November 1, 2026

Transmitted via Email

The Honorable Lashrecse Aird
Chair, Senate Committee on Local Government
Virginia Senate

The Honorable Dan Helmer
Chair, House Committee on Counties, Cities, and Towns
Virginia House of Delegates

Dear Senator Aird & Delegate Helmer:

On behalf of Old Dominion University, the Institute for Coastal Adaptation & Resilience hereby submits this Report on Tree Canopy Conservation and Replacement pursuant to Chapter 626 of the 2026 Virginia Acts of Assembly.

Sincerely,



Jessica C. Whitehead, Ph.D.

Joan P. Brock Endowed Executive Director
Institute for Coastal Adaptation and Resilience
Old Dominion University

Virginia Tree Canopy Work Group Report



Photo: Carlin Stiehl/Chesapeake Bay Program

OLD DOMINION UNIVERSITY

INSTITUTE FOR COASTAL ADAPTATION & RESILIENCE

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1 Executive Summary

Legislative Mandate and Stakeholder Process

Enacted by the 2026 Virginia General Assembly, House Bill 549 (HB 549) directed Old Dominion University's Institute for Coastal Adaptation and Resilience (ICAR) to convene a Work Group to examine Virginia's existing statutory and regulatory framework governing tree canopy conservation, preservation, and replacement. The legislation directed the Work Group to evaluate policies balancing canopy conservation with economic development, identify mature tree preservation incentives, improve locality parity and consistency, and provide regulatory certainty for developers and local governments.

To ensure the Work Group's recommendations reflected perspectives from across the Commonwealth, ICAR initiated a stakeholder engagement process consisting of regional listening sessions, opportunities for written public comment, and Work Group meetings. The Work Group, including representatives of local governments, planners, state agencies, environmental organizations, residential and commercial developers, and citizen stakeholders, convened for a series of consensus-building meetings. This report includes findings from ICAR and to-date consensus recommendations from the Work Group. Additional recommendations are expected in an Addendum due to the Virginia General Assembly by December 1, 2026.

Key Findings & Existing State Resources

ICAR identified 11 primary findings that should be used to guide policy on preserving and replacing tree canopy. The findings identify the benefits of trees and tree canopy, as well as existing resources that can be used in support of the goals. Additional state resources include the Virginia Tree Ordinance Database, Virginia Department of Forestry's (VDOF) Urban Tree Canopy Mapper, Virginia Tech's Virginia Urban Tree Canopy website, and the forthcoming VDOF Forestland and Urban Tree Canopy Conservation Plan.

- Environmental and Community Benefits of Tree Canopy
- Stormwater Management and Flood-Risk Reduction
- Urban Heat Mitigation and Climate Regulation
- Air Quality Improvement
- Noise Reduction and Acoustic Benefits
- Biodiversity and Ecological Connectivity
- Additional Climate, Health, and Community Benefits
- Implications for Urban and Suburban Planning
- Public Health Outcomes, Planning, and Policy
- Tree Preservation and Replacement
- The Value of Trees in Residential and Commercial Development

Recommendations

After evaluating the stakeholder feedback from listening sessions and public commentary and holding three virtual meetings, the Virginia Tree Canopy Work Group reached consensus on the following recommendations summarized below:

1. **Virginia Department of Forestry (VDOF)**

   Provide VDOF with additional funding to provide technical assistance to local governments and developers on tree canopy conservation and replacement.

2. **Local Government Incentive Authority**

   Authorize all Virginia localities, and encourage environmental justice communities in particular, to utilize any incentives for conservation and replacement they wish to use in their local tree ordinances (after conferring with their local developers and other stakeholders).

3. **Virginia Department of Environmental Quality (DEQ) Stormwater**

   Work with DEQ to identify ways to provide additional stormwater credit for preserving mature trees. Support a public education initiative to raise awareness of the existing credits tree planting receives as a stormwater Best Management Practice and the benefit of conserving trees to both reduce stormwater runoff and post-construction treatment needs.

4. **Aligning Tree Canopy Goals & Requirements with Other State Requirements**

   Ensure alignment of new Tree Canopy goals and requirements with other related state requirements.

5. **Virginia Tree Canopy Work Group Should Continue Meeting to Develop Specific Legislative Recommendations**

   The stakeholders participating in this Work Group should continue working together to take the consensus recommendations agreed upon in this report and develop proposed legislation that incorporates these recommendations.

6. **Tree Planting in Under-resourced Communities**

   Any new consolidated tree replacement statute should contain provisions for encouraging tree planting in under-resourced communities impacted by extreme heat, flooding, public health challenges, particularly in densely populated areas with low existing tree canopy.

7. **Incorporate Tree Conservation into School Site Planning and Design**

   The Virginia Department of Education should revise current guidelines to more directly encourage conservation of mature trees and existing tree canopy during school site selection, master planning and facility design.

8. **Virginia Trees for Clean Water Program**

   Fully fund the Virginia Trees for Clean Water program which provides grants to civic groups, communities, localities, NGOs, and other organizations to plant trees.

Addendum Pending

The Work Group continues to meet and will release an addendum to this report by December 1, 2026, containing further consensus recommendations reached after the report's November 1, 2026 due date. The Work Group looks forward to providing the Committees with this addendum as soon as it is completed.



Photo: Marielle Scott/Chesapeake Bay Program

II Introduction and Background

The 2026 Virginia General Assembly enacted House Bill 549 (HB 549) to advance a comprehensive review of Virginia's statutory and regulatory framework governing tree canopy conservation, preservation, and replacement. Recognizing the growing importance of urban and community tree canopy for environmental resilience, economic development, stormwater management, public health, and quality of life, the legislation directed Old Dominion University's Institute for Coastal Adaptation and Resilience (ICAR) to convene a Virginia Tree Canopy Work Group (Work Group) to evaluate existing tree canopy policies and develop recommendations for improvements.

Under HB 549, the Work Group was charged with conducting a review of §§ 15.2-961 and 15.2-961.1 of the Code of Virginia, as amended by HB 549, as well as § 15.2-961.3, and all applicable state agency regulations, guidance documents, and memoranda related to tree canopy conservation and replacement. The legislation specifically directed the Work Group to:

I. Evaluate policies to increase tree canopy across the Commonwealth in a manner that balances state and local environmental and economic objectives;

II. Identify incentives to preserve healthy, mature trees;

III. Analyze and identify methods in which parity can be created for tree canopy requirements across local governments; and

IV. Develop recommendations to provide regulatory assurance and cost-effective methods for tree canopy conservation and replacement for developers.

The Work Group's findings and recommendations will be submitted to the Chairs of the House Committee on Counties, Cities, and Towns, and the Senate Committee on Local Government.



Photo: Marielle Scott/Chesapeake Bay Program

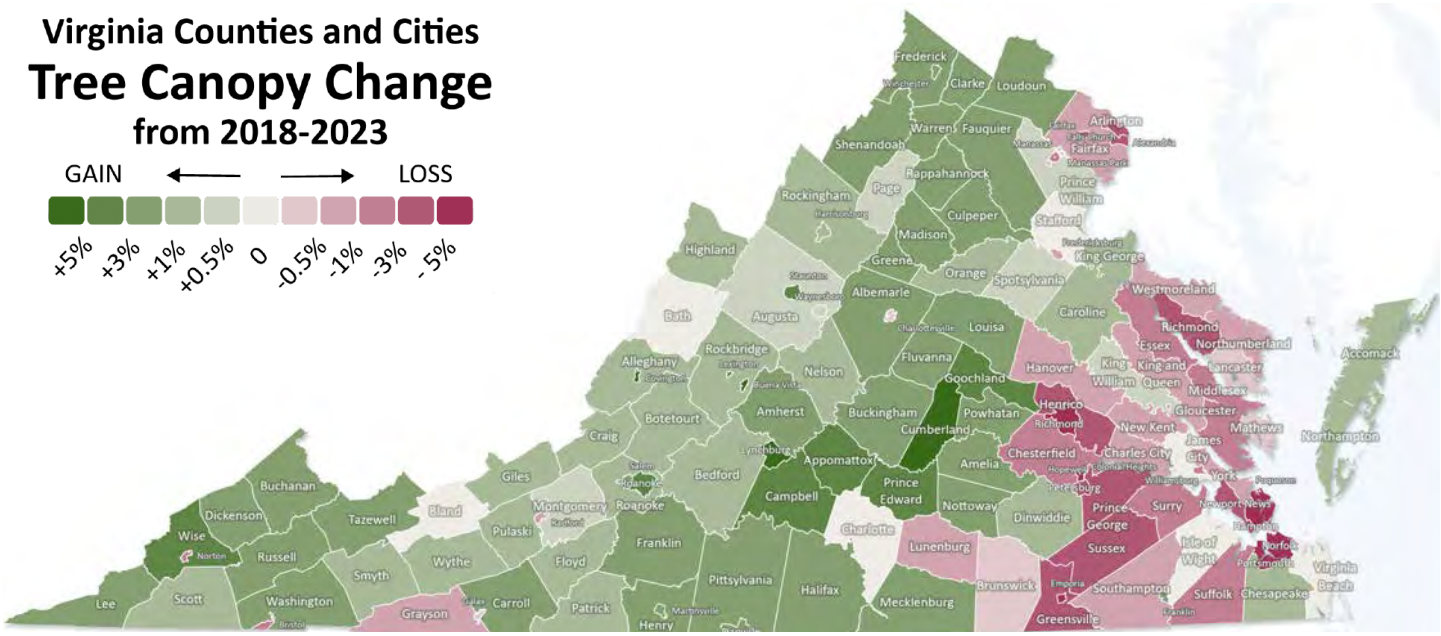


Figure 1. A map showing the variation in tree canopy cover change across the Commonwealth. (Source: Virginia Department of Forestry)

Stakeholder Engagement Process:

To ensure the Work Group's recommendations reflected perspectives from across the Commonwealth, ICAR conducted a stakeholder engagement process that included regional listening sessions, opportunities for written public comment, and formal Work Group meetings.

ICAR convened three regional listening sessions in the summer of 2026, inviting stakeholders to share their input. The first listening session was on June 4th, 2026 in the Central Virginia Region. Subsequent meetings occurred on June 24th, 2026 in the Northern Virginia Region and July 20th, 2026 in the Hampton Roads Region. In addition to in-person engagement opportunities, ICAR invited stakeholders to submit written comments and recommendations for consideration by the Work Group. Comments were due by August 15th, 2026. Stakeholders participating in the listening sessions included land planners, urban foresters, land use attorneys, engineers, environmental consultants, transportation consultants, local and regional government representatives, and other private citizens. All of the public comments provided by stakeholders at the listening sessions or submitted via email by the deadline were summarized and shared with the work group in writing and via a Power Point presentation during the first virtual Work Group meeting.

Work Group Timeline:

Members of the Work Group convened virtually on August 27, 2026 to review input from the listening session and public comments and to discuss recommendations. The Work Group met again to continue discussions on September 10th, 2026 and October 1st, 2026. Through this process, the Work Group identified practical, equitable, and effective strategies to support tree canopy conservation and replacement across Virginia while accommodating the diverse needs of local governments, property owners, developers and communities.

The Membership of the Work Group

Phil Abraham - *Virginia Association for Commercial Real Estate*
Mitchell Smiley/Jessica Dennis - *Virginia Municipal League*
Joe Lerch - *Virginia Association of Counties*
Andrew Clark - *Home Builders Association of Virginia*
Ann Jurczyk - *Chesapeake Bay Foundation*
Karen Firehock - *Green Infrastructure Center Inc.*
Sheri Shannon - *Southside ReLeaf*
Nathan Thompson - *Virginia Department of Forestry*
Eldon James - *Virginia Chapter of the American Planning Association*
Chris Swanson - *Virginia Department of Transportation*
Robert Benson - *Community Advocacy Stakeholder*


Photo: Will Parson/Chesapeake Bay Program

III ICAR Findings

ICAR has determined that the following findings should inform policy on preserving and replacing tree canopy:

Environmental and Community Benefits of Tree Canopy

Tree canopy is a critical component of green infrastructure in cities and suburban communities, providing multiple ecosystem services that improve environmental quality, climate resilience, biodiversity, and human well-being. Unlike many engineered interventions designed to address a single problem, trees can simultaneously regulate stormwater, reduce heat exposure, improve air quality, moderate noise, store carbon, provide wildlife habitat, and enhance neighborhood quality. These benefits are particularly important in urbanized landscapes, where impervious surfaces, buildings, transportation infrastructure, and loss of vegetation have substantially altered natural hydrological, thermal, and ecological processes (Livesley et al., 2016).

Stormwater Management and Flood-Risk Reduction

Tree canopy contributes to stormwater management through several complementary processes. Leaves, branches, and bark and roots of trees intercept and store rainfall. Soils and organic matter below the tree also absorb and store rainwater and assist with groundwater recharge. Root systems can improve soil structure and infiltration capacity. Trees also return soil water to the atmosphere through transpiration, helping restore storage capacity between rainfall events. Together, these processes can reduce total runoff volumes, delay runoff, and moderate peak flows entering stormwater drainage systems (Berland et al., 2017; Kuehler et al., 2017; Dowtin et al., 2023).

The magnitude of these benefits depends strongly on tree size and species, canopy density and leaf area, soil characteristics, antecedent moisture, rainfall intensity, and the amount and configuration of surrounding impervious surface.


Photo: Will Parson/ Chesapeake Bay Program

A systematic review by Dowtin et al. (2023), for example, identified high leaf area, dense crowns, favorable bark-storage characteristics, and soil conditions that promote infiltration as important determinants of stormwater performance. Experimental evidence from residential neighborhoods also demonstrates measurable hydrologic effects: removal of mature street trees increased surface runoff relative to a comparable control catchment (Selbig et al., 2022). Tree canopy should therefore be viewed as a distributed component of the urban or suburban stormwater-management network, complementing practices such as bioswales, rain gardens, permeable pavement, and detention systems.

Urban Heat Mitigation and Climate Regulation

One of the most consistently documented benefits of urban trees is their ability to reduce heat exposure. Buildings, roads, parking lots, and other impervious surfaces absorb and store solar energy, contributing to the urban heat-island effect. Trees counteract these processes primarily through shading and evapotranspiration. Canopy shade reduces the amount of solar radiation reaching streets, sidewalks, buildings, vehicles, and people, while transpiration converts sensible heat into latent heat and can reduce surrounding air temperatures (Livesley et al., 2016). Shaded pavement also lasts longer due to the reduction of solar impacts (McPherson & Muchnick, 2005).

Recent systematic reviews consistently identify urban trees as particularly effective forms of vegetation for mitigating heat, although cooling magnitude varies substantially with climate, canopy density, tree size, species, soil moisture, urban morphology, and spatial arrangement (Alonzo et al., 2025; Li et al., 2026). Importantly, shade can substantially reduce pedestrian radiant heat exposure even where reductions in ambient air temperature are relatively modest. Consequently, canopy located along sidewalks, transit stops, schools, parks, residential areas, and other heavily used outdoor spaces can directly improve human thermal comfort and reduce exposure to extreme heat. When trees are not present on a street, people perceive distances to be longer, hotter, and less pleasant, making pedestrians less inclined to walk than if streets are well-treed (Tilt et al., 2007).

Tree canopy can also provide indirect climate benefits by reducing building energy demand. Shade and lower surrounding temperatures reduce summer cooling requirements, while strategically located vegetation can influence winter heating demand. At the national scale, Nowak et al. (2017) estimated that urban and community trees reduce residential energy consumption in the United States and consequently avoid emissions associated with electricity generation.

The interaction between tree canopy and temperature is also important for understanding how heat exposure affects human health, particularly in communities that experience higher ambient temperatures. Recent longitudinal evidence indicates that tree-canopy retention is as critical as canopy expansion for mitigating heat-related health risks. Neighborhoods with elevated summer temperatures experience disproportionate impacts when canopy declines, suggesting that the spatial patterning of canopy loss can amplify existing vulnerabilities to extreme heat (Garcia et al., 2026).

These patterns parallel broader research showing that tree-canopy distribution often reflects historic segregation, disinvestment, and uneven access to environmental amenities. As a result, strategies to expand or preserve canopy may yield the greatest health benefits when targeted toward communities facing both higher temperatures and structural inequalities in environmental conditions. Prioritizing canopy protection and growth in these areas can therefore support more equitable climate resilience outcomes and reduce disparities in heat exposure and related health risks (Garcia et al., 2026).

Air Quality Improvement

Urban trees interact with air pollution through several mechanisms. Leaves and other plant surfaces intercept airborne particulate matter, while gaseous pollutants such as ozone, nitrogen dioxide, and sulfur dioxide can be absorbed through stomata or deposited onto plant surfaces. Modeling across the United States has demonstrated that urban forests collectively remove substantial quantities of atmospheric pollutants (Nowak et al., 2006). Trees can also indirectly improve air quality when their cooling and energy-conservation effects reduce energy demand and associated emissions.

However, the relationship between trees and local air quality is more complex than simply "more trees equals cleaner air." Although not a common feature of urban or suburban areas in the Commonwealth, dense tree canopies within narrow, heavily trafficked street canyons can restrict atmospheric circulation and, under some conditions, increase pollutant concentrations near street level (Abhijith et al., 2017). Species selection also matters because trees differ in pollutant deposition capacity, pollen production, and emissions of biogenic volatile organic compounds. Consequently, strategic planting and management, as well as appropriate species selection are important for maximizing air-quality benefits while minimizing potential disservices.

Noise Reduction and Acoustic Benefits

Vegetation can also help moderate the urban acoustic environment. Trees and other vegetation can attenuate sound through scattering and absorption by foliage, branches, trunks, and the ground surface. The effectiveness of vegetation as a physical noise barrier depends on the depth, density, structure, and location of the vegetated area; therefore, isolated trees generally provide less direct sound attenuation than wide and structurally complex vegetation belts.

The benefits of urban greenery extend beyond reductions in measured sound pressure. Vegetated landscapes can change people's perception of the acoustic environment, visually screening roads and other noise sources and introducing more desirable natural sounds such as birdsong and rustling vegetation. Recent systematic evidence suggests that exposure to urban greenery may reduce noise-related annoyance and psychological distress, although the strength of evidence varies among studies (Mueller et al., 2025). Thus, tree canopy can contribute to healthier and more pleasant urban soundscapes even where reductions in measured decibel levels are relatively modest.

Biodiversity and Ecological Connectivity

Urban and suburban tree canopy also provides essential habitat in landscapes that are often highly fragmented. Trees supply food, nesting and roosting sites, shelter, and movement corridors for birds, insects, mammals, and other organisms. Mature trees can be especially important because structural characteristics such as large crowns, cavities, deadwood, and complex branching provide habitat features that young trees cannot immediately replace.

Importantly, biodiversity benefits depend not only on the amount of canopy, but also on its ecological quality and configuration. Tree species diversity, native vegetation, understory structure, age diversity, connectivity among habitat patches, and proximity to other natural areas all influence the biodiversity supported by urban forests. Recent empirical evidence indicates that higher urban canopy cover and native trees can support greater bird diversity and ecological functions (Threlfall et al., 2025). Protecting existing mature trees, increasing habitat connectivity, and planting diverse and locally appropriate species can therefore make tree-canopy strategies simultaneously serve urban resilience and biodiversity conservation objectives.



Photo: Will Parson/Chesapeake Bay Program

Additional Climate, Health, and Community Benefits

Trees also contribute to climate-change mitigation by storing carbon in woody biomass and soils and continuing to sequester atmospheric carbon as they grow. Across the continental United States, urban trees represent a substantial carbon stock and sink (Nowak & Crane, 2002). Although urban-tree carbon sequestration alone is small relative to fossil-fuel emissions, it represents an important co-benefit of strategies primarily implemented for adaptation, stormwater management, habitat, or community improvement.

The combined environmental benefits of tree canopy can also translate into significant human-health and social benefits. A broad review of more than 200 studies found multiple pathways connecting urban trees with health, including reductions in heat and air-pollution exposure as well as associations with physical activity, stress reduction, mental health, and other health outcomes (Wolf et al., 2020). Tree canopy can additionally improve neighborhood aesthetics, recreational experiences, and property values, although these benefits, and access to them, are not distributed equally across urban populations.

Urban trees provide an important means of connecting urban residents with nature, particularly in densely built environments where opportunities for everyday contact with nature may be limited. Beyond their environmental benefits, trees provide important social, aesthetic, and cultural benefits to urban communities (Roy et al., 2012). Trees and urban forests can strengthen residents' sense of place and connection to their local environment, while mature or distinctive trees may become recognizable landmarks that contribute to emotional attachment to neighborhoods, streets, and public spaces. Trees can also embody cultural heritage and landscape history, helping preserve community identity and providing opportunities for environmental and cultural learning across generations (Cheng et al., 2021; Wang et al., 2022).

However, the presence of urban trees is not always perceived positively. Across literature, several tree issues were identified, such as reduced solar access, tree-root-induced cracked sidewalks, maintenance problems, increasing allergies from pollen, promoting insects, and obscured views (Roy et al., 2012). Understanding these challenges is as important as recognizing the benefits of urban trees, as it can help inform tree planting and management strategies that maximize ecosystem services while minimizing potential conflicts and unintended impacts on residents and urban infrastructure.

Implications for Urban and Suburban Planning

Taken together, scientific evidence supports treating tree canopy as multifunctional infrastructure rather than simply an aesthetic landscape feature. A single mature tree can simultaneously intercept rainfall, shade impervious surfaces, cool pedestrians and buildings, capture atmospheric pollutants, store carbon, provide habitat, and improve the experience of streets and neighborhoods. At neighborhood and watershed scales, networks of healthy trees can therefore contribute to multiple municipal objectives, including climate adaptation, stormwater management, public health, biodiversity conservation, and community livability.

At the same time, canopy percentage alone is an incomplete measure of performance. The benefits delivered by urban forests depend on where trees are located, their size and condition, species and functional diversity, surrounding land cover and soils, and long-term survival. Effective urban forestry strategies should therefore combine canopy-expansion targets with protection of mature trees, appropriate species selection, adequate rooting space and soil volume, maintenance, ecological connectivity, and spatial prioritization toward locations where environmental hazards and community needs are greatest.

Public Health Outcomes, Planning, and Policy

Recent longitudinal evidence demonstrates that tree canopy can influence population-level mortality in ways less captured by traditional ecosystem-service assessments. While static canopy cover has long been associated with improved environmental conditions, emerging research indicates that year-to-year changes in canopy may be more consequential for human health than baseline canopy levels alone. A decade-long analysis of Chicago neighborhoods, for example, found that annual increases in tree canopy were associated with measurable reductions in all-cause mortality, while canopy losses were linked to increased mortality risk, particularly in areas experiencing higher summer temperatures. These findings suggest that tree-canopy dynamics represent an important public health consideration alongside total canopy extent (Garcia et al., 2026)

This study also identified significant associations between canopy increases and reductions in several cause-specific mortality categories, such as cardiovascular, respiratory, mental health, and musculoskeletal conditions. These results align with established pathways through which trees influence health and argue that tree canopy management can serve as a preventive health intervention, with benefits accruing over time as canopy expands or is preserved.

The study highlights several considerations relevant to urban-forest planning and tree-canopy statutes. Since baseline canopy was not associated with mortality, static canopy-percentage targets may be insufficient for achieving public health goals. Instead, policies that emphasize canopy retention, maintenance, and year-to-year growth may better reflect the mechanisms through which trees influence health outcomes. This study also underscores the importance of protecting existing mature trees, which contribute substantially to canopy cover and provide immediate environmental and health benefits that newly planted trees may take decades to match (Garcia et al., 2026).

Such evidence suggests that tree canopy strategies should prioritize neighborhoods with elevated temperatures and environmental disparities. Integrating longitudinal canopy monitoring, maintenance requirements, and spatial prioritization into planning frameworks can help ensure that tree canopy supports climate resilience, reduces health disparities, and maximizes the co-benefits of urban forests.



Photo: Will Parson/ Chesapeake Bay Program

Tree Preservation and Replacement

Peer-reviewed research consistently shows that preserving mature trees yields substantially greater environmental and public-health benefits than replacement planting. However, physical site conditions and state and local development requirements can make preservation impractical or infeasible. Mature canopy provides far higher levels of cooling, carbon storage, stormwater mitigation, and air-quality improvement; services that young trees cannot replicate for decades (Acosta-Martínez et al., 2026). These ecological functions are central to climate-resilience strategies, and their loss creates long-term deficits that replacement planting cannot quickly resolve (Lo Piccolo et al., 2026).

Public-health evidence reinforces this priority. Mature urban trees reduce heat exposure, improve air quality, and lower risks associated with extreme temperatures and pollution, whereas newly planted trees offer minimal near-term health protection (Salisbury et al., 2024). Additional studies show that an established canopy supports mental health, reduces stress, and contributes to overall well-being (Lo Piccolo et al., 2026).

Economic and long-term canopy outcomes also favor preservation. Mature trees generate significantly higher ecosystem-service value, and jurisdictions that emphasize preservation maintain stronger canopy cover over time than those relying primarily on replacement planting (Ordóñez et al., 2021). Modeling studies further demonstrate that replacement trees require decades to approach the functional value of preserved mature trees (Stephenson et al., 2014).

Although research demonstrates the environmental and public-health benefits of preserving mature trees, preservation is not always practical or feasible during land development. The ability to retain existing trees depends on their condition and location, physical site characteristics, and the improvements necessary to accommodate development. Site grading, drainage modifications, and construction activities can damage root systems or compromise long-term tree survival. Buildings, roads, utilities, and stormwater facilities may also conflict with areas needed to protect existing trees (Willis et al., 2024). Research also identifies physical site constraints as a major barrier to preservation and highlights the importance of early planning and coordination among design, construction, and tree-care professionals to improve preservation opportunities (Despot & Gerhold, 2003). Many new technologies in the marketplace such as underground structural cells, now make it possible to co-locate street trees with stormwater and utility infrastructure.

State and local land use regulations and development standards can further limit opportunities to preserve existing trees. Zoning requirements governing setbacks, lot dimensions, building placement, and parking, along with standards for streets, utilities, and stormwater management, can restrict the flexibility available to design development around mature trees. In some cases, meeting these requirements may necessitate tree removal or require changes that increase development costs, reduce the number of permitted lots or dwelling units, or otherwise affect project feasibility. Greater coordination among these requirements, along with appropriate flexibility in site

design and development standards during the local development review process, can create additional opportunities for tree preservation while accommodating otherwise permitted development.

Research shows that preservation of trees and residential development can be compatible, but some local and state development regulations (including site constraints, infrastructure requirements, etc.) can present challenges (Kellogg et al., 2017).

Taken together, these findings support prioritizing the preservation of healthy, mature trees where feasible, while recognizing the need for flexibility to accommodate site conditions, infrastructure requirements, and permitted development. Where preservation is impractical or infeasible, replacement planting remains an important strategy for restoring tree canopy, although newly planted trees cannot immediately replicate the environmental benefits of mature trees.

The Value of Trees in Residential and Commercial Development: Market Benefits and Preservation Tradeoffs

Trees and tree canopy can enhance the market value and environmental quality of residential and commercial development. Preserving existing trees, however, can also increase development costs and result in site design constraints that affect the number of residential units that can be developed on a particular parcel and overall project feasibility. In some situations, the added value of treed lots may offset the additional costs of retaining trees and avoiding damages to trees during construction. The extent to which the economic benefits of trees offset these impacts depends on site conditions, local market demand, and the scope of preservation.

Trees and tree canopy provide economic and market benefits to residential developers and homebuilders. Mature trees, landscaped streets, and wooded open spaces can enhance community character, improve privacy and outdoor comfort, and create attractive amenities that distinguish residential developments. These features can strengthen buyer demand, support higher home and lot prices, and improve project marketability.

Research links trees and surrounding canopy to higher residential property values, although premiums vary by market, location, and tree characteristics. A national analysis found that tree cover on surrounding properties generally has a stronger positive association with residential property values than trees located on individual lots, although the relationship varies with neighborhood canopy density (Kovacs et al., 2022). For developers, these findings suggest that incorporating trees into streetscapes, common areas, and other shared amenities may create economic value while providing environmental benefits. They also suggest that the market benefits of tree canopy can extend across a development without requiring extensive tree cover on individual residential lots (Kovacs et al., 2022).

IV Current State Resources

Virginia has several resources that support tree canopy conservation, local policy development, and urban forestry planning. These resources vary in scope and availability, and opportunities exist to improve their accuracy, accessibility, and long-term maintenance to better inform local and state policy decisions, and assist local governments, industry, and other stakeholders in developing and implementing effective tree canopy policies.



Virginia Tree Ordinance Database

Although local government statutes relating to trees were not the focus of the Work Group's mandate, we note that the Virginia Tree Ordinance Database (VTOD), developed through a partnership among Virginia Tech Department of Forest Resources and Environmental Conservation, the Virginia Department of Forestry (DOF), and Trees Virginia, is a valuable resource. It provides a centralized repository of local government statutes related to tree canopy and urban forestry across Virginia. Intended to assist citizens, local officials, and industry in evaluating, designing, and comparing local tree regulations, the database currently includes 37 Virginia localities. However, it does

not reflect all localities that have adopted or amended tree ordinances in recent years, highlighting the need for periodic updates to maintain its accuracy and usefulness.

Furthermore, the database is simply a listing of existing local codes; it is not an analysis of which codes are effective, well constructed or compliant with state code.

Virginia Urban Tree Canopy Mapper

The Work Group also acknowledges the value of the Virginia Department of Forestry's Urban Tree Canopy Mapper (Mapper). It provides statewide and community-level data on tree canopy conditions and forest health. Developed in partnership with the Virginia Geospatial Extension Program at Virginia Tech and supported in part by the Urban and Community Forestry Grant Program and the Virginia Trees for Clean Water Grant Program, the Mapper provides residents and practitioners with accessible, community-level canopy data. It integrates statewide metrics including tree cover, fragmentation, and surface temperatures to help users evaluate current conditions and inform urban forestry planning.

The Mapper also illustrates why consistent, sustained state investment in VDOF is essential. Tools of this scale require ongoing maintenance, data updates, and technical capacity that cannot be supported through intermittent or one-time appropriations. Likewise, grant programs such as Virginia Trees for Clean Water play a critical role in enabling localities to expand and maintain tree canopy, yet these programs remain vulnerable to annual budget fluctuations. The Mapper demonstrates the value of stable statewide funding streams: when VDOF has reliable resources, it can produce high-quality public tools, support local governments, and advance long-term canopy restoration and forest health goals. This underscores the Work Group's recommendation that the General Assembly provide consistent funding for VDOF and fully support programs like Virginia Trees for Clean Water.

Virginia Tech Urban Tree Canopy website

Virginia Tech's Virginia Urban Tree Canopy website provides information, data, and planning tools to assist local governments and other stakeholders with urban tree canopy assessment, conservation, and management. Developed with funding and assistance from VDOF and the U.S. Forest Service, the website organizes resources into three categories: assessment, planning, and implementation. Available materials include tree canopy assessment reports for 26 Virginia localities, information on the Urban Tree Canopy Mapper, databases on tree canopy growth and local tree ordinances, and tools to assist with tree species selection. These resources are intended to help localities evaluate existing canopy conditions, establish canopy goals, and develop informed tree preservation and planting strategies.

Forestland and Urban Tree Canopy Conservation Plan

During the 2024 Session, the General Assembly enacted HB 309, directing VDOF to develop the Commonwealth's inaugural statewide Forestland and Urban Tree Canopy Conservation Plan (Plan) to assess forestland and tree canopy conditions and trends, including changes in tree canopy coverage between 2018 and 2023; identify conservation challenges and priorities; establish conservation goals; and evaluate potential funding sources. This Plan is currently under development, but will demonstrate the status of the Commonwealth's Tree Canopy from 2018 to 2023, including localities in which tree canopy has grown or diminished. The Work Group expects that the Plan will reinforce and complement the recommendations provided in the following section of this report.



Photo: Will Parson/ Chesapeake Bay Program

V Virginia's Existing Tree Canopy Statutes

The Code of Virginia has three statutes authorizing localities to adopt ordinances governing the planting, replacement, and conservation of trees during the development process. Each establishes minimum tree canopy requirements based on the type and intensity of development, calculated as canopy spread reached at 10 to 20 years of growth. However, the statutes differ in their geographic applicability, required canopy percentages, provisions for preserving existing trees, available credits, and procedures for obtaining exceptions or deviations from the requirements.

§ 15.2-961 - Replacement of trees during development process

Authorizes any Virginia locality to adopt an ordinance requiring the planting or replacement of trees during development. Establishes minimum tree canopy requirements ranging from 10% to 30%, depending on the type and density of development, generally calculated as canopy spread reached at 10 to 20 years of growth. Requires provisions for reducing canopy requirements or granting credits for preserving existing trees and allows exceptions or deviations under certain circumstances, including when strict compliance would prevent otherwise permitted uses or densities. Also authorizes tree canopy banks or funds to satisfy a portion of the requirements through off-site planting or replacement in qualifying circumstances.

§ 15.2-961.1 - Conservation of trees during land development process in localities belonging to a nonattainment area for air quality standards

Provides additional tree conservation authority to eligible localities in Northern Virginia's Planning District 8. Establishes minimum tree canopy requirements ranging from 10% to 30%, depending on the type and density of development, generally measured 20 years after development. Requires ordinances to prioritize preservation of healthy existing trees where feasible within applicable development standards and permitted densities. Establishes tree preservation targets, enhanced credits for preservation and planting, procedures for obtaining deviations, and mechanisms for meeting canopy requirements through off-site tree preservation or planting.

§ 15.2-961.3 - Replacement of trees during development process in localities

Enacted in 2022, this statute provides an alternative tree replacement framework available to any Virginia locality. Establishes minimum tree canopy requirements ranging from 10% to 20%, depending on the type and density of development, generally calculated as canopy spread reached at 20 years of growth. Includes provisions for mixed-use development, credits for preserving existing trees, exceptions or deviations under qualifying circumstances, and mechanisms for satisfying certain requirements through off-site tree canopy banks or funds.

VI Recommendations

After evaluating stakeholder feedback and holding three virtual meetings, the Virginia Tree Canopy Work Group reached a consensus on the following recommendations:

Recommendation #1: Virginia Department of Forestry (VDOF)

The General Assembly should provide additional funding to VDOF to provide technical assistance to local governments and developers on tree canopy conservationand replacement, including:

- Creating a technical manual and a pattern book for integrating trees into development projects.
- Providing standardized guidance, including creating a Technical Assistance Center with VDOF field staff to support localities and developers on species selection, planting methods, canopy calculation, and diversity requirements.
- Maintain & update statewide canopy data tools and fill data gaps by partnering with universities, non-governmental organizations, and other key stakeholder groups.
- Create a public education campaign on tree canopy benefits and fund a definitive statewide valuation of trees and tree canopy, to include specific elements.*

*the elements recommended for inclusion are: the environmental contributions of mature trees to clean air and water, habitat and ecosystem benefits of mature trees, tree contributions to commercial and residential property value, community livability and business 'draw' and resulting beneficial impacts on locality tax bases, contributions to citizen physical and mental health (and the societal costs of poor health), the costs of climate-related impacts from lack of tree canopy (e.g., heat islands), cost-effectiveness of trees as green infrastructure for stormwater management versus hard infrastructure costs and flood damage costs, reduction in residential energy costs due to shade trees, educational value for students and citizens, community value of parks and other natural areas with established canopy coverage, safety value of street trees, disproportionate impacts and costs resulting from the lack of trees in disadvantaged communities.

Recommendation #2: Local Government Incentive Authority

Authorize all Virginia localities, and encourage environmental justice communities in particular, to utilize any incentives for conservation and replacement they wish to use in their local tree ordinances (after conferring with their local developers and other stakeholders). The list of possible incentives could include, but is not limited to:

- density bonuses,
- fast-track permits,
- performance bonds,
- tax abatements and state income tax credits.

The General Assembly should consider whether tax-relative incentives should be applied statewide.

Recommendation #3: Virginia Department of Environmental Quality (DEQ) Stormwater


Photo: Will Parson/ Chesapeake Bay Program

Work with DEQ to identify ways to provide additional stormwater credit for preserving mature trees.

Support a public education initiative directed at site designers and stormwater engineers to raise awareness of the existing credits tree planting receives as stormwater best management practice (BMP) and the benefit of preserving trees to both reduce stormwater runoff and post-construction treatment needs.

Recommendation #4: Align Tree Canopy Goals & Requirements with Other State Requirements

Ensure alignment of new Tree Canopy goals and requirements with other related state requirements, according to the following recommendations:

- State stormwater BMPs should include green infrastructure as a priority methodology.
- Virginia Department of Transportation (VDOT) and VDOT-funded locality road/ highway construction should make tree conservation a core element of highway and other state-maintained road planning and make tree replacement a priority program, consistent with public safety.
- Tree canopy conservation and replacement should be a first-tier strategy for Chesapeake Bay Preservation Act compliance in Resource Protection Areas and Resource Management Areas.
- Dominion Energy and other power companies operating in Virginia should minimize loss of tree canopy while maintaining power line clearance. Where right-of-ways are cleared, utilities should plant carefully selected understory trees whose mature height naturally remain below power lines, ensuring alignment with public safety and maintenance standards.

Recommendation #5: Virginia Tree Canopy Work Group Should Continue Meeting to Develop Specific Legislative Recommendations

The stakeholders participating in this Work Group should continue working together to take the consensus recommendations agreed upon in this report and develop proposed legislation that incorporates these recommendations.

They should also work to incorporate into this draft legislation compromise language on

as many of the unresolved issues from this Work Group as possible.

Recommendation #6: Tree Planting in Under-resourced Communities

Any new consolidated tree replacement statute should contain provisions for encouraging tree planting in under-resourced communities impacted by extreme heat, flooding, public health challenges, particularly in densely populated areas with low existing tree canopy. An example of such authority can be found at lines 223 through 234 of HB 1346 from 2022.

Recommendation #7: Incorporate Tree Conservation into School Site Planning and Design


Photo: Will Parson/ Chesapeake Bay Program

The Virginia Department of Education's Guidelines for School Facilities in Virginia's Public Schools provide statewide guidance to local school divisions on the planning, design, construction, and renovation of public school facilities. Because the guidelines address site selection, acreage, parking and circulation, athletic and outdoor facilities, landscaping, and other site-development considerations, they provide an opportunity to incorporate tree conservation and replacement into school facility planning.

The Work Group recommends that the Virginia Department of Education revise the guidelines to more directly encourage conservation of healthy mature trees and existing tree canopy during site selection, master planning, and facility design. School divisions should consider opportunities to retain trees and forested areas when locating buildings, parking, vehicular and bus circulation, athletic facilities, stormwater facilities, and other improvements.

Recommendation #8: Virginia Trees for Clean Water Program

Fully fund the Virginia Trees for Clean Water program, which provides grants to civic groups, communities, localities, NGOs, neighborhood associations, public educational institutions, state agencies, tribal organizations and volunteer groups to plant trees.

VII Appendices

A) Pending Addendum

The Work Group continues to meet and will release an addendum to this report by December 1, 2026, containing further consensus recommendations reached after the report's November 1, 2026 due date. We look forward to providing the Committees with this addendum as soon as it is completed.

The additional recommendations under consideration relate to:

- expanding authority for localities to provide incentives for tree conservation, to increase tree canopy percentages beyond those contained in current law, and to require 10-year tree canopy targets,
- allowing minor deviations in site plans that increase tree conservation,
- supporting stormwater and trees educational initiative,
- broadening the scope of tree canopy analysis across public and private development,
- reviewing and improving regulations relating to tree removal and emergency management, and
- consolidating, simplifying, and changing current legislative authority, including existing law related to the clustering of single-family dwellings.

B) Summary of Public Comment from Regional Listening Sessions

Key Takeaways from the Virginia Tree Canopy Work Group Summer 2026 Listening Sessions

1. The General Assembly should simplify Code Sections-961, 961.1, and 961.3, consolidating these related sections, and providing clear guidance on preservation authority, mitigation requirements, and local flexibility. Consider creation of a model ordinance localities could adopt.

2. Statewide minimum standards (baseline canopy requirements, consistent definitions of tree canopy, and uniform/standardized methodologies for calculating canopy) and flexibility in local site design requirements are needed. This clarification should allow localities (with the support of regional planning district commissions) to tailor implementation based on geography, soil conditions, and development patterns, while preserving property rights.

3. To provide regulatory assurance for developers and to ensure maximum tree canopy preservation and replacement, tree canopy policies must be aligned with stormwater BMPs, VDOT right of way policies, CBPA requirements, sea level rise planning, and utility coordination. This could include clarification when preserved trees count towards stormwater credits.

4. Mature tree preservation is most cost-effective, more climate- resilient, and more beneficial for stormwater and heat mitigation. Incentives for mature tree preservation should include density bonuses, fast-track permitting, and performance bonds.

5. VDOF should create a pattern book (including success stories) and a state website as educational resources. In addition, VDOF should provide standardized guidance and technical assistance through extension agent for local governments and developers on species selection, planting methods, canopy calculation, and diversity requirements.

6. Data gaps are a major barrier. Participants wanted consistent baseline canopy data, long-term monitoring of tree survival, and support from research institutions. Participants recommended centralized state-supported data maintenance and training for localities.

7. Tree canopy funds are inconsistent, unclear, or unpredictable. Participants recommended clarity on who contributes (developers, HOAs, landowners), how funds can be used (maintenance, infrastructure adjustments), and how to ensure long-term tree survival. Consider allowing localities to adopt tree removal fees.

C) Summary of Public Comments on the Draft Report Recommendations

Public Comment #1

- Only use “conservation,” “conserve,” and “conserving,” except for when mentioning the Chesapeake Bay Preservation Act. In development, trees cannot remain “untouched,” as with the act of preservation.
- On Recommendation #7: Are we not encouraging the planting of trees on school site planning and design? This is a primary goal in Arlington’s review of new schools.

Public Comment #2

On Recommendation #1

- Expand technical assistance to help localities adopt and administer tree conservation ordinances, including model ordinance language, plan review standards, inspection procedures, and enforcement guidance. Partner with Trees Virginia on education and implementation support. Technical manuals alone will not address limited local staffing capacity.
- Clarify the purpose and scope of the proposed statewide tree valuation and whether existing research could meet that need. Prioritize resources that directly support local implementation.

On Recommendation #2

- To my knowledge, Fairfax County remains the only Virginia locality to have adopted a tree conservation ordinance pursuant to § 15.2-961.1. Examine why other eligible localities have not used this authority and identify barriers to adoption and implementation. Partner with Trees Virginia to educate local officials about the importance of enforceable tree conservation requirements and help localities use the authority available under Virginia Code §§ 15.2-961, 15.2-961.1, and 15.2-961.3, as applicable.
- Remove expedited permitting from the proposed incentives. HB 2660 already shortened review timelines, and further reductions would compromise review quality without additional forestry staff.
- Clarify how performance bonds would function as an incentive rather than financial security for required improvements.
- Prioritize practical design flexibility, particularly modified zoning setbacks that accommodate existing mature trees. Also evaluate how the substantial footprint of required stormwater facilities limits tree preservation on development sites.

On Recommendation #3

- Expand this recommendation beyond stormwater credits and education to address conflicts between required stormwater infrastructure and existing trees. Evaluate facility placement, grading, maintenance access, and opportunities to reduce disturbance through alternative designs.
- Clearly distinguish credit for preserving mature trees from credit for planting new trees. Integrate tree preservation into early stormwater planning before facility locations and grading establish which trees can remain.

On Recommendation #4

- Explicitly align statewide canopy goals with existing tree conservation enabling legislation and support local adoption and implementation. Transportation, stormwater, and utility requirements should reinforce those goals.
- Replace discretionary language with clear, enforceable obligations, particularly for state regulated utilities, while addressing legitimate safety needs and identifying responsibility for oversight.
- Clarify that prioritizing green infrastructure does not necessarily preserve existing canopy. Explicitly address retention of mature trees and forest soils, including when green infrastructure construction would otherwise require clearing.

On Recommendation #5

- Any continuing work group should include subject matter experts from Virginia localities that have adopted existing enabling authority and perhaps from localities outside Virginia with established tree conservation ordinances governing preservation and planting on development sites.
- Include practitioners responsible for plan review, inspections, enforcement, and program administration so legislative recommendations reflect implementation experience and local resource constraints.

On Recommendation #6

- Measure success through survival and sustained canopy development, rather than planting totals alone.

On Recommendation #7

- Integrate tree conservation into school site selection, feasibility studies, and early design. Involve local forestry staff before building locations, athletic facilities, circulation, and stormwater layouts are established.
- Strengthen the recommendation by calling for documentation of how design alternatives were evaluated to preserve mature trees and forested areas.

Regarding the addendum

- I support further consideration of design flexibility that preserves mature trees, particularly modified setbacks, and a closer examination of conflicts between stormwater infrastructure and tree preservation. Any consolidation of existing legislation should preserve existing local authority and adopted ordinances.
- Please also clarify which recommendations have reached consensus and which issues remain under consideration, particularly how the incentive authority addressed in Recommendation #2 differs from the expanded incentive authority listed for the addendum.

Public Comment #3

On Recommendation #1

- Assume you mean a valuation system for trees and tree canopy that is developed to be used across the state, not one uniform set of values that is statewide, correct? It would be helpful to clarify that. Also, need to note here, or in the list of specific elements

below, the additional value added by native trees that will be taken into account.
- Substitute "...habitat, biodiversity, and ecosystem benefits...." for "habitat and ecosystem benefits."
- Comment on "contributions to citizen physical and mental health" (and the societal costs of poor health) - Both the reduction in heat stress-related hospitalizations and deaths when shade trees are preserved and planted, and the increase in mental health benefits and air quality improvement.

On Recommendation #2
- Density bonuses - comment - And other potential zoning approaches, such as reduced setbacks?

On Recommendation #5
- Legislation would need to address the funding and responsibility for maintenance of planted and preserved shade trees in urbanized areas.

Regarding the addendum
- Bullet one - "For tree preservation and afforestation, with particular emphasis on native tree species."

Public Comment #4

On Recommendation #3
- Work with DEQ to promote environmental site design for stormwater management on development projects by reevaluating the assigned land cover loading rates in the Virginia Runoff Reduction Method to ensure that the preservation of existing trees is incentivized.
- Work with DEQ to revise the tree planting specification requirements in the Virginia Stormwater Handbook (P-FIL-09) so that trees planted during development could be awarded nutrient reduction credits when: 1) they are planted to meet planning requirements, or any other local, state, or federal requirements, and 2) financed through local, state, and federal programs.

On Recommendation #4
- Revise the first bullet point to "Green infrastructure stormwater BMPs provide benefits beyond nutrient removal and should be prioritized through incentive programs to encourage their selection over non-vegetated BMPs."
- Suggest deleting the third bullet [point] because the Bay Act and the CBPA Regulations are already designed to do this, as described on page iii of the Riparian Buffers Modification & Mitigation Manual.

Public Comment #5

On Recommendation #8
- In addition to fully funding Virginia Trees for Clean Water, there is a need to ensure that it is appropriately staffed so it can be an effective program.

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