STATE OF THE URBAN FOREST

This report is to update residents and their constituents on the City of Knoxville urban forestry program and outline the City's progress on goals and objectives that have been developed by the City of Knoxville Tree Board and other applicable management plans.

City of Knoxville Urban Forestry Program Progress Report

A. Introduction

Since 2003, the City of Knoxville has adopted and followed two tree plans and produced one management plan. These documents have provided guiding policies, best management practices and implementation programs for use by the City of Knoxville Public Service Department in its planting, management and maintenance of City trees. In 2012, the City of Knoxville hired its first full time Urban Forester and in 2013 created a dedicated Urban Forestry Division. The following is a progress report for the City of Knoxville Tree Board and the Urban Forestry Division to use in assessing the implementation of previously established tree-related policies and proposed implementation programs from these plans. This document is a "snap shot" in time. The management of urban forest resources is a dynamic and fluid process and this document will be updated annually to reflect efforts related to urban forestry in the City of Knoxville. The City of Knoxville Urban Forester and City of Knoxville Tree Board may add, amend, dissolve, and prioritize action items in this plan as needed throughout the year.

B. Overview of Plans and Guiding Documents

1. ### Urban Forest Management Plan, Knoxville - September 2011 – (not an adopted document)
   http://www.knoxvilletn.gov/UserFiles/Servers/Server_109478/File/PublicService/Trees/treeplan.pdf
   This document provides an assessment of the status of the City's urban forest resources, estimates the costs and benefits of the urban forest to the community and the City Public Service Department and makes recommendations to the City about development of a formal urban forestry program.

2. **Knoxville - Knox County Tree Conservation and Planting Plan – adopted in June 2007**
   http://www.knoxvilletn.gov/UserFiles/Servers/Server_109478/File/PublicService/Trees/treeplan_draft.pdf
   This plan was adopted to provide a framework for forest protection and to enhance the city and county landscape with tree planting programs, this document is considered a companion to the City of Knoxville Street Tree Master Plan.

3. **City of Knoxville Street Tree Master Plan – adopted in January 2003**
   http://archive.knoxmpc.org/plans/treeplan/index.htm
   The street tree master plan was adopted to provide guidance for the City of Knoxville for tree planting along Knoxville's streets and highways. First adopted tree list for the city was noted in this document and has been updated in subsequent documents, the most current up-to-date recommended tree species list can be found on the City of Knoxville's website at:
   http://www.knoxvilletn.gov/UserFiles/Servers/Server_109478/File/PublicService/Trees/trees.pdf

C. **Public Service Department Urban Forestry Division Goals and Guiding Principles**
   The following sections are goals of the City of Knoxville Urban Forestry Division followed by the progress and/or status of the policy or program where applicable. All goals fit under the City of Knoxville "Goal Statement" and "Guiding Principles."

   1. **Goal Statement -** To enhance, expand, and preserve the City's urban forest and improve the City's tree management program in an equitable, proactive, economic and sustainable manner.

2. Guiding Principles

- Public Safety: Ensure the safety of residents and visitors through proactive maintenance of public trees.

- Equal Opportunity: All neighborhoods are targeted for enhancement through urban forestry. Equitable access to urban forestry resources for all communities is critical to the success of the program.

- Commitment to Professionalism: Enhance, expand, and preserve the City's tree canopy, maximizing its benefits and increasing its sustainability. Utilize current professional standards and proper arboricultural techniques.

- Education: Educate the community to expand its support of urban forestry and the benefits of tree canopy in the City of Knoxville.

D. Urban Forest Inventory and Assessment

Tree inventories and assessments provide the foundation for a systematic and proactive tree management program. Tree inventories and assessments are ongoing and help monitor the City's progress and improve community relations by linking data to citizen's request for service. Assessments also help guide tree investments and assure equitable investments for all communities. The following are the progress and action items for inventorying and assessing the City's urban forest resources:

1. Tree Canopy Study

The success of an urban forestry program and its guiding documents and ordinances can by monitored by assessing the tree canopy and health of the urban forest on a routine basis.
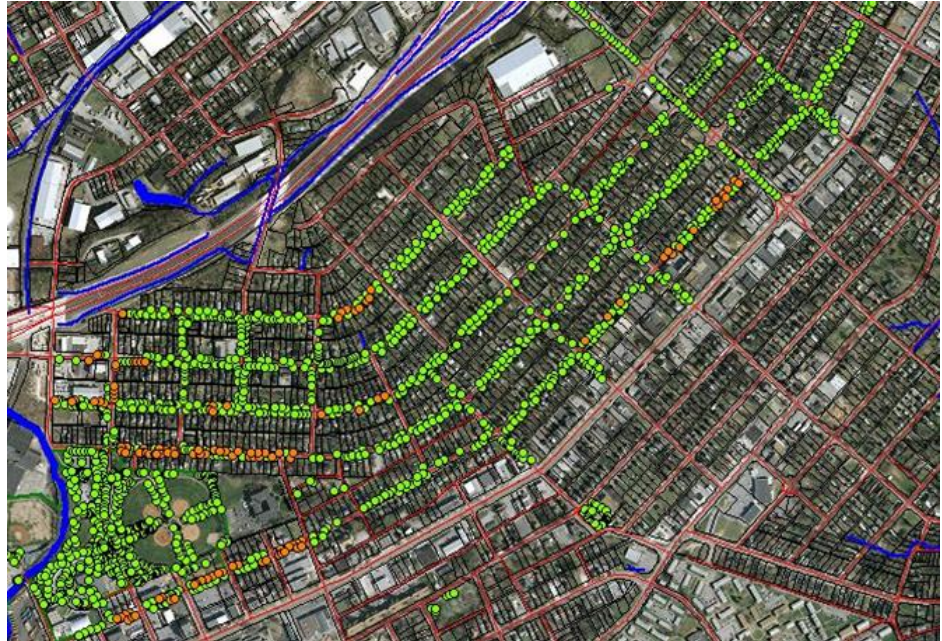
a) ***Action Item:*** The City needs to determine canopy cover goals City-wide and re-evaluate canopy cover on a 10-year basis.

    a. ***Progress Statement:*** The City of Knoxville completed a comprehensive tree canopy study in 2014 using FGIS and i-Tree canopy. Those results can be found at the following location http://www.knoxvilletn.gov/government/city_departments_offices/public_service/urban_forestry/canopy_assessment/ The studies shows that the City of Knoxville had 40% tree cover in 1997 and as of 2010 still has 40% tree cover within the City. The City also conducted individual neighborhood canopy assessments by dividing the City into 60 different areas and each council district, but still needs to develop a report and determine canopy goals for the City.

2. Street Tree and Park Tree Inventory

a) ***Action Item:*** The City needs to complete the individual tree inventory within parks and along City streets before developing a successful proactive urban forestry program.

    a. ***Progress Statement:*** As of September 2014, 25% of City Streets and Public Spaces have been inventoried with data being collected and inputted into Treekeeper, a tree management software program. To date the City has 17,478 sites of which 14,137 have trees and 3,341 are

available for planting. There have been 170 distinct species identified in the City of Knoxville to date.

Above: A map of the Parkridge neighborhood tree inventory. Individual trees can be selected to show specific attributes of each tree, or grouped together to create maintenance work orders.

3. Forest Resource Assessment

a) *Action Item:* The City needs to conduct a complete assessment of public forested lands including the Urban Wilderness to determine forest structure and health, the environmental effects, and the tree benefits and values to the community. The City should work with local partners and look for grant opportunities to assess public forested land and develop management programs for these forested areas.

   a. *Progress Statement:* In 2014, the City assessed Marie Myers Park, William Hastie Park, and Stanley Lipponcott Ridge Park by partnering with the University of Tennessee and the Tennessee Division of Forestry. The City will continue to look for opportunities and resources to evaluate its forest resource.

E. Planting and Conservation Strategies

1. Tree Planting Program

Public Property: Tree planting occurs on publically owned lands, such as improved right of ways and parks. Tree lined streets and parks helps infiltrate city stormwater, increase home values and promote vibrant neighborhoods. Planting and selecting trees for the proper location, adequate planting space and species diversity will maintain investments and benefits associated with the urban forest. The City works with neighborhoods, other government departments and agencies to coordinate tree planting in a proactive, equitable, and sustainable way.

a) *Action Item:* The City should strive to have a net increase in the number of trees planted annually.

    a. *Progress Statement:* As of 12-3-14, the Urban Forestry Division has removed 391 trees along city streets and within parks (this does not include the number of trees removed from storm related events and trees removed for construction and drainage projects). The City planted 565 trees during the 2014 planting season and is expected to plant 552 trees during the 2015 planting season (this does not include public trees planted as part of development projects).

Above: Trees planted along Neyland Greenway as a replacement to several sycamore trees that were removed in 2013 due to bacterial leaf scorch.

b) *Action Item:* The City should continue to update and expand the recommended tree planting species list to promote native and non-invasive

exotics species, and develop specifications to ensure trees are properly planted and adequate soil is available for tree planting.

  b. ***Progress Statement:*** The recommended tree list updated in 2013 can be found at http://www.knoxvilletn.gov/UserFiles/Servers/Server_109478/File/Public Service/Trees/treeplan.pdf and in 2014 the city developed recommended planting and soil specifications for trees being planted on City property and can also be found at http://www.knoxvilletn.gov/trees

c) ***Action Item:*** The City should develop an up-to-date master planting plan based on a complete tree inventory and up-to-date tree canopy studies

  c. ***Progress Statement:*** Tree inventory is approximately 25% complete and a comprehensive canopy study was completed in 2014. The City should begin discussion on a master planting plan as soon as the inventory is complete and tree canopy goals are determined.

Private Property – Private property owners play an important role in maintaining the urban forest resources of any community. The City's Urban Forestry Division will continue to seek outreach and education opportunities with private property owners and neighborhoods and work with local partners to promote a healthy urban forest on private property.

a) ***Action Item:*** Develop and explore partnerships with existing organizations to encourage tree planting, as well as the creation of a third-party tree foundation.

  a. ***Progress Statement:*** There have been several discussions with different community organizations about potential partnerships in creating a tree foundation and the City has partnered with Keep Knoxville Beautiful, Dogwood Arts, Knox County Schools, and several neighborhoods on small planting projects since 2013.

b) ***Action Item:*** Develop tree planting standards for parking lots

  b. ***Progress Statement:*** The city and county are currently drafting recommendations for tree planting within parking lots to mitigate stormwater runoff from impervious surfaces as new federal clean water standards are beginning to require the first one-inch of runoff to be infiltrated.

2. Edible Urban Forests

Urban forests can also be a food source for local neighborhoods. Edible trees can be planted and mapped in urban areas to help provide an economical approach to the availability of food, while still providing the ecological benefits of trees.

a) ***Action Item:*** The City should continue to promote the implementation of an edible urban forest, with support from neighborhoods, community organizations and a third-party tree foundation.

a. ***Progress Statement:*** The City has received significant interest from several communities about the creation of an edible urban forest. The City helps guide organizations on how to approach a successful edible urban forest project. Currently, the City plants edible trees along streets and within parks if a proper fruit or nut tree fits the location and will not create additional maintenance cost in the future.

3. **Gateway Planting and Landscaping Through Partnerships**
Cooperation and partnerships with local community organizations, neighborhoods, businesses, TDOT and the FHWA are needed to enhance the major entrance corridors to the city through gateway landscaping and boulevard treatments, particularly with concurrency to road and other development projects.

   a) ***Action Item:*** The City should partner with local community organizations to pursue new gateway beautification and landscaping projects.

      a. ***Progress Statement:*** The City has done extensive planting within medians located along major corridors, including Callahan Drive, Middlebrook Pike, Sevier Avenue, Magnolia Avenue, James White Parkway and Hall of Fame Drive but has done limited planting along major interstate interchanges to date. The City continues to work with neighborhoods on local beautification projects as resources permit.

4. **Conserving Trees and Woodlands and Controlling Invasive Species**
Many roads are lined by pockets of forested areas that should be conserved. Hillsides particularly need to be protected to avoid erosion and other problems. Occasionally, invasive plants such as privet, honeysuckle, mimosas or kudzu blemish these wooded areas and should be removed.

   a) ***Action Item:*** The City needs to develop a comprehensive plan for dealing with invasive species and promoting healthy forests.

      a. ***Progress Statement:*** The City has been undergoing efforts to control invasive species in the last several years, including the use of goats and herbicides to control kudzu and other invasive species throughout the City. In 2014, the City of Knoxville allocated additional funds $20,000 to

Above: Goats have been used to help minimize the impact of Kudzu in different areas of the City

combat invasive species throughout the City. The City still needs to assess several public parks and locations and develop a comprehensive plan on maintaining these natural spaces. The City may apply for a grant to help cover the costs of developing an extensive management plan for areas such as the urban wilderness.

b) ***Action Item:*** The City should review the current tree protection ordinance and update as necessary.

        b. ***Progress Statement:*** The City updated Article III (trees on public property) of the tree protection ordinance in 2014. The City will continue to hear public input on other issues that may need to be addressed in the Tree Protection Ordinance and work with the City of Knoxville Tree Board on any recommended changes.

Above: The Critical Root Zone of a hackberry tree at Lakeshore Park is being protected during the demolition of a nearby building. Article III of the tree protection ordinance was amended in 2014 and addressed the protection of tree roots within the City of Knoxville.

5. Sustainably Utilize Urban Wood Waste

a)   ***Action Item:*** The City needs to look for innovative ways of utilizing urban wood waste from brush and leaf pick-up and other tree maintenance projects.

        a. ***Progress Statement:*** The City of Knoxville visited the City of Chattanooga in 2014 to look at ways and share ideas on how urban wood waste could be utilized. The City of Knoxville has also began networking and building a list of contacts that may

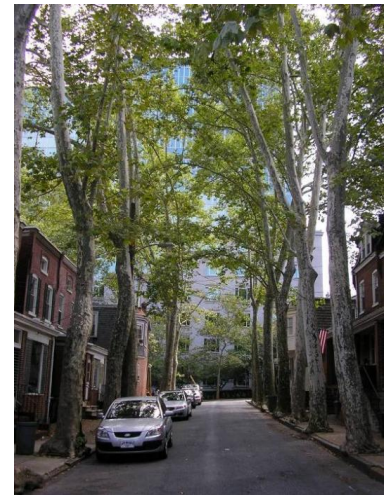**Above: Large limbs are set aside to be used for a natural playscape for children.**

have interests in participating in future wood utilization projects and activities. In 2014, the City donated a portion of a large diseased oak tree that was removed. The removed portions of the tree was utilized for a natural playscape for local children.

F. Tree Maintenance Recommendations
1. Cyclical Pruning Program
Trees are valued assets and like vehicles, trees are less costly to maintain and provide more predictable results if they are maintained in a systematic way. A shift from a reactive maintenance program to a systematic pruning program takes a large amount of will, the benefits are lofty. The benefits include lower costs gained through efficiencies and better quality trees are not only healthier and safer, they look better.

    a. ***Action Item:*** The City needs to finalize the tree inventory and develop a cyclical pruning program.

    b. ***Progress Statement:*** The City of Knoxville currently only has one bucket truck and a seven (7) man crew which support reactive maintenance throughout the City. In order to manage and care for thousands of trees the City has planted and move towards a proactive management philosophy, the City will need to establish a second management crew. This would require one additional crew member and one additional bucket truck for the Urban Forestry Division.

Above: Trees that are routinely pruned help increase public safely and the longevity of the tree.

2. Proper Tree Care and Maintenance
Poor maintenance creates issues that increase costs and decrease aesthetics throughout the City. The City of Knoxville's Urban Forester and Knoxville Tree Board has the expertise to provide workshops and trainings for entities managing trees on public property, such as the City of Knoxville Public Service Department, Public Building Authority, Parks and Recreation Department, and to assist Knox County and Knox County Schools as needed.

Proper Tree Pruning Enforcement for Public Service Department - Poor pruning creates wounds and poor tree structure that last a lifetime, creating defects that could decrease public safety and aesthetics.

a) ***Action Item:*** Provide training for crews periodically to ensure that new employees are aware of proper pruning techniques and conduct quality control checks to ensure crews prune properly.

   a. ***Progress Statement:*** The City of Knoxville provides an annual training for all Horticulture and Urban Forestry crews that conduct pruning throughout the City. Training typically occurs in November before the winter pruning months.

Above: The City provides yearly maintenance training for tree maintenance crews to help prevent improper pruning practices from occurring, such as a flush cut seen above.

Provide Adequate Watering and Young Tree Pruning - Newly planted trees should receive at least one inch of water every week for the first two years after the tree was planted. Trees should also be pruned within the first three growing seasons to promote better branch structure and architecture.

a) ***Action Item:*** Assign a staff person the responsibility to monitor rainfall and ensure that newly planted trees are watered during their first two seasons. The City should explore different devices and techniques to help improve efficiency and frequency of watering.

   a. ***Progress Statement:*** The City of Knoxville urban forester and arborist monitor rainfall daily and assign staff areas of the City to be watered. When appropriate, the City plants trees along an entire neighborhood block side, section of a median, or park to minimize maintenance costs. The City also has utilized watering bags and is exploring other watering devices to improve the effectiveness and efficiency of watering trees.

b) ***Action Item:*** Assign a staff person to prune newly planted trees within the first three years that a tree was planted in order to promote a single stem, good branch spacing and remove poorly structured limbs to reduce future maintenance.

   b. ***Progress Statement:*** During the winter of 2014 the City of Knoxville conducted the first year of the young tree pruning program, pruning trees that were planted during the 2011 planting season.

Provide Safety Training and Conduct Weekly Tailgates for Maintenance Crews

a) *Action Item:* Urban Forestry crew members who conduct tree related maintenance should go through yearly chainsaw, aerial bucket and electrical hazard awareness training. Urban Forestry Crews should conduct weekly tailgate discussions on current arboriculture issues including proper maintenance practices and working safely on the job site.

   a. Progress Statement: The City of Knoxville has a yearly chainsaw safety course for employees and is working to incorporate a yearly aerial bucket truck and electrical hazard awareness program for crews that conduct maintenance on trees. The City is looking to partner with other local government agencies, KUB, and local tree care professionals to participate in the training. The Public Service Department has recently hired an internal planning and safety coordinator to help promote safe working practices. This individual has begun conducting routine safety courses with employees.

G. Ongoing Urban Forestry Efforts

1. City of Knoxville and Knoxville Utilities Board (KUB) Cooperation

a) *Action Item:* The City should continue strong dialogue and cooperative efforts between the urban forestry department and the Knoxville Utilities Board (KUB)

   a. *Progress Statement:* The City continues cooperative efforts with KUB to manage and conduct maintenance on trees located under overhead power lines and around underground utilities. The City has also updated its tree protection ordinance to promote proper tree planting around utility lines. KUB continues to have a positive role on the City of Knoxville Tree Board and KUB at times provides additional maintenance support of trees that conflict with utility lines.

Above: The City is working with KUB and customers to help prevent improper trees from being planted underneath utility lines. KUB has a demonstration garden at the University of Tennessee Garden.

2. Emerging Tree Disease and Pest Issue Monitoring and Management

a) **Action Item:** Pests and diseases such as Thousand Cankers Disease and Emerald Ash Borer, and other emerging issues continue to be a problem in our region. The City should continue to monitor the occurrence of these pests and plan for control strategies as they arise in line with State and Federal recommendations regarding control of these pests and diseases.

a. **Progress Statement:** The City of Knoxville treats about a dozen trees for Emerald Ash borer on an annual basis and will continue to educate local neighborhoods and organizations on their ability to identify and report potential pest issues to authorities. The City has teamed with the Nature Conservancy on their Healthy Trees, Healthy Tennessee campaign to help educate residents on local threats from tree pests.

H. Conclusion

The City of Knoxville has an extensive urban forest that provides many benefits to the community. The City has made a commitment to improving the urban forest by planting appropriate trees in proper locations and maintaining and protecting trees by using proper arboriculture and best management practices. By forming an Urban Forestry Division within the Public Service Department, the City has started to increase the benefits associated with trees to a higher level.

The City of Knoxville has higher standards for trees planted throughout the City and more oversight with an Urban Forester to ensure trees are properly planted and maintained. The City has a better understanding of its urban forest resource from an ongoing tree inventory and urban canopy assessment. Public Service workers are more educated and trained on proper arboriculture practices which helps promote a healthier urban forest and extend the life expectancy of trees. The City is safer because more trees are being maintained properly, and residents are being connected to professional tree care arborists through educational events and outreach. However, there is still room for improvement.

Currently the City has no systematic tree maintenance program. Tree maintenance is performed on demand by calls and work orders generated by citizen requests. The City needs to move towards a systematic or cyclical maintenance program where time and money can be saved while improving the health and value of the urban forest. The current condition of the urban forest is in fair condition, and the introduction of proper planting and mulching practices combined with a young tree pruning program will elevate the condition of the urban forest in time.