

Green Infrastructure Working Group

Getting Greener in Lexington – Moving the Conversation Forward

Making it easier to walk or ride your bike to your friend's house, the library, or the store; plant a tree; or walk along a shaded sidewalk or path.

January 20, 2023

Protect, preserve, and promote Lexington's natural ecosystems and green infrastructure as a cornerstone of sustainable development and social, environmental, and economic well-being.

-- Lexington 2020 Comprehensive Plan

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Part I – Executive Summary and Introduction

Executive Summary

The [2040 Lexington Comprehensive Plan](#) adopted by Planning Commission and City Council in 2020 was well received; the proof of its value is how City Council, City Administration, various commissions, community partners, and the public use the Plan. With the Plan's adoption, City Council and Planning Commission introduced an innovation in planning practice by nominating catalyst projects that begin implementing different aspects of the Plan. **One such catalyzing project was reconvening the Green Infrastructure Working Group. Its new charge was to recommend to Council and Planning Commission how Lexington can achieve the goal, objectives and strategies established in the Green Infrastructure Chapter.**

In addition to laying out green goals, the Green Infrastructure Chapter highlighted the value of partnerships among residents, businesses, local nonprofit organizations, major institutions, agencies, and City Hall to create a greener, more sustainable Lexington. Past City Council initiatives demonstrate how City Council and Lexington residents value our natural resources and open spaces. Examples include funding the City Arborist, the Tree Board, the Tree Canopy study, the Woods Creek and Trail restoration, stormwater retention projects, and recycling programs. The Lexington News-Gazette editorial of December 14, 2022 highlighted these past accomplishments as examples of what can happen to create a greener, more sustainable Lexington (see Annex 8)

There are other examples of how the Lexington community and the Council have come together to address both opportunities and challenges facing our City. For example, in 1966, the Historic Lexington Foundation was founded when many of Lexington's buildings were threatened with demolition by neglect, and in 2013 Main Street Lexington was established as a volunteer committee to create a prosperous and welcoming downtown. Since their founding, both organizations have significantly contributed to Lexington, raised external financial resources, and mobilized community support.

The working group reflected on the multi-disciplinary nature of advancing green infrastructure and identified numerous organizations, agencies, and institutions already engaged in these beneficial initiatives. A stroll down Main Street during the Rockbridge Community Festival illustrates the contributions of many organizations that make Lexington an engaged community. The City can harness this resource to advance green infrastructure.

We recommend using the Collective Impact (CI) model (described later in this Report, p. 28) to leverage a public/private partnership network for further advancing the green infrastructure initiatives for the City of Lexington. This collaborative approach is becoming the preferred model among funders, and three local organizations/coalitions have successfully adopted CI to achieve noteworthy outcomes: Boxerwood, Live Healthy Rockbridge, and Rockbridge Outdoors.

The Report organizes the suggested strategies in the Green Infrastructure Chapter around six initiatives that form the basis of an integrated approach, much of which can be advanced by a well-coordinated community effort. Tapping the expertise of our major institutions, community partners, and talented individuals can significantly move these initiatives forward for all Lexington neighborhoods and residents.

✓ Health and Recreation	✓ Bicycle-Pedestrian Network
✓ Urban Green Space	✓ Land Use Development
✓ Waterways	✓ Climate Change, Resilience, and Sustainability

What is Green Infrastructure?

The Comprehensive Plan includes a description of Green Infrastructure that addresses different concerns and opportunities within the natural and built environment. These include urban open space, the natural environment, natural corridors, and the places where the built and natural environment overlap. As noted in the Green Infrastructure chapter:

- Green infrastructure includes natural and nature-based systems and corridors that sustain clean air, water, wildlife, and biodiversity while enriching the quality of life for communities and residents.
- Green infrastructure includes planned and unplanned networks of natural areas and open spaces at the regional scale, including parks, nature reserves, river corridors, trails, forests, and wetlands.
- At the local scale, green infrastructure can be parks and open spaces associated with schools, universities, major institutions, cemeteries, rain gardens, bioswales, green walls and roofs, and tree canopy.

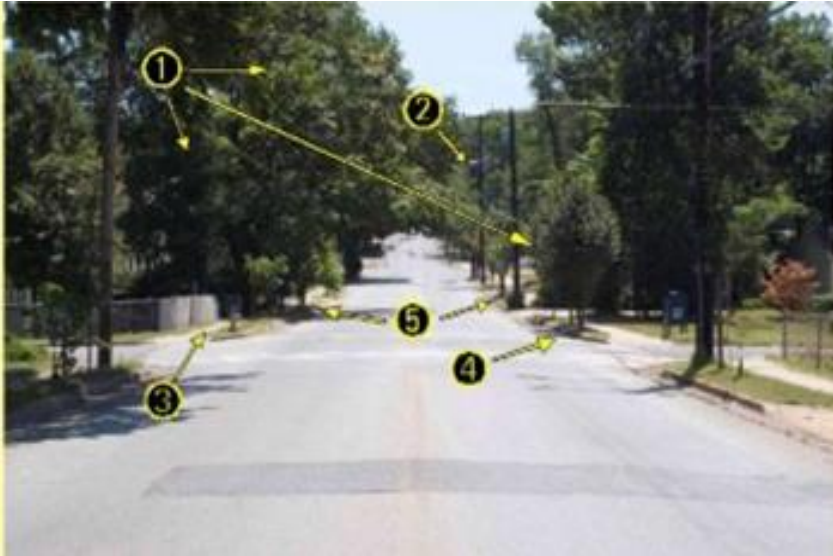

Co-Benefits

Figure 1, the Greening of Decatur Street, gives a vivid example of **the co-benefits of green infrastructure**: the tree canopy provides shade, sidewalks promote wellness, walking, and accessibility; bike lanes promote safety and encourage ridership, stormwater management using bioretention filters pollutants, curb bump-outs slow traffic, and L.E.D lights reduce energy consumption. Other examples of co-benefits are the Maury River and the parallel Chessie Trail; we benefit from access to nature, and wildlife benefits from a protected green corridor that preserves biodiversity.

Report Highlights

- *Health and Recreation.* The co-benefits of green infrastructure and health and recreation are numerous and highlighted in the Report, as well as ensuring equity in access to open spaces, parks, tree canopy, safe pedestrian and bicycle routes, and shopping and services.
- *Waterways.* To maintain and improve the quality of our waterways, we can review city codes and development standards that impact water quality and implement stormwater best practices that filter pollutants before they enter our waterways.
- *Urban green spaces.* An updated Urban Tree Canopy report will direct tree plantings to neighborhoods that need shade and to green corridors where biking and walking are encouraged.
- *Bicycle-Pedestrian Network.* We are fortunate to have a Bicycle-Pedestrian Plan whose implementation can be expedited by a three-year work plan with an initial focus on upgrading crosswalks and ensuring a safe walking and riding environment for children and residents with disabilities around schools and frequently visited destinations.
- *Land-Use.* Our land use practices can further support biodiversity and environmentally sensitive site design by reviewing our codes and joining other cities to promote monarch butterflies and bees.
- *Sustainability.* We have two major educational institutions and two community-based nonprofits actively engaged in sustainability initiatives. Tapping their expertise can move Lexington forward to improve our resilience.

Figure 1—The Greening of Decatur Street

Before	After
	
<p>1. Tree Canopy. Non-native and low-growth trees reduce habitat and contribute to the urban heat island effect.</p>	<p>1. Tree Canopy. Native large canopy trees increase habitat, clean air, and cool street, sidewalks, and homes.</p>
<p>2. Street Lighting. Sodium and mercury vapor streetlights are inefficient; lights above the trees result in less light reaching the sidewalk.</p>	<p>2. Street Lighting. L.E.D streetlights are extremely efficient and closer to the street to enhance public safety.</p>
<p>3. Walkability and Accessibility. Broken and narrow sidewalks limit access for disabled persons and strollers.</p>	<p>3. Walkability and Accessibility. ADA-compliant sidewalks (36 inches wide) promote wellness, walking, and community.</p>
<p>4. Bike Access. The wide street promotes speeding, making it less safe for bikes and pedestrians. In addition, the lack of dedicated bike lanes discourages bike use.</p>	<p>4. Bike Access. Clearly marked bike lanes promote safety and are an alternative to cars.</p>
<p>5. Storm Water. The storm water drains debris and pollutants directly into local rivers.</p>	<p>5. Storm Water. Bioretention gardens and tree boxes filter pollutants and debris.</p>
<p>6. Traffic. No bump out</p>	<p>6. Traffic. The bump out produces a 'wiggle' in the street, slowing traffic.</p>

Source: [Greening of Decatur Street](#), Edmonston, Maryland, population 1617 (2020 census)

Introduction

Scope

The Green Infrastructure Working Group is organized through the Planning Commission as a catalyst project under the Comprehensive Plan. The scope of the Group's work was two-fold:

- Provide advice and practical recommendations during the development by consultants of the Bicycle-Pedestrian Plan under the broader aim of enhancing connectivity.
- Review the Green Infrastructure Chapter and recommend to City Council, Staff, and Planning Commission how the strategies in the Chapter can be implemented over time by working with local public/private/nonprofit organizations.

Membership

The Green Infrastructure Working Group was initially formed in 2019 to advise the Planning Commission while drafting the Comprehensive Plan. In 2021, Planning Commission reconvened the working group with former and new members that include:

Sam Allen - Resident, **Arthur Bartenstein** - ABL Landscape Architecture, **Betty Besal** - Tree Board, **Pat Bradley** - Planning Commission, **Dale Brown** - VMI (retired), **John Driscoll** - Planning Commission, **Hugh Latimer** - W&L, **Lee Merrill** - RACC, **Jess Reid** - Lexington Running Store, **Holly Ostby** - Carilion Clinic, **Elise Sheffield** - Boxerwood, **Alexia Smith** - Friends of Brushy Hills, **Barbara Walsh** - RACC, **Dave Walsh** - Red Newt Bike Shop, **Chris Wise** - Friends of the Chessie Trail. The City is fortunate to have such depth and breadth of expertise and interest.

Process

The Group held ten Zoom meetings from October 2021 to December 2022. Two of these meetings focused on the Bicycle-Pedestrian Plan to provide feedback to the consultants, Michael Baker International. The remainder of the meetings reviewed the different aspects of the Green Infrastructure Chapter, including its goals and strategies. We also benefited from presentations by members of the Working Group. Annex 1 includes a listing of the meetings and presentations.

On October 27, 2022, the Planning Commission reviewed a Draft Report, voiced their support for the recommendations, and requested that the Working Group provide additional information on the next steps, implementation, and how to move the Report forward. As a result, the Working Group prepared a Briefing Note outlining seven items: priorities; the Collective Impact (CI) Model including potential partners; the formation of a transition group; funding; next steps; a name for the initiative; and a suggested motion. At their January 12, 2023 meeting, Commission members concurred with these recommendations and proposed forwarding the Report and the Briefing Note to Council after a final review at the next Planning Commission meeting on January 26, 2023.

"Our parks, our creeks, and all those connections between them are equal in value and services to the roads that carry us to various places."

Green Infrastructure Working Group



Green Time on the Chessie Trail—The Chessie Trail Marathon

"Green Time" promotes physical activity and makes Lexington a more attractive City to work, study, and live by connecting the population to the natural world and each other. Green time is contingent upon green infrastructure for destinations and corridors for play and exercise, reducing stress and improving mood, encouraging social interaction and community building, and fostering an appreciation of nature.

(Lexington Comprehensive Plan 2040)

Part 2- Initiatives

The Green Infrastructure chapter describes the ecosystem of a healthy and vibrant community, with the six initiatives in the Report reflecting Lexington's places, climate, and topography. For each initiative, the Report highlights its value and provides a description, notes the relevant strategies within the Green Infrastructure Chapter, and suggests recommendations on implementation. Potential partners, many of whom are already engaged in these initiatives, are suggested or noted. For example, Live Healthy Rockbridge, a collective impact coalition, actively engages with health and recreation-related initiatives. Some initiatives, such as the Bicycle-Pedestrian Network, are well advanced in planning, with the focus now shifting to implementation. Finally, in selected initiatives, the working Group included an implementation matrix. Educational resources used in drafting the Report are listed in Annex 6.

- **Health and Recreation**
- **Urban Green Space**
- **Waterways**
- **Bicycle-Pedestrian Network**
- **Land Use Development**
- **Climate Change, Resilience, and Sustainability**

The Timeframes noted throughout the document are from the Comprehensive Plan:

- **The Short-term** (1-5 years) can be completed within five years of the Plan's adoption;
- **The Long-term** (5+ years) may be initiated within five years but will be completed beyond the first five years of the Plan's adoption; and
- **Ongoing actions** which will continue for the life of the Plan.

While the Comprehensive Plan is a statutory document required by Virginia, this Green Infrastructure Report is non-statutory. Instead, it's a roadmap to implement the Comprehensive Plan's Green Infrastructure and Natural Resources chapter using resources within the city administration, community organizations, major institutions, and Lexington's residents and businesses. The recommendations and suggested actions range from low-hanging fruit to longer-term projects that different interested parties can undertake.

Health and Recreation

Value and Description

Increasingly, cities and towns are realizing the health benefits of green infrastructure investments. These investments include practical measures such as street trees and increasing urban forest coverage to improve air and water quality, reduce heat island effects, and support walkable communities. A healthy population is the foundation of a community's economic vitality, civic engagement, and social fabric. Additionally, studies demonstrate how lower-income communities do not have the same access to parks, trees, and garden areas as their more affluent neighbors. Lastly, research shows the connection between access to nature and mental health benefits.

The 2021 [Rockbridge Area Community Health Assessment](#), developed over a year-long process, provides an in-depth look at the area's health and resulted in a Community-wide Strategic Plan supported through the activities of the Live Healthy Rockbridge coalition. Numerous topics emerge from the coalitions' assessment and activities that closely link to the Green Infrastructure Chapter. This includes connectivity and ensuring access from neighborhoods to destinations such as health care services, grocery stores, bus stops, and recreation sites. Ensuring equity in access underpins the approach. The following summarizes key points from the health assessment and the links to green infrastructure.

Health Behaviors - In a city as small as Lexington, how can we make it easier for residents to choose healthy options such as walking and biking to engage in everyday activities like going to work, accessing health care, grocery shopping, visiting the library, or going to city hall.

Socioeconomic factors - We must make sure the bike/pedestrian improvements address connectivity and improve infrastructure quality in and around lower-income neighborhoods. For many lower-income households, access to transportation is seriously limited, so walking or biking are often the only means of accessing essential services like health care or groceries.

COVID-19 - While many of the restrictions regarding the pandemic have eased, the fact remains that Covid is still here. Anything we can do to promote outdoor activities and provide safe places for people to congregate outdoors helps mitigate the impacts of Covid. This means ensuring that we have outdoor spaces that are consistently accessible to the most vulnerable in our community.

Mental health concerns are consistently identified as a top need in the community since the early community health assessments, and the 2021 assessment are no different. Studies have shown how outdoor activity helps ease stress and improve overall mental health.

***"Anything we can do to make it easier/more convenient to choose the healthy option is worth doing."
--Green Infrastructure Working Group***

Regarding recreational facilities, Lexington owns and operates a swimming pool, two City school athletic fields, and seven park facilities: three large parks, three neighborhood parks, and an athletic field complex (see map in Annex 4). The Comprehensive Plan also identifies two projects to improve trail connectivity and river access – the Brushy Hills Connector Trail and the Chessie Nature Trail expansions. Finally, the Comprehensive Plan notes the importance of continued investments to ensure ample access to parks, recreation facilities, and trails. These investments should include ADA improvements to green spaces and facilities to support the City's aging and disabled populations.

Comprehensive Plan

While numerous strategies in the Comprehensive Plan intersect with Health and Recreation, five focus on the relationship between health and access to services and green infrastructure.

- In the Transportation Chapter--TR 4.1 *Ensure fairness, equity, and community engagement in the transportation planning process and its nexus with housing, services, health, safety, and livelihood needs of all citizens and groups.*
- In the Community Facilities Chapter--CF 5.9 *Work with the health system and other health providers to implement the Rockbridge Area Community Health Assessment, where possible.*
- In the Green Infrastructure Chapter-- GI 5.1 – *Identify and collaborate with local organizations to promote the development and use of green infrastructure sites, linkages, and waterways within the City and the larger region, including sports organizations, the Rockbridge Area Outdoor Partnership, Carilion Rockbridge Community Hospital and retail businesses selling outdoor equipment.*
- In the Green Infrastructure Chapter-- GI 1.4 – *Plan for access to healthy, affordable, locally-grown goods for all neighborhoods by supporting sustainable food initiatives, such as urban agriculture, farmers' markets, and composting.*

Recommendations

- ✓ **Work with Live Healthy Rockbridge** to coordinate planned improvements with programming provided by local organizations.
- ✓ Prioritize infrastructure improvements related to walking and biking to **improve connectivity** between low-income neighborhoods, essential services such as healthcare, groceries (including the Lexington Farmers' Market), and social/support service organizations.
- ✓ Improve **ADA compliance for existing sidewalks** and identify trail sections that can be made **accessible**, such as portions of Woods Creek.
- ✓ Continue to maintain **improvements to local parks** made during 2020 and 2021 (more seating/tables) to facilitate and encourage outdoor socializing. Introduce picnic tables that are wheelchair friendly.

Urban Green Space

Value and Description

Urban green spaces offer both significant environmental and quality of life benefits. Studies have shown that a broad array of health benefits are associated with the availability of urban green space and physical activity. For example, greenways such as the Chessie Trail and Woods Creek offer all ages greater opportunities for active biking or walking for commutes, exercise, and errands. A significant proportion of vigorous physical activity in early childhood also takes place in urban parks and playgrounds. In addition, it is well documented that outdoor activity helps ease stress and improve overall mental health. Finally, outdoor civic spaces promote social interactions, a sense of belonging, cultural identity, and personal connection to our community.

Well-located and well-managed urban green spaces within the City increase property values and attract homebuyers and new residents. Cities and towns also recognize the importance of public spaces in building the local economy by providing places that combine socializing, working, and learning. Lexington's Courtyard Square and installing the picnic tables and canopy next to the library offer local examples. In addition, Lexington's link to regional green areas and trails, such as the Chessie Trail, Brushy Hills, and other trails, bring additional economic benefits through increased tourism.

Urban green space broadly includes publicly accessible parks, recreational fields, walking trails, and the tree canopy throughout the City. Examples in Lexington include Hopkins Green, Jordans Point Park, the Woods Creek Trail, and Brewbaker Field, among others. In addition, privately owned properties' landscape elements also significantly contribute to the community's green infrastructure fabric. While the public cannot access private property, owners have substantial opportunities to contribute to the health of Lexington's green infrastructure resources.

Green Infrastructure Chapter

Given the value of urban green space within Lexington, how can we increase, improve, and protect it for the future? Five strategies within the Green Infrastructure Chapter address Urban Green Space:

- *GI 1.1 Explore opportunities to improve or add public access sites and linkages and increase public access to waterways.*
- *GI 1.3 Undertake a city-wide green infrastructure assessment and develop a plan to create a continuous publicly accessible green infrastructure network that connects neighborhoods, destinations within the City, waterways, and regional assets.*
- *GI 3.2 Grow and maintain the City's tree canopy coverage through the existing tree planting program and other grants as may be available.*
- *GI 3.1 Develop Jordan's Point Park in accordance with the 2020 Park Master Plan.*
- *GI 3.3 Continue strengthening zoning and development regulations that address landscaping, tree preservation, and native plants. Consider incentives to promote tree planting and preservation beyond minimum requirements.*

Recommendations

The following recommendations are actions that will ensure that future Lexington citizens continue to have access to quality urban green spaces.

Trees

- ✓ Continue to **monitor the urban tree canopy** (UTC) and set goals and deadlines to increase UTC with each subsequent study.
- ✓ Extend **protection to private trees** by adding the designations of "memorial," "heritage," "specimen," and "street trees" to the Tree Ordinance.
- ✓ Update the City's Comprehensive **Tree Management Plan**.
- ✓ Focus tree planting in "**green corridors**" where biking and walking are encouraged.
- ✓ Focus tree planting in **neighborhoods with low canopy coverage**.
- ✓ Favor use of **native species for city plantings** wherever feasible.

Greenspace

- ✓ Develop a map of public, private, and institutional greenspace, and establish connecting biking and pedestrian corridors among them.
- ✓ Establish **use classifications for greenspaces** to allow different planting, maintenance, and mowing protocols.
- ✓ Establish **permanent protection and public access for existing parks and trails**, particularly in institutional overlay areas like college campuses.
- ✓ Establish **permanent protection for the Brushy Hills Preserve** in recognition of its sizeable value for "green time," habitat conservation, carbon sequestration, and other ecosystem services.
- ✓ Maximize **community value at Jordans Point Park** by increasing riverside access for fishing, swimming, boating, and other active and passive recreational uses.
- ✓ Work with DEQ, Virginia Department of Forestry, and other agencies to **stabilize streambanks and increase tree canopy at Jordans Point**.

Foundational Framework

- ✓ Foster "Friends of _____" and other groups to **encourage citizen involvement** in green infrastructure protection and care.
- ✓ Review existing City codes to ensure adequate **promotion and protection of trees and green space**.
- ✓ Encourage communication and **synergy among various City boards and commissions** (e.g., Tree Board, Architectural Review Board, Cemetery Advisory Board, Planning Commission) to ensure the establishment and protection of green infrastructure.

Urban Green Space Matrix - Key to Symbols					
City Council	CC	Master Gardeners	MG	Rockbridge County	RC
City Administration	CA	Tree Board	TB	Architectural Review Board	ARB
Public Works	PW	RACC (Land use Committee)	RACC	Cemetery Advisory Board	CAB
Planning Commission	PC	Friends of Brushy Hills	BH		

Urban Green Space Matrix		
	Potential Partners	Timeframe
GI 1.1 Explore opportunities to improve or add public access sites and linkages and increase public access to waterways.		
Increase River access for fishing, swimming, and boating at Jordans Point Park	CA, PC, CC, PW	ongoing
GI 1.3 Undertake a city-wide green infrastructure assessment and develop a plan to create a continuous publicly accessible green infrastructure network that connects neighborhoods, destinations within the City, waterways, and regional assets		
Develop a map of public, private, and institutional greenspaces and establish connecting bike and pedestrian corridors among them.	CA., PC, CC, TB, RACC	long
Focus tree planting in "green corridors" where biking and walking are encouraged.	CA, PC, CC, TB, RACC	long
Focus on tree planting in neighborhoods that have low canopy coverage.	CA, PC, CC, TB, RACC, PW	long
Establish use classifications for greenspaces to allow different planting, maintenance, and mowing protocols.	CA, PC, CC, TB, RACC, PW	long
Establish permanent protection and public access for existing parks and trails, particularly in institutional overlay areas like our college campuses.	CA, PA, CC, TB, RACC	long

Urban Green Space Matrix		
	Potential Partners	Timeframe
Establish permanent protection for the Brushy Hills Preserve, recognizing its sizable value for green time, habitat conservation, carbon sequestration, and other ecosystem services.	CC, PC, CC, BH., RACC, RC	long
GI 3.1 Develop Jordan's Point Park following the 2020 Master Plan.		
- Work with the DEQ and other agencies to stabilize streambanks - Increase tree canopy at Jordans Point Park.	DEQ, CA, PC, CC, TB, RACC, PW	medium
GI 3.2 Grow and maintain the City's tree canopy coverage through the existing tree planting program and other grants as may be available.		
Continue to monitor the urban tree canopy (UTC) and set goals and deadlines to increase UTC with each subsequent study.	TB, PC, CC, PW	ongoing
Update the City's Comprehensive Tree Management Plan.	TB, PC, CC, PW	short
Use native species for City plantings wherever possible.	TB, PW	long
GI 3.3 Continue strengthening zoning and development regulations that address landscaping, tree preservation, and native plants. Consider incentives to promote tree planting and preservation beyond minimum requirements.		
Extend protection to private trees by adding the designations "memorial," "heritage," "specimen," and "street trees" to the Tree Ordinance.	TB, PC, CC	short
Review City codes to ensure adequate promotion and protection of green infrastructure.	TB, CA, PC, CC	short
Encourage communication and synergy among various City Boards and Commissions (e.g., Tree Board, Architectural Review Board, Cemetery Advisory Board, Planning Commission) to ensure the establishment and protection of green infrastructure.	TB, ARB, CAB, PC	short
Foster "Friends of the ____" and other groups to encourage citizen involvement in green infrastructure protection and care.	CC, PC, CC, BH., RACC, RC	short

Waterways

Description and relevance



Elevation Study of Lexington showing waterways. Source: Arthur Bartenstein

Brushy Hills, located outside the city limits, were once a water source for Lexington and are protected by a 560-acre forest and watershed tract that is a hiking destination with 14 miles of trails. Moores Creek Dam, another historical source of city water (dating back to 1910), retains what is described as a 22-acre pristine lake of exceptionally clean water. According to DEQ investigations, water from Moores Creek still enters Woods Creek via pipeline, thus serving, especially in the summer, as a significant and valued "diluter" of urban creek pollutants. Moores Creek remains a potential emergency water source for the City if the old connection and water treatment requirements are addressed. Lexington also has smaller waterways, such as Sarah's Run, which feeds into Wood Creek, and Town Branch on the eastern side of Lexington. Unfortunately, Town Branch is barely visible after being covered over by development.

VA DEQ-instigated water quality studies undertaken in 2015/16 for Woods Creek recommended improvement measures, including locating pet waste containers and digesters along the trail. Previously, Lexington had obtained state grants for implementing stormwater best practices along Woods Creek. VMI's stormwater projects have focused on a combination of retention and removing contaminants from stormwater before it flows into Woods Creek and Town Branch. In addition, Lexington and Rockbridge are fortunate to have an active RACC Watershed Committee whose activities include water monitoring of local waterways.

Our natural waterways have influenced how Lexington developed since its founding and continue to be an essential part of our daily lives. We draw our drinking water from the Maury and enjoy walking along its riverbank on the Chessie Trail and kayaking, fishing, and swimming in its waters. The [Maury River](#) portion that borders Lexington begins around Jordan's Point and ends at Andy McThenia's property. At one end, city residents can access the Maury at Jordan's Point Park; at the other, the Uncas Trail leads to the river.

As of July 2022, the entire 42 miles length of the Maury, which begins and ends in Rockbridge County, is recognized as a [Virginia Scenic River](#).ⁱ The Virginia Scenic Rivers program recognizes and provides a level of protectionⁱⁱ to rivers with significant scenic, historic, recreational, and natural values. The Maury also acts as an important green corridor for wildlife and is listed in good condition by the [EPA](#) 'How's My Waterway' website.

The Maury is a tributary of the James, and thus of the Chesapeake Bay, whose poor health is the focus of significant watershed concern and activity by well-resourced federal, state, and private entities.

Woods Creek, flowing along the west side of Lexington, offers daily enjoyment to adults and children who walk and run along a maintained path connecting city neighborhoods to the city center and Washington and Lee and Virginia Military Institute. Unfortunately, Woods Creek has a Virginia DEQ status of 'impaired recreation and aquatic life.' The springs at

Green Infrastructure Chapter reference or strategy

- *GI 3.4 Promote the installation of stormwater best management practices such as bioswales, pervious surfaces, and rain gardens, including on City property and parking lots.*
- *GI 3.5 Enhance the protection of streams and natural wetlands by updating development standards and incentives to protect and restore buffer areas and discourage underground piping of streams.*
- *GI 3.6 Limit the extent of impervious surfaces that degrade water quality by considering reductions to minimum parking requirements and encouraging the use of pervious surfaces in development projects.*

Recommendations.

- ✓ Review **city codes and development standards that impact the water quality** of our natural streams and wetlands.
- ✓ Develop an integrated approach to **improve and maintain water quality along Woods Creek** among the City of Lexington, W&L and VMI.
- ✓ Engage the VMI academic community and cadets to **assess previous stormwater best management practices** by private land owners, developers, and the City of Lexington dating back to the 1980s; the research can inform future programs.
- ✓ Explore the potential for **the City of Lexington to adapt VMI stormwater management best practices**.
- ✓ Incorporate green infrastructure principles, including stormwater drainage best practices, **to improve retention and filtration possibilities as part of the VDOT bike path** and road improvements along North Main Street.
- ✓ Review and **secure potential grants to promote and protect water quality** via public and private programs.
 - ✓ The City of Lexington: Review grant funding opportunities for public projects eligible under the [Stormwater Local Assistance Fund](#) (SLAF). The program provides matching grants to local governments for best management practices (BMPs).
 - ✓ Private Residential landowners: Continue working with Natural Bridge Soil and Water Conservation District on voluntary programs and grants for residential landowners to reduce bacteria from pet waste, nutrients from lawn fertilizers, and various stormwater run-off pollutants from impervious surfaces. Most of the practices are eligible for a 75% cost-share, and some provide a flat incentive payment up to the installation cost; see <http://vaswcd.org/vcap>.

The recommendations above and the Matrix below focus on three activities: (1) using best practices in stormwater management to reduce the flow of contaminants to streams and Maury River, (2) updating zoning and development standards, and (3) pursuing education programs.

Waterways Matrix – Key to Symbols					
City Council	CC	Master Gardeners	MG.	Rockbridge County	RC.
City Administration	CA	Tree Board	TB.	Architectural Review Board	ARB
Public Works	PW	RACC (Land use Committee)	RACC	Cemetery Advisory Board	CAB
Planning Commission	PC.	Friends of Brushy Hills	BH.	NB Soil & Water Conservation District	SWCD
Carilion	CAR	Boxerwood	BX		

Waterways - Matrix	Potential Partners	Timeframe
GI 3.4 Promote the installation of stormwater best practices such as bioswales, pervious surfaces and rain gardens, including on City property and parking lots.		
For public property, incorporate design/construction standards into City ordinances and identify potential funding under the Stormwater Local Assistance Fund.	CA, PC, CC	Short-term
Coordinate with private development to promote stormwater best practices and identify adaptable best practices from major institutions such as VMI and W&L.	CA, RACC	Ongoing
Partner with environmental design firms to promote measures that can be incorporated into smaller-scale developments.	CA,	Ongoing
Partner with Natural Bridge Soil and Water Conservation District to facilitate access to voluntary programs and grants for residential landowners to reduce bacteria from pet waste, nutrients from lawn fertilizers, and new impervious surfaces.	SWCD, CA, MC, RACC, BX	Ongoing
Review city codes and development standards that impact the water quality of our natural streams, river, and wetlands and recommend priorities for code improvements.	PC, CC	Short-term
GI 3.5 Enhance the protection of streams and natural wetlands by updating the development standards and incentives to protect and restore buffer areas and discourage underground piping of streams.		
Identify and implement riparian mitigation efforts, including the removal of invasive plant species, reintroduction of native plant species, and stabilization and restoration of eroding creekbanks.	MC, TB, SWCD, BX	Ongoing
Implement stormwater management systems and procedures that meet or exceed State standards and regulations and involve on-site mitigation measures where possible.	CA, CC	Long-term

Waterways - Matrix	Potential Partners	Timeframe
Develop an integrated approach to improving and maintaining water quality along Woods Creek among the City of Lexington, Washington and Lee, and VMI.	CA, CC, SWCD, RACC	Long-term
GI 3.6 Limit the extent of impervious surfaces that degrade water quality by considering reductions to minimum parking requirements and encouraging the use of pervious surfaces in development projects.		
Evaluate existing parking requirements in each zoning category, including mixed-use developments- recommend reductions where feasible.	PC, CA, CC	Short-term
Determine a strategy to reward developers, builders, and property owners who install pervious paving systems in driveways, parking lots, and related areas.	PC, CA, CC	Short-term
Evaluate tax credits or, conversely, tax surcharges for impervious pavement.	CA, CC	Short-term



The Woods Creek Restoration Project (2002-2004) exemplifies how the City of Lexington, residents, community partners, Washington and Lee, and Virginia Military Institute can work together to improve Lexington's Green Infrastructure.

Bicycle-Pedestrian Network

Value and Description

In surveys undertaken during the Comprehensive Plan, pedestrian and bike infrastructure ranked among the top priorities for the community. The May 2022 [Bicycle and Pedestrian Plan](#), financed by VDOT, recommends bicycle and pedestrian routes that "*access desired destinations and increase the scope and pedestrian networks while working within the limited street width and available right-of-way found throughout Lexington.*" Elements of the recommended network include sidewalks, crosswalks, slow streets, bike lanes, sharrows, and shared-use paths. The Green Infrastructure Working Group met with the consultants and provided extensive written feedback on the initial draft shared with Planning Commission.

Within Lexington's Comprehensive Plan, there are numerous references to the importance of "building an interconnected and attractive transportation network that provides all residents with safe and efficient mobility choices --- including automobile, bicycle, and pedestrian travel" (p102). In addition, the Transportation and Green Infrastructure Chapters include the following strategies.

Transportation Chapter

- *TR 3.4 Create an interconnected network of pedestrian and bicycle infrastructure to link neighborhoods to downtown, parks, and other historic and green infrastructure amenities. Target bicycle and pedestrian connection and corridor improvements along Neighborhood and Civic Corridors.*

Green Infrastructure Chapter

- *GI 1.3 Undertake a city-wide green infrastructure assessment and develop a plan to create a continuous publicly accessible green infrastructure network that connects neighborhoods, destinations within the City, waterways, and regional assets.*
- *GI 1.5 Encourage access to energy-efficient transportation options by supporting the siting of e-vehicle charging stations and facilities for bicycles and other micro-mobility devices.*

The Plan presents a proposed network map (see Figure 2) that picks up on long-considered circular and cross-connect networks. Given the street width and relatively flat topography, the Plan shows a spine along Main Street and an overall loop consisting of Woods Creek on the west and Taylor/Spotswood/Lewis streets on the east. In addition, the Plan highlights five priority projects and includes a prioritization matrix. The Bicycle-Pedestrian Plan is available on the City's website [here](#).

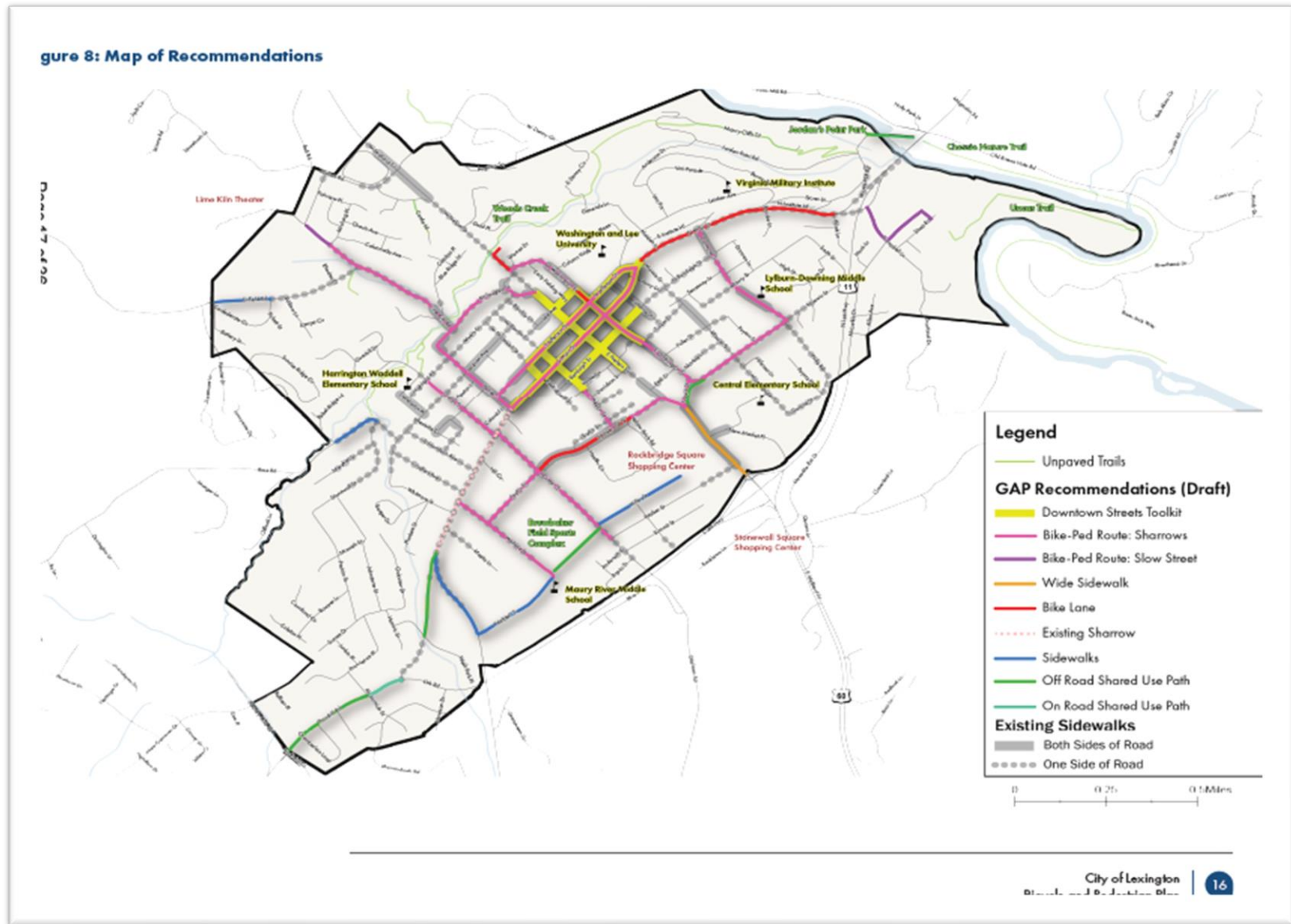


Figure 2. Map of Proposed Bicycle and Pedestrian Network, 2022

Recommendations

Priorities

- ✓ Prioritize a **safe walking and riding environment for children and residents with disabilities** around and leading to schools and frequently visited destinations, including adding and upgrading crosswalks identified in the Plan.
- ✓ **Plant trees along the main spines/routes** while we wait for infrastructure funding. Work with the Tree Board to identify appropriate trees to provide shade on sidewalks, including high-priority pedestrian corridors.
- ✓ Begin planning for the proposed **connection to the Brewbaker Field Sports and swimming complex**.

Planning and Management

- ✓ **Develop a rolling three-year work plan and timeframe for implementing the Plan.** Review recommendations for the Plan annually, and distinguish among potential projects that require capital funds, are eligible for grants, and can be done through maintenance and operations funding and volunteer engagement. **Develop a stakeholder group** to advise staff and City Council on bicycle-pedestrian improvements.
- ✓ Develop and **adopt implementation metrics** among City of Lexington Staff and Departments regarding the implementation of the Plan, for example:
 - Improve X linear feet of sidewalks within three years and upgrade Y number of crosswalks annually.
 - Develop typology and design guidelines for a safe street in Lexington, particularly for 'slow streets' tied to street repaving, sidewalk improvements, tree planting, and other utility improvements. See the example from Edmondson, Md. (p.3).
- ✓ Consider a **U.S. Department of Transportation grant** to develop or update a comprehensive safety action plan.
- ✓ **Map bicycle and pedestrian routes**, including on W&L campus and VMI post, and make these maps available to the public.

GAPs

- ✓ Address Gaps in the Plan, including:
 - Lack of bicycle parking at key destinations.
 - Continued cooperation with Rockbridge County to **link City-County trails and bike networks**.
 - Planning for increasing future **use of personal electric vehicles**, from electric scooters to e-bikes to electric golf carts.
 - **Bike and pedestrian paths on Thornhill Rd.** from the intersection of South Main to route 251.
 - Review of options for a **safe crossing of the Route 11 by-pass** connecting the isolated McCorkle/Campbell neighborhoods to the LDM School/Richardson Park; see Annex 2 for proposed elevated and grade crossing locations. ⁱⁱⁱ

Land Use and Development

Value and Description

How and where we build can have intended and unintended impacts on the quality of our neighborhoods, downtown, and commercial areas. A priority outlined in [Evaluating and Conserving Green Infrastructure Across the Landscape: a Practitioners Guide](#) is to 'protect natural assets and minimize land disturbance while keeping the landscape connected.' We are fortunate in Lexington and Rockbridge County that we have connected natural landscapes that can be conserved for future generations. However, additional research is required to identify practical steps to integrate green infrastructure and nature-based solutions into our land-use policies and infrastructure.

Green Infrastructure Chapter

1. *GI 1.6 Support urban wildlife and biodiversity initiatives such as "[Monarch Butterfly City](#)" or "[Bee City](#)" designations and citizen-led efforts to install birdhouses and bat houses.*
2. *GI 3.3 Continue strengthening zoning and development regulations that address landscaping, tree preservation, and native plants. Consider incentives to promote tree planting and preservation beyond minimum requirements.*
3. *GI 4.1 Educate and encourage landowners to install green infrastructure best practices, plant native trees and vegetation, and reduce fertilizer and pesticide use.*

Recommendations

- ✓ Support urban wildlife and biodiversity initiatives, e.g., **apply for Monarch Butterfly City and Bee City status.**
- ✓ Review zoning and development regulations to **incorporate environmentally sensitive site designs.**
- ✓ Identify partners for scaling up **educational efforts on green infrastructure best practices.**
- ✓ Review recently passed Virginia legislation for the [opt-in program](#) that allows localities to draft a local ordinance requiring developers to **plant new or preserve existing trees when they build.** ^{iv}
- ✓ Incorporate **green infrastructure elements into City GIS** to support Green Infrastructure conservation and restoration; see Annex 3.

Land Use and Development Matrix - Key to Symbols					
City Council	CC	Master Gardeners	MG	Rockbridge County & Lex Schools	RCLEX, Box
City Administration	CA	Tree Board	TB.	Architectural Review Board	ARB
Public Works	PW	RACC (Land use Committee)	RACC	Cemetery Advisory Board	CAB
Planning Commission	PC.	Friends of Brushy Hills	BH	NB Soil & Water Conservation District	SWCD
Carilion	CAR	Boxerwood	BX		

Land Use and Development Matrix	Potential Partners	Timeframe
GI 1.6 Support urban wildlife and biodiversity initiatives.		
Apply for Monarch Butterfly City and Bee City designations.	CA, MG	Short-term
Purchase and install informational signs to publicize the programs.	CA, MG	Short-term
Explore whether other, similar initiatives can be undertaken.	CA, MG, BX	Ongoing
GI 3.3 Continue strengthening zoning and development regulations that address landscaping, tree preservation, and native plants. Consider initiatives to promote tree planting and preservation beyond minimum requirements.		
Consider adding provisions for new development that specify minimum tree and landscape planting requirements per zoning classification.	CA, PC, CC,	Ongoing
Review zoning and development regulations to incorporate environmentally sensitive site designs.	CA, PC, CC	Ongoing
Incorporate green infrastructure elements into Lexington GIS system	CA	Ongoing
GI 4.1 Educate and encourage landowners to install green infrastructure best practices, plant trees and native vegetation, and reduce fertilizer and pesticide use.		
Coordinate with nurseries, garden centers, arborists, and other entities to help to publicize and educate the public about this initiative.	RACC, MG, BX	Ongoing
Coordinate with educational programs within area schools.	RCLEX, BX	Ongoing

Climate Change, Resilience, and Sustainability

Value and Description

Climate change is occurring and intensifying as a result of human activity. According to NASA, "multiple studies published in peer-reviewed scientific journals show that 97% or more of actively publishing climate scientists agree: Climate-warming trends over the past century are extremely likely due to human activities" (<https://climate.nasa.gov/scientific-consensus/>). Furthermore, a 2021 [EPA analysis](#) shows that the most severe harms from climate change fall disproportionately upon underserved communities who are least able to prepare for and recover from heat waves, poor air quality, flooding, and other impacts.

The impacts of climate change are becoming more local. For Lexington and Rockbridge County, this can mean rising temperatures, including an increase in the frequency of 90-degree plus days that stress residents, infrastructure, agriculture, and plants and animals. And we are experiencing more frequent extreme weather, from heavy rain and frequent flooding to extended drought periods.

Introducing an ecosystem approach to providing city services can help plan for more livable, healthy, and resilient cities. A 2015 study on the benefits of restoring ecosystem services in 25 urban areas concluded that investing in ecological infrastructure and rehabilitating ecosystems such as rivers, lakes, and woodlands are often economically advantageous, even based on the most traditional economic approaches. ^v

Currently, the City of Lexington and neighboring jurisdictions do not have a plan to systematically address climate-related issues, increase our resilience to potential climate-related impacts, or measure our progress toward eliminating local contributions to climate change. Washington and Lee University (W&L), Virginia Military Institute (VMI), Boxerwood Education Association (Boxerwood), and the Rockbridge Area Conservation Council (Rockbridge Conservation or RACC) have led local efforts to increase resiliency and reduce greenhouse gas emissions and energy use.

- **W&L has expanded the activities of its Office of Sustainability and is on 'an emissions mission to be a carbon-neutral campus by 2050.'** The university recently agreed to purchase energy equivalent to 100% of campus electricity from an offsite solar farm. Previously, from 2010 to 2019, the campus reduced its greenhouse gas emissions by 42% and saved over 8 million dollars in utility costs. In addition, the Sustainability Office recently initiated a Community Connections program to better align campus and community initiatives.
- **At VMI, seven buildings are either constructed or under development to meet Leadership in Energy and Environmental Design (LEED).** Additionally, after an energy audit, a new Post-wide building-automation system resulted in electrical use reduction of 9%, natural gas use remained the same despite increased square footage, and domestic water use was reduced by 6%. The Post also developed an extensive stormwater management program that includes above- and below-grade retention and reuse. The retention sites have reduced flooding and improved the quality of water released to Woods Creek and Town Branch.
- **Boxerwood, in cooperation with Lexington and the other two local school systems, provides a longstanding environmental education program for 2,000+ local students yearly, creating opportunities for students to become actively involved in sustainability initiatives and field-based conservation action.** This work includes working with school partners on school-based sustainability issues such as food waste, recycling, and habitat restoration. Boxerwood also facilitates the annual Backyard Composting Challenge with the City of

Lexington and Rockbridge County, increasing the number of composting households. In 2021 it also launched COREworks(Community Offsets for a Regenerative Economy). COREworks is a community-based voluntary carbon offset marketplace that funds local projects in Solar and Energy Efficiency, Tree Planting, Food Waste Diversion, and Regenerative Agriculture.

- **Rockbridge Conservation (RACC) members have monitored and improved the water quality of our streams; promoted land and wildlife conversation, regenerative agriculture, green schools, and planning for Green Infrastructure, Smarter Growth, and Low Impact Development;** sponsored two solar co-ops to help residents and businesses reduce energy consumption; acquired and managed trails; initiated community recycling and local foods programs; sponsored the annual community cleanup; and hosted numerous forums, seminars, and research initiatives to provide science-based information on community issues to residents and decision-makers since 1976. Additional ongoing initiatives related to climate change, resilience, and sustainability are co-sponsoring the Ready, Set, Solar residential and commercial solar program, facilitating solar for Habitat houses and E-vehicle education and recharging stations, running the community composting program in Lexington, encouraging the reduction of single-use plastics, researching landfill methane-emissions control, and actively contributing to Lexington's Green Infrastructure Plan.
- In January 2022, **Carilion Rockbridge Community Hospital was recognized by the EPA, earning "[ENERGY STAR certification](#) for superior energy performance.** Several initiatives, including capital investments in plant operations and preventative maintenance program for equipment, contributed to this recognition."

There are regional examples, often led by larger municipalities, where other City Councils have endorsed an Energy and Climate Action Plan (ECAP or CAP). For example, Charlottesville's current effort, [Charlottesville Acting on Climate Change](#), uses workshops, surveys, and cataloging of the sources of greenhouse gas emissions. In April 2022, Charlottesville City Council reviewed the [Preliminary Content for the Climate Action Plan](#) that will be the basis for a community town hall workshop. In September 2020, Blacksburg published a [Climate Action Plan](#) that focuses on mitigation and establishes a set of strategies to reduce community-wide greenhouse gas emissions.

A possible scenario for our region is to develop a climate action plan for Rockbridge County and the Cities of Lexington and Buena Vista. Tapping the expertise, student and faculty research, and possible resources of our four educational institutions (W&L, VMI, SUV, and MGCC), together with community partners such as Boxerwood and RACC, can offer an opportunity to develop a climate action plan matched to community needs.



Boxerwood Solar Collector funded through CORE works.



RACC GO Solar and Electric Vehicle public information event.

Some ideas on high-impact and easily achievable actions

Energy Efficiency/Clean Energy

- Transition traffic lights and streetlights to LED as part of upgrades & maintenance.
- Install programmable thermostats in city facilities.
- Transition to motion-triggered and LED lighting in city facilities.
- Phase in electric vehicles and equipment as equipment is replaced, or sooner if grants become available.
- Develop a policy for new public building construction or renovation to meet LEED/energy efficiency/LID/carbon neutral standards.
- Solarize schools and other public buildings as feasible.
- Install charging stations for EV

Carbon Sequestration/GHG Reductions

- Implement a shade tree planting program with a completion date to mitigate increasing temperatures in all neighborhoods and business districts.
- Implement all tree-related initiatives proposed in section in the Greenspace section (see p. 10)
- Identify carbon credit options for Brushy Hills.
- Support installation of methane controls at the Rockbridge Regional landfill.

Reduce Waste

- To advance the City's Zero Waste Resolution, adopt ordinances (e.g., plastic bag tax) and implement programs (e.g., expanded recycling, community-scale composting, and yard waste mulching, Caught Green Handed, state Styrofoam ban, etc.).

Green Infrastructure Chapter

The Green Infrastructure Chapter highlights two objectives related to climate change, resilience, and sustainability: (1) promote energy sustainability and environmental resilience; and (2) support partnerships that improve green infrastructure and protect natural resources.

Strategies:

- *GI 1.4: Plan for access to healthy, affordable, locally grown foods for all neighborhoods by supporting sustainable food initiatives such as urban agriculture, farmers' markets, and composting.*
- *GI 2.1: Encourage green building and green infrastructure in development proposals to increase property values and reduce infrastructure costs.*
- *GI 2.2: Improve the energy efficiency of City buildings and operations and assess the feasibility of installing solar panels on Waddell Elementary School.*
- *GI 4.2 Identify and collaborate with local organizations to educate landowners on installing solar panels.*
- *GI 5.3: Work with regional stakeholders to develop a comprehensive regional Energy and Climate Action Plan that identifies common issues, agreed-upon approaches and principles, joint action, and individual contributions by each partner locality and the major institutions of higher learning.*

Recommendations

Climate Plan & Actions

- ✓ Encourage Lexington Mayor and City Council to **join the [Global Covenant of Mayors for Climate and Energy](#)**. (Charlottesville, Roanoke, and Blacksburg are members.)
- ✓ Engage with W&L and VMI to assist Lexington in conducting a **baseline inventory of municipal energy use and costs**, including estimates of carbon footprint and greenhouse gases produced.
- ✓ Convene energy and climate action working group with representatives of the City (City Council, Planning Commission, Public Works), W&L, VMI, residents, businesses, Boxerwood, RACC, and others to identify possible **actions to reduce Lexington's carbon footprint and increase sustainability and resiliency**. Identify other key players to include and invite speakers from neighboring municipalities to learn about their approaches. Develop carbon reduction goals, strategies, and timelines.
- ✓ Promote a **regional climate change action plan** by partnering with Rockbridge County, Buena Vista, and educational institutions. Develop a regional vision of sustainability and adopt a joint plan of action complete with metrics and milestones.

Community Sustainability

- ✓ Partner with and support efforts of our nonprofit community to **promote energy sustainability and environmental resilience among Lexington households**, including current initiatives led by Boxerwood and RACC.
- ✓ Collaborate with the Threshold Commission and Habitat for Humanity to **identify opportunities for energy efficiency and solar improvements and retrofits for lower-income households**.
- ✓ Recognize the desirability and responsibility to **facilitate development of appropriately-sited solar panel power generation** on building rooftops in Lexington (as feasible) and devise promotion incentives.
- ✓ Continue to **promote waste reduction strategies**, including composting, with local partners and the regional landfill.

"Green infrastructure is the interconnected natural systems and ecological processes that provide clean water, healthy air quality, and natural habitat for humans and wildlife."

--Green Infrastructure Working Group

Part 3 Making it Happen

Who is involved in Green Infrastructure?

The Green Infrastructure Chapter emphasized the importance of engaging citizens in efforts to create a greener, more sustainable Lexington and supporting partnerships to protect natural resources. As noted in other sections of this Report, nonprofit organizations and higher education institutions are already contributing to the planning and implementation of green infrastructure initiatives. This last section of the Report suggests how we can engage, leverage, and align our community resources and initiatives with residents, businesses, city government, and nonprofits. Table 1 highlights the number of organizations and boards whose activities intersect with green infrastructure activities.

Table 1-Who is involved in Green Infrastructure?	
<p>Lexington City</p> <ul style="list-style-type: none"> • Lexington City Council • City Administration • Planning Commission • Lexington Public Works • Tree Board • Architectural Review Board • Lexington Public Schools • Cemetery Advisory Board • Lexington City Public Schools 	<p>Rockbridge County</p> <ul style="list-style-type: none"> • Rockbridge County Supervisors • County Administration • Rockbridge County Public Schools <p>Buena Vista</p> <ul style="list-style-type: none"> • City of Buena Vista
<p>Not-for-Profit Organizations</p> <ul style="list-style-type: none"> • Boxerwood • Rockbridge Conservation (RACC) (Land use Committee) • Master Gardeners • Friends of Brushy Hills • Friends of the Chessie Trail • Main Street Lexington • Historic Lexington Foundation 	<p>Major Institutions</p> <ul style="list-style-type: none"> • Carilion Rockbridge Community Hospital • Washington and Lee University • Virginia Military Institute • Sigma Nu
<p>NB Soil & Water Conservation District</p>	<p>Coalitions</p> <ul style="list-style-type: none"> • Live Healthy Rockbridge • Rockbridge Outdoors • Live Healthy Rockbridge Kids • Rockbridge Waste Reduction Roundtable

What is the Collective Impact model?

Implementing a City-wide green infrastructure plan is challenging because it is a complex multi-disciplinary topic with various needs and implementation scales. To address ever-evolving complex environmental projects, the [Virginia Environmental Endowment](#) (VEE) recommends adopting a collaborative approach nationally articulated as the [Collective Impact](#) model. According to VEE, Collective Impact is becoming a preferred adaptive management technique for addressing complex sustainability challenges. The Collective Impact approach features multiple organizations contributing their expertise and resources to tackle a central problem or concern. The well-researched model has five core characteristics: a common agenda, shared measurement systems, mutually reinforcing activities, continuous communication, and a backbone support organization (see Annex 5).

Local organizations in the area are already implementing the CI model for several community-wide concerns. Organizations and coalitions familiar with this model include Boxerwood (Rockbridge Waste Reduction Roundtable), Carilion Clinic (Live Healthy Rockbridge), and Lexington & Rockbridge Area Tourism (Rockbridge Outdoors). To illustrate how the model works, descriptions of Live Health Rockbridge and Rockbridge Outdoors follow.

Rockbridge Waste Reduction Roundtable. Boxerwood, in its work with schools and waste reduction, found that it and other local organizations also working on waste reduction were stepping on each other's toes. Using the Collective Impact model, with Boxerwood as the backbone entity and a staff member as a facilitator, were able to organize area waste reduction efforts simply by disseminating information among the coalition members. Members work on a common interest, with each member bringing their own strengths to the table. Regular communication creates a synergy in which new opportunities become apparent.

Live Healthy Rockbridge (LHR) is a coalition whose mission is *working together for community wellbeing*. The backbone organization for LHR is Carilion Clinic, which provides a full-time employee to coordinate meetings, maintain minutes, and provide leadership for the coalition. This Group helps identify the most pressing needs impacting the Rockbridge area's health and develops a community-wide strategic plan to address the identified needs. Three committees function as smaller groups within the coalition to focus on specific health and wellness issues. *Continuous communication through emails and regular meetings allows community partners to identify collaborative opportunities to ensure the most efficient use of the collective resources throughout the coalition.*

Rockbridge Outdoors has a slightly different framework. A part-time support person coordinates meetings and prepares minutes through a grant from the Central Shenandoah Planning District. Leadership is provided from within the members, with rotating officers. While the list of objectives the coalition would like to accomplish is long, they agree upon a small number of initiatives each year to focus their energies and resources. This framework also uses committees for smaller groups within the coalition to focus on specific issues. The committees regularly report to the entire coalition, to allow for regular communication and continued opportunities for cross-sector collaboration. Member organizations apply for grants, with other member

organizations *closely involved with particular projects serving as co-applicants*. The collaborative nature of these applications is looked upon favorably by local, state, and federal funders.

The above descriptions give examples of successful local use of the collective impact model, but they are not the only options for implementing it. Each CI coalition has its own culture and practices based on interests, needs, and personalities. The Collective Impact model provides a strong framework while allowing for this flexibility. The key takeaway is that these organizations find common ground in tackling a pressing issue whose solution is greater than any one organization on its own can achieve. In the CI model, organizations, including local governments and agencies, come together to mobilize their strengths synergistically for the benefit of the whole (in this case, the City of Lexington and its wellbeing).

This Report has many recommendations ranging from relatively small projects to more significant systemic changes requiring buy-in and support from local institutions, nonprofits, and neighboring municipalities to succeed. No one entity will be able to accomplish everything. The Collective Impact model offers small, under-resourced communities like ours a well-documented way forward for achieving the outcomes we need and desire. However, the model cannot advance without the support and collaboration of a key player: the City of Lexington itself.

The Working Group recommends that the City Council adopt a Collective Impact model for realizing a greater number of Green Infrastructure goals highlighted in this Report. Further, given competing demands for limited city resources and staff, we suggest that the City support a multi-year grant application with a City-selected local nonprofit organization able to hire or assign a CI coordinator for this role.

Comprehensive Plan Strategies

The goal and strategies in the Comprehensive Plan focus on plans, policies, and programs that support environmental stewardship, eco-friendly development, and equitable access to green infrastructure. Recognizing that ecological impacts extend beyond jurisdictional boundaries, extensive cooperation and coordination are encouraged to ensure that Lexington continues its longstanding stewardship of the environment.

- *GI 4.3 Continue to engage the support of local students, volunteers, and nonprofit organizations to help the City achieve its environmental and green infrastructure goals.*
- *GI 5.1 Identify and collaborate with local organizations to promote the development and use of green infrastructure sites, linkages, and waterways within the City and the larger region, including sports organizations. The Rockbridge Area Outdoor Partnership [now Rockbridge Outdoors], Carilion Hospital, and retail businesses selling outdoor equipment.*
- *GI 5.2 Collaborate with regional organizations, such as the Central Shenandoah Planning District Committee and the Natural Bridge Soil & Water Conservation District, to seek funding and resources to implement green infrastructure best management practices to improve local and regional water quality.*
- *GI 5.3 Work with regional stakeholders to develop a comprehensive regional Energy and Climate Action Plan that identifies common issues, agreed-upon approaches and principles, joint actions, and individual contributions by each participating locality and the major institutions of higher learning.*

Recommendations

- ✓ Adopt a suitable **Collective Impact model for Lexington to collaboratively advance green infrastructure** strategies and programs highlighted in this Report and in the Green Infrastructure Chapter of the Comprehensive Plan.
- ✓ Seek funding for a **Lex Green Infrastructure coordinator** based on the adopted Collective Impact model.
- ✓ Implement **pilot projects to demonstrate Green Infrastructure** initiatives, for example, a bike and pedestrian path integrating tree planting.
- ✓ **Maintain this Report as a "Living Document,"** with updates, timelines, and an annual review.
- ✓ Solicit an annual **CI report card to measure progress** on implementing green infrastructure strategies.
- ✓ Foster "Friends of _____" and other groups to **encourage citizen involvement** in green space protection and care.

Next Steps

- ✓ Solicit endorsement and support from City Council and consider a work session with City Council to co-develop the final Report.

The residents of Lexington, Buena Vista & Rockbridge all benefit from our wealth of natural resources and scenic beauty. Many community partners and individuals are interested in making our community a better place for all to live. While we have limited governmental resources to further green infrastructure projects, we can accomplish a lot with the assistance of these partners, local educational institutions, and intergovernmental coordination: let's get started!

--Green Infrastructure Working Group

Funding Opportunities

One member of the Green Infrastructure Group noted that projects listed without costs is like restaurant menus without prices. The working group acknowledged that we did not have the resources to develop cost estimates, especially for capital costs. Yet we could begin to identify potential funding for organizations and public authorities, including the collective impact model, Table 2 outlines some of these funding sources. The Virginia Department of Conservation and Recreation quarterly newsletter, [Greenways and Trails E-News](#), includes updated grant information on numerous programs.

We also discussed the potential of leveraging volunteer or pro bono efforts through the organizations involved in green infrastructure-related activities. Annex 7 outlines a framework for considering projects where monetary and non-monetary costs are reduced with community input and volunteer efforts, for example, tree planting.

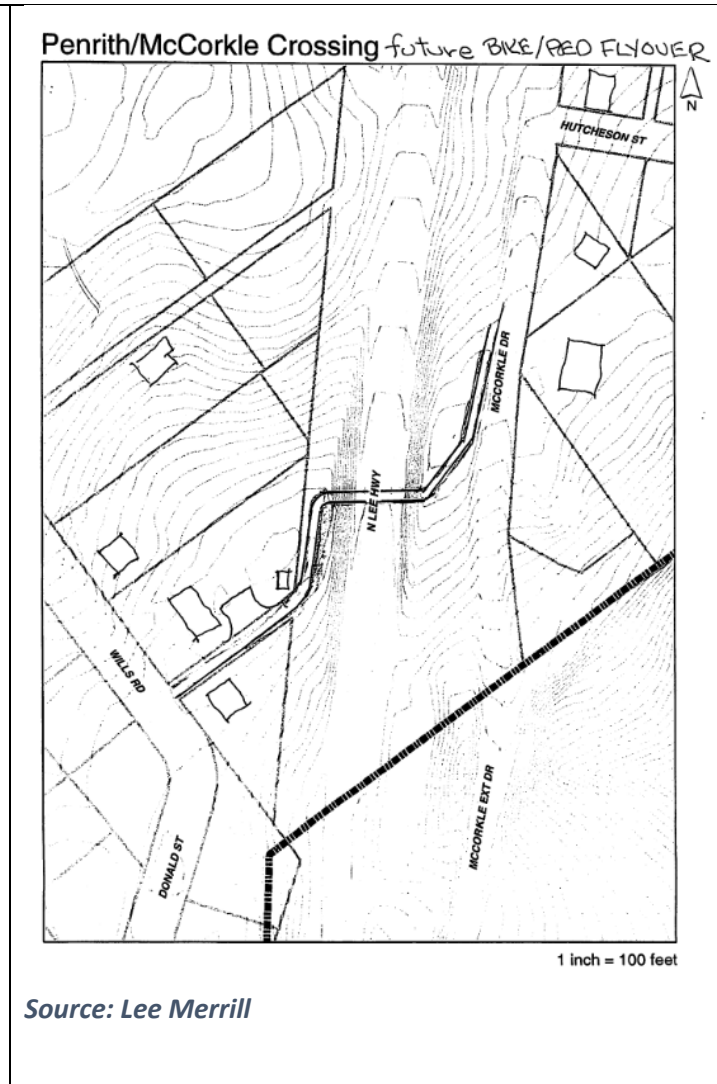
Table 2. Potential Sources of Green Infrastructure Funding	Eligible Applicant/Recipient		
	Public	Not-for-Profit	Homeowner
Rockbridge Community Foundation Health Foundation disseminated \$700,000 last year from an endowment to Rockbridge entities promoting community wellbeing and health this year. Major funder. Grant applications should be received by March 1 each year.		✓	
VDOT- Safe Streets Grants, Develop or update a comprehensive safety action plan (Action Plan). The deadline is usually September.	✓		
Virginia Environmental Endowment (VEE) – major funder <ul style="list-style-type: none"> • Collective Impact Environmental Coordination & Action • James River Water Quality Improvement Program (per above, focus on water quality anywhere in the watershed) 	✓	✓	
Stormwater Local Assistance Fund (SLAF) . The program provides matching grants to local governments for planning, designing, and implementing stormwater best management practices (BMPs).	✓		
Natural Bridge Soil and Water Conservation District Virginia offers small-scale funding for 15 practices under the program that are eligible for a 75% cost-share, and some provide a flat incentive payment up to the installation cost, see http://vaswcd.org/vcap			✓
Central Shenandoah Planning District Commission	✓	✓	
Chesapeake Bay Trust: Green Streets Grant Program (major funder; annual competition)	✓	✓	
USDA Community Development Grants	✓	✓	
Community Foundation of Rockbridge, Bath, Allegheny		✓	
National Fish and Wildlife Foundation (NFWF) – major Bay watershed improvement funding		✓	

Annexes

Annex 1-Green Infrastructure Working Group Meetings

<p>October 26, 2021</p> <ul style="list-style-type: none">• Introductions• Review of the Scope of our work• Nick Britton of Michael Baker International, Bike-Ped presentation• Discussion on the Green Infrastructure Chapter <p>November 16, 2021</p> <ul style="list-style-type: none">• The Great Reveal—Rank Order of Strategies and Projects• Review the definition of Green Infrastructure in the Chapter• Define and discuss the activities <p>December 14, 2022</p> <ul style="list-style-type: none">• Highlight emerging issues and directions coming out of the first two meetings, John Driscoll• Activities of the Tree Board & The Urban Tree Canopy Study of 2009, Betty Besal• Mapping Green Infrastructure, Lee Merril and Arthur Bartenstein• COREworks, Boxerwood's Local Carbon Offset Marketplace, Elise Sheffield <p>January 18, 2022</p> <ul style="list-style-type: none">• Dale Brown, VMI Green Infrastructure initiatives• Holly Ostby, Health Impact Assessment and the role of the Live Healthy Rockbridge• Sam Allen, Framework for considering Green Infrastructure proposals	<p>February 15, 2022</p> <ul style="list-style-type: none">• Review and discussion on the 60% draft Bike-Ped Plan Draft• Outline the Report and selection of activities for members to work on• How could the work of the Green Infrastructure Working Group continue? <p>March 15, 2022</p> <ul style="list-style-type: none">• Jane Stewart, University Energy Specialist• Alexia Smith, Brushy Hills <p>April 19, 2022</p> <ul style="list-style-type: none">• Sandra Stuart, Natural Bridge Soil & Water Conservation District <p>June 28, 2022</p> <ul style="list-style-type: none">• Review and discuss the working draft of the Report <p>September 20, 2022</p> <ul style="list-style-type: none">• Review and discuss the final draft of the Report to be presented to the Planning Commission. <p>December 15, 2022</p> <ul style="list-style-type: none">• Updating the Report based on Planning Commission comments.
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Annex 2-Lexington Pedestrian Flyover



Annex 3—Lexington GIS and Mapping

Key elements to be mapped for GI conservation and restoration are patches (planted yards), forests, and corridors connecting into County. See <http://gicinc.org/>

- **Status Notes on GIS Layers relevant to developing a Lexington GI Plan 12/14/22**

Natural features layers

- Topography @2' contour interval - available in the system now - add visual analysis of both elevation patterns (e.g., prominent valleys and ridgelines) and relative slope gradients.
- Floodplains - available in the system now
- Critical Riparian zone (av. 35' alongside all-natural streambeds)-citizen surveys?
- Retention/Filtration structures, public and private (VMI students 2022)
- Tree Canopy Inventory from photography – City RFP being developed 2022
- Plant Groundcovers: maintained turf, seasonal grasses, gardens (recommend inclusion in Storm Water Study 2022?)

Open (undeveloped) space by ownership layers

- Municipal, available for public use
- Institutional, available for public use
- Private property, open for public use
- Private visually-contributing open space

Human movement layers

- Footpaths/trails in public use
- Public sidewalks with/without barriers
- Bike routes
- Alleys
- Quiet streets
- Arterials

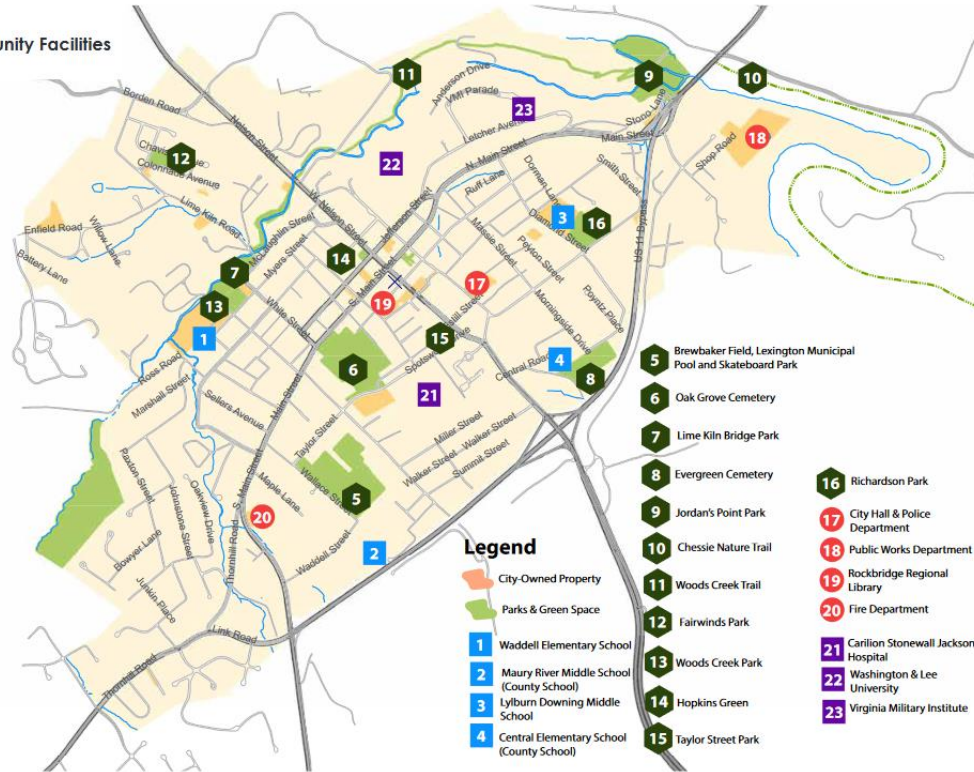
Impermeable developed layers

- Building footprints (including Noli diagram, i.e., figure-ground study)
- Public vehicular roadbeds
- Off-street vehicle parking
- Private paving for walks, terraces, etc.

Annex 4-Community Facilities Map

Community Facilities & Infrastructure

Map 10.1 Community Facilities



Annex 5- Collective Impact Characteristics

Collective Impact Characteristics

1. Common Agenda

The common agenda is a mutually accepted vision for change, which helps create objectives and targets and aligns the entities involved. Each participating organization spanning the public, private, and non-profit sectors must see itself contributing in a positive way.

2. Shared Measurement System

A shared measurement system provides a framework from which to track the project's progress and success. Participating organizations agree upon common indicators, which maximize transparency, accountability, and commitment. These indicators must be reassessed as the project unfolds to allow for corrective action and allow the indicators to be changed or the project to be tweaked if necessary.

3. Mutually Reinforcing Activities

One of the unique approaches of Collective Impact is that of mutually reinforcing activities. It allows each participating organization to employ its strengths while sharing resources with others. Each organization's activity may be distinct, but the partners work together to address the same agreed-upon problem, letting cross-sector collaboration flourish with a coordinated plan of action.

4. Continuous Communication

Due to the array of partners, continuous communication is essential to developing trust across the sectors. Regular meetings, among other forms of interaction, allow each organization to feel that their interests are being heard, and provide opportunities to report upon metrics identified.

5. Backbone Support Organization

The backbone support organization is the one that advocates for the cause, coordinates between partners—both in terms of funding and activity—and makes sure that all those involved are actively pursuing the strategy. This organization is essential to helping this complex framework of cross-sector partners positively and effectively interact and reinforce each other's strengths.

Source: FSG, The [Collective Impact](#) model

Annex 6 – Resources

- ✓ <https://hampton.gov/3003/Bike-Walk-Hampton-Plan>
- ✓ [Green Streets Handbook](#), EPA, March 2021
- ✓ <https://articles.vafb.com/news-and-features/categories/conservation-landscapes-offer-environmental-benefits-reduce-yard-work>
- ✓ [A Green Infrastructure Plan for the City of Norfolk](#): The link is to the Report; see current and future green infrastructure networks, pages 19 and 20. There is also a PowerPoint, see [A Green Infrastructure Plan for Norfolk: Building Resilient Communities](#)
- ✓ [CITY GREENPRINT: Charlottesville's Green Infrastructure Guide](#)
- ✓ [Jordan's Point Park Master Plan](#), November 2020, City of Lexington, Virginia
- ✓ <https://www.itreetools.org/>, This tool from the USDA estimates the value of trees and might be helpful for any metrics/progress on the Plan.
- ✓ [Project for Public Spaces](#).
- ✓ Climate Action Plan-- [Charlottesville](#) and [Roanoke](#) and [Washington & Lee University](#)
- ✓ Town of Blacksburg, [Climate Vulnerability Assessment](#), Sept. 2020
- ✓ [Building Community Resilience with Nature-Based Solutions-A Guide for Local Communities](#), June 2021, FEMA

Annex 7 – Framework for Considering Green Infrastructure Proposals

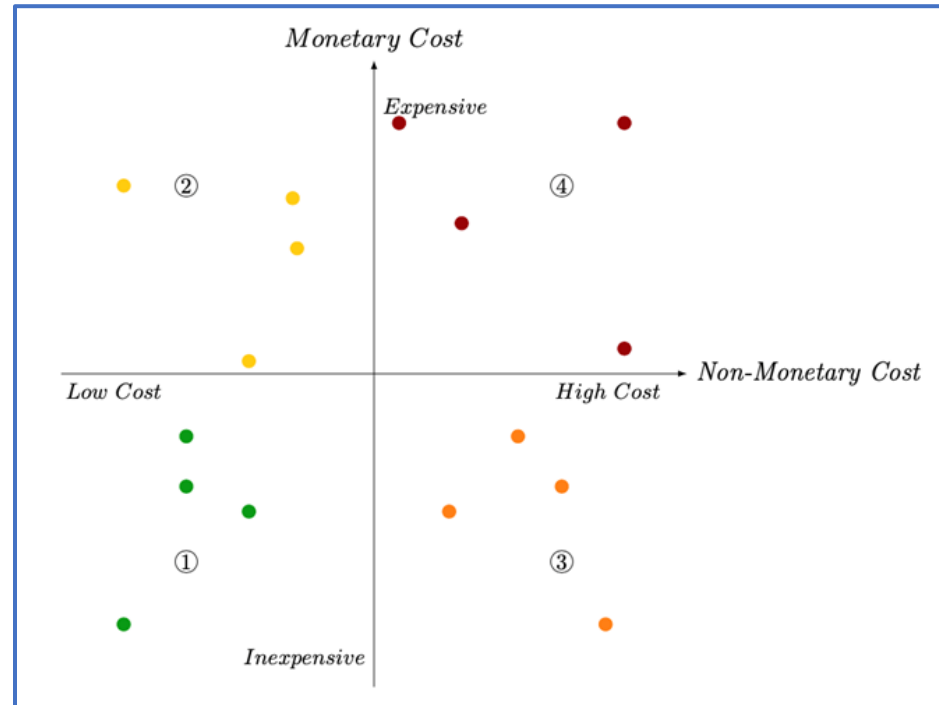
Framework for Considering Green Infrastructure proposals

The Working Group considered a framework for assessing project feasibility that considers monetary and non-monetary costs.

For example, the planning and cost of adding a sidewalk on Rt 11 north between the Lexington bridge and Walmart is an example of a high-cost project with many complexities. It is an example of an expensive project with high non-monetary costs that would fall in quadrant 4.

In contrast, there may be projects with low monetary cost, say with volunteers supplying the necessary labor, and yet may still be a "difficult sell" for some community members. This type of project would fall in quadrant 3.

Lastly, the framework can help find projects where monetary and non-monetary costs can be reduced with community input and volunteer efforts. Tree planting can be an example.



OPINION

SECTION A, PAGE 6, WEDNESDAY, DECEMBER 14, 2022

Editorial

Lexington Aims To Get Greener

It is encouraging that Lexington government officials are not letting the city's comprehensive plan collect dust – that the planning document adopted last year has not just been put aside on a shelf somewhere to await its next state-mandated update. No, an effort is underway by city officials and a group of interested citizens to galvanize local resources to implement the green infrastructure chapter of the comprehensive plan.

These folks are putting into practice an often-heard admonition to “think globally and act locally.” They are thinking about the dire impacts of global warming like extreme weather, rising sea levels and melting glaciers, and responding by doing what they can on a local level to lessen the impacts. If such grassroots efforts were to be replicated in other communities across the country and around the world, real progress could be made in the battle to save our planet.

Lexington's Green Infrastructure Working Group, composed of 15 citizens who are laying the groundwork for carrying out the directives of the green infrastructure chapter of the comprehensive plan, recently presented a draft report to the city's Planning Commission. The report outlines ways the objectives can be accomplished and suggested the formation of a citywide coalition of relevant organizations who can work together on this mission.

The report notes that Lexington is “an engaged community” fully capable of harnessing its resources to “advance green infrastructure.” Past examples of city initiatives are cited that have promoted green space and the preservation of natural resources such as the funding of a city arborist, creating a tree board, having a tree canopy study, the restoration of Woods Creek and Trail, stormwater retention projects, development of bicycle and pedestrian paths and recycling programs. The report emphasizes the value of partnerships among residents, businesses, local nonprofit organizations, major institutions, agencies and City Hall “to create a greener, more sustainable Lexington.”

To truly make progress in combating the effects of climate change, of course, these local efforts are going to have to be supported by state,



IN ITS REPORT to the Lexington Planning Commission on Oct. 27, the Green Infrastructure Working Group pointed to the Woods Creek Restoration Project, which was completed in 2004, as an example of the kinds of things that can be accomplished when different organizations within the city work together toward a common goal.

national and international initiatives. Hopes for making substantial progress on a national level were enhanced greatly earlier this year with passage of the most far-reaching federal legislation ever to combat climate change. This legislation is investing \$369 billion in measures designed to reduce carbon emissions by 40 percent over the next eight years.

On a statewide level, though, we were disappointed by Gov. Glenn Youngkin's decision to pull Virginia out of the Regional Greenhouse Gas Initiative. This multi-state, market-based program is enjoying success in leading the way to promote clean, renewable energy and offset the harmful effects of pollution and extreme weather events. It is indeed a shame that our state will no longer be a contributor to and beneficiary of this collaborative approach among states along the eastern seaboard.

Still, we can do what we can at a local level to contribute to the global campaign to combat climate change. A number of solar array renewable energy projects have come down the pike in Rockbridge County the past couple of years. These projects have been scrutinized by the county's planners to ensure that the benefits of producing renewable energy outweigh the costs of the loss of productive farmland. The county would do well to establish standards for how such projects can be reviewed efficiently and uniformly in the future.

Perhaps the county and Buena Vista can follow Lexington's lead in seeking out citizens to develop local strategies to combat climate change. All of us need to work together and pool our resources so that we can act locally to counter the very real dangers of this global menace. We commend Lexington for taking the initiative to start this process.

Annex 9 - Short History of Green Infrastructure in Lexington's Comprehensive Plan

Sixteen years ago, the previous 2007 Comprehensive Plan stated plainly, "Green infrastructure planning should be integrated into this chapter when it is updated." It gave as a goal, "***Encourage local environmental and community groups to work together, with the assistance of City staff, to engage the community in a planning process to create a green infrastructure plan.***"

When drafting the 2020 Comprehensive Plan, one of the most significant changes in approach was in the "Green Infrastructure & Natural Resources" section, formerly "Natural Resources." As part of the Comprehensive Plan update, a green infrastructure working group that included two planning commissioners, was tasked with examining the existing conditions of green infrastructure in the Lexington community and providing recommendations for improvement to be considered by the Commission. The working Group identified a key challenge for the chapter: how can we align City planning with ecological principles that promote human well-being and respect the value of ecosystems as a cornerstone of sustainable development in Lexington? The new chapter signaled a more intentional, active understanding of and approach to interacting with our environment (Comprehensive Plan p.33).

As part of the Commission's nomination of catalyst projects towards the end of 2020, the Green Infrastructure Working group was reconvened as a Planning Commission-led initiative. This was reflected in the Commission's 2020 Annual Report and a subsequent joint work session with the Council in July 2021.

Beginning in October 2021, the reconvened working group with two planning commissioners began meeting. Over the course of the year, the Planning Commission was briefed on the progress of the Group leading to the publication of the Draft Report, *Getting Greener in Lexington-Moving the Conversation Forward* in October 2022. The recommendations in the Report include using the Collective Impact model to engage a public/private partnership to initiate green infrastructure initiatives for the City of Lexington.

Endnotes

ii [Maury Scenic River report, Rockbridge County](#), April 2020 and [Extension of the Maury River Scenic River Designation](#), November 2021

ii **Benefits of scenic river designation** • Provides opportunities to consider scenic and other resources in planning and design. • Focuses on Federal Energy Regulation Commission reviews of hydro or related project proposals. • Encourages closer review of projects and proposals by state agencies and localities. Requires General Assembly authorization for dam construction. • Provides for continued existing appropriate riparian land uses. • Provides a framework for the appointment of a local Scenic River Advisory Committee. • Provides eligibility for land use tax considerations, if locally adopted.

Source: [DCR Virginia Scenic Rivers Program](#)

iii VDOT has an available bike/ped planner, and CSPD may have resources too. While the US Dept. of Transportation has a program for Reconnecting Neighborhoods to reconnect neighborhoods cut off by roads, Lexington's population may not meet the minimum threshold for eligibility.

iv <https://vpm.org/news/articles/30411/lawmakers-expand-opt-in-tree-replacement-program>

The ordinance shall require that the site plan for any subdivision or development include the planting or replacement of trees on the site to the extent that, at 20 years, minimum tree canopies or covers will be provided in areas to be designated in the ordinance, as follows:

1. Ten percent tree canopy for a site zoned business, commercial, or industrial;
2. Ten percent tree canopy for a residential site zoned 20 or more units per acre;
3. Fifteen percent tree canopy for a residential site zoned more than 10 but less than 20 units per acre; and
4. Twenty percent tree canopy for a residential site zoned 10 units or less per acre.

v Current Opinion in Environmental [Sustainability](#) 2015, **14**:101–108. This review comes from a themed issue on **Open issue**, Edited by **Eduardo Brondizio**, **Rik Leemans** and **William Solecki**. For a complete overview see the [Issue](#) and the [Editorial](#)

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