

DRAFT | April 2022



Climate Equity Action Plan 2030



*Equitable climate action for a
healthy and resilient Richmond*

Acknowledgments

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Content to be added.



A Note from the Racial Equity & Environmental Justice Roundtable

To the readers of this plan,

Our group - the RVAgreen 2050 Racial Equity & Environmental Justice Roundtable - came together in 2020 to help the Office of Sustainability create the City of Richmond's first plan to address climate change. That was a year of reckoning for Richmond: George Floyd's murder reignited a flame in demanding racial justice - especially in a city filled with monuments celebrating white supremacy - and the COVID-19 pandemic was highlighting just how much that legacy divided our community into those who could withstand critical shocks and those who struggled to do so.

Climate change is another shock to our community. If we do not act, we will continue to see impacts to Richmonders that live in historically marginalized, excluded, and overlooked communities. These are our neighborhoods. We started our learning journey with the Office of Sustainability by exploring some basic questions: What is climate change? What is equity? What is race? How do these concepts intersect? We created a vision in which all Richmonders, regardless of their identity or neighborhood, thrive in a climate-resilient and climate-neutral community. We lead with race in our work because in our community it predicts a person's quality of life outcomes.

The nearly two-year process to create this plan was, at times, humbling and challenging, but has helped to create a blueprint for Richmond and other cities to use for better, more equitable planning processes. Our group - Richmonders who care deeply about our communities - worked directly alongside technical experts to create this plan. The process merged different perspectives, knowledge, and lived experiences to make sure that our roadmap to an equitable, healthy, resilient, and climate-neutral Richmond is going to work for every community.

The process was not perfect, of course. Challenges ranged from the immediate and sudden impacts of COVID-19 to the deep-rooted mistrust on both sides of the city-community relationship. However, by working together to center equity in planning for the future of Richmond, we have moved our city closer to crafting solutions in a way which leaves no citizen out, no matter who they are or which community they call home.

We look forward to continuing this work together as a community towards a more equitable, healthy, and resilient Richmond.

- Members of the Racial Equity & Environmental Justice Roundtable



Land Stewardship

It is impossible to address climate change without also addressing land: where, what, and how the Richmond community preserves, develops, travels across and conducts activities on and through it. The land on which today's Richmond community lives, works, learns, and plays has a long history of stewardship and strife which drives who lives where and has access to what.

Indigenous people stewarded the land in and around today's Richmond for thousands of years. Europeans displaced these original stewards and began a progression of colonialism and degradation of groups of people and natural resources based on what would benefit white, land-owning male inhabitants. White settlers maintained their power through the capture and enslavement of hundreds of thousands of Africans and

centuries of laws and programs that hurt communities of color.

The history of the land currently known as Richmond has created systems that serve our community in inequitable ways, from education and healthcare to government and natural resources. Black, indigenous, and other people of color are more likely to live in marginalized areas that are more susceptible to harm resulting from climate change. These areas experience more heat and flooding due to lack of trees, more paved surfaces, and inadequate infrastructure. It is critical that the City of Richmond's efforts to address climate change uplift the voices and center the priorities of these communities.

No sentence, paragraph, or page of text can adequately describe or acknowledge the history and persisting legacies of centuries of misappropriation of Richmond's land and displacement of its people. However, it is important to recognize and disrupt this

persisting legacy of colonialism, white supremacy, and racism vocally, consistently, and with deliberate action. This document and the process by which it was developed represents one piece of ongoing work to establish more equitable systems in Richmond through community ownership.

The Richmond community and the City of Richmond government - the current stewards of this land - must take responsibility for where, what, and how we preserve our natural systems, develop equitable and restorative processes, and conduct our activities as governments, organizations, and individuals. We must understand the history of this land's past, acknowledge the injustices that continue to impact our community, and create a better story for its future people to tell.

This is a living statement that will evolve over time, created using currently available historical and cultural references.

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Executive Summary

Lessons Learned

As this document was being drafted by the Office of Sustainability, staff realized that the lessons learned along the way in the RVAgreen 2050 planning process were important to call out and put up front to promote transparency, honesty, and more equitable processes moving forward.

What Worked Well

Compensating Participants

Despite the challenges with the city's payment abilities described below, it was entirely worthwhile to compensate Roundtable participants. Compensation provided a fairer exchange of expertise, led to more trusting relationships, and also enabled and encouraged participation for many members. Notably, the Roundtable members who initially applied and elected not to receive a stipend all eventually had to discontinue their participation (although this was not directly tied to not being compensated for their time).

Maintaining Flexibility (and Levity)

Under "normal" circumstances an equitable planning process would have been difficult to achieve, but the 2020-2021 timeframe was particularly arduous due to a global pandemic and the legacy of white supremacy. The Office of Sustainability team revised the planning process timeline MANY times over the course of 2017 through 2022 to ensure that the Office was taking the time needed to build trust, expertise, and ensure an equitable process. It was critical that the staff and stakeholders supporting RVAgreen 2050 were flexible in terms of timelines, deliverables, and activities amidst the tumultuous backdrop of COVID-19, racial equity demonstrations, and uncertainty. At times it was also important to simply come together as fellow Richmonders, reflect, and acknowledge challenges but not allow them to weigh down the process or our spirits.

Demonstrating Mutual Respect

The Office of Sustainability was not able to provide financial compensation to all contributors to the RVAgreen 2050 process, such as the Working Groups, so it was important to make sure that participants' time was respected and used wisely. In addition to the regular virtual meetings, staff offered many other ways for Working Group members to participate and ensure their contributions provided mutual value. Towards the end of the process, staff also began opening space at the beginning of each meeting for participants to share their updates, successes, and challenges related to climate change and this resulted in several connections across sectors that will further our collective work.

What Did Not Work So Well

Conducting a Virtual Process

COVID-19 presented many challenges, one of the most significant being conducting the planning process almost entirely virtually in order to maintain the health and safety of all participants. Specifically for the Racial Equity & Environmental Justice Roundtable and the topical Working Groups, this excluded those who did not have consistent access to the internet and a device that made it convenient to participate in virtual meetings and review documents.

Navigating the City's Vendor System

The City of Richmond's procurement system is not ideal for creating an equitable compensation program for community members. For example, all Roundtable members had to individually register as city vendors and submit quarterly invoices in order to receive stipend payments. This would be a deterrent to participation from residents who are not U.S. citizens with social security numbers and those without bank accounts. In addition, city staff are not permitted to purchase gift cards using city funds, which would have provided an alternative method of compensation.

Connecting Complex Information Over a Long Timeframe

The Roundtable and Working Groups members dedicated many hours during and outside of the RVAgreen 2050 meetings to create and improve content that was often very technical and detailed. The Office of Sustainability team worked hard to maintain common themes and provide reminders of where the process was along the way. Despite these efforts, it was often difficult to see how specific tasks and concepts related to the bigger picture. For example, during the summer of 2021 the Working Groups engaged in a series of activities to map outcomes, outputs, and impacts related to each draft strategy as part of the prioritization process. Although immensely helpful to prioritizing strategies and identifying ways to measure progress, this activity had the least clear connection to what would show up in the final plan and was a complex task to manage.

RVAgreen 2050 By the Numbers

1

Vision

All Richmonders, regardless of their identity or neighborhood, thrive in a climate-resilient and climate-neutral community

2

Main goals to achieve

45% reduction in greenhouse gas emissions by 2030, below 2008 levels, and net zero emissions by 2050

Prepare for, adapt, and improve the community's resilience to local climate impacts

5

Pathways to get us there

-  Buildings & Energy
-  Community
-  Environment
-  Transportation & Mobility
-  Waste Reduction & Recovery

7

Community priorities to honor

-  Racial Equity & Environmental Justice
-  Government Accountability
-  Community Wealth
-  Affordable Housing
-  Beautiful & Safe Neighborhoods
-  Health & Well-being
-  Equitable Engagement & Communications

49

Prioritized strategies

Co-created by the Office of Sustainability, five technical Working Groups, and the Racial Equity & Environmental Justice Roundtable across all five Pathways to achieve our 2030 goals

12

Outcomes the community desires

- Cleaner and more efficient buildings
- Engaged and involved community
- Improved air quality
- Advanced green economy
- Increased support for climate action and resilience
- More green space and trees
- Lower greenhouse gas emissions
- Increased heat resilience
- Increased flood resilience
- Climate-ready community
- Less landfill waste
- Cleaner and more efficient transportation

RVAgreen 2050 at a Glance

RVAgreen 2050 is the City of Richmond's equitable climate action and resilience initiative.

Climate equity is addressing climate change in a way that is inclusive of and prioritizes those who are being impacted first and worst by climate change. Lower income populations and communities of color are more likely to live in areas with potential for greater impacts. [Read more.](#)

Climate action or mitigation is the reduction of greenhouse gas emissions that are causing climate change. Sources of this harmful pollution include burning fossil fuels such as coal and natural gas to create electricity, driving gas-powered vehicles, and landfilling and burning waste. [Read more.](#)

Climate resilience or adaptation, preparedness, and readiness is helping our community and city government respond to the impacts of climate change, such as, extreme heat, extreme weather, and flooding. [Read more.](#)

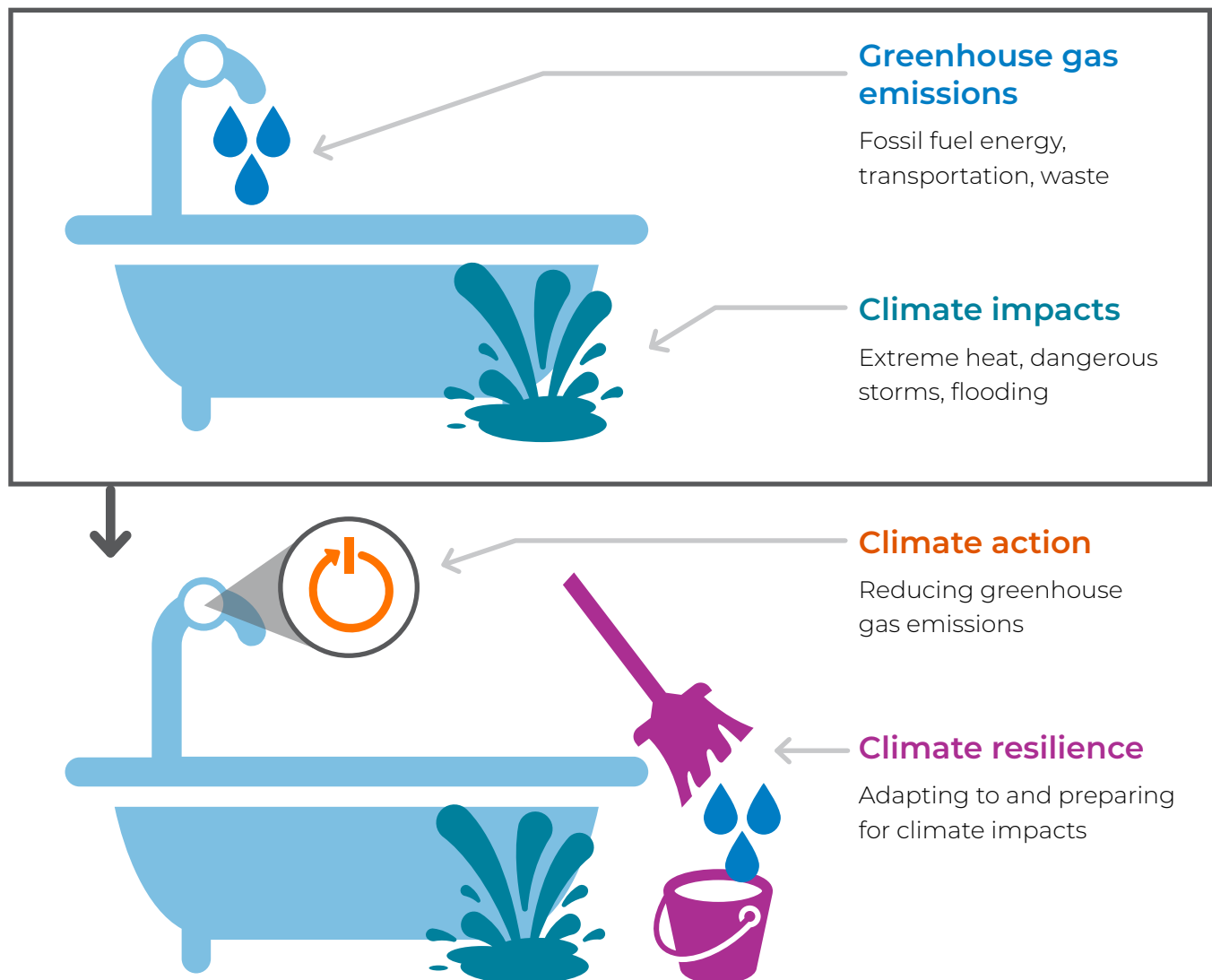


Figure i. Climate Action and Climate Resilience Address Climate Change as an “Overflowing Bathtub”

Climate Equity Action Plan 2030

Goals

Purpose of RVAgreen 2050 (adopted by City Council via Resolution No. 2020-R024 on June 8, 2020)

- » **Climate Action:** Achieve a 45% reduction in greenhouse gas emissions by 2030 from the 2008 baseline; achieve net zero greenhouse gas emissions by 2050
- » **Climate Resilience:** Prepare for, adapt, and improve Richmond's resilience to the local impacts of climate change

Vision

Statement of what the ideal future will look like when RVAgreen 2050 is implemented

Community Priorities

Cross-cutting public values to center in the plan

Pathways

Leverage points that will lead us towards realizing and operationalizing the goals and community priorities

- » **Buildings & Energy:** Accelerate the equitable transition to healthy, resilient, climate neutral buildings and energy sources
- » **Community:** Create an equitable and resilient Richmond while honoring and ensuring focus on community priorities
- » **Environment:** Invest in resilient, healthy, and equitably distributed natural resources throughout the community to support biodiversity and human well-being
- » **Transportation & Mobility:** Accelerate the transition for all to clean and equitable mobility systems
- » **Waste Reduction & Recovery:** Foster sustainable methods of waste reduction - wasting less, reusing more

Objectives

Long-term aims organized into the different pathways

Strategies

Actionable projects and programs that will be implemented to meet the goals and objectives

Actions

Specific steps to take to implement the strategy

Outcomes

Changes that will occur as a result of implementation of the Strategies and Actions

Indicators

Data points to measure progress towards the Outcomes

Pathways, Objectives, and Strategies

BUILDINGS & ENERGY	
Objective 1: Achieve climate neutrality and increase resilience in government buildings, infrastructure, and operations.	
BE-1.1	Municipal Energy Efficiency Program: Develop a program to achieve the energy efficiency goals of RVAgreen 2050 and Richmond 300.
BE-1.2	Municipal Clean Energy and Net Zero Construction: Incorporate measures toward the goal of converting all city buildings to clean energy by 2050.
BE-1.3	Municipal Climate Impact Mapping: Establish a protocol for tracking greenhouse gas emissions and planning for climate impacts.
BE-1.4	Municipal Resilient Infrastructure Assessment: Conduct a climate vulnerability and risk assessment of all city property (including buildings and parcels). Identify and prioritize properties for specific resilience projects.
Objective 2: Maximize energy efficiency, performance and resilience in all existing buildings.	
BE-2.1	Residential Energy Burden: Implement measures to reduce the energy burden of Richmond's most vulnerable communities and improve residential resilience to climate change.
BE-2.2	Commercial Energy Efficiency Programs: Develop policies, incentives, and financing mechanisms to improve commercial energy efficiency; offer assistance and technical expertise to those that are financially challenged and facilitate workforce development
BE-2.3	Construction & Energy Code Enforcement: Prioritize the most recent energy requirements in all new construction and site plan approvals.
Objective 3: Ensure all Richmonders have equitable access to affordable and renewable clean energy.	
BE-3.1	Solar Energy Education & Outreach: Provide equitable education and outreach to make homes and small businesses healthy, safe, and affordable through solar installations, focusing on frontline communities reducing disproportionately high energy burden in these neighborhoods.
BE-3.2	Solar Installation Incentives and Access: Encourage solar installations through the removal of zoning restrictions, incentivizing opportunities, and increasing funding for microgrids.
BE-3.3	Clean Energy Workforce Development: Establish training programs, apprenticeships, and a conservation corps/job placement program in low-income and diverse neighborhoods to build capacity for jobs related to solar installation and maintenance, weatherization upgrades, and energy efficiency auditing (e.g., prison to solar training).
Objective 4: Achieve climate neutrality and maximize resilience in all new buildings.	
BE-4.1	Net-Zero Energy Design: Develop and require builders to incorporate measures to advance net-zero energy design and green building in all new buildings.
BE-4.2	Resilient Design Guidelines: Develop Resilient Design Guidelines and require builders to incorporate design measures to reflect a changing climate, increased precipitation and flooding in concert with a public education campaign to convey the benefits of adaptive and resilient buildings.

Table ES-1 Pathways, Objectives, and Strategies

COMMUNITY	
Objective 1: Ensure that historically disinvested communities that are most affected by local climate impacts are centered and involved in the processes of developing, implementing, and evaluating solutions as a result of equitable communication and engagement strategies.	
C-1.1	Climate-Ready Affordable Housing: Climate-Ready Affordable Housing: Develop and implement climate mitigation and resilience requirements for the Affordable Housing Trust Fund.
C-1.2	Sustainable Employment Practices: Develop incentives for employers to facilitate greenhouse gas-reducing activities among employees.
C-1.3	Climate Action and Resilience Information Navigator: Help small businesses, homeowners, and renters navigate programs and incentives for reducing emissions and increasing climate resilience.
C-1.4	Community Benefits Scorecard and Agreements: Develop tools with frontline communities to evaluate City development projects and ensure they address community priorities for climate action and resilience, and encourage use by private developers as well.
C-1.5	Community Partnerships Program: Develop a climate action and resilience neighborhood partnerships program.
Objective 2: Increase the Richmond community's social resilience to climate change.	
C-2.1	Climate-Ready Community Fund: Establish a Climate-Ready Community grant program to provide funding to neighborhood-focused organizations to work with residents on climate action and resilience projects.
C-2.2	Community Compensation: Establish a policy and structure for paying community members for their time.
C-2.3	Organizational Collaboration: Partner with community leaders, organizations, and businesses to build community capacity for climate resilience.
C-2.4	Resilience Hubs: Create neighborhood resilience hubs in frontline communities.
ENVIRONMENT	
Objective 1: Make sure all residents have the opportunity to engage with healthy natural resources, spaces, and biodiversity.	
ENV-1.1	Green Space Management: Create a program and public-private partnerships to maintain and expand high-quality public green space.
ENV-1.2	Parks Master Plan: Support the development, funding, and implementation of a Parks Master Plan.
ENV-1.3	Urban & Community Agriculture: Develop, fund, and implement an urban and community agriculture program.
Objective 2: Reduce risks and impacts to the community and natural environment from extreme heat and drought.	
ENV-2.1	Urban Heat Island Reduction: Develop, fund, and implement an urban heat island reduction plan and program.
ENV-2.2	Urban Forest and Green Space Planning: Use urban forest and green space planning to increase climate resilience.
Objective 3: Reduce risks and impacts to the community and natural environment from extreme precipitation and flooding.	
ENV-3.1	Neighborhood Prioritization: Identify and prioritize extreme precipitation and flooding projects using community engagement and data.
ENV-3.2	Extreme Precipitation Resilience Planning and Operations: Increase planning and capacity for green infrastructure management and flood resilience measures.
ENV-3.3	Land Management Practices: Enhance land management practices to increase capacity for flood resilience measures.
Objective 4: Engage the natural environment to improve air quality and reduce greenhouse gas emissions.	
ENV-4.1	Carbon Sequestration: Implement equitable carbon farming, sequestration, and removal.

Table ES-1 Pathways, Objectives, and Strategies Continued...

TRANSPORTATION & MOBILITY	
Objective 1: Achieve climate neutrality in municipal fleet operations, encourage alternative travel options, and increase resilience and stewardship of transportation infrastructure.	
TM-1.1	Transportation Demand Management: Support commute alternatives for city employees through a transportation demand management framework.
TM-1.2	Municipal Connectivity & Complete Streets: Advance the city's Better Streets policy and prioritize walking and mobility-friendly connections between neighborhoods.
TM-1.3	Municipal Fleet Electrification: Electrify Richmond's fleet of vehicles and equipment.
TM-1.4	Climate Resilient Infrastructure: Develop a climate resiliency plan for transportation infrastructure that prioritizes projects using Envision and the Climate Equity Index.
Objective 2: Create vibrant neighborhoods where all residents can easily ride transit, walk, or bike to meet daily needs in alignment with Richmond Connects.	
TM-2.1	Resilient Bus Transit System: Improve and expand bus routes, stops, and bike share options, with priority for low car ownership and underserved areas.
TM-2.2	Integrated Connectivity: Develop shared-use, green biking and walking paths that connect neighborhoods to Richmond's employment centers and amenities.
TM-2.3	Residential Mobility and Complete Streets: Promote safely walkable and bikeable neighborhoods that connect Richmonders to jobs, necessities, and amenities throughout the city in alignment with the Richmond Connects Plan.
Objective 3: Transition the community rapidly and equitably to clean-fuel vehicles and transit.	
TM-3.1	Private and Commercial Vehicle Electrification: Facilitate the transition to electric vehicles across the city.
TM-3.2	Charging infrastructure: Support the equitable and geographically-distributed expansion of publicly-available charging stations.

WASTE REDUCTION & RECOVERY	
Objective 1: Transition the community rapidly and equitably to clean-fuel vehicles and transit.	
WR-1.1	Zero Waste Practices: Demonstrate high-impact zero-waste practices through a commitment to meet the standards set by Governor Northam's Executive Order 77 and Governor Youngkin's Executive Order 17.
WR-1.2	Waste Stream Reporting: Track and make available the impact of the city's waste reduction programs in order to provide a model for other institutions, business, organizations, and Richmonders.
Objective 2: Encourage community waste reduction by equitably prioritizing a circular economy.	
WR-2.1	Incentivize & Reward Institutional Waste Reduction: Promote institutional and corporate best practices for zero waste initiatives.
WR-2.2	Consumer Education: Better inform Richmonders about the impacts of waste, litter, and consumer choices.
WR-2.3	Recycle Specialty Materials: Address materials in the waste stream that cannot be managed through curbside recycling or composting initiatives.
Objective 3: Develop and implement a comprehensive and equitable citywide composting plan.	
WR-3.1	Municipal Composting Initiatives: Provide education about and options for composting at city-owned properties and events, including opportunities for the distribution of matured organic matter.
WR-3.2	Citywide Composting Program: Develop an equitable residential organic waste composting program that includes regular curbside pickup and accessible dropoff locations.
Objective 4: Ensure that policies and standards for waste generation and disposal reflect the community's priorities for an equitable, clean, and sustainable Richmond.	
WR-4.1	Public Advocacy for Waste Reduction: Engage Richmonders to develop and mobilize support for legislation, policies and programs aimed at reducing waste.
WR-4.2	Construction & Disposal Standards: Require new and updated standards for site development and waste management
WR-4.3	Transparency & Environmental Justice: Protect communities from industrial waste by requiring regular waste audits and impact assessments for all new and existing facilities.

Table ES-1 Pathways, Objectives, and Strategies Continued...

'SMARTIE' Model

The Office of Sustainability and Working Groups used the 'SMARTIE' model to ensure the strategies in the Plan meet the Objectives and Goals.

S	Strategic? Reflects an important dimension of what your organization seeks to accomplish (programmatic or capacity-building priorities)
M	Measurable? Includes standards by which reasonable people can agree on whether the goal has been met (by numbers or defined qualities)
A	Ambitious? Challenging enough that achievement would mean significant progress; a "stretch" for the organization.
R	Realistic? Not so challenging as to indicate lack of thought about resources or execution; possible to track and worth the time and energy to do so
T	Time-bound? Includes a clear deadline
I	Inclusive? Brings traditionally excluded individuals and/or groups into processes, activities, and decision/policy making in a way that shares power
E	Equitable? Includes an element of fairness or justice that seeks to address systemic injustice, inequity, or oppression

How to Use this Document

The goal of creating this 2030 Action Plan is to provide a transparent and accessible description of the steps our community will take to achieve the goals of RVAgreen 2050. It also provides relevant background information on the rationale behind and the process used to create the Plan. It is not intended to be a comprehensive research paper on climate change, but instead to communicate what is most relevant for city government and community stakeholders in order to take action on one of the greatest threats of our time. Use the Table of Contents and the following points of interest to navigate to relevant content based on your own needs:

- » Head straight to the **Richmond 2030 Action Plan section** for the strategies and actions that will get us closer to the RVAgreen 2050 goals.
- » **Learn more about climate equity, climate action, and climate resilience** in the Richmond context.
- » **Take action** to support RVAgreen 2050 and help ensure accountability for progress.

» **Learn more about the process** to create this action plan and how the City of Richmond can improve planning processes going forward.

» **Look for Equity in Practice Tips** throughout the plan that share how the Office of Sustainability and the project team centered equity throughout the RVAgreen 2050 planning process.

» **Look for Innovation Tips** throughout the plan that share new practices that the Office of Sustainability pioneered for the RVAgreen 2050 planning process.



EQUITY TIP ▶
Equity in Practice Tips look like this!

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INNOVATION TIP ▶
Innovation Tips look like this!

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This is a living document that will change over time.

CHAPTER 1

Vision for an Equitable, Healthy, and Resilient Richmond

Vision for an Equitable, Healthy, and Resilient Richmond

We envision a future Richmond where all Richmonders, regardless of their identity or neighborhood, thrive in a climate-resilient and climate-neutral community.

This vision is supported by the following principles:

- 1** Community and personal well-being, local ecosystems, and economic vitality are balanced in a truly sustainable Richmond.
- 2** Everyone has equitable access to resources that are clean, sustainable, and affordable, including air, water, food, energy, housing, transportation, economic opportunities, and natural resources.
- 3** Everyone has the ability and resources to take ownership of equitable climate action and community resilience planning and implementation.
- 4** “Identity” includes but is not limited to: race, ethnicity, age, ability, gender, sexual orientation, and religion. We lead with **race** in our work to transform systems impacting all historically disenfranchised communities.

BIPOC, which stands for Black, Indigenous, and people of color, is used throughout this Plan to refer to those who experience varying types of discrimination and prejudice caused by systemic racism in the United States. Language is important, especially when addressing such an important issue. This term may not be ideal for all, but it highlights the unique relationship to whiteness and white supremacy for all people of color. Learn more from [The BIPOC Project](#).



Why act now?

Climate change is real. It is the shift in the long-term, average weather pattern of a region. These changes are happening across the world at an alarming rate.

Humans are causing climate change. Human activities are driving climate change. These include burning fossil fuels for energy and transportation, producing materials and waste, and changing land uses and landcover. [Read more](#) about the sources of Richmond's greenhouse gas emissions contributing to global climate change.

Climate change is already causing harm. Climate change is one of the greatest threats modern humans have ever faced. Not only does it cause direct harm in the form of dangerous heat waves, storms, and flooding, a changing climate exacerbates other threats to the well-being and safety of people, natural resources, and critical infrastructure. In the above graphic are just a few headlines about what's been happening in Richmond in recent years.

Climate change is harming some more than others.

Individuals in poverty have fewer resources to cope with climate change impacts. These impacts amplify risk factors for physical and mental illnesses, job loss, and decreased food security. Furthermore, as a result of historic and institutional racism, people of color are more likely to live in marginal and exposed areas that are more susceptible to climate impacts. This is true across the world and right here in Richmond. [Read more](#) about centering equity in climate action and resilience.

The cost of inaction is severe.

The National Oceanic and Atmospheric Administration tracks weather and climate disasters - such as hurricanes, tornadoes, flooding, and heatwaves - where overall damages and costs reached or exceeded \$1 billion. Since 1980, there have been 308 of these events across the country with damages exceeding \$2 trillion (Figure 1.1). In Virginia alone there have been 90 of these \$1 billion disasters since 1980 (Figure 1.2). These events are increasing in frequency and intensity. Climate change is projected to significantly affect human health, the U.S. economy, and the environment unless significant actions are taken to reduce greenhouse gas emissions and proactively adapt to climate impacts.¹

We have the support to act now. A majority of Richmonders believe that elected leaders, government, corporations, and citizens should do more to address climate change.² The Richmond community has come together under the leadership of Mayor Levar Stoney and the Office of Sustainability to develop the RVAgreen 2050 equitable climate action and resilience plan.

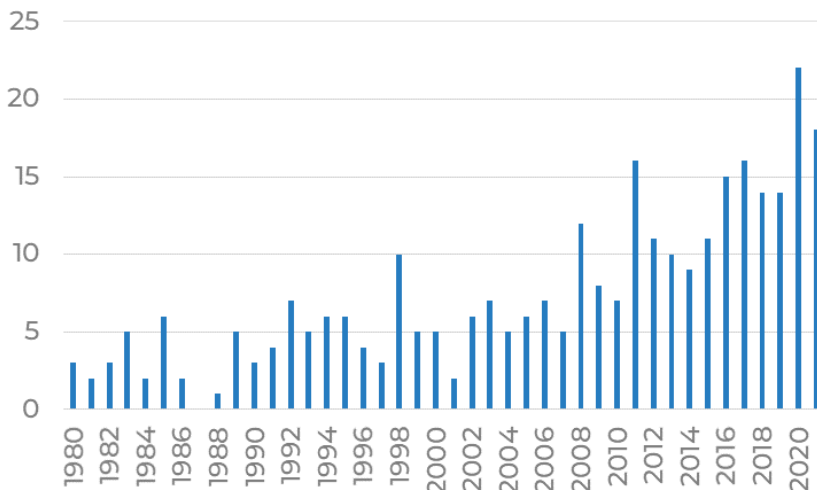


Figure 1.1. United States Billion-Dollar Weather and Climate Disasters

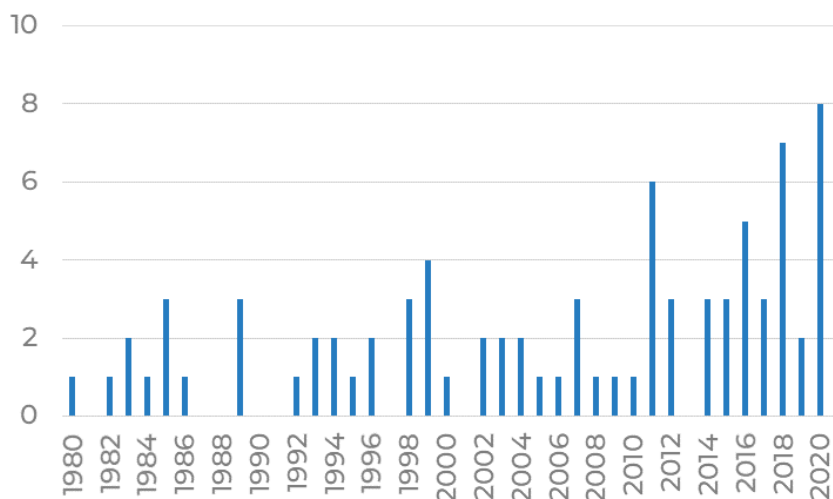


Figure 1.2. Virginia Billion-Dollar Weather and Climate Disasters

¹ https://www.epa.gov/sites/default/files/2021-03/documents/ciraii_technicalreportforca4_final_with_updates_11062018.pdf

² <https://climatecommunication.yale.edu/visualizations-data/ycom-us/>

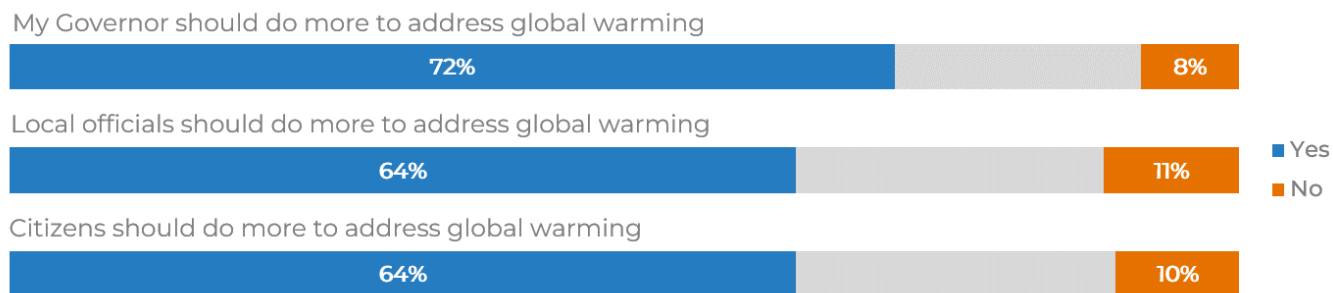


Figure 1.3. Public Opinions about Climate Change (2020)

In September 2021, Richmond City Council passed a [resolution](#) to declare the existence of a climate and ecological emergency that threatens the City of Richmond, the surrounding region, the Commonwealth of Virginia, civilization, humanity, and the natural world. The City government and community are ready to move forward together to act on climate change and achieve the RVAgreen 2050 vision for Richmond (Figure 1.3).

Acting on climate change has many benefits. Reducing the greenhouse gas emissions that cause climate change and helping our community prepare for climate impacts produces broad social, economic, and environmental benefits (Figure 1.4).

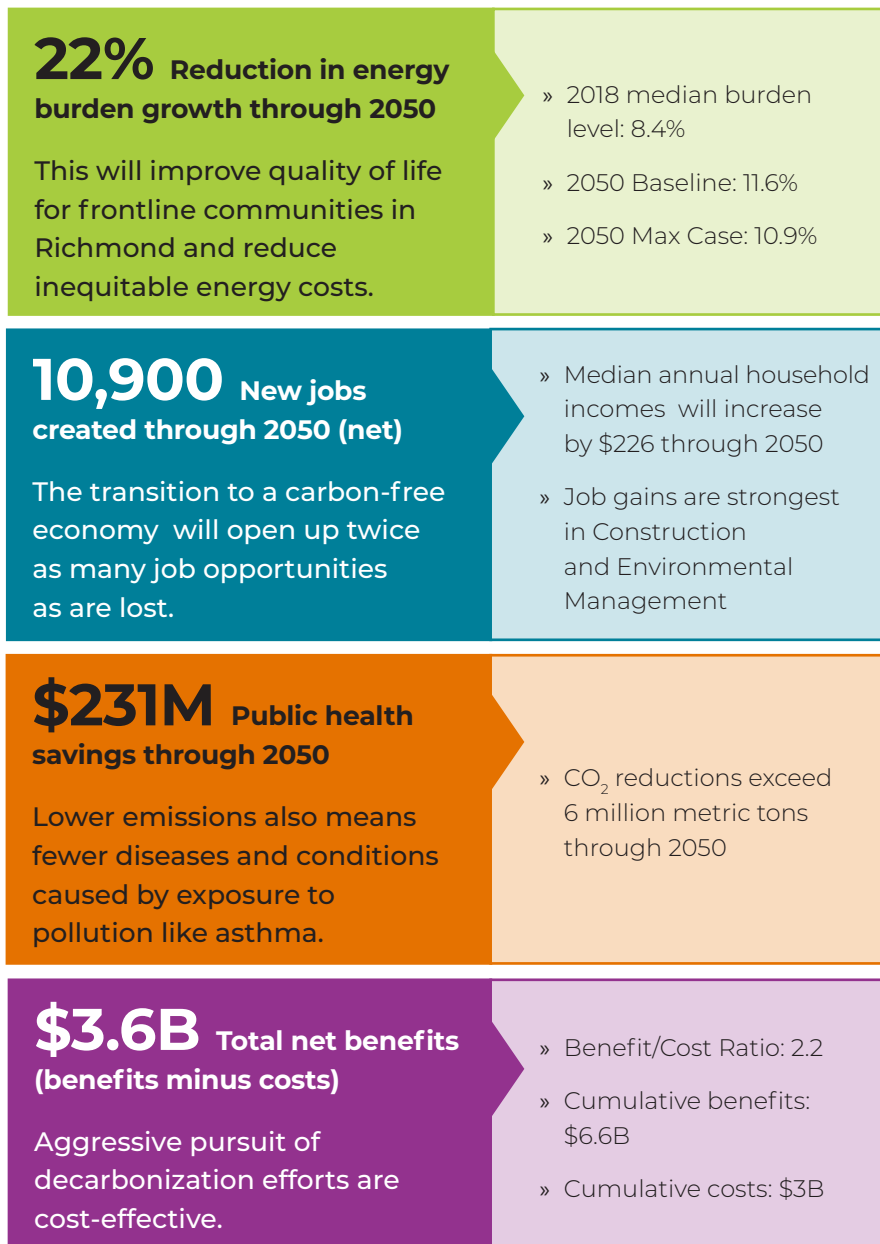


Figure 1.4. Max Case Greenhouse Gas Emissions Reduction Co-Benefits, Greenlink Analytics

CHAPTER 2

Background: Getting to RVAgreen 2050

Background: Getting to RVAgreen 2050

RVAgreen 2050 expands on the solid foundation formed by the city's first sustainability plan. It is the next evolution of the city's sustainability and resilience program.

The City of Richmond's history of sustainability planning and programs began with the appointment of a Sustainability Manager in 2010. The Office of Sustainability has always comprised a small but determined team working to enhance the quality of life for all residents by making Richmond equitable, healthy, and resilient. The city's first sustainability plan was developed in 2011 and adopted by Richmond City Council in 2012.

The Office of Sustainability is now championing RVAgreen 2050, the City of Richmond's equity-centered climate action and resilience planning initiative to reduce greenhouse gas emissions 45% by 2030, achieve net zero greenhouse gas emissions by 2050, and help the community adapt to climate impacts of extreme heat, severe storms, and flooding.

RVAgreen 2050 expands on the solid foundation formed by the city's first sustainability plan. It is the next evolution of the city's sustainability and resilience program.

Leadership in Climate Action & Resilience

Mayor Levar Stoney announced RVAgreen 2050 within the first few months of his first term. Mayor Stoney and the City of Richmond have also committed to several national and global compacts to address climate change. This 2030 Action Plan builds on these commitments to equitably reach net zero greenhouse gas emissions by 2050 and adapt to the changing climate.



Source: Chicago Climate Charter North American Climate Summit



Source: Climate Mayors



Source: Mayors for 100% Clean Energy Endorsement



Source: We Are Still In

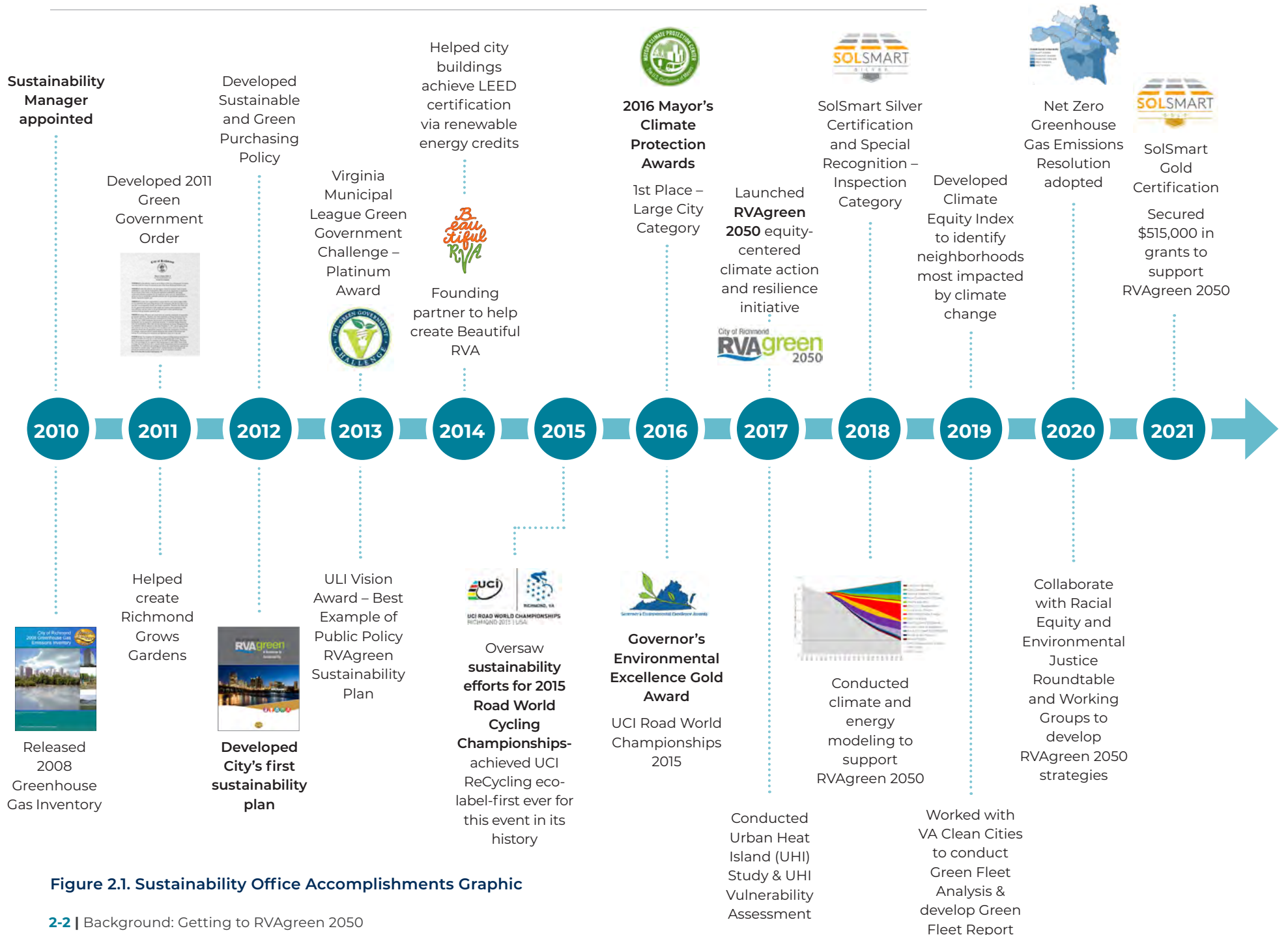


Figure 2.1. Sustainability Office Accomplishments Graphic

Climate action and resilience are key to the Mayor's and City Council's priorities:

Mayor Priority Area: Adult & Youth Education. Aligns with City Council Focus Area(s): Strong Futures for Children, Adults, and Families and Responsive, Accountable and Innovative Government

Mayor Priority Area: Economic Empowerment. Aligns with City Council Focus Area(s): 21st Century Richmond: Planned Growth, Economic Progress, and Affordable Housing and Strong Futures for Children, Adults, and Families

Mayor Priority Area: Vibrant, Inclusive, & Mobile Communities. Aligns with City Council Focus Area(s): 21st Century Richmond: Planned Growth, Economic Progress, and Affordable Housing and Responsive, Accountable and Innovative Government

Mayor Priority Area: Public Safety, Health, & Wellness. Aligns with City Council Focus Area(s): Safe Neighborhoods and Responsive, Accountable and Innovative Government

Mayor Priority Area: Efficient & High Quality Service Delivery. Aligns with City Council Focus Area(s): Responsive, Accountable and Innovative Government, and Strategic Infrastructure Investment

Net Zero Resolution

Achieving net zero greenhouse gas emissions is a priority because Richmond's climate is changing now. In the last few years, Richmond has seen warmer temperatures, earlier and more severe pollen seasons, and more dangerous weather involving heat waves and flooding. Ambitious and equitable action to mitigate damage from climate hazards is necessary to improve the health and quality of life of all Richmond residents, especially those most vulnerable to harm.

Mayor Stoney patroned and City Council unanimously adopted [Resolution No. 2020-R024](#) in June 2020 to "recognize the effects of global warming caused by human activity and establish a climate action goal to achieve a 45 percent reduction in greenhouse gas emissions by 2030 and net zero greenhouse gas emissions by 2050 from the 2008 baseline."

The Resolution also endorsed actions to:

- » Prepare for, adapt, and improve resilience to the local impacts of climate change;
- » Develop and implement an equity-centered, integrated climate action and resilience plan to advance the climate action and resilience goals;
- » Educate residents and businesses on matters related to the climate crisis; and
- » Full community participation, inclusion, and recognition of the residents, businesses and community organizations who will be integral to the climate action plan development and implementation



Net zero means reducing greenhouse gas emissions to as close to zero as possible and pulling just as much carbon out of the atmosphere as we pump into it. *Source: World Resources Institute*

Through the net zero resolution, City Council acknowledged their support of the development and implementation of an equity-centered, integrated climate action and resilience plan. The resolution also supported a process involving full community participation, inclusion, and recognition of residents and businesses within the City of Richmond, along with community organizations dedicated to faith, youth, labor, academic institutions, civic participation, and marginalized populations, and other such community allies, who would be integral to the climate action plan development, implementation, and mobilization effort.

“I feel excited...to see the plan that we’ve put together and the prospect of what things are going to look like if it’s fully implemented.”

*- Roundtable member,
anonymous*

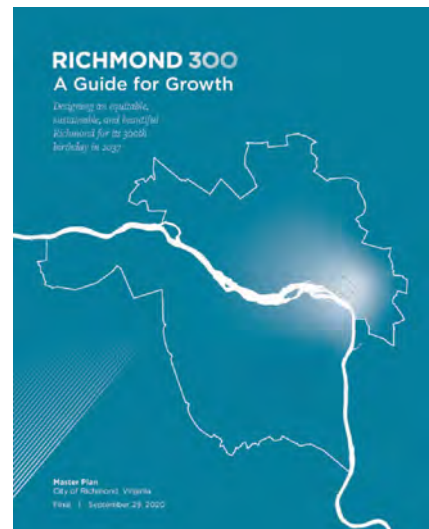
Climate Emergency Resolution

In addition, City Council unanimously patroned and adopted [Resolution No. 2021-R049](#) in September 2021 to “declare the existence of a climate and ecological emergency that threatens the City of Richmond, the surrounding region, the Commonwealth of Virginia, civilization, humanity, and the natural world.” Council acknowledged the inequitable impacts of climate change on communities at the frontline of climate change and called for climate resilience measures that would dismantle the systemic structures that undermine the health of Black people. Council recognized that the costs of the city’s inaction on climate change far outweighs the costs of immediate mitigation and resilience efforts.

Read the full text of these Resolutions in [Appendix K](#).

“WHEREAS, Council is of the opinion that environmental racism is a systemic structure that undermines the health of Black residents of the city of Richmond.”

*–City Council Resolution
No. 2021-R049*



Alignment with other City Plans

The RVAgreen 2050 initiative builds on a foundation set by many previous City plans and programs and aligns with current efforts. For example, in December 2020, the [Richmond 300: A Guide for Growth Master Plan](#) was adopted, outlining a vision for a sustainable and resilient city with healthy air, clean water, and a flourishing ecosystem. The Master Plan update includes implementation of RVAgreen 2050 as a key piece to achieving various goals, and this 2030 Action Plan builds on that content with additional detail and actionable steps.

This Climate Equity Action Plan 2030 sets in motion the commitments across many other city efforts to equitably reduce greenhouse gas emissions and enhance Richmond’s resilience to climate impacts.

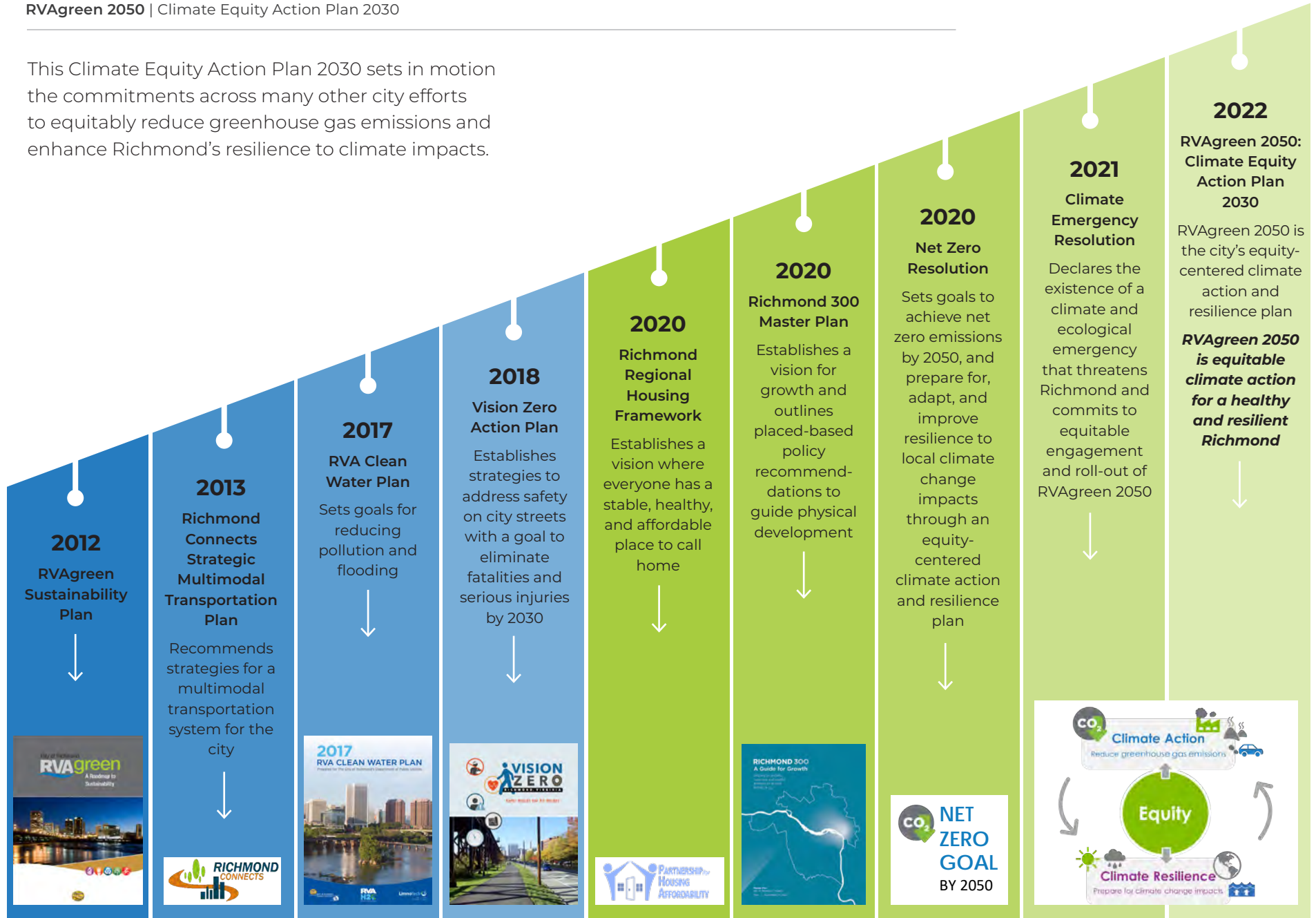


Figure 2.2. A Next Step in City Planning Graphic

CHAPTER 3

Climate Equity

Climate Equity

RVAgreen 2050 is **equity-centered** climate action and resilience.

“Council hereby commits to using a community engagement process and the Climate Equity Index of the RVAgreen 2050 plan to keep the concerns of frontline and marginalized communities central to all climate mobilization planning processes.”

- City of Richmond
Climate Emergency Resolution

The process to create an equitable climate action and resilience plan was neither easy nor perfect. It required significantly more time than a conventional planning process, personal and professional learning among staff and participants, and thoughtful evaluation at each step to ensure equity was prioritized. However, the resulting plan advances equity, notes lessons learned for future planning processes, and represents a step in the right direction for the important work of building trust between government and community. This chapter provides information on the rationale for and details of this process.

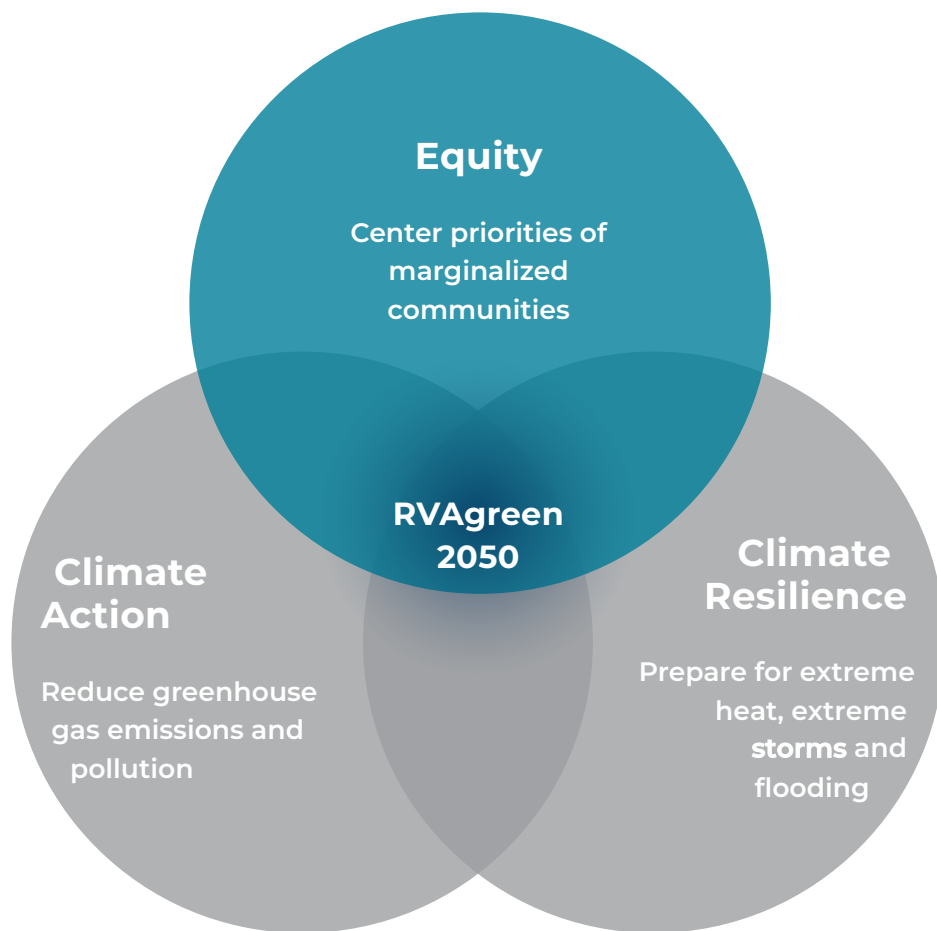


Figure 3.1. Nexus of Equity, Climate Action, and Climate Resilience

Low-income populations and communities of color are more likely to...



live in areas with less greenspace and are more vulnerable to respiratory and heat related illnesses



lack access to energy efficient housing and often are disproportionately impacted by high energy bills



be impacted by extreme weather events as a result of climate change



live in neighborhoods that lack convenient access to transit, or safe walking and biking options



live in housing without air conditioning and are more vulnerable to heat related and respiratory illnesses and death



exposed to pollution and airborne allergens and are more vulnerable to asthma and other respiratory illnesses

Figure 3.2. Disproportionate Impacts Faced by Communities at the Frontlines of Climate Change

Disproportionate Impacts

Climate change is harming some more than others (Figure 3.2). Individuals in poverty have fewer resources to cope with climate change impacts. These impacts amplify risk factors for physical and mental illnesses, job loss, and decreased food security. Furthermore, as a result of historic and institutional racism, BIPOC individuals are more likely to live in marginal and exposed areas that are more susceptible to climate impacts.

This is true across the country and in Richmond. The neighborhoods most adversely impacted by climate change - particularly in the city’s East End, Southside, and Northside - are the same that are most affected by inequities of wealth, underlying health conditions, lack of transportation access, and others. This is directly linked to historic racist policies and programs such as race-based housing segregation that resulted in decades of public and private disinvestment in these frontline communities.³

Frontline Communities

The Office of Sustainability uses the term “communities on the frontlines of climate change” to identify those who are hit first and worst by the impacts of environmental injustice and the climate crisis. These communities confront many vulnerabilities, including racism, poverty, housing insecurity, and more, which intensify climate threats.

³ Check out Groundwork RVA’s Climate Safe Neighborhoods for more information.

Communities that are most vulnerable to climate change impacts are also often underrepresented in public planning processes. In particular, the voices of BIPOC individuals, as well as lower income residents, are underrepresented for many reasons: time and capacity conflicts with traditional planning methods; flawed communication and language; and lack of trust and burnout from participating in past efforts that have seen limited results.

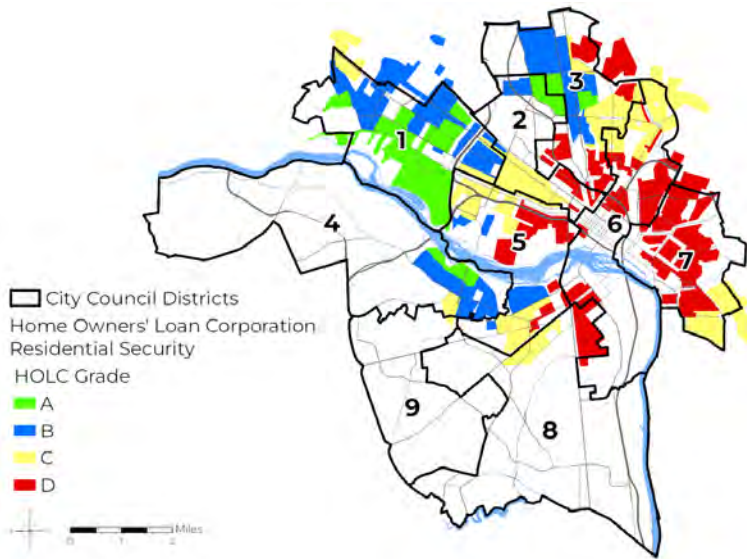


Figure 3.3. RVAgreen 2050 Climate Equity Index, Home Owners' Loan Corporation Residential Security Map (1923)

EQUITY + INNOVATION TIP ▶ The Office of Sustainability developed the RVAgreen 2050 Climate Equity Index to identify the communities in Richmond that are on the frontlines of crises such as climate change and conducted intentional engagement to uplift these underrepresented voices.

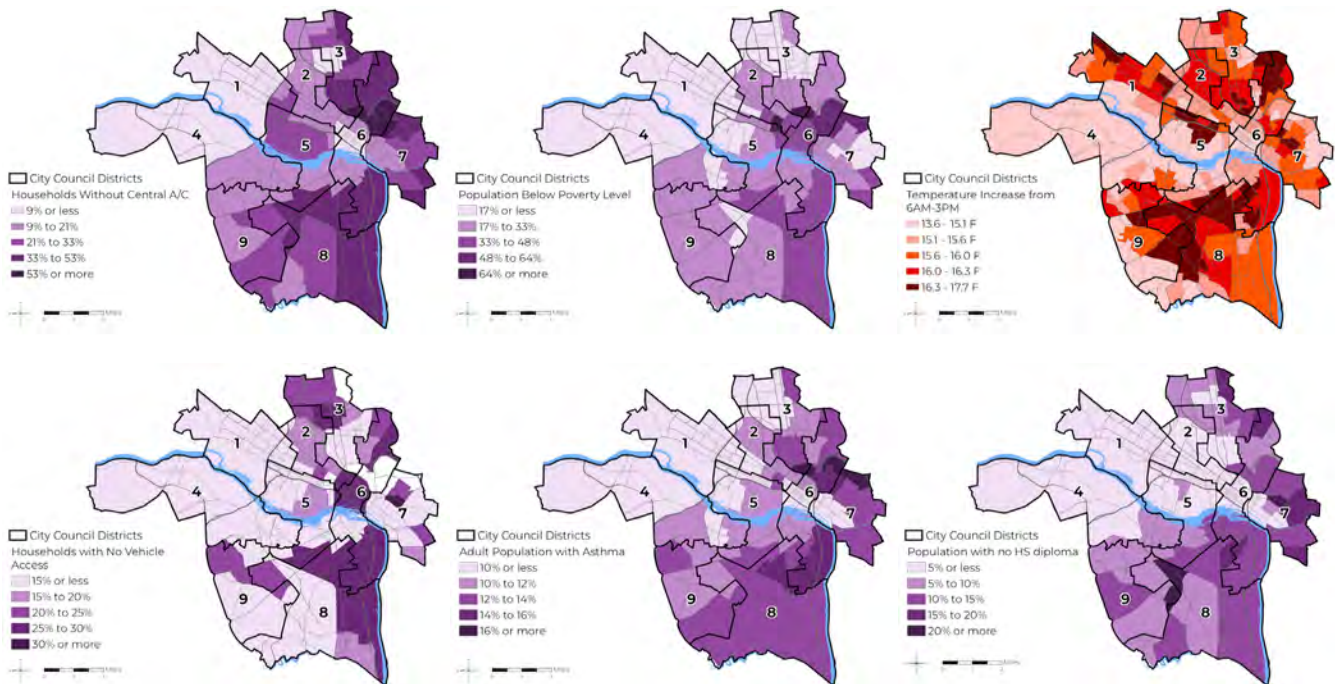


Figure 3.4. Households without central air conditioning, population below poverty level, urban heat islands, households without access to a vehicle, adults with asthma, population over 25 without a high school diploma (RVAgreen 2050 Climate Equity Index, 2019)

Centering Equity

The framework below provided a guide for centering equity in the planning process as well as in the shared accountability framework for implementation. This framework enables those involved in this planning process to address the disproportionate impacts of climate change so that all members of the community are adequately prepared, have access to resources to be resilient, and are empowered to participate.

The RVAgreen 2050 project team extensively researched best practices and engaged in expert- and peer-led training and discussions on how to center equity in the climate action and resilience planning process. In the end, the solution came down to one question. ▶▶▶



What does a climate action plan look like when the City of Richmond centers the priorities of the community members who are on the frontlines of climate change?

Racial and Socio-Economic Equity

Make a commitment to correct past harms and prevent future unintended consequences

Address the underlying structural and institutional systems that are the root causes of social and racial inequities

Procedural

Create processes that are transparent, fair, and inclusive in developing and implementing any program, plan, or policy

Ensure that all people are treated openly and fairly

Increase the civic engagement opportunities of communities that are disproportionately impacted by climate change

Distributional

Fairly distribute resources, benefits, and burdens

Prioritize resources for communities that experience the greatest inequities, disproportionate impacts, and have the greatest unmet needs

Structural

Closing the gaps so race and economic status can no longer be used to predict life outcomes and outcomes for all groups are improved

Figure 3.5. RVAgreen 2050 Equity Framework | Source: Government Alliance on Race and Equity; Desiree Williams-Rajee, Kapwa Consulting (modified)

Where are frontline communities?

The Climate Equity Index was created at the beginning of the RVAgreen 2050 process to understand the city’s vulnerabilities and risks due to the impacts of climate change ([read more](#) about this process).

Beginning with a list of 15 demographic variables from the U.S. Centers for Disease Control (CDC) Social Vulnerability Index, the team added additional geographic factors to the social vulnerability analysis based on best practices research, examples from peer cities, and available data at the census tract level in Richmond. Any one of the 39 final factors may increase an individual’s or a community’s vulnerability to the impacts of climate change in Richmond - heat, extreme storms, and flooding.

Based on examples from peer cities’ social vulnerability analyses, the 39 factors were combined using a statistical methodology to determine relative vulnerability to climate change impacts at the census tract level (Figure 3.6).

Read more about this methodology in [Appendix D](#).

The social vulnerability map shown below visualizes this relative vulnerability across Richmond’s census tracts. The map provides an objective and quantitative way to begin identifying the communities on the frontlines of climate change - those who are being impacted first and worst.

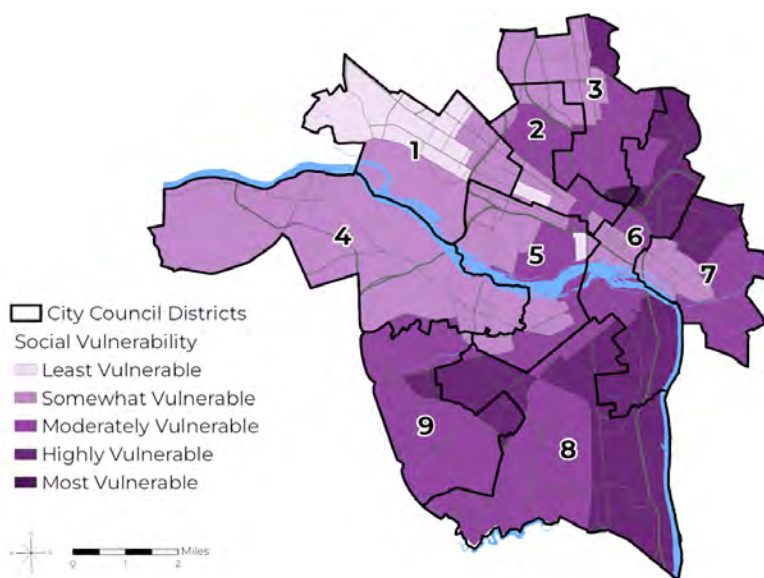



Figure 3.6. Social Vulnerability to Climate Change, RVAgreen 2050 Climate Equity Index (2019)

Population	Health & Safety	Household	Income & Education	Housing & Transportation
<ul style="list-style-type: none"> » Elderly (65+) » Children (under 18) » Race and ethnicity » Female » Limited English Proficiency 	<ul style="list-style-type: none"> » Health Opportunity Index » Disabilities » Obesity » Asthma » COPD » Coronary heart disease » High Blood Pressure » Kidney Disease » Poor mental health (self-assessed) » Poor physical health (self-assessed) » Uninsured » Low food access » Crime 	<ul style="list-style-type: none"> » Single parent households » Custodial grandparents » Renters » Elderly living alone 	<ul style="list-style-type: none"> » Poverty » Work out doors » SNAP/food stamps » Public assistance income » Housing costs >30% of income » No high school diploma » Unemployment » Housing Choice Voucher program participant 	<ul style="list-style-type: none"> » Multi-unit structures » Mobile homes » Crowding » No vehicle access » No central air conditioning » Emergency housing » Group homes » No internet access

Figure 3.7. RVAgreen 2050 Climate Equity Index Social Vulnerability Analysis Factors

What are the priorities of those who live in frontline communities?

EQUITY TIP ▶ 

The Office of Sustainability began the community engagement process for RVAgreen 2050 by identifying the priorities of the communities on the frontlines of climate change. This process is explained in detail [here](#). The Office then intentionally designed each phase of the planning process to keep these community priorities front and center.

This process included identifying and prioritizing strategies and actions that address these community priorities *and* help reduce greenhouse gas emissions 45% by 2030, achieve net zero greenhouse gas emissions by 2050 and help make our community more resilient to climate change.



Racial Equity & Environmental Justice:

Richmond's racist past has created systems that serve our community in inequitable ways, from education and healthcare to government and natural resources. The city's BIPOC communities in particular face more harm due to crises such as climate change and COVID-19 due to historic and systemic racism.



Government Accountability:

Richmonders want to be involved and informed during decision making processes. The city must build trust between government and the community through open and honest communication.



Community Wealth:

Richmonders want improved access to jobs and wrap-around services that provide education, job training, job retention, and living wages.



Neighborhoods:

Richmonders want to live in safe and beautiful neighborhoods that promote security, sustainability, and beauty, and provide access to green space.



Affordable Housing:

Richmond's buildings should be safe and affordable. This includes providing access to efficient and affordable housing across the city.



Health & Well-Being:

Richmonders are concerned with water and air quality, violence, food access, and the impact these issues have on mental and physical health.



Engagement & Communication:

Many voices are underrepresented in public processes for several reasons, including lack of trust and burnout from participating in past efforts that have seen limited results.

Figure 3.8. RVAgreen 2050 Community Priorities



CHAPTER 4

Climate Action

Climate Action

RVAgreen 2050 is equity-centered **climate action** and resilience.

“It is in the best interests of the citizens of the City of Richmond that the Council recognize the effects of global warming and establish a climate action goal to achieve a 45% reduction in greenhouse gas emissions by 2030 and net zero gas emissions by 2050.”

-City of Richmond Net Zero Resolution

Current Greenhouse Gas Emissions

Greenhouse gas emissions [GHG] are causing climate change, and it is important to understand what human activities are creating them. The Office of Sustainability partnered with ICLEI-Local Governments for Sustainability (ICLEI) to create an inventory of Richmond’s GHG emissions using 2008 as a baseline year. The Office prepared subsequent annual inventories for the calendar years 2013-2018. Richmond’s inventories are verified as compliant with the ICLEI Protocol for Government Operations and the US Protocol for Accounting and Reporting of GHG Emissions.

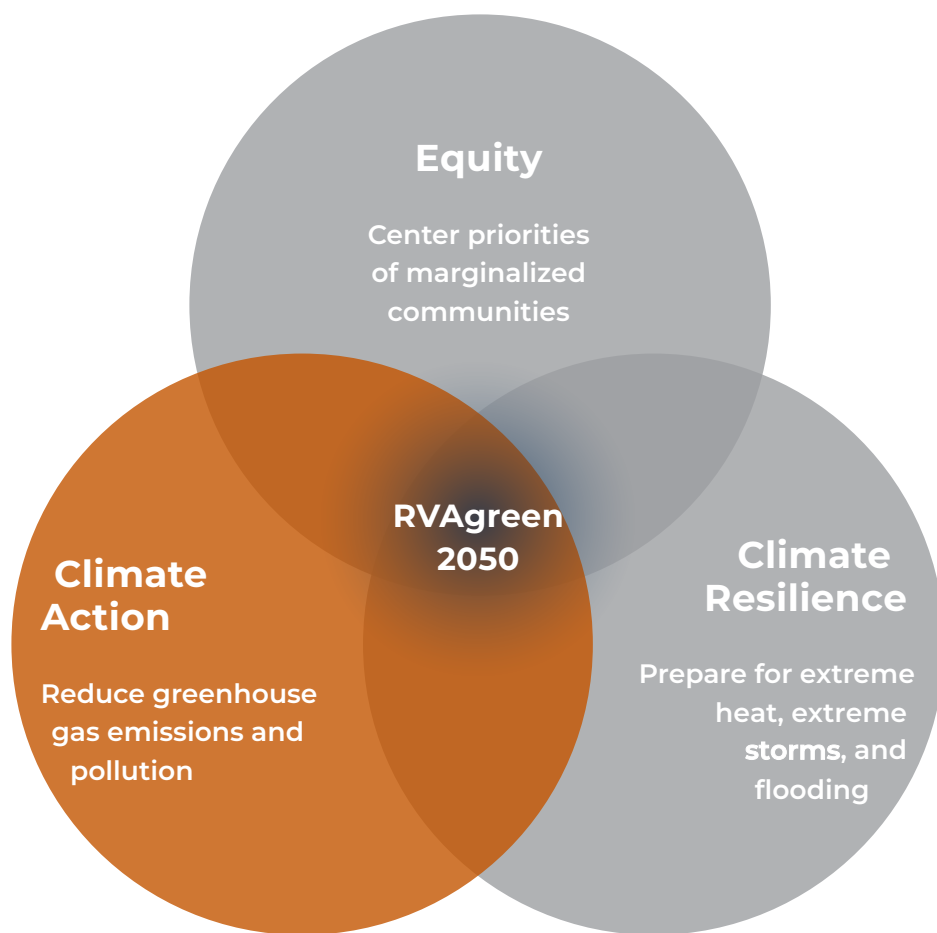


Figure 4.1. Nexus of Equity, Climate Action, and Climate Resilience

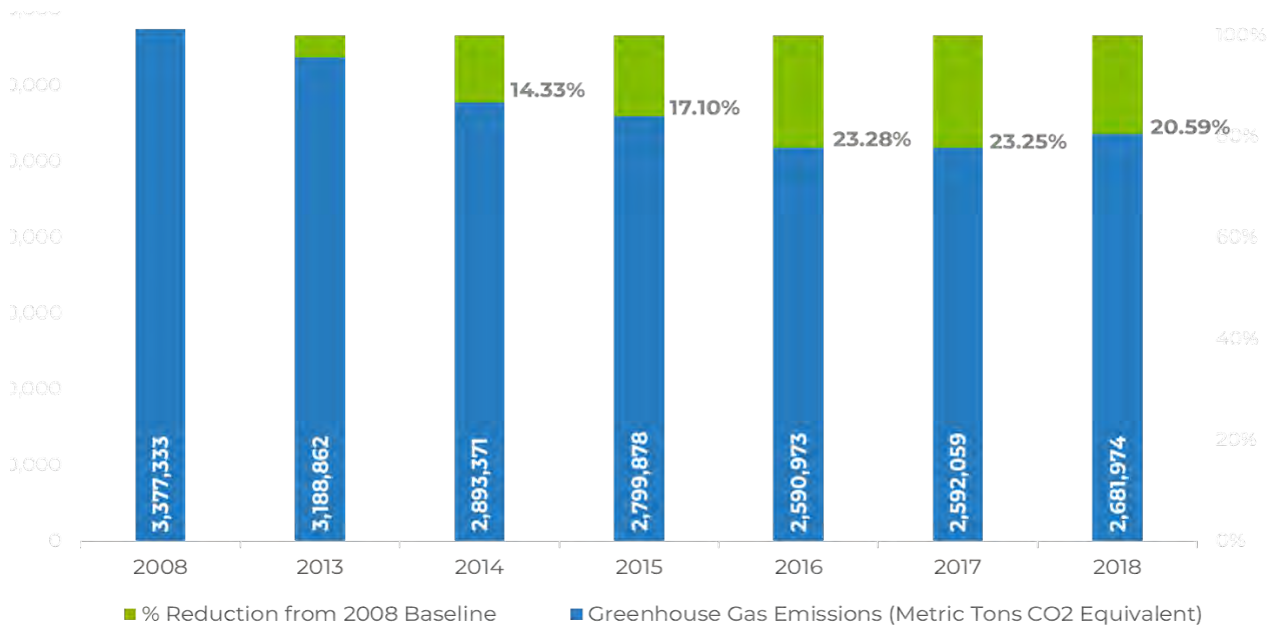


Figure 4.2. Citywide Greenhouse Gas Emissions and Reductions (2008-2018)

The 2008 GHG inventory set a baseline of emissions that are generated directly from activities within the City of Richmond’s geographic boundary (Scope 1 emissions) and from GHG emissions released into the earth’s atmosphere as a result of the generation of energy consumed within the city limits (Scope 2).



In 2018, the City of Richmond reported a 21% reduction in GHG emissions from the 2008 baseline inventory (Figure 4.2).

Citywide GHG Emissions by Sector and Source

The Office measures, tracks, and reports emissions data for the following sectors:

- » Water & Wastewater
- » Solid Waste
- » Transportation
- » Industrial Building Energy
- » Residential Building Energy
- » Commercial Building Energy

Tracking the GHG emissions by sector allows for a better understanding of reduction opportunities.

This 2030 Action Plan incorporates the foundational knowledge gleaned from Richmond’s GHG inventory in order to develop effective strategies for further GHG emissions reduction efforts.

The majority of Richmond’s citywide emissions by sector are the result of building energy use, totaling approximately 66%. Transportation emissions contribute approximately 31% of GHG emissions, 3% come from solid waste, and less than 1% from water and wastewater treatment (Figure 4.3).

It is also crucial to understand GHG emissions by source. Within Richmond’s geographical boundaries, emissions from electricity usage make up 47% of citywide emissions due to the production of energy from a variety of fuel sources. Gasoline and diesel fuel used for transportation purposes account for 31% of Richmond’s GHG emissions and the use of natural gas makes up 18% of Richmond’s GHG emissions. The remaining 4% is produced by the use of fuel oil/kerosene, the generation of solid waste, and water/wastewater treatment.

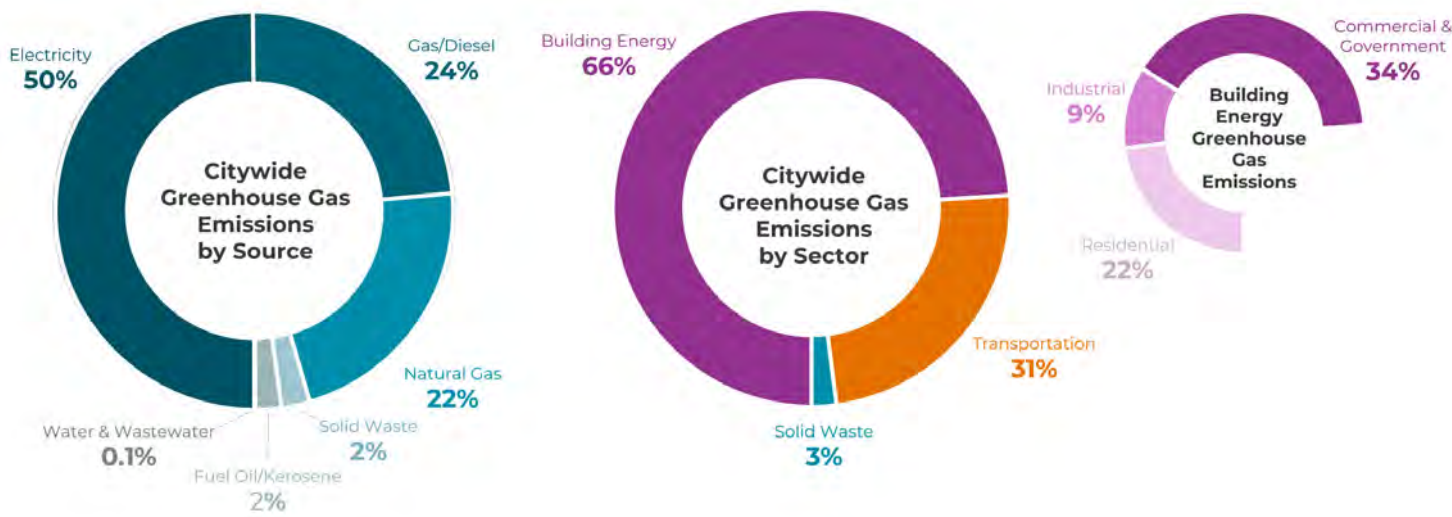


Figure 4.3. Citywide Greenhouse Gas Emissions by Source and Sector (2018)

In 2021, the majority of Virginia’s electricity was generated by natural gas and nuclear power (Figure 4.4). Emissions from electricity generation will decrease as the amount of renewable energy on the electrical grid increases and as Virginia continues to reach its renewable portfolio standard targets. Dominion Energy is committed to producing 100% carbon-free electricity by 2050.

Trends in annual GHG emissions reporting by source or sector will fluctuate based on reporting data. What is most important is that the community understands the trends in emissions to inform the priorities of strategies and actions and see a downward trend overall. To date, emissions reductions have largely resulted from using a cleaner electricity fuel mix (replacing coal with natural gas, although it is still a carbon-emitting fossil fuel) and by vehicles becoming more efficient.

Citywide Greenhouse Gas Emissions Per Capita

With a goal of reducing total annual GHG emissions 45% by 2030 and achieving net zero emissions by 2050, it is important to keep Richmond’s population growth in mind. Because every person has their own carbon footprint, which contributes to the city’s overall GHG emissions percentage, there will be a natural increase in GHG emissions as the population of Richmond increases.

Therefore, it is important to understand Richmond’s per capita GHG emissions. Currently, Richmonders emit 11.81 MTCO₂e [metric tons of carbon dioxide equivalent] per person per year (Figure 4.5). In order to fully understand the impact of strategies in the Plan, it will be important to report on population fluctuations as the city expects a steady decrease in GHG emissions per capita.

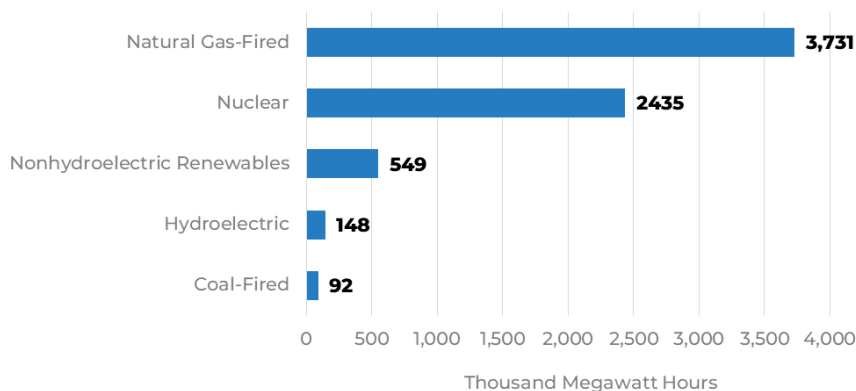


Figure 4.4. Virginia Net Electricity Generation by Source (October 2021, Energy Information Administration)

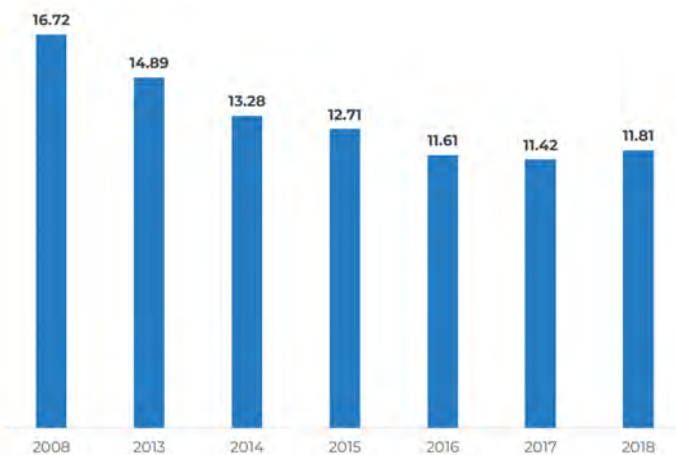


Figure 4.5. Citywide Greenhouse Emissions Per Capita (MTCO₂e)

Climate and Energy Modeling

Through the implementation of strategic and innovative long-term measures such as transportation improvements, corporate sustainability goals, building energy efficiency upgrades, energy service delivery improvements, an increase in renewable energy, and advances in waste management, Richmond’s citywide GHG emissions have maintained a downward trend to date inline with its long term goals.

In order to continue to stay on track with targets as Richmonders work toward carbon neutrality, it is critical to identify the most impactful and effective strategies in meeting the City of Richmond’s unique complexities and priorities. To accomplish this task the Office of Sustainability worked with Greenlink Analytics (Greenlink) and Integral Group (Integral) to model citywide GHG emissions specific to the City of Richmond connecting “where are we now?” to “where are we going?”

To do this work, Greenlink leveraged public data sets and its own proprietary models to create a comprehensive picture of current and future energy usage and GHG emissions. Integral modeled the waste sector and worked with Greenlink on overall emissions modeling. One of the proprietary models Greenlink used in its analysis for Richmond was ATHENIA.

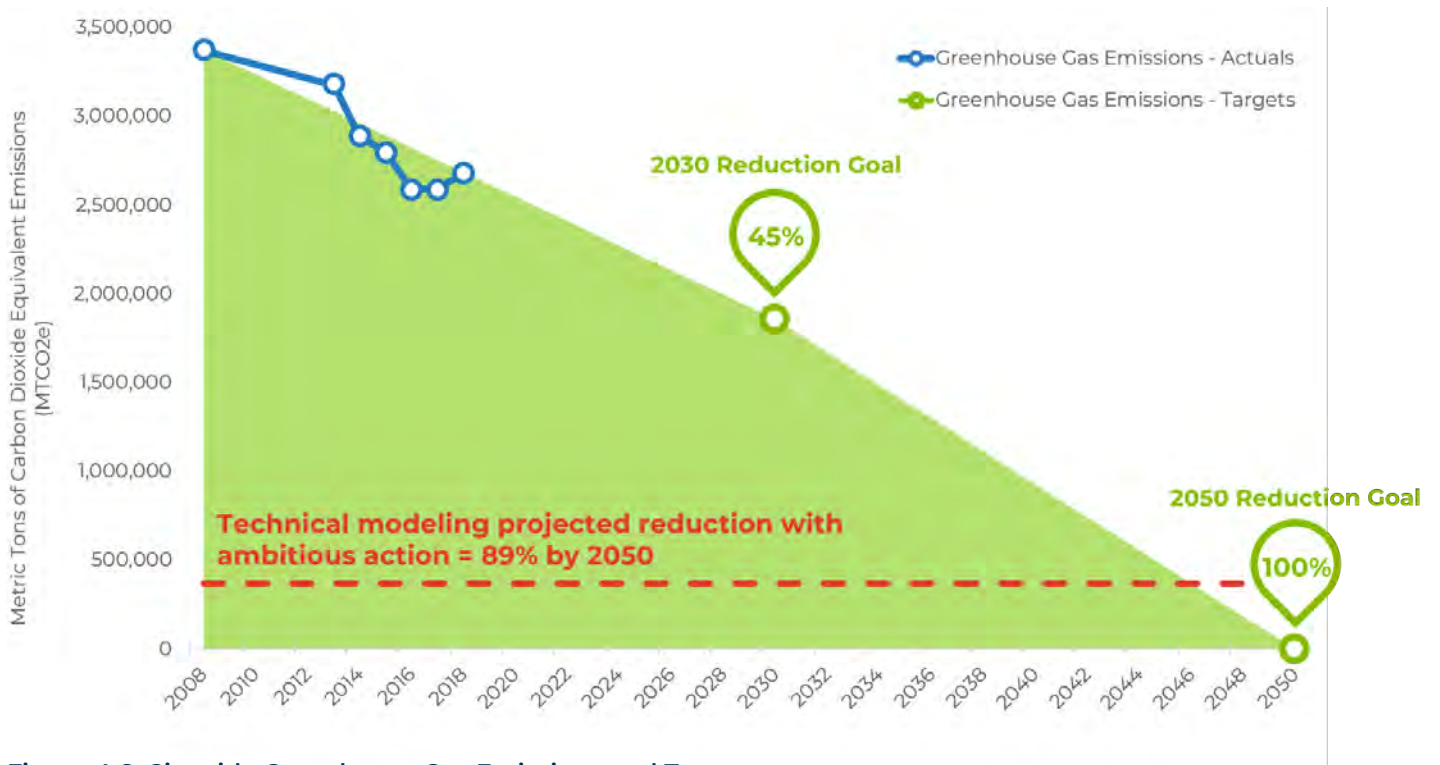


Figure 4.6. Citywide Greenhouse Gas Emissions and Targets

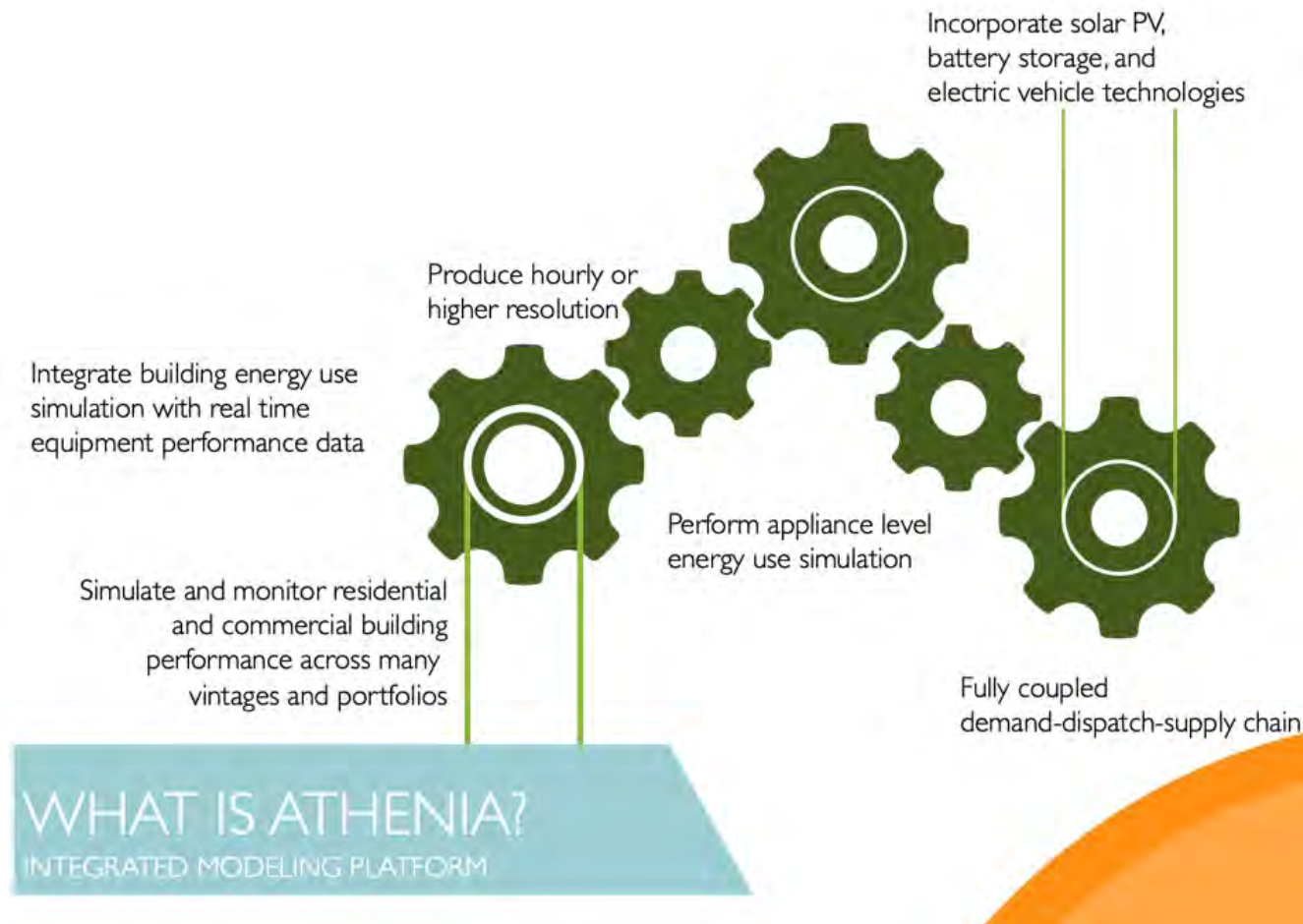


Figure 4.7. ATHENIA Platform for Climate and Energy Modeling

ATHENIA is Greenlink’s deep learning, neural network, energy systems model that analyzes hundreds of thousands of individual observations of energy use in a particular geographic region and creates a ‘digital twin’ which can be used to forecast dynamic responses to system changes such as energy supply, demand, and modifications to behaviors (Figure 4.7).

It has been recognized as one of the most accurate energy models in the U.S. and has received awards from the Massachusetts Institute of Technology (MIT), the US Department of Energy, the National Science Foundation, the Georgia Institute of Technology (Georgia Tech), and others.

“There were times when the ‘experts’ got a little bogged down in the esoteric part of it and the terms of art and were a little reluctant to let those things go, but because it was such an open process and everybody felt so comfortable and so safe, those conversations could be really frank and really open and there was a lot of give and take.”

- Jeanne,
Roundtable member

Modeling Scenarios to Reach Climate Action Goals

Understanding Richmond's projected 2030 and 2050 GHG emissions requires sophisticated modeling efforts and consideration of technical, economic, social, cultural, environmental, and policy drivers (Figure 4.8).

Greenlink provided the necessary modeling in order to understand the impact and effectiveness of an extensive list of potential strategies and best practices. Greenlink did this by modeling the GHG emissions if no action was taken to reduce emissions and also if aggressive action was taken to meet emissions reduction goals.

First, Greenlink modeled future annual emissions based on a 'Business as Usual' (BAU) baseline scenario that represents the best estimate of future emissions without any additional climate mitigation actions other than the anticipated vehicle efficiency changes from planned federal regulations and programs, and the reduction in electric grid emissions outlined in the [Virginia Clean Economy Act](#).

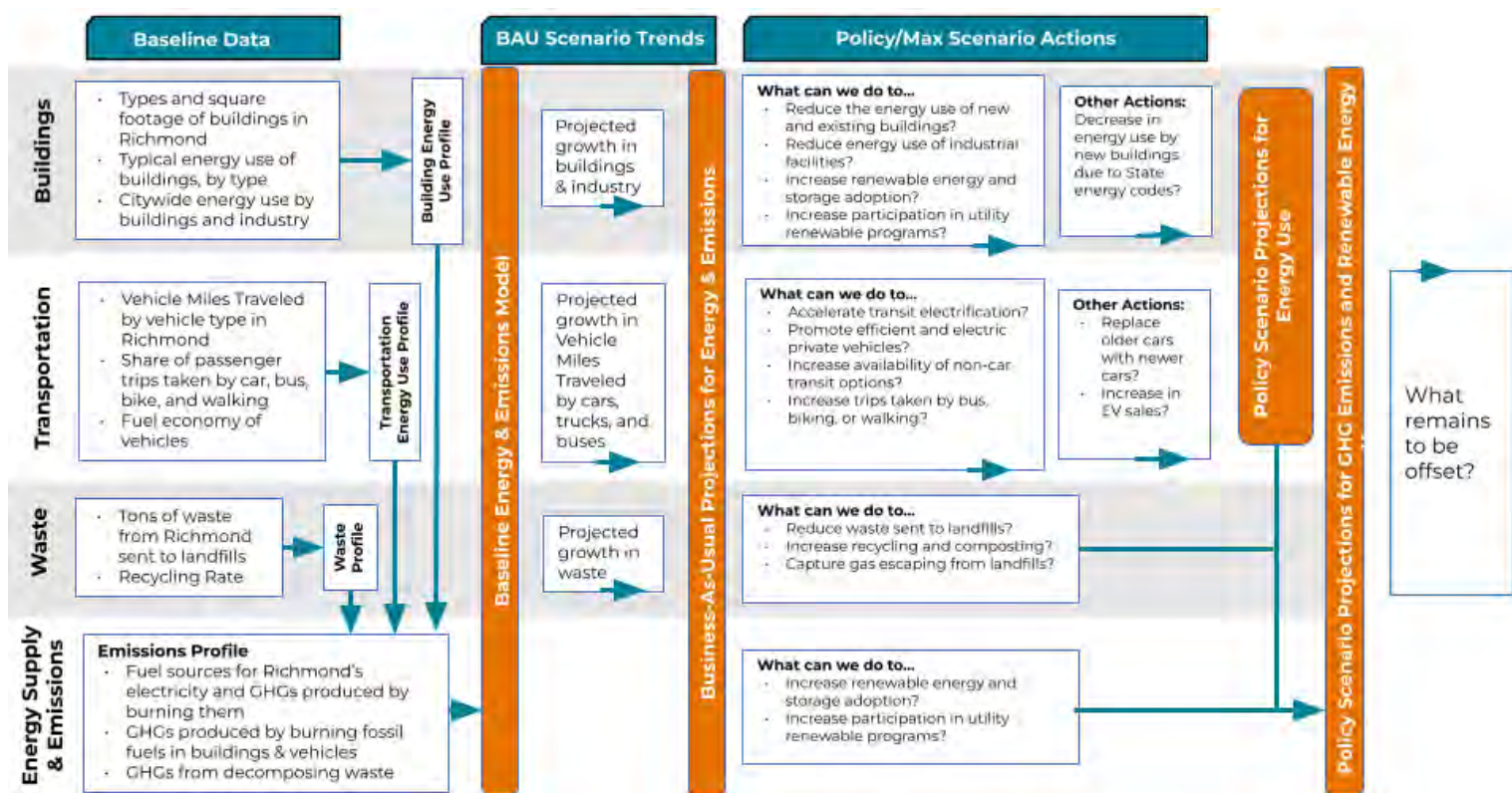


Figure 4.8. Climate and Energy Modeling Process

The BAU baseline scenario as modeled in the wedge diagram below is depicted by the top line of the emissions trajectory showing a 37% reduction in greenhouse gas emissions by 2030 without changing any current policies, programs, or operations and a 63% reduction in greenhouse gas emissions by 2050.

Next, Greenlink modeled a Policy Actions Scenario representing the max case GHG emissions reductions. In the wedge diagram above it is represented by the line at the top of the gray wedge (also the bottom of the colored wedges).

The colored wedges represent the magnitude of emissions reductions needed to help reach the City's reductions goals. Each colored wedge represents a primary emissions source by sector with the larger wedges representing the greater emissions reductions potentials. The remaining GHG emissions represented in gray would be what is remaining after all of the emissions represented above the gray are removed through policies, programs, efficiency, reduction, and avoidance efforts.

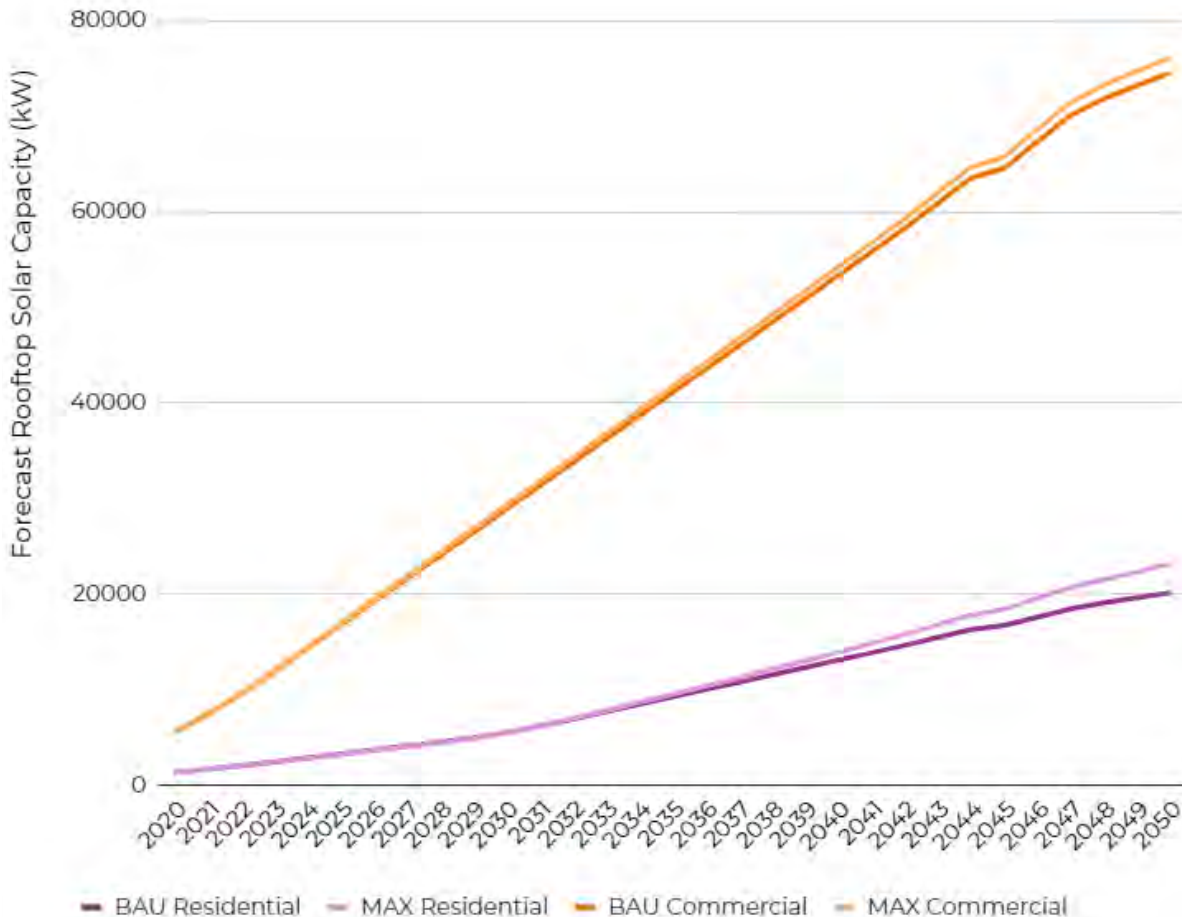
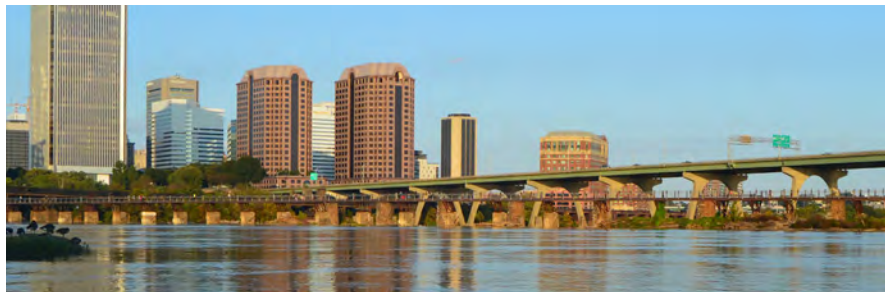


Figure 4.9. Max Case Greenhouse Gas Emissions Reduction Trajectory



If all strategies in this plan are implemented successfully, it is projected that Richmond would realize a 51% decrease in GHG emissions by 2030 and an 89% decrease in GHG emissions by 2050.

The greatest impact toward the 2030 goal will be the implementation of strategies that facilitate commercial energy efficiency and commercial solar. Between 2030 and 2050, the electrification of vehicles and corresponding reduced gasoline consumption will deliver the greatest GHG emissions reductions, followed by lowered emissions resulting from the reduction of natural gas use.

The current Policy Actions scenario achieving only an 89% reduction in emissions by 2050 does not meet the City of Richmond’s goal for net zero emissions. To reach carbon neutrality by that date, new technologies will need to be developed and deployed, carbon sequestration implemented, or carbon offsets will need to be purchased. During future Plan updates, the remaining emissions analysis will be updated accordingly.

With technological advances anticipated over the next 25 years, it is reasonable to expect that Richmond will be able to fully meet - or hopefully beat - the net zero goal without purchasing carbon offsets to reach carbon neutrality.

Working towards the ambitious 2030 and 2050 GHG emissions reduction goals, it will also be critical for all sectors of the Richmond community to work together with an “all-in” approach as outlined in the Strategies of this 2030 Action Plan.



CHAPTER 5

Climate Resilience

Climate Resilience

RVAgreen 2050 is equity-centered climate action and **resilience**.

“Council is of the opinion that justice calls for climate resilience that addresses the specific experiences, vulnerabilities, and needs of frontline communities within the City of Richmond...”

– City of Richmond
Climate Emergency Resolution

Climate is defined as the long-term weather pattern in a region, and it is increasingly changing throughout the world. Research and the associated data show that land surface temperature, sea-surface temperature, and sea level have dramatically increased while snow cover and sea ice extent have decreased over the past 100 years. The currently changing climate is linked to rising concentrations of greenhouse gases such as carbon dioxide, methane, and hydrofluorocarbons in the atmosphere, which insulate the planet and cause it to warm. Human activities are driving climate change by burning fossil fuels for energy and transportation, producing materials and waste, and changing land uses and landcover.

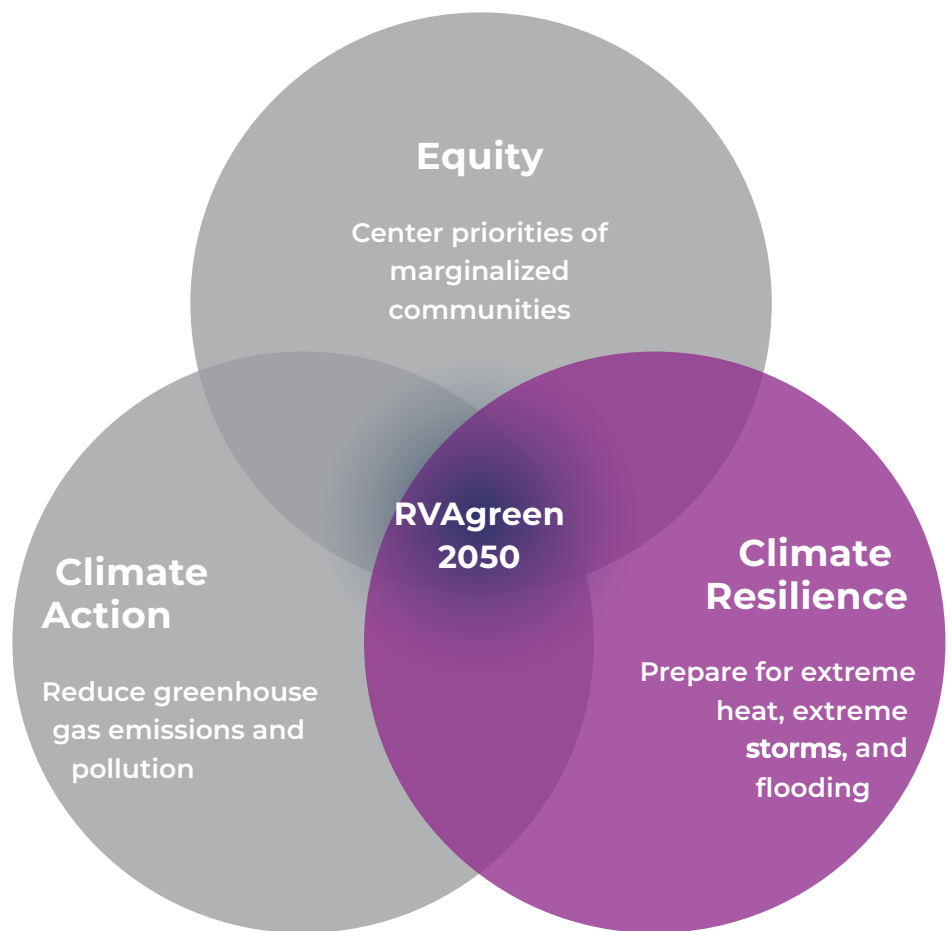


Figure 5.1. Nexus of Equity, Climate Action, and Climate Resilience

The impacts of climate change vary by location. Richmond faces hotter temperatures, extended heat waves, and more extreme rain events. These impacts are projected to increase in the future, along with those associated with sea level rise. In the words of Richmond-based climate scientist Dr. Jeremy Hoffman, Richmond must prepare for a future that is **“hotter, wetter, sneezier, and wheezier.”**

Hotter

Richmond is already seeing the impacts of climate change when it comes to temperature. Richmonders have experienced, and will continue to have, higher average temperatures, more dangerously hot days (above 95 degrees), and longer heat waves.

In summer of 2017, the City of Richmond partnered with the Science Museum of Virginia, Virginia Commonwealth University, University of Richmond, and Groundwork RVA to measure and map Richmond’s urban heat islands and its vulnerability to heat.

EQUITY TIP ▶ In 2020, the Office of Sustainability created a more comprehensive analysis of vulnerability to heat by Census tract (Figure 5.4).

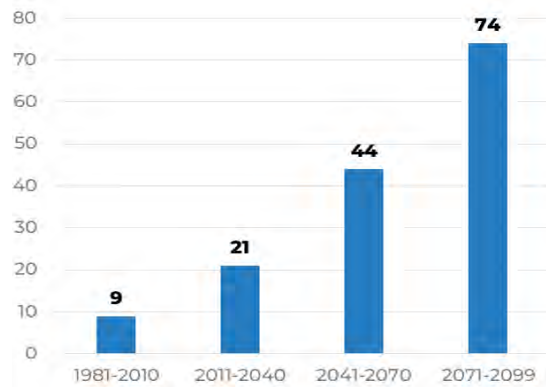


Figure 5.2. Mid-Atlantic Regional Integrated Sciences and Assessments (MARISA), Average Annual Number of Days with Temperatures over 95 degrees F for 1981-2010 in a High Emissions Future - Richmond, VA

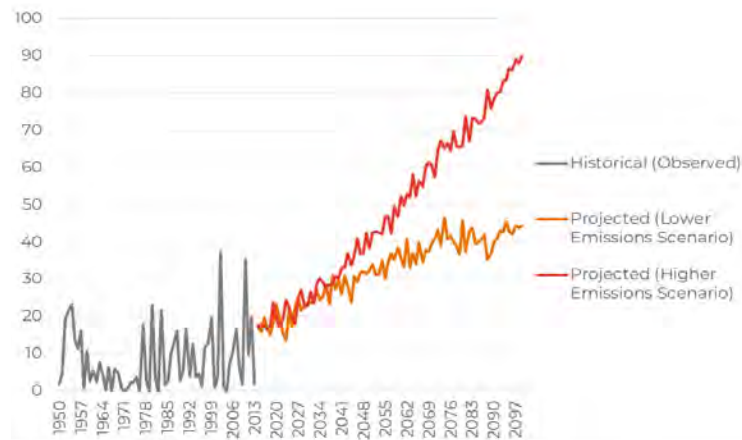


Figure 5.3. U.S. Climate Resilience Toolkit Climate Explorer, Average Daily Maximum Temp (°F) - Richmond, VA

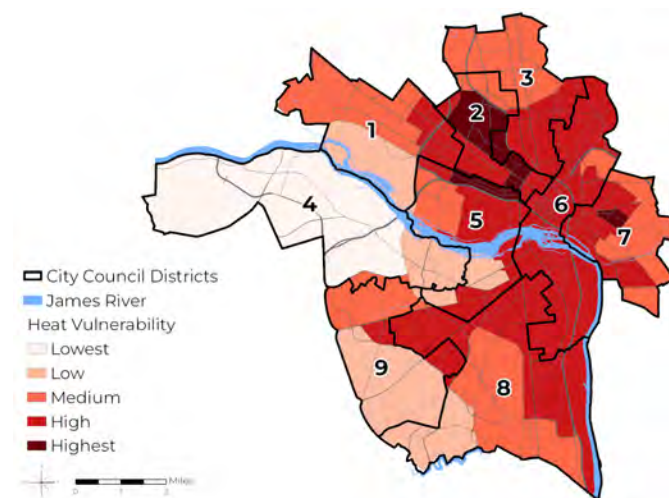


Figure 5.4. Heat Vulnerability by Census Tract (RVAgreen 2050 Climate Equity Index, 2019)⁴

⁴ Heat vulnerability factors: age (under 18 and 65+); poverty; working outdoors; 65+ living alone; no central air conditioning; living in emergency and transitional shelters; housing cost burden; surface temperature; underlying health conditions

Wetter

Precipitation patterns are more difficult to forecast and project into the future than temperature because they are more scattered and variable - for example, if it is hot in one area of the city, it is hot across the city; however, it may be raining on one block and not on the next. There are several methods for developing precipitation projections being studied by federal and research institutions (see side note). Regardless, Richmond's rain and snow patterns are changing.

There is an upward trend in the average annual precipitation and annual number of extreme precipitation events (greater than two inches) across the state in recent decades (Figure 5.5). Annual precipitation and the number and intensity of heavy precipitation events are projected to continue increasing. During dry periods, naturally-occurring droughts will be more intense due to higher temperatures.⁵

NOTE: The United States government's precipitation frequency estimates (currently, NOAA's Atlas 14), which are used by governments and many other organizations for infrastructure, safety, and other planning purposes, are based on an assumption that extreme precipitation characteristics do not change over time.⁶ However, climate change is impacting the frequency and severity of storms.

As of the writing of this Action Plan, there was no scientific consensus for how to best model projected precipitation at the small geographic level needed to determine impacts specific to Richmond. NOAA has been working on incorporating climate change considerations into its precipitation estimates and plans to share an assessment report in early 2022.⁷

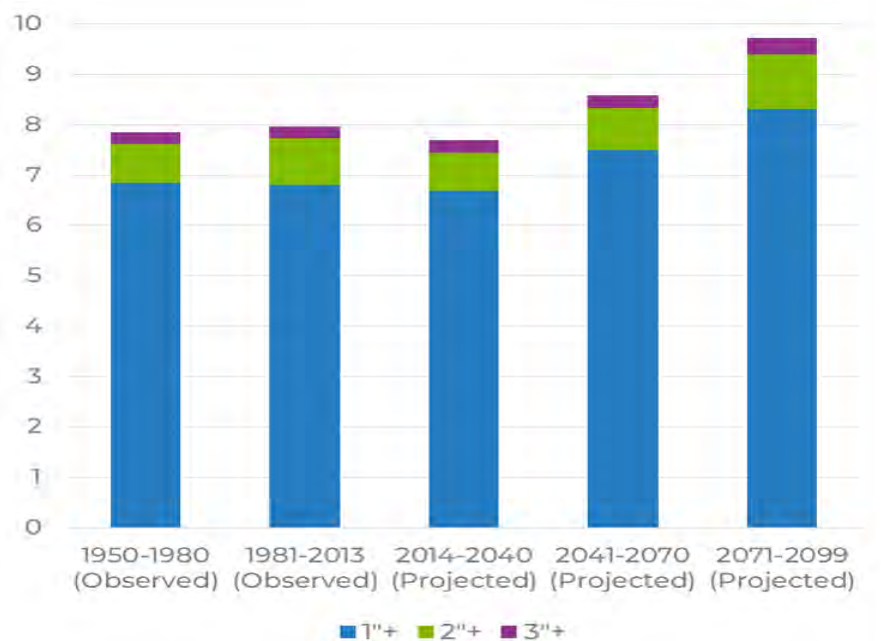


Figure 5.5. U.S. Climate Resilience Toolkit Climate Explorer, Days w/ >1", >2", >3" Precipitation - Richmond, VA

5 <https://statesummaries.ncics.org/chapter/va/>

6 https://www.nrcc.cornell.edu/workshops/mar_2020_utility/atlas14.pdf

7 https://www.weather.gov/media/owp/oh/hdsc/docs/202110_HDSC_PR.pdf

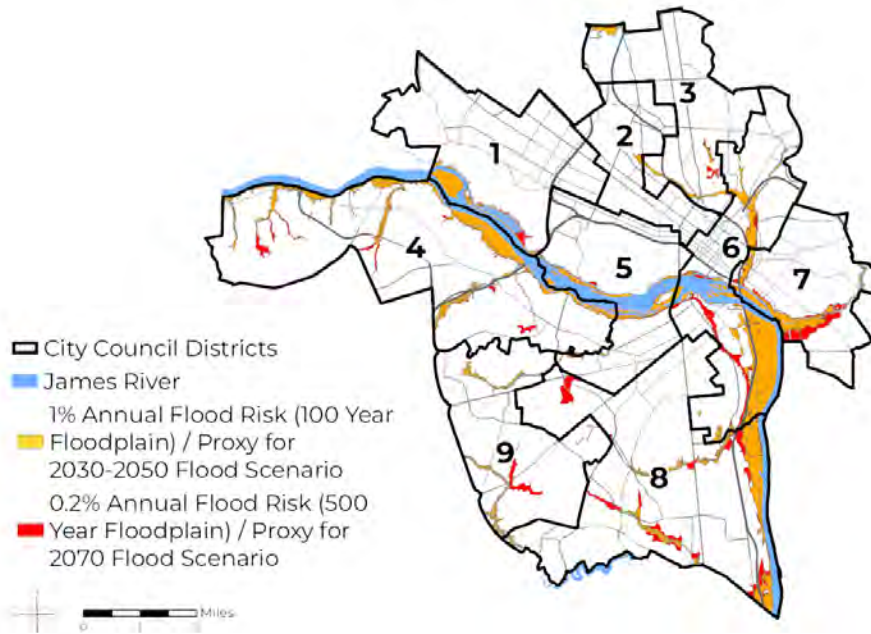


Figure 5.6. Future Flooding Scenarios (RVAgreen 2050 Climate Equity Index, 2019)

The Office of Sustainability is working with technical experts on detailed precipitation projections and mapping of future flooding impacts for Richmond. In the meantime, following an example from Washington DC’s climate vulnerability and risk assessment⁸, the map above uses the present 100-year (1% annual chance) and 500-year (0.2% annual chance) floodplains as determined by FEMA as a proxy for future flooding (Figure 5.6).

RVAgreen 2050 staff and stakeholders evaluated risks and vulnerabilities caused by potential flooding as part of the planning process in order to develop strategies to increase resilience.

Read more about the potential impacts of climate change to Richmond’s community in [Appendix D](#).

A Note on Sea Level Rise

Over the last century, the sea level along the Virginia coast has risen nearly twice the global average. Richmond will be impacted by sea level rise as it causes rising river levels upstream to the James River fall line at the 14th Street/Mayo Bridge. The exact amount of sea and river level rise is dependent on the status of global emissions and what is done to mitigate additional impacts. It is important to consider how this will impact riverfront property especially as Richmond experiences increased precipitation. In addition, sea level rise projections may change over the coming years and should be monitored closely. Richmond may also face increased housing pressure as people relocate to Richmond or seek temporary shelter in Richmond from storm surges impacting coastal communities in Virginia.

8 https://doee.dc.gov/sites/default/files/dc/sites/ddoe/publication/attachments/AREA_Vulnerability_Assessment_DRAFT_2016-06-21lowres_.pdf

Dangerous Impacts

Richmond's increasing temperatures and storms pose significant threats to our community, natural resources, and critical infrastructure (Figure 5.7).

Community Impacts

Health and Safety

Climate change is already causing new health problems and worsening existing ones. Threats to human health include extreme heat, poor air quality, and changes in bacteria, viruses, and other infectious agents.

People with pre-existing health conditions such as cardiovascular and respiratory illnesses may be more at risk of heat-related illness, including heat exhaustion and heat stroke. Richmond's winter is shortening and pollen seasons are arriving earlier in the year and are more intense, posing a risk to those with allergies and asthma. Richmond was the third ranked "Asthma Capital" in the country in 2021 based on estimated asthma prevalence, emergency visits, and asthma-related fatalities. Changing weather patterns threaten to make these outcomes worse. Warmer winters are also allowing for increased transmission of tick-borne illnesses such as Lyme disease.

Weather changes will impact food systems and supply. Extreme events, such as heavy rainfall, disrupt critical services such as healthcare and public safety. In addition, research has shown that physical aggression, violence, and crime increase with rising temperatures.

Economy

Climate change has had and could continue to have serious impacts on the global, national, and local economies. Extreme weather events cause physical damage, health and safety impacts, and disruptions to systems that affect worker safety, access to jobs, communications infrastructure, and other critical economic factors.

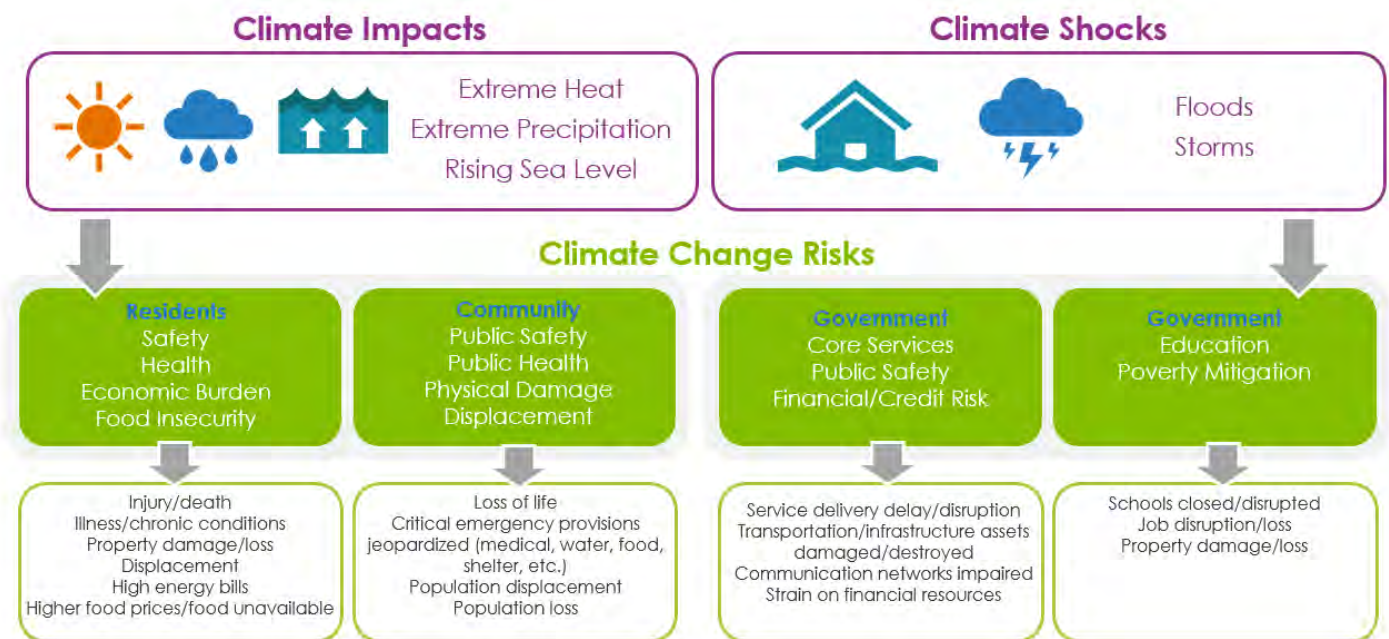


Figure 5.7. Climate Change Risks

Lower-income residents and communities will face disproportionate impacts.⁹ For example, Richmond has an above-average poverty rate (23% versus 11% nationally) and a high median household energy burden (the proportion of income spent on utility bills).

EQUITY TIP ▶
The Office of Sustainability compared energy burden showing lower-income residents, renters, and BIPOC households face higher energy burdens (Figure 5.8).¹⁰

As temperatures increase, residents in housing that is not adequately insulated will face increased energy costs in order to stay safe and cool. These same households may be faced with choosing between paying for utilities and other necessities such as housing and food.

RVAgreen 2050 staff and stakeholders also evaluated the risks and vulnerabilities caused by extreme heat as part of the planning process in order to develop strategies to increase resilience.

Read more about the potential impacts of climate change to Richmond's community in [Appendix D](#).

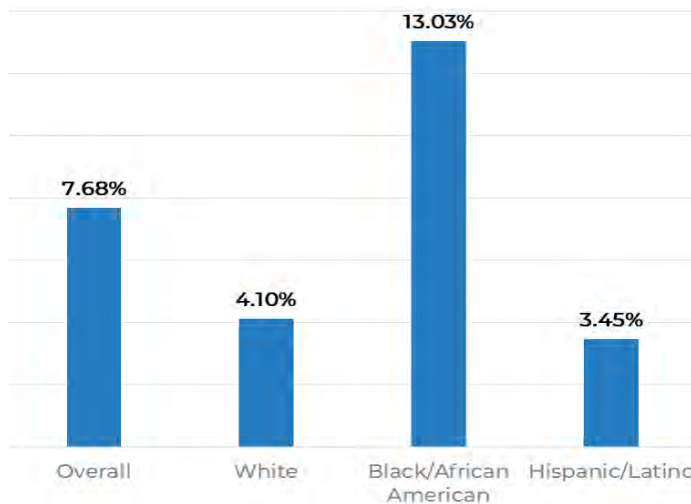


Figure 5.8. Richmond Median Household Energy Burden by Race and Ethnicity

Natural Resources Impacts

In addition to existing threats from human population growth and development, plant and animal species are being confronted by threats from climate change. Rising air and water temperatures, prolonged droughts, extreme storms and impacts such as soil erosion, flooding, and changes in water quality will alter habitats that are critical to the health and beauty of Richmond's natural environment.

“Over 900 of Virginia’s wildlife species are believed to be imperiled by the ongoing loss or degradation of their habitats. During the coming decades, climate change will exacerbate and intensify these impacts and the consequences to wildlife could be profound.”

– Virginia Department of Game and Inland Fisheries, Virginia’s Strategy for Safeguarding Species of Greatest Conservation Need from the Effects of Climate Change.¹¹

9 <https://www.brookings.edu/research/ten-facts-about-the-economics-of-climate-change-and-climate-policy/>

10 <https://www.rva.gov/sustainability/initiatives>

11 <http://bewildvirginia.org/climate-change/virginias-strategy-for-safeguarding-species-of-greatest-conservation-need-from-the-effects-of-climate-change.pdf#page=4>

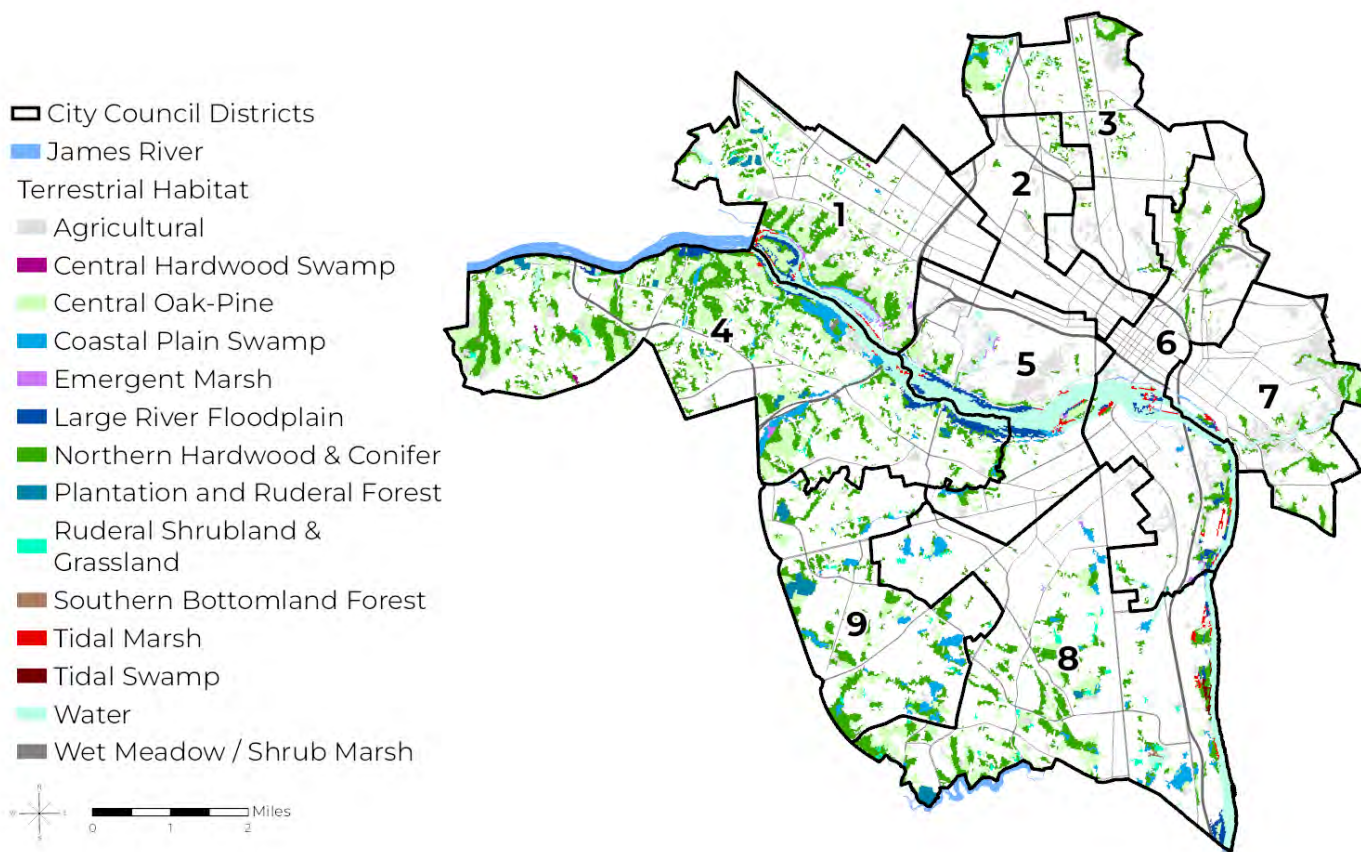


Figure 5.9. RVAgreen 2050 Climate Equity Index, Terrestrial Habitats of Richmond (as designated by the Northeast Climate Science Center and North Atlantic Landscape Conservation Cooperative, 2013)

It is difficult to pinpoint specific habitats and species at risk within the City of Richmond boundaries because of the cross-jurisdictional nature of natural resources. Additional research is needed to evaluate specific risks and vulnerabilities to individual habitats.

RVAgreen 2050 staff and stakeholders evaluated the risks and vulnerabilities of natural resources such as the James River, green spaces and trees, and protected natural areas as part of the planning process in order to develop strategies to increase resilience.

Read more about the potential impacts of climate change to Richmond’s natural resources in [Appendix D](#).

Critical Infrastructure Impacts

“Cities depend on infrastructure, like water and sewage systems, roads, bridges, and power plants, much of which is aging and in need of repair or replacement.

These issues will be compounded by rising sea levels, storm surges, heat waves, and extreme weather events, stressing or even overwhelming essential services. Urban dwellers are particularly vulnerable to disruptions in essential infrastructure services, in part because many of these infrastructure systems are reliant on each other.”

– Third National Climate Assessment

As an older city, Richmond's built infrastructure - such as water and sewer pipes, roads, and railways - will continue to be taxed by climate impacts. Other cities' climate risk assessments referenced for this plan noted that most built infrastructure is able to withstand extreme heat events without major impacts and the major areas of concern are in residents' ability to access critical services and facilities. However, it is important to note that extreme heat still poses a risk to infrastructure itself - for example, increased energy demand for cooling systems

may stress power infrastructure, and in recent years Virginia Railway Express and Amtrak trains have experienced delays due to heat causing speed restrictions.

Critical infrastructure and systems were identified by considering the people, resources, and infrastructure in the City of Richmond, as well as the services those resources provide (Figure 5.10). These assets include those both internal and external to the City's operational control, such as buildings and housing, communications and energy

infrastructure, community centers and educational facilities, transportation infrastructure, and health and safety facilities.

RVAgreen 2050 staff and stakeholders evaluated the risks and vulnerabilities of critical infrastructure and systems as part of the planning process in order to develop strategies to increase resilience.

Read more about the potential impacts of climate change to Richmond's critical infrastructure in [Appendix D](#).

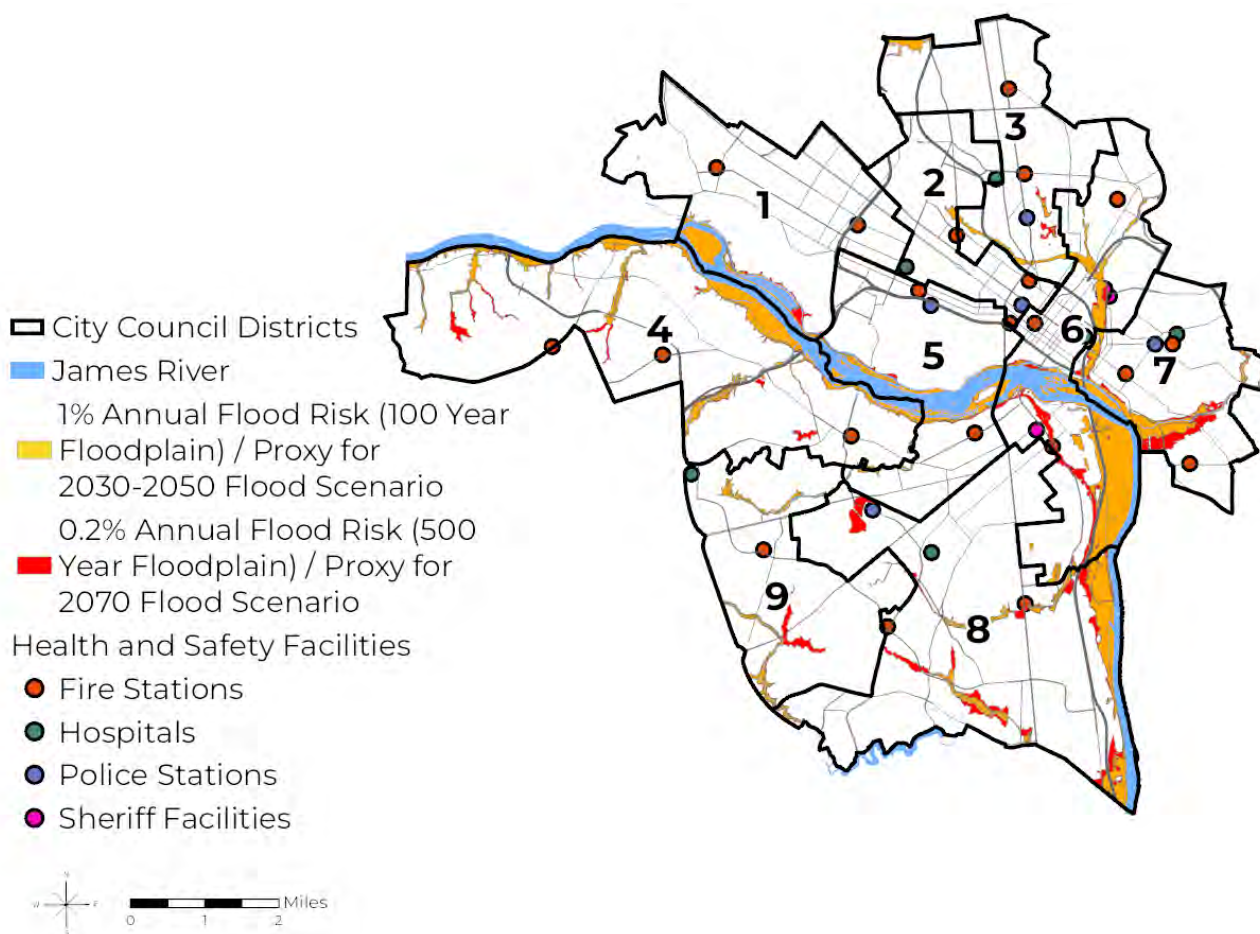


Figure 5.10. RVAgreen 2050 Climate Equity Index, Future flood scenarios and various health and safety facilities (2019)



© Richmond Region Tourism

Planning for Climate Resilience

Climate resilience, adaptation, preparedness, and readiness are helping our community respond to climate change. Given that there are very limited resources to address the city’s adaptation and mitigation needs, it is important for the Office of Sustainability to conduct a climate assessment to prioritize actions around the highest risks and most immediate vulnerabilities, while also showing the possibility for future flexibility. The Office of Sustainability identified and prioritized the climate factors which pose the greatest risk to Richmonders: heat, precipitation, and sea level rise.

Adaptation and mitigation needs were then prioritized based on vulnerabilities to each risk factor (Figure 5.11).

EQUITY TIP ▶ **The Office of Sustainability conducted a climate assessment to prioritize actions around the highest risks and most immediate vulnerabilities.**

As part of the assessment, the Office of Sustainability evaluated and mapped over 150 demographic variables, built assets, and natural resources and areas. These range from factors that affect a person’s ability to deal with very high temperatures, such as respiratory illness and access to air conditioning, to critical community assets such

as police stations and bridges that could be impacted by increased storms.

EQUITY TIP ▶ The resulting Climate Equity Index developed by the Office is an innovative, no-cost map-based tool available to all city staff and the public to enable users to better understand how climate change is impacting the community.

The Climate Equity Index, scientific information, and stakeholder expertise and input were all used to develop the strategies that will enhance the resilience of Richmond’s community, natural resources, and critical infrastructure to the impacts of climate change.

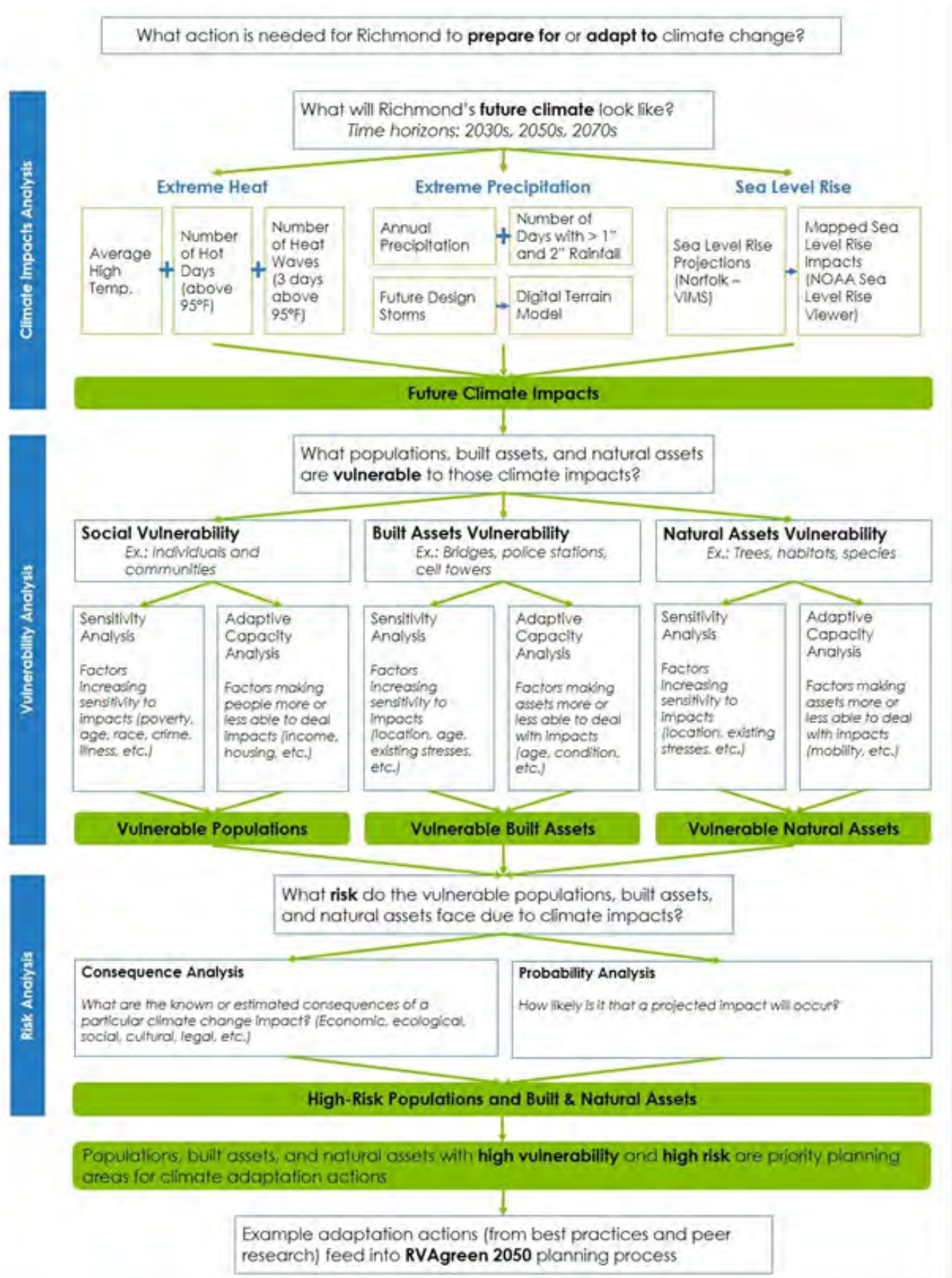


Figure 5.11. Climate Vulnerability and Risk Assessment Process



CHAPTER 6

RVAgreen 2050 Planning Process

RVAgreen 2050 Planning Process

The process to create the 2030 Action Plan was a lengthy one: from Mayor Stoney’s initial announcement of RVAgreen 2050 in April 2017 to the forthcoming approval and adoption of the plan in mid- to late 2022.

This Plan represents the culmination of input from hundreds of stakeholders over thousands of hours to ensure that the process and contents of the Plan incorporate diverse and representative voices.

The process was difficult and rapidly-changing due to various factors, including the COVID-19 pandemic, limited budgets and staff capacity, and many “stop, reflect and rethink” moments that the Office initiated to ensure the City created an equitable plan rather than diverting back to a more traditional process.

The Office knows this plan is limited by many factors that will be uncovered as the future becomes reality and will not address all of the very complex and critical issues facing our community because of climate change, but it will provide a framework to reach our goals and lay a foundation for better processes and plans moving forward.

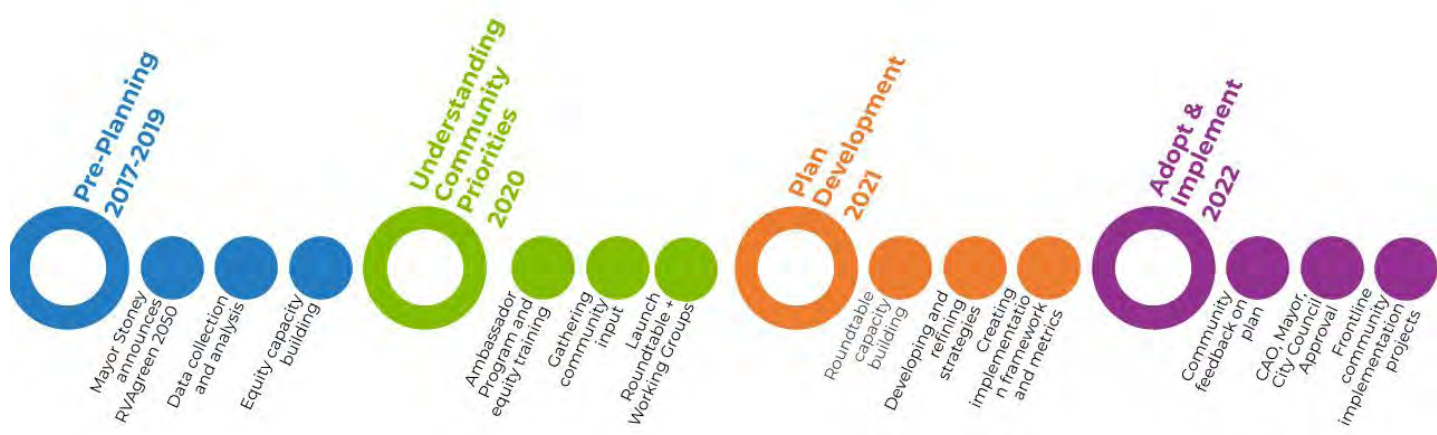


Figure 6.1. RVAgreen 2050 Planning Process

Process Overview

Pre-Planning (2017-2019)

From 2017 through 2019, the Office of Sustainability built internal staff capacity, conducted research and technical modeling, participated in racial equity training, and gathered data to inform the rest of the planning process.



© James Loving



© Richmond Region Tourism

The Office developed the RVAgreen 2050 Climate Equity Index, an innovative GIS based mapping tool that identifies the communities in Richmond that are on the frontlines of local climate change.

Understanding Community Priorities (2020)

EQUITY TIP ▶
As a result of the disadvantages brought about by historic and systemic racism, Richmond’s BIPOC communities in particular are more vulnerable to crises such as climate change. Therefore, it was critical from the outset that the planning process was carried out in a way that was intentionally inclusive of these communities.

EQUITY TIP ▶ **The Office used the Index to identify, purposefully reach out to, and engage frontline communities in the planning process.**

This Action Plan uses the term “communities on the frontlines of climate change” to identify those who are hit first and worst by the impacts of environmental injustice and the climate crisis. These communities confront many vulnerabilities, including racism, poverty, housing insecurity, and more, which intensify climate threats.

EQUITY TIP ▶ **The goal of this phase of the RVAgreen 2050 planning process was to listen to the community and gather information on their successes, challenges, everyday needs and priorities so that these could be centered in the planning process.**

Originally, listening sessions were designed around direct resident engagement. When the COVID-19 pandemic began, the Office adjusted engagement plans to focus on organizations that work to empower communities on the frontlines of climate change so as not to overburden residents already under immense and inequitable stresses.

The organizations that participated in the community listening sessions seek to address community priorities such as empowerment, community investment, conservation, workforce development, and youth-based services.

EQUITY TIP ▶

To reduce the redundancy and impact on these organizations during an already stressful period, the Office utilized previous surveys and reports from other organizations to help identify and add context to the community priority list.

A community-wide survey continued this process to get feedback from the broader community. [Read more](#) on what the Office heard on community priorities.

This listening process is ongoing.

EQUITY TIP ▶

The Office of Sustainability sought to reflect back to the community what was heard and simultaneously confirm RVAgreen 2050 is adequately addressing community priorities.

The Office acknowledges and understands that this document is not produced entirely using direct feedback from residents. Finally, as the Office conducted the community listening process during the height of the COVID-19 pandemic and demonstrations across the city supporting the Black Lives Matter movement, the Office examined the relationship between crises such as climate change and COVID-19 and underlying inequities that cause disparate impacts which often come down to race.

Plan Development (2021-2022)

In fall 2020, the Office of Sustainability convened community organizations serving frontline communities, institutional partners, government content experts, and other stakeholders for the RVAgreen 2050 Racial Equity & Environmental Justice Roundtable (as the central advisory group) and topical working groups: Buildings & Energy, Community, Environment, Transportation & Mobility, and Waste Reduction & Recovery. There were over 125 people involved in these key stakeholder groups.

Starting in 2021, during the Plan Development Phase, the Office began working with these groups to translate the community priorities into strategies that achieve the following goals:

1. Increase equity, particularly racial equity
2. Reduce greenhouse gas emissions and pollution
3. Enhance resilience to climate impacts

In summer and fall of 2021, the project team refined the draft strategies based on community feedback. With input from the Roundtable and Working Groups, the Office of Sustainability developed Indicators and an Equitable Implementation and Accountability Framework and then spent considerable time creating the first draft of the RVAgreen 2050 plan. The draft Action Plan was reviewed by the Roundtable, Working Groups, and city staff before going to the community for final input in the spring of 2022.

Adopt & Implement (2022 onwards)

This 2030 Action Plan will be shared broadly with the community for feedback before it is finalized. Then, it will go to City Administration and Mayor Stoney for approval before it is presented to City Council for adoption. After the Action Plan is adopted, implementation begins!

Community Priorities



Look out for this symbol next to the actions in the Plan for those that support this Community Priority

Racial Equity & Environmental Justice

EQUITY TIP ▶ **An important first step to creating this equitable climate action and resilience plan was listening to community members facing the worst impacts of local climate change and understanding their priorities. These seven priorities were central to developing and prioritizing the strategies and actions in this Action Plan.**

Richmond's history - whether measured in centuries, decades, years, months, weeks, or days - is fraught with racism. This has created systems that serve our community in inequitable ways, from education and healthcare to government and natural resources. Our Black, indigenous, and communities of color in particular face more harm due to crises such as climate change and COVID-19.

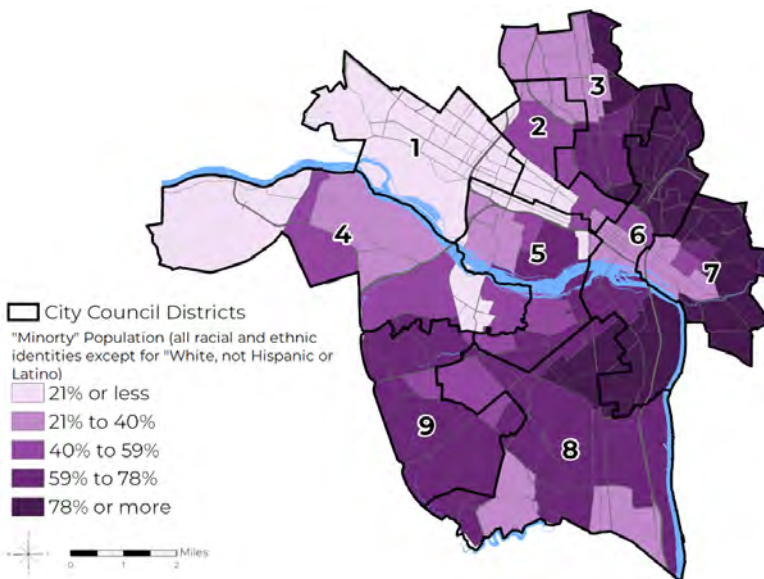


Figure 6.2. “Minority” Population (all racial and ethnic identities except “White, not Hispanic or Latino”), U.S. Census (2019)

What does this look like in Richmond?

Many of the inequities associated with climate change impacts come down to race and ethnicity. For example, our Black, African American, Hispanic, and Latino communities have higher rates of poverty, fewer available resources, and receive less support than others, which reduces their ability to prevent, cope with, and adapt to climate change impacts. Climate change impacts increase the vulnerability of individuals below the poverty level, causing a rise in risks such as physical and mental illnesses, job loss, and decreased food security.

EQUITY TIP ▶ **Compare this map of Richmond’s population that does not identify as “White, not Hispanic or Latino” to the other maps in this plan showing urban heat islands, tree canopy coverage, and other factors to see how the same neighborhoods compare.**



Look out for this symbol next to the actions in the Plan for those that support this Community Priority

Government Accountability

What we heard

Residents want to be involved and informed during decision making processes. We need open and honest communication between the City of Richmond and the community in order to build trust. The City should keep the community informed of progress on initiatives and follow through with its promises. Tailored and trusted avenues of communication are key to dealing with the climate crisis.

What does this look like in Richmond?

Many voices are missing from traditional public planning processes, especially those of Black and African American, Hispanic and Latino, and lower-income residents. These same communities are facing disproportionate impacts due to climate change.

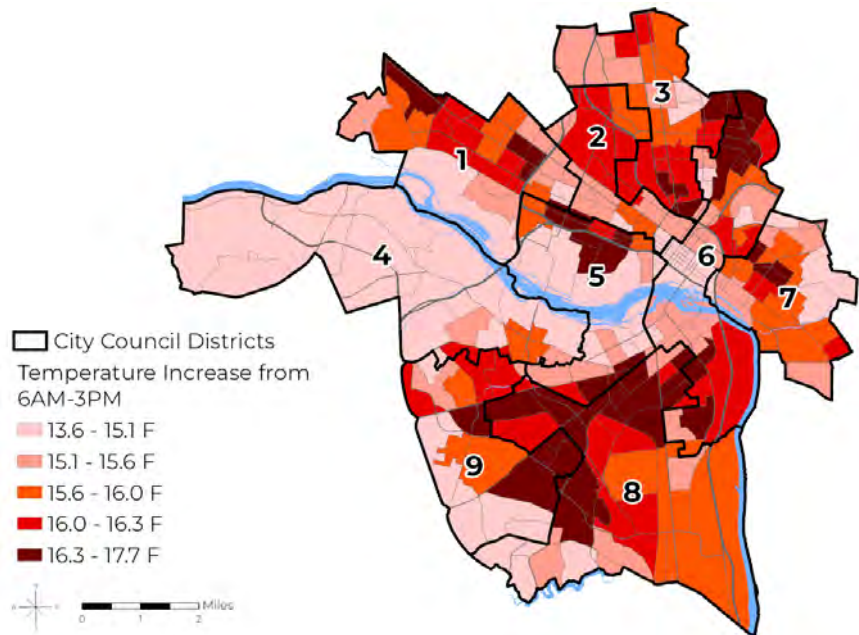


Figure 6.3. Urban Heat Islands, Dr. Jeremy Hoffman, Science Museum of Virginia (2017)



Look out for this symbol next to the actions in the Plan for those that support this Community Priority

Community Wealth

What we heard

Richmond residents want improved access to jobs. Residents indicated the need for wrap-around services that provide improved education, job training, job retention, and living wages. The City and community should work together to increase the potential for Richmond residents to reach higher economic status. This includes enhancing access to well-paying and sustainable jobs, quality education, and strategies for saving money and building wealth.

What does this look like in Richmond?

A 2016 Brookings Institution study found that the average U.S. net worth of a typical white family (\$171,000) is nearly ten times greater than that of a Black family (\$17,150). This wealth gap reflects historic and current racism in systems that affect access to property, jobs, public transportation, and other financial resources. Communities on the frontlines of climate change will use a greater proportion of their resources to deal with impacts to their health, safety, and shelter, among other basic necessities.

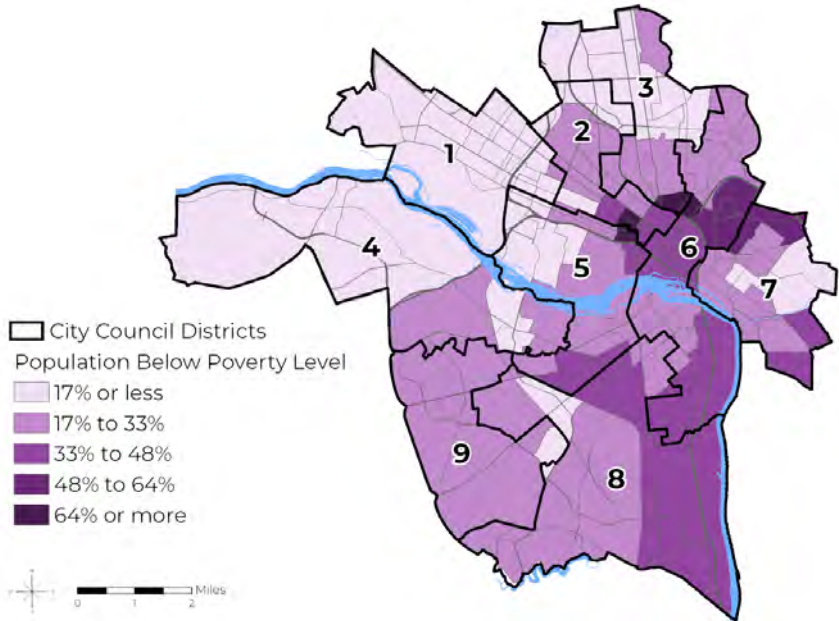


Figure 6.4. Individuals Below Poverty, U.S. Census (2019)

A 2017 Greater Washington Partnership report showed that only 2% of jobs in the Richmond region are accessible by transit within a 40-minute commute. Nearly 90% of jobs are accessible by car within a 40-minute commute, but many Richmond households do not have access to a vehicle, especially those in neighborhoods with higher proportions of residents of color. At the same time, we are seeing an increase in greenhouse gas emissions caused by transportation in Richmond over the last few years.



Look out for this symbol next to the actions in the Plan for those that support this Community Priority

Affordable Housing

What we heard

Residents are wary of potential developments that reduce access to affordable housing. Richmond’s residents are concerned about being priced out of the city due to increased housing demand and an influx of developments replacing existing housing. Richmond’s housing should be accessible, clean, safe, and affordable featuring energy efficiency and cost-saving measures in neighborhoods throughout the city.

What does this look like in Richmond?

Richmond has one of the highest eviction rates in the country. Eviction leads to a devastating cycle of housing and economic instability. Energy burden is a contributor to Richmond’s high eviction rate. Energy burden represents the percentage of annual income that a household or individual pays for energy consumption. A household is considered in “high burden” if they spend more than 6% of their annual income on energy bills - Richmond’s average energy burden is 8.47%.

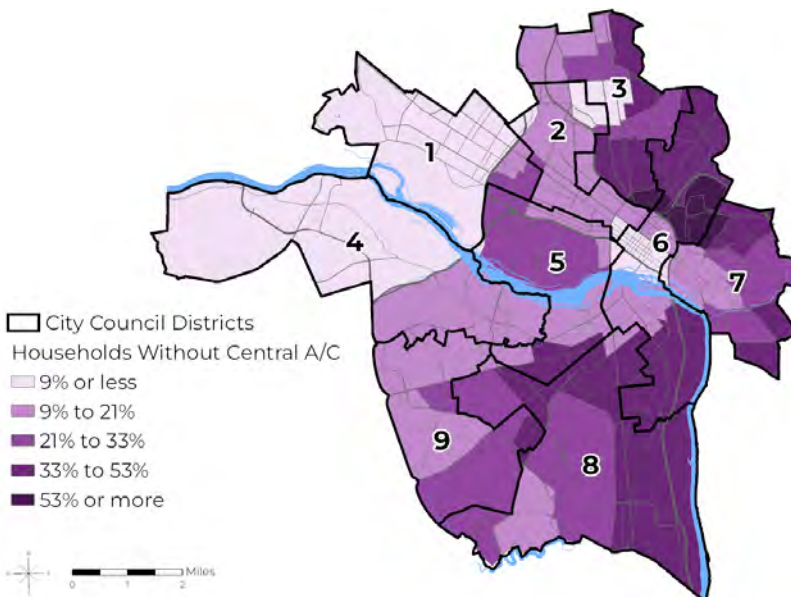


Figure 6.6. Households without Central Air Conditioning, City of Richmond Assessor’s Office (2019)

Many households in Richmond lack central air conditioning. In the face of increasing extreme heat events caused by climate change, this lack can pose health risks. In addition, these households may be spending more on electricity bills if they use window or portable air conditioning units. As Richmond continues to experience more dangerous heat, households may be forced to choose between staying safe by using air conditioning and running a high energy bill, and the ability to pay their monthly rent.

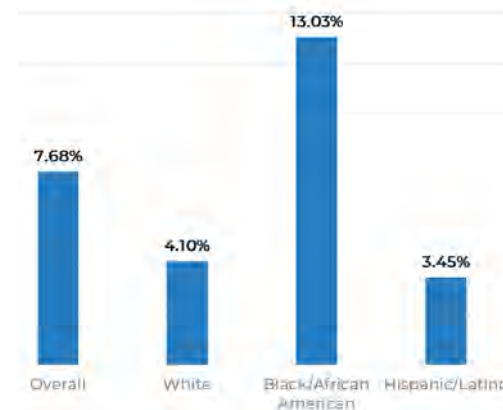


Figure 6.5. Energy Burden (Proportion of Income Spent on Energy Bills) by Race and Ethnicity, Greenlink Analytics



Look out for this symbol next to the actions in the Plan for those that support this Community Priority

Neighborhoods

What we heard

Richmonders want to live in safe and beautiful neighborhoods with access to parks and other amenities. Residents are concerned about issues such as increased littering and flooding as well as a lack of accessible green space, sidewalks and pedestrian connections in many neighborhoods. Our neighborhoods should promote safety, sustainability, beauty, and provide access to green space.

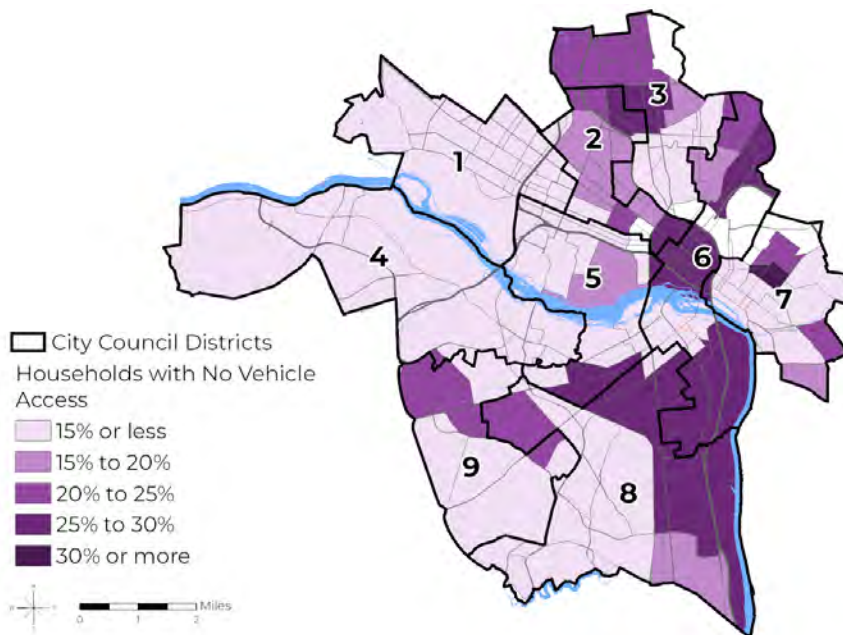


Figure 6.7. Households without Access to a Vehicle, U.S. Census (2019)

What does this look like in Richmond?

Nearly 80% of Richmond residents live within a ten-minute walk to a park, but those who do not are commonly living in areas of the city with more people of color and lower-income populations. These same areas have less tree canopy coverage and more paved surfaces, creating a higher heat burden and increasing the risk to health and safety of residents during times of extreme heat, especially among the elderly, children, and those with chronic health conditions.



Look out for this symbol next to the actions in the Plan for those that support this Community Priority

Health & Well-Being

What we heard

Residents are concerned with water and air quality, violence, food access, and the impact these issues have on mental and physical health. They want more available facilities and services to support better health including green spaces, bike and pedestrian infrastructure, and grocery stores.

What does this look like in Richmond?

Many of Richmond’s neighborhoods face multiple inequities related to health, safety, and climate change. For example, some communities with higher rates of chronic illnesses, such as asthma, are also in areas that get hotter than others during heat waves. Asthma can increase a person’s risk of illness during an extreme heat event, and climate change is making these events happen more frequently. As the top city in the country for number of people affected by pollen, the risk of asthma-related illness is even more acute. Climate change is also accelerating existing social instability due to factors such as increased crime and reduced food access.

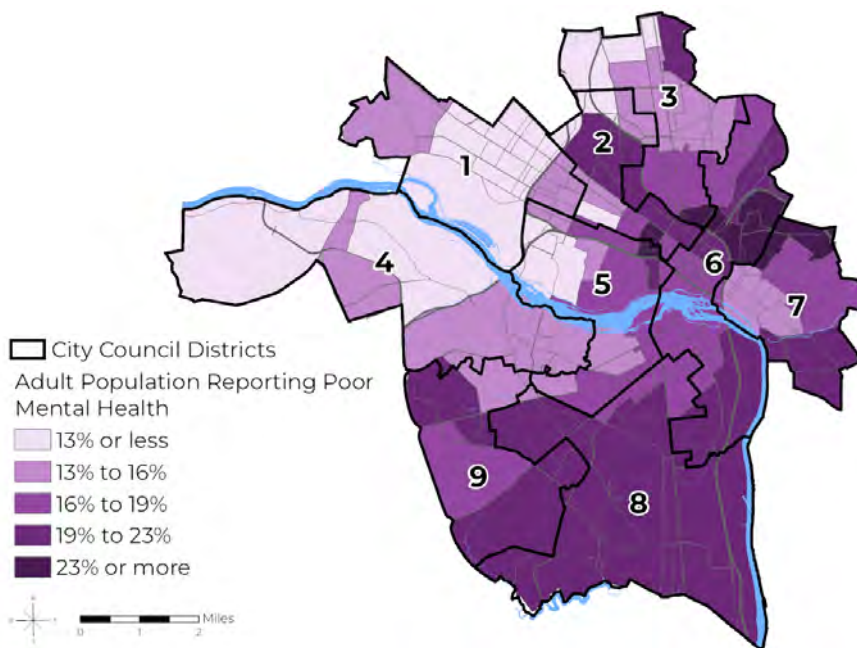


Figure 6.8. Adult Population Self-Reporting Poor Mental Health, U.S. Centers for Disease Control (CDC, 2018)



Look out for this symbol next to the actions in the Plan for those that support this Community Priority

Engagement & Communication

What we heard

The voices of Black, African American, Hispanic and Latino, and lower income residents are underrepresented in public processes for many reasons: time and capacity conflicts with traditional planning methods; flawed communication and language; and, lack of trust and burnout from participating in past efforts that have seen limited results.

What does this look like in Richmond?

Climate change affects some members of our community more than others. Due to historic and institutional racism, people of color are more likely to live in more marginal and exposed areas that are more susceptible to climate impacts. These community members are further marginalized in traditional public planning processes.

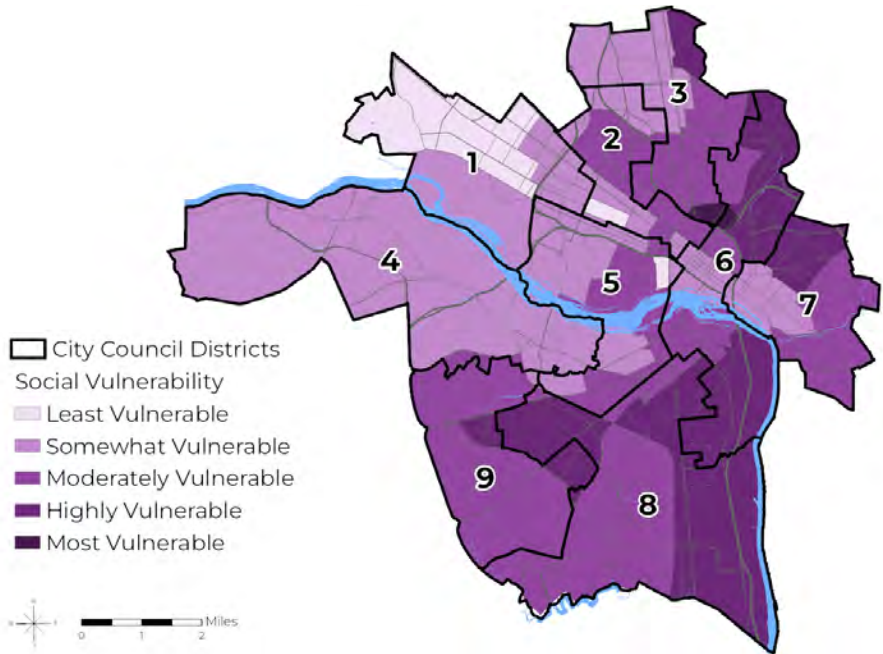


Figure 6.9. Social Vulnerability to Climate Change, RVAgreen 2050 Climate Equity Index (2019)

EQUITY TIP ▶ **The Office of Sustainability developed the RVAgreen 2050 Climate Equity Index to identify the communities in Richmond that are on the frontlines of crises such as climate change and purposefully reached out to these communities to engage them in our process.**

Planning Process Groups

Much of the RVAgreen 2050 planning process took place on two parallel tracks: some steps and tools were more typical of traditional city and climate planning processes, while others were specifically aimed at improving the traditional process in order to center equity. The stakeholder groups described below are a good example of how this played out in the process.

Racial Equity & Environmental Justice Roundtable

Overview

EQUITY TIP ▶ **The Racial Equity & Environmental Justice Roundtable was a group of Richmond residents who were paid for their time and lived experience expertise.**

Their roles in the planning process included:

- » Help the City center equity in the planning process and elevate frontline community voices
- » Inform, guide and provide input on planning process

- » Provide recommendations for RVAgreen 2050
- » Serve as liaisons to ensure community assets, needs and priorities are integrated into the planning process

Over 16 semi-monthly meetings during the process, this dedicated group of citizens played a crucial role in all stages of content development - from creating the vision statement and Equity Screening Tool used to evaluate proposed strategies and actions, to informing the prioritization of strategies, to engaging directly with residents in their neighborhoods on the topic of climate change. The Office of Sustainability staff members managed Roundtable logistics including setting meeting agendas, taking notes, communications, and meeting facilitation along with an equity facilitator hired to work with the Roundtable.

Formation and Membership

After the initial listening sessions process in spring 2020, Office of Sustainability staff reached back out to the organizations serving communities on the frontlines of climate change with a request: help us recruit residents who will be paid for their time to provide lived experience expertise in the RVAgreen 2050 planning process. In August 2020, the

Office distributed an online application that was open for the month of September and received over 50 applicants. Applications were scored using objective criteria based on responses to the following questions:

- » Do you have **experience or ideas for** engaging the communities where we seek to increase participation (Black/African American, Hispanic/Latino, lower-income, and other communities on the frontlines of climate action)?
- » Do you have **experience or ideas for** engaging communities in Council Districts where we seek to increase participation (3rd, 5th, 6th, 7th, 8th, 9th)?
- » Do you have a reference who can speak to your abilities to engage these communities?
- » Is your application complete?

Everyone who provided positive responses to these questions - and who was not a better fit for a technical Working Group based on their professional affiliation (i.e., would likely participate in the RVAgreen 2050 process as part of their job) - was invited to join the Roundtable. As a result of this process, the Office invited a 14-member group of community stakeholders to form the Roundtable, with at least one resident from all nine of the city's Council Districts.

Stipends

EQUITY TIP ▶ It is a best practice to pay community members for their time and lived experience expertise as part of public planning processes, just as we would typically pay technical consultants.

The process used by the Richmond 300 Master Planning team to form and compensate Engagement Teams paved the way for the idea and logistics needs for Roundtable members to be compensated, but to our knowledge this had never been done at the individual level over an extended time period for any other city plan. Based on research into best practices and peer city plans, the RVAgreen 2050 Roundtable application offered four options for compensation:

- » Community Leader: \$5,000 total stipend - *Designed for a resident working independently of a paid position to fulfill Roundtable responsibilities, who identifies as a member of a community on the frontlines of climate change, and would help directly engage residents as part of the planning process*
- » Community Partner: \$3,000 total stipend - *Designed for a community-based*

organization that serves communities on the frontlines of climate change and can “sponsor” one representative (staff or other) to participate on the Roundtable

- » Community Ally: \$1,000 total stipend - *Designed for a resident working independently of a paid position to fulfill Roundtable responsibilities, who identifies as a member of a community on the frontlines of climate change, and would serve in an advisory role on the planning process*
- » A commitment level as described above while opting out of a stipend for participation

Applicants' stipend selection played no role in the application evaluation process and we trusted individuals to select the amount best suited for their participation.

Activities

The Roundtable accomplished many things over the course of 16 semi-monthly meetings from November 2020 through the completion of the plan development in 2022. Details of each meeting - including meeting slides and materials - are available on the Office of Sustainability website. These activities included:

- » Kicking off the planning process with an Equitable Decision-Making &

Community Engagement training facilitated by Richmond-based nonprofit organization Virginia Community Voice (as part of the Working Groups process);

- » Co-learning with Office of Sustainability staff about climate action, resilience and equity;
- » Developing the RVAgreen 2050 vision statement and Equity Screening Tool;
- » Identifying basic principles for equitable and inclusive community engagement and advising on the overall engagement strategy for RVAgreen 2050;
- » Developing personal “mini-engagement” plans as part of the overall strategy to directly engage with neighbors;
- » Providing input on drafting and prioritizing Action Plan objectives, strategies, and actions;
- » Taking part in an Equity Assessment conducted by Virginia Commonwealth University Urban and Regional Planning professor Dr. Meghan Gough’s *Sustainable Community Development* class in spring 2021;
- » Providing input on the Shared Accountability Framework; and,
- » Providing input on what the deliverables for the plan should look like.



Roundtable and Working Group members collaborated with the Science Museum of Virginia to host two walks in different neighborhoods across Richmond to collect and compare hyperlocalized air quality data and discuss participants' experiences in these different spaces.

Lessons Learned

Many lessons learned from the RVAgreen 2050 planning process are described in [this section](#) of the Plan. Because the formation and implementation of the Roundtable concept was so new to city planning, a few recommendations specific to the Roundtable are listed below:

- » The City of Richmond's procurement system is not ideal for creating an equitable compensation program for community members. For example, all Roundtable members had to individually register as city vendors and submit quarterly invoices in order to receive stipend payments.

This would be a deterrent to participation from residents who are not U.S. citizens with social security numbers and those without bank accounts. In addition, city staff are not permitted to purchase gift cards using city funds, which would have provided an alternative method of compensation.

- » Despite the challenges with the city's payment abilities described above, it was entirely worthwhile to go through that process to compensate the Roundtable participants. This provided a fairer exchange of expertise, led to more trusting relationships, and also enabled and encouraged participation for many members.

Notably, all the Roundtable members who initially applied and elected not to receive a stipend eventually discontinued their participation. This was not directly linked to a lack of compensation for their time, but perhaps those who received stipends were more motivated or committed.

- » COVID-19 presented many challenges, one of the most significant being conducting the planning process almost entirely in a virtual format in order to maintain the health and safety of all participants. This excluded those who did not have consistent access to the internet and a device that made it convenient to participate in virtual meetings and review documents.

Working Groups

Overview

The five Working Groups provided topical expertise on RVAgreen 2050 objectives, strategies, and actions to the Office of Sustainability and the Racial Equity & Environmental Justice Roundtable. They also assisted with translating community priorities into equitable climate action and resilience strategies; identifying opportunities for community engagement and capacity building; and, building government accountability. The Working Groups were divided into five broad topic areas listed below which align with the RVAgreen 2050 Pathways. Additionally, cross-sectional community priorities, such as racial equity, engagement and communications, government accountability, community wealth, affordable housing, and health, were represented across multiple Working Groups.



- » **Buildings & Energy** - Clean and equitable energy sources; healthy, resilient, zero-carbon buildings; grid security; housing



- » **Community** - Centering community priorities such as well-paying and sustainable jobs, affordable and sustainable housing, education, health and safety, neighborhood beautification; community resilience



- » **Environment** - Ecosystem resilience, regeneration, and conservation; green space and trees; biodiversity; water quality and conservation



- » **Transportation & Mobility** - Clean and equitable mobility systems, infrastructure, and land use; public transportation; biking and walking; electric vehicles; densification; transit-oriented development



- » **Waste Reduction & Recovery** - Zero waste; reducing, reusing, and recycling; composting; circular economy

Formation and Membership: A single online application was used for both the Roundtable and the Working Groups (although it provided different questions based on the group(s) of interest to the applicant). An open call was put out throughout the month of September 2021. Over 55 community members applied; in addition, the Office of Sustainability reached out to nearly every City department and several external agencies and groups to solicit participation from key experts and stakeholders. Applications from community members were evaluated based on three objective criteria: Is their application complete? Do they live, work, or study in Richmond? Do they have topical knowledge? If the answer to all three questions was “yes,” the applicant was invited to join. Over 125 people participated in the Working Groups during the RVAgreen 2050 process.

Roles within the groups included:

- » **Community Co-Chair:** A resident of Richmond with topical expertise who worked with the other co-chair and coordinator to review meeting agendas, facilitate meetings, and report to the Roundtable

- » City Co-Chair: A City of Richmond staff member with topical expertise who worked with the other co-chair and coordinator to review meeting agendas, facilitate meetings, and report to the Roundtable
- » Additional members: Residents of Richmond, people who work in Richmond, and additional City of Richmond staff members with topical expertise who helped develop equitable climate action and resilience strategies

EQUITY TIP ▶ At least one Roundtable member served on each Working Group to provide their lived experience, expertise, and ideas.

- » Coordinators: Office of Sustainability staff members who managed group logistics including setting meeting agendas, taking notes, communications, and meeting facilitation along with the co-chairs

Activities

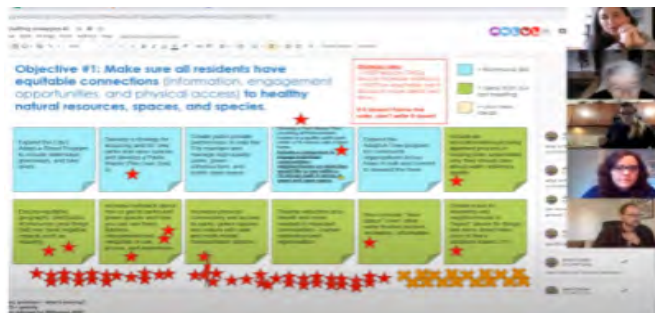
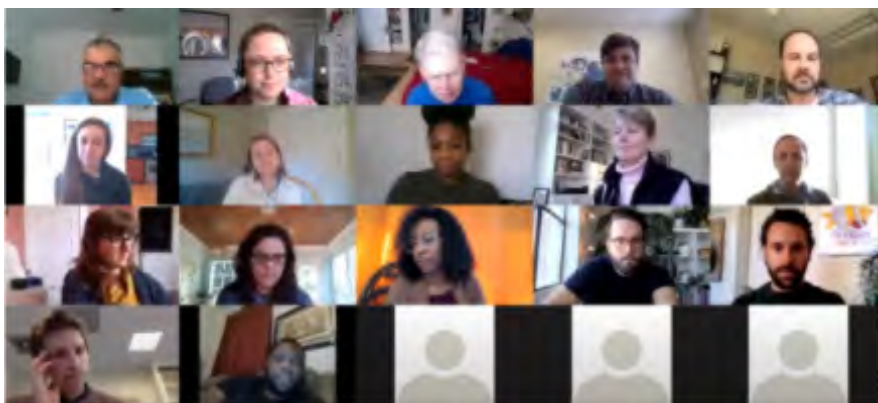
The Working Groups accomplished many things over the course of 17 semi-monthly meetings from November 2020 through the completion of the plan development in 2022.

Details of each meeting - including meeting slides, materials, and recordings - are available on the Office of Sustainability website.

These activities included:

EQUITY TIP ▶ Kicking off the planning process with an Equitable Decision-Making & Community Engagement training facilitated by Richmond-based nonprofit organization Virginia Community Voice.

- » Identifying topical research needs;
- » Providing input on the RVAgreen 2050 vision and Equity Screening Tool developed by the Roundtable;
- » Assisting with the climate vulnerability and risk assessment for various neighborhoods, natural resources, critical infrastructure and assets;
- » Drafting and prioritizing the Action Plan objectives, strategies, and actions;
- » Providing input and details for equitable implementation and accountability of the plan; and
- » Reviewing and providing input on the draft plan content.



Screenshots from the virtual Working Group and Roundtable meetings

Community Engagement

The Office of Sustainability knew from the outset that equitable and inclusive community engagement would be key to the RVAgreen 2050 process. During the summer 2020 community listening phase, we heard from residents that the voices of Black and African American, Hispanic and Latino, and lower income residents are underrepresented in public processes for many reasons: time and capacity conflicts with traditional planning methods; flawed communication and language; and, lack of trust and burnout from participating in past efforts that have seen limited results.

Community engagement took place throughout the multi-year RVAgreen 2050 planning process in several ways: some within the process itself, as well as several phases of community-wide engagement with specific “asks.”

EQUITY TIP ▶ The Office of Sustainability set ambitious engagement goals to drive its commitment to equitable and representative community participation in the planning process.

This includes:

- » Increase by 50% the total number of participants between each of the three RVAgreen 2050 engagement periods.
- » Match citywide demographic representation within 10% across all three engagement periods combined, and demonstrate an upward trend in achieving a representative sample of the Richmond population between each engagement period, within the following demographic categories: City Council District; age; race; ethnicity; education level; number of people in household; household income; and additional household factors (children, seniors, chronic health conditions, sensory impairment, mobility impairment).

- » Demonstrate an upward trend in the percentage of participants indicating that the mode of participation was easy to comprehend and complete between each engagement period, with a baseline goal of 75% for Phase 2.
- » Engage people who have never participated in a city planning process before, with a goal of 50% of participants across all three engagement periods combined.

COVID-19 presented a significant challenge to community engagement efforts throughout the planning process, but with the help of many community and city partners the Office of Sustainability was able to increase the number of participants across each engagement period and increase diversity of representation.

Additional details on progress towards the engagement goals can be found in [Appendix H](#).

Phase 1: Understanding Community Priorities (Spring-Summer 2020)

EQUITY TIP ▶ **The goal of this phase of the RVAgreen 2050 planning process was to listen to the community, specifically Richmonders on the frontlines of local climate impacts, and gather information on their successes, challenges, everyday needs, and priorities.** !

At the start of the COVID-19 pandemic, the Office of Sustainability adjusted the engagement plans to minimize impacts on residents and moved the focus to engaging organizations that work to empower communities on the frontlines of climate change.

EQUITY TIP ▶ **To reduce redundancy and more robustly use community input, the Office used previous surveys and reports from other organizations could be used to help identify and add context to the community priority list.** !

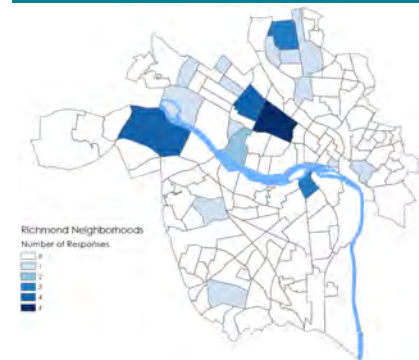
A community-wide online survey rounded out this phase of the process. [Read more](#) about the community priorities.

Phase 2: Developing Strategies (Spring 2021)

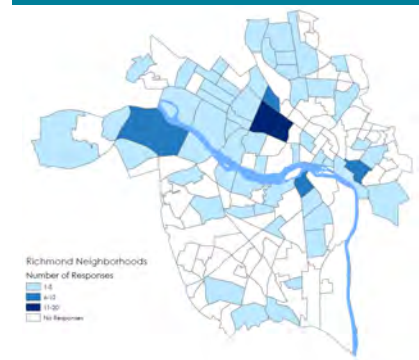
The goal of this phase of community engagement was to seek input on RVAgreen 2050. Throughout April 2021, Richmonders provided feedback on the draft vision, objectives, and strategies. Feedback was gathered in three different ways: through a 10- or 30-minute online survey, via direct commentary on a Konveio document of the draft content, and by paper survey distributed by members of the Racial Equity and Environmental Justice

EQUITY + INNOVATION TIP ▶ **During this phase, the Office of Sustainability used a first of its kind approach for City of Richmond planning processes. After each week of the four-week engagement period, the Office GIS mapped and evaluated where feedback was coming from and sought assistance from community partners and residents to increase input from underrepresented areas.** !

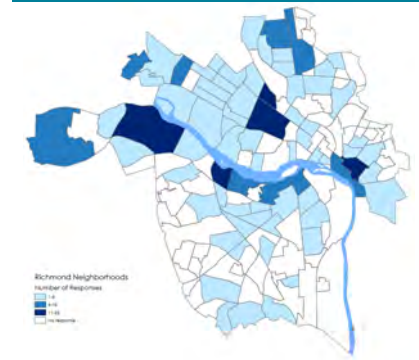
Week 1 ▼



Week 2 ▼



Week 3 ▼



Week 4 ▼

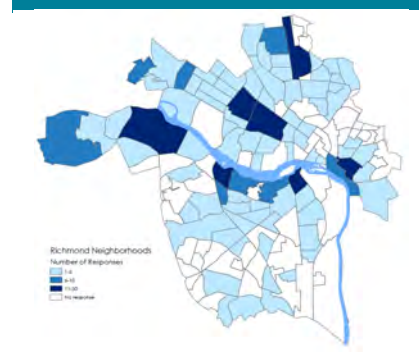


Figure 6.10. April 2021 Community Engagement Results

Phase 3: Reviewing Final Action Plan (Spring 2022)

In spring 2022, the draft plan will be shared for community-wide input after which the Office of Sustainability will finalize and seek approval of the plan from City Administration, the Mayor, and City Council. At that point we will begin implementation in collaboration with residents, community organizations, stakeholders, and other partners. Additional details on this engagement phase can be found in [Appendix H](#).

Ongoing and Future Engagement

INNOVATION TIP ▶ !
Throughout the RVAgreen 2050 planning process, the Office of Sustainability used a novel approach to offer several ways for the community to get involved in the process at any time based on their interest and capacity. The opportunities were framed in terms of the estimated time commitment for each action as described below.

1 minute: sign up for [e-newsletter updates](#) to stay up to date on the planning process and opportunities to participate

5 minutes: [share](#) the opportunity to participate with your community to help build awareness of and enhance participation in the process by sharing digital flyers and social media content

15 minutes: invite an Office of Sustainability staff member to attend your community meeting to present on RVAgreen 2050

30 minutes: set up a virtual “office hours” session with an Office of Sustainability staff member to discuss specific topics

“I am very thankful for the city’s transparency throughout this process. For me, the Roundtable was an invaluable asset of planning.”

- Monica, Roundtable member

The Office of Sustainability will continue to offer these methods of engaging with RVAgreen 2050 as well as work with city and community partners to create new and innovative ways to engage the community. The Office is also working to continually improve the community engagement process with more equitable planning and programs. Ideas for future engagement efforts include:

» **Youth Engagement:** Expand engagement for the RVAgreen 2050 equity-centered climate action and resilience planning initiative to the city's youth population (18 and under), especially in the 6th, 8th, and 9th City Council districts where general engagement has been the lowest so far. Partner with community organizations and volunteers to create a Youth Council to inform programs for youth engagement in RVAgreen 2050 implementation. Compensate Youth Council members for their time and also match members with RVAgreen 2050 stakeholders for one-on-one mentorship opportunities based on their interests and career goals.

» **Expanded In-Person Engagement:** COVID-19 hindered efforts to conduct in-person engagement throughout the RVAgreen 2050 process and is an area for improvement going forward.

» **Expanded Ambassador Program:** The RVAgreen 2050 Ambassador program was created at the beginning of the community engagement process to provide a way for residents with the interest and capacity to engage their own community - however they defined it - by having informal presentations and conversations about RVAgreen 2050. The program shifted to virtual due to COVID-19 which made it more difficult to operate and the Office lacked staff capacity to support it. The program could be expanded to include in-person and more focused activities.

“It was really a cool experience for me in regards to working with the Working Groups. And of course, how much I learned or am learning. It’s pretty impactful in my personal life - I’ve changed the way I’ve done things, I’ve been more cognizant of the way I’m using things, I started composting, I got an EV, I got solar panels on my house...it inspired me.”

- Angela, Roundtable member

This was a real collaborative effort with people who live in the city and are most affected by this, and that it’s not just a bunch of bureaucrats sitting around in offices in city hall developing plans that they think are going to work on paper. This is something that’s been really thought about by real citizens for a year and a half.”

- Jeanne, Roundtable member

CHAPTER 7

**Richmond 2030
Action Plan**

Richmond 2030 Action Plan

The equitable climate action and resilience Strategies that appear in this Plan are the result of several years of work with hundreds of stakeholders contributing thousands of hours of input and expertise.

The Strategies were also informed by hundreds of reviews, comments, and questions gathered from multiple rounds of community engagement. This is the first of several action plans that will transition Richmond to net zero greenhouse gas emissions by 2050 and increase resilience to local climate impacts of extreme heat, extreme storms, and flooding.

Drafting Strategies

After developing Objectives for the Pathways, the Working Groups began the process of drafting strategies.

They used the City's recently updated comprehensive plan, Richmond 300: A Guide for Growth, and generated their own ideas as jumping off points and a variety of inputs including technical (ex. greenhouse gas emissions modeling), policy (ex. best practices from other cities), and equity (ex. community priorities) to inform their strategy drafting. To become an initial strategy, an idea had to reduce GHG emissions and/or increase resilience AND had to be equitable. These were preliminary conclusions made at a high level.

By the end of this part of the planning process, the Working Groups had generated 188 initial strategies.

The Racial Equity and Environmental Justice Roundtable designed the [Equity Screening Tool](#) to help determine the extent to which proposed climate action and resilience strategies prioritized equity by prompting users to answer a series of questions. For example, what communities would benefit most from the proposed action? How has the community, including the historically disenfranchised, been engaged? The RVAgreen 2050 project team used the Tool to conduct a basic equity assessment of each Strategy in the Action Plan. The Equity Screening Tool requires ongoing evaluation and refinement to ensure effectiveness as it continues to be used in making decisions in implementation.

Strategy Drafting Process




*To help make the Strategies more equitable, the Working Groups used the **Equity Screening Tool** during this part of the process. Once all the Working Groups finished drafting the Strategies, the Community Working Group and the Racial Equity & Environmental Justice Roundtable reviewed the Strategies and provided input on whether they sufficiently addressed community priorities and racial equity simultaneously.

Figure 7.1. Strategy Drafting Process

Strategy Prioritization

The Working Groups prioritized 188 initial strategies down to 49 across the five RVAgreen 2050 Pathways to ensure that the Plan is both **ambitious** in terms of equity, climate action and resilience and **achievable** given timelines, available resources, and capacity.


INNOVATION TIP ▶ 

In order to accomplish the very complex and difficult task of prioritizing strategies, the Office of Sustainability developed an innovative methodology: the Prioritization Matrix.

The Racial Equity & Environmental Justice Roundtable informed the development of the Matrix by recommending two separate categories of scoring - an Impact Score and an Equity Score.

- (1) **Impact Score Criteria:** Attributes relevant to climate resilience, carbon footprint, implementation constraints, and a ranking of community support.
 - (2) **Equity Score Criteria:** Each of the community priorities identified through the community listening sessions.
- Weighting was then assigned to each criterion (Figure 7.2).

Together with the Working Groups and Roundtable, the Office formulated 13 criteria - six that comprised the Impact Score and seven that comprised the Equity Score.

EQUITY TIP ▶ 

Within the Impact Score, the Office created the Community Support criteria to enable the April 2021 community engagement feedback on the draft strategies to be reflected in the scoring, weighting, and ultimately, the prioritization of all the strategies.

IMPACT SCORE		
Criteria	Description	Weight
Climate Action	Potential greenhouse gas emissions reductions	x8
Climate Resilience	Improved resilience to climate change impacts	x4
Feasibility	Barriers and amounts of financial and political capital required	x4
Cost-Effectiveness	The cost of implementation compared to the rate of return	x4
Community Support	Priority rankings from the April 2021 community-wide survey	x4
Economic Development	The number of jobs created and sustained	x2
6 Criteria		26 Total

EQUITY SCORE	
Criteria (Community Priorities)	Weight
Racial Equity & Environmental Justice	x6
Health and Wellbeing	x5
Government Accountability	x3
Community Wealth	x3
Housing and Buildings	x3
Neighborhoods	x3
Engagement and Communications	x3
7 Criteria	26 Total

Figure 7.2. Impact Score and Equity Score

Once the appropriate criteria were identified, the Office developed a scoring system for the criteria between 1 (low impact) and 5 (high impact) to apply to each of the 188 draft strategies to answer the question “To what degree would the strategy address or improve each of these criteria?” The Office calculated a score for every strategy for each of the 13 criteria. Scores were based on the technical modeling, consultant’s experience and expertise, and staff input.

EQUITY TIP ▶ The Roundtable had final say on the weights of the different criteria to ensure that the prioritization scoring reflected equity-centered values appropriately.

Criteria were weighted according to their importance in determining the priorities needed to reach the goals of the Plan.

For each of the 188 strategies, the Office multiplied the weighting for each of the 13 criteria by their score (six criteria under Impact Score and seven criteria under Equity Score) and summed the totals to arrive at a weighted Impact Score, a weighted Equity Score, and a weighted combined Impact and Equity Score for each strategy.

See [Appendix J](#) for more information on this process and an example of the complex matrix tool the Office used to prioritize strategies using the criteria in Figure 7.2.

To prioritize among the 188 strategies, the Office ran multiple scenarios. One scenario sorted all 188 strategies according to Impact Score and identified those that fell in the top 75th percentile. Similarly, a second scenario highlighted those strategies in the top 75th percentile for Equity Score. A third scenario identified the

top 75th percentile for both their Impact Score and Equity Score. Finally, The Office ran a fourth scenario sorting all 188 strategies by their combined Impact Score and Equity Score, focusing on those that fell into the top 75th percentile. This final scenario turned out to be the Goldilocks Scenario and was the one that the Office recommended to all Working Groups.

Each Working Group then reviewed the strategies in the Goldilocks scenario that were relevant to their group and reincorporated some strategies that did not rise to the top 75th percentile but were important to the overarching goals to arrive at the collective list of 49 prioritized Strategies.

The list of all 188 strategies prior to the prioritization process can be found in [Appendix C](#).

1	Sort by IMPACT score, informed by equity	X	<ul style="list-style-type: none"> » Looked like a traditional climate action plan » Resilience is not prioritized » Equity is not centered
2	Sort by EQUITY score, informed by impact	X	<ul style="list-style-type: none"> » Looked like a resilience plan » Mitigation is not prioritized
3	Top IMPACT and EQUITY only	X	<ul style="list-style-type: none"> » Too limiting; number of strategies would make it difficult to achieve our 2030 goals
4	Sort by combined IMPACT + EQUITY scores	✓	<ul style="list-style-type: none"> » “Not too hot, not too cold, just right” » Isolate strategies in the top 75th percentile based on combined scores

Figure 7.3. Ranking Methodology

Prioritized Strategies by Pathway

To refine the 49 prioritized Strategies, the Office screened them to ensure that they followed the 'SMARTIE' model:

S	Strategic? Reflects an important dimension of what your organization seeks to accomplish (programmatic or capacity-building priorities)
M	Measurable? Includes standards by which reasonable people can agree on whether the goal has been met (by numbers or defined qualities)
A	Ambitious? Challenging enough that achievement would mean significant progress; a “stretch” for the organization.
R	Realistic? Not so challenging as to indicate lack of thought about resources or execution; possible to track and worth the time and energy to do so
T	Time-bound? Includes a clear deadline
I	Inclusive? Brings traditionally excluded individuals and/or groups into processes, activities, and decision/policy making in a way that shares power
E	Equitable? Includes an element of fairness or justice that seeks to address systemic injustice, inequity, or oppression

Cross-Cutting Outcomes

The overarching goals of the RVAgreen 2050 process were created to equitably reduce greenhouse gas emissions and increase resilience to the impacts of climate change.

INNOVATION TIP ▶ **After developing and prioritizing the draft strategies to achieve these goals, the Office of Sustainability asked the Working Groups to perform an innovative step for a climate action planning process which was to map the potential positive and negative impacts of each strategy.**

EQUITY TIP ▶ **This was a challenging exercise for the Working Groups but it was valuable because it helped identify potential unintended consequences of particular strategies (ex. an urban heat island readiness and impervious surface reduction plan could lead to a higher cost of living).**

See the example from the Environment Working Group below.

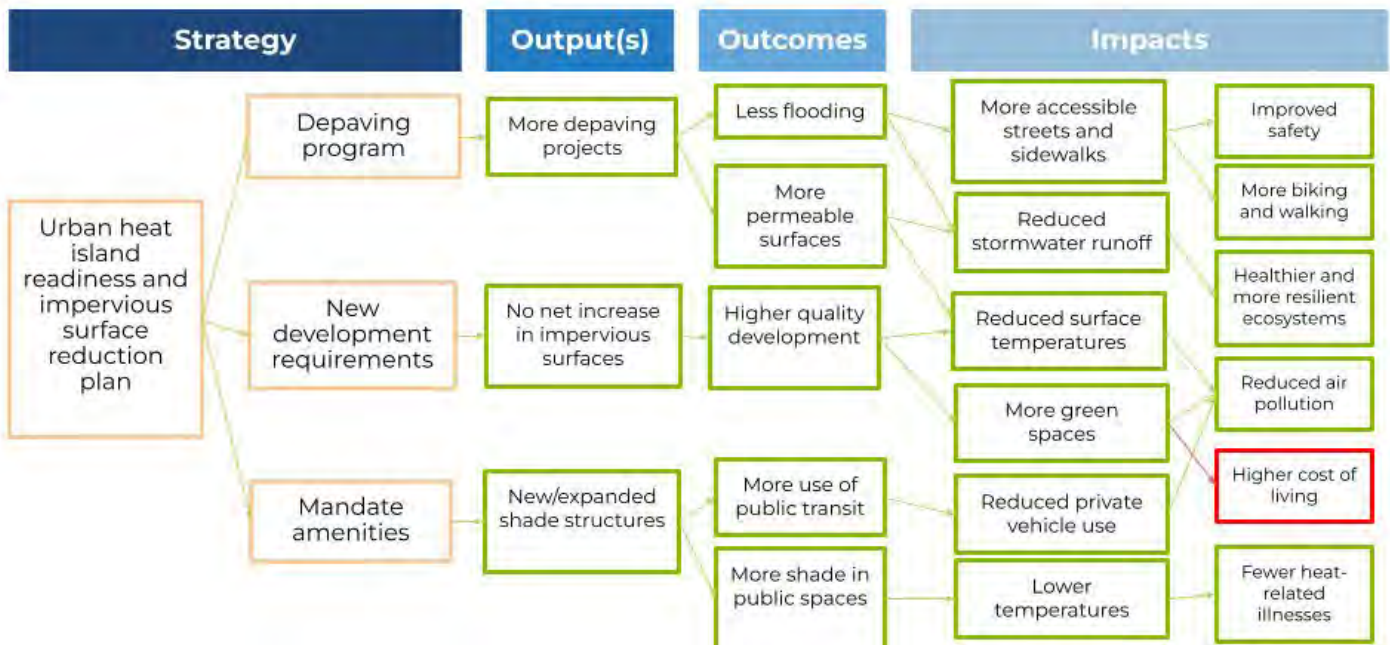


Figure 7.4. Example Environment Impact Map

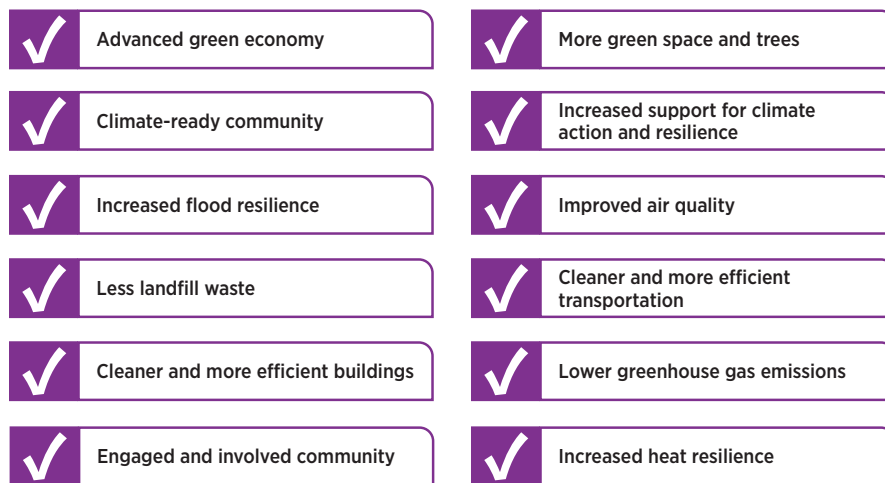


Figure 7.5. RVAgreen 2050 Cross-Cutting Outcomes

The mapping exercise was also valuable because it brought to light a number of common high-level themes across the five Pathways and 49 Strategies that stakeholders wanted to see as a result of implementation of the Plan. The Office of Sustainability used these results from the impact mapping, in addition to community feedback, to develop a set of 12 Outcomes for the Plan (Figure 7.5). Each Outcome represents an aspect of a future Richmond that the community wants to see. The 12 Outcomes are introduced here and referenced with each Objective within the Plan.

Refer to the [Accountability and Measuring Progress section](#) for more information on determining progress towards these Outcomes.

Advanced green economy: More green jobs, employers encouraging sustainability practices, more businesses participating in green initiatives, increased climate-related job training and apprenticeship programs, and less unemployment

Cleaner and more efficient buildings: Reduced energy usage in buildings, increased solar installations, improved building insulation, improved indoor air quality, and more Energy Star certified buildings



Cleaner and more efficient transportation: Increased mode shift and active transportation, fewer single occupancy cars, more electric vehicles and fewer cars with

internal combustion engines, improved biking and walking infrastructure, convenient and accessible public transit for all, and improved bus stop amenities



Climate-ready community: Expanded access to services related to climate change, emergency preparedness, more neighborhood shelters and resilience hubs, improved climate education, more efficient housing that is disaster-ready, an empowered community with improved health and well-being, established networks with community members ready to assist their neighbor in response to climate impacts, and reduced climate related illnesses and fatalities

Engaged and involved

community: Every Richmonder understands their role and responsibility to do their part and help their neighbor with climate action and resilience; initiatives demonstrating civic engagement through a truly community-owned plan with full participation and improved community cohesiveness



Improved air quality: Cleaner air across all of Richmond with consistency across demographics resulting in little difference between neighborhoods of best and worst air quality; fewer asthma and respiratory-related illnesses, and fewer cars with internal combustion engines and other polluting sources

Increased flood resilience:

Sufficient storm runoff drainage in all neighborhoods with no standing water, adequate capacity of the city’s stormwater management system with regular maintenance to ensure effectiveness against long term evolving climate impacts; efficient emergency response during heavy precipitation events; increased green

infrastructure, and significant reduction of impermeable surface coverage across all of Richmond.

Increased heat resilience:

Consistent and reduced temperatures across all neighborhoods, adequate employer heat safety information and response, more households with central air conditioning, sufficient cooling centers for all Richmonders, reduced heat-related illnesses and the elimination of heat islands.



Increased support for climate action and resilience:

Adequate funding through the City’s annual budgeting process, partnerships and grant opportunities to successfully implement all RVAgreen2050 strategies; provisioning of sufficient staffing and resources to support the actions in the Plan; equitable distribution of resources to make funding available for neighborhood-based climate action and resilience projects resulting in strong fiscal health for the city government and local economy.

Less landfill waste: Expanded programs and services to compost and recycle waste in all Richmond households; improved education to inform consumers on solid waste elimination through purchasing choices; zero waste commercial, manufacturing, and industrial processes that do not affect neighboring communities; and community reuse, materials swap, and repair programs.

Lower greenhouse gas emissions:

Climate mitigation programs to effectively eliminate the carbon footprint of every Richmonder through equitable means in all households, commercial buildings, industrial processes, and government operations.



More green space and trees:

Increased tree canopy across all of Richmond with more green roofs, green infrastructure, healthy flora and fauna, expanded, accessible and well-maintained vegetated parks and green spaces.

Guide to the 2030 Action Plan

RVAgreen 2050 | Climate Equity Action Plan 2030

Strategy BE-4.1

Net-zero Energy Design:
Develop and require builders to incorporate measures to advance net-zero energy design and green building in all new buildings.

New construction is the easiest, most cost-effective opportunity for implementing clean energy, advanced energy efficiency technologies, and other sustainable features into the built environment because it is most cost effective to build new structures with these technologies already integrated rather than paying more to retrofit them later.

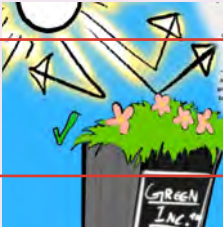


Illustration created by Thomas Jones.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Develop a central repository of funding opportunities and incentives for green and net-zero construction that supports the local labor workforce with a focus on affordable housing in frontline communities.	✓	Economic Development	\$	2022 - 2025	↓↓↓	☀️ ⚡️ 🏠	👥 🏢 🏠 🏡 🏠
ii. Promote legislation for adoption of building codes requiring all new buildings to be powered by clean energy with the goal of net-zero energy design.	✗	Planning & Development Review	\$	2022 - 2025	↓↓↓	☀️ ⚡️ 🏠	👥 🏢 🏠 🏡 🏠
iii. Require solar readiness measures for all new buildings.	✗	Planning & Development Review	\$	2022 - 2025	↓↓↓	☀️ ⚡️ 🏠	👥 🏢 🏠 🏡 🏠

BE-18 | Buildings and Energy

Strategy Reference Number:
Shorthand used to refer to the Strategy

Strategy Name

Context: Relevant background information and rationale for the Strategy

GHG Reductions: An estimate of how much the Action will reduce greenhouse gas emissions

↓ ↓ ↓ Low

↓ ↓ ↓ Medium

↓ ↓ ↓ High

Resilience: Climate change impacts that the Action addresses

☀️ 🔥 Extreme heat

🏠 🌊 Flooding and sea level rise

☁️ ⚡️ Extreme weather events

🔄 🏠 Community resilience

Equity: Community priorities that the Action addresses

👥 Racial equity and environmental justice

🗣️ Engagement and communications

🏛️ Government accountability

🏠 Affordable housing

🏡 Health and well-being

🏡 Neighborhoods

📈 Community wealth

Actions: Specific steps to take to implement the Strategy

Status: Where the Action is in terms of implementation as of the writing of this plan

👍 Ongoing = already started or underway

✓ Ready to go = ready to be implemented or is in another city plan

✗ Requires policy change = requires city or state law or policy change in order to be implemented

City Steward: The City of Richmond department or unit with primary responsibility for implementing the Action

Cost: An estimate of the cost of implementation of the Action through 2030

\$ = <\$1M

\$\$ = \$1M-\$50M

\$\$\$ = >\$50M

Time: Timeframe for implementation



PATHWAYS

Buildings and Energy



Buildings and Energy

Accelerate the equitable transition to healthy, resilient, climate neutral buildings and energy sources.

Greenhouse gas emissions generated from the energy used within Richmond's building stock made up the largest percentage of Richmond's 2018 carbon footprint at 66%. Looking at emissions by source, within Richmond's geographical boundaries, emissions from electricity usage made up 47% of the 2018 carbon footprint due to the mix of fuel sources used to produce electricity. The use of natural gas made up 18% of Richmond's 2018 carbon footprint.

Successful implementation of all the strategies and actions in the Buildings & Energy Pathway will move Richmond well on its way to achieving the 2030 and 2050 greenhouse gas emissions reductions goals and is projected to reduce emissions from buildings 36% by 2030 and 80% by 2050.

Implementation of strategies in this Pathway to lower emissions generated from building energy usage and improve building resilience to heat and flooding will also create many co-benefits including cost savings on utility bills, lower building maintenance costs, improved health from better indoor air quality, electric grid stability, energy independence, workforce development and economic development opportunities. The City is committed to improving neighborhoods and the lives of the people who live in them, which is why these efforts are aligned through Mayor Stoney's Equity Agenda, Richmond 300, the Affordable Housing Trust Fund, and city department priorities.

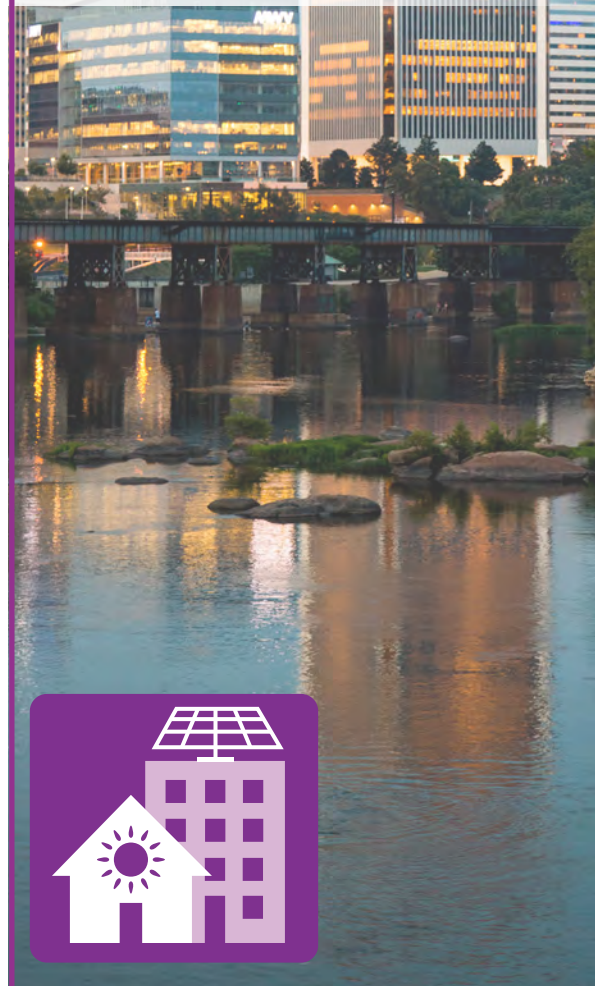
OBJECTIVES

BE-1: Achieve climate neutrality and increase resilience in government buildings, infrastructure, and operations.

BE-2: Maximize energy efficiency, performance and resilience in all existing buildings.

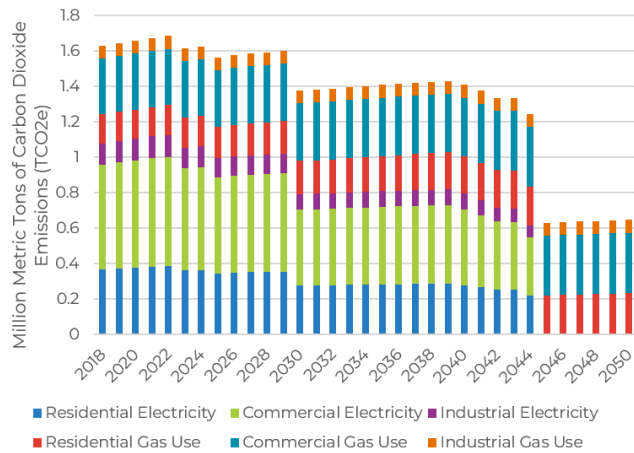
BE-3: Ensure all Richmonders have equitable access to affordable and renewable clean energy.

BE-4: Achieve climate neutrality and maximize resilience in all new buildings.





Business As Usual (BAU)



Max Scenario

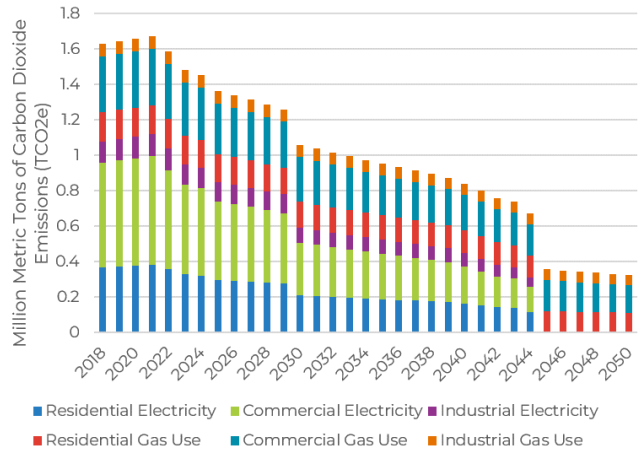


Figure 7.6. CO₂ Emissions Across All-Building Types Show Declines

For the successful implementation of strategies in this Pathway including maximizing energy efficiency in existing buildings and designing new buildings to net zero standards, it is important to consider all the complexities of Richmond’s building footprint, the energy grid, clean energy options, and required legislation as well as the need to plan for modifications to all of the above.

The technical modeling performed by Greenlink Analytics for this Pathway took into account building demand characterizations and forecasts from their proprietary AI software ATHENIA and then evaluated impacts on hourly building energy demand modified by investments in efficiency and utility-scale

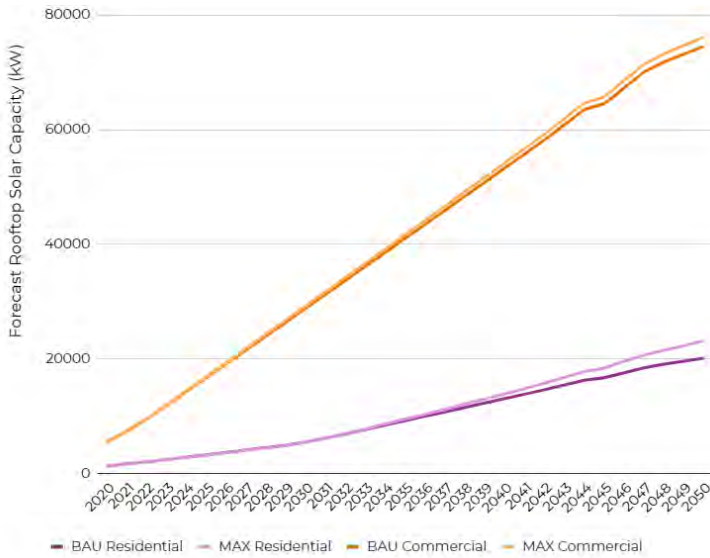
solar and battery storage additions resulting from Dominion Energy’s plans to comply with the Virginia Clean Economy Act that requires Dominion’s electricity to be carbon-free by 2045.

The chart below shows the reduction of GHG emissions by year from electric and natural gas usage by sector in the Business as Usual (BAU) scenario on the left and the max case scenario on the right, which depicts the results from successful implementation of all RVAgreen2050 strategies and actions where overall emissions are projected to decrease 59% by 2030 and 89% by 2050.

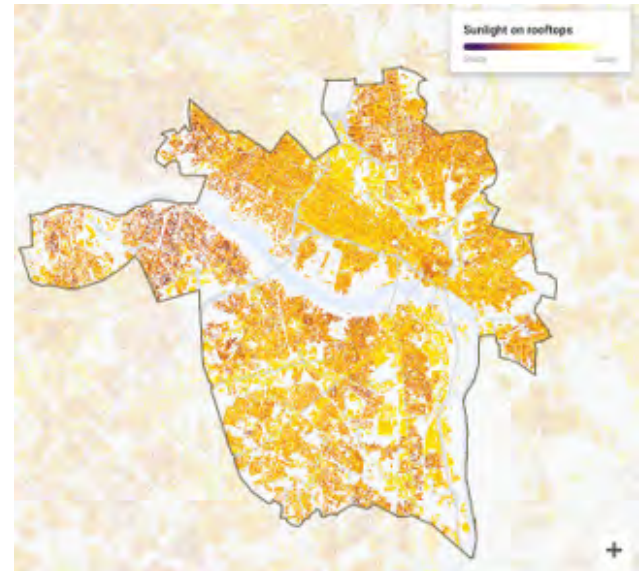
By 2050, energy efficiency improvements will significantly reduce electricity demand by up to 63% through HVAC upgrades, building controls, LED lighting, weatherization, process improvements, and behavioral changes. On the other hand, solar adoption forecasts consider technological learning by manufacturers, learning and competition by installers, changes in price, consumer behaviors in Richmond over the past 7 years, permitting costs, bulk purchasing programs, rooftop assessments through satellite and LIDAR imagery, and strategic PV deployment.



Forecast Rooftop Solar Capacity (kW)



Solar Technical Availability | Source: Google EIE



Electric Efficiency Supply Curve for Virginia

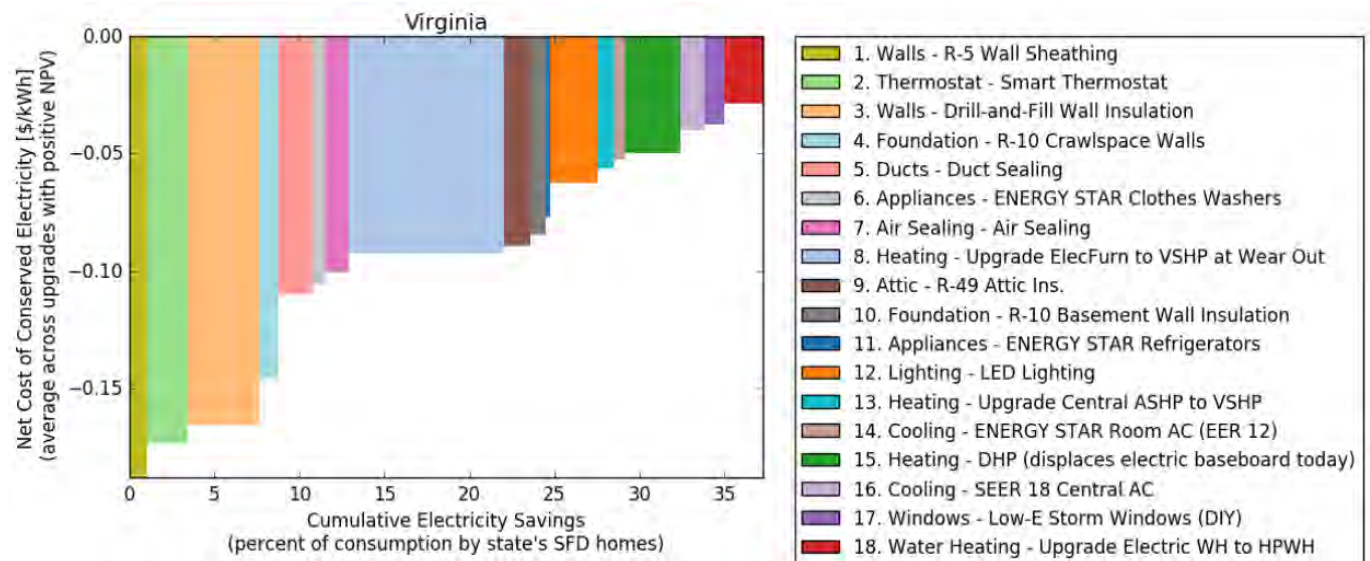


Figure 7.7. Assessing Clean Energy Options





Objective BE-1

Achieve climate neutrality and increase resilience in government buildings, infrastructure, and operations.

OUTCOMES

How does this Objective contribute to a more equitable, healthy, and resilient Richmond?

- | | |
|--|--|
|  Advanced green economy |  Increased flood resilience |
|  Cleaner and more efficient buildings |  Increased heat resilience |
|  Cleaner and more efficient transportation |  Increased support for climate action and resilience |
|  Climate-ready community |  Less landfill waste |
|  Engaged and involved community |  Lower greenhouse gas emissions |
|  Improved air quality |  More green space and trees |

STRATEGIES

BE-1.1: Municipal Energy Efficiency Program: Develop a program to achieve the energy efficiency goals of RVAgreen 2050 and Richmond 300.

BE-1.2: Municipal Clean Energy and Net Zero Construction: Incorporate measures toward the goal of converting all city buildings to clean energy by 2050.

BE-1.3: Municipal Climate Impact Mapping: Establish a protocol for tracking greenhouse gas emissions and planning for climate impacts.

BE-1.4: Municipal Resilient Infrastructure Assessment: Conduct a climate vulnerability and risk assessment of all city property (including buildings and parcels). Identify and prioritize properties for specific resilience projects.



Strategy BE-1.1

Municipal Energy Efficiency Program: Develop a program to achieve the energy efficiency goals of RVAgreen 2050 and Richmond 300.

The City of Richmond has an obligation to lead by example and act expeditiously to reduce its energy usage in buildings and operations. Efficiency has the benefit of saving taxpayer dollars budgeted for utility costs and often reducing maintenance costs providing an even bigger benefit.



Illustration created by Thomas Jones.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Convert all city-owned streetlights to LED, integrate solar options where feasible, and streamline efficiency measures; Prioritize improvements in formerly redlined neighborhoods and proactively communicate climate impact and resilience benefits with the communities.		Public Utilities-Streetlighting	\$\$	2022 - 2025			
ii. Track energy usage in all City-owned buildings and set energy usage benchmarks according to building type and climate impacts.		Public Works	\$	2022 - 2025			
iii. Equitably prioritize energy efficiency retrofits of City-owned buildings in areas that serve the public therefore improving their health, safety, and accessibility while rating the highest return on investment in cost savings and GHG reductions.		Public Works - Special Capital Projects	\$\$\$	2022 - 2025			
iv. Create an Energy Manager position with authority to identify equity gaps in energy management, work across all departments and coordinate partnerships in frontline communities.		Public Works	\$	2022 - 2025			



Strategy BE-1.2

Municipal Clean Energy and Net Zero Construction: Incorporate measures toward the goal of converting all city buildings to clean energy by 2050.

A net-zero energy building is a highly energy-efficient building where 100% of the energy used by the building (i.e. site energy use) is met with renewable energy generated on site over the course of a year. It is most cost effective to build structures correctly the first time rather than paying escalating costs and managing deferred maintenance to retrofit later. Maximizing efficient design and installing solar energy systems from the start provides the best return on investment for government buildings and serves as a model for the community as the City continues to lead by example.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Incorporate electrification requirements into all Capital Improvement Plans (CIPs).		Public Works-Special Capital Projects	\$\$	2022 - 2025			
ii. Catalog and track natural gas usage of all city buildings and facilities.		Public Works	\$	2022 - 2025			
iii. Require green building standards in all new municipal construction to achieve net zero energy and incorporate the infrastructure required to make them solar-ready, wired for EV chargers, and compatible for demand response enrollment. Include the social cost of carbon in all building design, construction and CIP budgeting.		Public Works - Special Capital Projects	\$	2022 - 2025			
iv. Phase out fossil fuel dependence in all city agreements and contracts by giving preference to companies that reduce the city's energy footprint.		Procurement Services	\$	2022 - 2025			



Strategy BE-1.3

Municipal Climate Impact Mapping: Establish a protocol for tracking greenhouse gas emissions and planning for climate impacts.

Through ongoing tracking of GHG emissions and continuous improvement of operational protocols the City will continue to find opportunities to institutionalize climate mitigation while reflecting the community’s goals in all city operations.

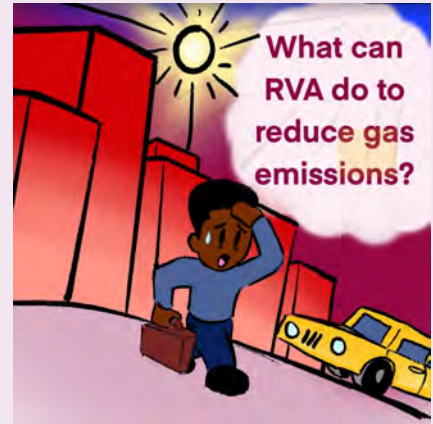


Illustration created by Thomas Jones.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Create a departmental GHG tracking protocol to identify reduction opportunities and publicize key performance indicators (KPIs) quarterly. Incorporate data and equity into performance based budgeting.		Sustainability	\$	2022 - 2025			
ii. Incorporate a review of City operations every 5 years to identify opportunities to address climate impacts and incorporate climate projections into land use planning, building regulations, and capital investments prior to implementation.		Sustainability	\$	2026 - 2030			



Strategy BE-1.4

Municipal Resilient Infrastructure Assessment:

Conduct a climate vulnerability and risk assessment of all city property (including buildings and parcels). Identify and prioritize properties for specific resilience projects.

The City of Richmond will endure the costs of climate change one way or another; now or in the future. An infrastructure assessment identifying the need for resilience measures will provide the City with a functional plan to reduce future costs related to climate change impacts, enhance livability for all of our residents, and move into a sustainable future in an equitable way.



Illustration created by Nehemiah Terry.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Conduct a climate vulnerability and risk assessment of all city property (including buildings and parcels) and operations (water supply, stormwater, etc.). Review potable water supply plans to account for climate change-induced heat and drought impacts.		Sustainability	\$	2022 - 2025			
ii. Identify and prioritize specific resilience projects in accordance with the Climate Vulnerability & Risk Assessment.		Sustainability	\$	2026 - 2030			








Objective BE-2

Maximize energy efficiency, performance and resilience in all existing buildings.

OUTCOMES

How does this Objective contribute to a more equitable, healthy, and resilient Richmond?

- | | |
|--|--|
|  Advanced green economy |  Increased flood resilience |
|  Cleaner and more efficient buildings |  Increased heat resilience |
|  Cleaner and more efficient transportation |  Increased support for climate action and resilience |
|  Climate-ready community |  Less landfill waste |
|  Engaged and involved community |  Lower greenhouse gas emissions |
|  Improved air quality |  More green space and trees |

STRATEGIES

BE-2.1: Residential Energy Burden: Implement measures to reduce the energy burden of Richmond’s most vulnerable communities and improve residential resilience to climate change

BE-2.2: Commercial Energy Efficiency Programs: Develop policies, incentives, and financing mechanisms to improve commercial energy efficiency; offer assistance and technical expertise to those that are financially challenged and facilitate workforce development.

BE-2.3: Construction & Energy Code Enforcement: Prioritize the most recent energy requirements in all new construction and site plan approvals.



Strategy BE-2.1

Residential Energy Burden:

Implement measures to reduce the energy burden of Richmond’s most vulnerable communities and improve residential resilience to climate change.

One of the most direct ways in which RVAGreen 2050 can fulfill the City’s equity objectives is by weatherizing and electrifying the existing housing stock and reducing residents’ energy bills. Richmond’s average energy burden is 8.4% (4.5% from electricity and 3.9% from natural gas), which is well above the national average energy burden of 3.3%. Successful implementation of this strategy will improve the quality of life for frontline communities and reduce inequitable energy costs at the same time.

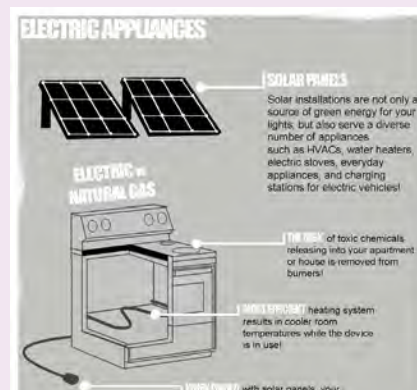


Illustration created by Liam Harrison.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Facilitate energy efficiency upgrades through community-based programs, advocacy, partnerships, and low/no-cost financial options.		Housing & Community Development	\$\$\$	2022 - 2025			
ii. Establish partnerships to provide equitable thermal comfort through immediate cooling relief in the way of equipment, tree canopy, and utility bill assistance to low income residents and/or residents of formerly redlined neighborhoods and heat islands.		Sustainability	\$\$	2022 - 2025			
iii. Educate all residents about the benefits of electrification by sharing targeted case studies in the areas of highest utility burden.		Sustainability	\$	2022 - 2025			



Strategy BE-2.2

Commercial Energy Efficiency Programs:

Develop policies, incentives, and financing mechanisms to improve commercial energy efficiency; offer assistance and technical expertise to those that are financially challenged and facilitate workforce development.

Between now and 2030 the greatest opportunity for GHG emissions reductions across the community is through energy efficiency gains in commercial buildings. Once building owners understand their building’s measure of efficiency they can turn energy saving opportunities into action.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Implement a Commercial Property Assessed Clean Energy (cPACE) program to facilitate energy efficiency upgrades.		Sustainability	\$	2022 - 2025			
ii. Require retrocommissioning for existing commercial buildings to improve the efficiency of a building’s equipment and systems.		Planning & Development Review	\$	2026 - 2030			
iii. Develop and promote a Green Business Challenge and/or certification program that prioritizes small businesses in underserved communities.		Sustainability	\$	2022 - 2025			
iv. Benchmark existing commercial buildings to establish a baseline and conduct ongoing measuring/tracking in conjunction with energy audits and retrofits		Sustainability	\$	2026 - 2030			
v. Require an equitable building performance policy for existing commercial buildings over 5,000 sf through a phased-approach.		Planning & Development Review	\$	2022 - 2025			
vi. Encourage builders and developers to hire Small, Women-owned and Minority-owned businesses (SWaM) as part of all workforce development initiatives.		Community Wealth Building	\$	2022 - 2025			



Strategy BE-2.3

Construction & Energy Code Enforcement:

Prioritize the most recent energy requirements in all new construction and site plan approvals.

Buildings are among the leading sources of climate-changing greenhouse gas emissions. Rapid transition to highly efficient and clean buildings will lower costs for owners and occupants, reduce harmful air pollution, and help prevent the worst effects of climate change. Energy and green building codes are becoming more stringent, however overall code compliance rates remain low due to a variety of constraints centered around code enforcement. While building and energy codes are set by the state, enforcement remains a local government responsibility.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Facilitate Energy Code Adoption by working with allied organizations to encourage the Board of Housing and Community Development to adopt the most recent International Energy Conservation Code (IECC) for all commercial and residential buildings.		Planning & Development Review	\$	2026 - 2030			
ii. Enforce energy efficiency requirements during plan review and approvals by training plan reviewers and building inspectors and cultivating the department's capacity to enforce letter and spirit of building energy code provisions.		Planning & Development Review	\$	2022 - 2025			







Objective BE-3

Ensure all Richmonders have equitable access to affordable and renewable clean energy.

OUTCOMES

How does this Objective contribute to a more equitable, healthy, and resilient Richmond?

- | | |
|--|--|
|  Advanced green economy |  Increased flood resilience |
|  Cleaner and more efficient buildings |  Increased heat resilience |
|  Cleaner and more efficient transportation |  Increased support for climate action and resilience |
|  Climate-ready community |  Less landfill waste |
|  Engaged and involved community |  Lower greenhouse gas emissions |
|  Improved air quality |  More green space and trees |

STRATEGIES

BE-3.1: Solar Energy Education & Outreach: Provide equitable education and outreach to make homes and small businesses healthy, safe, and affordable through solar installations, focusing on frontline communities reducing disproportionately high energy burden in these neighborhoods.

BE-3.2: Solar Installation Incentives and Access: Encourage solar installations through the removal of zoning restrictions, incentivizing opportunities, and increasing funding for microgrids.

BE-3.3: Clean Energy Workforce Development: Establish training programs, apprenticeships, and a conservation corps/job placement program in low-income and diverse neighborhoods to build capacity for jobs related to solar installation and maintenance, weatherization upgrades, and energy efficiency auditing (e.g., prison to solar training).



Strategy BE-3.1

Solar Energy Education & Outreach:

Provide equitable education and outreach to make homes and small businesses healthy, safe, and affordable through solar installations, focusing on frontline communities reducing disproportionately high energy burden in these neighborhoods.

The equitable transition to renewable energy for all requires improving access to clean and renewable energy, decreasing costs, and empowering every Richmonder to be part of the solution regardless of income and address.

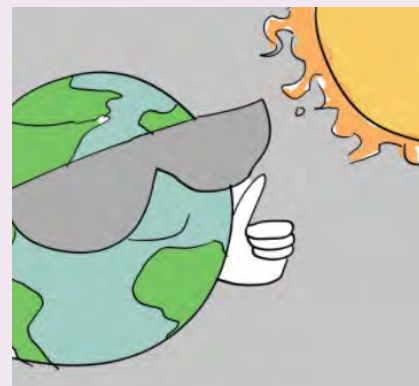


Illustration created by Nehemiah Terry.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Provide equitable education and outreach to make homes and small businesses healthy, safe, and affordable through solar installations.		Sustainability	\$	2022 - 2025			
ii. Facilitate the installation of solar on residences and small businesses in frontline communities reducing disproportionately high energy burden in these neighborhoods.		Sustainability	\$	2022 - 2025			



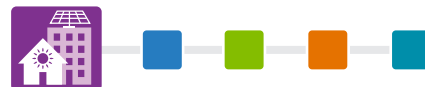
Strategy BE-3.2

Solar Installation Incentives and Access:

Encourage solar installations through the removal of zoning restrictions, incentivizing opportunities, and increasing funding for microgrids.

Community solar and private solar installations are among the greatest opportunities for GHG reductions in Richmond between now and 2030. Locally controlled renewable clean energy presents an opportunity for energy independence for Richmond residents and businesses.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Incentivize opportunities for ground-mounted solar and community (shared) solar on parking lots and non-buildable or previously disturbed land with access to community solar for energy-burdened communities.		Planning and Development Review	\$	2022 - 2025			
ii. Provide funding for microgrids & battery backups for energy storage to community-based organizations particularly in frontline communities.		Sustainability	\$\$\$	2026 - 2030			
iii. Fully exempt solar from property tax increases through the adoption of an ordinance per VA Code Section 58.1-3660 and 3661.		Finance	\$	2022 - 2025			
iv. Improve access to renewable energy by reviewing existing zoning ordinances and policies for impediments and revise to reduce all barriers and allow solar and battery storage to be placed in more places.		Planning & Development Review	\$	2022 - 2025			



Strategy BE-3.3

Clean Energy Workforce Development:

Establish training programs, apprenticeships, and a conservation corps/job placement program in low-income and diverse neighborhoods to build capacity for jobs related to solar installation and maintenance, weatherization upgrades, and energy efficiency auditing (e.g., prison to solar training).

Currently 13,500 Richmonders work in the field of clean energy making up 2.3% of all Richmond metro area jobs. The transition to a local carbon-free economy will open up many job opportunities with the most expected gains in the construction and energy management fields. Solar installations also serve as a catalyst to build local workforce capacity and economic development opportunities in the renewable energy sector.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Establish training programs, apprenticeships, and a conservation corps/job placement program in low-income and diverse neighborhoods.		Community Wealth Building	\$	2022-2025			
ii. Build capacity for jobs related to solar installation and maintenance, weatherization upgrades, and energy efficiency auditing (e.g. prison to solar training).		Community Wealth Building	\$	2022 - 2025			









Objective BE-4

Achieve climate neutrality and maximize resilience in all new buildings.

OUTCOMES

How does this Objective contribute to a more equitable, healthy, and resilient Richmond?

- | | |
|---|--|
|  Advanced green economy |  Increased flood resilience |
|  Cleaner and more efficient buildings |  Increased heat resilience |
|  Cleaner and more efficient transportation |  Increased support for climate action and resilience |
|  Climate-ready community |  Less landfill waste |
|  Engaged and involved community |  Lower greenhouse gas emissions |
|  Improved air quality |  More green space and trees |

STRATEGIES

BE-4.1: Net-Zero Energy Design: Develop and require builders to incorporate measures to advance net-zero energy design and green building in all new buildings.

BE-4.2: Resilient Design Guidelines: Develop Resilient Design Guidelines and require builders to incorporate design measures to reflect a changing climate, increased precipitation and flooding in concert with a public education campaign to convey the benefits of adaptive and resilient buildings.



Strategy BE-4.1

Net-zero Energy Design:

Develop and require builders to incorporate measures to advance net-zero energy design and green building in all new buildings.

New construction is the easiest, most cost-effective opportunity for implementing clean energy, advanced energy efficiency technologies, and other sustainable features into the built environment because it is most cost effective to build new structures with these technologies already integrated rather than paying more to retrofit them later.



Illustration created by Thomas Jones.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Develop a central repository of funding opportunities and incentives for green and net-zero construction that supports the local labor workforce with a focus on affordable housing in frontline communities.		Economic Development	\$	2022 - 2025			
ii. Promote legislation for adoption of building codes requiring all new buildings to be powered by clean energy with the goal of net-zero energy design.		Planning & Development Review	\$	2022 - 2025			
iii. Require solar readiness measures for all new buildings.		Planning & Development Review	\$	2022 - 2025			



Strategy BE-4.2

Resilient Design Guidelines:

Develop Resilient Design Guidelines and require builders to incorporate design measures to reflect a changing climate, increased precipitation and flooding in concert with a public education campaign to convey the benefits of adaptive and resilient buildings.

The impacts of climate change are already affecting Richmond (urban heat island effect, increased flooding, demand on the electric grid, etc). Resilience is no longer a “nice to have;” it is a must have and resilient design standards need to be institutionalized into all building and infrastructure projects.



Illustration created by Rena Bridge.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Develop Resilient Design Guidelines.	✓	Planning & Development Review	\$	2022 - 2025	↓ ↓ ↓	☀️🌡️ ⚡️ 🏠 🔄	👤🏢 🏛️🏡 ❤️🌱 📈🧭
ii. Require builders to incorporate resilient design measures to reflect a changing climate, increased precipitation and flooding.	✗	Planning & Development Review	\$	2026 - 2030	↓ ↓ ↓	☀️🌡️ ⚡️ 🏠 🔄	👤🏢 🏛️🏡 ❤️🌱 📈🧭
iii. Create a public education campaign to convey the benefits of adaptive and resilient buildings.	✓	Sustainability	\$	2022 - 2025	↓ ↓ ↓	☀️🌡️ ⚡️ 🏠 🔄	👤🏢 🏛️🏡 ❤️🌱 📈🧭



PATHWAYS

Community



Community

Create an equitable and resilient Richmond while honoring and ensuring focus on community priorities.

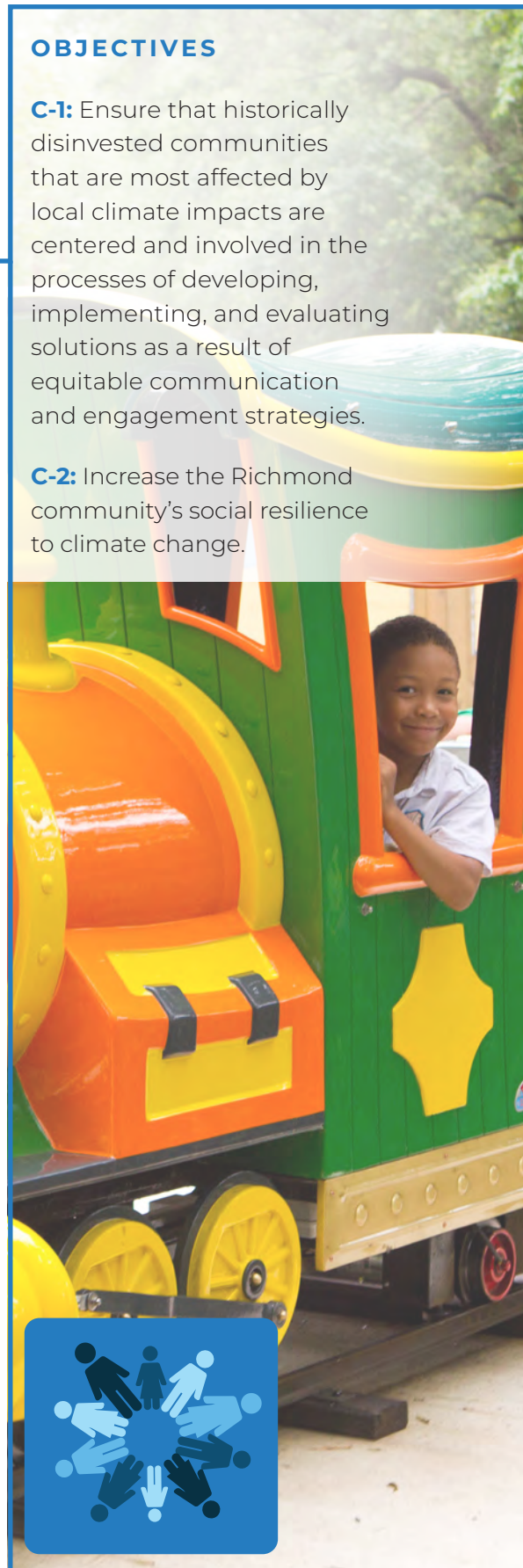
As described in the Climate Equity section, climate change is impacting some members of our community more than others based on a number of factors, many of which stem from historical and persisting legacies of discriminatory policies and practices. Although the 2030 Action Plan will not resolve these complex and colossal issues; it is important to ensure that no additional harm is done and that the City and community work together to center equity and community priorities in the implementation of this Action Plan.

The RVAgreen 2050 planning process timeline overlapped with a critical period in Richmond’s history and reckoning for equity—particularly racial equity. The strategies and actions in this Pathway seek to continue that work along with reducing the community’s greenhouse gas emissions and enhancing resilience to climate impacts by ensuring that historically disinvested communities most affected by local climate impacts are centered and involved in developing, implementing, and evaluating solutions and that the Richmond community’s social resilience to climate change increases.

OBJECTIVES

C-1: Ensure that historically disinvested communities that are most affected by local climate impacts are centered and involved in the processes of developing, implementing, and evaluating solutions as a result of equitable communication and engagement strategies.

C-2: Increase the Richmond community’s social resilience to climate change.





Accomplishing these strategies will create co-benefits including developing pathways to green jobs, enhancing the climate readiness of affordable housing, protecting human health, and enhancing community cohesiveness for a more resilient Richmond.

The [Richmond Equity Agenda](#) proposed by Mayor Stoney and adopted by City Council in the summer of 2021 provides a foundation for implementing the strategies and actions in this Pathway. It establishes the City's definition of equity and underscores that racial equity in particular will improve the quality of life for all residents. It also specifically calls out implementation of the RVAgreen 2050 initiative as one of the priorities for achieving equity and justice in access to resources and opportunities.



Also launched in 2021, the [Richmond Racial Equity Essays](#) project, is a collection of essays, interviews, podcasts, and other media featuring voices of Richmonders from all backgrounds and walks of life exploring what an equitable Richmond looks like. Many participants in the project were also RVAgreen 2050 stakeholders, and several solutions for a more equitable Richmond are connected to RVAgreen 2050, the environment and climate change.

The City of Richmond's definition of "equity" is to "empower people and communities that have experienced past injustices by removing barriers to access and opportunity."



Objective C-1

Ensure that historically disinvested communities that are most affected by local climate impacts are centered and involved in the processes of developing, implementing, and evaluating solutions as a result of equitable communication and engagement strategies.

OUTCOMES

How does this Objective contribute to a more equitable, healthy, and resilient Richmond?

- | | |
|---|---|
| <input checked="" type="checkbox"/> Advanced green economy | <input checked="" type="checkbox"/> Increased flood resilience |
| <input checked="" type="checkbox"/> Cleaner and more efficient buildings | <input type="checkbox"/> Increased heat resilience |
| <input checked="" type="checkbox"/> Cleaner and more efficient transportation | <input checked="" type="checkbox"/> Increased support for climate action and resilience |
| <input checked="" type="checkbox"/> Climate-ready community | <input type="checkbox"/> Less landfill waste |
| <input checked="" type="checkbox"/> Engaged and involved community | <input checked="" type="checkbox"/> Lower greenhouse gas emissions |
| <input checked="" type="checkbox"/> Improved air quality | <input type="checkbox"/> More green space and trees |

STRATEGIES

C-1.1: Climate-Ready Affordable Housing: Climate-Ready Affordable Housing: Develop and implement climate mitigation and resilience requirements for the Affordable Housing Trust Fund.

C-1.2: Sustainable Employment Practices: Develop incentives for employers to facilitate greenhouse gas-reducing activities among employees.

C-1.3: Climate Action and Resilience Information Navigator: Help small businesses, homeowners, and renters navigate programs and incentives for reducing emissions and increasing climate resilience.

C-1.4: Community Benefits Scorecard and Agreements: Develop tools with frontline communities to evaluate City development projects and ensure they address community priorities for climate action and resilience, and encourage use by private developers as well.

C-1.5: Community Partnerships Program: Develop a climate action and resilience neighborhood partnerships program.



Strategy C-1.1

Climate-Ready Affordable Housing:

Develop and implement climate mitigation and resilience requirements for the Affordable Housing Trust Fund.

Affordable housing is consistently one of the highest priorities of the Richmond community. Climate change is having an impact on housing affordability: rising temperatures mean rising energy bills in warmer months, extreme storms cause flooding and water damage, and housing insecure families are less able to cope with sudden crises. Climate-ready housing will be safer and more affordable into the future.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Develop climate mitigation and resilience requirements for new affordable housing units funded with any amount of money from the Affordable Housing Trust Fund.		Housing and Community Development	\$	2022 - 2025			
ii. Develop guidance, including funding resources, and educational programs for developers to incorporate climate mitigation and resilience requirements into affordable housing units.		Housing and Community Development	\$	2022 - 2025			



Strategy C-1.2

Sustainable Employment Practices:

Develop incentives for employers to facilitate greenhouse gas-reducing activities among employees.

The private sector plays an important role in the response to climate change. Among others, one area of responsibility is to mitigate the impacts of employees' work-related activities, such as commuting. Providing incentives for more sustainable activities often has co-benefits including healthier and more satisfied employees.



Illustration created by Kt Nowak.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Develop incentives for employers to create telework and alternative transportation options programs to reduce greenhouse gas emissions from employee commuting.		Sustainability	\$	2022 - 2025			
ii. Develop incentives for employers to facilitate additional practices among employees that will reduce emissions.		Sustainability	\$	2026 - 2030			



Strategy C-1.3

Climate Action and Resilience Information Navigator:

Help small businesses, homeowners, and renters navigate programs and incentives for reducing emissions and increasing climate resilience.

The City of Richmond government is a large and complex system, so it is important to make it easier to find and understand available resources to help residents and businesses reduce their environmental impacts and increase their resilience to climate change.



Illustration created by Matthew Bennett.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Create a guide of city and other incentive programs, grants, permitting, building codes, zoning, and licensing processes geared toward small businesses, homeowners, and renters to help them reduce greenhouse gas emissions and increase their resilience to climate impacts.		Sustainability	\$	2022 - 2025			
ii. Create ongoing, regular training or other informational activities to help stakeholders navigate the guide.		Sustainability	\$	2022 - 2025			



Strategy C-1.4

Community Benefits Scorecard and Agreements:

Develop tools with frontline communities to evaluate City development projects and ensure they address community priorities for climate action and resilience, and encourage use by private developers as well.



Illustration created by Thomas Jones.

Richmond’s population is growing, and with it there is huge incentive for private development across the city. Private development of housing, commercial spaces, and other uses will be more successful in the long run if it addresses community priorities and contributes to Richmond’s climate response.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Develop a community benefit scorecard for City development projects with frontline communities and provide information and assistance to private developers.		Housing and Community Development	\$	2022 - 2025			
ii. Develop a community benefit agreement template for City development projects with frontline communities and provide information and assistance to developers on how to use it and engage communities.		Housing and Community Development	\$	2022 - 2025			



Strategy C-1.5

Community Partnerships Program: Develop a climate action and resilience neighborhood partnerships program.

There are many nonprofit, community, and private organizations and institutions already taking action on climate change. It is important to build connections and opportunities for action and collaboration across Richmond to maximize efforts to reduce GHG emissions and increase resilience to climate impacts.



Illustration created by Kadejah Harden.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Develop a climate action and resilience neighborhood partnerships program to build trust, share knowledge, and identify and connect community projects to volunteers and resources.		Sustainability	\$	2022 - 2025			
ii. Establish a framework for identifying, establishing, and maintaining neighborhood partnerships, as well as partnerships with organizations and institutions.		Sustainability	\$	2022 - 2025			



Objective C-2

Increase the Richmond community’s social resilience to climate change.

OUTCOMES

How does this Objective contribute to a more equitable, healthy, and resilient Richmond?

- | | |
|--|---|
| <input checked="" type="checkbox"/> Advanced green economy | <input checked="" type="checkbox"/> Increased flood resilience |
| <input checked="" type="checkbox"/> Cleaner and more efficient buildings | <input type="checkbox"/> Increased heat resilience |
| <input type="checkbox"/> Cleaner and more efficient transportation | <input checked="" type="checkbox"/> Increased support for climate action and resilience |
| <input checked="" type="checkbox"/> Climate-ready community | <input type="checkbox"/> Less landfill waste |
| <input checked="" type="checkbox"/> Engaged and involved community | <input type="checkbox"/> Lower greenhouse gas emissions |
| <input type="checkbox"/> Improved air quality | <input type="checkbox"/> More green space and trees |

STRATEGIES

- C-2.1: Climate-Ready Community Fund:** Establish a Climate-Ready Community grant program to provide funding to neighborhood-focused organizations to work with residents on climate action and resilience projects..
- C-2.2: Community Compensation:** Establish a policy and structure for paying community members for their time.
- C-2.3: Organizational Collaboration:** Partner with community leaders, organizations, and businesses to build community capacity for climate resilience.
- C-2.4: Resilience Hubs:** Create neighborhood resilience hubs in frontline communities.



Strategy C-2.1

Climate-Ready Community Fund:

Establish a Climate-Ready Community grant program to provide funding to neighborhood-focused organizations to work with residents on climate action and resilience projects.

Community members and organizations are ready to act on climate change and need the financial resources to do so. There are many opportunities to direct city, foundation, and private funding directly into communities to increase their resilience to climate impacts, and it is important to involve the community in building the structure that does that.



Illustration created by Kadejah Harden.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Engage stakeholders in a process to establish a framework for accepting and funding grant requests, including paying residents and enabling organizations to work on climate action and resilience projects in target neighborhoods.		Sustainability	\$\$	2026 - 2030			
ii. Identify funding sources and begin distributing funds on a regular basis.		Sustainability	\$\$	2026 - 2030			
iii. Utilize the Central Virginia COVID-19 Response Fund and other eligible sources to provide direct and immediate assistance to community organizations that assist residents before, during, and after extreme weather events.		Emergency Management	\$\$	2026 - 2030			






Strategy C-2.2

Community Compensation:

Establish a policy and structure for paying community members for their time.

Residents and other stakeholders who provide their time and lived experience expertise should be compensated financially just as “technical” consultants would be. This provides a fairer exchange between government and community, promotes trust, and encourages participation among those who may not otherwise be able to contribute.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Establish a citywide policy and payment structure or system for compensating community members for their time and expertise in the process of developing, implementing, and evaluating climate action and resilience solutions.		Sustainability	\$\$	2022 - 2025			



Strategy C-2.3

Organizational Collaboration:

Partner with community leaders, organizations, and businesses to build community capacity for climate resilience.

Climate change is a global issue with local impacts that go all the way down to the neighborhood and even block level. By connecting hyper-local leaders and activists, we can create a more collaborative and efficient system to respond to climate impacts that helps individuals, households, communities, and the city as a whole.



Illustration created by Kadejah Harden.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Connect and build capacity among community leaders, public health and healthcare infrastructure, local nonprofits, and businesses to collaboratively identify neighborhood leaders and resources for emergencies.		Sustainability	\$	2022 - 2025			
ii. Develop community asset maps to increase climate resilience.		Sustainability	\$	2022 - 2025			



Strategy C-2.4

Resilience Hubs:

Create neighborhood resilience hubs in frontline communities.

Climate resilience cannot be limited to people with expendable income and time. The City of Richmond needs to support all community members with the resources and pathways to increase their climate resilience. Resilience Hubs are community-serving facilities augmented to: support residents and coordinate resource distribution and services before, during, or after a natural hazard event.¹²

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Identify community facilities such as community centers and libraries to serve as resilience hubs and cooling centers to the community.		Sustainability	\$	2022 - 2025			
ii. Provide funding to these facilities to enable them to serve as resilience hubs for low-income, elderly, young, and populations experiencing homelessness.		Sustainability	\$\$	2026 - 2030			

12 Definition of Resilience Hub from the Urban Sustainability Directors Network



PATHWAYS

Environment



Environment

Invest in resilient, healthy, and equitably distributed natural resources throughout the community to support biodiversity and human well-being.

The Richmond 300 Master Plan sets a vision for Richmond’s Thriving Environment:

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.

The natural environment plays a critical role in achieving the goals of the Master Plan as well as this 2030 Action Plan, both in terms of equitably reducing greenhouse gas emissions and enhancing the community’s resilience to climate change, as well as protecting the natural environment itself from the impacts of climate change so that Richmond’s human, animal, and plant life are safe and healthy for years to come.

The strategies and actions in this Pathway aim to provide more equitable access to healthy natural spaces, protect the natural environment from the impacts of climate change, and engage the natural environment to decrease greenhouse gas emissions and increase resilience to the impacts of climate change.

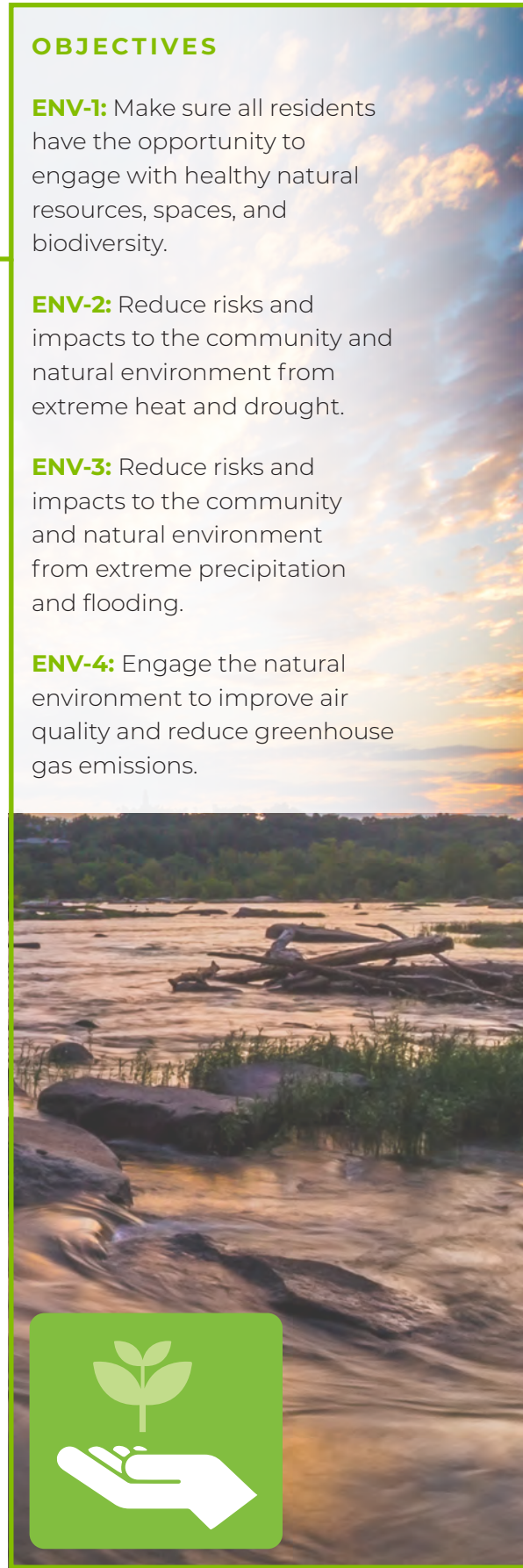
OBJECTIVES

ENV-1: Make sure all residents have the opportunity to engage with healthy natural resources, spaces, and biodiversity.

ENV-2: Reduce risks and impacts to the community and natural environment from extreme heat and drought.

ENV-3: Reduce risks and impacts to the community and natural environment from extreme precipitation and flooding.

ENV-4: Engage the natural environment to improve air quality and reduce greenhouse gas emissions.





Accomplishing these strategies will create co-benefits including more beautiful neighborhoods, protecting human health, and creating pathways to green jobs.

Impervious surfaces - those that are paved or hardened and do not allow water to infiltrate, such as roads, rooftops, and sidewalks - make up 36% of Richmond's land. This means that a significant portion of Richmond's 62.5 square miles is more prone to hotter temperatures during heat waves and increased stormwater runoff during extreme storms.

Slightly over 40% of the city is covered by tree canopy (compared to the national average of 27%), but it is not evenly distributed throughout Richmond. The same neighborhoods where there is less tree cover and more impervious surface are also often where there are more residents of color, lower-income households, and more people with underlying health conditions that make them more vulnerable to harm from the local impacts of climate change.



Figure 7.8. Land Cover, National Agriculture Imagery Program (2008)

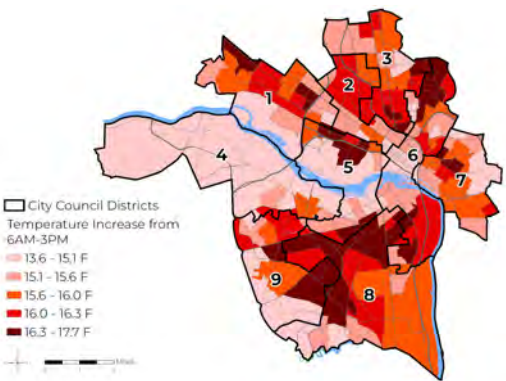


Figure 7.9. Urban Heat Islands, Dr. Jeremy Hoffman, Science Museum of Virginia (2017)

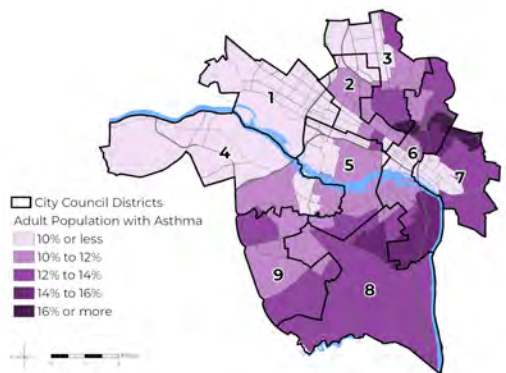


Figure 7.10. Adult Population with Asthma, U.S. CDC (2017)



Objective ENV-1

Make sure all residents have the opportunity to engage with healthy natural resources, spaces, and biodiversity.

OUTCOMES

How does this Objective contribute to a more equitable, healthy, and resilient Richmond?

- | | |
|--|--|
|  Advanced green economy |  Increased flood resilience |
|  Cleaner and more efficient buildings |  Increased heat resilience |
|  Cleaner and more efficient transportation |  Increased support for climate action and resilience |
|  Climate-ready community |  Less landfill waste |
|  Engaged and involved community |  Lower greenhouse gas emissions |
|  Improved air quality |  More green space and trees |

STRATEGIES

ENV-1.1: Green Space Management: Create a program and public-private partnerships to maintain and expand high-quality public green space.

ENV-1.2: Parks Master Plan: Support the development, funding, and implementation of a Parks Master Plan.

ENV-1.3: Urban & Community Agriculture: Develop, fund, and implement an urban and community agriculture program.



Strategy ENV-1.1

Green Space Management:

Create a program and public-private partnerships to maintain and expand high-quality public green space.

“Green space” - parks and other open spaces with plants, trees, water, animals, and other natural features - are critical to a healthy and resilient community. Parks, open spaces, and urban forestry are what will make our city safe and habitable through the climate crisis.



Illustration created by Kt Nowak.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Create a transparent structure to formalize public-private partnerships to help the City create, maintain, and manage high-quality parks, green infrastructure, and public open space.		Parks and Recreation	\$	2022 - 2025			
ii. Create a plan for the control and minimization of the presence and impacts of invasive species, taking climate change into account.		Parks and Recreation	\$	2026 - 2030			
iii. Validate and implement recommendations of the Mayor's Green Team (2020) including fostering interdepartmental cooperation and coordination on green space and parks projects.		Parks and Recreation	\$\$	2026 - 2030			
iv. Create a citywide definition of “high-quality green space” that supports equitable climate action and resilience.		Parks and Recreation	\$	2022 - 2025			



Strategy ENV-1.2

Parks Master Plan:

Support the development, funding, and implementation of a Parks Master Plan.

A majority of Richmonders are within walking distance to a public green space, but those who are not are often in areas that also experience higher temperatures due to the urban heat island effect, among other inequities. Every community deserves to experience nature and investments in the health of present and future Richmonders.



Illustration created by Matthew Bennett.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Support the development, funding, and implementation of a Parks Master Plan providing all Richmonders access to a quality public park within a ten-minute walk that meets the surrounding community's priorities. Prioritize locations based on a set of factors co-created with the community.		Parks and Recreation	\$\$	2022 - 2025			
ii. Create a permanent office/position within the Department of Parks & Recreation to manage partnership and volunteer programs.		Parks and Recreation	\$	2022 - 2025			
iii. Establish a fee or fund for parks and green infrastructure maintenance and the acquisition of new green space, such as \$0.005 per dollar of real estate taxes or parking fees for non-city residents at high-use locations on summer weekends.		Parks and Recreation	\$	2026 - 2030			
iv. Create a communications strategy to introduce Richmonders to the City's public green and blue spaces (including how to get to them and how to use them responsibly) that is tailored to individual interests, physical ability, and other factors.		Parks and Recreation	\$	2022 - 2025			



Strategy ENV-1.3

Urban & Community Agriculture: Develop, fund, and implement an urban and community agriculture program.

One of the most effective ways to cultivate stewardship of natural resources is to connect people directly to the environment around them. Encouraging residents to grow their own fresh food provides opportunities for healthier lifestyles, engagement with the environment, reducing food insecurity, and increasing resilience to disruptions in food systems.



Illustration created byKt Nowak..

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Increase visibility and accessibility of the Richmond Grows Gardens urban agriculture program. Partner with food justice community organizations and include an apprenticeship training program. Increase funding for staffing, maintenance, and materials. Encourage cultivation of native plants.	✓	Parks and Recreation	\$\$	2022 - 2025	↓ ↓ ↓	☀️ ⚡️ 🏠 🔄	👥 🏢 🏠 🌳 📈 🗺️
ii. Identify changes needed in the community garden ordinances for sales of produce grown in community gardens.	✗	Parks and Recreation	\$	2022 - 2025	↓ ↓ ↓	☀️ ⚡️ 🏠 🔄	👥 🏢 🏠 🌳 📈 🗺️
iii. Incentivize owners of multifamily dwellings to remove barriers to individuals growing their own food and allow universal access to community gardening and composting.	✓	Planning & Development Review	\$	2022 - 2025	↓ ↓ ↓	☀️ ⚡️ 🏠 🔄	👥 🏢 🏠 🌳 📈 🗺️



Objective ENV-2

Reduce risks and impacts to the community and natural environment from extreme heat and drought.

OUTCOMES

How does this Objective contribute to a more equitable, healthy, and resilient Richmond?

- ✓ Advanced green economy
- ✓ Increased flood resilience
- ✓ Cleaner and more efficient buildings
- ✓ Increased heat resilience
- ✓ Cleaner and more efficient transportation
- ✓ Increased support for climate action and resilience
- ✓ Climate-ready community
- ✓ Less landfill waste
- ✓ Engaged and involved community
- ✓ Lower greenhouse gas emissions
- ✓ Improved air quality
- ✓ More green space and trees

STRATEGIES

ENV-2.1: Urban Heat Island Reduction: Develop, fund, and implement an urban heat island reduction plan and program.

ENV-2.2: Urban Forest and Green Space Planning: Use urban forest and green space planning to increase climate resilience.



Strategy ENV-2.1

Urban Heat Island Reduction:

Develop, fund, and implement an urban heat island reduction plan and program.

The science and thermometers are clear - Richmond is getting hotter. The increasing heat is not impacting everyone evenly: urban heat in Richmond's historically redlined neighborhoods is an example of the long-lasting effects of institutional racism. Mitigating the urban heat island effect will create a healthier and more equitable and resilient community.



Illustration created by Thomas Jones.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Develop, fund, and implement an urban heat island reduction plan with a focus on vulnerable populations and ecosystems. Include actions such as mandating benches and shade structures at all bus stops and establishing “rubber-stamped” shade structure designs that businesses can build and install in the public right-of-way.		Sustainability	\$\$	2022 - 2025			
ii. Develop a cool surfaces program for lighter color and green roofs and lighter color surfaces such as streets and parking lots.		Sustainability	\$\$	2026 - 2030			
iii. Develop a depaving program for impervious surfaces that includes an ordinance to allow non-Public Works entities to conduct depaving projects, with standards and guidelines for such projects.		Public Works - Special Capital Projects	\$	2026 - 2030			
iv. Establish requirements for major development related to mandating a net decrease or net-zero standard in impervious surface areas upon project completion. May include an impervious surface credit trading system based on watershed for smaller development.		Planning and Development Review	\$	2026 - 2030			



Strategy ENV-2.2

Urban Forest and Green Space Planning: Use urban forest and green space planning to increase climate resilience.

The increase in extreme heat over the next several decades will be a life-altering shift in our local climate that will fundamentally change how Richmonders work, learn, and play. Increasing the proportion of heat-resilient and heat-reducing spaces across the city will help maintain community health, the local economy, and prevent further harm.



Illustration created by Kt Nowak.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Develop, fund, and implement an urban forest master plan, engaging the community to develop a set of criteria for places to focus planting efforts (existing canopy, heat, plantable space, utilities, and other infrastructure).		Public Works - Urban Forestry	\$\$	2022 - 2025			
ii. Increase city resource capacity internally and via community partnerships for maintaining existing resources that enhance extreme heat and drought resilience by increasing the maintenance budget, hiring (including through a workforce development program), and providing staff training and engagement opportunities to increase buy-in and decrease turnover.		Public Works - Urban Forestry	\$\$	2022 - 2025			
iii. Expand the Adopt-A-Tree program through new opportunities such as by allowing community organizations to buy trees in bulk and committing to caring for the trees.		Public Works - Urban Forestry	\$	2022 - 2025			
iv. Validate and implement the recommendations of the Mayor's Green Team (2020) by adopting the use of proffers or impact fees on new developments to increase green space and tree canopy.		Parks and Recreation	\$\$	2026 - 2030			



Objective ENV-3

Reduce risks and impacts to the community and natural environment from extreme precipitation and flooding.

OUTCOMES

How does this Objective contribute to a more equitable, healthy, and resilient Richmond?

- | | |
|--|--|
|  Advanced green economy |  Increased flood resilience |
|  Cleaner and more efficient buildings |  Increased heat resilience |
|  Cleaner and more efficient transportation |  Increased support for climate action and resilience |
|  Climate-ready community |  Less landfill waste |
|  Engaged and involved community |  Lower greenhouse gas emissions |
|  Improved air quality |  More green space and trees |

STRATEGIES

ENV-3.1: Neighborhood Prioritization: Identify and prioritize extreme precipitation and flooding projects using community engagement and data.

ENV-3.2: Extreme Precipitation Resilience Planning and Operations: Increase planning and capacity for green infrastructure management and flood resilience measures.

ENV-3.3: Land Management Practices: Enhance land management practices to increase capacity for flood resilience measures.



Strategy ENV-3.1

Neighborhood Prioritization:

Identify and prioritize extreme precipitation and flooding projects using community engagement and data.

Flooding is often a neighborhood-level issue in Richmond. Depending on the age and condition of existing infrastructure, one block may flood due to an extreme storm while another is safe. In addition, flooding is often an issue that does not get attention until it happens. To protect each neighborhood in Richmond from increasing storms, the City, in collaboration with the community, must work to identify areas of need and invest in flood mitigation strategies.

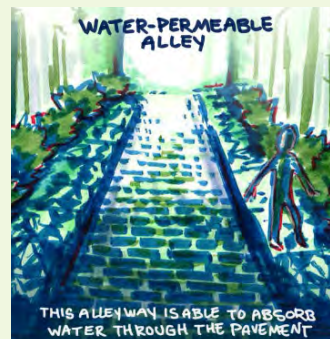


Illustration created by Rena Bridge.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Engage community and use data (to equitably identify and prioritize extreme precipitation and flooding resilience projects using the Stormwater Capital Projects Ranking Matrix and additional resources. Increase transparency and accessibility of data and decisionmaking.		Public Utilities - Stormwater Utility	\$\$	2022 - 2025			
ii. To ensure projects meet neighborhood needs, conduct equity-centered engagement processes with prioritized neighborhoods.		Public Utilities - Stormwater Utility	\$	2022 - 2025			



Strategy ENV-3.2

Extreme Precipitation Resilience Planning and Operations:

Increase planning and capacity for green infrastructure management and flood resilience measures.

The City of Richmond has invested in built infrastructure solutions to protect areas such as Shockoe Bottom, but as the climate continues to warm and extreme precipitation gets worse, flooding will occur in areas that have never experienced it before. Expanding capacity for flood management programs will help ensure all areas of our community are safe for decades to come.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Identify non-rate increase resources for and increase City capacity for flood resilience by increasing maintenance budget, hiring more staff (including through workforce development program), and providing staff training and engagement opportunities to increase buy-in and decrease turnover.		Public Utilities - Stormwater Utility	\$\$	2022 - 2025			
ii. Continue to develop and expand the RVAH2O Green Infrastructure (GI) Master Plan for GI on public lands and rights-of-way to improve stormwater quality and reduce runoff through City projects and community partnerships, and include public engagement and education programs.		Public Utilities - Stormwater Utility	\$\$	2022 - 2025			
iii. Create incentives or requirements in zoning and development processes (such as proffers or impact fees) for green infrastructure on new development.		Planning and Development Review	\$	2026 - 2030			
iv. Increase accessibility of procedures and materials to develop public-private partnership projects that increase resilience to the impacts of flooding and extreme precipitation, such as green infrastructure installations.		Public Utilities - Stormwater Utility	\$	2026 - 2030			



Strategy ENV-3.3

Land Management Practices:

Enhance land management practices to increase capacity for flood resilience measures.

Land development plays a huge role in flooding in terms of the potential to protect communities as well as the potential to increase likelihood of flooding. Richmond has a limited amount of land for development and it is important to make sure that it is used wisely and safely to prevent future problems with flooding. More stringent flood management practices will provide long-term economic benefits compared to developing solutions down the road to fix problems once they have occurred.

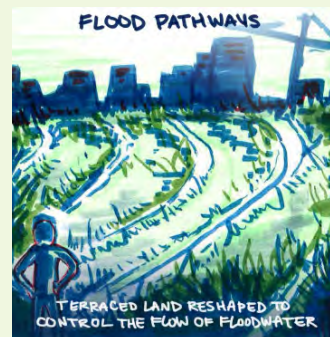


Illustration created by Rena Bridge.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Identify opportunities for land management practices to increase resilience to flooding, such as the City acquiring flood-prone land.	✓	Public Utilities - Stormwater Utility	\$\$	2026 - 2030	↓ ↓ ↓	☀️🌡️ ⚡️🌧️ 🏠🔄	👤🏢 🏛️🏡 📈📊
ii. Restrict development in riparian areas; identify locations and engage developers on development of low flood risk areas.	✗	Planning and Development Review	\$	2026 - 2030	↓ ↓ ↓	☀️🌡️ ⚡️🌧️ 🏠🔄	👤🏢 🏛️🏡 📈📊



Objective ENV-4

Engage the natural environment to improve air quality and reduce greenhouse gas emissions.

OUTCOMES

How does this Objective contribute to a more equitable, healthy, and resilient Richmond?

- | | |
|--|--|
|  Advanced green economy |  Increased flood resilience |
|  Cleaner and more efficient buildings |  Increased heat resilience |
|  Cleaner and more efficient transportation |  Increased support for climate action and resilience |
|  Climate-ready community |  Less landfill waste |
|  Engaged and involved community |  Lower greenhouse gas emissions |
|  Improved air quality |  More green space and trees |

STRATEGIES

ENV-4.1: Carbon Sequestration: Implement equitable carbon farming, sequestration, and removal.



Strategy ENV-4.1

Carbon Sequestration:

Implement equitable carbon farming, sequestration, and removal.

Carbon sequestration is the process of capturing and storing atmospheric carbon dioxide (a greenhouse gas). It has the potential to mitigate climate change by reducing the amount of greenhouse gases in the atmosphere causing global warming. Carbon can be stored in trees, soils, and other vegetation. There are many opportunities to explore strategies that use carbon sequestration and provide co-benefits to the community.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Explore the potential for carbon farming, sequestration and removal on vacant public or private land, throughout the City’s parks and open space system, schools, and in coordination with other landowners, prioritizing investments in frontline communities where feasible.		Sustainability	\$	2026 - 2030			



PATHWAYS

Transportation and Mobility



Transportation and Mobility

Accelerate the transition for all to clean and equitable mobility systems.

Greenhouse gas emissions generated from the transportation sector within the City of Richmond made up the second-largest percentage of Richmond’s 2018 carbon footprint at 31%. Specifically, these are emissions from gasoline and diesel fuel. Successful implementation of all the strategies and actions in the Transportation & Mobility Pathway will move Richmond well on its way to achieving the 2030 and 2050 greenhouse gas emissions reductions goals and is projected to reduce transportation emissions 40% by 2030 and 98% by 2050.

While the energy used in buildings creates the most GHG emissions, emissions generated from the transportation sector are the most harmful to Richmond’s air quality due to localized pollution.

Lowering transportation emissions creates co-benefits including fewer respiratory diseases and conditions like asthma caused by exposure to pollution. In the max case scenario where city- and community-wide emissions are projected to decrease 59% by 2030 and 89% by 2050 with successful implementation of all strategies in this Plan, Richmonders will realize \$231M in public health savings through 2050.

Within Richmond, passenger cars outnumber all other classes of vehicles combined in terms of the most vehicle miles traveled.

OBJECTIVES

TM-1: Achieve climate neutrality in municipal fleet operations, encourage alternative travel options, and increase resilience and stewardship of transportation infrastructure.

TM-2: Create vibrant neighborhoods where all residents can easily ride transit, walk, or bike to meet daily needs in alignment with Richmond Connects.

TM-3: Transition the community rapidly and equitably to clean-fuel vehicles and transit.



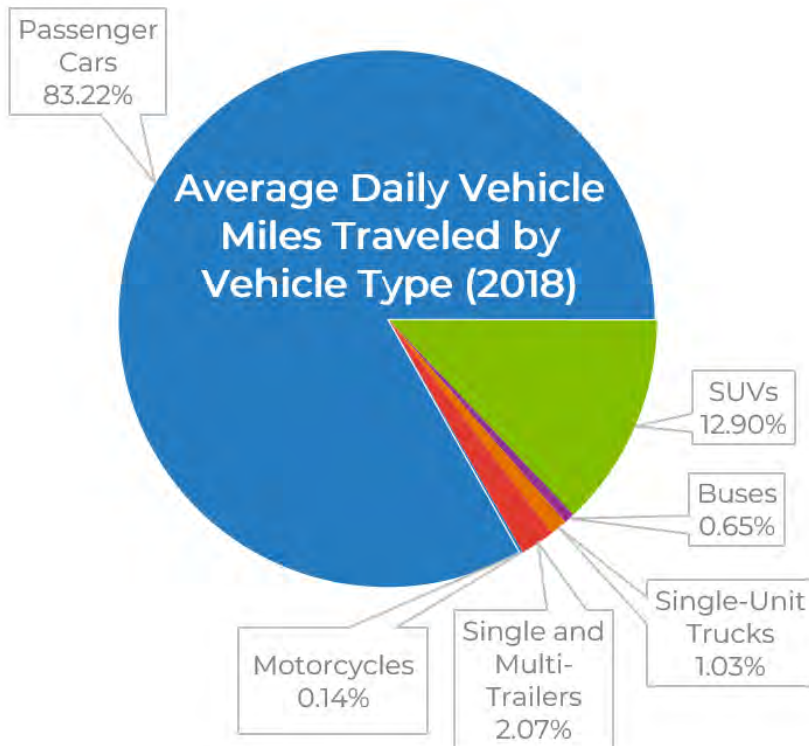


Figure 7.10. Average Daily Vehicle Miles Traveled (VMT) in Richmond by Vehicle Type (2018)

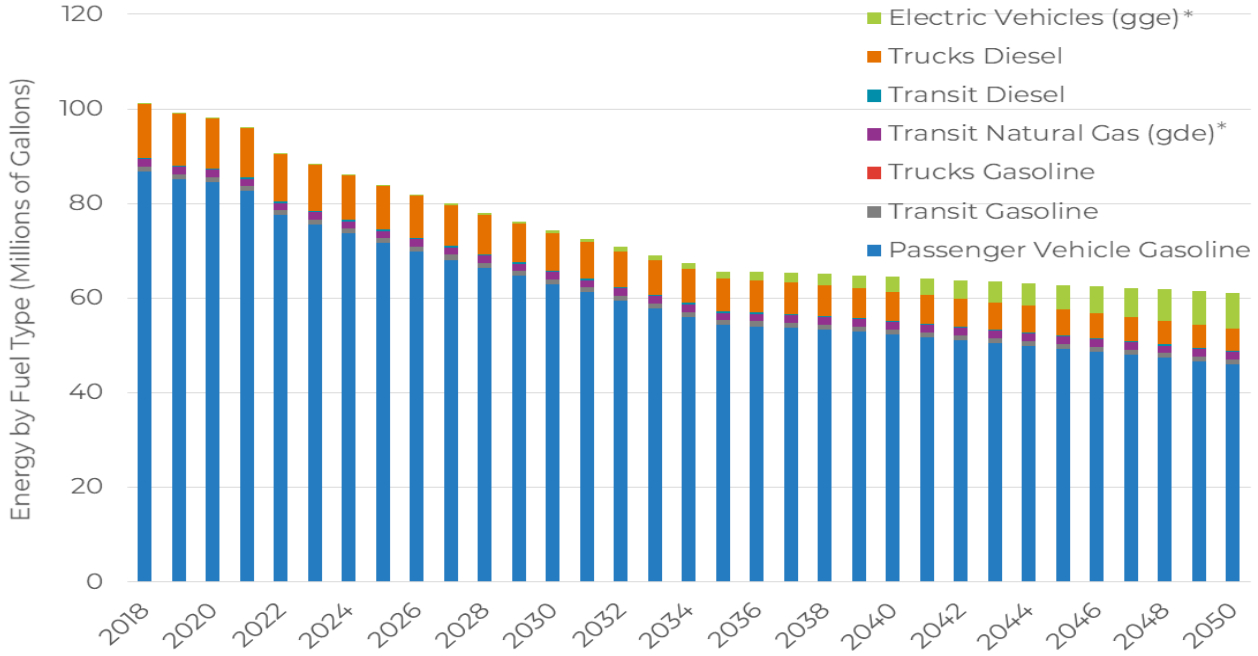
Improving infrastructure and encouraging behaviors that shift Richmonders to clean mobility options by increasing alternative modes of transportation through walking, biking, clean public transit and micro-mobility are essential to reducing GHG emissions. As Richmond’s population grows, it will be important to manage Richmond’s infrastructure and public transit system to improve equitable mobility for all. These efforts are aligned through the Mayor Stoney’ Equity Agenda, Richmond 300, Richmond Connects, Vision Zero and city department priorities.

In addition to increasing alternative modes of transportation, accelerating the decrease of internal combustion engine (ICE) vehicles is important to clean mobility in Richmond. Greenlink’s Business as Usual (BAU) EV ownership projections are aligned with Richmond registration data and projected to grow at the same rate as the official Virginia EV forecast, where EVs are 40% of all new light-duty vehicle sales by 2030 and half of such sales by 2050.

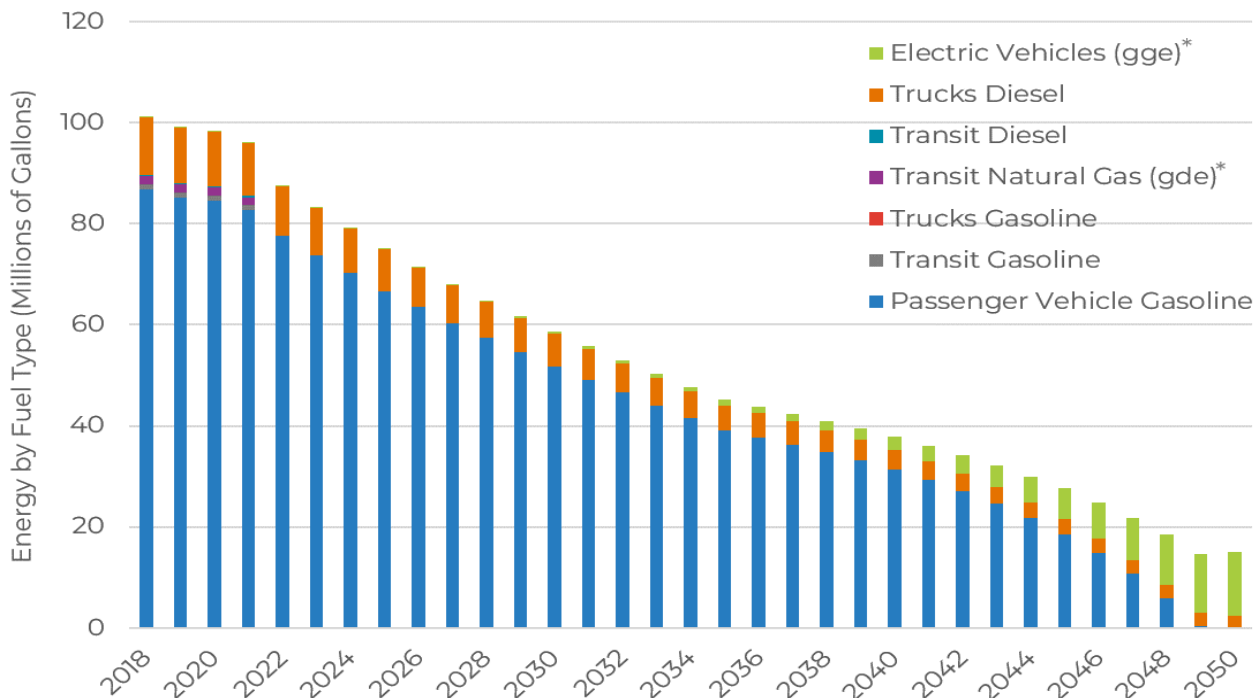
In the max case scenario, transportation energy demand drops by 40% by 2030 and 70% by 2050 as the result of improved vehicle efficiencies from better mile-per gallon for remaining gasoline and diesel vehicles and the significant improvement in efficiency by electric vehicles (EV) over internal combustion engine (ICE) vehicles.



Business as Usual Case



Max Case



*gge = gasoline gallon equivalent **gde = diesel gallon equivalent

Figure 7.11. Transportation Energy Demand Drops 70% by 2050 in Max Case



Objective TM-1

Achieve climate neutrality in municipal fleet operations, encourage alternative travel options, and increase resilience and stewardship of transportation infrastructure.

OUTCOMES

How does this Objective contribute to a more equitable, healthy, and resilient Richmond?

- | | |
|--|--|
|  Advanced green economy |  Increased flood resilience |
|  Cleaner and more efficient buildings |  Increased heat resilience |
|  Cleaner and more efficient transportation |  Increased support for climate action and resilience |
|  Climate-ready community |  Less landfill waste |
|  Engaged and involved community |  Lower greenhouse gas emissions |
|  Improved air quality |  More green space and trees |

STRATEGIES

TM-1.1: Transportation Demand Management: Support commute alternatives for city employees through a TDM framework.

TM-1.2: Municipal Connectivity & Complete Streets: Advance the City's Better Streets policy and prioritize walking and mobility-friendly connections between neighborhoods.

TM-1.3: Municipal Fleet Electrification: Electrify Richmond's fleet of vehicles and equipment.

TM-1.4: Climate Resilient Infrastructure: Develop a climate resiliency plan for transportation infrastructure that prioritizes projects using Envision and the Climate Equity Index.



Strategy TM-1.1

Transportation Demand Management: Support commute alternatives for city employees through a transportation demand management framework.

Leading by example, the City will inspire employers to promote transportation alternatives including public transit options that reduce the percentage of drive-alone trips and therefore reduce emissions as well as the need for parking throughout the city.



Illustration created by Maggie Colangelo.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Support and further develop employee commute alternatives such as transit, ridesharing, vanpooling, and telecommuting options and provide safe bicycle and pedestrian access to City offices with bicycle storage and shower facilities..		Public Works-Office of Equitable Transit & Mobility	\$	2022 - 2025			
ii. Enforce an anti-idling policy among City employee drivers and optimize vehicle routing for fuel savings.		Public Works - Fleet	\$	2022 - 2025			



Strategy TM-1.2

Municipal Connectivity & Complete Streets:

Advance the City’s Better Streets policy and prioritize walking and mobility-friendly connections between neighborhoods.

Better Streets attend to the needs of people first, considering pedestrians, bicyclists, transit, street trees, stormwater management, utilities, and livability as well as vehicular circulation and parking. They improve equitable access for residents to jobs, shopping, entertainment, parks, amenities, and community services while promoting active transportation and improving health at the same time.



Illustration created by Matthew Bennett.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Develop programs and projects that promote stewardship of the City’s Complete Streets policy between neighborhoods and economic centers.		Public Works-Office of Equitable Transit & Mobility	\$	2022 - 2025			
ii. Connect green spaces, neighborhood nodes and jobs in order to promote walkability and continuity for use by all modes of transportation.		Public Works-Office of Equitable Transit & Mobility	\$\$	2022 - 2025			



Strategy TM-1.3

Municipal Fleet Electrification:

Electrify Richmond’s fleet of vehicles and equipment.

Municipal fleet operations represent a considerable portion of the City’s expenses and associated debt. Investing in the municipal fleet operations of the future now by transitioning vehicles to electric will yield reduced expenses in the future and overall life cycle savings.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Develop and implement a municipal fleet electrification plan for all new vehicles and equipment purchases.		Public Works-Fleet	\$	2022 - 2025			
ii. Implement the recommendations of the Clean and Green Fleet Report.		Public Works-Fleet	\$	2022 - 2025			
iii. Require all new vehicle and equipment purchases to evaluate electric options that incorporate full life cycle costs and the social cost of carbon in budget forecasting.		Public Works-Fleet	\$	2022-2025			
iv. Incorporate alternative fuel vehicles in the city fleet when electric vehicle options are not viable, prioritizing those with the next-highest emissions reduction potential.		Public Works-Fleet	\$\$	2022-2025			
v. Support the local economy through local biofuel/negative carbon opportunities, generate workforce development, and identify climate resilience and redundancy measures of alternative fuels.		Public Works-Fleet	\$	2026-2030			



Strategy TM-1.4

Climate Resilient Infrastructure:

Develop a climate resiliency plan for transportation infrastructure that prioritizes projects using Envision and the Climate Equity Index.

Richmond is already experiencing climate change impacts - localized flash flooding events overwhelming drains and street infrastructure. The intentional design, implementation and maintenance of climate resilient transportation infrastructure is needed to protect residents and the broader community from future climate impacts.



Illustration created by Rena Bridge.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Develop, implement, and fund a Climate Resiliency Plan for transportation infrastructure using the Climate Equity Index to prioritize budget requests for resilient maintenance.		Sustainability	\$\$	2026-2030			
ii. Adopt an ordinance to require the city to use the Envision framework for all new city infrastructure projects.		Sustainability	\$	2022-2025			
iii. Require that all new infrastructure projects are sited to avoid/minimize impacts to natural resilience features such as wetlands, forests, and vegetated riparian buffers.		Planning & Development Review	\$	2022-2025			



Objective TM-2

Create vibrant neighborhoods where all residents can easily ride transit, walk, or bike to meet daily needs in alignment with Richmond Connects.

OUTCOMES

How does this Objective contribute to a more equitable, healthy, and resilient Richmond?

- | | |
|---|---|
| <input checked="" type="checkbox"/> Advanced green economy | <input type="checkbox"/> Increased flood resilience |
| <input type="checkbox"/> Cleaner and more efficient buildings | <input checked="" type="checkbox"/> Increased heat resilience |
| <input checked="" type="checkbox"/> Cleaner and more efficient transportation | <input checked="" type="checkbox"/> Increased support for climate action and resilience |
| <input checked="" type="checkbox"/> Climate-ready community | <input type="checkbox"/> Less landfill waste |
| <input checked="" type="checkbox"/> Engaged and involved community | <input checked="" type="checkbox"/> Lower greenhouse gas emissions |
| <input checked="" type="checkbox"/> Improved air quality | <input checked="" type="checkbox"/> More green space and trees |

STRATEGIES

TM-2.1: Resilient Bus Transit System: Improve and expand bus routes, stops, and bike share options, with priority for low car ownership and underserved areas.

TM-2.2: Integrated Connectivity: Develop shared-use, green biking and walking paths that connect neighborhoods to Richmond’s employment centers and amenities.

TM-2.3: Residential Mobility and Complete Streets: Promote safely walkable and bikeable neighborhoods that connect Richmonders to jobs, necessities, and amenities throughout the city in alignment with the Richmond Connects Plan.



Strategy TM-2.1

Resilient Bus Transit System:

Improve and expand bus routes, stops, and bike share options, with priority for low car ownership and underserved areas.

Better public transit is one of the highest priorities of Richmonders. Transit connects people to jobs, healthcare, education, housing, critical community resources, and to each other. Enhanced public transit will make the lived experience better for every Richmonder while minimizing the use of single-occupancy vehicles and reducing transportation emissions.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Improve public transit frequency, reliability, access, convenience, user experience, and local and regional connectivity.		Public Works-Office of Equitable Transit & Mobility	\$\$	2022-2025			
ii. Prioritize transit improvements in underserved communities by connecting high-density housing to employment centers and amenities.		Public Works-Office of Equitable Transit & Mobility	\$\$	2022-2025			
iii. Improve and maintain priority transit stops in low-income and low car ownership areas.		Public Works-Office of Equitable Transit & Mobility	\$\$	2022-2025			
iv. Expand the bike and e-bike share program citywide and make it accessible and affordable.		Public Works-Office of Equitable Transit & Mobility	\$	2022-2025			
v. Integrate and connect street trees with public transit and biking infrastructure to increase shade and improve stormwater management.		Public Works-Urban Forestry	\$	2022-2025			



Strategy TM-2.2

Integrated Connectivity:

Develop shared-use, green biking and walking paths that connect neighborhoods to Richmond’s employment centers and amenities.

Improved connectivity of greenways in previously under-served neighborhoods will enable Richmonders to increase their use of safe, convenient, and comfortable bike paths and sidewalks as a means of travel to community necessities and amenities.



Illustration created by Maggie Colangelo.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Develop shared use paths with strategically integrated tree cover, and prioritize the connection of low-income neighborhoods to jobs, necessities, amenities, green spaces, natural resources, and local and regional greenways.		Public Works-Office of Equitable Transit & Mobility	\$\$	2026-2030			



Strategy TM-2.3

Residential Mobility and Complete Streets:

Promote safely walkable and bikeable neighborhoods that connect Richmonders to jobs, necessities, and amenities throughout the city in alignment with the Richmond Connects Plan.

Enhancing walking and biking throughout Richmond’s neighborhoods will improve the interconnectivity of alternative transportation modes and support vibrant neighborhoods throughout Richmond.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Prioritize the expansion and improvement of pedestrian and shared mobility infrastructure to all areas of Richmond through state, regional and federal grants.		Public Works-Office of Equitable Transit & Mobility	\$\$	2022 - 2025			
ii. Prioritize funding for the implementation of pedestrian-friendly networks through beautification and placemaking (e.g. ADA, street trees, benches, and solar-powered LED lighting), prioritizing underserved and low car ownership communities.		Public Works-Office of Equitable Transit & Mobility	\$	2022-2025			



Objective TM-3

Transition the community rapidly and equitably to clean-fuel vehicles and transit.

OUTCOMES

How does this Objective contribute to a more equitable, healthy, and resilient Richmond?

- | | |
|---|---|
|  Advanced green economy |  Increased flood resilience |
|  Cleaner and more efficient buildings |  Increased heat resilience |
|  Cleaner and more efficient transportation |  Increased support for climate action and resilience |
|  Climate-ready community |  Less landfill waste |
|  Engaged and involved community |  Lower greenhouse gas emissions |
|  Improved air quality |  More green space and trees |

STRATEGIES

TM-3.1: Private and Commercial Vehicle Electrification: Facilitate the transition to electric vehicles across the city.

TM-3.2: Charging infrastructure: Support the equitable and geographically-distributed expansion of publicly-available charging stations.



Strategy TM-3.1

Private and Commercial Vehicle Electrification:

Facilitate the transition to electric vehicles across the city.

The transition to electric transit vehicles (buses, shared vehicles, vehicles for hire, etc.) and electric privately owned vehicles in Richmond will require an ‘all in’ approach with all sectors supporting and promoting opportunities including incentives and rebates, corporate programs, public transit modifications, curb management initiatives, parking requirements, and vehicle sales.



Illustration created by Maggie Colangelo.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Facilitate the transition to affordable, convenient, and reliable electric vehicles for transit vehicles (buses, shared vehicles, and vehicles for hire).		Sustainability	\$\$	2026-2030			
ii. Facilitate the transition to affordable, convenient, and reliable electric vehicles for private vehicles.		Sustainability	\$	2026-2030			



Strategy TM-3.2

Charging infrastructure:

Support the equitable and geographically-distributed expansion of publicly-available charging stations.

As the world transitions to electric vehicles it is essential that Richmond develop a comprehensive plan to support (not provide) a convenient and equitable charging infrastructure network within the geographical boundaries of the city. Richmond must be responsive to meet the growing demands of Richmonders.



Illustration created by Alexander Matthews.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Support equitable planning for the build-out of electric vehicle charging stations throughout the City and ensure equitable distribution of these stations geographically.		Sustainability	\$	2026-2030			



PATHWAYS

Waste Reduction and Recovery



Waste Reduction and Recovery

Fostering sustainable methods of waste reduction - wasting less, reusing more.

Greenhouse gas (GHG) emissions generated from the waste sector within the City of Richmond made up 3% of Richmond's 2018 carbon footprint. Successful implementation of all the strategies and actions in the Waste Reduction & Recovery Pathway is projected to achieve net zero emissions in the waste sector by 2030, move Richmond well on its way to achieving the 2030 and 2050 GHG emissions reduction goals, realizing an adaptive waste management infrastructure, ensuring a healthy natural environment, and enhancing climate resilience for all Richmonders.

While the GHG emissions generated from solid waste only accounted for 3% of Richmond's 2018 carbon footprint, the co-benefits of a zero waste Richmond are far-reaching.

All of the efforts in this Pathway encourage individual and collective participation in a growing and circular economy that will also improve the health of our natural environment. Every effort toward waste reduction on a local level can make significant positive upstream effects on reducing emissions from processes outside Richmond's geographic boundaries. By implementing the strategies that reduce GHG emissions associated with waste we will create 1000s of jobs over the product life cycles through recycling and composting.

Reducing the amount of waste that Richmonders generate in our households, businesses, industries, and institutions is a responsibility that the entire community shares.

OBJECTIVES

WR-1: Lead by example and model zero-waste strategies in all municipal operations.

WR-2: Encourage community waste reduction by equitably prioritizing a circular economy.

WR-3: Develop and implement a comprehensive and equitable citywide composting plan.

WR-4: Ensure that policies and standards for waste generation and disposal reflect the community's priorities for an equitable, clean, and sustainable Richmond.





Aiming for 'zero waste' can only be achieved through a variety of commercial and industrial solutions including smarter materials production and material reuse in addition to changing personal practices such as extending the useful life of the materials we use, encouraging alternatives to single-waste plastics, and composting organic waste.

Improving recycling, composting, and source reduction efforts will lead to a 70% reduction in landfill waste by 2050 as modeled in the scenarios below by Integral who calculated specific GHG intensities for each component of the waste stream using the EPA's

industry-standard Waste Reduction Model (WARM) taking into account the emissions intensity of the waste stream.

For example, in a landfill, organic waste decomposes and releases methane, a potent greenhouse gas, but metal and glass is inert. Greenlink took Integral's waste modeling and identified policies and programs that led to the development of the strategies and actions in this Pathway that will reduce specific types of waste, resulting in both reduced tonnage and a shifting GHG intensity for the residual refuse.

Zero Waste: The conservation of all resources by means of responsible production, consumption, reuse, and recovery of products, packaging, and materials without burning and with no discharges to land, water, or air that threaten the environment or human health. (Zero Waste international Alliance)

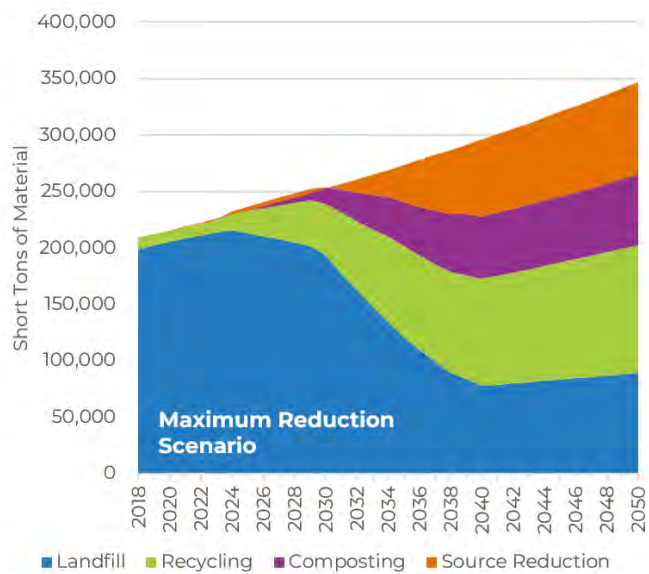
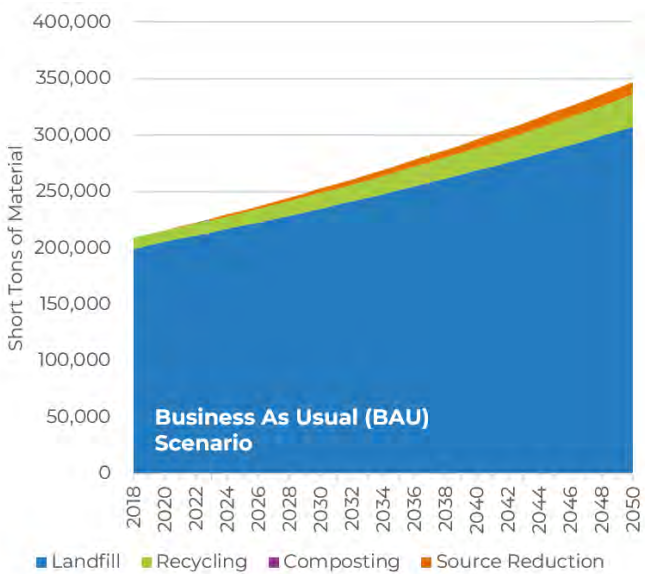


Figure 7.12. Potential to Cut Landfill Waste by More Than 70%



Objective WR-1

Lead by example and model zero-waste strategies in all municipal operations.

OUTCOMES

How does this Objective contribute to a more equitable, healthy, and resilient Richmond?

- | | |
|---|---|
| <input checked="" type="checkbox"/> Advanced green economy | <input checked="" type="checkbox"/> Increased flood resilience |
| <input checked="" type="checkbox"/> Cleaner and more efficient buildings | <input checked="" type="checkbox"/> Increased heat resilience |
| <input checked="" type="checkbox"/> Cleaner and more efficient transportation | <input checked="" type="checkbox"/> Increased support for climate action and resilience |
| <input checked="" type="checkbox"/> Climate-ready community | <input checked="" type="checkbox"/> Less landfill waste |
| <input checked="" type="checkbox"/> Engaged and involved community | <input checked="" type="checkbox"/> Lower greenhouse gas emissions |
| <input checked="" type="checkbox"/> Improved air quality | <input checked="" type="checkbox"/> More green space and trees |

STRATEGIES

WR-1.1: Zero Waste Practices: Demonstrate high impact zero-waste practices through a commitment to meet the standards set by Governor Northam’s Executive Order 77 and Governor Youngkin’s Executive Order 17.

WR-1.2: Waste Stream Reporting: Track and make available the impact of the city’s waste reduction programs in order to provide a model for other institutions, business, organizations, and Richmonders.



Strategy WR-1.1

Zero Waste Practices:

Demonstrate high-impact zero-waste practices through a commitment to meet the standards set forth by Governor Northam’s [Executive Order 77](#) and Governor Youngkin’s [Executive Order 17](#).

The City of Richmond must lead by example to model sustainable waste management practices in city operations by modifying purchasing decisions, implementing training, and changing employee behaviors.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Eliminate single-use plastics and align city operations with state standards to demonstrate high-impact zero-waste practices in design and expansion.		Procurement Services	\$	2026 - 2030			
ii. Implement strategies that incentivize behavior change among city employees, such as elimination of desk-side trash bins, promotion of recycling and composting, removal of single-use plastics and Styrofoam, and regular waste minimization and sustainability trainings.		Public Works-Solid Waste & Recycling	\$	2026 - 2030			



Strategy WR-1.2

Waste Stream Reporting:

Track and make available the impact of the city’s waste reduction programs in order to provide a model for other institutions, business, organizations, and Richmonders.

The City of Richmond can serve as a model for the community by tracking and sharing the impact of its waste reduction programs in order to identify best practices that effectively divert landfill waste throughout the city.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Track and visibly promote large-scale zero waste efforts.		Public Works-Solid Waste & Recycling	\$	2022 - 2025			
ii. Conduct an internal waste audit to assess waste streams and their recovery, recycling, and disposal.		Public Works-Solid Waste & Recycling	\$	2022 - 2025			



Objective WR-2

Encourage community waste reduction by equitably prioritizing a circular economy.

OUTCOMES

How does this Objective contribute to a more equitable, healthy, and resilient Richmond?

- | | |
|--|---|
| <input checked="" type="checkbox"/> Advanced green economy | <input type="checkbox"/> Increased flood resilience |
| <input type="checkbox"/> Cleaner and more efficient buildings | <input type="checkbox"/> Increased heat resilience |
| <input type="checkbox"/> Cleaner and more efficient transportation | <input checked="" type="checkbox"/> Increased support for climate action and resilience |
| <input checked="" type="checkbox"/> Climate-ready community | <input checked="" type="checkbox"/> Less landfill waste |
| <input checked="" type="checkbox"/> Engaged and involved community | <input checked="" type="checkbox"/> Lower greenhouse gas emissions |
| <input checked="" type="checkbox"/> Improved air quality | <input type="checkbox"/> More green space and trees |

STRATEGIES

WR-2.1: Incentivize & Reward Institutional Waste Reduction: Promote institutional and corporate best practices for zero waste initiatives.

WR-2.2: Consumer Education: Better inform Richmonders about the impacts of waste, litter, and consumer choices.

WR-2.3: Recycle Specialty Materials: Address materials in the waste stream that cannot be managed through curbside recycling or composting initiatives.



Strategy WR-2.1

Incentivize & Reward Institutional Waste Reduction:

Promote institutional and corporate best practices for zero waste initiatives.

Large organizations and institutions recognize the cost saving opportunities of reducing waste and identifying new ways to foster a circular economy. Incentivizing waste reduction programs and promoting companies for their waste reduction efforts can further enhance these endeavors while saving costs and instituting sustainable practices.



Illustration created by Nehemiah Terry.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Seek cost-effective best practices among institutional partners and identify opportunities for collaborations to minimize waste.		Public Works-Solid Waste & Recycling	\$	2022-2025			
ii. Incentivize waste reduction programs and manufacturing processes that minimize GHG emissions.		Public Works-Solid Waste & Recycling	\$	2026-2030			
iii. Promote and reward companies earning zero-waste certification.		Public Works-Solid Waste & Recycling	\$	2022-2025			



Strategy WR-2.2

Consumer Education:

Better inform Richmonders about the impacts of waste, litter, and consumer choices.

By educating Richmonders about their waste stream and the direct impacts on their health, the economy, and the natural environment generated by their consumer choices we can all be more empowered to make better choices ultimately improving our quality of life.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Create an education campaign to inform the public on how to reduce environmental impacts generated by consumer choices.		Public Works-Solid Waste & Recycling	\$	2026-2030			
ii. Create an accessible, large-scale education campaign for all residents about incentives and benefits of reducing waste. Include information about waste stream cycles, sources and quantities, environmental justice, and health impacts.		Public Works-Solid Waste & Recycling	\$	2026-2030			

RECYCLING	RESIDENTIAL COMPOSITION	COMMERCIAL COMPOSITION
Paper	41.5%	32.4%
Plastic	20.0%	23.1%
Glass	13.6%	13.9%
Metal	22.6%	27.8%
Other Organics	0.0%	0.0%
Food	0.0%	0.0%
Carpet/Textiles	2.4%	2.8%
C&D	0.0%	0.0%
Residue	15.0%	10.0%

REDUCED VIA SAVE AS YOU THROW	RESIDENTIAL % REDUCTION	COMMERCIAL % REDUCTION
Paper	33%	25%
Plastic	75%	50%
Glass	75%	50%
Metal	75%	50%
Other Organics	60%	80%
Food	67%	38%
Carpet/Textiles	70%	80%
C&D	N/A	56%
Electronics	80%	80%
Residue	50%	50%

Figure 7.14. Max Case Waste Characterization



Strategy WR-2.3

Recycle Specialty Materials:

Address materials in the waste stream that cannot be managed through curbside recycling or composting initiatives.

Thinking sustainably and circularly about responsible management and reuse of specialty materials is becoming a necessity.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Provide information and locations for how to recycle e-waste.		Public Works-Solid Waste & Recycling	\$	2022-2025			
ii. Develop protocols and cost considerations for responsible recycling and disposal of solar panels, batteries, and other byproducts of renewable energy and weatherization upgrades.		Public Works-Solid Waste & Recycling	\$	2026 - 2030			



Objective WR-3

Develop and implement a comprehensive and equitable citywide composting plan.

OUTCOMES

How does this Objective contribute to a more equitable, healthy, and resilient Richmond?

- | | |
|--|--|
|  Advanced green economy |  Increased flood resilience |
|  Cleaner and more efficient buildings |  Increased heat resilience |
|  Cleaner and more efficient transportation |  Increased support for climate action and resilience |
|  Climate-ready community |  Less landfill waste |
|  Engaged and involved community |  Lower greenhouse gas emissions |
|  Improved air quality |  More green space and trees |

STRATEGIES

WR-3.1: Municipal Composting Initiatives: Provide education about and options for composting at city-owned properties and events, including opportunities for the distribution of matured organic matter.

WR-3.2: Citywide Composting Program: Develop an equitable residential organic waste composting program that includes regular curbside pickup and accessible dropoff locations.



Strategy WR-3.1

Municipal Composting Initiatives:

Provide education about and options for composting at city-owned properties and events, including opportunities for the distribution of matured organic matter.

Yard waste and food waste makes up 30% of the local waste stream. Composting these materials instead can reduce carbon emissions and improve local soil quality.



Illustration created by Emma Rimmer.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Conduct organic waste and diversion education and awareness activities.		Public Works-Solid Waste & Recycling	\$	2022-2025			
ii. Provide options for composting in all city-owned buildings, parks, schools, and facilities and at city-sponsored events.		Public Works-Solid Waste & Recycling	\$	2026-2030			
iii. Make compost and mulch available to city properties, residents, and small businesses.		Public Works-Solid Waste & Recycling	\$	2022-2025			



Strategy WR-3.2

Citywide Composting Program:

Develop an equitable residential organic waste composting program that includes regular curbside pickup and accessible drop-off locations.

Virginia is the only state from North Carolina to Maine without a yard waste landfill ban, and many states have food waste bans as well. Implementing an organic waste diversion program would provide benefits such as reduced landfill gas emissions, improved soil quality, expanded urban agriculture programs, and avoided costs for transportation fuel, labor, and vehicle maintenance.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Incentivize, support, and provide education for the creation of facilities and services to provide equitable access to organic waste collection and composting.		Public Works-Solid Waste & Recycling	\$\$	2026-2030			
ii. Encourage and incentivize organic waste reduction activities at all commercial buildings and events.		Public Works-Solid Waste & Recycling	\$\$\$	2026-2030			
iii. Establish an equitable city-wide organic waste diversion and reduction program that includes curbside pickup, prioritizing city housing projects and other frontline communities.		Public Works-Solid Waste & Recycling	\$\$	2026-2030			
iv. Provide educational measures for onsite and backyard composting.		Public Works-Solid Waste & Recycling	\$	2022-2025			
v. Provide options for convenient food scrap and yard waste drop-off by residents for composting.		Public Works-Solid Waste & Recycling	\$	2022-2025			



Objective WR-4

Ensure that policies and standards for waste generation and disposal reflect the community’s priorities for an equitable, clean, and sustainable Richmond.

OUTCOMES

How does this Objective contribute to a more equitable, healthy, and resilient Richmond?

- | | |
|--|--|
|  Advanced green economy |  Increased flood resilience |
|  Cleaner and more efficient buildings |  Increased heat resilience |
|  Cleaner and more efficient transportation |  Increased support for climate action and resilience |
|  Climate-ready community |  Less landfill waste |
|  Engaged and involved community |  Lower greenhouse gas emissions |
|  Improved air quality |  More green space and trees |

STRATEGIES

WR-4.1: Public Advocacy for Waste Reduction: Engage Richmonders to develop and mobilize support for legislation, policies and programs aimed at reducing waste.

WR-4.2: Construction & Disposal Standards: Require new and updated standards for site development and waste management.

WR-4.3: Transparency & Environmental Justice: Protect communities from industrial waste by requiring regular waste audits and impact assessments for all new and existing facilities.



Strategy WR-4.1

Citywide Public Advocacy for Waste Reduction:

Engage Richmonders to develop and mobilize support for legislation, policies and programs aimed at reducing waste.

Community mobilization and collective action is necessary to advocate for the adoption of key state and local waste management legislation to initiate policies and programs that will reduce greenhouse gas emissions and benefit the community and the local economy.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Create a geographically and demographically representative task force to mobilize support for key legislation (e.g., banning plastic bags) and to work with institutions to remove single-use plastics and minimize other large waste streams.		Public Works-Solid Waste & Recycling	\$	2022-2025			
ii. Advocate for a bottle deposit bill in the General Assembly.		Public Works-Solid Waste & Recycling	\$	2022-2025			
iii. Pass an ordinance to impose a tax on plastic bags, the phasing out of polystyrene containers, and a balloon release ban, per state-enabling legislation.		Sustainability	\$	2022-2025			
iv. Mandate an equitable multi-family and commercial recycling program for new and existing properties at no additional cost to renters.		Public Works-Solid Waste & Recycling	\$\$	2026-2030			
v. Create a “Save-as-you-save” campaign that encourages reductions in residential trash volume.		Public Works-Solid Waste & Recycling	\$	2026-2030			



Strategy WR-4.2

Construction & Disposal Standards:

Require new and updated standards for site development and waste management.

Updated construction standards and waste management practices will attract economic development that will support a strong local economy and sustainable development.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Develop and update construction standards and protocols to require environmentally-friendly and equitable processes. Include required permit siting and staging for recycling and composting. Add requirements for construction and demolition material recycling and reporting.		Planning & Development Review	\$	2026-2030			



Strategy WR-4.3

Transparency & Environmental Justice: Protect communities from industrial waste by requiring regular waste audits and impact assessments for all new and existing facilities.

Throughout Richmond’s history, environmental injustice has resulted from systemic racism and poorly managed industrial practices. In order to prevent industrial waste from further impacting historically disadvantaged communities and communities of color new protocols must be established and institutionalized.

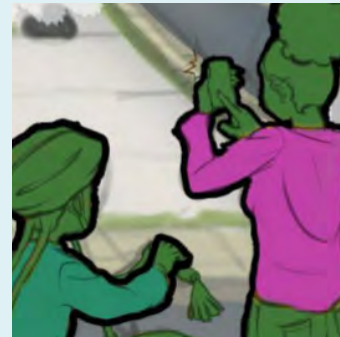


Illustration created by Kadejah Harden.

ACTIONS	STATUS	CITY STEWARD	COST	TIME	GHG REDUCTIONS	RESILIENCE	EQUITY
i. Implement measures to identify the potential impacts of new facilities on neighboring communities.		Planning & Development Review	\$	2026-2030			
ii. Advocate for state and regional policies that reduce industrial waste from facilities in frontline communities and those in floodplains or flood-prone areas.		Sustainability	\$	2026-2030			
iii. Require or incentivize external and transparent industrial waste audits, with findings published to identify potential impacts on the surrounding community.		Sustainability	\$	2026-2030			



CHAPTER 8

Accountability and Measuring Progress

Accountability and Measuring Progress


RVAgreen 2050 stakeholders asked throughout the planning process how progress would be tracked and reported towards achieving the goals of the Plan. This section answers that question and describes how progress towards the 2030 Action Plan goals will be measured.



Outcomes & Indicators

Some areas of progress for the Plan will be easier to measure than others. For example, quantifying greenhouse gas emissions to measure progress towards the goals of a 45% reduction below 2008 levels by 2030 is possible using established protocols and methodologies that are complex but result in numbers we can easily compare across years. On the other hand, measuring progress in areas such as climate resilience and equity will be more difficult to quantify. How do you adequately measure the resilience of our community to threats such as heat waves and floods? What data can tell us whether our climate action and resilience efforts are creating a more equitable Richmond?

The Office of Sustainability, with input from the Working Groups, identified a set of 24 Indicators to help measure progress towards the 12 Outcomes and overarching goals of the 2030 Action Plan.

EQUITY TIP ▶ **For each Outcome there are two indicators: one that is more “traditional” and one that is specifically geared towards ensuring equitable progress toward the Outcome.** 

In developing the Indicators, the Office considered what would be measurable with currently available data (or data we could eventually obtain), what would be meaningful to the community, and what would help ensure equitable progress towards the Outcomes.

OUTCOME	INDICATOR	DATA SOURCE & NOTES
Advanced green economy	Number and percentage of green jobs	To be determined: In 2013 the U.S. Bureau of Labor Statistics eliminated its Green Goods and Services Occupations data and publications program. Alternative methodology to be identified using best practices and peer city research.
	Number of residents completing training, education, and apprenticeship programs related to climate action and resilience by race and ethnicity	City departments, higher education institutions, and partner organizations
Cleaner and more efficient buildings	Total building energy use (Btu)	Dominion Energy, City of Richmond
	Percentage of households with high energy burden by race and ethnicity	U.S. Census*
Cleaner and more efficient transportation	Percentage of travel (mode share) not with single-occupancy internal combustion engine vehicles	U.S. Census*
	Percentage of population within a 10 minute walk of a fixed-route transit stop with amenities by race and ethnicity	U.S. Census + Greater Richmond Transit Company (GRTC)
Climate-ready community	Number of residents receiving information on climate change impacts through website, social media, events, trainings, and other communications channels (to be defined)	To be determined; methodology to be developed using Office of Sustainability communications platforms and tracking information.
	Percentage of population facing "high vulnerability" to climate change per the Climate Equity Index by race and ethnicity	RVAgreen 2050 Climate Equity Index
Engaged and involved community	Number of respondents to annual sustainability survey (online, paper, phone, and in-person)	Annual community survey
	Number of respondents to annual sustainability survey (online, paper, phone, and in-person) by race, ethnicity, and income - compare to citywide demographics	Annual community survey
Improved air quality	Citywide average Air Quality Equity Score	To be determined: methodology to be developed with community partners modeled after Tree Equity Score; data to be gathered when air quality monitoring network is established (est. 2023/24).
	Average Air Quality Equity Score by race and ethnicity	To be determined: methodology to be developed with community partners modeled after Tree Equity Score; data to be gathered when air quality monitoring network is established (est. 2023/24).

Table 8.1. Outcomes Table

OUTCOME	INDICATOR	DATA SOURCE & NOTES
Increased flood resilience	Number of incidents of standing water, flooding, and emergency service during heavy precipitation events	Assemble data from RVA311, emergency service providers, and other sources to be identified
	Number of calls/311 requests for standing water, flooding, and emergency service during heavy precipitation events by census tract (and/or race and ethnicity if available)	Assemble data from RVA311, emergency service providers, and other sources to be identified
Increased heat resilience	Temperature difference between hottest and coolest areas of the city	Urban heat island study and/or satellite data
	Percent of population facing "high heat vulnerability" to climate change per the Climate Equity Index by race and ethnicity-race and ethnicity don't predict vulnerability	RVAgreen 2050 Climate Equity Index
Increased support for climate action and resilience	Percentage of RVAgreen 2050 actions funded	City budget
	Annual \$ allocated directly from the city or facilitated through a partnership with the city to community organizations for neighborhood-based climate action and resilience projects	City budget
Less landfill waste	Total waste going to landfill (tons)	Transfer station operator and private haulers
	Percentage of households that have access to curbside/on-site recycling services by census tract	U.S. Census*
Lower greenhouse gas emissions	Total community GHG emissions (MTCO _{2e})	Office of Sustainability greenhouse gas emissions inventory
	Per capita GHG emissions by census tract (MTCO _{2e})	Office of Sustainability greenhouse gas emissions inventory - calculation methodology to be developed with community partners
More green space and trees	Citywide average Tree Equity Score	American Forests Tree Equity Score Tool
	Percentage of population within a 10 minute walk of a public park with green space by race and ethnicity	U.S. Census* + Department of Parks and Recreation data

*The Office of Sustainability is currently evaluating the results of the 2020 census due to emerging concerns over equity, accuracy, and representation. RVAgreen 2050 staff will monitor the ongoing discussion and identify new data sources as needed.

Table 8.1. Outcomes Table Continued...

RVAgreen 2050 Shared Accountability Framework

Purpose

A critical concern for RVAgreen 2050 stakeholders throughout the planning process was ensuring the Action Plan does not end up sitting on a shelf. Equitable implementation of the Plan is just as important as the Plan itself.

Commitments

- » **Regular Evaluation:** Taking concrete steps to plan for and measure progress to stay on track toward goals.
- » **Transparency:** Publicly communicating goals, plans, and outcomes. Identifying needs and potential impact up front.
- » **Culture of Improvement:** Receive feedback. Revise plans and measures over time to stay on track toward goals.

» Trusting Relationships:

Relationships entered into mutually and oriented around a commitment that parties make each other.

» Institutionalizing Sustainability in City Government:

Creating an organizational backbone to combat climate change through organizational structure, culture, staffing, and decision-making.

EQUITY + INNOVATION TIP ▶ **The Shared Accountability Framework helps answer, “Are we on or off track toward equitable implementation of RVAgreen 2050?”** The framework creates an accountability process that commits to *regular evaluation, transparency, trusting relationships, a culture of improvement, and institutionalizing sustainability in city government*. The framework lays out specific roles and responsibilities as part of implementation, and “we” refers to the entire Richmond community working towards the goals of RVAgreen 2050.

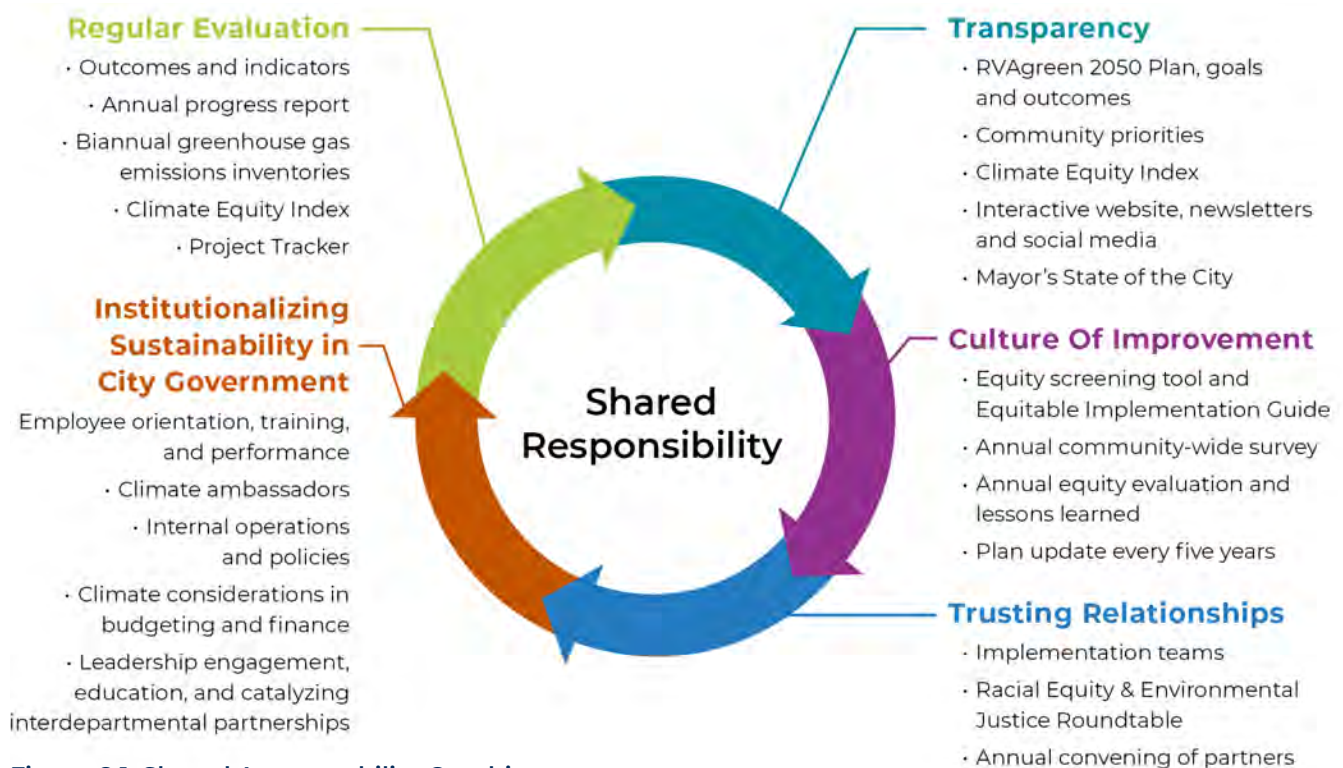


Figure 8.1. Shared Accountability Graphic

Structure

The Shared Accountability Framework is built around a key question asked by RVAgreen 2050 stakeholders during the planning process: **Who** is accountable for **what**? It is important to keep in mind on the “what” that there are levels of control to consider as we measure progress: for example, some strategies require changes in state policy over which the city has limited influence.

WHO?	WHAT?
<p>Office of Sustainability</p> <p><i>Primary convener providing support to city and community leaders</i></p>	<ul style="list-style-type: none"> » Steward development, adoption and implementation of the Climate Equity Action Plan 2030 » Champion actions to institutionalize sustainability in city government, including: <ul style="list-style-type: none"> » Building awareness among all city employees through new employee orientation and other training opportunities, incorporating climate competencies into job descriptions and performance evaluations, and other initiatives » Mobilizing employees through a climate ambassadors program to promote a culture of sustainability » Evaluating and updating city policies and programs to reduce greenhouse gas emissions and address the impacts of climate change (such as procurement, hazard mitigation, social services, and others) » Incorporating climate considerations into the city’s annual budgeting processes » Convene and support Implementation Teams, including quarterly convenings by RVAgreen 2050 Pathway » Convene and support the Racial Equity and Environmental Justice Roundtable » Track data for annual progress report and additional updates as needed, including: <ul style="list-style-type: none"> » Indicators » Biannual greenhouse gas inventories » Climate Equity Index project tracker » Website updates » Organize annual convening of implementation partners » Conduct annual community-wide sustainability survey » Provide annual reports to Green City Commission, Mayor and Chief Administrative Officer, City Council, and Planning Commission » Steward development and adoption of plan updates (2035, 2040, 2045)
<p>Implementation Teams</p> <p><i>Groups of stakeholders from city departments, partner organizations, and community</i></p>	<ul style="list-style-type: none"> » Implement Climate Equity Action Plan 2030 Strategies and actions » Use the Equity Screening Tool, equitable implementation guide, Climate Equity Index, and other equity-centered tools to guide implementation » Provide updates to the Office of Sustainability at regular intervals

Table 8.2. Shared Accountability Structure and Commitments

WHO?	WHAT?
<p>Racial Equity and Environmental Justice Roundtable</p> <p><i>10-member group of residents paid for their time and lived experience expertise to center equity in implementation</i></p>	<ul style="list-style-type: none"> » Develop and update as needed an equitable implementation guide (as a next iteration of the RVAgreen 2050 Equity Screening Tool) » Two members per RVAgreen 2050 Pathway assist Implementation Teams to ensure equitable implementation of strategies and actions » Work with Office of Sustainability to conduct an annual evaluation of plan objectives and strategies; review and approve changes » Create an annual report on implementation using the Shared Accountability Framework » Members commit to: <ul style="list-style-type: none"> » Monthly Roundtable meetings » Quarterly Implementation Team meetings by Pathway » Staggered 2-year terms » Living or working in communities on the frontlines of climate change (census tracts with above-average social vulnerability via the Climate Equity Index) » Assist with recruiting new members at the end of their terms » Members receive a stipend payment of \$500 every 6 months for their service
<p>Mayor and Chief Administrative Officer</p>	<ul style="list-style-type: none"> » Ensure overall accountability for RVAgreen 2050 » Review and approve 2030 Action Plan to be adopted into the Richmond 300 Master Plan » Review annual reporting information » Provide annual updates, highlights, and priorities in State of the City address » Ensure there is dedicated and consistent city funding for implementation » Review and approve plan updates (2035, 2040, 2045)
<p>City Council</p>	<ul style="list-style-type: none"> » Ensure overall accountability for RVAgreen 2050 » Review and adopt 2030 Action Plan into the Richmond 300 Master Plan » Review annual reporting information » Ensure there is dedicated and consistent city funding for implementation » Review and adopt plan updates (2035, 2040, 2045)
<p>Planning Commission</p>	<ul style="list-style-type: none"> » Review and approve 2030 Action Plan to be adopted into the Richmond 300 Master Plan » Review annual reporting information » Review and approve plan updates (2035, 2040, 2045)
<p>Green City Commission</p>	<ul style="list-style-type: none"> » Review annual reporting information <ul style="list-style-type: none"> » Provide recommendations and input on updates, particularly in technical areas » Adopt priorities annually to support RVAgreen 2050 strategy implementation
<p>Richmond Community</p>	<ul style="list-style-type: none"> » Participate in planning, implementation, and update processes (read more on our community’s shared responsibility in the next section)

Table 8.2. Shared Accountability Structure and Commitments Continued...



CHAPTER 9

Act on our Shared Responsibility

Act on our Shared Responsibility

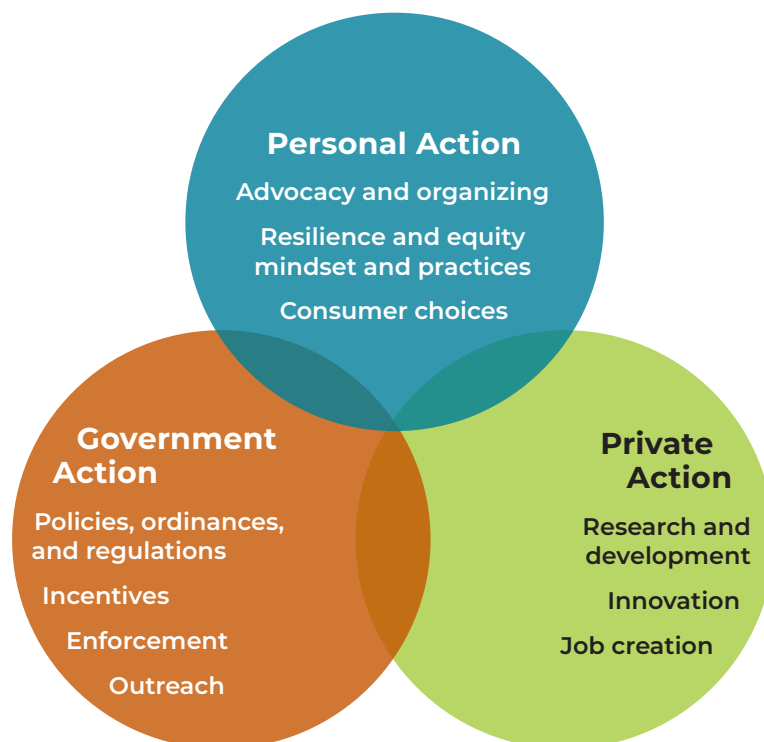
While climate action requires shared responsibility, it must be acknowledged that everyone has common but differentiated responsibilities. This concept is a principle of the 1992 United Nations Framework Convention on Climate Change, which noted that wealthier, industrialized nations have a particular responsibility to mitigate emissions and more resources to do so. When this concept is applied on a microscale to the Richmond community, it is important to acknowledge the barriers to action for many community members and the critical role of large institutions and more affluent individuals with the resources to lead by example.

For some, advocacy and engagement may look like purchasing an electric vehicle to replace a gas-powered car and sharing their experiences with their neighbors, while for others it may be showing up to City Council meetings or staying informed about climate action by reading a news article. In this way, there is a spectrum of climate advocacy.

While the city can create policies, incentives, and regulations to push climate action and resilience work forward, the private sector's flexibility can create market disruption and acceleration through innovative technology and business models. Consumers can shift market demand to favor more sustainable practices and products.

The public and private sectors must collaborate to ensure these products and practices become accessible and affordable to all income levels. Individuals can make different choices in their day to day lives and commit to staying informed about Richmond's climate actions.

Collaboration and communication are key to the transformative change that Richmond needs and only together can this vision of a more equitable, healthy, and resilient community become a reality.



What Can I Do?

The RVAgreen 2050 website is an ever-growing hub of resources on how every member of our community can get involved in creating a more equitable, healthy and resilient Richmond.

Individuals, businesses, and neighborhoods can take action in a variety of ways and contribute to our community's response to climate change. These include reducing your carbon footprint by going solar or riding public transit, enhancing your resilience to climate impacts by weatherizing your home or reporting flooding issues, and engaging with your local community organizations.



Illustration created by Maggie Colangelo.

Stay informed

Visit the [RVAgreen 2050 website](https://www.rvagreen2050.com), sign up for the email newsletter, follow us on social media, and stay tuned to updates on RVAgreen 2050 such as progress reports, meetings, and opportunities to provide input and ideas.

Spread the word

Talk about climate change - at the dinner table, at work, at school, at your place of worship, wherever you find your community. Encourage others to get involved.

Get involved

Connect with local organizations and community groups working to make Richmond healthier and more resilient.

Make your voice heard

Know your City Council district and contact your representative about your priorities. Participate in City Council and other public meetings. Hold the City of Richmond accountable for its role.

“I think seeing this plan come together like this is the best part of the process because anytime you make it a ground up process starting with the people - starting with folks in the community - 9 times out of 10 that’s the right way to do things. I feel like we did things the right way.”

*- Roundtable member,
anonymous*

References and Endnotes

Glossary



Glossary

ADA compliant sidewalks	Americans with Disabilities Act (ADA) compliant sidewalks possess a number of features that make them more accessible to individuals with disabilities. Standards define appropriate sidewalk width, surface texture, trip hazards, slope, and the availability of curb ramps.
Air Quality Index	Air Quality Index (AQI) is the nationally recognized indicator for reporting air quality. It runs from 0 to 500, and higher AQI values signify greater levels of air pollution and greater health concerns. A value below 50 (green) generally indicates good air quality, while a value above 300 (maroon) is hazardous.
anaerobic digestion	Anaerobic digestion is the process through which bacteria break down organic matter - which includes animal manure, biosolids, and food wastes - in an environment that lacks oxygen (usually a sealed vessel).
anti-idling	Motor vehicle emissions make up a significant portion of most cities' emissions. Anti-idling laws aim to reduce these emissions by requiring motorists to turn off their engines when parked, stopped, or standing for more than a set amount of time (three minutes, for example).
BEV/HEV vehicles	BEVs are Battery Electric Vehicles, which are powered solely by an electric battery with no gas engine parts. HEVs are Hybrid Electric Vehicles, which use an electric motor to assist gas-powered engines and all energy comes from gasoline.
bike-friendly infrastructure	Bike-friendly infrastructure is part of a "complete street" that is accessible and safe for all pedestrians, cyclists, public transit, and vehicles. It includes bikeways, lanes for bikes, shared use and quiet-street bike routes, painted buffer lanes, and conventional bike lanes, among others.
blower duct/duct leakage testing	Blower door and duct leakage tests measure the air flow that passes through a duct system. These tests can help to identify inefficiencies and make repairs that will lead to lower energy bills, improved air quality, and better performance.
carbon sequestration	Carbon sequestration is the process for capturing and storing atmospheric carbon dioxide, used to reduce the overall amount of carbon dioxide in the atmosphere and reduce the effects of global warming.
clean energy	Clean energy is energy derived from renewable, zero-emissions sources, as well as energy saved through energy efficiency measures. Renewable energy comes from natural processes, and energy efficiency reduces the amount of energy required. A clean energy economy powered by both renewables and energy efficiency is the most sustainable energy planning scenario.

circular economy	Circular economies share three principles: design out waste and pollution, keep products and materials in use, and regenerate natural systems. These circular economies aim to gradually decouple economic activity from the consumption of finite resources by promoting waste reduction and materials reuse.
climate neutral	Climate neutrality is achieved by balancing the amount of emissions generated with Earth's natural capacity to absorb them. It does not necessarily mean zero emissions, but reaching an equilibrium between emissions and absorptive capacity.
combined heat and power (CHP)	Combined heat and power (CHP) is an energy efficient technology that generates electricity and captures the heat that would otherwise be wasted to provide thermal energy used for heating, such as steam or hot water. CHP can work at an individual facility or building and be used in both residential and industrial processes, though it is most common in industrial settings.
composting	Composting is the natural process of recycling organic matter (leaves, food scraps) into a fertilizer. Anything that grows can decompose and composting helps to speed up this process.
design phase	The design phase is the design of a building construction or renovation project, inclusive of the issuance of a request for proposal and the project budget approval.
e-mobility	E-mobility, short for Electro Mobility, is the concept of using electric powertrain technology to enable electricity-powered modes of transportation. This can include full electric vehicles, plug-in hybrid vehicles, e-bikes, and other modes of transportation that use electricity to "go."
energy burden	Energy burden means the percentage of household income that goes toward energy costs. Low income, African American, Latino, and people who rent often have a much higher energy burden than the average household.
energy efficient retrofits	Retrofits for energy can include improvements or modifications that may improve energy efficiency or decrease energy demand. These have the potential to reduce operational costs and help meet market expectations for newer buildings.
Energy Star standards	Energy Star standards are government-based benchmarks for energy efficiency in over 70 products.
EnergyCap	EnergyCAP is an energy management and utility bill software that allows users to benchmark buildings, analyze energy data use, and automate many accounting and management tasks.
environmental justice	Environmental justice is the fair treatment and meaningful involvement of all people – regardless of race, color, national origin, or income – with respect to the development, implementation and enforcement of environmental laws, regulations and policies. No group should bear a disproportionate share of negative environmental impacts resulting from industrial, governmental and commercial operations or policies.

<p>equity</p>	<p>From the City of Richmond Equity Agenda:</p> <p>The City’s definition of “equity” is to “empower people and communities that have experienced past injustices by removing barriers to access and opportunity”</p> <p>The City recognizes its duty to remove barriers (including educational, economic, and physical barriers, such as roads and access to affordable housing) to ensure greater access to resources and opportunities</p> <p>The City understands and appreciates that advancing racial equity not only improves the lives of those who have faced injustice, but also leads to a higher quality of life for people of all backgrounds</p>
<p>e-waste</p>	<p>E-waste, short for electronic waste, refers to electronic products that are nearing the end of their useful life. Certain components of e-waste contain materials that can make them hazardous to human and environmental health.</p>
<p>food waste diversion</p>	<p>Food waste diversion aims to redirect organic waste from the landfill and use it as a more useful resource. Food waste in landfills can contribute to global warming by emissions of carbon dioxide and methane gas that are released as it breaks down.</p>
<p>green infrastructure</p>	<p>Green infrastructure is any of a range of measures that use plant or soil systems, permeable pavement (or other substrates), stormwater harvest and reuse, or landscaping to store, infiltrate, or evapotranspire stormwater and reduce flows to sewer systems.</p>
<p>green roofs</p>	<p>Green roofs, also called rooftop gardens, are a vegetative layer grown on a rooftop. Green roofs provide shade, remove heat from the air, and reduce temperatures on the roof surface and surrounding air; as such, they have been found to reduce the heat island effect and reduce building energy usage.</p>
<p>greenway</p>	<p>Greenways are open space corridors that can be managed for conservation, recreation, and alternative transportation. They usually follow natural or existing land or water features. They serve to connect people and communities, provide recreational outdoor space, link cultural and historic sites, provide refuge for wildlife, and numerous other benefits.</p>
<p>health impacts of climate change</p>	<p>Climate change influences human health and disease in numerous ways, and will intensify some existing health threats while creating new ones. Emerging health threats include respiratory and cardiovascular disease, injuries, premature deaths related to extreme weather events, changes in the prevalence and distribution of food and water-borne illnesses, and threats to mental health.</p>
<p>high-performance buildings</p>	<p>A high-performance building considers public building design, construction, and renovation programs that achieve certification using the U.S. Green Building Council’s Leadership in Energy and Environmental Design (LEED) green building rating standard or the Green Building Initiative’s ‘Green Globes’ building standard, or meets the requirements of VEES.</p>

human-centered design	Human-centered design (HCD) values the perspectives and knowledge of those most affected by the challenges and potential solutions to a problem. There are generally multiple phases that progress from establishing a basic understanding of the problem or opportunity to implementing and testing ideas.
industrial waste	Industrial waste is an all-encompassing term used to describe material considered to be no longer of use after a manufacturing process has been completed. It can be hazardous or non-hazardous, although both can harm the environment if not properly managed. It can also include solid waste, toxic waste, chemical waste, and secondary waste (e.g., scraps, construction materials).
municipal energy management plan	Municipal energy management plans aim to reduce their city's energy usage through a strategic plan for local government operations. The typical goal of these plans is to reduce energy consumption by practicing energy efficiency and environmental stewardship across city operations. Most of these plans work within a SMART framework.
neighborhood amenities	Neighborhood amenities contribute to community life and enjoyment, and can include schools, stores, parks, and restaurants, for example. Families that live in neighborhoods with more of these community amenities tend to report more trust, sociability, and neighborliness and less loneliness and other maladies.
net-zero energy	Net zero energy is a concept defined by the use of energy conservation, energy efficiency, and on-site renewable generation to account for 100% of a targeted building's or community's energy usage.
organic waste	Organic waste is any material that is biodegradable and comes from either a plant or animal.
Portfolio Manager	Portfolio Manager is a tool created by the EPA to measure and track energy and water consumption and greenhouse gas emissions. It can be used to benchmark the performance of one building or a whole portfolio of buildings.
public-private partnerships	A long-term contract between a private party and a government entity, for providing a public asset or service, in which the private party bears significant risk and management responsibility and remuneration is linked to performance.
regeneration of ecosystems	Ecosystem regeneration seeks to restore the vital ecosystem services that play an important role in human society, such as providing food, drinking water, materials, and fuel, as well as broader climate regulation. Urban sustainable regeneration focuses on the complex interactions between urban environments and ecosystems and attempts to implement planning processes that consider both.

<p>resilient infrastructure</p>	<p>Climate-resilient infrastructure is planned, designed, built, and operated in a way that anticipates, prepares for, and adapts to changing climate conditions. It can withstand disruptions caused by these climate conditions. It can include retrofits to existing infrastructure, new infrastructure, and new additional infrastructure such as sea walls.</p>
<p>retro-commissioning</p>	<p>Retrocommissioning is the first step in the building upgrade process. Commissioning outlines the interactions across all the energy flows in a building and produces a systematic method for planning upgrades that increase energy savings. It ensures that all systems are designed, installed, functionally tested, and capable of being operated and maintained according to the owner's needs, and retrocommissioning simply applies this process to existing buildings that have never been previously commissioned.</p>
<p>smart cities infrastructure</p>	<p>Smart cities are a framework, mostly comprising communication and information infrastructures and technologies, to develop, deploy, and promote sustainable development practices to address urbanization challenges. It facilitates a more interconnected city that can improve energy distribution, streamline trash collection, decrease traffic congestion, and improve air quality, for example.</p>
<p>targeted universalism</p>	<p>Targeted universalism is an engagement and implementation framework that acknowledges that one size does not fit all - in terms of solutions, programs, and more - and is inclusive of the needs of both dominant and marginalized groups. However, it pays particular attention to the situation of the marginalized group in its development, implementation, and ongoing evaluation.</p>
<p>transportation accessibility</p>	<p>Transportation accessibility measures how much you can get to in a given amount of time. It works jointly with transportation multimobility to determine the overall accessibility of a transportation system.</p>
<p>transportation demand management</p>	<p>Transportation Demand Management (TDM) focuses on understanding how people make their transportation decisions and helping people use the infrastructure in place for transit, ridesharing, walking, biking, and telework. It seeks to ensure that the design of transportation and physical infrastructure naturally encourages alternatives to driving.</p>
<p>transportation multimobility</p>	<p>Multimobility means combining a variety of transportation methods to move around.</p>
<p>upstream emissions</p>	<p>Upstream emissions are emissions that are generated from production and processing operations, rather than the direct burning of fossil fuels. These often rise the total energy expenditures of production processes, such as the extra upstream emissions required to dilute or heat bitumen in oil sands deposits.</p>
<p>Virginia Energy Conservation & Environmental Standards (VEES)</p>	<p>VEES are a series of conservation and environmental standards in place to guide construction and new development in Virginia.</p>

vulnerability to climate change	Vulnerability to climate change encompasses physical, ecological, and social aspects that stem from increased extreme weather events, rising temperatures, changing precipitation patterns, sea level rise, and other aspects of climate on which the environment and human systems depend.
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Appendices

