LONGVIEW, WA TREE INVENTORY SUMMARY REPORT

July 9th, 2018

Source of images: City of Longview

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City of Longview Urban Forest Summary

Having a healthy, diverse urban forest can provide many benefits to the city, residents, and wildlife. In addition to being aesthetically pleasing, trees also; scrub the air of pollutants, slow the release of stormwater runoff into the watershed, filter stormwater, provide oxygen, reduce energy costs, provide shade, offer habitat and food for wildlife, and increase the value of real estate. The key to a sustainable and healthy urban forest is species and age diversity, proper tree maintenance, risk management, and public support which can be accomplished with an urban forest management plan.

The inventory data was analyzed in Microsoft Excel, Access, and the City's Tree Plotter app (https://pg-cloud.com/LongviewWA/) to determine the state, characteristics, and trends of Longview's urban forest. The information is provided to guide future maintenance and management and to better plan for the health and longevity of Longview's urban forest.

The data includes 12,293 trees that were inventoried as well as 4,076 proposed planting sites ranging from small, medium, and large. Several stumps were also inventoried at the request of the City of Longview and are labeled as such in Tree Plotter but were not included in the following charts and graphs.

Analyses and summaries were completed for the inventoried park trees to determine the health and diversity of all trees managed by the City. Also, the maintenance practices and staff responsible for the care and planting of trees are different for streets and parks. It is important to note that park trees tend to have a better growing environment which leads to larger statured trees which could skew the data when included with street trees.

The following section provides the results and recommendations based on the City's tree characteristics and organized by *Structure*, *Management*, *Risks,* and *Planting Sites*.

"Longview parks workers…roll an autumn purple ash tree into place behind Community Church in Longview" Source: TDN.com

Tree Inventory
Summaries & Recommendations

Structure

Urban forest structure describes the tree population in terms of its species composition, number of trees, age classes, and tree distribution. These summaries assist urban forest managers in proper tree management and planting to ensure long lasting canopy and benefits distributed equally across the City.

Tree Diversity and Composition

Species composition data are essential since the types of trees present in a community greatly affect the amount of benefits produced, tree maintenance activities, and budgets.

Table 1: Composition of the top ten species (of 12,293 trees)

Common Name	Count	% Whole
Kwanzan cherry	1,093	9%
Norway maple	1,042	8%
Cherry plum	1,039	8%
European white birch	692	6%
Red maple	510	4%
European hornbeam	507	4%
Green ash	403	3%
Sweetgum	387	3%
Cherry species	379	3%
American elm	376	3%
Total	**6,428**	**52%**

Graph 1: Composition of the top ten species

- Kwanzan cherry
- Norway maple
- Cherry plum
- European white birch
- Red maple
- European hornbeam
- Green ash
- Sweetgum
- Cherry species
- American elm
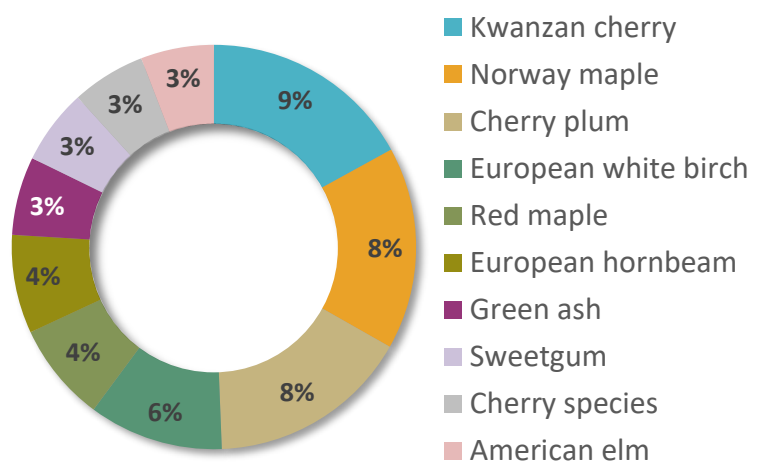
The 12,293 trees inventoried are comprised of 210 different species classifications (accounts for "pine", "fir", "oak", "chitalpa", "dogwood", "cherry", "ash", "maple", "magnolia", "camillia" and "apple", and general classifications e.g. Broadleaf Deciduous Large Other as well as planting sites). The top species comprise 52% of the tree population, the highest percent consists of kwanzan cherry with 9% (1,093 trees) of the total tree population.

Size and Age Distribution

The distribution of tree ages influences the structure of the urban forest as well as the present and future costs. An uneven-age urban forest offers continued flow of ecological benefits and a more uniform workflow allowing managers to more accurately allocate annual maintenance schedules and budgets.

Table 2: DBH (diameter at breast height, 4.5') distribution

DBH Range	Count	% Whole
1-11in	5,675	46%
12-19in	3,317	27%
20-26in	1,407	11%
27+in	1,879	15%
Total	**12,278**	100%

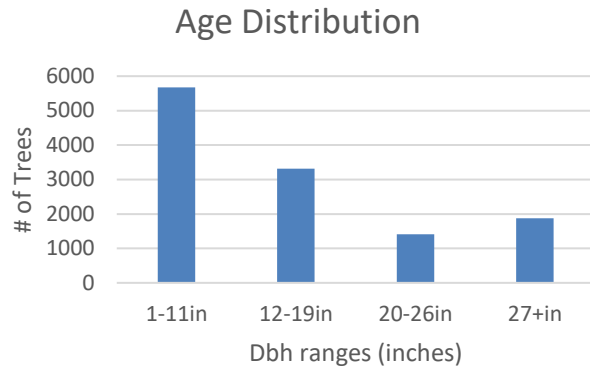Graph 2: DBH distribution of inventoried trees

To optimize the value and benefits of community trees, the urban forest should have a high percentage of large canopy trees which provide more ecosystem benefits.

On the other hand, there must be a suitable number of younger, smaller trees in the urban forest to account for the loss of large and mature trees in decline. Having a healthy percentage of young trees in the urban forest will ensure a sustainable tree population as well as age distribution in future years.

Table 2 and Graph 2 above show the distribution of size classes (DBH or diameter at breast height, 4.5") for the inventoried trees that were assigned a value.

In Table 2, 5,675 trees or 46% of the urban forest is comprised of trees with a DBH ranging from 1 inch to 11 inches. This indicates that the majority of the urban forest is comprised of young or small statured trees. This is desired for a healthy urban forest as shown below in Graph 3. According to Chart 2 the DBH range with the least number of trees is 20 to 26 inches. The average DBH for the whole population is 14.7 inches and the largest recorded DBH is 86 inches.

Graph 3: Ideal diameter class for an urban forest
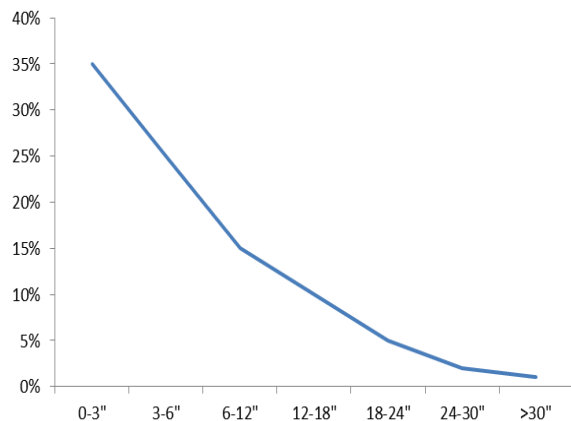
The age distribution of Longview's urban forest is similar to the ideal age distribution depicted on the left. However, trees with a DBH of 27 inches or greater make up 15% of Longview's urban forest. Urban trees in this DBH range can offer larger ecological benefits if the tree is properly maintained and remains healthy. However, at this size, street trees should be monitored frequently to determine maintenance needs, potential risks, and signs of decline.

An ideal age distribution in the tree population allows managers to allocate project annual maintenance costs uniformly and assures continuity in overall tree canopy coverage and associated benefits which are often dependent on the growing space of individual trees (e.g. open grown versus restricted growing areas). It is recommended to monitor and strategically manage large trees throughout the City, considering the risks that are associated with large, mature trees.

Management

Tree characteristics and outside forces affect the management needs for urban trees. An analysis of the condition and maintenance requirements assists managers in planning the urban forest. Tree condition indicates how well trees are managed and how well they perform given site-specific conditions. Tree maintenance needs are assigned for public safety reasons and for the health and longevity of the trees. Understanding the maintenance needs assists tree managers in establishing daily work plans.

Urban Forest Condition

The inventory data was analyzed to identify potential trends in tree condition and management needs. Local information on the condition of street and park trees plays an important role in community planning, municipal budgeting, and use of resources. Each inventoried tree's health was evaluated based on the condition of the wood and the foliage.

Table 3 below summarizes the 12,293 trees that were assigned a condition rating. It shows that the majority of the trees inventoried are classified as being in good condition, comprising 62% or 7,567 trees. Table 6 shows the detailed information for each condition class. Notice that 80 trees are classified as dead / removal required and 575 are noted as Poor condition. The dead trees or trees noted for removal should be addressed and planned for immediately.

Table 3: Trees summarized by condition

Condition	Count	% Whole
Good	7,567	62%
Fair	3,218	26%
Excellent	853	7%
Poor	575	5%
Dead / Removal Required	80	1%
Total	**12,293**	**100%**

Graph 4: Trees summarized by condition
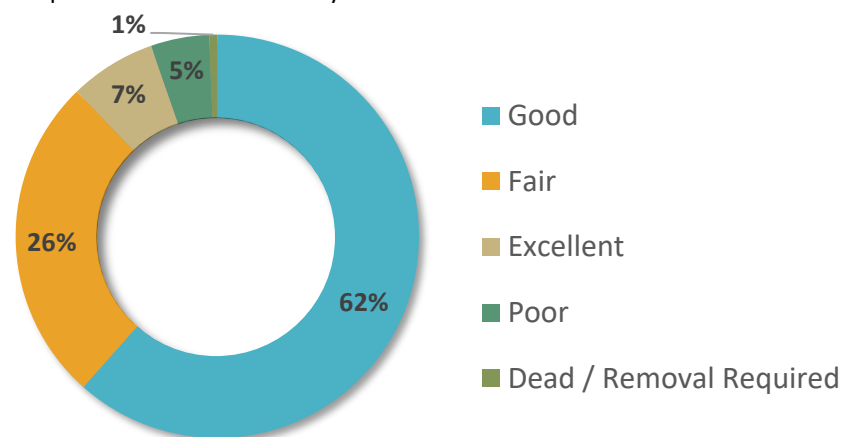
Primary Maintenance Requirements

The inventory required an assessment of the maintenance needs, if any, for each tree. This information along with risk assessment ratings, location, and the Tree Plotter application were used to guide the maintenance recommendations. The tables below provide a summary of the primary removals required as well as pruning recommendations for Longview trees.

Table 4: Trees recommended for removal

Tree Work	Count	% Whole
Immediate Removal	3	0.02%
Removal	411	3%
Total	**414**	**3%**

Table 5: Priority pruning recommendations

Tree Work	Count	% Whole
High Priority Pruning	465	4%
Immediate Priority Pruning	17	0.1%
Total	**482**	**4%**

Table 6: Maintenance pruning recommendations

Tree Work	Count	% Whole
Routine Pruning	7,900	64%
Training Pruning	2,657	22%
Total	**10,557**	**86%**

Of the 11,453 trees assigned a maintenance task, the majority (7,900) are recommended for routine pruning. This involves the removal of dead, dying, diseased, broken, poor structured or attached limbs. Routine pruning can also involve the removal of branches for clearance of buildings, cars, light poles, etc. Pruning to train young trees is recommended for 2,657 trees or 22% of the trees assigned a maintenance task. High priority pruning is recommended for 465 trees or 3.78% of the urban forest. These trees have dead and/or diseased limbs that could potentially cause serious injury or property damage if not addressed in a timely manner. 17 trees have been marked for immediate priority pruning and should be pruned immediately. 825 trees were identified as not needing any maintenance although all trees should be routinely observed to assess for any new maintenance issues.

Image 1: Locations of trees recommended for removal
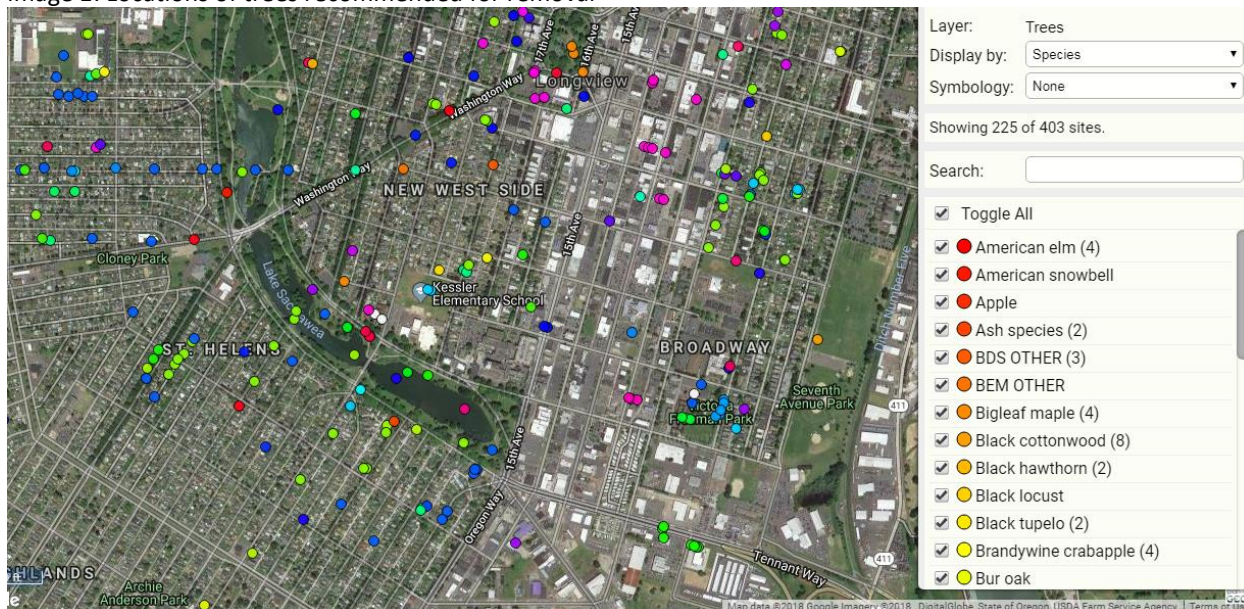
The map above shows the location of trees recommended for removal. This map can be viewed at https://pg-cloud.com/LongviewWA/?scenario=TreesForRemoval.

The inventory of street and park trees shows that there is a need to remove trees in order to lower the risk and maintain public safety. It is recommended that these trees be prioritized by size, condition, and location and remove the largest, poorest quality trees as soon as possible. Trees with the highest Target Risk and Probability of Failure should take top priority over other trees. Three trees have been labeled as Immediate Removal, meaning the entire tree poses a serious risk to all its surroundings and should be planned for removal immediately. 411 trees have been recommended for removal. This indicates that the tree is dead or dying and will not recover. Note that these trees are not an imminent threat or they would be labeled for immediate removal.

Risk

This section summarizes the potential risks identified during the street and park tree inventory. Criteria used to determine risk included a rating of the *Likelihood of Failure*, *Likelihood of Impacting a Target*, *Timeframe for Possible Failure*, and *Consequence of Failure*. This assessment assigns a Risk Rating to each tree in the inventory if a defect is observed.

Table 7: Summary of Risk Rating and counts of greatest risk

Risk Rating	Count	Imminent Probability of Failure
High	16	11
Moderate	271	77
Low	7,194	172
Total	**7,481**	**260**

The table above provides a count of each Risk Rating category as well as a count for an additional criterion that determines the Risk Rating. The criteria "Probability of Failure" with a

rating of "Imminent" highlights the trees that need to be addressed immediately. Trees with these criteria should be considered to have an extremely high potential for failure that could cause the most damage and/or harm within a year or during a wind/storm event.

As seen in Table 7, 16 trees have a "High" Risk Rating but have the lowest count of Imminent Probability of Failure (11 of 16 trees). The map below shows the location of these 11 trees and can also be viewed at https://pg-cloud.com/LongviewWA/?scenario=HighRiskImminentFailure.

Image 2: Locations of "High" risk trees that have an Imminent Probability of Failure
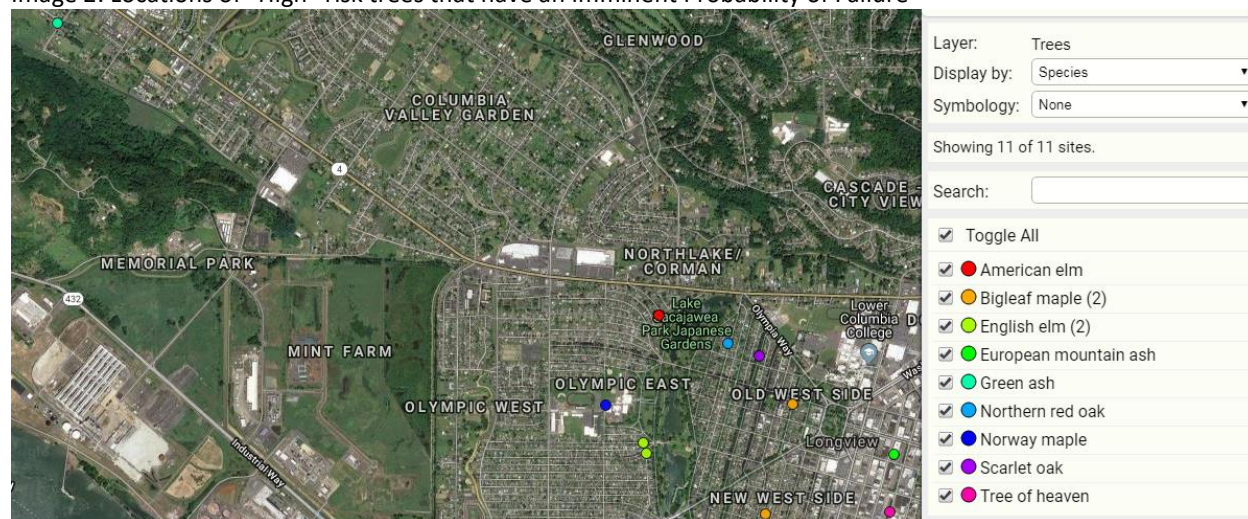
There are 271 trees with a "Moderate" Risk Rating and among those, 77 have an Imminent Probability of Failure. In total, 7,481 trees were given a Risk Rating. Of those trees, 260 have an Imminent Probability of Failure, but 172 are "Low" risk. Along with the trees identified for removal, these are trees that should be evaluated and be considered for immediate maintenance. No trees were assigned an "Extreme" Risk Rating.

Planting Sites

To ensure a healthy urban forest, managers should keep track of tree removals, newly planted trees, and future planting sites. The City of Longview has a favorable number of young trees as well as available planting sites to ensure a healthy tree canopy in future years. Table 8 below provides the count of available planting sites by size that were assigned based on specific guidelines outlined by the City, detailed below.

Table 8: Proposed planting sites

Planting Site	Count	% Whole
Vacant Site Large	900	22%
Vacant Site Medium	1,453	36%
Vacant Site Small	1,723	42%
Total	4,076	100%

The planting sites were selected based on the following guidelines; the proposed planting space must be at least 3 feet wide, must be 25 feet from intersections, light poles, and existing tree

trunks. In addition, the sites must be 10 feet away from fire hydrants, water meters, electrical boxes, driveways, and alleyways. The proposed planting site was determined small, medium, or large based on the width of the planting space. Three feet planting spaces were deemed small planting sites along with any site that had wires at least 20 feet overhead. Medium planting sites were four to five feet wide and large planting sites are five feet or wider. The map below shows the locations of large planting sites and can also be viewed at https://pg-cloud.com/LongviewWA/?scenario=LargePlantingSites.

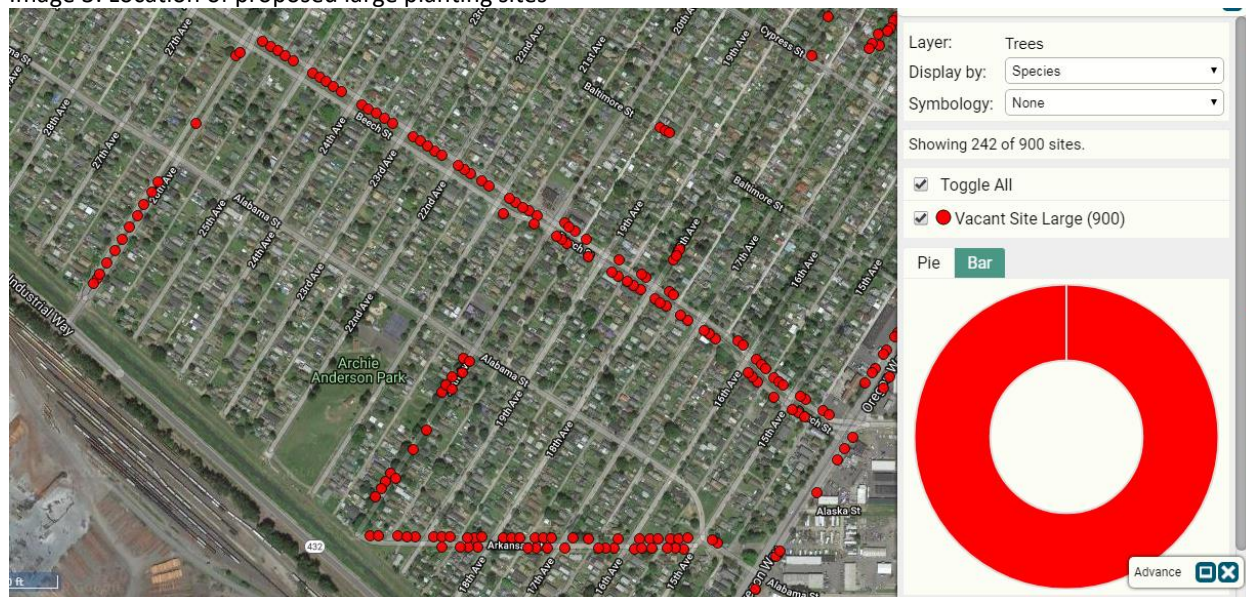Image 3: Location of proposed large planting sites

Table 8 above shows there are a total of 4,076 proposed planting sites. 1,723 (42%) of the proposed sites are small planting sites. 1,453 (36%) available planting sites are medium in size and 900 (22%) are large areas for planting. This information regarding location and size of planting sites will be used by the City when considering tree planting and choosing the location and species suitable for the site(s).

The urban and community forest is a defining and valued characteristic of Longview making the place a desirable place to live, work and play. It is a resource that has a history and legacy of care and management; however, certain trees require immediate removal or maintenance. The City should strive to achieve a routine maintenance schedule of all trees and continue to plant trees, especially after removal, to enhance the urban forest and the benefits that trees provide. While it will take work and additional resources to address the maintenance needs, its implementation will help ensure that Longview's urban and community forest will continue to be a valued part of the community.

Photo source: TDN.com