RVAgreen 2050 Buildings & Energy Working Group

November 18, 2020

City of Richmond RVAgreen 2050

Equitable climate action for a healthy and resilient Richmond

Agenda

- Ground rules
- What is RVAgreen 2050?
- Icebreaker! Getting to know each other
- Presentation: Setting the stage for equitable climate action & resilience
- Logistics and next steps

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Who is here?

Name…Organization…Richmond Neighborhood
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Ground Rules / Group Expectations

Sustainability Accomplishments

2010

Sustainability Manager appointed

Released 2008 Greenhouse Gas Inventory

2011

Developed 2011 Green Government Order

Helped create Richmond Grows Gardens

2012

Developed Sustainable and Green Purchasing Policy

Developed City's first sustainability plan

2013

Virginia Municipal League Green Government Challenge – Platinum Award

Helped city buildings achieve LEED certification via renewable energy credits

ULI Vision Award – Best Example of Public Policy RVAgreen Sustainability Plan

2014

Founding partner to help create Beautiful RVA

2015

Oversaw **sustainability efforts for 2015 Road World Cycling Championships**-achieved UCI ReCycling eco-label-first ever for this event in its history

2016

2016 Mayor's Climate Protection Awards
1st Place – Large City Category

Governor's Environmental Excellence Gold Award
UCI Road World Championships 2015

2017

City of Richmond RVAgreen 2050

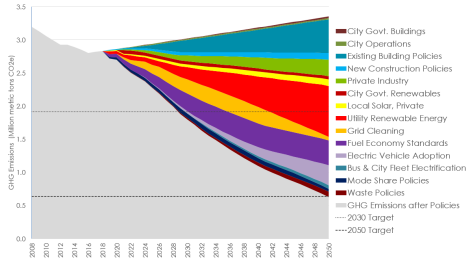
Launched **RVAgreen 2050**

Conducted Urban Heat Island (UHI) Study & UHI Vulnerability Assessment

2018

SolSmart Silver Certification and Special Recognition – Inspection Category

Conducted climate and energy modeling to support RVAgreen 2050



2019

Developed **Climate Equity Index** to identify neighborhoods most impacted by climate change

Worked with VA Clean Cities to conduct **Green Fleet Analysis** & develop **Green Fleet Report**

Secured **$152,000** in technical assistance to support RVAgreen 2050

2020

Net Zero Resolution adopted

RVAgreen 2050 inclusive community engagement process

RVAgreen 2050 Process

Planning Process Groups - Roles

Frontline Community Leaders (Roundtable)	• Help the City center equity in the planning process and elevate frontline community voices • Share lived experience to inform and guide process and provide recommendations • Serve as liaisons to ensure community needs and assets are integrated into planning process
Working Groups	• Provide topical expertise on RVAgreen 2050 goals and strategies to Roundtable • Assist with translating community priorities into equitable climate action and resilience strategies
Sustainability Office	• Primary convener • Bridge between community and City • Support community leaders to navigate current systems and identify leverage points for change
Third Parties	• Facilitator for Roundtable • Equity coach/consultant and technical consultants for Office of Sustainability staff • Local universities – research, documentation, process evaluation support

Technical Working Groups

Buildings & Energy

"Accelerate the transition to healthy, resilient, zero-carbon buildings and equitable energy sources"

topics:

- CHP (private industry)
- Bldg Weatherization
- Code Enforcement
- Streetlight Upgrade
- EV/Solar Readiness Requirements
- Renewable Energy (private vs. municipal)
- Existing Bldg Performance Codes and Standards
- Industrial Energy Efficiency
- Benchmark Govt Bldgs
- Benchmark Private Bldgs
- Private Bldg Energy Retrofits
- Govt Bldg Energy Retrofits
- Water/Wastewater Efficiency Upgrades (incl. built water/stormwater/wastewater infrastructure)
- Decarbonization thru Local Codes
- Performance-Based Procurement (Govt Bldgs)
- Grid/Energy Security and Resilience
- Reduce Natural Gas Leakage
- Green Building Standards
- Anaerobic Digester Upgrade

Transportation & Land Use

- *"Accelerate the transition to clean, and equitable mobility systems"*

topics:

- Transit-Oriented Development
- EV Charging Intrastructure, Education, Incentives
- EV Market Transformation Programs
- Low Emissions Zones /
- Congestion Pricing
- Expand Public Transit
- Electrify City Fleet
- Electrify GRTC
- Electrify private vehicles
- Bike / Pedestrian Networks (Active Transportation)
- Parking Managemen
- Land Use (incl. zoning for renewables like groundmount)
- Densification
- Shared mobility
- Autonomous vehicles
- Ridesharing and Ridehailing services

Waste

"Eliminate our dependency on landfill disposal and foster sustainable consumption habits"

topics:

- Recycling
- Composting
- Anaerobic Digester Upgrade
- Circular Economy
- Zero waste
- Solid waste management
- Waste reduction
- Consumption

Community

"Create an equitable, healthy, prosperous, and resilient Richmond for all while ensuring focus and honoring community priorities"

topics:

- Workforce development programs (incl. well-paying, sustainable jobs)
- Cooling infrastructure
- Local energy resource centers
- Community resilience hubs
- Disaster risk management / warning systems
- Local healthy food systems (incl. food access, gardens)
- Equitable engagement and communication (incl. listening to community leaders, addressing immediate needs, and maintaining and building relationships)
- Government accountability
- Beautiful and safe neighborhoods (incl. beautification, litter prevention, green space, sidewalks)
- Affordable infrastructure
- Physical and mental health
- Multicultural communications
- Income and racial equity
- Money saving
- Youth
- Displacement and aging in place; shelter
- Homeownership and wealth building
- Violence and public safety
- Clean water, clean air
- Making sustainability relevant to all communities and ensuring it reaches all communities

Environment

"Invest in Ecosystem Resilience, Regeneration, and Conservation"

topics:

- UHI reduction, more green, less paved
- Green space and tree canopy protection/ development
- Env. protected/sensitive areas/zoning
- Stormwater infrastructure - GI
- Water quality and conservation
- Biodiversity

Icebreaker

- **Breakout rooms:** What motivates you to help make Richmond more equitable, healthy and resilient?

- *Reminder: shorturl.at/vCKPU and update your contact info!*

Presentation:

Setting the Stage for Equitable Climate Action & Resilience

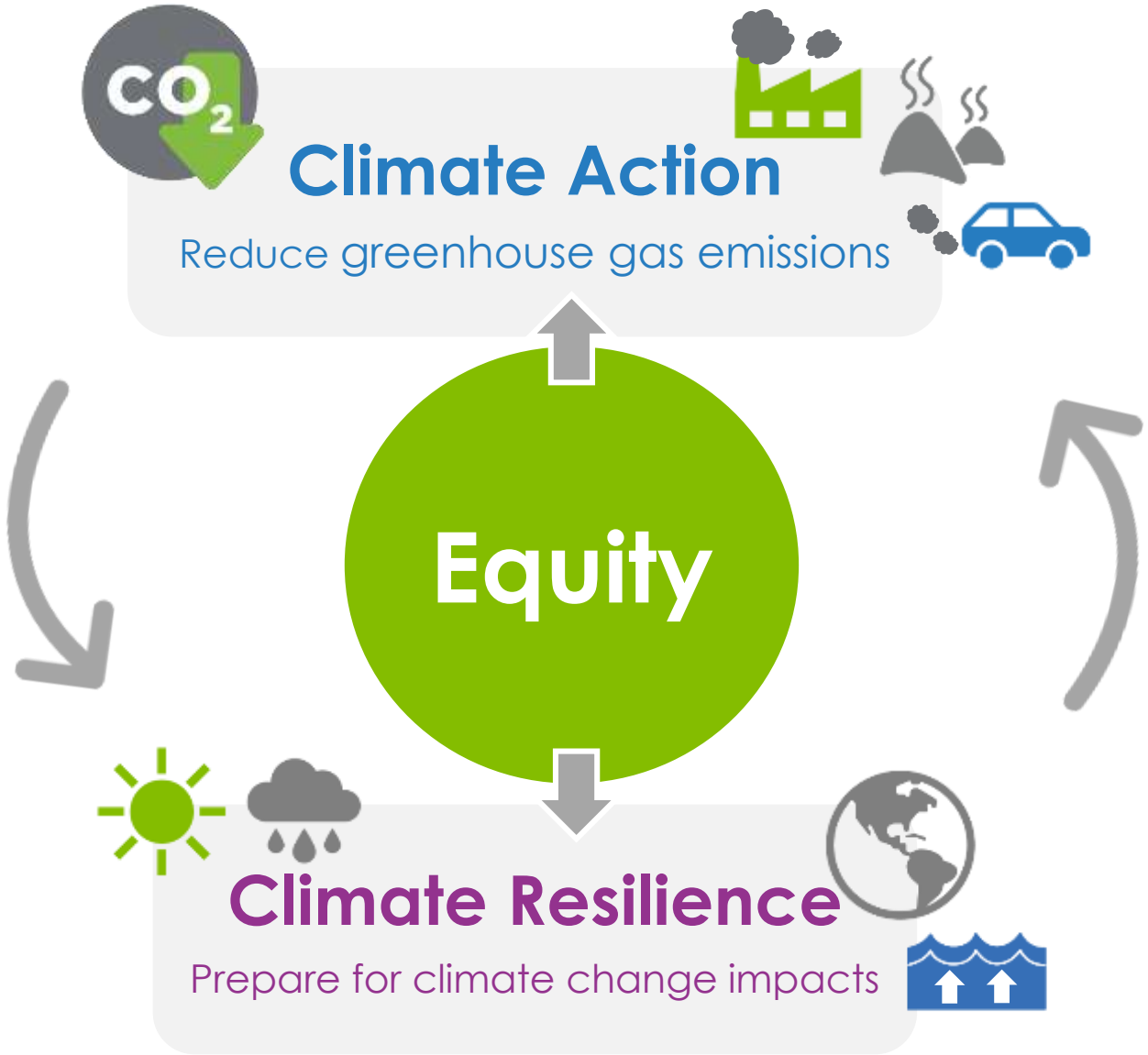
City of Richmond

RVAgreen 2050

What is climate action and resilience planning?

Traditional approach:

RVAgreen 2050 - *Integrated approach:*



City of Richmond
RVAgreen 2050

Equitable climate action for a healthy and resilient Richmond

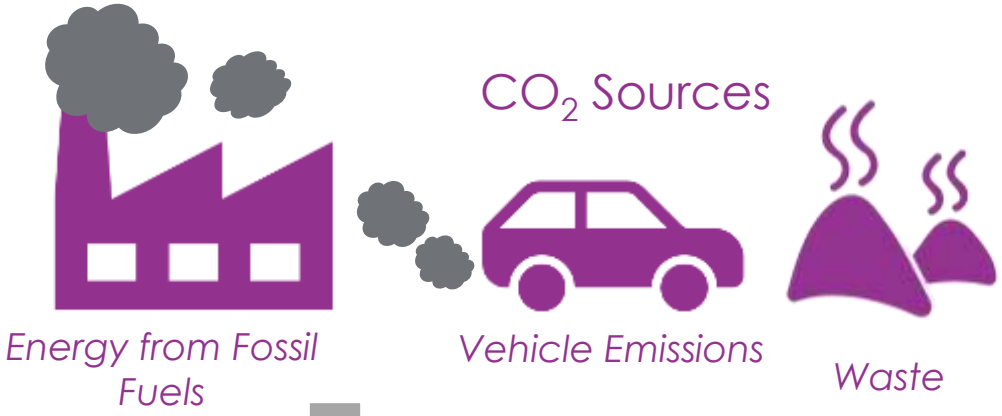
Climate Action

What is Climate Change?

Climate change is a shift in the long-term, average weather pattern

Human-caused emissions—especially from burning fossil fuels—are driving climate change

Climate Change = Climate Impacts



Climate Impacts

Extreme Heat
Extreme Precipitation
Rising Sea Level

Climate Shocks

Floods
Storms

Climate Risks

Residents

Safety
Health
Economic Burden
Food Insecurity

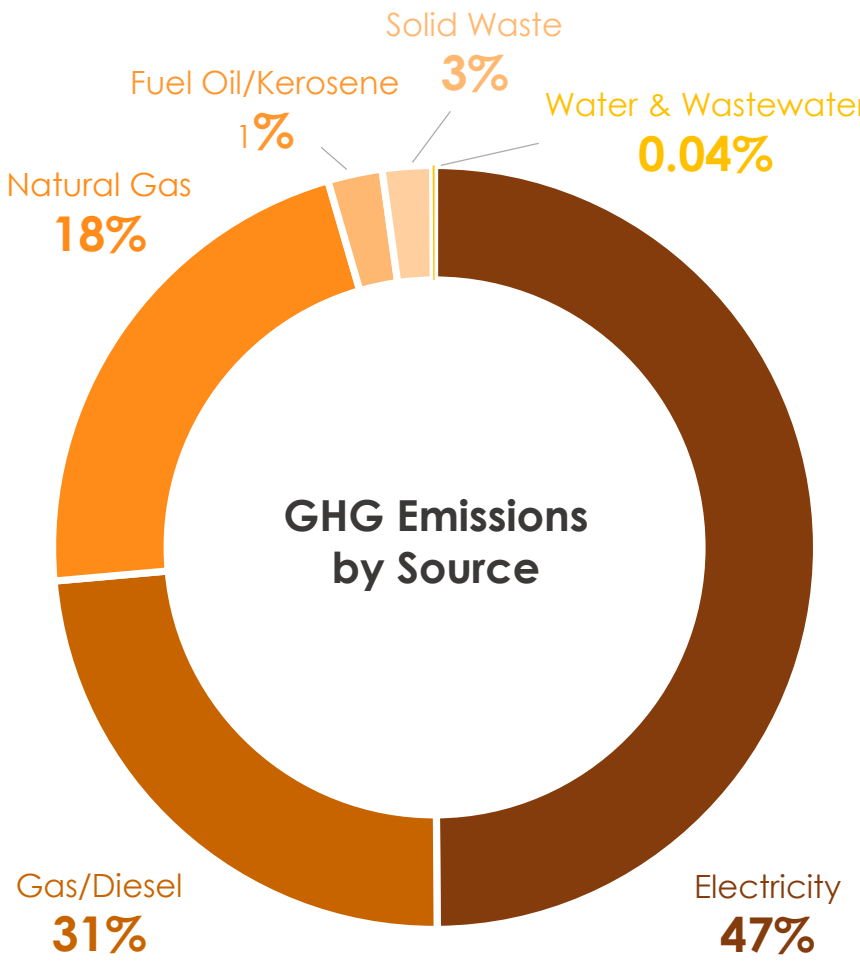
Community

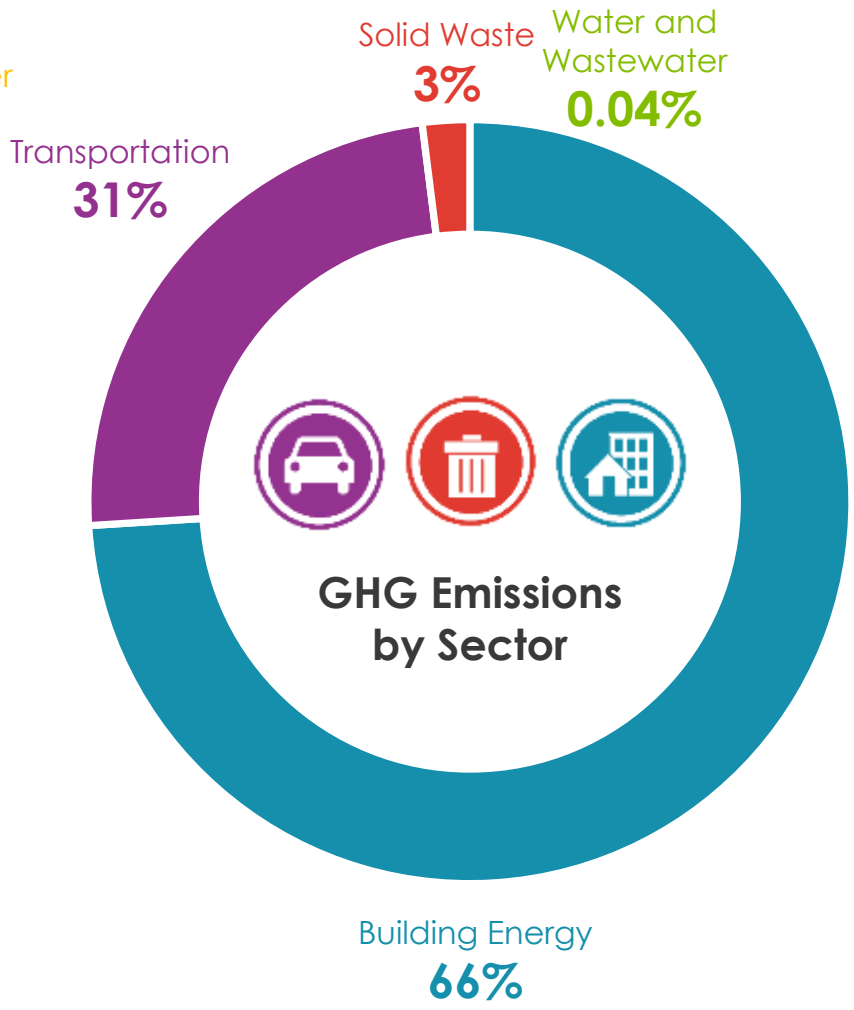
Public Safety
Public Health
Physical Damage
Displacement

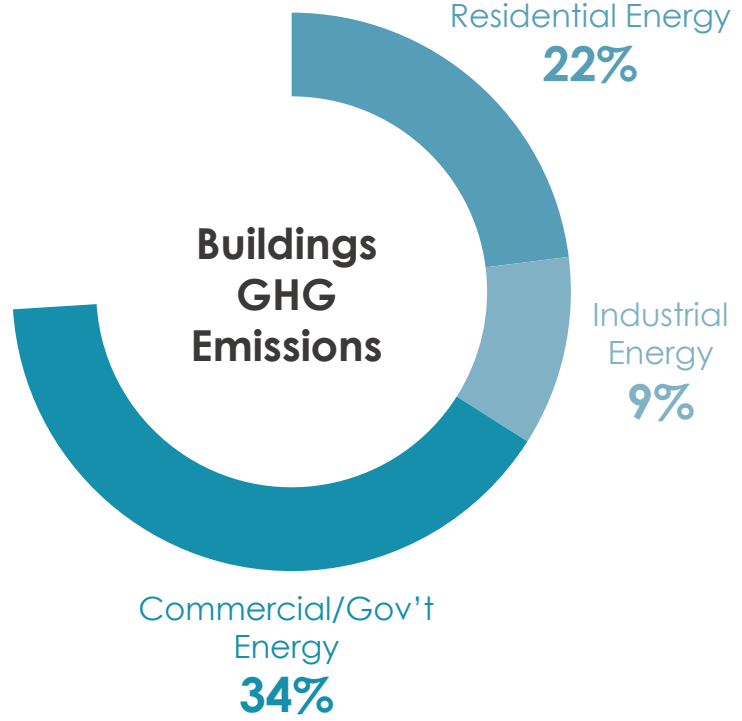
Government

Public Safety
Core Services
Education
Poverty Mitigation
Financial/Credit Risk

Richmond Community GHG Emissions

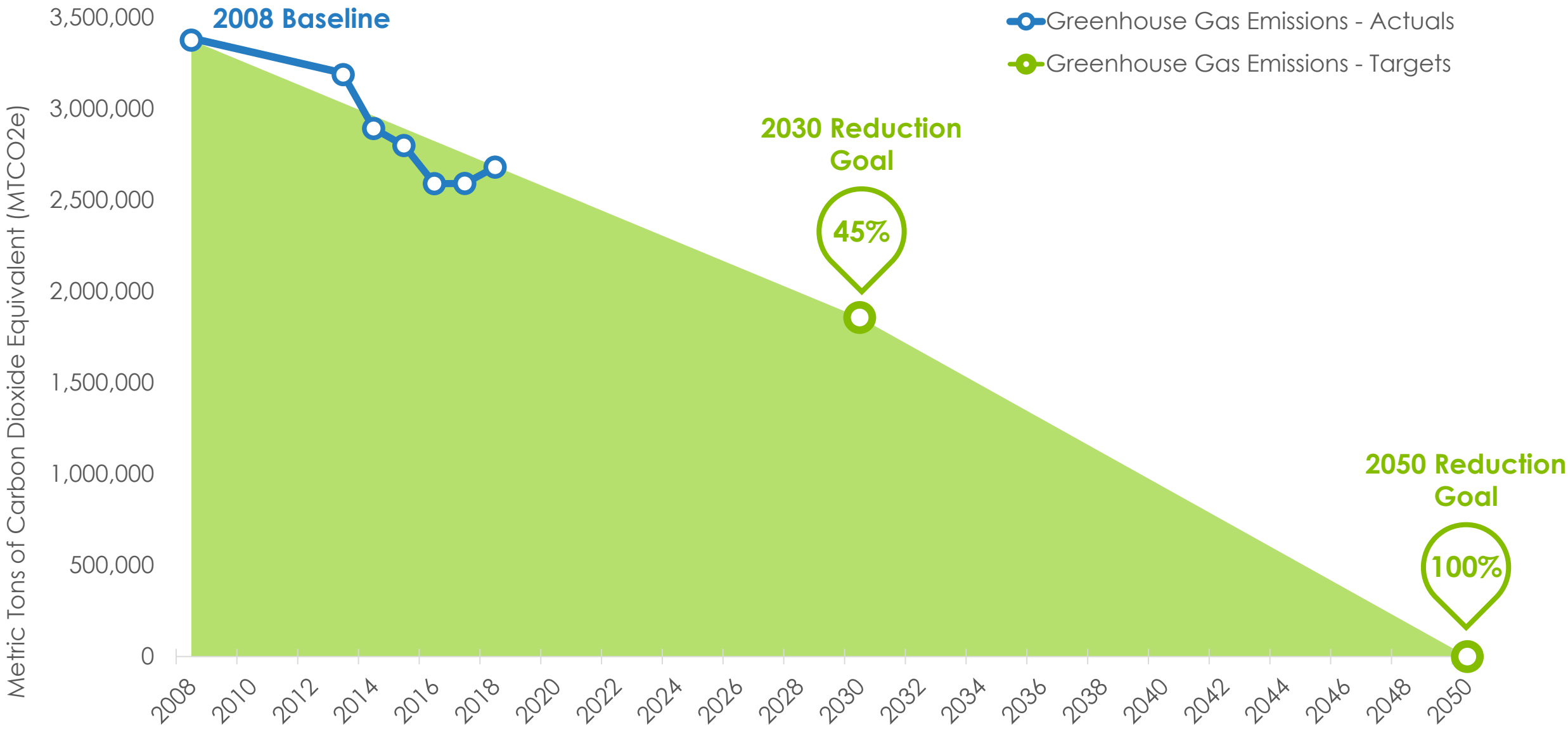






2018 Community GHG Emissions
Source: Richmond Greenhouse Gas Inventory

Citywide GHG Emissions and Targets

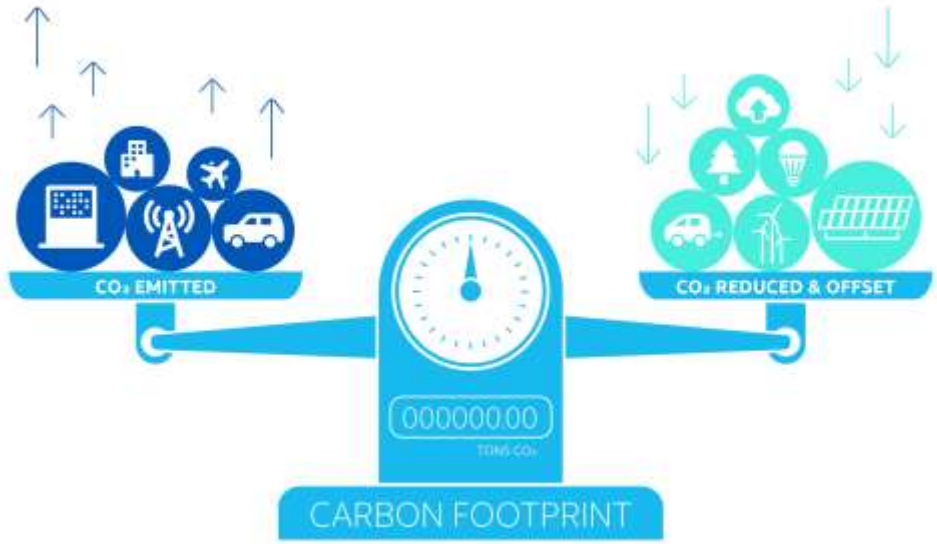


What is Carbon Neutrality?

Emissions produced from energy supply + buildings + transportation + waste

=

emissions captured locally + emissions offset



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Equitable climate action for a healthy and resilient Richmond

Climate Resilience

Climate Change is Already Impacting Richmond

April 19, 2017

allergy season in Richmond

This year brought Richmon
fourth-highest tree pollen
in 30 years

May 26, 2017

Two water rescues F
James, which is unde
warning much of the

September 17, 201

Remnants of Hurri
gave the Richmond
deadly tornado in 2

February 13, 2017

The warm weather is gone fo
now, but Sunday left a mark
Richmond's records

May 10, 2017

Science shows Richmon
season more intense th

February 25, 2019

James River hits highest lev

July 20, 2019

Excessive Heat Warning
in some parts of Central

October 19, 2018

Michael, Florence an
deadliest hurricane s

August 5, 2019

'We haven't really seen anything li
Richmond couple comes across flo
during walk

September 27, 2019

Richmond's September weather is going to
rank high for heat and low

October 2, 2019

Wednesday was the hottest Oc
recorded in Richmond — and t
over

October 10, 2019

Drought expands across Virgi

RICHMOND, Va. — The latest update from the U.S.
Virginia in a moderate drought. This is an increase

November 12, 2019

4 PM UPDATE: Dry and fri
after Richmond's snowies
30 years

February 3, 2020

Early spring-like weather c
tracking chance of sprinkle

Rain becomes more likely Wednesday.

February 18, 2020

Henrico storm spotter compares weather this February
to prior years - the difference

January 2020 was Earth
January on record

The long-term trend of above-average temperatu

Climate Satellites | climate analyses and statistics

April 30, 2020

February 1
warmer Ja
Environme

After Richmond's wett
months, the James Riv
another minor flood

May 24, 2020

Summer weather outlook: extra warmth and
rainfall favored across Va.

July 20, 2020

Richmond's heat wave continues after hotte
day of the summer on Sunday

Four Seasons Resort

July 29, 2020

Richmond hasn't seen 20 straight days of high
in the 90s since 'Waterworld' was in theaters

October 15, 2020

U.S. Winter Outlook: Cooler North,
warmer South with ongoing La Nina

Persistent drought dominates the Western landscape

November 12, 2020

UPDATE: James River in Richmond could rise
to its highest levels since 1996 following
downpours

Richmond's Future Weather

	Daily Temperature Maximum	Hot Days	Extended Heat Waves	Days with Over 1" Rainfall
2041-2060 Tomorrow	**75°F**	**45** Above 95°F	**20** 3-Day Periods	**8.8** Per year
1987-2017 Today	**70°F**	**11** Above 95°F	**3** 3-Day Periods	**8.3** Per year
1950-1980 Yesterday	**69°F**	**7** Above 95°F	**1** 3-Day Periods	**7.7** Per year

Climate Change Risks

Climate Impacts

Extreme Heat
Extreme Precipitation
Rising Sea Level

Climate Shocks

Floods
Storms

Climate Change Risks

Residents
Safety
Health
Economic Burden
Food Insecurity

Community
Public Safety
Public Health
Physical Damage
Displacement

Government
Core Services
Public Safety
Financial/Credit Risk

Government
Education
Poverty Mitigation

Injury/death
Illness/chronic conditions
Property damage/loss
Displacement
High energy bills
Higher food prices/food unavailable

Loss of life
Critical emergency provisions jeopardized (medical, water, food, shelter, etc.)
Population displacement
Population loss

Service delivery delay/disruption
Transportation/infrastructure assets damaged/destroyed
Communication networks impaired
Strain on financial resources

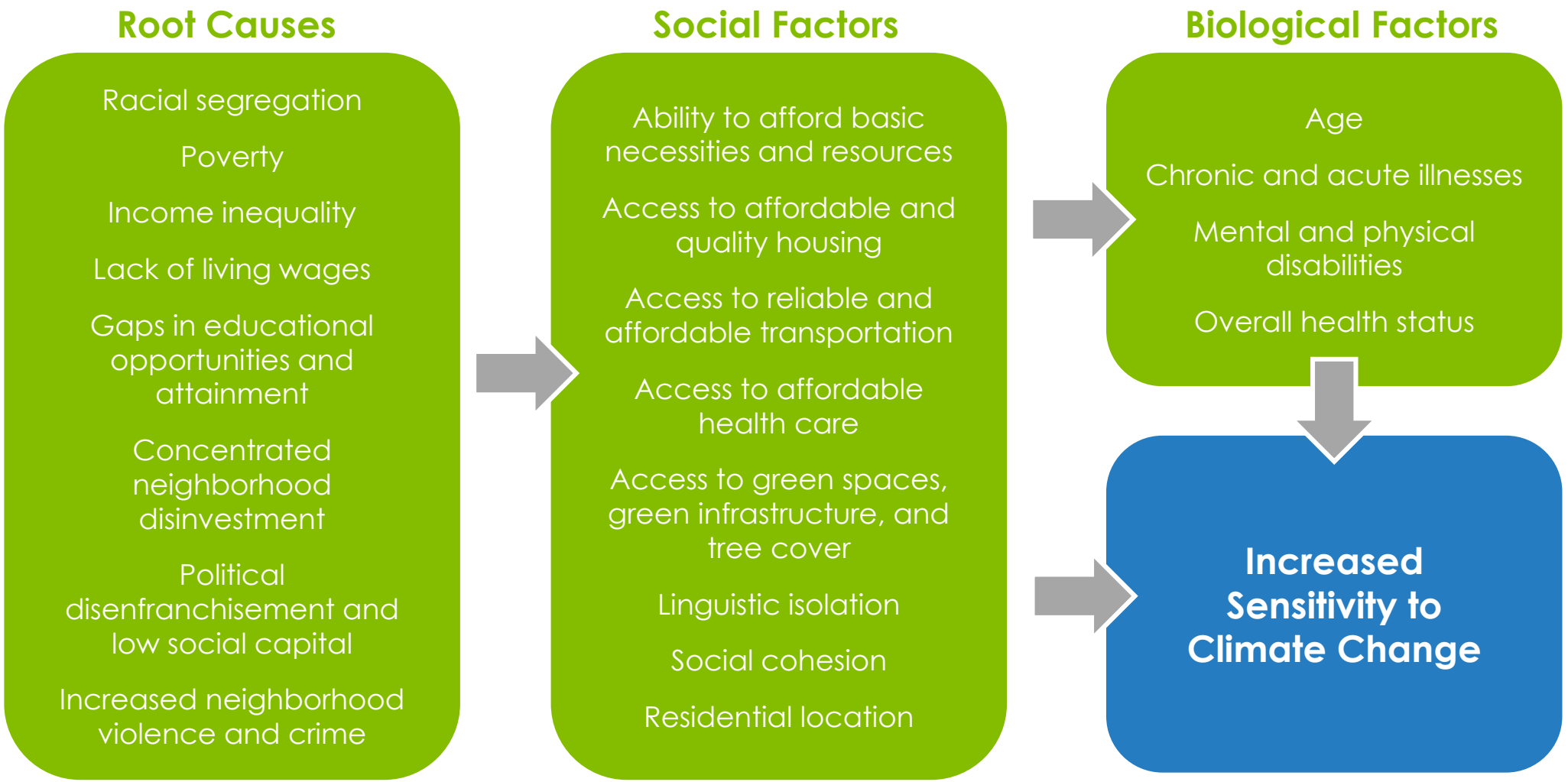
Schools closed/disrupted
Job disruption/loss
Property damage/loss

City of Richmond
RVAgreen 2050

Equitable climate action for a healthy and resilient Richmond

Equity

Climate Change Affects Some More Than Others



Source: Government Alliance for Racial Equity (modified)

Race, Income & Disproportionate Climate Impacts

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

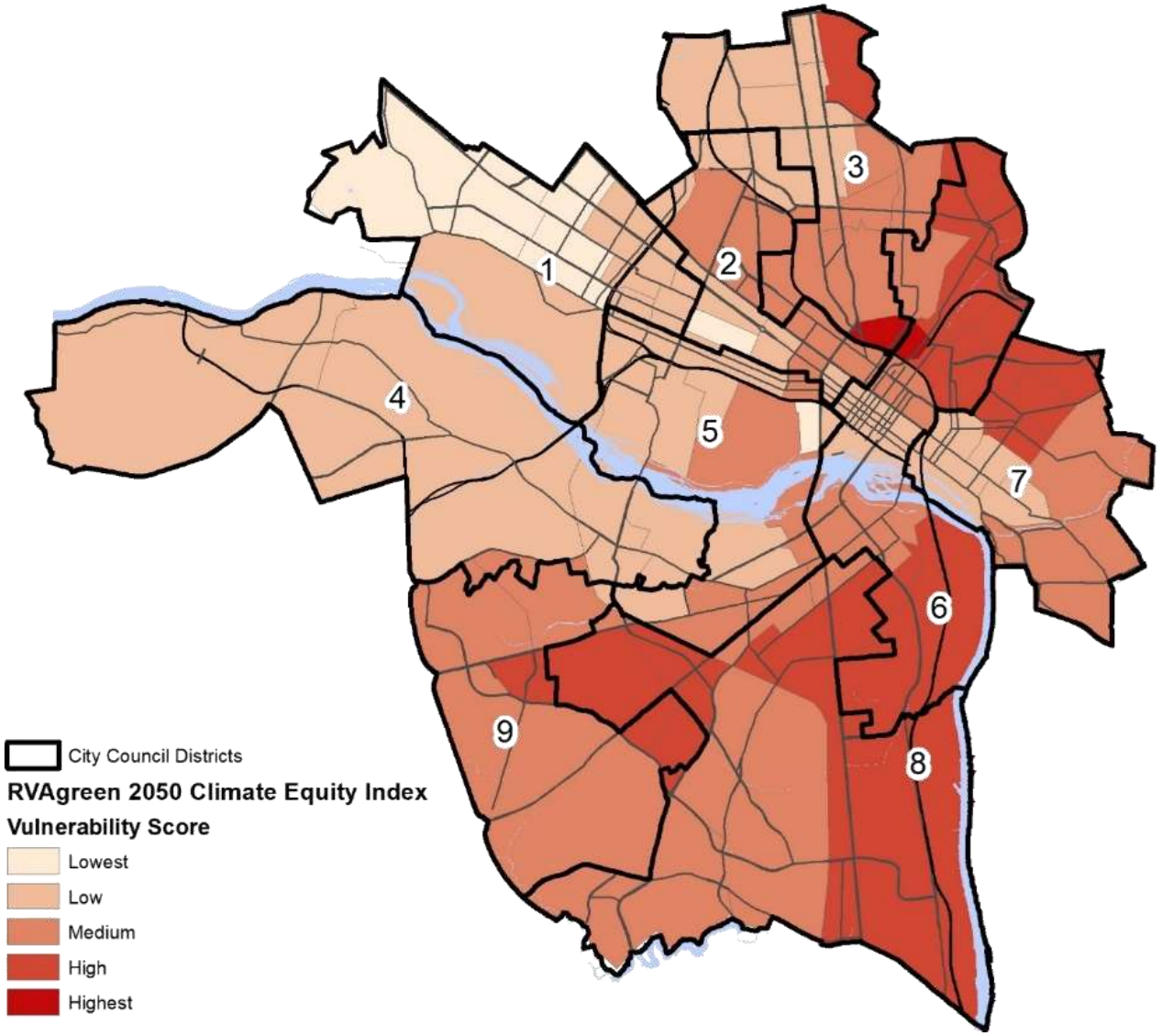
be impacted by extreme weather events as a result of climate change

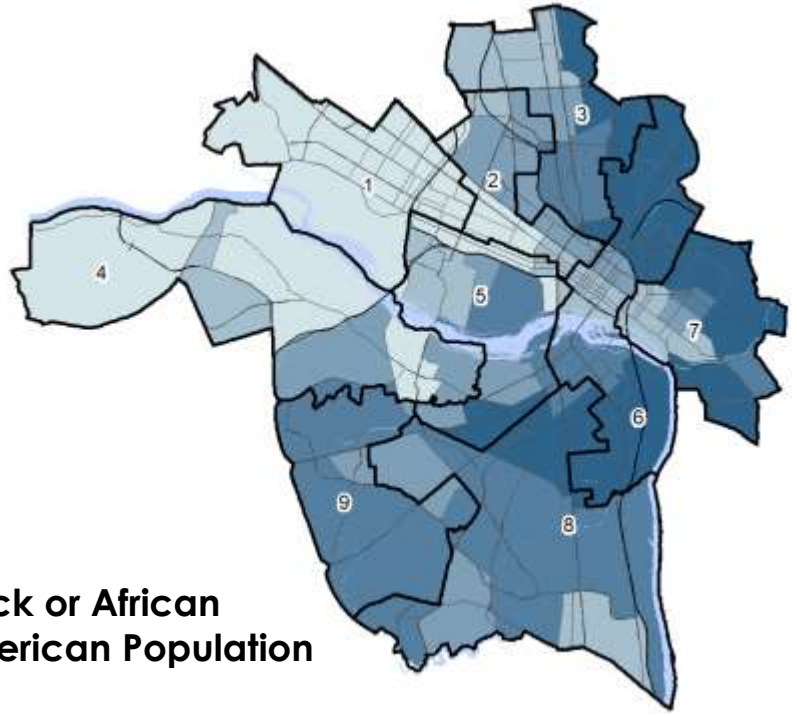
live in neighborhoods that lack convenient access to transit, or safe walking and biking options

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

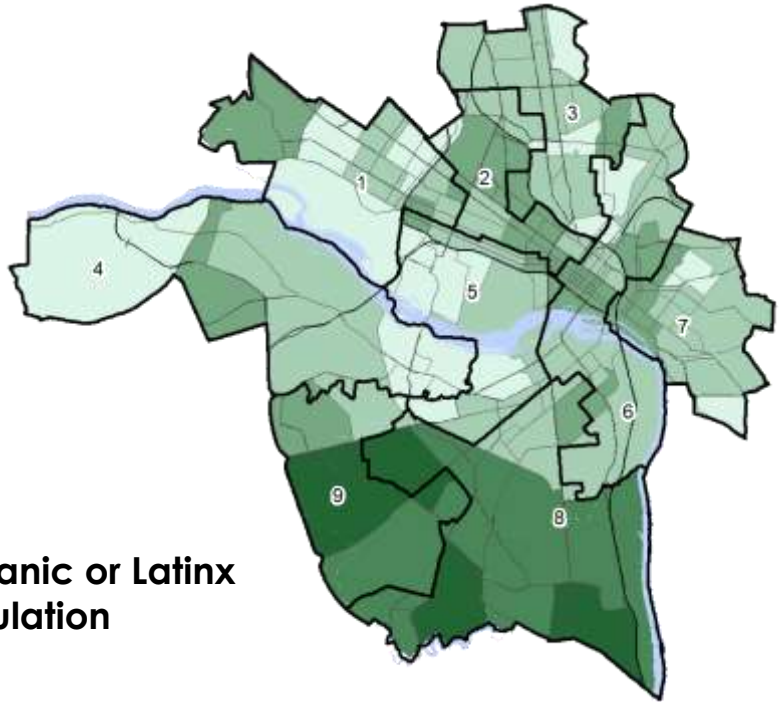
be exposed to pollution and airborne allergens and are more vulnerable to asthma and other respiratory illnesses

People of color face disproportionate impacts

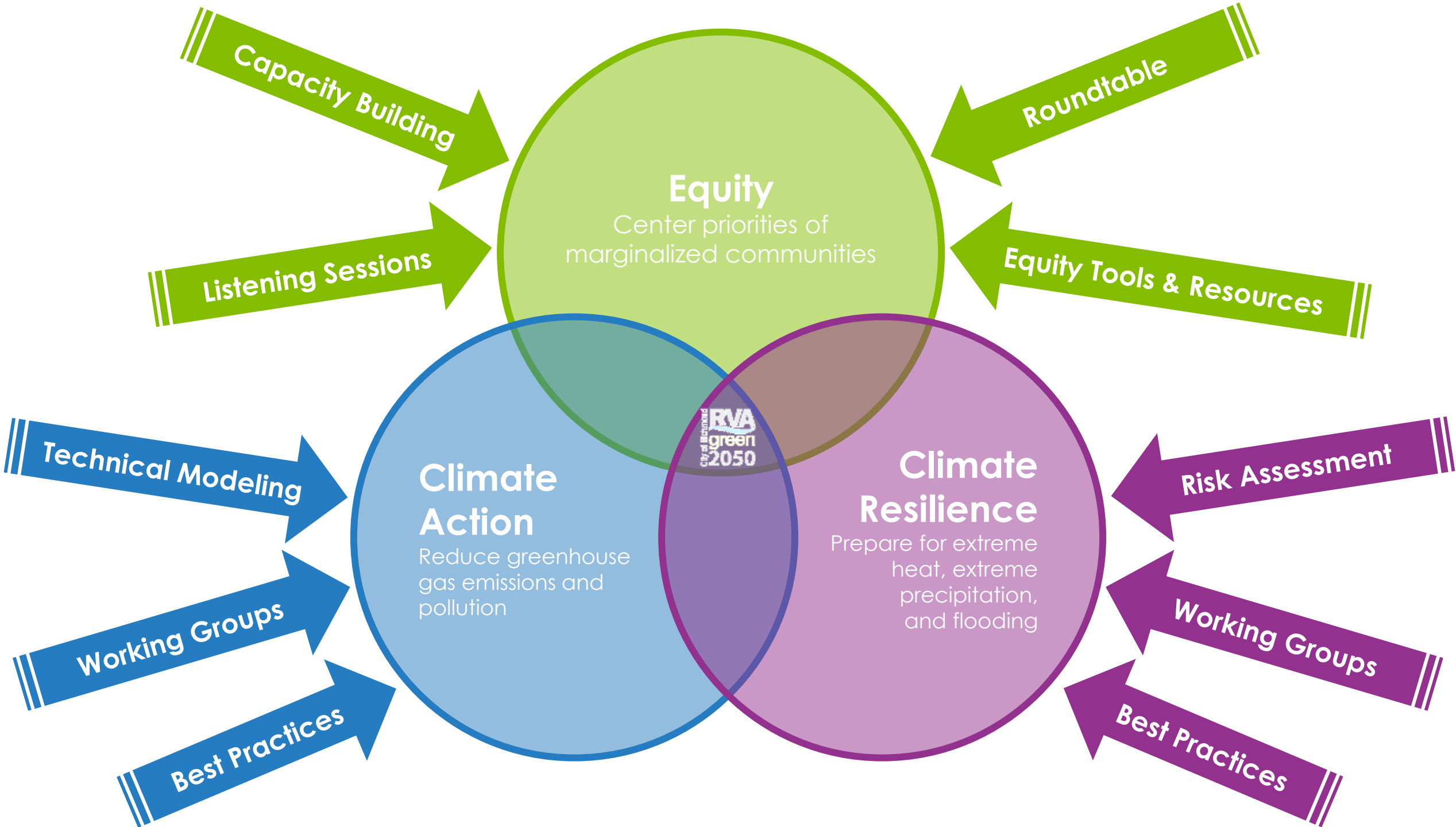




Black or African American Population



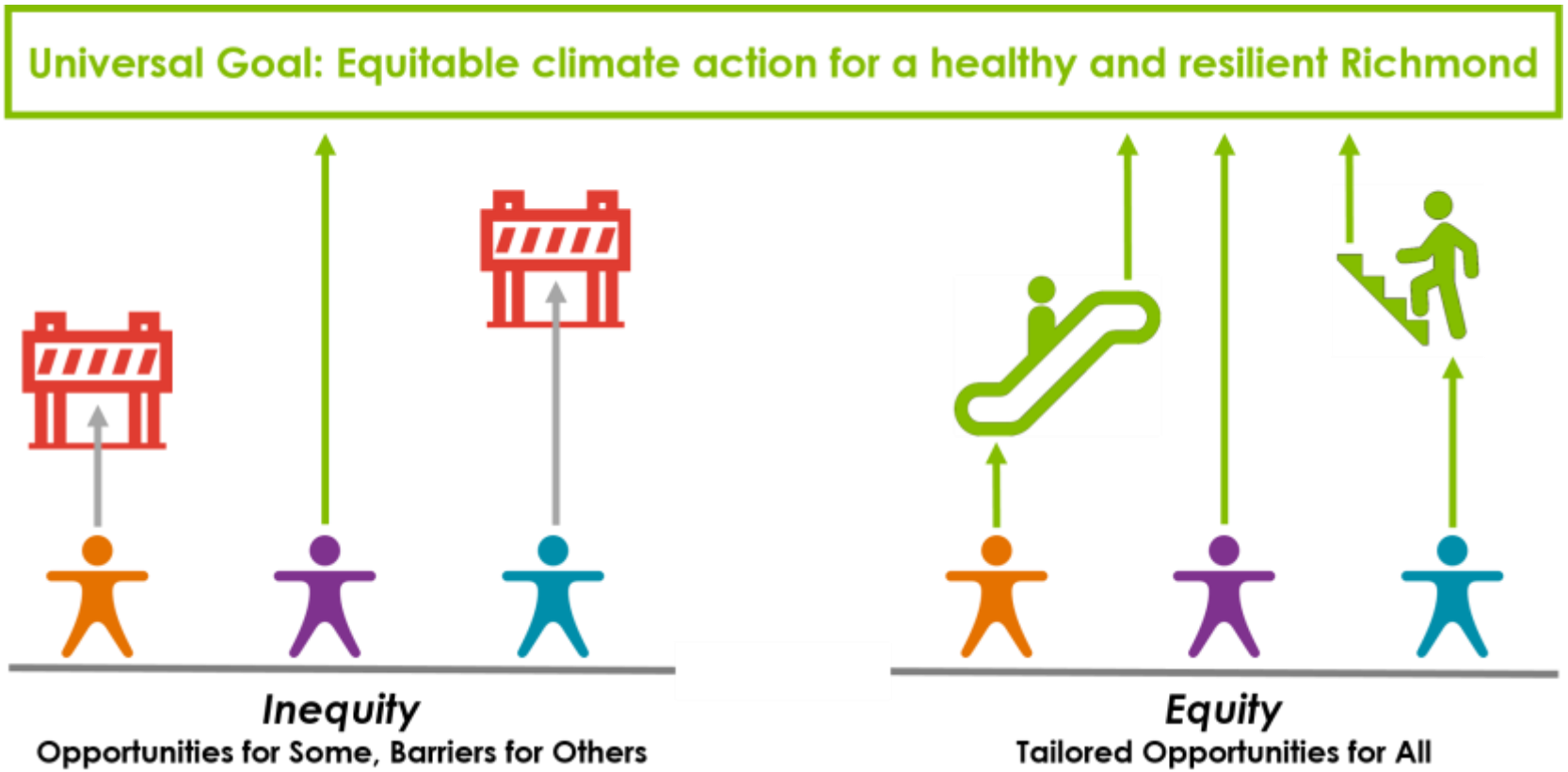
Hispanic or Latinx Population


Capacity Building
Roundtable
Equity
Center priorities of marginalized communities
Listening Sessions
Equity Tools & Resources
Technical Modeling
Risk Assessment
Climate Action
Reduce greenhouse gas emissions and pollution
RVA green 2050
Climate Resilience
Prepare for extreme heat, extreme precipitation, and flooding
Working Groups
Working Groups
Best Practices
Best Practices

Nexus Example

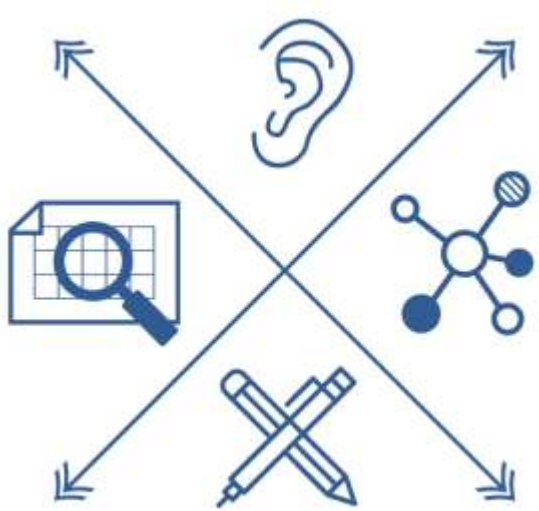
Universal Goal, Targeted Actions

Our **targeted universal strategy** is inclusive of the needs of both dominant and marginalized groups but pays particular attention to the situation of the marginalized group.



Source: Kapwa Consulting; John Powell, Hass Institute; City of Portland, OR (modified)

People-Centered Approach



We are using the **Virginia Community Voice Blueprint** to guide our efforts to engage and equip Richmonders in this process, particularly frontline communities.

Our approach begins with the identification of issues faced on a personal level and explores creative solutions that will best suit an individual's needs.

Understanding Community Priorities

Listen: Identify community strengths and challenges

- Listening sessions w/ frontline organizations (virtual)
- Gathering existing community-based plans, surveys, etc.
- Virtual Ambassador Program
- Community survey

Plan Development

Connect: Organize people around key issues

- Roundtable
- Topical working groups

Craft: Collaborate on equitable solutions

- Frontline community workshops
- Communitywide input Sessions

Reflect: Gather feedback for impact and improvement

- Mid-process equity assessment
- Final equity assessment
- Racial equity-specific indicators

Centering Equity

Source: Government Alliance on Race and Equity; Desiree Williams-Rajee, Kapwa Consulting (modified)

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

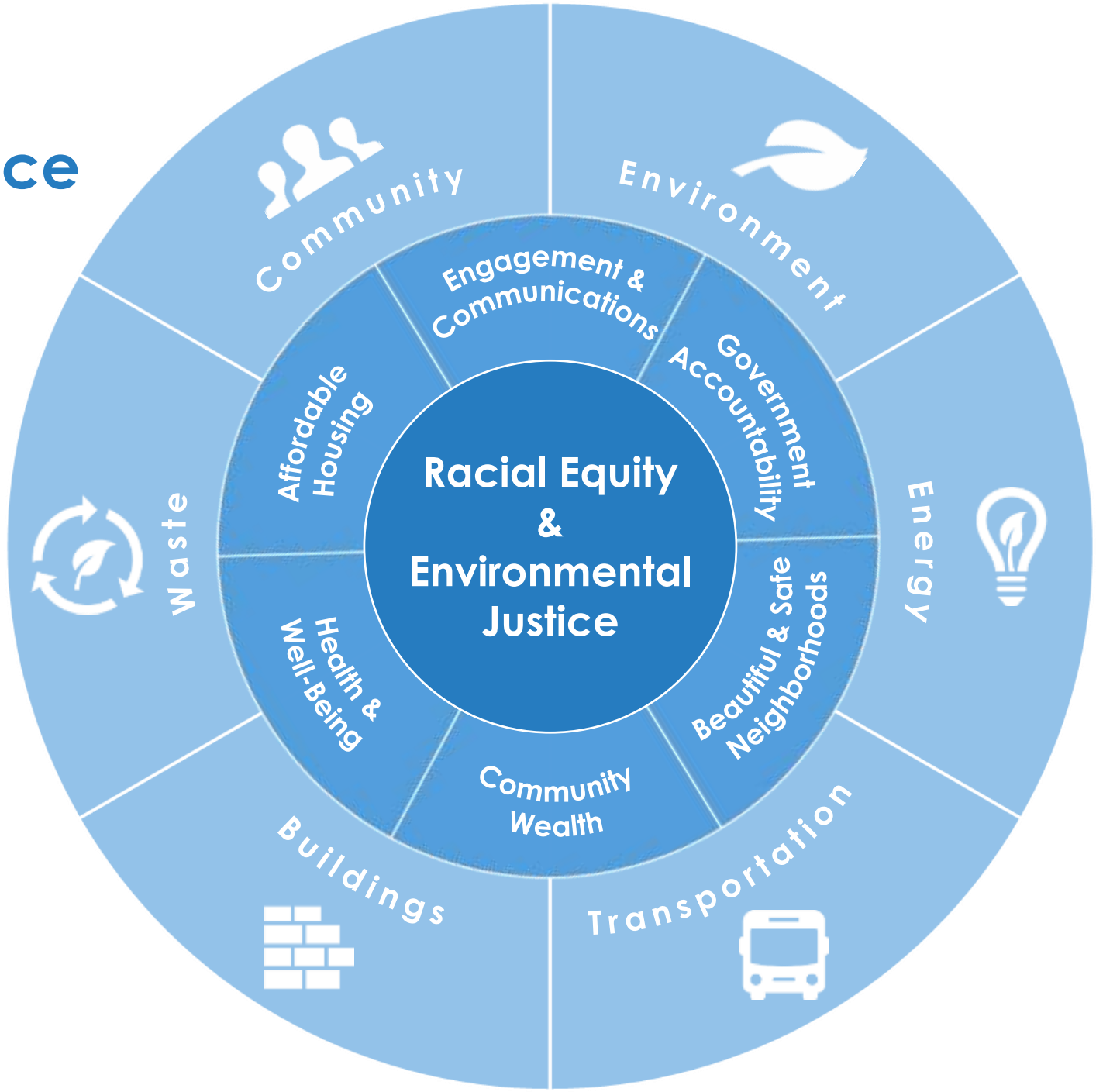
Fairly distribute resources, benefits, and burdens

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

Centering Community Priorities & Lived Experience



Our Toolbox…

A Next Step in City Planning

2012

RVAgreen Sustainability Plan

2013

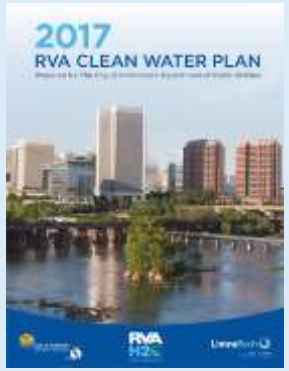
Richmond Connects Strategic Multimodal Transportation Plan

Recommends strategies for a multimodal transportation system for the city

2017

RVAH2O Clean Water Plan

Sets goals for reducing pollution and flooding



2018

Vision Zero Action Plan

Establishes strategies to address safety on city streets with a goal to eliminate fatalities and serious injuries by 2030

2020

Richmond Regional Housing Framework

Establishes a vision where everyone has a stable, healthy, and affordable place to call home

2020

Richmond 300 Master Plan

RICHMOND 300
A GUIDE FOR GROWTH

Establishes a vision for growth and outlines placed-based policy recommend-ations to guide physical development

2020

Net Zero Resolution

Sets goals to achieve net zero emissions by 2050, and prepare for, adapt, and improve resilience to local climate change impacts through an equity-centered climate action and resilience plan

NET ZERO GOAL
BY 2050

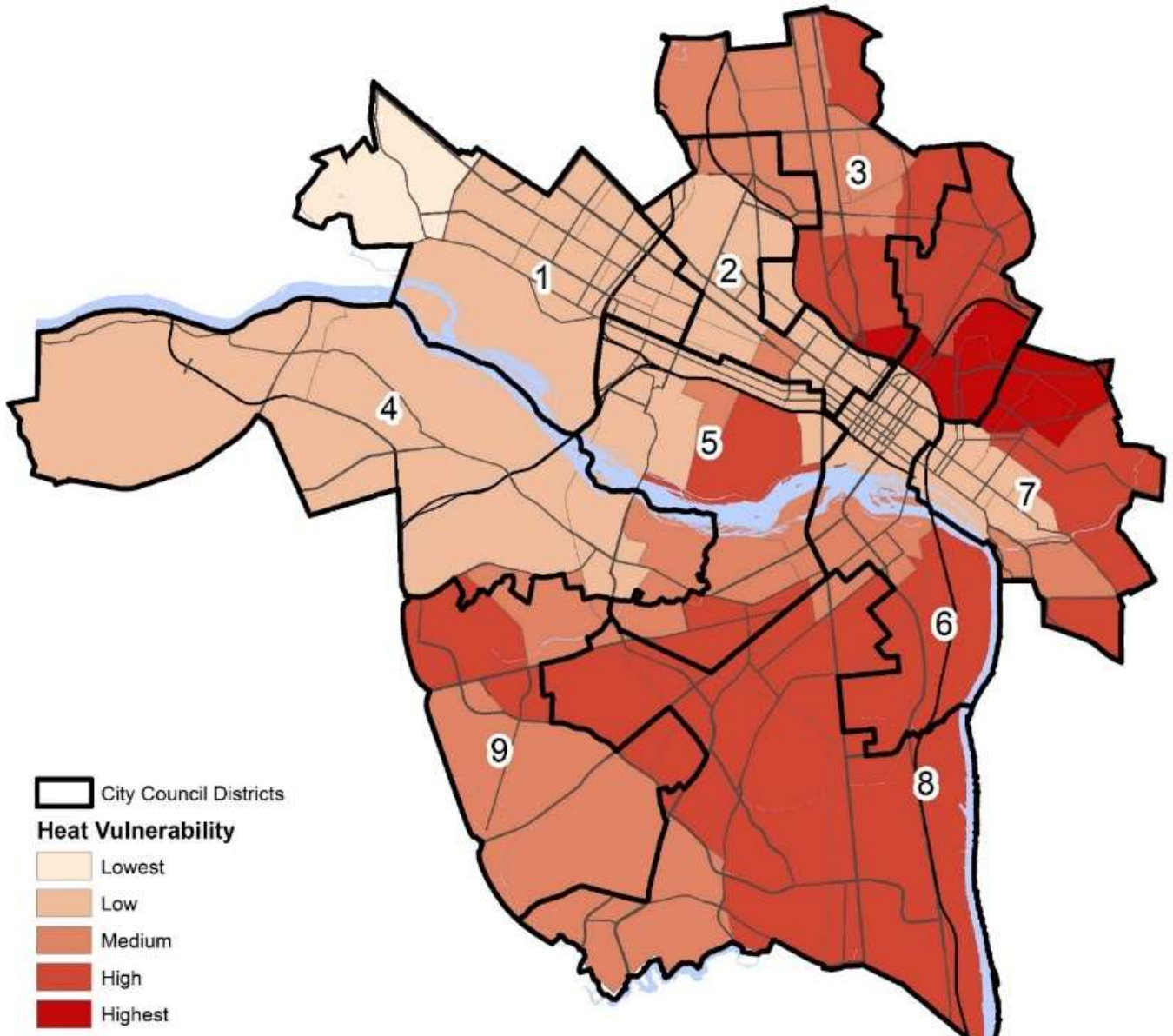
2022

RVAgreen 2050 Roadmap

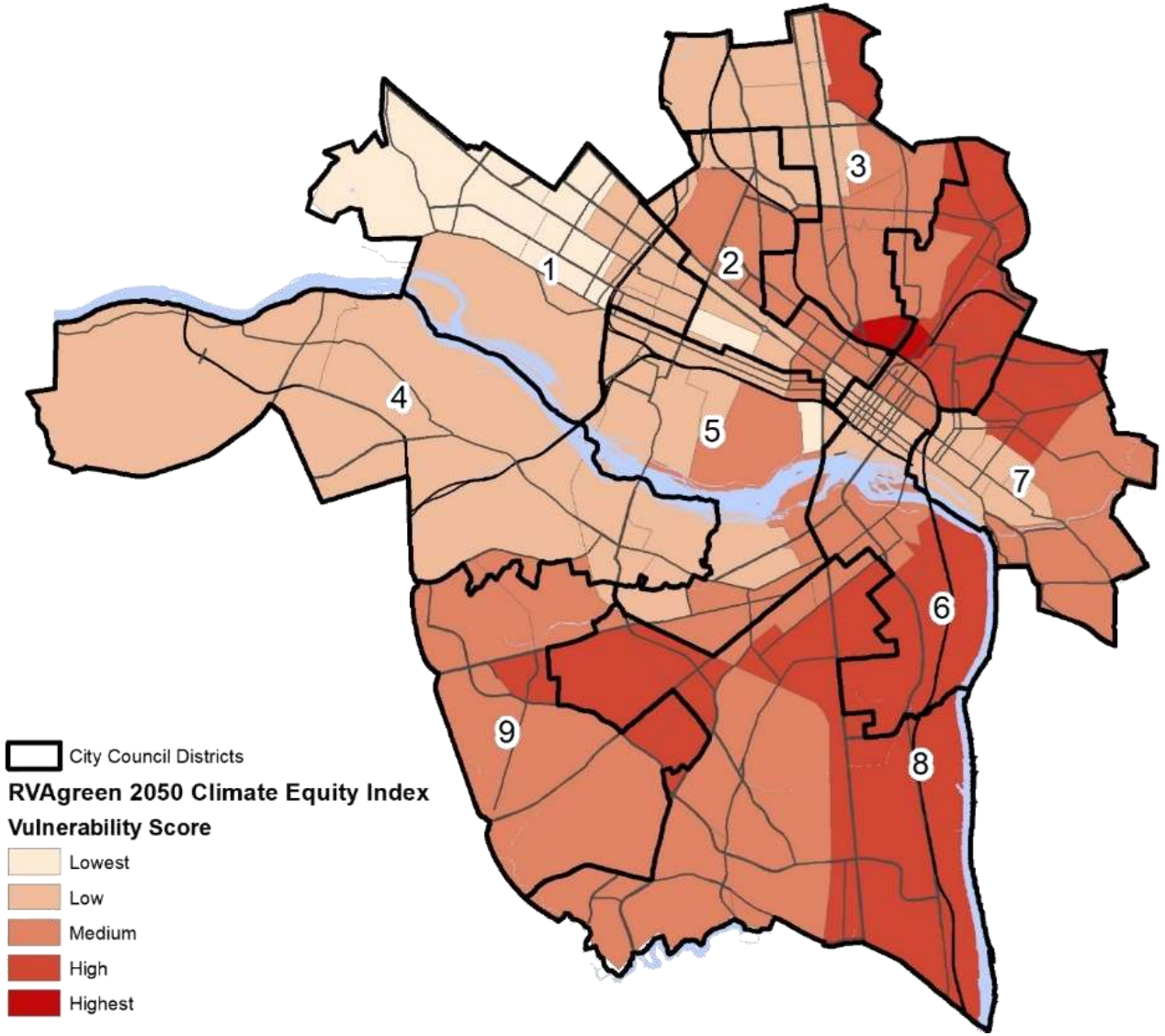
RVAgreen 2050 is the city's equity-centered climate action and resilience plan

RVAgreen 2050 is equitable climate action for a healthy and resilient Richmond

Urban Heat Vulnerability Assessment

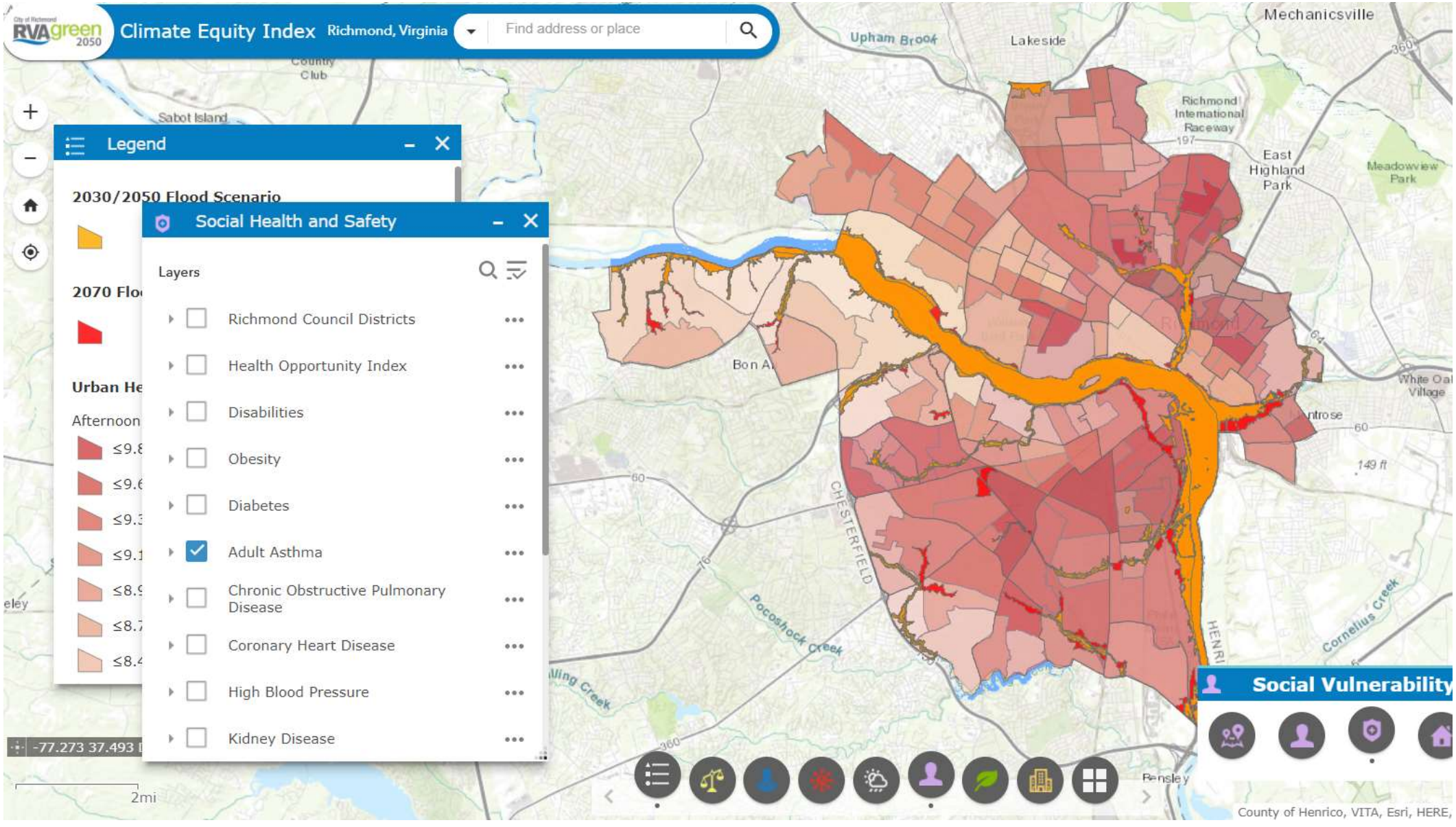


Climate Equity Index



- Poverty
- Age
- Race
- Gender
- Disabilities
- Chronic health conditions
- Mental health
- Household composition
- Working outdoors
- Public assistance income
- Housing characteristics
- Crime
- Education
- Language
- Social isolation
- Employment
- Transportation access
- Air conditioning
- Housing (shelters, group homes)

Climate Equity Index



Climate Vulnerability & Risk Assessment

What action is needed for Richmond to **prepare for** or **adapt to** climate change?

Climate Impacts Analysis

What will Richmond's **future climate** look like?

Vulnerability Analysis

What communities, built assets, and natural resources are **vulnerable** to those climate impacts?

Risk Analysis

What **risk** do the vulnerable communities, built assets, and natural resources face due to climate impacts? *(Economic, ecological, social, cultural, legal, etc.)*

Communities, built assets, and natural resources with **high vulnerability** and **high risk** are priority planning areas for climate adaptation actions

Engagement Phase 1: Understanding Community Priorities *(April – September, 2020)*

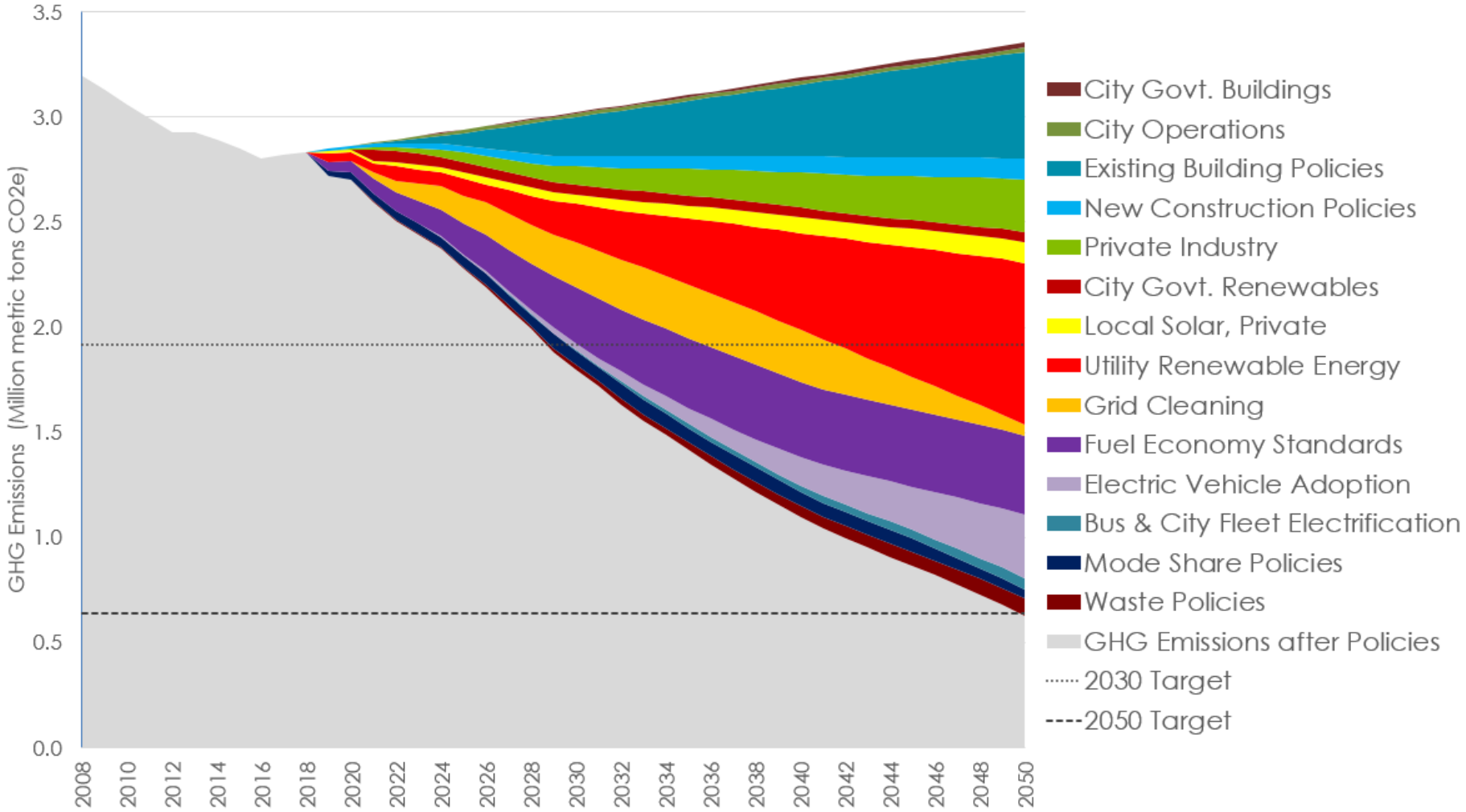
- Community-wide survey (470+ responses)
- Listening sessions (62)
- Virtual Ambassador Program (34 participants)
- Virtual "office hours"
- Roundtable & Working Groups (134 participants)
- Dedicated website, social media, e-newsletter

Understanding Community Priorities

The RVAgreen 2050 planning process is centered in equity and the priorities of the Richmond community. What we've heard so far:

GHG Mitigation Modeling

PREVIOUS *GHG Reductions for Goal Scenario (80% by 2050)*



Technical Modeling Action Matrix: Buildings

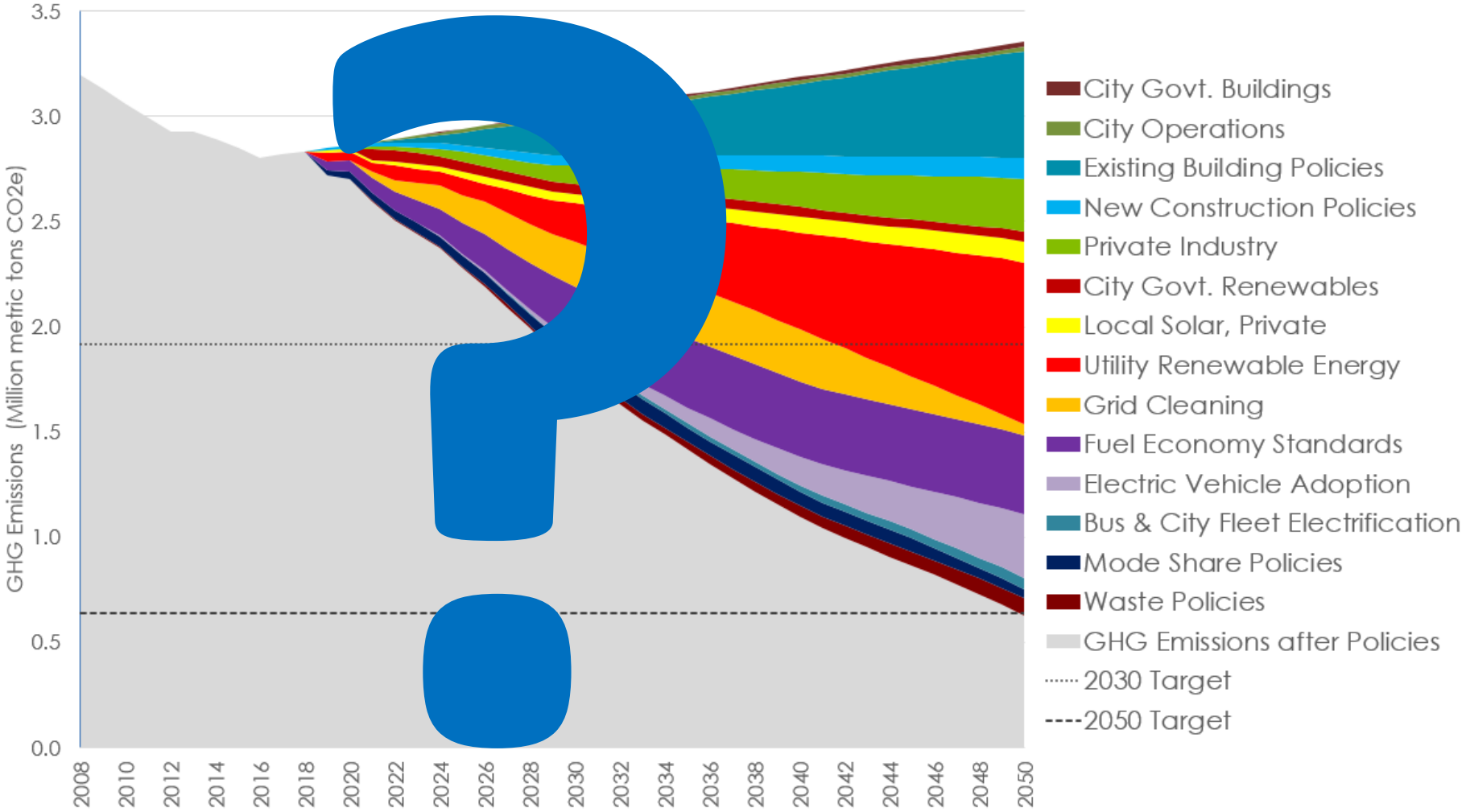
Sector	Action Wedge	Action #	Action Short Name	Goal Scenario: GHG Reductions in 2050 (tCO2e	Goal Scenario: Percent Reduction from 2050 BAU	Goal Scenario: Cumulative GHG Reduction Potenti 2020-20	Goal Scenario: Percent of Cumulative Emissio	Type of Action Modeled	General Action Description	Specific Action by City of Richmond	Metric	Sphere	Co-benefits	Aligned Adaptation Strategies	Estimated Cost	Estimated Benefits	Ease of Implementation	Potential Finance Sources
Buildings	Local Government Buildings	CB.1	Benchmark Local Government Buildings	See CB.3	See CB.3	See CB.3	See CB.3	Direct Policy Intervention	Benchmark all municipal buildings in ENERGY STAR Portfolio Manager, and disclose data. Conduct energy audits on poor performers to identify opportunities for improvement	same	Number of buildings benchmarked, and benchmarking results	Sphere of Control	Better information for action	Conduct resiliency audits to identify climate adaptation and resilience risks and opportunities	No upfront cost, just staff time (estimated to be 0.5-3 hours per building)	Average of 10% energy savings per building; captured within benefits from retrofits (CB.3)	Easy	No added costs
Buildings	Local Government Buildings	CB.2	Develop Energy Retrofit Plan	See CB.3	See CB.3	See CB.3	See CB.3	Not Modeled	Develop Strategic Energy Management Plan for municipal buildings	same	Plan results	Sphere of Control	Better information for action	Include adaptation strategies in plan	If done with an external consultant, $100,000-300,000, depending on scope.	Not specifically modeled	Easy	Budget Allocation
Buildings	Local Government Buildings	CB.3	Retrofit Government Buildings	**23,506**	**0.7%**	**325,032**	**0.7%**	Direct Policy Intervention	Retrofit all government buildings for deep energy efficiency over next 30 years, aiming for 50%+ reduction in energy use	same	Government electricity and natural gas use	Sphere of Control	Some adaptation-focused measures, such as passive survivability, are supported by energy efficiency retrofits. Job creation benefits. Reduced peak demand improves grid resiliency.	Include resiliency upgrades in building retrofits. Focus especially on supporting community needs through backup generation and community resilience hubs at public spaces.	$37 million in retrofit costs between 2020-2050	$105 million in energy savings between 2020-2050 $83 million in local economic benefit from existing building activities; Up to 56 jobs per year; $22 million in avoided carbon costs	Hard	ESCOs, Taxes, Bonds, Green Banks, Energy Efficiency Incentives
Buildings	Local Government Buildings	CB.4	Adopt performance-based procurement for new government facilities	See CB.3	See CB.3	See CB.3	See CB.3	Direct Policy Intervention	Include Performance Based Procurement measures in RFPs for new construction of public buildings and municipal land dispositions, to reward bidders that build high performance buildings (net zero, Passive House, Living Building Challenge)	same	RFPs issued	Sphere of Control	Health benefits from higher performing buildings	Adaptation-focused measures, such as passive survivability, backup generation, and flood control measures can also be included	Net zero energy (NZE) can have 0-5% cost premium on traditional construction; projects using the performance based procurement model have realized net zero at 0%	$30 million in energy savings from NZE-ready building construction	Easy	N/A - using performance based procurement neutralizes any potential additional costs
Buildings	City Operations	CO.1	Anaerobic Digester Upgrade	**16,340**	**0.5%**	**450,833**	**0.9%**	Direct Policy Intervention	Wastewater Biodigester: Conduct engineering analysis to expand and upgrade biodigesters so that the biogas output can be used in place of natural gas to produce electricity and thermal energy.	same	Analysis results	Sphere of Control	Reduced local pollution	As part of analysis of wastewater opportunities, analyze risks of flooding and other weather impacts to water/wastewater facilities and infrastructure	Not Calculated	$31 million in avoided carbon costs	Medium	ESCOs, operating revenue, green bonds
Buildings	City Operations	CO.2	Water and Wastewater Efficiency Upgrades	See CO.1	See CO.1	See CO.1	See CO.1	Direct Policy Intervention	As part of the Strategic Energy Management Plan, identify opportunities to reduce wastewater energy use and install on-site renewable energy	same	Analysis results	Sphere of Control		As part of analysis of wastewater opportunities, analyze risks of flooding and other weather impacts to water/wastewater facilities and infrastructure	Not calculated	Not calculated	Easy	ESCOs, operating revenue, green bonds, energy efficiency incentives
Buildings	City Operations	CO.3	Streetlight Upgrade	**2,184**	**0.1%**	**54,605**	**0.1%**	Direct Policy Intervention	Replace all city-owned streetlights with LED lights, use direct lumen-for-lumen match to maximize efficiency, and 3000 kelvin or less color temperature to protect human health and wildlife. Explore using public-private partnership to reduce costs.	same	Number of streetlights converted / Streetlight energy use	Sphere of Control	Supports human health and sleep cycles Supports wildlife by not disrupting natural patterns	Install sensors in new streetlights to monitor environmental conditions, and support a smart, connected city	$7 million to change all City-owned streetlights	$472,280 savings per year $12 million savings 2020-2050	Easy	Public-private partnerships, utility funding, green bonds, grants
Buildings	City Operations	CO.4	Study and Reduce Natural Gas Leakage	Not Modeled	Not Modeled	Not Modeled	Not Modeled	Not Modeled	Conduct study on local and upstream methane leakage	same	Study results	Sphere of Control	Reduced hazards from leakage		Low	N/A	Easy	Utility funds
Buildings	City Operations	CO.5	Account for Natural Gas Leakage in Climate Reporting	Not Modeled	Not Modeled	Not Modeled	Not Modeled	Not Modeled	Incorporate methane leakage into GHG inventories, as fugitive emissions line item, in line with GPC BASIC+	same	Fugitive emissions GHG line item in inventory	Sphere of Control	Better information for action		$0	N/A	Easy	No added costs
Buildings	Existing Building Actions	EB.1	Private Building Benchmarking	**78,580**	**2.4%**	**1,899,622**	**3.9%**	Market Transformation	All large private buildings annually benchmark their energy use in ENERGY STAR Portfolio Manager and report the results to the city, which publishes summary results online.	Lobby General Assembly to adopt legislation enabling local jurisdictions to require energy benchmarking and public disclosure, and adopt local ordinance requiring benchmarking by large private buildings	Short-term: Draft local ordinance to have at the ready in advance of state legislation	Sphere of Influence	Better information for action	Consider requiring or incentivizing resiliency audits to identify climate adaptation and resilience risks and opportunities.	Cost of $0-$2000 per year per building.	Average of 10% energy savings per building; captured in retrofit action (EB.2)	Medium	City enforcement fines, with initial support from foundations or general fund budget

Technical Modeling Action Matrix: Energy

Sector	Action Wedge	Action #	Action Short Name	Goal Scenario: GHG Reductions in 2050 (tCO2e	Goal Scenario: Percent Reduction from 2050 BAU	Goal Scenario: Cumulative GHG Reduction Potential 2020-20	Goal Scenario: Percent of Cumulative Emissio	Type of Action Modeled	General Action Description	Specific Action by City of Richmond	Metric	Sphere	Co-benefits	Aligned Adaptation Strategies	Estimated Cost	Estimated Benefits	Ease of Implementation	Potential Finance Sources
Clean Energy	Local Government Renewable Energy	RRE.1	Municipal Solar	7,435	0.2%	192,997	0.4%	Direct Policy Intervention	Install solar on municipal buildings to fullest extent possible (including parking lot canopies and solar at water treatment facilities). Recommend issuing RFP for large-scale PPA to achieve low price and large scale. Consider adding battery storage at critical facilities to enable uninterrupted operation.	same	MWs of solar installed on city facilities	Sphere of Control	Demonstrates leadership. Builds local industry for solar installation. Increases resiliency of government buildings in the event of power outages or other climate disruption, both to continue provision of critical services, and to offer community resilience hubs (if battery storage is included). Potential for job creation and economic growth.	Combine with battery storage to create community resilience hubs	$23 million over 10 years	$58 million in economic activity over 10 years; 42 jobs per year during install; 4 jobs annually for O&M	Medium	Power Purchase Agreement (PPA), existing electricity budget
Clean Energy	Local Government Renewable Energy	RRE.2	Municipal Renewable Procurement	38,340	1.1%	1,208,795	2.5%	Direct Policy Intervention	Purchase off-site renewable energy to cover remaining city demand after deployment of city-based solar, after conducting energy efficiency retrofits. Begin by investigating possibility of purchasing through VEGPA.	same	MWh of renewable energy purchased	Sphere of Control	Demonstrates leadership, and expands renewable energy installations statewide. If done through group purchasing, will have spillover effects to additional jurisdictions	N/A	If properly negotiated, PPA may be less expensive than current price of electricity, assuming that city pays standard commercial electricity rate currently	Annual electricity cost savings of ~$4 million/year; $126 million in avoided electricity costs due to PPA savings 2020-2050; 33 jobs created through indirect and induced benefits of reduced electricity spending; $86 million in avoided carbon costs	Medium	Power Purchase Agreement, existing electricity budget
Clean Energy	Local Solar	RRE.3	Private Building Solar	98,623	2.9%	1,841,251	3.7%	Sectoral Goal	Install solar across private buildings in Richmond to the greatest economic extent to meet more than 10% of electrical demand city-wide.	Offer tax credits for local solar and provide education. Advocate with Commonwealth and Dominion for increased solar incentives and reduced legal barriers	MWs of solar installed on private buildings.	Sphere of Influence	Increases resilience, especially if paired with battery storage. Improved local air quality. Reduced concerns about fuel supply disruptions. Potential for job creation and economic growth.	Promote battery storage combinations to increase resilience. Ensure ground-mount systems are not in flood zones.	$7 million per year / approximately $267 million between now and 2050	$494 million in economic activity between now and 2050; $121 million in avoided carbon costs 150 to 190 jobs per year	Medium	Utility incentives, local and federal tax credits, Power Purchase Agreements, grants, PACE loans
Clean Energy	Utility-supplied Renewable Energy	SRE.1	State Renewable Policy	769,125	22.9%	10,691,051	21.7%	Sectoral Goal	Make state Renewable Portfolio Standard stronger and mandatory, and continue to put in place strong renewable energy mandates through state energy plans and other state policies.	Adopt local resolution for 100% renewable (or carbon-free) electricity by 2050. Support stronger state Renewable Portfolio Standard and other requirements to provide support to meet this goal.	Grid Fuel Mix	Sphere of Interest	Reduced fossil fuel combustion in region will have positive impacts on air quality, which will improve human health and reduce the negative air quality impacts caused during heat waves.	N/A	Cannot be calculated at this time with available data	$547 million in avoided carbon costs	Medium	PPAs, state financing, cost recovery
Clean Energy	Utility-supplied Renewable Energy	SRE.2	Utility Renewable Purchase Option	See SRE.1	See SRE.1	See SRE.1	See SRE.1	Sectoral Goal	Utility bill option for 100% renewable energy	Work with Dominion to support development of regional renewable electricity and ability for City residents and business to buy green power	Grid Fuel Mix, Resident electricity costs	Sphere of Interest	Reduced fossil fuel combustion in region will have positive impacts on air quality, which will improve human health and reduce the negative air quality impacts caused during heat waves; positive equity impacts if electricity costs are reduced	N/A	Cannot be calculated at this time with available data	See SRE.1	Hard	PPAs, state financing, cost recovery

Climate and Energy Modeling-2020

GHG Reductions for Net Zero by 2050



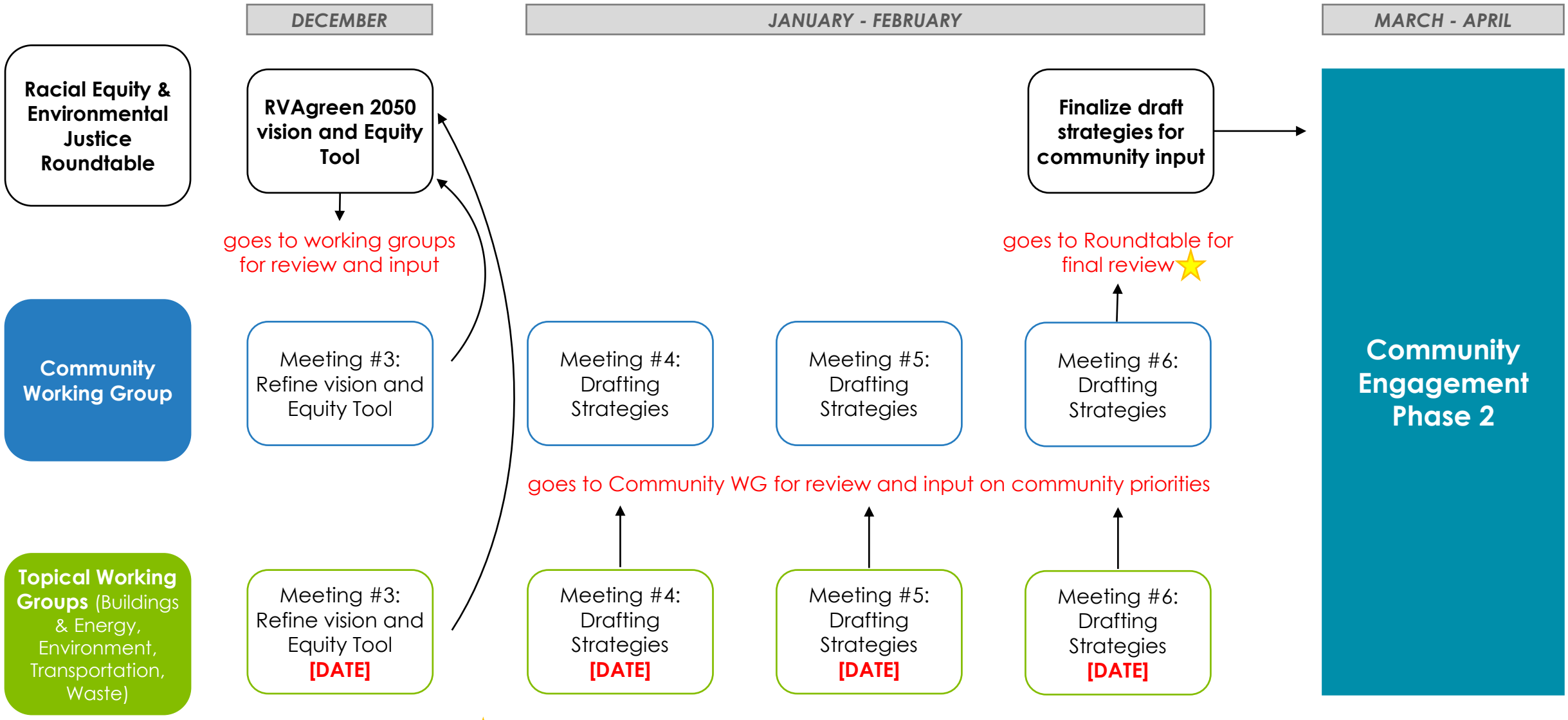
Relevant Legislation

- Virginia Clean Economy Act
- Regional Greenhouse Gas Initiative (RGGI)
- Solar Freedom Act
- Clean Energy Choice Act
- Virginia Energy Plan
- Community Solar Development Pilot Program

What’s next…

RVAgreen 2050 Process: Working Groups Timeline Overview

Workflow (Nov.-Mar.)



Draft strategies will also go to City Administration for review; all comments will go to WGs for consideration

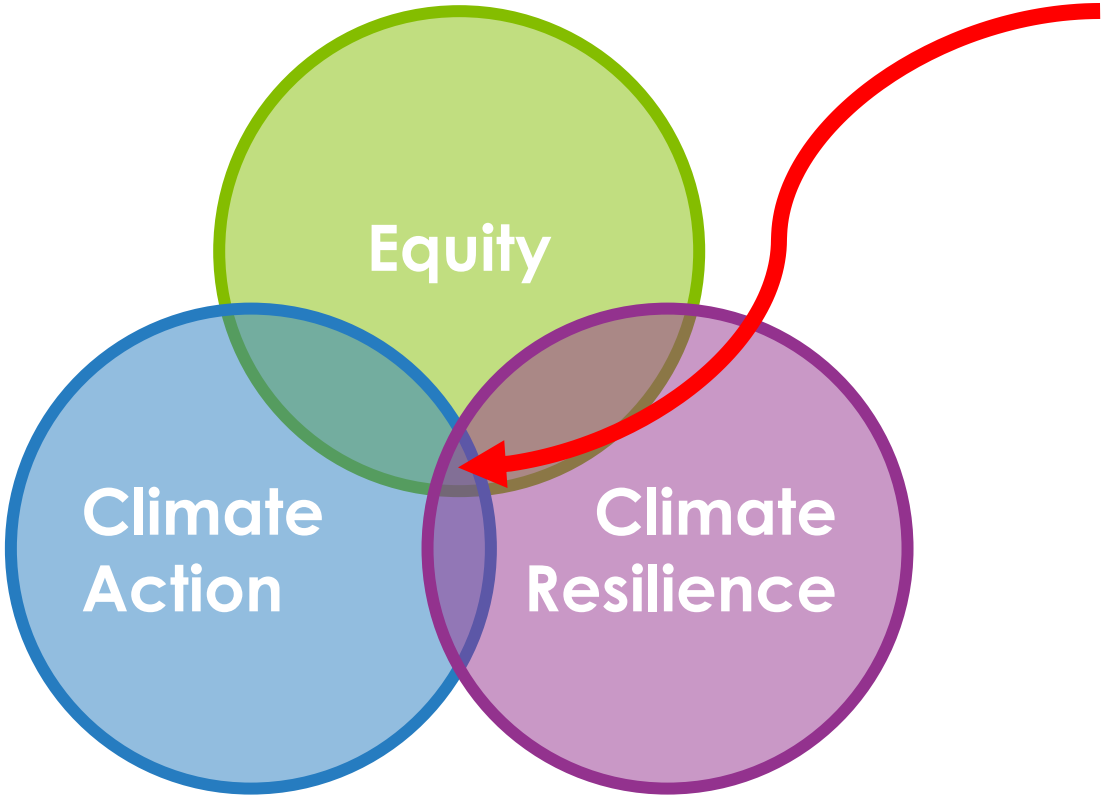
Our task: drafting SMARTIE strategies at the equity-climate action-resilience nexus

Is the strategy…

Strategic?
Measurable?
Ambitious?
Realistic?
Time-bound?
Inclusive?
Equitable?

From SMART…	… to SMARTIE
Build a volunteer team of 100 door-to-door canvassers by May…	…with at least 10 people of color recruited as volunteer leaders first, so that they can help shape the way we run the canvasses.

Our task: drafting SMARTIE strategies at the equity-climate action-resilience nexus



Does the strategy:

1. Address community priorities?
2. Reduce greenhouse gas emissions?
3. Increase resilience to climate impacts?

Topics we'll address in this working group

- CHP (private industry)
- Building weatherization
- Code enforcement
- Streetlight upgrades
- EV/Solar readiness requirements
- Renewable energy (private vs. municipal)
- Existing building performance codes & standards
- Industrial energy efficiency
- Benchmark private buildings
- Benchmark government buildings
- Private building energy retrofits
- Government building energy retrofits
- Water/wastewater efficiency upgrades (including built water/stormwater/wastewater infrastructure)
- Decarbonization through local codes
- Performance-based procurement (govt. buildings)
- Grid/energy security & resilience
- Reduce natural gas leakage
- Green building standards
- Anaerobic digester upgrade

Next Steps

Homework!

- Review this presentation and additional information slides
- Explore the shared Google Drive
- Email us: what other information would be helpful?

Next meeting: December 16, 2020

Reviewing RVAgreen 2050 vision and equity tool from Roundtable

Complete this survey-help us improve for next time!

- https://forms.gle/wVjr6ZkuHUX1SRzC6

MORE INFORMATION!

Nature of Climate Action Work: Sphere of Interest, Influence, and Management

INTEREST = affected by outcome

Ex: Recyclables market

Ex: Federal fuel economy standards

INFLUENCE = no decision; influence decision making

Ex: State energy and building codes

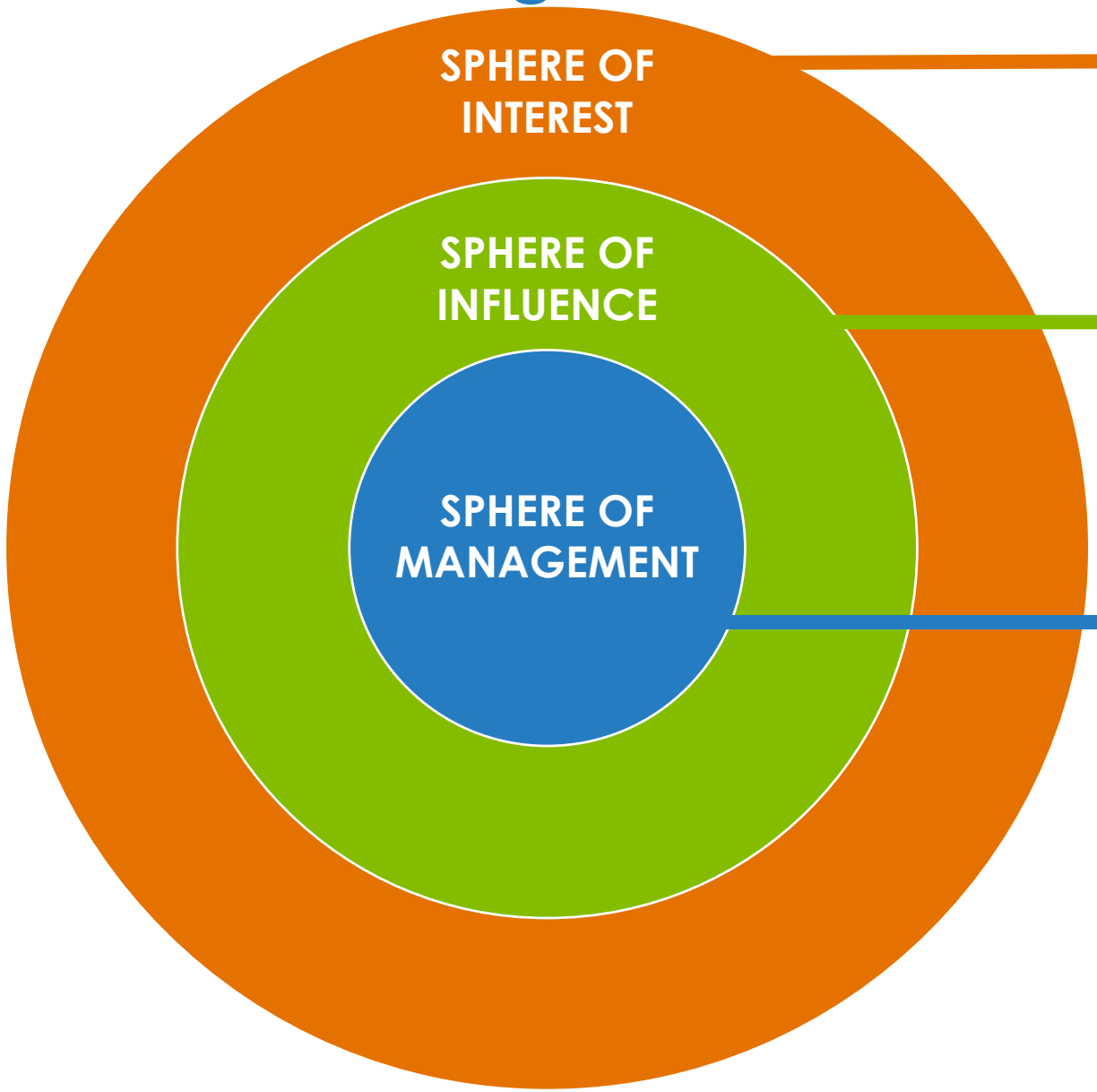
Ex: Transportation mode shift

MANAGEMENT = decision-making authority

Ex: Renewable energy on municipal buildings

Ex: Strategic planning and coordination

Nature of Climate Action Work: Sphere of Interest, Influence, and Management



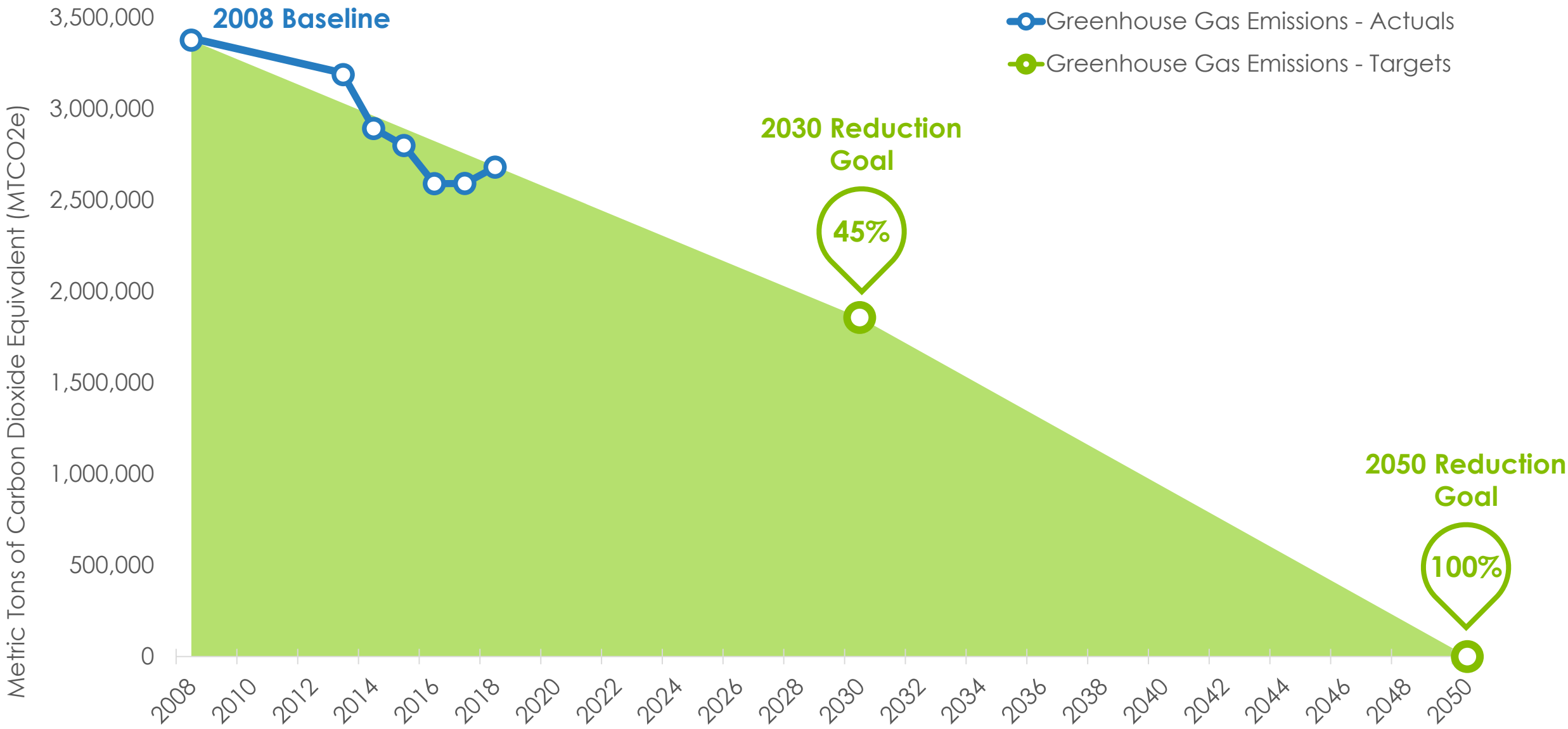
INTEREST
Neither control nor direct influence, but interest in and possibly affected by the outcome of decisions made by other actors

INFLUENCE
No decision-making authority, but access to resources and forums that can be used to influence decision-making by market actors or other levels of government

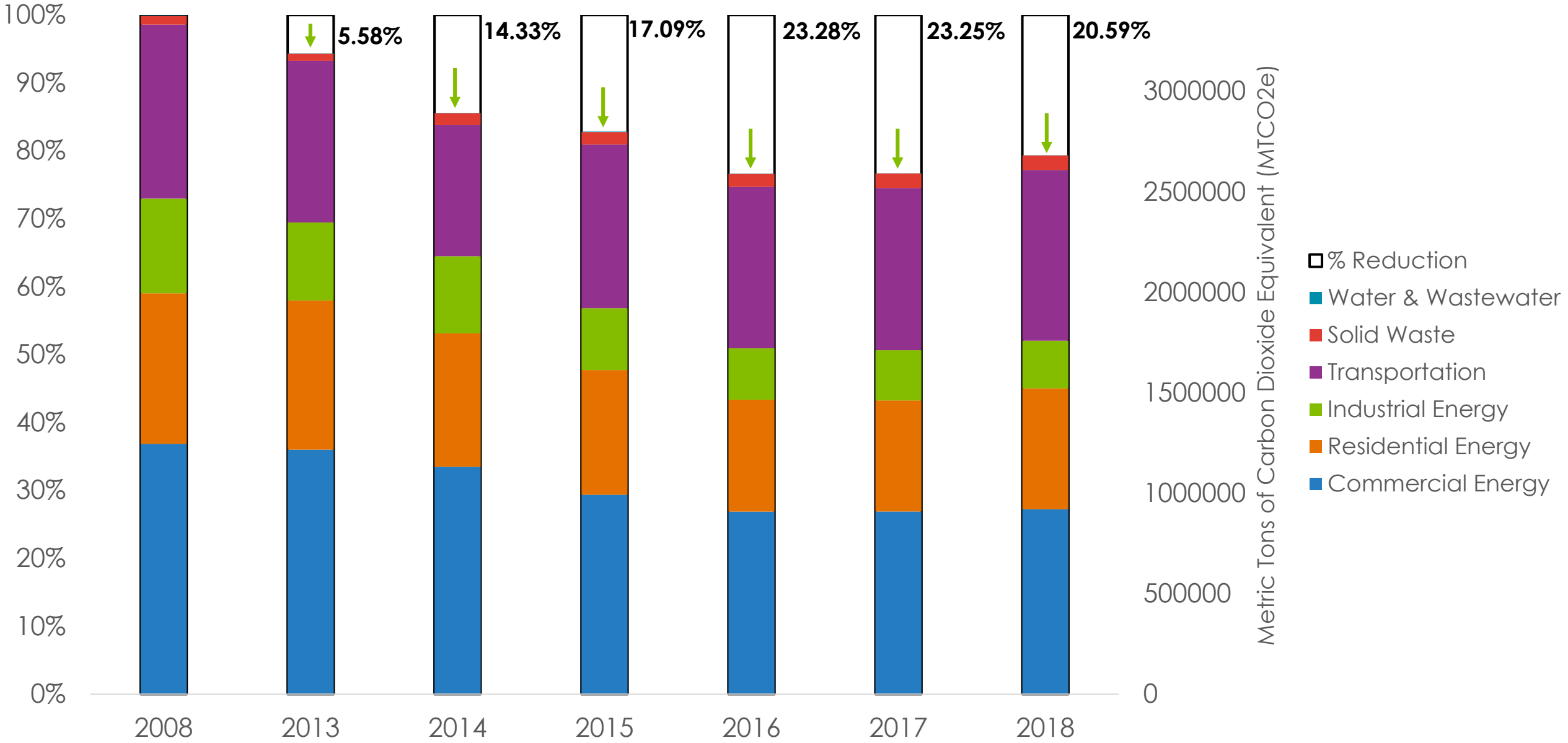
MANAGEMENT
Near-complete or full decision-making authority over components of the urban system or issue in question

Greenhouse Gas Emissions Inventory

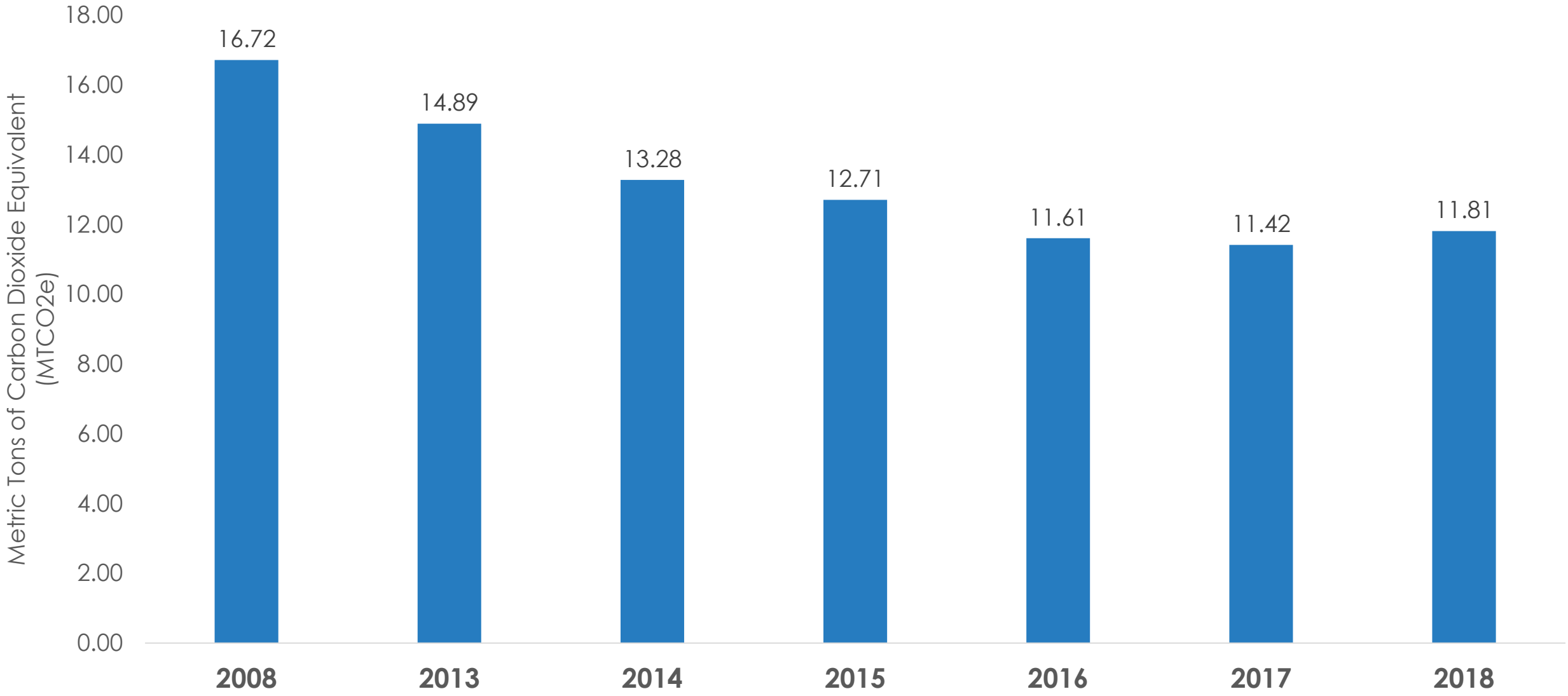
Citywide GHG Emissions and Targets



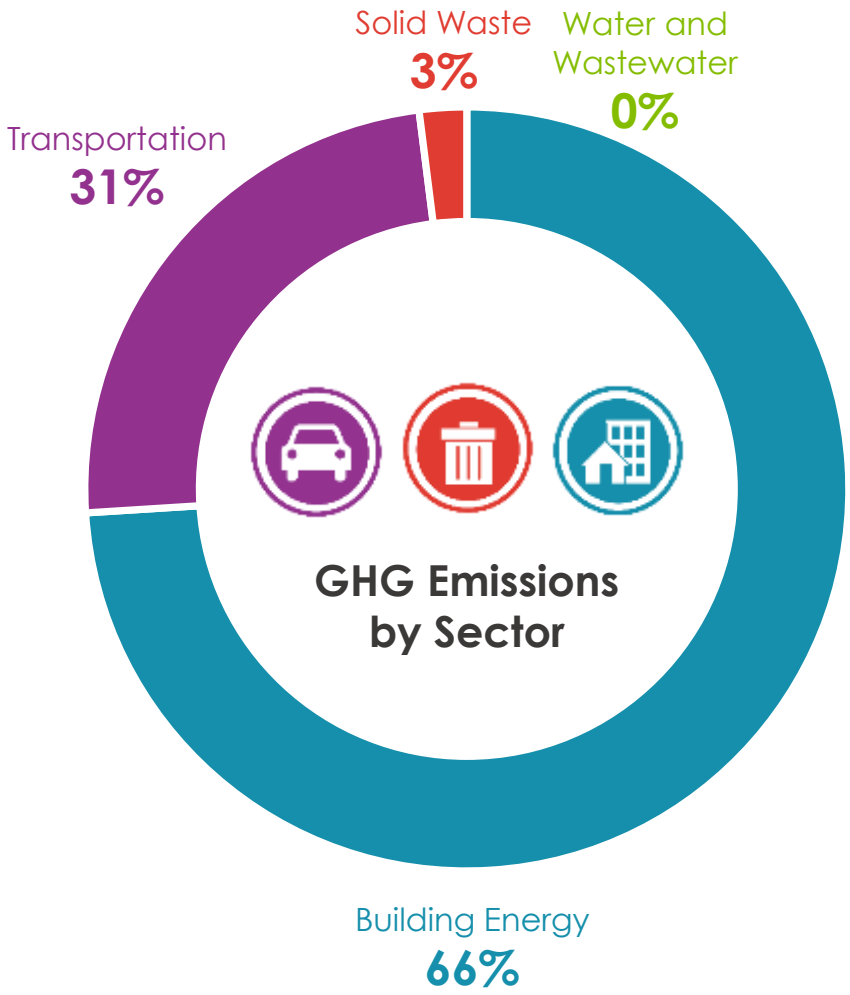
Richmond Community GHG Emissions

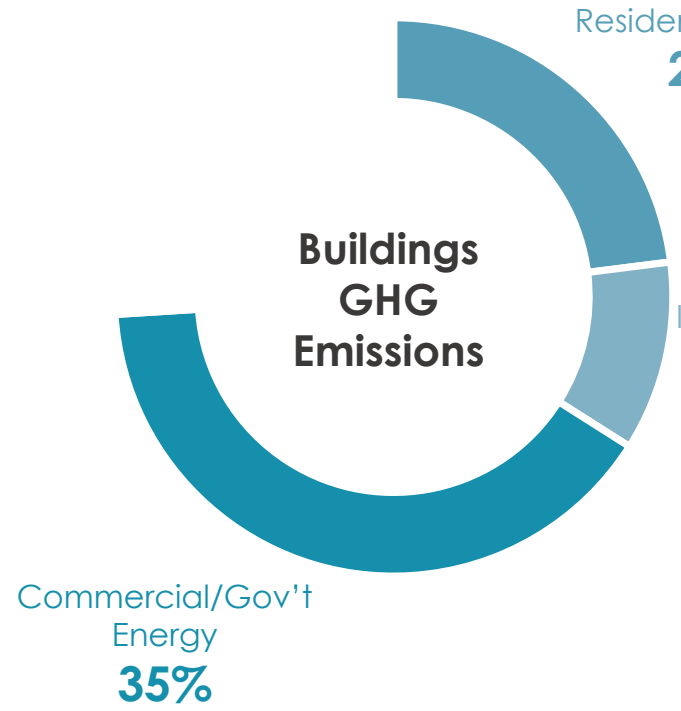


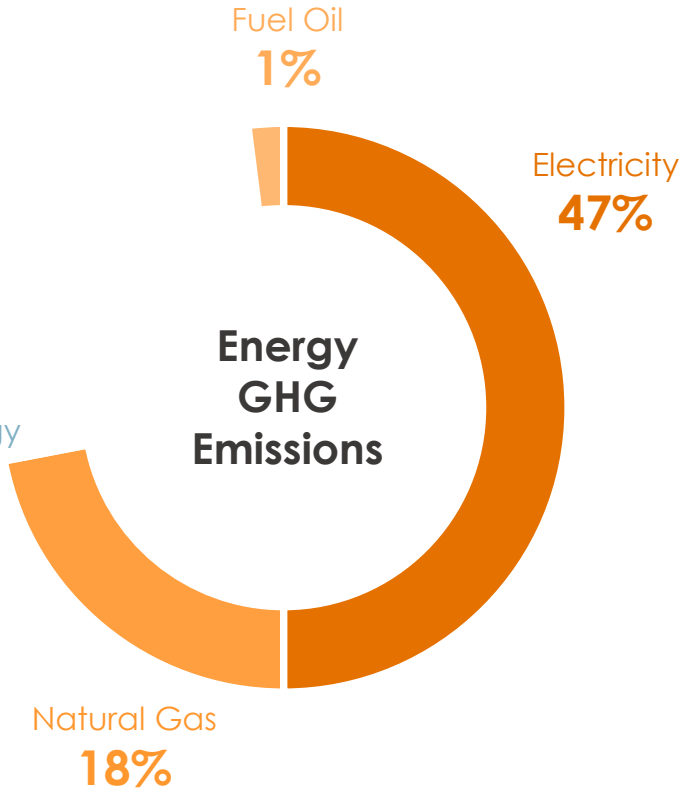
Richmond Community GHG Emissions Per Capita



Richmond Community GHG Emissions

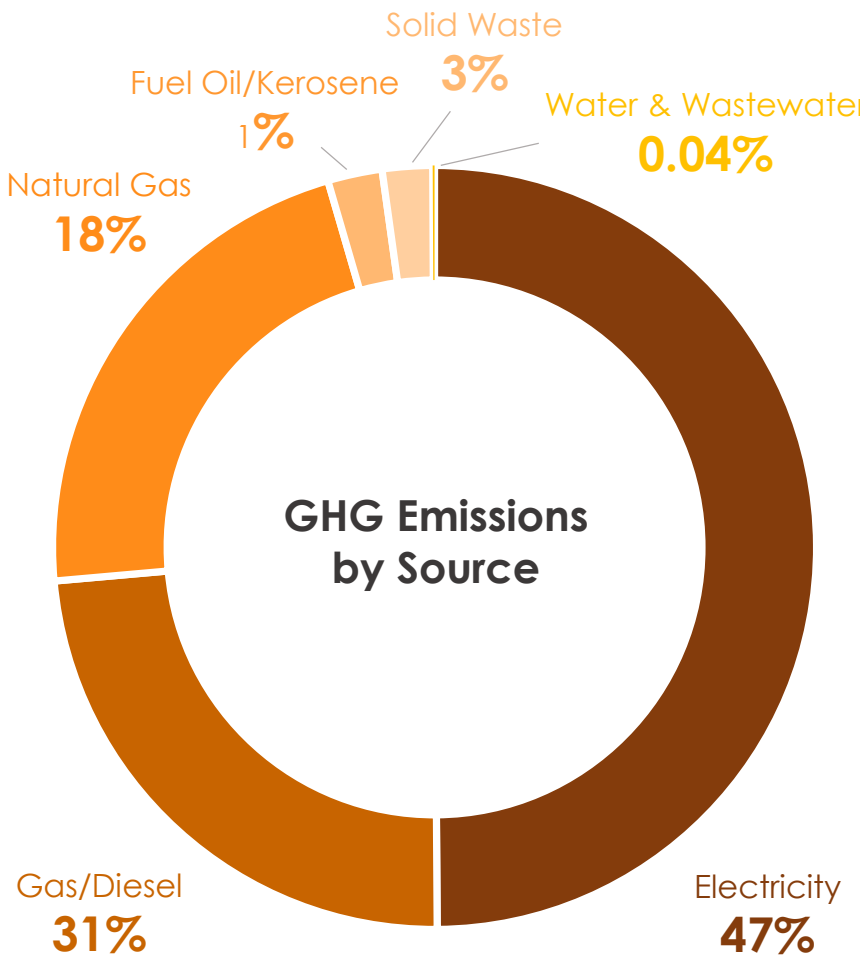


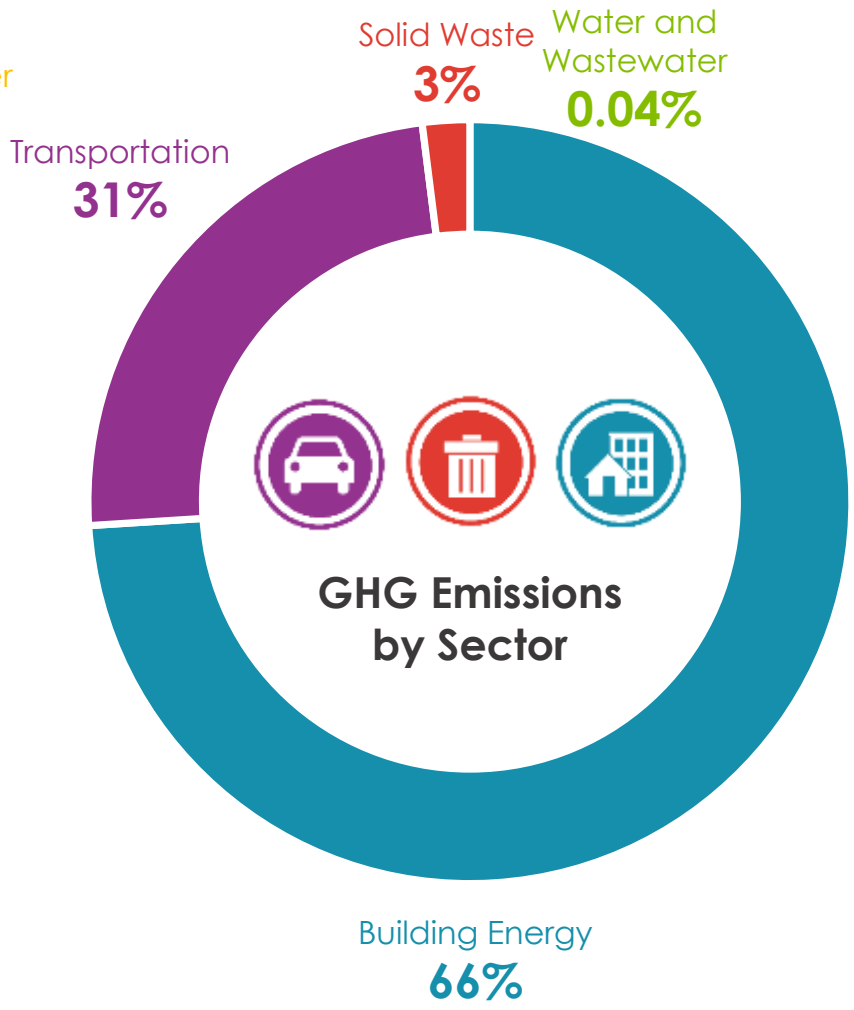


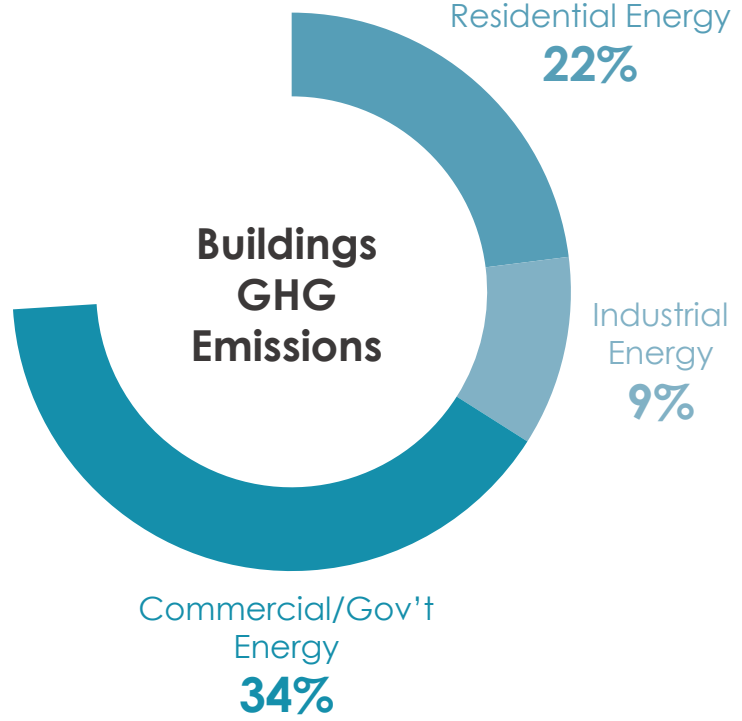


2018 Community GHG Emissions
Source: Richmond Greenhouse Gas Inventory

Richmond Community GHG Emissions

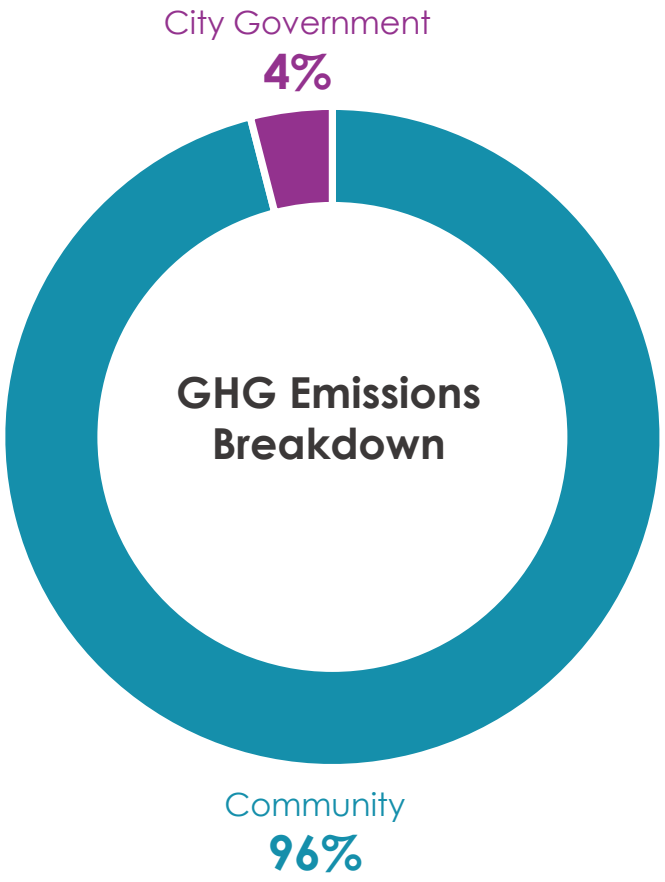


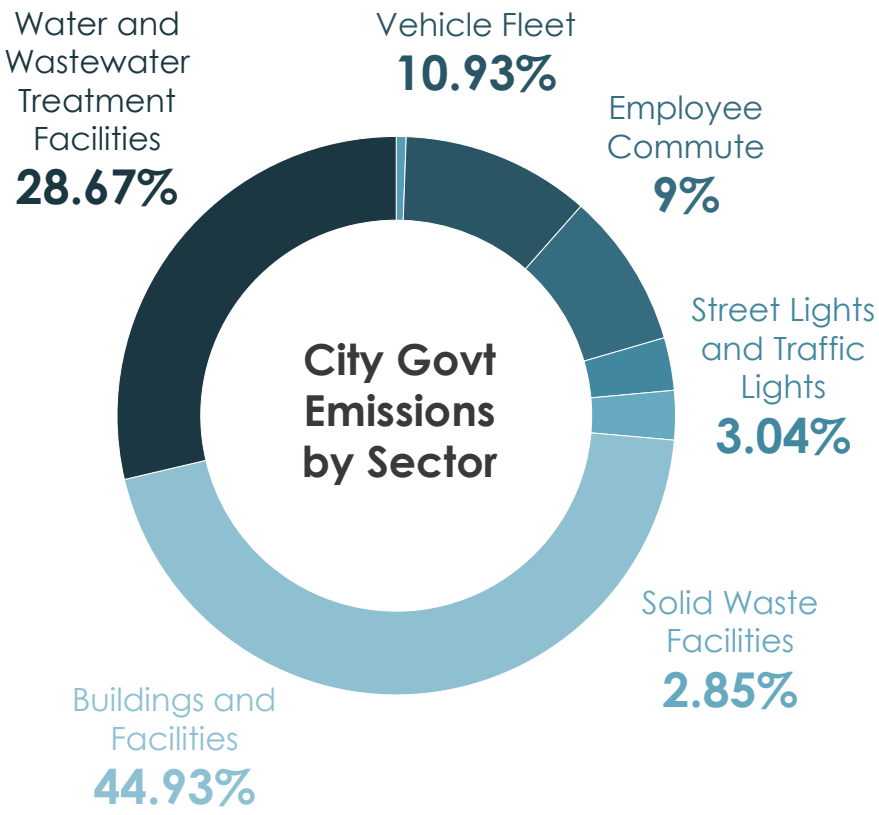


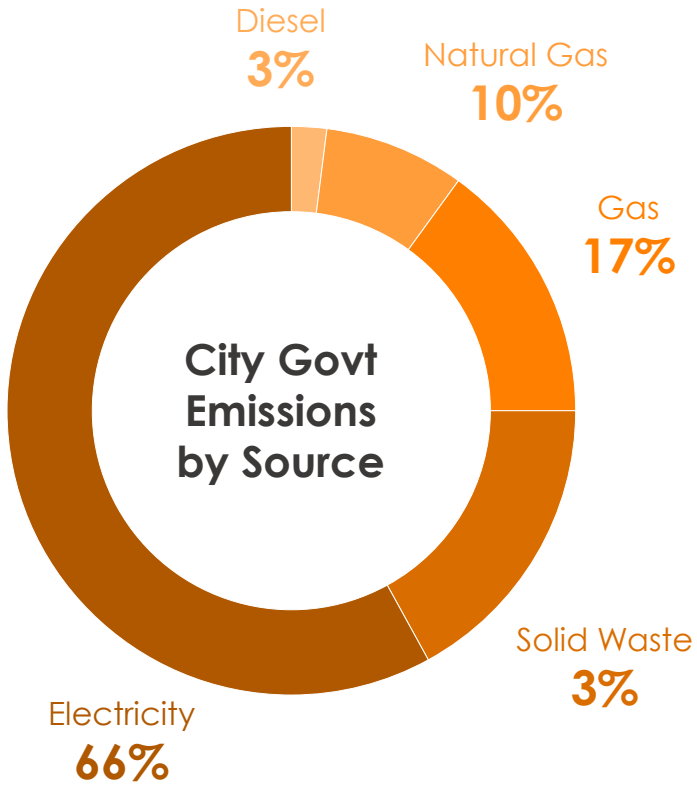


2018 Community GHG Emissions
Source: Richmond Greenhouse Gas Inventory

Richmond City Government GHG Emissions







2018 City Government GHG Emissions
Source: Richmond Greenhouse Gas Inventory

Community Survey Results

We will be accepting survey responses throughout the planning process – please share!
English: https://www.surveymonkey.com/r/VCNGMMY
Spanish: https://www.surveymonkey.com/r/TRJSMTC

RVAgreen 2050 Community Survey Results

As of 11/5/2020: 471 responses

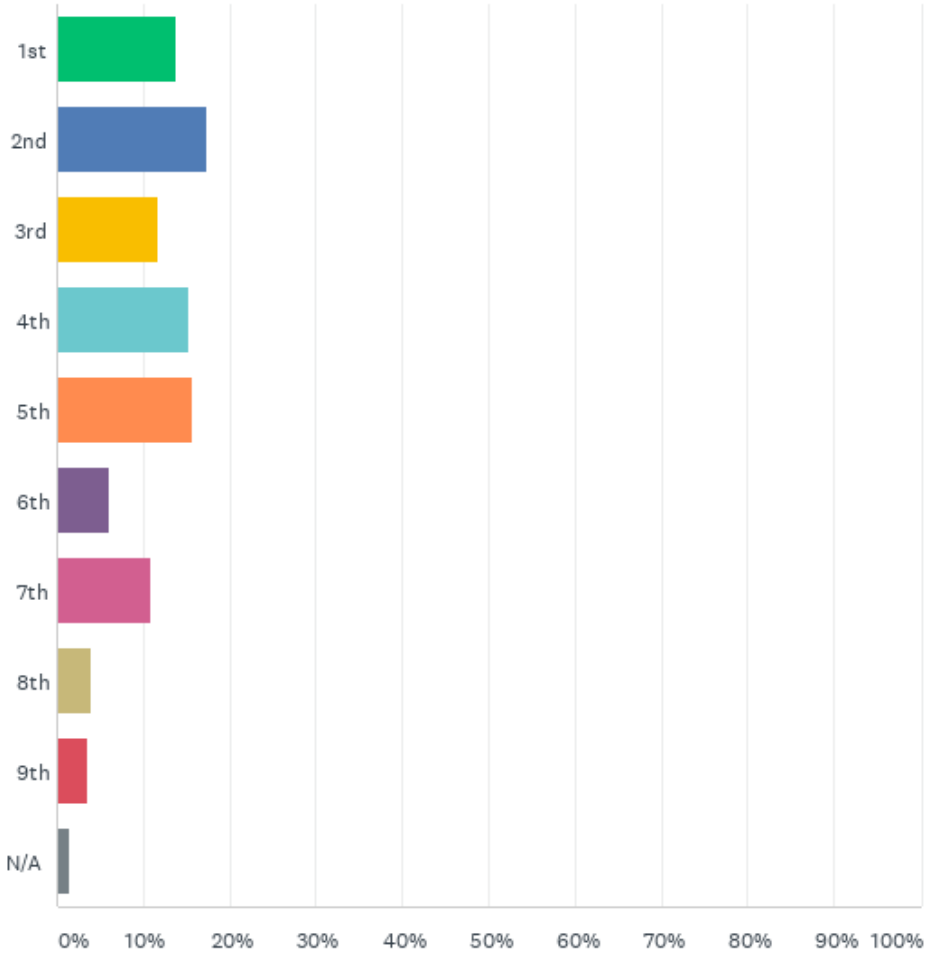
Respondent Demographics

- 17.6% are from the 2nd District
- 37.9% are 30-39 years old
- 65.0% are women
- 83.0% are white
- 99.1% speak English at home
- 80.5% have a bachelor's or higher
- 18.6% earn between $100,000-$150,000
- 24.7% have a child in the home
- 65.0% own their home

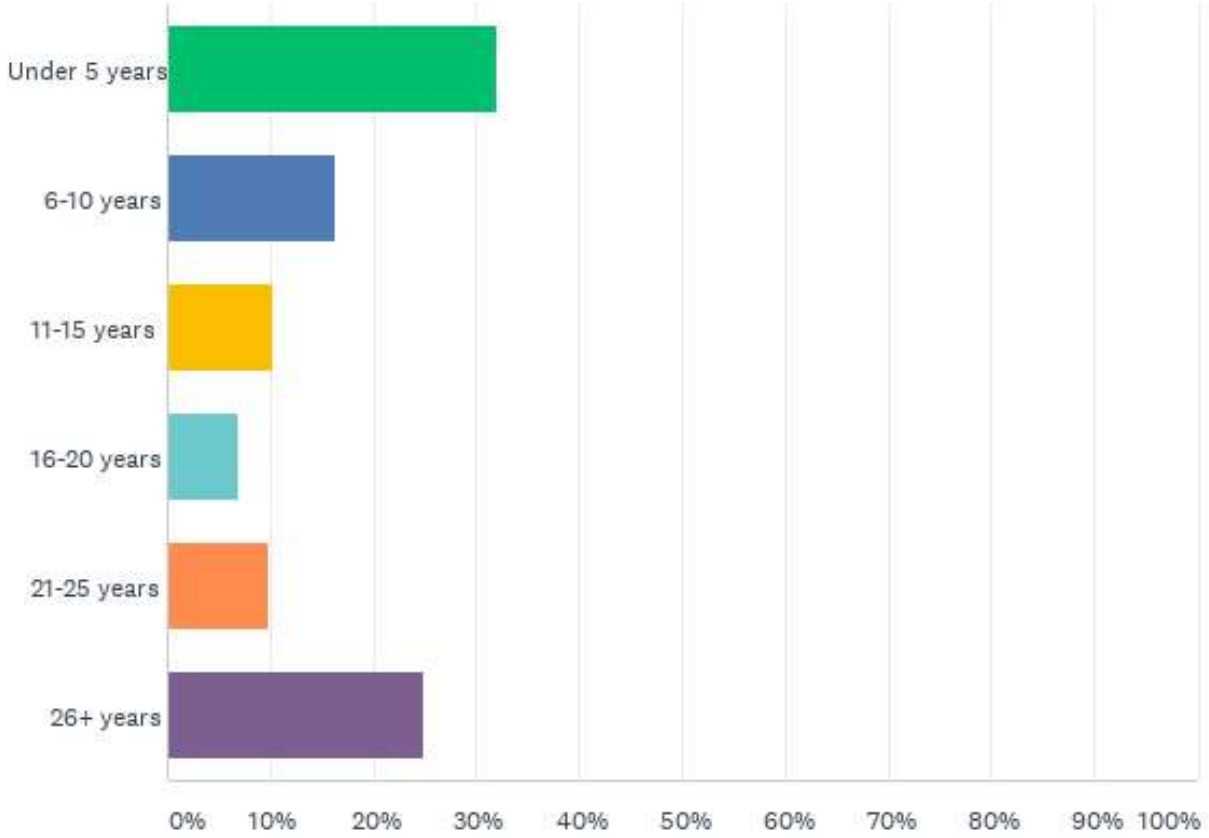
City of Richmond Demographics

- 17.7% are 30-39 years old
- 52.3% are women
- 44.6% are white
- 10.2% speak another language
- 39.3% have a bachelor's or higher
- Median household income $51,285
- 18.2% have children in the home
- 43.6% own their home

Which City Council district do you live in?

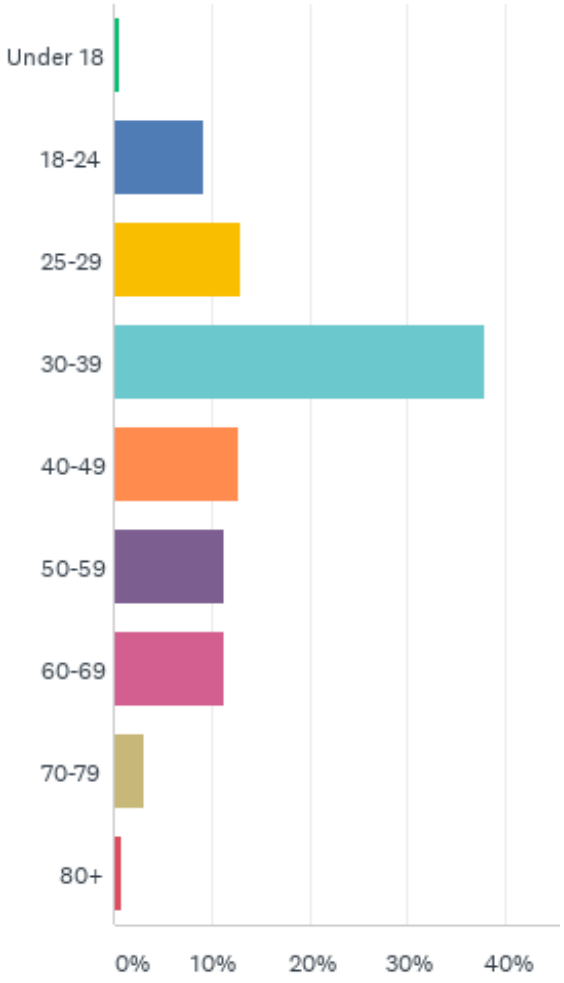


How long have you lived in Richmond?

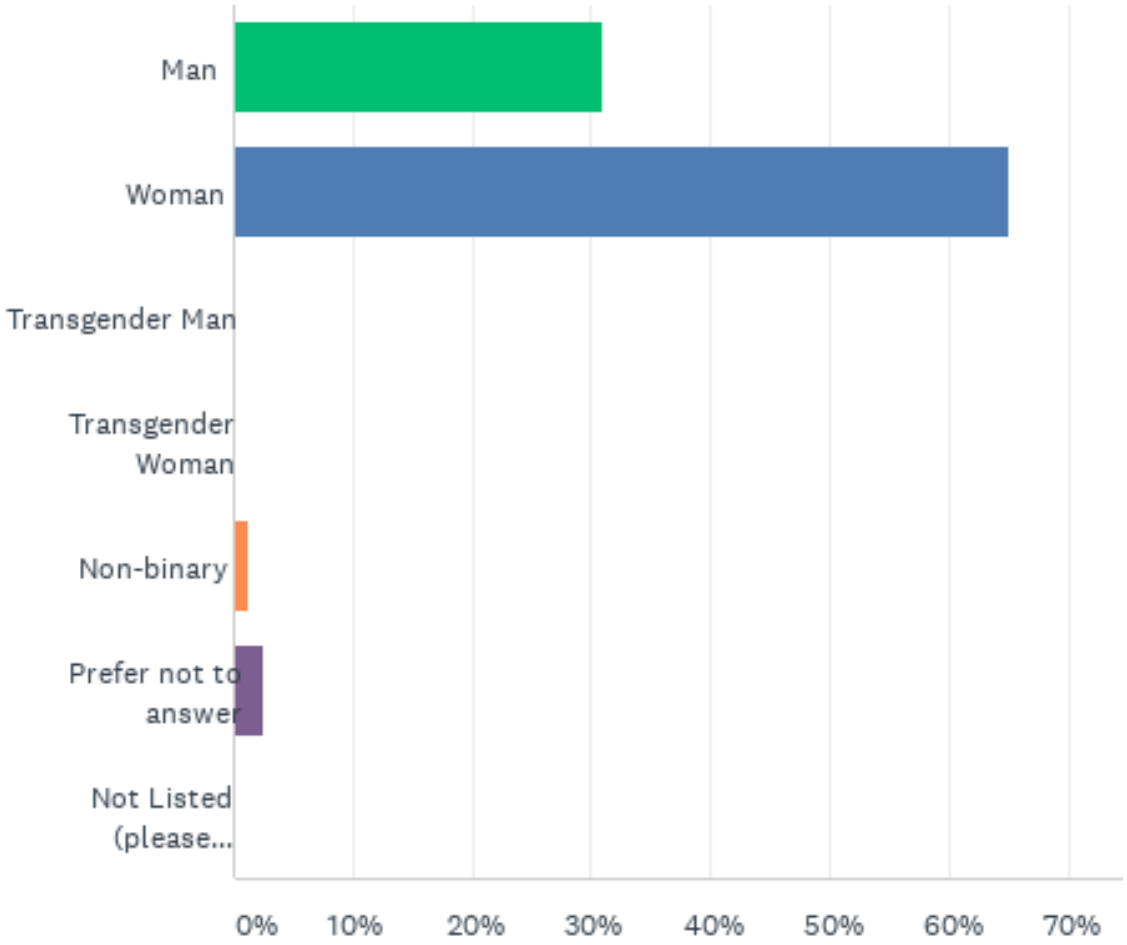


RVAgreen 2050 Community Survey Results

Age



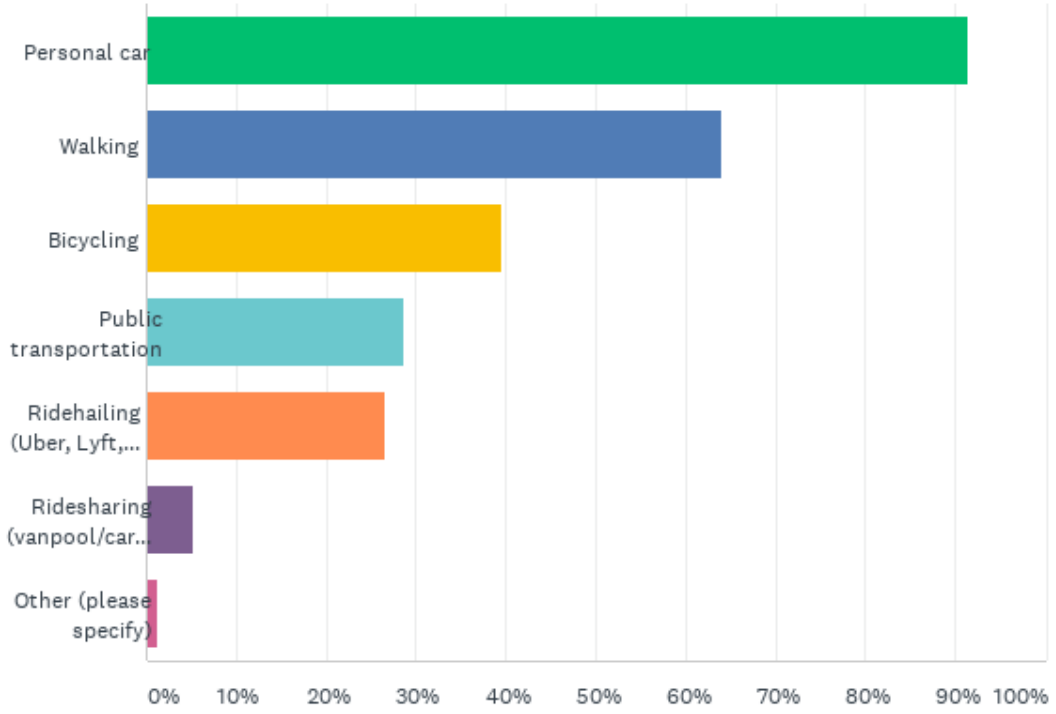
Gender Identity



Income

How Do You Get Around Richmond?

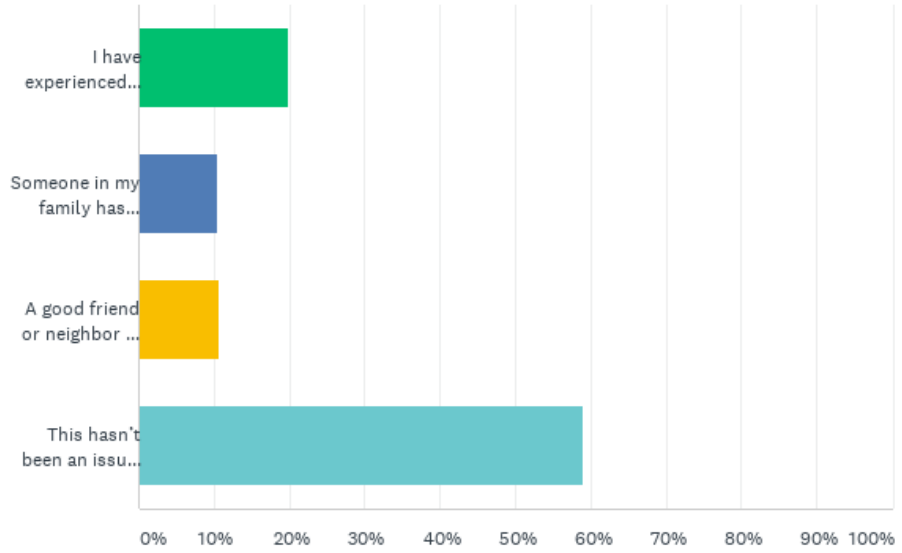
- Personal Car..... 91.4%
- Walking..... 64.3%
- Bicycling..... 39.8%
- GRTC..... 29.0%
- Ride-hailing..... 26.5%
- Ride-sharing..... 5.2%



Environmental Experiences

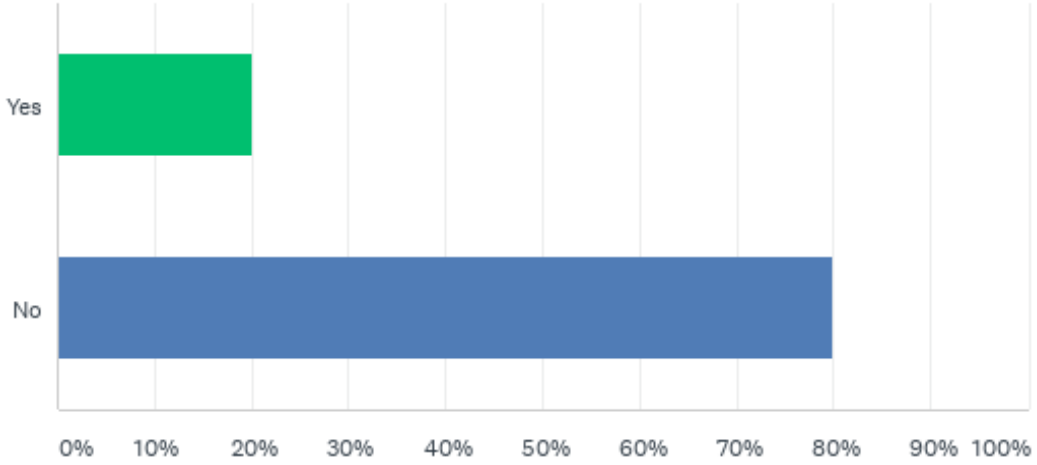
Experienced Extreme Heat?

- 20.1% have experienced
- 20.6% know someone who has experienced
- 59.3% have not experienced



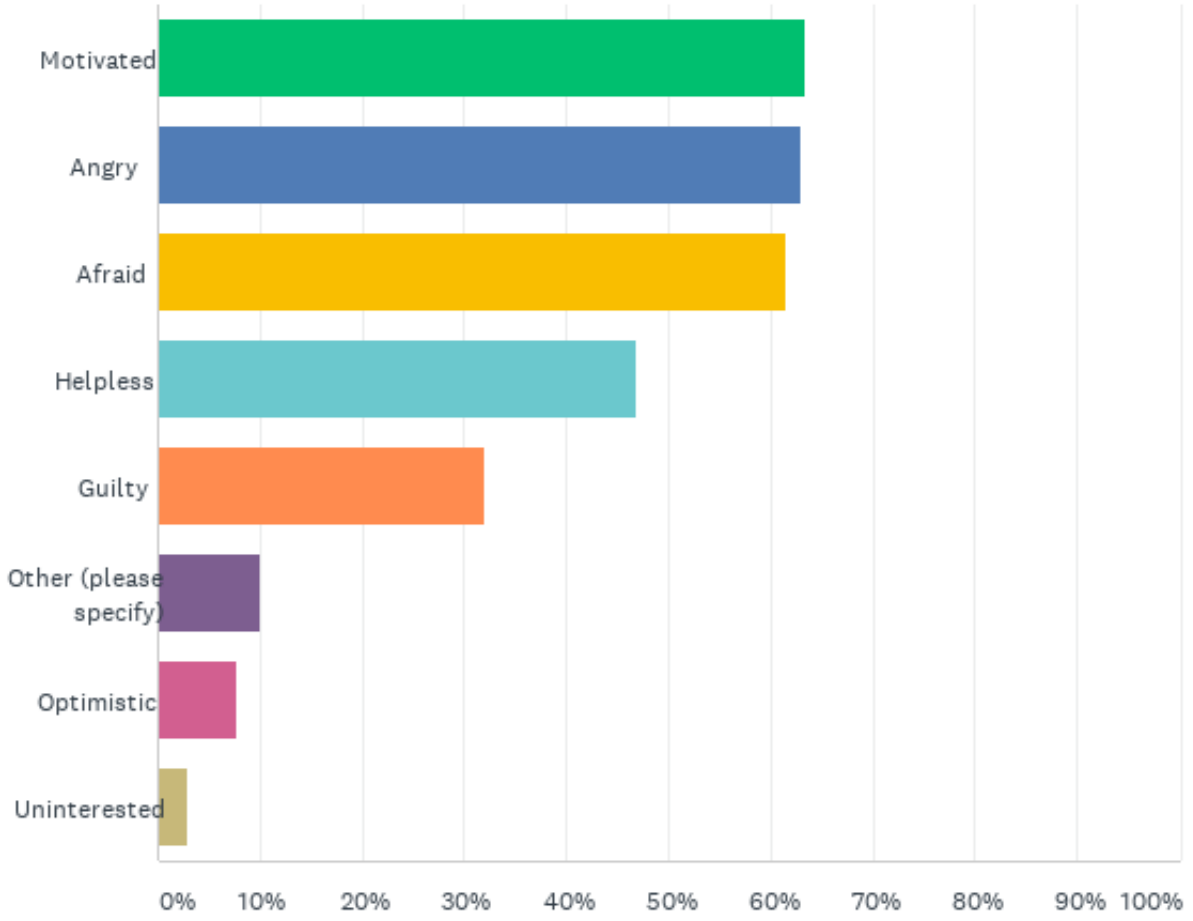
Experienced Flooding?

- 20.4% have experienced
- 79.6% have not experienced



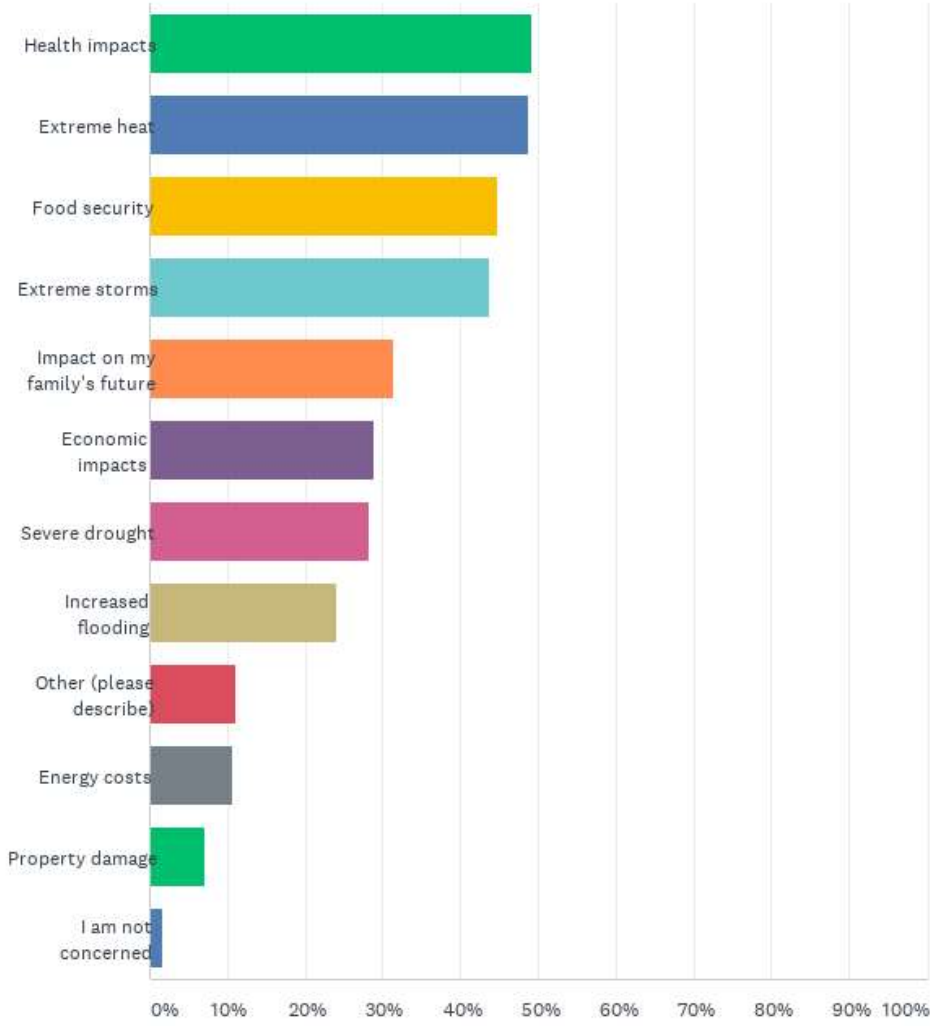
Climate Change Makes Me Feel…

64.2% Motivated
63.0% Angry
61.4% Afraid
46.5% Helpless
32.1% Guilty
7.9% Optimistic
3.0% Uninterested



Climate Change Impact Concerns

49.0% Extreme Heat
48.7% Health Impacts
44.8% Food Security
43.6% Extreme Storms
31.3% Impact on Family
29.0% Economic Impacts
27.8% Severe Drought
24.1% Increased Flooding



Where Would You Allocate Money?

56.5% Affordable and Sustainable Housing

50.6% Clean Energy

47.8% Trees and Urban Green Spaces

47.3% Sustainable Transportation

29.7% Waste Reduction

26.3% Healthy Food Access

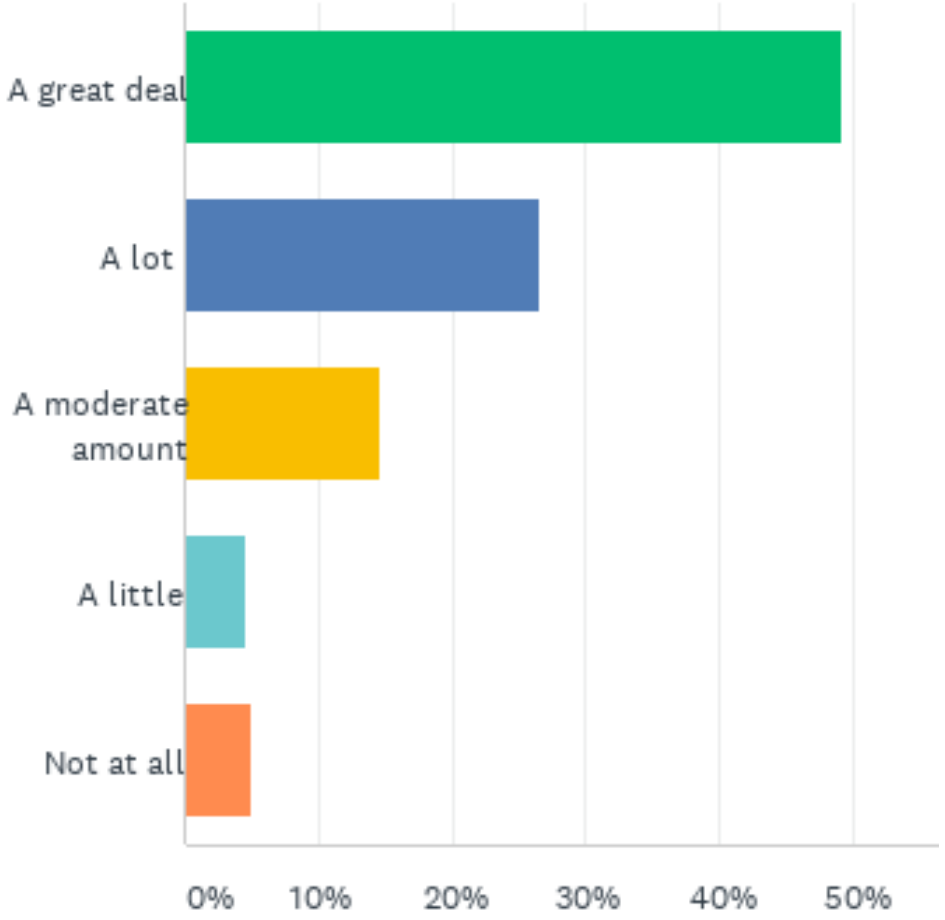
22.1% Stormwater Infrastructure

19.5% Green Jobs

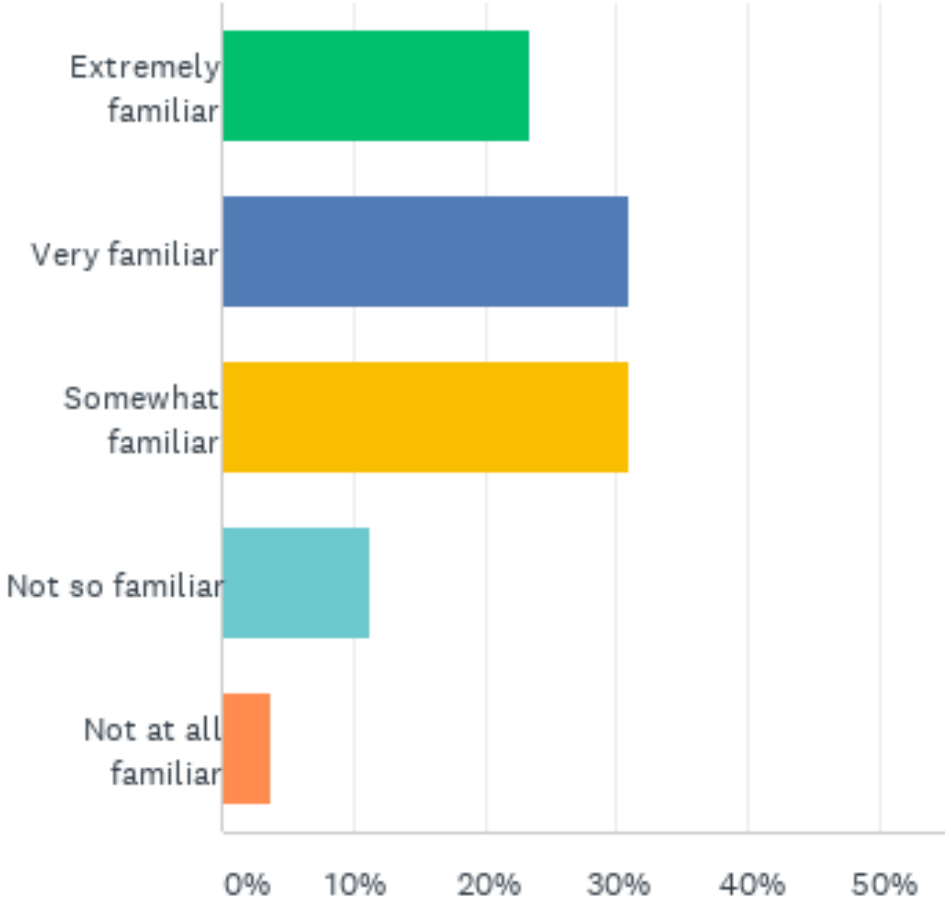
Some Key Takeaways

- 84.5% of respondents believe the largest barrier for addressing climate change is a **lack of political support and / or will**
- 94.9% of respondents believe are at least a little concerned with environmental justice in Richmond, VA
- 85.0% of respondents are at least somewhat familiar with the goals of environmental justice
- 70.2% of respondents **have not participated in a City of Richmond planning process before**

Concerned with Environmental Justice in Richmond, VA



Familiar with the Goals of Environmental Justice



Vision of equitable climate action for a healthy and resilient Richmond