

Biophilic Arlington

A Natural and Human Approach to Sustainable Urban Futures

Summary

Living in proximity to nature makes people happier, healthier, and more productive. Biophilic cities, where a commitment to natural space and natural features is at the core of planning and design, provide abundant and varied opportunities to connect residents with the natural world. By committing to biophilic principles, Arlington will realize numerous, tangible benefits for its future as a sustainable county and a nurturing human habitat.

The Biophilic City Concept

“Biophilia” means having an affinity for and kinship with nature. Humans have evolved in and with nature, and are still innately attuned to the natural world. This is because all humans retain genetic traits—operating through the five senses and affecting the nervous, endocrine and circulatory systems—that continue to resonate with the myriad stimuli of natural environments.

Urbanism is a major feature of human cultural evolution. It is a means of accommodating and organizing large populations in focused geographic space, and an opportunity for dynamic social interaction and economic efficiencies. Urban development, however, can separate inhabitants entirely from the natural environment.

A biophilic city is an urban area that recognizes the importance of natural habitat and intentionally designates natural space and natural features as a priority in its planning and development. Similarly, a biophilic community is an urban population for which natural space is everyday space, and the opportunity to experience nature is both readily available and regularly practiced. For urban jurisdictions, biophilic design is a strategic perspective on plans, policies, programs and resource allocation concerning the space residents inhabit and share. It applies to a broad range of stewardship contexts, including land use, development, construction, environment, transportation, and infrastructure. It influences the scope and delivery of public services, public information, education and recreation. In all cases, it centers on prioritizing nature-ful habitat for human wellbeing.

Why a Biophilic Arlington Matters

Arlington County is recognized as a desirable place to live and work. For a small, urban community, it has many notable natural assets. It also has a central location in a larger metropolitan area, providing economic opportunity, a wide choice of cultural, intellectual, and recreational amenities, and a stable tax base. But Arlington, like many other

communities, is already facing challenges in balancing future population and economic growth with preserving and maintaining the essential character that provides residents with a resilient and nurturing home town. Residents have clearly demonstrated a dominant preference for natural spaces, and paths and trails to access them, as overwhelmingly illustrated in the 2016 citizen survey for the “Plan for Our Places and Spaces” initiative, and as noted in the draft Public Spaces Master Plan that derives from that initiative. Arlington must strive to enhance its role as healthy habitat for residents while also allowing for healthy development of the county itself. A key to that balance is a commitment to biophilic principles.

Benefits, Impacts and Advantages of a Biophilic County

A biophilic approach to urban planning and design is human-centered and derives from emerging research and experience that connects the fundamental premises of sustainable urban environment with new concepts and data about the intricate relationship between humans and their habitat. From land use to transportation, from parks to schools, from residential neighborhoods to business enclaves, biophilic design creates a multiplier effect to the quality-of-place benefits in the community. Being rooted in human genetic predispositions, however, it also brings quality-of-existence benefits to each individual who experiences everyday life in a biophilic community.

The following sections delineate many of the benefits and positive impacts that can result from community adoption of a biophilic approach to planning and design.

Environmental Protection

Biophilic design is compatible and complementary with a wide variety of existing environmental protection and energy conservation priorities, bringing into consideration more comprehensively the impact on everyday experience. Guidelines for stormwater control, air quality, or building energy efficiencies (LEED), all very important in their own right, certainly contribute to biophilic results. But successfully addressing those specific requirements is not sufficient to bring the full spectrum of benefits to residents that can be obtained when they are part of a broader strategic approach based on biophilic principles.

A biophilic approach contributes to:

- Improvement of air quality, including carbon and particulate levels.
- Improvement of water quality, including chemical content, erosion and silt flow, and retention of groundwater.
- Enhancement of local resilience to weather and climate impacts, and the perception by inhabitants of those impacts.
- Reduction of intrusiveness of undesired light and sound, and the perception of their intrusion.
- Reduction heat-island effect with use of tree canopy and other plant cover, rather than paved surfaces, as well as with green roofs, green walls and solar panel installations.

Health and Well-being

At the heart of the biophilic city concept is the direct and documented benefit that everyday nature provides to humans who experience it. These are physiological and psychological impacts grounded in human evolution, and are universal in humankind. We are not only

nurtured by nature, we are soothed and protected from the unhealthy facets of the built environments we create and the lives we live in them. From a growing body of evidence:

- Physiological and neurological evidence demonstrates the significant effect that exposure to natural spaces and features has on blood pressure, cortisol levels, and heart rate.
- Natural space can help individuals deal with emotional stress, anxiety, and fatigue.
- Natural surroundings and the ability to spend time in natural spaces can help balance the sympathetic and parasympathetic portions of the nervous system, support immune system function, and reduce vulnerability to psychosomatic and anxiety-based afflictions.
- Engagement with natural settings helps restore energy, reduce frustration and irritability, mitigate mental distraction, and improve ability to concentrate.
- Engagement with nature and natural design in hospitals is demonstrated to be beneficial to patients suffering from illness or injury, including more rapid recovery, reduced need for medications, and a better emotional state. Families and caretakers also benefit.
- Phytoncides, chemicals exuded by trees and other life forms in woody areas, contribute to the well-being of anyone who inhales them by their positive effects on the nervous and endocrine systems.

Education and Child Development

It is widely recognized that childhood exposure to outdoor, physical play is in decline and is a cause for concern. This is particularly true for experience in natural spaces. Increasingly, it is known that nature and natural spaces provide unique opportunities for learning and development, as well as health benefits, including the following:

- Local natural parks and gardens provide nearby hands-on opportunities for science teaching, from ecology and biology to geology and environmental science.
- Regular activity in natural space is demonstrably therapeutic to children with anxiety or attention-deficit disorders, reducing frustration and restoring calm and ability to focus.
- Accessible natural spaces provide unparalleled opportunities for exploration and discovery, essential ingredients of child development and of learning about the world and self, including self-esteem and self-confidence.
- Programmed activities in natural spaces increase student awareness of the importance of nature, and of natural resource stewardship and responsibility. Without experiences in nature as children, many will have difficulty caring for or relating to nature as adults.
- Nature provides an experience that is interactive and dynamic. It surrounds with a complex array of sensory stimuli, such as visual patterns (fractals) that captivate, fascinate, and nourish creativity with forms and action that are innately interesting. Cognition, problem-solving and imagination are exercised in natural settings in ways that artificial environments cannot replicate.

Natural Habitat and Biodiversity

Biophilic design brings nature closer to people, therefore bringing people closer to nature, on an everyday basis. It serves as an umbrella concept for responsible stewardship of land

and resources, and promotes an awareness of the natural world that is our origin. A biophilic approach emphasizes:

- Use of native plants, which are acclimated to our soil, climate, and pollinators, and therefore provide a more efficient and resilient approach to landscaping.
- Healthy and diverse habitat, enabling a wide array locally appropriate flora and fauna, from migrating birds to critically needed pollinating insects to the hundreds of documented species of wildlife known to reside in our urban county.
- Nature in the built environment, making the county feel alive and bringing many everyday benefits to those who garden, walk, and watch.
- Nature-ful walkways, pathways, plazas and other pedestrian features and spaces that make possible and encourage walking for transportation, health and pleasure.
- Everyday opportunities for residents to experience the sights and sounds of nature and to discover the wonders of our natural community.

Economics and Business

Recent studies are demonstrating that nature has value, and that value can be accounted for in areas ranging from health care costs to employee productivity, and property values to retail profits. The scope of these positive impacts is broad:

- Biophilic design in and around the built environment promotes ability to focus, maintain cognitive acuity, and recover from mental fatigue, contributing to employee and student performance in measurable ways.
- With significant portions of workplace costs attributable to personnel, the positive impacts of biophilic design can produce measurable profit enhancements that result from improvements in attendance, retention, learning, and attitude.
- The fullest benefit of a biophilic built environment results from creating nearby natural spaces that are visible, and perhaps audible, outside. Project siting, surrounding land use, and building design all play a role in maximizing the biophilic workday, school day, or shopping day.
- A high valuation of natural space in a community enhances the value of the community directly (assets) and indirectly (identification with, and commitment to, community).
- Natural spaces and natural features in the built environment create a positive atmosphere for all retail activity, enhancing customer experience and as well as sales.
- Natural spaces and features, such as trees and parks, have quantifiable benefit for communities, including property values, concomitant tax revenues, and attractiveness to new businesses and employees.

Social Activity and Community Participation

Natural environments provide amazing everyday experiences, stimulate curiosity and wonder, and promote interest in how our world works, for residents of all ages. Sharing common experiences in nature promotes community cohesion and an awareness of the common interests of residents. Examples are:

- Gardening and park care provide essential opportunities for children and adults to share equity and stewardship in the community.

- Plentiful natural public spaces create more opportunities for a variety of outdoor social experiences and events for families and groups of all sizes.
- Abundant opportunities to experience nature stimulate interest in our outdoor environment and promote concern and caring for our natural neighbors as well as our human neighbors.
- Interconnected parks, corridors, and natural islands in the built environment provide opportunity, incentive, and safer travel for residents, employees, visitors, and wildlife to travel around Arlington by car-free means, helping to reduce pollution and congestion and promoting exercise.
- Participation by volunteers such as Master Naturalists, Master Gardeners, Tree Stewards, and individuals and groups who serve as stream monitors and stream clean up groups adds to the sense of shared stewardship and commitment to our community. These service initiatives also are a significant supplement to the resources regularly allocated by the county for its existing biophilic programs.

Characteristics of a Biophilic County: “Arlington, Naturally”

In committing to biophilic principles, Arlington will continue and strengthen its existing recognition and protection of our natural heritage and assets, the common good, and accountable government. The following sections describe some of the ways a biophilic emphasis would be observable in our civic culture and in our county planning and prioritizing.

Community Ethos, Citizen Engagement, and County Government Commitment

- Being a biophilic city is about both the availability of Arlington’s natural assets to its residents and public recognition of those assets as part of the county’s identity. Arlington’s biophilic identity is expressed in official policies, actions, and communications and evidenced in public awareness, support and participation community affairs.
- Leaders and residents recognize the human role in protecting and improving natural spaces, and that a biophilic habitat benefits everyone and makes a more desirable and healthy community.
- A biophilic Arlington will directly engage in, be knowledgeable about, and show responsibility for the nature around us. Awareness of and appreciation for nature will be promoted to all citizens and ages through various means, from citizen science to school-based education.

Policies, Plans, and Strategies

- Ensure that nature is a priority in urban planning, zoning, and management functions in all areas and levels of government. Performance goals and measures include biophilic targets and results. Best practices for conserving and integrating natural habitat are included among planning options.
- Integrate nature into public and private development planning (such as site plans) in a meaningful way. Prioritize preservation of natural space and natural enrichment of all outdoor space.

- Create a permanent fund for land acquisition to combat continued loss of needed public open space and to restore and maintain adequate ratios of natural parks and recreational spaces to Arlington's population.
- Enrich wildlife habitat--through the inclusion of native plants, small ponds, butterfly gardens, trees, and shrubs--as a standard practice in development planning.
- Encourage use of natural elements (such as green roofs, rooftop gardens, courtyards, and atria with native plantings) into buildings, and ensure that access to natural spaces is available, through park paths, intra-county trails, and walkway connections within the built environment.
- Adopt a bird-friendly window policy to prevent bird mortality from window strikes. Include provisions for new construction and for retrofitting existing structures in areas of concern. New glass technology can save birds while improving energy efficiency.
- Adopt a dark-sky policy to limit strong night lighting in and on tall buildings and towers to avoid interference with bird navigation and enhance views of the night sky, without affecting safety or functionality at ground level.
- Provide priorities and guidelines to businesses and developers to facilitate negotiations and avoid confusion, time delays, and development costs of plans and designs that are not in line with county biophilic principles.
- Ensure that in both facilities and curriculum, the public school system is a full participant in the biophilic commitment. Teachers and students are fundamental to a biophilic future, and school grounds are valued open spaces for outdoor recreation and exposure to nature.

Programs and Initiatives

- Create connections between parks, privately owned open spaces, and other natural areas, producing a network of corridors that link the many small habitats to each other and to the existing larger natural areas along Four Mile Run, the Potomac River, and the many stream branches throughout Arlington.
- Promote and incentivize preservation of existing trees, especially on private property, and promote planting of native tree species throughout the county. Replacement timelines are measured in decades.
- Adopt a countywide initiative for all public and private spaces to increase planting of native ground cover, small plants, and shrubs. Determine a feasible target and time frame, and establish incentives to promote the cause. Ten-in-Ten (10% of all planted space within 10 years being native) is one example. Include the business community, adult and youth service organizations, and the schools in this initiative.
- Incentivize homeowners to create backyard habitats and support certification programs for wildlife-sanctuary properties (such as National Audubon Society and National Wildlife Fund backyard-habitat certifications).
- Communicate and educate the public about Arlington's natural spaces and features, their importance to the community, and their benefits, through improved signage, enhanced information sources, recognition and celebration programs, and expanded facilities and programs to help residents learn about nature and its importance for human habitat.

Biophilic Arlington: A Naturally Sustainable Approach to the Future

Arlington County is known locally and recognized nationally as a superior place to live, work, and play. Our county's natural heritage--its parks, trails, trees, and wildlife--is a key element in this recognition.

Leaders and residents in many urban communities are increasingly aware and appreciative of both the value and the vulnerability of urban natural space. Around the globe, cities are formalizing their commitment to a natural urban environment as both an expression of identity and a guideline for development. The Biophilic Cities Project at the University of Virginia School of Architecture, founded and directed by Professor Tim Beatley (biophiliccities.org), provides information resources, a forum for development and exchange of ideas and experiences among partner cities, and recognition. Cities such as Birmingham, UK, Washington, DC, Austin, TX, Portland, OR and Wellington, NZ have already joined and are celebrating their commitment to urban nature.

The Arlington County Board has demonstrated a strategic and ongoing commitment to its people, its space, and its future, by declaring Arlington to be a biophilic county and becoming a Partner in the Biophilic Cities Network.

David Howell, December 2017

(Natasha Atkins, Elizabeth Gearin, Joslin Gallatin, Caroline Haynes, Evan Howell, Kurt Moser, Bill Ross, and Stella Tarnay contributed to or commented on earlier versions of this document.)

Selected Resources on Biophilia and Biophilic Design:

Beatley, Timothy. *Biophilic Cities: Integrating Nature into Urban Design and Planning*. Island Press, Washington, DC. 2011.

Beatley, Timothy. *Handbook of Biophilic City Planning and Design*. Island Press, Washington, DC. 2016.

Browning, Bill; Garvin, Chris; Ryan, Catie; Kallianpurker, Namita; Labruto, Leslie; Watson, Siobhan; Knop, Travis. *The Economics of Biophilia*. Terrapin Bright Green, LLC, New York. 2012.

Louv, Richard. *The Nature Principle: Human Restoration and the End of Nature-Deficit Disorder*. Algonquin Books of Chapel Hill, Chapel Hill, NC. 2011.

Williams, Florence. *The Nature Fix: Why Nature Makes Us Happier, Healthier, and More Creative*. W.W. Norton & Company, New York, NY. 2017.