UPDATE 2022

VB
Parks & Recreation

URBAN FOREST MANAGEMENT PLAN

PARK & LANDSCAPE SERVICES | PLANNING, DESIGN & DEVELOPMENT

PREPARED BY: Stromberg Garrigan & Associates, Inc. | WPL Site Design

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Marshview Park, Virginia Beach, VA

Executive Summary

Purpose of the UFMP Update

The purpose of the Virginia Beach Urban Forest Management Plan Update is to identify immediate and long-term priority actions to preserve, expand, and diversify a sustainable urban forest for Virginia Beach. This document updates the previous Urban Forest Management Plan adopted in 2014. It provides a current assessment of the city's urban forest and establishes a clear set of priorities, objectives, projects, and recommendations for managing and collaborating with partners and stakeholders on positive urban forest growth.

The Urban Forest in the Pembroke Area, Virginia Beach, VA

Mission

The mission of the Plan Update is to preserve and expand the City of Virginia Beach's urban forest and cultivate its stewardship for an adaptable, healthy, sustainable, and vibrant community.

Vision

By 2045, Virginia Beach will achieve 45% tree canopy coverage by planting, nurturing, and protecting a diverse, regenerative urban forest in partnership with the local community, which includes residents, business owners, developers, nonprofit organizations, and government entities. Virginia Beach will be a model city for tree management and green infrastructure that supports the long-term health, well-being, and adaptability of the city, its environment, its residents, and its economy.

Plan Priorities

Acknowledging a nearly 2,082-acre loss of Virginia Beach's Urban Forest Infrastructure between 2012 and 2018, which significantly impacts the health, safety, and welfare of the Virginia Beach community, we will:

- Accept that unless a shift in community philosophy, public policy, and tree infrastructure valuation occurs, the measurable UTC goal of 45% reaffirmed in this plan will likely not be achieved.
- Preserve and protect Virginia Beach's existing urban forest infrastructure

- Minimize the foreseeable impacts to the existing Urban Forest Infrastructure.
- Ensure that annual tree canopy loss is not greater than the annual tree canopy gain, therefore resulting in a net gain.
- Greatly expand and proactively undertake tree preservation, replacement planting, and reforestation efforts.

Measurable Objectives

- Establish tree replacement equivalency in terms of size, maturity, ecological benefit, and economic value for use in assessment of replanting efforts, reforestation, and potential tree replacement bonds.
- Ensure adequate resources, human and otherwise, to track and record real-time tree loss and tree planting, building on the efforts currently in place specifically for City property, to be able to better project actual UTC loss and gain in between periodic aerial assessments.
- Implement active measures to preserve and protect Virginia Beach's existing urban forest so that no more than 350 acres of UTC are lost in any given year.
- Outline a detailed schedule and strategy for undertaking 1,012 acres of tree preservation and/or planting per year for the next 13 years, with additional yearly preservation and/or planting thereafter to maintain 45% tree canopy.

Introduction

What Are the Urban Forest and the Urban Tree Canopy?

The U.S. Forest Service's 2011 Vibrant Cities & Urban Forests report defines urban forests as "systems of trees, other vegetation, and water within any urban area. They can be understood as dynamic green infrastructure that provides cities and municipalities with environmental, economic, and social benefits. Urban forests are forests for people." In other words, the urban forest is more than just a collection of trees. It comprises the trees and everything integral to their ecosystem within our community. According to the U.S. Forest Service, urban forests "include urban parks, street trees, landscaped boulevards, gardens, river and coastal promenades, greenways, river corridors, wetlands, nature preserves, shelter belts of trees, and working trees at former industrial sites." As the 2014 Urban Forest Management Plan noted, Virginia Beach's urban forest is a vital component of the city's infrastructure, as important as efficient transportation and clean water.

Urban tree canopy, or "UTC" for short, has a more quantifiable definition than urban forest. It is blanket term for measurable tree coverage in a given area, referring to the size, in square feet or acres, of the layer of leaves, branches, and stems of trees that cover the ground when viewed from above. Based on the 2012-2018 Tree Canopy

Change Assessment completed for the City of Virginia Beach by the University of Vermont Spatial Analysis Laboratory, a conservative estimate for a the average tree canopy size of an individual tree in the city was 414 square feet. From this average canopy size, the approximate number of trees can then be estimated. According to the 2012-2018 Tree Canopy Change Assessment, there are approximately 6.6 million trees estimated to exist in Virginia Beach.

Why Is the Urban Forest So Important?

A healthy urban forest is vital for maintaining the quality of life in Virginia Beach, defined broadly as the city's public health, safety, and welfare. The direct and indirect benefits of an urban forest are numerous, but one important benefit is the ability of a healthy urban forest and its root system to intercept rainfall and absorb millions of gallons of stormwater per year. In a low-lying city like Virginia Beach, with an average elevation of 12 feet above sea level, interception of stormwater is crucial to mitigating flood events and maintaining the integrity of the land on which the city sits. Acting as natural stormwater infrastructure, a healthy urban forest prevents excess runoff, reduces sudden flood effects, and filters out pollutants from paved surfaces before they reach larger bodies of water.

In highly developed areas, the urban forest also lowers air temperatures and reduces the urban heat island effect by releasing moisture into the atmosphere, providing shade, and absorbing reflective heat from impervious surfaces and structures, which can reduce energy consumption and costs. Additionally, the urban forest has positive economic and social effects, such as increasing property values, boosting activity in commercial districts, strengthening community engagement and pride, encouraging physical activity, and discouraging crime. Many of these benefits were discussed in the 2014 Urban Forest Management Plan, which found that apartments and offices rent more quickly and have a higher occupancy rate when surrounded by a tree canopy and that homes planted with trees sell more quickly and are worth more money than those without.

A healthy Urban Forest functions as a network of green infrastructure that provide a broad set of systemic community-wide economic, health, and safety benefits.

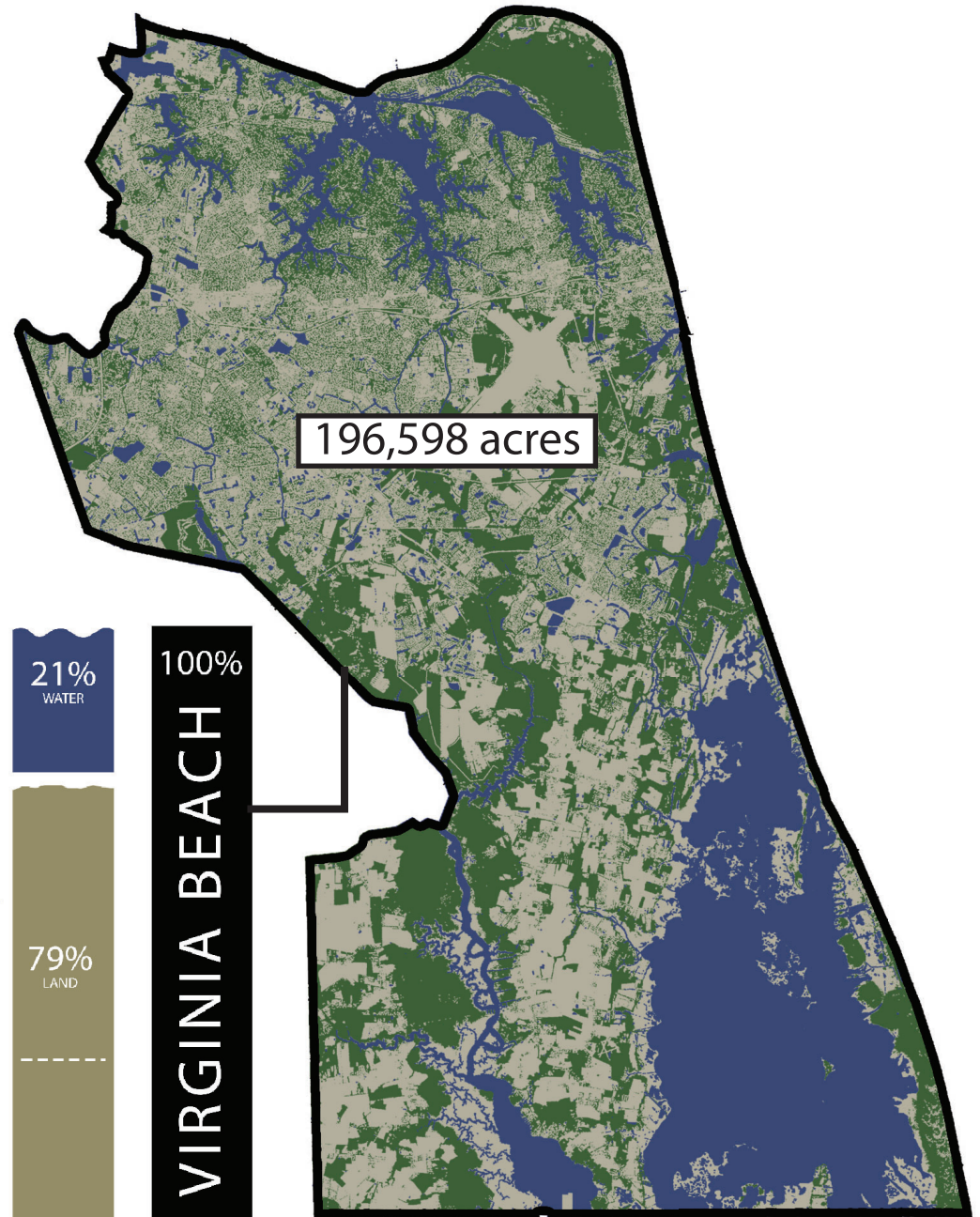*Red Wing Park, Virginia Beach, VA*

The UTC

Virginia Beach's
Urban Tree Canopy (UTC)

The review of Virginia Beach's urban tree canopy in this Plan Update builds upon and refines findings in the University of Vermont Spatial Analysis Laboratory's 2012-2018 Tree Canopy Change Assessment. The assessment established metrics and used tree coverage data from 2012 and 2018 to estimate the change in Virginia Beach's UTC over that six-year timeframe.

Using LiDAR (light detection and ranging) aerial mapping technology, the data from the 2012-2018 assessment indicated that Virginia Beach's UTC, based on total land coverage, dropped from 41.7% to 40.3% (a total of 1.34% net reduction). Relative to the total tree canopy area, this would equate to a 3.2% loss, which amounts to 2,082 net acres of tree canopy. This equates to approximately 219,105 trees.

The goal of this plan is to achieve a 45% Urban Tree Canopy (UTC) by the year 2045.

* A 40% tree canopy was a goal for municipalities previously set as a benchmark in a 1997 article from American Forests Magazine, the publication of the eponymous national forest conservation organization. American Forests also cites a national analysis by U.S. Forest Service researchers specifying that "a 40-60 percent urban tree canopy is attainable under ideal conditions in forested states." Given that Virginia Beach is located in a forested region, 40% should be the baseline for the UTC in the city, with 45% being the target goal recommended in the 2014 Urban Forest Management Plan and reiterated in this Plan Update.

196,598 acres

41,724 acres — 21% WATER

100%

154,874 acres — 79% LAND

VIRGINIA BEACH

62,443 acres — 40.3% URBAN TREE CANOPY

Virginia Beach's UTC Coverage in 2018

Assessment

Benefits of Trees and the Urban Forest

Virginia Beach's urban forest contributes to the city's overall sustainability as a community and to the quality of life of its residents. The path to a sustainable community, as defined by the Urban Sustainability Directors Network (USDN), includes the common elements of "a healthy environment, a strong economy, and the well-being of people living in the community." The tree canopy plays numerous roles within the city and affects all areas of sustainability, including but not limited to stormwater management, energy use, air and water quality, wildlife habitat, public health, economic viability, social equity, and overall livability.

Since trees are the defining element of the urban forest, it is important to establish the value that a tree provides to the community. There are both direct and indirect benefits from trees, and these benefits compound when trees are working together in the same area. The "natural capital" of the urban forest can be categorized, as with other contributing factors to a community's overall sustainability, into environmental, economic, and social benefits. These benefits are collectively known as ecosystem services, which are often defined as direct and indirect contributions of natural systems to human well-being — in other words, any positive benefit that wildlife or ecosystems provide to people.

In The Sustainable Urban Forest: A Step-by Step Approach, published by the Davey Institute and the U.S. Forest Service, urban forester Michael Leff summarizes the ecosystem services provided by trees:

Environmental & Health

- Improve air quality by absorbing and filtering pollutants
- Reduce greenhouse gases by direct carbon sequestration and through avoided carbon emissions from reduced energy use
- Save energy by directly shading building and through the cooling effects of transpiration
- Mitigate overall air temperature extremes and reduce urban "heat island" effect
- Help manage stormwater, reduce flooding, and improve water quality
- Support wildlife populations and overall biodiversity
- Reduce ultraviolet radiation levels

Economic

- Save energy and cut costs for summer cooling (shade) and winter heating (windbreak)
- Increase property values, benefiting homeowners and increasing local tax revenues
- Boost commercial district activity
- Support green industry jobs
- Reduce cost to taxpayers for traditional "gray" infrastructure (like treatment plants and stormwater pipes)
- Supply wood products — ranging from recycled material such as mulch, to hardwood furniture, and fuel for energy production

Social

- Promote public health and well-being
- Encourage physical activity by creating attractive, shaded outdoor spaces
- Discourage crime and create safe places to gather
- Strengthen community engagement and revitalize neighborhoods
- Promote social equity and environmental justice for neglected communities
- Supply healthy edibles — fruit and nuts
- Provide solace, spiritual sustenance, and a sense of place

The City of Virginia Beach calculated the value of the ecosystem services provided by its existing UTC to be almost $446M in 2018 USD annually based on the benefits derived from an average tree with a 414-square foot canopy. In 2022, this would equate to roughly $493M. The economic values of Virginia Beach's ecosystem services are based on the cost of obtaining these same services without the benefit of having trees. Without trees, additional infrastructure such as filtration systems, check dams, and ponds, would need to be built to meet state and federal environmental quality standards for stormwater mitigation and erosion control. Without trees, air pollution and ambient temperatures would be far less mitigated through transpiration. Whole ecosystems would be greatly affected, with no trees contributing to pollination and fewer habitats for insects, mammals, and birds. The local lumber industry and various other tree byproducts would essentially cease to exist. The wellbeing of the public would also suffer from lack of trees in streets and open space. These would be just a few of the ramifications of not having trees, and they underscore the value of trees in our city.

A summary of the annual value of the ecosystem services provided by the city's UTC is outlined below:

Ecosystem Service	Calculated Value
Increased Property Value	$199,337,587
Stormwater Runoff Reduction	$142,815,001
Electricity Conservation	$39,516,769
Air Quality Improvement	$30,087,746
Natural Gas Conservation	$18,648,412
CO_2 Reduction	$15,535,459
Total Annual Ecosystem Services	$445,940,973

*Values are in 2018 USD

Benefits of Single Trees
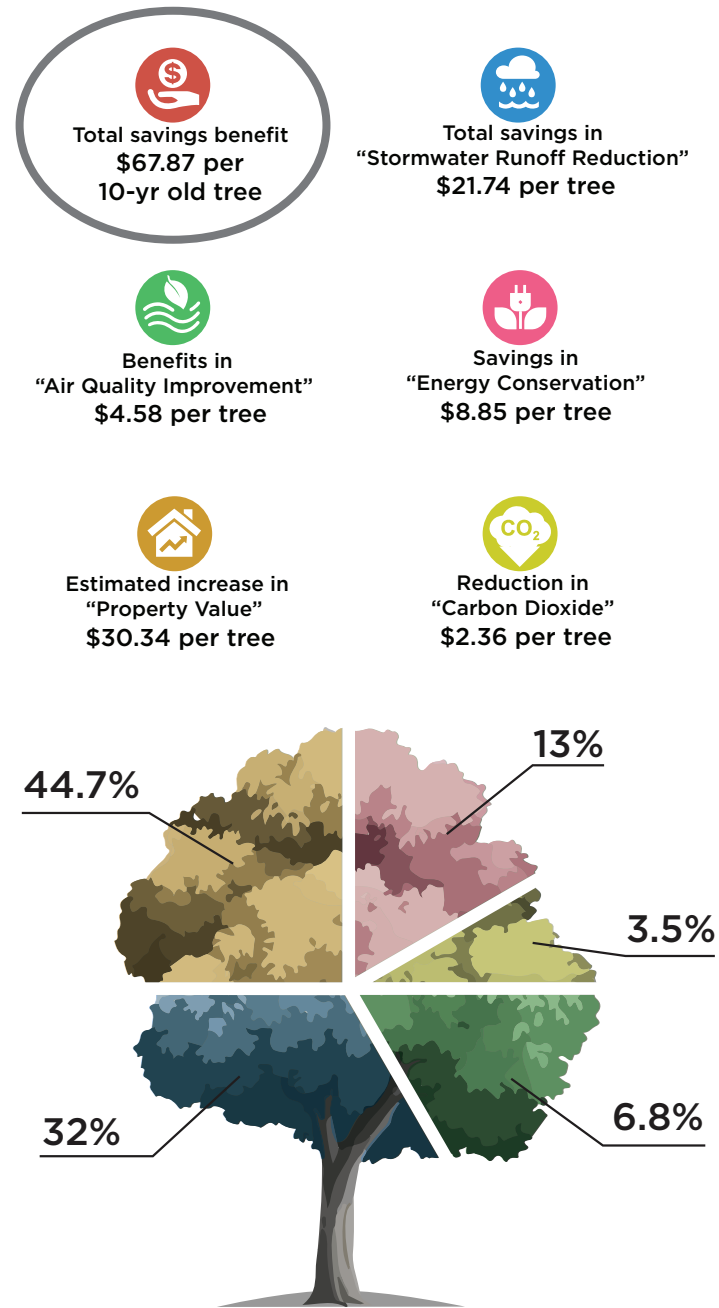
Environmental & Health Benefits

Water Quality & Water Table Management

Habitat & Diversity

Stormwater Absorption

Soil Stability & Erosion Control

Pollination

Urban Heat Island Reduction

Air quality improvement through Carbon Dioxide (CO2) reduction/carbon sequestration

Human Health, Safety & Wellness

Environmental & Health Benefits of A Tree in Virginia Beach

Economic Benefits

Total savings benefit $67.87 per 10-yr old tree

Total savings in "Stormwater Runoff Reduction" $21.74 per tree

Benefits in "Air Quality Improvement" $4.58 per tree

Savings in "Energy Conservation" $8.85 per tree

Estimated increase in "Property Value" $30.34 per tree

Reduction in "Carbon Dioxide" $2.36 per tree

44.7%

13%

3.5%

32%

6.8%

Economic Benefits of A Tree in Virginia Beach in 2018 USD

Benefits of Trees as a Forest

Environmental & Health Benefits

Soil Stability & Erosion Control

Pollination

Habitat & Diversity

Urban Heat Island Reduction

Human Health, Safety & Wellness

Water Quality & Water Table Management

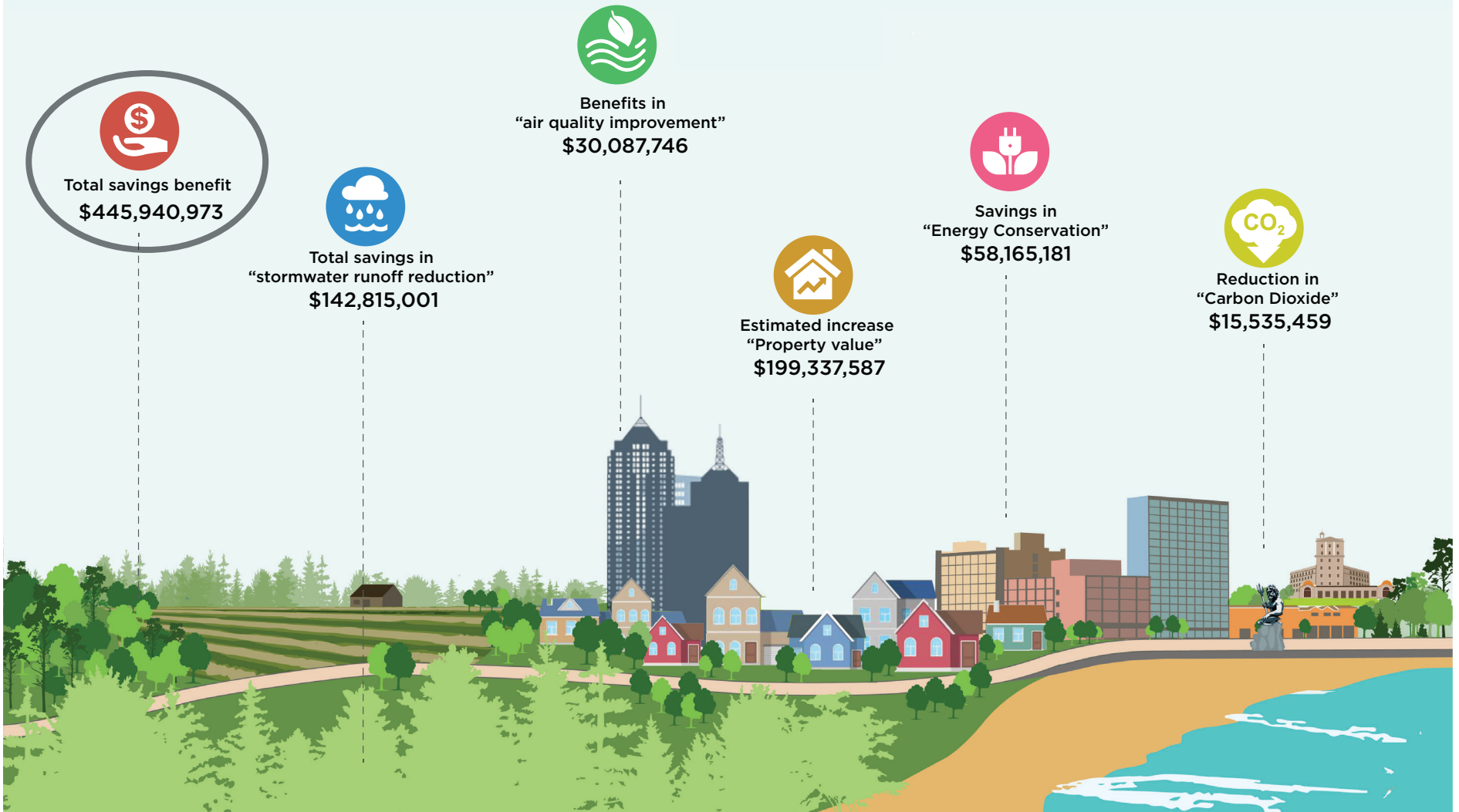Air quality improvement through Carbon Dioxide (CO_2) reduction/carbon sequestration

Environmental & Health Benefits of the Urban Forest in Virginia Beach.

Benefits of Trees as a Forest

Economic Benefits

Benefits in "air quality improvement"
$30,087,746

Savings in "Energy Conservation"
$58,165,181

Total savings benefit
$445,940,973

Reduction in "Carbon Dioxide"
$15,535,459

Total savings in "stormwater runoff reduction"
$142,815,001

Estimated increase "Property value"
$199,337,587

Economic Benefits of the Urban Forest in Virginia Beach in 2018 USD

Tree Metrics

Establishment of Assessment Metrics

The City of Virginia Beach used the UTC metrics established in the 2012-2018 University of Vermont assessment for the basis of quantification. The following information provides an updated understanding of the current state of Virginia Beach's UTC. The UTC quantification metrics found in the University of Vermont assessment establish a consistent methodology for performing future citywide UTC assessments as the city strives to reach its 45% UTC goal by the year 2045.

As touched upon in the Introduction of this Plan Update, 414 square feet is an average derived from University of Vermont data for the purposes of UTC estimates. This is a tree at approximately 10 years' growth and is a more conservative estimate than the 828 square feet average tree canopy size used in the 2014 Urban Forest Management Plan.

The following graphics highlight the tree size used for assessment, the number of trees in an acre, the number of trees lost from 2012 to 2018, and the total value of ecosystem services lost as a result of lost trees over the same time period. It is important to note that tree loss is immediate, in contrast to tree gain. It can take at least 10 years to grow a new tree large enough to provide similar measurable value of the ecosystem services to a more mature tree. Calculation must account for the 10 years it would take for a tree to effectively replace the dollar value lost during the same assessment period.

TREE SIZE RANGE IN VB

2,500 SF
(Largest Single Tree Size)

414 SF
(Average tree size used for UTC assessment)

16 SF
(Smallest Single Tree Size)

SF = Square Foot
Measured by LiDAR

An Individual Tree

The area of an individual tree was estimated at 414 square feet and used as a conservative basis of measurement for the UTC. A 414 square foot canopy size is what one would find on a 10-year-old canopy tree.

Tree Metrics

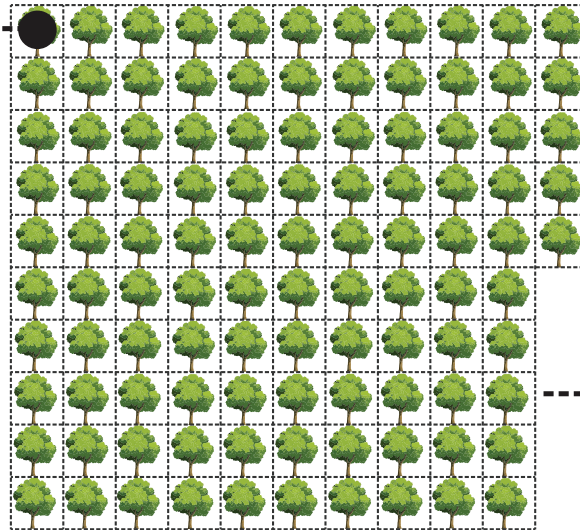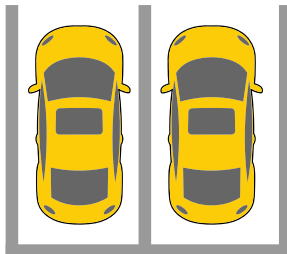## Number of Trees In An Acre

While the UTC Assessment data uses square feet and acres as a basis of measurement, providing the context of how many trees are in an acre can help to contextualize and scale the value of tree loss or gain.
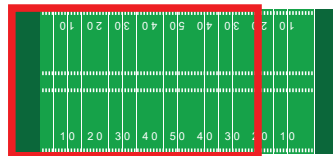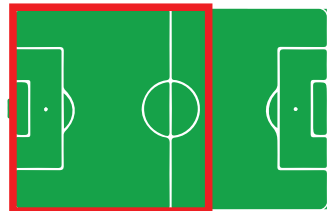

1 ACRE = 43,560 SF = APPROX. 105[1] TREES

1.34% = APPROX. 2,082[1] ACRES LOST
1.34% = 219,105 TREES LOST

414 SF TREE

EQUIVALENT TO

**75% OF AN AMERICAN
FOOTBALL FIELD**

EQUIVALENT TO

**1,578 AMERICAN
FOOTBALL FIELDS**

EQUIVALENT TO

2 PARKED CARS
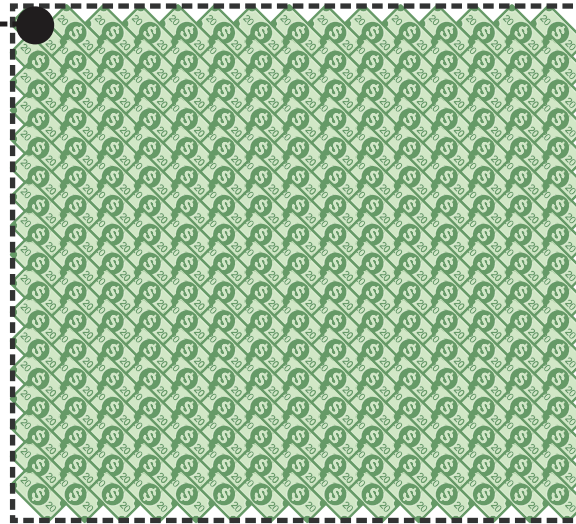
**60% OF AN INTERNATIONAL
FOOTBALL FIELD**
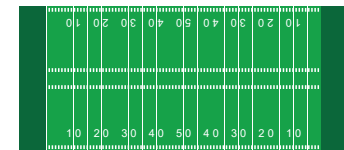
**1,249 INTERNATIONAL
FOOTBALL FIELDS**
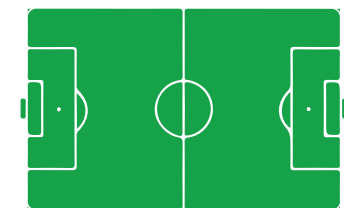
[1] *Values are rounded to the nearest whole number*

Tree Metrics
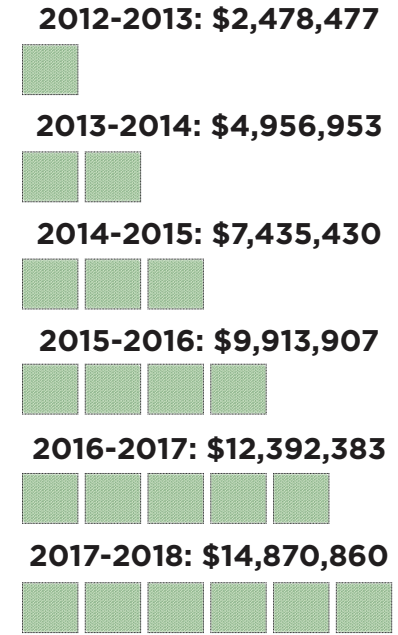
YEARLY VALUE OF TREES LOST PER YEAR FROM 2012-2018

CUMULATIVE LOSS OF VALUE FROM 2012 THROUGH 2018:

2012-2013: $2,478,477

2013-2014: $4,956,953

2014-2015: $7,435,430

2015-2016: $9,913,907

2016-2017: $12,392,383

2017-2018: $14,870,860

$52,048,010
Total loss from 2012 to 2018

$1,390,425,406
Total loss from 2012 to 2045
(assuming the same rate of loss)

If trees are planted to achieve
the 45% goal by 2045,
& if the rate of tree loss is eliminated,
the City will gain roughly

$2,130,747,303
in equivalent value

**BASED ON A
414 SF TREE SIZE**

**1 TREE
=
$67.87 VALUE PER YEAR**

**36,518[1] TREES X $67.87 PER YEAR
=
$2,478,477 PER YEAR**

Value of Tree Loss Between UTC Assessments

The amount of net tree loss as measured in acres can be tabulated to show approximated value in trees from 2012 to 2018. Projecting the rate of loss forward without intervention shows the compounding loss as an opportunity cost which would otherwise be attributed to various City services.

* Values are in 2018 USD
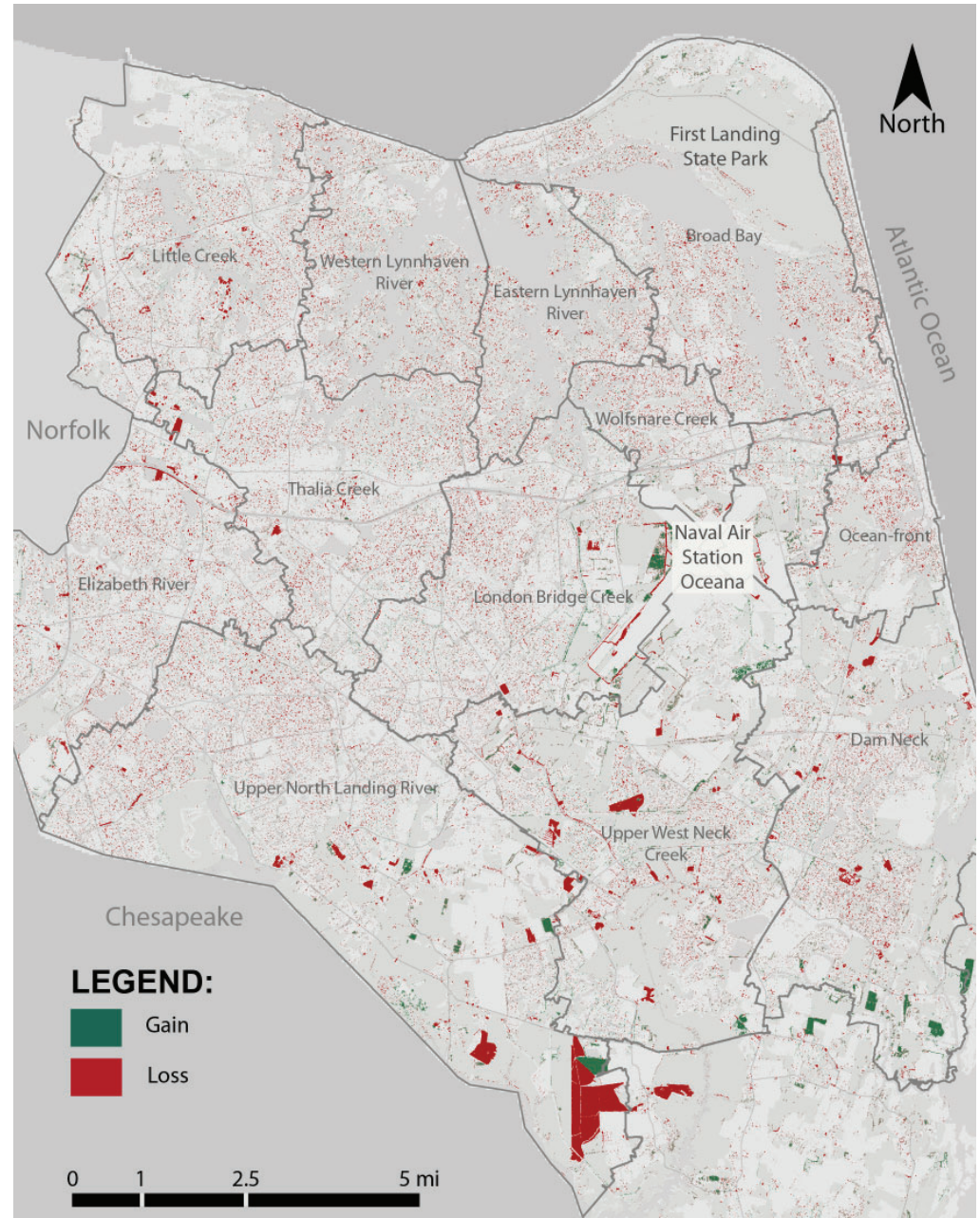
Mapping Gain & Loss

Changes in the UTC

As a continuation of the assessment/management/collaboration model established in the 2014 Urban Forest Management Plan, the current extent and condition of the UTC was assessed for both geographical losses and gains. This section details the changes in the UTC from 2012 to 2018 and highlights the areas of the city where such losses and gains were observed.

Currently, UTC loss is outpacing UTC gain by twofold. At the current pace and with no proactive plan or policy measures, the UTC would decrease to roughly 34.3% by 2045. This would amount to a loss of over 800,000 trees or roughly 7,600 acres between 2022 and 2045, which is roughly equivalent to 13% of the existing tree canopy.
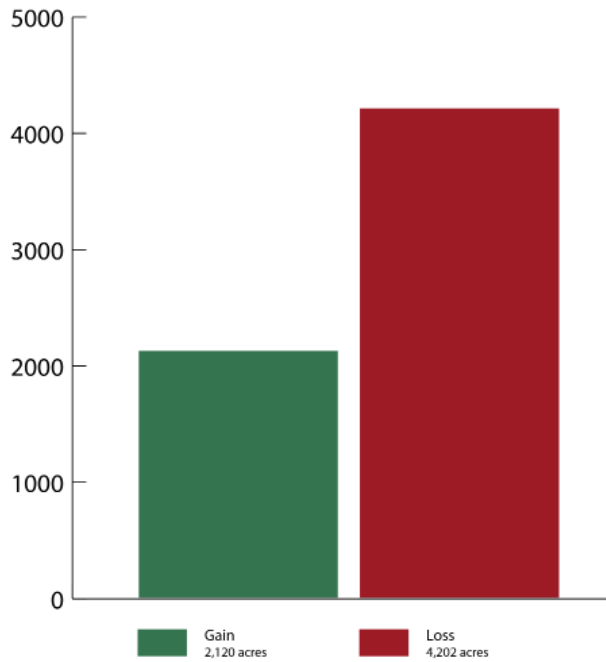
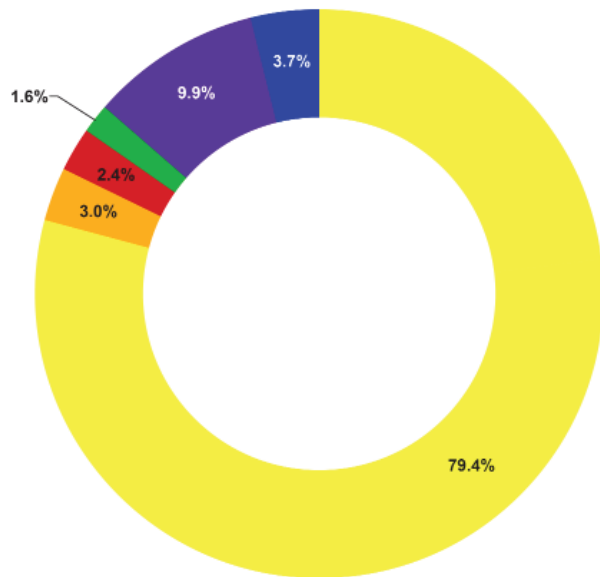*Virginia Beach Bar Chart of Tree Canopy Change in Acres from 2012 to 2018.*

Partial Virginia Beach Map of Tree Canopy Change from 2012 to 2018.

Mapping Gain

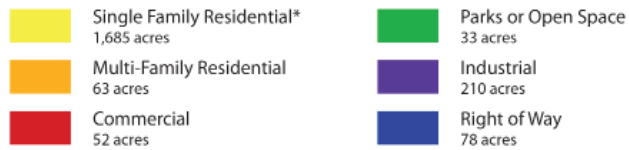## Tree Canopy Gain Per Zoning District

Change from 2012-2018 - Gains

During the six-year period between the two aerial assessments of the UTC in 2012 and 2018, there were certain areas of the city that experienced gains in the UTC. These gains, though small, were significant in the residentially and agriculturally zoned properties in the southern half of Virginia Beach away from urban development. Agricultural timbering activities occur not only on agriculturally zoned land but on land zoned for single-family residential as well. The categorizations used in the map below represent zoning districts rather than land use categories. It is recommended that additional analysis be completed that also looks at land use in order to fully assess sources of loss.
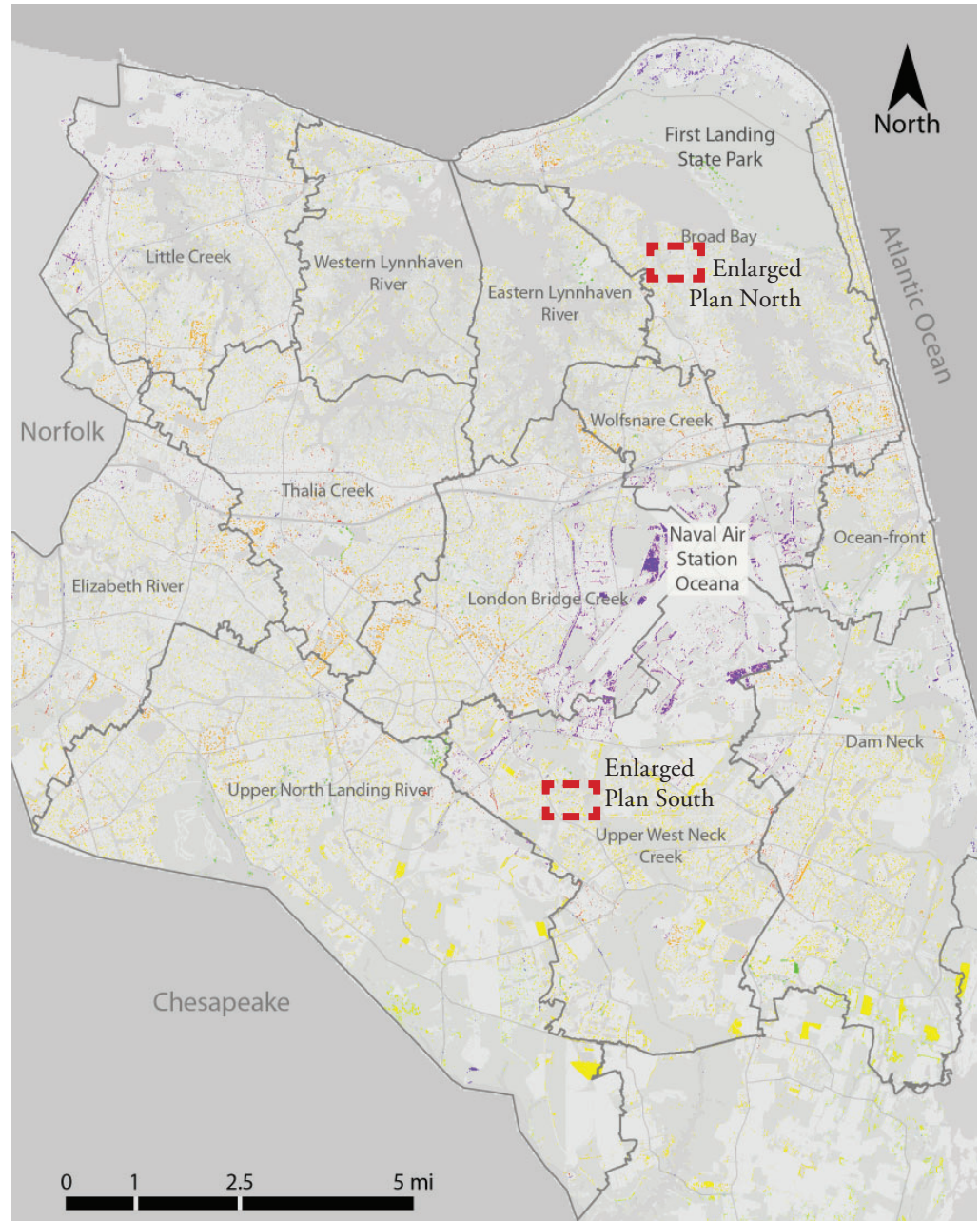

Virginia Beach Tree Canopy Gain By Percentage from 2012 to 2018.

Zoning Categories

- **Single Family Residential***
  1,685 acres
- **Multi-Family Residential**
  63 acres
- **Commercial**
  52 acres
- **Parks or Open Space**
  33 acres
- **Industrial**
  210 acres
- **Right of Way**
  78 acres

* Agriculturally zoned land is included within Single Family Residential Zoning Category

*Partial Virginia Beach Map of Tree Canopy Gain from 2012 to 2018.*

▪ ▪ Upscale on page 17

Mapping Loss

Tree Canopy Loss Per Zoning District

Change from 2012-2018 - Losses

Tree loss reflected in the UTC assessment was over twice the amount of tree gain from 2012 to 2018. As with the gains, losses occurred primarily on residentially and agriculturally zoned properties. However, there were also significant losses of UTC acreage in rights-of-way and, to a lesser extent, in multifamily and commercial zones. In rights-of-way 337 acres of UTC were lost with 315 aggregate acres lost in the multifamily and commercial zones. Much of Virginia Beach's existing development is located in the Lynnhaven River watershed where over 2% (roughly 759 acres) of UTC loss occurred.
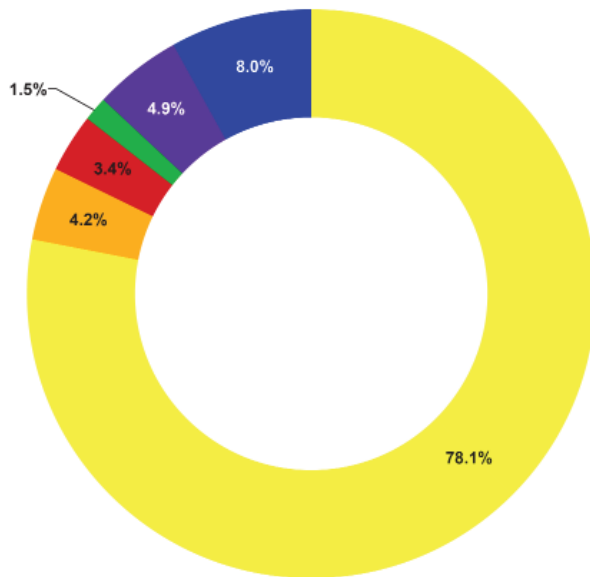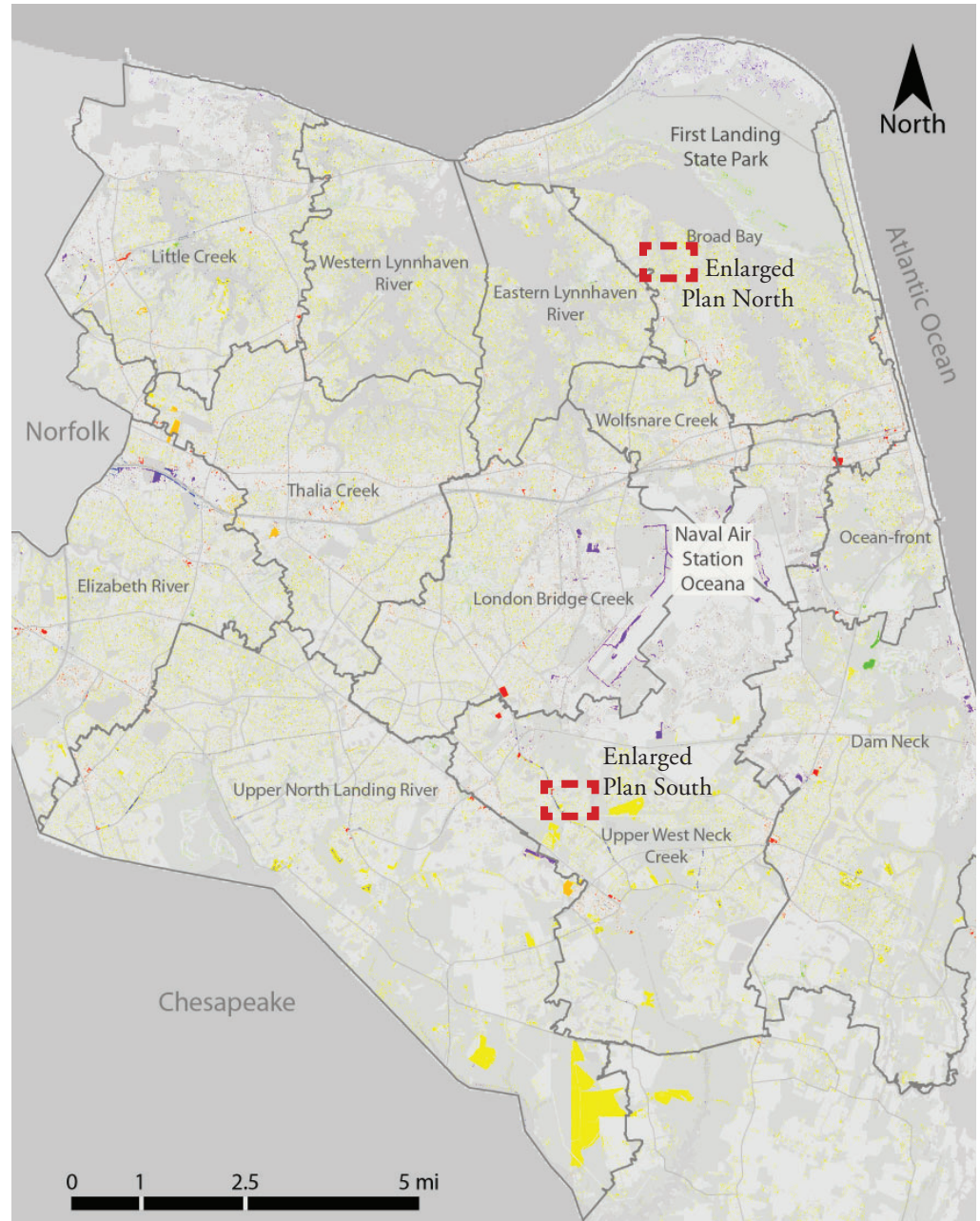

Virginia Beach Tree Canopy Gain By Percentage from 2012 to 2018.

Zoning Categories

🟨 Single Family Residential* 3,282 acres	🟩 Parks or Open Space 63 acres
🟧 Multi-Family Residential 175 acres	🟪 Industrial 205 acres
🟥 Commercial 142 acres	🟦 Right of Way 337 acres

* Agriculturally zoned land is included within Single Family Residential Zoning Category
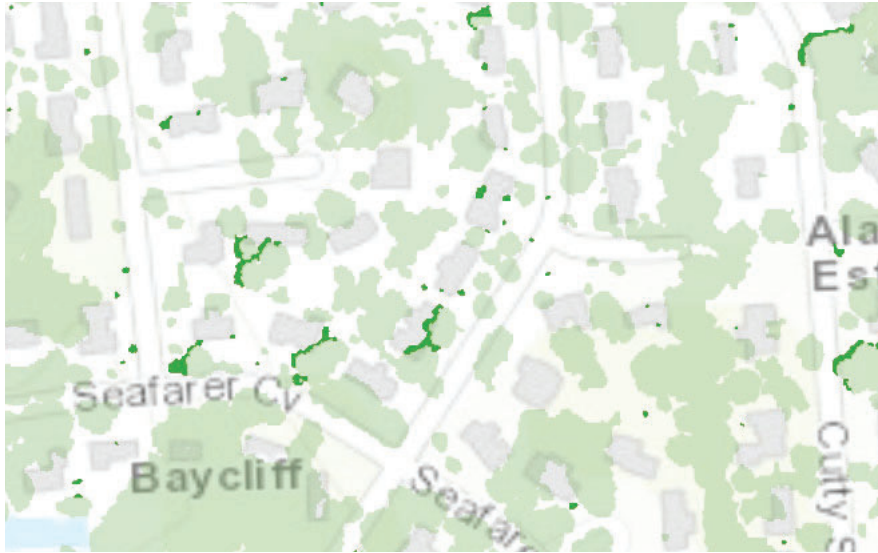

Partial Virginia Beach Map of Tree Canopy Loss from 2012 to 2018.
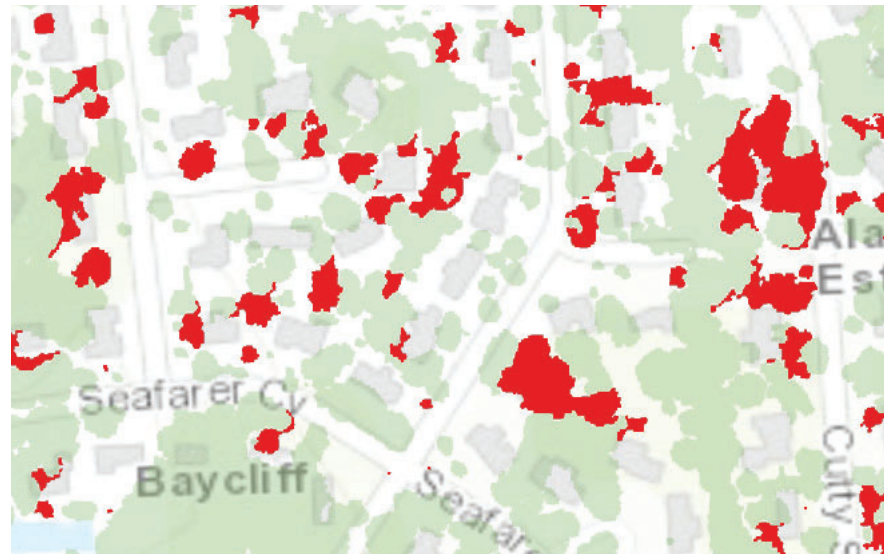
▬ ▬ Upscale on page 17

Mapping Gain & Loss

Lynnhaven River Watershed Area of Virginia Beach
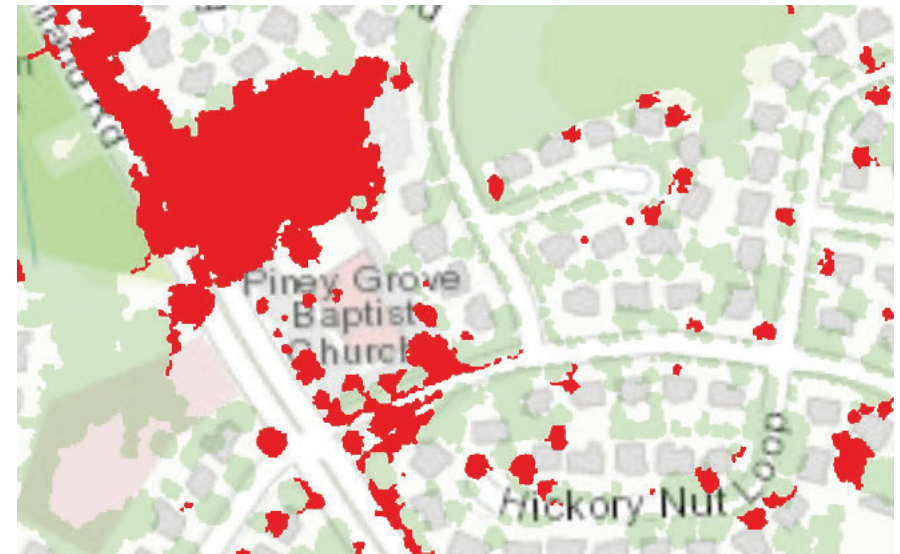

Tree Canopy Gain

Southern Rivers Watershed Area of Virginia Beach

Tree Canopy Gain

Tree Canopy Loss

Tree Canopy Loss

Management & Collaboration

The Goal

The current plan establishes a goal of 45% tree canopy coverage by 2045. The existing tree canopy is nearly 1 million trees short of this goal, necessitating planting of almost 40,000 trees per year until 2045 in order to reach the desired tree canopy coverage. Meanwhile, the City is also losing roughly 36,000 trees every year on average. Steps taken to achieve the 45% tree canopy coverage should account for not only the gap between the existing and desired canopy, but also this current rate of decline.

Moving Forward

Virginia Beach's urban forest is a dynamic asset that requires a multi-pronged approach to mitigate tree loss (preservation) and promote tree gain (planting), to minimize tree conflicts with other assets, and to ensure the health and longevity of trees in the community. Everyone has a role in managing the urban forest, and management of the urban forest will achieve the greatest success and community support as a collaborative effort between all stakeholders, from the municipal government to homeowners to developers.

Between 2012 and 2018, the City of Virginia Beach had a net loss of 1.34% in its Urban Tree Canopy, which is equivalent to 219,105 trees or roughly 2,082 acres.

Current Tree Canopy in 2022*

39.42%

61,000
acres

6.4M
trees

Yearly planting required to achieve **45%** UTC by 2045

36k annual loss

76k trees

36k replacement

if yearly tree loss remains the same

or

40k trees

if yearly tree loss is reduced to zero
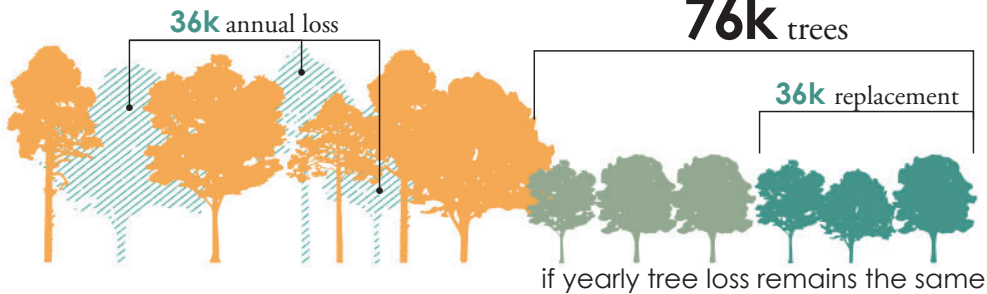
* Projected 2022 tree canopy based on average yearly loss from 2012-2018

Bald Cypress at Stumpy Lake Natural Area, Virginia Beach, VA

Next Steps

Municipal Center Champion Tree, Virginia Beach, VA.

Next Step #1: Keep Doing What's Working

<u>Targeted Goal:</u>

Build upon and carry forward the successful elements of the sustainability model established in the 2014 Urban Forest Management Plan, and more recent and groundbreaking achievements made since embarking on this current plan beginning in 2021.

<u>Desired Outcomes:</u>

- Tree Mapping / Inventory – Continue and advance tree mapping for new installations, replacements, and maintenance of trees.
- Inventory Trees – Continue the Virginia Beach Tree Inventory for trees and extend the inventory to include available parcels for reforestation, preservation, and temporary holding nurseries.
- Tree Canopy Loss Mitigation – Continue to implement and apply the new City Policy for tree loss mitigation based on acre, caliper size, or specimen.
- Collaboration & Engagement - Expand on the success of events like Arbor Day and Treetopia and multiply recent efforts on the website and branding that have a high response rate.

<u>Tools & Techniques</u>

- Review the most recent strategies and successes toward UTC preservation which have occurred since the most recent UTC assessment.
- Find ways to summarize these achievements and broadcast this information to other City Departments in order to solicit help and spur improvements.
- Pre-plan the next UTC Assessment collection and the next Urban Tree Forest Management Plan Update with the knowledge learned since 2021.

Next Steps

Princess Anne Commons Arbor Day Celebration, Virginia Beach, VA.

Next Step #2:
Undertake A Multi-Level Educational Program

Targeted Goal:

Greatly increase community and stakeholder understanding of the problem of tree canopy loss and the need for and benefits of a healthy, growing tree canopy in Virginia Beach.

Desired Outcomes:

- A seamless connection to constituents, City staff, and elected officials about the UTC and documentation of each meeting occurrence.

- The establishment of a network of organized constituent groups supporting the allocation of City resources to implement the vision of this Plan Update will have taken place.

- Formation of several formalized projects, actions, and partnerships will have been established over the next five years. Partnerships would ideally involve an organized constituent group with members such as residents, business owners, and developers who are committed to not cutting down trees and who can become advocates for budgetary and staff resources.

Tools & Techniques

- Expand current branding and public relations initiative for the educational program and various implementation initiatives to foster greater awareness of the importance of the tree canopy to the environmental, economic, and social health of Virginia Beach.

- Formalize the current educational program crafted for the various stakeholder groups who can have the greatest effect on maintaining the city's tree canopy, including residents, business owners, developers, government staffers, elected officials, and the tree service industry.

- Perform outreach with formalized groups to establish a partnership network.

- Utilize a multi-generational approach to tap into younger residents' interest in the environment and to senior citizens' interest in supporting community benefits and beautification.

Next Steps

View of the forest at Marshview Park and Owls Creek.

Next Step #3:
Target Public Lands for Maximum Tree Cover

Targeted Goal:

Prioritize public resources on increasing UTC on public lands, where there is the greatest ability to permanently protect the urban forest.

Desired Outcomes:

- The City and its partners will take steps to maintain and preserve public lands.

Tools & Techniques

- Record formal protection covenants on public woodlands.
- Allocate annual capital resources for tree plantings.
- Pursue funding through government and foundation grants to leverage city funds in maximizing the number of annual tree plantings.
- Map all areas on public lands, including those owned and managed by non-City public entities, where unforested areas could be planted with trees.
- Implement a capital improvement project that includes funding for a targeted number of planted trees per year and that leverages city funds with potential grant opportunities that could speed up or improve the outcomes of tree planting projects.
- Coordinate with Department of Parks and Recreation staff to maximize tree cover in all park improvement projects.
- Apply for grants for Natural Area preservation.

Next Steps

Excerpt from Parks & Landscape Services' Tree Mapping

Next Step #4:
Formalize Tree Tracking And Removal Notification System

Desired Outcomes:

- Tree planting and removal will be documented and tracked citywide.
- The Urban Forest will be established as a public service utility/resource.
- A combination of reporting methods and tracking/management platforms will be utilized to establish an information clearing house for the Department of Parks and Recreation.
- The tracking systems currently used for trees on City-owned properties will be deployed throughout the city to better gauge the state of the UTC in between aerial assessments.

Tools & Techniques

- Further develop an electronic tree removal permitting process for the tree service industry for tree removal on City Property.
- Record and document all approved site plan tree inventories and preservation plans for City trees for more thorough tracking.
- Explore tree tracking and management software for use beyond just City-owned properties.
- Provide access to tree mapping and inventory layers in GIS to other departments for coordination and awareness of the tree maps.
- Enlist additional seasonal staff that can be wholly designated to inventorying trees City wide.
- Consider programs like Tree Keeper and Capterra to help with assembling and reporting data collected in the tree inventories.
- Map and Measure Trees by Council District for the ability to compare and prioritize UTC goals.

Future Considerations

Victoria Park Neighborhood, Virginia Beach, VA

Future Consideration #1:
Inform Other City Departments and the Development Community About the UTC Goals and Tree Mitigation Policy

<u>Desired Outcomes:</u>

- The City culture should better embrace the city's trees and urban forest as public infrastructure and as a public resource providing a public service.

- The Tree Planting, Preservation and Replacement ordinance in the City Code should be updated to better support the UTC and other current best practices.

- City's Landscaping Guide and Tree Planting, Preservation, and Replacement documents should be updated and coordinated between all City departments with regard to tree planting and preservation.

<u>Tools & Techniques</u>

- Establish a city-wide replacement standard for tree removal and replacement on all new site plans and subdivision plans based on the recent State Ordinance Model (SB537) that passed this year. The new language in State Code, Section 15.2-961 suggests a tree canopy coverage ranging from 10%-20% based on development intensity.

- Update standards and requirements for tree protection and preservation to meet with ever-advancing technology, and apply them to all land use and zoning classifications for development.

- Extend bonding based on the recently passed City policy to cover both new plantings and tree preservation for all site plans and to enforce tree preservation plans submitted with site plans.

- Clarify guidance language that is based on the use of trees as a visual, spatial, and aesthetic quality for new development.

- Hold regular training and briefings with various City departments on the City policies and goals for the UTC and correlative tree mitigation.

Future Considerations

Tree Preservation Area on a Construction Site, Virginia Beach, VA

Future Consideration #2:
Incentivize Tree Protection Through The Land Development Ordinances

Targeted Goal:

Explore zoning tools and techniques that could provide incentives, like development density bonuses, for achieving greater than the minimally required tree canopy on land development plans. In addition, tree preservation would be incentivized more than tree planting, and fees in lieu of tree planting or preservation would not yield additional bonuses but would be required if minimum tree canopy requirements cannot be achieved on the proposed site.

Desired Outcomes:

- The zoning, subdivision, and site plan ordinances will include provisions for certain zoning districts or overlays that allow for development density bonuses (increase height or number of units, for example) if base tree canopy requirements are exceeded by a certain percentage.

- New development where it is not possible to meet tree planting requirements onsite should fund tree planting efforts offsite. That funding should pay for enough tree planting to provide an equivalent percentage of tree canopy coverage as required by its zoning designation.

Tools & Techniques

- Decide which areas of the city would benefit most from an increased tree canopy, higher density, or additional housing, and consider implementing a zoning overlay that incentivizes higher tree canopy percentages in exchange for development incentives.

- Adopt a formal tree mitigation / preservation credit process by enacting Code that mirrors the recently passed State model ordinance (SB537).

- Promote a CIP Tree Fund that developers can pay into when meeting tree planting requirements onsite is impossible. Payment in lieu should support planting at least as many trees in appropriate locations as would have been required onsite for a particular development.

- If trees must be removed for a development, incentivize the removal of smaller, less mature trees so that replacement of them could achieve the same canopy size, resulting in less net loss to the UTC.

- Use Stormwater Credits as an incentive for tree preservation as metrics become available for the stormwater quality and quantity benefits of preserving large groups of mature trees. This work is being conducted by researchers at Virginia Polytechnic Institute and State University.

Future Considerations

Town Center Urban Trees, Virginia Beach, VA

Future Consideration #3:
Establish a Tree Protection Easement Program.

Targeted Goal:

Creating a mutually beneficial program that allows property owners to institute protective easements or covenants in exchange for property tax relief is a method for protecting trees (at least for a set duration of time).

Desired Outcomes:

- A program that incentivizes property owners of all land use types to implement protective easements or covenants for the preservation of trees will be established, with property tax relief provided to participants. This would function similar to the City's Agriculture Preserve Program.

- While larger property owners may find more use from this program due to the practicality of preserving large land tracts, owners of property of all sizes may be interested in participating on some level.

Tools & Techniques

- Establish a set of program guidelines that provides property tax relief for property owners who enter into easement agreements or covenants to preserve mature tree canopies.

- Directly promote the easement program first to the city's many property owners who have larger tracts of land that abut against waterways, intact woodlands, and other fragile environments.

- Once a critical mass of interest develops, begin promoting the program to other areas where the preservation of the tree canopy would aid in reducing fragmentation of the urban forest.

- Seek to replicate natural and managed reforestation processes on both green development and redevelopment sites.

- Tree protection and reforestation easements would be set up in perpetuity, however, a strategy should be developed for ongoing tree survivability, forest quality, inspection, and maintenance of the easements in order to ensure annual tax reliefs are merited for the life and quality of the resource. Considerations could include location of the tree with respect to property lines as well as value and health of the tree.

Future Considerations

Future Consideration #4:
Establish a Property Owner Tax Incentive Education Program.

<u>Targeted Goal:</u>

There are federal tax incentivizes for reforestation projects, including projects which are a part of timbering operations. Establishing a program that educates property owners and connects them with resources to promote reforestation can aid in offsetting timbering impacts, especially in the southern areas of the city.

<u>Desired Outcomes:</u>

- A program that connects timbering operations and rural property owners to tax incentive opportunities related to reforestation will be promoted and managed similarly to the Agricultural Reserve Program.
- New development will result in a net gain in the UTC by requiring developers who are not able to meet tree planting requirements to fund tree planting efforts in more suitable locations or by allowing developers to replant trees of the same caliper as the removed trees.

<u>Tools & Techniques</u>

- Reach out directly to rural property owners and timber companies to gauge interest and obtain support for the city's reforestation efforts. Inform these stakeholders about the federal tax incentives available for reforestation projects.
- Promote the existing Agricultural Reserve Program and allow tree planting to be an eligible agricultural activity for participation in the program.
- The state's new model tree preservation and replanting ordinance (SB537) allows for reforestation on other site in lieu of preservation on the development site under certain circumstances. This framework should be used to aid in reforestation efforts city-wide in concert with federal tax incentivization programs.
- The federal tax incentives in Virginia go beyond just education and many are tied to various state and federal agencies. In general terms, the costs of reforestation are tax deductible up to a certain dollar amount per property. Also, sales for standing timber can often qualify for lower capital gains tax rates.