



# Keep Cool DC

Melissa Deas

2024

# Agenda

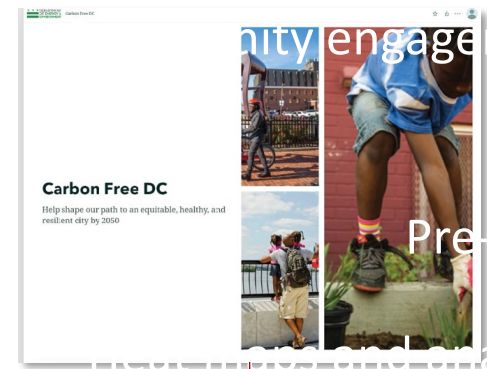
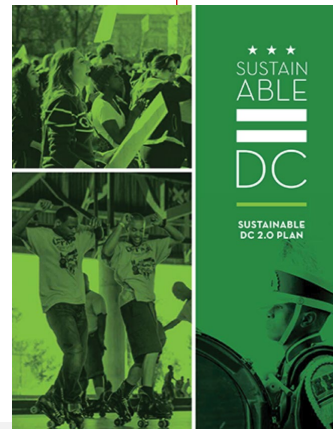
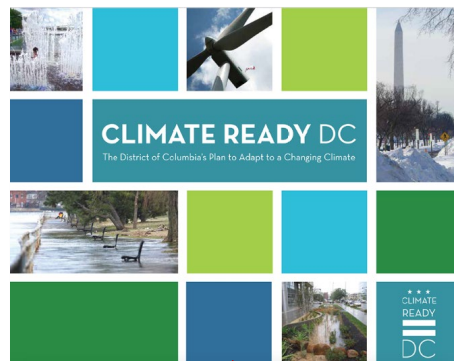
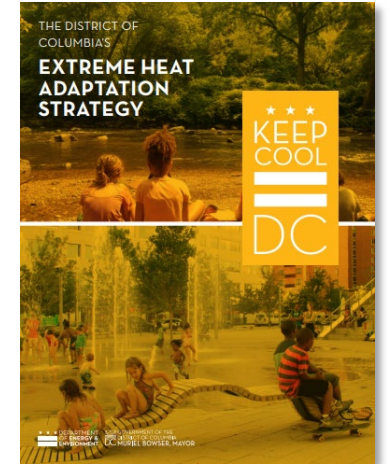
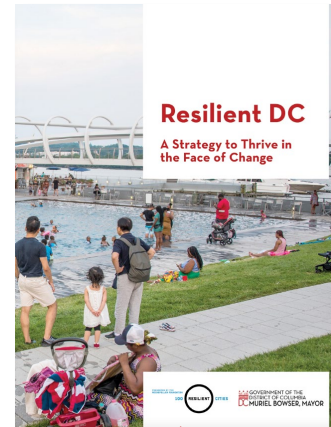
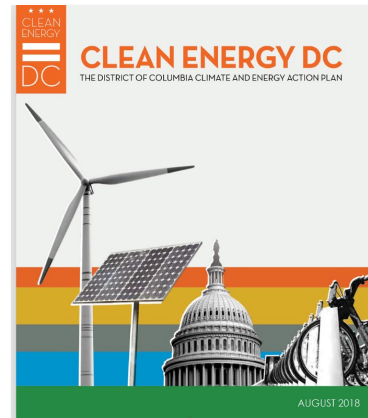
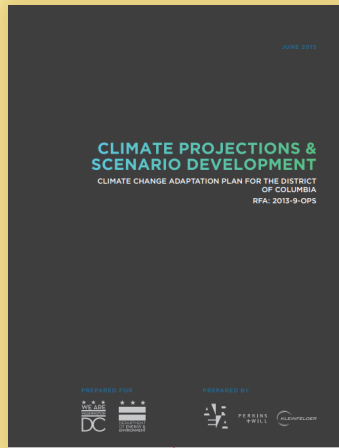


- 1 Why a Comprehensive Heat Plan?
- 2 What information did we draw on
- 3 Overview of policies
- 4 Next steps

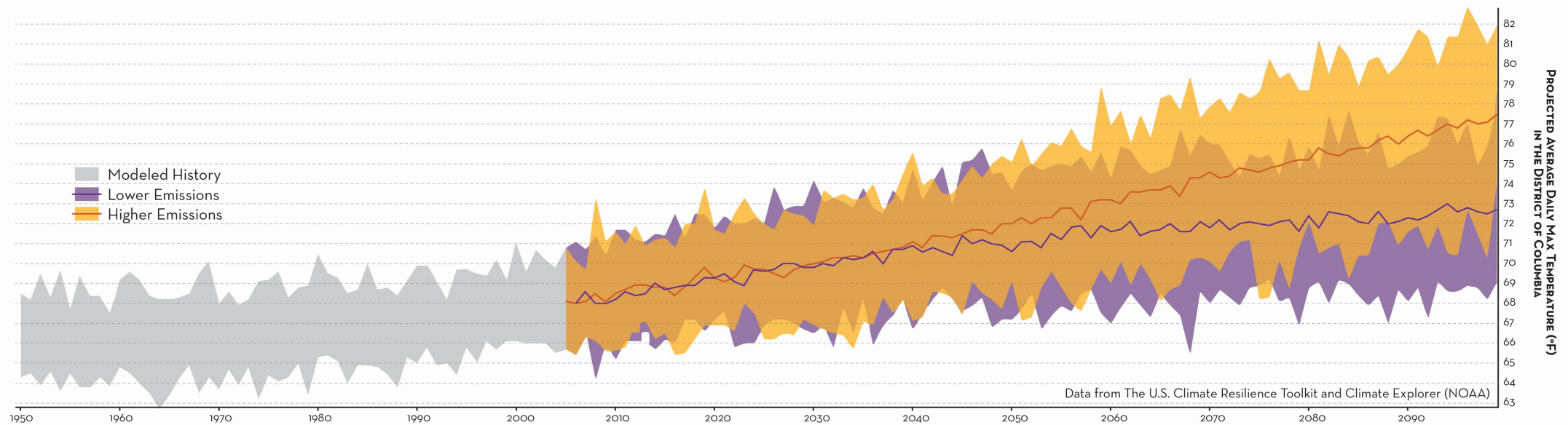
# Philip



# How we got here



# We know it is getting hotter



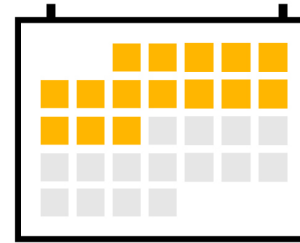
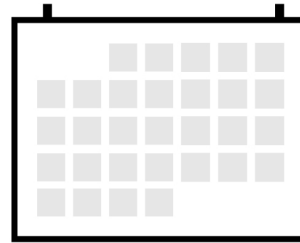
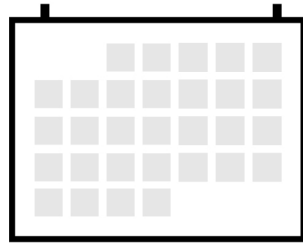
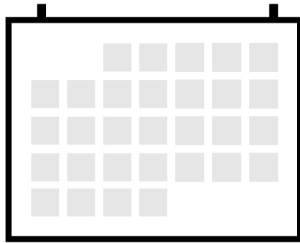
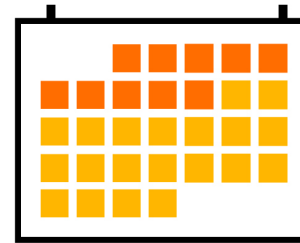
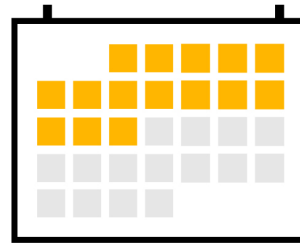
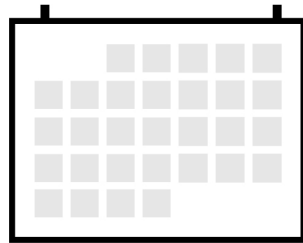
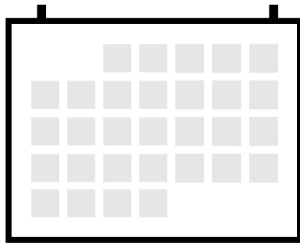
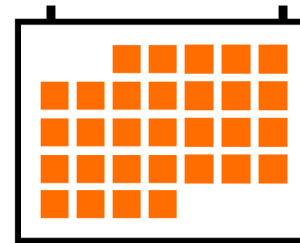
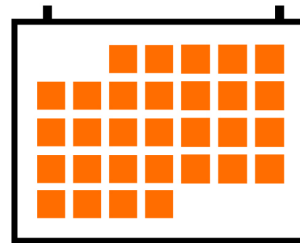
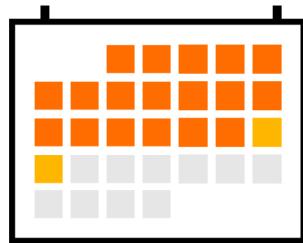
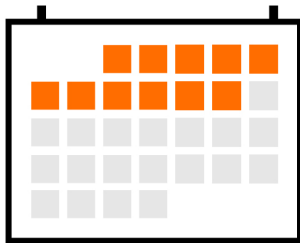
# Climate Projections

**Baseline**

**2020s**

**2050s**

**2080s**



Days above 95°F:  
■ Low emissions scenario  
■ High emissions scenario

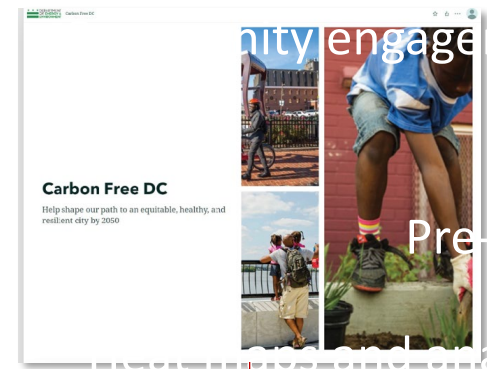
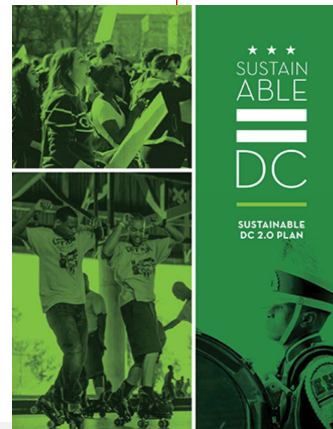
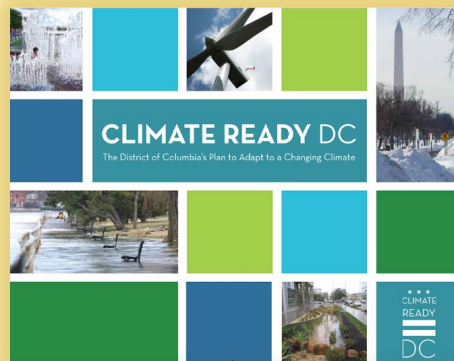
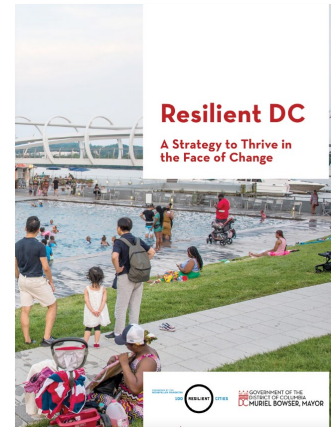
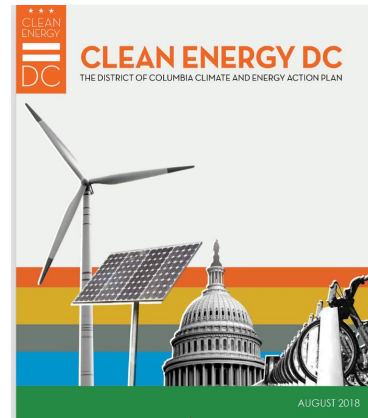
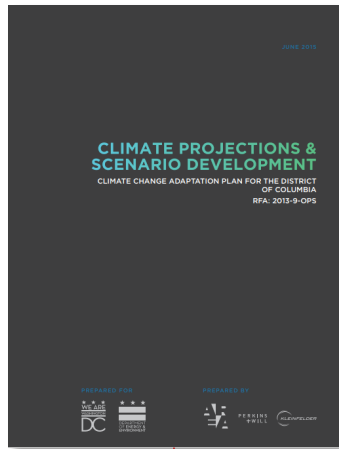
**11**  
days / dias

**18-20**  
days / dias

**30-45**  
days / dias

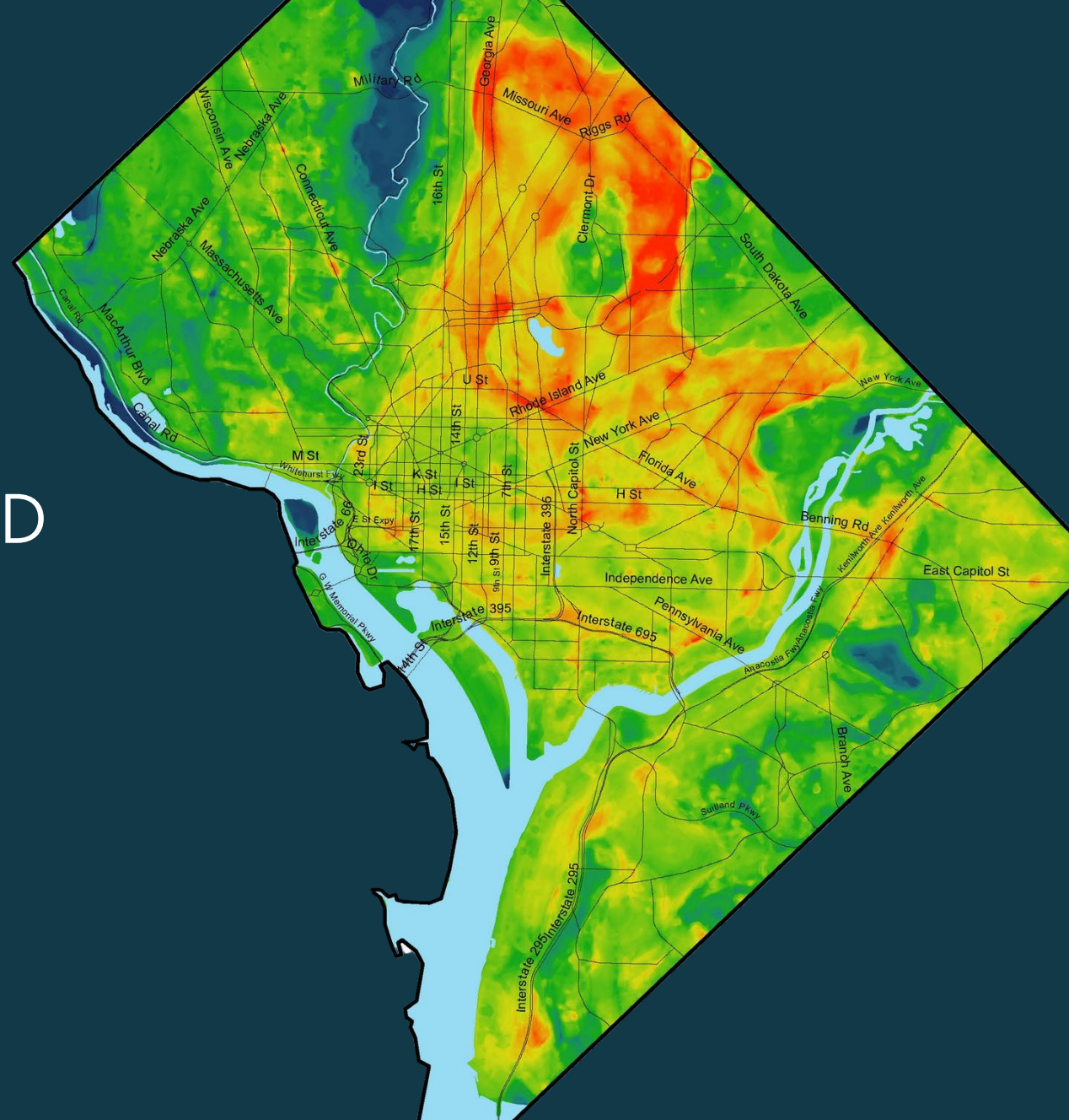
**40-75**  
days / dias

# How we got here



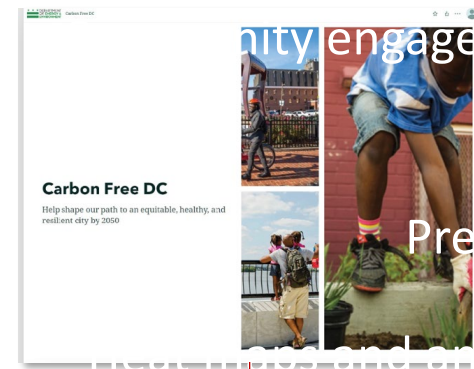
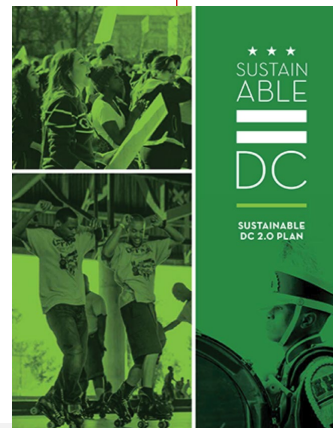
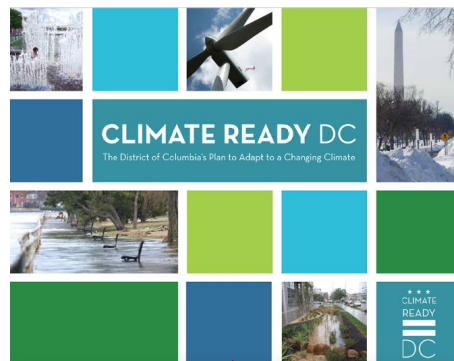
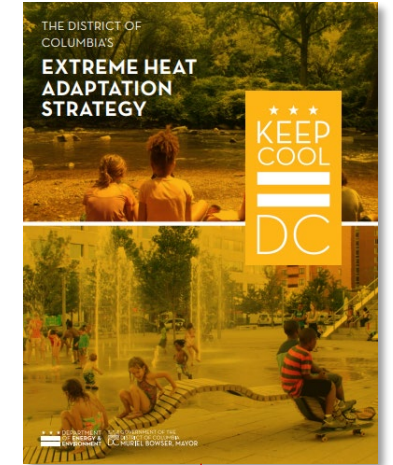
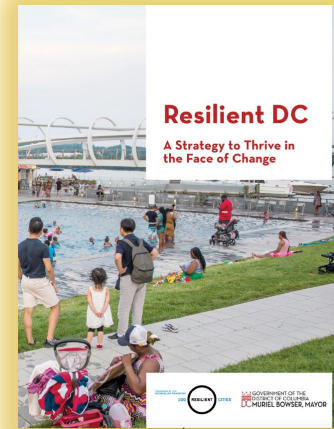
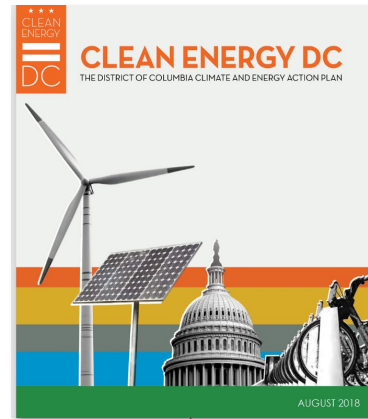
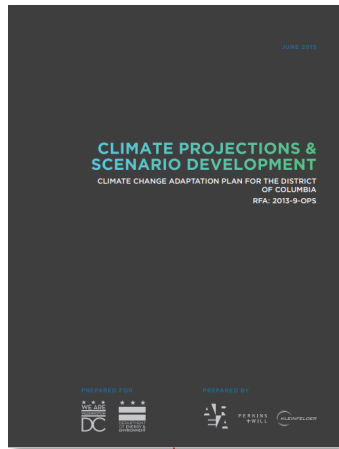
# THE URBAN HEAT ISLAND

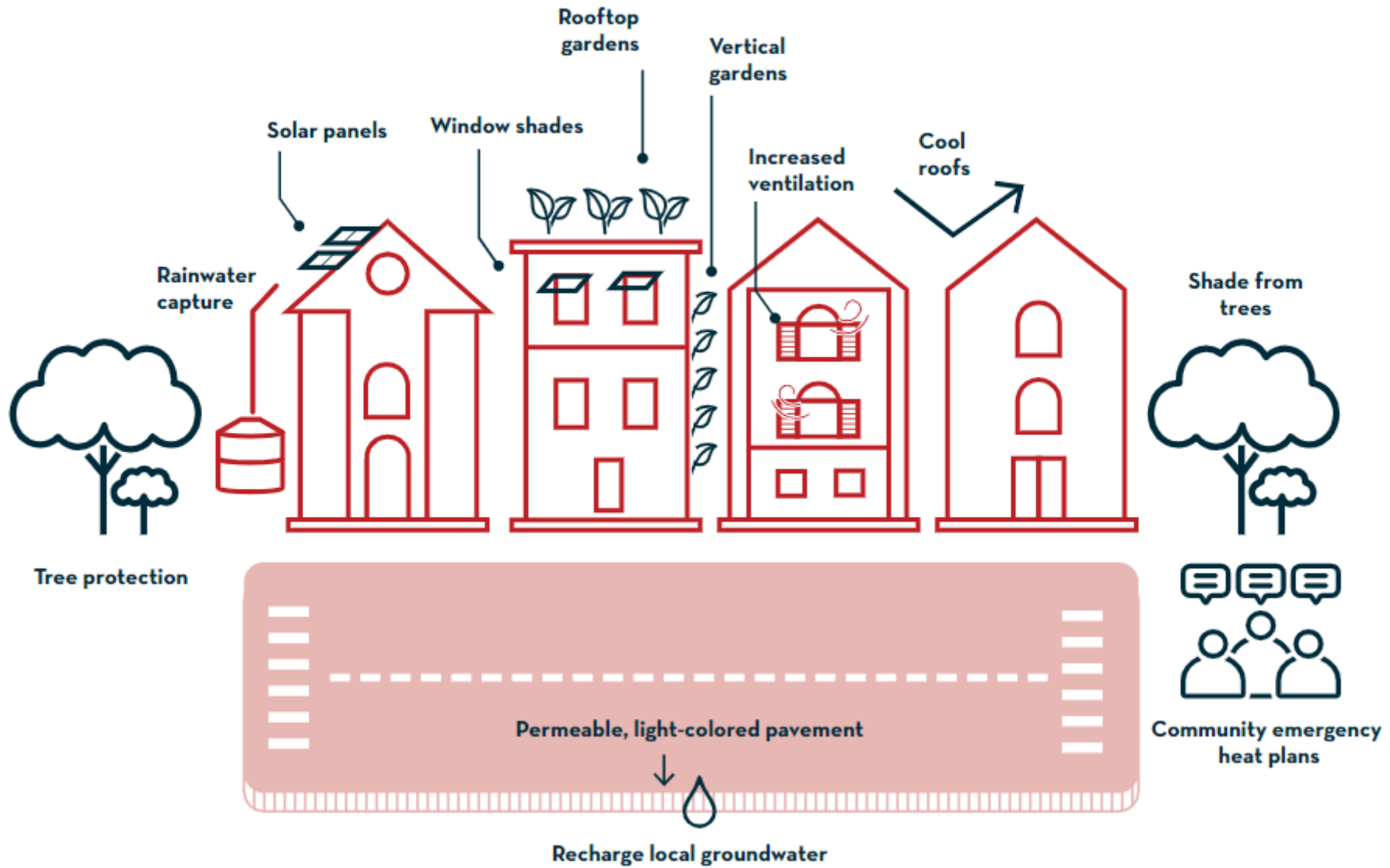
Certain neighborhoods in the District are 16.5°F warmer than others

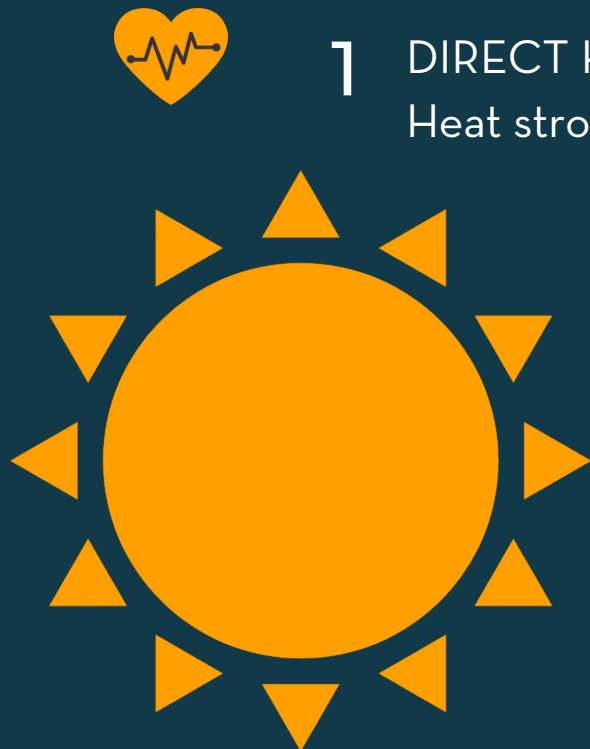




# How we got here







**1** DIRECT HEALTH RISKS  
Heat stroke, heat exhaustion, heat rash



**2** INDIRECT HEALTH RISKS  
Worsening air quality, increased vector borne diseases, adverse birth outcomes



**3** INFRASTRUCTURE RISKS  
Rail buckles, softening asphalt, airline disruptions



**4** ENERGY RISKS  
Higher emissions, blackouts, increased energy costs



**5** ENVIRONMENTAL RISKS  
Decreased water quality, habitat shifts



**6** PUBLIC SAFETY RISKS  
Increased homicide rates

# COMMUNITY FEEDBACK



2-hours  
Focus  
Groups



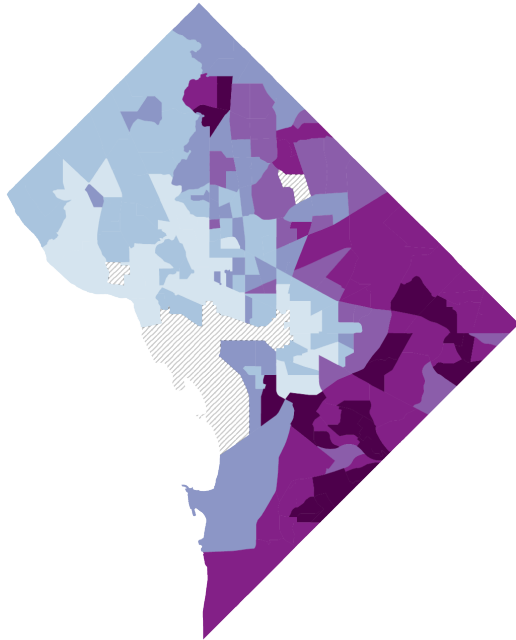
Survey  
Responses

*Focus on engaging those  
most sensitive to heat*

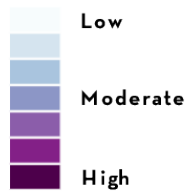
*Focus on collecting a  
representative sample*

# Heat Sensitivity-Exposure Index

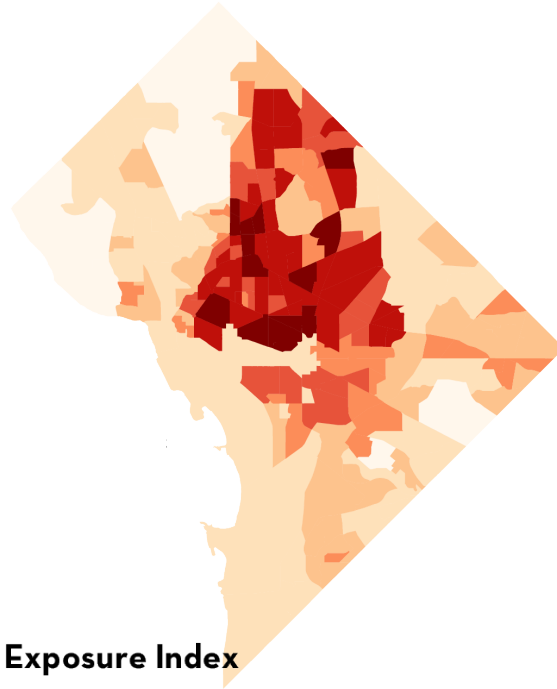
2020 Heat Sensitivity Index



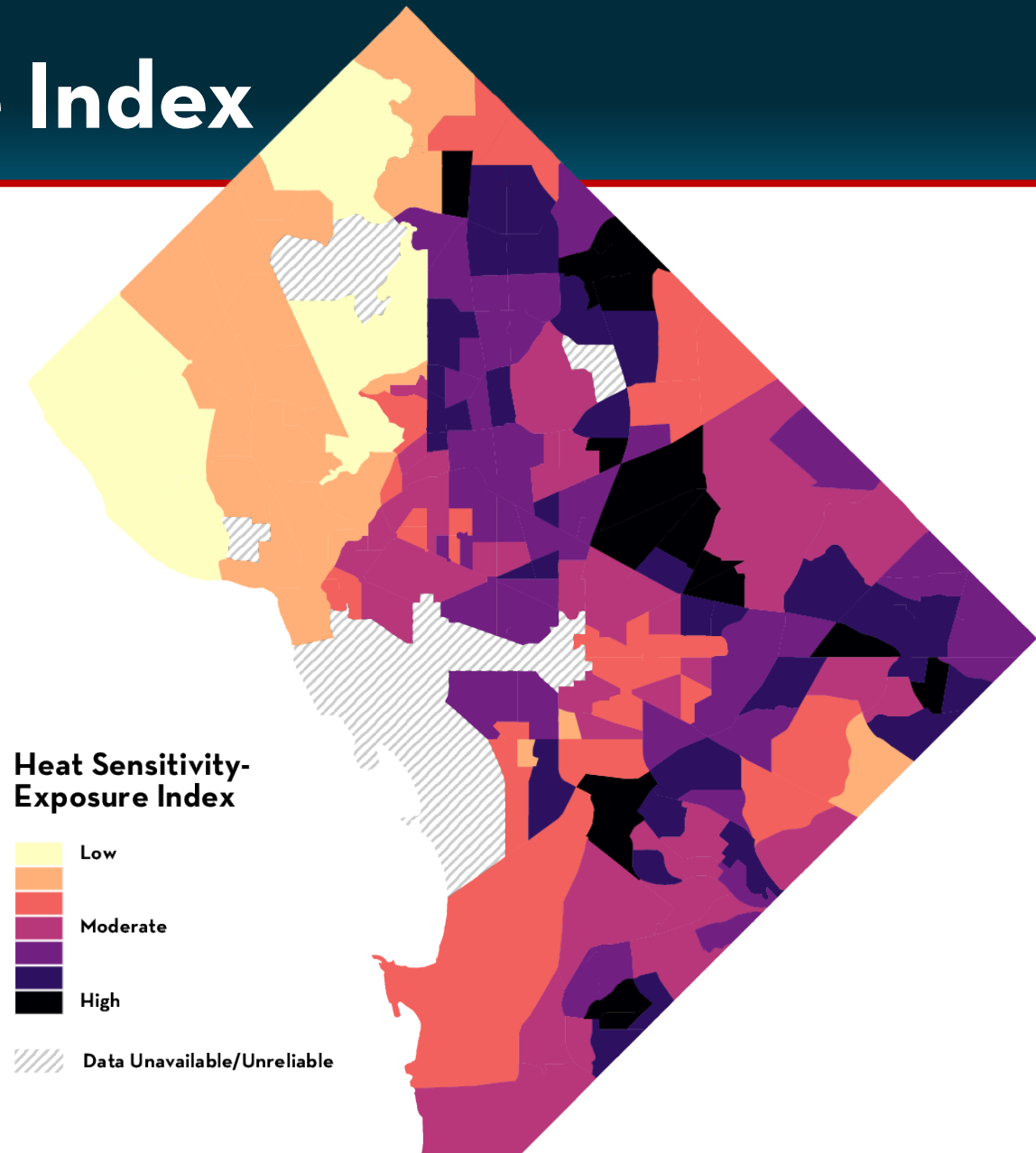
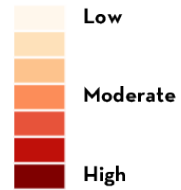
Heat Sensitivity Index



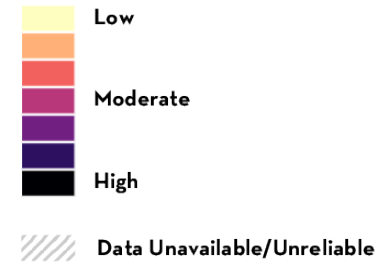
2020 Heat Exposure Index



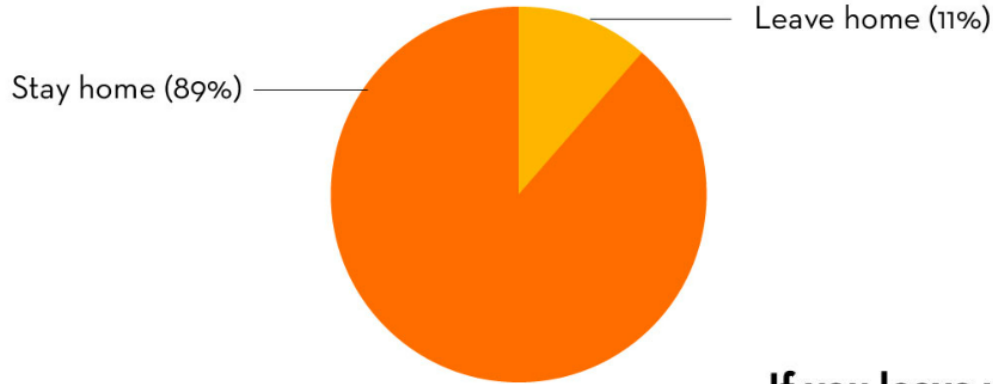
Heat Exposure Index



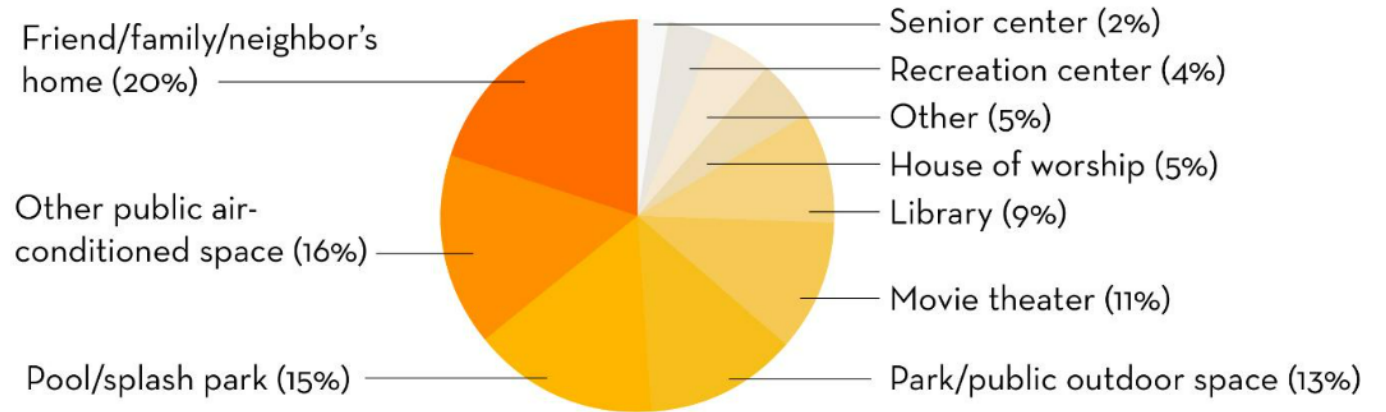
Heat Sensitivity-Exposure Index



**On extreme heat days, are you more likely to:**



**If you leave your home during extreme heat, where are you more likely to go?**



## Heat at home

Air conditioning is a popular and effective way to stay cool indoors during the summer; however, some apartment buildings charge residents an extra fee for window AC units. This can lead to residents choosing not to use their AC units or using them improperly. For example, one resident's apartment building charges a fee *per AC unit per month*. To save a little money by avoiding this fee, this resident used her window AC unit with the window shut. However, without proper ventilation, waste heat from the AC unit made the room warmer and the lack of circulation prevented a breeze, **further amplifying the heat**. This woman had to seek **medical care after experiencing heat stress and difficulty breathing**.

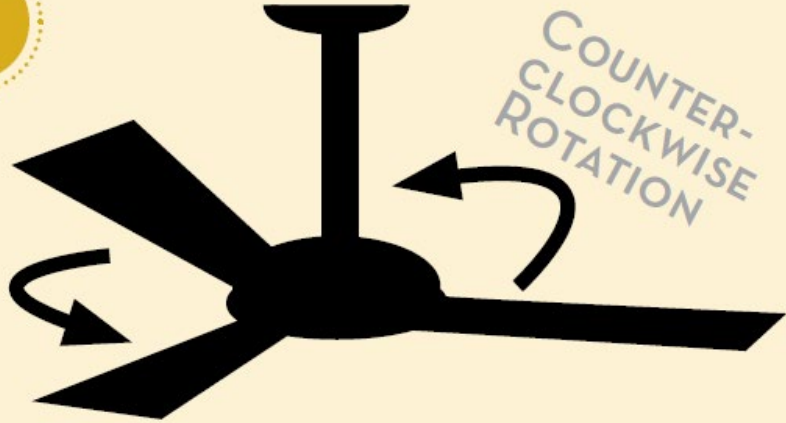


## Heat while commuting

Many residents are exposed to heat on their commutes, including walking or biking in the heat and waiting at bus stop or poorly ventilated Metro stations. One resident remembers a summer day when he had to stop and rest in a bus shelter while commuting due to **"fear of passing out."** He said, **"there were no other places to stop and rest under shade** because it was all residential buildings," emphasizing the value of trees and shading structures on high heat days.



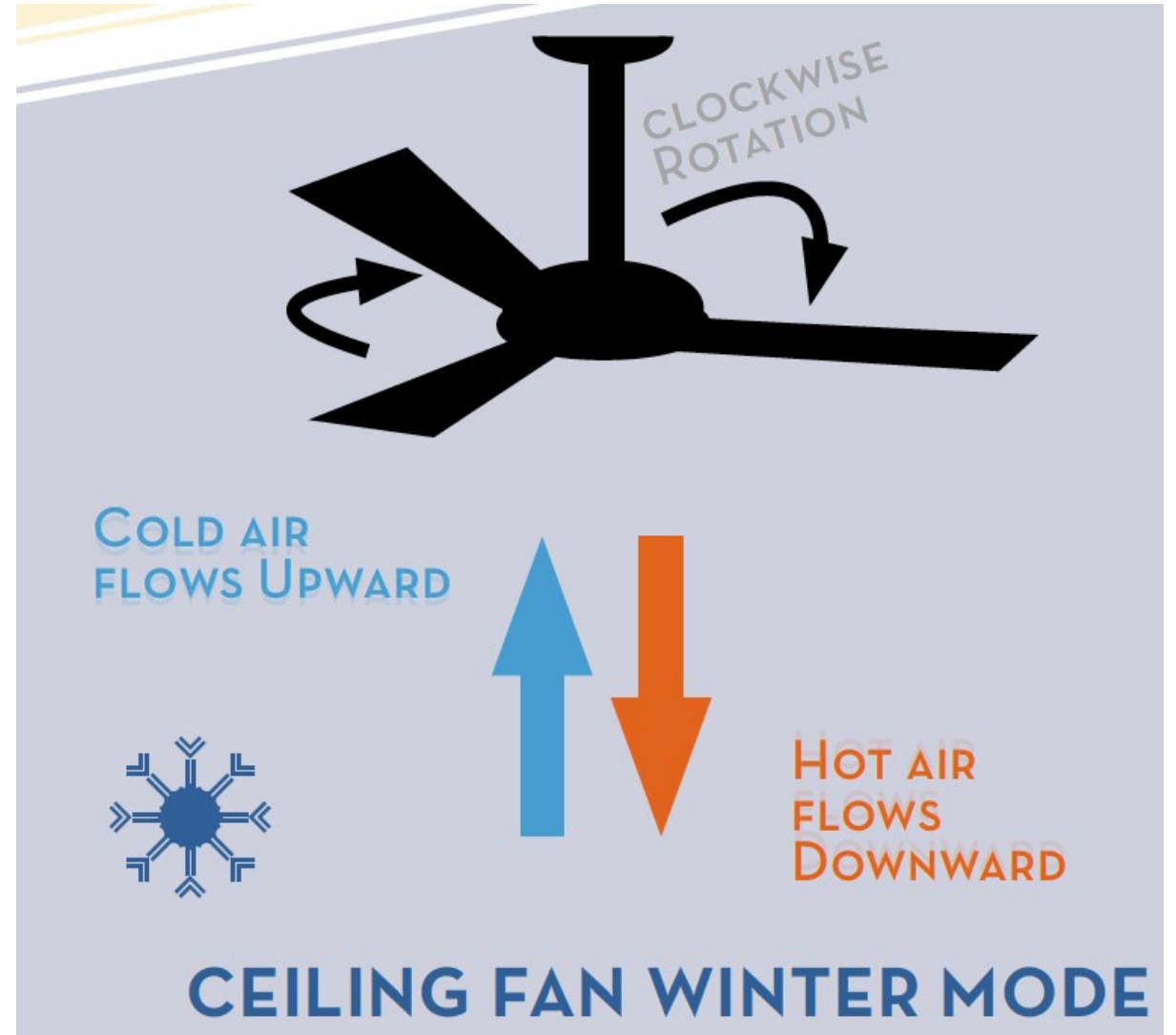
# CEILING FAN SUMMER MODE



COLD AIR  
FLOWS  
DOWNWARD



HOT AIR FLOWS  
UPWARD



# COOLING DOWN



**This section describes the strategies that the District will pursue to combat urban heat.**

**STRATEGY 1:**  
**INCREASE COOL SPACES**

Improve access to shade, cool spaces, and drinking water.

**STRATEGY 2:**  
**DESIGN FOR HEAT**

Ensure that new development decreases the UHI.

**STRATEGY 3:**  
**ENHANCE TREE EQUITY**

Increase equitable access to healthy, well-maintained trees.

**STRATEGY 4:**  
**KEEP LEARNING**

Continue to study the UHI effect and heat mitigation strategies.

**STRATEGY 1:  
INCREASE COOL SPACES**

**STRATEGY 2:  
DESIGN FOR HEAT**

**STRATEGY 3:  
ENHANCE TREE EQUITY**

**STRATEGY 4:  
KEEP LEARNING**

1.1

Cool Neighborhoods

1.2

Cool Businesses

1.3

Cool Commutes

1.4

Cool Schools

1.5

Cool and Accessible  
Parks

**STRATEGY 1:  
INCREASE COOL SPACES**

**STRATEGY 2:  
DESIGN FOR HEAT**

**STRATEGY 3:  
ENHANCE TREE EQUITY**

**STRATEGY 4:  
KEEP LEARNING**

1.1

Cool Neighborhoods

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Cool Businesses

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Cool Commutes

1.4

Cool Schools

1.5

Cool and Accessible  
Parks

**Maintain existing green spaces and expand their use by investing in play space, shade trees, splash parks, benches, and adding shaded pedestrian and cycling trails where possible.**

**PARTNER AGENCIES**

DOEE, DPR, DDOT, and MPD

# STAYING SAFE

A young man in a white and black Under Armour jacket is drinking from a public water fountain. He is smiling and looking towards the camera. The background shows a park-like setting with trees and buildings, including a prominent clock tower. The entire image has a blue tint.

**This section describes how the District will keep residents safe on the hottest days.**

**STRATEGY 5:  
IMPROVE COOLING  
CENTERS**

**STRATEGY 6:  
EDUCATE RESIDENTS  
ABOUT HEAT RISKS**

**STRATEGY 7:  
SUPPORT SAFETY AT  
HOME**

**STRATEGY 8:  
SUPPORT SAFETY  
OUTDOORS**

**STRATEGY 9:  
ENSURE CLEAN AND  
RELIABLE POWER**

STRATEGY 5:  
IMPROVE COOLING  
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7.1

Maximum Air  
Temperature  
Standards

7.2

Better Cooling  
Technique  
Education

7.3

Expanded Cooling  
Assistance

7.4

Heat Ambassadors



STRATEGY 5:  
IMPROVE COOLING  
CENTERS

STRATEGY 6:  
EDUCATE RESIDENTS  
ABOUT HEAT RISKS

STRATEGY 7:  
SUPPORT SAFETY AT  
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Maximum Air  
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7.4

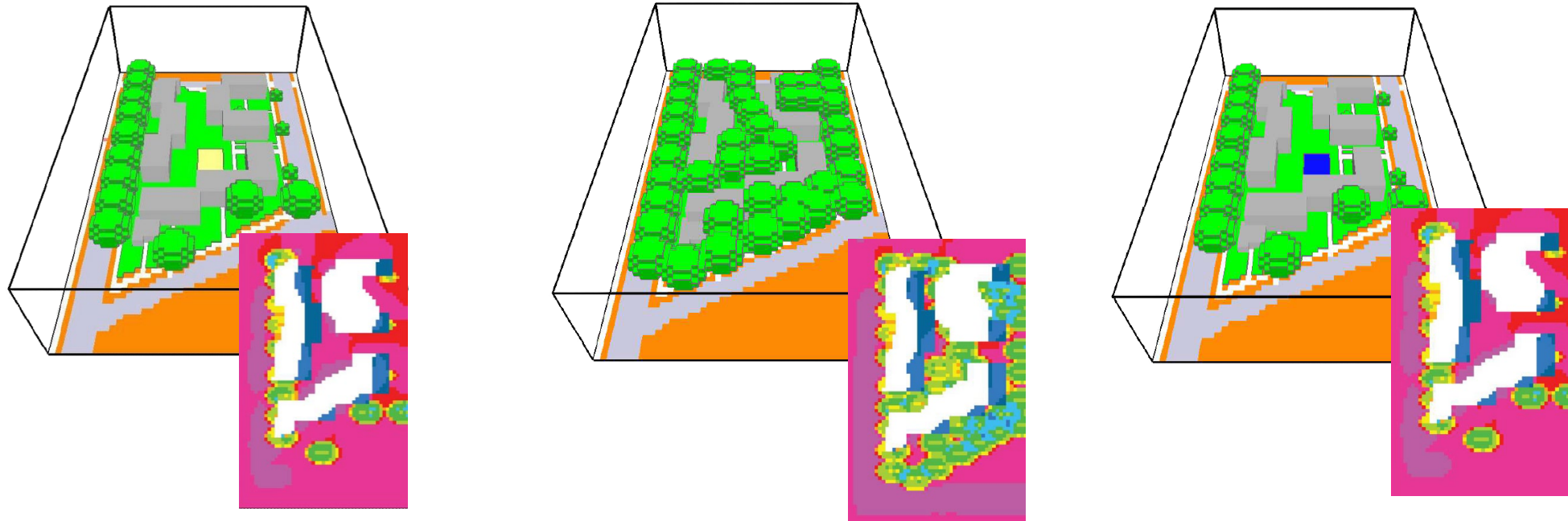
Heat Ambassadors

**Create a heat ambassador program, through which trained ambassadors check on vulnerable residents during extreme heat events.**

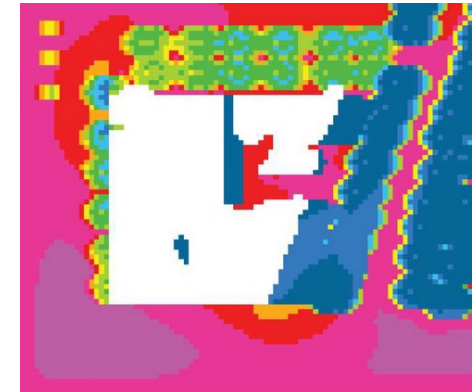
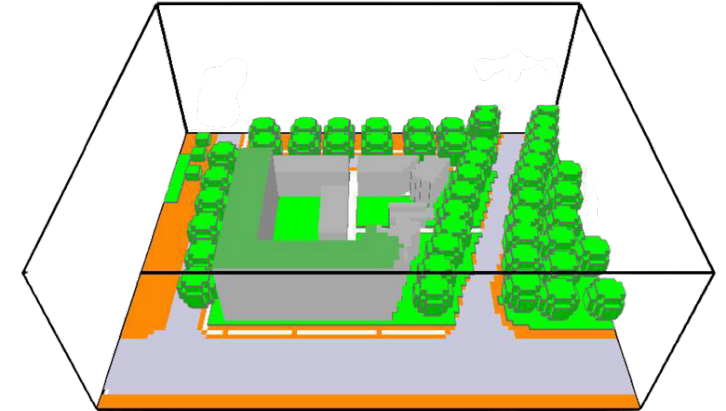
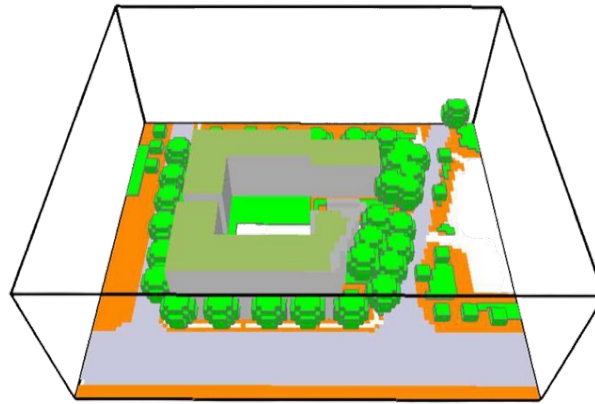
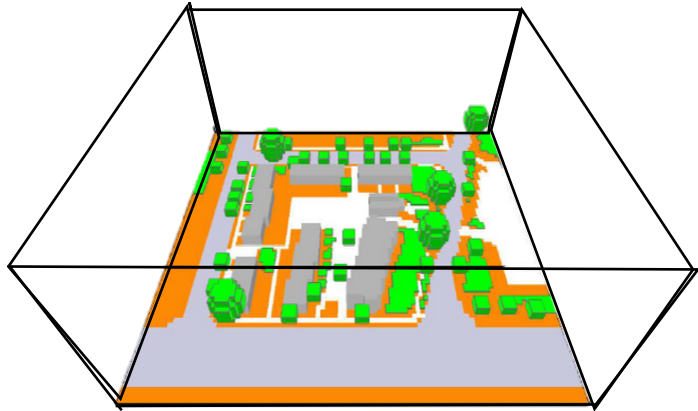
**PARTNER AGENCIES**

DOEE, HSEMA, Serve DC, DHS, and DC Health

# HEAT MODELING: CARVER TERRACE



# HEAT MODELING: GREENLEAF



# LESSONS FROM HEAT MODELING

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## ● TREES ARE THE BIG WINNER

During the hottest time of the day, trees reduced heat 5-12°F

## ● MODELED DATA HAS LIMITATIONS

24-hour time period may distort results

## ● DENSITY AND HEAT CAN COEXIST

This is especially true when building heights increase shade

## ● BUILDING EFFICIENCY GOALS ALSO MATTER

Cool and green roofs may not have big impacts on UHI, but do help with efficiency

# Resilient Design Guidelines

## Process

Intended for municipal planning and regulatory staff, building owners, developers, facility managers, & designers

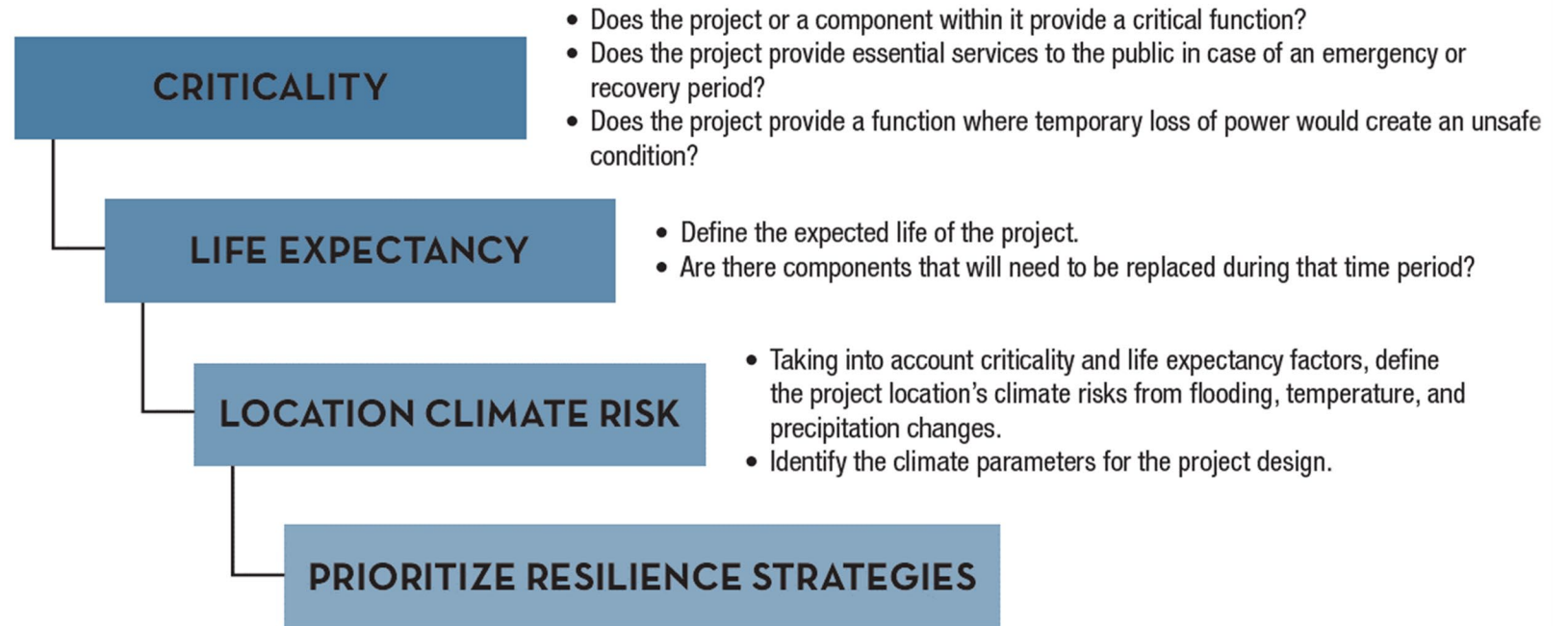


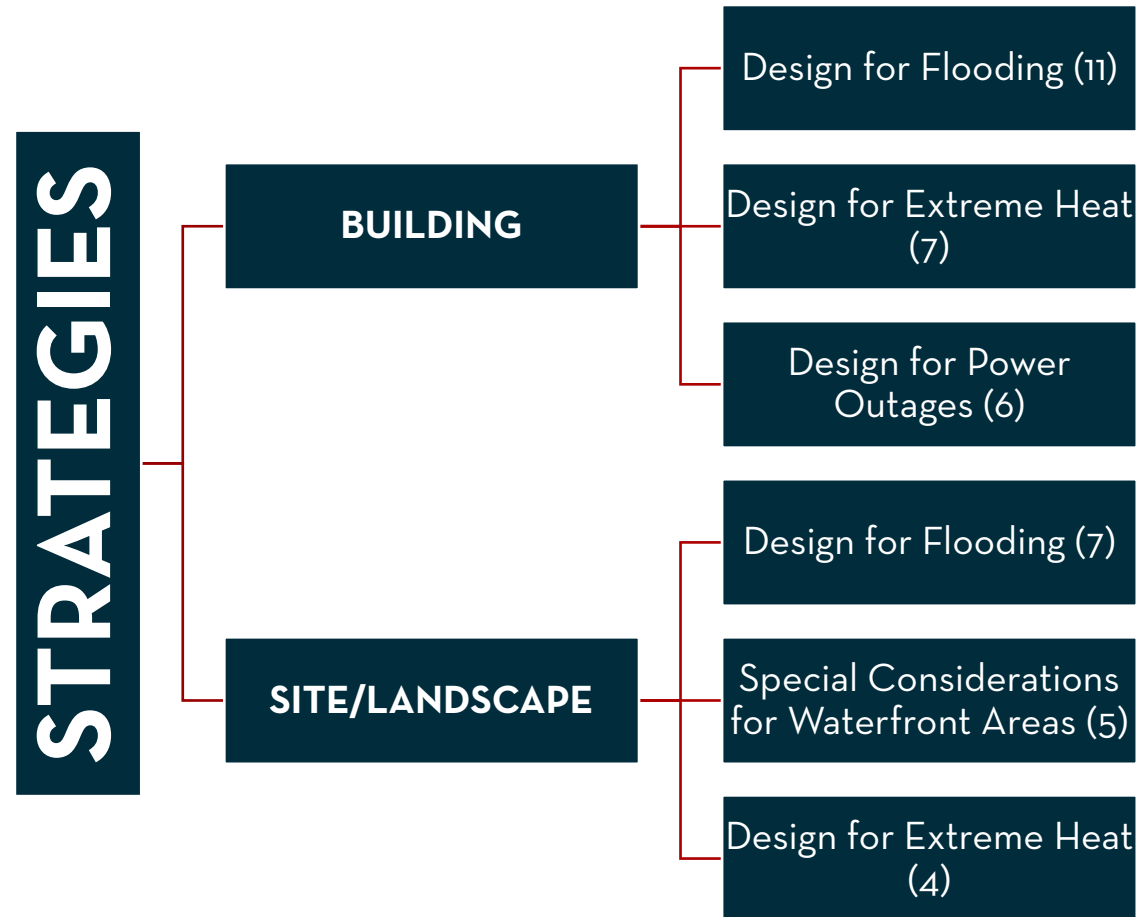
Figure 4: Steps to create a Resilience Profile for a project.

# Implementation Example - Resilient Design Guidelines

Hazard	Timeframe	Low Emissions Scenario <sup>viii</sup>		High Emissions Scenario <sup>ix</sup>	
		Mean	Range	Mean	Range
Days per year with Maximum Temperature >95°F <sup>9</sup>	2000s	13.1 days/year			
	2020s	18.3	6.7 to 29.9	20.3	6.8 to 33.9
	2050s	31.8	12.4 to 51.2	46.5	23.2 to 69.9
	2080s	41.2	17.8 to 64.6	72.4	39.2 to 105.6
Days per year with Maximum Heat Index >95°F <sup>10</sup>	2000s	29.1 days/year			
	2020s	48.8	34.7 to 62.9	51.7	37.0 to 66.3
	2050s	68.2	48.8 to 87.6	80.3	60.7 to 99.8
	2080s	76.5	56.4 to 96.6	106.4	82.3 to 130.5

Projected Change in Cooling Degree Days Over Historical Values <sup>x</sup>		
Period	Low Emissions Scenario	High Emissions Scenario
2020s	416	434
2050s	701	904
2080s	888	1522

# Resilient Design Strategies





# Thank you

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