CHARLOTTE
URBAN FOREST
MASTER PLAN

2017

PRESERVING AND ENHANCING CHARLOTTE'S URBAN FOREST

COMMUNITY INVOLVEMENT

Public Survey Respondents:	2,846
Stakeholder Meetings:	4
Number of Stakeholder Groups Participating:	30
Community Meetings:	3
Community Meeting Participants:	25

The City of Charlotte and TreesCharlotte, in partnership with the community, completed an urban forest master plan in 2017. This plan is a guide to maintain, protect and enhance Charlotte's already extensive tree canopy cover. This vital city asset requires proactive care and protection, especially with the city's high rates of growth and development.

The forest needs constant care and replenishment. The plan was developed with input from nearly 3,000 Charlotte residents, along with expert analysis from Davey Tree Service. The following summary provides an overview of study findings, action steps, and how you can help Charlotte become a more vibrant community by caring for its urban forest.

THIS DOCUMENT IS ONLY A SUMMARY OF THE MASTER PLAN.
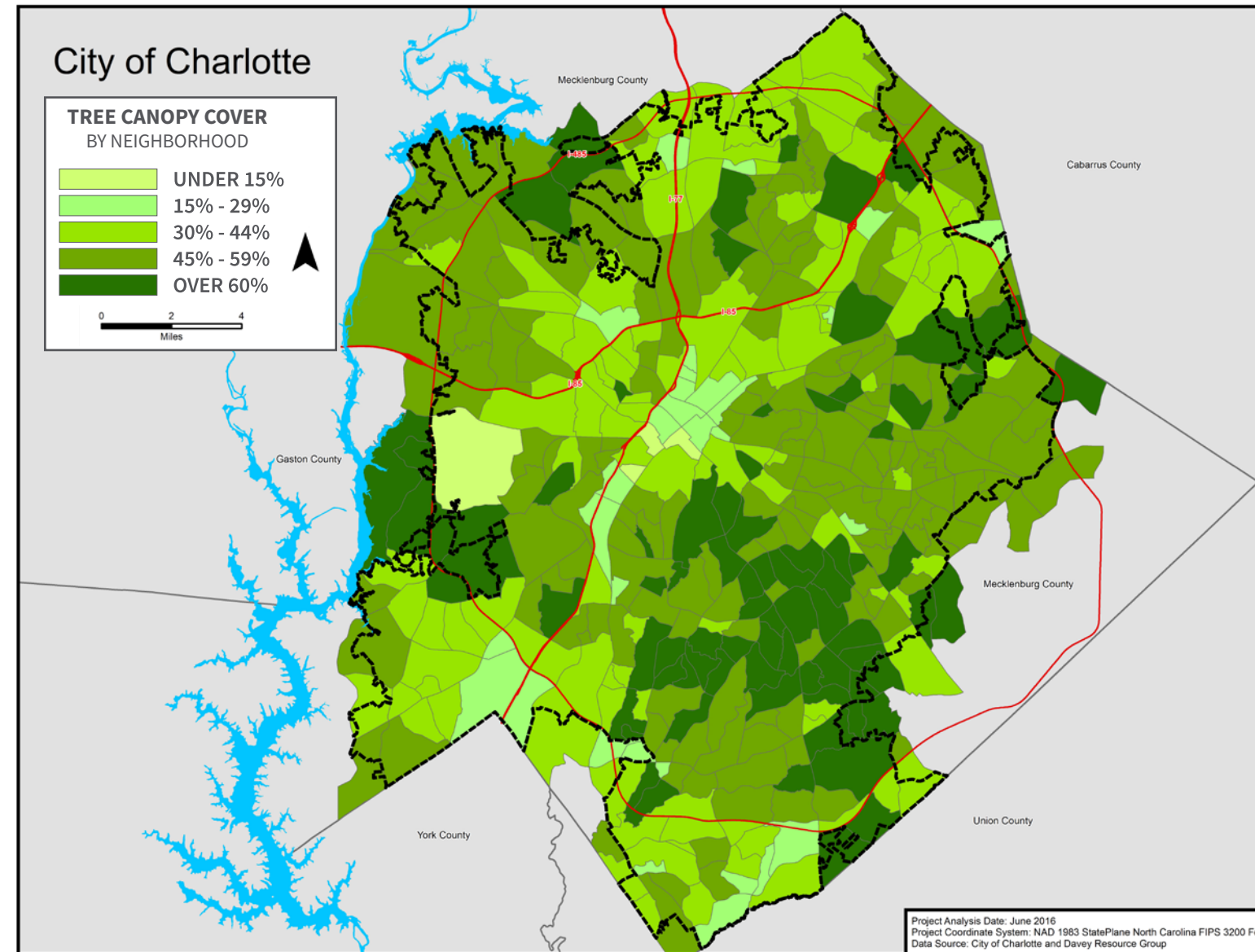**TO ACCESS THE FULL PLAN, VISIT: WWW.TREESCHARLOTTE.ORG**

CHARLOTTE HAS ONE OF THE

BEST URBAN FORESTRY

PROGRAMS IN THE COUNTRY

Charlotte, North Carolina, is proud to be known for its vibrant urban tree canopy. When viewed from above, tree canopy covers 47% of the city, which makes Charlotte one of the top cities in the U.S. for tree canopy coverage.

In addition to the aesthetic benefits Charlotte's trees provide, the city receives over $530 million in real benefits and services from these trees every year.

City of Charlotte

TREE CANOPY COVER
BY NEIGHBORHOOD

- UNDER 15%
- 15% - 29%
- 30% - 44%
- 45% - 59%
- OVER 60%

0   2   4
Miles

Mecklenburg County

Cabarrus County

Gaston County

Mecklenburg County

York County

Union County

Project Analysis Date: June 2016
Project Coordinate System: NAD 1983 StatePlane North Carolina FIPS 3200 Feet
Data Source: City of Charlotte and Davey Resource Group

BENEFIT	QUANTITY	UNIT	ANNUAL VALUE
STORMWATER: Reduction of Runoff	1,228,048,450	gallons	$208,768,237
ENERGY: Savings from Avoided Cooling	111,978,321	kWhs	$15,397,019
PROPERTY: Increases in Property Values	-	$	$286,511,443
AIR: Carbon Monoxide (CO) Removed	135,150	lbs.	$89,778
AIR: Nitrogen Dioxide (NO2) Removed	681,620	lbs.	$116,180
AIR: Ozone (O3) Removed	4,407,940	lbs.	$2,950,338
AIR: Sulfur Dioxide (SO2) Removed	145,672	lbs.	$10,234
AIR: Dust, Soot, Other Particles Removed (Particulate Matter, PM10)	5,380,616	lbs.	$3,753,477
Carbon Sequestered	470,010	tons	$16,995,245
Total Annual Benefits			$534,591,951

CHARLOTTE'S TREES PROVIDE THE CITY OVER

$530 MILLION

IN REAL BENEFITS AND SERVICES ANNUALLY

Why trees?

1 **Trees provide effective and low-cost solutions to many urban challenges.** Urban trees have proven to benefit multiple city management areas, including planning, economic development, public health, and sanitation.

2 **Trees are a smart investment.** Cities see a strong return on investment from every public dollar spent on trees and tree care. A recent five-city study found that cities accrued benefits ranging from $1.50–$3.00 for every $1.00 invested in trees (U.S. Environmental Protection Agency 2015).

3 **Trees increase in value over time.** Unlike man-made systems, trees are the only urban infrastructure that actually increase in services and value over time. As trees mature, the benefits they provide increase exponentially. Traditional city infrastructure such as roads and bridges deteriorate with age.

Charlotte's Tree Canopy is at Risk

Community-wide, more robust action is required to meet the city's 50% canopy by 2050 goal. The most pressing challenges facing Charlotte's tree canopy include:

AGING CANOPY

Thousands of trees in Charlotte were planted around the same time period (1895-1920). Today, many of these trees (including most of the iconic large oaks) are reaching the end of their lifespan – all at once. As these trees age out, extreme changes in canopy cover will occur in some neighborhoods.
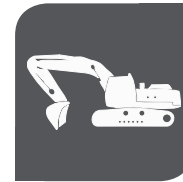
CANOPY LOSS TO DEVELOPMENT

Charlotte was recently named by Forbes Magazine as one of the fastest-growing cities in the country. This accelerated growth equates to a large amount of land clear-cut as homes, office buildings, and streets are built. A tree protection policy is in place and trees are being replanted; however, replanting won't counteract these losses.

LACK OF NEIGHBORHOOD ORGANIZATION FOR CITIZEN ENGAGEMENT

During the planning process, public meetings were held to get citizen input on Charlotte's canopy. One universal comment was that many want to work on their neighborhood's tree canopy, but aren't aware of a way to do so. There's no active organization at the neighborhood level to allow for more long-term local involvement (other than one-time tree planting events with TreesCharlotte).

LOW-INCOME AREAS WITH MATURE TREES

Unlike many cities across the country, Charlotte is unique in that tree canopy coverages do not correlate with average household income levels. This means that many lower-income areas host a large number of mature trees on both public and private land. Properly caring for large, mature trees is a significant financial burden for many.

REACTIVE TREE CARE

City budgets are stretched thin and ongoing care and maintenance of 180,000 street trees is challenging to fund and manage. At the current budget, the city touches only a fraction of the public trees in Charlotte each year, spending the majority of time and resources reacting by responding to service calls, storm damage, etc. Proactive care would lessen susceptibility to tree failure and storm damage, and prolong tree lives.

LACK OF EDUCATION & AWARENESS ON VALUE OF AND CARE FOR TREES

While the general public recognizes that Charlotte's trees are a unique city asset aesthetically, decisions on land management (both public and private) often don't reflect this value system. There is an overall lack of awareness of the benefits trees provide, their importance to the community and ways to manage landscapes and care for trees to optimize the urban forest.

Is the 50% canopy by the year 2050 goal attainable?

The weight of evidence suggests we are not on a path to meet the goal. In all three models completed for Charlotte's plan, an overall net loss of canopy was predicted. These models lead us to believe that not only will we not meet our goal, but current canopy levels will not be maintained. Three analyses were undertaken to start to understand Charlotte's future canopy:

Aging Canopy Analysis

Myers Park	Year 2016	Year 2050	Rate of Change
Number of Street Trees	6,260	2,676	-57%
Canopy of Street Trees (acres)	85	47	-45%
Value Pollution Benefits ($)	$5,890	$4,081	-31%
Carbon Absorbed Annually (tons)	81	51	-37%

40 Trees Planted Annually (current rate) | 21% of street trees are considered mature (over 24" DBH)

Grier Heights	Year 2016	Year 2050	Rate of Change
Number of Street Trees	751	271	-64%
Canopy of Street Trees (acres)	9	6	-33%
Value Pollution Benefits ($)	$788	$478	-39%
Carbon Absorbed Annually (tons)	7	5	-29%

1 Tree Planted Annually (current rate) | 14% of street trees are considered mature (over 24" DBH)

IMPACT OF AGING CANOPY

The first model looked at two older neighborhoods in Charlotte that have large numbers of older street trees. The natural life cycle of the existing street trees over the next 30 years was forecasted. In 30 years, these neighborhoods could see a loss of an estimated 60% of their oldest street trees due to natural aging out of the street tree population.

CANOPY CHANGE IN THREE CHARLOTTE DEVELOPMENTS
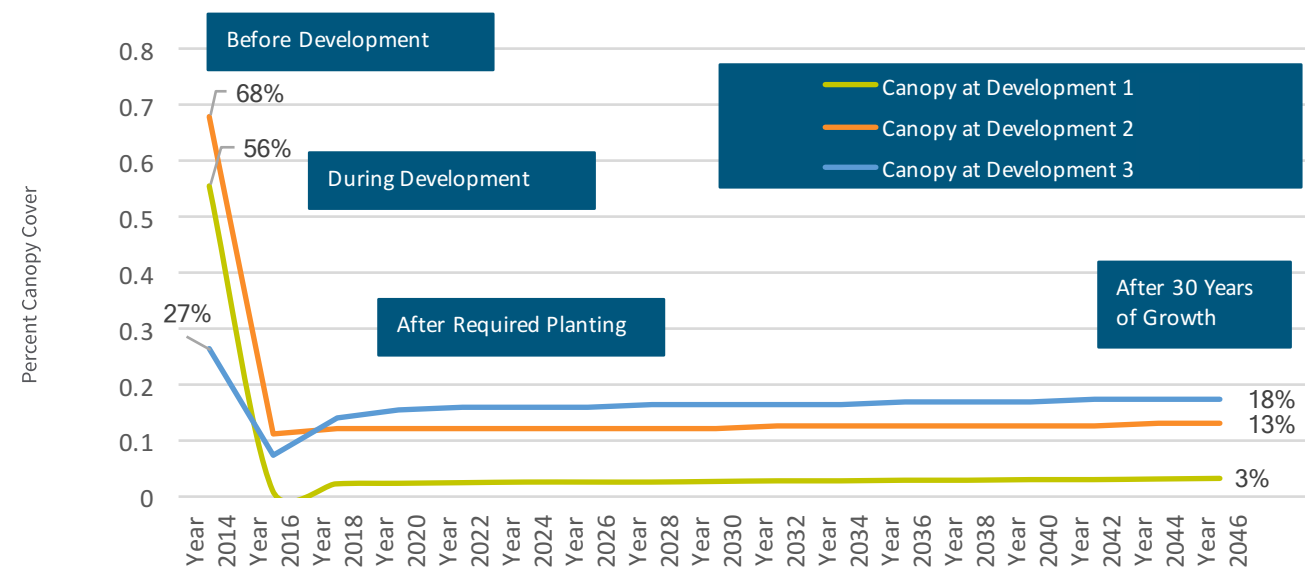
IMPACT OF DEVELOPMENT

Tree cover on three recent development sites was examined before and during development to track the changes in canopy. On each site, there was between 10% to 55% canopy loss. The average canopy loss for the three sites is about 40%. Full details can be found on the website.

Future Land Use and Canopy Cover

LAND USE CLASS	YEAR 2012			CANOPY BASED ON FUTURE LAND USE		
	Total Acres a	Canopy Acres b	Canopy Cover c	Total Acres d	Canopy Acres e = c x d	Canopy Cover f = e / d
Agriculture	2,442	496	20.0%	0	0	0.0%
Industrial	7,962	1,661	21.0%	16,267	3,393	21.0%
Institutional	12,325	4,580	37.0%	10,409	3,868	37.0%
Mixed Use*	1,427	294	21.0%	19,266	2,619	13.6%
Multi-Family	11,391	4,103	36.0%	8,721	3,141	36.0%
Office/Research	4,714	1,482	31.0%	4,730	1,488	31.0%
Park/Open Space	18,900	10,671	56.0%	15,867	8,958	56.0%
Parking	256	42	16.0%	7	1	16.0%
Residential**	75,301	41,128	55.0%	89,661	44,000	49.1%
Retail	6,945	1,181	17.0%	3,814	648	17.0%
Utility	2,312	1,041	45.0%	538	242	45.0%
Warehouse	7,284	1,496	21.0%	1,000	205	21.0%
Water	1,137	26	2.0%	123	3	2.0%
Vacant	27,340	15,836	58.0%	0	0	0.0%
All Other Land Use *(transportation, right of way, unknown)*	16,783	7,577	45.0%	26,117	11,791	45.0%
TOTAL	**196,519**	**91,613**	**47.0%**	**196,519**	**85,357**	**40.9%**

ESTIMATING OVERALL CANOPY BY FUTURE LAND USE

The second model used the city's future land use map and applied the average canopy cover of each land use today to forecast potential future canopy. If the future land use map is realized in full, overall canopy coverage could be as low as 41%.

No matter which analysis is chosen, each shows a significant loss of tree canopy in coming years. Loss of canopy will have huge impacts on the benefits trees provide to residents, contributing to serious public health issues, poor air and water quality, and declining communities.

The Way Forward: Prioritizing Initial Goals

1. ORGANIZATION

The first priority of implementation is to create a comprehensive organization structure through the Canopy Team and adjust the roles of the City and TreesCharlotte.

2. ASSESSMENT

The second priority is to complete a new canopy assessment to allow for further study of development and aging-tree impacts. An update and completion of the street tree inventory is also needed.

3. MANAGEMENT PLAN

Simultaneous with the assessment process, the City will develop and implement a proactive management plan for street tree care and replacement.

4. ENGAGEMENT

Broad and meaningful engagements of residents across Charlotte in tree plantings, tree care and advocacy is critical to the future of the urban forest and meeting the 50% goal.

HOW CAN YOU GET INVOLVED?

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, and we will be working to add more options soon.

- **Help Plant Trees**
  TreesCharlotte hosts tree planting events from October to April

- **Get Involved in Your Neighborhood**

- **Donate or Sponsor a TreesCharlotte Program**

- **Become a TreesCharlotte TreeMaster**

- **Help Care for New Trees**
  Sign up as a stewardship volunteer or join a group to care for newly planted trees.

- **Plant and Care for Trees in Your Yard**

- **Attend Arbor Week or Other Environmental Education Events in Charlotte**

- **Consult a Certified Arborist for Tree Care on Your Property**

Where to Start: Take Action

Twelve action steps are recommended under three general tasks.

TASK ONE: ASSEMBLE A TEAM

1. CANOPY TEAM FORMATION

The Canopy Team will maintain momentum, establish a unified voice, address issues at large scale, and make fundraising more effective.

2. EXPAND PARTNERSHIP BETWEEN TREESCHARLOTTE AND THE CITY OF CHARLOTTE

TreesCharlotte is well suited to scale-up tree planting, young tree care and neighborhood engagement with increased funding. A more potent TC will free up city resources for more technical needs.

3. ENGAGE THE NEIGHBORHOODS

Real progress happens at the local level. To achieve this, Charlotte needs to define neighborhood/working areas, identify local champions, provide access to data, set local goals and support neighborhood groups.

TASK TWO: IMPLEMENT PLAN IN PARTNERSHIP

4. COMPLETE AND UPDATE THE TREE CANOPY ASSESSMENT

Re-measure tree canopy cover in 2017. Industry standards call for updates every five years, which is especially important in a city that is experiencing rapid growth.

5. INITIATE A CITYWIDE IDENTITY CAMPAIGN

Charlotte needs to celebrate its canopy – not just emphasize the challenges it faces. Tree canopy should be tied to quality of life in city branding and marketing.

6. CONNECT EXPERTISE AND RESOURCES WHERE MOST NEEDED

The City can do this by creating a community urban forester position and creating a program to provide financial resources for tree care on private land.

7. EXPLORE CORPORATE PARTNERSHIP OPPORTUNITIES

Corporations have goals that align with the work to preserve tree canopy. Companies working to attract or relocate professional talent understand that quality of life is an important recruiting factor.

8. ASSESS POLICY IMPLICATIONS

Charlotte is ahead of many cities by having a tree protection ordinance. However, many feel this ordinance should be stricter with higher preservation requirements to prevent loss of canopy.

9. REFINE AND IMPROVE COMMUNICATION AND EDUCATION

More frequent and effective communication about urban forestry is needed between the City, TreesCharlotte and citizens. Work to limit messaging to a few key topics and improve how these topics are communicated.

10. COMPLETE AND UPDATE TREE INVENTORY DATA

A comprehensive inventory of public trees (on streets and in parks) is the foundation for both public safety and effective management.

11. FORMALIZE A MANAGEMENT PLAN FOR PUBLIC TREES

Management plans are needed to assist in the day-to-day implementation and to project adequate funding needs. The lack of a formal management plan limits proactive tree care and budgeting.

12. REFINE THE TREE PLANTING STRATEGY

The City and TreesCharlotte need to work on equitable distribution, prioritizing areas of predicted future canopy loss and benefits-based plantings, creating a methodical planting schedule, increasing species diversity, and identifying planting partners.

The Vision

Charlotte's Urban Forest Master Plan provides the blueprint for the engagement and purposeful action of community leaders, residents and organizations in sustaining our tree canopy.

By 2050, and for generations after, 50% of Charlotte will be covered by a resilient, diverse, robust urban forest supported by broad-based community partnerships and informed residents. The entire Charlotte community will recognize our urban forest as a treasured natural resource and be active, enthusiastic participants in its preservation.

TASK THREE: MEASURING PROGRESS

Davey recommends meeting annually to gauge short term progress, and evaluating the overall plan implementation progress every five years. These benchmarks should be agreed upon at the outset by the Canopy Team.

EXAMPLES OF SHORT-TERM GOALS INCLUDE:

☑ **City-Wide Canopy Coverage Percentage**

☑ **Rate of Change in Canopy**

☑ **Equitable Distribution of Benefits**

☑ **The Number of Neighborhoods that Have Reached 50% Canopy Cover**

For assessing long-term progress, it is recommended that Charlotte assess its programs utilizing the matrix of the 26 indicators of a sustainable urban forest used during the plan's original development.

A five-year implementation plan has been created (found on **www.TreesCharlotte.org**). All tasks within the 12 action steps have been prioritized and placed in a general timeline, including suggested partner involvement.

About the Plan

Plan Participants: City of Charlotte, TreesCharlotte, Davey Resource Group.

Stakeholder meetings:

Bartlett Tree Research Lab

Trees, Bees & All of These

Catawba Lands Conservancy

Centralina Council of Governments

Charlotte Center City Partners

Charlotte Chamber of Commerce

Charlotte-Mecklenburg Schools (CMS)

Charlotte-Mecklenburg Storm Water Services

Charlotte Water

City of Charlotte Neighborhood & Business Services

City of Charlotte Planning

City of Charlotte Solid Waste Services

City of Charlotte Department of Transportation

Charlotte Tree Advisory Commission

City of Charlotte Engineering / Landscape Management

Dilworth Community Association

Mecklenburg County Park & Recreation

Central Piedmont Community College (CPCC)

Duke Energy

ECM Solutions

Heartwood Tree Service

Home Builders Association of Greater Charlotte

LandDesign

Myers Park Homeowners Association

Mecklenburg County Air Quality

Piedmont Natural Gas

Real Estate & Building Industry Coalition (REBIC)

Self Help

TreesCharlotte

UNC Charlotte Urban Institute

References:

Clark, JR et. al. 1997. A Model of Urban Forest Sustainability. Journal of Arboriculture 23(1): 17-30.

Coder, R.D. 1996. "Identified Benefits of Community Trees and Forests." University of Georgia Cooperative Extension Service, Forest Resources Publication FOR96-39.

EPA U.S. Environmental Protection Agency. 2015. Heat Island Effect: Trees and Vegetation. http://www.epa.gov/heatislands/mitigation/trees.htm. Accessed May 30, 2015

National Tree Benefits Calculator. 2015. http://www.treebenefits.com/calculator Accessed December 2015.