



City Of Winchester

Chesapeake Bay Urban Tree Canopy Program Goal Setting and Implementation Plan



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Background of City:

Winchester, founded in 1744, is the oldest Virginia city west of the Blue Ridge Mountains. Located at the northern entrance of the Shenandoah Valley, the City encompasses 9.3 sq. miles and is the medical, governmental, commercial and financial center for the surrounding areas. The City has a population of approximately 26,000, with 7,650 single-family detached and attached homes and over 4,000 multi-family dwellings. The City of Winchester is dedicated to providing quality services to our citizens in a cost-effective and efficient manner, while anticipating the future needs of our community.

The Winchester Tree Division is located at 301 E. Cork Street within the Public Works Department facility. The Winchester Tree Division and the Winchester Tree Commission are faced with a primarily mature (and in some cases over-mature) tree canopy that is beginning to decline. Winchester is striving to preserve and increase the overall tree canopy within the City and in doing so, improve the water quality for its citizens and everyone downstream.

Urban Tree Canopy:

The urban tree canopy (UTC) is the layer of leaves, branches and stems of trees that cover the ground when viewed from above.

Why is the Urban Tree Canopy Important?

UTC can provide many benefits. It can mitigate temperatures, filter the air and water, provide wildlife habitat, increase property values and beautify the community.

Air Quality

In December 2002, Winchester-Frederick County entered into an Early Action Compact with the Virginia Department of Environmental Quality because the area was in non-attainment with the EPA standard for ozone levels. The goal was to reduce the level of ozone in the area to meet the EPA standards of 80 parts per billion, subsequently lowered to 75 PPB. The goal was met, but ozone measurements remain near the upper limit on many summer days. Any future lowering of the ozone limits would put Winchester back into non-attainment.

Low-level (near the surface) ozone is a major contributor to respiratory ailments, especially in children and the elderly. Hospital admittances and emergency room visits spike on days when the ozone levels are highest.

Low-level ozone is the result of chemical reactions that are driven by sunlight and high temperature. A good tree canopy is one way to reduce the temperature in the city and thus reduce the level of ozone production.

Other benefits to air quality include:

- Helping to settle out, trap and hold particle pollutants (dust, ash, pollen and smoke) that can damage human lungs. The particulate matter (PM) 2.5 (2.5 microns in size) is the most deadly for human health. Winchester is near (but, not yet over) the EPA limit for PM 2.5. Lower limits for PM 2.5 are being considered by EPA.
- Absorbing carbon dioxide (CO₂) and other dangerous gasses and, in turn, replenishing the atmosphere with oxygen. A healthy tree stores about 13 pounds of carbon annually, or about 2.6 tons per acre per year (source: Maryland Department of Forestry).
- An acre of tree canopy provides enough oxygen for 18 people every day.

Stormwater Management

Abrams and Opequon Creeks are on the state's impaired waters list for excessive bacteria and an inability to support aquatic resources. In the urban sector, inadequate stormwater management is the major cause of these impairments. UTC can intercept rainfall, which reduces impervious runoff, thus lessening the potential for combined sewer overflows and the direct transport of a variety of surface pollutants into local streams. UTC associated with forested riparian buffers can also filter runoff and lessen in-stream erosion by dissipating energy from storm events while helping to stabilize streambanks. Trees, along with shrubs and grasses, are part of a natural system that provides nutrient uptake, addressing the nutrient reduction goals of the Chesapeake Bay Agreement Tributary Strategies. Forested buffers and UTC in general, provide shade, which not only lowers stream temperatures but also reduces the heat inland effect, lessening the thermal shock from urban runoff. Sudden increases in stream temperature cause a drop in dissolved oxygen levels that, combined with increased velocity and pollution-loading, can severely impact aquatic resources.

Economic Benefits

In addition to the many environmental benefits provided by increasing UTC, there are quantifiable economic and quality of life benefits as well. American Forests has developed a number of land use decision-making tools, such as Urban Ecosystem Analyses and CityGreen, that can estimate the overall community cost savings from stormwater management (runoff reduction and pollution prevention), decreased heating and cooling costs, increased carbon sequestration and storage, and increased property values.

Existing Tree Canopy:

The City of Winchester's total area is 5,900 acres of which 1,578 acres or 27% is existing UTC. An additional 2,928 or 58% of the City could theoretically be transformed into UTC. A total of 1,394 acres or 15% of the City is not suitable for UTC. These figures are based on a 2009 report provided by the Virginia Department of Forestry and the Virginia Geospatial Extension Program at Virginia Tech's Department of Forestry.

Local Ordinances, Regulations and Comprehensive Plans:

Winchester has a local tree ordinance within the City Code that will complement the City's desire to increase the overall tree canopy by preventing unapproved tree removals from occurring on City-owned property. The City Planning Department has tree planting requirements in place that will help to prevent loss of tree canopy due to new construction.

The City's water protection ordinance provides for the establishment of riparian buffers along the City's five designated streams: Abrams Creek, Town Run, Redbud Run, Hogue Run and Buffalo Lick Run. Buffers must be a minimum of 35 feet from the top of the streambank, and the target vegetative cover in these areas must be an indigenous riparian forest with ground cover, shrub and tree canopy layers. In cases where the 35-foot minimum buffer cannot be maintained, property owners must submit a mitigation plan that identifies the impacts and alternatives to the proposed developments and then specifies mitigation that will address water quality and stream buffer impacts.

Site plans for development within the City must include a landscape plan that provides for large, deciduous shade trees that are compatible with urban environments adjacent to public rights of way, within surface parking areas and along property lines. Requirements are contained within the Zoning Ordinance to ensure that such trees planted in conjunction with development are maintained and/or replaced if necessary. Additionally, the Planning Department requires assurance that the developer makes reasonable efforts to preserve, replenish and protect existing mature trees, and it may refuse to approve any site plan that proposes unnecessary destruction of existing trees.

The development of the Opequon Creek Total Maximum Daily Load (TMDL) Implementation Plan (IP) is a requirement of Virginia's 1997 Water Quality Monitoring, Information and Restoration Act. The IP is required to identify corrective measures to meet state and federal water quality standards. The plan identified the lack of streamside buffers and overall tree canopy as major causes of local impairments, and it listed establishing buffers and increasing tree canopy as high priority practices in the strategies to improve water quality. The Virginia State Water Control Board approved the Opequon TMDL IP in January 2007.

Factors in Establishing a Goal:

When deciding on a percentage increase of the City's UTC, Winchester has chosen to gather input from the Winchester Tree Commission, the Natural Resources Advisory Board, the Town of Leesburg and City staff. Factors that are considered include identifying the public and private property potentially suitable for planting based on Tree Commission planting lists and commitments by large land owners.

Goal Setting:

Winchester has set a goal to increase its UTC to 35% citywide over the next 10 years. This goal would increase the canopy by 8% over its current 27%. With trees being relatively slow-growing in nature, the objective is to plant 60% of the trees needed to reach the overall UTC goal in the first five years of the program.

Tree planting alone is not a cost-effective strategy. A multi-prong approach is needed, with a major emphasis on mature tree canopy protection and maintenance. Retaining existing

trees is very important to reaching the UTC goal. One way that Winchester is prolonging the life of its street trees is with the use of rubber sidewalk adjacent to trees. This reduces the need for cutting tree roots, which leads to tree decline and death. The 35% UTC goal cannot be attained by planting on public property alone. Winchester will work with homeowners and some of the larger land owners to promote voluntary tree plantings to increase the UTC on private property.

UTC Implementation Plan: Measures Needed to Attain 35% Goal:

- Winchester will plan to maintain the existing 27% UTC.
- An additional 475 new acres of UTC will be added over the next 10 years.
- Using the rate of 62 trees = 1 acre of canopy, Winchester will need to plant 29,450 trees in the next 10 years.
- The Winchester Tree Commission will increase the promotion of its Adopt-a-Tree program, which allows people to purchase trees for planting on public property.
- Plant 60% of the acres needed in the first five years of the program.
- Work with large land owners to identify goals for voluntary tree planting.
- To meet our goal, a majority of the tree planting within the City must occur on private property.

Collaboration with Large Land Owners

Using the City's Geographical Information System (GIS) to develop maps with overlays of the existing canopy, it will be possible to conduct UTC planning charettes. This approach will work well for both public and private lands. Involving the community in that process will generate the political will needed to reach the 35% goal. With many larger private properties, there can be multiple decision-makers, including property managers, maintenance staff, and boards of directors. The charrette process allows all stakeholders, private and public alike, to reach consensus on potential areas to increase UTC.

Potential Partners and Suggested Contacts:

- Winchester Parks & Recreation (Brad Veach/Debbie Lewis)
- Winchester Public Schools (Kevin McKew)
- Shenandoah University (Dr. Tracy Fitzsimmons, Gene Fisher, Dr. Woodward Bousquet)
- Winchester Medical Center (David Siegfried)
- Frederick County Schools (Al Orndorff)
- Economic Development Authority (Jim Deskins, Larry Omps, Richard Pifer)
- Museum of the Shenandoah Valley (Mary Stickley)

Annual Community Tree Plantings

The Opequon Watershed, Inc., along with the Virginia Cooperative Extension Service and the Virginia Departments of Conservation and Recreation, Environmental Quality, and Forestry have been sponsoring annual community tree plantings on public and private lands since 2007. The program has focused on riparian areas, promoting the City's riparian buffer ordinance and the Opequon Creek TMDL IP. These efforts also seek to encourage a new approach to managing urban streamside lands and stormwater drainages. With the assistance of a \$5,000 Water Quality Improvement Fund grant and donated supplies and materials, the

partners and local volunteers have planted over 1,200 bare root seedlings with mats and protective tree tubes over the past three years. The average survival rate is just under 90%. Because of increased community interest, the program was expanded in 2009 to multiple sites, including two City elementary schools. The project partners also include the City Department of Public Works, the Winchester Tree Commission and Winchester Public Schools. The partners plan to continue this highly successful annual community event.

Community Education & Outreach

Raising the awareness of citizens and local decision-makers on the multiple benefits of UTC is an important part of the overall strategy. Fully understanding the benefits will encourage planting on private residential properties as well as a willingness to increase local funding for maintenance and plantings on public lands. Local organizations such as the Winchester Joint Council of Garden Clubs and The Opequon Watershed, Inc. could partner with the Winchester Tree Commission and the Natural Resources Advisory Board to co-sponsor educational programs for a variety of audiences, including local government decision-makers, builders and developers, institutional landowners and managers, homeowners, and K-12 and college students. Workshops and public presentations on the Green Infrastructure approach to natural resource management, along with documentaries such as *Return to the Forest Where We Live*, are excellent examples of available resources to increase public support for UTC. In addition, maintenance and protection of mature tree canopy is very important. An extensive Tree Owners Manual has been developed by the USDA Forest Service to assist land managers and homeowners alike with tree purchase, planting and maintenance.

Date to Achieve UTC Goal:

Winchester plans to achieve a UTC of 35% by July 2019. This will require a 10-year commitment by the City and private land owners. The end result will be worth the commitment.

Conclusion:

By setting a goal to increase the UTC and identifying measures to achieve that goal, Winchester hopes to do its part in preserving our natural resources, protecting not only our local environment, but also the Potomac River and the Chesapeake Bay.

References:

Winchester Riparian Buffer Ordinance

http://www.winchesterva.gov/documents/government/city_code/CH09.pdf (Section 9-80 – 9-85)

Opequon Creek TMDL Implementation Plan

<http://www.deq.state.va.us/tmdl/implans/opeqip.pdf>

Northern Shenandoah Valley – Ozone Early Action Plan

http://www.valleyairnow.com/NSVEAP_factsheet.pdf