

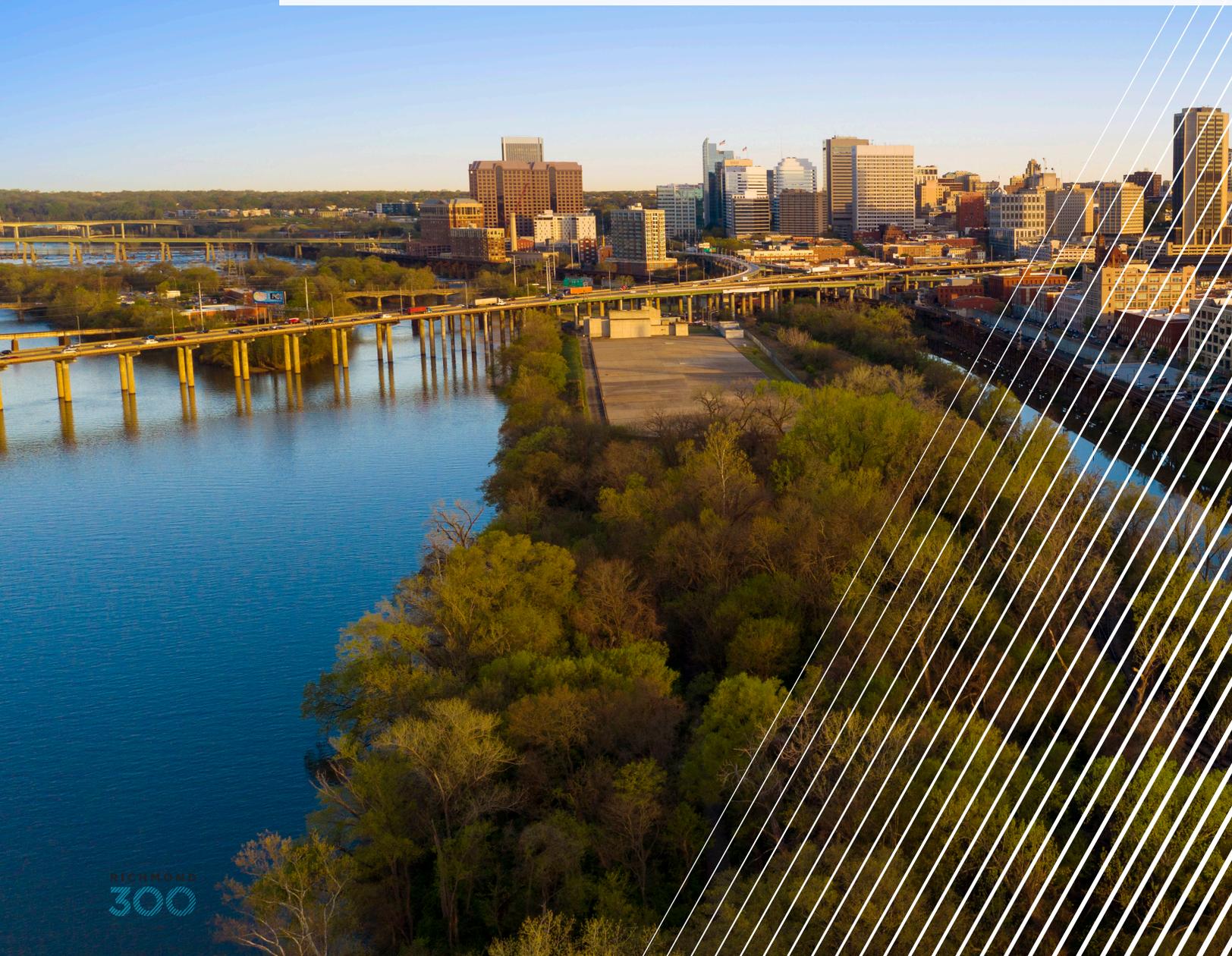


## CHAPTER 6

# Thriving Environment

**Vision:** Richmond is a sustainable and resilient city with healthy air, clean water, and a flourishing ecosystem.

Carbon emissions are low, air and water quality are high, and city-wide solid waste production is minimal. The City is positively adapting to the effects of a changing climate, with a built environment that enhances and protects natural assets, including the James River. All residents have equitable access to nature and a healthy community.



# Goals, Objectives, and Strategies

## Goal 15: Clean Air



Improve air quality within the city and the region, achieve a 45% reduction in greenhouse gas emissions within the city by 2030, and achieve net zero greenhouse gas emissions within the city by 2050 via RVAgreen 2050.

### Existing Context

#### **Richmond is in the midst of a global climate crisis.**

Much of the built environment and the means by which people and goods get around contribute to greenhouse gas (GHG) emissions and release of other pollutants to the atmosphere. While urban form and residential density will not solve these problems alone, houses built at lower densities that require an automobile for most trips use more energy and, therefore, create more pollution overall, as compared to neighborhoods that are built including a dense mix of uses and do not require an automobile for most trips.

#### **RVAgreen 2050 was launched in with the goal of reducing greenhouse gas emissions within the city by 80% by 2050 and in 2020, this goal was increased to a 100% reduction by 2050.**

The RVAgreen 2050 plan has not yet been developed, but will include ways to change the paradigm of how Richmonders get and use energy by transforming Richmond's energy system, guiding the city to more energy efficient buildings that save money for residents and businesses, and using cleaner and more reliable energy and transportation options that result in healthier air and a higher quality of life for our community. Goal 15 of *Richmond 300* focuses on reducing energy consumption and shifting our energy production to renewable sources.

#### **Greenhouse gas emissions in Richmond come from a variety of sources.**

In 2015 in Richmond, 40% of community GHG emissions were from commercial buildings, 24% from the transportation sector, 23% from residential buildings, and 11% from industrial facilities. In 2015, 50% of community GHG emissions resulted from the use of electricity, 24% from gasoline/diesel consumption and 22% from natural gas consumption. Overall energy consumption in Richmond actually decreased by 2% between 2008 and 2015. According to the U.S. Energy Information Administration, in 2016 in the Commonwealth of Virginia, 45.6% of GHG emissions came from the transportation sector.

#### **Renewable energy is beginning to take shape in Richmond.**

In 2017, Richmond achieved SolSmart Silver designation for its efforts to provide resources and reduce barriers to make it faster, easier, and less expensive for the community to go solar. While only accounting for

0.08% of the total energy supply, the production of solar energy has increased by nearly 450% between 2008 and 2015. Analysis by VCU's Center for Urban and Regional Analysis shows great potential for rooftop solar panels to produce up to 12% of the city's energy demand; however, this would require upgrades to our electricity distribution and energy storage infrastructure.

**Streetlights account for a major demand in the use of power by the City of Richmond.**

The Department of Public Utilities (DPU) owns and operates 37,000 streetlights, as well as an electric distribution utility that supports their operation. The electric utility system grid is co-located on poles with Dominion Energy, Verizon, and some other isolated Telecom providers (i.e., Fiber, Radio Frequency, etc.). DPU is currently in a pilot phase of examining LED technology and its effects on lighting levels, color rendering, power usage, and various electrical grid effect characteristics. DPU works closely with Richmond Police Department (RPD) in various environmental impact initiatives to enhance or promote a sense of greater public safety.

## Objective 15.1

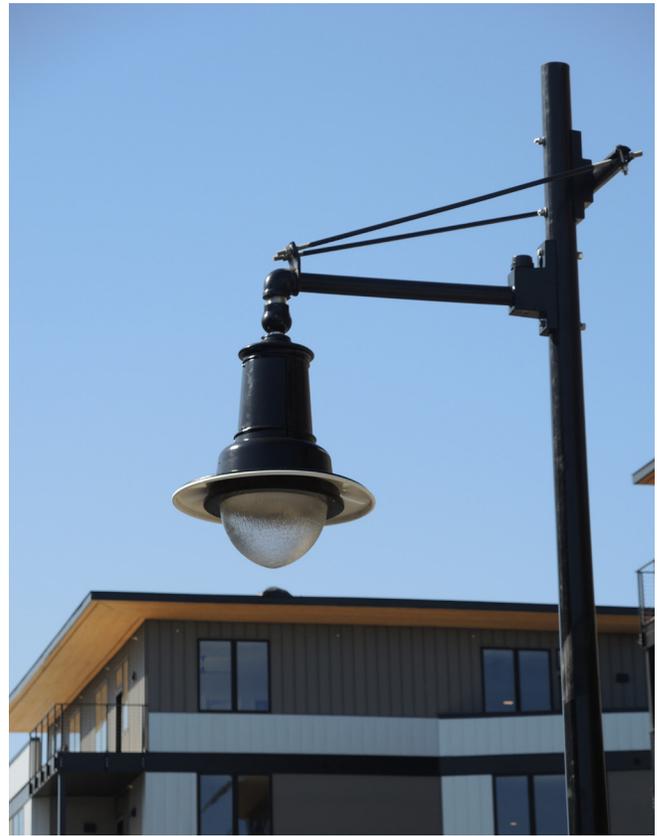
### Reduce air pollution related to transportation.

- a. Increase the number of Richmonders living in a development pattern that encourages density and reduces dependency on single-occupancy vehicles (see Goal 1, Goal 8, Goal 14).
- b. Locate jobs near residents (see Goal 1, Goal 11).
- c. Transition public and private vehicles to modes that do not emit greenhouse gas (see Goal 10).
- d. Enforce the anti-idling policy for City vehicles.
- e. Adopt a Council resolution to encourage idling reduction community-wide.
- f. Increase use of mass and active transportation options (see Goal 8).
- g. Continue to engage with the CMAQ Program's measures to improve air quality in the city.

## Objective 15.2

### Reduce air pollution related to City infrastructure and facilities.

- a. Conduct an energy audit, publish grades for efficiency, and benchmark energy use for all City facilities.
- b. Develop an energy management program for City government to include:
  - i. Education programs for City procurement and capital project management staff on the provisions in City Council Resolution 2008-R152-2009-14 for green, high-performance building standards on City construction projects.
  - ii. Specific reduction goals for municipal greenhouse gas emissions by sector.
  - iii. A plan to retrofit all City buildings to improve efficiency.
  - iv. Installation of renewable energy (solar, wind, hydro, geothermal) on City buildings and land (methane-capture at landfill and wastewater treatment plant).
  - v. Identification of opportunities to reduce wastewater energy use.
  - vi. The purchase off-site renewable energy to cover remaining City demand after deployment of on-site solar and energy efficiency initiatives, and other strategies as appropriate.
- c. Convert streetlights to LED and/or solar.
- d. Conduct study on local and upstream methane leakage from DPU operations.
- e. Adopt a green building ordinance for municipal facilities.



Manchester streetlights are LED.

### Objective 15.3

#### Reduce air pollution related to private buildings.

- a. Engage local professional expertise to develop incentives and/or other components of a robust Green Building program that may include:
  - i. Transitioning from natural gas to electric.
  - ii. Changing the Zoning Ordinance to encourage developers to renovate buildings with deep energy retrofits and/or build new construction following green building guidelines by creating incentives such as reducing parking requirements or density bonus.
  - iii. Upgrading energy efficiency of industrial facilities.
  - iv. Transitioning buildings from fuel oil to all electric.
  - v. Evaluating the potential of green development zones as permitted by state code.
- b. Work with local providers to market energy retrofit programs for low-income individuals.
- c. Encourage industrial facilities to use Combined Heat and Power to generate electricity and thermal energy.
- d. Create a Commercial Property Assessed Clean Energy (CPACE) program.
- e. Advocate in the General Assembly for enabling legislation allowing jurisdictions to:
  - i. Adopt residential PACE programs.
  - ii. Require energy benchmarking and public disclosure, and adopt local ordinance requiring benchmarking by large privately owned buildings.
  - iii. Adopt stricter energy efficiency requirements in their building codes.
- f. Advocate in the General Assembly to amend the statewide uniform building code to require greater energy efficiency.
- g. Review existing zoning and policy for impediments to renewable energy and revise them to reduce barriers.
- h. Evaluate establishing incentives to encourage the installation of solar panels on private buildings, such as matching the state's 30% incentive.

- i. Develop guide for high-performance / net zero energy new construction and historic retrofits to encourage green construction practices.
- j. Evaluate creating legislation to require stronger energy-efficiency and green-building standards of developers requesting zoning variance and/or site plan approvals.
- k. Develop a comprehensive 'green business' program, similar to that of Montgomery County, Maryland or the Loudoun County, Virginia Green Business Challenge.

### Objective 15.4

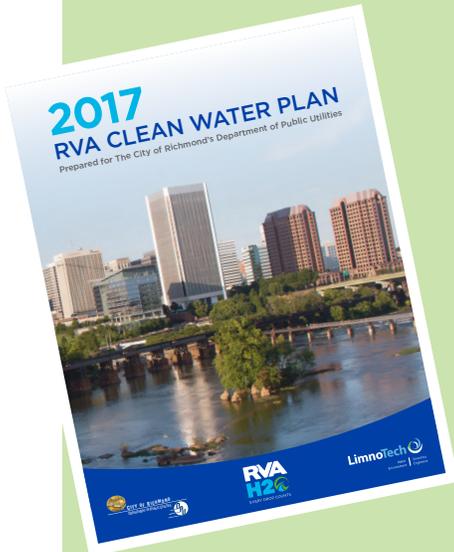
#### Reduce the amount of waste going to landfills.

- a. Develop and implement a multi-family and commercial recycling program.
- b. Increase the number of public recycling bins and increase the frequency that recycling is collected.
- c. Increase city-wide composting for residential, commercial, and industrial users by coordinating with private composting companies.
- d. Create incentives for construction and demolition material recycling.
- e. Create "pay-as-you-throw" program.
- f. Demonstrate sustainable consumption, sustainable building practices, and zero-waste behaviors in the design and expansion of City operations.
- g. Require new construction projects to provide areas for dumpsters, recycling, and composting.
- h. Advocate in the General Assembly for enabling legislation allowing cities to ban or tax plastic bags, single-use plastics, balloons, and Styrofoam.
- i. Lobby the General Assembly to encourage bottle deposit to decrease litter, especially near the river.
- j. Expand the City's Adopt-a-Street Program to include waterways, greenways, and bike lanes.

## Goal 16: Clean Water



Improve local water quality and manage the built environment to enhance and protect natural assets such as the James River.



### Existing Context

**Clean water not only improves the natural environment that supports plant and animal life, but also improves human health, as the James River is the source of the city's drinking water.**

Pollutants from impervious surface runoff and other pollutants that find their way into the James River degrade water quality. Goal 16 of *Richmond 300* includes recommendations that seek to improve the quality of the water in all of the city's waterways.

**The James River's water quality is steadily improving.**

The James River is a natural habitat, recreational destination, and the source for drinking water for the Richmond Metropolitan Region. The quality of the water in the James River affects habitats, recreation, and public health. In 2013, the City began an initiative called RVAH2O to focus on water quality and quantity issues within the city. Part of the initiative was the development of the *RVA Clean Water Plan*, which seeks to create one systematic approach to management of the city's water resources.

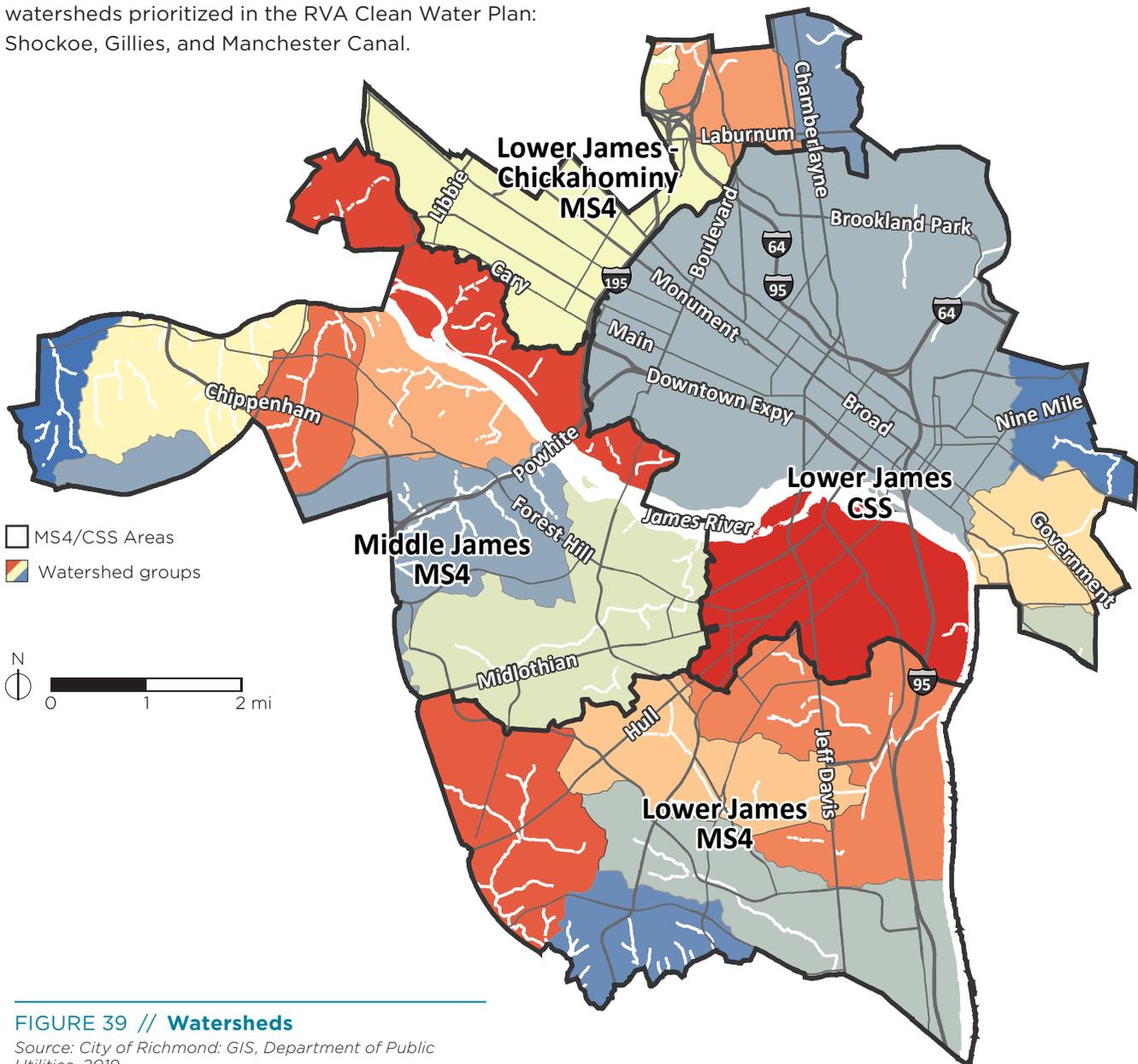
**Similar to other older cities, Richmond is partially within a combined sewer system (CSS), meaning that sanitary sewage and stormwater are combined in one pipe system.**

Approximately 32% of the city's land area is within the combined sewer area with 52% of the city's population. During major storms, the CSS can be overwhelmed, resulting in untreated sewage being released directly into the James River, as shown in Figure 39. There are 25 overflow points. The City and Commonwealth have invested close to \$300 million since the 1980s to make improvements to the CSS infrastructure to reduce combined sewage overflow (CSO) events and are engaged in a \$117 million effort to reduce these events further.



**Green infrastructure improves water quality and reduces the amount of water runoff that enters the CSS, resulting in fewer CSO events.**

Stormwater runoff, a major cause of water pollution in urban areas, carries trash, bacteria, heavy metals, and other pollutants from the urban landscape to waterways. Higher flows resulting from heavy rains also can cause erosion and flooding in streams, damaging habitat, property, and infrastructure. The City is actively installing green infrastructure, a cost-effective, resilient approach to managing rain event effects, using vegetation, soils, and other elements to manage water and create healthier urban environments. In 2020, the City kicked off a green infrastructure Master Planning process for three watersheds prioritized in the RVA Clean Water Plan: Shockoe, Gillies, and Manchester Canal.



**FIGURE 39 // Watersheds**

Source: City of Richmond: GIS, Department of Public Utilities, 2019

## Objective 16.1

### Restore all streams into healthy riparian areas.

- a. Reduce parking requirements and increase landscaping requirements particularly in industrial areas along the James River south of downtown (see Goal 4).
- b. Replant stream buffers in riparian areas on City-owned property, and encourage private property owners to do same.
- c. Prevent building in riparian areas.
- d. Create watershed plans for each of the watersheds in the city, on both public and private land, including impervious reduction targets.
- e. Implement the RVA Clean Water strategy to replace or restore 10 acres of riparian buffers according to state guidance.
- f. Implement the RVA Clean Water strategy to restore 2,500 linear feet of stream.
- g. Explore programs to daylight streams and de-culvert streams.
- h. Implement strategies to reduce pollutants entering waterways (shown in Figure 40), such as encouraging the reduction of lawn chemicals and preventing debris from entering streams.
- i. Identify brownfields for redevelopment and explore programs to incentivize redevelopment of the brownfields into appropriate uses.
- j. Implement RVA Clean Water strategy to reduce contribution of pollutants to the Municipal Separate Storm Sewer System (MS4).
- k. Implement RVA Clean Water strategy to construct Long-Term Control Plan projects.
- l. Reduce litter in the city, by encouraging more trash/receptacles and more frequent cleaning/management of areas with a lot of litter, so the litter does not flow into city waterways.

## Objective 16.2

### Place an additional 100 acres under conservation easement, prioritizing conservation of land that creates connected green corridors.

- a. Identify properties to acquire and set aside money to acquire the properties.
- b. Implement RVA Clean Water strategy to place an additional 10 acres under conservation easement.

## Objective 16.3

### Reduce water consumption by 10% per capita.

- a. Implement RVA Clean Water strategy to implement new water conservation technologies and promote water conservation efforts.
- b. Encourage on-site graywater uses in public and private facilities.
- c. Minimize drinking water waste through infrastructure improvements.
- d. Encourage planting of drought-resistant species.
- e. Adjust pricing to encourage conservation/utility bills reflective of use, and ensure there are programs to teach people about water conservation so that low-income families are not burdened with unexpectedly high bills.
- f. Develop incentives for commercial/institutional water reduction.
- g. Benchmark water usage in utility bills by comparing usage to average usage.
- h. Benchmark water usage in all City facilities and develop plan to reduce consumption.

## Objective 16.4

### Increase green stormwater infrastructure

throughout the city, prioritizing areas with a high heat vulnerability index score.

- Explore creating incentives or requirements in zoning and development processes for green infrastructure on private property.
- Identify opportunities for green infrastructure on public lands and rights-of-way; explore creating green infrastructure guidelines within the Better Streets manual.
- Continue funding programs to plant trees and educate public on importance of trees.
- Develop guidelines for use of porous paving materials for alley re-paving projects.
- Market the City's stormwater credit program, and explore changes to the program to increase its use and encourage more landowners to plant vegetation that reduces the quantity and improves the quality of stormwater runoff.
- Implement the RVA Clean Water plan strategy to install or retrofit green infrastructure draining 104 acres of impervious surfaces in the MS4.
- Implement the RVA Clean Water strategy to install or retrofit green infrastructure draining 18 acres of impervious surfaces in the CSS.

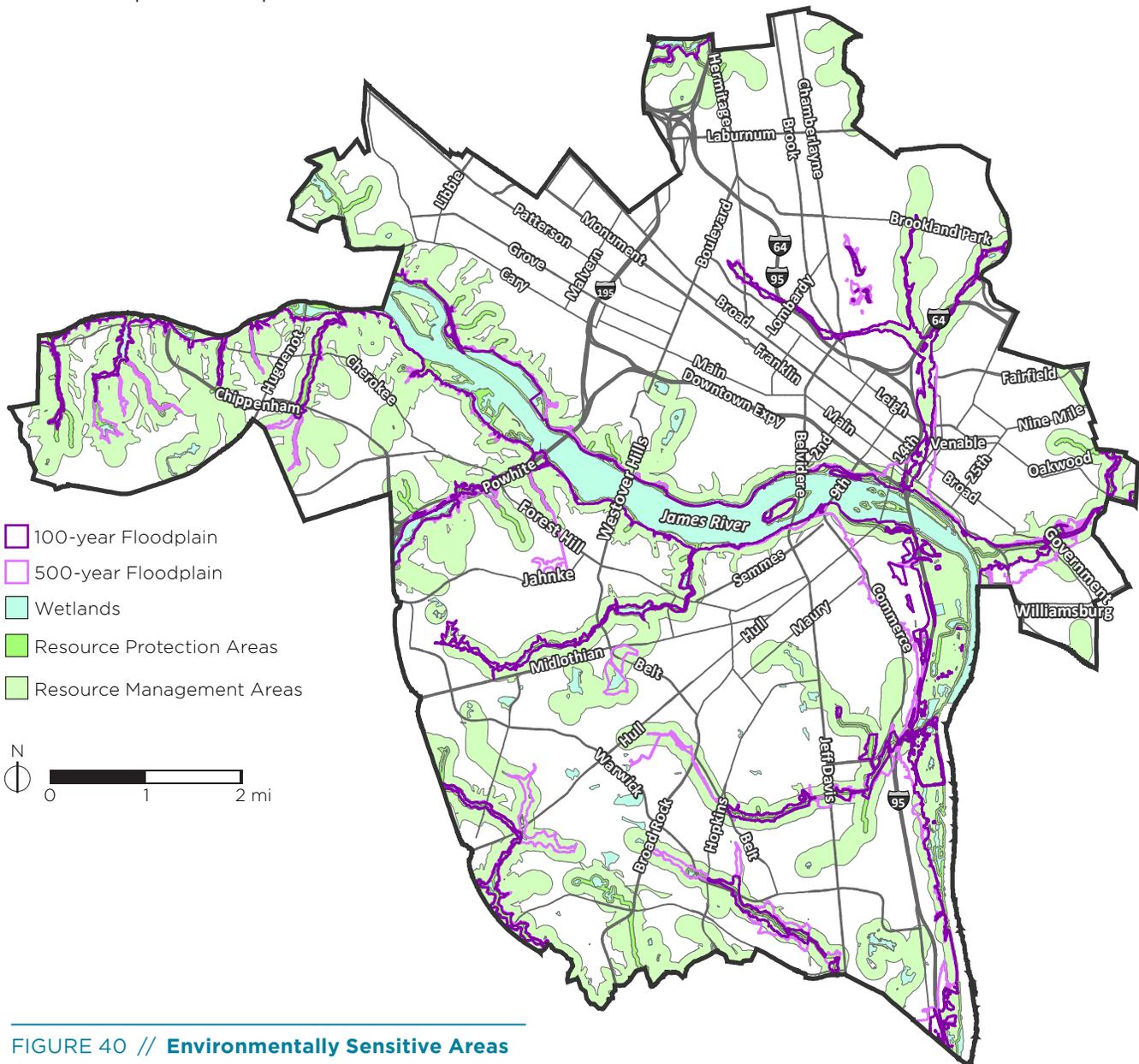


FIGURE 40 // Environmentally Sensitive Areas

Source: City of Richmond: Department of Public Utilities, 2019

## Goal 17: Resilient & Healthy Communities



Positively adapt to the effects of a changing climate via RVAgreen 2050, and ensure that all residents have equitable access to nature and a healthy community.

### Existing Context

#### **The manner in which humans design and use land has significant effects on the natural environment and an individual's health.**

The Science Museum of Virginia predicts that due to a changing climate, Richmond will experience more days over 95 degrees and more major rain events. Urban form, land use, and transportation systems have direct effects on public health, and can influence factors such as obesity, diabetes, and asthma rates, as well as overall fitness. The recommendations outlined in Goal 17 of this Plan seek to make Richmond more resilient and healthy with a focus on natural habitats, open space, parks, and agriculture. In addition to Goal 17, various sections of this Plan outline many recommendations that seek to improve the health of Richmonders; for example, Goals 1 and 4 describe strategies to create walkable neighborhoods and destinations, Goal 8 outlines recommendations to increase active transportation options, Goal 14 presents strategies for creating and improving quality housing, and Goals 15 and 16 provide recommendations for improving air and water quality.

#### **Richmonders are vulnerable to urban heat.**

Urban heat vulnerability is a term used to describe an area's conditions that make it more or less sensitive to heat. Currently, 21.5% of Richmonders live in census tracts designated as "highest" in terms of urban heat vulnerability, while 19.6% live in census tracts designated as "high." These areas correspond with some of the densest areas of the city and areas of the city with the highest poverty rates. As Richmond continues to experience longer and hotter heat waves, implementing strategies to make the city cooler will be increasingly critical to keep Richmonders healthy and our natural environment thriving.

#### **Two in five Richmonders do not have easy access to quality food.**

Based on 2015 data from the U.S. Department of Agriculture, 40% of Richmonders live in a food desert, meaning they live over a mile away from a full-service grocery store. Having access to quality food can decrease overweight and obesity rates, which are currently increasing.

#### **The City of Richmond has sought to understand the factors that influence these concentrated areas with limited access and identify local solutions.**

In 2011, the Mayor's Office appointed community advocates, academics, community leaders, business owners, and others to the Food Policy Taskforce, which was charged with providing recommendations on food policy and land use planning that would promote greater access to healthy foods. In 2014, the City conducted a Food Policy Analysis, which was used to inform a city-wide community engagement campaign conducted by the Richmond Food Justice Alliance (RFJA) in 2019. RFJA collaborated with a committed group of impacted residents to develop and implement the campaign. This 8-month effort allowed for individuals who experience food insecurity firsthand to identify the

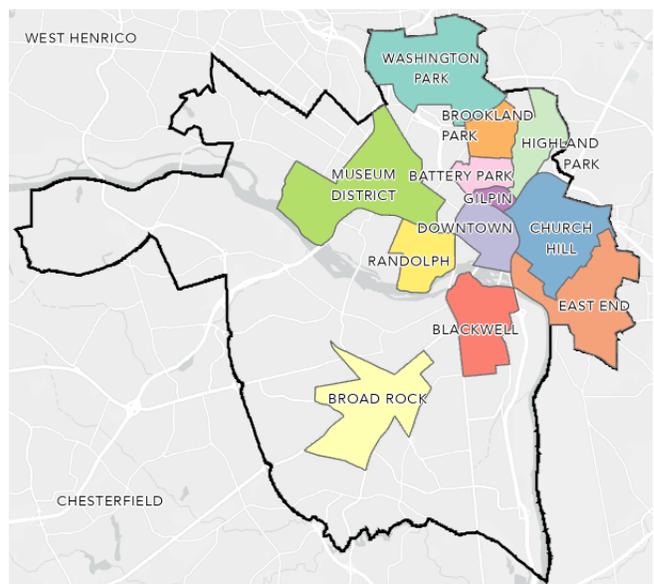
solutions that would benefit them and their families most. Relevant land use and city planning policies that were identified in the campaign are included in objective 17.4.

**Access to open space and natural systems can decrease the risk of diseases like obesity and asthma and increase biodiversity and overall environmental health.**

Asthma, diabetes, and obesity rates are higher in areas of concentrated poverty. According to the Centers for Disease Control and Prevention (CDC), asthma rates in adults living in the East End and the Southside, in areas of concentrated poverty, are double that of adults living in the West End (14% and 7%, respectively). Asthma rates are linked to pollution and poor housing conditions. Across the city, diabetes rates vary from less than 5% in the West End to over 20% in the East End and the Southside, which is higher than the highest state averages in the U.S. (West Virginia has the highest statewide diabetes rate at 15%). According the CDC, in 2014, 65.3% of Richmonders were considered overweight or obese, a 25% increase since 2011, when the rate was 52%.

**The James River is rich and critical habitat for thousands of plant and animal species.**

The James River Park System is biodiverse and hosts a rich array of species, 14 mammal species, 170 bird species, 10 frog species, 100 insect species, and more than 450 species of wildflowers, grasses, trees, shrubs, and wetland/aquatic plants. However, these plant communities are under stress from invasive species. The James River also serves as spawning ground for migratory fish, such as shad, herring, perch, and bass that swim from the ocean and the Chesapeake Bay to spawn at and above the James River Fall Zone.



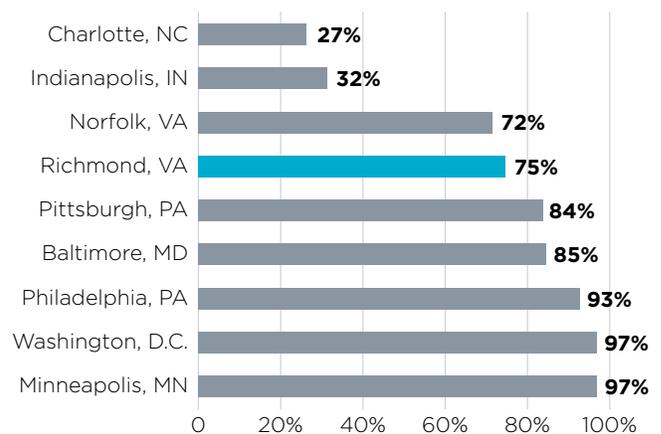
Throughout the engagement process, RFJA [some members of RFJA are picture in the top photo] asked community members to self-identify the community they belong to, instead of staying strict to their current zip code or the name associated with a census tract. Note that the colored regions in the map [bottom image] are not representative of specific boundaries but instead represent a grouping of multiple areas with similar experiences under a common, recognizable name from that area. Therefore, the absence of neighborhood titles on the map does not mean they were ignored.

## Objective 17.1

**Increase the percentage of Richmonders within a 10-minute walk of quality open space to 100%,** prioritizing low-income areas with a high heat vulnerability index rating, with a long-term goal of having all Richmonders within a 5-minute walk of a quality open space, as shown in Figure 41 and Figure 42.

- a. Utilize the Maggie Walker Community Land Trust to create public open space.
- b. Revise the Zoning Ordinance to include a green space/green amenity minimum (see Goal 4).
- c. Engage residents (particularly traditionally under-represented communities), developers, government, technical experts, and other stakeholders in defining and encouraging excellence in design of public open and green space.
- d. Develop a strategy for acquiring land for new parks and open spaces, and develop a Parks Master Plan (see Goal 2).
- e. Implement strategies in Goal 8 to connect parks and increase access to parks.
- f. Promote the Parklet Program, encourage the development of parklets throughout the City.
- g. Rely on principles of crime prevention through environmental design rather than police presence to ensure park safety.
- h. In designating and designing new parks, consider and mitigate potential negative effects, such as increased adjacent property values, cultural displacement, and increased regulation of public space.
- i. Amend City ordinances to allow public access to school yards and playgrounds during non-school hours.
- j. Create public-private partnerships to help the City maintain and manage high-quality parks, green infrastructure, and public open space.
- k. Create dedicated funding for the creation and maintenance of new and existing parks, public open space, plazas, and greenways, such as 1) a bond referendum and/or 2) a neighborhood-based program where landowners and developers pay fees that will be used to create a park in their neighborhood.

- l. Develop incentives to create publicly accessible open space as part of private development (see Goal 4).



**FIGURE 41 // Percentage of Population within 10-minute Walk of Parks**

Source: City of Richmond, Trust for Public Land, 2017

75%

of Richmonders lived within a 10-minute walk of a park in 2017

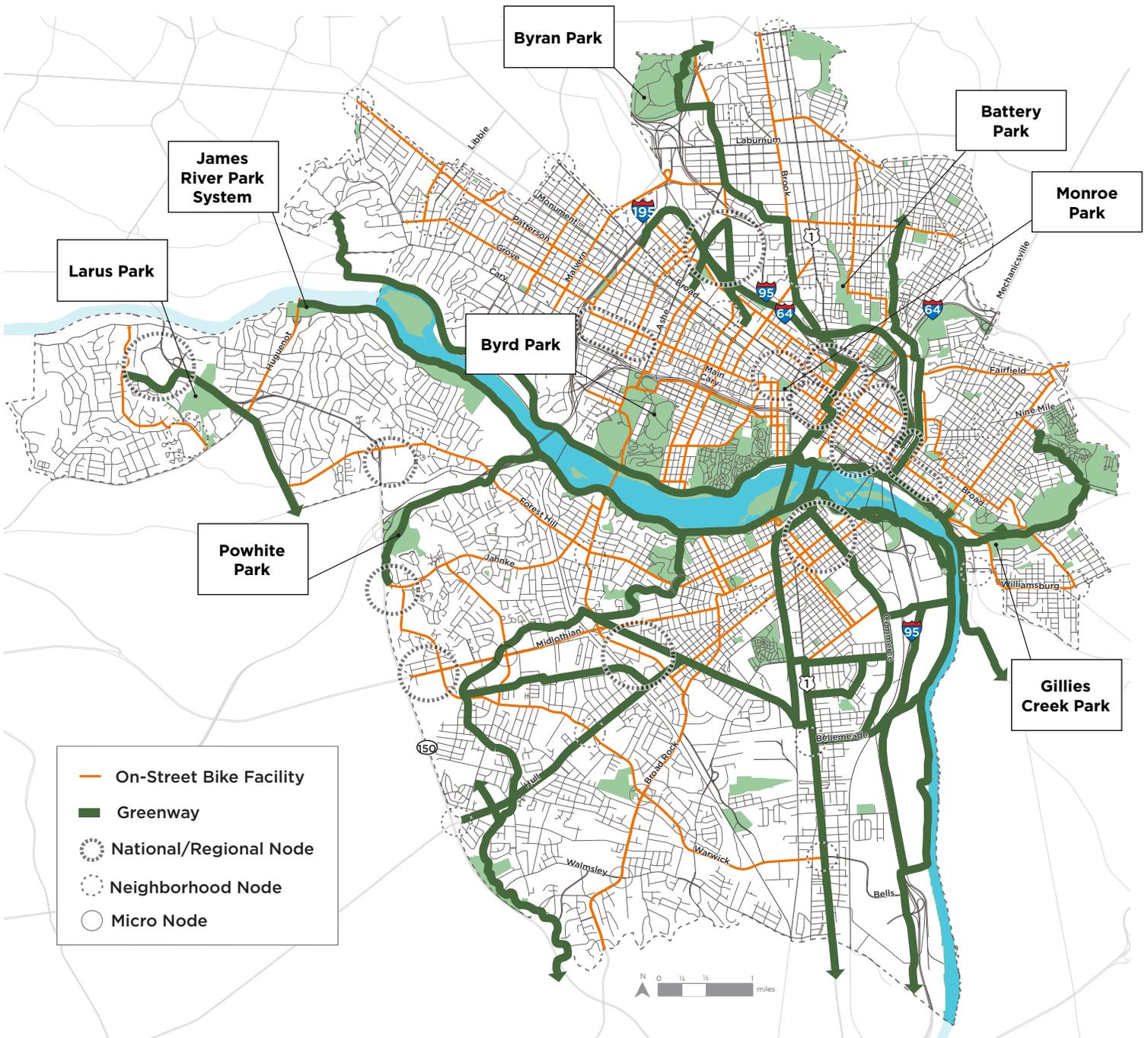


FIGURE 42 // Parks, Greenways, and Bike Facilities Map

## Objective 17.2

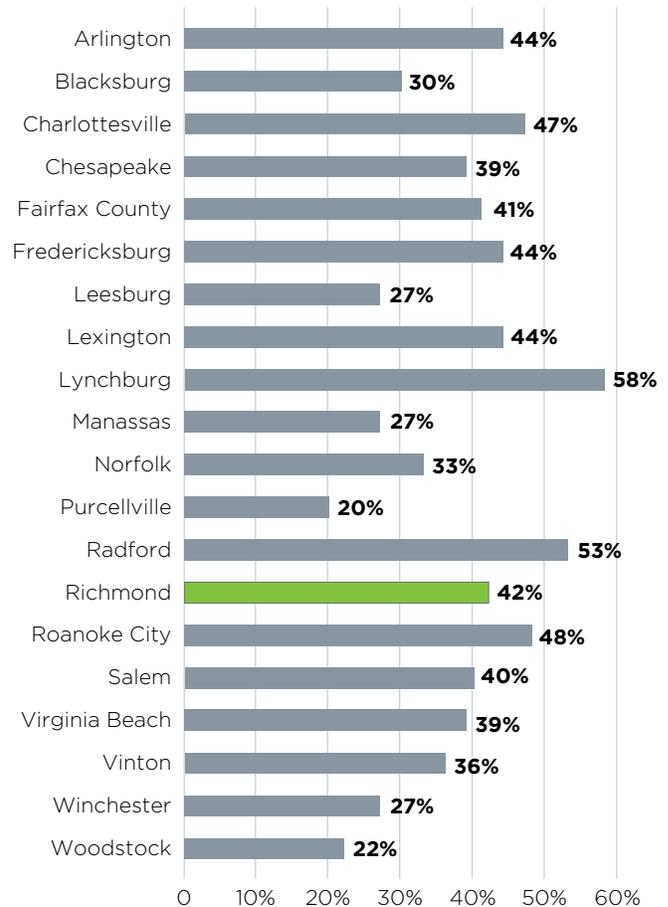
### Increase city-wide tree canopy from 42% to 60%

(see Figure 43) and seek to achieve a 30% tree canopy in all neighborhoods, prioritizing areas with a high heat vulnerability index rating and low tree canopy coverage.

- Develop education and incentive programs to encourage private land owners to plant trees and care for existing trees.
- Develop a tree management plan that provides specific guidance on tree planting, care, species options, and other strategies.
- Develop an urban forest master plan.
- Expand the Adopt-A-Tree program for community organizations to buy trees in bulk and commit to steward the trees.
- Train neighborhood groups on how to manage trees.
- Revise the Zoning Ordinance to increase the parking screening requirements and require a 10% tree canopy coverage of surface parking lots.
- Explore incentives, programs, and requirements for new developments and additions to existing buildings to retain mature trees, replace lost trees, and plant more trees if none were there originally.
- Implement RVA Clean Water strategy to increase tree canopy on City property by 5%.
- Reinstate the Urban Forestry Commission.
- Revise the subdivision ordinance to regulate neighborhoods to include street terraces.
- Relocate overhead utilities to alleys or bury overhead utilities to accommodate mature canopy street tree planting.
- Revise the Zoning Ordinance to plant trees during the redevelopment process, per the Code of Virginia 15.2-961.

# 42%

of Richmond is covered by tree canopy



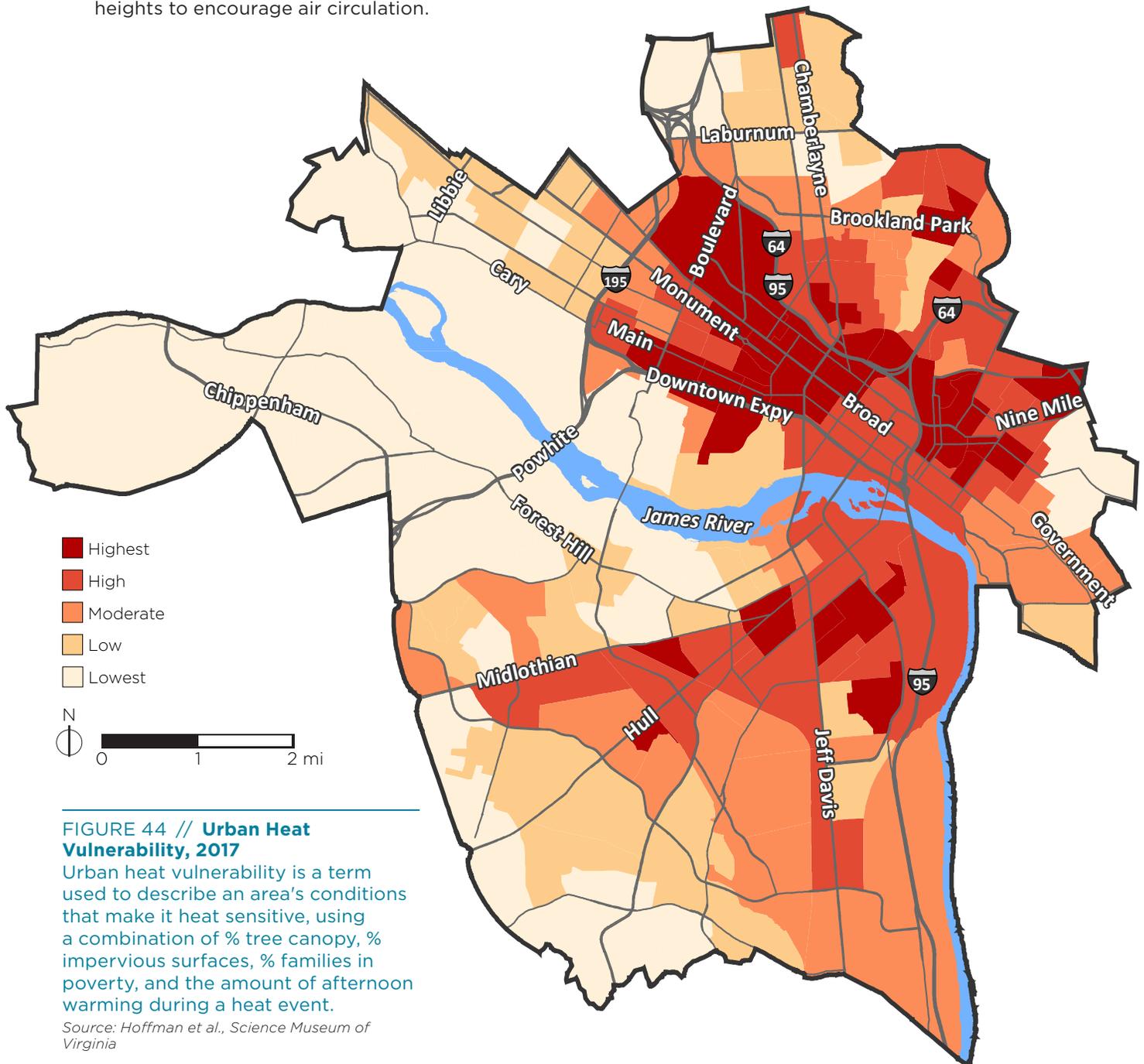
**FIGURE 43 // Comparison of Existing Urban Tree Canopy Coverage in Virginia Localities, 2010**

Source: McKee, Jennifer, *A Report on the City of Richmond's Existing and Possible Urban Tree Canopy*, Virginia Tech: 2010

### Objective 17.3

**Reduce urban heat**, prioritizing areas with a high heat vulnerability index rating, as shown in Figure 44.

- a. Encourage lighter-colored surfaces for roads and roofs to reflect sunlight.
- b. Identify opportunities for green roofs on public facilities, and encourage green roofs in private development.
- c. Design neighborhoods with a variation in building heights to encourage air circulation.
- d. Encourage redevelopment of surface parking lots into mixed-use developments and/or park area, potentially taxing properties with parking lots as a primary use at a higher rate.
- e. Increase the tree canopy and overall green spaces throughout the city (see related strategies in Goal 17).
- f. Reduce parking minimums in the Zoning Ordinance.



**FIGURE 44 // Urban Heat Vulnerability, 2017**  
Urban heat vulnerability is a term used to describe an area's conditions that make it heat sensitive, using a combination of % tree canopy, % impervious surfaces, % families in poverty, and the amount of afternoon warming during a heat event.  
*Source: Hoffman et al., Science Museum of Virginia*

## Objective 17.4

**Expand access to the local healthy food system, prioritizing residents in low-income areas.**

- a. Expand the community garden program by developing standards and guidelines for community gardens on public lands to ensure transparency, continuity of use, community benefit, and access to a water source.
- b. Develop and promote content explaining where urban agriculture is permitted by right in the Zoning Ordinance and explore expanding where it is permitted as a by-right use.
- c. Create opportunities for funding technical support, tools, and processes for all residents to participate in urban agriculture.
- d. Attract healthy food retailers to low-income areas by increasing residential density and providing financial and technical support for retailer creation, expansion, remodeling, or equipment upgrades.
- e. Expand where farmers' markets, grocery stores, and other healthy food retailers are permitted, especially in Nodes and along enhanced transit corridors.
- f. Coordinate City resources, such as facilities, land, or infrastructure, to promote center processing and efficient distribution of regionally grown, healthy foods to Richmond Public Schools.



## Grocery Store Market Analysis

### CONTEXT

**Richmond:** Over the past several years, City staff have heard the desires of many residents to have a grocery locate in their neighborhood. For these residents, having access to a grocery store in their neighborhood provides easy access to high-quality food options that may not be available at convenience stores and very small independent groceries where the breadth of selection or overall prices are not as competitive as they are in other neighborhoods.

**Market:** The nature of the grocery business has changed over the past fifty years, more retail establishments (beyond the traditional grocery store) sell grocery items and grocery stores have continued to get larger (with the additional parking and delivery needs that come with the larger size). With traditional narrow margins, the market for grocery stores has transitioned to larger stores that service a larger trade area (with higher household incomes) and require more real

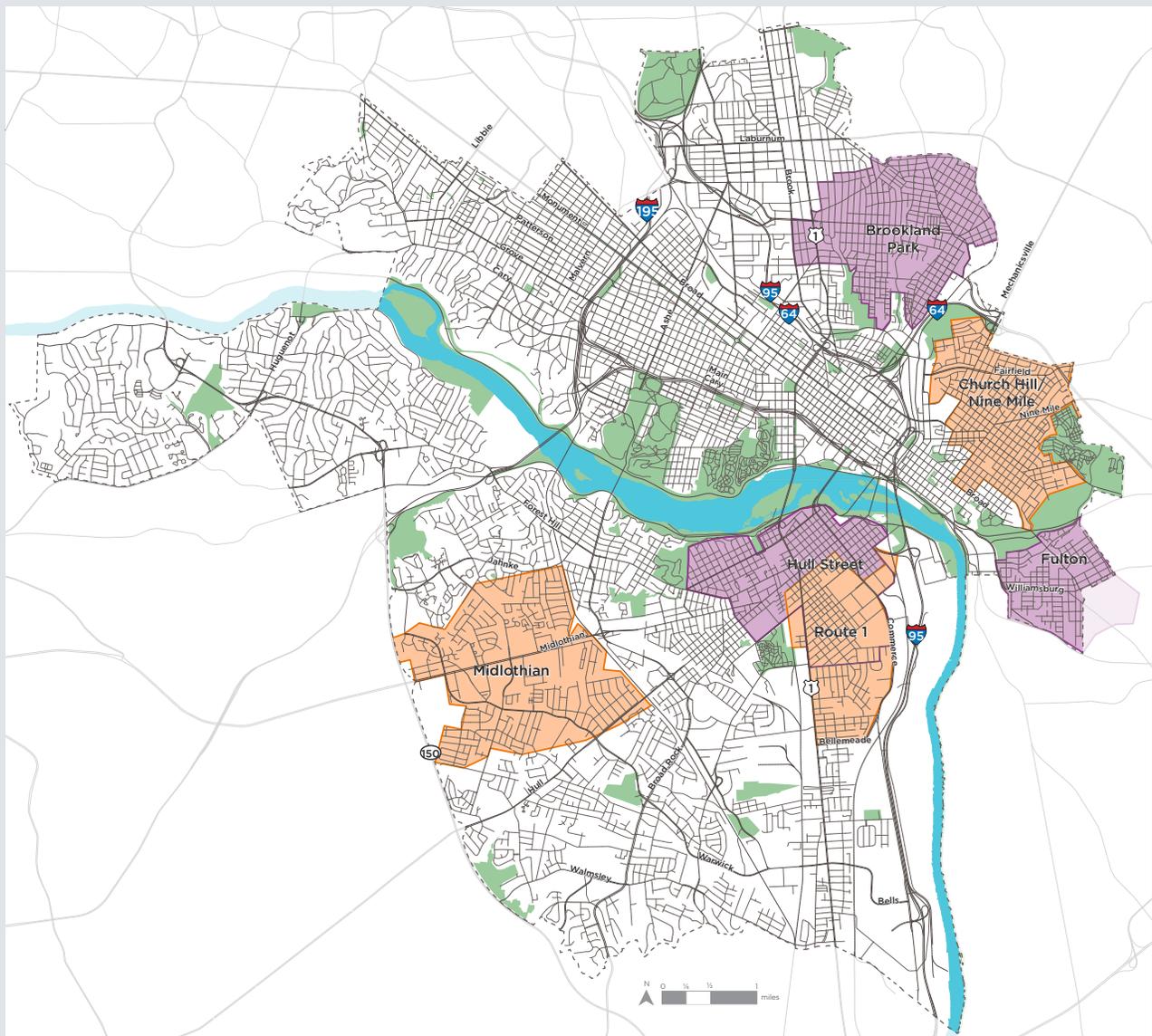


FIGURE 45 // Trade Areas Studied in the Grocery Store Market Analysis

estate than what many older areas of the city have available. While there are alternative models of grocery stores, e.g., member-owned food co-ops, the alternative models are also difficult to organize.

## MARKET ANALYSIS

**Purpose:** The effort to locate grocery stores traditionally focuses on increasing supply in neighborhoods. However, at the beginning of the *Richmond 300* process, PDR hired VCU CURA to analyze six neighborhoods in Richmond and determine what market factors would need to change in order to attract a grocery store. Figure 45 shows the six neighborhoods and associated trade areas used in the analysis included in this analysis. The trade areas are for a local grocery store and also took into account traffic volumes on major roads. The full description of VCU CURA's research can be found in the *Richmond 300* Supporting Reports (under separate cover).

**Findings:** Food deserts usually exist because there is a lack of market demand to support a grocery store because the neighborhood is either low-density, low-income, or both.

VCU CURA found that traditional methods to reduce food deserts have not included policies related to attracting a new supply of housing units in the neighborhood to increase demand within the area for a grocery store. Traditional methods to reduce food deserts have included providing grants to incentivize grocers to open in food deserts, increasing participation in Supplemental Nutrition Assistant Program (SNAP), increasing public transit and other transportation modes, increasing education about healthy food, and advocating for policy change at the state and federal levels.

VCU CURA's analyses estimated how many additional households earning the area median income would be required to economically support a small or large grocery store.<sup>1</sup> The analyses showed that four of six neighborhoods may support a small grocery store using the 2014 population estimate. An increase of 1,000 households earning the regional median

household income would allow almost all trade areas to support a small grocery store. However, few operators of stores of that size exist in today's market, and most operators would want to see a larger market area than what may barely support one store. Although none of the neighborhoods in question could support a large grocery store with their 2014 populations, three neighborhoods currently had near 80% of the minimum potential demand. See Table 6 for a summary of the analyses.

While total number of households in some of these neighborhoods has increased between 2000 and 2017, none of the neighborhoods have regained the level of population they once had. For example, the Brookland Park Boulevard Area lost nearly half its population between 1970 and 2010 (population of 24,000 in 1970 and 13,000 in 2010). See Table 6 for a summary of the analyses.

**Conclusion:** Based on these analyses, in addition to the aforementioned traditional methods, policy makers should also consider encouraging the creation of more housing units within food deserts as another solution to reduce food deserts. That said, there are a couple of caveats: 1) the continuous change in how people buy food and the changing grocery market will continue to be challenge as the City develops policy and implements programs to expand food access; and 2) there are grocery stores just outside of the city limits that do affect the opportunities for grocery store location in Richmond as many of our neighborhoods (including these 6) are in relatively close proximity to grocery stores in neighboring communities that feature auto-oriented grocery stores.

Finally, with rare exceptions, following the traditional suburban model of grocery store trade area analysis will not work for Richmond. *Richmond 300* is about creating a specific identity for the city that is authentically Richmond. That will mean creating high-quality, accessible, and inclusive neighborhoods of sufficient population and household income to become attractive to the market.

<sup>1</sup> A small grocery store is assumed to be 25,000 square feet, the estimated size of an urban neighborhood supermarket. A large grocery store is assumed to be 44,094 square feet, the median gross leasable area of U.S. neighborhood supermarkets according to Dollars and Cents of Shopping Centers/The SCORE 2008 (Urban Land Institute).

TABLE 6 // Grocery Store Market Analyses Findings

	Support small grocery store?			Support large grocery store?		
	2014 Households	+1,000 Households	+5,000 Households	2014 Households	+1,000 Households	+5,000 Households
<b>Brookland Park</b>	Maybe 130% demand	Yes 160% demand	Yes 280% demand	No 80% demand	No 90% demand	Yes 160% demand
<b>Church Hill/ Nine Mile</b>	Maybe 130% demand	Yes 160% demand	Yes 280% demand	No 80% demand	No 90% demand	Yes 160% demand
<b>Fulton</b>	No 60% demand	No 90% demand	Yes 210% demand	No 30% demand	No 50% demand	Maybe 120% demand
<b>Hull Street (including Manchester)</b>	Maybe 100% demand	Maybe 130% demand	Yes 250% demand	No 60% demand	No 70% demand	Maybe 140% demand
<b>Midlothian</b>	Maybe 140% demand	Yes 170% demand	Yes 290% demand	No 80% demand	Maybe 100% demand	Yes 160% demand
<b>Route 1 (South Richmond)</b>	No 80% demand	No 110% demand	Yes 220% demand	No 40% demand	No 60% demand	Maybe 130% demand

Table Notes:

- 2014 Households is based on the 2010-2014 ACS 5-year Estimates. Additional households are assumed to earn the regional median household income of \$59,677 (2010-2014 ACS 5-year Estimates)
- Percent demand means the amount of households that exist to meet the demand to support the grocery store. A demand of 80% means that there the trade area only has 80% of the households needed to support the grocery store. Usually grocers want to see a demand of at least 150% before moving into a market.

## Objective 17.5

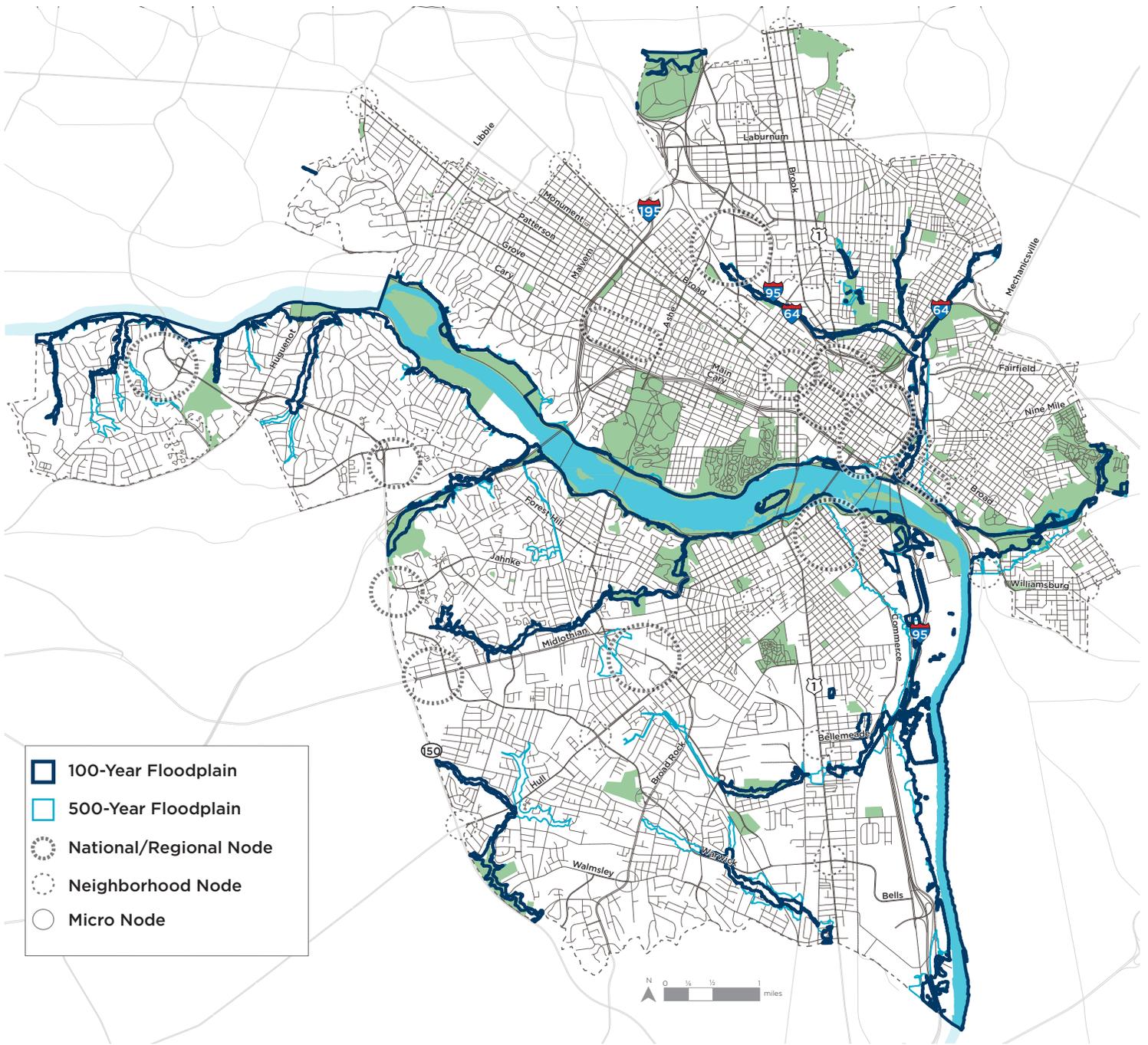
### Reduce the effect from heavy rainfall events and sea level rise.

- a. Request that the Federal Emergency Management Agency update the flood plain maps.
- b. Encourage development in areas at lower risk of flooding.
- c. Evaluate the transportation investments needed to create emergency egress from areas at risk of flooding.
- d. Where possible, expand wetlands and other features that manage flooding identified in the RVA Clean Water Plan.
- e. Conduct a sea-level-rise impact analysis to identify areas in Richmond that may be affected.
- f. Reduce impervious surfaces (see Goal 16).
- g. Identify opportunities for acquiring land in the Resource Management Areas (RMAs) and Resource Protection Areas (RPAs), shown in Figure 40, at high risk of flooding, as shown in Figure 46, to conserve, discourage development, and implement strategies to slow, spread, and infiltrate floodwater.

## Objective 17.6

### Increase the resiliency of infrastructure and community assets.

- a. Bury power lines and locate key energy network assets to enhance grid resilience.
- b. Establish assessment guidelines for public infrastructure that ensure resilience to current and future hazards.
- c. Increase local renewable energy generation (see Goal 16).
- d. Evaluate transportation networks to identify emergency routes and promote redundancy.
- e. Develop micro-grids with on-site energy storage for critical public facilities.
- f. Develop microgrid communities with on-site energy storage.
- g. Support increased usage of energy storage technology, including small-scale storage systems in residential, commercial, and industrial buildings, vehicle-to-grid infrastructure, and larger stand-alone storage facilities where appropriate.
- h. Identify community facilities to serve as resilience hubs and update systems to be more resilient.



**FIGURE 46 // Floodplains with Nodes**

Source: Digital Flood Insurance Rate Map (DFIRM) database, which is administered by the Federal Emergency Management Agency (FEMA), 2018

## Objective 17.7

**Increase and enhance biodiversity** within Richmond.

- a. Implement strategies in Equitable Transportation to connect parks via greenways that could also serve as animal habitat corridors, explore using RMAs and RPAs to create green ribbons through the city.
- b. Increase the prevalence of native plant species and plants for healthy pollinator communities at public facilities and promote such planting on private lands.
- c. Implement the RVA Clean Water strategy to use 80% native plants in new landscaping at public facilities by 2023.
- d. Develop a strategy to integrate invasive plant management into existing city programs and reduce invasive plant coverage within the city.
- e. Discourage use of pesticides and herbicides and encourage organic practices to improve and maintain soil health and healthy habitat and ecosystems.
- f. Encourage use of bird-safe glass and other building materials and features that protect and enhance natural ecologies where appropriate.
- g. Encourage bird houses, bat houses, and other structures that provide important and safe shelters for wildlife.
- h. Revise the City's weed ordinance to allow for exemptions for native plant species and plants for healthy pollinator communities on private lands.
- i. Convert large City-managed non-recreational mown areas, such as floodwall impoundment areas, to native community wildflower/pollinator species meadows, mown or bush-hogged once or twice each year.

## Objective 17.8

**Reduce light pollution.**

- a. Seek and develop strategies to achieve certification as an International Dark Sky Association International Dark Sky Community.
- b. Install hooded light fixtures on public rights-of-way and buildings to reduce light pollution and reduce effect on nocturnal species.



A blue heron descends into the James River.