

Welcome!

UFMP Advisory Group

Workshop 1 of 3 - The Trees

February 23, 2023, 8:00 - 10:00 a.m.

AGENDA

- Welcome & Introductions (5 mins.)
- Presentation (20 mins.)
- 3 Group Discussions (90 mins.)

KnoxvilleTreePlan.org

KNOXVILLE URBAN FOREST MASTER PLAN



SAVE THE DATES

AG Workshop #2: Thursday, Mar. 23rd, 8-10 am

AG Workshop #3: Thursday, Apr. 20th, 8-10 am

How We Got Here

Efforts leading up to UFMP

2011: City tree inventory and management Plan

- 100,000+ trees across 1,000 miles of streets, parks

2012: Improvements to city urban forest program

- Overhauled our planting contract, education, developed a pruning cycle, volcano mulching, updated tree protection ordinance, outreach, etc.

2015: Creation of Trees Knoxville

- Creating tree canopy partner, helping to bridge between public and private stakeholders

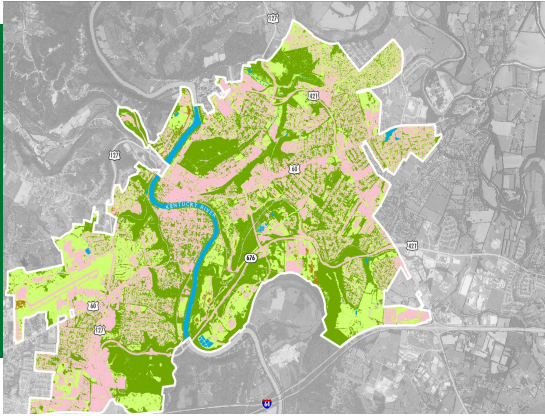
2020: Urban Tree Canopy Study - 38%

- Measured amount and change of tree canopy in 2008 and 2018 (GIS analysis)
- Partnerships: Trees Knoxville, City of Knoxville, TN Dept. of Ag/Forestry, Knoxville Utilities Board (KUB), Knox County, TVA, Knoxville Garden Club

2023: Urban Forest Master Plan

- City and Mayor budgeted for 2022-2023 Fiscal Year - 50% of project to be run through TK
- Trees Knoxville raises funds, puts out RFP In July 2022, acquires funding from City, State, KUB, Keep Knoxville Beautiful and TN Dept. of Ag/Forestry
- Consultant Urban Canopy Works selected October, project kick-off December 2022.

Urban Canopy Works



Urban Forest Planning

- Strategic planning (UF Master Plans)
- Tree canopy assessments
- Existing conditions analysis
- Public engagement
- Existing policy/plan/code reviews



Municipal Services

- City arborist services
- Code/regulation reviews
- Operations analysis
- Urban Tree Canopy (UTC) assessments
- Special Projects (tree planting contract management, planting plan design, inventories, more)



Arboricultural Consulting

- Risk assessment (realtors, campuses, other grounds)
- Development/Construction Services
- Appraisal / Assessment Services
- Appraisals for insurance losses (post hurricanes and other storms)

Knoxville Plan

Community Focused

Over 22,000 acres of tree canopy in City of Knoxville (38%)

Approximately 75% on privately owned land.



TREES KNOXVILLE



CITY OF KNOXVILLE



Department of
Agriculture

Forestry



UFMP Process

Three Phases

Phase I: Project
Launch

Phase II: Discovery

Phase III: Plan
Development

Phase I: Project Launch

UFMP Process

Three Phases

Phase I: Project Launch

Phase II: Discovery

Phase III: Plan Development

Timeline: November - December 2022

Efforts:

- Project Set Up
- Data Collection
- Project Website - ***KnoxvilleTreePlan.org***
- Steering Committee
- Advisory Group
- Kick Off Event - December 14, 2022



Phase II: Discovery

UFMP Process

Three Phases

Phase I: Project
Launch

Phase II: Discovery

Phase III: Plan
Development

Timeline: January - June 2022

Focus:

1. What exists or is in place currently?
2. Where do we want to go?

Research/Analysis

- Tree canopy trends
- City public tree Inventory
- Impact of climate
- Invasives and natives
- Planting strategies
- Prior urban forest efforts
- Broader city plans
- Review of City operations
- Review of City policies/code
- Intersections of Trees
Knoxville, City and County

Engagement

- Advisory Group (80-100 ppl)
 - 3 Workshops
- Interviews (15+)
- Community input form online
 - www.knoxilletreeplan.org/you-tell-us.html
 - Open through May
- Citywide Open House - date TBD
- Speaking Circuit
 - Knoxville Neighborhood Advisory Board - 1/11
 - Water Quality Forum - 1/12
 - Knox/Knox County Food Policy Council - 2/15
 - East Tennessee ASLA - 2/21
 - Sierra Club - Harvey Broom Group - 4/11
 - More TBA

Phase III: Plan Development

UFMP Process

Three Phases

Phase I: Project
Launch

Phase II: Discovery

**Phase III: Plan
Development**

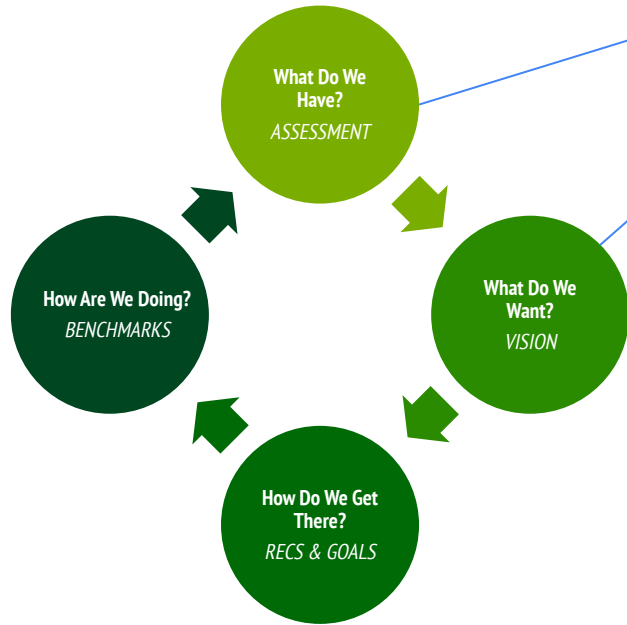
Timeline: June-October 2022

Efforts:

- Setting Goals
- Developing Plan
- Review Process
- Final Plan Release

Discovery: Self Assessment Approach

#1 Adaptive Management



#2 Structure for Self Assessment

How sustainable is Knoxville's urban forest?

The Trees

The Players

The Management Approach

Structure for Self Assessment

Workshop #1: The Trees
Thursday, February 23, 8-10am

Workshop #2: The Players
Thursday, March 23, 8-10am

Workshop #3: The Mgmt Approach
Thursday, April 20, 8-10am

| KNOXVILLE (TN) Indicators of a Sustainable Urban Forest | | Assessed Score | | | |
|--|---|------------------------------------|------|------|--|
| | | Low | Mod. | Good | |
| The Trees | Urban Tree Canopy Cover | | | | |
| | Equitable Distribution | | | | |
| | Streets & Parks (public, landscape) | Age/Size Distribution | | | |
| | | Condition | | | |
| | | Diversity / Pest Vulnerability | | | |
| | | Suitability - Overhead | | | |
| | | Suitability - Ground Level | | | |
| | | Suitability - Soil Conditions | | | |
| | Natural Areas / Woodlands (public or private) | Suitability - Invasives | | | |
| | | Suitability - Climate Adaptability | | | |
| | | Age/Size Distribution | | | |
| | | Condition | | | |
| | | Diversity / Pest Vulnerability | | | |
| | | Suitability - Overhead | | | |
| | All Other Lands (primarily private) | Suitability - Ground Level | | | |
| | | Suitability - Soil Conditions | | | |
| | | Suitability - Invasives | | | |
| | | Suitability - Climate Adaptability | | | |
| | | Age/Size Distribution | | | |
| | | Condition | | | |
| | The Players | Diversity / Pest Vulnerability | | | |
| Suitability - Overhead | | | | | |
| Suitability - Ground Level | | | | | |
| Suitability - Soil Conditions | | | | | |
| Suitability - Invasives | | | | | |
| Suitability - Climate Adaptability | | | | | |
| Neighborhood Action | | | | | |
| Large Landholder Involvement | | | | | |
| The Mgmt Approach | Green Industry Involvement | | | | |
| | City Department/Agency Cooperation | | | | |
| | Funder Engagement | | | | |
| | Utility Engagement | | | | |
| | Developer Engagement | | | | |
| | Public Awareness | | | | |
| | Regional Collaboration | | | | |
| The Mgmt Approach | Tree Inventory | | | | |
| | Canopy Assessment | | | | |
| | Management Plan | | | | |
| | Risk Management Program | | | | |
| | Maintenance of Publicly Owned Trees (ROWs) | | | | |
| | Planting Program | | | | |
| | Tree Protection Policy | | | | |
| | City Staffing and Equipment | | | | |
| | Funding | | | | |
| | Disaster Preparedness & Response | | | | |
| | Communications | | | | |

ABOUT THE PROJECT

Self Assessment Structure

Today's Set of Indicators of a Sustainable Urban Forest

Best Practice or Industry Standard

Low, Moderate or Good based on that Standard

Conditions in Knoxville

| SUSTAINABLE URBAN FOREST THE TREES | Overall Objective or Industry Standard | Score Levels | | | Knoxville Today | |
|--|---|---|---|---|---|--|
| | | Low | Moderate | Good | | |
| Urban Tree Canopy Cover | Achieve the desired tree canopy cover according to goals set for the entire city and neighborhoods. | No goals are set or tree canopy cover is not on a trajectory to achieving goal. | Canopy is somewhat stable, though not on a trajectory to achieving the established goal. | Canopy goal is achieved or well on the way to achievement. | No canopy goal is currently in place in Knoxville. 38% of Knoxville is covered by tree canopy as of 2018. This is decrease in overall canopy cover from 40% in 2008 (net loss of 732 acres). | |
| Equitable Distribution of Canopy | Ensure that the benefits of tree canopy are available to all, especially for those most vulnerable within the community. Achieve low variation between tree canopy and equity factors citywide by neighborhood. | Tree canopy is not equitably distributed across the community. | Tree canopy is moderately distributed across the community. | Tree canopy is equitable in distribution across the community. | Tree canopy across Knoxville neighborhoods range greatly, from 5% to 63%. 25 of the 60 neighborhoods fall below the citywide average. | |
| Streets/Parks (public) | Age/Size Distribution | No data is available OR size distribution does not align with ideal. Young 0-6" DBH: 40% Establishing 7-17" DBH: 30% Maturing 18-24" DBH: 20% Mature Over 24" DBH: 10% | City Level - Size distribution generally follows the ideal. Neighborhood Level - Size distribution generally follows the ideal OR neighborhood level data are not available. | Size distribution follows the ideal recommendation at both city-wide and at the neighborhood level. | Age distribution of inventoried trees shows lower than ideal quantities of maturing and mature trees. Trees by management zone show the same trend in general. | |
| | Condition | No current information is available on tree condition or risk. | Information from a partial or sample or inventory is used to assess tree condition and risk. | Information from a current, GIS-based, 100% complete public tree inventory is used to indicate tree condition and risk. | Condition of public trees in Knoxville is complete and used to manage risk. | |
| | Diversity / Post Vulnerability | To manage a sustainable tree population that is resilient to pests, establish a genetically diverse population across the entire city and for each neighborhood. Industry standards recommend that no more than 30% of any family, 20% of any genus, or 10% of any species dominate the urban forest. Newer standards are recommending no more than 5% of any species." | Data is not available or tree population does not follow the recommended industry standard citywide. | Only one level (family, genus, species) is following recommended standards at citywide or neighborhood levels. | The industry standard recommending no more than 30% of any family, 20% of any genus, or 10% of any species has been met at the citywide or neighborhood levels.. | Public trees do not exceed the recommended diversity threshold for species, genus and family. Trees by management zone show the same trend as well. |
| | Suitability - Overhead | Trees have room to above ground (trunk, canopy) grow safely, fully, and for the long term, providing the maximum services to the community. | Data is unavailable OR less than 50% are considered suitable. | 50% to 75% of trees are considered suitable OR only partial data is available. | More than 75% of trees are considered suitable. | Data is not collected on existing conflicts with overhead utilities. |
| | Suitability - Ground Level | Trees have room to below ground (roots, soil) to grow safely, fully, and for the long term, providing the maximum services to the community. | Data is unavailable OR less than 50% are considered suitable. | 50% to 75% of trees are considered suitable OR only partial data is available. | More than 75% of trees are considered suitable. | Data is not collected on existing conflicts with hardscape or underground utilities. |
| | | Trees have the potential to provide | | Equity of tree cover | | |

| KNOXVILLE (TN) | | Assessed Score | | | |
|--|--|--------------------------------|---------|------|--|
| | | Low | Mod. | Good | |
| The Trees | Indicators of a Sustainable Urban Forest | | | | |
| | Urban Tree Canopy Cover | | | | |
| | Equitable Distribution | | | | |
| | Streets & Parks (public) | Age/Size Distribution | | | |
| | | Condition | | | |
| | | Diversity / Post Vulnerability | | | |
| | | Suitability - Overhead | No data | | |
| | | Suitability - Ground Level | No data | | |
| | | Suitability - Soil Conditions | No data | | |
| | Suitability - Invasives | | | | |
| | Suitability - Climate Adaptability | | | | |
| | Natural Areas / Woodlands (public or private) | Age/Size Distribution | No data | | |
| | | Condition | No data | | |
| | | Diversity / Post Vulnerability | No data | | |
| | | Suitability - Overhead | No data | | |
| | | Suitability - Ground Level | No data | | |
| | | Suitability - Soil Conditions | No data | | |
| | Suitability - Invasives | TBD | | | |
| Suitability - Climate Adaptability | No data | | | | |
| All Other Lands (primarily private) | Age/Size Distribution | No data | | | |
| | Condition | No data | | | |
| | Diversity / Post Vulnerability | No data | | | |
| | Suitability - Overhead | No data | | | |
| | Suitability - Ground Level | No data | | | |
| | Suitability - Soil Conditions | No data | | | |
| Suitability - Invasives | No data | | | | |
| Suitability - Climate Adaptability | No data | | | | |
| The Players | Neighborhood Action | | | | |
| | Large Landholder Involvement | | | | |
| | Green Industry Involvement | | | | |
| | City Department/Agency Cooperation | | | | |
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| The Mgmt Approach | Utility Engagement | | | | |
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| | Tree Inventory | | | | |
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| | Management Plan | | | | |
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| Tree Protection Policy | | | | | |
| City Staffing and Equipment | | | | | |
| Funding | | | | | |
| Disaster Preparedness & Response | | | | | |
| Communications | | | | | |



Today's Topic: Trees

Data on the Trees Themselves

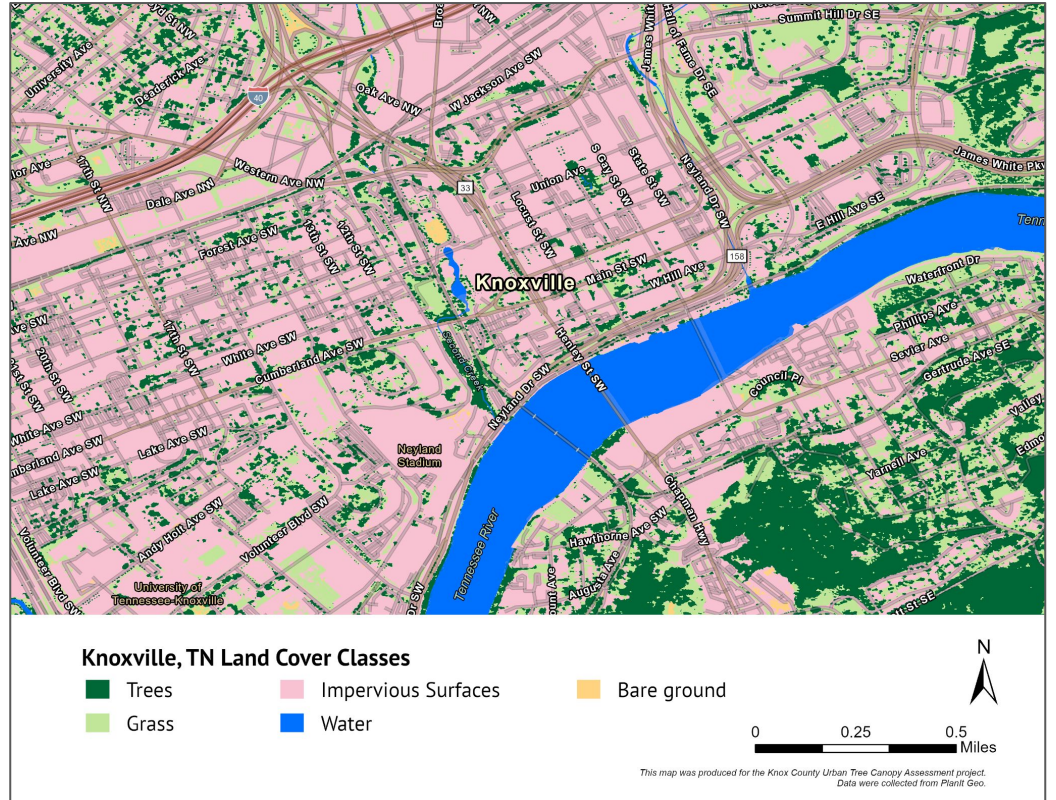
Indicator 1: Tree Canopy Cover

Objective: To achieve set goals.

What is tree canopy cover? amount of land covered by trees (during summer when leaves are out) as seen from above.

How is it measured? **Five land classes:**

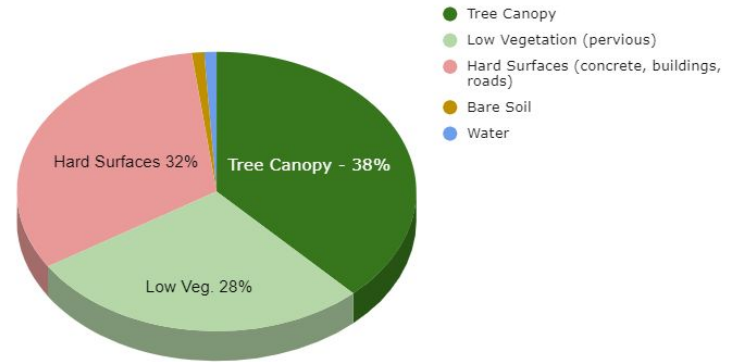
- Tree Canopy
- Low Vegetation (lawns, shrubs)
- Hard Surfaces (concrete, buildings, roads, anything that is Impervious to water)
- Water
- Bare Soil (ag. fields, ball fields, construction, desert)



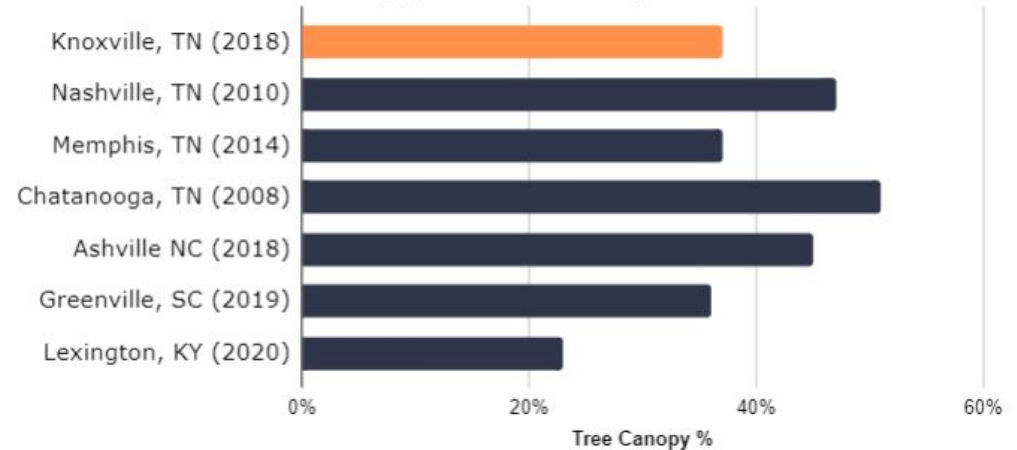
Indicator 1: Tree Canopy Cover

Objective: To achieve set goals.

- 38% Tree Canopy Cover in Knoxville (as of 2018)
- Down from 40% in 2008.
- No canopy goal in place currently.
- $\frac{3}{4}$ on private lands.



Tree Canopy Cover Comparisons

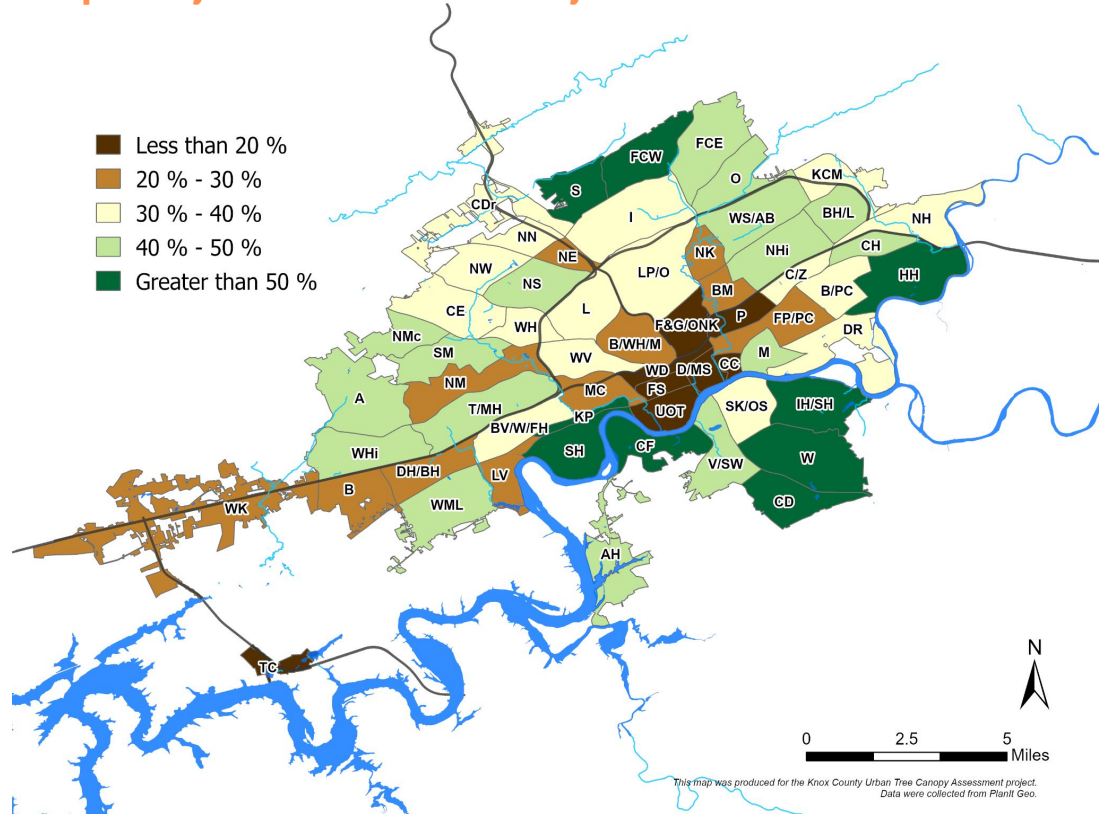


Indicator 2: Location Tree Canopy Cover (distribution)

Objective: Is the tree canopy distributed equitably across the community?

Percent of tree canopy cover in Knoxville neighborhoods ranges from 5% to 63%.

25 of the 60 neighborhoods fall below the citywide average.



This map was produced for the Knox County Urban Tree Canopy Assessment project. Data were collected from PlanIt Geo.

Indicator 2: Location Tree Canopy Cover (distribution)

Objective: Is the tree canopy distributed equitably across the community?

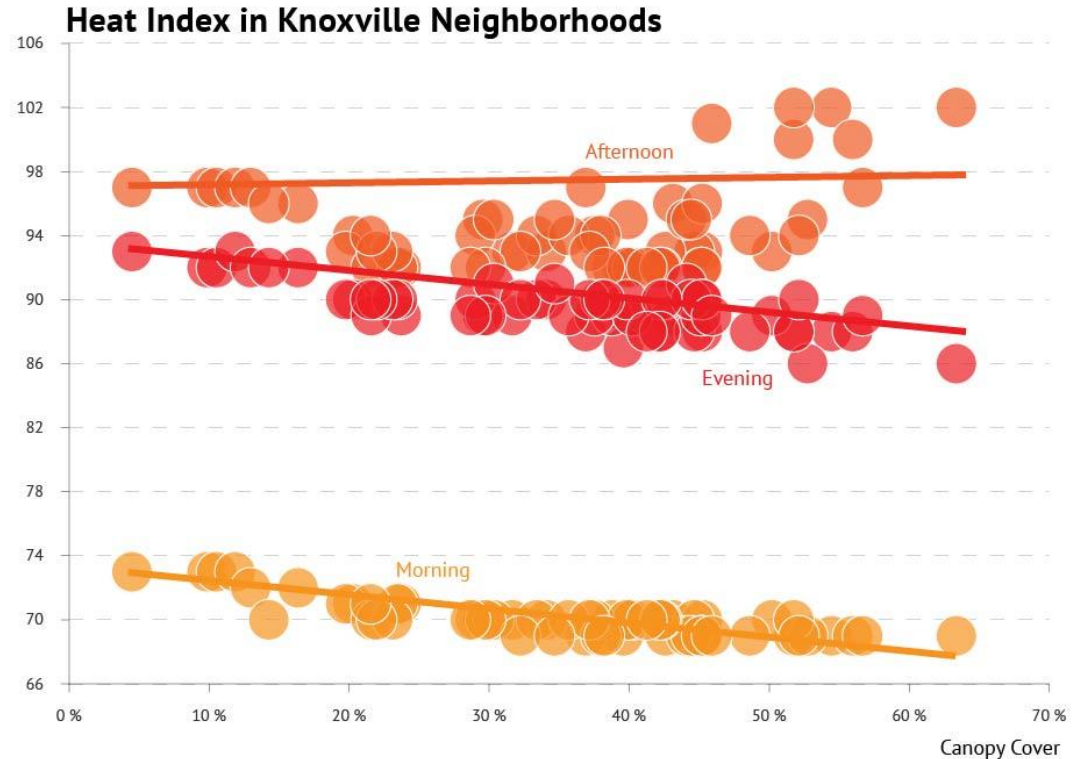
Heat is higher overall and longer lasting in low canopied neighborhoods.

Higher income, higher canopy.

Areas redlined in 1930s based on race and poverty have lower canopy.

Areas of lower canopy also often have higher concrete (impervious surfaces)

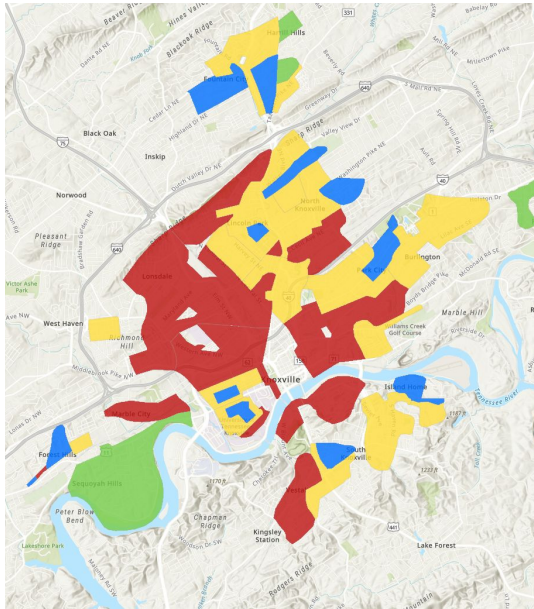
High canopy is not high quality.



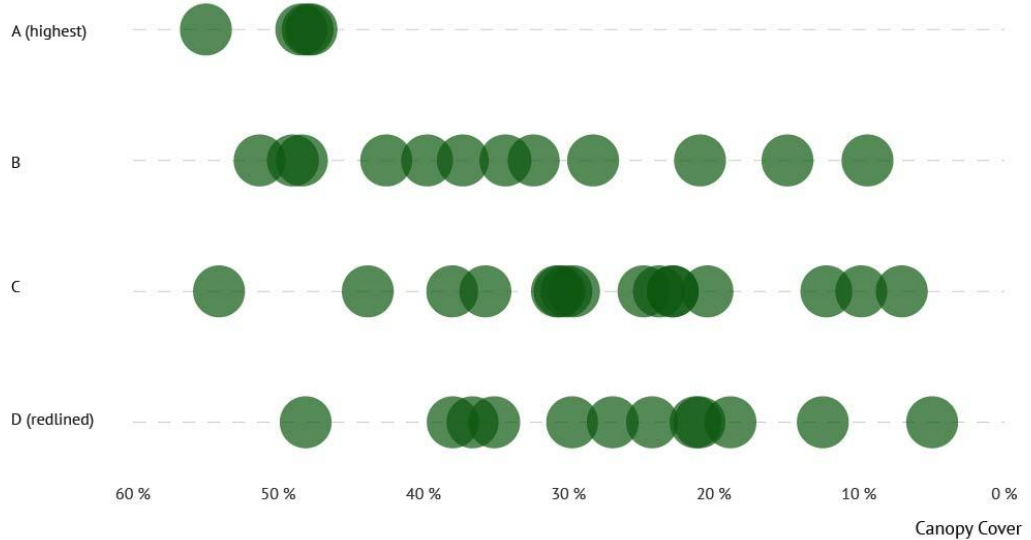
Indicator 2: Location Tree Canopy Cover (distribution)

Objective: Is the tree canopy distributed equitably across the community?

Areas redlined in 1930s-1960s based on race and poverty have lower canopy. A - green, B - blue, C - yellow, D red.



Percent Tree Canopy in Redlining Districts, Knoxville, TN

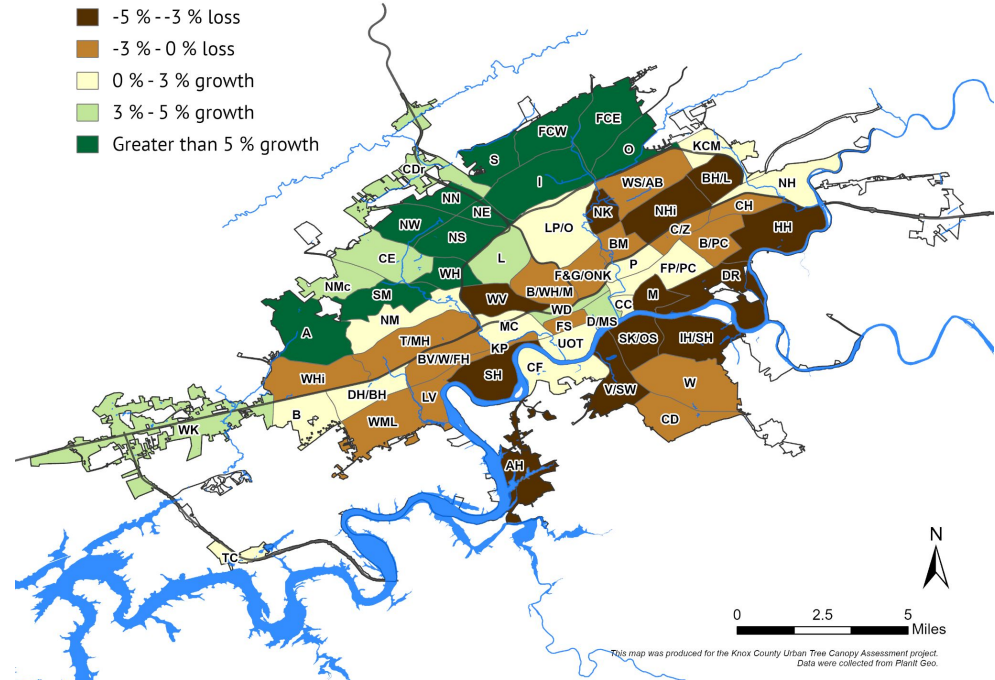


Indicator 2: Location Tree Canopy Cover (distribution)

Objective: Is the tree canopy distributed equitably across the community?

Gains occurred in 19 neighborhoods

Losses occurred in 41 neighborhoods



Remaining Indicators

Indicators on Individual Trees

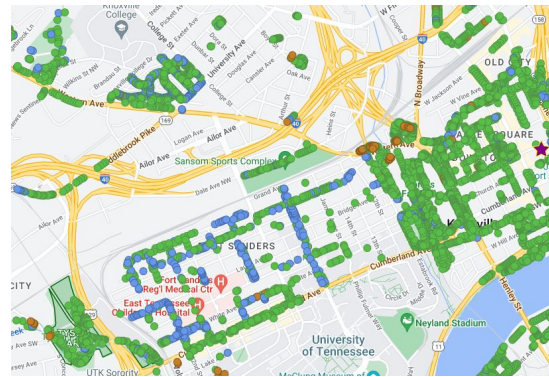
3. Tree Age (size)
4. Condition
5. Diversity (vulnerability)
6. Suitability - Overhead
7. Suitability - Ground Level
8. Suitability - Soils
9. Suitability - Invasives
10. Suitability - Climate Adaptation

Data Sources:

Streets/Parks: 25,000+ public trees inventoried, 5 management zones (City)

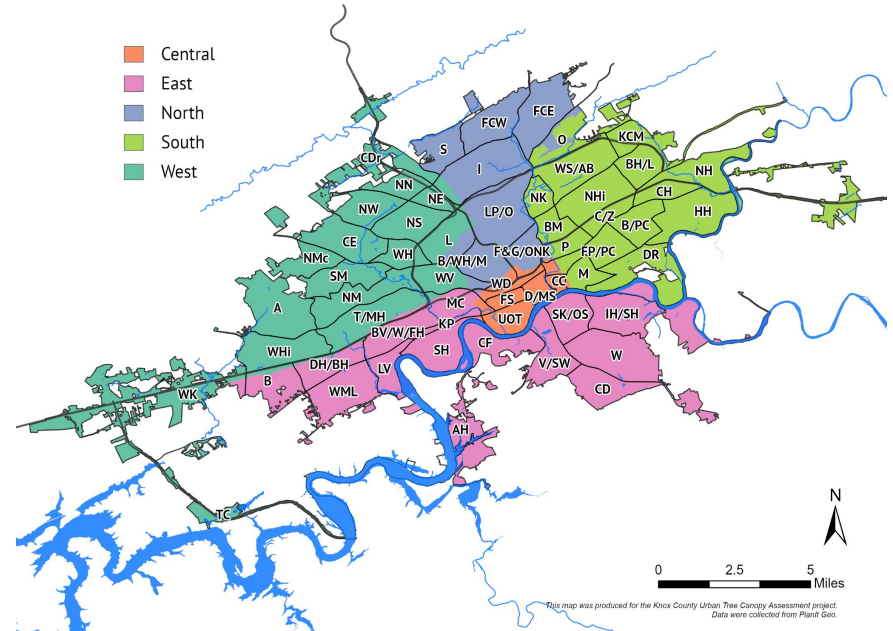
Natural Areas/Woodlands: Lacking data on woodlands and trees on private property.

All Other Lands: Mostly privately owned



25,000+ public trees inventoried

Grouped into 5 management zones.



Other Data Sources

Woodlands, Private Lands.

Why?

1. **Diversity / Resilience to disease**
2. **Invasives**
3. **Future canopy** (sustainability & resilience)

No data set available.



Syracuse

1.5 million trees (99 trees per acre) according to sampling study.
Most common species: European buckthorn, sugar maple, tree-of-heaven. 36% invasives

Vacant lot urban forests are low quality, not resilient

Dumping on vacant lot

Hazardous Trees

Red lining = vacant lots

City owned vacant lot portfolio:

- 1,000+ parcels and growing
- 5,749 acres in city ownership

Future Vacant Lot

A sea of buckthorn

The collage consists of several images and text boxes. At the top left, a photo shows a vacant lot with a large pile of trash and debris, labeled 'Dumping on vacant lot'. To its right, a photo shows a dense, overgrown area with tall, thin trees, labeled 'Hazardous Trees'. Below these, a photo shows a yellow excavator demolishing a building, labeled 'Future Vacant Lot'. To the right of this is a red text box with white text: 'Red lining = vacant lots' and 'City owned vacant lot portfolio: • 1,000+ parcels and growing • 5,749 acres in city ownership'. At the bottom right, a photo shows a large area of water with many bare, tangled tree branches protruding from it, labeled 'A sea of buckthorn'.

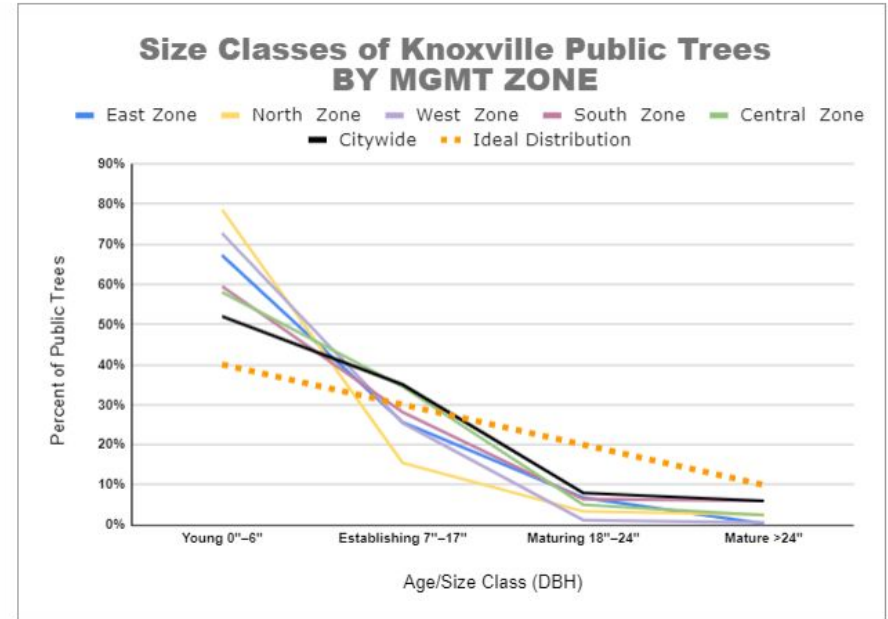
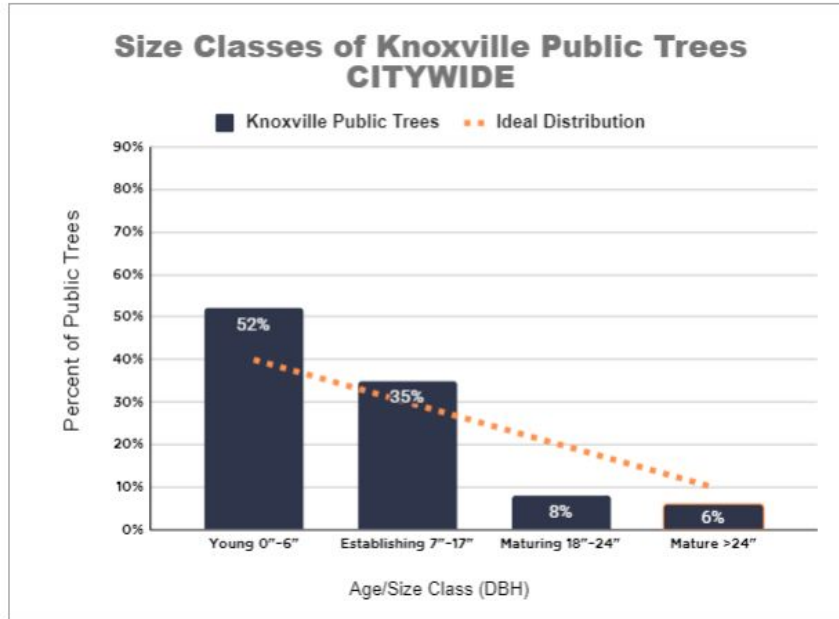
Indicator 3: Age (size) Distribution

Objective: Is there a diverse mix of tree ages in Knoxville?

Ideal standard:

- 40% young (0"-6" DBH),
- 30% establishing (7"-17" DBH)
- 20% maturing (18"-24" DBH)
- 10% mature (over 24" DBH).

WHY? Important to long term sustainability to maintain flow of urban forest benefits over time.



Indicator 4: Condition / Risk

Objective: Is there accurate information condition of trees in Knoxville?

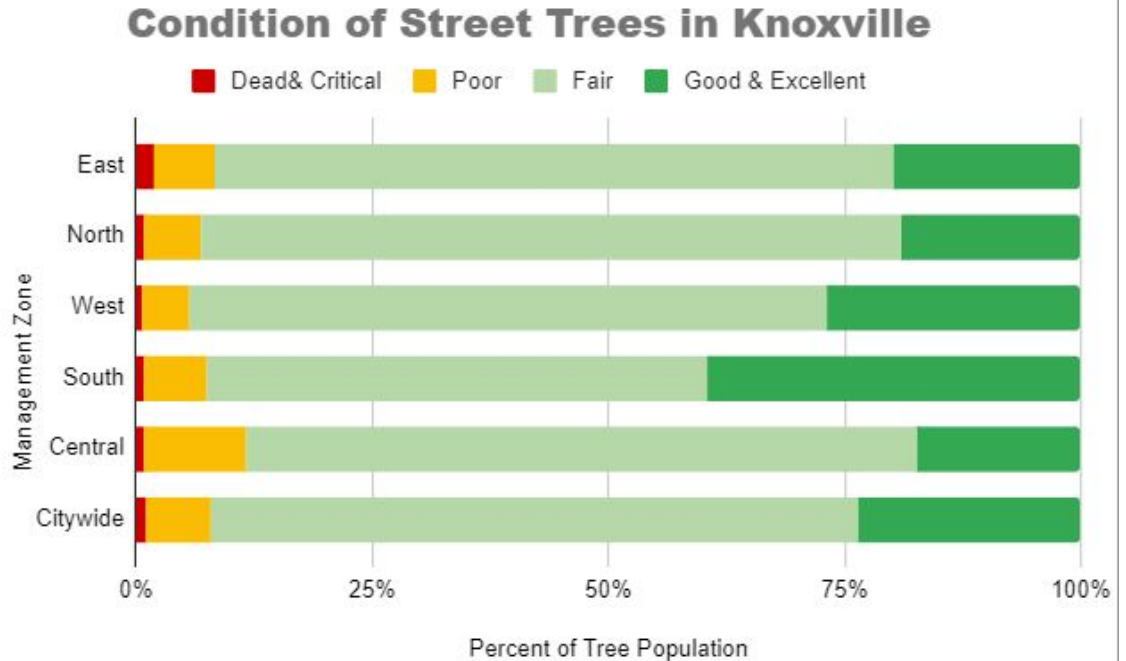
Why? Important indicators of:

1) risk to public

2) future canopy (sustainability & resilience).

Knoxville has a complete inventory that is updated on an ongoing basis (5 year cycle).

Knowledge of condition is current and risk is actively managed.



Indicator 4: Condition / Risk

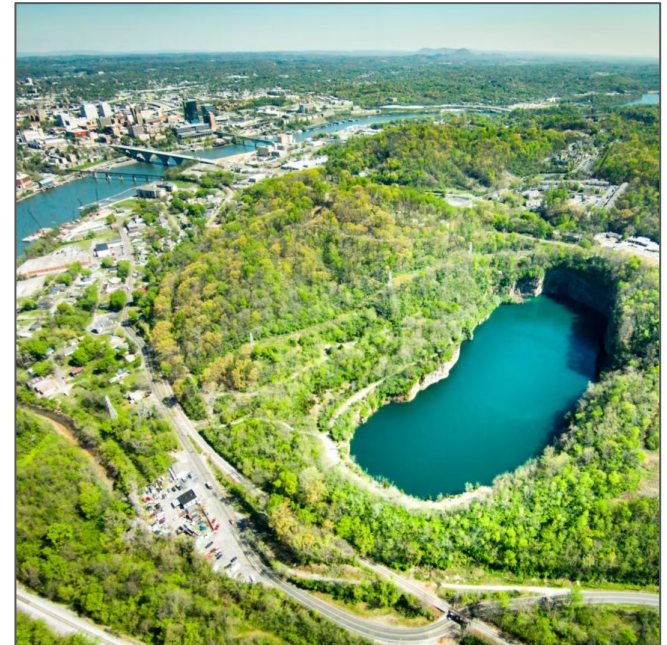
Objective: Is there accurate information condition of trees in Knoxville?

Woodlands. : Possess a detailed understanding of the ecological structure and function of all natural areas. Why?

1. **Ecosystem health**
2. **Invasives**
3. **Future canopy** (sustainability & resilience).

Limited data is available on makeup and condition of woodlands in Knoxville.

However, is it known (anecdotally) that quantity of invasives are significant and a threat to trees and ecosystems in naturalized areas in Knoxville region.



Indicator 5: Diversity / Vulnerability

Objective: Is there a diverse tree population?

Why? Maintaining a sustainable tree population that is resilient to pests & diseases and climate changes.

Ex.

FAMILY: Sapindaceae / Aceraceae

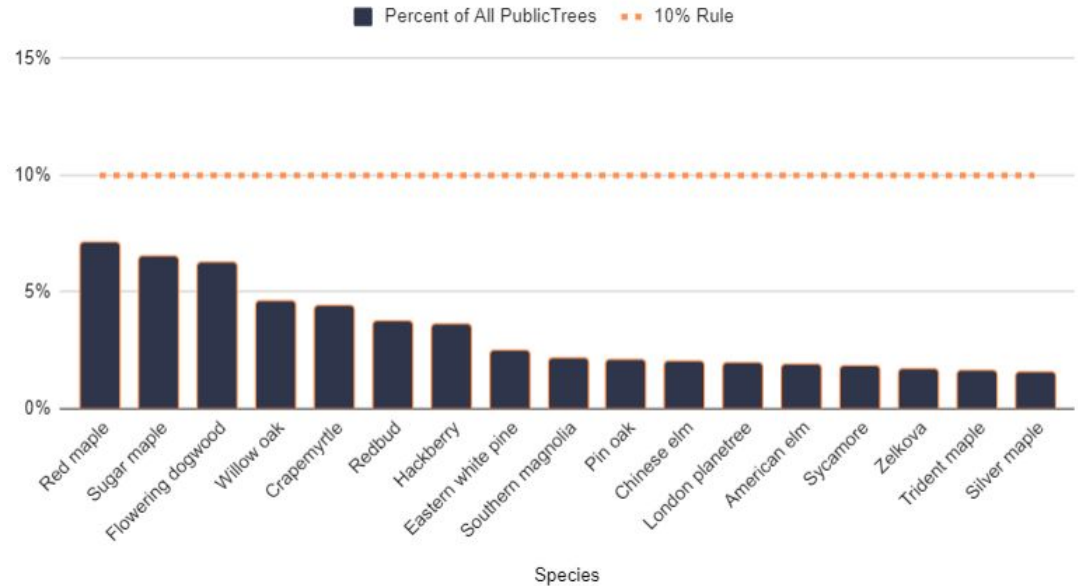
GENUS: Maples

SPECIES: Red maple

Ideal standard: No more than 10% of any one species (e.g. red maple), 20% of any one genus (e.g. Acer / maple), 30% of any one family (e.g. Sapindaceae)

No threshold is exceed - both citywide and by management zone.

Knoxville Public Tree SPECIES Diversity



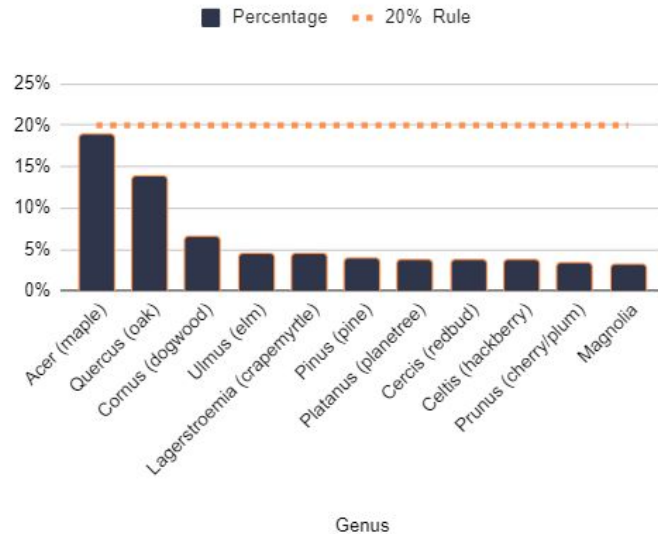
Indicator 5: Diversity / Vulnerability

Objective: Is there a diverse population across the entire city and for each neighborhood?

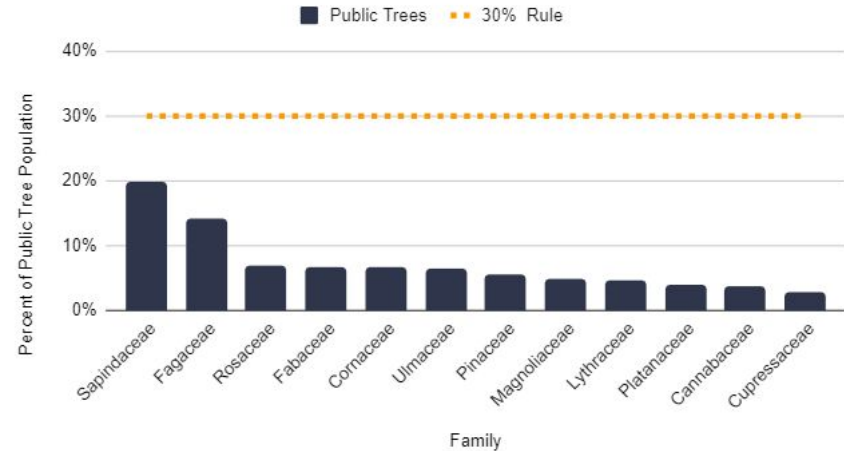
Why? Maintaining a sustainable tree population that is resilient to pests & diseases and climate changes.

Ideal standard: No more than 10% of any one species (e.g. red maple), 20% of any one genus (e.g. Acer / maple), 30% of any one family (e.g. Sapindaceae)

Knoxville Public Tree Genus Diversity



Knoxville Public Tree Family Diversity



Next Indicators: Suitability

Objective: Are Knoxville trees suited to their environment?

How suitable are tree sites to support its long-term survival? An indicator of resilience and sustainability.

- 6. Space Above - Overhead Utilities**
- 7. Space Below - Hardscape & Utility Conflicts**
- 8. Soil Conditions**
- 9. Invasive Species**
- 10. Climate Change Adaptation**



Indicator 6: Suitability - Space Above

Space above for healthy, long-lived trees.



Do the trees in place currently have suitable space above to grow?

YES: Small ornamental trees planted under power lines, or no above power lines present.

NO: Large shade trees planted under power lines.

No data available currently to quantify percentage of “right tree, right place.”.



Indicator 7: Suitability - Space Below

Space at or below ground for healthy, long-lived trees.

Do the trees in place currently have suitable space at ground level to grow?

Competition for space with sidewalks and utilities.

No data available currently on:

- Existing conflicts with hardscape at the ground level.
- Utility conflict data and soil volumes are not available.



Indicator 8: Suitability - Soil Conditions

The needed soils for healthy, long-lived trees.

Pollutants, compaction, soil volume all effect long term health of trees.

Data not currently available.



Image: Arbor Day Foundation

Indicator 9: Suitability - Invasives

Minimal existence of invasives to allow growth and longevity of trees.

Streets/parks inventory shows just over 2% of inventory are invasive, most of which is callery pears, followed by Tree of Heaven.

Invasives in urban wilderness and private lands are known to be prevalent, choking existing trees.

- bush honeysuckle,
- privet,
- kudzu,
- multiflora rose,
- and many others...



Indicator 10: Suitability - Climate Adaptation

Trees that will persist or thrive as the climate warms.

24% of public inventoried trees expected **to fare better over the next 100** years due to climate change.

- willow oak (5% of public trees today)
- common hackberry (4%)
- Southern magnolia (2%)
- American elm (2%)
- Eastern redcedar (1.3%)
- boxelder maple (1.2%)
- American sweetgum(1.0%)
- black cherry(1.0%)
- river birch (0.9%)
- black gum (0.7%)
- ...remaining list on handout.

23% of public inventoried trees expected to **decline over the next 100** years due to climate change.

- red maple (7% of public trees today)
- sugar maple (7%)
- Eastern redbud (4%)
- silver maple(2%)
- tulip poplar (1.4%)
- serviceberry (0.5%)
- Eastern hemlock (0.5%)
- black locust (0.4%)
- Virginia pine (0.4%)
- scarlet oak (0.3%)
- ...remaining list on handout.

Tree Species that may find new habitat within the Region: florida maple, black hickory, black ash, swamp tupelo, ashe juniper, slash pine, bluejack oak, laurel oak, live oak, gum bumelia, & cedar elm



Your turn.

Three Group Discussions

Discussion 1: Priorities & Goals (30 mins)

Discussion 2: Challenges (30 mins)

Discussion 3: Solutions / Ideas (30 mins)



1. Priorities & Goals

(20 minute group discussion, 10 minute report back)

Where do we want to be? What does success look like? What are our future goals and priorities? What does your neighborhood look like on that day you can say “We did it.”

Plan to have at least 3 goals or priorities to report back!



2. Challenges

(15 minute group discussion, 10 minute report back)

We've just heard some top goals/priorities from the group. How do we get there? What other challenges are we likely to face in reaching these goals?

DO NOT PROBLEM SOLVE YET!

Plan to have at least 3 challenges to report back!



3. Getting There

(15 minute group discussion, 10 minute report back)

Start to brainstorm on solutions to some of the challenges you've heard. Resources we could be utilizing better. Start thinking about options.

Plan to have at least 3 ideas or concepts to report back!

Next Steps

Homework

1. **Additional Comments**
 - a. Turn in paper comment form
 - b. rachel@urbancanopyworks.com

2. **Next Workshops**
 - a. Workshop #2: Mar. 23rd, 8-10 am
 - b. Workshop #3: Apr. 20th, 8-10 am

3. **Engage your Network**
 - a. Invite Us Over! (available through July)
 - b. Spread the Word
 - i. About the Project
www.KnoxvilleTreePlan.org
 - ii. Give Input:
 1. Online input form (on website)
 2. Public Events TBA

KNOXVILLE
URBAN FOREST MASTER PLAN

Home UFMP Process About Knoxville Trees Plan Updates Get Involved You Tell Us

**KNOXVILLE
URBAN
FOREST
MASTER PLAN**

Knoxville is investing in trees for the long term.

Trees and tree canopy play a very significant role as city infrastructure in Knoxville, especially as we face the impacts of climate change.

Trees are one of the best ways to reduce the heat island effect and air pollution, which together have huge impacts on public health. Trees also play a key role in intercepting stormwater to prevent flooding and water pollution, and can improve quality of life in many other ways.

NEXT UP

Community Kick Off Event Success!
The community project kick-off event was a success with almost 100 attendees braving the rainy weather to...

However, the tree canopy in Knoxville has seen a lot of changes in the last decade, and is