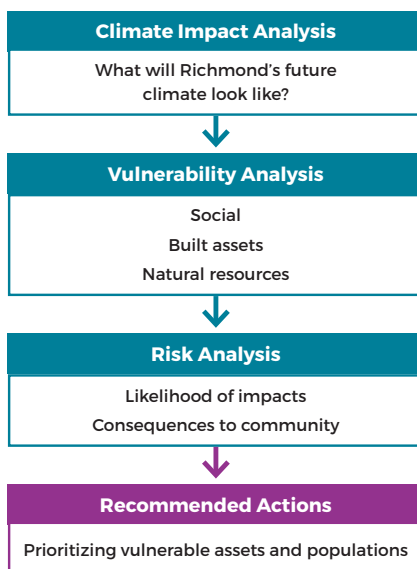
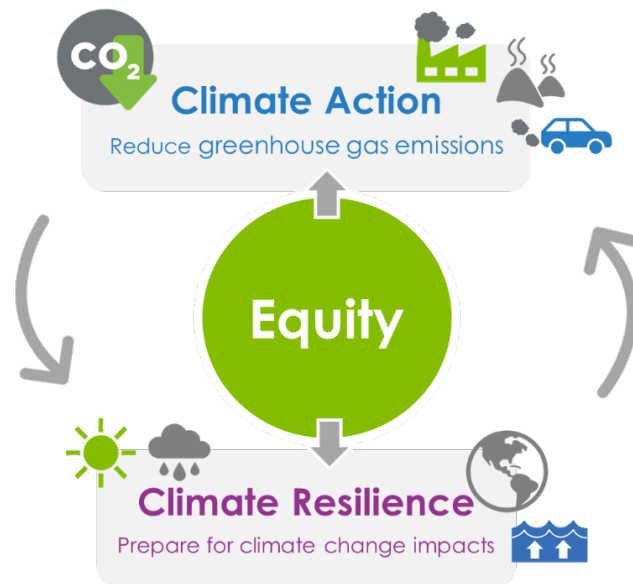


# RVAGreen 2050 Climate Vulnerability and Risk Assessment

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



## Climate Vulnerability and Risk Assessment Process

A Climate Vulnerability and Risk Assessment (CVRA) was conducted to understand the specific climate threats Richmond is currently facing and will face in the coming decades, as well as the vulnerabilities of Richmond's residents, built infrastructure, and natural resources to increasing climate risks.

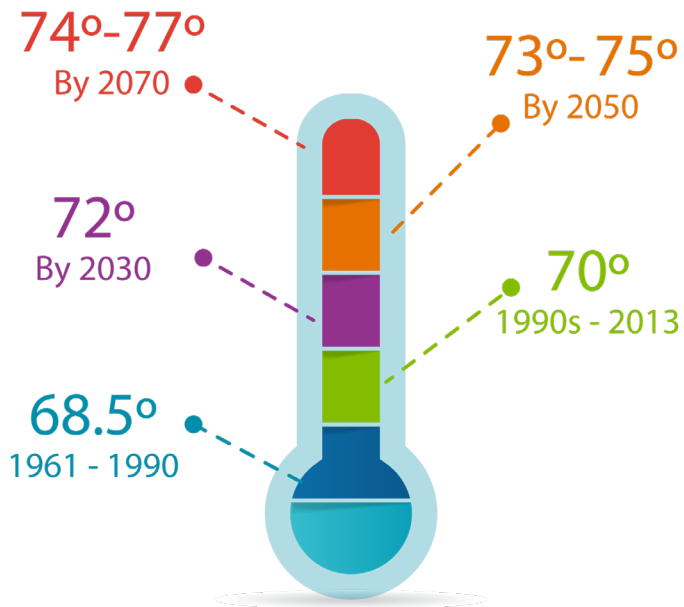
*Equitable climate action for a healthy and resilient Richmond*

## Richmond's Changing Climate



### Heat

- Continued increases in annual average high temperatures
- More days of extreme heat with temperatures reaching 95°F and higher
- Urban heat island effects, unevenly distributed across Richmond neighborhoods
- Impacts to health, increased energy demand, and higher energy costs



**Annual Average High Temperature Increase**

Future temperature ranges reflect lower and higher global emissions scenarios.

Source: U.S. Climate Resilience Toolkit



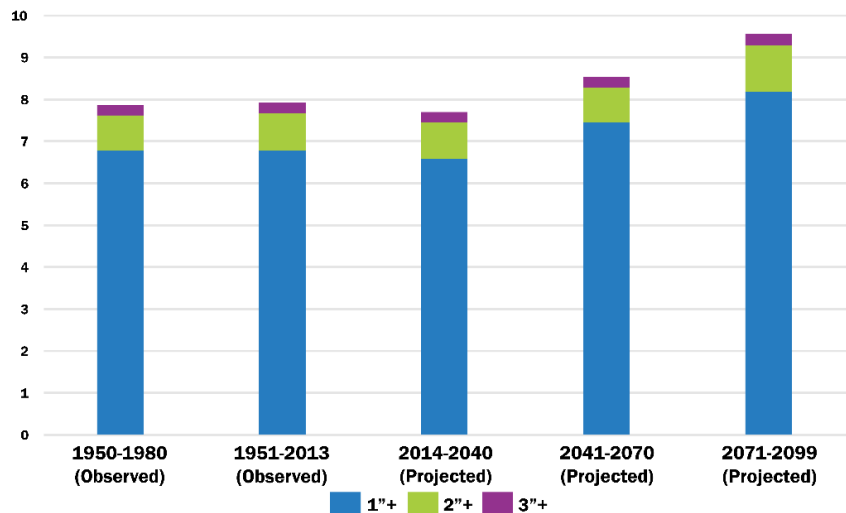
### Precipitation and Storms

- Total annual precipitation will slightly increase
- Heavy rain events will become more frequent and more intense
- Severe and extreme storm events will be more intense and cause more flooding



### Sea Level Rise

Virginia is facing the impacts of sea level rise at a greater rate than the rest of the world. While sea level rise impacts are more limited in Richmond with its inland location and topography, some areas and natural and community assets along the James River will be impacted.



**Historic and Projected Annual Days with >1, >2, >3 inches of Precipitation in Richmond**

Source: U.S. Climate Resilience Toolkit

## Climate Vulnerability and Risk

The vulnerability and risk assessment describes how climate impacts will affect Richmond’s people, built infrastructure, and natural resources.

Social vulnerability is assessed in the [RVAgreen 2050 Climate Equity Index](#), which accounts for community demographics, health and safety factors, and housing and mobility characteristics. Technical working groups evaluated the vulnerability of and potential consequences of climate impacts to Richmond’s built and natural assets. These built and natural assets were also identified and mapped relative to heat and flood risks.

### Vulnerability

#### Sensitivity

How much would a system, asset, or population group be affected by a climate impact?

#### Adaptive Capacity

How well can they adjust?

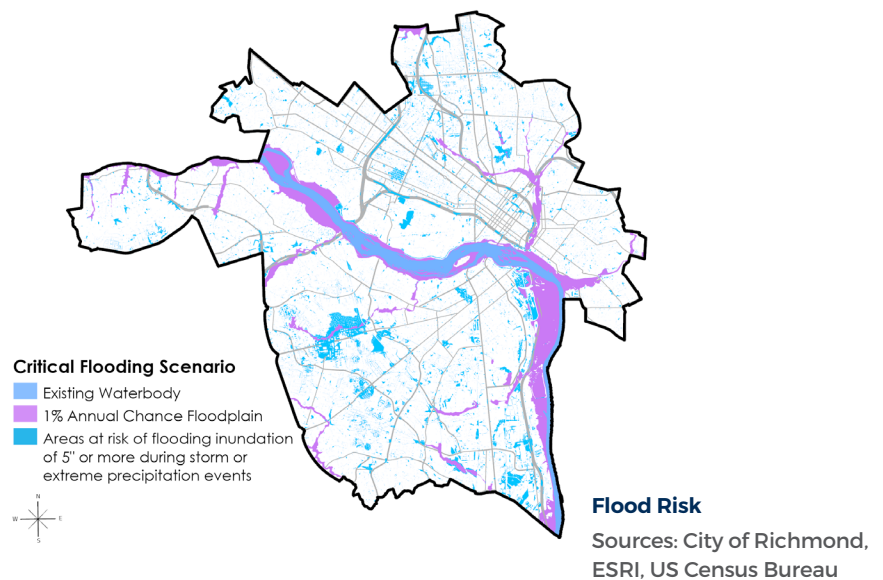
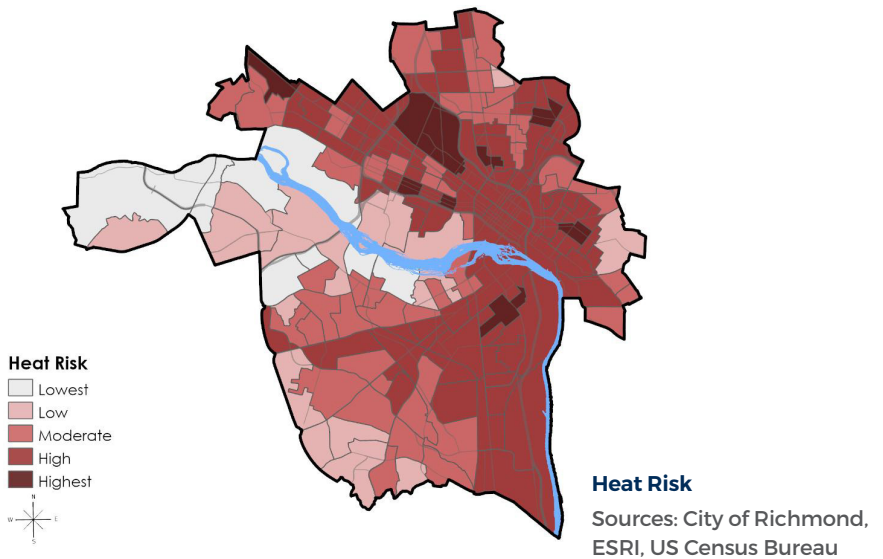
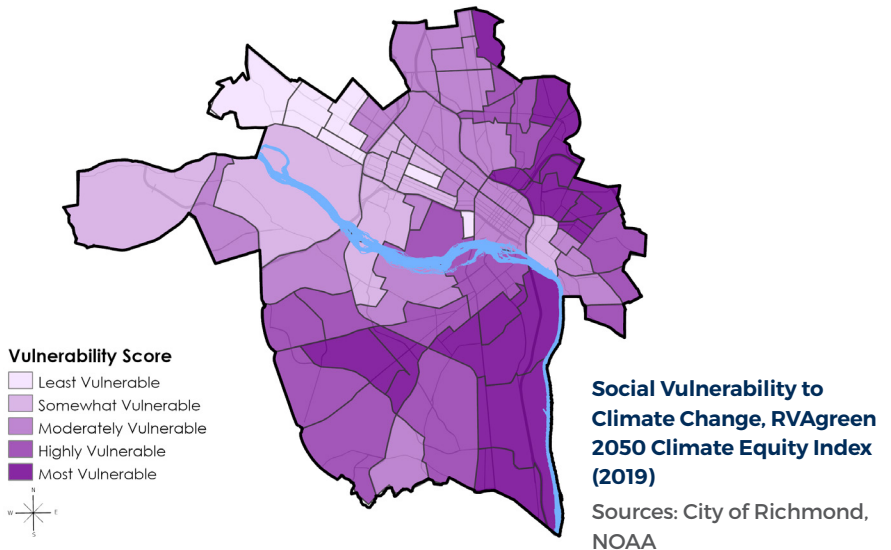
### Risk

#### Probability

How likely is a system, asset, or population group to be impacted?

#### Consequence

What would happen if the system, asset or group is impacted?



## Priority Planning Areas

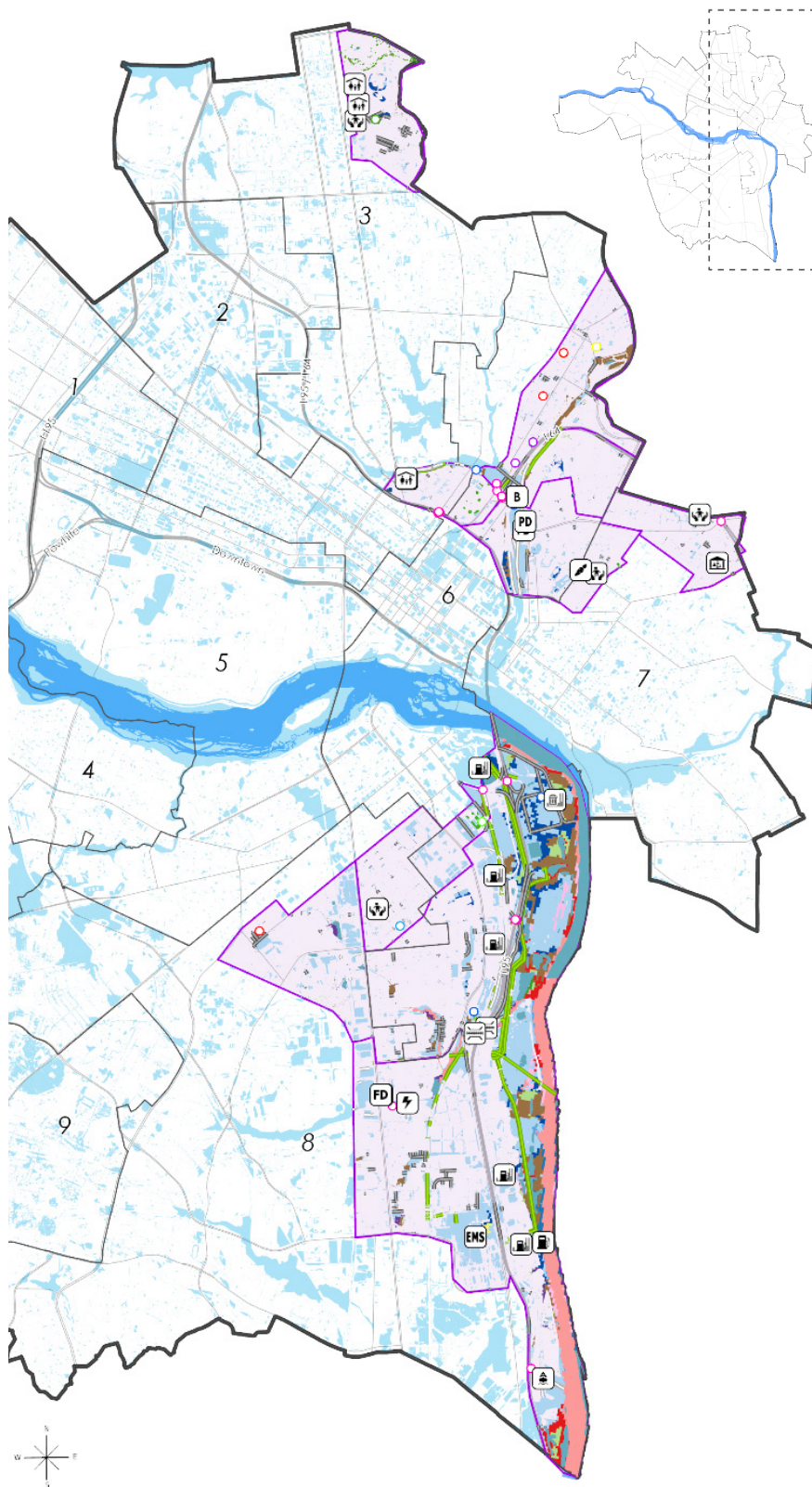
The Climate Vulnerability and Risk assessment overlays social vulnerability with vulnerability ratings of built and natural assets to show connections between people and environment and to inform prioritization of climate resilience strategy implementation. The maps on this and the following page show a summary of some of the most vulnerable areas of the city due to flooding or extreme heat.

### Composite Infrastructure- Flood Risk

- Most Socially Vulnerable Tracts
- Flooding Inundation
- City Council Districts

- B Biodiesel Plants
- CC Child Care Centers
- CC Community Centers
- EMS EMS Stations
- FD Fire Stations
- MT Marine Transportation
- NSF National Shelter Facility
- PP Petroleum Ports
- PT Petroleum Terminals
- PRE Potential Renewable Energy Sites
- RB Railroad Bridges
- STP Sewer Treatment Plant
- S Sheriff Facilities
- SNAP SNAP Businesses

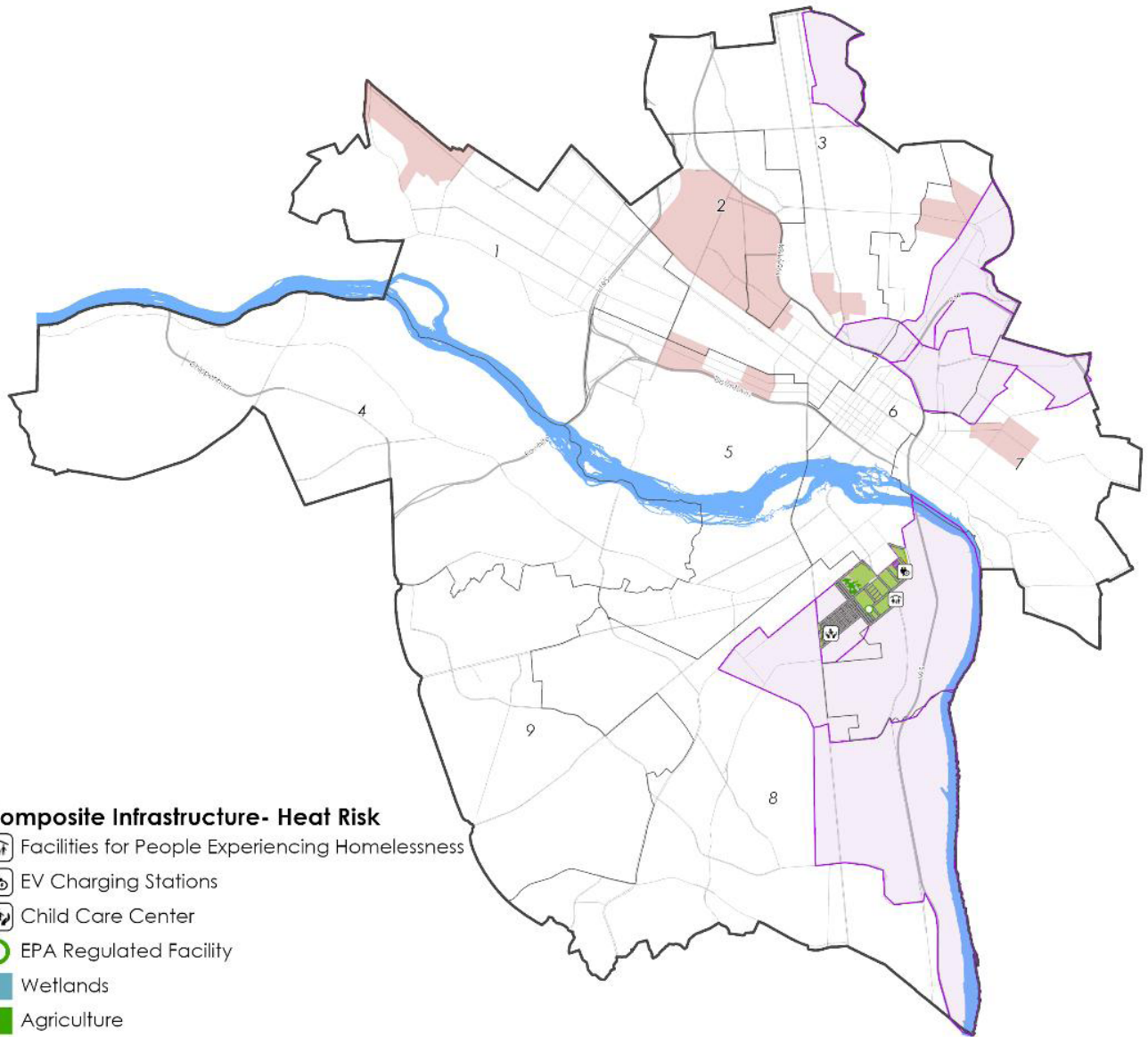
- Bridges
- City Property
- EPA Regulated Facilities
- K-12 Public Schools
- Parks and Playgrounds
- EV Charging Stations
- Private Schools
- Voting Stations
- Spiritual Places/Places of Worship



**Composite Infrastructure and Flood Risk**

Sources: City of Richmond, ESRI, US Census Bureau, FEMA



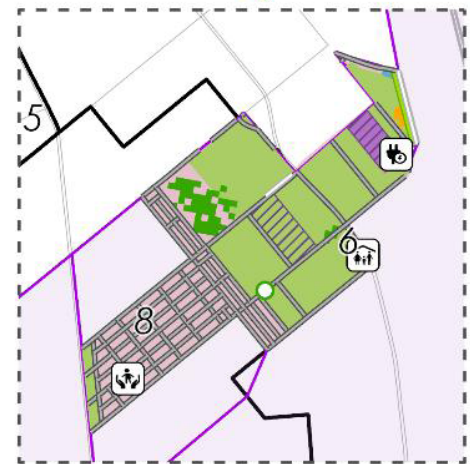


**Composite Infrastructure- Heat Risk**

- Facilities for People Experiencing Homelessness
- EV Charging Stations
- Child Care Center
- EPA Regulated Facility
- Wetlands
- Agriculture
- Southern Atlantic Coastal Plain Mesic Hardwood Forest
- National Register Historic Districts
- State Federal Historic Districts
- Enterprise Zones
- Roads
- Railroads
- Electric Power Transmission Lines

**Most Socially Vulnerable- Heat Risk**

- Most Socially Vulnerable Tracts
- Block Groups with Highest Heat Risk
- City Council Districts



**Composite Infrastructure and Heat Risk**

Sources: City of Richmond, ESRI, US Census Bureau

## Community Input and Priorities

The RVAgreen 2050 equitable climate action planning process began by identifying the priorities of Richmonders who bear the greatest impacts of climate change. The Climate Equity Action Plan 2030 includes climate resilience strategies centering the needs of communities in areas of high climate and social vulnerability.

### Community Priorities



Racial equity and environmental justice



Government accountability



Health and well-being



Community wealth



Engagement and communications



Affordable housing



Neighborhoods

## Recommended Actions

The RVAgreen 2050 Climate Equity Action Plan and Climate Vulnerability and Risk Assessment provides various strategies for increasing community resilience, including:

- More flood resistant housing (retrofits, relocations)
- Central AC in public housing and community facilities
- Microgrids and backup power for critical facilities
- Modernized electric grid (efficient, clean energy)
- Distributed energy, renewables, and storage
- Healthcare system climate resilience plans reflecting COVID lessons
- Tree canopy climate vulnerability assessment
- Historic resources climate protection programs
- Community and business preparedness workshops and programs
- Outdoor worker health and heat safety education

To learn more about all RVAgreen 2050 efforts and get involved, visit us at [rvagreen2050.com](https://rvagreen2050.com)