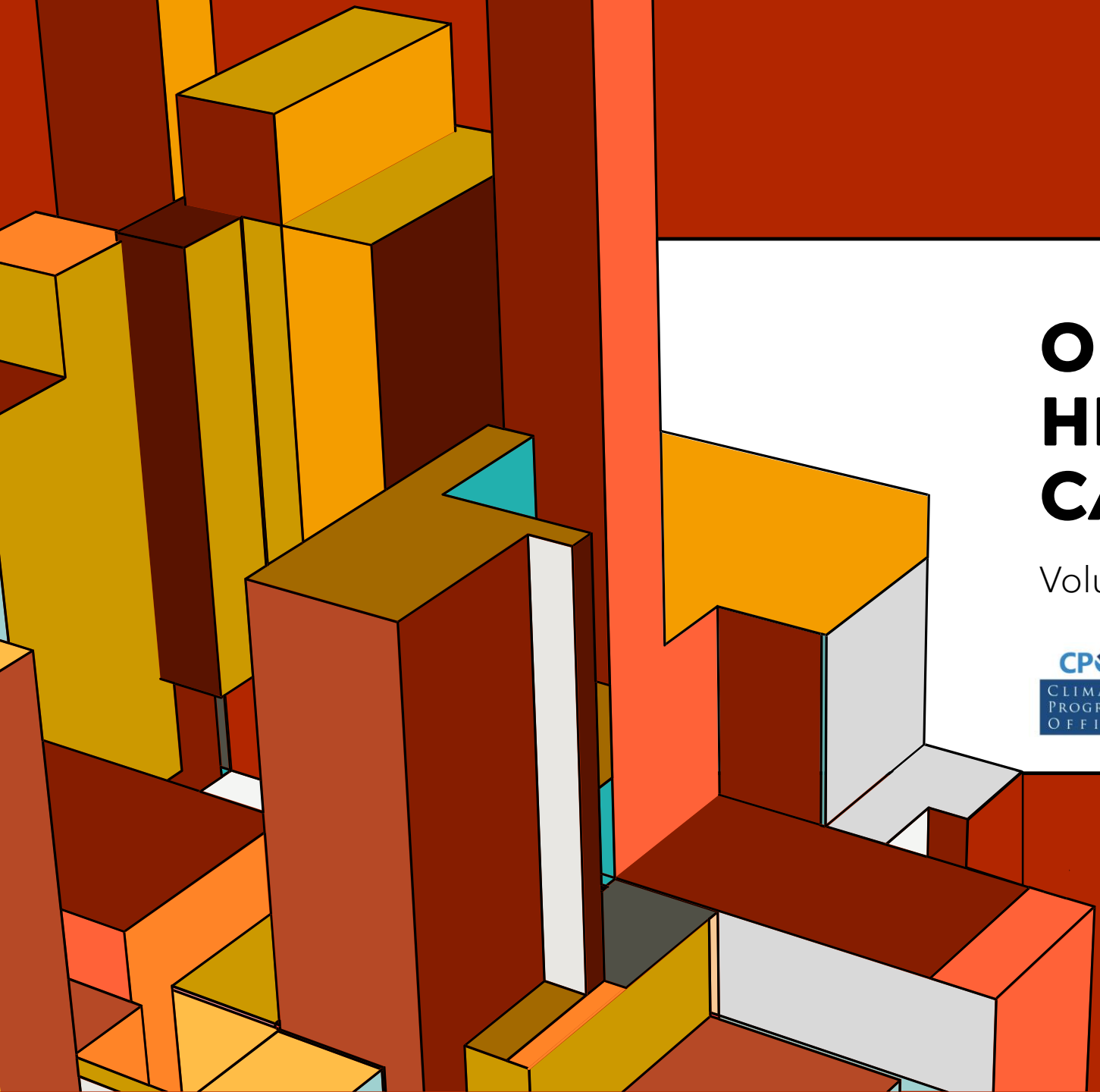
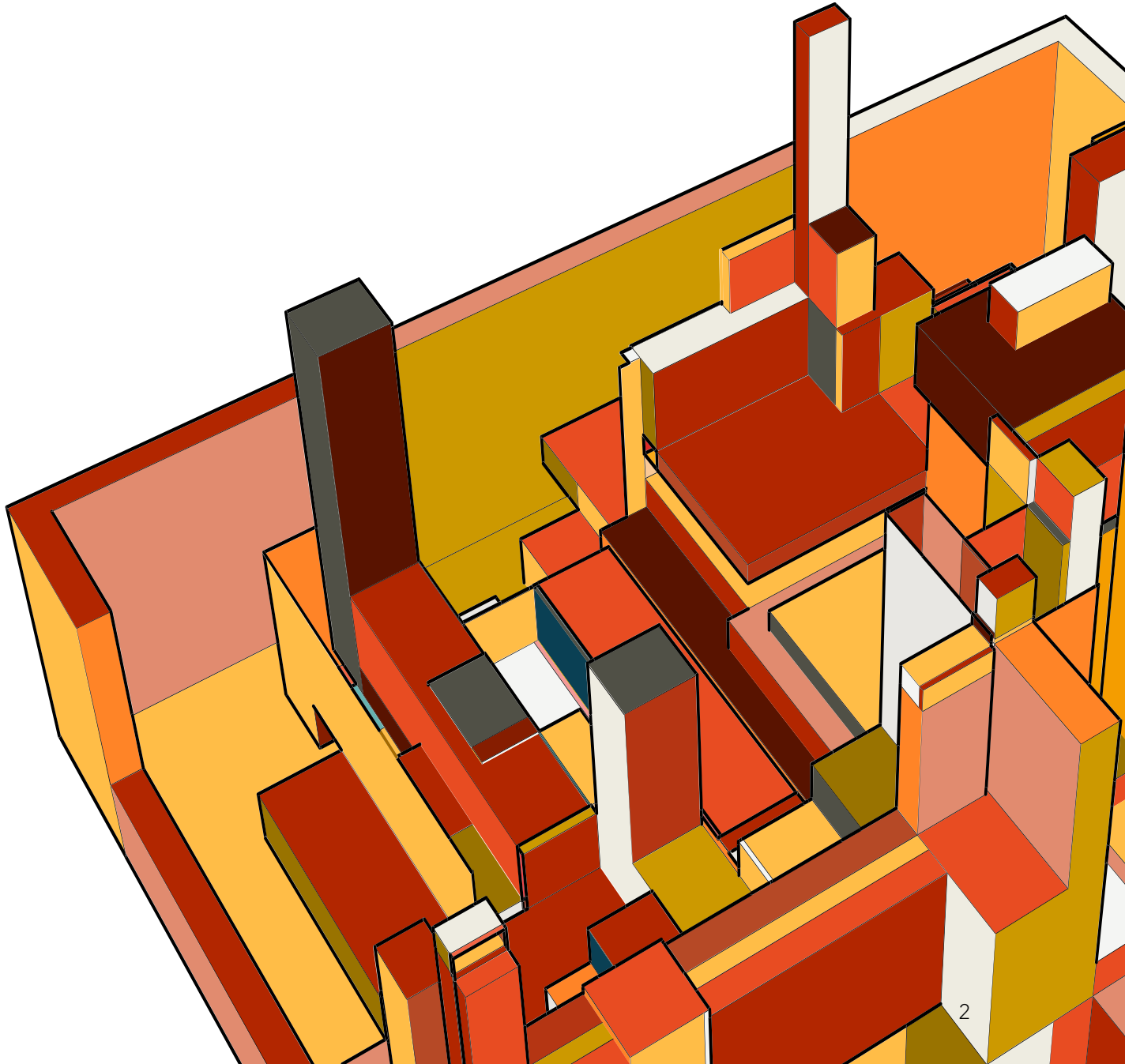


OKLAHOMA CITY HEAT WATCH CAMPAIGN

Volunteer Training | July 27, 2023

AGENDA

1. Introduction to Extreme Heat, Health, & Equity
2. Oklahoma City Urban Heat Watch
    A. Background
    B. Training Video
    C. Knowledge Check
    D. Waiver
3. Logistics
4. Questions & Answers



ADAPTOKC

Adopted as amendment to plan**okc** in Summer 2020

GOAL

Mitigate effects of extreme heat

INITIATIVE

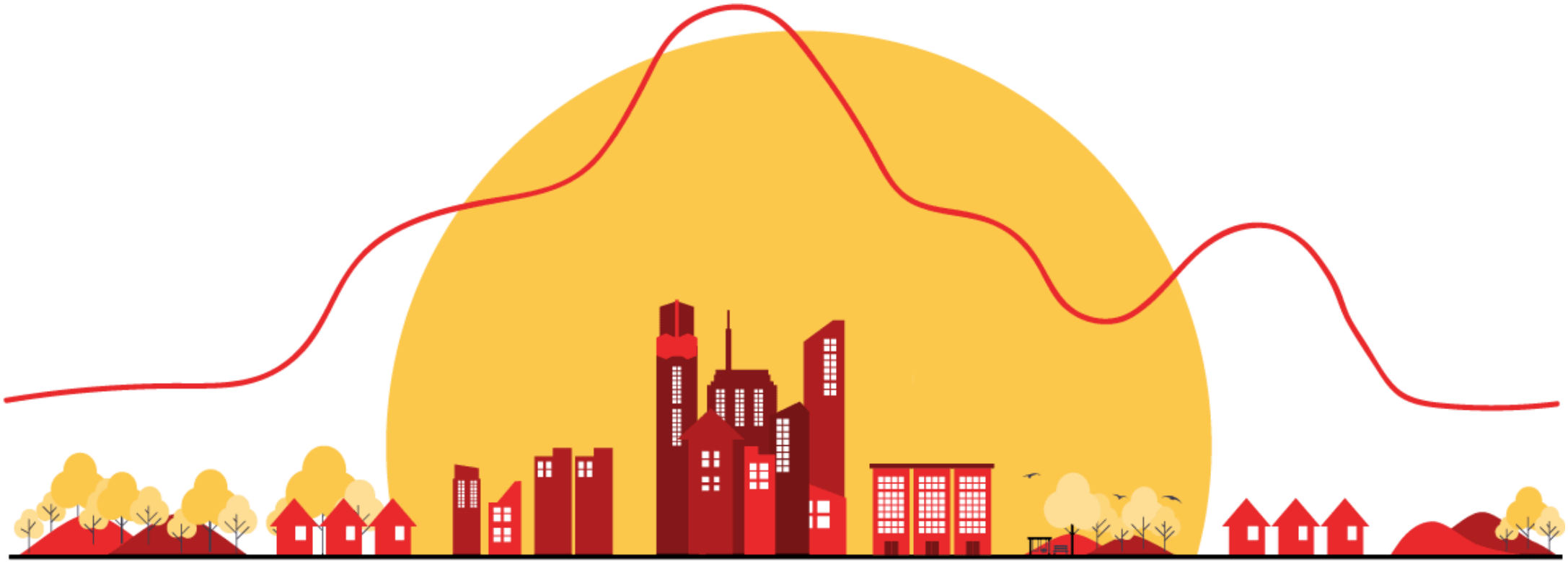
Mitigate areas of high heat exposure

POLICY

NB-14: Determine methods to measure, monitor, and report local urban heat island conditions

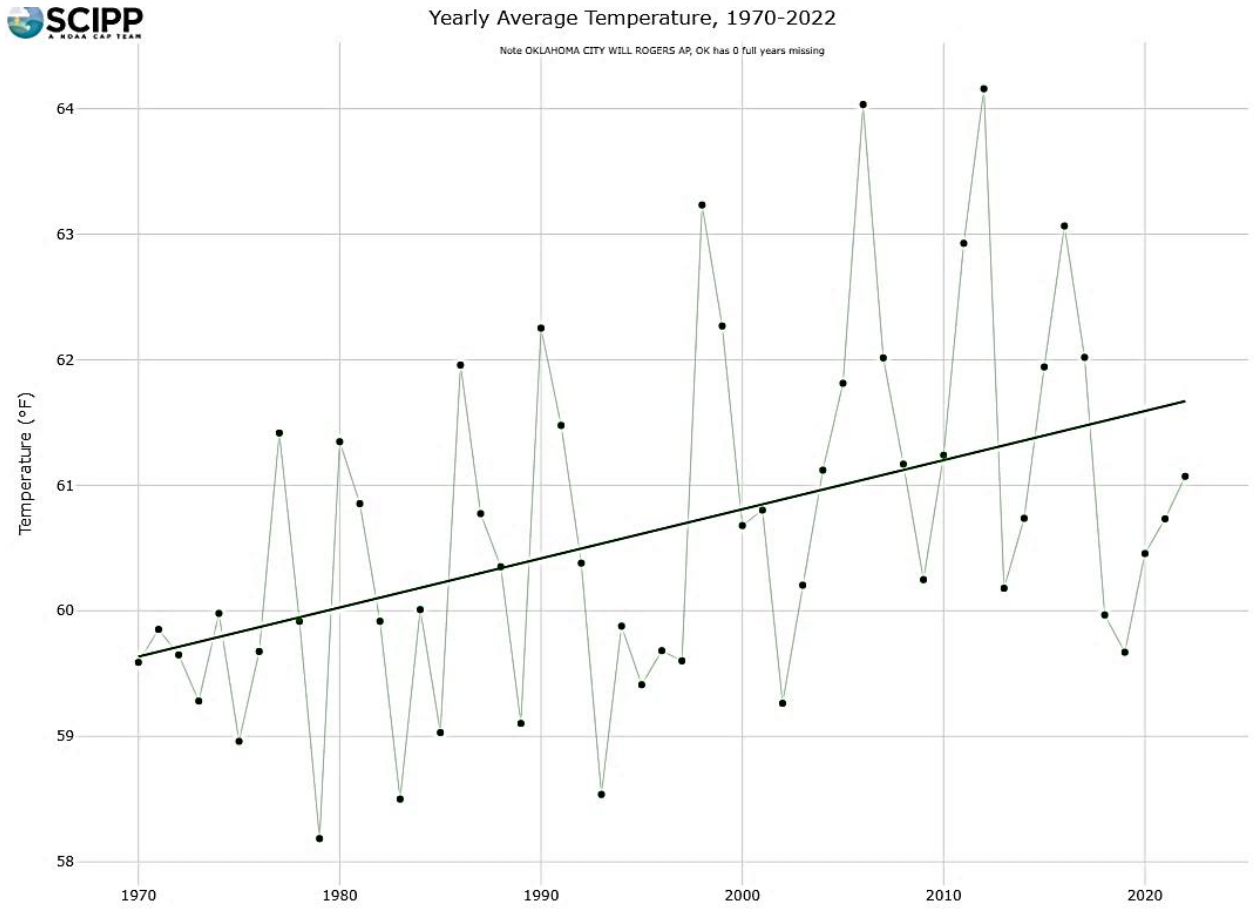
URBAN HEAT ISLAND

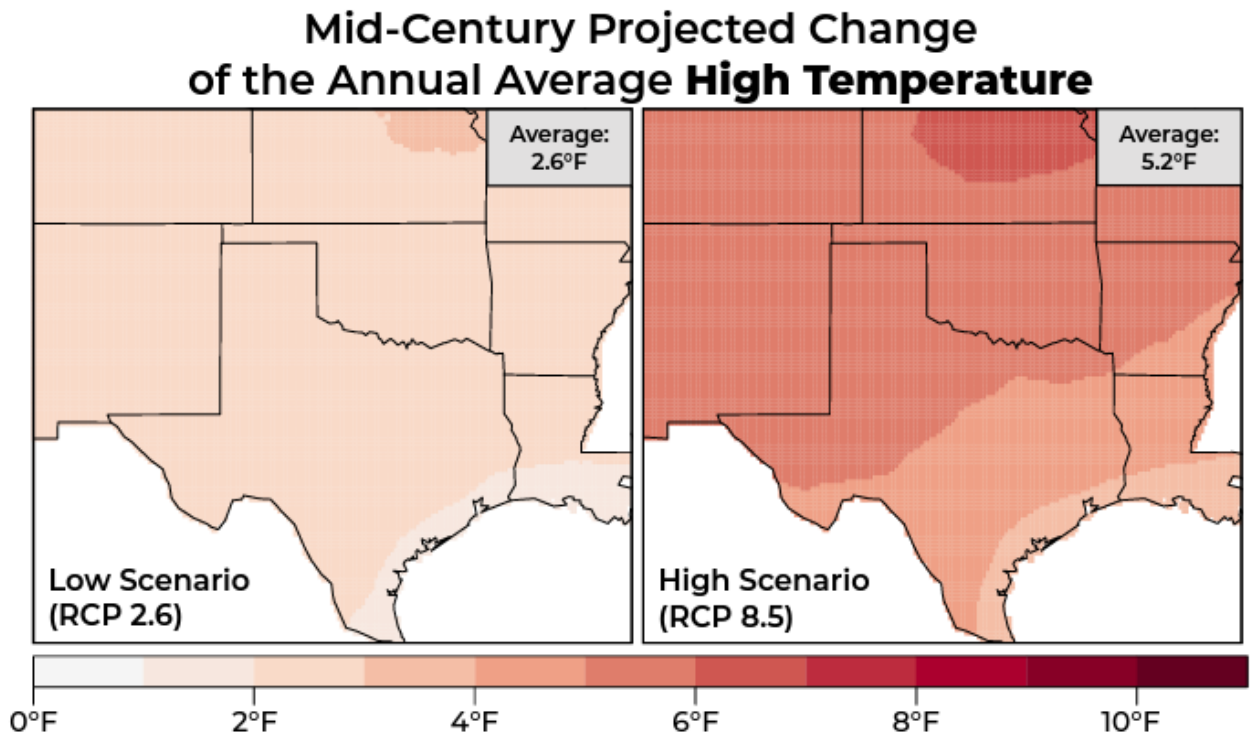
Unshaded areas – mostly hard surfaces like concrete or asphalt where temperatures are up to 7° hotter than vegetated areas



EXTREME HEAT IN OKC

Projections: Up to 28 more days over 100°F by mid-century





EXTREME HEAT EFFECTS

PUBLIC HEALTH

When the body overheats and becomes dehydrated, blood thickens causing the heart to pump harder, risking serious damage to it and other organs

VULNERABILITIES

Everyone experiences extreme heat but not everyone is affected evenly.
Exposure + Sensitivity = Vulnerability

IMPERVIOUS SURFACES

More than 4% of Oklahoma City's entire area is made of parking lots due, in part, to zoning policy

WATER QUALITY

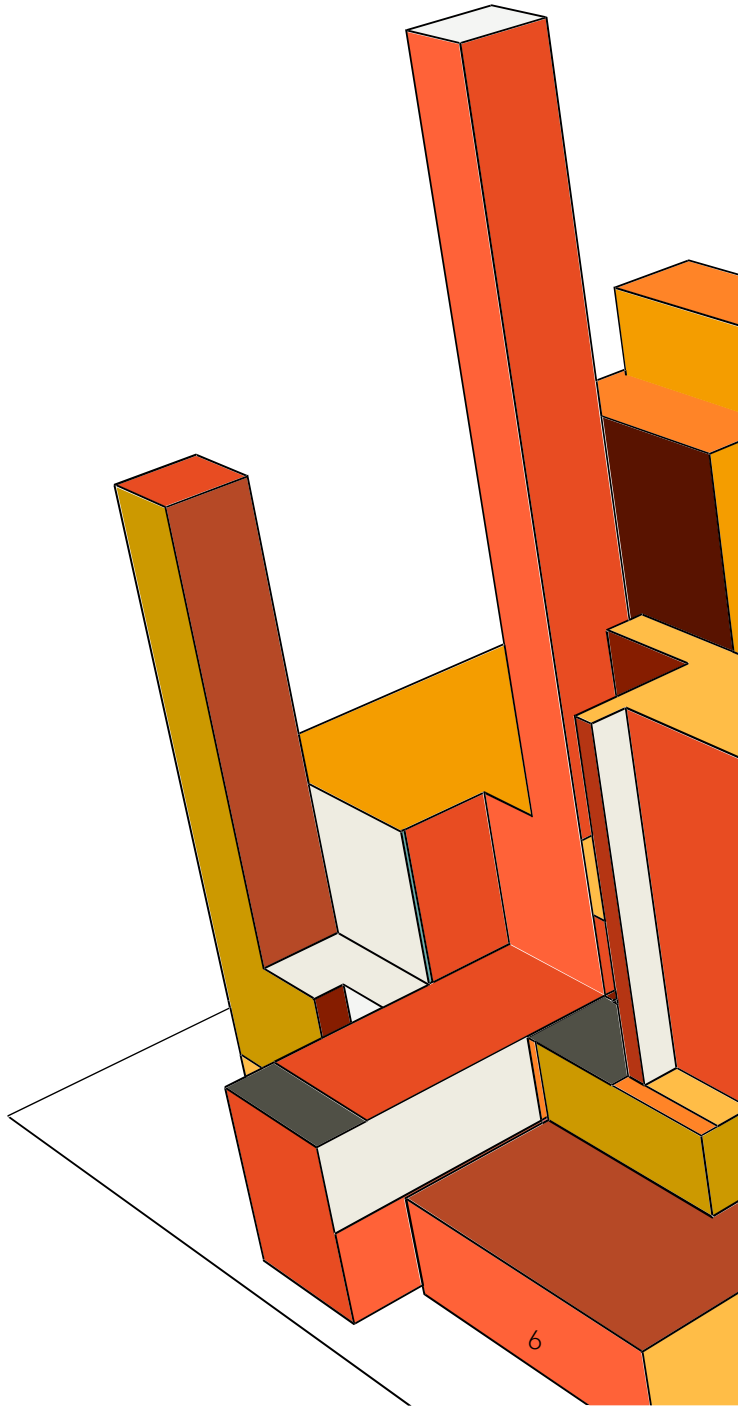
Warmer water temperatures, coupled with high levels of nutrients like lawn fertilizers create conditions for blue green algae blooms

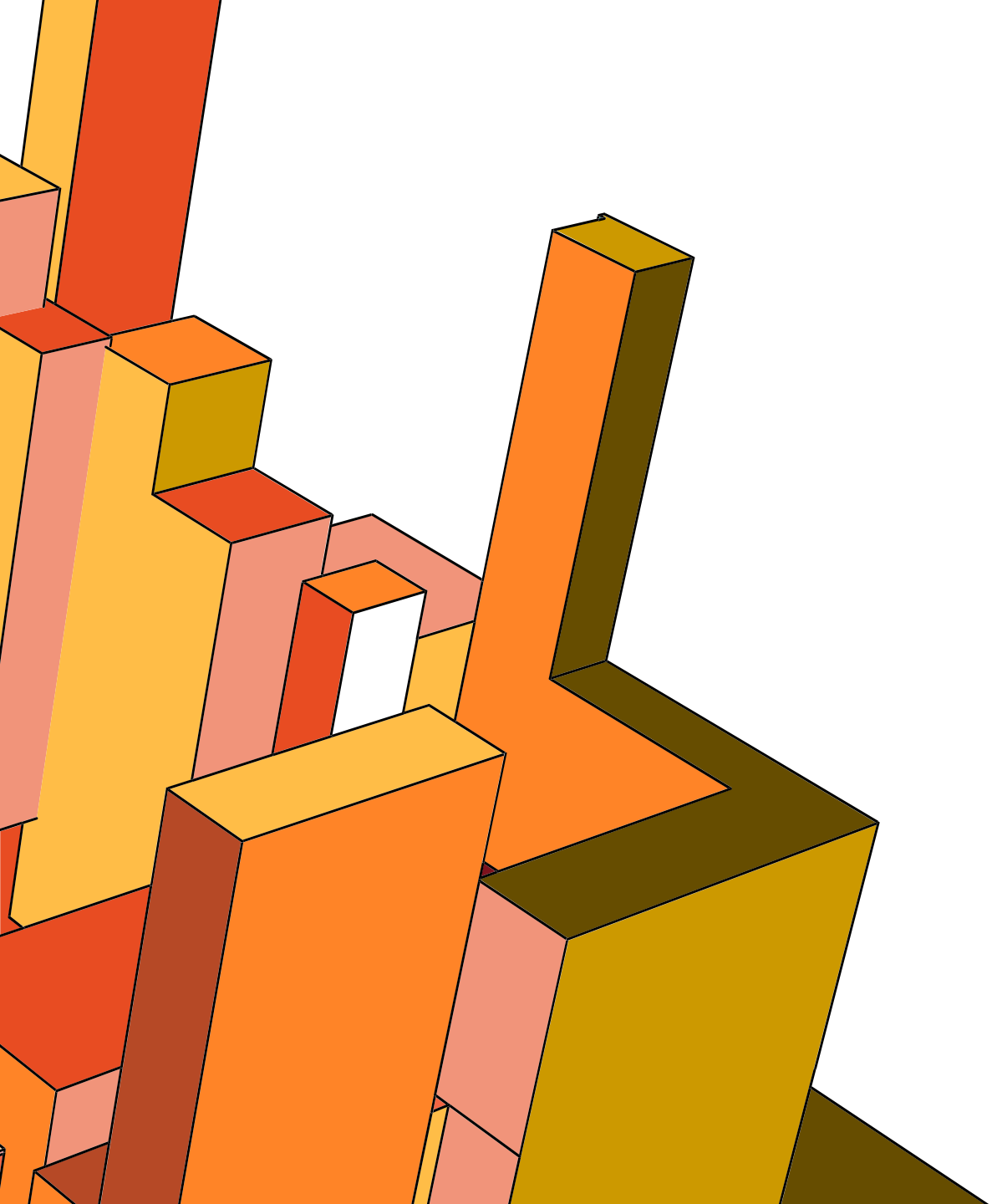
COOLING DEMAND

Electricity demand increasing during the day and at night to keep up with cooling needs

AIR QUALITY

Tailpipe emissions in the presence of sunlight on hot, windless days can form ground-level ozone, aka smog





Oklahoma State of the State's Health Report Summary

		2000	2010	2015	2016	2017
Causes of Death	Alzheimer's Disease Deaths	C	C	D	D	D
	Cerebrovascular Disease Deaths	D	F	D	D	D
	Chronic Lower Respiratory Disease Deaths	D	F	F	F	F
	Diabetes Deaths	C	D	F	F	F
	Heart Disease Deaths	F	F	F	F	F
	Infant, Child and Adolescent Unintentional Injury Deaths	D	D	D	D	D
	Influenza/Pneumonia Deaths	C	D	C	C	C
	Intentional Injury Deaths	D	D	F	F	D
	Malignant Neoplasm Deaths	C	D	F	D	F
	Nephritis Deaths	C	C	C	C	B
	Suicides	D	D	D	D	D
	Unintentional Injury Deaths	D	F	F	F	D
	Unintentional Poisoning Deaths	D	F	C	C	C
Disease Rates	Asthma Prevalence	B	C	C	C	C
	Colon Cancer Incidence (excluding rectum)	C	C	D		
	Depression (Ever)			D	D	D
	Diabetes Prevalence	B	D	D	D	D
	High Blood Pressure (Ever)			D		D
	High Cholesterol Diagnosis (Ever)			D		D
	Invasive Breast Cancer Incidence (female only)	C	C	C		
	Lung Cancer Incidence	D	D	D		
	Prostate Cancer Incidence	B	C	C		

DISPROPORTIONATE IMPACT

VULNERABLE POPULATIONS

Elderly people, children and those with already existing conditions such as heart, respiratory or kidney disease are particularly vulnerable

ENERGY BURDEN

People experiencing low or moderate incomes are more likely to live in older homes and unable to afford weatherization

OUTDOOR WORKERS

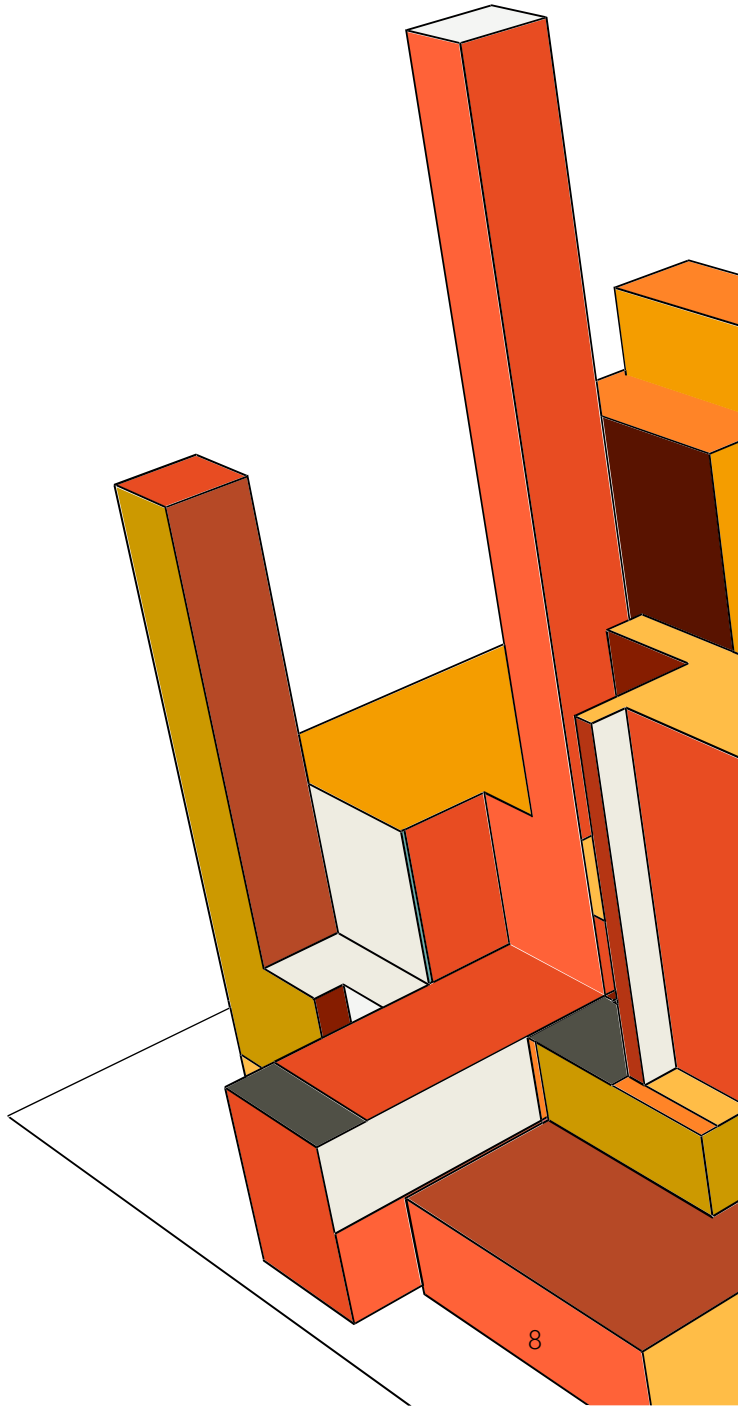
Farm workers, public safety, landscaping crews, parks staff, water/sewer line maintenance workers, roofers, construction workers, etc.

PUBLIC TRANPORTATION

Residents without a personal vehicle are more exposed to extreme heat than others on average summer days

CAPACITY TO ADAPT

Some do not have the economic, political, or social capacity to adapt to extreme temperatures as effectively as others



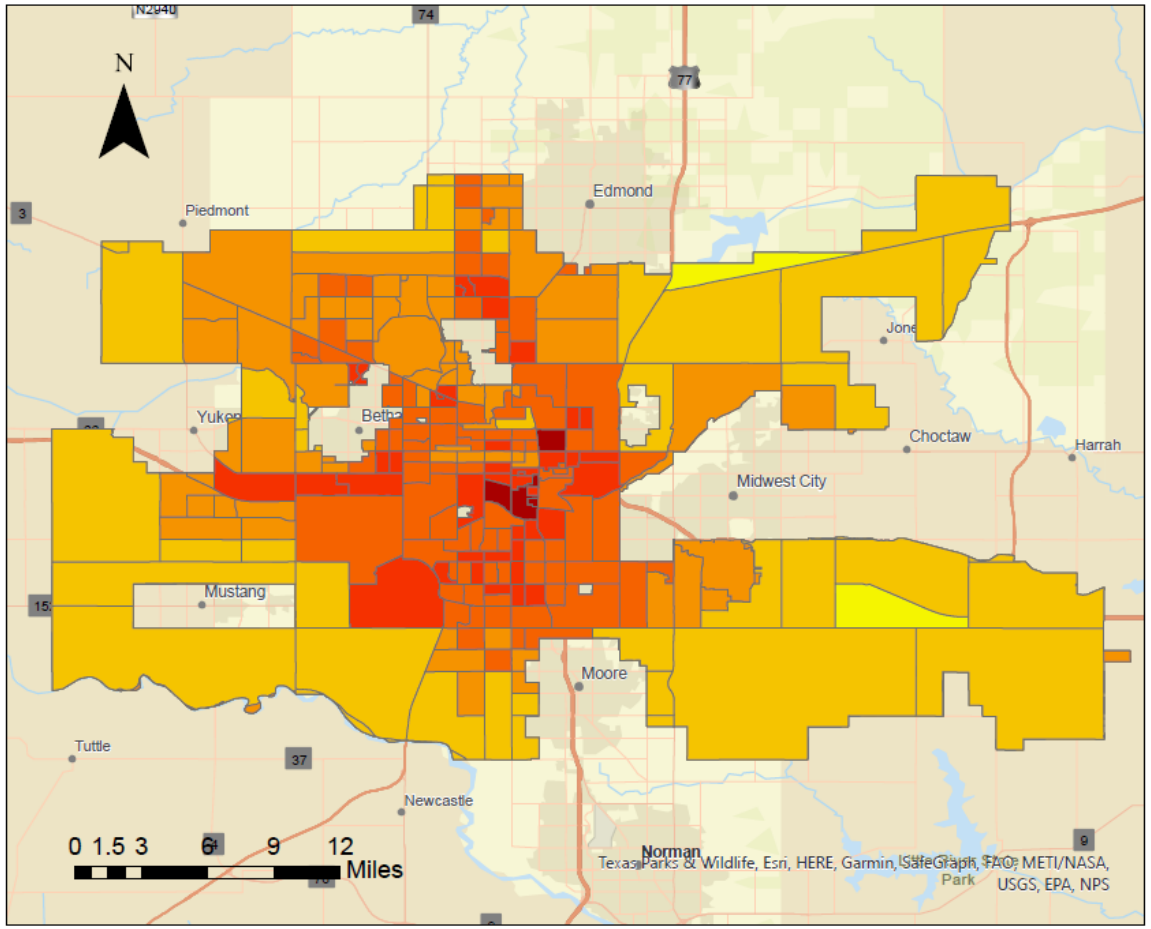
HEAT VULNERABILITY INDEX

Developed via NASA ROSES project led by Dr. Wenwen Cheng

Identified which OKC Census Tracts were most vulnerable to extreme heat from 2015 to 2020

Workshop held Saturday July 8th @ The Auditorium at The Douglass

Oklahoma City Heat Vulnerability Index (HVI)
2020



Legend
Zscore
- L-L
- H-L
- L-M
- H-M
- L-H
- H-H

Notes:
Six HVI categories were classified based on their Z-score: Greater than 2Z, High-High risk (H-H); Less than 2Z, greater than 1Z, Low-High risk (L-H); less than 1Z, greater than 0Z, High-Moderate risk (H-M); less than 0Z, greater than -1Z, Low-Moderate risk (L-M); less than -1Z, greater than -2Z, High-Low risk (H-L); less than -2Z, Low-Low risk (L-L).

INTRODUCTION TO OKC HEAT WATCH CAMPAIGN

PARTNERS

18 partner organizations from education, health, government, and nonprofit sectors

HEAT + AIR QUALITY DATA

Volunteers use sensors attached to their personal vehicles to collect temperature and particulate matter data

VOLUNTEERS

The study relies on “street scientist” volunteers (YOU!)

SURVEYS, ANALYSIS, & REPORT

NOAA’s consultant, CAPA Strategies, will analyze data, conduct a jurisdictional scan, and prepare a report to help the partnership team plan next steps

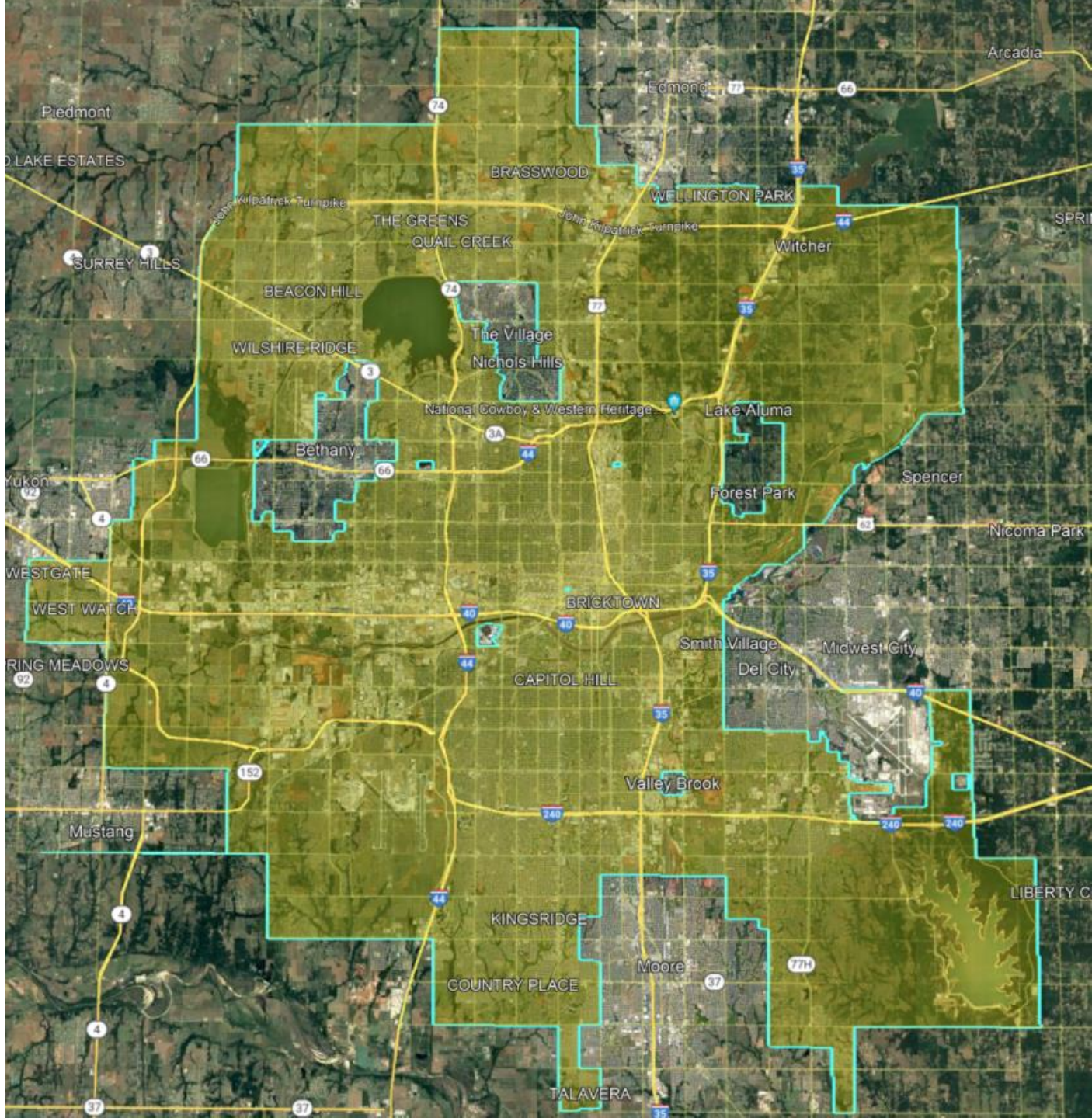
STEERING COMMITTEE & PARTNERS

PROJECT AREA

350

Square Miles

2019 Tree Canopy
Study Area

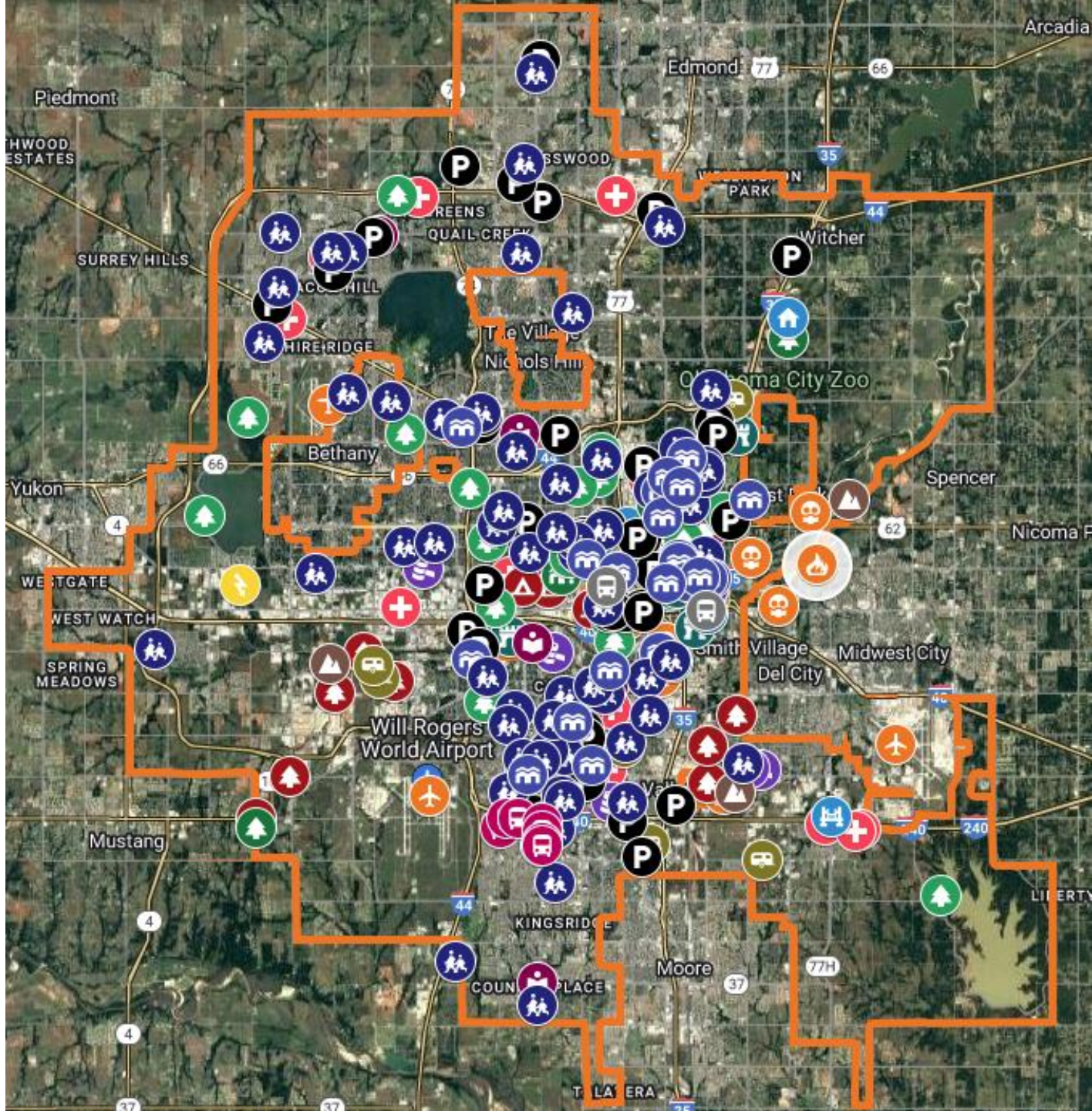


ROUTE DESIGN

263

Places of Interest

Extremely hot
and not hot places



HEAT HUBS

1) NORTH

   NW Library

   5600 NW 122nd Street, 73142

2) SOUTH

   Southern Oaks Library

   6900 S Walker Ave, 73109

3) EAST

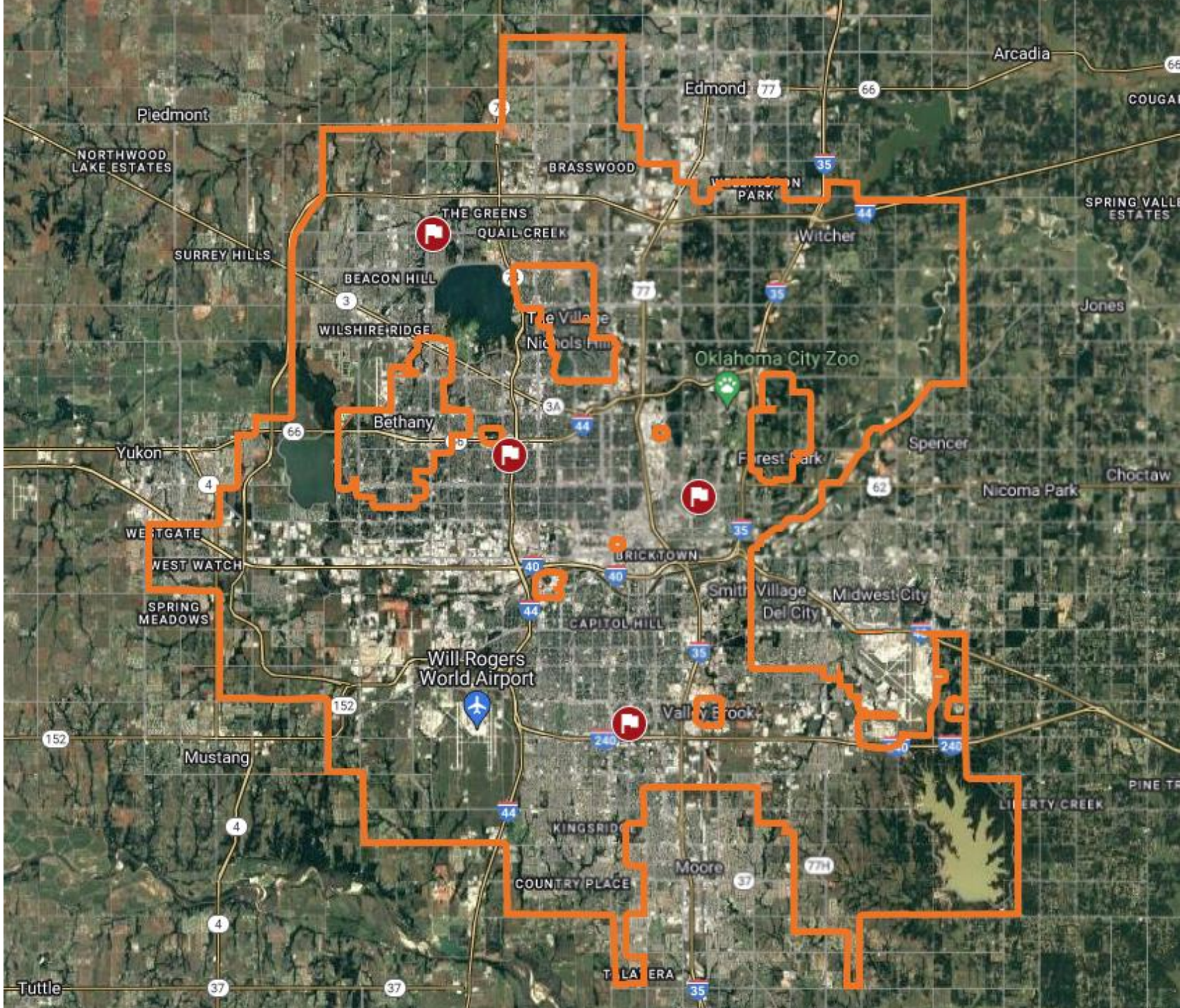
   Pitts Recreation Center

   1920 N Kate Ave, 73111

4) WEST

   Will Rogers Senior Center

   3501 Pat Murphy Dr, 73112



ROUTE DESIGN

35

Routes

x 3 volunteers per shift
=
105 per shift

Data collection routes as planned (in blue).

Actual collected temperature data along the planned routes (red to blue).

DATA COLLECTION

Sensor Head:

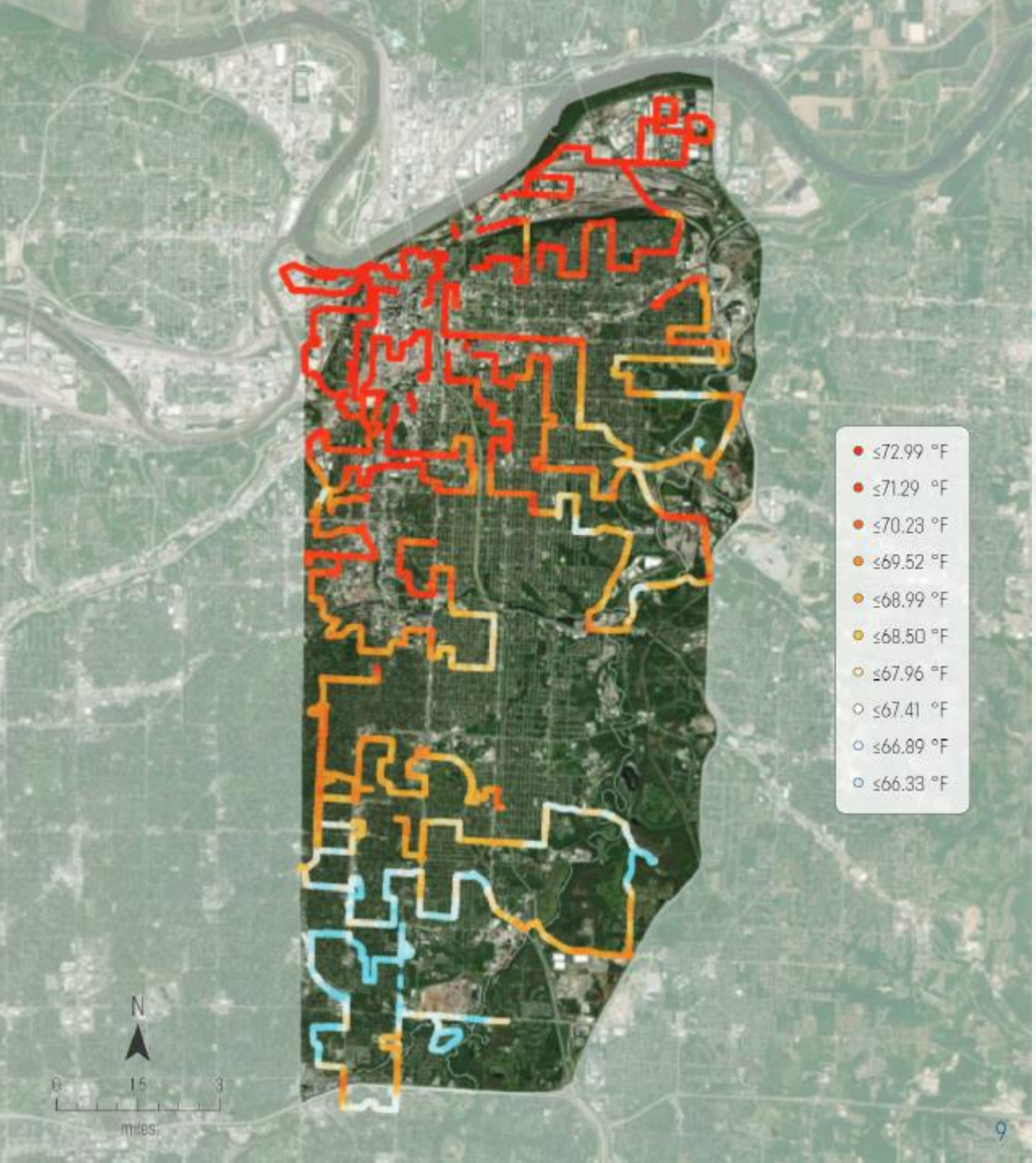
Measures the air while also blocking direct sunlight.

Sensor Tube:

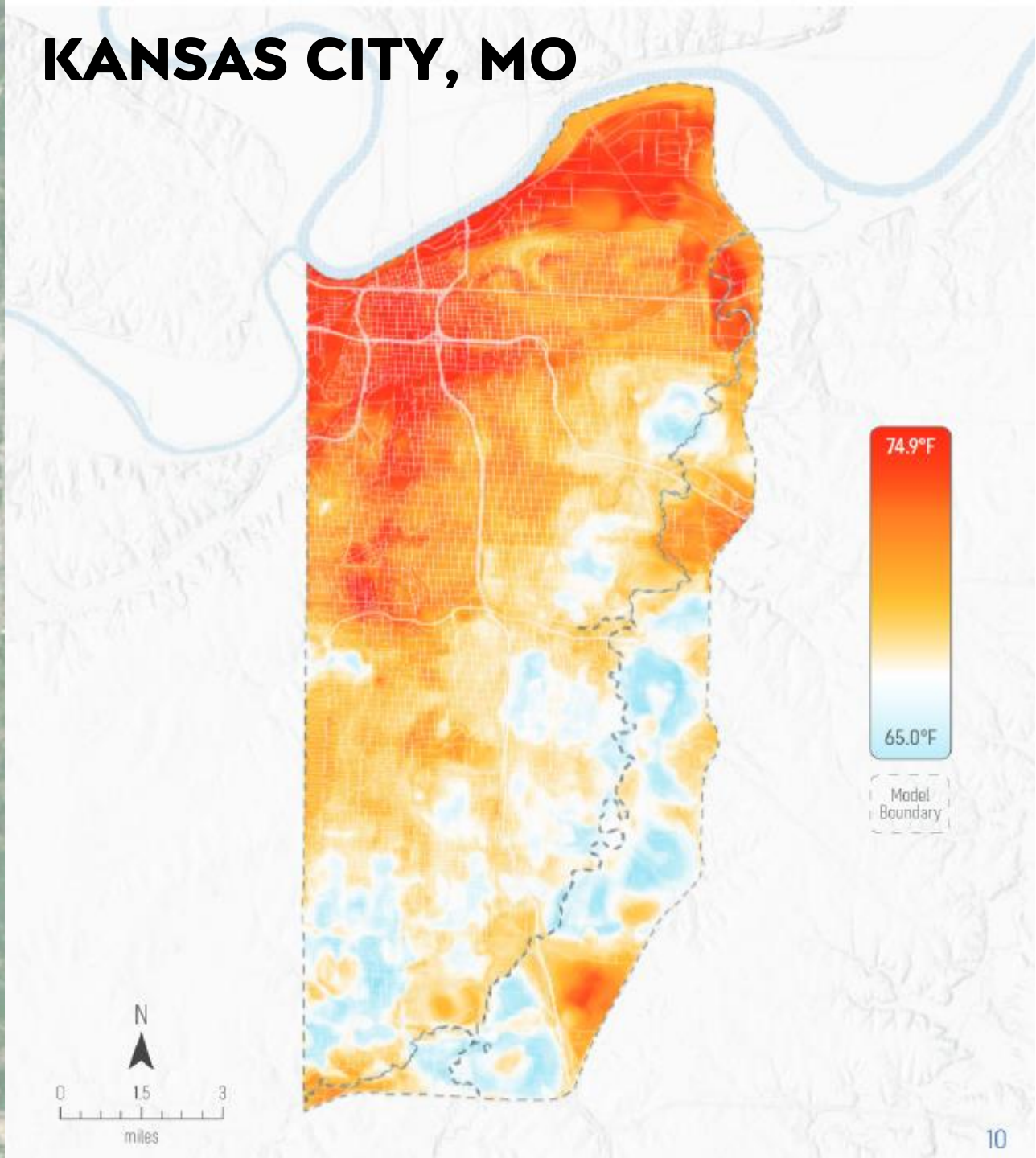
Places sensor at distance from vehicle & transfers data.

Sensor Base:

Mounted on Passenger-side Window ONLY.



KANSAS CITY, MO



FINAL REPORT

Summary of Data

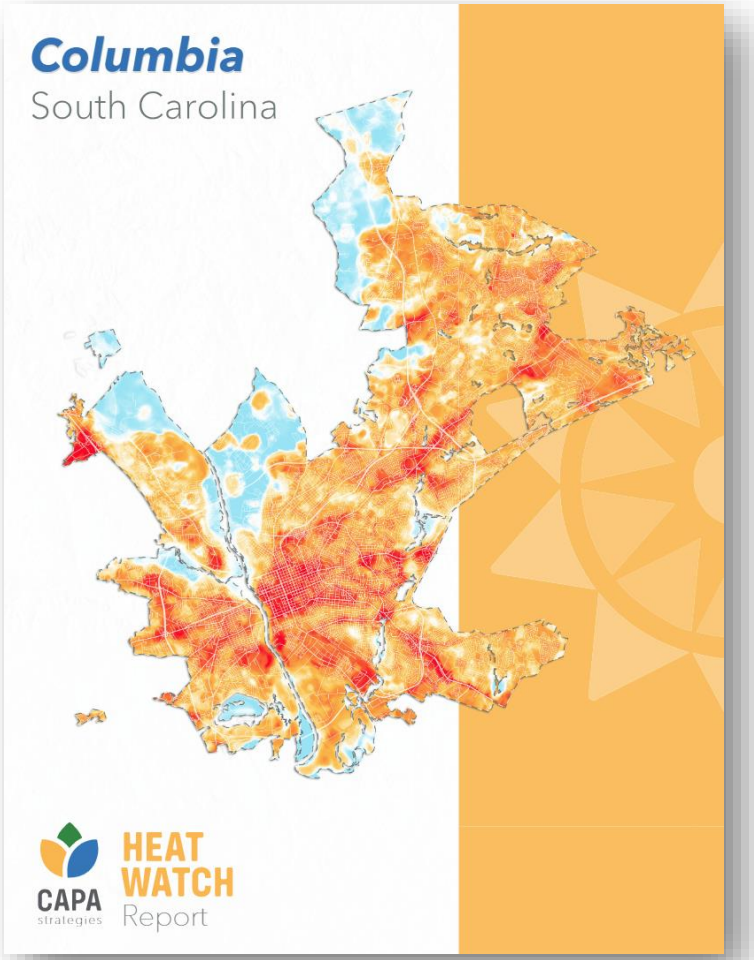
Methodology

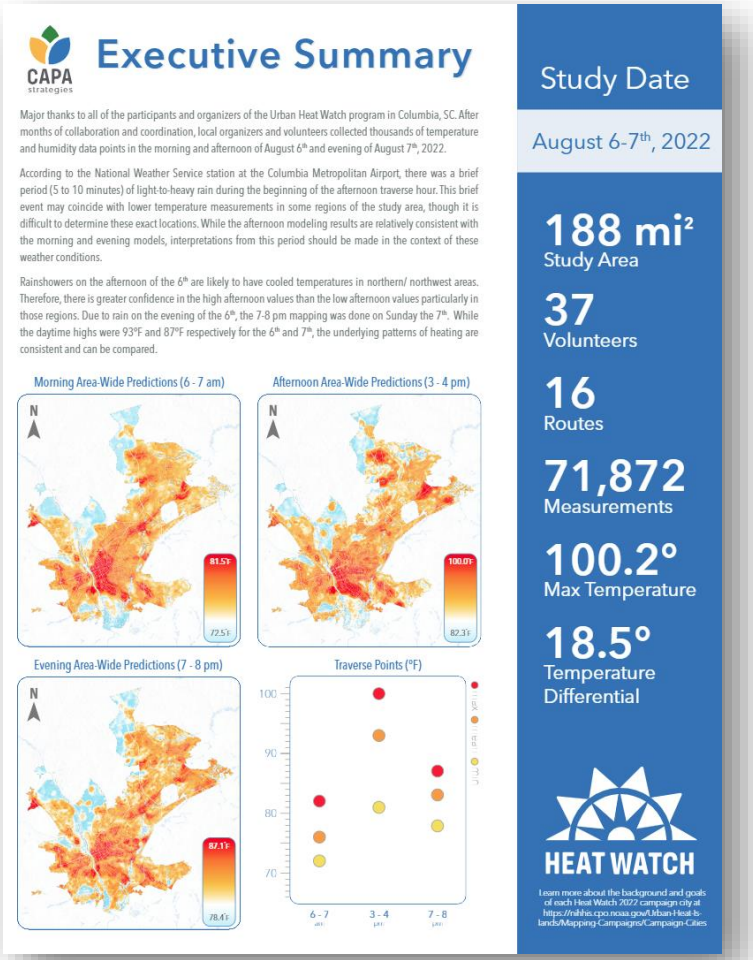
Observations

Surveys

Media

Analysis





COMMUNICATION

WhatsApp

1. All-Volunteer WhatsApp Group
2. Your Heat Hub WhatsApp Group

1. All volunteers email distribution group (BCC so no reply-all issues)

WHAT WE'LL COMMUNICATE

- Date Annoucement
- Route Assignment
- Day-Of Updates (check-ins, etc.)
- Troubleshooting (Sensors, Backups, etc.)
- Photos!
- Feedback Surveys

TRAINING REQUIREMENTS

VOLUNTEER TRAINING

Link to Video

KNOWLEDGE CHECK

Link to Google Form

LIABILITY WAIVER

Link to Liability Waiver

CAPA strategies

Accelerating community adaptation to climate change

Heat Watch

Program Overview

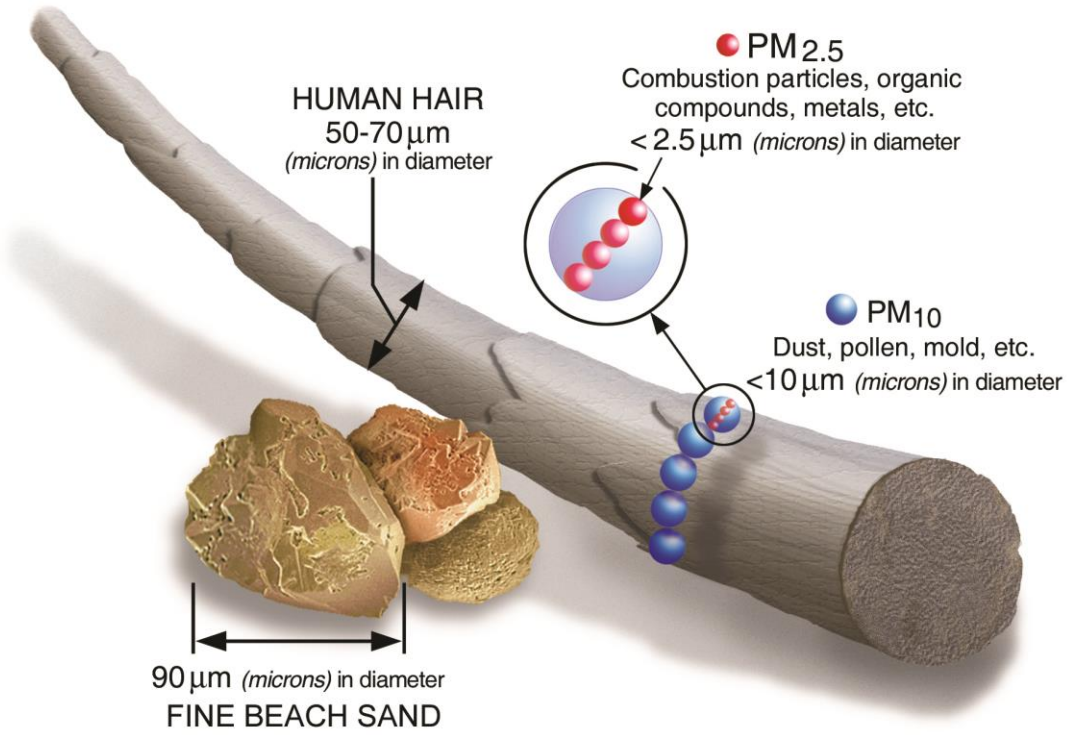
Particulate Matter

- Particulate Matter (PM) = Tiny air particles made of various chemicals
  - 2.5 microns = PM2.5
  - 10 microns = PM10

- Produced by
  - Combustion processes
  - Automobiles
  - Construction equipment
  - Industrial plants
  - Wildfire

- Harmful when breathed at elevated levels for prolonged periods

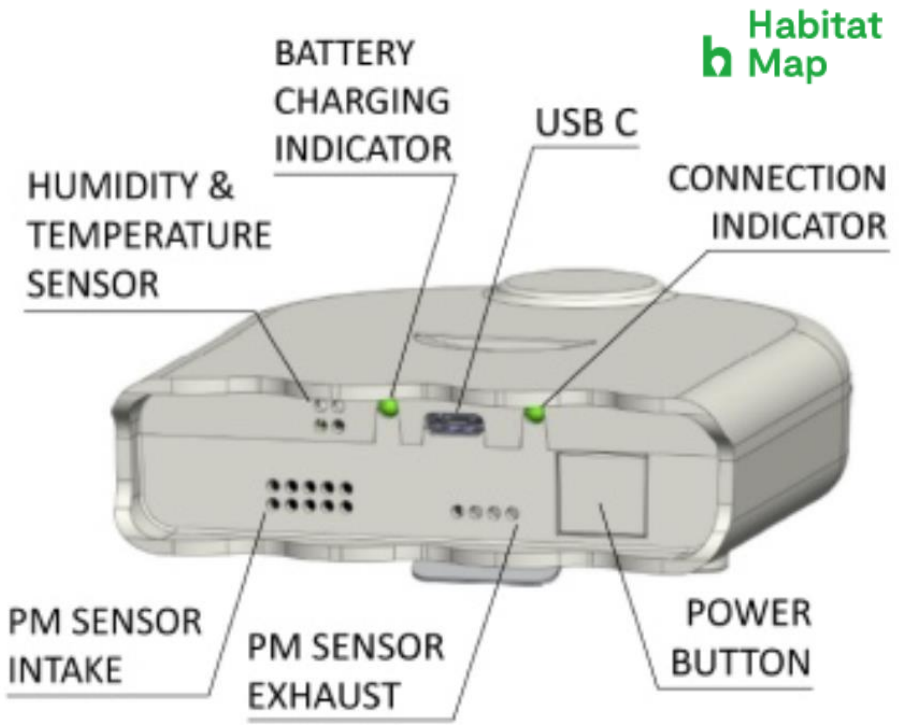
- Spatially-rich data collection approach



US AQI Level	PM2.5 (ug/m3)	Health Recommendation
Good	0-12.0	Air quality is satisfactory and poses little or no risk
Moderate	12.1-35.4	Sensitive individuals should avoid outdoor activity as they may experience respiratory symptoms.
Unhealthy for Sensitive Groups	35.5-55.4	General public and sensitive individuals in particular are at risk to experience irritation and respiratory problems
Unhealthy	55.5-150.4	Increased likelihood of adverse effects and aggravation to the heart and lungs among general public
Very Unhealthy	150.5-250.4	General public will be noticeably affected. Sensitive groups should restrict outdoor activities.
Hazardous	250.5+	General public at high risk of experiencing irritations and adverse health effect. Should avoid outdoor activities.

Source: EPA, CAPA

The AirBeam 3.0



The AirBeam3.0 measures “particulate matter” of 1, 2.5 and 10 micron diameter, otherwise known as PM1, PM2.5, PM10.

Turning on Sensor

Similar to the CAPA heat sensor, a series of lights help to communicate the sensor functions:

Turn on: press in white button on bottom of sensor; The connection light will turn green for about 2 minutes.

Wait: Yellow light indicates the sensor is looking for GPS lock. This should take 5-10 minutes.

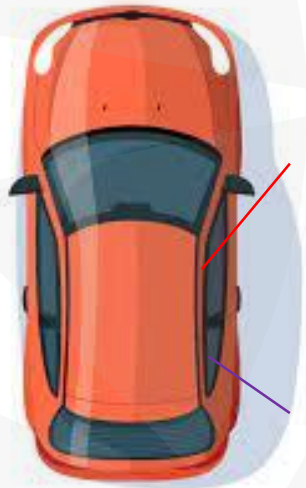
Go! Orange light means the sensor has locked GPS, and you are good to go!

Installation

To install your AirBeam on your back right window, roll down your window, put the sensor clip over, and roll up the window tight

Driver side
(left)

Passenger side
(right)



Front right window:
CAPA heat sensor

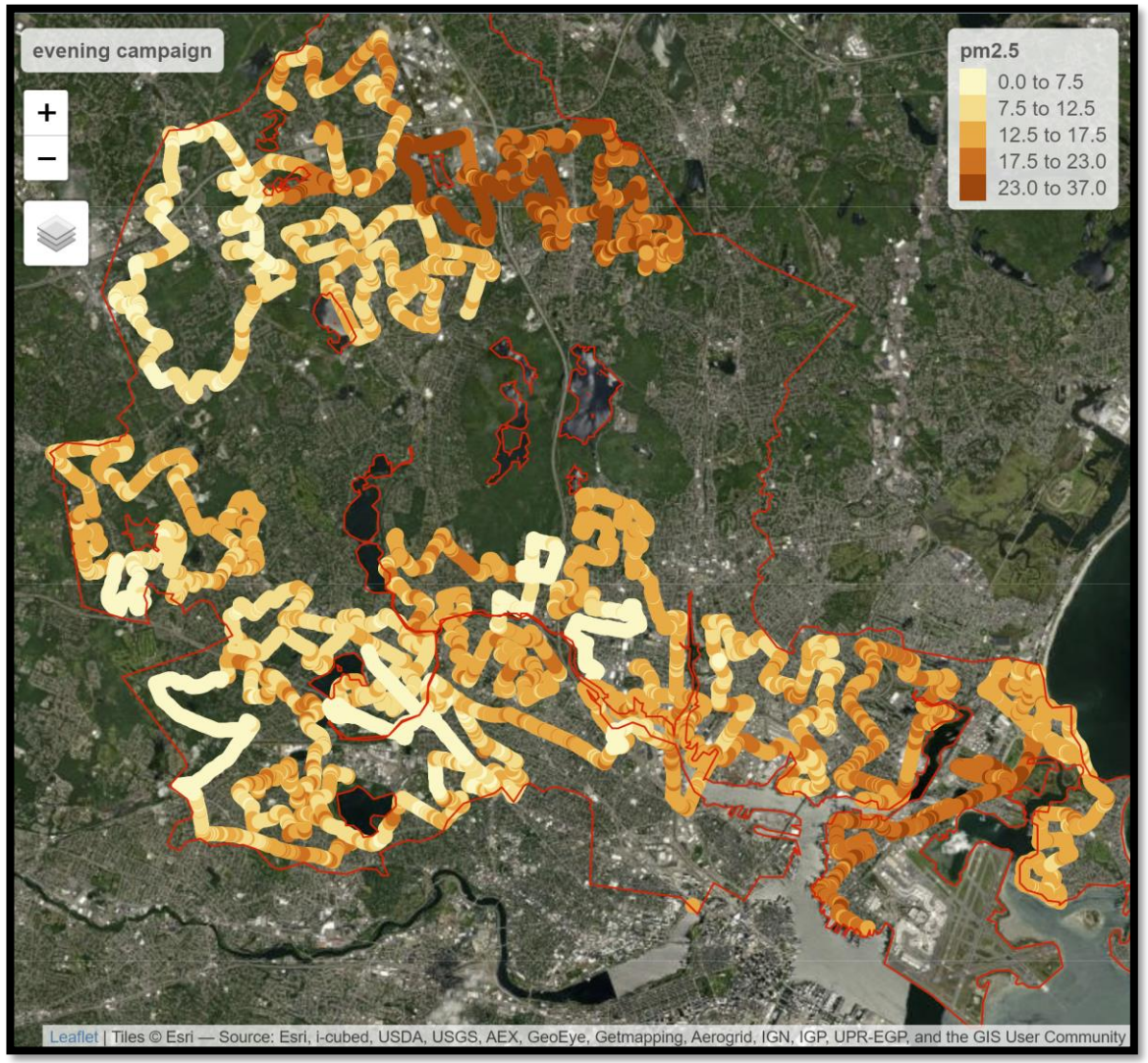
Back right window:
AirBeam sensor

Turn off sensor

After your route, simply decompress the white button again, and the lights will go off.

For the next time period, simply repeat the installation process the exact same.

The data will be retrieved later by CAPA.



Example AirBeam PM2.5 data, Mystic River, Massachusetts

SENSOR DISTRIBUTION

How we'll get you the equipment and when you'll return it.

Morning Shift

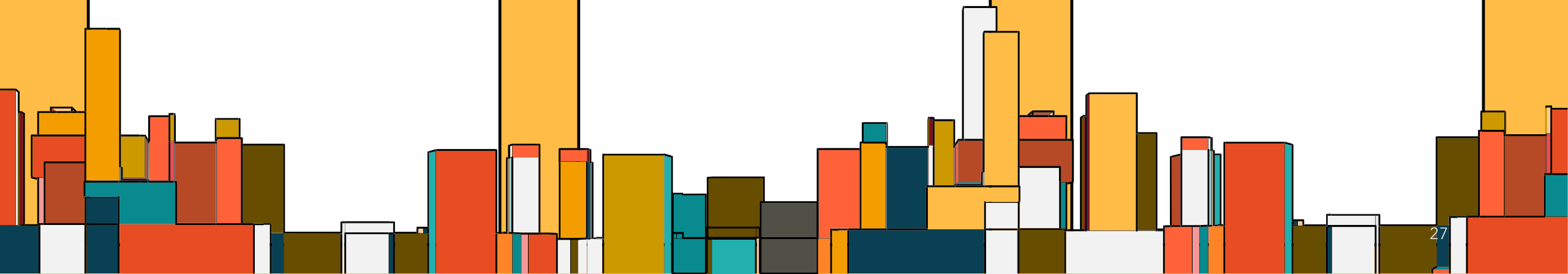
Morning Shift volunteers will pick up sensors at their Heat Hubs the day before (August 11) the data collection day.

Return Sensors

When your shift is over, please return the sensors to the OKC Heat Watch Team at your assigned Heat Hub.

What if...?

Contact your assigned Heat Hub Captain if any issues arise during your route.



NEXT STEPS

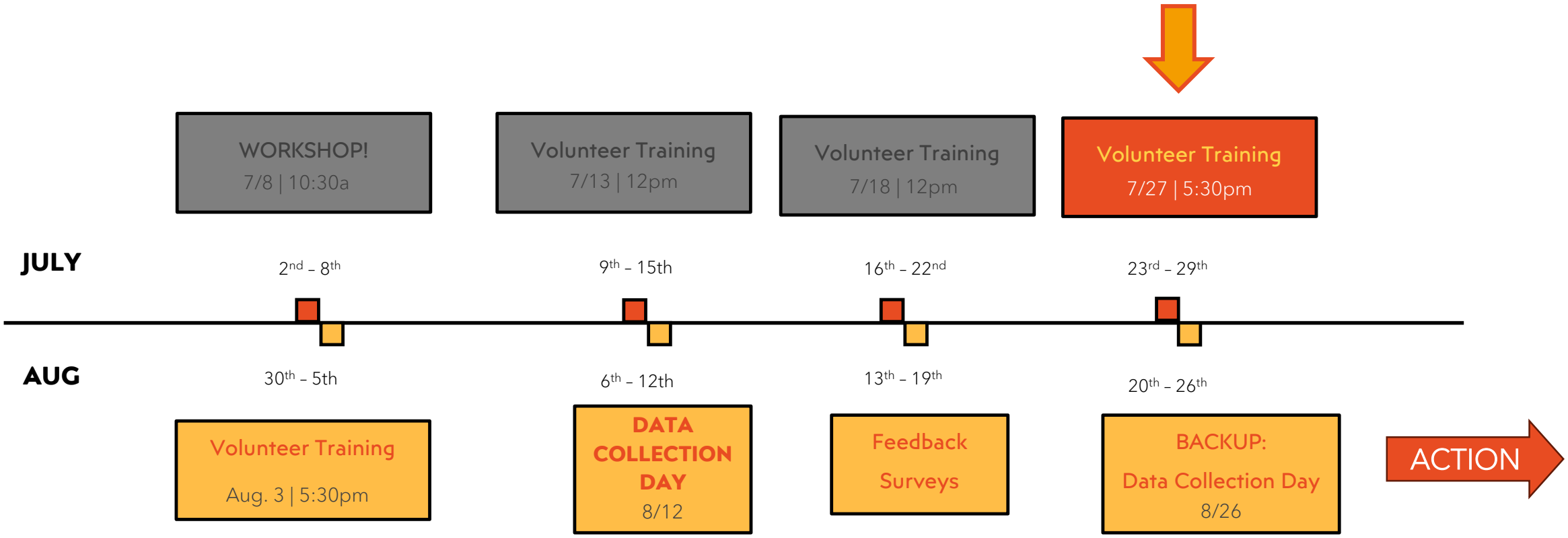
ONCE YOU COMPLETE THE WAIVER, WE'LL SEND YOU...

1. Route & Heat Hub Assignment
2. Information Sheets
    A. Checklist
    B. Sensor Information
    C. Accessing Route Directions
    D. Day-of Reminders

WhatsApp

1. Invite to WhatsAPP Group(s)
2. Connection to Heat Hub Captain

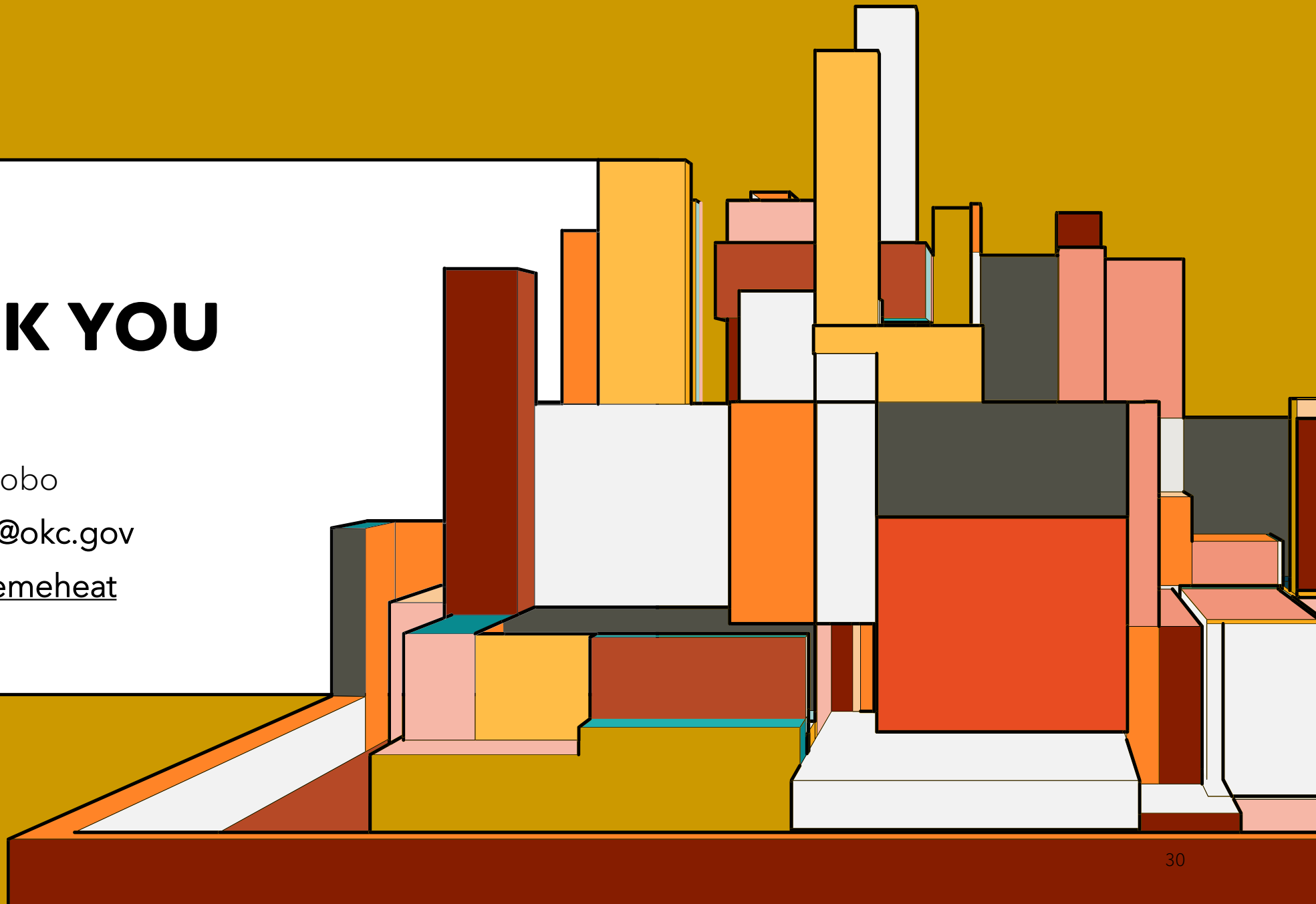
CAMPAIGN TIMELINE



THANK YOU

T.O. Bowman

Sarah Terry-Cobo

sustainability@okc.gov

okc.gov/extremeheat