



ANNAPOLIS AHEAD 2040 COMPREHENSIVE PLAN

Tree Canopy Approach

October 12, 2023

ANNAPOLIS AHEAD 2040

1. INTRODUCTION

ANNAPOLIS AHEAD

Annapolis Ahead 2040 is the City of Annapolis' Comprehensive Plan update, a citywide plan required by Maryland Land Use Code to be updated approximately every ten years following the release of new Census data. Like previous plans, this one has as its essential purpose, to bring about the careful development of the City and the conservation of what is most exceptional about it. As a general and citywide Plan, it does this by guiding public and private decisions that work toward achieving the vision set forth by the City and its residents over the use of land, water and other natural resources, streets and other infrastructure, parks and open spaces, and other community facilities, and many other aspects of the city related to development through the year 2040. The guidance within this Plan is a representation of the agreement that Annapolis, as a whole, has come to over long-range goals and outcomes. With it, the City's government has a roadmap to make wise and popular decisions on development proposals, the expenditure of public funds, the City's development code, cooperative efforts, and issues of pressing concern. Likewise, the Plan provides city residents, property owners, business owners, and those looking to invest in the city with a clear view of the city's direction.

This Plan explores conditions as they are today, how these conditions may have changed since the last comprehensive plan, and anticipates what the future may hold. From this analysis, the Plan provides goals, performance metrics, and recommended actions that will guide Annapolis toward a healthy, balanced and harmonious future over the next 20 years.

There are many features of this Plan that distinguish it from prior comprehensive plans and reinforce its

relevance to the Annapolis of today. The most important of these features are the following three themes which are interrelated and guide all goals, performance metrics, and recommended actions of the Plan.

Equity

The Plan's focus on equity is guided by an awareness of longstanding racial inequities in how public and private resources are invested in Annapolis communities. The Plan includes many goals, metrics, and recommended actions aimed at reversing these decades long trends and ensuring that all residents and communities have access to the opportunities and resources they need to be successful.

Health

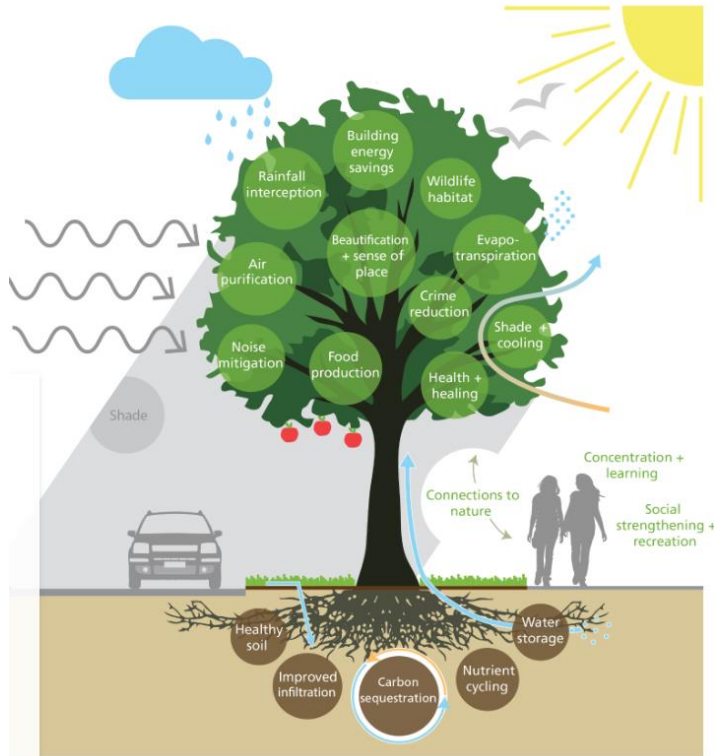
The Plan's focus on health is grounded in an appreciation for how the built and natural environment of the city plays an influential role in the physical and mental health of the city's residents and communities. The Plan offers many goals, metrics, and recommended actions aimed at ensuring that our surroundings are designed to improve our health.

Resilience

The Plan's focus on resilience is based on the fact that Annapolis will continue to face challenging environmental conditions driven by climate change which in turn have economic and social consequences. The Plan offers goals, metrics, and recommended actions designed to help the city better prepare for, respond to, and adapt to more frequent storms, increasing flooding, extreme heat, and other climate driven conditions.



ANNAPOLIS AHEAD 2040



ENVIRONMENTAL SUSTAINABILITY GOAL ES2

EXPAND THE CITY'S TREE CANOPY PARTICULARLY WITHIN HEAT ISLANDS AND ALONG RIPARIAN CORRIDORS.

PERFORMANCE MEASURE 1

No net annual loss of tree canopy.

PERFORMANCE MEASURE 2

Increase the City's tree canopy to 45% of its total land area by 2040.

PERFORMANCE MEASURE 3

Establish a consistent budget line item introduced in the City's capital budget for tree planting and proactive tree maintenance.

RECOMMENDED ACTIONS

- ES2.1 Create new city policies that incentivize tree planting in residential areas, protect heritage trees, and expand mitigation planting requirements within the Critical Area.
- ES2.2 Revise the City's tree mitigation policy to require a 5-year maintenance agreement rather than a perpetual easement to expand those areas where new canopy may be created.
- ES2.3 Create an Urban Forest Master Plan that includes updates to the Street Tree Master Plan end priority areas feasible for new tree planting in the public realm.
- ES2.4 Initiate a pilot planting program for Minority-owned businesses based in the communities where the planting is targeted.
- ES2.5 Develop soil amendment and watering guidelines for new street trees to enhance the survival rate of new street trees.
- ES2.6 Promote and expand RePlant Annapolis, a community tree planting initiative in partnership with the Watershed Stewards Academy.
- ES2.7 Create an online dashboard for tracking the City's tree canopy year by year to ensure the goal of 45% coverage is met by 2040.
- ES2.8 Continue to utilize fees collected through Critical Area mitigation to offset the costs of new tree planting initiatives elsewhere in the City.
- ES2.9 Establish a consistent budget line item in the Capital Improvement Program for tree planting and proactive tree maintenance.
- ES2.10 Explore opportunities to plant trees on HACA and Anne Arundel County facilities within the City for the purposes of meeting mitigation requirements and the general tree canopy goals. (Also listed under goal LU 6 in the Land Use element)
- ES2.11 Support the establishment of a dedicated non-profit organization focused on tree canopy preservation, enhancement, and expansion.
- ES2.12 Work with NOAA or other partners to conduct a citywide surface heat mapping that will augment existing data on heat islands based on impervious coverage and tree canopy.

PRESENTATION OVERVIEW

- Background context
- Methodology for determining tree canopy goals in Annapolis Ahead 2040
- Actions for achieving the goals in Annapolis Ahead 2040



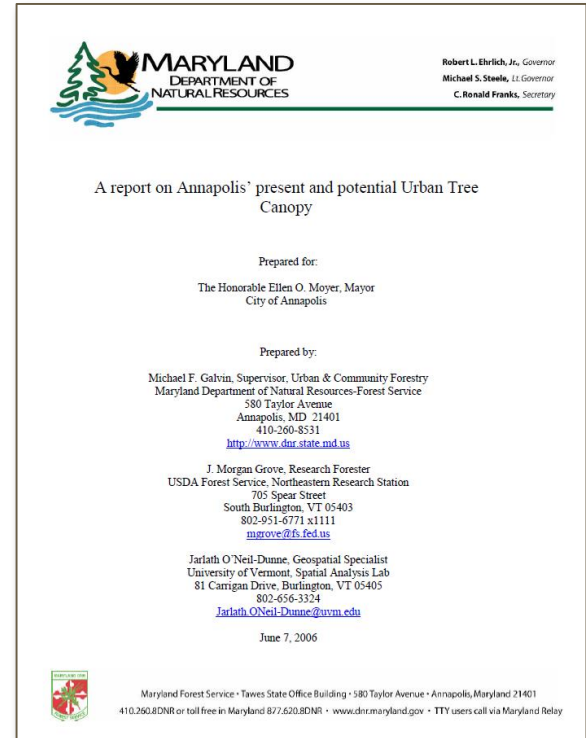
Many environmental factors for tree loss are accelerating due to climate change.

2009 COMPREHENSIVE PLAN

- The 2009 Comprehensive Plan set a tree canopy goal based on a 2006 tree canopy study that recommended 50% canopy cover by 2036.
- The 2006 analysis showed the City to have approximately 41% tree canopy coverage.
- The report also recommended that the City conduct a follow up tree canopy survey every 10 years to help meet the goal.

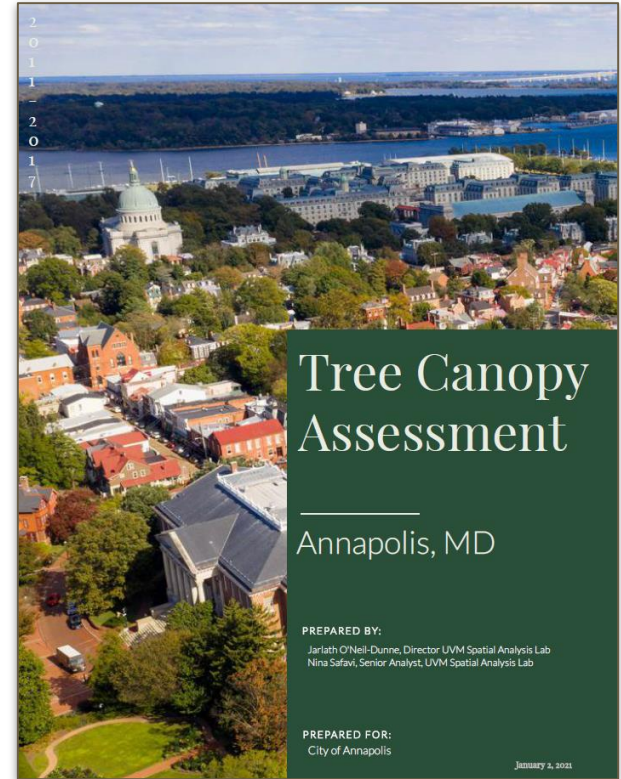
"In a study of all (245) small watersheds in Montgomery County, MD, Goetz et al. (2003) found overall of tree cover of 44.6% to be associated with stream health ratings of 'good' "

Excerpt from 2006 Urban Tree Canopy Plan

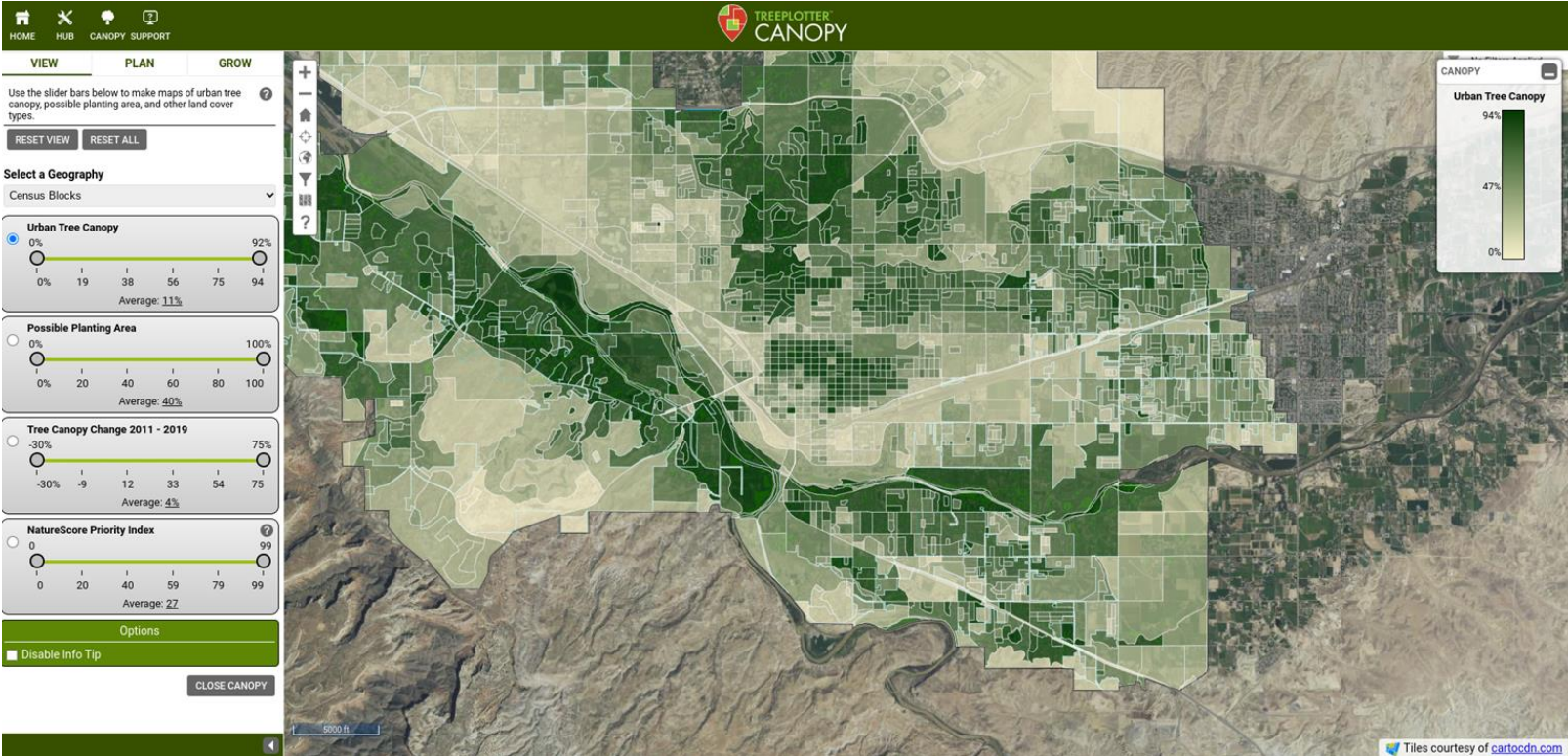


MOST RECENT ANALYSIS

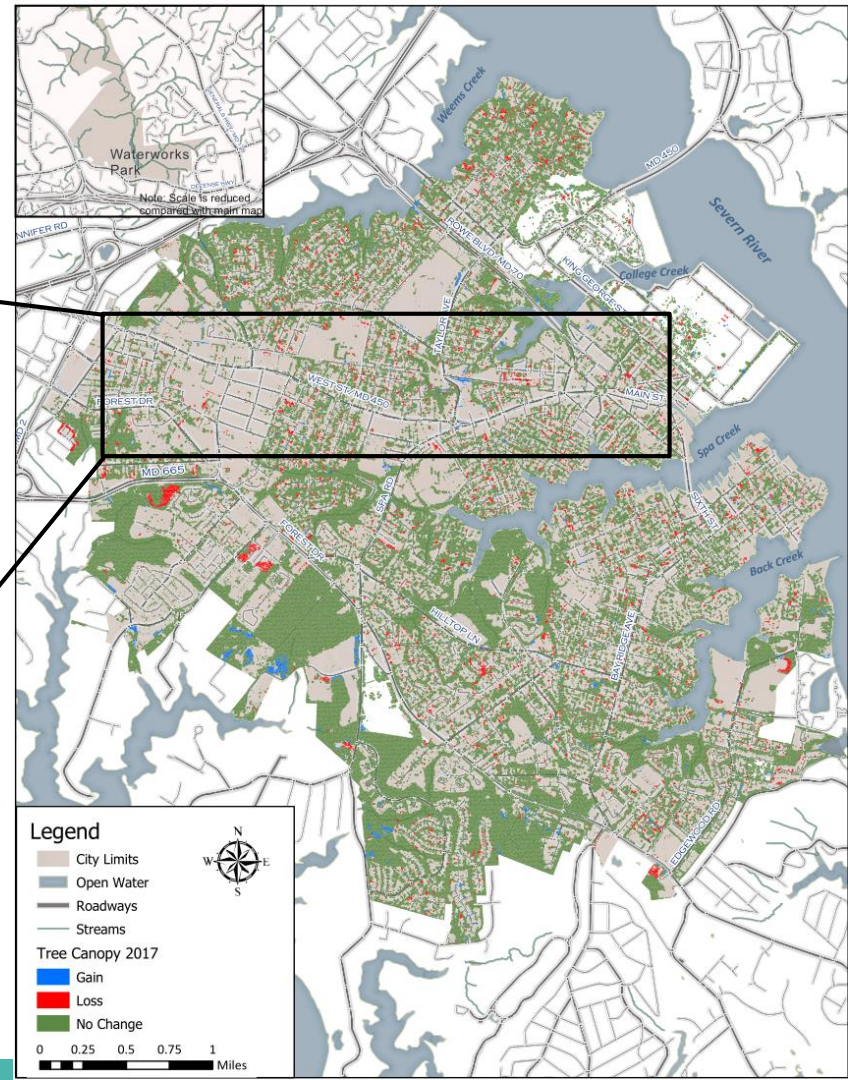
- The University of Vermont (UVM) provided a report on the tree canopy within Annapolis in 2020. The results of their findings use available Tree Canopy data from 2011-2017.
- The report determined that the Annapolis tree canopy has diminished by 2% (rounded) from 2011-2017 with the canopy as of 2017 placed around 41%. With 5 years and the COVID-19 Pandemic having past since the tree canopy was analyzed, Planning & Zoning staff anticipate there could be a further loss of 1%-3%.
- UVM's findings also determine that single family homes removing trees without replacements are the primary reason why tree canopy is diminishing.



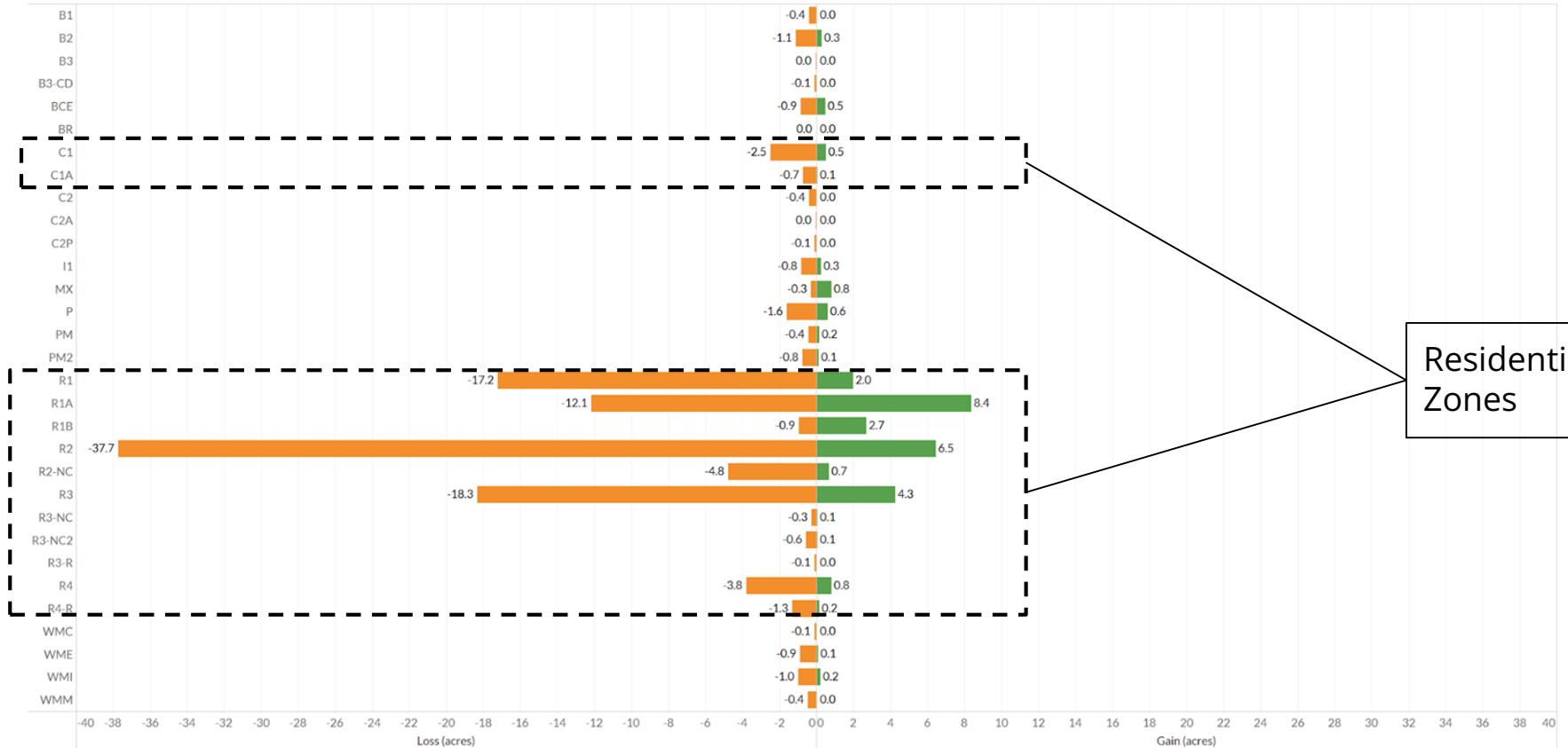
NEW TREE SURVEY TOOLS



TREE CANOPY CHANGE



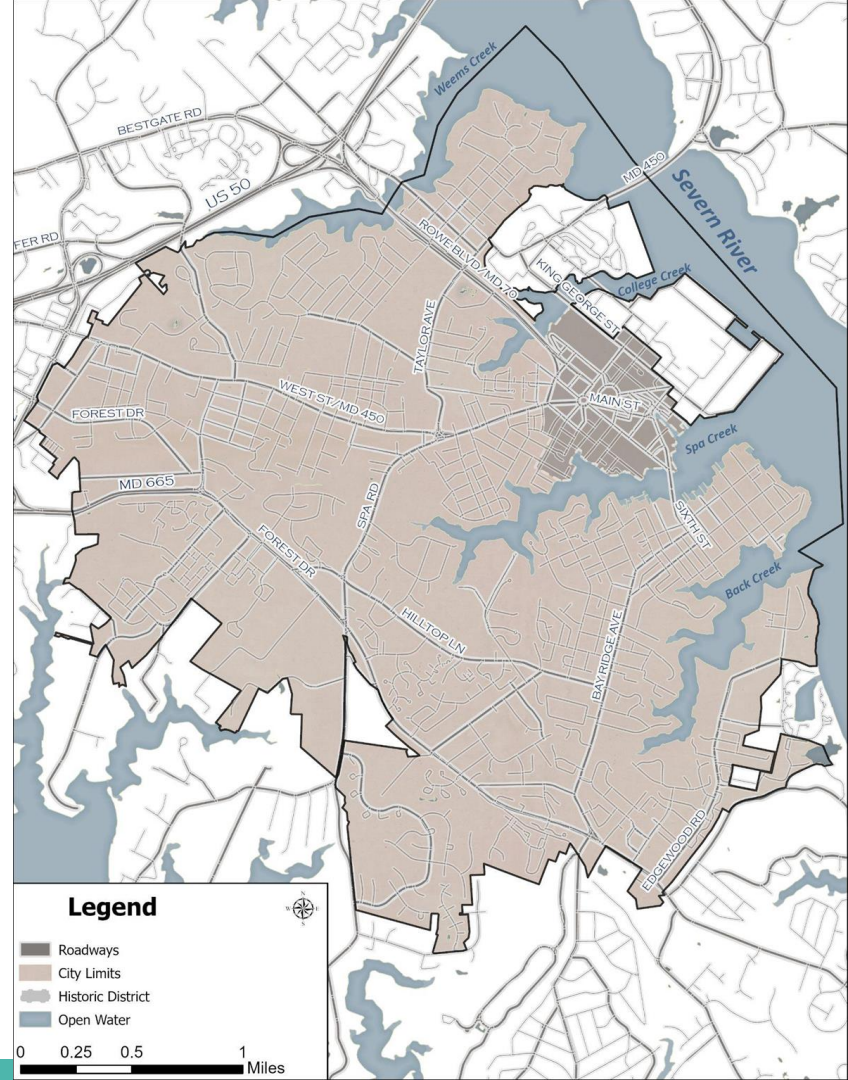
TREE CANOPY CHANGE BY ZONING



BACKGROUND

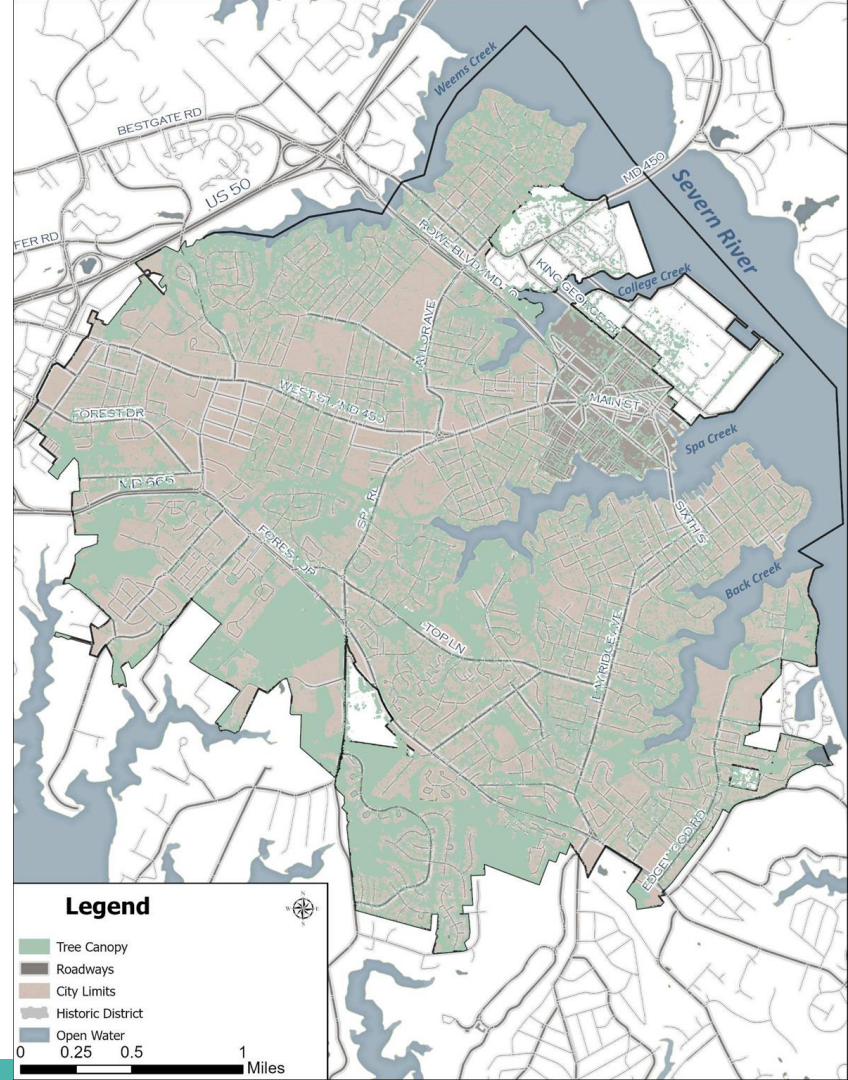
Annapolis has **4,548** acres of land.
This area does not include:

- U.S. Naval Academy
- Annapolis Middle School



EXISTING URBAN TREE CANOPY

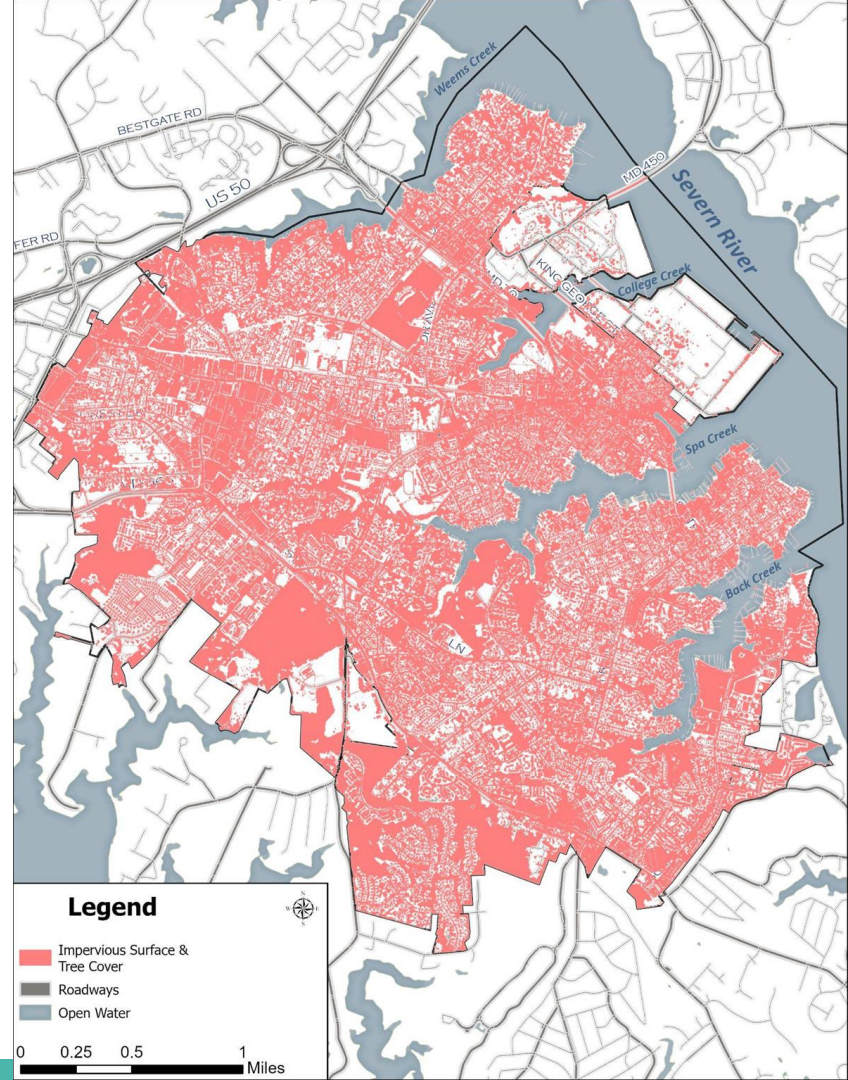
Tree Canopy Acreage within Annapolis is 1876 acres or **41.25%** of Annapolis is covered with Urban Tree Canopy



LAND COVER

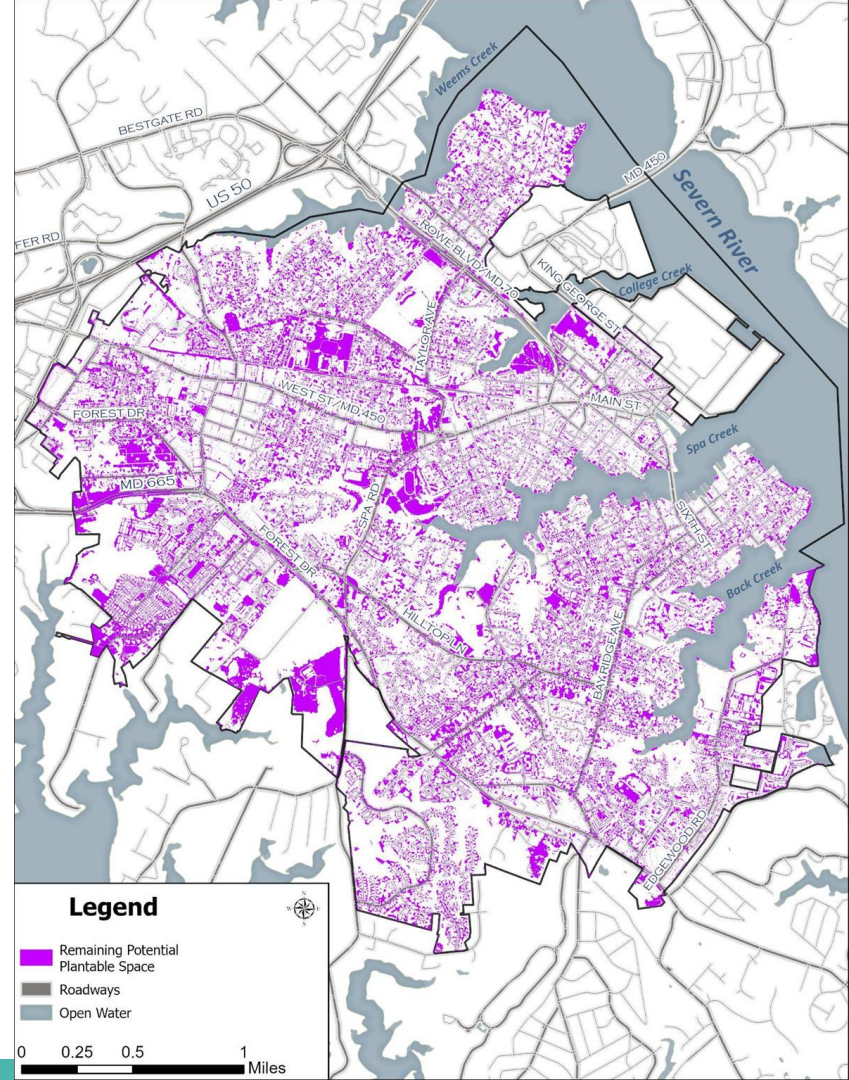
- **73%** of Annapolis is covered by either Impervious Surfaces (ex. Roads, Homes, Buildings, etc.), Tree Canopy, or Water (ex. Streams or Chesapeake Bay).
- Excluding land that is already covered will prioritize the potential areas for planting.

*Image includes some tree canopy within Anne Arundel County and U.S. Naval Academy



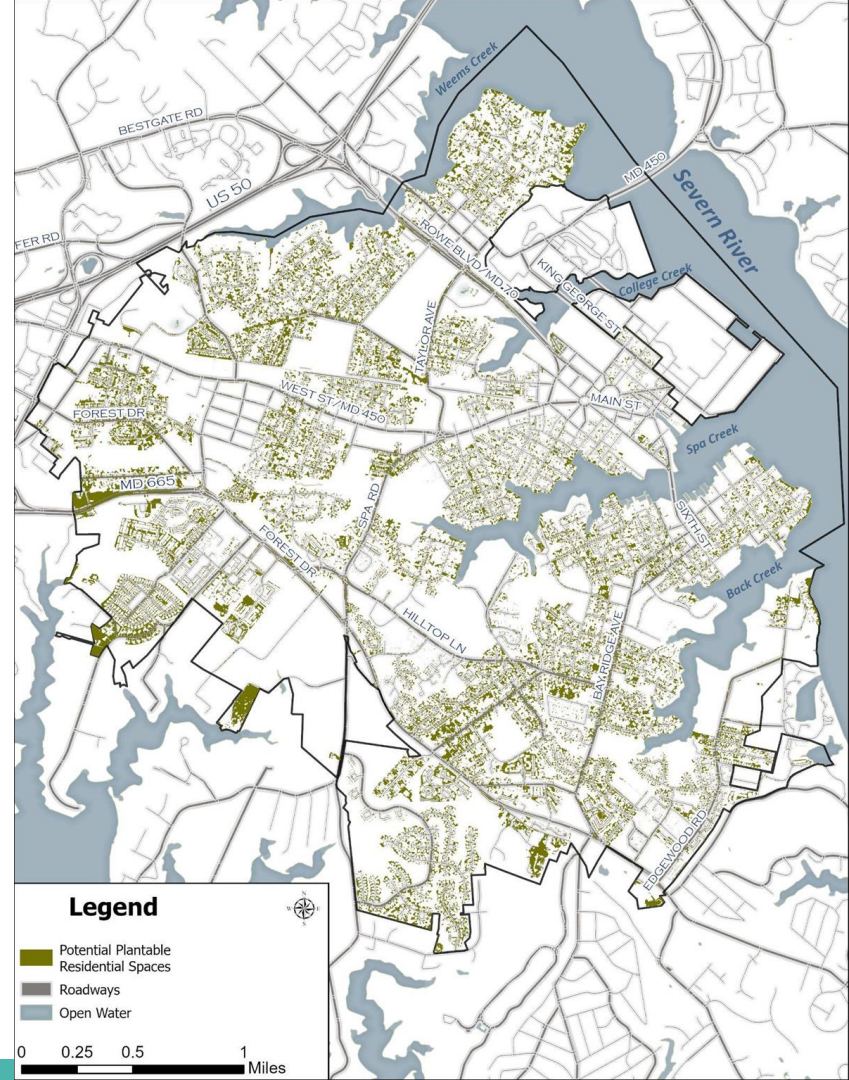
REMAINING POTENTIAL PLANTABLE SPACE

- As of 2017, 1219 acres or **27%** of land has no impervious surface, tree canopy cover, or existing water surface
- Not all of the land shown can be planted on (ex. Easements, underground/overhead utilities, proximity to structures, etc.)



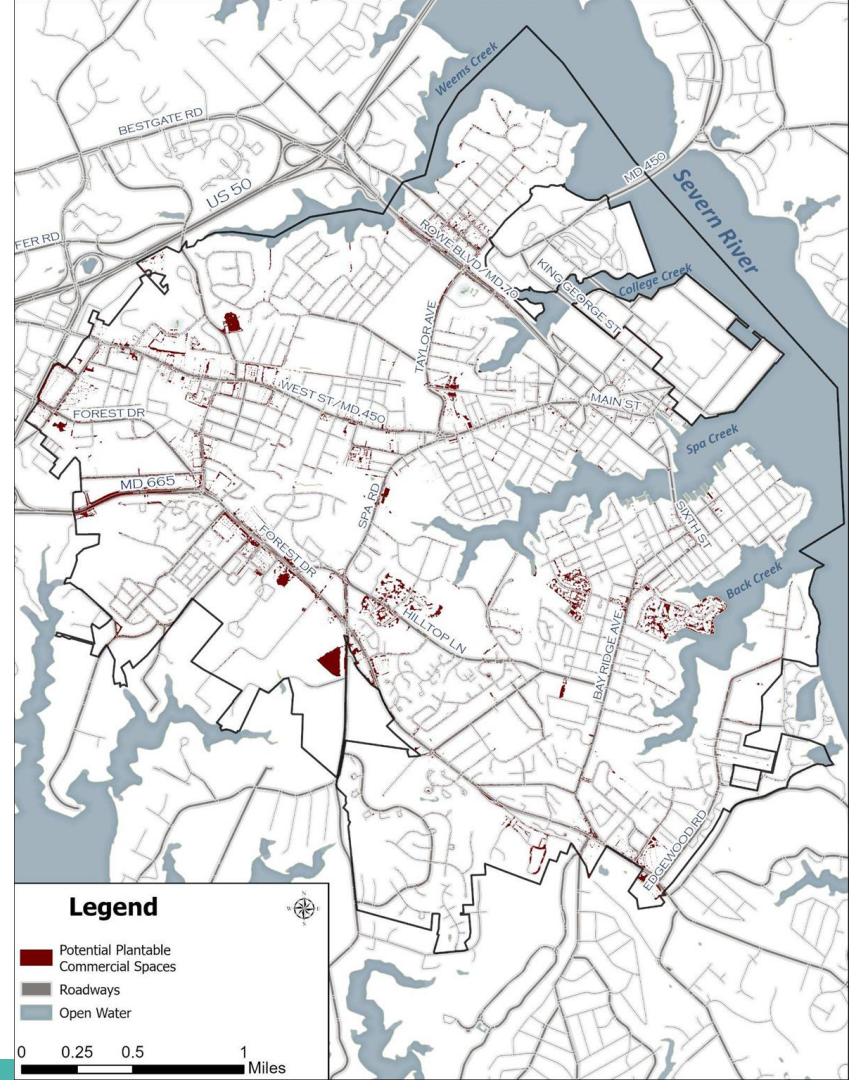
POTENTIAL RESIDENTIAL PLANTABLE SPACE

Plantable Acreage within remaining
Residential Spaces =
678 acres or **18%** of city land cover



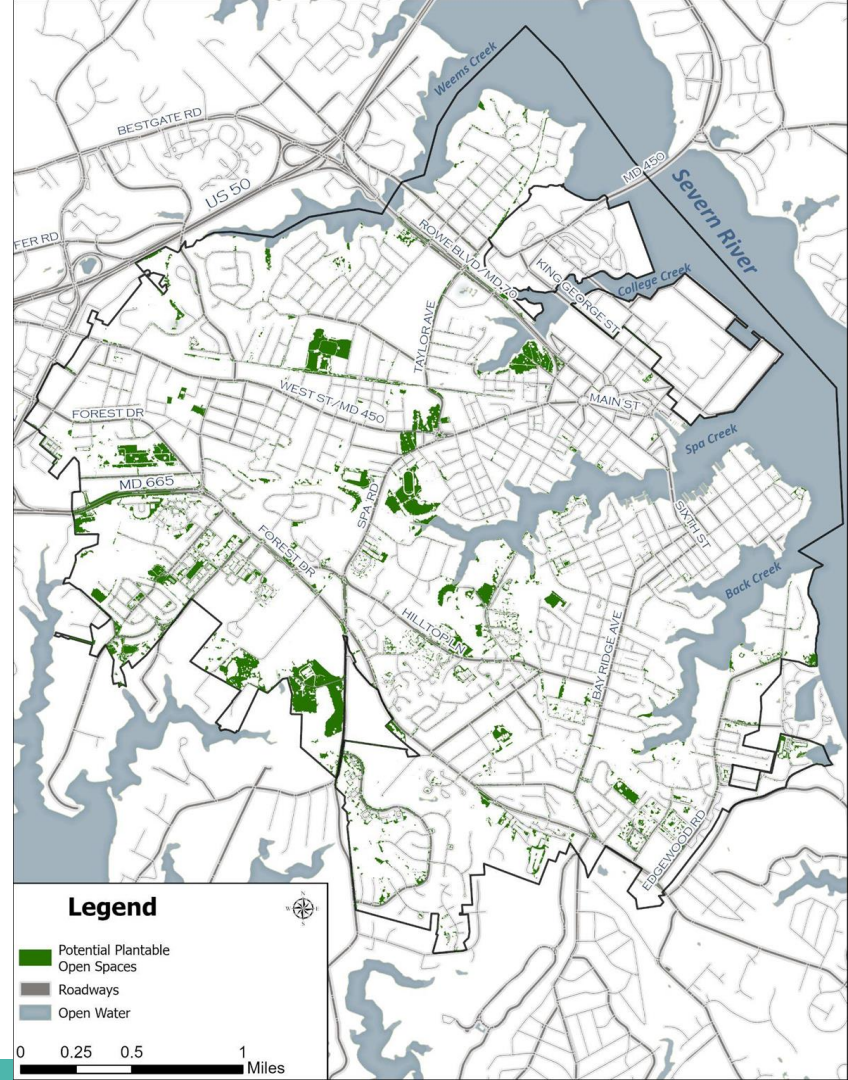
POTENTIAL COMMERCIAL PLANTABLE SPACE

Plantable Acreage within remaining Commercial/Mixed Use Spaces = 173 acres or **4%** of city land cover



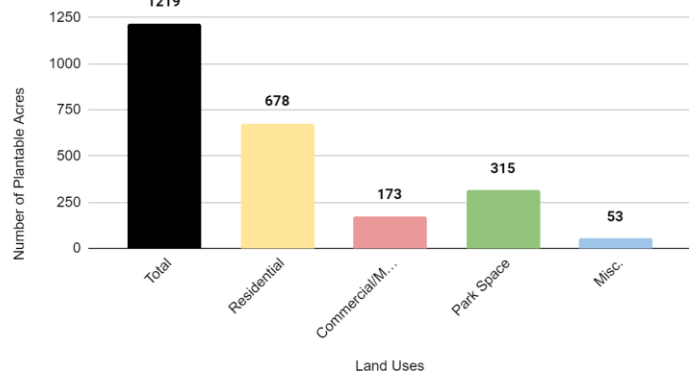
POTENTIAL OPEN SPACE PLANTABLE SPACE

Plantable Acreage within remaining
Open Spaces =
315 acres or **7%** of city land cover

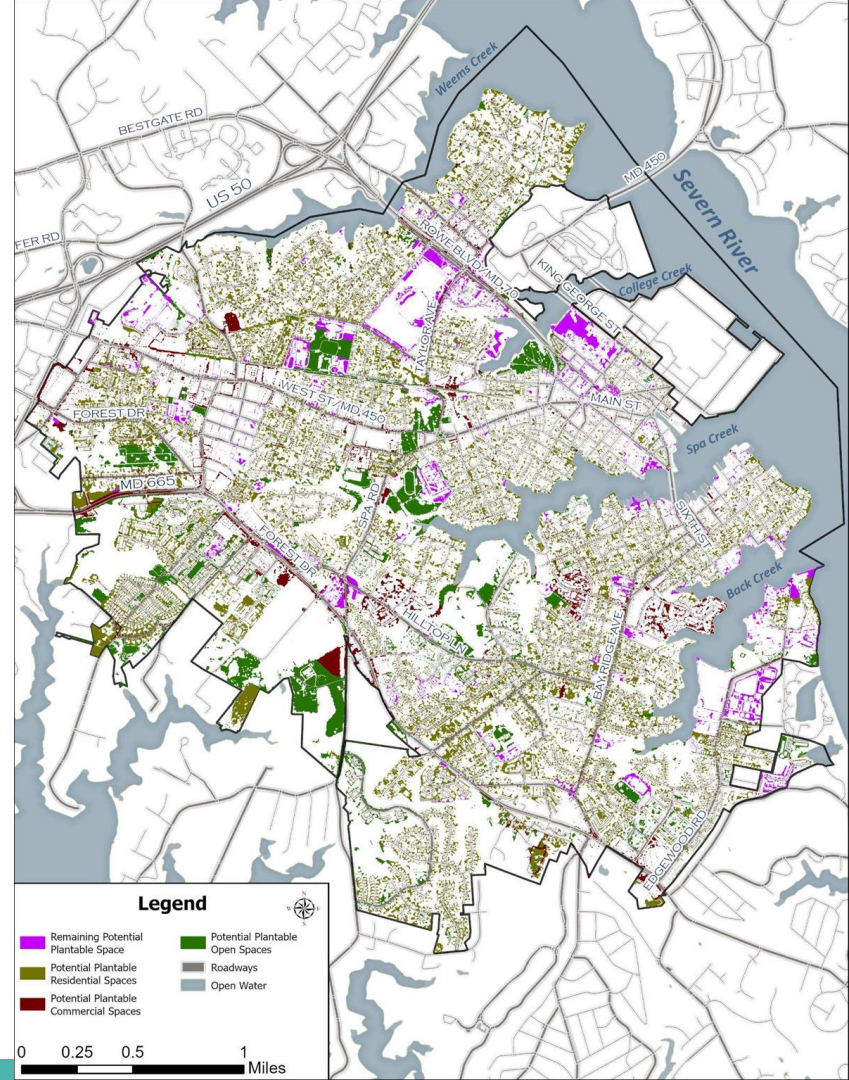
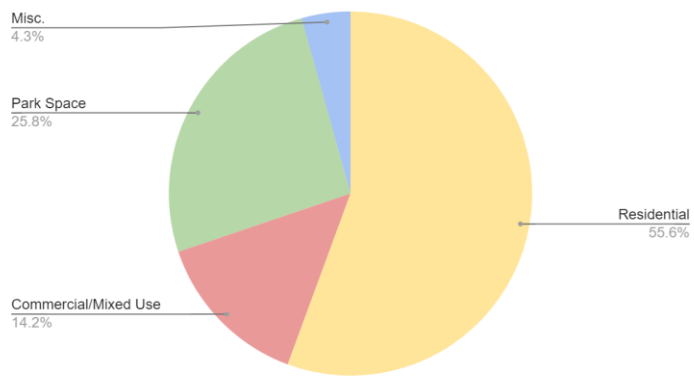


WHERE CAN WE PLANT ?

Remaining Plantable Land in Annapolis(Acres)



Remaining Plantable Land in Annapolis Percentage Breakdown



WHERE CAN WE PLANT ?

Planting Space Restrictions

- Underground utilities
- Overhead utilities
- Easements
- Proximity to structures
- Maintaining an accessible sidewalk
- Sufficient planting space
- Property owners' (businesses and residents) negative perceptions of trees
- Conflicts with recreational programming

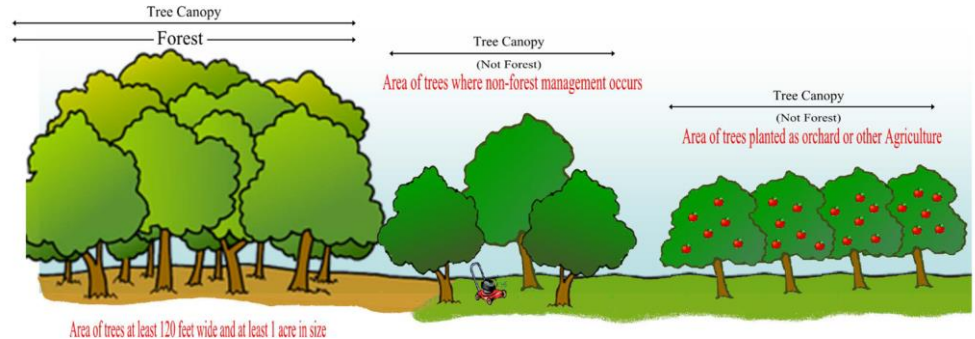


Truxtun Park Road

TREE PLANTING REQUIRED TO MEET GOALS

- To reach **50%** urban tree canopy cover, **398** acres of land would have to be planted. To reach **45%**, **149 Acres** would have to be planted.
- 45 mature trees per acre** would be an accurate representation of urban tree canopy cover based on the average canopy size of various typical native canopy trees.
- 17,910 trees** would have to be planted to get from **42%-50%** or **6,716 trees** to get from **42%-45%**

Average diameter of residual trees contributing to target stocking	Target SDI	Approximate range of average trees per acre	Average range of basal area per acre
7 to 12 inches	60	50 to 60	30 to 40 ft ²
13 to 18 inches	60 to 70	30 to 40	50 ft ²
19 inches and larger	80 to 90	30 to 80	60 to 80 ft ²



REACHING THE 45% GOAL

1. Legislation to expand the range of tree replacement in the critical area from 100 ft to 1000ft.
2. Legislation to protect heritage trees.
3. Incentivize plantings in single family residential zones.
4. Sponsored tree giveaways.
5. Establish a non-profit tree advocacy organization
6. Develop an Urban Forest Master Plan

1. EXPAND CRITICAL AREA REQUIREMENTS

Annapolis has approximately 22 miles of Chesapeake Bay frontage, and the Critical Area Commission reviews all proposed development within 100 ft from the water. The standards for tree replacement are currently more stringent within the 100ft buffer and all trees removed must be replaced at a 1:1 ratio, at a minimum.

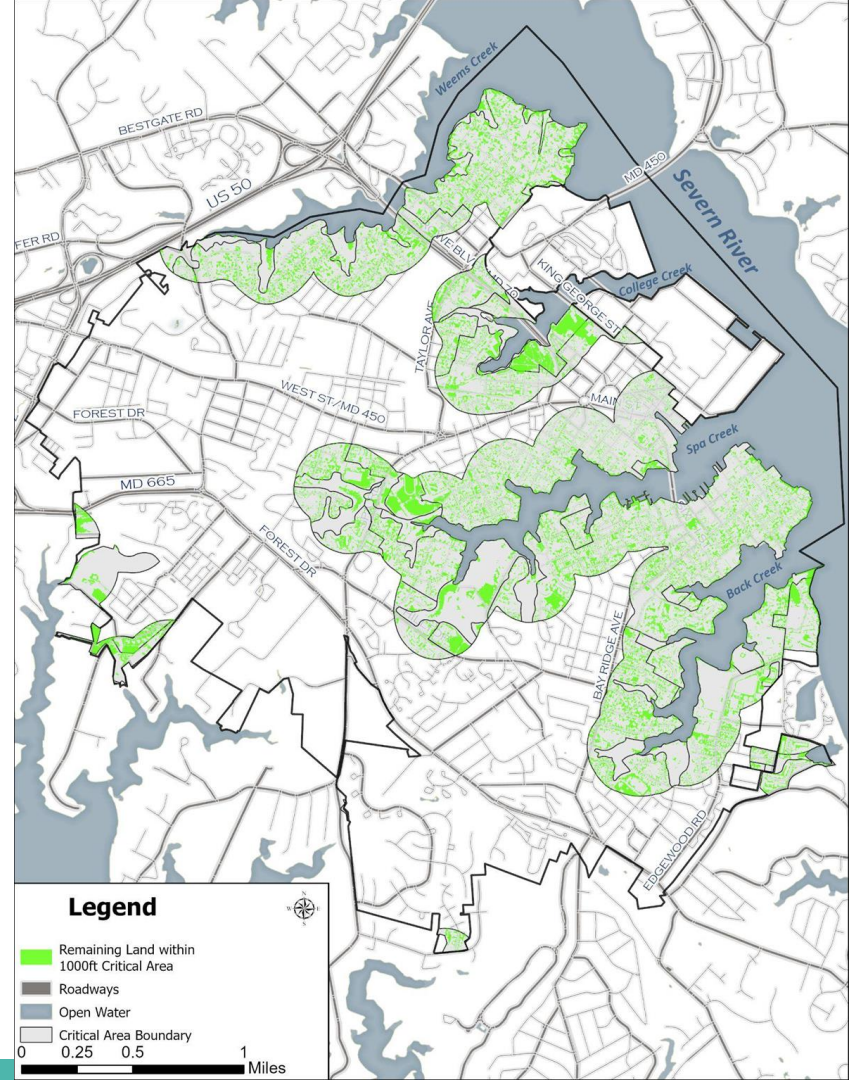
The proposed change would expand the tree replacement buffer from 100 ft to 1000 ft so that when a tree is removed within this new buffer, there would have to be replacement tree. Currently this only applies to trees within the 100ft buffer.



View of Spa Creek from its headwaters

CRITICAL AREA PLANTABLE SPACE

Plantable Space within Critical Area =
420 Acres or **9.2%** of city land cover



2. PROTECT HERITAGE TREES

Many jurisdictions have adopted protections for heritage trees based on size and species.

§ 25-8-602 - DEFINITIONS.

In this article:

- (1) HERITAGE TREE means a tree that has a diameter of 24 inches or more, measured four and one-half feet above natural grade, and is one of the following species:
- (a) Ash, Texas
 - (b) Cypress, Bald
 - (c) Elm, American
 - (d) Elm, Cedar
 - (e) Madrone, Texas
 - (f) Maple, Bigtooth
 - (g) All Oaks
 - (h) Pecan
 - (i) Walnut, Arizona
 - (j) Walnut, Eastern Black

This list of eligible heritage tree species may be supplemented, but not reduced, as prescribed by rule.



Rendering of the planned Bay Village II development designed around a heritage tree.

Heritage Tree definition from Austin, TX

3. INCENTIVIZE RESIDENTIAL PLANTINGS

Though difficult to implement, tree planting within single-family residential zones is critical to increasing tree canopy in Annapolis. This is where the largest loss of tree canopy is occurring and yet where the greatest potential for stewardship exists.

By planting in residential areas, local residents can feel involved in the process to help enhance their immediate surroundings, improve property values, and combat climate change.



*Image Courtesy of RePlant Annapolis /
Watershed Stewards Academy*

4. FUND TREE GIVEAWAYS

- Another method of addressing tree canopy loss not solely within Residential Zones would be additional sponsored tree giveaways during planting seasons
- City of Annapolis has organized free tree giveaways in recent years through partnership with the Arbor Day Foundation and more recently RePlant Annapolis



*Recent tree planting along Hilltop Lane
at the Saltaire Community*

5. ESTABLISH A TREE ORGANIZATION

Cities where successful tree canopy expansion has occurred most often have a private advocacy and education based organization focused on urban tree canopy issues. Formalizing such an organization in Annapolis would help boost tree planting and preservation efforts.



6. DEVELOP AN URBAN FOREST MASTER PLAN

A road map providing detailed information, recommendations, and resources needed to effectively grow and manage a city's tree canopy

Snapshot of Cambridge, MA

- Historic City
- Population 117,000
- 7 square miles
- 2007 Urban Forestry budget: \$1,420,587
- UTC assessment showed loss of 2% from 2009-2014
- Urban Forest Master Plan in 2018
- City now has three urban forestry staff positions
- 2022 Urban Forestry budget: \$3,450,301



Excerpt from Cambridge Urban Forest Master Plan