.0% | 9-16" | 30.0% |
| 24.2% | 17-24" | 20.0% |
| 24.2% | 25+" | 10.0% |

*diameter at breast height (4.5' above ground)

** based on recommendations from 2011 Minnesota Shade Tree Short Course

## Condition Distribution

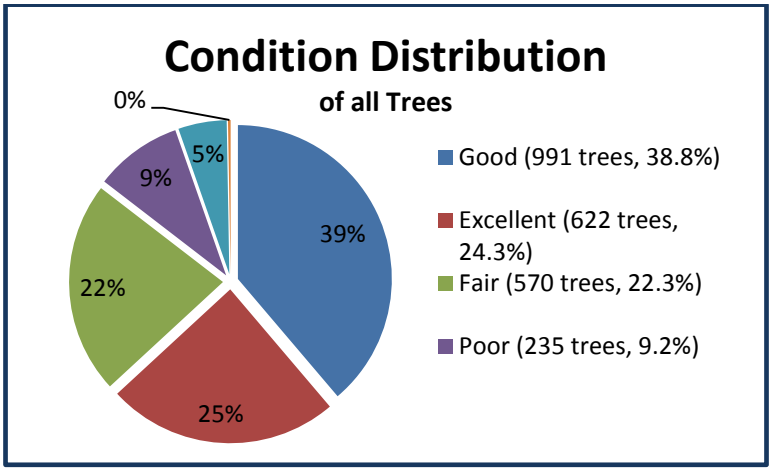
A condition rating helps to assess overall tree health and to evaluate a species structure and performance. For the 2020 inventory, Bluestem Forestry Consulting Inc. used criteria adapted from the International Society of Arboriculture Valuation of Landscape Trees, Shrubs and Other Plants: A Guide to the Methods and Procedures for Appraising Amenity Plants (Ninth Edition) as the basis for the field condition rating.

At least seven factors were examined and rated to determine the condition of a tree. These factors are crown development, trunk, major branch structure, twig growth rate, foliage health, insects/diseases and roots. General descriptions of the criteria used to categorize each condition are in the following table.

| Rating | Description |
|---|---|
| Excellent | A tree in excellent condition has no visible defects and appears to be in perfect health. The tree will exhibit all of the characteristics typical of its species. An excellent tree can be expected to live well into the future. |
| Good | A tree in good condition has a sound trunk and a full canopy and has only minor mechanical injuries such as minor trunk scarring that will eventually heal. The tree will exhibit most of the characteristics associated with its species and can be expected to live for many years. |
| Fair | A tree in fair condition will be exhibiting minor to moderate defects. Some situations that would warrant a fair rating include: a thinning canopy, twigs growth may only be 1/2 the expected rate, significant mechanical injury such as scarring on the trunk, insects or disease may be present but are controllable and the crown may be lacking the natural or desired symmetry characteristic to the species. If given routine maintenance such as pruning and mulching a tree that is graded fair will contribute to the forest for many years. |
| Poor | A poor tree will be expressing low vigor and significant decline as evidenced by branch dieback, abnormal leaf size, early fall coloration, trunk decay due to injury or canker or the production of new branches on the main stem. A tree in poor condition will most likely require removal, but may be improved with priority pruning. |
| Very Poor | A tree in very poor condition is on the verge of dying. Dieback will be severe or it may be lacking a full crown. Trunk/crown cavities or decay, severe cracks and seams or severe root problems may also be present. Removal for safety will be required. |
| Dead | A tree in dead condition is simply a dead standing tree. These will most likely occur in wooded or unmaintained areas, but may also occur with smaller new plantings that have failed. These trees will require removal. |

The tree inventory results show that a large majority of City trees (85.4%) are in fair, good or excellent condition. This is a really solid percentage. Dead trees make up 0.3%. P o o r and very poor trees total 5.4%. The goal for Shawano should be no tree in less than fair condition. The number of trees in poor and very poor condition is primarily due to over-mature trees that are beginning to fail.

The chart below is a graphic representation of condition distribution:

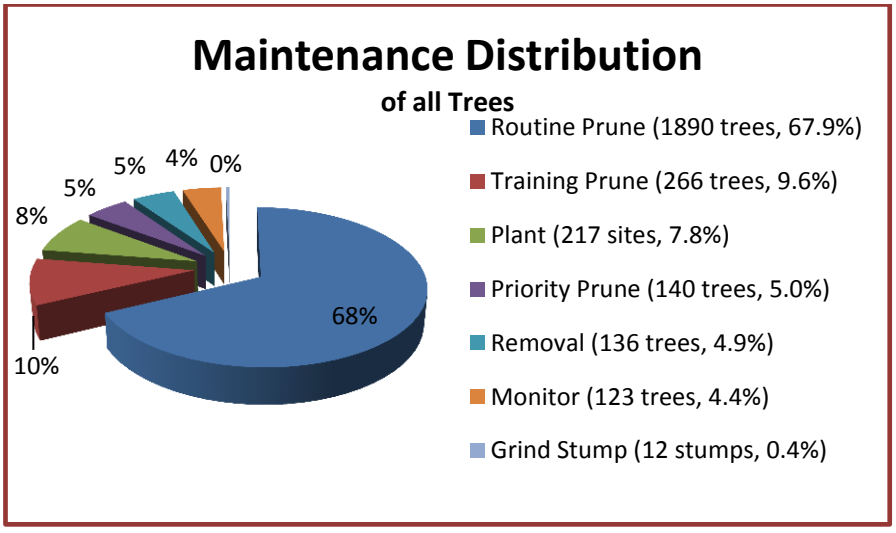


## Maintenance Distribution

Each tree inventoried was assigned a maintenance category. Field judgments were made from the ground based on observation and hazard estimation. Criteria were adapted from two sources: A Photographic Guide to the Evaluation of Hazard Trees in Urban Areas (Second Edition) by Nelda Matheny & James Clark and from a Minnesota Department of Natural Resources Publication How to Detect, Assess and Correct Hazard Trees in Recreational Areas. The following are the definitions of the maintenance categories:

| Rating | Description |
|---|---|
| Removal | Trees designated as a removal are either dead or have one or more defects that cannot be remedied. These trees will most likely have a severe trunk defect such as a cavity or extensive decay, have severe cracks associated with weak unions or have a large percentage of crown death and are safety risks. These trees must be removed immediately. |
| Prune Priority | These trees have severe deadwood, hangers or broken branches that require remediation as soon as possible. Trees with unattached hanging branches or dead attached branches will be listed in this maintenance category. Overall re-evaluation of the tree while pruning may result in removal of the tree if more extensive problems are noted. |
| Monitor | These trees are experiencing decline or some other defect and need monitoring to be sure that they do not continue to fail and need removal. |
| Routine Prune | All trees need to be placed on a cycle of trimming to correct structural problems or growth patterns that will eventually affect the tree adversely. Routine pruning will result in a healthier, more vigorous tree and will extend the life of most trees. A routine pruning cycle of once every 5-8 years is ideal. |
| Training Prune | Training pruning is the structural pruning of all trees 10 years of age or younger. Removing poorly attached co-dominant, crossing and competing limbs while the tree is young, resulting in small cuts and wounds will produce a well-balanced mature crown. This is the most cost-effective form of all maintenance. |
| Grind Stump | Existing stumps. |

The following chart shows the breakdown of trees by maintenance need:



## Parks

Woodlawn Cemetery and 22 parks were inventoried in Shawano. A total of 666 trees were inventoried in the cemetery and 901 throughout the park areas. This represents 6.1% of the total public tree population. This is an impressive number. Park/municipal area trees and street trees are combined in the 'Schedule of Activities.'

Below is a breakdown of the tree counts per park/municipal area.

| COUNT OF TREES/SITES PER AREA | |
|---|---|
| **Park Name** | **Count of Trees** |
| Arlington Park | 61 |
| Cemetery | 666 |
| Channel Park | 3 |
| Circle Drive Park | 10 |
| Co-op Park | 55 |
| Don Martzke Sports Park | 66 |
| Eberlein Park | 21 |
| Feivor Park | 15 |
| Franklin Park | 69 |
| Hartman Park | 33 |
| Huckleberry Harbor Park | 32 |
| Judd Park | 18 |
| Kleeman Family Park | 27 |
| Kuckuk Park | 120 |
| Memorial Park | 139 |
| Pearl Court Park | 6 |
| Recreation Center | 5 |
| Scenic Park | 2 |
| Shrank's Forest Hill Park | 56 |
| Smalley Park | 53 |
| Spirit of Shawano Park | 12 |
| Sturgeon Park | 30 |
| Water Tower Park | 18 |

# EMERALD ASH BORER PLANNING

The Emerald Ash Borer (*Agrilus planipennis*) is an exotic pest native to Asia that was identified in southeastern Michigan near Detroit in the summer of 2002. The adult beetles munch on ash foliage but cause little damage. The real damage is caused by the EAB larvae that feed on the inner bark of ash trees, disrupting the tree's ability to transport water and nutrients. It is suspected that the insect was initially introduced to the United States via solid wood packing material carried in cargo ships or airplanes originating in its native Asia. Once infested with EAB, ash trees typically decline and die over a period of 2-3 years depending upon insect volume. The burden of dealing with volumes of dead and dying trees within a short period of time can place an enormous strain on community budgets, personnel and resources.

At present, the entire state of Wisconsin is under quarantine for EAB and it has been confirmed in Shawano as of summer 2020. City staff has indicated that because their ash population is relatively low (212 trees, 8.4% of population), they would like to retain some ash in their population by treating with chemical applications. The alternative is to remove all ash trees from the public tree population. After analyzing the data, it seemed best to preserve only the larger trees that are in good and excellent condition. It is not wise to preserve any tree that is in less than favorable condition.

Treatment will need to occur every-other year using TreeAge for the life of the tree or until it is decided to remove it. Based on the average diameter of ash in Shawano of 13.6" the cost of chemical and supplies per tree is approximately $33. There will be an initial investment of approximately $2,500 for equipment to deliver the chemical. It is recommended that this task be completed with in-house staff, but a pesticide applicators license is required for this chemical. Because treatment occurs in spring and summer, this winter is an excellent time to obtain this certification.

**Marshalling yard/wood utilization.** The City of Shawano takes all of their wood waste to the City yard site for chipping which is then made available to the public. If a contractor removes a tree, she/he will dispose of the waste. The City may want to consider alternative uses for wood waste as their tree population grows larger. A good contact for additional wood waste options is Sabina Dhungana, WI DNR Forest Products Staff, sabina.dhungana@wisconsin.gov, phone 608-261-0754. The non-profit Wisconsin Urban Wood (WUW) may also be of assistance utilizing dead, risk or ash tree that have been removed. WUW can be reached by contacting Don Peterson, info@wisconsinurbanwood.org, phone 608-622-7212. Other potential contacts include CityWood, phone 608-698-7559.

## Community Outreach and Education

Education and outreach plays a key role in communicating the effects of EAB on the City's urban forest and increasing public awareness, understanding, and support for the City's Urban Forest and Management Plan. Increasing public awareness of the City's plan for EAB will also enhance the effectiveness their program.

Provide information to residents assisting with identification of ash on their properties and provide information on treatment options or the removal option. Be sure to stress that ash deteriorate very quickly and the longer the tree deteriorates, the more expensive removal costs will be.

- Educate citizens about EAB, the tree management guidelines presented in this plan, and proper wood utilization methods.
- Find the latest Factsheets from UWEX and the WI DNR at http://labs.russell.wisc.edu/eab/eab-news-and-

resources/#Management_Factsheets.

- Educate and inform all municipal leaders and officials through presentations and written reports as needed.
- Inform the community on EAB through local media outlets, direct or indirect mailing (tax and utility bills), newsletters, fliers, public meetings, neighborhood associations, and local garden clubs.

## Other Insects for Consideration

Asian Longhorned Beetle (ALB)

ALB is an invasive insect originally from China that has become a serious problem to trees in certain parts of the United States. The beetle's larvae creates tunnels by girdling stems and branches on trees. The insect has been reported to have entered the United States via wood packing materials originating from China.

Although ALB seems to prefer maple species (*Acer* spp.) in the United States, it has also been found in horsechestnut/buckeye species (*Aesculus* spp.), alder species (*Alnus* spp.), birch species (*Betula* spp.), poplar species (*Populus* spp.), willow species (*Salix* spp.), and elm species (*Ulmus* spp.). This list in not conclusive since a complete list of host trees in the U.S. has not been determined.

The adult beetles are persistent from July to October, but can be found later in the fall if temperatures remain warm. After adults emerge from their larvae tunnels, they bore another tunnel through wood, creating a round exit hole in the tree bark. Adults generally remain on or around the trees they originated from, only traveling short distances to feed and reproduce.

At the present ALB has not been found in Wisconsin. For more information on the identification and management of ALB please refer to http://asianlonghornedbeetle.com/.

## Other Diseases for Consideration

Oak Wilt (OW)

The disease is caused by the fungi *Ceratocystis fagacearum*, which attacks the water-conducting (vascular) system of trees. A tree responds by blocking its vascular system to contain the disease and, in doing so, cuts off the water supply to its leaves. Shawano has 257 oak trees within its public tree population. These are primarily black oak which are very susceptible to oak wilt. Shawano staff has been smart and planned well to include ash in their population by choosing oaks in the white oak family. While bur and white oak tend to be less susceptible to oak wilt than red/black oaks, all oaks should be planted carefully and cared for at the proper time of year because of the risk from oak wilt.

Oak wilt can be spread by insects that carry the pathogen on their bodies from an infected tree to an uninfected tree. It also spreads via the vascular system of grafted roots of adjacent trees. If the disease is allowed to progress, it will spread to healthy oaks that are connected by the roots (root grafts) to the diseased trees. In forested areas where oak is common and root grafting is widespread, an ever-widening pocket of dead oaks will form. Where oak is mixed with other species and is a minor part of the forest, oak wilt will spread slower and may actually stop where roots are not grafted. New pockets of dead oak may also be formed by sap-feeding beetles spreading oak wilt above ground.

In urban areas oak trees are most easily infected by overland spread in the springtime, from bud swelling until two to three weeks past full leaf development. The Wisconsin Department of Natural Resources recommends that you avoid pruning, cutting, or wounding oak trees April through July (April, May, June, and July) in urban areas. Observations and unpublished research have shown that overland infection can occur after July, yet these mid-summer through early fall

infections are not common. To take a very cautious approach, do not prune or otherwise wound oaks from April to October. In some years, spring comes much earlier. If daytime temperatures begin to reach the 60-degree mark, stop pruning oak at that time, even if it is still the middle of March.

The first signs of OW occurs when leaves in the upper crown turn a dull green, bronze, or tan beginning at the leaf margin. Soon after, the leaves will drop off with various degrees of discoloration. Brown streaks develop in the new sapwood. Trees in the red oak group are not known to recover once infected. The white oak group varies in species resistance to OW, but they usually die slowly over a period of several years.

# STAFFING, EQUIPMENT AND TRAINING

Shawano has the benefit of most of the critical pieces of equipment for tree work, excepting a stump grinder. The City feels they can complete all necessary tree work in-house. But, as always, if staff feels a tree is too unsafe to remove by in-house crews, a contractor should be utilized. Shawano also has the benefit of a part-time City Forester who is an ISA Certified Arborist which is a phenomenal asset to Shawano. In addition, the Department of Public Works works with Shawano Municipal Utilities to manage trees. Most tasks, aside from planting, occurs during winter which is ideal for tree care. It is heartening to see such dedication by staff as well as support from City officials to grow the urban forest. Shawano really is a model for communities throughout Wisconsin.

It will require an average of 94 staff days of work annually to manage the urban forest in the future. Again, workloads will continue to increase as trees grow and mature. A full list of responsibilities and the time required to complete them can be found as Attachment 1: Schedule of Activities 2021-2025.

The following activities can be completed in-house vs. contracted:

| **In-House** | **Work contracted:** |
|---|---|
| **Removals**: Most <15" dbh<br>**Prunes**: Most<br>**Plantings**: All | **Removals:** When needed based upon tree & generally when ≥ 15" dbh<br>**Grind stumps**: All<br>**EAB Treatments:** All |

Staff should receive training immediately on proper pruning and tree felling techniques. Each year, staff should receive training on some facet of tree care to continually expand their capabilities. The DNR has an urban forestry training page that is in real time and lists all upcoming training opportunities. This page can be found at: http://dnr.wi.gov/topic/UrbanForests/events.html. The Wisconsin Arborist Association also has training opportunities and information can be found at: www.waa-isa.org/events-programs/. A figure has been included in the budget for staff training. Staff will be completing most work in-house and training is critical for proper safety and tree care. Some trees may need to be contracted out to a qualified tree care firm if they are unsafe for staff to complete.

# TREE MAINTENANCE TIMELINE

This inventory provides an overall look at Shawano urban forestry maintenance needs. To simplify the order of activities, the following summary has been provided by year. A further description of activities and their associated costs can be located in Attachment 1: Schedule of Activities. Administration is strongly encouraged to support the following activities:

| *Activities to be Completed in 2021:* |
|---|
| Complete removals 0-10% condition rating (83 trees) |
| Complete priority prunes 1 (86 trees) |
| Grind stumps (83 stumps) |
| Chemical treatment of 1/2 of ash to be preserved (78 ash trees) |
| Inspect monitor and very poor, poor trees (approximately 225 trees) |
| Receive chainsaw safety training/tree felling training and or similar |

| *Activities to be Completed in 2022:* |
|---|
| Complete removals ≥15% condition rating (53 trees) |
| Complete ash removals in fair, poor, very poor condition (48 trees) |
| Complete priority prunes 2 (54 trees) |
| Grind stumps (101 stumps) |
| Chemical treatment of 1/2 of ash to be preserved (78 ash trees) |
| Inspect monitor and very poor, poor trees (approximately 225 trees) |
| Receive training on a variety of topics |

| Activities to be Completed in 2023 & Yearly Thereafter : |
|---|
| Grind existing stumps (12 stumps) |
| Chemical treatment of 1/2 of ash to be preserved (78 ash trees) |
| Inspect monitor and very poor, poor trees (approximately 225 trees) |
| Complete routine prunes on 1/8 of population (265 trees) |
| Complete 1/2 of young tree training prunes (88 trees) |
| Plant trees (40 plantings) |
| Receive training on a variety of topics |

# URBAN FORESTRY GOALS

This inventory was the first step towards establishing a defined, efficient forestry program to maximize benefits and minimize costs for the City of Shawano. The next step is to identify goals and begin the process of implementation. The primary goals and objectives that have been identified to establish a management program in order of priority are:

GOAL 1: ELIMINATE HIGH RISK SITUATIONS.

Objective A: Remove high-risk trees.
Objective B: Prune high risk branches.
Objective C: Remove EAB/ash trees

GOAL 2: ESTABLISH A ROUTINE, COMPREHENSIVE URBAN FORESTRY PROGRAM FOR A HEALTHY FOREST

Objective A: Perform yearly tree inspections/Evaluate risk management program.
Objective B: Perform training prunes.
Objective C: Perform routine pruning and removals.
Objective D: Plant high quality trees with low maintenance requirements.
Objective E: Inventory updating.

# GOAL 1: Eliminate high-risk situations.

The first and foremost objective of any municipality entrusted with the responsibility of an urban forest is the safety of its residents and visitors. Until a safe environment has been attained, no other objectives can be tackled. The following is a prioritized list of actions that need to be taken to eliminate the high-risk situations identified during the inventory:

1. Remove trees identified as Removals.
2. Prune trees identified as Prune Priority.

A complete listing of activities and their costs can be found as Attachment 1: Schedule of Activities.

## Objective A: Remove High Risk Trees

Tree removals are an integral part of a sound forest management program. Removals are as necessary to the urban forest's life cycle as are tree plantings and maintenance. Removals do, at times, stimulate a public reaction because people grow attached to the trees in the vicinity of their homes. Nevertheless, a successful urban forestry program demands that a removal policy be adopted and applied uniformly throughout the City. A clear policy provides coherent guidelines to enable City officials and crews to make informed, defensible, consistent removal decisions. Furthermore, such a policy can help allay public concerns about tree removals. The City's potential losses from liability claims are also reduced due to healthier and lower risk trees.

The goal of a removal plan is to develop a comprehensive risk reduction program that will guarantee the timely removal of high risk or potentially high risk trees as well as to heighten awareness of hazard abatement procedures.

There are three important reasons for establishing a strong removal policy. The first is to maintain safe public areas by reducing potentially high-risk trees and the liability associated with them. Secondly, the removal of dead and declining trees allows the urban forest manager to make room for new, diverse plantings which in turn increases the overall health of the community forest. Thirdly, it is more cost effective to maintain healthy trees rather than decadent, senescing, over mature trees.

In Wisconsin, municipal governments have a legal duty to exercise reasonable care to protect the general public from foreseeable hazards. To minimize the liability associated with trees in high use areas, such as urban streets and parks, land managers must demonstrate reasonable care in maintaining these trees. Political pressure, inadequate time, untrained staff and inadequate funding are not valid reasons for inaction and may potentially leave the City liable should there be no designated risk tree removal program showing the effort to reduce the number of these trees.

Based on the inventory data, Bluestem estimates that 65 trees should be immediately removed from the existing tree population. Once this initial group of trees is removed, the City's removal program should stabilize at approximately (1.0% of the total population).

Each tree was given a condition rating when it was inventoried. This number is used to calculate the appraised replacement dollar value of each tree, but is also used to prioritize removals. Ratings range from a low of 0% to a high of 100% in 5% increments. For example, a specimen tree in perfect condition received a 100%. A dead standing tree received a 0%. Most removals fall between 0-25%. Removals should start with condition ratings of 0% and continue until they are all removed. This work should begin immediately.

Several factors can assist with prioritizing tree removals and management:

1. Utilize the Risk Management Guide (attachment 2). This guide is a step-by-step system for evaluating risk within the population. This guide was utilized during the inventory fieldwork and is a good guide for the City to use for day-to-day duties. For example, several steps are listed for tree evaluation. One step is to 'Identify Problematic Conditions'. The inventory identified a condition rating for each tree inventoried. A tree was assigned one of six ratings: excellent, good, fair, poor, very poor or dead. Very poor and dead trees need to be prioritized for removal. Other steps include identifying problematic species, diameters and defects. Some problematic species include willow and boxelder. These trees are typically weak wooded and tend to fail more often than other species such as oak. Problematic diameters include larger diameter trees. A 2" dbh dead tree poses minimal risk, while a 30" dead or very poor condition tree poses a very high risk. Additionally, certain defects should be red-flagged for action. Cavities, decay and excessive dieback are some of the more severe defects noted during the inventory. All of this data can be found within the inventory database. Target and location are also important factors to consider when prioritizing removals. Playgrounds and busy streets where pedestrians and vehicles frequent should receive higher priority than streets with wooded/naturalized rights-of-way. The combination of these factors should be used to determine the order in which trees need to be removed.

2. Prioritizing Funding. The safety risk of failing trees cannot be over-stressed. Staff time and funding needs to be prioritized to maximize public safety and reduce tree-related liability. The frequency of other non-safety tasks should be

reduced so that staff can dedicate more time to pruning and removals. Will a reduced mowing schedule endanger residents? Will a 32" silver maple with a trunk cavity endanger residents?

One of the primary purposes of the inventory was to identify risks. The City can reduce these risks and increase safety for its residents through prompt implementation of the inventory-based pruning and removal recommendations in this plan.

A "high risk" is any tree or tree part that demonstrates a high risk of failure or fractures which would result in damage or injury to people or property. Usually, high-risk trees demonstrate visible defects.

There are two distinct aspects to the definition of a high risk tree: 1) a physical defect within a tree that increases its potential for failure, and 2) the proximity of the tree to people or property that increases the likelihood of personal injury or property damage. A decaying tree in the middle of the Chequamegon National Forest may have a potential for failure, but the chance that tree will cause personal injury is remote. However, that same tree located at the little league fields or anywhere in Shawano, should be considered a high risk because of its urban location.

One task of the urban forest manager is to anticipate tree failures before they occur. There are no absolutes in determining risks - only sound judgment based on experience at recognizing structurally unsound trees.

The number of trees marked for removal within a given year further describes a forest system's health, although in some instances trees need to be removed for reasons unrelated to health. The objective is to eventually have no City trees with a condition rating lower than fair.

The risk assessment that Shawano should use to evaluate trees was created by the International Society of Arboriculture. It is titled A Photographic Guide to the Evaluation of Hazard Trees in Urban Areas, 2nd Edition by Nelda Matheny and James R. Clark. This can be purchased at Amazon.com and through other sources. Additional resources include the US Forest Service's "Urban Tree Risk Management" guide. This is available at no charge from the WI DNR regional urban forester.

When a tree has been identified for removal or priority pruning, it may indicate an underlying deficiency. For this reason, all trees scheduled for removal along with trees in need of priority pruning need to receive a thorough inspection twice a year (once with the leaves on and once without the leaves) until the tree has been removed or the hazard has been eliminated. Likewise, all trees identified as in need of monitoring, poor or very poor or dead should also receive a similar inspection.

Trees that need to be regularly and frequently inspected were identified as 'Monitors.' These trees may have a problem developing such as dieback or may have old storm damage that warrants attention. A list of these trees can be found in the inventory database.

City policy should require tree pruning and removal in accordance with national industry standards. Standards-based specification are commonly used when municipalities hire a contractor or purchases materials, but should also be applied to all work completed by staff. Industry standards and specifications include current editions of:

~ American National Standard for Safety in Tree Care Operations, ANSI Z133 (current revision). Can be purchased at:

http://www.treecareindustry.org/public/gov_standards_z133.htm

~ American National Standard for Tree Care Operations - Tree, Shrub and Other Woody Plant Maintenance - Standard Practices, ANSI A300 (current revision). Can be purchased at: http://www.tcia.org/standards/A300.htm

## Objective B: Prune High-risk Branches

A total of 140 trees are in need of priority pruning.

Priority prune trees have obvious risks such as branch cavities, hangers or significantly sized deadwood. These trees should be pruned immediately, in conjunction with the initial high-risk removals in 2021 and 2022. Prune Priority 1 trees present a higher risk and should be removed in 2021. Prune Priority 2 trees should be removed in 2022.

The tree inventory was a ground visual only survey and was not intended to substitute for a thorough hazard tree survey and as such the trees have not been aerially inspected. Additional defects may be noted from an aerial inspection. It is important that while trees are being pruned from an aerial bucket truck that their condition be re-evaluated. If the pruner feels they would not benefit from being pruned, they should be removed.

# GOAL 2: Establish a routine, comprehensive urban forestry program for a healthy forest.

Systematic maintenance of existing trees is important for three reasons: safety, cost savings and aesthetics. Maintained trees have a greater lifespan and provide greater canopy benefits than trees that are not maintained. Proper maintenance can also reduce removal and replanting costs. With limited budgets and time, it is necessary to prioritize actions. High-risk tree situations should always be eliminated first (Goal 1) and then routine maintenance should proceed. The following routine objectives are listed from highest to lowest priority.

## Objective A: Perform Yearly Tree Inspections & Evaluate the Risk Management Program

It is important that *all* of the street and park trees in the City get a yearly inspection. Trees that have been identified during the inventory as needing priority pruning, monitoring or removal need a hazard inspection at least *twice* yearly. Complete this inspection once with leaf cover and once without until the hazard has been eliminated or the situation resolved. Additionally, all large diameter trees need an extra inspection after storms. If any hazards are identified, the situations need to be corrected immediately, and then continue with the list of routine maintenance.

It is important that an ISA Certified Arborist complete all tree inspections (greater than 6" in diameter).

Seven factors should be considered when evaluating trees:

| Factor | Considerations |
|---|---|
| Crown Development | Characteristic of species and well balanced |
| | Branching throughout entire upper 2/3 of trunk area |
| | Lacking full crown |
| Trunk | One central leader is desired |
| | No defects |
| | Missing sections of bark |
| | Extensive decay or hollow |
| Major branch structure | Evenly distributed braches |
| | Structurally important branches not dead or broken |
| Twig growth rate | Typical for species and age |
| | Growth rate reduced |
| Foliage | Normal size and color |
| | Small leaves with deficiencies |
| Insects & Disease | No apparent problems |
| | Severe infestation |
| Roots | Extensive root loss |
| | Stem girdling roots present |
| | Trunk flare present indicating proper planting depth |

An excellent resource guide is "How to Recognize Hazardous Defects in Trees" published by the USDA Forest Service (Guide # NA-FR-01-96). This can be found at: http://www.na.fs.fed.us/spfo/pubs/howtos/ht_haz/ht_haz.htm

To reduce high-risk situations within Shawano, The City Administrator and Director of Public Works should evaluate the risk management program annually. The evaluation can be accomplished by following the Risk Management Guide (Attachment 2). This inventory and management plan represents the first comprehensive inventory but is not a substitute for a hazard tree evaluation. This management plan is the first phase of the risk management program.

## Objective B: Perform Young Tree Train Prunes

Training pruning is the structural pruning of all trees 10 years of age or younger. Some benefits of training pruning include:

- *Pruning 2-3 times in the first ten years of a tree's life will reduce 90% of the structural problems the tree will ever have resulting in a healthier and more storm resistant tree that costs less to maintain and has fewer employee call-outs*.

- *This is the easiest pruning to perform due to the small size of the trees.*

- *Increased safety to both the tree and public due to elimination of sight obstructing branches and less branch breakage from car/truck strikes.*

- *Training pruning is the most cost effective pruning because it reduces long-term routine pruning costs.*

- *It is the most economical pruning because an in-house crew can complete it quickly and efficiently.*

Trees that are structurally pruned at this stage require much less care as they mature. Because Shawano has done such a stellar job of pruning their younger trees, they can prune these trees every fourth year at this point. This results in cost savings and still adequately prunes the tree. This equates to approximately 190 training prunes per year annually. As trees are planted, this number will increase. All of the training prunes can be completed until they are unable to be reached from the ground or are older than 10 years planted, and then they will be scheduled for routine pruning.

## Objective C: Perform Routine Pruning & Removals

One of the most beneficial and noticeable activities performed in the urban forest is routine pruning. Routine pruning is the cycle of pruning all trees on a rotating basis. Once all of the safety issues have been addressed, all trees 10 years of age or over (approximately 6" or over) need to be placed on a routine pruning cycle. Some benefits of routine pruning include:

- Increased health and viability of trees.
- Fewer tree mortalities and fewer structural deficiencies.
- Reduced liability from potential tree-related injuries or damages to property.
- Increased property values.

- Enhanced aesthetic value.
- Fewer complaints/requests.
- Increased longevity of tree.
- Reduced future costs associated with hazardous limbs and decay.
- Improved cost effectiveness of tree maintenance reducing the need for on-demand pruning and associated staff overtime.

An excellent resource on proper pruning can be found at:
https://dnr.wi.gov/topic/forestmanagement/documents/pub/FR-256.pdf

A feasible routine pruning cycle needs to be established. Industry guidelines are to prune each tree over 6" dbh once every 5-8 years. An eight year cycle is recommended. Essentially, the City can be broken into eight zones and a different zone has work completed in a particular year. For example, routine pruning in 2022 will occur in zone 1, zone 2 in 2023, etc. Taking into consideration Shawano current level of stocking, the above mentioned routine pruning cycle of seven years will result in approximately 265 trees pruned annually. The cemetery should be broken into two zones and these should be the final two zones of maintenance completed because cemeteries typically present lower risk to visitors and do not have homes nearby.

If a tree is pruned properly (throughout the entire canopy) and is on a routine pruning cycle, no limb over 4" in diameter should need to be removed. The best time of year to prune is when the leaves are off the trees. If pruning does occur while the trees have their leaves on, it should be after the leaves have fully expanded and not when they are in the process of forming. Pruning should also be avoided when the leaves are turning colors in the fall and in the process of dropping. All American elms and oaks should be pruned during dormancy.

Another facet of routine maintenance includes 'routine' tree removals. Any given City can expect approximately 1-2% of trees will need to be removed per year due to high-risk situations that develop naturally as the tree population matures. This is in addition to the initial safety removals.

## Objective D: Plant high quality trees with low maintenance needs

The City has completed only extensive tree plantings in recent years. Trees provide huge benefits and planting needs to occur on an annual basis to assure that trees are growing for future generations and age diversity remains to lessen maintenance spikes. There were only 217 vacant sites identified during the inventory.

Vacant sites were chosen based upon several factors. These include:

- Width of boulevard – If the site had a sidewalk, the distance between the sidewalk and curb needs to be a minimum of 5 feet. Anything less that this causes poor growth and may eventually lead to gridling roots and heaving walks.
- Distance to nearby structures/trees – For a tree to be healthy, it needs to be able to grow unimpeded by other trees or structures such as buildings. Planting sites were only identified when the trees planted will have time to spread their branches and will not interfere with the growth of other trees or touch structures.
- Overhead utilities – It is acceptable to plant when overhead utilities are present, and these sites were identified as such and small trees only are recommended in these areas. Some small trees tend to grow very widely. Be sure that the height AND width of the mature tree is taken into consideration when planting.

- All planting sites were identified as either small or large. This indicates the size of tree suitable for planting in that particular circumstance. As mentioned above, small trees should be planted where overhead utility lines are present and large trees are appropriate where they have plenty of space to grow. A list of species recommendations by size can be found below. There are 171 large sites and 46 small sites.

To continue enjoying and increase the varied benefits of trees, trees must be planted. Certain planting policies can be applied. As always, no planting should take place until all of the high risk safety situations identified have been alleviated. Then, the order of priority for tree planting should be:

1. Trees lost within the past year.
2. Trees lost within the past three years.
3. Appropriate sites within the current work zone.
4. Homeowner requests.

Beginning in Year 2023, 40 plantings have been included in the budget annually (see Attachment 1: Schedule of Activities). Re-planting of removals should occur first (assuming there is sufficient spacing) and then move on to filling existing vacant planting sites. Plantings can occur by the in-house crew.

Shawano is a Zone 4b climate and types allow for some good street and park tree planting selections. The list below is a quick general list for review.

Good **large** selections include:
swamp white oak (Quercus bicolor) *
hackberry (Celtis occidentalis)
bur oak (Quercus macrocarpa) *
elm (Ulmus spp.) – 'New Horizon', 'Accolade', 'Cathedral' *
American Liberty elm (Ulmus americana 'Liberty')
Kentucky coffeetree (Gymnocladus dioica) – 'Espresso', 'Macho' and other male cultivars do not produce seed pods.
ginkgo (Ginkgo biloba) – Male cultivars only as the female produces fruit which has a very unpleasant odor.
Turkish filbert (Corylus colurna)

Good **medium** selections include:
river birch (Betula nigra)
amur chokecherry (Prunus maackii)
horsechestnuts (Aesculus spp.)
amur maackia (Maacia amurensis)

**Smaller** sites can be filled with:
Japanese tree lilac (Syringa reticulata)
serviceberry (Amelanchier x grandiflora)
hophornbeam (Ostrya virginiana)
American hornbeam (Carpinus caroliniana)

Hawthorn (Crateagus spp.)

It is important to diversify the urban forest as much as possible. Every effort should be made to continue diversification. Planting many different species and varieties keeps the urban forest healthy and attractive. Ideally, no more than 5% of any one species and 10% of any one genus should comprise the City's trees. It is recommended at present and into the future (next 10 years) that planting of maples should not occur or be very limited due to this genus representing a quarter of the current public tree population.

Many excellent tree planting resources can be found online. A newer publication developed by the WI DNR division of forestry can be found at dnr.wi.gov/forestry/publications/newtreeplanting.pdf.

All plant quality should follow the American National Standard for Nursery Stock; ANSI Z60 (current revision) should be used when purchasing plant material. Can be found at: http://www.isa-arbor.com/education/onlineResources/cad/resources/educ_CAD_DevelopingPlantingSpecifications.pdf

Shawano may want to consider entering into "Growing Agreements" with nurseries. These are agreements between communities and nurseries where trees are specifically grown for that community. This is being done by several communities throughout Wisconsin to assure that the community will receive a diverse supply of trees of specific sizes at known times for a known price. The agreements are set up several years in advance and require the community to pay a small up-front fee. But, it provides for a better quality of tree on the dates required. Shawano may want to partner with other communities (Cumberland, Rice Lake, Hayward, etc.) to jointly order trees. The use of gravel beds are also an option and more information on those can be found at: http://www.mntreesource.com/gravel-beds.html

## Objective E: Inventory Maintenance and Updating

The inventory database has been provided to the City of Shawano in ArcMap and MS Excel. Staff should complete work orders and input the completed work into the inventory on a continuing basis. Without continual updating in this way, the inventory quickly becomes obsolete.

This management plan contains provisions for five years, beginning in 2021. Typically, a complete re-inventory should be completed every 5 years. When the inventory expires in 2026, a qualified, experienced forester should thoroughly evaluate all of the trees on an individual basis again. It is beneficial for an experienced eye outside the City perform an inventory due to changing tree conditions and factors.

# ATTACHMENT 1:

## *2021-2025 Schedule of Activities*

# 2021 Activities

| Activity | In-House or Contract | # of Trees | Contract Cost or Staff Hours Required | Misc. Comments |
|---|---|---|---|---|
| Tree Removals (0-10% condition rating & 1-14" dbh) | In-House* | 10 | 3 days for a 3-4 person crew | Avg dbh = 10.0" Crew averages 4 daily (does not include stump) |
| Grind Stumps from in-house Removals | Contract | 10 | $350 | Total DBH = 100 inches @ $3.50/inch. |
| Tree Removals (0-10% condition rating & ≥15" dbh) | Contract | | $44,400 | Avg dbh = 28.7" Average cost = $600/tree (includes stump) |
| Priority Prune 1 | In-House | 86 | 9 days for a 3-4 person crew | Avg dbh = 28.5" Crew averages 10 daily |
| Chemically Treat 1/2 of Ash Trees (in good or excellent condition) | In-House (Pesticide Applicator License Required) | 78 | One time purchase of equipment = $2,500<br>Chemicals (Tree-Age) = $2,500<br>8 days for a 1 person crew | Crew treats 10/day. Cost of chemical averages $33/tree |
| Inspect Monitor and Poor Trees | In-House<br>ISA Certified Arborist | 225 approx | 5 days | |
| Training (plant diagnostics, tree felling, chainsaw safety) | Contract | n/a | $1,000 | Check WAA Fall Conference for potential training opportunities |

| | |
|---|---|
| **TOTAL STAFF HOURS/COST*** | **55 days/$11,000** |
| **TOTAL CONTRACT COST** | **$50,750** |

**Combined Total of Staff Cost & Contract Cost = $61,750**

*Approximate Cost (including benefits = $25.00/hour. Equipment costs not included.

# 2022 Activities

| Activity | In-House or Contract | # of Trees | Contract Cost or Staff Hours Required | Misc. Comments |
|---|---|---|---|---|
| Tree Removals (≥15% condition rating & 1-14" dbh) | In-House* | 14 | 3 days for a 3-4 person crew | Avg dbh = 7.9" Crew averages 5 daily (does not include stump) |
| Grind Stumps from Removals (including ash removals) | Contract | 58 | $1,680 | Total DBH = 480 inches @ $3.50/inch. |
| Tree Removals (0-10% condition rating & ≥15" dbh) | Contract | 38 | $22,800 | Avg dbh = 23.6" Average cost = $600/tree (includes stump) |
| Priority Prune 2 | In-House | 54 | 6 days for a 3-4 person crew | Avg dbh = 24.5" Crew averages 10 daily |
| Remove ash trees in fair, poor or very poor condition (1-14" dbh) | In-House* | 33 | 7 days for a 3-4 person crew | Avg dbh = 9.6" Crew averages 5 daily (does not include stump) |
| Remove ash trees in fair, poor or very poor condition (≥15" dbh) | Contract | 16 | $9,600 | Avg dbh = 23.0" Average cost = $600/tree (includes stump) |
| Chemically Treat 1/2 of Ash Trees (in good or excellent condition) | In-House (Pesticide Applicator License Required) | 78 | Chemicals (Tree-Age) = $2,500<br>8 days for a 1 person crew | Crew treats 10/day. Cost of chemical averages $33/tree |
| Inspect Monitor and Poor Trees | In-House<br>ISA Certified Arborist | 225 approx | 5 days | |
| Training (tree pruning and risk tree identification) | Contract | n/a | $1,000 | Check WAA Fall Conference for potential training opportunities |

| | |
|---|---|
| **TOTAL STAFF HOURS/COST*** | **69 days/$13,800** |
| **TOTAL CONTRACT COST** | **$37,580** |

**Combined Total of Staff Cost & Contract Cost = $51,380**

*Approximate Cost (including benefits = $25.00/hour. Equipment costs not included.

# 2023 & Beyond Activities

| Activity | In-House or Contract | # of Trees | Contract Cost or Staff Hours Required | Misc. Comments |
|---|---|---|---|---|
| Grind Existing Stumps Identified in Inventory (1 time only) | Contract | 12 | $735 | Total DBH = 210 inches @ $3.50/inch. |
| Chemically Treat 1/2 of Ash Trees (in good or excellent condition) | In-House | 78 | Chemicals (Tree-Age) = $2,500<br>8 days for a 1 person crew | Crew treats 10/day. Cost of chemical averages $33/tree |
| Inspect Monitor and Poor Trees | In-House<br>ISA Certified Arborist | 225 approx | 5 days | |
| Routine Prune (1/8 of population) | In-House | 265 | 14 days for a 3-4 person crew | Crew averages 20 daily |
| 1/3 Young Tree Training Prunes | In-House | 88 | 5 days for 1 crew member | Average = 20 daily |
| Plant Trees** | Purchase From Supplier; Plant In-House | 40 | Trees = $7,000; 2 days for a 4 person crew | Trees = $175/each; Crew plants 10 daily |
| Training (tree pruning and risk tree identification) | Contract | n/a | $1,000 | Check WAA Fall Conference for potential training opportunities |

| | |
|---|---|
| **TOTAL STAFF HOURS/COST*** | **67 days/$13,400** |
| **TOTAL CONTRACT COST** | **$8,000** |

**Combined Total of Staff Cost & Contract Cost = $21,400**

*Approximate Cost (including benefits = $25.00/hour. Equipment costs not included.

# ATTACHMENT 2:

*Risk Management Guide*

# RISK MANAGEMENT

Risk: is the potential for suffering harm or loss
Risk Management: is the ability to minimize the potential for harm or loss from occurring by implementing a sound risk reduction strategy.

Types of Risk

- Financial
- Physical harm

A Risk-Reduction Strategy for Trees

- Evaluate the natural resource being managed
- Evaluate the resources available to you (fiscal, staff, equipment, etc.)
- Develop a policy statement
- Develop an action plan
- Periodic review of all four components

EVALUATE THE NATURAL RESOURCES BEING MANAGED

Evaluate the Entire Population

An understanding of the entire population allows you to identify the key problem areas within the population.

- Species distribution
- Diameter distribution
- Condition distribution
- Defects
- Locations and targets

Identify Problematic Species

Identify the species that, based on your knowledge and experience, pose the greatest physical threat.

- High history of failure
- High storm damage potential
- Prone to high-risk structural defects

Identify Problematic Diameters

Identify the diameters that, based on your knowledge and experience, pose the greatest problem in your population.

- Large diameter trees

Identify Problematic Conditions

Identify the conditions that, based on your knowledge and experience, pose the greatest problem in your population.

- Very poor trees

- Poor trees

Identify Problematic Defects

Identify the defects that, based on your knowledge and experience, pose the greatest problem in your population.

- Basal decay and cavities
- Major dieback
- Poor branch attachments

Identify Locations and Targets

Identify the locations and targets that, based on your knowledge and experience, pose the greatest physical threat in your population.

- Busy streets
- Playground areas

EVALUATE THE RESOURCES AVAILABLE TO MANAGE

Staffing

- Number
- Training
- Work load

Equipment

- Diagnostic
- Capabilities/limitations
- Availability

Fiscal

CREATE A TREE RISK MANAGEMENT POLICY STATEMENT

Components of a Policy Statement

- State your agency's understanding of its responsibility to maintain a safe public area.
- Identify the manager of the risk reduction program.
- List any general constraints on managing hazard trees such as financial or personnel.

The following is an example of a Hazard Tree Policy Statement:

> The City of Metropolis has an active policy to maintain the safety of public lands from potentially hazardous trees. The City will strive to eliminate, in a timely fashion, any tree deemed hazardous. When available fiscal and human resources limit the ability of the City to remove high-risk trees, priority shall be placed on trees deemed to carry the highest risk. The standard for rating the potential risk of a tree will be the International Society of Arboriculture's twelve point hazard evaluation system. The Director of Parks, Recreation and Forestry will administer this program and

have final judgment in all matters concerning the mitigation measures taken for any tree deemed hazardous.

Benefits of a Policy Statement

- It defines for staff the overall mission of the company or agency as it relates to high-risk trees.
- Minimizes political influence
- Allows staff to do their job

DEVELOP AND IMPLEMENT AN ACTION PLAN

Goal

After evaluating your resources, define problem areas and broad solutions to those problems. View this as a wish list.

Objectives

Define clear objectives that address the general goals you have established. The details should be more specific. A good objective defines what is going to be done and in what timeline.

Actions

A series of actions should be identified that address each objective defined

PERIODIC REVIEW OF ALL FOUR COMPONENTS

Review all four components of your risk management plan frequently.

# ATTACHMENT 3:

## *Ash Map Location*

# ATTACHMENT 4:

*All Tree Map Location*