Urban Forest Master Plans & Urban Tree Canopy Analysis

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Georgia Planning Association
September 7, 2018
What is an Urban Forest Master Plan?

An Urban Forest Master Plan is a road map, providing detailed information, recommendations and resources needed to effectively and proactively manage and grow a city's tree canopy.
Management Plan VS. Master Plan

<table>
<thead>
<tr>
<th></th>
<th>Management Plan</th>
<th>Master Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tree Population (Data)</td>
<td>Public (Streets &amp; Parks)</td>
<td>Public &amp; Private</td>
</tr>
<tr>
<td>People</td>
<td>City Staff</td>
<td>All Stakeholders</td>
</tr>
<tr>
<td>Goals</td>
<td>Proactive Maintenance</td>
<td>Shared Vision</td>
</tr>
<tr>
<td>Creation Timeframe</td>
<td>4 – 6 weeks</td>
<td>9 – 12 months</td>
</tr>
<tr>
<td>Implementation Timeframe</td>
<td>5 – 10 years</td>
<td>10 – 20 years</td>
</tr>
<tr>
<td>Costs</td>
<td>$3,000 - $10,000</td>
<td>$25,000 - $150,000</td>
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URBAN FOREST PROGRAM CONTINUUM™

STAY ON TRACK FOR SUSTAINABLE GROWTH

Below are the steps that urban forest programs take to create and maintain the healthiest and most resilient urban forest possible. Each component creates a strong foundation of strategic planning, program funding, and community support which results in thriving urban forests.

DEDICATED COMMITMENT
- Certified Arborist Staff
- Annual Level 1 Assessments

TREE CITY USA
- Tree Board
- Funding
- Ordinance

TREERENT INVENTORY
- Inventory Updating
- Goal Setting

FUNDED PROGRAM
- Urban Forest Management Plan
- Proactive Maintenance

URBAN FOREST MASTER PLAN
- 20-year Vision
- Urban Tree Canopy Analysis
- Stakeholder Input

- 10 Year Cycle
- 5 Year Cycle

DAVEY RESOURCE GROUP
A Division of The Davey Tree Expert Company
So Why Do You Need One?

- To proactively address growing environmental challenges
- To practice and model cooperation and efficiency
- To create clear goals and baseline metrics for the entire urban forest
- To foster long-term advocates and increase civic participation in the preservation of our urban forest
- To create a coordinated vision
Why Pittsburgh needed a plan

<table>
<thead>
<tr>
<th>City</th>
<th>Planting Budget</th>
<th>Total Annual Street Tree Expenditure</th>
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<tbody>
<tr>
<td>Pittsburgh</td>
<td>$0</td>
<td>$816,400</td>
</tr>
<tr>
<td>New York City</td>
<td>$8,160,000</td>
<td>$21,774,576</td>
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<tr>
<td>Minneapolis</td>
<td>$223,855</td>
<td>$9,209,041</td>
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<tr>
<td>Charlotte</td>
<td>$180,000</td>
<td>$1,819,460</td>
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<tr>
<td>Charleston</td>
<td>$109,125</td>
<td>$531,200</td>
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</table>
The planning process

- Steering Committee
- Existing reports and data
- Public outreach and surveys
- State of the Urban Forest report
- The audience and layout of the plan
- Reviewing other cities urban forest master plans
Create a Steering Committee

**Steering Committee Member Organizations**

- Tree Pittsburgh
- Pittsburgh Shade Tree Commission
- City Forester, City of Pittsburgh
- Pittsburgh Shade Tree Commission
- Western Pennsylvania Conservancy, TreeVitalize Pittsburgh
- Pittsburgh Parks Conservancy
- Department of City Planning, City of Pittsburgh
- Duquesne Light
- The Pennsylvania State University
- Urban Redevelopment Authority of Pittsburgh
- Western Pennsylvania Conservancy
- Pennsylvania Department of Conservation and Natural Resources, Bureau of Forestry
- Davey Resource Group
- Allegheny County Sanitary Authority (ALCOSAN)
- Pennsylvania Environmental Council
- Remaking Cities Institute, Carnegie Mellon University
- Pittsburgh Community Reinvestment Group
- USDA Forest Service
Adaptive Management

• Urban Forestry: Planning and Managing Urban Greenspaces

• ufmp Toolkit.net
  • Inland Urban Forest Council

What Do We Have?
What Do We Want?
How Are We Doing?
How Do We Get There?
Criteria & Indicators

- **Criteria and Indicators for Sustainable Urban Forest Planning and Management**

- **The Sustainable Urban Forest, a Step-by-Step Approach**
  - USDA Forest Service and The Davey Tree Expert Company, 2016
Vibrant cities cultivate thriving urban forests that boost public health, safety, sustainability, and economic growth.

MAKE THE CASE
Evidence keeps growing — see research data and real examples of trees’ impact.

MAKE IT HAPPEN
Get started in your own community with the Urban Forestry Toolkit.
Urban Forestry Toolkit
The U.S. Forest Service Step-by-Step Guide to Implementing Urban Forestry in Your Community

Assess | Prioritize | Organize | Plan | Build | Sustain

1. Begin With Urban Tree Canopy
2. Street Tree Inventory
3. Benefits Of Your Trees
The Cleveland Tree Plan

Collaborating to Rebuild The Forest City

August 2015

Prepared for:
The Cleveland Forest Coalition
City of Cleveland
Cleveland Neighborhood Progress
Holden Arboretum
LAND Studio
Western Reserve Land Conservancy/Thriving Communities Institute

Prepared by:
Davey Resource Group
A Division of The Davey Tree Expert Company
1500 North Main Street
Kent, Ohio 44240
800-828-8312
WHAT DO WE HAVE?

State of the Urban Forest

- Existing reports + data
- Benchmarks
- Structure, Function, and Value
- Public outreach
Cleveland was assessed on 25 indicators of a sustainable urban forest, categorized into three groups: the trees, the players, and the management approach. Each indicator was given a Low, Moderate, or Good performance rating. Cleveland was found to rate in the Low performance level in more than 18 (70%) of the indicators, shown in Table 2.

The Trees: Low Performance Level. There is a lack of accurate data on the public trees in Cleveland, which creates difficulties in management, budgeting, and most importantly, ensuring public safety. The City Urban Forestry Division inspects 8,000–9,000 trees annually, but the lack of comprehensive information makes data-driven decision making very difficult. There is, however, an accurate assessment of overall canopy cover rates from a 2013 Cuyahoga County urban tree canopy assessment.

The Players: Low-Moderate Performance Level. A number of non-profit organizations and volunteers are eager for involvement, and some tree planting, stewardship, and other short-term funding and programs are in place. However, most have been working independently and without a unified vision, thus inefficiently in terms of making significant progress city-wide. The city has multiple departments working within the urban forest, but coordination efforts are minimal and goals for each department differ. City budgets are stretched thin and trees are not a priority. The public often views trees as a nuisance because of the perception that they cause significant damage. While players are in place, the unified vision and common goals are lacking.

The Management Approach: Low-Moderate Performance Level. The lack of a comprehensive and fully updated tree inventory affects almost every indicator in this category, causing low performance ratings. Although efforts have been made in recent years to revise and improve preservation and installation practices, revisions have not been incorporated into the relevant city code and development specifications. Tree protection policies and installation guidelines are outdated and without enforcement penalties. The city has a significant backlog in tree maintenance, lacks adequate funding to catch up, and is operating in a reactive manner only. Planting is relatively ad hoc and is not planned around equitable distribution of trees across the city.

<table>
<thead>
<tr>
<th>Indicators of a Sustainable Urban Forest</th>
<th>Assessed Performance Level (green)</th>
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<tbody>
<tr>
<td>Tree Canopy</td>
<td>Low</td>
</tr>
<tr>
<td>Size/Age Distribution</td>
<td>Mod.</td>
</tr>
<tr>
<td>Condition of Public Trees - Streets, Parks</td>
<td>Good</td>
</tr>
<tr>
<td>Condition of Public Trees - Natural Areas</td>
<td>Mod.</td>
</tr>
<tr>
<td>Species Diversity</td>
<td>Low</td>
</tr>
<tr>
<td>Species Suitability</td>
<td>Low</td>
</tr>
<tr>
<td>Neighborhood Action</td>
<td>Low</td>
</tr>
<tr>
<td>Large Private Landholder Involvement</td>
<td>Mod.</td>
</tr>
<tr>
<td>Green Industry Involvement</td>
<td>Good</td>
</tr>
<tr>
<td>City Department/Agency Cooperation</td>
<td>Low</td>
</tr>
<tr>
<td>Funder Engagement</td>
<td>Mod.</td>
</tr>
<tr>
<td>Utility Engagement</td>
<td>Low</td>
</tr>
<tr>
<td>Public Awareness</td>
<td>Low</td>
</tr>
<tr>
<td>Regional Collaboration</td>
<td>Mod.</td>
</tr>
<tr>
<td>Tree Inventory</td>
<td>Low</td>
</tr>
<tr>
<td>Canopy Assessment</td>
<td>Mod.</td>
</tr>
<tr>
<td>Equitable Distribution</td>
<td>Mod.</td>
</tr>
<tr>
<td>Management Plan</td>
<td>Low</td>
</tr>
<tr>
<td>Risk Management Program</td>
<td>Low</td>
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<tr>
<td>Maintenance Program - Streets, Parks</td>
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<tr>
<td>Maintenance Program - Natural Areas</td>
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<tr>
<td>Planting Program</td>
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<td>Tree Protection Policy</td>
<td>Low</td>
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<tr>
<td>City Staffing &amp; Equipment</td>
<td>Mod.</td>
</tr>
<tr>
<td>Funding</td>
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Oak, Pin at 408 S Glenwood Ave

<table>
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<tr>
<th>Address</th>
<th>408</th>
</tr>
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<tbody>
<tr>
<td>Street</td>
<td>S Glenwood Ave</td>
</tr>
<tr>
<td>Site</td>
<td>1</td>
</tr>
<tr>
<td>From Street</td>
<td>Dead End</td>
</tr>
<tr>
<td>X</td>
<td>1683869.1</td>
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<td>Target Neighborhood</td>
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<tr>
<td>Growing Space Type</td>
<td>Tree Lawn/Parkway</td>
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<td>Aboveground Utilities</td>
<td>No</td>
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<td>Clearance Requirements</td>
<td>None needed</td>
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<tr>
<td>Last Changed Date</td>
<td>09/08/2017</td>
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<tr>
<td>Last Changed By</td>
<td>Deb Sheeler (DRG)</td>
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Tree

<table>
<thead>
<tr>
<th>Suffix</th>
<th>Side</th>
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<tbody>
<tr>
<td></td>
<td>Front</td>
</tr>
<tr>
<td>On Street</td>
<td>S Glenwood Ave</td>
</tr>
<tr>
<td>To Street</td>
<td>W Stewart Rd</td>
</tr>
<tr>
<td>Y</td>
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<td>Site ID</td>
<td>11429</td>
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<tr>
<td>Ward</td>
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</tr>
<tr>
<td>ROW</td>
<td>0</td>
</tr>
<tr>
<td>Growing Space Size</td>
<td>6</td>
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<tr>
<td>Hardscape Damage</td>
<td>Sidewalk</td>
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<td>Comments</td>
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<td>Last Changed Time</td>
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</tbody>
</table>
Functional Tree Benefits

- $262,000 Carbon Sequestration
- $3.75 million Pollution Removal
- $3.22 million Energy & Carbon
- Total $7,232,000
<table>
<thead>
<tr>
<th>Neighborhood</th>
<th>% Possible Tree Canopy</th>
</tr>
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<tbody>
<tr>
<td>Allegheny Center</td>
<td>20%</td>
</tr>
<tr>
<td>Allegheny West</td>
<td>28%</td>
</tr>
<tr>
<td>Allentown</td>
<td>31%</td>
</tr>
<tr>
<td>Arlington</td>
<td>33%</td>
</tr>
<tr>
<td>Arlington Heights</td>
<td>28%</td>
</tr>
<tr>
<td>Banksville</td>
<td>21%</td>
</tr>
<tr>
<td>Bedford Dwellings</td>
<td>26%</td>
</tr>
<tr>
<td>Beechview</td>
<td>28%</td>
</tr>
<tr>
<td>Beltzhoover</td>
<td>29%</td>
</tr>
<tr>
<td>Bloomfield</td>
<td>38%</td>
</tr>
<tr>
<td>Bluff</td>
<td>36%</td>
</tr>
<tr>
<td>Bon Air</td>
<td>42%</td>
</tr>
<tr>
<td>Brighton Heights</td>
<td>19%</td>
</tr>
<tr>
<td>California-Kirkbride</td>
<td>26%</td>
</tr>
<tr>
<td>Carrick</td>
<td>29%</td>
</tr>
<tr>
<td>Central Business District</td>
<td>30%</td>
</tr>
<tr>
<td>Central Lawrenceville</td>
<td>23%</td>
</tr>
<tr>
<td>Central Northside</td>
<td>30%</td>
</tr>
<tr>
<td>Central Oakland</td>
<td>40%</td>
</tr>
<tr>
<td>Chartiers City</td>
<td>38%</td>
</tr>
<tr>
<td>Chateau</td>
<td>28%</td>
</tr>
<tr>
<td>Crafton Heights</td>
<td>47%</td>
</tr>
<tr>
<td>Crawford-Roberts</td>
<td>34%</td>
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<tr>
<td>Duquesne Heights</td>
<td>33%</td>
</tr>
<tr>
<td>East Allegheny</td>
<td>44%</td>
</tr>
<tr>
<td>East Carnegie</td>
<td>31%</td>
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<tr>
<td>East Hills</td>
<td>24%</td>
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<td>East Allegheny</td>
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<td>East Carnegie</td>
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<tr>
<td>East Hills</td>
<td>24%</td>
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<tr>
<td>East Liberty</td>
<td>35%</td>
</tr>
<tr>
<td>Elliott</td>
<td>37%</td>
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</tbody>
</table>

**Top 10 Neighborhoods Highest Percentage Canopy Cover**

<table>
<thead>
<tr>
<th>Neighborhood</th>
<th>% Possible Tree Canopy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allegheny Center</td>
<td>82%</td>
</tr>
<tr>
<td>Glen Hazel</td>
<td>81%</td>
</tr>
<tr>
<td>St. Clair</td>
<td>69%</td>
</tr>
<tr>
<td>New Homestead</td>
<td>67%</td>
</tr>
<tr>
<td>Perry North</td>
<td>64%</td>
</tr>
<tr>
<td>Spring Garden</td>
<td>63%</td>
</tr>
<tr>
<td>Regent Square</td>
<td>61%</td>
</tr>
<tr>
<td>Ridgemont</td>
<td>61%</td>
</tr>
<tr>
<td>Arlington Heights</td>
<td>60%</td>
</tr>
<tr>
<td>Oakwood</td>
<td>59%</td>
</tr>
</tbody>
</table>

**Bottom 10 Neighborhoods Lowest Percentage Canopy Cover**

<table>
<thead>
<tr>
<th>Neighborhood</th>
<th>% Possible Tree Canopy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chateau</td>
<td>5%</td>
</tr>
<tr>
<td>North Shore</td>
<td>7%</td>
</tr>
<tr>
<td>Central Business District</td>
<td>8%</td>
</tr>
<tr>
<td>Bluff</td>
<td>12%</td>
</tr>
<tr>
<td>Southside Flats</td>
<td>12%</td>
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<tr>
<td>Strip District</td>
<td>12%</td>
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<tr>
<td>East Allegheny</td>
<td>14%</td>
</tr>
<tr>
<td>Lower Lawrenceville</td>
<td>15%</td>
</tr>
<tr>
<td>Manchester</td>
<td>17%</td>
</tr>
<tr>
<td>Bloomfield</td>
<td>18%</td>
</tr>
</tbody>
</table>
WHAT DO WE WANT?
Outreach Campaign

• Steering Committee
• Departments
• Public Meetings
• Survey
• Review/Comment
Outreach Campaign

- Public Meetings
- Survey
- Review/Comment
Public Opinion

1,699 surveys completed
52% improve quality of life
10% lower energy bills
52% hardscape damage
2% trees cost too much
More trees
Better maintenance
64% more planting & protection
37% support 1% fee

Public Survey Questions

- Trees provide many benefits to our community. What are the most important to you?
- What problems do you encounter with public trees?
- What does Pittsburgh’s urban forest need the most?
- What would you be willing to do to ensure Pittsburgh’s trees are maintained and protected for future generations to come?
HOW DO WE GET THERE?
Vision, Goals + Objectives

OUR VISION & GOALS

CONNECT
- Connect urban forestry partners through a single vision
- Utilize urban forestry research with on-the-ground operations
- Increase access to trees so that all can enjoy

ENGAGE
- Focus on neighborhood-based initiatives and solutions to urban forestry issues
- Implement a coordinated and comprehensive outreach and educational campaign
- Encourage public and private participation in urban forest management through volunteerism

MANAGE
- Match funding to desired level of service for urban forestry management
- Develop a proactive management regime for public trees
- Implement a technically sound risk management program
- Expand tree benefits for future generations through a sustainable planting program

PLAN
- Establish a comprehensive tree emergency response and recovery plan
- Incorporate urban forestry practices into the City's stormwater management plan
- Achieve 60% urban tree canopy cover in 20 years

PROJECT
- Monitor the resource for exotic and invasive pests and diseases
- Protect trees and preserve their role in defining the City's character
PRESERVING AND ENHANCING CHARLOTTE'S URBAN FOREST
Charlotte Urban Forest Master Plan 2017

Help preserve and care for Charlotte's tree canopy.

Charlotte, North Carolina is proud to be known and valued for its vibrant urban tree canopy. When viewed from above, tree canopy covers 47% of the city, which makes Charlotte one of the highest canopy cities in the U.S. On top of the aesthetic benefits Charlotte's trees provide, the city receives over $335 million in real benefits and services from these trees every year.

Download the Charlotte Urban Forest Master Plan summary document (PDF format).
How YOU can get involved.

We need YOU. If you are interested in joining the team to help preserve the tree canopy in Charlotte, we want to hear from you. There are a number of ways to get involved (list below), and we will be working to add more options soon.

Help Plant Trees. TreesCharlotte hosts tree planting events from October to April, with a short break in January to avoid bad weather. Find out when the next planting is scheduled and join us.

Get Involved in Your Neighborhood. Are there tree activities currently going on in your neighborhood? Find out by getting in touch with us through the form below. If not, nominate your neighborhood for a community tree planting or stewardship event here. Cankerworm banding assistance is also provided to neighborhood groups through the city’s Neighborhood Services division. More neighborhood engagement options are anticipated as the implementation of this plan progresses.

Donate or sponsor a TreesCharlotte program (a 501(c)3 organization)
**SO WHAT NOW?**

In order to make any progress or reach any goal, the first step is defining what success looks like. How do we measure progress and success? Ultimately, every city must create its own definition and benchmarks for progress. However, based on study results and input from stakeholders, progress in Largo can be gauged by achieving higher canopy levels, gaining partnerships and public engagement to collaborate and share the workload, and making improvements in public tree management.

These three “missions” can be achieved through implementing 14 strategies:

**MISSION 1: INCREASE TREE CANOPY COVER AND ASSOCIATED BENEFITS**

**STRATEGY 1: SET A CANOPY GOAL**

Setting a tree canopy target creates a goal around which a community can rally. It should be set as a community and incorporated into both outreach efforts and city policy.

**STRATEGY 2: WORK TO ACHIEVE CANOPY GOAL THROUGH PRESERVATION**

Tree preservation is just as important to reaching a canopy goal as tree planting. Preservation efforts include improving the management of public trees, ensuring an effective tree protection policy is in place, and educating the community on tree care best practices.

**STRATEGY 3: WORK TO ACHIEVE CANOPY GOAL THROUGH PLANTING**

Tree planting can be implemented in a number of ways, including ramping up city plantings, incorporating trees into stormwater management efforts, exploring a complete streets policy, and encouraging and assisting neighborhoods interested in implementing their own tree campaigns.

**STRATEGY 4: WORK TO ACHIEVE CANOPY GOAL THROUGH SUPPORT**

Support structures are also important in achieving a canopy goal. These include a strong tree protection policy, public access to urban forest data and study results, and ensuring that a wide range of tree species are available for tree plantings.

**STRATEGY 5: REGULARLY MEASURE AND ASSESS CANOPY PROGRESS**

The amount of tree canopy should be measured every five years to track progress and identify any problem areas or new opportunities. Costs for this UTC update can potentially be shared through joint updates with other cities or counties.

**STRATEGY 11: DEVELOP A 3-5 YEAR MANAGEMENT PLAN**

Current management of public trees is largely reactive in nature. The city can move towards a more proactive program by prioritizing immediate needs and reallocating budget and resources to a cyclical proactive tree care program.

**STRATEGY 12: IMPROVE AND STREAMLINE THE TREE SELECTION PROCESS**

A new smart tree selection tool was developed for the Parks Division as part of this study. Use of this tool will streamline tree selection on large plantings and improve tree diversity, which is critical for the long-term health of the urban forest.

**STRATEGY 13: INSTITUTE POLICY IMPROVEMENTS**

Tree preservation is critical to maintaining a constant canopy level. More stringent penalty and enforcement mechanisms in city tree protection policies will ensure Largo can sustain a healthy urban forest well into the future.

**STRATEGY 14: DEVELOP A DISASTER MANAGEMENT PLAN**

Urban forest disaster management plans extend beyond just emergency response. They can play a critical role in tree preservation well after storms pass. Forward-thinking disaster plans include a public communication and messaging component to avoid unnecessary tree removals during the weeks or months after a storm event.

Each of these strategies are spelled out in more detail and in a chronological four-year format in the full version of the plan, which can be found at www.Largo.com.

Implementation of these 14 strategies will allow Largo to improve the sustainability of its urban forest resource and achieve a more vibrant and healthy community for all.

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**HOW CAN I GET INVOLVED?**

If you are interested in getting more involved in the implementation of this urban forest plan, we want to hear from you! Visit the Recreation, Parks & Arts page at Largo.com and click on the link to volunteer, or call the Parks Division (727) 586-7415 and let them know you’re interested in getting involved. Your urban forest needs you!

Other ways to make a difference:

- Plant and care for trees in your yard.
- Participate in neighborhood plantings when they happen in your area.
- Attend Arbor Day or other environmental education events in Largo.
- Utilize the expertise of the Pinellas County Extension and Largo Parks Division staff.
- Consult a certified arborist for tree care on your property.

Stay tuned for future urban forest community projects!
<table>
<thead>
<tr>
<th></th>
<th>CURRENT PROGRAM</th>
<th>10% BUDGET REALIGNMENT*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(30% Removal, 60% Routine Pruning and 10% Structural Pruning)</td>
</tr>
<tr>
<td></td>
<td>Tasks Performed***</td>
<td>Cost****</td>
</tr>
<tr>
<td>PROACTIVE: Removals ($2,000 per)</td>
<td>4</td>
<td>$8,468</td>
</tr>
<tr>
<td>PROACTIVE: Pruning ($100 per)</td>
<td>200</td>
<td>$20,000</td>
</tr>
<tr>
<td>PROACTIVE: Program Cost/Structural Pruning ($30 per)</td>
<td>250</td>
<td>$7,500</td>
</tr>
<tr>
<td>REACTIVE: Inspection</td>
<td>n/a</td>
<td>$47,840</td>
</tr>
<tr>
<td>REACTIVE: Gen. Maintenance Contract Removals ($2,000 per)</td>
<td>25</td>
<td>$50,000</td>
</tr>
<tr>
<td>REACTIVE: Gen. Maintenance Contract Pruning ($100 per)</td>
<td>280</td>
<td>$27,960</td>
</tr>
<tr>
<td>REACTIVE: City Maintenance Pruning and Removal</td>
<td>n/a</td>
<td>$128,960</td>
</tr>
<tr>
<td>Total Proactive Tree Maintenance</td>
<td>$27,500</td>
<td>10%</td>
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<tr>
<td>Total Reactive Tree Maintenance</td>
<td>$254,760</td>
<td>90%</td>
</tr>
<tr>
<td>Maintenance Program Total</td>
<td>$282,260</td>
<td>69%</td>
</tr>
<tr>
<td>Administration</td>
<td>$46,592</td>
<td>11%</td>
</tr>
<tr>
<td>Tree Planting*****</td>
<td>$78,155</td>
<td>19%</td>
</tr>
<tr>
<td>TOTAL PROGRAM BUDGET</td>
<td>755</td>
<td>$407,007</td>
</tr>
</tbody>
</table>
## Action #1:
### Establish a Unified Voice, Formalize Partnerships

There are many active players in Cleveland and most are working independently on short-term projects. Formation of a coalition of urban forest stakeholders will serve to create a unified voice and direction for all urban forestry efforts.

The city has a substantial backlog in tree maintenance, which can have serious impact on public safety. A formal partnership between the city and the coalition has the potential to reduce some of the city's workload, freeing up time and resources for the city to address the maintenance backlog. Prerequisite: None

<table>
<thead>
<tr>
<th>Steps</th>
<th>Resources Required</th>
<th>Suggested Participants</th>
<th>Target Completion Date</th>
<th>Progress Tracking</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ 1. Build an advisory team for the formation of the coalition, starting with Tree Plan team plus a few additional key stakeholders.</td>
<td>Time</td>
<td>City (Sustainability, Urban Forestry, Planning, Capital Projects), Western Reserve Land Conservancy, Holden Arboretum, Cleveland Neighborhood Progress, LAND Studio, NEORSD, First Energy, Dominion, NOACA, NEORSD, Metroparks</td>
<td>End of 2015</td>
<td></td>
</tr>
<tr>
<td>☐ 2. Define how the coalition is to be set up, funded, and staffed. The coalition could take many forms, from a collection of organized stakeholders to a brand new non-profit to a municipal tree commission. However it is set up, there needs to be lead agencies from both the public and private sectors that are committed to urban forestry as part of their mission and willing to fundraise.</td>
<td>Time</td>
<td>Same as above</td>
<td>End of 2015</td>
<td></td>
</tr>
<tr>
<td>☐ 3. Map out coalition’s program of work, using the goals and recommendations in this plan as the foundation. Gauge interest of other potential participants.</td>
<td>Time</td>
<td>Same as above</td>
<td>Q1 2016</td>
<td></td>
</tr>
<tr>
<td>☐ 4. Determine interest of city in formal agreement, start discussions between coalition, city leadership, and/or lead agencies.</td>
<td>Time</td>
<td>Office of Sustainability to start discussion with City leadership. City Legal Department, Public Works/Urban Forestry, Coalition Members.</td>
<td>Q1 2016</td>
<td></td>
</tr>
<tr>
<td>☐ 5. Define clear responsibilities for each partner, work out particulars of agreement. Determine what groups are authorized to work on public property on behalf of this plan, and in what ways the city supports them.</td>
<td>Time</td>
<td>Coalition members, as will be defined in Steps 1, 2 &amp; 3.</td>
<td>Q1 2016</td>
<td></td>
</tr>
<tr>
<td>☐ 6. Formalize agreement with city.</td>
<td>Time, Legal Services</td>
<td>Legal, Coalition members as will be defined in Steps 1, 2 &amp; 3.</td>
<td>Q2 2016</td>
<td></td>
</tr>
</tbody>
</table>
2014 Urban Tree Canopy Assessment

Tony Giarrusso
Associate Director
CENTER FOR SPATIAL PLANNING
ANALYTICS AND VISUALIZATION

Sponsored by the
City of Atlanta
Agenda

• Project Background
• 2008 Baseline Canopy Assessment
• 2014 Canopy update
• Methods and findings
• Canopy change 2008-2014
• Interpreting change
• Implications
• Recommendations

Summary of findings

• Overall change numbers not as important as specifics
• Quality vs. quantity
• Loss is site by site
• Loss is accelerating
What is Urban Tree Canopy?

• Definition: The layer of leaves, branches, and stems of trees that cover the ground when viewed from above

• Affected by local geography
  • Phoenix and Atlanta never had the same tree canopy
  • Miami and Chicago never had the same tree canopy

• Affected by land use and development
  • Residential neighborhoods have more trees and open space than downtown
  • Multi-family residential areas typically have more trees and open space than industrial and commercial areas
Why Study Tree Canopy?

• Reveals patterns
  • Tree distribution
  • Changes over time
  • Points to reasons for loss/gain
• Measures quantity, not quality
  • Species matters
  • Tree health matters
  • Bio-diversity matters
• Great tool for policy-makers and planners
Project History

• First City of Atlanta Baseline Urban Tree Canopy (UTC) Assessment (2008)
• Derived UTC (and other land cover) from high-resolution satellite imagery
• Goal was to establish a UTC baseline and monitor UTC change over time
• Calculated UTC statistics for the city as a whole and small areas
• Results intended to inform sustainability efforts and policy decisions related to climate, water and air quality, and watershed protection
FINDINGS: 2008 Baseline UTC Assessment

- Tree cover distribution driven by land use
- 77% of Atlanta’s UTC was on single-family residential land
- The highest amount of canopy was in neighborhoods along Nancy and Utoy Creeks (>70%)
- Very limited tree cover in the downtown vicinity and along transportation corridors (<10%)
- Atlanta has higher tree canopy than most other major U.S. cities
Canopy Update: 2014 UTC Assessment

- Obtained WorldView-2 satellite imagery taken in late summer 2014
- Determined land cover through imagery classification
- Three classes of land cover
  - Trees
  - Non-Tree Vegetation
  - Non Vegetation
- Manual classification performed to improve accuracy
Accuracy: 2014 UTC Assessment

- Accuracy Assessment (250 Randomly Stratified Points)
- Compared 2014 results to Google Earth Historic Imagery
- 91.8% Overall Accuracy
Findings: 2014 Urban Tree Canopy Assessment

- Tree Cover: 25,921 (30.0%)
- Non-Tree Vegetation: 40,740 (47.1%)
- Non-Vegetation: 19,758 (22.9%)
Summaries: 2014 Urban Tree Canopy Assessment

- Council Districts
- NPU
- Small Watersheds
- Parks
- Neighborhoods
- City Grid (6 Acres)
- Watersheds
- Zoning

Jurisdiction
Location
Environmental
Land Use - Policy
City-wide trends: 2014 UTC Assessment

- Tree cover distribution driven by land use
- Sixty-two neighborhoods have >= 60% canopy, with majority located in SW and NW Atlanta
- Thirty neighborhoods have <= 25% canopy, almost all < 2 miles from downtown
- Canopy varies greatly by small watersheds, ranging from 5% for a section of Peachtree Creek to 82% for a section of the South River
City-wide trends: 2014 UTC assessment

- 76% (30,788 acres) of the city’s UTC is located on single-family residential land
- 58% of single-family land is tree-covered
- 7.7% (3,128 acres) of the city’s UTC is located on multi-family residential land
- 40% of multi-family land is tree-covered
- 6.2% (2,515) of the city’s UTC is located on industrial land.
- 26% of industrial land is tree-covered
UTC Change: 2008 - 2014

- Compared 2014 to 2008
- Calculated change for city and smaller geographies
- City annexed over 2,000 acres and changed boundaries between 2008 and 2014
- Statistically insignificant change across most geographies (+-5%)
- Greatest canopy loss in NW and NE
- Greatest canopy gains in W, SW and S of the city core
UTC Change Summaries: 2008 - 2014

- Calculated change for NPUs, neighborhoods, council districts, large and small watersheds, zoning categories, parks and the city grid

- There were changes in all geographies between 2008-2014 except for the city grid (new NPU, council districts redrawn, updated neighborhoods, new parks, revised watershed layers, etc.)

- To account for the boundary changes, 2008 UTC data was aggregated to the 2014 geographic units

- NPU Q did not exist in 2008

- No 2008 satellite imagery for land annexed after 2008
UTC Change Summaries: 2008 - 2014

% Tree Cover Change by Council District (2008-2014)

Change in Percent Tree Cover
2008-2014
-10.0% - 5.1%
-5% - 0%
0.1% - 5%
5.1% - 10%

Tree Cover Change in Acres by Watershed

- Nancy Creek: 8.1 acres
- Peachtree Creek: 6.7 acres
- Long Island Creek: 1.5 acres
- Mud Creek: 1.9 acres
- Doolittle Creek: 0.5 acres
- Shoal Creek: 2.4 acres
- Bakers Ferry: 5.1 acres
- Sandy Creek: 2.0 acres
- Sugar Creek: 4.3 acres
- Utoy Creek: 5.2 acres
- Camp Creek: 2.2 acres
- Proctor Creek: 4.8 acres
- South River: 2.4 acres
- Intrenchment Creek: 2.4 acres

% Tree Cover Change by Council District (2008-2014)

- Council District 1: 4.8%
- Council District 2: 5.1%
- Council District 3: 2.4%
- Council District 4: 2.0%
- Council District 5: 4.3%
- Council District 6: 5.2%
- Council District 7: 6.7%
- Council District 8: 8.1%
- Council District 9: 1.5%
- Council District 10: 1.9%
- Council District 11: 0.5%
- Council District 12: 4.6%
Verifying Change: 2014 UTC Assessment

- Manually inspected 720 grid cells on the computer to evaluate findings
- Conducted field visits for over 100 sites to validate findings and qualify change
UTC Change CITY GRID: 2008 - 2014

- Change at city grid scale (6 acres) is more revealing
- 277 grid cells showed UTC loss >= 1 acre, over 100 of which were a result of a single-family redevelopment
- 50 of the 102 sites showing UTC gain >= 1 acre were “false growth” (secondary growth on cleared land)
- 32 “pipe farms” identified, all of which show UTC growth
- Largest pipe farm is 80 acres, cleared between 2003-2007
UTC Gain: 2008-2014

- Normal canopy growth
- Street tree growth in subdivisions built circa 2008
- Planted trees (parks, individual lots)
- *False* gain found in unfinished developments (Estimated 900 acres or 2.3% of the City’s canopy)
- Sites showing largest contiguous gain – pipe farms

Gain >=1 acre
UTC Gain: 2008-2014 ---- Tree Plantings

• SE Neighborhood Center -- McDonough Blvd
UTC Gain: 2008-2014 ---- Street Trees

- Dupont Commons – NW Atlanta Near Railyard
UTC Gain: 2008-2014 ---------- Growth

- Freedom Park
UTC Gain: 2008-2014 ---------False gain

- Unfinished Development
UTC Gain: 2008-2014 -----False gain

• Pipe Farm
UTC Gain: 2008-2014 -------False gain

• City’s Largest and Oldest Pipe Farm

2017
UTC Loss: 2008-2014

- 277 grid cells with $\geq 1$ acre canopy lost
- Redevelopments (single-family lots and neighborhoods)
- New Developments (multi-family, industrial, government, churches, and infrastructure improvements)
- 15 sites $> 10$ acres in size showed $\geq 50\%$ canopy loss
UTC Loss: 2008-2014 ---- New development

- Condos and Apartments (Buckhead)
UTC Loss: 2008-2014 ---- New development

- Single-Family Subdivision (West Atlanta)
UTC Loss: 2008-2014 ---- New development

- Single-Family (NW Atlanta)
UTC Loss: 2008-2014 ---- New development

- Industrial (SE Atlanta)
UTC Loss: 2008-2014 ----- New development

- Multi-Family (NW Atlanta)
UTC Loss: 2008-2014 ---- New development

- Commercial (NW Atlanta)
UTC Loss: 2008-2014 ---- New development

- Townhomes (NE Atlanta)
UTC Loss: 2008-2014 ------ Redevelopment

- Mixed Residential (NW Atlanta)
UTC Loss: 2008-2014 ---- Redevelopment

- Single-Family (NW Atlanta)
UTC Loss: 2008-2014 ---- Redevelopment

- Single-Family (NW Atlanta)
Implications: The Future of the City’s Trees

• Most of the city’s trees are on private property
• Development has steadily increased since 2012
• Some zoning categories permit complete or almost complete removal of trees (industrial)
• Street trees do not provide the same benefits as a forest
• The gap between high-quality canopy gain and overall loss is widening

New Building Permits 2012 - 2017
City Goals: Conserve and Maintain UTC at 50%

- **Official City Goal:**
  
  Maintain 50% canopy coverage with no net loss

- **Solution:**

  Increase canopy coverage
  Mitigate canopy loss
City Goals:
How do we get to 50% Canopy Coverage

- Existing UTC = 47.1%
- 50% UTC = increase of 2,500 acres of UTC
- **Plant trees on public land**
  - Possibilities
    - ~1,500 acres of non-tree vegetation (NTV) on existing park land
    - ~300 acres of NTV on APS land
    - ~800 acres of NTV on “other” public lands (GDOT, MARTA, FULCO)
    - ~3,000 acres in Right-of-Way
- **Plant on private land**
  - Possibilities
    - ~14,600 acres on NTV on private land
  - Incentivize citizens and businesses to protect existing trees and plant new ones
City Goals: No Net Loss of Canopy

- Loss mitigation
  - Increase canopy on public lands
  - Permanently protect existing forests
  - Zoning code modifications to limit max lot coverage or tree removal
  - Permanently protect trees of certain caliper (size, age, health)
  - Public education campaign

<table>
<thead>
<tr>
<th>% Single-Family Lots Built Out to Max Lot Coverage</th>
<th>100%</th>
<th>50%</th>
<th>25%</th>
<th>10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated Acres Lost</td>
<td>14,887</td>
<td>7,443</td>
<td>3,722</td>
<td>1,489</td>
</tr>
<tr>
<td>Estimated % UTC Lost</td>
<td>37%</td>
<td>18%</td>
<td>9%</td>
<td>4%</td>
</tr>
</tbody>
</table>

Summary of Zoning Regulations in R Districts
Recommendations (Immediate Action)

- Refine policies and set canopy goals to ensure that each area of the City receives the benefits of a healthy canopy;

- Inform sustainability efforts and policy decisions related to climate, water and air quality; and

- Educate the public about the importance of tree canopy in Atlanta.
Specific Recommendations For Consideration

• Protect the few largest tracts of high quality forests (approx. 5,700 acres of vacant forested land remain – 14% of existing canopy).

• Evaluate policy decisions related to land development, especially “pipe farms”

• Identify tools to prevent clearing of large sites that will not be completed (e.g. development bonds)

• Evaluate effect of maximum allowable lot coverage on tree canopy, especially on residential land.
Specific Recommendations For Consideration

- Identify methods for reducing tree loss during redevelopment of single-family properties.
- Implement conservation measures for new subdivisions.
- Evaluate open space requirements for multi-family and other developments.
- Require replanting of native and high quality trees to ensure equal or higher quality than trees that are removed.
Next Steps: UTC Assessments in the City of Atlanta

UTC

Update

2018
Thank you!

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