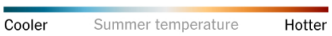
How Decades of Racist Housing Policy Left Neighborhoods Sweltering

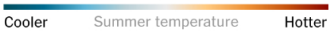
By Brad Plumer and Nadja Popovich
Photographs by Brian Palmer Aug. 24, 2020

In the 1930s, federal officials **redlined these neighborhoods** in Richmond, Va., marking them as risky investments because residents were Black.

Today, they are some of the **hottest parts of town** in the summer, with few trees and an abundance of heat-trapping pavement.



White neighborhoods that weren't redlined tend to be **much cooler** today — a pattern that repeats nationwide.



RICHMOND, Va. — On a hot summer's day, the neighborhood of Gilpin quickly becomes one of the most sweltering parts of Richmond.

There are few trees along the sidewalks to shield people from the sun's relentless glare. More than 2,000 residents, mostly Black, live in low-income public housing that lacks central air conditioning. Many front yards are paved with concrete, which absorbs and traps heat. The ZIP code has among the highest rates of heat-related ambulance calls in the city.

There are places like Gilpin all across the United States. In cities like Baltimore, Dallas, Denver, Miami, Portland and New York, neighborhoods that are poorer and have more residents of color can be 5 to 20 degrees Fahrenheit hotter in summer than wealthier, whiter parts of the same city.

And there's growing evidence that this is no coincidence. In the 20th century, local and federal officials, usually white, enacted policies that reinforced racial segregation in cities and diverted investment away from minority neighborhoods in ways that

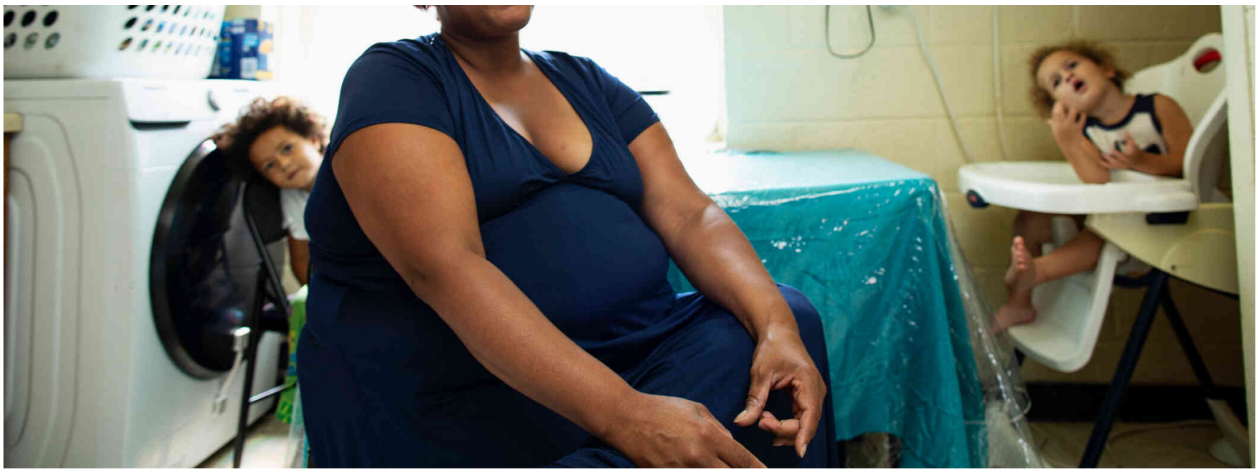
created large disparities in the urban heat environment.

The consequences are being felt today.

To escape the heat, Sparkle Veronica Taylor, a 40-year-old Gilpin resident, often walks with her two young boys more than a half-hour across Richmond to a tree-lined park in a wealthier neighborhood. Her local playground lacks shade, leaving the gyms and slides to bake in the sun. The trek is grueling in summer temperatures that regularly soar past 95 degrees, but it's worth it to find a cooler play area, she said.

"The heat gets really intense, I'm just zapped of energy by the end of the day," said Ms. Taylor, who doesn't own a car. "But once we get to that park, I'm struck by how green the space is. I feel calmer, better able to breathe. Walking through different neighborhoods, there's a stark difference between places that have lots of greenery and places that don't."

Sparkle Veronica Taylor's children, Apollo, left, and his brother Ax at the Gilpin Court complex where they live.



Ms. Taylor often walks more than a mile so her two sons can play in a tree-covered park. “It’s a cooler space,” she said. “Just a totally different environment.”

To understand why many cities have such large heat disparities, researchers are looking closer at historical practices like redlining.

In the 1930s, the federal government created maps of hundreds of cities, rating the riskiness of different neighborhoods for real estate investment by grading them “best,” “still desirable,” “declining” or “hazardous.” Race played a defining role: Black and immigrant neighborhoods were typically rated “hazardous” and outlined in red, denoting a perilous place to lend money. For decades, people in redlined areas were denied access to federally backed mortgages and other credit, fueling a cycle of disinvestment.

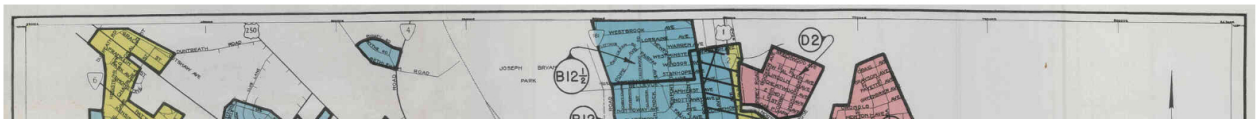
In 2016, these old redlining maps were digitized by historians at the University of Richmond. Researchers comparing them to today’s cities have spotted striking patterns.

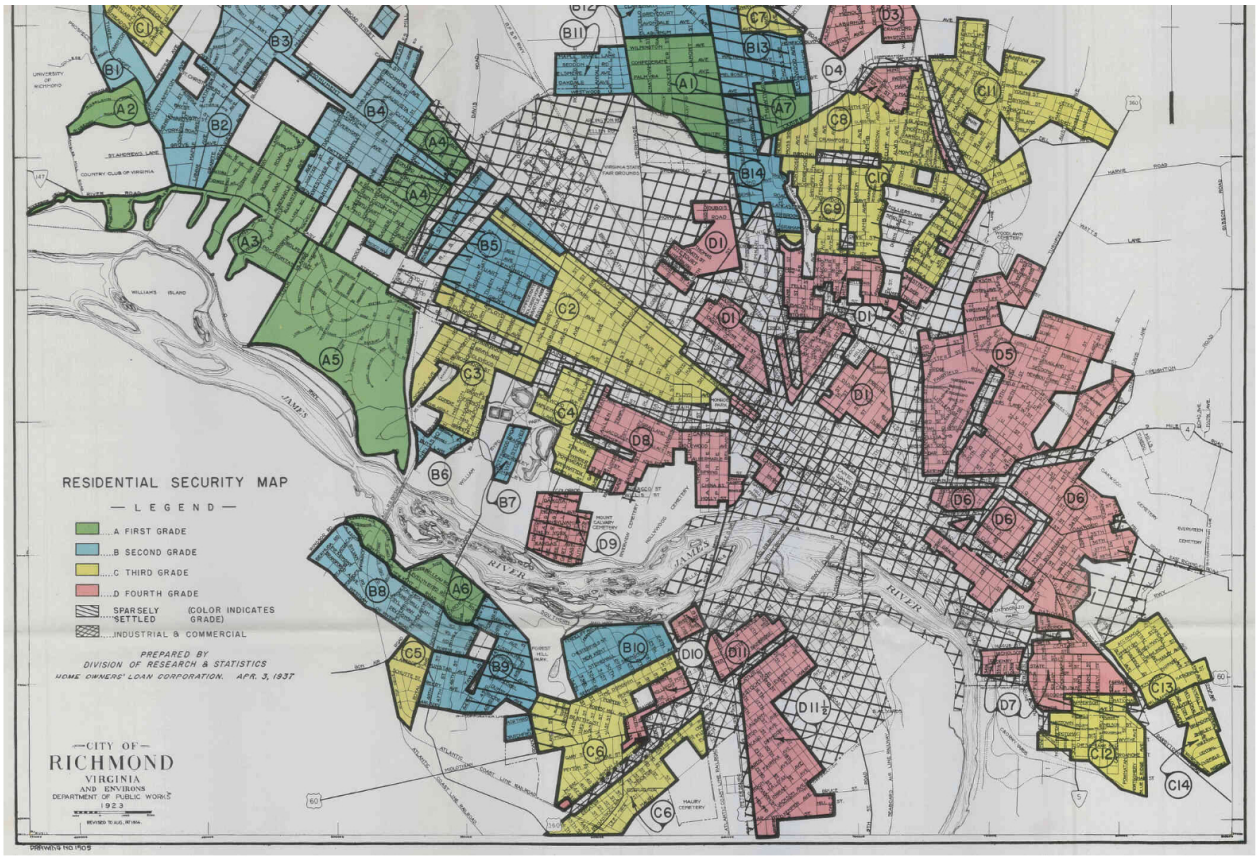
Across more than 100 cities, a recent study found, formerly redlined neighborhoods are today 5 degrees hotter in summer, on average, than areas once favored for housing loans, with some cities seeing differences as large as 12 degrees. Redlined neighborhoods, which remain lower-income and more likely to have Black or Hispanic residents, consistently have far fewer trees and parks that help cool the air. They also have more paved surfaces, such as asphalt lots or nearby highways, that absorb and radiate heat.

“It’s uncanny how often we see this pattern,” said Vivek Shandas, a professor of urban studies and planning at Portland State University and a co-author of the study. “It tells us we really need to better understand what was going on in the past to create these land-use patterns.”

Heat is the nation’s deadliest weather disaster, killing as many as 12,000 people a year. Now, as global warming brings ever more intense heat waves, cities like Richmond are drawing up plans to adapt — and confronting a historical legacy that has left communities of color far more vulnerable to heat.

A Redlined Past, a Hotter Future

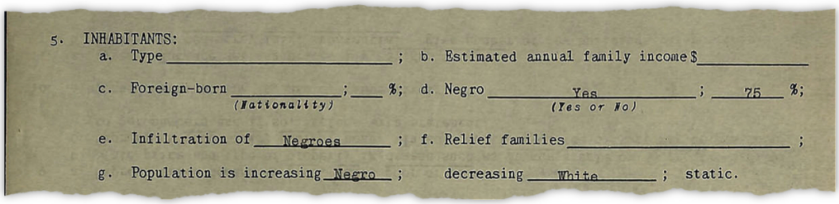




Source: Nelson, Winling, Marciano, Connolly, et al., Mapping Inequality

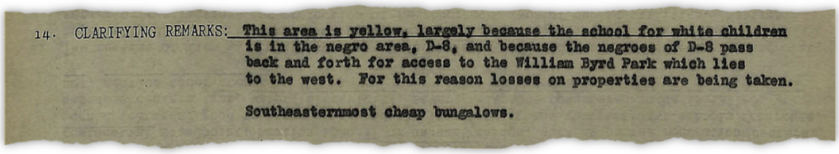
The appraisers in Richmond were transparent in their racism as they mapped the city in the 1930s as part of a Depression-era federal program to rescue the nation's collapsing housing markets.

Every Black neighborhood, no matter its income level, was outlined in red and deemed a "hazardous" area for housing loans. The appraisers' notes made clear that race was a key factor in giving these neighborhoods the lowest grade.



5. INHABITANTS:
a. Type _____; b. Estimated annual family income $_____
c. Foreign-born _____ (Nationality); ____ %; d. Negro _____ Yes (Yes or No); 75 %;
e. Infiltration of Negroes; f. Relief families _____;
g. Population is increasing Negro; decreasing White; static.

One part of town was outlined in yellow and rated as "declining" because, the appraisers wrote, Black families sometimes walked through.



14. CLARIFYING REMARKS: This area is yellow, largely because the school for white children is in the negro area, D-8, and because the negroes of D-8 pass back and forth for access to the William Byrd Park which lies to the west. For this reason losses on properties are being taken.

Southeasternmost cheap bungalows.

Source: Mapping Inequality

By contrast, white neighborhoods, described as containing "respectable people," were often outlined in blue and green and were subsequently favored for investment.

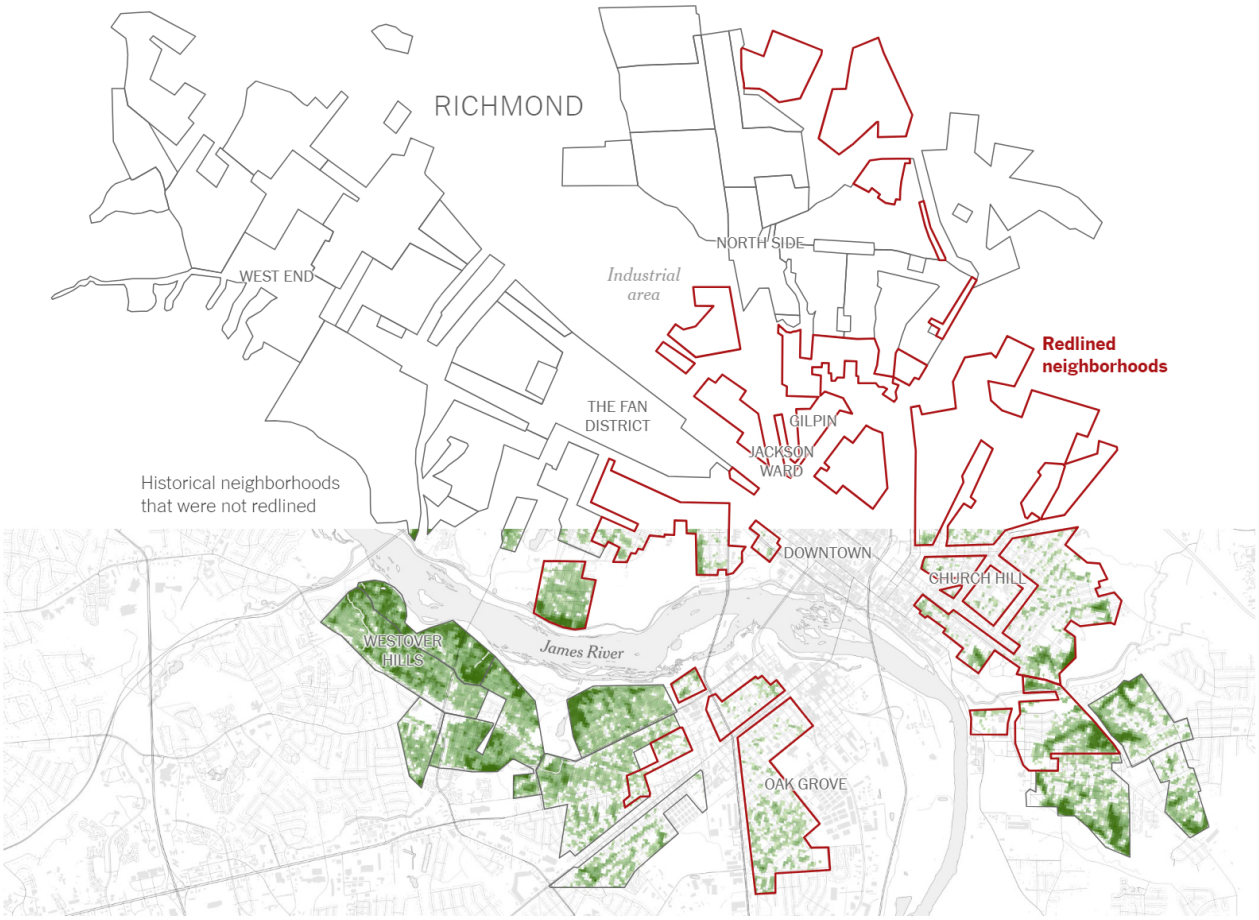
Richmond, like many cities, was already segregated before the

1930s by racial zoning laws and restrictive covenants that barred Black families from moving into white neighborhoods. But the redlining maps, economists have found, deepened patterns of racial inequality in cities nationwide in ways that reverberated for decades. White families could more easily get loans and federal assistance to buy homes, building wealth to pass on to their children. Black families, all too often, could not.

That inequity likely influenced urban heat patterns, too. Neighborhoods with white homeowners had more clout to lobby city governments for tree-lined sidewalks and parks. In Black neighborhoods, homeownership declined and landlords rarely invested in green space. City planners also targeted redlined areas as cheap land for new industries, highways, warehouses and public housing, built with lots of heat-absorbing asphalt and little cooling vegetation.

Disparities in access to housing finance "created a snowball effect that compounded over generations," said Nathan Connolly, a historian at Johns Hopkins who helped digitize the maps. Redlining wasn't the only factor driving racial inequality, but the maps offer a visible symbol of how federal policies codified housing discrimination.

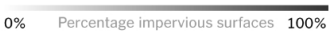
Congress outlawed redlining by the 1970s. But the practice has left lasting marks on cities.



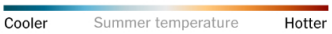
Formerly redlined areas have less **tree cover** today than areas that weren't redlined.

0% Percentage tree cover 100%

They have more **paved surfaces**, like roads and parking lots, that absorb and radiate heat.



That adds to up to **higher summer temperatures** compared to the city average.



Neighborhoods to Richmond's west that were deemed desirable for investment, outlined in green on the old maps, remain wealthier and predominantly white, with trees and parks covering 42 percent of the land. Neighborhoods in Richmond's east and south that were

once redlined are still poorer and majority Black, with much lower rates of homeownership and green space covering just 12 percent of the surface.

These patterns largely persisted through cycles of white flight to the suburbs and, more recently, gentrification.

Today, Richmond's formerly redlined neighborhoods are, on average, 5 degrees hotter on a summer day than greenlined neighborhoods, satellite analyses reveal. Some of the hottest areas, like the Gilpin neighborhood, can see temperatures 15 degrees higher than wealthier, whiter parts of town.

Even small differences in heat can be dangerous, scientists have found. During a heat wave, every one degree increase in temperature can increase the risk of dying by 2.5 percent. Higher temperatures can strain the heart and make breathing more difficult, increasing hospitalization rates for cardiac arrest and respiratory diseases like asthma. Richmond's four hottest ZIP codes all have the city's highest rates of heat-related emergency-room visits.

Few neighborhoods in Richmond have been as radically reshaped as Gilpin. In the early 20th century, Gilpin was part of Jackson Ward, a thriving area known as "Black Wall Street" and the cultural heart of the city's African-American middle class, a place where people came to see Louis Armstrong or Ella Fitzgerald perform.

But with redlining in the 1930s, Jackson Ward fell into decline. Black residents had a tougher time obtaining mortgages and property values deteriorated. In the 1940s, the city embarked on "slum clearance" projects, razing acres of properties and replacing them with Richmond's first segregated public housing project, Gilpin Court, a set of austere, barracks-style buildings that were not designed with heat in mind.

A decade later, over the objections of residents, Virginia's state government decided to build a new highway right through the neighborhood, destroying thousands of homes and isolating Gilpin.

West Duval Street in 1956. Today the street overlooks a six-lane highway.
Edith Shelton Collection/The Valentine

Interstate 95 cleaved central Richmond in two, isolating neighborhoods.
The Library of Virginia

Chamberlayne Parkway is one of the few roads left connecting Gilpin to the rest of downtown.

Today, Gilpin's community pool sits empty, unfixed by the city for years. Cinder block walls bake in the sun, unshaded by trees. While city officials and local utilities have provided many people with window air-conditioners, residents said they often aren't enough, and old electric wiring means blown fuses are common.

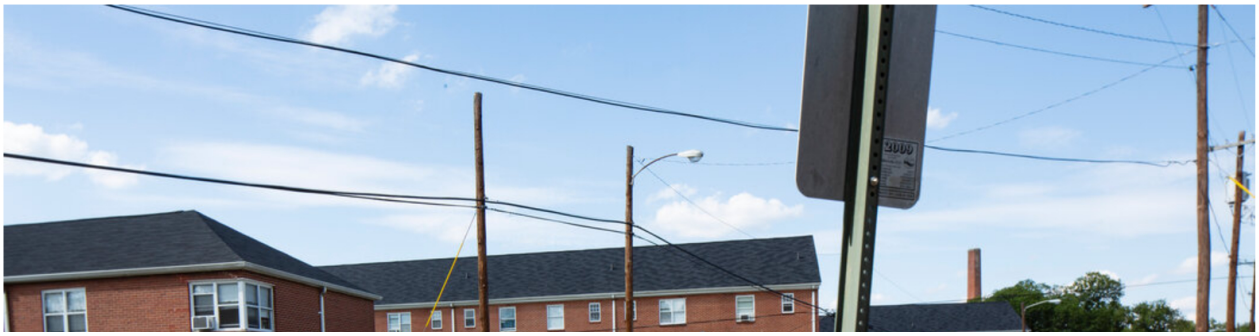
"The air conditioning unit in my bedroom runs 24/7," said Ms. Taylor, the 40-year-old mother of two. "Air circulation is poor up here on the upper level of where I live."

Gilpin is grappling with a mix of heat and poverty that illustrates how global warming can compound inequality.

Sherrell Thompson, a community health worker in Gilpin, said residents have high rates of asthma, diabetes and blood pressure, all conditions that can be worsened by heat. They are also exposed to air pollution from the six-lane highway next door.

There are no doctor's offices nearby or grocery stores selling fresh produce, which means that people without cars face further health challenges in the heat.

"It becomes a whole circle of issues," Ms. Thompson said. "If you want to find any kind of healthy food, you need to walk at least a mile or catch two buses. If you have asthma but it's 103 degrees out and you're not feeling well enough to catch three buses to see your primary care physician, what do you do?"



Gilpin, a majority-black, low-income area that was formerly redlined, has plenty of heat-absorbing pavement and scant tree cover, making it much hotter in the summer.

Westover Hills, a majority-white, middle-income neighborhood that was greenlined in the 1930s, is cooler than average on summer days thanks in part to its tree canopy.

In Gilpin, the average life expectancy is 63 years. Just a short drive over the James River sits Westover Hills, a largely white, middle-income neighborhood that greets visitors with rows of massive oak trees spreading their leaves over quiet boulevards. Life expectancy there is 83 years.

A broad array of socioeconomic factors drives this gap, but it is made worse by heat. Researchers have found that excess heat and a lack of green space can affect mental well-being and increase anxiety. Without parks or shady outdoor areas to gather, people are more likely to be isolated indoors during the summer, a dynamic worsened by the coronavirus pandemic.

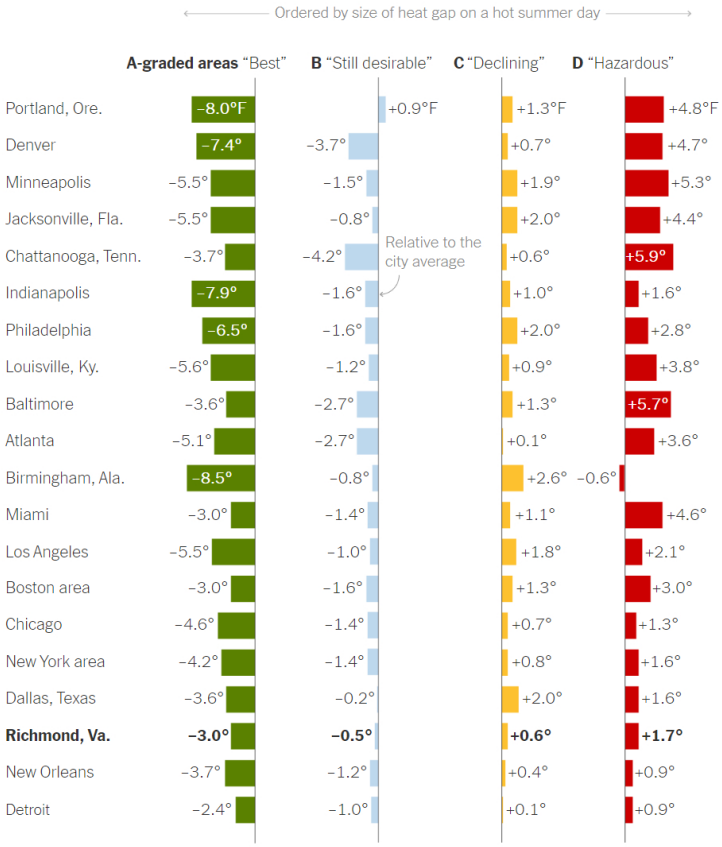
“Especially when there’s no green space nearby, the heat traps

people in their homes," said Tevin Moore, 22, who grew up in Richmond's formerly redlined East End. "The heat definitely messes with you psychologically, people get frustrated over every little thing."

Climate Planners Confront Racial Inequality

Nationwide, the pattern is consistent: Neighborhoods that were once redlined see more extreme heat in the summer than those that weren't.

Across U.S. cities, neighborhoods assigned lower grades by the federal government in the 1930s are hotter today



The New York and Boston values reflect graded neighborhoods in the broader area, including some suburbs. | Source: Hoffman, Shandas and Pendleton, Climate

Every city has its own story.

In Denver, formerly redlined neighborhoods tend to have more Hispanic than Black residents today, but they remain hotter: parks were intentionally placed in whiter, wealthier neighborhoods that then blocked construction of affordable housing nearby even after racial segregation was banned. In Baltimore, polluting industries were more likely to be located near communities of color. In Portland, zoning rules allowed multifamily apartment buildings to cover the entire lot and be built without any green space, a practice the city only recently changed.

The problem worsens as global warming increases the number of hot days nationwide.

Today, the 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. "All of a sudden

suggest, the number of very hot days could double. "All of a sudden you're sitting on top of really unlivable temperatures," said Jeremy Hoffman, chief scientist at the Science Museum of Virginia and a co-author of the redlining study.

Playground equipment, with no shade, at Gilpin Court.

To escape the heat, the Taylor family treks to a greener playground in Lombardy Park.

For years, cities across the United States rarely thought about racial equity when designing their climate plans, which meant that

racial equity when designing their climate plans, which meant that climate protection measures, like green roofs on buildings, often disproportionately benefited whiter, wealthier residents. That's slowly starting to change.

In Houston, officials recently passed an ordinance to prioritize disadvantaged neighborhoods for flood protection. Minneapolis and Portland are reworking zoning to allow denser, more affordable housing to be built in desirable neighborhoods. Denver has passed a new sales tax to fund parks and tree-planting, and city officials say they would like to add more green space in historically redlined areas.

And in Richmond, a city in the midst of a major reckoning with its racist past, where crowds this summer tore down Confederate monuments and protested police brutality, officials are paying much closer attention to racial inequality as they draw up plans to adapt to global warming. The city has launched a new mapping tool that shows in detail how heat and flooding can disproportionately harm communities of color.

"We can see that racial equity and climate equity are inherently entwined, and we need to take that into account when we're building our capacity to prepare," said Alicia Zatcoff, the city's sustainability manager. "It's a new frontier in climate action planning and there aren't a lot of cities that have really done it yet."

Officials in Richmond's sustainability office are currently engaged in an intensive listening process with neighborhoods on the front lines of global warming to hear their concerns, as they work to put racial equity at the core of their climate action and resilience plan. Doing so "can mean confronting some very uncomfortable history," said Ms. Zatcoff. But "the more proponents there are of doing the work this way, the better off we'll all be for it."

To start, the city has announced a goal of ensuring that everyone in Richmond is within a 10-minute walk of a park, working with the Science Museum of Virginia and community partners to identify city-owned properties in vulnerable neighborhoods that can be converted into green space. It's the city's first large-scale greening project since the 1970s.

Green space can be transformative. Trees can cool down neighborhoods by several degrees during a heat wave, studies show, helping to lower electric bills as well as the risk of death. When planted near roads, trees can help filter air pollution. The presence of green space can even reduce stress levels for people living nearby.

And trees have another climate benefit: Unlike paved surfaces, they can soak up water in their roots, reducing flooding during downpours.

A few years ago, in Richmond's formerly redlined Southside, local nonprofits and residents sought to address the lack of green space and grocery stores by building a new community garden, a triangular park with a shaded veranda and fruit trees. "Almost instantly, the garden became a community space," said Duron Chavis of Lewis Ginter Botanical Garden, which backed the effort. "We have people holding cookouts, people doing yoga and meditation here, they can get to know their neighbors. It reduces

meditation here, they can get to know their neighbors. It reduces social isolation."

Duron Chavis at an urban farm in Richmond, Va., one of several built to address rising heat and a lack of grocery stores nearby.

Richmond's long-term master plan, a draft of which was released in June, calls for increasing tree canopy in the hottest neighborhoods, redesigning buildings to increase air flow, reducing the number of paved lots and using more light-colored pavement to reflect the sun's energy. The plan explicitly mentions redlining as one of the historical forces that has shaped the city.

"Even people who don't believe institutionalized racism are struck when we show them these maps," said Cate Mingoya, director of capacity building at Groundwork USA, which has been highlighting links between redlining and heat in cities like Richmond. "We didn't get here by accident, and we're not going to get it fixed by accident."

Still, the challenges are immense. Cities often face tight budgets, particularly as revenues have declined amid the coronavirus pandemic.

And tree-planting can be politically charged. Some researchers have warned that building new parks and planting trees in lower-income neighborhoods of color can often accelerate gentrification, displacing longtime residents. In Richmond, city officials say they are looking to address this by building additional affordable housing alongside new green space.

Richmond's draft master plan envisions building a park over Routes I-95 and I-64 to reconnect Gilpin with historical Jackson Ward, as well as redeveloping the public housing complex into a more walkable mixed-income neighborhood. That plan is not imminent, but local activists fear residents could eventually be

priced out of this newer, greener area.

“My worry is that they won’t build that park until the people who currently live here are removed,” said Arthur Burton, director of the Kinfolk Community Empowerment Center, who has been working to build community gardens in historically redlined areas like Gilpin.

While many are optimistic about Richmond’s efforts to focus on racial equity, they warn there’s still much work to be done to undo disparities built up over many decades. Inequality in housing, incomes, health and education “all make a difference when we’re talking about vulnerability to climate change,” said Rob Jones, executive director of Groundwork’s Richmond chapter. “Greening the built environment is absolutely important,” he said, “but it’s only a start.”

Brad Plumer, a writer on the Times’ climate team, reported from Richmond, Va., and Washington, D.C. Nadja Popovich, a graphics editor and writer on the Times’ climate team, reported from Richmond and New York. Brian Palmer is a Richmond-based freelance visual journalist.

Additional reporting from Denver by Veronica Penney. Additional development by Josh Williams.

The maps use land surface temperatures derived from remotely-sensed satellite data to estimate heat disparities across cities. The values reflect heat being radiated from surfaces, rather than the overlying air temperatures. Detailed maps of air temperature for cities in the United States aren’t available nationwide. Surface and air temperatures most often follow the same pattern in cities, according to an analysis by Dr. Shandas of Portland State University, though the difference between the hottest and coolest areas is usually greater for surface temperatures.

Sources: Tree cover and impervious surface data are from the National Land Cover Database 2016. Temperature values are derived from NASA/U.S.G.S. Landsat thermal data, via Hoffman et. al., Climate

Correction: Aug. 31, 2020
An earlier version of this article described incorrectly a highway that was built through Jackson Ward. While the route that isolated Gilpin later became part of the national Interstate highway system, it was not a federal highway when it was built.

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