PLAN FORWARD

Environment Element

Draft Text Changes

Changes to the Policy Plan Draft Text

On December 6, 2022, the Board of Supervisors authorized Plan amendment (PA) 2022-CW-2CP with the goal of a complete update to the Countywide Comprehensive Plan Policy Plan (Policy Plan). The Plan amendment was divided into two phases with Phase 1 focusing on updates to the Preface/Introduction, Land Use, Transportation, Environment, Parks and Recreation, and Human Services elements, as well as proposing the addition of policies addressing community health and equity. The elements included in the first phase are those most often used during the development review and long-range planning process.

Draft Plan text was initially released in Spring of 2025 and is located under Outreach Materials, Outreach Phase III on the project webpage, and has been revised based on additional community feedback, including discussions with the Board of Supervisors and Planning Commission. In order to easily identify the changes to the draft text since the Spring 2025 publication, the changes have been highlighted in yellow and are located on the project webpage under Outreach Materials, Outreach Phase IV. Clean versions of the draft Plan text are available as Attachments 1A through 1G, along with staff's analysis of the draft Plan text, in the Staff Report.

The Fairfax County Planning Commission and the Fairfax County Board of Supervisors will hold public hearings on the proposed Plan amendment in the Board Auditorium, Ground Level, Government Center Building, 12000 Government Center Parkway, Fairfax, Virginia as follows:

Planning Commission Public Hearing: October 15, 2025, at 7:30 p.m.
Board of Supervisors Public Hearing: November 18, 2025, at 4:30 p.m.

ENVIRONMENT

INTRODUCTION

This element provides guidance for achieving a balance between the need to preserve, conserve, and restore the environment, while planning for the orderly development and redevelopment of the county. The objectives and policies listed below have been designed to help decision makers implement policies and regulations regarding the use of land that will conserve and restore a legacy of natural resources. The objectives and policies in this element are intended to work together and be considered holistically, while considering environmental features and county directives to ensure a high-quality environment for future generations.

In order to describe the environmental considerations that are relevant to the development and redevelopment of land in Fairfax County and to formulate policies to address those considerations ~~issues~~, it is appropriate to review the context of environmental planning within this largely urban and suburban community. The expectation for the preservation, conservation, restoration, management, and rehabilitation of meaningful ~~components~~ functions of the county's environmental ~~heritage~~ resources should be high, given the large number of people who live ~~here~~ in the county and the importance of local environmental resources to the quality of life. ~~It is also important to incorporate n~~ Natural environmental features and functions should be incorporated into all aspects of planning and development to ensure ~~that~~ the benefits of nature can contribute to healthy communities such as recreational opportunities, green space, energy conservation through reduced water use and increased tree canopy shading, transportation connections in the form of hiking and biking trails, enhanced stream health, improved water quality, reduced flood risk, and enhanced ecosystems and habitats.

The opportunities and limitations on what may be achieved through environmental planning are affected by past actions and by the county's function as a home and employment center to a large number of people. Because thousands of acres of meadows, forests, wetlands, and agricultural land have been converted to urban and suburban development since the 1950s, the ability to achieve environmental preservation goals by limiting future development no longer exists. The scarcity of certain environmental amenities focuses current and future environmental planning efforts on the preservation, conservation, and restoration of remaining resources and the rehabilitation of degraded environments. Furthermore, climate change has highlighted the need for resilient and adaptive ~~sustainable~~ concepts to be used in land use planning and development particularly in areas disproportionally affected by climate change impacts. Preserving and restoring healthy ecosystems and encouraging the use of nature-based solutions can provide natural resilience to climate hazards, by absorbing flood water, dissipating heat, and dampening storm energy, among other benefits.

COUNTYWIDE OBJECTIVES AND POLICIES

Preserving, conserving, and restoring the built and natural environment in Fairfax County is challenged by the many different categories of concerns that are called "environmental." ~~:~~ Solving environmental problems is further complicated by the environmental impacts that may result from

efforts to resolve other major ~~topical~~ concerns, such as land use, transportation, recreation, and public facility issues. Many topics that have secondary environmental components are considered elsewhere. This Element of the Plan focuses primarily on environmental concerns which impact, or are impacted by, the development of land.

Environmental concerns have been grouped into two ~~three~~ broad categories for consideration:

- Environmental pollution: This category provides guidance on air quality, greenhouse gas emissions, water quality, noise and light pollution, and includes measures to avoid, minimize, and mitigate ~~mitigation measures to minimize~~ adverse impacts.

- Environmental hazards, resources, climate resilience and adaptation: This category provides guidance on problematic soils, flooding, and certain utility impacts. Additionally, it provides guidance on preserving, conserving, restoring, and enhancing environmental resources in the county through Environmental Quality Corridors (EQC), conservation corridors, healthy vegetation and soils, conservation easements, minimization and mitigation of disproportionate development impacts, and sustainable development practices.

- ~~Environmental hazards and climate resilience: This category provides guidance on problematic soils, flooding, and certain utility impacts.~~

- ~~Environmental resources.: This category provides guidance on preserving, and enhancing environmental resources in the county through Environmental Quality Corridors (EQC), healthy vegetation and soils, conservation easements, mitigation of development impacts, sustainable development practices, and minimizing disproportionate impacts.~~

Many of the environmental policies listed below will be implemented on a case-by-case basis as land is developed or redeveloped. These policies should be applied as appropriate to both private and public development. Development proposals should identify environmental assets and constraints, and incorporate appropriate site design with avoidance, minimization, and mitigation measures consistent with the guidance contained within this element. ~~to reduce impacts on the environment.~~

ENVIRONMENTAL POLLUTION

~~Our~~ The decision to occupy and alter Fairfax County's landscape has resulted in increased volumes and concentrations of specific pollutants in the air, in surface and ground waters, and in the soil. These pollutants can harm both the natural and the built environment.

~~In recognition of the impacts of human activity on the environment, most existing regulatory authority to protect preserve the environment has been focused on the control of pollution.~~

Although Fairfax County does not have to contend with ~~the more serious forms of~~ pollution associated with heavy industry, the conversion of land to urban uses and our dependence on ~~the automobile~~ vehicles have ~~resulted in~~ contributed to unacceptable amounts of pollution.

Air Quality

Over the past three decades, the region has made significant progress in improving air quality and meeting federal air quality standards. All six criteria pollutants~~ concentrations~~ (ground-level ozone, fine particulate matter, nitrogen dioxide, sulfur dioxide, carbon monoxide, and lead) regulated by the federal Clean Air Act have shown a downward trend in the region. Except for ozone, all other criteria pollutant concentrations are within the federal standards. The region is classified as moderate nonattainment area for ozone as it failed to attain the standard by a 2020 deadline. However, concentrations of ozone dropped below the standard and continue~~s~~ to show a downward trend since 2022.

Community-wide greenhouse gas (GHG) emissions have been tracked in Fairfax County since 2005 by the Metropolitan Washington Council of Governments by creating an inventory of all GHGs emitted by various ~~sources~~ sectors. ~~each year.~~ Fairfax County has adopted climate action goals to be carbon neutral across government operations by 2040 and community-wide carbon neutrality by 2050. More than 90% of GHG emissions are generated from residential and commercial building energy consumption and transportation. Remaining emissions ~~are~~ originate from other ~~sources~~ sectors, including solid waste, wastewater treatment, and process and fugitive emissions (fugitive emissions are leaks and irregular releases). The main drivers of increased GHG emissions in the county are primarily growth in population, increased commercial development, and use of synthetic refrigerants called hydrofluorocarbons. The main drivers of decreased emissions are improved energy efficiency, an increasingly less carbon-intensive electricity grid, and more fuel-efficient or electric vehicles.

Air quality plans and emissions control measures necessary to maintain the region's compliance with federal air quality standards are pursued at the state and regional level by the Metropolitan Washington Air Quality Committee in coordination with state air and transportation boards. Local actions and practices have air quality benefits~~. These practices~~ which can be applied during the land development process, and are found within various~~ying~~ objectives of this element.

Objective 1: Preserve and improve air quality, and reduce greenhouse gas emissions.

Policy a. Establish land use patterns and transportation strategies and facilities that encourage the use of public transportation, electric vehicles, non-motorized transportation, and reduce trip lengths to reduce emissions of ~~oxides of nitrogen~~ nitrogen oxides, carbon monoxide, and hydrocarbons from automobiles. Consistent with other Land Use and Transportation objectives, support and encourage the following during the reviews of development proposals, particularly for proposals in mixed use centers:

- The concentration of growth in mixed-use~~,~~ transit-oriented centers in a manner that will optimize the use of transit and non-motorized trips, minimize vehicular trips and traffic congestion, and provide facilities to support transit use and other non-motorized transportation.

- In mixed-use developments, the provision and orientation of employment, shopping, and recreational opportunities in close proximity to residences in a manner that will minimize motor vehicle use.

Policy b. Support air quality improvement and carbon capture through tree preservation, tree planting, and natural landscaping practices consistent with Objective 10 of this element of the Policy Plan.

Policy c. Support energy conservation, minimization of indoor air pollution, and other green building practices consistent with Objective 13 of this element of the Policy Plan.

~~Policy d. Support the application of episodic pollution reduction measures that can be applied when air quality conditions are predicted to be poor.~~

~~Policy e. Support the use of low-emissions maintenance and landscaping equipment.~~

Policy d~~f~~. Apply best available technology toward the minimization of emissions from stationary sources of air pollution.

Policy e~~g~~. In cooperation with federal, state, and regional agencies, maintain compliance with national ambient air quality standards.

Water Quality

~~The Department of Public Works and Environmental Services (DPWES)~~ ~~monitors~~ ~~Watershed health monitoring~~ Monitoring of the ecological conditions within county streams~~, in support of watershed management planning efforts. These assessments~~ routinely indicates that the health of most county streams ~~are~~ is impaired and that most streams have degraded biological diversity. ~~DPWES also routinely monitors surface waters throughout the county for pollutants and water quality indicators such as fecal coliform bacteria, dissolved oxygen, chloride, sediments, phosphorus, and nitrate nitrogen.~~

Streams, reservoirs, wetlands, and riparian areas store and convey water, provide habitat ~~for aquatic species~~, filter pollutants from stormwater runoff, ~~serve to~~ replenish drinking water sources ~~that may ultimately provide drinking water~~, store carbon, and are places of natural beauty that provide recreational and aesthetic opportunities, contributing to the quality of life in Fairfax County. Much of the county's parkland consists of stream valley parks, and ~~much of~~ the county's existing and planned trail system is located near streams. Streams beginning in Fairfax County eventually flow into the Potomac River and Chesapeake Bay. The county is required by the

Commonwealth of Virginia to manage stormwater and address impaired local waterbodies and the Chesapeake Bay through action plans, to achieve Total Maximum Daily Load (TMDL) allocations, and the Municipal Separate Storm Sewer System (MS4) permit issued by the Virginia Department of Environmental Quality (DEQ).

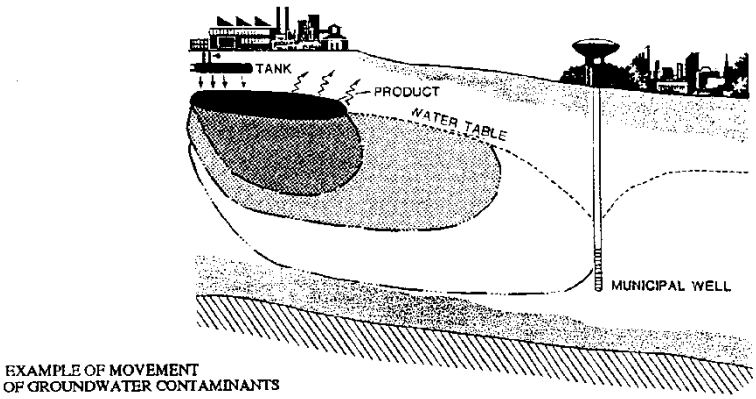
Land use and development activities, such as increased impervious surfaces, vegetation removal, and soil compaction, have the potential to degrade the ecological function ~~quality~~ of streams by increasing the peak flow rate and volume of stormwater runoff. ~~through~~ This can result in the direct transport of pathogens and pollutants, increased water temperatures, and ~~as well as through~~ hydrologic changes that ~~can~~ alter stream flows and morphology, and increase flood risk. In certain areas, flood risk impacts can be further exacerbated by increasing rainfall intensity from a changing climate. ~~flow in streams, resulting in alterations to stream morphology (e.g., stream bank erosion). Further, stormwater runoff from impervious surfaces can have elevated temperatures adversely impacting cooler water species. This can result in dissolved oxygen depletion and the ecological degradation of streams draining urban land. Some effects of this ecological degradation related to elevated stream water temperatures may include rapid changes in stream flows, elevated concentrations of nutrients and contaminants, altered channel morphology, and reduced biotic richness, with increased dominance of tolerant species.~~ The preservation, conservation, and restoration of the ecological functions of watersheds ~~quality of streams~~ is important to the conservation of ecological resources in Fairfax County. Therefore, efforts to avoid, minimize, and mitigate the adverse impacts of land use and development on the county's streams should be pursued.

The Occoquan Reservoir, one of Fairfax County's principal sources of drinking water, and many smaller impoundments in the county are highly stressed due to the impacts of stormwater runoff. With increasing population and development pressure, ~~traditional~~ existing nonpoint sources of pollution ~~will continue to have the potential to threaten reservoir water quality~~, in addition to emerging contaminants, such as salt and poly- and per-fluoroalkyl (PFAS) substances, will continue to degrade reservoir water quality.

~~Freshwater salinization syndrome has resulted from increases in salt concentrations in freshwater bodies. This syndrome is due to human activities such as road salt application, water softening, commercial and industrial processes, weathering of concrete, sea level rise, and fertilizer application. Excessive salt in freshwater can harm aquatic life, pollute drinking water, damage infrastructure, and cause other pollutants to become more concentrated and mobile. DPWES coordinates with state and regional entities on salt management efforts including a formal chloride total maximum daily load (TMDL) action plan, addressing salinization in the Occoquan Reservoir, and monitoring trends in salinization and specific ions to better inform salt management strategies in county watersheds.~~

~~Poly- and per-fluoroalkyl substances (PFAS) are a group of over 6,000 manufactured chemicals used in industry and consumer products since the 1940s. Certain PFAS, such as perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS), do not breakdown in the environment, can bioaccumulate in living beings, and can adversely impact human health and the environment. The majority (two-thirds or more) of human exposure to PFOA/PFOS comes from diet, and approximately one-quarter comes from drinking water.~~

Certain areas of the county, including residences and businesses, are served by individual well water supplies in Fairfax County. The county's Health Department operates the well monitoring program and tests for several environmental parameters. Additional health and safety considerations should be evaluated when locating hazardous materials or underground storage tanks within areas in proximity to wells.



EXAMPLE OF MOVEMENT
OF GROUNDWATER CONTAMINANTS

Source: Rothschild, Edward R., 1988, "Underground Storage Tank Management," p. 54. In Geraghty and Miller, Inc., 1988, The Fundamentals of Ground-Water Contamination, Fall 1988/Winter 1989 Seminar notes.

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~~FIGURE 12~~ to be removed

Objective 2: **Prevent and reduce pollution of surface and groundwater resources. Preserve, conserve, and restore the ecological integrity of streams in Fairfax County.**

Policy a. Evaluate the potential adverse impacts on receiving stream channels and downstream flooding from a 100-year storm event to ensure stormwater outfalls are properly designed and sized. ~~The county will pursue the following programmatic strategies:~~

- ~~Maintain a best management practices (BMP) program for Fairfax County and ensure that new development and redevelopment complies with the county's best management practice (BMP) requirements.~~
- ~~Update BMP requirements as newer, more effective strategies become available.~~
- ~~Update erosion and sediment regulations and enforcement procedures as new technology becomes available.~~
- ~~Monitor the performance of BMPs.~~
- ~~Monitor Fairfax County's surface and groundwater resources.~~
- ~~Regulate land use activities to protect preserve surface and groundwater resources.~~
- ~~Support watershed management planning~~

Policy b. In order to minimize the impacts that new development and redevelopment projects may have on the county's watersheds, and to address the increasing stormwater runoff from heavier rainfall events, techniques should be incorporated to meet one of the following stormwater management guidelines as provided below.

- Incorporate measures designed to reduce stormwater runoff volumes and flow rates from existing and proposed impervious surfaces to mimic undeveloped (good forested) conditions for the 2-year 24-hour storm to the maximum extent practicable.

- If good forested conditions (or to maximum extent practicable) is not achievable, developments should comply with the following table depending on impervious surface coverage:

	Peak Flow Control	**Runoff Volume Control**
For development with impervious surfaces at or exceeding 40 percent	Reduce the peak runoff rate for the 2-year 24-hour storm in the existing condition by at least 30 percent.	Retain the first inch of rainfall on-site. If, on a given site, the retention on-site of the first inch of rainfall is demonstrated not to be fully achievable, all available measures should be implemented to the extent practical in order to support this goal and achieve partial retention of the first inch of rainfall.
For development with impervious surfaces between 18 and less than 40 percent	Reduce the peak runoff rate for the 2-year 24-hour storm in the existing condition by at least 20 percent.	Provide stormwater management measures that are sufficient to attain the Rainwater Management credit, or its equivalent, in the most current version of the LEED rating system.

**Use the Energy Balance method to reduce the peak runoff rate to good forested condition when warranted by downstream conditions.*

~~For new development and redevelopment, apply better site design low-impact development (LID) techniques that mimic natural hydrologic runoff characteristics through avoidance, minimization, and mitigation. Such techniques should be considered at the earliest stages of site design to reduce the impacts of stormwater runoff (quality and quantity), groundwater recharge when such recharge will not degrade groundwater quality, natural areas, and provide climate resiliency. In order to minimize the impacts that new development and redevelopment projects may have on the county's streams, lakes, ponds, and wetlands, some or all of the following practices should be considered.~~

~~- Exceed minimum code requirements for water quality and quantity, with measures designed to reduce pollutants and protect downstream receiving waters by reducing stormwater runoff volumes and peak flows from existing and proposed impervious surfaces to the maximum extent practicable and appropriate for specific watershed conditions.~~

Policy c. In order to minimize the impacts that new development and redevelopment projects may have on the county's watersheds, the application of low-impact development (LID) techniques should be prioritized when designing projects:

- Manage stormwater (quantity and quality) as close to the source as possible with nutrient reduction requirements being met on-site to the greatest extent possible.

- Minimize the amount of impervious surface created and convey drainage from impervious areas into pervious areas.

- Where site conditions are appropriate encourage the use of BMPs and bioengineering practices that are innovative, nonstructural, maximize infiltration, and designed to be adaptive to climate change.

- Design stormwater management facilities to provide multiple benefits, such as habitat creation and restoration, biodiversity, recreation, traffic calming, education~~al~~, and improved aesthetics while maintaining safety.

- Maximize the use of infiltration landscaping with native or adapted (non-invasive, climate-resilient) species, including within streetscapes and parking lots.

- Encourage the establishment of coordinated stormwater controls within a development site or ~~over~~ across multiple development sites, when possible, by incorporating multiple BMPs in sequence to enhance the treatment of runoff.

~~- Encourage fulfillment of tree canopy requirements through tree preservation instead of replanting where existing tree canopy permits. Encourage tree canopy and preservation thresholds that exceed the minimum Zoning Ordinance requirements.~~

- Encourage the preservation of wooded areas and steep slopes particularly when adjacent to stream valley Environmental Quality Corridor (EQC) areas, Resource Protection Areas, and major and minor floodplains.

- Encourage cluster development when designed to maximize preservation of ecologically valuable land.

- Encourage shared parking between adjacent land uses where permitted, reduce parking where appropriate, and use pervious parking surfaces in low-use parking areas.

- Minimize and phase clearing and grading during construction to limit erosion.

Policy d. Where practical and feasible, retrofit older stormwater management facilities to perform water quality functions to better preserve downstream areas from degradation.

Policy e. Preserve water resources by maintaining high standards for discharges from point sources.

- For proposed land uses known or likely to use or discharge contaminants, such as PFAS, encourage monitoring of wastewater and stormwater discharges, best management practices for ~~PFAS~~ contaminant use and storage, and the use of ~~PFAS~~ safer alternatives.

- Encourage monitoring of cooling system discharge into the wastewater system and, if applicable ~~needed~~, provide pre-treatment for applicable uses. Additionally, for such uses in the Upper Occoquan Service Authority (UOSA) service area, encourage the use of cooling systems that do not discharge to the wastewater or stormwater systems, or that use non-chemical and non-water-based cooling systems.

- For proposed land uses known or likely to contaminate water sources through animal waste or other pollutants, in consultation with county agencies responsible for monitoring of water quality and/or wastewater, ensure relief areas are connected to the wastewater system, or alternative measures are provided, to reduce bacteria loads at the source before waste or other pollutants leaves the site and adversely affects stormwater runoff/receiving waters.

Policy f. Encourage preservation of stream channels and associated vegetated riparian buffer areas along stream channels upstream of Resource Protection Areas (as designated pursuant to the Chesapeake Bay Preservation Ordinance) and Environmental Quality Corridors, to further mitigate against stormwater impacts and enhance corridor quality and connectivity. To the extent feasible establish boundaries of these buffer areas consistent with Objective 9 of this element of the Policy Plan.

Policy g. ~~Consider watershed management plans that are adopted or endorsed by the Board of Supervisors as a factor in making land use decisions to ensure preservation of the environment and downstream areas.~~ Consider strategic watershed planning efforts, including documents adopted or endorsed by the Board of Supervisors, to enhance the health of county waterways.

Policy h. Development and redevelopment projects should ensure the following regarding toxic substances and hazardous materials, as applicable:

- Sites that have been subject to contamination by toxic substances or other hazardous materials are remediated to the extent that they will not present unacceptable health or environmental risks for the specific uses proposed for these sites and that unacceptable health or environmental risks will not occur as a result of contamination associated with nearby properties.

- Proposals that include the use or storage of hazardous materials should provide adequate containment facilities, monitoring, and spill prevention strategies to preserve surface and groundwater resources consistent with state regulations.

- Site investigations and remedial actions, as appropriate, should be pursued to ensure that site contamination on or near properties subject to development proposals will not present unacceptable health or environmental risks.

Policy i. Encourage commitments for salt management plans that are provided to building owners and property managers for the purpose of creating awareness of the adverse impacts of excess salt use and provide recommendations for efficient use of salt ~~use~~, or salt alternatives, while maintaining safety.

Policy j: Non-residential developments requiring special exception or special permit approvals in the Residential-Conservation (R-C) zoning district should retain at least 50% of the site as contiguous, undisturbed open space (e.g. tree preservation area, environmentally sensitive area, etc.) to mitigate impacts on Occoquan Reservoir water quality.

Programs to improve water quality in the Potomac River~~/Estuary,~~ and Chesapeake Bay ~~will~~ continue to ~~have significant impacts on~~ influence planning and development in Fairfax County. W~~w~~ater quality and the marine environment in the Bay haves~~s~~ not improved on a consistent basis over the past twenty years. Land use activities throughout the watershed, such as agriculture, and urban and suburban development, continue to adversely impact water quality. Storm intensification resulting from climate change will also lead to more pollutants entering waterways.

In order to preserve the Chesapeake Bay, other waters, and wetlands of Virginia from degradation resulting from the loss of riparian buffers and runoff pollution, the Commonwealth ~~has~~ enacted regulations requiring localities within Tidewater Virginia (including Fairfax County) to designate "Chesapeake Bay Preservation Areas," within which land uses are either restricted or water quality measures must be provided. Fairfax County ~~has~~ adopted a Chesapeake Bay Preservation Ordinance pursuant to these regulations.

The more restrictive type of Chesapeake Bay Preservation Area is ~~known as~~ the "Resource Protection Area (RPA). With a few exceptions (e.g. water wells, recreation, infrastructure improvements, "water dependent" activities, and redevelopment), new development is prohibited in these areas. In Fairfax County, RPAs include the following features:

- water bodies with perennial flow;
- tidal wetlands;
- tidal shores;
- nontidal wetlands contiguous with and connected by surface flow to tidal wetlands or water bodies with perennial flow; and
- ~~a~~ buffer areas that include any land within a major floodplain and any land within ~~not less than~~ 100 feet ~~in width around~~ of the above features.~~; and~~
- ~~as part of the buffer area, any land within a major floodplain.~~

The other~~, less sensitive~~ category of land in the Preservation Area~~s~~ is ~~called~~ the "Resource Management Area (RMA)." Development is permitted in RMAs as long as it meets water quality goals and performance criteria for these areas. These goals and criteria include stormwater management standards, maintenance requirements and reserve capacity for on-site sewage disposal facilities, erosion and sediment control requirements, demonstration of attainment of wetlands permits, and conservation plans for agricultural activities. In Fairfax County, any area that is not designated as an RPA is designated as an RMA.

A *Chesapeake Bay Supplement* has been prepared to address a range of issues related to water quality and is incorporated by this reference as part of the Comprehensive Plan.

Objective 3: Preserve the Potomac Estuary and the Chesapeake Bay from the avoidable impacts of land use activities in Fairfax County.

Policy a. Support the analysis and recommendations contained in the *Chesapeake Bay Supplement* to the Comprehensive Plan.

Policy b. Where tidal shoreline erosion control measures are needed, apply techniques that are consistent with the "Guidelines for Tidal Shoreline Erosion Control Measures" in Appendix 1 of this element. Consistent with this guidance and with guidance developed by the Virginia Institute of Marine Science pursuant to §15.2-2223.2 of the Code of Virginia and § 28.2-104.1 of the Code of Virginia, support the application of living shoreline approaches as preferred approaches for stabilizing eroding tidal shorelines where practicable.

Policy c. Support efforts to mitigate or compensate for losses of wetlands near the area(s) of impact.

Noise

Transportation-generated noise impacts the lives of many who live in the county. Some county residents are subjected to unhealthful levels of noise from vehicular ~~highway~~ traffic, aircraft operations, and railroads, including WMATA's Metrorail. Federal agencies with noise mitigation planning responsibilities have worked with the health community to establish maximum acceptable levels of exposure (Guidelines for Considering Noise in Land Use Planning and Control). These guidelines, expressed in terms of sound pressure levels, are: DNL 65 dBA for outdoor recreation areas; DNL 50 dBA for office environments; and DNL 45 dBA for residences, schools, theaters and other noise-sensitive uses. While federal guidelines consider all land uses to be compatible with noise levels below DNL 65 dBA, adverse noise impacts can still occur at levels below DNL 65 dBA. Planning goals supporting new residential development in the DNL 60-65 dBA airport noise contours could be supported under specified conditions.

Objective 4: Minimize human exposure to unhealthful levels of transportation-generated noise.

Policy a: Regulate new development to ensure that unhealthful levels of transportation noise are reduced to acceptable levels of exposure.

Policy b: Reduce noise impacts in areas of existing development.

To achieve acceptable levels of exposure referenced above, ~~these standards~~ new noise-sensitive development in areas impacted by transportation ~~highway~~ noise between DNL 65 and 75 dBA will require mitigation strategies determined through the provision of noise studies during the review of the development. New residential development should not occur in areas with projected highway noise exposures exceeding DNL 75 dBA or projected aircraft noise exposures exceeding DNL 65 dBA. However, broader planning goals for the county's urbanized areas may suggest that sites near major highways and Metrorail would be appropriate for residential development or other noise-sensitive uses, even when projected noise impacts may exceed DNL 75 dBA. Design approaches that shield noise-sensitive areas through the placement of non-habitable spaces such as stairwells, hallways, or parking garages to minimize the exposure of exterior facades of noise-sensitive interior spaces to noise levels below DNL 75 dBA, should be utilized.

In order to avoid exacerbating noise and land use conflicts and to further the public health, safety and welfare, where new residential development is considered in the DNL 60-65 dBA aircraft noise contours the following should be fulfilled:

- A noise study that documents the expected noise impacts is conducted during the development review process.

- Commitments to construction standards and materials are provided during the development review process to ensure that noise levels within interior living spaces do not exceed 45 dBA.

- Pre-construction noise modeling for building components is conducted and documentation submitted to the County for review and approval prior to building permit issuance to ensure noise levels within interior living spaces do not exceed 45 dBA.

- Verification letters are submitted to the County certifying that the noise-modeled components have been properly installed prior to issuance of a Residential Use Permit.

- Post-development noise studies are conducted, if requested by Fairfax County, prior to issuance of a Residential Use Permit in order to evaluate the effectiveness of the noise mitigation measures.

- Adequate assurances are provided by the property owner at the time of rezoning to address potential conflicts or threats to the long-term viability of~~,~~ Dulles Airport. These assurances may include such things as recorded avigation easements/plats, hold harmless agreements, and/or similar assurances.

- All promotional and marketing materials and leasing and purchasing agreements include disclosure statements that disclose the presence of the airport and potential associated impacts, as well as a map of Dulles Airport, the DNL 65 dBA noise contour line, and general locations of residential units and private active recreation spaces. Such disclosure statements, as well as a map of Dulles Airport and the DNL 65 dBA noise contour line are included in any community association documents and recorded in the land records. Notice of such statements, maps, and noise contours are made to all initial and subsequent lessors and purchasers.

Lighting

Light pollution, the excessive use of artificial light, can negatively impact human health, plant and wildlife behavior, and the ability to observe the night sky. Plants and animals depend on natural light and dark cycles to govern behaviors such as reproduction, nourishment, sleep, and protection from predators. Increasing urbanization requires that care be taken to ~~reduce~~ minimize unfocused emissions of light and that efforts be made to avoid creating sources of light glare and trespass which may interfere with plant and animal behaviors, and human visual acuity, as well as serve as potential sources of energy waste.

Objective 5: **Minimize light emissions to those necessary and consistent with general safety.**

Policy a. Recognize the nuisance and harmful impacts on humans, plants, and wildlife resulting from light emissions that are unfocused, unshielded, or have excessive brightness or color temperature (Kelvins).

Policy b. Encourage incorporation of principles for responsible outdoor lighting design.
- Use light only when and if it is needed.

- Target direct light to places for safety purposes.
- Consider brightness levels of necessary lighting and use lower-level light when appropriate.
- Use warmer color lights.

ENVIRONMENTAL HAZARDS, RESOURCES, ~~AND~~ CLIMATE RESILENCE AND ADAPTATION

~~Resilience is defined as the capacity of a community, business, or natural environment to prevent, withstand, respond to, and recover from a disruption. As a result of changes in the climate, Fairfax County now experiences more frequent and intense storms, more extreme flooding events, expansion of flood-prone areas, and increased flood risk due to sea level rise and tidal surges, and more extreme heat events. These events can have significant impacts on community members, the environment, infrastructure, and the local economy. Environmental hazards in Fairfax County range from urban flooding, storm severity, heat, problem soils, and drought conditions.~~

Common environmental hazards in Fairfax County include, but are not limited, to riverine and urban flooding, severe storms, excessive heat, drought conditions, problem soils, and the potential for petroleum pipeline accidents.

In addition to climate hazards, ~~S~~some soils in the county can cause hazardous conditions during development. Marine clay soils found in the eastern part of the county and shrink swell clay soils found primarily in the western area can cause foundation failures, cracked and shifting walls, and in extreme cases, catastrophic slope failure. Asbestos bearing soils may pose a health risk to construction workers requiring special precautions during excavation. The preservation and restoration of healthy soils is also an important consideration in the land development process. Policies related to healthy soils are included in Objective 10 of this element.

Objective 6: Ensure that new development either avoids problem soil areas~~,~~ or implements appropriate engineering measures to protect existing and new structures from unstable soils.

Policy a: Limit densities on slippage soils~~,~~ and cluster development away from slopes and potential problem areas.

Policy b: Ensure new development on problem soils provides appropriate engineering measures to ~~ensure against~~ mitigate geotechnical hazards.

As a result of changes in the climate, Fairfax County now experiences more frequent and intense storms, more extreme flooding events, expansion of flood-prone areas, ~~and~~ increased flood risk due to sea level rise and tidal surges, and more extreme heat events. These events can have significant impacts on community members, the environment, infrastructure, and the local economy.

Objective 7: **Minimize the exposure of new development to the potential of flood impacts.**

Policy a: Prohibit new structures within major and minor floodplains ~~flood impact hazard areas~~.

Policy b: Use ~~A~~appropriate data sources ~~should be used~~ to account for potential flood risks and projected climate change impacts to ensure resiliency of the built environment.

Policy c: Consider flood risk reduction policies that are adopted or endorsed by the Board of Supervisors and incorporate appropriate strategies as part of site design to reduce downstream flooding and potential adverse impacts on receiving stream channels.

Fairfax County is crossed by several major gas and petroleum pipelines. Ruptures of these lines could cause environmental degradation from spillage~~,~~ or could result in a fire or explosion with the possibility of loss of life.

Objective 8: **Minimize the exposure of county residents to potential pipeline ruptures and explosions and avoid hazards from electrical transmission and distribution facilities.**

Policy a: Ensure pipeline safety and minimize the hazards associated with gas and petroleum pipelines through improved construction inspection and quality assurance during construction and by requiring appropriate construction practices and building setbacks.

Policy b: Ensure new development minimizes unnecessary human exposure to unhealthful impacts of low-level electromagnetic fields from electrical transmission lines.

The preservation, conservation, and restoration of environmental resources and the creation of resilient landscapes are ~~is~~ a key priorities~~y~~ of the county. Although not all open space land is ecologically significant or appropriate for preservation, data indicates a cumulative loss of some of Fairfax County's environmental resources, and a fragmentation of remaining ecologically significant land. Large tracts of natural land are scarce in the more urban inner part of the county; however, several areas of low-density development and ecologically significant areas remain throughout the county. While low-density zoning has been used as a conservation tool within some areas of the county, such as the Occoquan Basin, as a single measure it is not an adequate means to conserve our resources.

Larger, contiguous tracts of natural open space provide scenic variety and ecological value within the county, an attractive setting for and buffer between urban land uses, essential habitats for scarce or sensitive plant and animal species, and have the capacity to reduce air, water and noise pollution.

A conserved network of different habitats including natural vegetation and stream valleys, established through the Environmental Quality Corridor (EQC) policy can serve to connect these larger areas and provide similar benefits. In addition to the establishment of EQCs, there are opportunities through the site design process to further create a network of natural lands, working landscapes, and varying types of natural areas that can further serve as conservation corridors. The retention of ~~environmental amenities~~ natural resources on developed and developing sites is ~~also~~ important to this concept. The most visible of these ~~amenities~~ is the county's tree canopy ~~cover~~. It is possible to design new development in a manner that preserves some of the existing vegetation in landscape plans, and to restore lost vegetation through replanting. The mission of a forest conservation program is to preserve and enhance the county's urban forests by upholding tree conservation ordinance requirements, promoting sustainable development, and retaining and restoring meaningful amounts of the county's tree canopy ~~cover~~. The identification of potential connectivity between areas of tree canopy ~~cover~~, as well as meadows, wetlands, and even streetscapes and green roofs, can offer multiple benefits, such as improving biodiversity, mitigating impacts of climate change, and providing opportunities for passive recreation. Habitat nodes and corridors can be designed to be context and species sensitive. For example, small urban parks and streetscape plantings may not support the movement of larger animals but could comprise a corridor adequate for smaller animals and pollinators if designed correctly.

Biodiversity has been defined as "the diversity of life in all its forms, and at all levels of organization." Biodiversity is important because of tangible products of natural systems (e.g. wood products from forests), and more ~~broadly~~ importantly because of the services that diverse ecosystems provide. In addition to climate change, invasive plants are a leading cause of biodiversity loss and are a detriment to the ecological health of community landscapes, particularly where contiguous forests and soils are disturbed and where edge habitats are created.

Healthy soils include a complex community of organisms including fungi, bacteria, insects, and small animals. This soil food web facilitates the decay of organic matter and the cycling of nutrients, helping to bind soil particles and form soil structure. The benefits of healthy soils include, but are not limited to, carbon sequestration, increased water infiltration and groundwater recharge, better rooting environment and habitat for flora and fauna, and absorbing nutrients, sediments, and pollutants.

Objective 9: Identify, preserve, and enhance an integrated network of ecologically valuable land and surface waters for present and future residents of Fairfax County.

Policy a: Identify, preserve, restore, and enhance the Environmental Quality Corridor ~~system~~ (EQC) system. Lands may be included within the EQC system if they can achieve any of the following purposes:

- Habitat Quality: The land has a desirable or scarce habitat type, or one could be readily restored, or the land hosts a species of special interest. This may include: habitat for species that have been identified by state or federal agencies as being rare, threatened or endangered; rare

vegetative communities; unfragmented vegetated areas that are large enough to support interior forest dwelling species; and aquatic and wetland breeding habitats (i.e., seeps, vernal pools) that are connected to and in close proximity to other EQC areas.

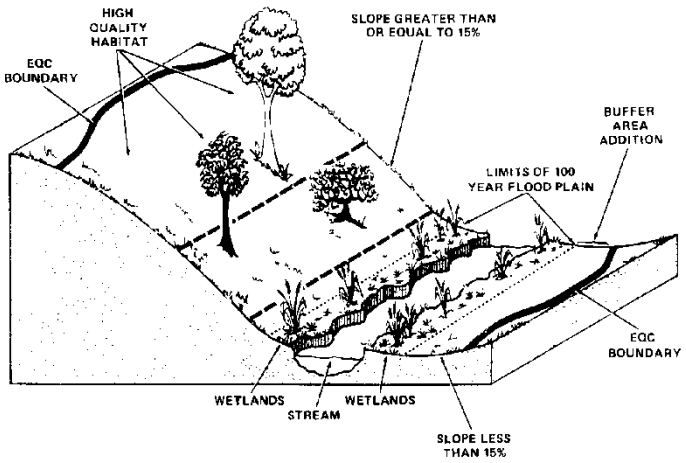
– Connectivity: This segment of open space could become a part of a corridor to facilitate the movement of wildlife and/or conserve biodiversity. This may include natural corridors that are wide enough to facilitate wildlife movement and/or the transfer of genetic material between core habitat areas.

– Hydrology/Stream Buffering/Stream Preservation: The land provides, or could provide, buffering to one or more streams, ponds or lakes through: the provision of shade; vegetative stabilization of stream banks; moderation of sheet flow stormwater runoff velocities and volumes; trapping of pollutants from stormwater runoff and/or flood waters; flood control through temporary storage of flood waters and dissipation of stream energy; separation of potential pollution sources from streams; accommodation of stream channel evolution/migration; and preservation of steeply sloping areas near streams from denudation.

– Pollution Reduction Capabilities: Preservation of this land would result in significant pollutant reductions. Water pollution, for example, may be reduced through: trapping of nutrients, sediment and/or other pollutants from runoff from adjacent areas; trapping of nutrients, sediment and/or other pollutants from flood waters; preservation of highly erodible soils and/or steeply sloping areas from denudation; and/or separation of potential pollution sources from streams.

While the core of the EQC system will be the county's stream valleys, additions to the stream valleys should be selected to augment the habitats and buffers provided by the stream valleys, and to add representative elements of the landscapes that are not represented within stream valleys. The stream valley component of the EQC system shall include the following elements (See Figure 1):

REMOVE FIGURE:

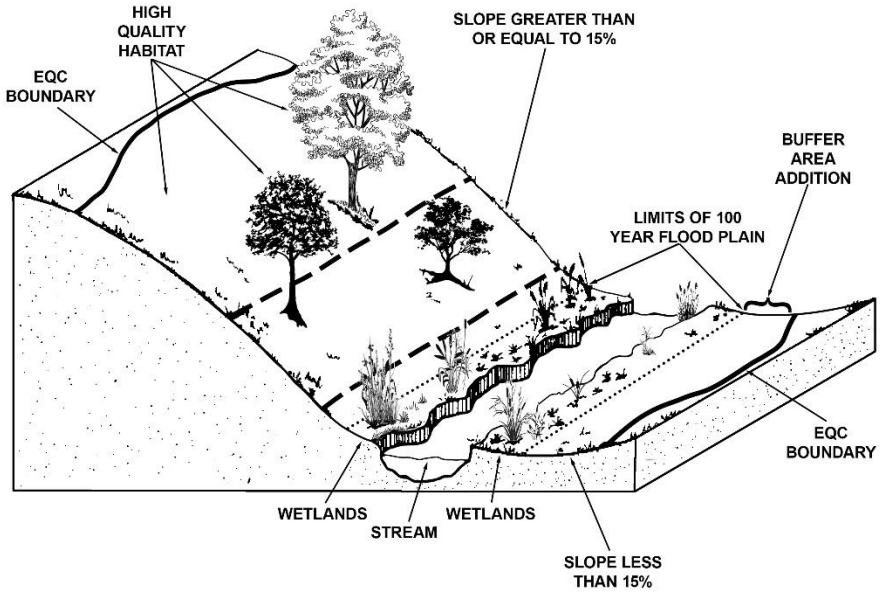


A TYPICAL
ENVIRONMENTAL QUALITY CORRIDOR

Source: Fairfax County Office of Comprehensive Planning

~~FIGURE 4~~

REPLACE WITH:



A TYPICAL
ENVIRONMENTAL QUALITY CORRIDOR

Source: Fairfax County Department of Planning and Development

FIGURE 1

– All 100-year floodplains ~~flood plains~~ as defined by the Zoning Ordinance;

– All areas of 15% or greater slopes adjacent to the floodplain ~~flood plain~~, or if no floodplain ~~flood plain~~ is present, 15% or greater slopes that begin within 50 feet of the stream channel;

– All wetlands connected to the stream valleys; and

– All the land within a corridor defined by a boundary line which is 50 feet plus 4 additional feet for each % slope* measured perpendicular to the stream bank. This measurement should be taken at fifty-foot intervals beginning at the downstream boundary of any stream valley on or adjacent to a property under evaluation.

**The % slope used in the calculation will be the average slope measured within 110 feet of a stream channel or, if a flood plain is present, between the ~~flood plain~~ floodplain boundary and a point fifty feet up slope from the flood plain.*

Modifications to the boundaries so delineated may be appropriate if the area designated does not benefit any of the EQC purposes as described above. In addition, some disturbances that serve a public purpose such as unavoidable public infrastructure easements and rights of way may be appropriate. Disturbances for access roads should not be supported unless there are no viable alternatives to providing access to a buildable portion of a site or adjacent parcel. Disturbances should be minimized and occur perpendicular to the corridor's alignment, if practical, and disturbed areas should be restored to the greatest extent possible.

The following efforts within EQCs support the EQC policy and are encouraged with appropriate coordination with Fairfax County:

- Natural channel design methods in coordination with the Department of Public Works and Environmental Services (DPWES) should be applied to stream stabilization and restoration efforts to the greatest extent possible, and native species of vegetation should be used.

- Replanting efforts in EQCs that would restore or enhance the environmental values of areas that have been subject to clearing; native species or adapted non-invasive climate resilient species of vegetation should be applied.

- Removal of non-native invasive species of vegetation from EQCs to the extent that such efforts would not be in conflict with county ordinances; such efforts should be pursued in a manner that is least disruptive to the EQCs.

- Daylighting of piped streams to establish a restored corridor.

Other disturbances to EQCs should only be considered in extraordinary circumstances and only where mitigation/compensation measures are provided that will result in a clear and substantial net environmental benefit relating to most, if not all, of the EQC purposes listed above that are applicable to the

proposed disturbances.

Policy b. Preservation of EQCs should be achieved through dedication to the Fairfax County Park Authority, if such dedication is in the public interest. Otherwise, EQC land should remain in private ownership within common open space appropriate commitments for preservation. The use of conservation easements as a means of preservation should be considered.

~~Policy c. To provide an incentive for the preservation of EQCs while maintaining protecting the integrity of the EQC system, allow a transfer of some of the density from the EQC portion of developing sites to the less sensitive areas of these sites. The increase in effective density on the non-EQC portion of a site should be no more than an amount which is directly proportional to the percentage of the site that is preserved, and should not be so intense as to threaten the viability of the habitat or pollution reduction capabilities that have been preserved on the EQC portion of the site. Overall site yield will decrease as site constraints increase. Maximum density should be determined according to a simple mathematical expression based upon the ratio of EQC land to total land. This policy is in addition to other plan policies which impact density and does not supersede other land use compatibility policies.~~

Objective 10: Preserve and enhance tree ~~cover~~ canopy, natural areas, and soils to, among other benefits, enhance environmental resources.

Policy a: Preserve, restore, or enhance the maximum amount of tree canopy ~~cover~~ on developed and developing sites consistent with planned land use and best silvicultural practices.

Policy b: Encourage fulfillment of tree canopy requirements through tree preservation instead of replanting where existing tree canopy permits. Encourage tree canopy and preservation thresholds that exceed the minimum Zoning Ordinance requirements.

Policy c~~b~~: Encourage energy-conscious landscaping efforts such as the planting of trees to provide shading of buildings and parking lots during the summer months.

Policy d~~c~~: ~~Encourage~~ Ensure natural landscaping design and techniques.

- Landscaping plant species should be native to the mid-Atlantic region or adapted (non-invasive, climate-resilient), and be non-invasive (as identified by the Virginia Department of Conservation and Recreation).

- Landscaping design should strive to create habitat, promote biodiversity, reduce turf grass coverage, and minimize the need for mowing, fertilizers, herbicides, and pesticides.

Policy ed: Encourage native and adapted street trees, understory, and/or groundcover plantings within road medians, along roadways, and within utility corridors, where consistent with safety and in a manner that does not impact accessibility.

Policy fe: Encourage the rebuilding of soil profiles to ensure adequate organic matter and aeration in all planting and pervious areas to satisfy the cultural requirements of trees, shrubs, and groundcovers and provide other benefits of healthy soils.

Policy gf: Identify invasive plant species within development and redevelopment sites and provide appropriate management plans for eradication. Invasive plant species management plans should include the common and scientific names of the invasive species targeted for management, the designated management area, control and disposal methods, treatment timing and monitoring procedures, program duration, and any necessary reforestation efforts.

Policy hg: Establish a county-wide conservation corridor connectivity network plan for use in the review of new and redevelopment projects.

Policy ih: Identify existing or potential conservation corridor areas on or adjacent to new and redevelopment projects and encourage site design approaches that place tree preservation, natural landscaping, green infrastructure, and other environmental features within and/or adjacent to those areas. Habitat nodes and corridors should be designed in relation to local conditions and target species.

Policy ji: Ensure both public and private development proposals identify environmental constraints and opportunities, and demonstrate how environmental impacts will be mitigated.

Objective 11: Promote the use of conservation and open space~~/conservation~~ easements as tools to preserve environmental resources and create or enhance conservation corridor connectivity.

Policy a: Use conservation and open space~~/conservation~~ easements for the preservation of Environmental Quality Corridors, Resource Protection Areas, and other environmentally sensitive areas such as land along the Potomac and Occoquan Rivers.

Policy b: Use conservation and open space~~/conservation~~ easements to preserve open space in already developed areas in order to provide natural areas, preserve environmentally sensitive resources, and wildlife habitats in an urban or suburban context.

Policy c: Use conservation and open space~~/conservation~~ easements as appropriate to support stream restorations, and preserve woodlands~~, monarch~~ specimen trees, and/or rare or otherwise significant stands of trees, as identified by the county.

Policy d. Where appropriate, use conservation and open space easements outside of private residential lots as a mechanism to preserve environmental resources.

Objective 12: Identify approaches which address the environmental and health impacts of development with particular attention to vulnerable areas, or populations, in the county that are disproportionately impacted by heat, urban flooding, lack of trees, pollution, or other environmental considerations.

Policy a. Appropriate data sources should be used when considering policy changes and in the review of new and redevelopment projects, such as heat maps, flood risk assessments, and other available information to identify communities most susceptible to increased health and safety risks.

Policy b. Recognize adverse environmental impacts such as, but not limited to, flooding, urban heat island effect, poor air quality, and site contamination, and mitigate the impacts through increased tree conservation/plantings, green infrastructure, enhanced connectivity, ~~within vulnerable areas,~~ and other remediation efforts within new and redevelopment opportunities.

Policy c. Consider the effects and proximity of major environmental pollution sources during the review and update of area plans. Ensure appropriate mitigations are provided.

Objective 13: Design and construct buildings and associated landscapes to use energy and water resources efficiently in support of reducing greenhouse gas emissions, improving climate adaptation and resiliency, and minimizing short- and long-term negative impacts on the environment and building occupants.

Policy a. In consideration of other Policy Plan objectives, encourage the application of energy conservation, energy efficiency, renewable energy generation, water conservation, climate adaptation and resiliency, and other green building practices in the design and construction of new development and redevelopment projects. These practices may include, but are not limited to:

- ~~Encourage t~~The inclusion of professionals with green building accreditation on development teams;

- Sustainable landscape and site design which reduces impacts to ecological systems;

- Optimization of energy performance of structures, benchmarking, and inclusion of energy-efficient design;

- Use of renewable energy resources and on-site renewable energy generation, such as, but not limited to, solar, wind, and/or geothermal systems. Additional support for the provision of building designs that will facilitate future retrofits for on-site energy generation;

- Building electrification to include the use of energy efficient appliances, heating/cooling systems, lighting and/or other strategies;

- Application of best practices for water conservation, such as water efficient landscaping and innovative wastewater technologies, that can ~~serve to~~ reduce the use of potable water and/or reduce stormwater runoff volumes that contribute to urban flooding and/or hazardous conditions;

- Reuse of existing building materials and recycling/salvage of non-hazardous construction, demolition, and land clearing debris;

- Use of recycled and/or rapidly renewable building materials that originate from nearby sources;

- Reuse, preservation, and conservation of existing buildings, including historic structures;

- Retrofitting and upgrading existing building systems to reduce building energy use and improve efficiency;

- Improve building occupant experience through provision of natural lighting for occupants and reduction of potential indoor air quality problems through measures such as increased ventilation, indoor air testing and use of low-emitting adhesives, sealants, paints/coatings, carpeting and other building materials;

- Energy and water usage data collection and performance monitoring;

- Solid waste and recycling management practices for multiple waste streams to improve diversion rates in support of increased waste reduction and the county's climate goals;

- Provision of vegetated and/or highly reflective roofs and shade structures to increase resilience and reduce impacts of heat island;

- Provision of infrastructure to support multimodal (e.g. showers and lockers for employees, secure bicycle parking facilities for employment, retail, institutional, and multifamily residential uses); and

- Provision of information to owners of buildings with green building/energy efficiency measures that identifies both the benefits of these measures and their associated maintenance needs.

Policy b. Encourage commitments certification under established green building rating systems for the design and construction of new buildings (e.g., the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) program for any new construction or other equivalent program*).

**An equivalent program is one that is independent, third-party verified, has regional or national recognition, is comprehensive in scope, and has comparable implementation to the LEED rating system.*

Policy c. Within Suburban Centers, Community Business Centers, and Industrial Areas as identified on the Concept Map for Future Development, unless otherwise recommended in the applicable Area Plan, ensure that zoning proposals for nonresidential development incorporate green building practices sufficient to attain certification at the LEED Silver level using LEED or an equivalent program.

Ensure that zoning proposals for nonresidential development in Transit Station Areas (TSAs) and the Tysons Urban Center as identified on the Concept Map for Future Development, or where developments with exceptional intensity or density are proposed (e.g. at 90 percent or more of the maximum planned density or intensity), incorporate green building practices sufficient to attain certification at the LEED Gold level using LEED or an equivalent program.

Ensure zoning proposals for multifamily residential development within the above mentioned areas identified on the Concept Map for Future Development incorporate green building practices sufficient to attain certification at the LEED Silver level using LEED or an equivalent program.

Policy d. Ensure that zoning proposals for residential development that are not otherwise addressed in Policy c above attain certification under an established residential green building rating system such as EarthCraft or an equivalent program as defined in Policy b above. As intensity or density increases, the expectations for achievement in the area of green building practices would commensurately increase.

Policy e. Promote implementation of green building practices by encouraging commitments to monetary contributions in support of the county's environmental

and climate initiatives, with such contributions to be refunded upon demonstration of attainment of certification under the applicable LEED rating system or equivalent rating system.

Policy f. Ensure applicants involved in public-private partnerships where land is leased or provided by the county meet or exceed county operational policy for green building certification.

Policy g. Ensure the provision of or readiness for charging stations and related infrastructure for electric vehicles within new development and redevelopment proposals.

Policy h. Ensure all fenestration and lighting is "bird-friendly" consistent with guidelines published by the American Bird Conservancy, or equivalent guidance ~~standards~~.

Policy i. Ensure zoning proposals pursuing an adaptive reuse, major renovation, or building retrofit incorporate green building practices sufficient to attain certification through LEED or an equivalent program.

APPENDIX 1

GUIDELINES FOR TIDAL SHORELINE EROSION CONTROL MEASURES

Measures to control erosion along the county's tidal shoreline are often pursued in order to protect adjacent property. Where county approval of tidal shoreline erosion control measures is needed, the Virginia Marine Resources Commission Habitat Management Division's Tidal Wetlands Guidelines should be consulted. Consistent with this guidance artificial shoreline structural elements should only be pursued where there is active, detrimental shoreline erosion which cannot be otherwise controlled, and such structures should be constructed in a manner that minimizes adverse wetlands impacts.

Living shoreline approaches to shoreline stabilization (approaches that apply biological techniques, using native plant species) have been identified by the Commonwealth of Virginia as the preferred stabilization methods for tidal shorelines. Only living shoreline approaches should be permitted unless the best available science shows that such approaches are not suitable. If the best available science shows that a living shoreline approach is not suitable, then elements of living shoreline approaches should be incorporated into permitted projects to the maximum extent practicable. Unless otherwise advised through such guidance, best available science resources include:

- Virginia Marine Resources Commission Habitat Management Division's Tidal Wetlands Guidelines,
- Virginia Institute of Marine Science's Comprehensive Coastal Resource Management Portal, and
- Virginia Institute of Marine Science as the Commonwealth's designated science advisor on coastal and marine natural resource-related issues.