Town of Woodstock

Urban Tree Canopy Plan

Photograph Courtesy of the Town of Woodstock

Woodstock Planning & Community Development and the Woodstock Tree Board

September 2011

Executive Summary

In 2009, the Department of Forestry's Urban and Community Forestry Partnership Division notified the Town of Woodstock of its opportunity to participate in carrying out the Chesapeake Bay Program's *Riparian Forest Buffer Directive 03-01*. The *Riparian Forest Buffer Directive 03-01* was signed by the Chesapeake Executive Council in December 2003 and "clearly recognizes the importance of maintaining and increasing tree canopy as a way to extend the watershed functions of the forest in developed areas" (2005). With assistance from Virginia Geospatial Extension Program (VGEP) at Virginia Tech's Department of Forestry, the Spatial Analysis Laboratory (SAL) of Vermont and the Shenandoah County Geographic Information System (GIS) Coordinator, the analysis of the Town of Woodstock's Urban Tree Canopy (UTC) was carried out by the Virginia Department of Forestry. As a condition of receiving the assessment at no cost, the Town agreed that it would develop and implement a plan to increase canopy coverage over time. The assessment includes the Town's existing tree canopy percentage, percentage of urban tree canopy by subdivision, potential urban tree canopy summary, and a tree canopy comparison with other towns and cities. The assessment is located in *Appendix A*.

The Town of Woodstock's existing tree canopy totals 21.7% of all land area in the Town. Out of twenty-nine towns and cities, Woodstock was positioned 28th in tree canopy comparison, ranking just slightly ahead of the Town of Purcellville. The Woodstock Tree Board recommends an **8.3 percent increase in the Town's urban tree canopy within the next ten years, resulting in 30 percent tree canopy land coverage**. Urban tree canopy is important for air quality, water quality and provides the locality with other economic benefits.

The Urban Tree Canopy Plan includes the following information, which is consistent with the *"Guidelines for Implementing the Chesapeake Bay Program's Urban & Community Tree Canopy Goals" (2005)*:

- Background and purpose of the Woodstock Tree Board
- Why the Urban Tree Canopy is important to the community
- The plan's application to Town ordinances, regulations and the Comprehensive Plan
- Goal Setting & Timetable
- Implementation Plan
- Potential Partners

After adoption of the Urban Tree Canopy Plan (UTC) by the Town Council by resolution, the plan will be submitted to the Department of Forestry for final approval. The adoption of the plan exemplifies a commitment to improving the Town's urban environment, improving community appearance and continued partnerships with community organizations, and improving the tributaries of the Chesapeake Bay.

Background

The Town of Woodstock is an incorporated municipality located in the heart of the Shenandoah Valley. Based on the 2010 Census, the Town's population is 5,071. The Town of Woodstock operates as a Town Council/Manager form of government, with several committees tasked to conduct public business. The Woodstock Tree Board was developed in the spring of 2005 with the following purpose:

- To develop, implement and maintain an urban forestry management program
- To develop standards and guidelines for planting, maintenance and preservation of public trees
- To promote education of the general public on proper tree-care practices
- To support the efforts of other groups interested in urban forestry in the Town of Woodstock
- To advise the Town Manager, Town Council and appropriate Boards and Commissions on matters pertaining to municipal plantings, and the designation of historic or landmark trees

The Tree Board is comprised of Town staff, forestry and horticulture experts, educators and other community non-profit and business organization leaders. Although the Town of Woodstock is one of the smallest localities that participated in the study, the Urban Tree Canopy Assessment met the Tree Board's purpose.

The Town of Woodstock has earned and maintained its "Tree City USA" status from the Arbor Day Foundation for five consecutive years. In order to do so, the Town must attain the following on an annual basis: (1) Maintain a Tree Board or Department (2) Maintain and Update an Urban Forestry and/or Tree Care Ordinance (3) An Urban Forestry Program with an Annual Budget of at least $2 per capita (4) An Arbor Day Observation & Proclamation.

The Tree Board continues to spearhead Town projects and activities, including community outreach and education, park development, environmental preservation efforts, and master plan guidance. The Tree Board identified the need to participate in the tree canopy study and analysis when the Virginia Department of Forestry notified the Town of the opportunity. The analysis has identified potential locations for additional tree plantings and has emphasized the Board's ability to work with private property owners to increase canopy coverage through tree care guidance and education on appropriate tree selection.

Importance of the Urban Tree Canopy

An urban forest is defined as "trees growing individually, in small groups or under forest conditions on public and private lands in our cities, towns and their suburbs" (2005:1). Further, a tree canopy is defined as "the layer of tree leaves, branches, and stems that cover the ground when viewed from above" (2005:1). When tree canopy is present, especially in the urban environment, benefits that essentially outweigh costs can be identified. The USDA's Community Tree Guide highlights the following benefits of urban and community forests (2006:15-30):

- Energy Conservation
- Reduction in Atmospheric Carbon Dioxide
- Improved Air Quality
- Reduction in Storm Water Runoff and Improved Hydrology
- Aesthetic Benefits
- Property Value Benefits
- Noise Reduction
- Wildlife Habitat

Energy Conservation

Tree plantings provide shade in areas that have built , impervious surfaces, reducing the amount of power (energy) that is needed to cool residences and commercial buildings in the heat of the summer. Trees can lower temperatures on individual building sites as much as 5 degrees as compared to surrounding parcels. With proper placement, trees provide a wind break in the cold winter months (wind-speed reduction), for a reduction in heating costs (2006:15-16).

Reduction in Atmospheric Carbon Dioxide

Carbon dioxide is considered one of the primary greenhouse gases. Urban forests reduce carbon dioxide in the atmosphere, with trees directly absorbing carbon dioxide into their stems and leaves. Although decaying trees and tree care maintenance activities contribute to the release of carbon dioxide, avoided power plant emissions (for cooling and heating), as well as actual carbon sequestration by trees increases the annual carbon uptake (2006:18).

Improves Air Quality

Some of the cities with close proximity to the Town of Woodstock are under air quality monitoring requirements. The Northern Shenandoah Valley Regional Commission put together the Shenandoah Valley Air Quality Initiative (SHENAIR), which is a group of local governments, universities and Shenandoah Valley citizens interested in air quality (levels

of small particle matter that can cause various respiratory health problems) (NSVRC). The Environmental Protection Agency (EPA) recognizes that urban trees help to minimize air pollution in the following ways: (1) absorbs gaseous pollutants (2) intercepts small particulate matter (3) releases oxygen (4) transpires water and shade surfaces, lowering air temperatures and reducing ozone levels (5) reduces energy use, which reduces emissions (2006:19-22).

Reduction in Storm water Runoff & Improved Water Quality

Trees reduce storm water runoff, which causes pollution of wetlands, streams, lakes, rivers and oceans. Woodstock and the Valley's waterways are tributaries to the Chesapeake Bay, which increases the importance of trees assisting in pollutant removal into these tributaries. Storm water that flows quickly over impervious surfaces, picking up pollutants on parking lots, buildings and other developed areas can be alleviated by properly designed tree planting areas. Storm water interception by trees can reduce peak storm water flow, which contributes to stream and riverbank erosion, grassed channel erosion and the loss in stability of other soil structures. Although larger trees increase the uptake of water in the soil (allowing for more storm water storage), groups of smaller trees combined with other plantings can also be effective in storm water control. Properly designed rain gardens and filtration boxes promote good water quality and are noted in Sara S. Hollberg's *Better Models for Development in the Shenandoah Valley 2010* (2010:40-44). The monetary value of storm water runoff reduction is great (2006:22-24).

Aesthetic Benefits & Increased Property Values

One of the primary reasons that people plant trees is because of the aesthetic benefits. Trees are beautiful and there are many different species and varieties to choose from. Many people pay large sums of money in order to change their residential landscape (adding color, texture and interest). Property values increase and people are willing to pay more for properties with "ample" trees versus properties with few or no trees. The aesthetic benefits of trees extend beyond residential planting. McPherson, et al, note that "in contrast to areas without trees, shoppers shop more often and longer in well-landscaped business districts…they are willing to pay more for parking and [are] willing to pay more for goods and services" (2006:24-25). Trees in residential and commercial districts can positively benefit Town tax revenues.

Noise Reduction

Unhealthy levels of noise from interstate travel, vehicles and planes can be mitigated by urban tree buffers.

Wildlife Habitat

Urban trees and other green spaces increase the connectivity of the urban environment to wildlife habitat. The importance of wildlife habitat in and near urban centers makes individuals young and old aware of being part of a larger ecosystem – and the subsequent

conservation of biodiversity. Maintaining the environmental areas for wildlife to inhabit buffers them from becoming a residential nuisance.

Photograph Courtesy of the Town of Woodstock

Application to the Town of Woodstock's Ordinances, Regulations and Comprehensive Plan

Upon the application to the Arbor Day Foundation in 2005 for the Tree City designation, the Town of Woodstock created an Urban Tree Ordinance found in the *Code of the Town of Woodstock Virginia*, *Chapter 26, Article VI, Sections 26-100 through 26-105*. The Urban Tree Ordinance is simply one tool that is utilized to protect public plantings, and shall be accompanied by the following future considerations for an increase in the urban tree canopy:

- Development of Future Tree Preservation and/or Planting Ordinances
- Landscaping Plan Requirements or Recommendations for Developments
- Incorporation of Tree Preservation and/or Planting standards or recommendations in the Urban Development Area (UDA) Zoning Ordinance
- Comprehensive Plan – Environmental Section Update

Development of Future Tree Preservation Ordinances

The Town of Woodstock will remain apprised of developments in the State Code regarding *enabled* tree preservation ordinances and landscape requirement ordinances. The Town currently requires a landscaping plan to be submitted for all new developments (commercial, residential, subdivisions, etc.) and the landscaping plan is reviewed by the Town's agent (horticulture/arborist/landscaping consultant).

Landscaping Plan Requirements or Recommendations for Developments

The Town, with support from the Tree Board, can develop a tree specification manual for developments to support green infrastructure (in the same way that the Town has a specification manual for gray infrastructure – roads and utilities).

Urban Development Area Zoning Ordinance

The Code of Virginia requires that localities with a growth rate of 15 percent or more develop an Urban Development Area (UDA) to accommodate at least ten years of future growth. State law requires the Town to amend the Comprehensive Plan and Zoning Ordinance to include elements of Traditional Neighborhood Design (TND) to be incorporated into UDAs at specified densities. These characteristics include: pedestrian-friendly road design, interconnection of new local streets with existing streets, connectivity of such roads and sidewalks, preservation of environmental and historic resources, mixed uses and mixed housing types, reduced front and side setbacks, and reduced subdivision street widths. In the summer of 2011, the Town Council and Planning Commission identified priority properties for the Town's Urban Development Area. The priority

property totals 116 acres in Town that will have a zoning ordinance with TND components. According to the Tree Canopy Assessment, the priority property currently has little canopy cover, and is mainly comprised of non-tree vegetation. It is imperative that some usable open space elements with tree canopy requirements be included in said zoning ordinance.

Comprehensive Plan

In addition to amending the Comprehensive Plan to include the UDA and its TND elements, the Town's Environment section of the Comprehensive Plan is in need of being updated. It currently addresses the following elements: (1) climate (2) sinkholes and groundwater (3) water quality (4) vegetation (5) floodplain and watershed (6) steep slopes (7) soil types. The Comprehensive Plan Implementation Program section shall include the Urban Tree Canopy Implementation Components herein and shall be reviewed periodically to ensure investment in green infrastructure or at least, plantings to increase tree canopy and maintenance of mature, viable trees existing on undeveloped parcels.

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Goal Setting & Timetable

Factors in Goal Setting

After the Tree Canopy Assessment was completed, the Tree Board convened at its regular meeting to review the assessment and to decide on the tree canopy percentage increase. Several factors were involved in deciding the percentage, including (1) growth of existing trees in several new developments and subdivisions (recently installed since year 2000) (2) provision of affordable housing while still including environmental features (3) economic conditions (4) Town projects and properties (5) subdivisions slated for development.

After reviewing the factors involving a percentage increase, the Tree Board agreed upon an 8.3 percent increase in tree canopy over the next ten (10) years.

There were several properties that had been brought into Town or cleared in anticipation of immediate residential or commercial development before the economic recession (and before the urban tree canopy assessment). In the upcoming years, there is potential for the following development to occur (Development Name, Use, Existing Condition according to assessment, UTC Potential):

- **Village Commons, High Density Residential** (Non-Tree Vegetation → Building Impervious + Potential Tree Canopy)
- **Orchard Hill, Low Density Residential** (Non-Tree Vegetation → Building Impervious + Potential Tree Canopy)
- **Mountainview Subdivision, High Density Residential** (Immature Trees, Non-Tree Vegetation → Building Impervious + Potential Tree Canopy)
- **Hisey Park, High Density Residential & Highway Commercial** (Immature Trees, Non-Tree Vegetation → Building Impervious + Potential Tree Canopy)
- **Chapman Subdivision, Low Density Residential & Affordable Housing** (Non-Tree Vegetation, Building Impervious → Potential Tree Canopy)
- **Woodstock Commons, High Density Residential** (Non-Tree Vegetation → Building Impervious + Potential Tree Canopy)
- **Flora Vista, High Density Residential** (Immature Trees, Non-Tree Vegetation → Building Impervious + Potential Tree Canopy)
- **Sunset Crest, Low Density Residential** (Non-Tree Vegetation → Building Impervious + Potential Tree Canopy)
- **Woodstock Mews, High Density Residential** (Non-Tree Vegetation, Building Impervious, Immature Trees → Building Impervious + Potential Tree Canopy
- **Woodstock Gateway, Highway Commercial** (Non-Tree Vegetation, Building Impervious, Immature Trees → Building Impervious + Potential Tree Canopy
- **Henry Ford Drive/Interstate Investment Property Corridor, Light Industrial**

(Non-Tree Vegetation → Building Impervious + Potential Tree Canopy)
- **North Gate Garden Apartments, High Density Residential** (Non-Tree Vegetation → Building Impervious + Potential Tree Canopy)
- **Orchard Place, Section VI, Low Density Residential** (Non-Tree Vegetation, Tree Canopy → Building Impervious + Potential Tree Canopy)

Many of the above developments have landscaping plans that shall be implemented when development occurs and many currently only have non-tree vegetation (mainly former agricultural uses or maintained lots). The Town of Woodstock shall allow for development that can result in some affordable housing with environmental features and also takes into consideration the current economic trends that drive housing. As a result, the Tree Board adopted an attainable tree canopy goal. There are several residential and commercial developments that required a landscaping plan and have young, immature trees that will be growing larger, thus increasing tree canopy, in the next ten years.

In addition to potential tree canopy resulting from the landscaping plan requirements of existing approved developments, the Town of Woodstock continues to maintain several park properties. The Tree Board will continue to make recommendations regarding public tree maintenance (street trees and park trees), plantings and current/future projects.

Goals

1) Facilitate tree planting in residential districts (private properties) to assist with the attainment of the 8.3 percent increase in overall tree canopy. Increase community awareness regarding the benefits of tree plantings.
2) Review and revise development requirements in relation to parking (impervious area), tree preservation, tree replacement, landscaping, and green infrastructure to encourage and incentivize an increase in tree canopy on individual and adjoining parcels.
3) Define requirements or recommendations for Street Trees in the Urban Development Areas (using Traditional Neighborhood Design components), therefore, increasing tree canopy on primarily grassed (non-tree vegetation) areas.
4) Develop and maintain a tree inventory program for the care of existing public trees in order to maintain current tree canopy and to locate planting spaces for future trees to assist in the attainment of the 8.3 percent increase in overall tree canopy.

Implementation Plan

The Woodstock Tree Board has outlined implementation techniques for the aforementioned goals.

GOAL 1: Facilitate tree planting in residential and commercial districts (private properties) to assist with the attainment of the 8.3 percent increase in overall tree canopy. Increase community awareness regarding the benefits of tree plantings.

Implementation Techniques:

- Use the tree canopy assessment for the identification of priority sites for additional tree canopy (additional tree plantings on residential and commercial properties)
- Continue Tree Board activities, which raises awareness among citizens and property owners of the benefits of tree canopy
- Tree Board to conduct community education through the following:
  - Continue Arbor Day events
  - Involve the school system through Arbor Day events, consultation with the administration and educators, and requests for collaboration on the development of educational materials (consistent with Standards of Learning and beyond)
  - Continue public park development activities and Tree Board involvement on green space development at the Town's parks
  - Develop an "approved" street tree/public tree list
  - Develop educational materials on native trees
  - Develop a "Tree Voucher Program" for residential property owners and citizens that promotes tree affordability (developed in conjunction and in compatibility with area retail establishments)
  - Tree planting and tree care guidelines brochure development by Staff and the Tree Board for public dissemination
  - Public presentations (annual or bi-annual) on tree planting and tree care

GOAL 2: Review and revise development requirements in relation to parking (impervious area), tree preservation, tree replacement, landscaping, and green infrastructure to be compatible with, encourage and incentivize an increase in tree canopy on individual and adjoining parcels.

Implementation Techniques:

- Review landscaping requirements and recommendations implemented by other

communities to compare
- Revise landscaping requirements within the zoning ordinance (while remaining cognizant of affordable housing)
- Develop a landscaping/tree planting specification manual for engineers and/or developers
- Landscaping maintenance ordinance to be developed and agreements to be executed
- Work with consultant on the Comprehensive Plan Amendment (for the Urban Development Area) for increased tree preservation and/or planting requirements in the resulting UDA zoning ordinance
- Work with the Tree Board, Planning Commission and Staff to review and revise/update Comprehensive Plan - Environmental Section (with Town Council approval)
- Develop public tree removal guidelines/permission forms that are compatible with the Town's Urban Tree ordinance.
- Identify and evaluate the waterways (streams) within the Town limits and the potential for partnerships with the private property owners for the development of riparian buffers (for lowered stream temperatures and increased water quality)

GOAL 3: Make provisions for street tree plantings in the Urban Development Areas, consistent with Traditional Neighborhood Design components.

Implementation Techniques:
- Work with consultant on the Comprehensive Plan Amendment (for the Urban Development Area) for increased tree preservation and/or planting requirements in the resulting UDA zoning ordinance

GOAL 4: Implement a Tree Inventory Plan for existing and future tree plantings and Maintenance Plan for existing trees.

Implementation Techniques:
- Collaborate with the Public Works Department regarding tree maintenance, problem trees and potential tree locations
- Appropriation of funds for a tree inventory program design (electronic) to be requested during the budget process
- Dialogue with the power company and other utility providers regarding utility conflicts and compatibility with street trees, other public trees and private trees

The implementation plan shall be reviewed annually by the Tree Board.

Potential Partners

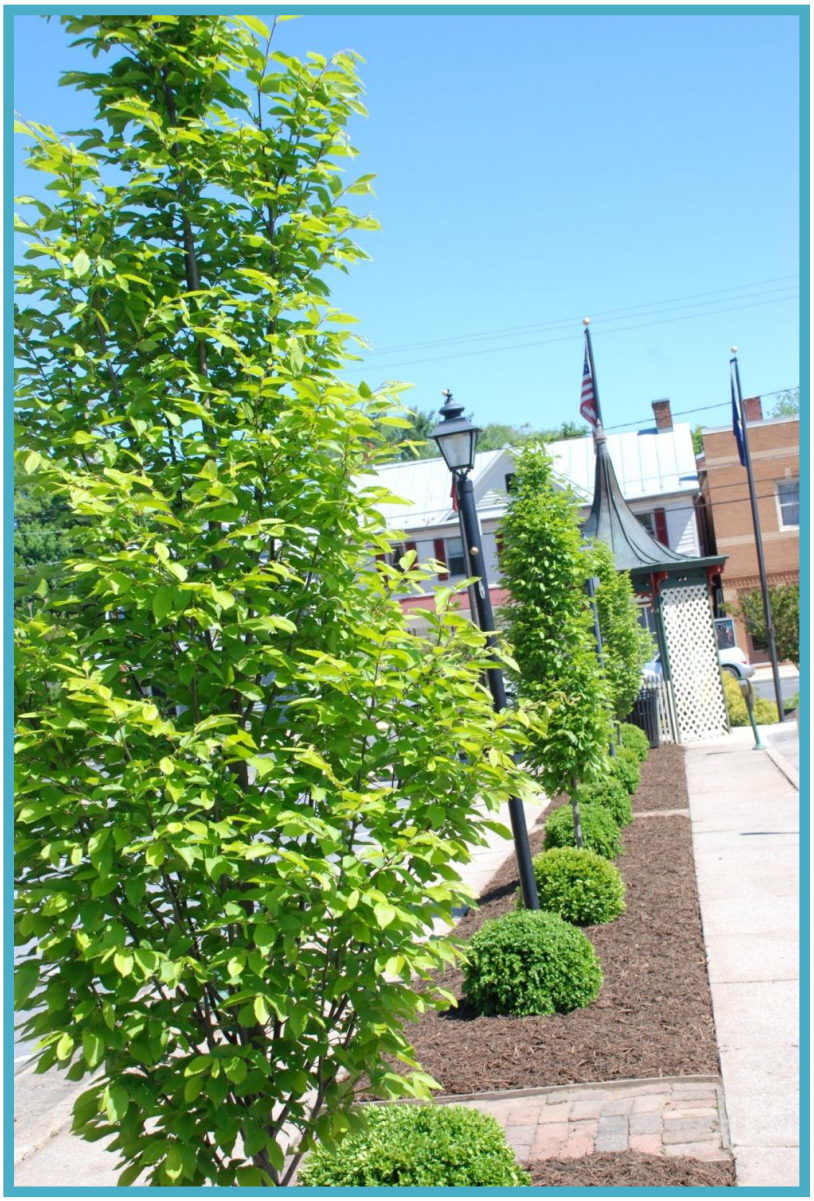
The Tree Board has identified the following partners, based on past collaboration and interest in tree canopy goals:

- Department of Forestry
- Non-Profit Organizations
- Shenandoah County Public School System
- Retail and Wholesale Nurseries
- Horticulturists and Arborists
- Town Council & Its Committees
    - Park Commission
    - Planning Commission
    - Woodstock Enhancement Committee
    - Ordinance Committee
    - Street Committee
    - Water & Sewer Committee
    - Tourism & Economic Development Committee
    - Finance Committee
- Dominion Virginia Power and Other Utility Companies
- Development Community
- Homeowner's Associations

Photograph Courtesy of Meredith Hoffman-Bauserman

Conclusion

The Town of Woodstock shall begin the Urban Tree Canopy Implementation Plan in December 2012, and work toward achieving the 8.3 percent until 2022, when a reassessment will occur based on updated information. An increase in tree canopy will result in improved environmental and economic benefits for the Town of Woodstock. It has been well-documented that development and urban living can be harmonious with the natural refuge that a tree canopy can provide. Community awareness and care of existing trees in residential districts will go a long way toward increasing the Town of Woodstock's tree canopy.



Photograph Courtesy of the Town of Woodstock

Appendix A: A Report on Woodstock's Existing & Possible Urban Tree Canopy

Works Cited

Chesapeake Bay Program: A Watershed Partnership. *Guidelines for Implementing the Chesapeake Bay Program's Urban and Community Tree Canopy Goals*. March 2005.

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Photograph Courtesy of the Town of Woodstock