

Bringing Down the Red Lines

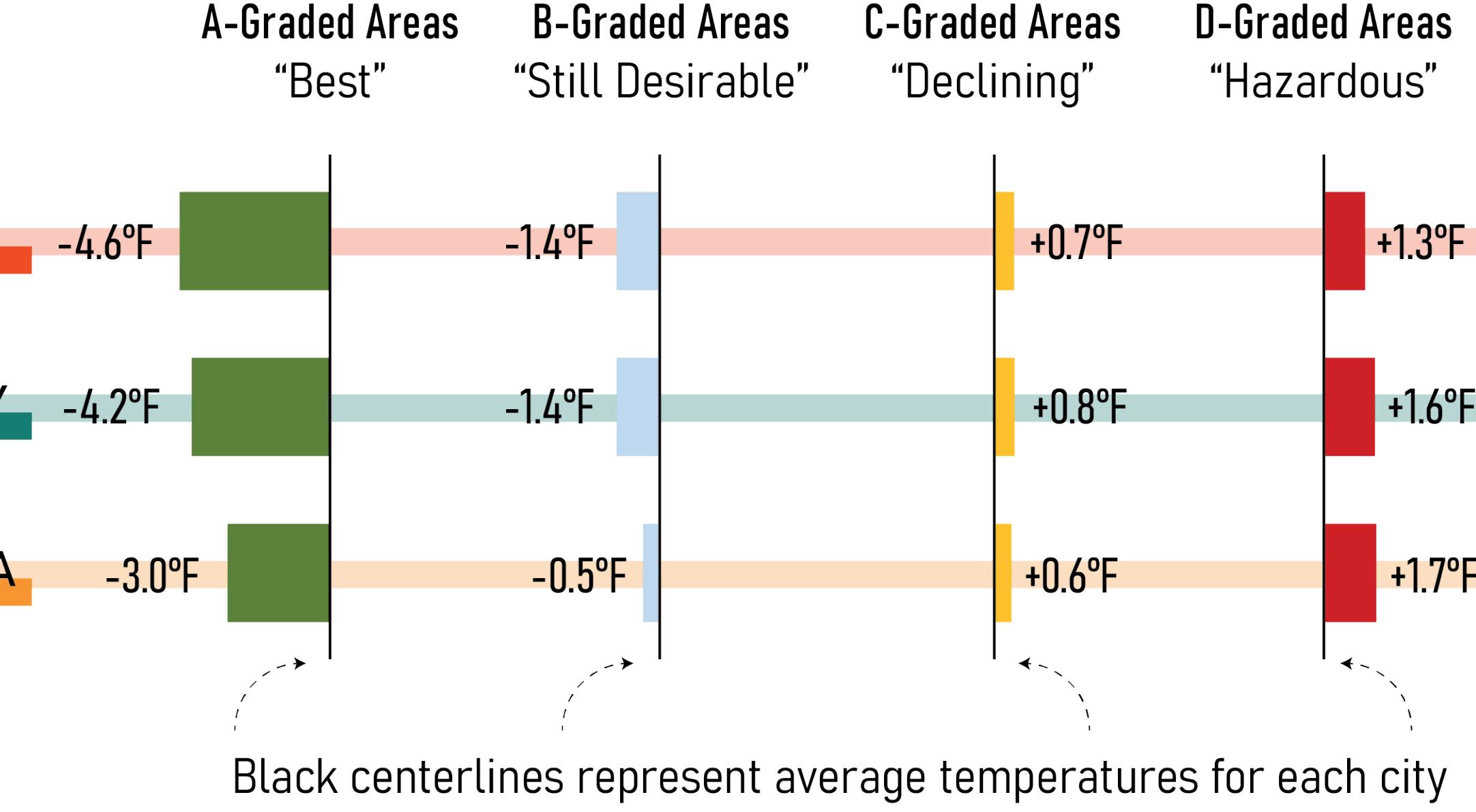
Maggie Ayers, Charlie Cross, Mary Claire Erskine, Miranda Lao

PLAN 6070 - Fall 2024

Three Case Studies in Mitigating Disparate Impacts of Urban Heat in Historically Redlined Communities

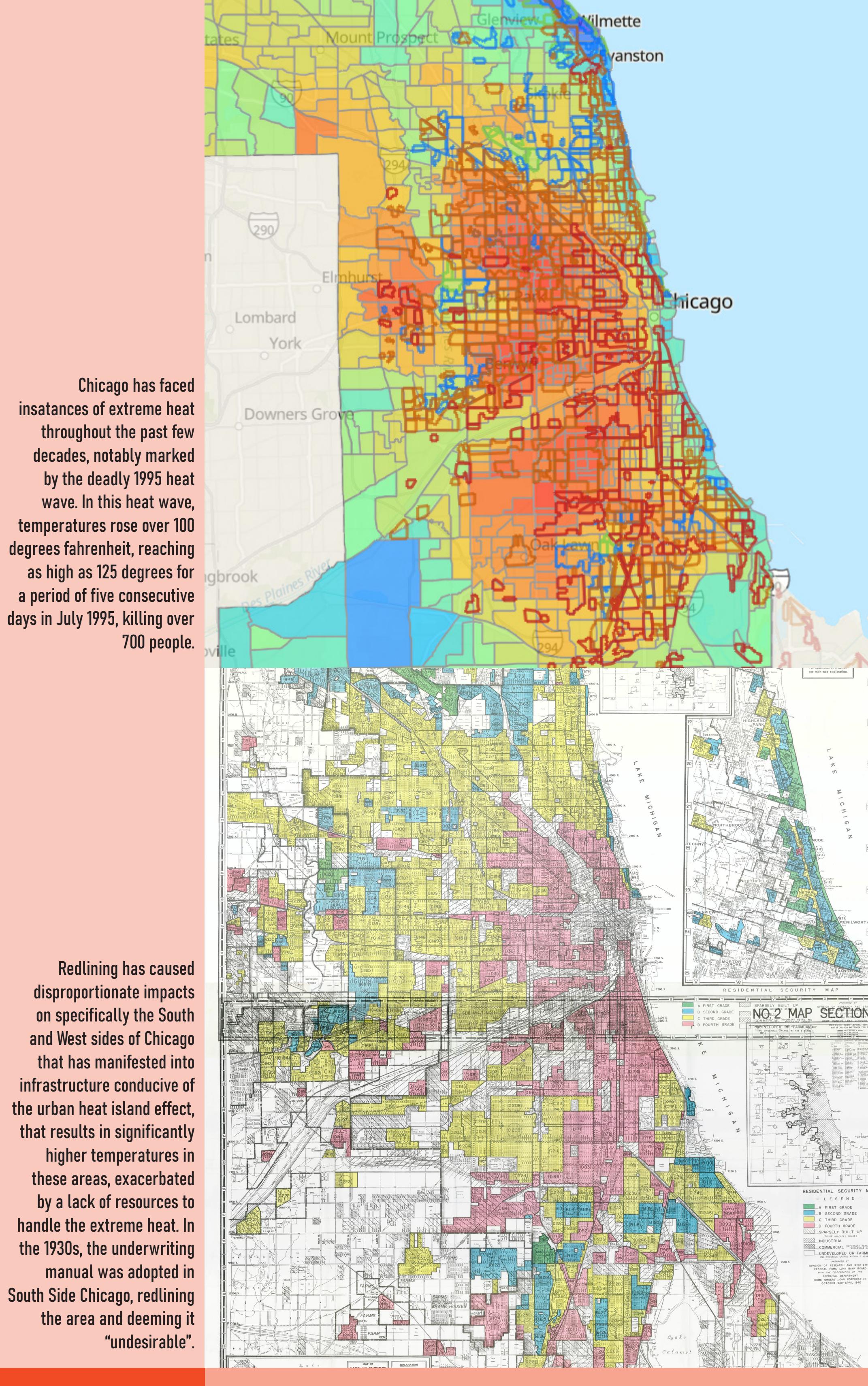
Urban Heat & Redlining

Across the country, the increased frequency, intensity, and duration of extreme heat waves in urban environments are the deadliest and most widely experienced consequence of climate change. Concentrated heat output intensified by urban surroundings is known as the urban heat island effect. The severity of extreme urban heat is not evenly distributed across a local urban environment. Many of the areas experiencing the most severe heat island effects coincide with the areas in which predominantly Black communities reside. These communities have been marginalized through histories of racist zoning policies, including through the practice of redlining. A 2020 study of 108 urban areas in the US by Hoffman et. al explicitly links these historical housing policies to the disparate impact of heat on residents in these urban areas, finding that "94% of studied areas display consistent city-scale patterns of elevated land surface temperatures in formerly redlined areas relative to their non-redlined neighbors by as much as 7°C." Here, we compare three case studies in urban heat island mitigation.



The chart above shows how average temperatures today compare to the city average across areas that were given different HLC ratings from the 1930s redlining maps in each of the three cities from the case study. This table uses data from a NYU published data visualization. "D-graded areas" correspond to redlined areas.

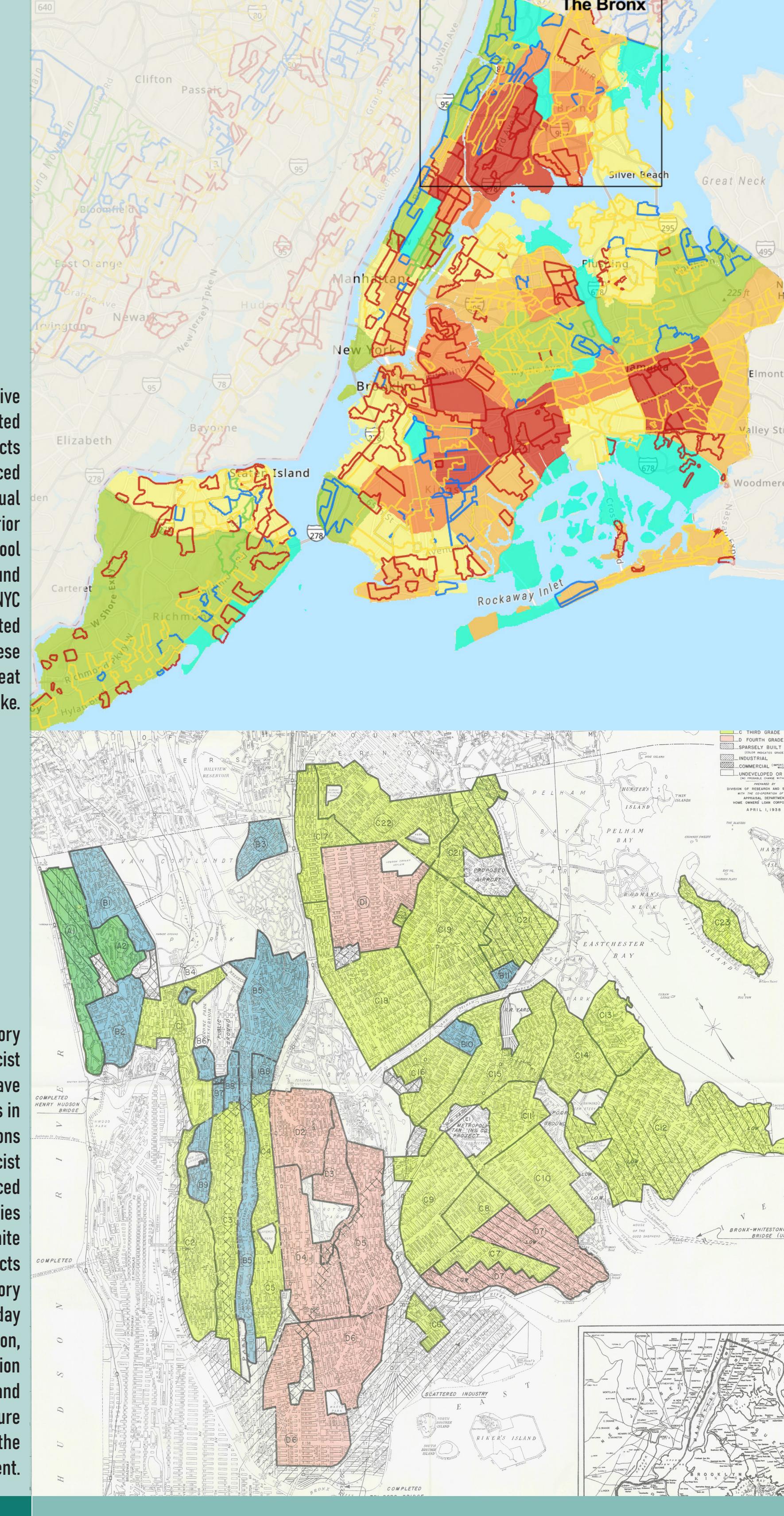
West Side & South Side Chicago, Illinois



Chicago has faced instances of extreme heat throughout the past few decades, notably marked by the deadly 1995 heat wave. In this heat wave, temperatures rose over 100 degrees fahrenheit, reaching as high as 125 degrees for a period of five consecutive days in July 1995, killing over 700 people.

Redlining has caused disproportionate impacts on specifically the South and West sides of Chicago that has manifested into infrastructure conducive of the urban heat island effect, that results in significantly higher temperatures in these areas, exacerbated by a lack of resources to handle the extreme heat. In the 1930s, the underwriting manual was adopted in South Side Chicago, redlining the area and deeming it "undesirable".

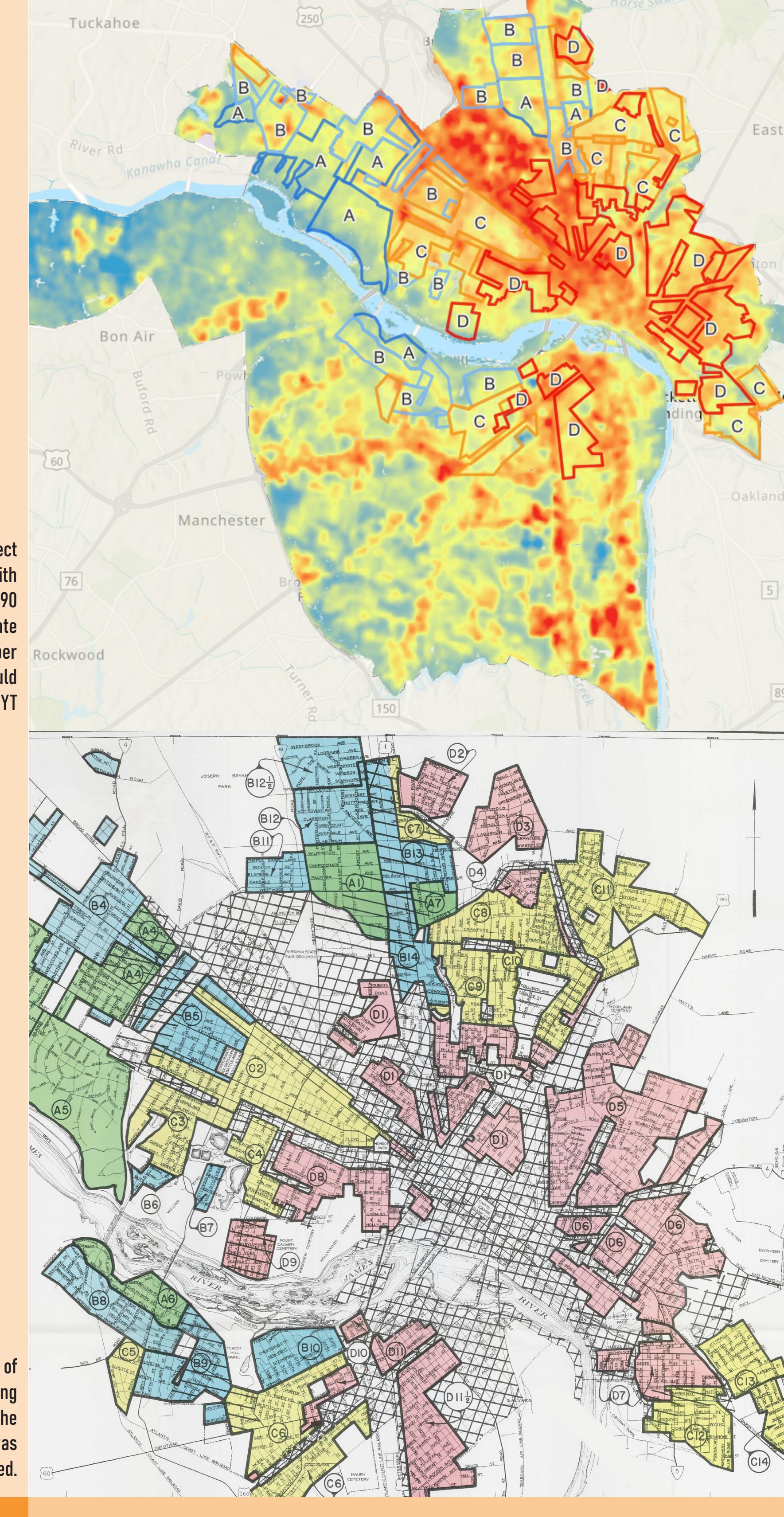
South Bronx New York, New York



The NYC Cool Roofs initiative and HOPE Program originated due to the increasing effects of urban heat experienced by New Yorkers. An annual average calculated prior to the release of the Cool Neighborhoods plan found a total of 115 deaths in NYC that were exacerbated by heat, with 13 of these directly related to heat stroke.

There is a long history of redlining and racist zoning practices that have perpetuated inequalities in NYC. Many of these actions were a direct result of racist practices and ideas forced onto minority communities by the powerful white population. The effects of these discriminatory practices can be seen today in resource allocation, demographic and population distribution, and land surface temperature distributions across the urban environment.

Northside, East End, & Southside Richmond, Virginia



"Richmond area can expect about 43 days per year with temperatures of at least 90 degrees. By 2089, climate models suggest, the number of very hot days could double." - NYU

Just Transition



The 2022 Chicago Climate Action Plan is based on a framework of just transition. This plan aims to reduce greenhouse gas emissions through fundamentally transforming the city's energy, transit, housing, stock, labor market, and equity dynamics. To address extreme heat at the neighborhood level, the plan proposes to plant over 75,000 trees, minimize hard pavement, and maximize green space, particularly in the South and West Side neighborhoods.

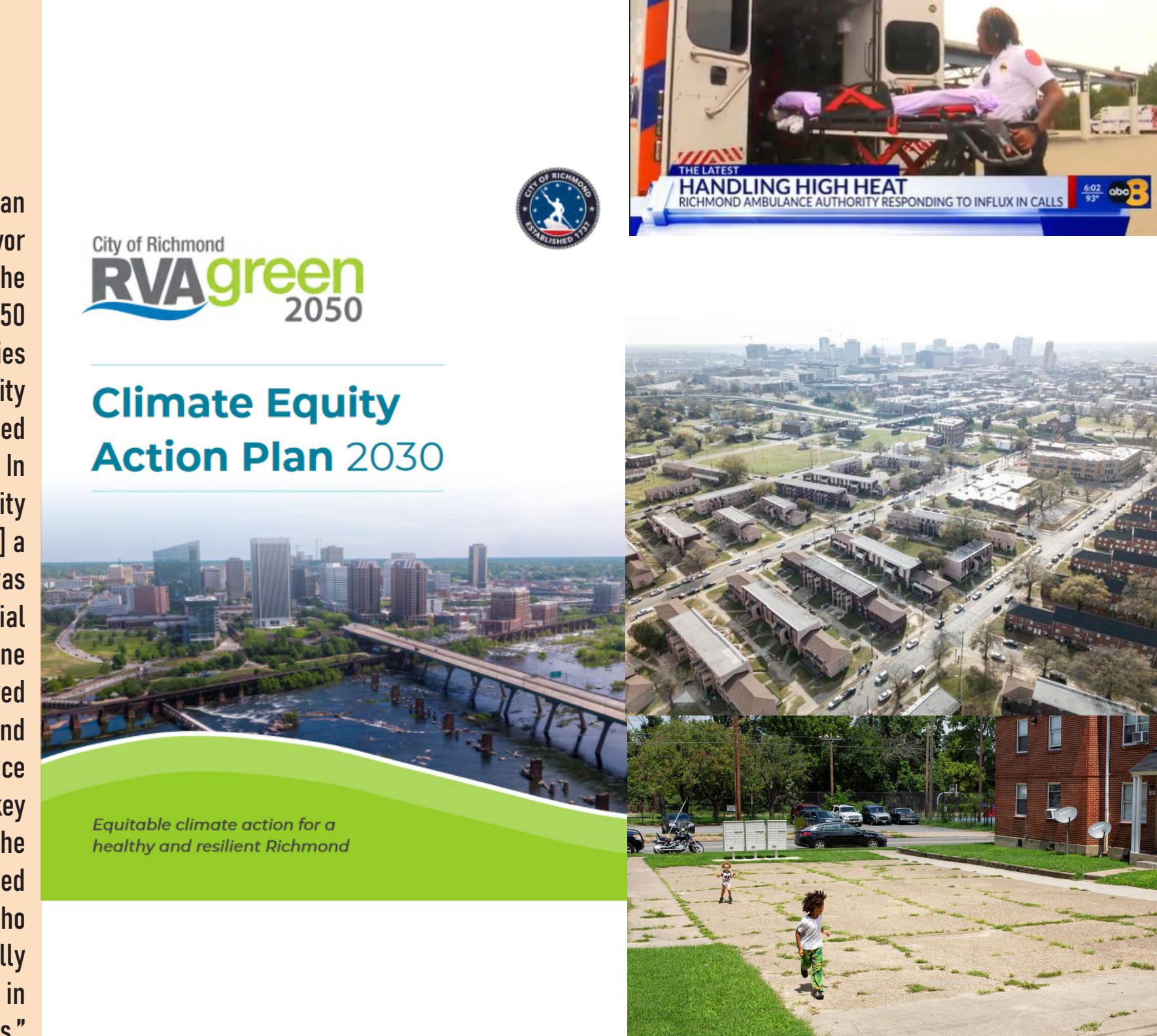
Emergent Strategy



From The HOPE Program About Page: "Equipping these communities experiencing climate change's consequences at disproportionate levels with tools to adapt and mitigate its growing effects, makes these neighborhoods livable for years to come."

"The NYC CoolRoofs program trains jobseekers in the application of a white coating to the tops of roofs. The energy efficient coating reduces the urban heat island effect in New York City's neighborhoods, lowering air temperatures during warm months. Graduates who complete the program are fully prepared to build a career in the green economy."

Reparative Planning



The plan begins with an introduction from Mayor Levar M Stoney stating: "The foundation of RVAgreen 2050 acknowledges the inequities ingrained in our community and historically perpetrated by local government. In creating the Climate Equity Action Plan 2030, [...] a city planning process [was centered] around racial equity [...] Frontline community members served on our Racial Equity and Environmental Justice Roundtable and were key decision makers in the process, which helped shift power to those who have been historically underrepresented in planning processes."

Planning Framework

Impacted Residents

Proposed Interventions: Climate Action Plans

Population Demographics & Budget

Were the interventions carried out?

Who's Involved?

Who's Responsible?

How is the community engaged?

Is this case study scalable or replicable?

How resilient is the intervention to political or administrative change?

The South Side & The West Side Chicago, IL

Just Transition

Proposed Interventions: Climate Action Plans

Population Demographics & Budget

Were the interventions carried out?

Who's Involved?

Who's Responsible?

How is the community engaged?

Is this case study scalable or replicable?

How resilient is the intervention to political or administrative change?

Planning Framework

Impacted Residents

Proposed Interventions: Climate Action Plans

Population Demographics & Budget

Were the interventions carried out?

Who's Involved?

Who's Responsible?

How is the community engaged?

Is this case study scalable or replicable?

How resilient is the intervention to political or administrative change?

Planning Framework

Impacted Residents

Proposed Interventions: Climate Action Plans

Population Demographics & Budget

Were the interventions carried out?

Who's Involved?

Who's Responsible?

How is the community engaged?

Is this case study scalable or replicable?

How resilient is the intervention to political or administrative change?

Planning Framework

Impacted Residents

Proposed Interventions: Climate Action Plans

Population Demographics & Budget

Were the interventions carried out?

Who's Involved?

Who's Responsible?

How is the community engaged?

Is this case study scalable or replicable?

How resilient is the intervention to political or administrative change?

Planning Framework

Impacted Residents

Proposed Interventions: Climate Action Plans

Population Demographics & Budget

Were the interventions carried out?

Who's Involved?

Who's Responsible?

How is the community engaged?

Is this case study scalable or replicable?

How resilient is the intervention to political or administrative change?

Planning Framework

Impacted Residents

Proposed Interventions: Climate Action Plans

Population Demographics & Budget

Were the interventions carried out?

Who's Involved?

Who's Responsible?

How is the community engaged?

Is this case study scalable or replicable?

How resilient is the intervention to political or administrative change?

Planning Framework

Impacted Residents

Proposed Interventions: Climate Action Plans

Population Demographics & Budget

Were the interventions carried out?

Who's Involved?

Who's Responsible?

How is the community engaged?

Is this case study scalable or replicable?

How resilient is the intervention to political or administrative change?

Planning Framework

Impacted Residents

Proposed Interventions: Climate Action Plans

Population Demographics & Budget

Were the interventions carried out?

Who's Involved?

Who's Responsible?

How is the community engaged?

Is this case study scalable or replicable?

How resilient is the intervention to political or administrative change?

Planning Framework

Impacted Residents

Proposed Interventions: Climate Action Plans

Population Demographics & Budget

Were the interventions carried out?

Who's Involved?

Who's Responsible?

How is the community engaged?

Is this case study scalable or replicable?

How resilient is the intervention to political or administrative change?

Planning Framework

Impacted Residents

Proposed Interventions: Climate Action Plans

Population Demographics & Budget

Were the interventions carried out?

Who's Involved?

Who's Responsible?

How is the community engaged?

Is this case study scalable or replicable?

How resilient is the intervention to political or administrative change?

Planning Framework

Impacted Residents

Proposed Interventions: Climate Action Plans

Population Demographics & Budget

Were the interventions carried out?

Who's Involved?

Who's Responsible?

How is the community engaged?

Is this case study scalable or replicable?