Photo Courtesy of MSD

Green Cincinnnati Plan
2023

FOCUS AREA

Resilience & Climate Adaptation

Green Cincinnati
BUILDING A SUSTAINABLE AND EQUITABLE CITY

city of CINCINNATI

FOCUS AREA

Resilience & Climate Adaptation

Anticipating, preparing, and responding to the challenges of changing conditions.

Vision

We are a city that will take bold action to heal past environmental, racial, and economic injustices, and that will continue to adapt, innovate, and respond to vulnerabilities to create a climate-ready, resilient, and socially cohesive community.

A Word from Tanner Yess, Resilience & Climate Adaptation Focus Area Chair

What is resilience? You can see it in the untapped potential of our young people; mothers who take multiple buses to buy groceries; residents that fight stormwater with guerrilla green infrastructure; and the urgency to build trust and partner with our frontline neighborhoods. This subcommittee started at the center, with equity, and with those most at risk from a changing climate—our low-income and/or communities of color. We are looking forward with ideas that could correct yesterday's environmental and social injustices. We are making ourselves ready to adapt to a changing climate by bolstering our collective resilience. In the 2023 Green Cincinnati Plan (GCP), we have made Resilience a dedicated pillar as well as a distinct Focus Area.

Stakeholders provide recommendations for Resilience and Climate Adaptation at the 2023 Green Cincinnati Plan kick-off meeting. Photo courtesy of OES staff.

FOCUS AREA CHAIR

RESILIENCE & CLIMATE ADAPTATION FOCUS AREA CHAIR
Tanner Yess

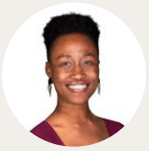
ORGANIZATION
Co-Executive Director
Groundwork Ohio River Valley

Climate Safe Neighborhoods, a program of Groundwork Ohio River Valley in partnership with Green Umbrella and the Office of Environment and Sustainability (OES), has been our North Star for outreach and engagement. Paid equity liaisons have ensured that our process reached those traditionally left out by the sustainability movement. Youth voices have been heard, languages translated, and hard topics discussed. Over seventy people provided input for the Resilience Subcommittee, and partner organizations worked with city government to distill feedback.

Cincinnati stakeholders prioritize actions and strategies at the Resilience and Climate Adaptation Focus Area Subcommittee meeting. Photo courtesy of OES staff.

Climate change is amplifying our ancestors' mistakes by doubling down on issues of infrastructure, public health, access to nature, and other problems perpetuated by racist and classist systems. Though ominous, we see opportunity—a chance to be proactive, prepare for the unexpected, and put resources into righting historical wrongs through green jobs, policy, and the equitable distribution of funding. This is the task we have chosen, and have been chosen for. Join us.

EQUITY LIAISON



"I want these neighborhoods to truly become sponges, become teaching laboratories for community members."

EQUITY LIAISON
Tyeisha A. Cole

ORGANIZATION
Climate Action Coordinator
Green Umbrella

NEIGHBORHOOD
Millvale & West Price Hill

EQUITY LIAISON

"I hope resiliency centers can come to fruition. Or we can add more funding to community/recreation centers."

EQUITY LIAISON
Phillip Marshall

NEIGHBORHOOD
South Cumminsville

Stormwater & Heat Adaptation

Goal

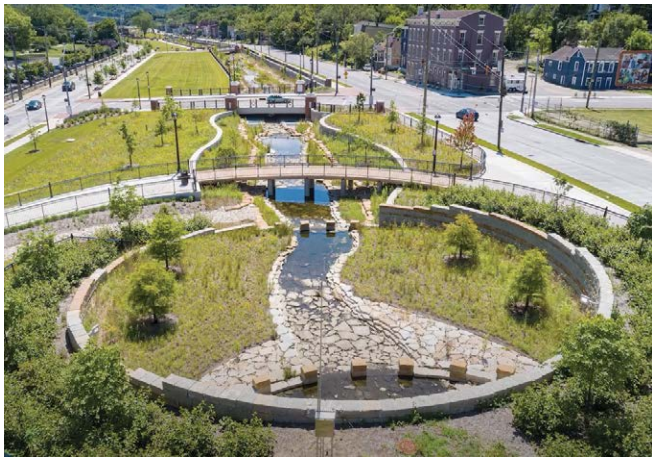
Complete 25 green infrastructure projects by 2028 in extreme heat and overland flood vulnerable communities.

BASELINE YEAR(S)

2022

DATA SOURCE(S)

US EPA Office of Community Revitalization, US EPA Green Infrastructure Program, US EPA Smart Growth Program, US EPA Urban Heat Island Reduction Program, US EPA Environmental Justice Screening Tool; Climate and Economic Justice Screen; Climate Safe Neighborhoods; Climate Equity Indicators Report; Hamilton County Multi-Hazard Mitigation Plan; MSDGC Environmental Sustainability Report; Living With Landslides



The Lick Run Greenway, completed in 2021 by Greater Cincinnati Metropolitan Sewer District, is an example of a large-scale green infrastructure project that reduces combined sewer overflows. Photo courtesy of MSD.

Strategy

Reduce extreme heat, overland flooding, landslides, and water-pollution vulnerabilities by incentivizing, improving, and increasing green infrastructure and other mitigating methods.

To be resilient against extreme heat, overland flooding, sewer backups/overflows, landslides, and water pollution, the City must increase green infrastructure.

"Green infrastructure" means using natural features or planned ecological systems to manage water by mimicking the natural water cycle. Examples of green infrastructure include:

- Green roofs
- Bioswales
- Green medians
- Wetlands
- Parks
- Permeable pavements
- Landscape gardens.

Green infrastructure not only manages storm water exceptionally well, but it is also excellent at mitigating extreme heat. Other methods to tackle extreme heat include, for example, equitable access to air conditioning and the use of heat reflective surfaces.

In contrast to green infrastructure, the urban built environment includes all the physical elements of the places people work and live, such as roads, buildings, houses, bridges, parks, open spaces, and infrastructure (sewer systems, water and power lines, etc.). This built environment sometimes removes or tries to control

many natural features, leading to unintended consequences for both people and the urban environment.

For example, hardscapes are large areas with impervious surfaces and gray infrastructure refers to the channelization of natural streams and runoff areas. Hardscapes and gray infrastructure with aging or limited capacity have amplified the effects of extreme storms. The excess water that runs off of hardscapes and gray infrastructure during heavy storms creates overland flooding, sewer backups, and sewer overflows.

These unmitigated storm water events pollute our recreational and potable water supplies, and they have had a direct effect on hillside instability, resulting in more frequent landslides. Large areas with reduced vegetation have also exacerbated extreme heat, creating what is referred to as "the heat island effect."

The City must recognize and adapt to these climate vulnerabilities now, especially because these vulnerabilities predominantly occur in sensitive land use areas and priority communities. Green infrastructure at multiple scales presents a resilient set of cross-cutting solutions that both promote the natural environment and allow for positive economic and social changes within the existing built environment.

	GCP PILLARS			ADDITIONAL PRIORITIES			
Priority Actions	Sustainability	Equity	Resilience	Jobs	Investment	Health	Feasibility
Incentivize green infrastructure projects in communities with extreme heat and flood vulnerabilities	🟢	🟢	🟢	🟡	🟡	🟢	🟢
Equitably restructure sewer rates based on permeable land surface and other contributing factors	🟡	🟢	🟢	🔴	🟢	🟡	🟢
Create a "sponge city" with more and diverse green infrastructure in public and residential places including green roofs, bioswales, green medians, wetlands, parks, permeable pavements, and landscape gardens	🟢	🟢	🟢	🟡	🟡	🟢	🟡
Continue to decrease sewer backups, sewer overflows, and overland flooding (flash flooding) by supporting sewer infrastructure improvements in priority communities	🟢	🟢	🟢	🟢	🟡	🟢	🟡
Partner with communities to identify opportunities to address property damage caused by overland flooding and hillside instability	🟡	🟢	🟢	🔴	🟡	🟡	🟡
Ensure all rental housing has at least one room with adequate air conditioning	🟡	🟢	🟢	🟡	🟢	🟢	🟡
Use heat reflective materials when appropriate (roads, parking surfaces, roofs, etc.)	🟢	🟢	🟢	🟡	🟡	🟢	🟡

🟢 strong alignment 🟡 moderate alignment 🔴 weak alignment

See Natural Environment Focus Areas for more green infrastructure actions

Community Planning & Social Cohesion

Goal

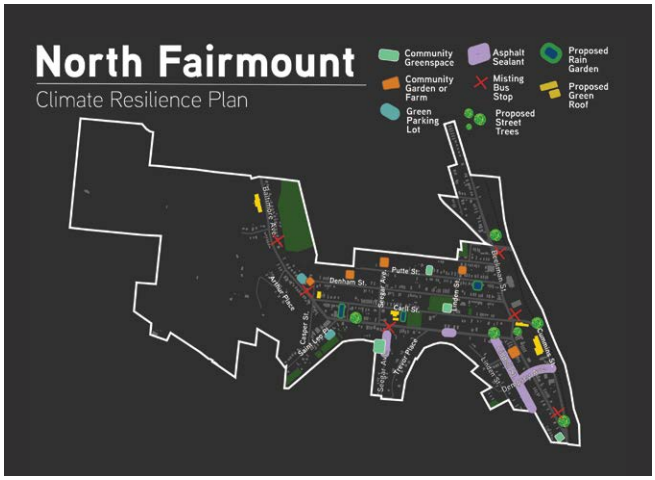
Complete five climate adaptation and resilience projects per year by 2028 that create 10 green jobs per project.

BASELINE YEAR(S)

2022

DATA SOURCE(S)

US EPA Office of Community Revitalization, US EPA Climate Change Adaptation Program, US EPA Environmental Justice Screening Tool; Climate and Economic Justice Screen; Climate Safe Neighborhoods; Climate Equity Indicators Report; Hamilton County Multi-Hazard Mitigation Plan; USDN Resilience Hubs Project; Report on the Impact of Climate Change on Migration



The resilience maps developed through the Climate Safe Neighborhoods project, like this one for North Fairmount, are examples of community planning and social cohesion. Photo courtesy of Groundwork Ohio River Valley.

Strategy 1

Increase access, stability, and security of mixed-income housing and resilience hubs for local residents and anticipated climate migrants.

Social cohesion is the ability for community members to cooperate to achieve shared well-being. Strong social cohesion is one of the most important factors in successfully responding to climate change impacts. Yet, climate change can threaten social cohesion. Affordable housing—a cornerstone of social cohesion—is especially vulnerable to the impacts of climate change. Ensuring the accessibility, stability, and security of affordable housing must be considered in resilient community planning. Reducing poverty and increasing economic mobility can ease the burden climate change places on social cohesion. For these reasons, the need to increase affordable housing underpins much of the socially resilient movement.

Neighborhood children gather at the Millvale Recreation Center. Recreation Centers are places of community connection and present an opportunity for resilience hub development. Photo courtesy of Liz Dufour/Cincinnati Enquirer.

Resilience hubs promote social cohesion, public health, equity, and they can help save lives. Through community planning, these hubs can provide the necessary resources for communities to withstand climate challenges. Resilience hubs come in many forms:

- Community institutions enhanced to increase adaptive capacity
- Multi-faceted support centers for residents
- Educational spaces for emergency preparedness
- Place for coordinated resource distribution and other services in response to climate challenges.

The City and its neighborhoods can take advantage of existing institutions to create the necessary resilience hubs.

In addition to serving residents, Cincinnati must prepare for a possible influx of climate migrants. "Climate migrants" are people who leave their homes because of climate shocks and stressors. People in the most vulnerable situations (those who live in rural, tropical, or drought-stricken areas) will probably migrate first; however, no one can predict the exact origin, number, timing, or scale of climate migrants. Although Cincinnati has its own climate vulnerabilities, it will likely emerge as a climate haven. The City will need tools to adapt to the anticipated population increase.

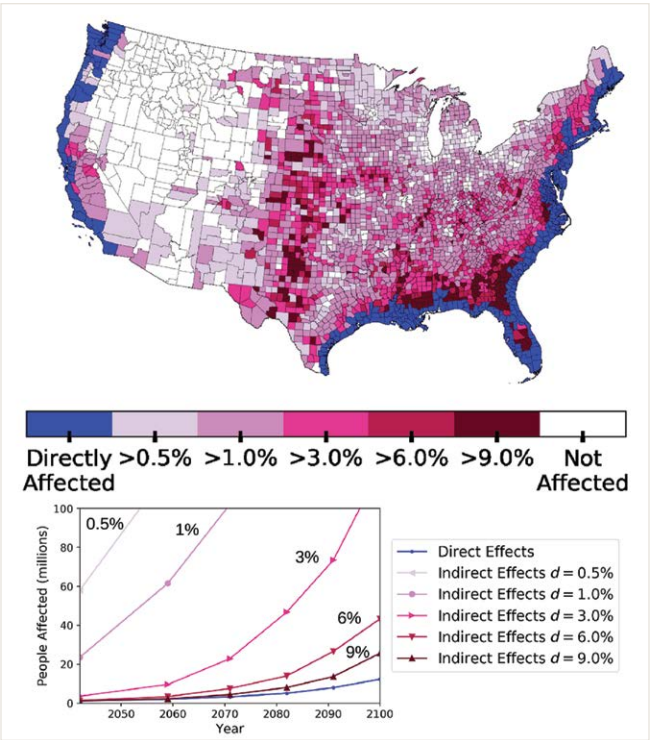
Priority Actions

	GCP PILLARS			ADDITIONAL PRIORITIES			
	Sustainability	Equity	Resilience	Jobs	Investment	Health	Feasibility
Continue to implement affordable and mixed-income housing strategies to stabilize communities	🟡	🟢	🟢	🟡	🟡	🟢	🟢
Develop neighborhood resilience hubs to foster community connection and increase emergency preparedness	🟡	🟢	🟢	🟡	🟡	🟢	🟢

🟢 strong alignment 🟡 moderate alignment 🔴 weak alignment

Community Planning & Social Cohesion

The Green team works on removing invasive species from the green roof at City Hall. Community-based programs like this provide green youth workforce training. Photo courtesy of Groundwork Ohio River Valley and Cincinnati Parks.



Prediction of climate migration within the United States from coastal displacement by 2100 due to sea level rise. Photo courtesy of PLOS One.

Strategy 2

Use more community-based assessments, planning, programs, and training to reduce the social impacts of climate vulnerabilities.

Climate vulnerability describes the extent to which social systems are susceptible to climate change impacts. Priority communities, both within the City and across the country, have an increased sensitivity to climate change and a higher risk of impact. They are likely to have fewer resources to adapt and recover from climate events, but when informed and equipped, these residents can serve as a powerful force for change. The City needs to ensure that residents—both current and future—understand and are prepared for the social effects of climate change. Social impacts may include:

- Health effects and exposure to pollution
- Lack of fresh food access
- Limited availability and connectivity to jobs, education, entertainment, and recreation
- Migration and displacement of households
- Loss of community identity.

Priority Actions	GCP PILLARS			ADDITIONAL PRIORITIES			
	Sustainability	Equity	Resilience	Jobs	Investment	Health	Feasibility
Fund and expand the Climate Safe Neighborhoods Program to cultivate the social infrastructure for resilient communities and provide green workforce training	🟡	🟢	🟢	🟢	🟡	🟡	🟢
Develop a climate migration response plan	🟡	🟢	🟢	🔴	🟢	🟡	🟢

🟢 strong alignment 🟡 moderate alignment 🔴 weak alignment

Pollution Reduction & Adaptive Land Use

Goal

Revitalize 25 contaminated, industrial properties in neighborhoods of the Lower Mill Creek Valley by 2028.

BASELINE YEAR(S)

2022

DATA SOURCE(S)

US EPA Brownfield and Land Revitalization Program; Ohio EPA Brownfield Program; US EPA Environmental Justice Screening Tool; Climate and Economic Justice Screen; Climate Safe Neighborhoods; Climate Equity Indicators Report; Hamilton County Multi-Hazard Mitigation Plan; MSDGC Environmental Sustainability Report; Living With Landslides; Cincinnati Choice Neighborhoods Transformation Plan; The Lower Price Hill Resurgency Plan; Revive Cincinnati: Neighborhoods of the Lower Mill Creek Valley; Made in Camp; Cincinnati Strategic Plan; Community Improvements Study Spring Grove Avenue Corridor; Project Cool It; A Naturally Industrious Revitalization Guide: The Beekman Street & Queen City Avenue Strategic Development Guidebook

Strategy 1

Mitigate pollution and clean up additional legacy brownfield sites to revitalize neighborhoods and result in healthier communities.

Known pollutants as well as emerging pollutants of concern need to be reduced in the environment before our air, water, and land become prohibitively contaminated. Emerging pollutants are those chemicals that have been detected in environmental monitoring that may cause unexpected ecological or health impacts and typically are not regulated under current environmental laws. Significant emerging pollutants of concern include pharmaceuticals and personal care products as well as microplastics.

Due to previous industrial development patterns in Cincinnati, the City is home to numerous vacant and underutilized properties. These properties, referred to as “brownfields,” tend to be contaminated. The challenges of brownfields include:

The historic Crosley building is an example of a brownfield site in Camp Washington. Clean-up of brownfield sites can revitalize neighborhoods and build healthier communities. Photo courtesy of Maddy Schmidt/WCPO.

- Presence of asbestos-containing materials and lead-based paint
- Lack of safety and increased vandalism
- Proximity to residential areas, parks, playgrounds, and flood zones
- Loss of tax revenue for the City.

The City has estimated that up to 500 potential brownfield properties may exist within priority communities of the Lower Mill Creek Valley alone.

Brownfield revitalization outcomes aligned with priority community needs and city planning can include stable, secure, and affordable living environments; energy-efficient, sustainable buildings that use renewable energy sources; economic investment; and job creation.

Benefits of brownfield revitalization for priority communities can include:

- Community pride and neighborhood anchors to strengthen place-making
- Increased economic value
- Better connectivity to fresh food, jobs, training, recreation, and green infrastructure
- Increased workforce capacity
- Creation of resilience hubs
- Climate adaptation to heat and flood vulnerabilities
- Healthier communities with reduced exposure to pollution.

Priority Actions

	GCP PILLARS			ADDITIONAL PRIORITIES			
	Sustainability	Equity	Resilience	Jobs	Investment	Health	Feasibility
Conduct inventories, assessments, and clean-ups of contaminated industrial sites, referred to as brownfields, in alignment with both community revitalization priorities and city-planned reuse	🟢	🟢	🟢	🟡	🟢	🟢	🟢
Address emerging pollutants, including pharmaceuticals and personal care products, that are endocrine-disrupting chemicals and microplastics	🟢	🟡	🟢	🔴	🟡	🟢	🟡

🟢 strong alignment 🟡 moderate alignment 🔴 weak alignment

Pollution Reduction & Adaptive Land Use

A resident of the East End experiences extreme flooding from the Ohio River on February 24, 2018. Flood zones are sensitive land use areas which require protection and adaptive land use. Photo courtesy of Liz Dufour/Cincinnati Enquirer.

Severe storms in 2016 resulted in landslides on Columbia Parkway. Hillsides are one type of sensitive land-use areas in Cincinnati. Photo courtesy of City of Cincinnati.

Strategy 2

Increase protection of vulnerable lands and infrastructure through policy development.

Urbanization has transformed land use in cities, and the degree of this transformation can impact how vulnerable communities and infrastructure are to climate change. Land use sensitivity is the main measurement of this vulnerability. Highly concentrated urban areas (e.g., heat islands and stormwater-impermeable hardscapes), flood zones, and hillsides are examples of sensitive land use areas in Cincinnati.

Core infrastructure—including energy, water, transportation, and healthcare systems—is especially vulnerable to climate change in these sensitive land use areas due to the socio-economic impacts that an outage would have. This is particularly true in priority communities because residents need these services to survive.

For communities to be resilient to climate change, the City needs to develop policies, such as Low Impact Development, that protect vulnerable land use and core infrastructure without creating unsustainable consequences.

Priority Actions	GCP PILLARS			ADDITIONAL PRIORITIES			
	Sustainability	Equity	Resilience	Jobs	Investment	Health	Feasibility
Protect landslide-prone hillsides and overland flood risk zones through land development policies such as Low Impact Development	●	●	●	●	●	●	●

● strong alignment ● moderate alignment ● weak alignment