Tree Canopy Management Strategy

DRAFT July 26, 2017 for Review

Review Copy. Do not reproduce or cite.

Source: http://www.livability.com/va/arlington

Metropolitan Washington
Council of Governments

2017 TREE CANOPY MANAGEMENT STRATEGY
Prepared by the Regional Tree Canopy Workgroup, Michael Knapp Chairperson, Brian LeCouteur, staff liaison.

Draft Report: July 26, 2017. For Review. Do not reproduce or cite.

ABOUT COG
The Metropolitan Washington Council of Governments (COG) is an independent, nonprofit association that brings area leaders together to address major regional issues in the District of Columbia, suburban Maryland, and Northern Virginia. COG's membership is comprised of 300 elected officials from 24 local governments, the Maryland and Virginia state legislatures, and U.S. Congress.

CREDITS
Editors: Michael P. Knapp, Brian M. LeCouteur

Contributing Editors: Members of the Regional Tree Canopy Workgroup

Review Copy Design/Layout: Plan-It Geo, LLC

ACCOMMODATIONS POLICY
Alternative formats of this document are available upon request. Visit www.mwcog.org/accommodations or call (202) 962-3300 or (202) 962-3213 (TDD).

TITLE VI NONDISCRIMINATION POLICY
The Metropolitan Washington Council of Governments (COG) fully complies with Title VI of the Civil Rights Act of 1964 and related statutes and regulations prohibiting discrimination in all programs and activities. For more information, to file a Title VI related complaint, or to obtain information in another language, visit www.mwcog.org/nondiscrimination or call (202) 962-3300.

El Consejo de Gobiernos del Área Metropolitana de Washington (COG) cumple con el Título VI de la Ley sobre los Derechos Civiles de 1964 y otras leyes y reglamentos en todos sus programas y actividades. Para obtener más información, someter un pleito relacionado al Título VI, u obtener información en otro idioma, visite www.mwcog.org/nondiscrimination o llame al (202) 962-3300.

ABOUT THE METROPOLITAN WASHINGTON COUNCIL OF GOVERNMENTS AND THE REGIONAL TREE CANOPY WORKGROUP

Founded in 1957, the Metropolitan Washington Council of Governments (COG) is an independent, nonprofit association, with a membership of 300 elected officials from 24 local governments, the Maryland and Virginia state legislatures, and U.S. Congress. COG is supported by financial contributions from its member governments, federal and state grants and contracts, and donations from foundations and the private sector.

The Board of Directors is COG's governing body and is responsible for its overall policies. In addition, a wide network of policy, technical, and advisory committees, partnerships, and programs advance COG's regional work. Elected leaders, police chiefs, housing directors, environmental experts, and transportation planners develop synergy working together at COG.

COG's Regional Tree Canopy Workgroup (RTCW) is an ad-hoc committee formed to develop strategies, tactics and recommendations that can be used to conserve and manage regional tree and forest resources in support of environmental, land use planning, regulatory and socio-economic goals. RTCW was convened to continue working on local government commitments to implement control strategies identified in the "Urban Heat Island Mitigation/Tree Planting/Canopy Conservation and Management" measure that was included in the 2007 Metropolitan Washington State Implementation Plan (SIP) for 8-Hour Ozone Standard. These control strategies include: Measuring Existing Resources and Tracking Changes, Developing Programs to Enhance and Increase Benefits from Trees, Public Outreach, Develop a Regional Canopy Management Plan, Examining Tree Species Selection, Enhancement of Monitoring Programs.

Initially, RTCW efforts centered around the development of a credited tree canopy measure for air quality plans; however, RTCW's focus was soon expanded to develop strategies and recommendations that support a broader set of goals and objectives to enhance regional tree cover to help improve air quality. One of the most significant control measures identified in the 2007 SIP was for local governments to collaborate in the development of: "*a long-range plan to enhance tree conservation and planting, and to establish goals for increasing tree canopy coverage between 2010 and 2030 that could lead to lower levels of ground-level ozone pollution.*"

Building on this measure, RTCW elected to generate a set of preliminary strategies and recommendations for air and water quality that may be used in the Metropolitan Washington region. Furthermore, this report is intended to help build interest, support and a strong foundation for local, state and regional governments to provide the resources needed to ultimately develop a fully developed regional canopy management plan.

ADDITIONAL ACKNOWLEDGEMENTS

Regional Tree Canopy Workgroup Members

Michael P. Knapp, Chairperson – Montgomery County, MD

CJ Lammers: MNCPPC - Prince George's County, MD

Todd Bolton: City of Takoma Park, MD

Katherine Nelson, MNCPPC - Montgomery County, MD

Laura Miller – DEP - Montgomery County, MD

Jim McGlone: Virginia Department of Forestry

Anne Hairston Strang: MDNR-Forest Service

Marian Honeczy: MDNR-Forest Service

Vincent Verweij: Arlington County

Gary Allen: Chesapeake Communities

Steve Saari, District of Columbia

Monica Lear: District of Columbia

Keith Cline: Fairfax County, VA

COG Member Governments

D.C.
District of Columbia

Maryland
Town of Bladensburg
City of Bowie
City of College Park
Charles County
City of Frederick
Frederick County
City of Gaithersburg
City of Greenbelt
City of Hyattsville
City of Laurel
Montgomery County
Prince George's County
City of Rockville
City of Takoma Park

Virginia
City of Alexandria
Arlington County
City of Fairfax
Fairfax County
City of Falls Church
Loudoun County
City of Manassas
City of Manassas Park
Prince William County

TABLE OF CONTENTS

LIST OF FIGURES AND TABLES

EXECUTIVE SUMMARY

Across the metropolitan Washington region, the forests and trees found along streets, and in parks, yards, and natural areas represent a valuable community asset. This resource is major constituent of our green infrastructure and provides major contributions to environmental quality and functionality, public health, local economies, and aesthetic appeal. Urban forests provide "triple bottom line" benefits: *social, economic,* and *environmental.* However, this natural resource must be thoughtfully managed and embedded in local and regional planning efforts for communities to continue enjoying these benefits.

Many facets of the growth, redevelopment, and demographic shifts that are likely to occur in our region over the next 30 years have potential to erode efforts to conserve our urban forests. An estimated increase of two million people by 2050, sprawl development patterns, the effects of climate change, increased storm severity, changing cultural values and related "nature deficit disorder" are examples of serious challenges to these efforts. The underlying intent of this report is to set into motion processes that are needed to mitigate challenges and to maximize the potential of urban forest to deliver its important and timely benefits while minimizing its potential risks.

The Regional Tree Canopy Workgroup (RTCW) of COG is a multi-governmental effort to manage our urban forests and to explore related synergistic opportunities at the regional scale. A regional approach to urban forest management is critical as the decisions and actions of one locality can impact the quality, health and functionality of urban forests across the entire region. Regional collaboration on urban forest issues can produce results that cannot be achieved by the efforts of individual communities.

Regional collaboration on urban forestry matters will help realize broader planning goals such as those identified by the Region Forward Initiative. The goals and recommendations identified in this report are intentionally aligned with the Region Forward Vision, which calls for a more prosperous, accessible, livable, and sustainable metropolitan Washington.

The recommendations in this report provide a policy framework **to protect, manage and expand our urban forests;** examine the opportunities presented by **collaborative stewardship;** encourage the formation of a standing **forestry policy committee;** and encourage the development of a **regional urban forest master plan.**

GOALS

Quality of Life

Protect, Manage, and Expand Urban Forestry Assets for Health and Quality of Life

Optimize Programs

Optimize Urban Forest Programs

Regional Plans and Goals

Develop a Regional Urban Forest Management Plan and Canopy Goals

Community Ownership

Inspire the Community to Take Ownership of Efforts to Protect & Expand Urban Forests

Integration with Region Forward

Integrate Urban Forestry with Region Forward

STRATEGIES

PROTECT: Trees and development
MANAGE: Proper tree maintenance practices
EXPAND: Volunteer tree stewardship

Identify resources for managing the forest
Evaluate existing staff and additional staff needs
Review and update existing tree policies
Develop and monitor program goals

Integrate Regional Plan with local plans
Conduct regional canopy assessments
Establish attainable canopy goals

Lead by example
Build synergistic partnerships
Engage the community

Increase Region Forward participation
Integrate RF with this Canopy Strategy Report

Quality of Life
Optimize Programs
Regional Plans and Goals
Community Ownership
Integration with Region Forward

"Use our urban forest assets to achieve the goals of **Region Forward** by **adopting** a regional urban forest management plan, **optimizing** local tree programs, **setting** canopy goals, **engaging** the community, **integrating** trees into land use planning, and **collaborating** over shared opportunities and challenges."

- *Regional Tree Canopy Workgroup*
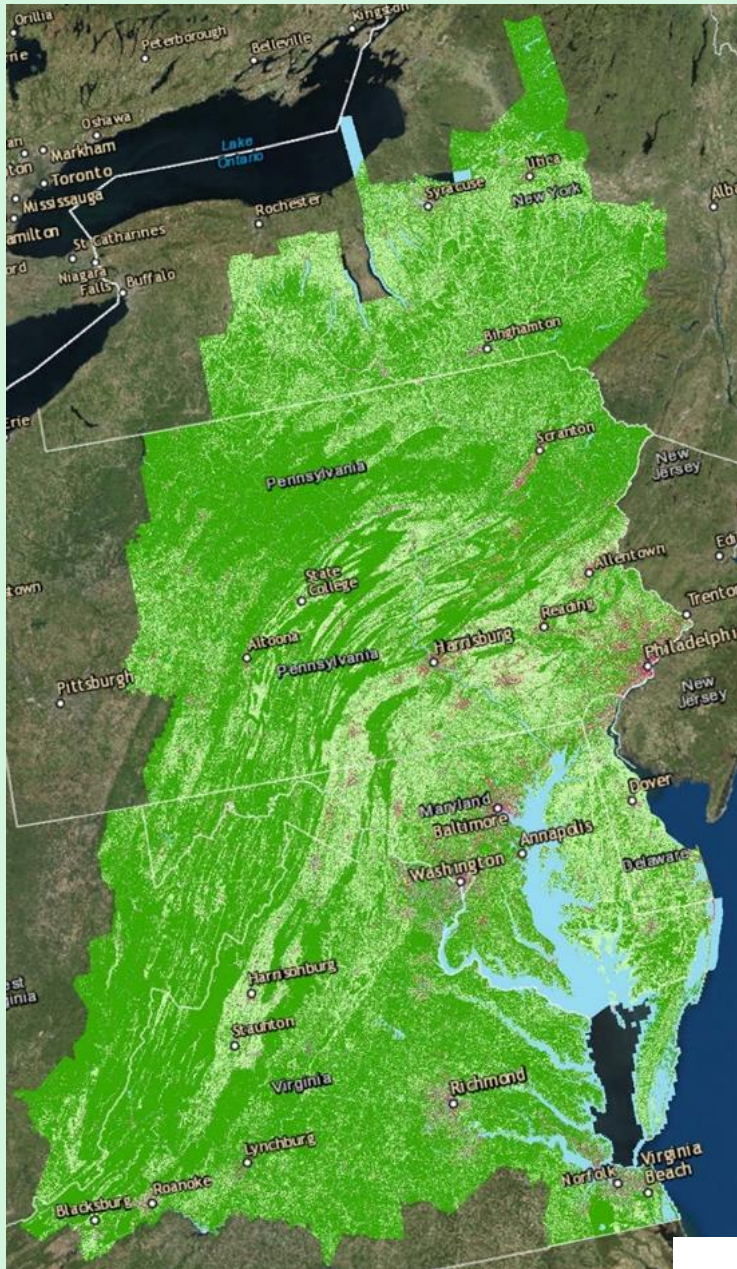
STATE OF THE CANOPY

Figure 1. Map Showing Tree Canopy across the Chesapeake Bay Watershed

Forest canopy was a dominant feature of our region long before European settlement, but much of those forests have since been cleared for farming and land development. While there have been efforts to reclaim lost forests and increase changes, it is not possible to evaluate the effectiveness of reforestation and conservation efforts without a baseline assessment.

Several localities and organizations in the region have understood the importance of assessing tree and forest canopy. Baseline canopy levels have been established across the region using satellite imagery and remote sensing technologies. These technologies provide a top-down view of the canopy. Many localities have also conducted on-the-ground surveys to identify the diversity and condition of trees and related vegetation. have evaluated the condition and extent of street tree populations, and identified potential planting spaces. The benefits and services of jurisdiction-wide tree canopy has been quantified and published by several communities. Other factors such as climate change, soil properties, and the impacts of insects and diseases have been researched, evaluated, and measured. All these factors provide important information about the health, condition and longevity of this vital resource.

Although a wide range of methodologies have been used to assess and quantify canopy levels, tree benefits, health, etc. on a region basis, we need to understand where gaps in these data and resources exist. This section provides a summary of many of the critical metrics which will shape the Regional Tree Canopy Management Strategy's goals and objectives.

Description of the Region

The Metropolitan Washington region extends across 3,000 square miles of the District of Columbia and parts of Maryland and Virginia. The Council of Governments is comprised of 24 member governments that represent urban, suburban, and rural communities that range in size from less than 10,000 to more than one million residents.

In general, tree removal far exceeds tree planting rates. During the period between 1973 and 1997, forest cover in the Baltimore-Washington region dropped from 820,569 acres to 555,090 – a decline of 32 percent, mostly due to urban development (American Forests). The most conservative estimates calculate that the region is losing 28 acres per day of open space (Source: Margaret Maizel One Image, LLC–Green More, or Less (Washington Post)). The population of metropolitan Washington is 5.4 million and the region is projected to add 1.5 million additional people from 2015 to 2045 (COG). Therefore, planning for protection of our urban forest is critical. Moreover, continuing canopy loss of this magnitude will result in a loss of environmental functionality in our region.

Table 1. Members of the Metropolitan Washington Council of Government

| District of Columbia	Maryland	Virginia
District of Columbia	Town of Bladensburg	City of Alexandria
	City of Bowie	Arlington County
	City of College Park	City of Fairfax
	Charles County	Fairfax County
	City of Frederick	City of Falls Church
	Frederick County	Loudoun County
	City of Gaithersburg	City of Manassas
	City of Greenbelt	City of Manassas Park
	City of Hyattsville	Prince William County
	City of Laurel	
	Montgomery County	
	Prince George's County	
	City of Rockville	
	City of Takoma Park	
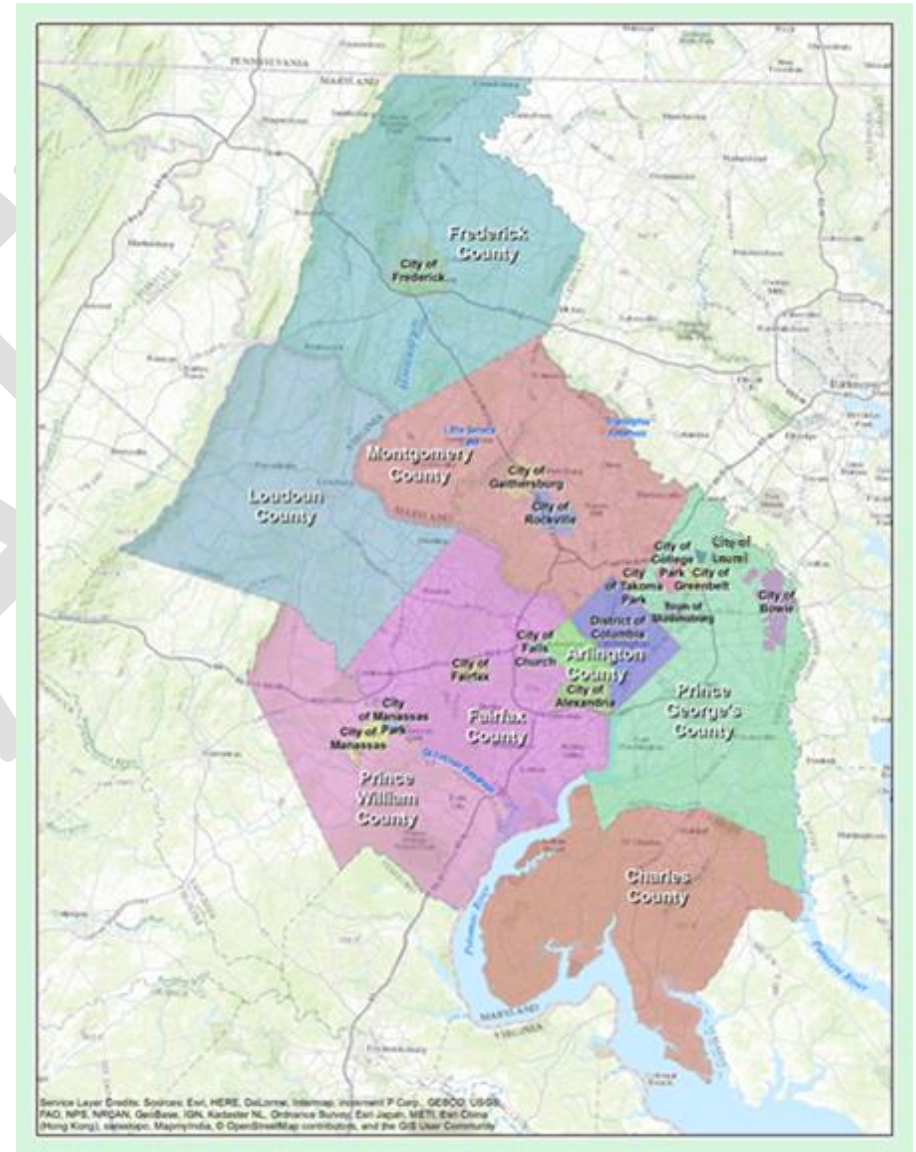
Figure 2. Map of the Metropolitan Washington Region

History of Tree Canopy & Urban Forestry Milestones in the National Capital Region

Popular myth often portrays the eastern United States as a pristine wilderness of untouched primeval forests when European settlement of North America began. In truth, the vegetation that early settlers encountered represented a mix of ecosystems that included forests, open woodlands, grasslands, savannahs, scrub, and forests with grassy openings, some of which were being manipulated by Native Americans to *not* become forests. Native Americans occupying the Chesapeake Bay region appear to have used clearing and fire to establish landscapes that attracted animals for hunting and facilitated agriculture and travel. These landscapes are now classified as "Savannah" and typically contain grasses, herbaceous plants and trees, and lack the interconnected canopy and woody understory plants normally associated with forests.

Native American populations declined sharply in eastern North America during the century that preceded European settlement. This decline is thought to have resulted in less intentional burning of savannahs and woodlands and a gradual succession of these vegetation communities into forests. Consequently, tree canopy levels were probably increasing when Captain John Smith explored the Chesapeake Bay in the early 1600's. In 1607, officials of the Virginia Company prepared an investment perspective that described Smith's exploration and the resources that he and others had been found in the region. This document directly mentions Chesapeake trees:

> "The country itself is large and great . . . the land is full of minerals, plenty of woods (the wants of England) . . .the soil is strong and lusty of its own nature."

Based on this description, it is safe to assume that forests covered 50 percent or more of the Chesapeake Bay watershed at the beginning of European settlement.

The investors of the Jamestown colony had hoped to exploit precious metals and gems, but since these were not readily available, the colonists quickly realized they would need to depend on the export of commodities such as tobacco, corn, indigo, lumber, livestock and animal furs to remain economically solvent. Following European agriculture models, colonists began to convert both savannah and forest lands into farmlands. Clearing native vegetation by axe and fire was a critical step in the production of most colonial exports; consequently, these practices were inexorably linked with the financial success and sustainability of the early colonies. Colonial expansion occurred at modest rates during the 17th century, but when European

John Smith's map of the Virginia Colony - Library of Congress

settlements managed to push outward from waterways the settlers did not continue the practice of burning savannah, grasslands, and woodlands that had been exercised on regular basis by Native American tribes. As a result, forests are thought to have expanded rapidly in areas surrounding European farms and towns.

18th Century Washington

By the beginning of the 18th century, vast tracts of forests dominated colonial landscapes; however, this trend was checked as more and more forested lands were cleared for plantations, towns, and transportation corridors. Canopy levels likely remained stable in the Mid-Atlantic colonies through the War of Independence and into the later years of the 18th century when planning for the new national capital began.

Large-scale urban forestry efforts are thought to have begun in the region around 1790 when Pierre L'Enfant was hired by George Washington to design the layout of the District of Columbia. L'Enfant's design incorporated wide boulevards and public parks that were to be adorned with trees. Many of the trees L'Enfant planned for were eventually planted. Photographs taken of streetscapes and federal building during the Civil War show an abundance of large, mature shade trees located between buildings and streets.

U.S. Sanitary Commission Building, Washington D.C. Photo from Civil War Era
National Archives

Photographs from this period also suggest that canopy levels had decreased to 20 to 30 percent in some communities due to increased military activity, agriculture, and timber harvests; however, tree canopy probably rebounded to pre-war levels as military activities diminished. Agriculture and timber production kept canopy levels outside of urban areas to 40 to 50 percent until parcels situated along the fringes of urbanized areas began to be targeted for development in the mid-20th century.

19th & 20th Century Washington

During the late 1800's and early 1900's, some communities created programs to plant and maintain street trees. In 1885, a Village Improvement Society was created to beautify the streets of Falls Church, Virginia, by activities that included tree care and planting. This organization implemented the first Arbor Day in Virginia in 1892.

In 1914, the State of Maryland passed a Roadside Tree Law to protect trees growing in public rights-of-way. This law is thought to be first law in the nation aimed in part at conserving publicly-owned street trees. It is still in effect today and is applicable to all Maryland COG communities.

The gradual conversion of farms to other uses that started to occur around the middle of the 20th century often took years to complete and was accompanied by reforestation on vacant parcels located near the urban/exurban interface. This phenomenon took place over a 20 to 30-year period and left a patchwork of young, even-aged forest stands scatter throughout our region. These can still be observed in their mature forms today.

Modern Era

By the early 1970's, early Landsat satellite imagery shows that canopy levels had reached 60 percent or more in several jurisdictions surrounding the District and affiliated urban centers. Much of this canopy consisted of young, early successional forest communities. Around this time, societal attitudes towards trees began to shift. During the 1980s the environmental and socio-economic contributions of urban trees began to be researched by the U.S.D.A. Forest Service, academia, and others. The results of this research started to be used by federal agencies, local governments, and community activists to underscore the benefits of preserving existing forests for various purposes including energy conservation and air and water quality. Reflecting this new paradigm, several local governments in our region enacted regulations aimed at conserving tree canopy during land development. One example of these regulations is the Tree Preservation Ordinance adopted by Fairfax County, Virginia in June, 1973. This ordinance was linked to erosion and sedimentation control permits and an Office of the County Arborist and Tree Commission was established to oversee its administration.

In 1983, the Takoma Park City Council enacted legislation to protect and preserve the city's tree canopy. This tree ordinance was one of the first in enacted suburban Maryland and helped establish the city's current reputation for environment stewardship. In 1989, at the request of Fairfax County and building on the work of the Northern Virginia Urban Forestry Roundtable, the Virginia Legislature enacted legislation that enabled jurisdictions in northern Virginia to adopt local tree conservation ordinances that placed greater emphasis on tree preservation during land development. The legislation also allowed the jurisdiction to grant additional credits for preserving rare or threatened forest communities and for planting trees for water quality improvements, energy conservation and wildlife benefits. It also enabled the jurisdiction to create a tree planting fund to collection fees when it was not feasible to plant trees on development sites. Most COG communities in northern Virginia have adopted local ordinances based on this legislation.

In 1990, the State of Maryland created a task force to "assess the problems and potential of Maryland's trees and forests to promote land stewardship." The following year, the Forest Conservation Act and Regulations were enacted with the main purpose of minimizing forest loss during land development. Although the State of Maryland administers these regulations, implementation was established at the local level through a site plan review process that occurs in all COG communities located in Maryland.

During the 1990's several non-profit tree groups sprang up in our region. These included local "ReLeaf" partners which were inspired by the Global ReLeaf program of American Forests. Fairfax ReLeaf was founded in 1991 with a mission of conserving, restoring, and promoting sustainable urban forests in Northern Virginia. This volunteer-based organization partnered with Fairfax County Government and Virginia Department of Forestry to plant thousands of tree seedlings along public highways and on public lands each year since its founding. In 1994, Fairfax ReLeaf organized an effort to assess the nature of Fairfax County's tree canopy and to quantify the levels of environmental and economic benefits trees provided to the community. This study was published in 1995 and was one of the first efforts in the nation to quantify tree benefits at a county scale. The results of the study were used by county officials to highlight the need curb canopy losses during land development.

In 1994, the Chesapeake Executive Council formally recognized the value of Urban Tree Canopy (UTC) for stormwater control and water quality benefits for municipalities in the Chesapeake Bay watershed. This action lead to an expanded directive in 2003 that called for at least five jurisdictions in Maryland, Pennsylvania, Virginia, and the District of Columbia "to complete an assessment of urban forests and to adopt a local goal to increase urban tree canopy cover and encourage measures to attain the established goals" for purposes of watershed planning by 2010. This directive set into motion efforts by several COG communities to assess their current levels of tree canopy and to set jurisdictional and watershed based urban tree canopy goals.

In 1999 the *Washington Post* featured a report by American Forests that used remote sensing studies to demonstrate that the District had suffered a 64 percent canopy loss between 1985 and 1997. After reading this article, Betty Brown Casey, a long-time resident and philanthropist took steps to establish Casey Trees, a Washington, D.C. based nonprofit tree organization.

Casey Trees' mission is to restore the tree canopy of the District through tree planting, public education, and tree advocacy. In 2002 Casey Trees conducted an inventory of all the District's street trees. This effort involved 500 volunteers, 35 college interns, and resulted in a database of 106,000 street trees and 25,000 empty planting spaces. This information was used by the District's Urban Forestry Administration to identify street tree planting goals, priorities, and maintenance needs.

In early 2003, shortly after the founding of Casey Trees, the District of Columbia enacted the Urban Forest Preservation Act to establish a program that required a permit to remove Special Trees (i.e., those with a circumference of 55 inches or more), and to establish a Tree Fund to plant trees.

In 2004, Arlington County, Virginia adopted an Urban Forest Master Plan containing a GIS street tree inventory, tree canopy satellite analysis, long-range goals and recommendations and a final Urban Forest Master Plan report including GIS based planting plans. The plan will ultimately contribute to the attractiveness and sustainability of Arlington through enhancements to the tree canopy.

1999 article reporting on changes to the Districts Tree Canopy
Washington Post and American Forests
National Archives

In 2007, COG convened a small committee of urban foresters and other officials to develop tree-related control strategies for ambient zone mitigation. The work of this group resulted in the "Urban Heat Island Mitigation/Tree Planting/Canopy Conservation and Management" measure that was included in the 2007 Metropolitan Washington State Implementation Plan (SIP) for 1997 8-Hour Ozone Standard. The control strategies include a recommendation to develop a Regional Canopy Management Plan which became the focal point for the formation of the Regional Tree Canopy Workgroup convened in 2011.

In 2009 the District and Fairfax County input tree canopy data from their respective jurisdictions into the ECO module of i-Tree software (developed by the U.S. Forest Service, Northern Research Station) to analyze the structure, function and values of urban tree canopy. Examples of the findings of

these reports included the amounts of air pollution (CO, NO2, O3, PM10, SO2) removed annually by the jurisdiction tree canopy (District: 492 tons/year. Fairfax County 4,670 tons/year); and, the monetary value of that service (District: $2.3 million/year. Fairfax County: $21.7 million/year). The reports identified the tree canopy levels of the District and Fairfax County at 28.1% and 46.6% respectively.

In 2013, the Montgomery County, Council enacted two tree bills the Tree Canopy Conservation Law and the Roadside Trees Protection law. The purpose of the Tree Canopy Conservation Law is to require land developers to plant new shade trees to offset the impacts of development on the natural environment. It is applicable to any activity that requires a sediment control permit. The law allows developers to pay fees in lieu of planting trees on development sites. Montgomery County places those fees into a fund that is used to plant trees in other locations. The second tree bill, the Roadside Trees Protection Law became effective on March 1, 2014. It was established to protect publicly owned trees from construction and maintenance activities that occur in, or adjacent to, county rights-of-ways. It is administered through the review of right-of-way use permit application and requires developers and property owner to locate the critical root zones of roadside trees and demonstrate how these will be protected during construction. County staff determines the feasibility of proposed tree protection plans and if roadside trees are likely to survive construction impacts. If the County determines that trees are not likely to survive construction impacts then the developer must plant a new tree and pay a $500 fee which the County will use to plant trees in other locations in rights-of-way.

Sources of Historical Information:

REFERENCES ON THE AMERICAN INDIAN USE OF FIRE IN ECOSYSTEMS compiled by Gerald W. Williams, Ph.D. Historical Analyst USDA Forest Service Washington, D.C. June 12, 2003

Early Industries in Virginia, Jamestown-Yorktown Foundation, Williamsburg, VA Billings, Warren. Jamestown and the Founding of the Nation. Gettysburg, PA: Thomas Publications, 1991.

Hudson, Paul. A Pictorial Booklet on Early Jamestown Commodities and Industries. Williamsburg, VA: Virginia 350th Anniversary Celebration Corporation, 1957.

Kelso, William M. and Beverly Straube. Jamestown Rediscovery 1994-2004. Richmond: Association for the Preservation of Virginia Antiquities, 2004.

What Is an Urban Forest?

The term "urban forest" encompasses a diverse range of trees and forests found throughout urban, suburban, and exurban landscapes in the region. This variety requires communities to adopt a wide-range of management approaches. The strategies used to manage native forest ecosystems only have limited application to managing street and residential trees and, vice-versa. Consequently, "Urban Forestry" has different meanings to COG communities depending on the nature of their trees and forests. Despite these differences, a common thread found throughout this region is the growing consensus that urban forests are an important component of community infrastructure, and a resource that must be carefully managed, protected, and included in local planning efforts.

1 STREET TREES	2 PUBLIC TREES
Shade trees located along urban and suburban streets are a key element of urban tree canopy.	Trees and forests located on parkland and other public lands represent a significant portion of the region's canopy.

3 RESIDENTIAL TREES	4 URBAN TREES
Privately-owned trees on residential property are the largest component of the region's urban forests.	Trees included in green designs add aesthetical appeal and psychological benefits to harsh urban environments.

5 WOODED AREAS	6 RIPARIAN BUFFERS
Private woodlots throughout the region contribute significant levels of environmental and socio-economic services.	Trees located along waterways are critical to regional water quality and provide important ecological benefits.

Benefits of Our Urban Forests

Roads, buildings, stormwater facilities, and water quality plants often come to mind when people think of public assets; however, natural resources represent assets as well. "Asset" can be defined as property owned by a person, company, or community having value and available to meet debts, commitments, or legacies. Research conducted over the past 30 plus years, and the practical application of information technologies to the field of urban forestry has resulted in the availablity of tools to quantify the services and values associated with trees. These values include monetary equivalencies and return on investment for the services and benefits provided by trees; both on an individual and community-wide basis. Irrespective of location, virtually all trees in the urban forest provide multiple services. Trees add benefits and increased values to regional environmental, social, economic and ecological processes that translate into beneficial impacts to our communities. These services should be viewed as vital to sustaining our quality of life, our local economy, and the health and functionality of our environment.

Economic	Social	Environmental

Economic

Property value:
Residential homes with healthy trees add property value (up to 15 percent).

Energy conservation:
Trees lower energy demand through summer shade and winter wind block, additionally offsetting carbon emissions at the power plant.

Stormwater facilities:
Trees and forests reduce the need for or size of costly gray infrastructure.

Commerce:
Trees are associated with retail and commercial districts where consumers spend more time and money.

Social

Public health:
Trees help reduce airborne particulates and reduce UV-B exposure by about 50 percent. The canopy moderates air temperatures and quality.

Crime and domestic violence:
Urban forests help build stronger communities. Nature and trees provide settings in which relationships grow stronger and violence is reduced.

Noise pollution:
Trees reduce noise pollution by acting as a buffer and absorbing up to 50% of urban noise (U.S. Department of Energy study).

Environmental

Air quality:
Trees address the Clean Air Act concerns by mitigating the negative human health impacts of pollution by absorbing and offsetting air pollutants such as particulate matter, ozone, sulfur dioxide, carbon monoxide, and CO_2.

Water quality and stormwater runoff mitigation:
Soil aeration, evapotranspiration, and rainfall interception by trees increases water quality and reduces stormwater flow.

Erosion control:
Tree roots hold soil together along stream banks and steep slopes.

Increased wildlife habitat:
Promotes biodiversity in urban areas.

> "Trees positively affect judgments of visual quality, but more significantly, appear to influence other consumer responses and behaviors"
> Trees Mean Business
> Kathleen L. Wolf, Ph.D., Univ. of WA

Managing the Benefits, Costs, and Risks of Urban Forests at the Regional Level

In addition to describing the benefits of tree and forests, canopy management must also address the costs and risks associated with these resources. The proximity of urban trees to people, buildings, and infrastructure can increase the risk of human injury, structural damage, utility outages, disruption to transportation, and other negative impacts. Do the costs associated with these disservices outweigh the benefits and services provided by our urban forests? A study featured in the publication *Piedmont Community Tree Guide: Benefits, Costs, and Strategic Planting* (McPherson 2006) presented monetary costs associated with the negative impacts of street, park, and shade trees, and modeled the benefits to cost ratios for four tree species over a 40-year period. The study estimates that $3.74 is returned on every dollar invested in the planting and care of the four species, and suggests that the benefits provided by urban trees in the piedmont region of the United States typically outweigh their costs.

When resources are invested to protect and manage urban forests, it contributes to the public good and long-term sustainability of our communities. However, to maximize the values and services provided by trees, steps must be taken to minimize their inherent costs and risks. This concept proves especially true when applied to urban tree populations which coexist with dense human populations. The most effective way to manage tree-related benefits, costs and risks is to create long-term strategic guidance by means of an **urban forest master plan**. In their classic form, these plans are used to guide tree care, reforestation and forest management activities; however, their biggest payoff may be realized when local governments encourage the community-at-large to participate in their development, thereby exposing a wider range of stakeholders to the opportunities and challenges associated with their urban forest.

*"The most effective way to manage tree-related benefits, costs, and risks is to create long-term strategic guidance by means of an **urban forest master plan**."*

Why do we need a plan to manage our urban forests at the regional level?

WHY?... Trees Benefit the Regional Environment, Society, and the Economy

Benefits of a regional plan include:

- The actions of one jurisdiction have potential to impact the quality, health, and functionality of urban forests across the entire region. Tree diseases, insects, invasive plants, and deer populations do not observe jurisdictional boundaries. When serious threats are not adequately managed in one jurisdiction they can easily spread; even when adjacent jurisdictions are devoting adequate resources to address threats within their own boundaries.

- Regional collaboration can produce synergistic results that are not obtainable by the efforts of individual communities, organizations or programs through the sharing of ideas and resources, and increased economies of scale.

- The effects of canopy gain/loss do not stop at jurisdictional lines. Canopy gains achieved in one jurisdiction can improve air and water quality in other jurisdictions. The inverse can also prove true: canopy loss in one jurisdiction can cause negative environmental impacts in neighboring jurisdictions.

- Templates and examples provided by a regional plan could encourage a consistent approach to urban forest conservation and encourage interjurisdictional communication over common opportunities, challenges and threats.

- A regional plan can guide the development of shared outreach and marketing strategies used to engage a wider set of demographics and to encourage new partnerships.

- A regional plan has potential to assist regionally addressed regulatory programs such those related to Clean Air Act and Chesapeake Bay requirements.
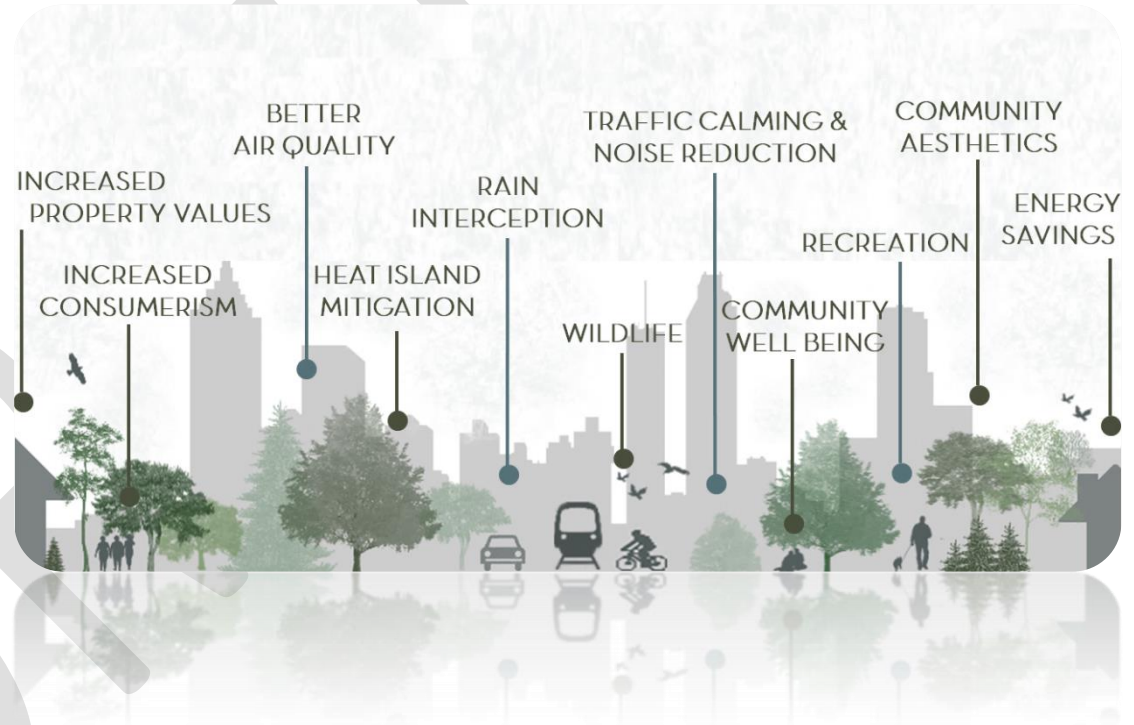
Preserving and Enhancing Forest Benefits

An urban forest master plan for the metropolitan Washington region should cover a time span of 20 years or more, and contain a set of practices, programs, policies, partnerships and resources that can be used to conserve and enhance regional tree and forest assets with the overarching goal of achieving a range of environmental, ecological, socio-economic and cultural goals. At a minimum, a plan should:

- Recommend a regional tree canopy goal and canopy levels for major categories of land use.

- Establish metrics to gauge the health and sustainability of urban forests in the region.

- Describe opportunities, threats and challenges that are likely to be encountered during the time span of the plan.

- Describe the roles of local, state, and federal governmental entities.

- Describe the roles of citizens and community-based organizations.

- Describe how government and community groups can interact and form synergistic partnerships.

- Describe strategies to mitigate impacts of land use change, forest pests, invasive plants, climate change on native forest ecosystems and urban trees.

- Describe potential linkages to regional, state, and federal regulatory processes, and other natural resource conservation programs.

- Describe practices to mitigate tree-related costs and risks such as tree risk and storm impact assessments, and street tree life cycle planning.

- Encourage local governments to conduct periodic reviews on the effectiveness of local efforts to conserve tree and forests during development.

- Encourage local governments to evaluate the current capacity, scope and effectiveness of their public tree care and forest conservation programs.

A COG committee could be established to develop a regional urban forest master plan and regional canopy goal to promote, monitor, and realign the plan as conditions and trends change over time. This committee could be comprised of representatives from: local, state and federal agencies; local non-profit tree organizations; local tree boards and commissions; the land development community; the tree care industry; citizen groups; and other stakeholders as needed to accomplish the work of the committee.

> ...if we can teach our children to honor nature's gifts, the joys and beauties of the outdoors will be here forever.
>
> -- Jimmy Carter

Land Use Changes and the Impact on Regional Tree Canopy

To better understand the current state of our regional tree canopy, existing land cover data was analyzed to show changes to forest cover and other land uses that occurred from 1984 to 2011. Comparisons of these changes are summarized in Table 2 (pg. 14). The process used 30-meter per pixel spatial resolution satellite imagery and US Geological Survey land cover data assessed at 85% or greater accuracy. This broad-scale analysis provides insight into the impact of population growth on natural lands and agricultural uses. The comparison highlights forest preservation areas, fragmented forests, and canopy loss particularly in areas of intense development.
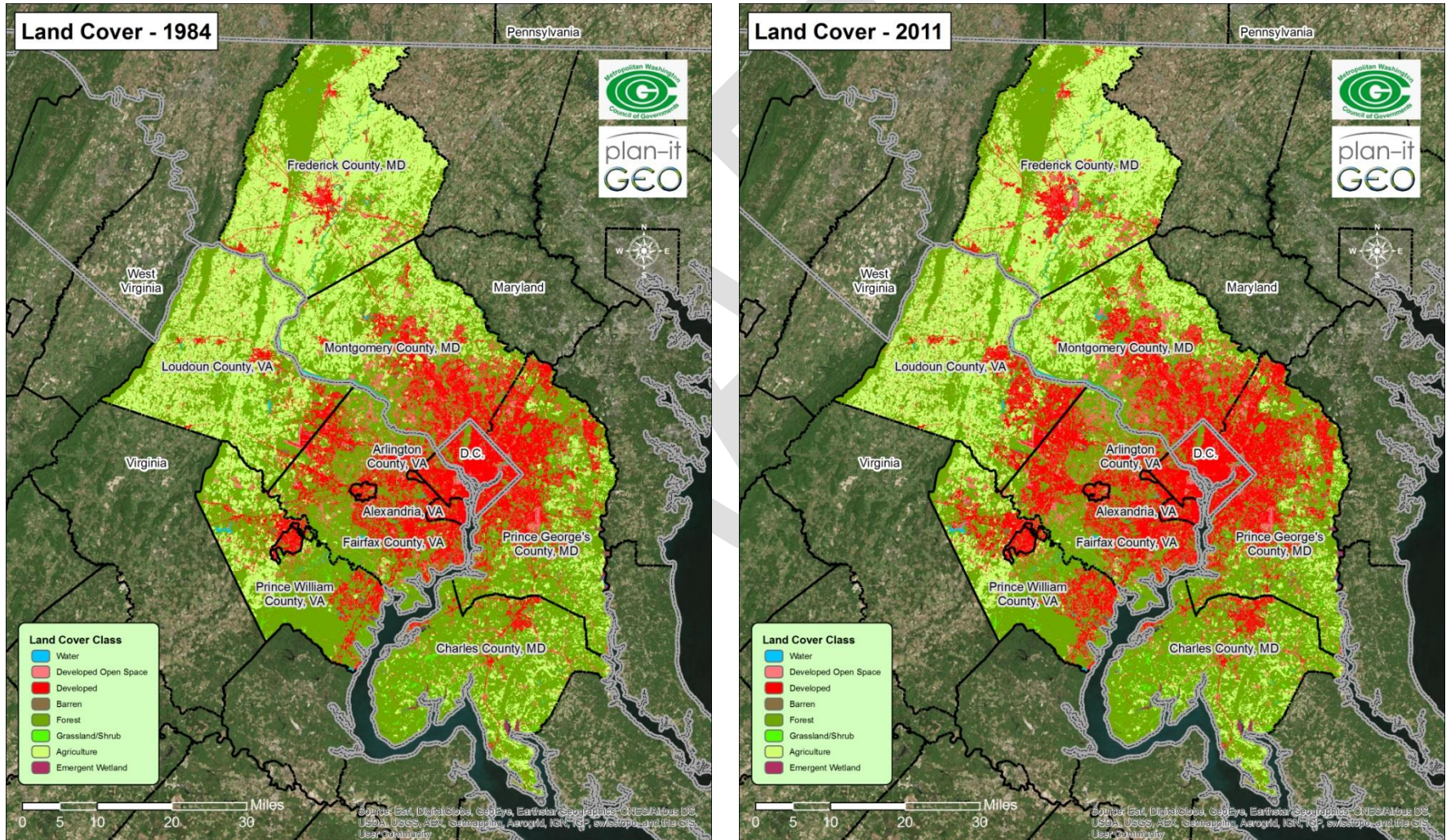
Figure 3: Visual comparison of the 1984 and 2011 regional land cover classifications

The data were analyzed to determine gains and losses of forest, development, agriculture, and grassland across the COG region and on a jurisdictional basis. Three time periods were analyzed to determine specific rates of change that occurred during 1) a 7-year period covering 1984 to 2001; 2) a 10-year period covering 2001 to 2011; and 3), the entire 27-year period covering 1984 to 2011.

The table below demonstrates that as development increased from 1984 to 2011, the Forest land cover type decreased by 4% or 81,922 acres of loss, totaling nearly 62,000 football fields in size or roughly 2,300 football fields per year. Between 1984 and 2011, the greatest increase in Developed Open Space (areas with constructed materials adjoining turf land cover) occurred from 1984 to 2001 with a 1% increase. Agricultural land decreased by a total of 2% or 49,037 acres. Developed land and Forest cover had the greatest percentage of change during the entire 27-year period.
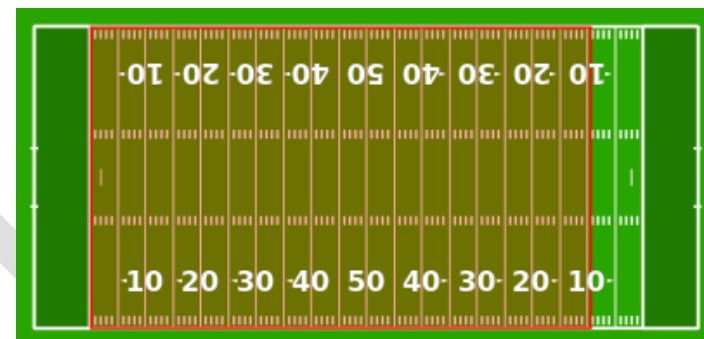
Comparison of a US football field area to an acre

Table 2. Summary of acres and percent land cover class changes from 1984 to 2011*

		1984 Baseline	1984 – 2011 Acres	%	2001 – 2011 Acres	%	1984 – 2011 Acres	%	2011 Baseline
	Forest	1,010,976	-50,853	-2%	-31,069	-1%	-81,922	-4%	929,054
	Developed	354,189	64,108	3%	27,862	1%	91,970	4%	446,158
	Developed Open Space	137,169	26,044	1%	4,037	0.2%	30,081	1%	167,250
	Agriculture	636,544	-37,802	-2%	-11,235	-0.5%	-49,037	-2%	587,507
	Grassland & Shrub	68,076	-686	0%	4,326	0.2%	3,640	0.2%	71,716

*Uses regionally available coarse, 30-meter resolution NLCD Landsat data with accuracy of up to 85%. Hyattsville not included.

Additional Land Use Change Studies

In 2013, data from the Chesapeake Conservancy Land Cover Data Project was used to establish concurrent land cover data for forestry acreage (and other possible landcover classes) in the COG region. Data was summarized for the COG region and is provided in Figure 4, below.

Figure 4. 2013 Chesapeake Conservancy COG Region Forest Acres
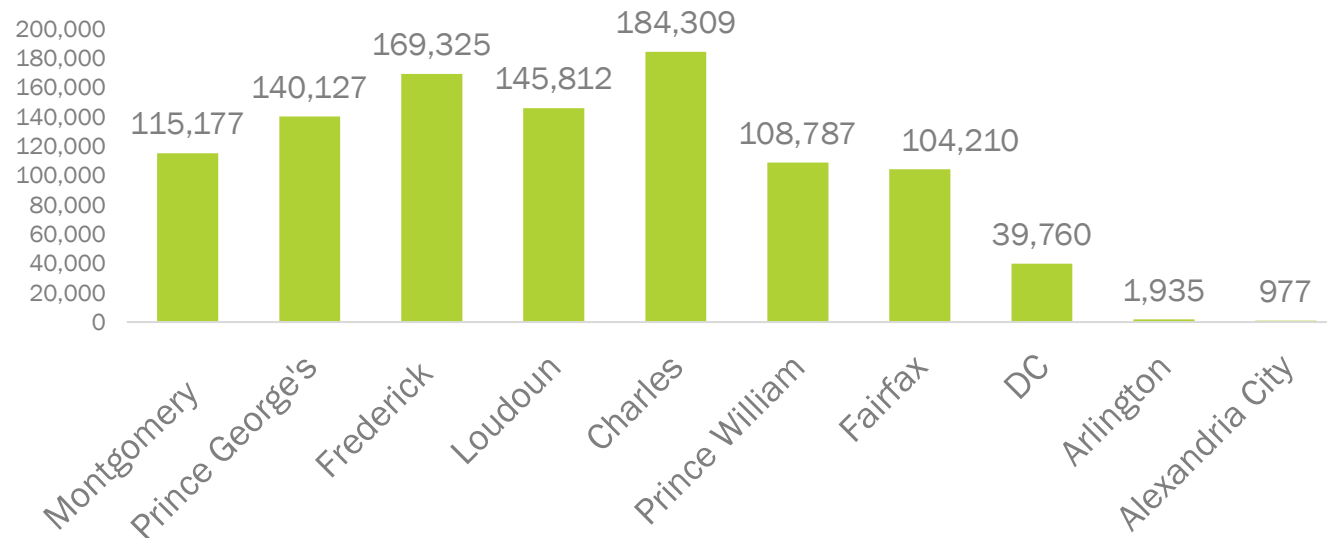
This recent land cover data can be used to compare the US Geological Survey Chesapeake Bay Watershed Land Cover Data Series (CBLCD-e11) that was summarized in Table 2, above, to establish trends/patterns of forest acreage over time. Figure 5 shows the change in forested acres over time.
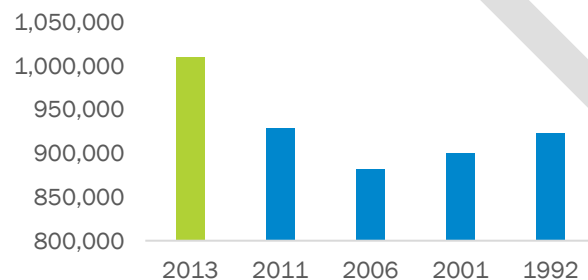
Figure 5. COG Region Forest Acres

Figure 5 compares the CBLCD-e11 results to the Chesapeake Conservancy Land Cover Data. The high variabity of forest acreage between 1992 and 2013 are most likely due to changes in technology and different classification schemes for forest acreage. More importantly, the spike in acreage in 2013, can most likely be attributed to the fact that the Chesapeake Conservancy data from 2013 was a 10m spatial resolution compared to the USGS Land Cover Data which had 30m spatial resolution (see images to the right).

Images showing coarse 30m resolution (left) and 10m resolution (right).

Assessment of Urban Forest Programs in the Region

Benchmarking the scope and capacity of tree programs within COG communities has been completed to weigh the feasibility implementing the strategies and tactics offered in this report. In 2013, local programs were assessed based on the minimum set of tools, data, metrics, and resources needed to implement and sustain a successful tree canopy management program. The results indicate that in 2013, 13 COG communities had programs that meet the minimum criteria; however, the results suggest the effectiveness of the programs probably range considerably. Local governments can treat the minimal criteria identified below as benchmarks. Goal 2, *Optimize Urban Forest Programs* recommends updating the 2013 evaluations which are summarized below.

Table 3. Results of 2016 survey to assess urban forest programs across the region

Jurisdiction	Tree or Forest Protection Ordinance	Tree Canopy Assessment	Tree Canopy/ Forest Cover Goal	Plan to Increase Tree Canopy	On/off-site, Bank, fee-in-lieu Mitigation	GI, UF, GS Plan **	Tree City USA, 2017
District of Columbia	●	●	●	◐	●	●	●
Charles Co.	●	○	◐		●	○	○
Frederick Co.	●	○	●	◐	●	●	○
Frederick	●	●	●	◐	●	●	●
Montgomery Co.	●	●	◐	○	●	●	●
Gaithersburg	●	●	●	◐	●	●	●
Rockville	●	●	●	●	●	●	●
Takoma Park	●	●	●	●	●	●	●
Prince George's Co.	●	●	●	●	●	●	●
Bowie	●	●	●	◐	●	●	●
Laurel	●	●	●	●	●	●	●
College Park	○	●	○	◐	○	●	●
Greenbelt	◐	●	●	◐	○	●	●
Bladensburg		●	○	◐	○	○	○
Alexandria	●	●	●	●	●	●	●
Arlington Co.	●	●	●	●	●	●	●
Fairfax Co.	●	●	●	●	●	●	●
City of Fairfax		●	○	◐	○	◐	●
Falls Church	◐	●	●	◐	○	○	●
Loudoun Co.	●	○	●	◐	○	●	○
Prince William Co.	●	○	●	◐	○	●	○
Manassas		●	●	●	○	◐	●
Manassas Park		○	○		○	◐	○
% Implemented + In Progress	75%	75%	79%	83%	58%	83%	67%

Table 3. Key

Unknown
○ Not Started
◐ In Progress/ Partially Applied
● Implemented/Yes

"Tree Canopy / Forest Cover Goal" updated from CEEPC 2013 survey

*
Gaithersburg, City of Fairfax, City of Falls Church, Bladensburg, College Park rely on underlying county tree canopy assessments

**
GI = Green Infrastructure
UF = Urban Forest
GS = Green Space

***
Montgomery Co. and Loudoun Co. apply goals to specific developments or master plans

RESOURCES FOR URBAN FOREST PLANNING AND MANAGEMENT

Resources and Links	Description
State, Regional, and Local Forest and Tree Canopy Plans Forest Action Plans Anacostia Watershed Forest Management and Protection Strategy Arlington County Urban Forest Master Plan Fairfax County Tree Action Plan City of Alexandria Urban Forestry Master Plan	These plans typically provide an analysis of current canopy conditions and trends and provide goals, strategies and tactics to conserve and manage urban forests at different scales and timeframes.
Local Land Cover Assessments Montgomery County Land Cover Assessment Prince George's County Forest Assessment Fairfax County Land Cover Analysis Arlington County Tree Canopy Coverage Map	Land cover assessments that use high-resolution imagery and Light Detection and Ranging (LiDAR) data to map extents of existing canopy and locate potential planting sites. Successive assessments are used to identify levels of canopy gain/loss trends. Various assessments have been completed across our region using differing analysts, methods, and scales.
Local Urban Forest Benefits Analysis iTree Analysis – Prince George's County Washington D.C. 2010 iTree Ecosystem Analysis Fairfax County 2010 iTree Ecosystem Analysis	Uses tree canopy data collection from ground plots and ECO iTree software module (developed by the U.S. Forest Service, Northern Research Station) to analyze the structure, function, and monetary equivalents of air quality, energy conservation, and carbon storage and sequestration services provided urban tree canopy.

Tree Inventory and Canopy Mapping Resources

Data on health and condition, species composition, geographic distribution, and service levels provides a foundation for urban forest management plans. The following tools are widely used to collect and analyze these data.

STREET AND PARK TREE INVENTORIES

Street and park tree inventories are a bottom-up approach to assessing the structure, maintenance needs, and risk levels of publicly-owned trees. The data reveals age and diameter classes, species diversity, and is used to set daily work priorities, develop annual work plans, and identify budget needs, all of which are essential ingredients for ensuring healthy and safe trees.

TREE CANOPY ASSESSMENTS

Tree canopy assessments (i.e., Urban Tree Canopy (UTC) assessments) are a top-down approach to identifying existing canopy levels and potential planting sites across an entire community. This technology typically uses satellite imagery and LiDAR data to create land cover maps that includes a tree cover layer which is highly useful in setting tree canopy goals.
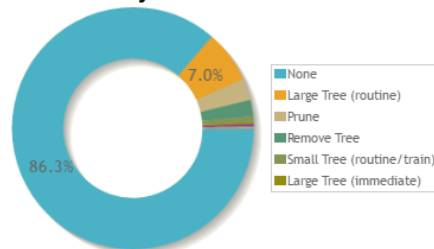

TREE INVENTORY AND MANAGEMENT

Tree inventory and management software can be used for data collection and management through free or subscription-based web and mobile applications. These tools assist communities in better data upkeep, tracking, reporting, and management.

TREE BENEFITS CALCULATORS

With the advancement of research on urban forests and single trees, we now have a better understanding of the "triple bottom line" benefits of trees. This research and science has been applied to a variety of tools such as online tree benefits calculators, tree inventory management software with reporting features, and the US Forest Service's i-Tree tools.

Tree Benefits Calculator   i-Tree

THREATS TO REGIONAL TREE CANOPY

There are many ongoing and potential threats to native forest communities and trees that have seeded naturally or were intentionally planted in urban areas. Street trees are the ultimate "urban tree" and a key component of the urban forest. This component of urban tree canopy provides shade and stormwater reduction services, and may be the only "forest" present in highly urbanized environs. A city environment is a difficult and stressful place for trees to take root and flourish. However, trees in suburban and rural areas are exposed to various biotic, abiotic, and anthropogenic threats as well. The following is a short list of the common threats to the region's canopy. A comprehensive list, description, and suggested management approaches are provided in Appendix B, *Near and Long-Term Sustainability Threats*.

THREATS TO FORESTS

Deer overpopulation and browse

Fragmentation of forest ecosystems

Invasive plants

Loss of forested properties

THREATS TO URBAN TREE CANOPY

Insufficient species diversity

Inadequate planting space

Insufficient funding for tree programs

SHARED THREATS TO URBAN TREE CANOPY AND FORESTS

Pests and diseases

Development and redevelopment of land

Absences of regional forest planning

Effects of climate change

Lack of public awareness and support

Storm damage

Source: ASLA

The promising state of the region's urban forest gives reason to be hopeful and reason to take action. **Trees are essential** infrastructure components that provide many measurable benefits. The urban forest delivers an extraordinary return on investment but, **if local and regional goals and strategies are not identified and pursued, our urban forests are likely to decline.**
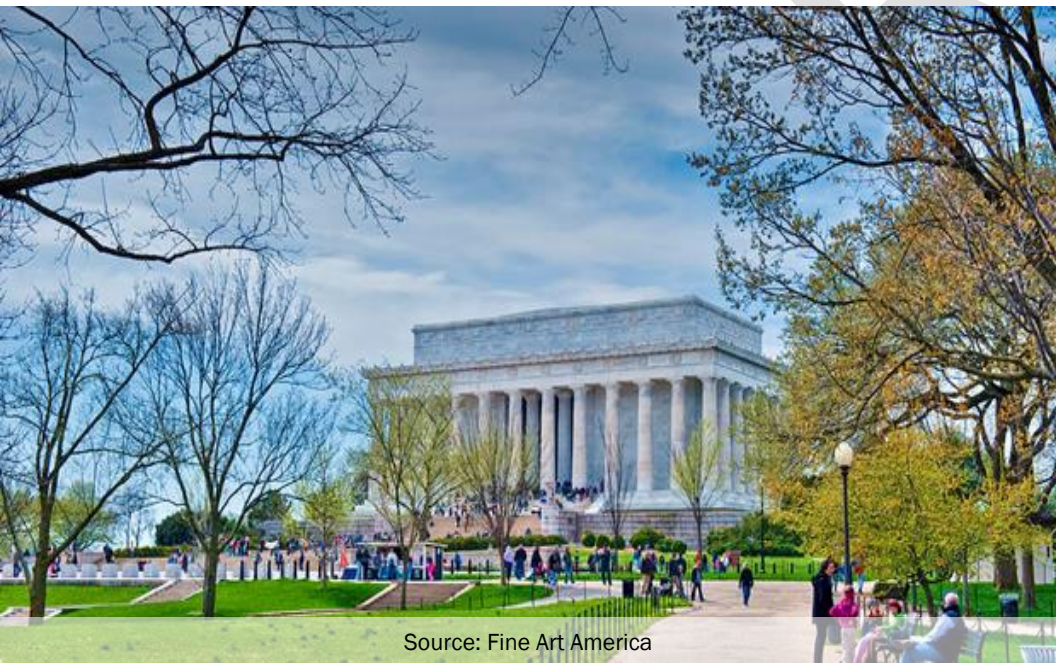
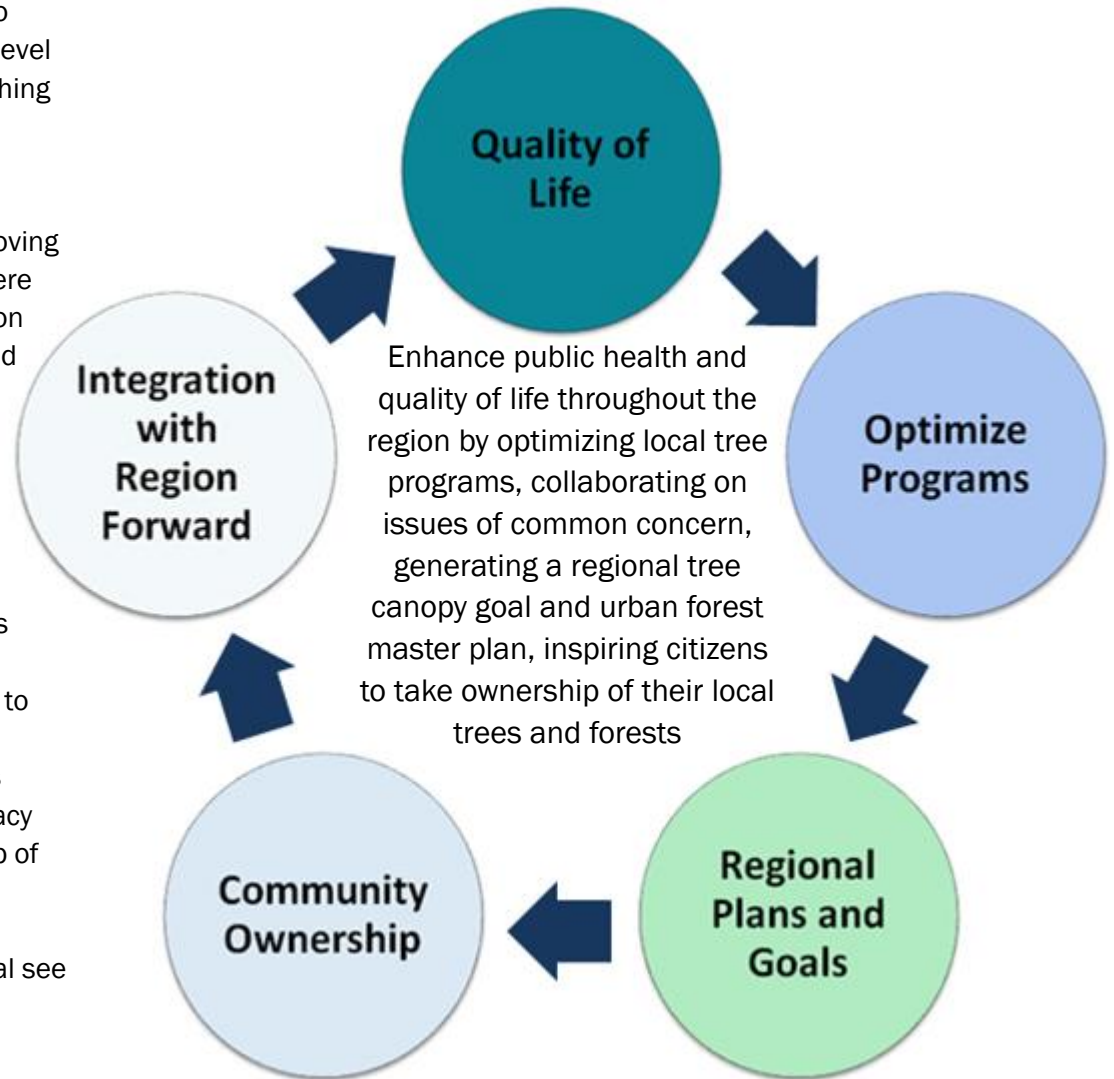Source: Fine Art America
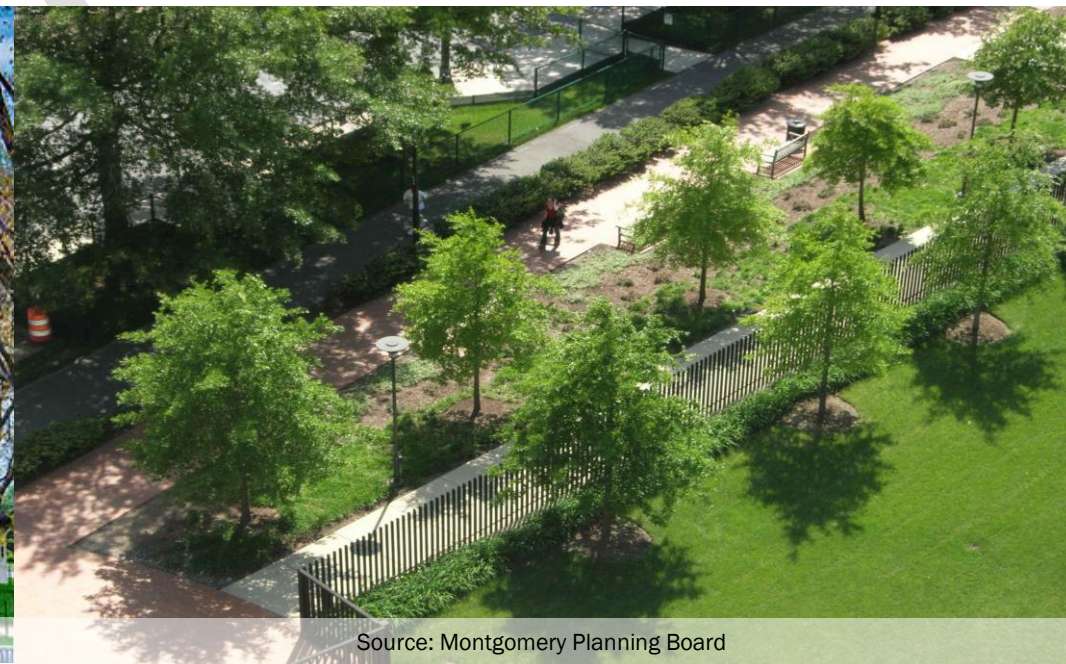
Source: Montgomery Planning Board

GOALS AND STRATEGIES

This section identifies a set of goals and strategies needed to protect and enhance urban forests at the local and regional level in the Greater Washington region. These include five overarching goals and ten strategies that support one or more of the five goals.

Some of the concepts are regional-based and aimed at improving the quality of life for all citizens throughout the region and were intentionally devised to align with COG's Region Forward vision to make this region more Prosperous, Accessible, Livable, and Sustainable Other concepts focus on local conservation efforts and are offered to COG communities as general recommendations to consider when establishing and strengthening local programs, policies, and practices.

Although substantial amounts of time and energy were required to develop the goals and strategies contained in this publication, the heavy lifting required to generate a Regional Urban Forest Master Plan and Regional Canopy Goal is likely to dwarf that required for this report. Furthermore, COG communities are not likely to realize the vision offered in this report without active partnerships with non-profit tree advocacy groups, and taking steps to inspire citizens to take ownership of their tree and forest assets.

For detailed description of strategies and tactics for each goal see Appendix C.

Quality of Life

Optimize Programs

Regional Plans and Goals

Community Ownership

Integration with Region Forward

Enhance public health and quality of life throughout the region by optimizing local tree programs, collaborating on issues of common concern, generating a regional tree canopy goal and urban forest master plan, inspiring citizens to take ownership of their local trees and forests

Green urban areas encourage healthy social interaction, provide stress reduction, help discourage criminal activity, and moderate weather extremes. Sidewalks shaded by urban trees encourage pedestrian and biking activity, and help create friendly and inviting neighborhoods.

Recommendation: Use urban forests to help mitigate climate change, address clean air, water quality and stormwater concerns, and to encourage healthy social interaction in communities.

STRATEGY 1.1

Protect: Develop policies and programs that acknowledge the value of urban forests and encourage their protection along waterways and in new developments

STRATEGY 1.2

Manage: Build and strengthen urban forest management programs at local and regional scales. Incorporate waste wood management practices into local solid waste programs to slow the breakdown of carbon-based tissues into gaseous forms

STRATEGY 1.3

Expand: Strategically plant new trees to: absorb and sequester atmospheric carbon; reduce levels of fossil fuels used to cool and heat buildings; lower ambient air temperatures during summer months; absorb and slow stormwater runoff; and to remove gaseous and particulate pollutants from air and rainwater

For detailed description of strategies and tactics for Goal 1, see Appendix C.
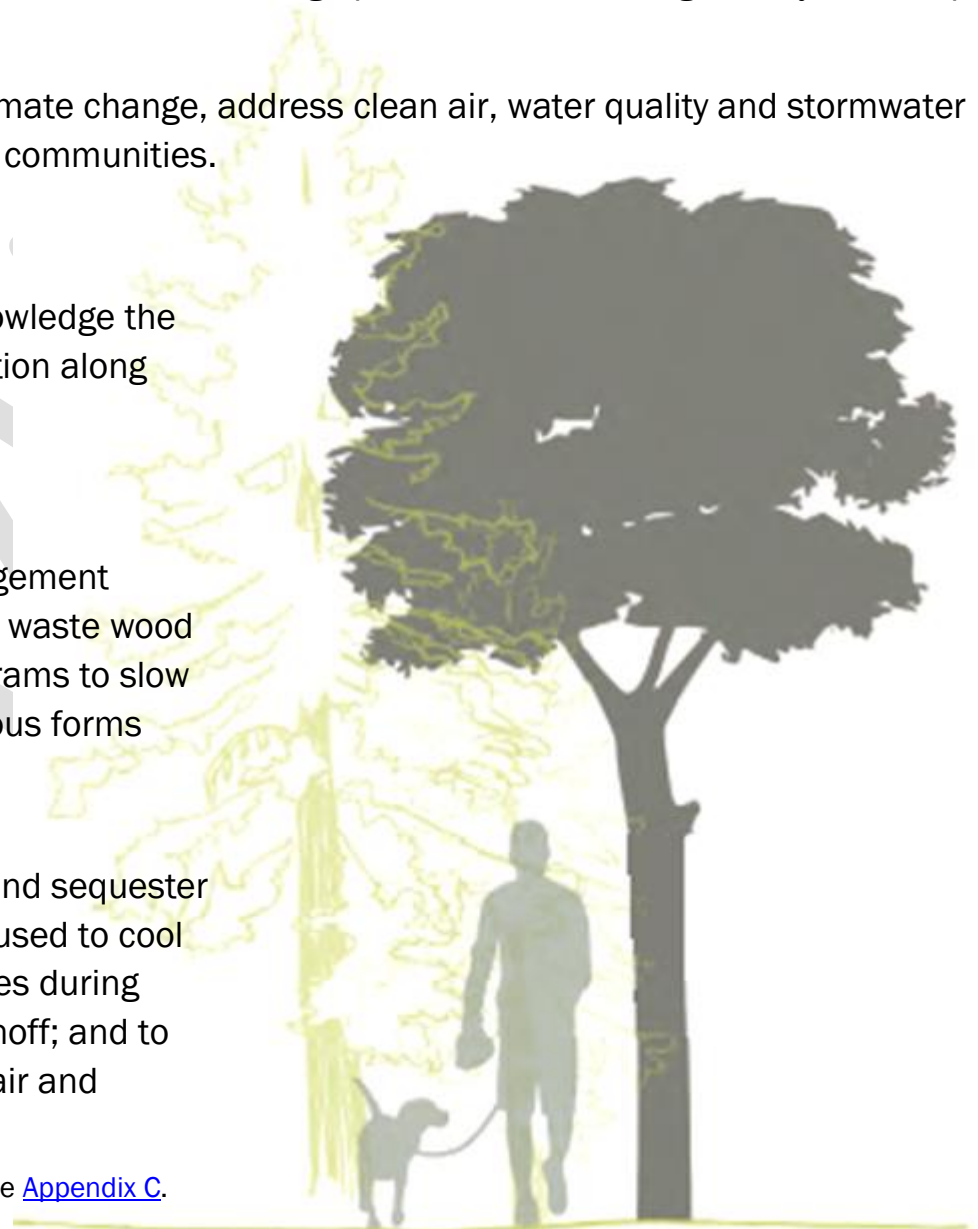
1.1) *PROTECT:*
Trees during and after Development

- Protect existing tree canopy during development
- Plant trees to replenish lost canopy
- Use mechanisms to protect forested lands in perpetuity

Montgomery Planning Approved Technical Tree Manual

Fairfax County Tree Conservation Ordinance

DC DDOT 2014 Green Infrastructure Standards

1.2) *MANAGE:*
Improve Tree Care Practices

- Improve the health and safety of public trees
- Implement tree –related risk management practices
- Provide sufficient budget and staffing levels

UMD Extension's *Pruning Ornamental Plants Guide*

Tree Care Industry Association ANSI A300 Standards

Funding Your Urban Forest Program

   (From the Society of Municipal Arborists)

1.3) *EXPAND:*
Encourage Community Stewardship

- Support and partner with non-profit tree groups
- Organize educational events to build awareness
- Recognize volunteers at public events

Fairfax Tree Stewards

City of Bowie, MD Memorial Tree Program

Prince George's County Clean Up Green Up

GOAL 2:   Optimize Urban Forest Programs

Local governments should periodically evaluate their urban forestry programs for effectiveness and to ensure that they are provided with adequate funding, staffing and training to accomplish their mission. Regional collaboration could produce synergistic results that are not obtainable by local programs through idea and resource sharing, and regional economies of scale. An on-going regional dialogue could encourage a more consistent approach to urban forest management and help to optimize the effectiveness of local programs.

Recommendation: Establish a forest policy and planning committee to support and guide regional collaboration and encourage among all COG member governments to adopt effective and consistent programs, policies, and practices.

STRATEGY 2.1

Local urban forestry staff engage in regional urban forest planning policy discussions

STRATEGY 2.2

Review and strengthen local tree-related policies and ordinances

STRATEGY 2.3

Develop action plans and metrics to measure program progress

STRATEGY 2.4

Evaluate current and future budget and staffing levels of local programs

For program evaluations, the US Forest Service has created the
Urban Forest Sustainability & Management Audit. See Appendix E for an overview.

For detailed description of strategies and tactics for Goal 2, see Appendix C.

Goal 2: Implementation: Optimize Urban Forest Programs

The following resources and examples can be used to realize Strategies 2.1-2.4

2.1) Policy and Ordinance Development

- ISA's Guidelines for Developing and Evaluating Tree Ordinances
- City of Rockville, MD Forest and Tree Preservation Ordinance
- DC's Special Tree Removal Permit
- Fairfax County, VA Tree Conservation Ordinance
- Montgomery County Roadside Tree Protection Law Guidelines
- Tree Protection as Residential Development Criterion

2.2) Program Evaluation

- USFS's *Urban Forest Sustainability and Management Audit Tool*
- Evaluating Urban Forestry Performance Measures
- Developing and Evaluating Comprehensive Urban Forest Management Plans
- Society of Municipal Arborists: Accreditation for Urban and Community Forestry Programs

2.3) Developing & Monitoring Program Goals

- Existing state/regional/local tree canopy goals
- Casey Trees (DC) Tree Report Card
- Goals for community forest programs
- City of Bowie, Urban Greening Strategy Report

2.4) Program Funding

- MD Urban & Community Forestry Committee's Grants Program
- VA Urban & Community Forestry Assistance Program Grants
- DC UFA Green Grant
- Sustaining and Funding an Urban Forestry Program
- Society of Municipal Arborists: Funding your Urban Forestry Program

GOAL 3: Develop a Regional Urban Forest Master Plan and Canopy Goals

Urban forest planning efforts are essential to the conservation and enhancement of tree canopy at the local and regional level. These efforts will help COG communities develop and implement goals, strategies, practices and actions that are needed to achieve local canopy goals and to sustain the health and functionality of tree and forest resources. A regional urban forest master plan will help the region to respond to growth pressures and to creatively implement the long-term vision and goals of local land use plans and Region Forward.

Recommendation: Develop quantitative and qualitative metrics to measure success of conservation efforts and canopy goals. Develop strategies to keep forested lands forested, intact and ecologically functional; and, to increase the extent and vitality of urban tree canopy while minimizing potential risks and conflicts.

STRATEGY 3.1

Develop a Regional Urban Forest Master Plan that helps guide and integrate local forest management plans and initiatives

STRATEGY 3.2

Conduct regional Urban Tree Canopy (UTC) assessments

STRATEGY 3.3

Establish attainable canopy goals at regional and local scales using existing goals and efforts as examples (see Appendix D for a comprehensive list of existing plans)
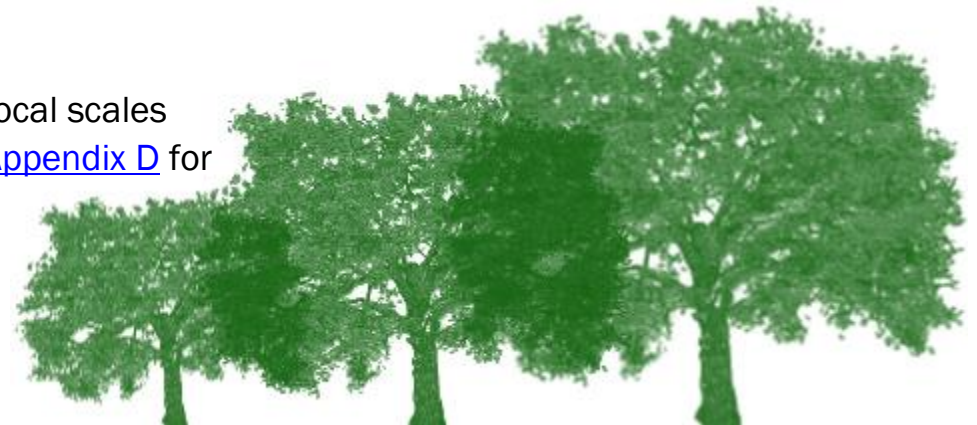
For detailed description of strategies and tactics for Goal 3, see Appendix C.

3.1) Integrate Local and Regional Plans

See Appendix D for an extensive list of local plans

🌳 Comprehensive planning with COG partners

🌳 Integrate urban forestry goals with Region Forward

🌳 Partnerships and collaboration

3.2) Conduct Regional UTC Assessments

Resources for canopy assessments

🌳 Washington, D.C.'s Urban Tree Canopy Plan

🌳 High-resolution UTC methods

🌳 i-Tree Canopy

🌳 Canopy Planner software

3.3) Establish Attainable Canopy Goals

Methods and tools available for goal setting

🌳 Share costs

🌳 Diversify partners   🌳 Training workshops

🌳 User-friendly and accessible tools   🌳 Dissemination and outreach

🌳 Implementation

See: Canopy Planner software, UTC Calculators, CommunityViz, ArcGIS

Legend
- No Tree Canopy Goal
- Tree Canopy Goal in Progress
- Tree Canopy Goal Implemented

Metropolitan Washington Council of Governments
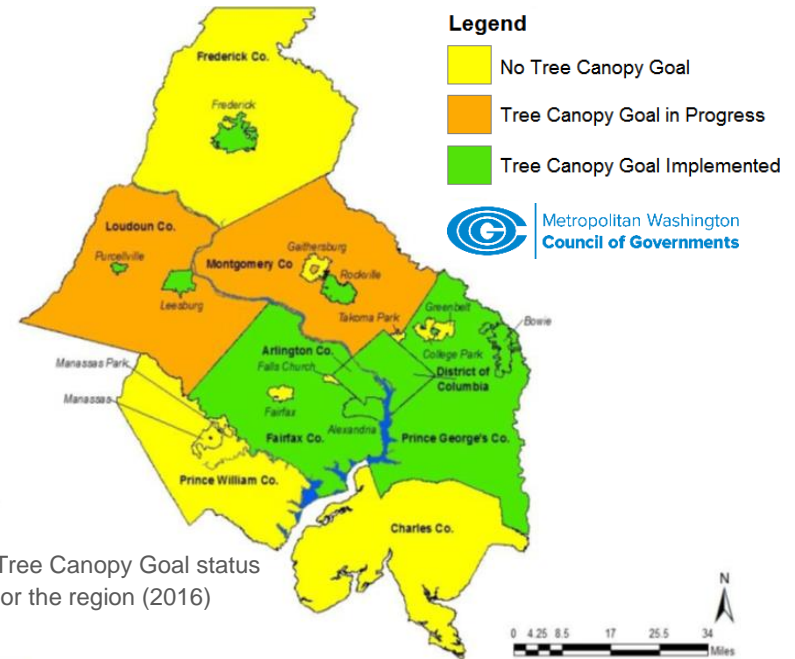
Tree Canopy Goal status for the region (2016)

DC's Canopy Planner

DC's Canopy Planner app

Urban forestry programs cannot succeed without the active support and engagement of the community. Community appreciation of tree benefits and engagement in urban forest planning, tree preservation, and tree planting efforts are necessary to ensure the long-term sustainability of the resource.

Recommendation: Encourage public participation in the development of shared visions, goals, and strategies and management plants at local and regional scales

STRATEGY 4.1

Invite citizens, civic associations, and non-profit tree groups to participate in planning activities related urban forestry and other forms of green infrastructure on public lands

STRATEGY 4.2

Build synergistic partnerships with private and public entities that advocate for tree preservation and organize volunteer activities focused on tree planting and maintenance

STRATEGY 4.3

Actively engage the community and acquire funding to develop a regional outreach and marketing program designed to identify and engage a broad demographic to encourage the formation of new partnerships.

Goal 4: Implementation: Inspire the Community to Take Ownership of Efforts to Protect & Expand Urban Forests

4.1) Lead by Example

- Educate citizens about the Green Infrastructure Demonstration Project Tour developed by COG in the Anacostia Watershed
- Establish tree canopy goals for specific categories of public lands
- Display the use of tree-related best management practices at highly trafficked areas around public facilities
- Provide educational materials and tours of successful tree preservation, tree planting, and green infrastructure projects

4.2) Build Synergistic Partnerships

- Build partnerships with non-profits, businesses, land owners, utilities, tree nurseries, community organizations, and others
- Conduct public surveys to better understanding public awareness, attitudes and interests
- Continue, strengthen, and grow existing partnerships established through COG and Region Forward

Region Forward
COG's Regional Planning Vision

4.3) Spark Community Interest via Studies and Neighborhood Projects

Value and benefits of trees

- USFS i-Tree Software Suite
- 2010 Fairfax County i-Eco study
- 2015 Washington, D.C. i-Eco study

Youth Education

- Arbor Day Foundation
- Green Schools National Network
- Project Learning Tree

Volunteer Tree Planting

- DC's Ketcham Elementary School Arbor Day

GOAL 5:   Integrate Urban Forestry with Region Forward

Region Forward is based on goals shared by officials and residents across the National Capital Region. It lays direction for the region and encourages leaders to think regionally when acting locally. Region Forward offers short and long-term targets and indicators to measure progress in creating a more prosperous, accessible, livable, and sustainable future. Urban forestry in the region should align with and complement the Region Forward's vision.

Recommendation: Integrate urban forestry efforts with Region Forward that align with short-term and long-term milestones set for the region

STRATEGY 5.1

Increase participation in the Region Forward Coalition

STRATEGY 5.2

Use the Region Forward Coalition as a forum for implementation of the Tree Canopy Management Strategy to strengthen mutual goals

For detailed description of strategies and tactics for Goal 5, see Appendix C.

www.regionforward.org

Accessibility: Walkable, mixed-use communities with housing and transportation choices

Sustainability: Healthy air, water, and land, abundant renewable energy sources, and a smaller carbon footprint

Prosperity: Resilient economy and preeminent knowledge hub

Livability: Vibrant, safe, and healthy neighborhoods

5.1) Participation in Region Forward Coalition

- Coordination with Region Forward representatives
- Member and community surveys
- Through collaboration, identify opportunities to strengthen urban forestry programs

5.2) Integrate Existing Plans and Initiatives

- Strengthen Region Forward goals with Tree Canopy Management Strategy efforts
- Report progress on UTC strategies to Coalition and other relevant committees

REGION FORWARD
BIG GOALS. BETTER COMMUNITIES.

NEXT STEPS

Local government officials and concerned citizens are encouraged to identify which goals and recommendations have applicability to their community. Individuals with a role may be municipal, county or state arborists, urban foresters, park system officials, landscape architects, environmental and land use planners, air and water quality officials, public health officials, non-profit board members, volunteers and employees, public works and transportation officials, and educators. In general, ask "What is our community doing to conserve and manage our tree and forest resources?" and "What can we do to improve these efforts?" This type of dialogue can reveal current levels of interests and spark efforts to establish and/or strengthen local tree conservation programs.

Metropolitan Washington
Council of Governments

APPENDICES

Source: NUCFAC 10-year Urban Forestry Action Plan 2016-2026

Appendix A. Change in Land Cover for Each COG Member Jurisdiction

The US Geological Survey Chesapeake Bay Watershed Land Cover Data Series, 2011 edition (CBLCD-e11) was used to determine land cover changes from 1984 to 2011. This regionally available coarse, 30-meter resolution data has an accuracy of up to 85%. For more information on the methods and data gathered, visit https://pubs.er.usgs.gov/publication/ds505. *Hyattsville and Laurel, MD became COG member governments after this land cover change analysis was completed.*

Table 4. Land cover acre and percent change from 1984 to 2011 for each COG member government. Categories are defined by the CBLCD-e11 project as follows: **Forest:** all standing trees forming contiguous patches >=1-acre in extent. **Developed:** Buildings, paved areas, industrial land uses. **Developed Open Space:** a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20% of total cover. **Agriculture:** a mix of crop, pasture / hay. **Grassland/Shrub**: Low-lying vegetation not classified as Forest, Agriculture, or Emergent Wetland. **Emergent Wetland**: 75-100 percent cover in herbaceous vegetation the substrate is periodically saturated with or covered with water.

Place	Forest Acre Change	Forest % Change	Developed Acre Change	Developed % Change	Developed Open Space Acre Change	Developed Open Space % Change	Agriculture Acre Change	Agriculture % Change	Grassland/Shrub Acre Change	Grassland/Shrub % Change	Emergent Wetland Acre Change	Emergent Wetland % Change
Arlington County	(92)	-4%	98	0.8%	10	0.5%	(16)	-95%	0.4	0.8%	-	NA
Charles County	(7,535)	-4%	4,336	32%	1,712	14%	(374)	-0.7%	439	3%	6	0.1%
City of Alexandria	(168)	-16%	180	2%	28	4%	(24)	-85%	(4)	-9%	(5)	-38%
City of Bowie	(1,018)	-24%	1,795	39%	504	43%	(1,225)	-76%	39	13%	-	NA
City of College Park	(139)	-19%	139	6%	18	4%	(18)	-90%	(3)	-11%	(0.4)	-67%
City of Fairfax	(87)	-10%	66	3%	26	4%	(8)	-42%	(3)	-8%	(0.2)	-25%
City of Falls Church	(8)	-2%	9	1%	(1)	-0.9%	-	NA	-	NA	-	NA
City of Frederick	(200)	-19%	2,022	47%	958	57%	(2,841)	-38%	8	11%	-	NA
City of Gaithersburg	(411)	-31%	1,031	30%	82	12%	(654)	-68%	(7)	-6%	0.2	9%
City of Greenbelt	(94)	-5%	114	6%	0.7	0.4%	(21)	-61%	(0.4)	-3%	-	NA
City of Manassas	(525)	-52%	692	17%	66	8%	(123)	-46%	(23)	-44%	-	NA
City of Manassas Park	(427)	-66%	365	50%	86	67%	(39)	-48%	16	53%	-	NA
City of Rockville	(148)	-9%	653	14%	81	5%	(517)	-68%	(6)	-5%	0.2	50%
City of Takoma Park	(10)	-3%	(0.2)	-0.03%	11	8%	-	NA	-	NA	-	NA
District of Columbia	(152)	-3%	334	1%	(61)	-2%	(37)	-65%	(4)	-3%	(22)	-26%
Fairfax County	(16,408)	-13%	16,866	21%	3,853	13%	(4,281)	-42%	(2)	-0.02%	15	2%
Frederick County	(1,935)	-1%	5,660	39%	3,581	37%	(7,777)	-3%	283	3%	(20)	-5%
Loudoun County	(13,187)	-10%	19,821	107%	2,883	33%	(11,028)	-7%	656	8%	(23)	-7%
Montgomery County	(5,047)	-4%	9,330	18%	6,851	25%	(10,853)	-11%	263	2%	(251)	-54%
Prince George's County	(15,458)	-11%	12,608	18%	4,411	19%	(4,950)	-12%	996	10%	187	7%
Prince William County	(18,871)	-14%	15,851	67%	4,984	44%	(4,252)	-10%	989	12%	(30)	-3%
Town of Bladensburg	-	NA	0.4	0.1%	(0.4)	-1%	-	NA	-	NA	-	NA
Total and % Change	**(81,922)**	**-4%**	**91,970**	**4%**	**30,081**	**1%**	**(49,037)**	**-2%**	**3,640**	**0.2%**	**(143)**	**-0.01%**

Appendix B. Near and Long-Term Sustainability Threats

NEAR-TERM SUSTAINABILITY THREATS

Development and redevelopment

Local climate, storms, pests & diseases

Poor maintenance procedures

Infill development & utility damage

Funding

Deer predation and browse

Invasive plants

Net loss of canopy

LONG-TERM SUSTAINABILTY THREATS

Poor land use planning

Lack of cohesive vision and planning

Deer predation and browse

Climate change

Lagging public awareness and support

Forest fragmentation

Forest and woodlot management

CONSTRUCTION DAMAGE　　　*EMERALD ASH BORER*　　　*POOR PRUNING*　　　*STORM DAMAGE*

Near-Term Sustainability Threats

DEVELOPMENT AND REDEVELOPMENT

As urban areas continue to expand, forests become fragmented and destroyed, decimating forest health and biodiversity. The best developers understand that building green means not just structural design. Rather, it encompasses the entire development site and its relationship to surrounding sites. They also understand that building green adds value, improving the investment-to-return ratio. Building green begins at the conception of the project, not at the construction phase, and should involve an arborist or forester to help determine what sort of trees and vegetation will have the best chance of thriving in the environment altered by construction. Arborists or urban foresters should continue to collaborate with the developer until the project is completed.

LOCAL CLIMATES

Urban areas can create a harsh environment for trees. Proximity to sidewalks, roads and buildings, as well as exposure to temperature extremes, light exposure, wind, and air pollutants, can cause significant stress on trees.

Trees planted in close proximity to light colored building walls with a southern orientation can create higher temperatures and increase the risk of sun scalding to a susceptible young tree's bark. Buildings also channel dry warm winds in the summer, increasing the risk of dryer soils and excessive leaf evapotranspiration and desiccation, and cold winds in the winter, increasing the risk of frost cracks to a tree's stem. Trees exposed to direct sunlight during the day and a rapid temperature decrease at night are also susceptible to frost cracks.

Reduce the risk of harsh local climates by understanding the planting site and appropriate species. Consider thick bark trees that can withstand dramatic changes in temperature. Also, in these types of local climates, choose species that are well suited for drier air and soils.

Frost cracks in a tree. Photo credit: Bob Bricault, MSU Extension

STORM DAMAGE

Tree damage caused by storms can be costly and consume much of a community's resources but the impacts of these storms can be minimized through proper planning, maintenance, and aftercare.

Ensuring a tree's optimum health through proper maintenance and routine pruning cycles is one way to prevent breakage during a storm. Tree inventories can help to identify trees that could potentially fail during extreme weather. These trees should be prioritized and managed appropriately.

After extreme weather, proper procedures for assessing damage, determining the appropriate next steps, and recovery should be completed. It is recommended to develop storm preparedness and recovery strategies and utilize available resources such as the Urban Forest Strike Team (http://www.ufst.org/), organized and trained by the US Forest Service.

PESTS AND DISEASES

Each locality within the region should plan for pest and disease issues to trees in a proactive manner. Trees in urban areas are at risk from the introduction and rapid spread of invasive forest pests and diseases throughout the U.S. Continued loss of major forest species due to nonnative forest pests and disease is the greatest single threat to the nation's urban forests.

Emerald ash borer (EAB), Agrilus planipennis Fairmaire, is an exotic beetle that was discovered in southeastern Michigan 2002. Since then it has spread to the Mid-Atlantic States and into New England, south as far as Georgia, and most recently spreading west into Nebraska and Colorado. The rapid spread of this pest is primarily due to human activity. Ash species are abundant in both planted and natural areas of urban forests, representing 10 to 40 percent of the canopy cover in many communities. Consequently, widespread ash mortality in urban forests and residential landscapes is having devastating economic and environmental impacts.

Storm Preparedness

Common steps to proactively plan your urban forest

✓ **Survey** trees for signs of instability and failure

✓ **Plan** and prioritize maintenance needs

✓ **Act** on your plan and use Certified Arborists

✓ **Document** tree value, assessment, and work completed

✓ **Speak** to residents about the importance of trees and care

Images to identify ash (*Fraxinus*) trees and the emerald ash borer Photo Source: http://csfs.colostate.edu/forest-management/emerald-ash-borer/

Emerald ash borer has already reached every state within the region. In 2003, EAB was found in Prince George's County, MD, followed by Fairfax County, VA where it was eradicated but later reconfirmed in 2008. Since then, ongoing efforts have been made to reduce the spread of the pest as well as maintain the tree loss caused by EAB. Many resources are available for more information. Local information can be found at:

http://www.fairfaxcounty.gov/dpwes/environmental/eab_general.htm

POOR MAINTENANCE PROCEDURES

Proper tree care starts during tree species selection, choosing the right tree for the given location and desired function. Proper maintenance is crucial during the first few years after planting to lengthen the longevity, improve the tree's structure and health, and minimize future maintenance costs.

Trees selected from the nursery should be of good growing stock and from local seed source if possible. Tree maintenance should be conducted using the ANSI A300 Standards by International Society of Arboriculture's Certified Arborists and follow scheduled routine pruning cycles. Appropriate soil moisture levels should be maintained throughout the growing season.


Improper pruning technique known as "topping"

INFILL DEVELOPMENT & UTILITY DAMAGE

Construction near trees should adhere to tree protection zones, minimizing tree limb, trunk, and root damage, and soil contamination from machinery and equipment.

The Critical Root Zone should be considered to identify the minimal area needed to protect trees during construction. In the State of Maryland, tree protection in rights-of-way is enforced through the Roadside Tree Protection Law (http://www.montgomerycountymd.gov/dep/Tree/laws-and-programs.html) which requires a permit to be acquired from the state. The law also requires the permittee to replant and pay into to the tree replacement fund.

To avoid damage to trees due to utility line clearance, the mature form and structure of trees to be planted needs to be considered. For existing trees, proper young tree pruning and routine cyclical pruning of mature trees can minimize the need for dramatic clearance pruning. In cases where large mature trees need cleared from utility lines, directional pruning should be conducted following ANSI A300 standards.
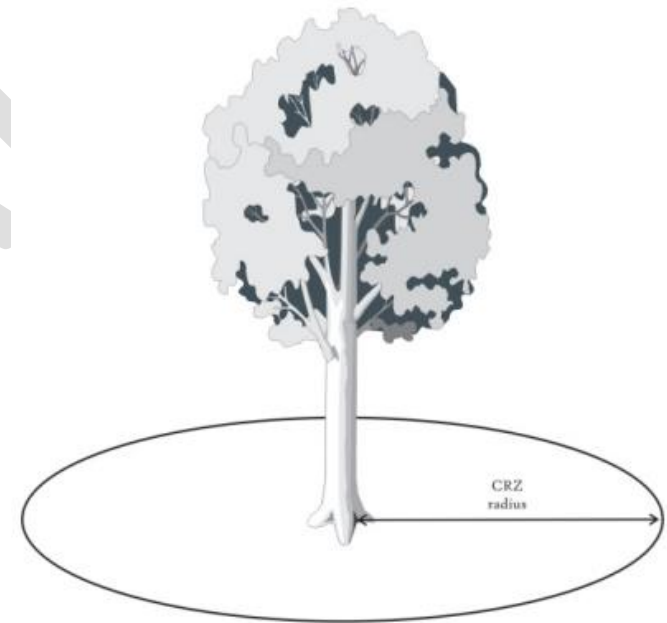
Critical Root Zone Formula
=
for each inch of trunk diameter
(measured @ 4.5 feet from soil)
provide
1.5 feet of Critical Root Zone radius

FUNDING

In recent years, funding for urban forestry programs has generally decreased dramatically due to various constraints for local governments. Less funding results in infrequent maintenance and an inefficient, hazardous, and costly program that is compromising tree health and safety. Consequently, the social and environmental benefits that trees provide are also diminishing.

Creating street tree maintenance programs would require communities to establish long-term funding solutions for public trees. Possible funding tools include general obligation bonds, an assessment district, parcel tax, and General Fund revenue.

Adequate funding for each community needs to be acquired to address increased maintenance requirements caused by EAB, continual tree plantings, advocacy, and overall urban forest sustainability.

DEER OVERPOPULATION & BROWSE

The near-term impacts to urban trees and forests from deer predation and browse include altered tree structure, increased susceptibility to pests and diseases, and/or young tree mortality. When deer browse on seedlings, saplings, and young trees, the branch shoots are removed, causing lateral buds to sprout, creating an altered branching structure. Browse and antler rubs create wounds that are an invitation for pests and diseases. Both of these can lead to tree mortality.

Reducing deer predation and browse depends on the situation. Consider preventative and management options such as deer fences and other barriers, repellants (*Deer Away*), traps, resistant tree species, and young tree pruning. Proper management of deer populations should be supported by the region.

Sustaining and Funding a Program

Methods for building support and acquiring funding

✓ **Support:** volunteer organizations, events (Arbor Day), advertising and promotions, community engagement, involvement in the local planning processes, use of a shade tree commission, tree inventories, master plans, and ordinances

✓ **Funding Options:** special improvement districts, tree trusts/endowments, memorial tree funds, adopt-a-tree, donations, special sales, grants, volunteers, general tax revenues, municipal revenue bonds, direct billing, permit fees/surcharges, insurance settlements

INVASIVE PLANTS

Invasive plants can impact the growing site for a desired tree or stand of trees as well as the tree itself. Planting non-native invasive plant species creates a seed source which can potentially be disseminated to open space, streambanks, and forested land.

Localities throughout the region should update or adopt and implement a recommended tree species planting list and mitigate areas containing invasive plants. Timing for herbicides and removal should be considered based on the invasive plant's growth and fruiting habits and applications should follow all treatment guidelines and precautions.

Often times, invasives can appear in open space and vacant lots. It's important to maintain these spaces and educate the property caretakers about invasive plant identification, prevention, treatment, and removal.

NET LOSS OF CANOPY

Net loss of canopy refers to the result of greater overall tree removal and decline compared to tree planting and natural regeneration rates. Communities and regions are using the widely available National Land Cover Database to determine their existing tree canopy coverage on a coarse scale. Other high-resolution options are also available and have been implemented in many communities.

The most fundamental approach to conserving forests is to direct development to areas where adequate infrastructure for growth (water, sewer, roads, and the like) already exists. Other methods include city tree canopy goals, ordinances, and best practices.

It is important to consider the quality of the canopy and regeneration, not just the extent.

Common Invasive Plants

Callery pear (*Pyrus calleryana*)

Ailanthus or Tree-of-Heaven (*Ailanthus altissima*)

Oriental bittersweet (*Celastrus orbiculatus*)

Resources: UMD Extension - Compilation of Regional Invasive Plant Species Lists, MD Invasive Species Council and the VA Dept. of Conservation & Recreation, Mid-Atlantic Invasive Plant Council

Example from the MD Sustainable Forestry Council's No Net Loss Strategies

✓ **Reduce** the rate of loss by 2020

✓ **Maintain** the state's existing 40 percent forest coverage

✓ **Prioritize** forest conservation

✓ **Protect** high quality forests

✓ **Offset** all sources of forest loss

✓ **Encourage** stewardship

Long-term Sustainability Threats

POOR LAND USE PLANNING

A community is made up of individuals with different needs, interests and lifestyles. Some needs, however, are common to all, such as sanitation, fresh air, clean water, and open space for recreation. The way a city develops can have a direct impact on these needs and the quality of life.

When it comes to land use planning, the two primary regulatory tools are zoning ordinances and subdivision and land development ordinances. While both address land use, they are not the same and are not "interchangeable." Zoning controls the location of land uses as well as density, while subdivision and land development primarily regulates lot layout as well as improvement design and completion. If a municipality desires to regulate land use location as well as design, it should consider both ordinance types.

For most localities, comprehensive plans guide development throughout the county. It is important for urban forestry programs to be aware and engaged in the plan development and revisions.

LACK OF COHESIVE VISION AND PLANNING

Successful urban forest programs both locally and on a regional scale depend on cooperative visioning and planning where interests and resources complement one another. Trees should not be an afterthought in the planning process. A thorough examination of urban forestry in the visioning process leads to a focus on not simply trees but on the entire ecosystem that supports the urban forest and region.

Cohesive visioning, planning, and partnerships are needed in order to achieve these canopy and program goals. The purpose of this Tree Canopy Management Strategy Report is to provide regional guidance for building and maintaining sustainable urban forest programs on a community scale that impacts the entire metropolitan Washington Area.

Forest-Friendly Land Use in Maryland

✓ **Forest Conservation Act** aims to save, maintain, and plant forested areas during development

✓ **Easements** to protect forests, streams, and wetlands on private property

✓ **Forest Conservation Bank** protects large areas of forest which are used to meet developer forest mitigation requirements in an offsite location

✓ **Additional information** can be found at:
http://www.montgomerycountymd.gov/dep/Tree/laws-and-programs.html

Implement and Strengthen Regional Planning

CHANGES IN CLIMATE

It is important to increase urban forest biodiversity to improve resiliency and respond to changes in climate.

Some of the predicted impacts of climate change in the coming decades include warmer winters and longer growing seasons, changes in the seasonality of precipitation and extreme events such as droughts and heavy rainfall, expanded ranges of insects and increased over-winter survival rates, and increased frequency of severity of storm events including wind velocity.

Though the exact nature of the impacts of climate change on a city's urban forest are not certain, management needs and effects on required resources can be anticipated along with strategies to adapt to these changes.

For additional resources and information see the US Forest Service's Urban Forests and Climate Change website, http://www.fs.usda.gov/ccrc/topics/urban-forests-and-climate-change
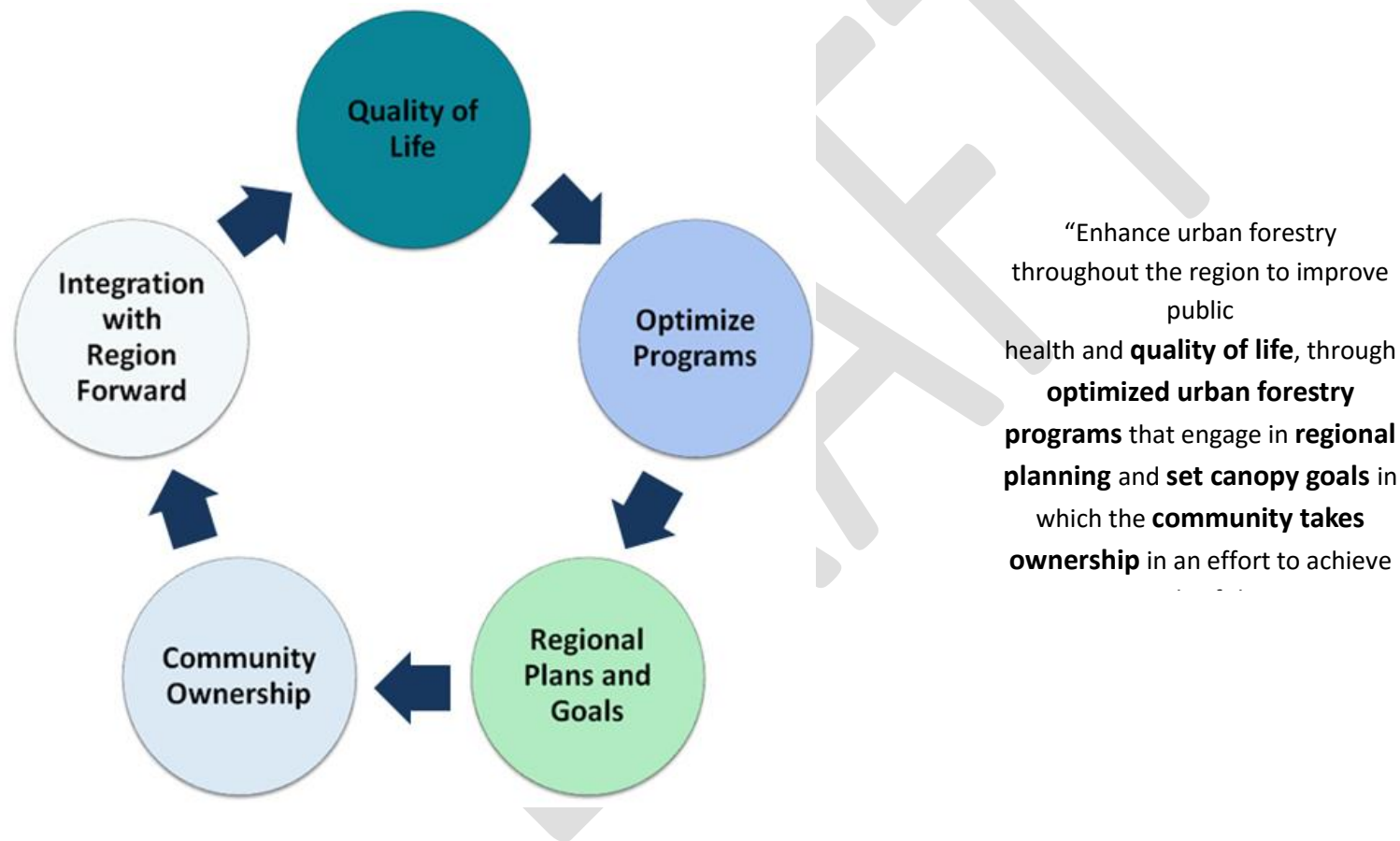
Climate Change Actions

✓ **Diversity:** Increase tree species diversity in plantings

✓ **Assess:** Conduct aerial imagery analyses of land cover, particularly of tree, grass, and impervious cover, to identify areas of higher temperature and planting opportunities

✓ **Planting Standards:** Improve tree planting in hardscapes that accommodate adequate soil volume

✓ **Collaborate:** Work with other departments to achieve common objectives such as reducing the heat-island effect

✓ **Promote:** Quantify the role an urban forest plays in mitigating climate change by sequestering and storage

FOREST AND WOODLOT MANAGEMENT

Just as it is important for species diversity in urban areas, the structure and composition of forests and woodlots play an important role in the health, sustainability, function, and benefits provided. Aging tree populations threaten the longevity of urban and rural forests.

Even-aged stands are at risk for large scale mortality or impacts from pests and diseases. An uneven-aged stand improves diversity, function, and sustainability which can be attained through proper forest management.

Many resources exist for proper forest and woodlot management to effectively achieve the property owner's, whether public or private, goals and objectives.

Resources for Forest Stewardship

✓ **Mylandplan.org** tool to guide landowners in setting goals and managing their land

✓ **Forestryforthebay.org** is a collaborative program to promote proper forest management practices and opportunities

✓ **Departments of Natural Resources** on state and county levels provide stewardship assistance and funding

✓ **Cooperative Extension Foresters and Conservation Districts**

Appendix C. Tactics for Implementing Strategies

The following section provides examples of tactics for implementing strategies to achieve the goals identified in this Tree Canopy Management Strategy.

"Enhance urban forestry throughout the region to improve public health and **quality of life**, through **optimized urban forestry programs** that engage in **regional planning** and **set canopy goals** in which the **community takes ownership** in an effort to achieve

STRATEGY 1.1

Protect: Develop comprehensive policies that encourage protection and enhancement of the urban forest and acknowledge the benefits provided by trees

➢ Integrate tree plantings/preservation as important elements in meeting environmental challenges

➢ Educate developers and builders about the value of trees to consider during all new and redevelopments

STRATEGY 1.2

Manage: Establish or maintain a proactive urban forest management program at city and regional scales

➢ Use tree planting and maintenance practices that continue to improve the quality of tree canopy and benefits

➢ Use detailed street tree inventories to ensure tree health and longevity

STRATEGY 1.3

Expand: Using a balanced approach, maintain what exists and strategically add new plantings. Continue to build partnerships and secure funding

➢ Encourage volunteer tree stewardship of existing and newly planted trees

➢ Maintain or improve community events related to the community's trees

➢ Create or enhance memorial tree and adopt-a-tree programs for added funding

STRATEGY 2.1

Obtain dedicated resources for management of the urban forest

➢ Identify services where departments can collaborate or work jointly

➢ Use canopy data and other data to educate citizens on the tree benefits

STRATEGY 2.2

Ensure the staff capacity is at a level capable of managing the public's urban forest

➢ Assess the status of all urban forestry programs throughout the region. Similar to the 2016-17 survey completed by COG ([see page 16](#)).

➢ If there is no urban forestry staff, provide trainings to the responsible department

➢ If capacity is below standards, create a citizen stewards program

➢ Monitor and improve staffing, roles, and workload

STRATEGY 2.3

Review and improve existing policies

➢ Compile and evaluate all known community tree ordinances

➢ Use or create model ordinances for urban forestry

STRATEGY 2.4

Develop plans with incremental program goals and methods of evaluation

➢ Gather data needed to properly manage the urban forest

➢ Collaborate with other departments or organizations

➢ Use the strategies to guide plans and goals for each community

STRATEGY 3.1

Develop a Comprehensive Regional Urban Forest Management Plan

➢ Use the information from the Tree Canopy Management Strategy to build support and guide the development of the Regional Plan

➢ Integrate Region Forward and other initiative's objectives with the Regional Plan (see Goal #5)

➢ Develop long-range, short-range, and site-specific goals, plans, and strategies

STRATEGY 3.2

Conduct regional Urban Tree Canopy (UTC) assessments

➢ Update canopy assessments at intervals that focus on identifying canopy change

• Identify areas of canopy loss and gain

➢ Integrate Chesapeake Bay stormwater requirements into region's goals

STRATEGY 3.3

Establish attainable canopy goals

➢ Stem the loss of canopy and consider a no net loss policy

➢ Consider establishing canopy and tree planting goals by region, watersheds, counties, and communities. Provide the guidance for establishing and pursuing canopy goals on local levels such as neighborhoods, planning areas, rights-of-way, public property, and land use

STRATEGY 4.1

Lead by example by implementing trees and other green infrastructure on public lands using industry best practices

- ➢ Conserve, plant, and maintain tree canopy on public properties

Examples of Local Tree Stewards Programs

STRATEGY 4.2

Build synergistic partnerships with all sectors influencing urban and community forestry

- ➢ Conduct public input surveys to assess the interests and understanding
- ➢ Develop an outreach and education plan that aligns with the goals established in this plan
- ➢ Provide technical assistance and training to target audiences
- ➢ Develop incentives and a recognition program for practices supporting urban forestry
- ➢ Formalize and maintain partnerships with utility agencies
- ➢ Partner with nurseries selling native non-invasive species and the landscape industry
- ➢ Educate the public on the importance of limiting the use of non-native invasive plant species
- ➢ Create opportunities for communication with identified partners
- ➢ Using available data, focus outreach on underserved areas

Richmond Tree Stewards

Montgomery County's Shades of Green Program

Tree Stewards of Arlington and Alexandria

Washington D.C.'s Casey Trees
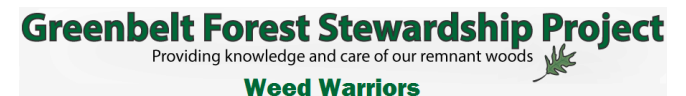
STRATEGY 4.3

Engage the community including the youth in interactive education and learning experiences

- ➢ Celebrate events such as Arbor Day and create school tree poster contests
- ➢ Involve school volunteers for tree plantings and encourage outdoor education
- ➢ Educate on the importance and benefits of trees by using i-Tree

Loudoun County, VA Master Gardeners

Fairfax County's Tree Stewards

Greenbelt, MD's Weed Warriors

STRATEGY 5.1

Increase participation and build synergistic partnerships

➢ Include all members of COG in planning, action, and monitoring of the Region Forward initiatives

➢ Conduct surveys to identify available resources, strategies, and best practices among communities

➢ Create an interactive website to communicate and build support for the effort

STRATEGY 5.2

Use the Region Forward Plan and Tree Canopy Management Plan to complement one another's goals

➢ Develop a committee focused on the integration of the two plans

➢ Identify goals of Region Forward that can be achieved through urban forestry efforts

➢ Provide effective strategies and solutions that meet the Plans' outcomes

➢ Improve tracking and monitoring to measure progress and Region Forward's identified Targets and Indicators

➢ Adjust the Region Forward and Tree Canopy Management Plan based on status of Targets and Indicators

Appendix D. Existing Local Urban Forest Plans and Reports

This list is an example of existing plans and reports to be integrated with a comprehensive regional urban forest management plan to support Goal 3.

Virginia

- Arlington County, VA's 2004 Urban Forest Master Plan
- City of Alexandra, VA's 2009 Urban Forestry Master Plan
- Fairfax County, VA's Tree Action Plan
- Prince William County's 2008 Comprehensive Plan
- Loudoun County's 2008 Comprehensive Watershed Management Plan
- City of Manassas, VA's Chesapeake Bay TMDL Action Plan

D.C.

- District of Columbia's 2006 – 2011 Urban Tree Canopy Assessment
- District of Columbia's 2013 Tree Canopy Plan
- District of Columbia's Demonstration Project for Community-Level Urban Forest Assessment, Management, and Engagement

Maryland

- Prince George's County 2010 Forest Canopy Assessment
- City of Frederick, MD's 2010 Urban Forestry Management Plan
- City of Bowie, MD's 2011 Urban Greening Strategy Report
- City of Hyattsville, MD's 2008 Urban Tree Canopy Assessment
- Anacostia Watershed's Forest Management and Protection Strategy
- Chesapeake Bay Program's Tree Canopy Outcome Management Strategy

Appendix E. Overview of the US Forest Service (USFS) Urban Forest Sustainability & Management Audit

A tool supporting Goal 2 for evaluating urban forest programs across the region.

US Forest Service Urban Forest Sustainability & Management Audit Overview (abbreviated)

Policy and Ordinances
- Tree Protection
- No Net Loss
- Tree Canopy Goals
- Risk Management
- Utility
- Sustainability
- Development Standards
- Public & Private Ordinance

Professional Capacity & Training
- Certified Arborist Staff/Contractor
- Other Professional
- Municipal Forestry Institute
- Master Gardener
- Landscape Architect
- Planners
- Tree Commission

Funding & Accounting
- Budgeted Annually
- Contingency Budget Process
- Funding based on Community Attribute
- Funding based on Performance Monitoring

Inventories and Plans
- Ecosystem Services
- Street and Park Tree Inventory
- Private, Campus, & Corporate Inventory
- Green Infrastructure
- Canopy Assessment
- 5-year Plan for Public and Private Trees
- Tree Planting Plan
- Annual Maintenance

Risk Management & Disaster Planning
- TRAQ and UF Strike Team Training
- Mitigation Prioritization
- Records, Reports, & Communications
- Risk Management Policy
- Tree Risk Management Plan
- Response/Recovery Protocols
- Incorporate UF in County Disaster Plan
- Disaster and Mitigation Plan

Standards & Best Management Practices
- Follow ANSI Standards
- Tree Age & Species Diversity
- Proper Planting & Maintenance
- Construction Standards
- Tree Nursery Standards
- Utility Management
- Wood Utilization

Other Criteria:
Outreach, Social Media, Volunteer Programs, ADF Tree City USA, Recognition Programs, Public Tree Maps, Education, Media Coverage

Appendix F. Additional Resources

PRUNING GUIDELINES: http://mdc.mo.gov/sites/default/files/resources/2010/04/3791_1459_0.pdf

RECOMMENDED TREE SPECIES: http://mdc.mo.gov/sites/default/files/resources/2010/06/8045_5179.pdf

SAMPLE TREE ORDINANCE: https://www.arborday.org/programs/treecityusa/documents/sample-tree-ordinance.pdf

TREE ORDINANCE GUIDELINES: http://www.isa-arbor.com/education/resources/educ_TreeOrdinanceGuidelines.pdf

TREE CONTRACTING SPECIFICATIONS: https://www.springfieldmo.gov/DocumentCenter/View/11756

TREES AND DEVELOPMENT GUIDELINES: http://www.a2gov.org/departments/field-operations/forestry/Pages/StreetTreesDevelopment.aspx

MUNICIPAL FORESTRY STAFF: https://www2.apwa.net/Documents/About/CoopAgreements/UrbanForestry/UrbanForestry-2.pdf

TREE BOARDS: http://www.tufc.com/pdfs/treeboard_handbook.pdf

URBAN WATERSHED FORESTRY MANAGEMENT: http://www.forestsforwatersheds.org/

FUNDING SOURCES: http://actrees.org/resources/tools-for-nonprofits/fundraising-tools-for-nonprofits/

TREES AS GREEN INFRASTRUCTURE BEST MANAGEMENT PRACTICES: http://water.epa.gov/polwaste/green/upload/stormwater2streettrees.pdf

VALUING TREE BENEFITS: www.itreetools.org

URBAN TREE CANOPY (UTC) ASSESSMENTS: www.nrs.fs.fed.us/urban/utc/

SUSTAINABLE URBAN FOREST GUIDE: http://www.mortonarb.org/files/Sustainable%20Urban%20Forest%20Guide%20(3-22-15)%20v5%20draft.pdf

PRIVATE PROPERTY TREE PROGRAM: http://treebaltimore.org/get-a-free-tree/

TREE INVENTORY TOOLS: www.planitgeo.com

TREES WORK: http://www.treeswork.org/

EMERALD ASH BORER MANAGEMENT: http://csfs.colostate.edu/forest-management/emerald-ash-borer

PLANNING TOOLS:

Urban Forest Management Plan Toolkit, APWA Urban Forest Management Plan, Plan-It Geo Urban Forest Cloud, CommunityViz, OpenTreeMap, NASF U&CF Management Plan & Guidebook, Forests for the Bay LandServer

CERTIFICATIONS AND PROGRAMS:

ISA Certified Arborist, SMA Municipal Forestry Institute, Urban Forest Strike Team Training, ISA TRAQ Program, American Society of Consulting Arborists, i-Tree Workshops, eLearn Urban Forestry Training, Plan-It Geo Webinars, USFS Urban Forest Connections Webinar Series, Mid-Atlantic Chapter ISA, UMD Extension's General Forestry Course

Source: http://www.livability.com/va/arlington

Source: https://truthaboutfederaldevelopment.wordpress.com/