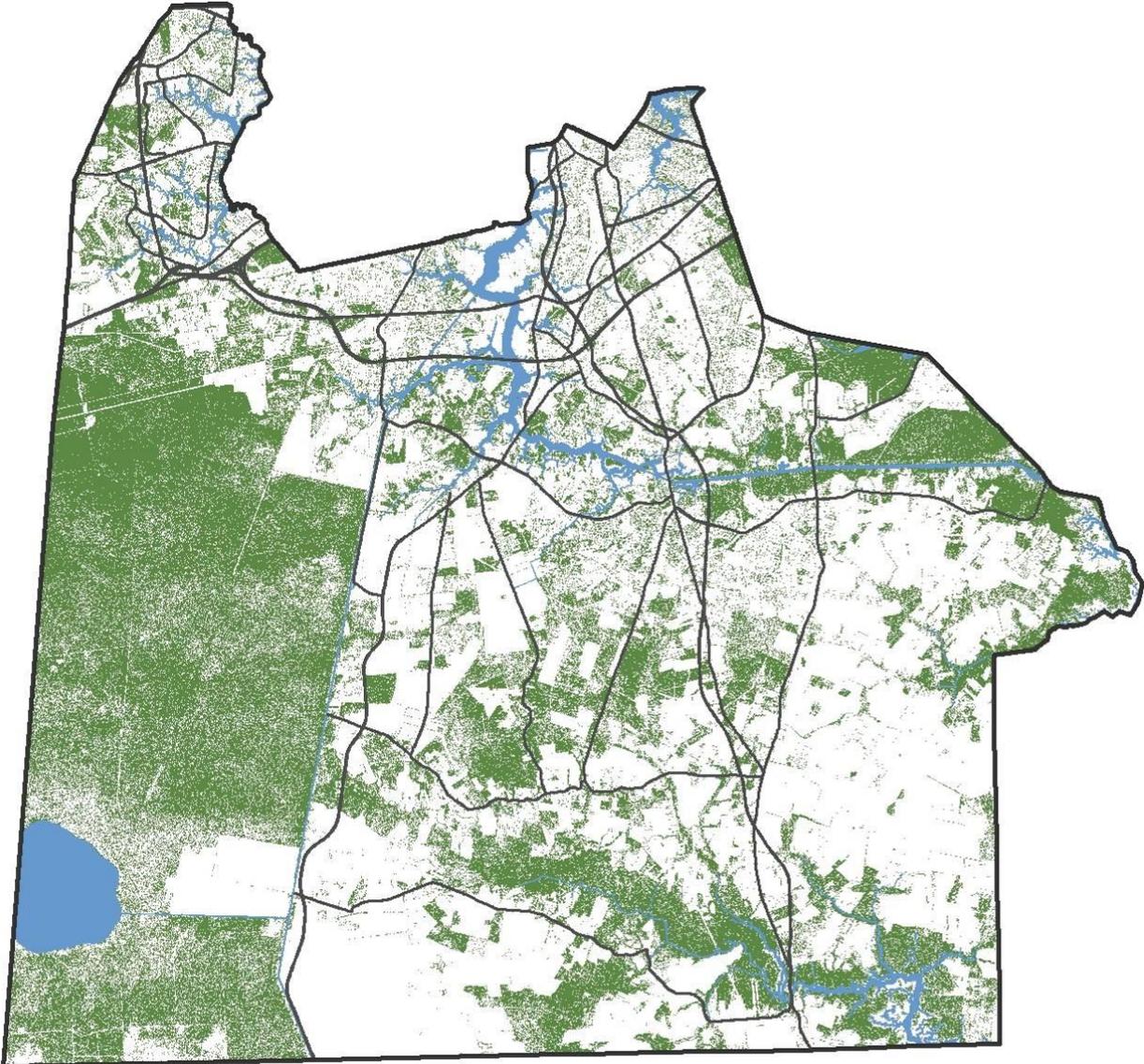


# URBAN FOREST MANAGEMENT PLAN 2010



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## ACKNOWLEDGEMENTS

### **CITY COUNCIL**

Mayor Alan Krasnoff  
Vice Mayor John M. de Triquet  
Lonnie E. Craig  
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Suzy H. Kelly – SCI Liaison  
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William Harrell – City Manager  
Amar Dwarkanath – City Manager’s SCI Liaison  
Dr. Wanda A. Barnard Bailey—City Manager’s SCI Liaison  
Brian Ballard—Co-Chair  
Barbara Brumbaugh—Co-Chair

#### Participating Departments:

Budget	Development and Permits	Parks and Recreation
Central Fleet Management	Economic Development	Planning
Chesapeake Public Schools	Fire	Public Communication
City Attorney	Human Resources	Public Utilities
City Council	Information Technology	Public Works
City Manager	Libraries	

### **Urban Forest Management Plan (UFMP) Committee**

Miklos Lestyán, Urban Forester  
Jean-Marie Eagler, (Senior Plan Writer/Editor)  
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Roxanne Stonecypher, Environmental Coordinator  
Brian Ballard, Principal Planner, (Plan Illustrations/Formatting)  
Barbara Brumbaugh, Environmental Quality Coordinator  
Karen Shaffer, Assistant Director – Planning Department

### **Agencies Providing Review and Endorsement of the UFMP:**

Chesapeake Environmental Improvement Council (CEIC) - City of Chesapeake Tree Board  
Chesapeake Arboretum

*With special appreciation for the Virginia Department of Forestry and Trees Virginia for their extended grant support which has made preparation of this Plan possible. In memory of Jean-Marie Eagler for her tireless work in support of Chesapeake’s Urban Forest.*

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**About the front cover:** The map shown on the cover illustrates the tree canopy coverage in Chesapeake using Light Detection and Ranging (LIDAR) elevation data acquired in September 2006. The LIDAR based coverage was created by the Chesapeake Information Technology Department and captures trees with heights greater or equal to 6 feet and delineates the canopy of many individual trees and small clusters of trees in addition to the canopy of wooded areas.



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## EXECUTIVE SUMMARY

The Urban Forest Management Plan addresses four management-related questions:

1. What do we want? (Overall purpose)
2. What do we have? (Resources)
3. How do we get what we want? (Goals, objectives and strategies)
4. Are we getting what we want? (Evaluation)

Each question is considered in terms of the three essential components of a sustainable urban forest: trees, management, and community.

### I. WHAT DOES CHESAPEAKE WANT OF ITS URBAN FOREST?

To maximize the social, aesthetic, functional, economic and recreational benefits, thereby enhancing the environment and increasing the quality of life for the citizens of Chesapeake.

### II. URBAN FOREST RESOURCES

**Trees.** According to satellite imagery, the City has a declining 36% tree canopy which provides millions of dollars in ecological services such as stormwater management, pollution uptake, and energy conservation (Appendix A).

**Management.** The City has an excellent Landscape/Tree Ordinance, enforced by the Department of Development and Permits. Tree care operations and budgeting are decentralized and distributed through several departments. The recently formed Urban Forest Division will work to coordinate and upgrade tree care operations, and prepare and manage an urban forest plan.

**Community.** Community surveys show positive attitudes towards achieving urban forest management objectives and understanding the benefits of trees.

### III. URBAN FOREST GOALS, OBJECTIVES AND STRATEGIES

**Trees.** Achieve a regionally appropriate tree canopy of 40% by 2030. Promote reforestation, conservation and proper tree care at the public and private level.

**Management.** Organize departments and allocate sufficient resources for effective and efficient urban forest management. Identify legislative initiatives and ordinance amendments that will assist in achieving canopy goals. Provide proper tree care for public trees and promote proper care for private trees.

**Community.** City management fosters continued community support of sustainable urban forest management objectives through education, meetings, surveys, and reforestation projects.

### IV. EVALUATION

An annual report prepared by the City's Urban Forester, and reviewed by the Tree Board to evaluate the status of urban forest management.

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## INTRODUCTION

Trees often play an unrealized vital role in our lives. Aside from their natural beauty, they assist us in the enjoyment of social, aesthetic, functional, economic and recreational benefits. Because of this, the City of Chesapeake has embarked on ways to effectively promote a safer, greener and more eco-friendly City by establishing measures that will assist with the continued preservation, expansion, and education about our City's urban forest. By preparing and implementing the Urban Forest Management Plan (UFMP), the City of Chesapeake seeks to protect, enhance, and provide proper care for valuable resources.

*"He who plants a tree, plants a hope." - Lucy Larcom*



2006



2010

In keeping with the vision of the Sustainable Chesapeake Initiative, to pursue environmental sustainability, and enhancement, the goal of the Urban Forest Management Plan is to provide a high quality of life that meets the social and economic needs of its residents, business community and visitors while maintaining and improving the quality of the City's natural environment. This plan will serve as an outline for managing and maintaining the City's existing urban forest areas, identify appropriate locations for reforestation, and provide education, training and urban forest management support to the community.

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## BENEFITS OF THE URBAN FOREST

To engage City of Chesapeake residents, leaders, youth, students and the extended community, the City Urban Forester has created the acronym SAFER to help people easily learn and remember the importance of trees and the urban forest. SAFER stands for “Social, Aesthetic, Functional, Economic and Recreational,” which describes some of the major benefits of the urban forest (Appendices A and B).

### **SOCIAL**

Throughout the City of Chesapeake, our parks and landscaped areas provide for opportunities for mental and spiritual rejuvenation for our residents. Past studies have shown that patients in hospital beds overlooking wooded landscapes tend to have higher recovery rates and employees who work in office parks with landscaping tended to be more productive than those who did not. Another study even found that teen girls who were exposed to green landscapes in their home environments scored higher on tests of concentration and self-discipline.

### **AESTHETIC**

Trees naturally enhance the aesthetic scenery for any environment of which they are a part. They also assist with providing shade during warm weather months, filtering light, are part of the natural habitat for wildlife and are an enhancement to architectural elements.

### **FUNCTIONAL**

The urban forest provides light reflection and deflection, absorbs sound, reduces heat, controls erosion, provides wind control, assists with natural storm water mitigation, helps conserve energy, and absorbs pollutants from both the air and groundwater as well as removing carbon dioxide from the air while releasing oxygen.



*Arbor Day 2007*

### **ECONOMIC**

Wooded landscapes are proven to help increase property values by up to 15% (see references in Appendix A1). They also reduce energy consumption by the natural cooling effect they have on the immediate surroundings especially in urban communities. Wooded landscapes also decrease stormwater runoff assist with reducing the need for structural stormwater controls.

### **RECREATIONAL**

The parks and forest areas located throughout the City of Chesapeake provide desirable environments for outdoor activities such as camping, jogging, hiking, walking, bird watching, picnicking and even nature studies.

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## PART I: PURPOSE

The overall purpose of having an urban forest management plan is to maximize the social, aesthetic, functional, economic, and recreational benefits of the urban and community forest, thereby enhancing the environment and increasing the quality of life for the citizens of Chesapeake.

This purpose reflects the Chesapeake City Council resolution of August 2008 which describes a sustainable Chesapeake as a city with a high quality of life that meets the social and economic needs of its current and future citizens, employees, visitors, and business community, while maintaining and improving the quality of its natural environment. A properly managed urban forest is an essential component of a sustainable Chesapeake.



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## PART II: URBAN FOREST RESOURCES

Trees are a source of sustainable life. They are the longest living organisms on earth. They assist with maintaining a balanced ecosystem by the role they play in removing toxins and pollutants from the air, energy conservation, heat reduction and even natural storm water mitigation. Managing and enhancing the City's existing urban forest resources requires research, monitoring and evaluation of the methods of care; education and training; and partnerships with residents, youth, the business community, commuters and visitors. The three components of a sustainable urban forest are **Trees, Management, and Community**. The harmonious interaction of these elements is vital to achieving the City's goal of preserving and enhancing the urban forest for the benefit of the community and the environment.

**TREES:** Trees are the most recognized component of the urban forest, either by their presence or absence. How we inventory, maintain, and enhance this resource, ultimately influences the benefits and quality of life desired by all.

### **Tree Inventory**

An inventory of tree canopy-essential for determining the value and extent of the City's urban forest resource was conducted in 2007. Tree canopy is the actual area covered by a tree's leaves, branches and stem when seen from above. This inventory was conducted by Chesapeake's Information Technology Department using satellite imagery and geographic information system (GIS) technology. The imagery based on mid-1990's and 2005 data showed that Chesapeake had an average of 36% tree canopy cover, excluding the Dismal Swamp with a decrease of 2% since 1995. Based on national studies, the recommended average tree canopy cover for this region is 40% (See Appendix A1).

The City of Chesapeake takes pride in its efforts to preserve and enhance a sustainable natural environment for its residents, business community and visitors. When healthy urban forests exist within a community they provide a number of ecological services which includes stormwater management, pollution uptake, and energy conservation. Appendix A provides documentation derived from analysis and data published by the non-profit organization American Forest that illustrates the approximate quantified monetary benefits in millions of dollars that this resource currently provides from these services. While these numbers are only general in nature, this type of analysis illustrates the scale of the quantified benefits that can be gained from a properly managed resource.

### **Future Tree Canopy Inventories**

With increasingly sophisticated technology, inventories utilizing techniques such as the light detection and ranging (LIDAR) based data now becoming available, will provide a more detailed and accurate assessment of the City's urban forest resources and will be used in annual updates on the state of the urban forest.

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### **Public Trees**

Chesapeake’s public trees, which include federal, state and local territory, account for approximately 36% of the City’s urban forest. The remaining trees are under private ownership. To upgrade the care of public trees, tree work contracting requirements for the City have been revised to require appropriate certification from the International Society of Arboriculture (ISA). Additionally, the City has initiated a training program to upgrade tree care by City employees involved in tree care operations.

### **Private Trees**

Proper care for private trees is encouraged for new developments, while percent of canopy and maintenance requirements are outlined in Chesapeake’s Landscape Ordinance (Appendix E). Proper maintenance for residential trees is encouraged through community outreach, education and support by the Urban Forestry Division and Horticultural Extension Agent at community organizations and school presentations.

### **Reforestation**

Under the UFMP, the City of Chesapeake will move towards reforestation of appropriate locations to increase tree canopy coverage. Reforestation includes techniques such as the reduction of scheduled grass mowing of large properties and locations such as schools, parks and right of ways. A reduction in mowing provides several immediate environmental benefits throughout the City such as stormwater retention, pollution uptake, improved water and air quality and energy conservation. The City currently supports the “Stop the Mowing, Start the Growing” reforestation policy. The Parks and Recreation Department has significantly cut back mowing and has started reforesting the perimeter of Centerville Park. This program is supported by the City’s Reforestation Guidelines under Chesapeake Ordinance 19-600. When an area is posted with reforestation signage, it will not be subject to maximum vegetation height restrictions.

#### *Centerville Park Entrance Reforestation*



*2008*



*2010*

### **Tree Conservation**

Tree conservation includes old concepts such as preserving existing woodlands and newer concepts such as agroforestry. Through education programs, private landowners are encouraged to appreciate the importance and value of a sustainable natural environment.

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This plan encourages city wide tree conservation practices such as agroforestry and assisting private landowners with identifying state and federal land use incentives.

Agroforestry is the practice of combining both agriculture and forestry to create integrated land-use systems. This practice would assist with a more productive use for woodlands as an alternative to traditional grain farming. Forested lands would be used for things such as crop and livestock production without the need for land clearing (ref 1).

**MANAGEMENT:** The urban forest requires human intervention to be sustainable. Sound urban forest management can help keep the balance between development and conservation and help maintain the optimal urban forest canopy for quality of life and ecologic benefits.

### **Urban Forest Division**

The City's Urban Forester, within the Department of Parks and Recreation, Urban Forest Division, is tasked with managing the urban forest with the goal of optimizing and preserving benefits for the citizens of Chesapeake. To achieve its mission the Urban Forest Division:

1. Conducts inventories of and quantifies urban forest assets, promotes proper tree care, conservation and reforestation.
2. Prepares, manages and updates the urban forest management plan.
3. Educates the extended community about urban forest benefits and management objectives, and provides technical assistance for conservation and reforestation efforts.
4. Trains municipal workers to upgrade tree care practices.
5. In keeping with the "green infrastructure" concept, works with adjacent municipalities to achieve regionally mutual urban forest objectives by interconnecting green hubs and corridors.

This regional effort is underway with the formation of the Urban Forest Roundtable of Hampton Roads (UFRHR). This Roundtable currently encompasses the 16 municipalities traditionally associated with Hampton Roads, as well as others as far away as Richmond.

### **Information Technology Department – GIS Support**

The Information Technology Department has provided Geographic Information Systems (GIS) supported aerial imagery to approximate percentage of tree canopy cover for the entire city and some of their affects upon a geographic region. This imagery also helps to estimate the benefits of the existing urban forest and identifies new sites for reforestation.

### **Chesapeake Landscape Ordinance**

The Zoning Division of the Department of Development and Permits enforces the Chesapeake Landscape Ordinance (sometimes known as the "Tree Ordinance") which requires a certain percent of tree canopy, landscape planting and buffer yards for all new developments and redevelopments depending on zoning intensity. This requires a landscape plan approval prior to final plan approval. The Zoning Division reviews the preliminary and final landscaping plan

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which must include the location, dimensions of green space, buffer yards and existing or proposed public and private easements. A permanent Certificate of Occupancy is issued after the division has verified installation of the required landscaping. Chesapeake's Landscape Ordinance has been cited as a model ordinance in a countrywide survey of ordinances (Appendices C, E ). Potential enhancements to this ordinance could include provisions for street trees, and a "no net loss" policy for trees on public property.

### **Tree City USA Program Participation**

For the past 24 years, the City of Chesapeake has been awarded certificates of compliance in the Tree City USA program conducted by The National Arbor Day Foundation in cooperation with the USDA Forest Service and the National Association of State Foresters. This program recognizes and commends towns and cities across America for answering the call for exemplary leadership and action in urban forest management practices. The program requires each city to establish a tree board, community tree ordinance, community forestry program with a minimum expenditure of \$2 per capita, and to hold an annual Arbor Day Observance and Proclamation.

### **Inter-Departmental Urban Forest Maintenance Activities**

Several departments and offices within the City of Chesapeake currently participate in tree care operations such as selection, installation, maintenance and removal. This includes Parks and Recreation, Public Works, Public Utilities, Agriculture, Schools, the Sheriff's Office, and the Fire Department.

#### *Parks and Recreation*

The Parks and Recreation Department's Grounds Division maintains trees in parks and on public grounds. The Urban Forest Division provides urban forest management planning and updates and evaluations by annual reports. This Division also provides tree risk assessment, and education to all City departments participating in tree care operations; reviews the City's tree contracting procedures; and provides technical support to the Special Programs Division and to the Chesapeake Arboretum. The Special Programs Division provides primary administrative support to the Chesapeake Environmental Improvement Council (CEIC). This Council organizes annual tree planting programs in conjunction with Arbor Day celebrations, procurement of tree planting volunteers, community education in tree care practices, organization and training of tree care teams, and recognition of volunteer participants. The CEIC further supports tree plantings with City "Gateway" beautification projects.

#### *Public Works*

The Public Works Department provides for maintenance and removal of trees in the right of way and selective planting/re-planting.

#### *Public Utilities*

The Public Utilities Department conducts tree care operations, primarily clearance and removal in conjunction with installation and maintenance of trees and shrubs at City water and sewer facilities.

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### *Agriculture*

The Agriculture Department, which is also the Chesapeake office of the Virginia Cooperative Extension (VCE), coordinates the VCE – Master Gardener Volunteer Program for the City with an estimated value over \$66,000 annually from the services provided to citizens through volunteer participation. The volunteers distribute information concerning tree identification, selection, planting, maintenance and problem diagnosis throughout the year via participation in the annual Arbor Day observance festivities, the help desk, educational programs and the information provided via the Internet.

The Extension Agent responsible for horticulture provides information on the identification, selection, planting, consultation with problem diagnosis and maintenance to homeowners, commercial clientele and professional arborists via site visits, various extension programs and professional certifications from various industry organizations.

### *Sheriff's Office*

The Sheriff's Office work crews provide court-mandated community service assistance with tree planting, maintenance, and removal. They have completed one of several reforestation projects at the intersection of Battlefield Boulevard and Military Highway. The Sheriff's Office also has a weekender program that provides labor for maintenance and beautification city wide.

### *Schools*

The School Administration depends primarily on outside and contract help for maintaining tree assets at 66 school properties. With the assistance of the City's Urban Forester and Horticultural Extension Agent, this program is currently being reviewed to determine best management practices for preserving and enhancing schools valuable urban forest assets.

### *Fire Department*

The Fire Department's tree care operations involve primarily emergency access and removal requirements. Providing tree care training to these emergency response teams, would increase safety, and help preserve trees to be retained.

### **Municipal Urban Forest Budgeting**

Current, allocations for tree care operations within the various City of Chesapeake departmental budgets for maintenance, planting, and management are not clear. The report from the Tree City USA application for 2009 shows City expenditure for urban forest tree care activities at \$2,261,504 spread out over eight departments and agencies within the City of Chesapeake. Two additional departments, Information Technology and Schools, will be included in future reports. The decentralized urban forest tree care activity by the various departments is also reflected in decentralized budgets with most of the funds contained in general funds, and not specified as line items for tree care.

Relevant budget allocation and funding guidance are provided in a national study of urban forestry budgetary practices (Urban Forestry Best Management Practices for Public Works Managers, Budgeting and Funding APWA 2007 (ref 2). Review of this guidance provides a

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perspective on the City's urban forest budgeting. For instance, a "1994 report revealed that average percentage of total municipal budget allocated to tree management was 0.31 percent, ranging nationally between .09 and .95 percent". The City of Chesapeake's overall budget for 2009-10 for urban forest tree care activities was .2%, falling just below the national average. The 2007 APWA reference also provides information on the average national budget allocation for urban forest activities showing 58% for maintenance, 14% for planting, and 8% for management. Further study, review, and recommendations for urban forest budgeting is an action strategy under management goals.

**COMMUNITY:** Community support and understanding, provides the essential incentive for managers and leaders to maintain a strong urban forest management program.

### **Community and Neighborhood Forestry Liaison Team**

This recently formed team of community volunteers, under the guidance of the Urban Forester, will reach out to the extended community to help neighborhoods achieve maximum urban forest benefits. The team also provides education and leadership by helping neighborhoods preserve, beautify, maintain and reforest appropriate locations within their own community and citywide, incorporating grants from the Neighborhood Beautification Program promoted by the Office of Neighborhood Coordination. The activities of this team will be reviewed in the annual urban forest report.

### **Chesapeake Environmental Improvement Council**

The Chesapeake Environmental Improvement Council (CEIC), administratively supported by the Parks and Recreation Special Programs Division, consists of 18 volunteers appointed by the Mayor. They serve on a governing board that assists with the *Keep Chesapeake Beautiful* initiative by offering volunteerism projects for beautification and solid waste management. CEIC also establishes partnerships with businesses, government agencies and civic and neighborhood groups. For the past several years, CEIC has assisted the City with planting over 2,000 trees during the city's annual Arbor Day celebrations.

### **Tree Board**

The City of Chesapeake's Tree Board (proposed to be renamed as the Community Forest Board), is comprised of Mayoral appointees from the Chesapeake Environmental Improvement Council. Their primary function is to review Chesapeake's past, current and proposed urban forest management practices based on input provided by the City Urban Forester via monthly reports. These reviews will serve as a basis for recommendations to City leaders.

### **Volunteer Advocates for Chesapeake Youth (VACY)**

The VACY (formally known as Chesapeake Bay Youth Conservation Corps) annually teaches hundreds of at-risk youth good work ethics through hands-on environmental enhancement and community service projects. The youth are tasked with both planting and maintenance of trees in addition to other activities and roles. VACY primarily works in the City of Chesapeake and provides assistance to the Parks and Recreation Department, Public Works

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Department, Agriculture Department, Urban Forester, Chesapeake Environmental Improvement Council, Northwest River Park and the Chesapeake Arboretum.

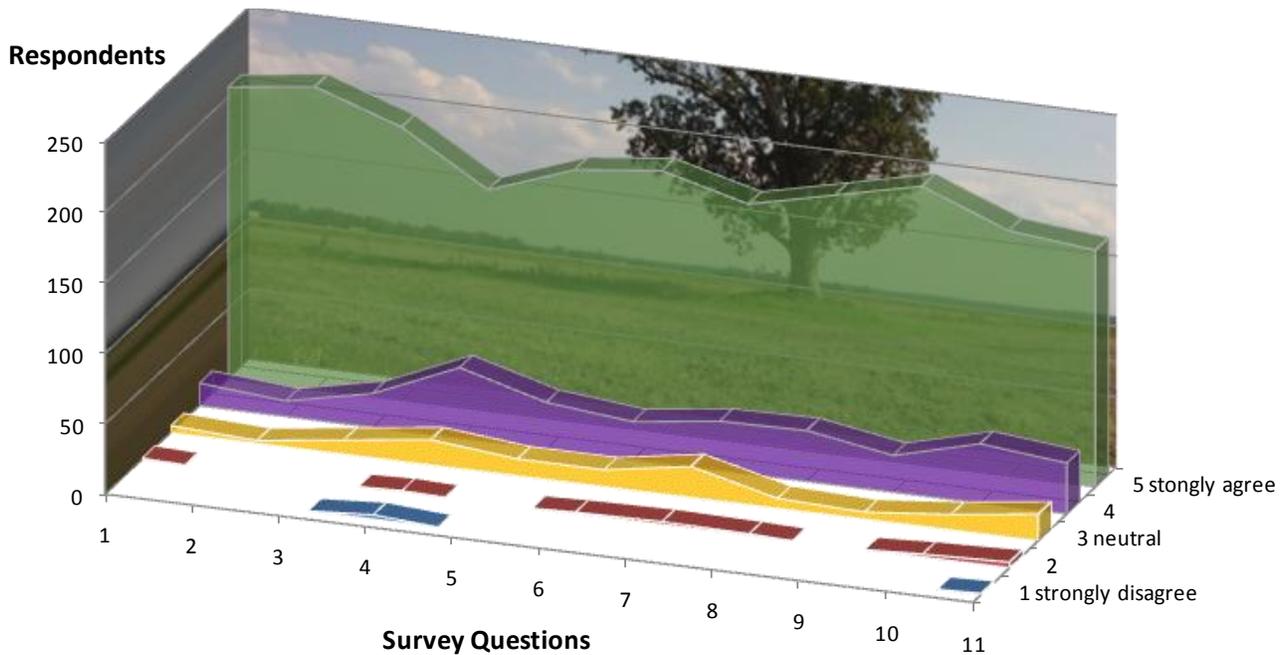
### **Chesapeake Arboretum**

In 2008, the estimated value for the Chesapeake Arboretum's activities for education programs, tree plantings, improvements to trails, bridges and gardens at the arboretum was \$82,000. The Arboretum expanded its educational programs to include programs for arborists, amateur photographers and Standard of Learning Programs for the Chesapeake Public School System and enlarged its tree nursery. The Arboretum operates a tree nursery, with some levels of City support to provide trees at minimal cost for municipal tree planting. During 2006-2010, the Arboretum Nursery provided 1,205 trees valued at \$40,060 at a cost of \$10,670 an estimated savings of \$29,390. Since these trees were planted by volunteers organized by Special Programs and by the Urban Forester, an estimated \$109,510 was saved by not contracting out (Appendix D). Due to funding and manpower issues, the Arboretum Board has indicated a desire to transfer operation of the tree nursery to the City. This type of transfer has potential for future urban forest enhancements and savings.

### **Community Survey**

In February 2009, a Survey of Community Attitudes Regarding Urban Forest/Tree Assets was created and given to 11 community organizations to complete following a fifteen to twenty minute presentation on urban forest management. The results are shown on the next page.

## Results Regarding Urban Forest / Tree Assets



1. 91% strongly agree that trees, in general, improve the quality of life for the City of Chesapeake
2. 99% agree that trees are important because they shade and cool their surroundings and reduce energy costs and consumption
3. 95% note that trees reduce the quantity of stormwater runoff and erosion
4. 90% believe that trees in business districts and residential neighborhoods attract more businesses and residents
5. 92% state that tree canopy should be maintained to reduce smog and dust, and filter other pollutants
6. 93% agree that trees can benefit the City because they reduce noise and block unsightly views
7. 89% believe trees are important because they increase property values
8. 96% of residents agree that trees protect water quality
9. 98% feel that Chesapeake should encourage developers to preserve and plant trees
10. 94% of respondents say they have a better understanding the benefits of the urban forest because of the presentation
11. 89% feel that our City government should manage urban forest assets

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## PART III: CHESAPEAKE'S URBAN FOREST GOALS, OBJECTIVES AND ACTION STRATEGIES

Goals are the broad solutions to the problems outlined in the resource inventory. The objectives provide the justification for actions to be taken and costs incurred.

### **Goal 1: To maintain a healthy and appropriate percent of urban tree canopy cover.**

**Objective 1:** Maintain data on Chesapeake's current and recommended optimum average tree canopy of 40% (the actual tree canopy will vary from 0% in farm lands to 100% in conservation areas).

*Action Strategy:* The Urban Forest Division of Parks and Recreation conducts research and interpretation of GIS and aerial imagery input from the City's Information Technology Department to obtain the most recent tree canopy inventory data.

*Action Strategy:* The Urban Forest Division conducts research to use the latest state-of-the-art tree canopy inventory and benefit quantification methods as recommended by the USDA U.S. Forest Service, the Virginia Department of Forestry, and by Virginia's land-grant university, Virginia Polytechnic Institute.

**Objective 2:** Obtain trees for city use at minimal cost.

*Action Strategy:* Apply for grants for tree planting.

*Action Strategy:* Utilize the Chesapeake Arboretum Nursery for a tree planting source.

*Action Strategy:* Provide technical support to the Chesapeake Arboretum for tree nursery operations.

*Action Strategy:* Prepare mid-range plans for Parks and Recreation Department operation of the tree nursery (currently under Arboretum Board direction), including manning, budgeting and operation.

**Objective 3:** Maintain a tree bank for off-site planting.

*Action Strategy:* In 2009, this concept was approved as a landscape waiver, permitting the Chesapeake Arboretum to function as the bank, for subsequent planting on City property. With ordinance updates, this concept can be formalized.

**Objective 4:** Train municipal tree care workers and provide incentives for professional certification.

*Action strategy:* Continue organizing and providing annual 12-hour training program for municipal workers, partnering with adjacent municipalities for instructors and student participation.

*Action strategy:* Provide training and information to supervisors and management, on the benefits of professional training.

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**Objective 5:** Promote proper care, reforestation and conservation of private land.

*Action Strategy:* Educate the community on proper tree care.

*Action strategy:* Support incentives for conservation and reforestation by local ordinances by providing information on state and Federal incentives, and by support of legislative initiatives.

*Action Strategy:* Promote agroforestry concepts to private landowners as an option to complete clearing for grain production by also maintaining forested lands for agriculture and livestock production (Ref 1. University of Missouri Center for Agroforestry).

*Action strategy:* Continue to fund the City's existing efforts to protect open space through easements or fee simple purchases.

**Objective 6:** Promote proper care of public trees.

*Action strategy:* Continue municipal tree worker training to upgrade in-house work. Monitor contract administration requirements to ensure qualified tree work contractors are utilized. This will require meetings with the City Purchasing and Contract Manager, and Departmental representatives. The latest tree worker contracting requirements were reviewed and implemented in early 2010.

**Objective 7:** Evaluate tree health and identify tree risks.

*Action Strategy:* The Urban Forester provides training to municipal tree care workers to perform tree health and risk assessments. Fieldwork will be used to upgrade proficiency.

**Goal 2: Proper management of valuable urban forest resources in order to provide maximum social, aesthetic, functional, economic, and recreational benefits to all elements of Chesapeake's extended community.**

**Objective 1:** The City Urban Forester maintains scientific and technical proficiency in all aspects of urban forest management.

*Action Strategy:* Urban Forester does independent research to maintain proficiency.

*Action strategy:* Urban Forester networks with urban forest community and professionals.

*Action Strategy:* Urban Forester attends national symposiums and conferences to upgrade professional knowledge in urban forestry.

**Objective 2:** Maintain and update the urban forest management plan-this includes establishment of urban tree canopy goals.

*Action Strategy:* Set the proposed date for achieving a 40% City wide average canopy by 2030.

*Action Strategy:* Review and endorsement by sustainable Chesapeake Initiative (SCI) Task Force, Tree Board, Director, City Manager, and City Council.

*Action Strategy:* Prepare an annual evaluation of urban forest management objective achievements.

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**Objective 3:** Maintain an inventory of urban tree canopy.

*Action Strategy:* Maintain close liaison with the City’s IT Department to submit requests and updates of the latest satellite and aerial imagery of tree canopy data.

*Action Strategy:* Utilize the latest U.S. Forest Service and Virginia Dept. of Forestry assistance for urban tree canopy assessments.

*Action Strategy:* Maintain technical proficiency in the latest techniques of “top down” and “bottom up” tree inventories.

**Objective 4:** Compile data on quantifiable and intangible benefits of the urban forest as it relates to Chesapeake.

*Action Strategy:* Do research and attend symposiums to obtain state-of-the-art quantifications and estimates.

*Action Strategy:* Disseminate benefits information to the extended Chesapeake community, by the annual urban forest report.

**Objective 5:** City codes and ordinances support urban forest objectives.

*Action Strategy:* Maintain a list of all codes and ordinances that address urban forest issues (currently 12 such documents are accounted for) and conduct an annual review to determine if any updates are required.

*Action strategy:* In keeping with the City’s Comprehensive Plan Design Guidelines under Streets, Streetscapes and Circulation, prepare recommended amendments to the landscape ordinance for enhanced landscaping and for street trees at appropriate locations.

*Action Strategy:* Prepare a recommended amendment to the Landscape Ordinance requiring a “no net loss” policy for public trees.

**Objective 6:** Support legislative initiatives to support urban forest management goals. These initiatives have been discussed within the Urban Forest Roundtable of Hampton Roads (UFRHR) and have the potential for receiving regional support.

*Action Strategy:* Support legislative initiatives to amend the Code of Virginia to permit local ordinances to increase tree canopy percent requirements.

*Action Strategy:* Support legislative initiatives to require arborists for hire to be licensed to protect the public from untrained tree workers.

*Action Strategy:* Support legislative initiatives to require bundling of utilities to increase tree planting space. This initiative has strong support from the development community.

**Objective 7:** Receive the Tree City USA certification annually (25<sup>th</sup> year).

*Action Strategy:* Prepare annual report and application in November of each year. This requires inputs from multiple departments and signature of the City’s Mayor.

**Objective 8:** Promote reforestation community tree planting projects, and enhanced landscaping to help achieve canopy goals.

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*Action Strategy:* Expand the “Stop the Mowing, Start the Growing” program. Parks, Schools, and right of ways are primary locations with extensive acreage. Reducing mowing (mowing costs in 2010 were \$100-160 per acre) will save money.

*Action Strategy:* Expand the “Stop the Mowing, Start the Growing” program to include negotiating with large landowners, private and public.

*Action Strategy:* Negotiate with Virginia Dept. of Transportation (VDOT) to reforest cloverleaf interchanges.

*Action Strategy:* Utilize the Design Guidelines of the City’s Comprehensive Plan for streets, streetscapes and gateway enhancements as opportunities for increasing tree canopy in a program of coordinated landscape enhancement.

**Objective 9:** Review current budgeting and funding practices as to adequacy for supporting urban forest management objectives.

*Action Strategy:* Utilizing the national study on urban forest budgeting for comparison, review each Department’s expenditure for urban forest-related activities, and prepare recommendations for minimal and optimal levels.

### **Goal 3: Community understanding and support of urban forest goals and objectives.**

**Objective 1:** Identify all elements of the City’s community, and maintain a current list. Elements will include homeowner associations, civic leagues, youth groups, business community, large landowners, state and federal landowners, transient workers, and tourists.

*Action Strategy:* Reach out to all community elements with education and training on urban forest goals and objectives.

*Action Strategy:* Community Forester teams establish a contact schedule and keep records of presentations and community feedback.

**Objective 2:** The City’s Tree Board provides input to City leaders on urban forest management issues.

*Action Strategy:* The Tree Board is provided training in urban forest management. Urban Forester will schedule education.

*Action Strategy:* The Tree board is provided the opportunity to review and comment on urban forest management projects.

*Action Strategy:* The Tree Board is representative of the community. This requires review of bylaws.

*Action Strategy:* The board provides input to the Urban Forester for the annual report.

**Objective 3:** Community elements participate in conservation and reforestation projects.

*Action Strategy:* Urban Forester provides training and suggests resources.

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## PART IV: EVALUATION

Having assessed urban forest resources, determined objectives, and set priorities, it is essential to evaluate performance in order to make necessary adjustments to address goals, accomplish objectives, and determine if priorities and action plans are realistic. While this plan is envisioned as a living document that sets general policy direction and is adaptable to future conditions, it is anticipated that there will be both an annual evaluations of the plan and a five year comprehensive update.

For the annual evaluation, an Urban Forest Management report card will be prepared as part of the annual State of Chesapeake's Urban Forest report generally based on a format used in Washington, DC (ref 3). The "report card" will grade performance in urban forest management with assignment of grades from "A" to "F". Areas graded will be the stated goals, objectives, and priorities. Grades will be assigned as follows:

- A** (90-100%) Full and optimum compliance
- B** (80-89%) Significant progress towards full compliance
- C** (70-79%) Efforts are underway, partial compliance achieved
- D** (60-69%) Minimal compliance
- F** (59%-and below) no compliance

Actual grade assignments will be by the City's Tree Board, based on individual research and on input from the City's Urban Forester.

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## REFERENCE NOTES

1. University of Missouri center for Agroforestry. Inaugural Symposium on Research.  
Retrieved from Web address:  
<http://www.centerforagroforestry.org/events/sym2010.asp>.
2. *Urban Forest Best Management Practices For Public Works Managers, Budgeting and Funding APWA 2007*  
<http://www.apwa.net/documents/about/urbanforestry/urbanforestry-1.pdf>
3. Casey Trees, Washington, DC. (2008). *Tree Report Card for the District of Columbia*.  
Retrieved from Web address: [www.caseytrees.org/.../key...report-card/.../treereportcardfinalpdf.pdf](http://www.caseytrees.org/.../key...report-card/.../treereportcardfinalpdf.pdf).

## APPENDICES

A. State of Chesapeake's Urban Forest Reports .....	22-29
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2. 2008	
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## Appendix A1

### The State of Chesapeake's Urban Forest – September 2007

Assessing Tree Cover and Developing Goals

City Arborist, Miklos Lestyán (Revised 1/15/08 to include GIS data)

#### Introduction

This is a report on the state of the urban forest in the City of Chesapeake, Virginia. It provides an inventory of tree canopy cover (tree canopy meaning the actual area of land covered with tree foliage), and associated benefits, both in monetary and functional terms. The report also provides recommendations for establishing canopy goals. The purpose of this report is to provide urban forest management information to city leaders, to help recognize and maximize financial and other benefits, and to minimize degradation of these benefits.

The quantified benefit of Chesapeake's urban forest is approximately 1.5 billion dollars (table 1). The unquantified benefits may exceed that figure. Without this resource the city would have to raise additional money to provide all the urban forest's social, aesthetic, functional, environmental and recreational benefits that the community needs and desires (encl.1).

#### Background

Healthy urban forest ecosystems include a mix of tree species and sizes, and having enough soil available to grow large trees. When urban forests are healthy, they provide communities with many valuable services that can be measured in dollar benefits. The value of trees for stormwater management is a good example. Trees slow stormwater runoff and reduce peak flows, and absorb water, nutrients and pollution. Additional ecological benefits provided by urban forests including improved air and water quality, energy conservation, and wildlife habitat enhancement—increase the importance of preserving and enhancing the green canopy infrastructure of our city. (ref. 1)

#### Findings

Chesapeake's total tree canopy cover based on 2005 data is 50% (encl. 2). Based on quantified values of stormwater management, pollution storage, and energy conservation for Chesapeake's 353 square miles of territory, this canopy is worth \$1.479 billion dollars on a one time basis, and \$100 million on an annual basis. (Table 1) The remainder of these findings is based on the City of Chesapeake's square mileage of 353 square miles excluding the Great Dismal Swamp National Wildlife Refuge (GDSNWR) area of 78.6 square miles. The GDSNWR is not subject to development and should be considered separately from areas subject to development and depletion of tree canopy (table 2 and 3).

Chesapeake's total tree canopy cover (excluding the (GDSNWR) based on 2005 data is 36%. This is an approximate 2% decrease in canopy cover from the (approximate date) of 1995 38% canopy cover (encl. 2, 3, table 2), resulting in a net loss in quantified value of approximately \$49.6 million dollars.

If development continues at the current rate, it is likely that the city of Chesapeake will continue losing an average of 2% of canopy cover every decade, along with associated monetary increases in stormwater management, pollution control and energy conservation.

This trend can be reversed by preservation, by establishing canopy goals and supporting sustainable urban forest management (ref. 1, 2).

TABLE 1: THE VALUE OF CHESAPEAKE’S URBAN FOREST – 2005

<i>Ecological Benefits:</i>	
Stormwater management (one time)	\$1.479 billion
Stormwater management (annual)	\$ 71.9 million
Air pollution stored (annual)	\$ 26.7 million
Energy conserved (annual)	\$ 1.5 million
TOTALS: (one time)	\$1.479 billion
(annual)	\$ 100 million

*Source: Based on data from American Forest Urban Ecosystem Analysis, August 2001 (Ref. 3)*

TABLE 2. THE VALUE OF CHESAPEAKE’S URBAN FOREST 1995-2005  
(EXCLUDING THE GREAT DISMAL SWAMP NATIONAL WILDLIFE REFUGE)

<i>Ecological Benefits</i>	<i>1995 value at 38% canopy</i>	<i>2005 value at 36% canopy</i>
Stormwater mgmt. (one time)	\$872.7 million	\$826.8 million
Stormwater mgmt. (annual)	\$ 42.4 million	\$ 40.2 million
Air Pollution Stored (annual)	\$ 15.7 million	\$ 14.9 million
Energy Conserved (annual)	\$ 1.52 million	\$ 1.52 million
Totals: (one time)	\$872.7 million	\$826.8 million
(annual)	\$ 59.6 million	\$ 55.9 million
GRAND TOTALS:	\$932.3 million	\$882.7 million

Table 3. City of Chesapeake Benefits of Increasing Canopy Cover to 40% (2007 +)  
(Excluding the Great Dismal Swamp National Wildlife Refuge)

	<i>2005 value at 36% canopy</i>	<i>Value at 40%</i>	<i>Benefit</i>
Stormwater mgmt. (one time)	\$826.8 million	\$918.6 million	\$96.8 million
Stormwater mgmt. (annual)	\$ 40.2 million	\$ 44.7 million	\$ 4.5 million
Air Pollution Stored (annual)	\$ 14.9 million	\$ 16.6 million	\$ 1.7 million
Energy Conserved (annual)	\$ 1.52 million	\$ 1.52 million	No Data
Totals: (one time)	\$826.8 million	\$918.6 million	\$91.8 million
(annual)	\$ 55.9 million	\$ 62.8 million	\$ 6.2 million

*Source: Based on data from American Forest Urban Ecosystem Analysis, August 2001 (Ref. 3)*

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## Recommendations

1. To retain valuable urban forest resources, the City of Chesapeake should strive to reverse tree canopy cover depletion, as experienced over the last ten years. Further, following the recommendation by American Forest (ref. 1,2,3,4), in the areas subject to development, or redevelopment, the City should strive to increase Chesapeake's urban forest canopy cover to an average of 40% to produce additional dollar benefits estimated at \$91.8 million on a one time basis and \$6 million on an annual basis (table 3) An example of potential canopy restoration areas are newly constructed road medians, clover leaf interchanges along the Chesapeake Expressway, school grounds, municipal sites, preservation of wooded areas in new developments, and preservation of wooded areas in the right-of-ways.
2. To optimize the benefits of the urban forest, and to reach and maintain canopy goals, the City of Chesapeake should implement an urban forest master plan to coordinate urban forestry efforts (tree planting/ reforestation, preservation, removal, maintenance, and design) currently spread out among at least five departments (Parks, General Services, Public Works, Utilities, and Schools).
3. To monitor the state of Chesapeake's urban forest resources, an annual State of The Urban Forest report should be prepared, with updated satellite urban tree canopy coverage statistics prepared every five years.

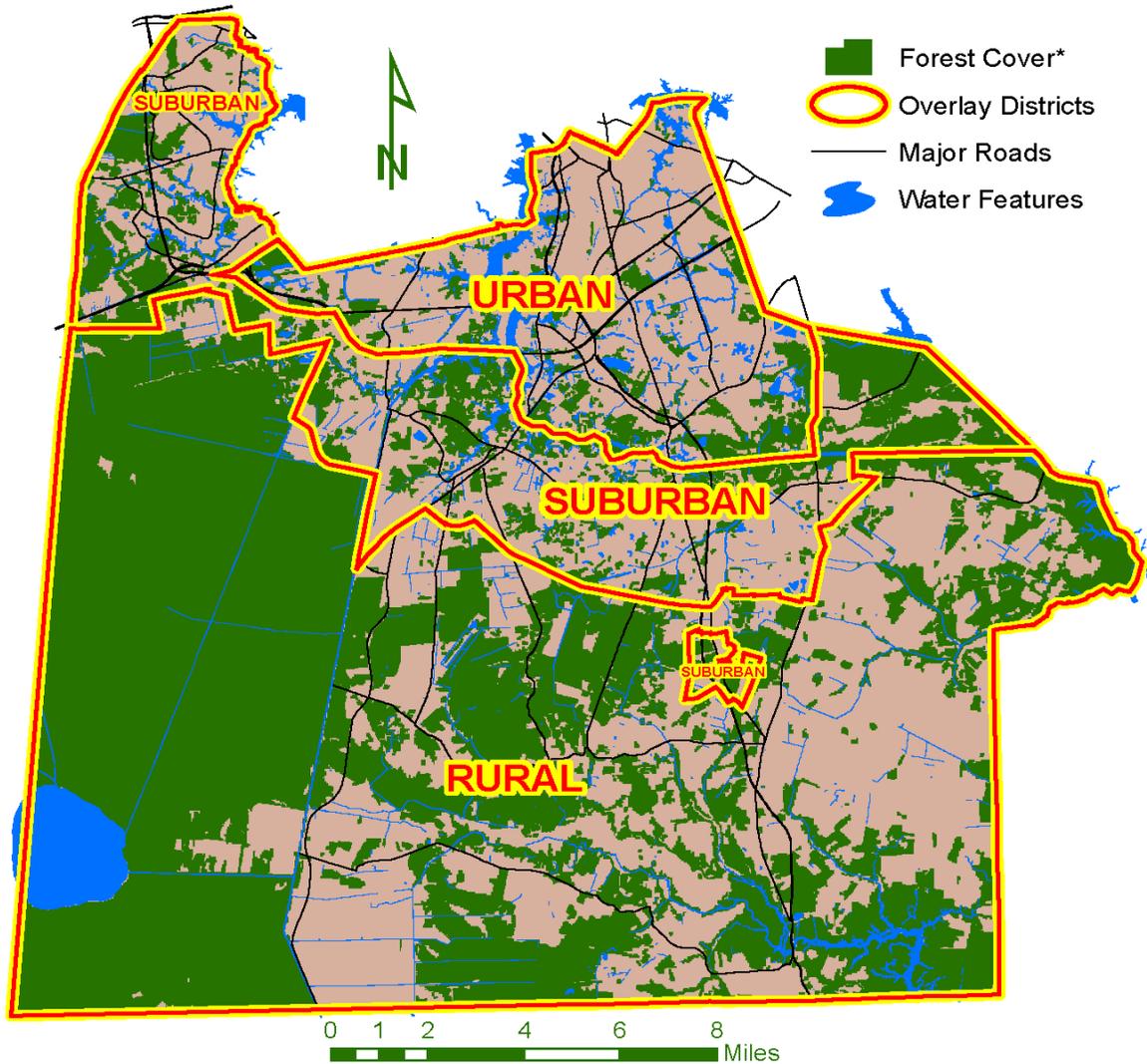
## Enclosures

1. Benefits of the Urban Forest (SAFER) – see Appendix C
2. City of Chesapeake Forest Cover Analysis based on Virginia Forest Cover Map 2005 (prepared by City of Chesapeake Information and Technology)
3. City of Chesapeake Forest Cover Analysis based on Virginia Forest Cover Map 2005, Excluding Great Dismal Swamp National Wildlife Refuge. (Prepared by City of Chesapeake Information and Technology)
4. City of Chesapeake Woody and Wetlands Cover Early 1990's based on National Land Cover Sheet, Excluding Great Dismal Swamp National Wildlife Refuge. (Prepared by City of Chesapeake Information Technology)

## Reference Notes

1. Guidelines For Implementing the Chesapeake Bay Program's Urban and Community Canopy Goals March 2005. Chesapeake Bay Program Directive 03-01.
2. Chesapeake Bay Urban Tree Canopy Goals 2007 Maryland Department of Natural Resources ([www.dnr.state.md.us/forests/programs/urban//urbantreecanopygoals.asp](http://www.dnr.state.md.us/forests/programs/urban//urbantreecanopygoals.asp))
3. Urban Ecosystem Analysis Atlanta Metro Area by American Forests 2001 ([www.americanforests.org/downloads/rea/AF\\_Atlanta.pdf](http://www.americanforests.org/downloads/rea/AF_Atlanta.pdf))
4. American Forests, The State of Our Urban Forest: Assessing Tree Cover and Developing Goals. September 1997. American Forests P.O. Box 2000 Washington DC 20013.

# City of Chesapeake, Virginia Forest Cover Analysis

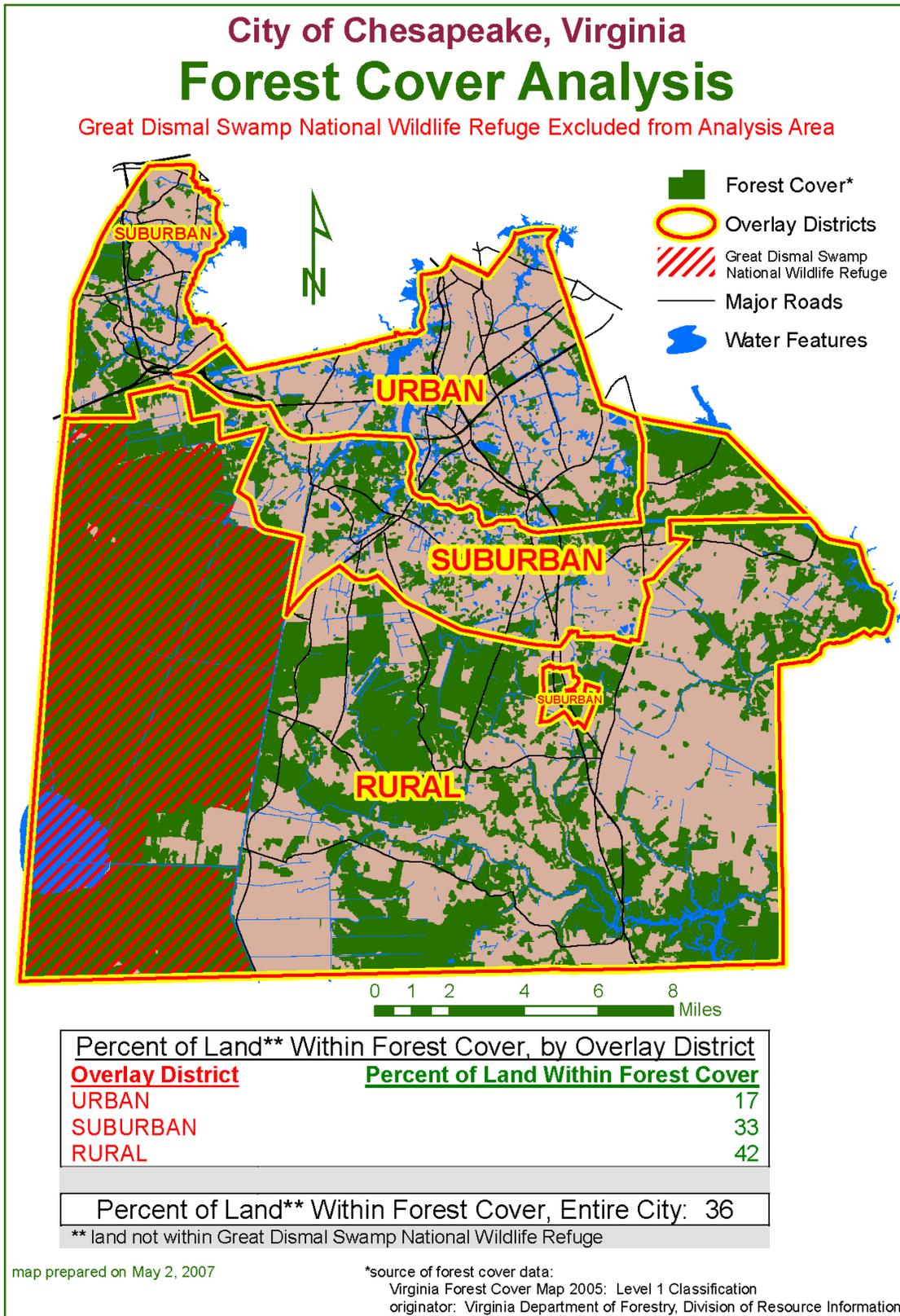


Percent of Land Within Forest Cover, by Overlay District	
<u>Overlay District</u>	<u>Percent of Land Within Forest Cover</u>
URBAN	17
SUBURBAN	33
RURAL	61

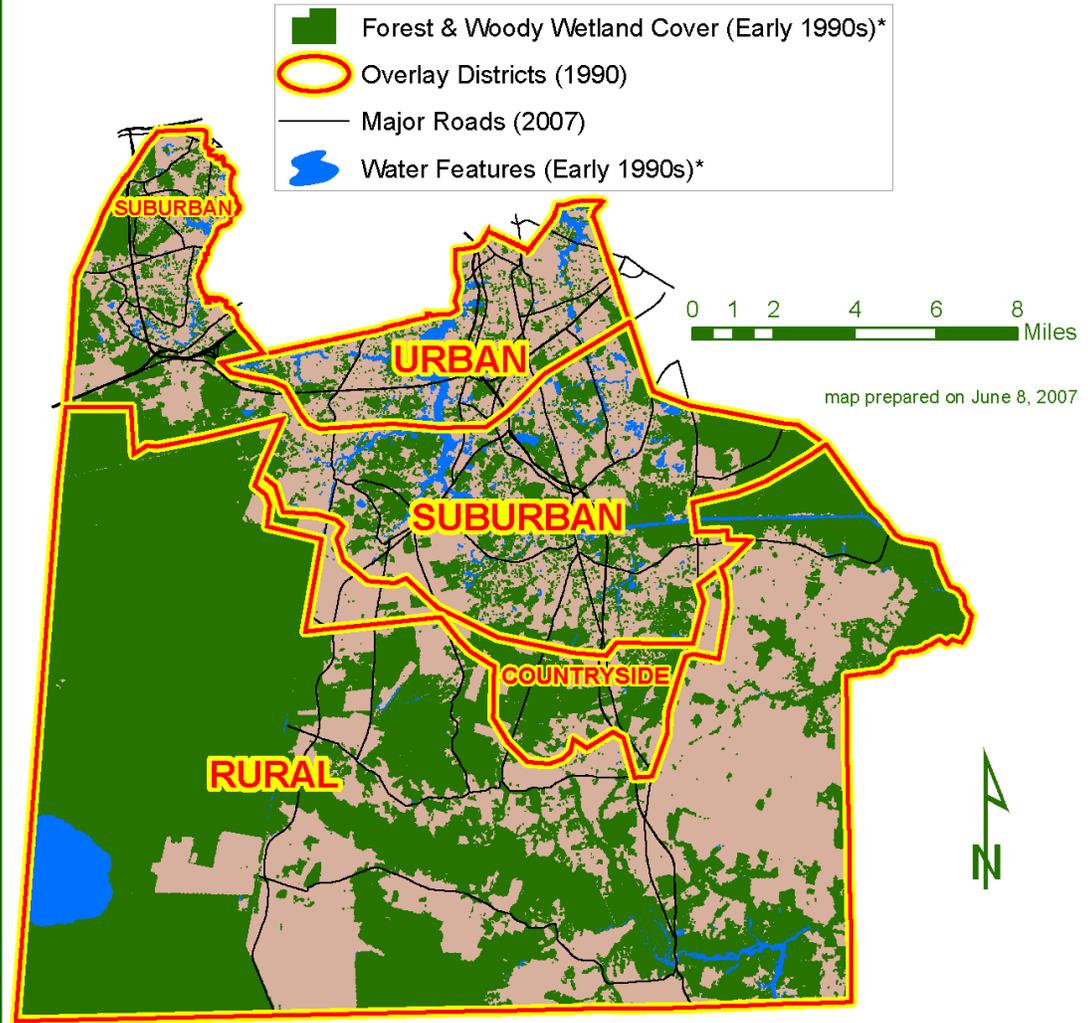
Percent of Land Within Forest Cover, Entire City: 50

map prepared on April 16, 2007

\*source of forest cover data:  
Virginia Forest Cover Map 2005: Level 1 Classification  
originator: Virginia Department of Forestry, Division of Resource Information



## City of Chesapeake, Virginia Spatial Analysis Forest & Woody Wetland Cover in Early 1990s



<b>Percent of Land Within Forest / Woody Wetland Cover, by Overlay District</b>	
<b>Overlay District</b>	<b>Percent of Land Within Forest / Woody Wetland Cover</b>
URBAN	15
SUBURBAN	34
COUNTRYSIDE	40
RURAL	63

Percent of Land Within Forest / Woody Wetland Cover, Entire City: 51

\*source of data:  
National Land Cover Data Set  
originator: U. S. Geological Survey  
RELIABILITY OF THE DATA SET IS GREATEST AT STATE LEVEL OR MULTI-STATE LEVEL.

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## APPENDIX A2

### The State of Chesapeake's Urban Forest – December 2008

Assessing Tree Cover and Developing Goals  
City Arborist/ Urban Forester, Miklos Lestyan

#### Introduction

This is an interim report on the state of the urban forest in the City of Chesapeake, Virginia. Interim reports are scheduled annually, an expanded report with updated canopy cover and quantified benefits will be provided in 2010, and then every five years thereafter. These reports are tools for effective management of a valuable City asset.

#### Background

The September 2007 report on the State of Chesapeake's Urban Forest, reported quantified benefits of \$1.5 billion in terms of stormwater management, energy conservation and pollution uptake, and surmised that the unquantified benefits may well exceed that figure (encl 1).

#### Findings

Since the publishing of the September 2007 report, some important urban forest management events have occurred:

1. Dec 18, 2007 City Council passed a resolution to request the Planning Commission to make recommendations concerning proposed amendments to the Chesapeake Landscape Ordinance to provide for enhanced landscaping and clarify requirements for canopy coverage.
2. Urban Community Forestry grant from the Virginia Urban Forest Council (#08UCF12), to prepare and write a "Sustainable Urban Forest Management Plan" for the City of Chesapeake. (encl 2)
3. Establishment of an Urban Forest Management Plan task force by the City Manager. This task force has become a subcommittee of the Sustainable Chesapeake Initiative (SCI). (encl3)
4. August 12, 2008, City Council passes resolution to develop an environmental sustainable program known as "Go Green Chesapeake: The Sustainable Chesapeake Initiative", which includes the preparation of an Urban Forest Management Plan (encl 4).
5. Sept 16, 2008 City Council passes revisions to landscape ordinance to enhance landscaping and clarify canopy coverage.
6. City of Chesapeake selected to participate in Urban Tree Canopy Analysis. (encl 5)

#### Recommendations

1. In recognition of the many quantified and unquantified benefits of the City's urban forest (encl 4), the City should continue focusing on retaining valuable urban forest resources, and strive to attain the recommended average tree canopy of 40%. (Encl 1). Examples of potential canopy restoration areas exist and proposed park sites, newly constructed road medians, clover leaf interchanges along the Chesapeake

- 
- expressway, school grounds, municipal sites, and preservation areas in new developments.
2. To strive for effective management of a \$1.5 billion resource (enclosure 1), and to reach and maintain canopy goals, the City should use an urban forest management plan to coordinate all urban forestry efforts (tree planting, removal, preservation, maintenance) currently spread out among six departments. This Plan is currently being prepared with a target date of January 2010 for completion.

**Enclosures** (can be found in original document)

1. September 2007 The State of Chesapeake's Urban Forest
2. Virginia Department of Forestry, 08UCF12 Grant Award, June 9, 2008
3. Sustainable Chesapeake Initiative, City Managers Approval for Urban Forest Management Plan. September 2008.
4. August 12, 2008 City Council Resolution "Go Green Chesapeake".

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## APPENDIX B

### BENEFITS OF THE URBAN FOREST

Prepared by Chesapeake City Arborist, Miklos Lestyan-12/08/09

#### **SAFER - Social, Aesthetic, Functional, Economic, Recreational** Benefits of the Urban Forest

##### **Social**

- Parks and landscaped areas provide opportunity for mental and spiritual rejuvenation.
- Patients recover more quickly in hospital beds overlooking wooded landscapes.
- Office parks with landscaping have more productive workers.
- Some statistical studies have shown reduced crime in wooded landscape neighborhoods.

##### **Aesthetic**

- Trees provide beautiful scenery, color, flowers, shade, filtered light, wildlife, enhancement to architectural elements.

##### **Functional**

- The urban forest provides shade/light reflection, and deflection, sound absorption, heat reduction, erosion control, wind control, heat reduction, wildlife habitat, particulate matter absorption, stormwater management, energy conservation, carbon sequestration, absorption of pollutants from groundwater and air (phyto-remediation).

##### **Economic**

The urban forest/wooded landscapes:

- Increase property values 10-30%
- Reduce energy consumption by the cooling effect.
- Due to stormwater retention, reduce the cost of building stormwater retention ponds (average cost is \$2 per cu ft storage).

##### **Recreational**

- Parks and forest preserves provide desirable places for outdoor activities –camping, jogging, hiking, picnicking, nature study, bird watching.

##### References:

1. Chesapeake Bay Urban Canopy Goals 2007. Maryland Department of Natural resources  
([www.dnr.state.md.us/forests/programs/urban//urbantreecanopygoals.asp](http://www.dnr.state.md.us/forests/programs/urban//urbantreecanopygoals.asp))
2. Guidelines for Implementing the Chesapeake Bay Program's Urban and Community Canopy Goals March 2005. Chesapeake Bay Program Directive 03-01.
3. Urban Ecosystem Analysis Atlanta Metro Area by American Forests 2001.  
([www.americanforests.org/downloads/rea/AF\\_Atlanta.pdf](http://www.americanforests.org/downloads/rea/AF_Atlanta.pdf))
4. Arboriculture, Integrated Management of Landscape Trees, Shrubs, and Vines by Harris, Clark and Mathney. Prentice Hall, New Jersey, 4<sup>th</sup> Ed.
5. Social benefits of trees [www.treesatlanta.org/health.html](http://www.treesatlanta.org/health.html)
6. Crime reduction and health benefits <http://www.lhhl.uiuc.edu/>

# APPENDIX C

APPENDIX C	
Components	A
	Comparison of Local Landscape Ordinances
Maintenance	Local Communities
Irrigation	Carboro, SC
Landscape Plan	Hillsborough County, FL
Internal to Parking Area	Lexington-Fayette County, KY
Screening Parking Area	Colorado Springs, CO
Installation before C.O.	Orlando, FL
Trees in ratio	Los Angeles, CA
Relative to Land Use	National, CA
Plant List Specified	Tampa, FL
Between Land Uses	Scottsdale, AZ
Minimum percentage	Wheaton, IL
Storage Screened	Rapid City, SD
Plant List Required	Raleigh, NC
Signed by a L.A.	Mount Pleasant, SC
Tree Preservation	Dallas, TX
Existing Conditions	Addison, TX
Sight Triangles	Ft. Worth, TX
Alternative Compliance	Garland, TX
Filing Fee Required	Grand Prairie, TX
Lighting Required	Irving, TX
Art or Water before C.O.	Las Colinas, TX
Escrow Required	Plano, TX
Conflict List Given	Richardson, TX
Natural Growth Areas	San Diego, CA
Street Trees	Vero Beach, FL
Special Districts	Corpus Christi, TX
Geographically Illustrated	Leon County, FL
Guidebook Provided	Thomson, CO
Updating & Revisions	Newark, DE
	Burbank, CA
	Aspen, CO
	Clackamas County, OR
	Lenexa, KS
	Bellevue, IL
	Charleston, IL
	Edwardsville, IL
	Lakewood, CO
	San Antonio, TX
	Austin, TX
	Demon, TX
	Farmers Branch, TX
	Queen Annes Co, CO
	New York City, NY
	Miami, FL
	Mobile, AL
	Tucson, AZ
	Mesa, AZ
	Oakland, CA
	Aurora, CO
	Wichita, KS
	Louisville, KY
	Prince Georges Co, MD
	Norfolk, VA
	St. Petersburg, FL
	Chesapeake, VA

## Local Landscape Ordinances

Note: Chesapeake data added in 2007 by local staff for comparison purposes.

A Comparison of Local Landscape Ordinances copyright 1992

## APPENDIX D

### CHESAPEAKE ARBORETUM NURSERY PRODUCTION 2006-2010

Planting Location by Year	Number of Large Canopy Trees	Container Size (gallons)	Cost (\$)	Market Value (\$)
<b>2006</b>				
Battlefield / Expressway Reforestation	40	3	120nc	360
<b>2007</b>				
Fire Station 7	3	3	30nc	60
Fire Station 13	4	3	40nc	80
<b>2008</b>				
Arbor Day - South Norfolk	12	15	720nc	2,160
Arbor Day - Western Branch Park	12	15	720nc	2,160
Public Works - City Garage	18	15	1,080nc	3,240
Centerville Park Phase I	226	3	2,000	6,000
<b>2009</b>				
Arbor Day - Centerville Phase II	213	3	2,000	6,000
Centerville Phase III	205	3	2,000	6,000
Grassfield High School	67	3	670	2,010
<b>2010</b>				
Arbor Day	205	3	2,000	6,000
Centerville Park Phase V	205	3	2,000	6,000
<b>TOTAL:</b>				
	<b>1,205</b>		<b>\$10,670*</b>	<b>\$40,060</b>

*Source: Chesapeake City Arborist*

\* nc provided at no cost

\* Estimated contractor cost: \$120,180

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## APPENDIX E

### **Chesapeake Tree Resource Ordinances/Regulations:**

1. Chesapeake Zoning Ordinance (CZO) 19-600 Landscape Ordinance.
2. CZO 19-600 Landscape Specifications Manual.
3. Tree Safety Ordinance (draft)
4. Chesapeake Bay Preservation Area Ordinance (CBPA) Chesapeake City Code, Chapter 26, Article X.
5. Public Facilities Manual, Chapter 6, page 40.
6. Public Facilities Manual, Volume I, Appendix XXII, Suggested Construction Notes
7. Planned Unit Developments, Article 11 CZO
8. Cluster Subdivision Ordinance; Article 6 CZO and Chapter 70 City Code



People who will not sustain trees will soon live in a world which cannot sustain people – Bryce Nelson



The cultivation of trees is the cultivation of the good, the beautiful and the ennobling in man – J Sterling

