

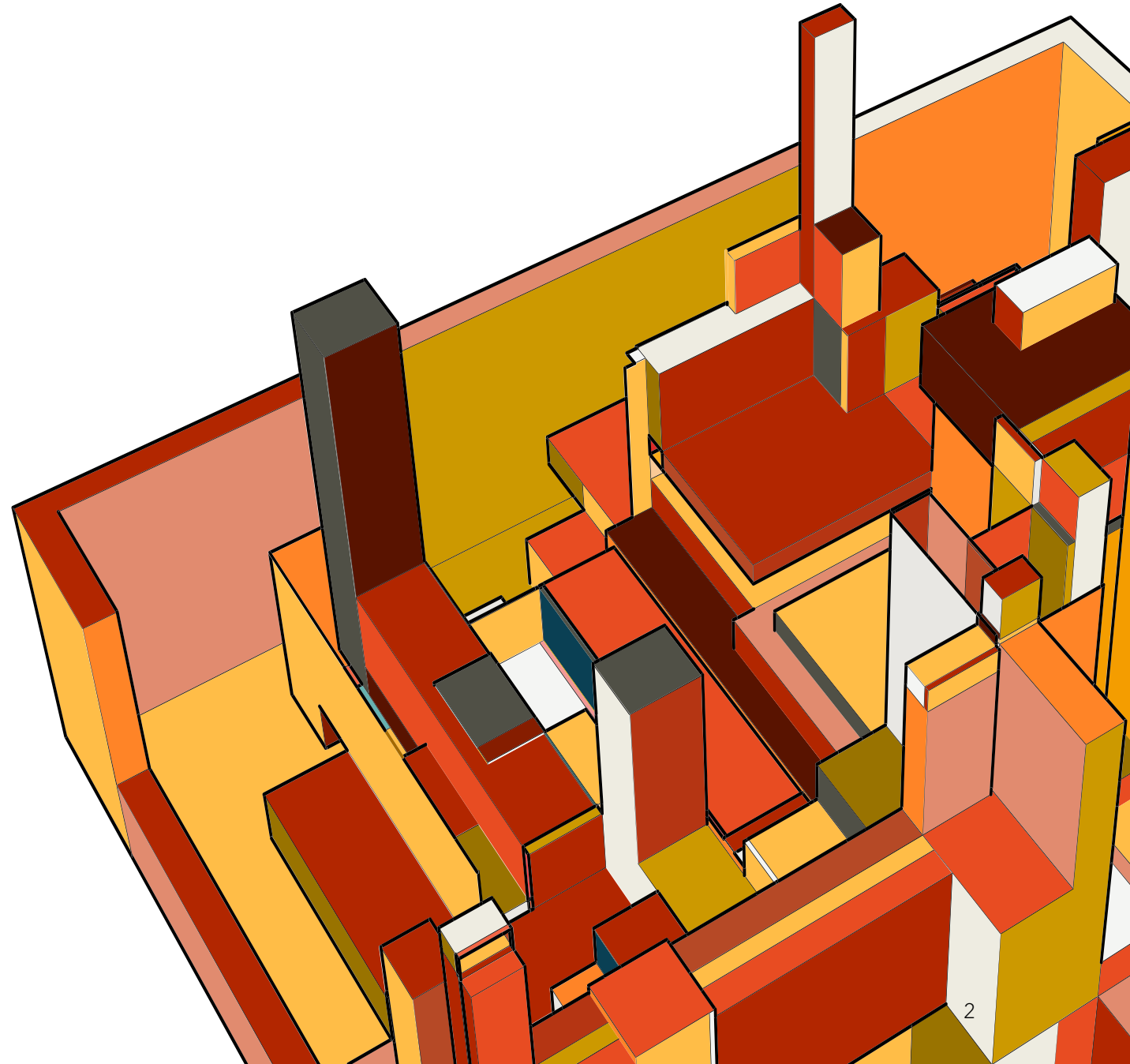
OKLAHOMA CITY URBAN HEAT WATCH

Volunteer Training | July 18, 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 planokc in Summer 2020



GOAL

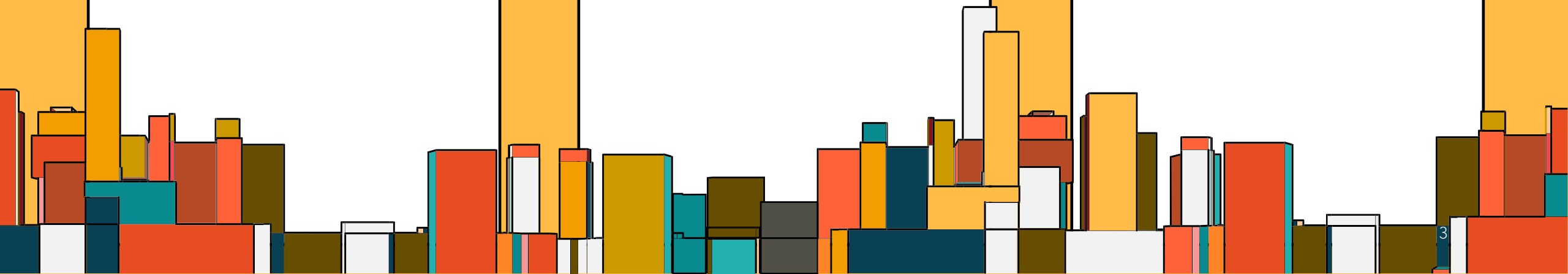
Mitigate effects of extreme heat

INITIATIVE

Mitigate areas of high heat exposure

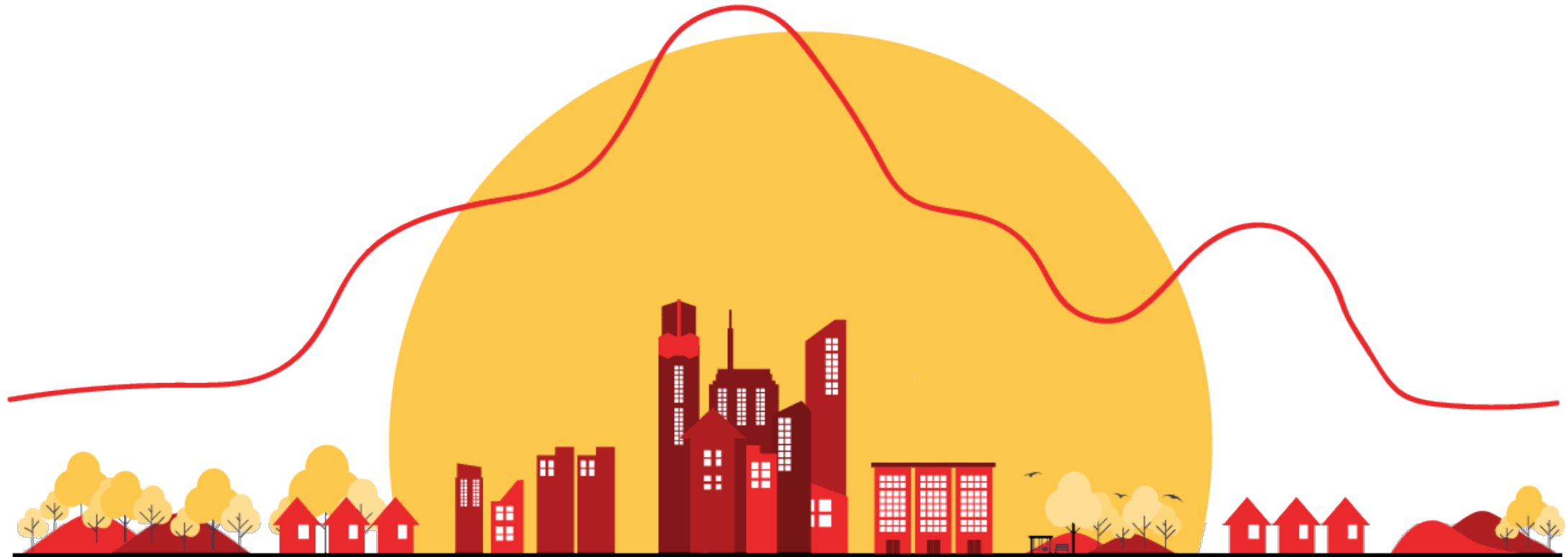
POLICY

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

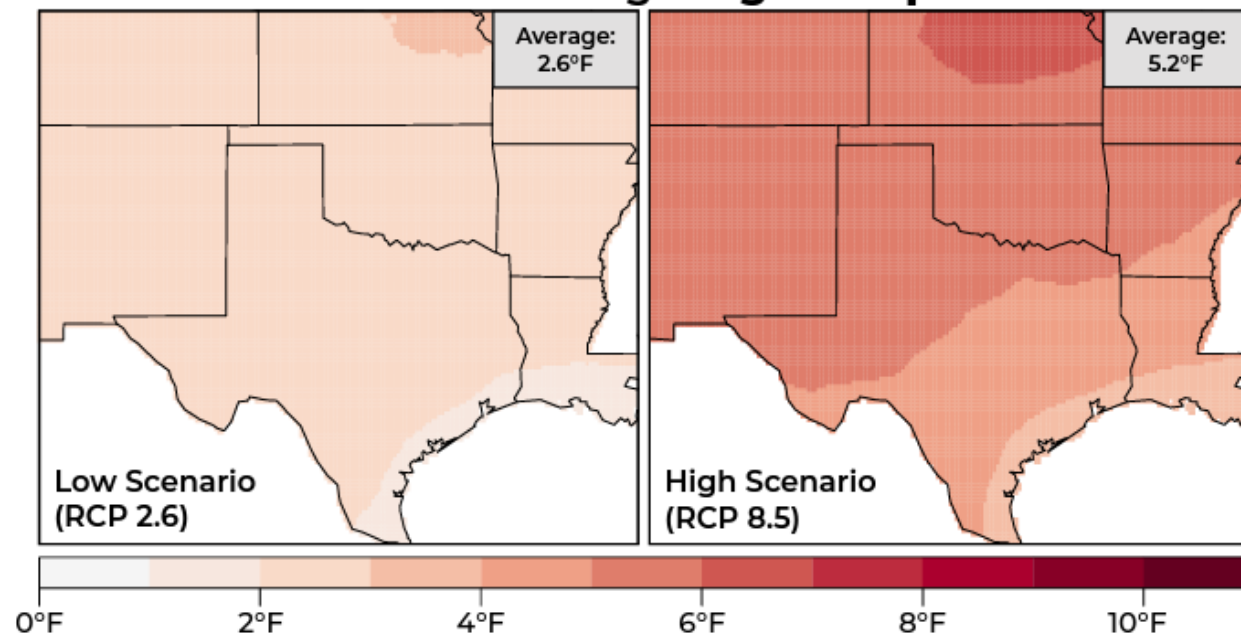


Yearly Average Temperature, 1970-2022

Note OKLAHOMA CITY WILL ROGERS AP, OK has 0 full years missing



Mid-Century Projected Change of the Annual Average High Temperature



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

IMPERVIOUS SURFACES

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

COOLING DEMAND

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

VULNERABILITIES

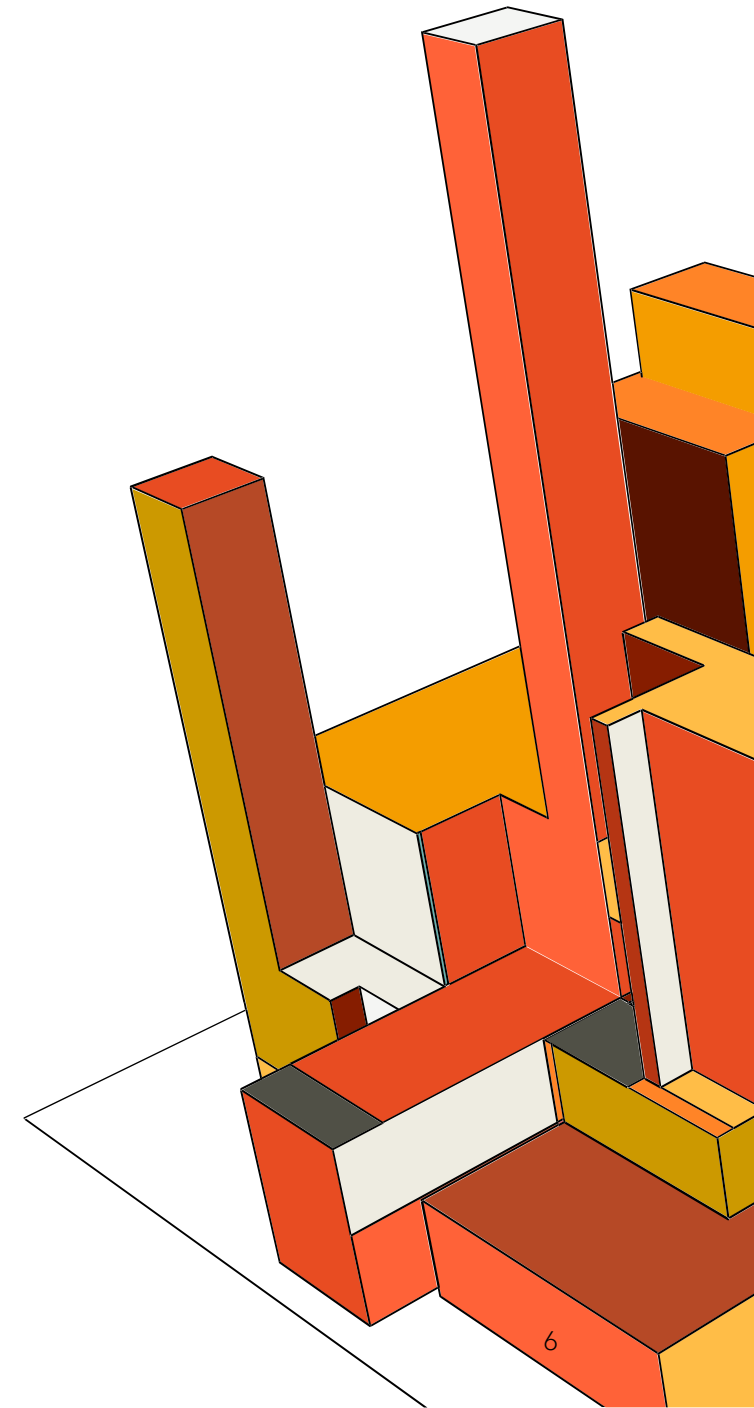
Everyone experiences extreme heat but not everyone is affected evenly.
Exposure + Sensitivity = Vulnerability

WATER QUALITY

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

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

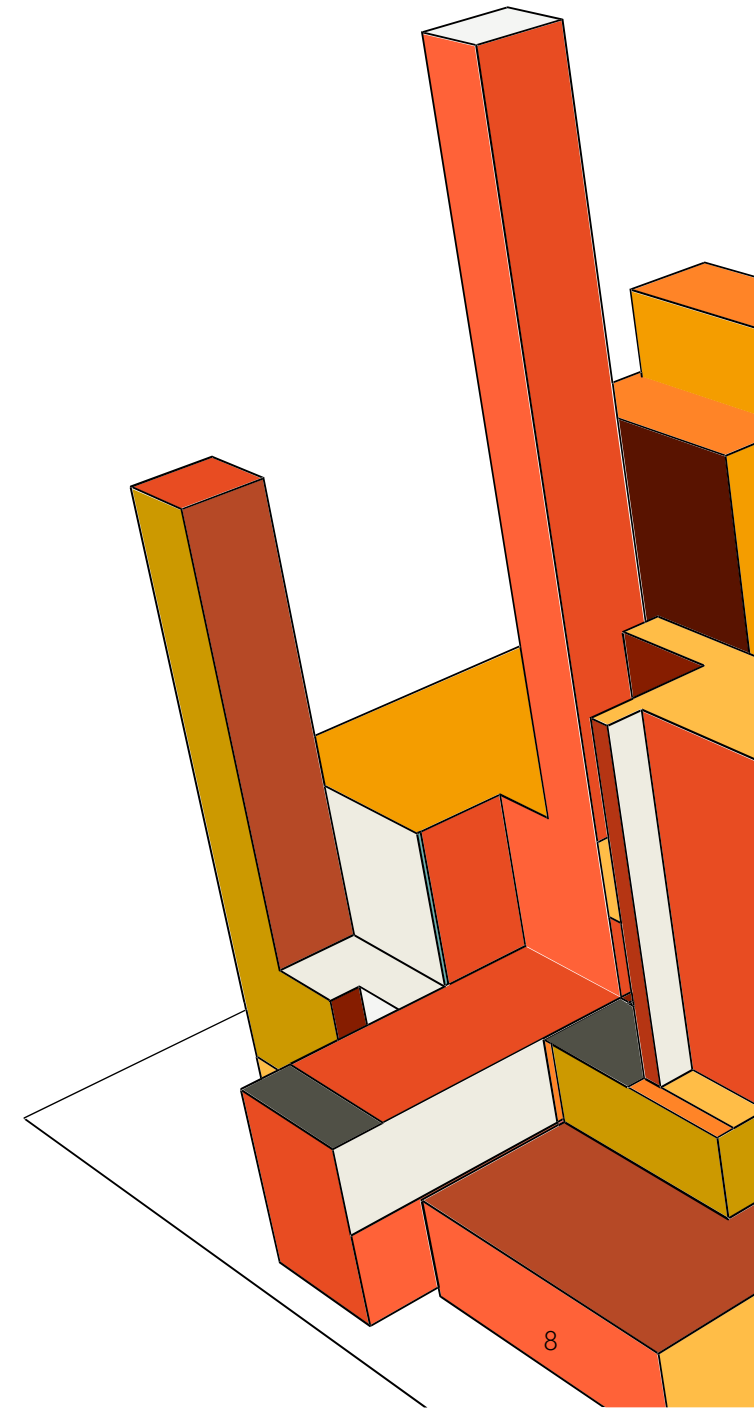
Farm workers, public safety, landscaping crews, parks staff, water/sewer line maintenance workers, roofers, construction workers, etc.

PUBLIC TRANSPORTATION

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



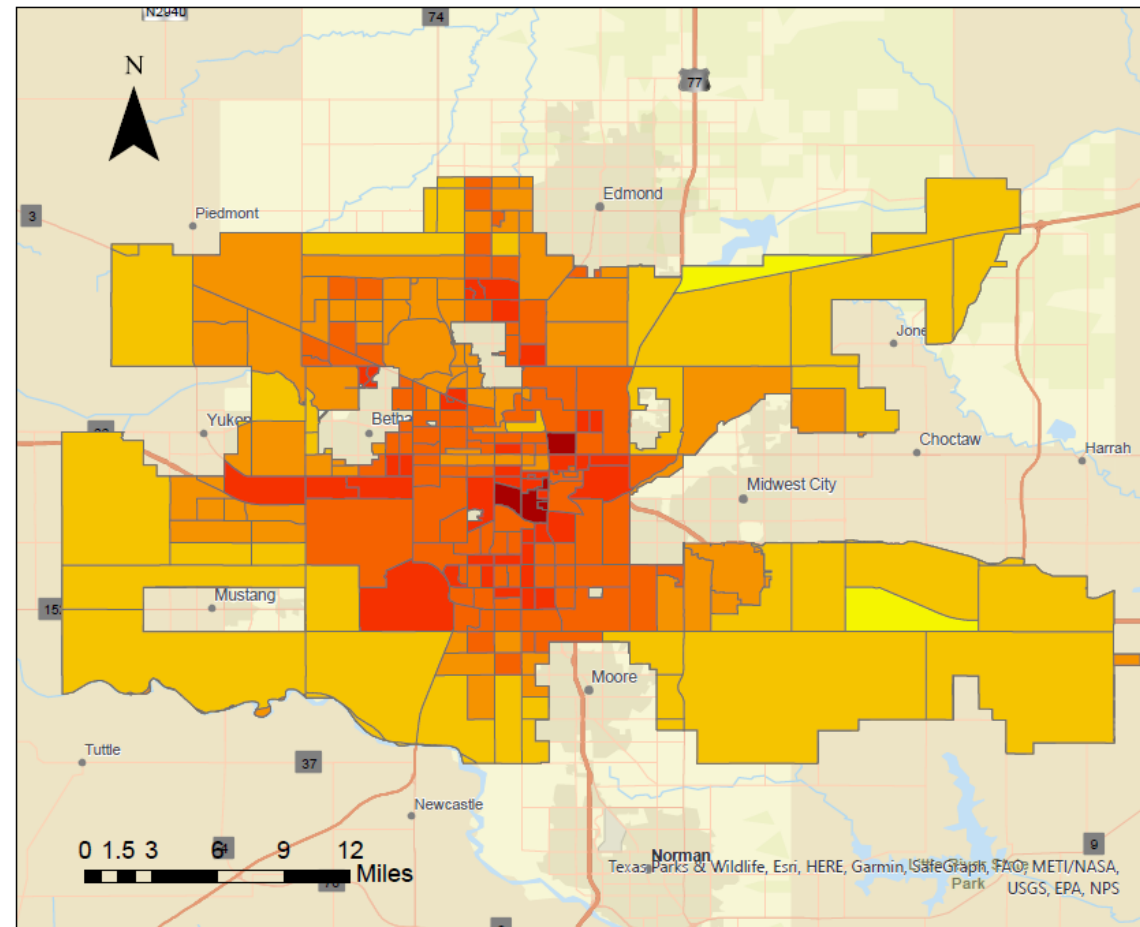
HEAT VULNERABILITY INDEX

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

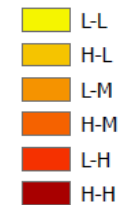
Workshop held Saturday
July 8th @ The Auditorium
at The Douglass

Oklahoma City Heat Vulnerability Index (HVI) 2020



Legend

Zscore



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



OKLAHOMA
Dept. of Agriculture,
Food and Forestry



OKLAHOMA
Environmental
Quality

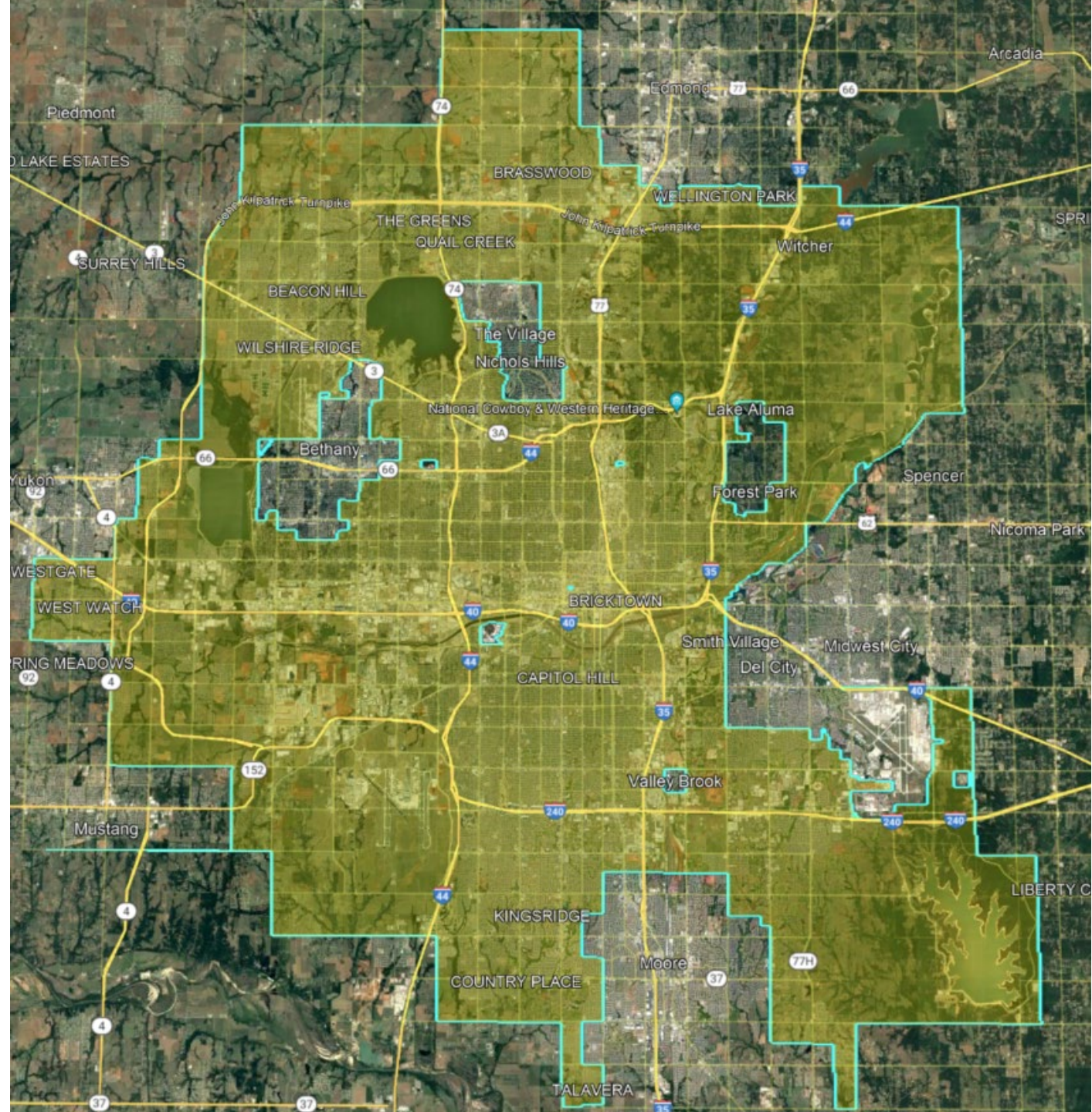


PROJECT AREA

350

Square Miles

2019 Tree Canopy
Study Area

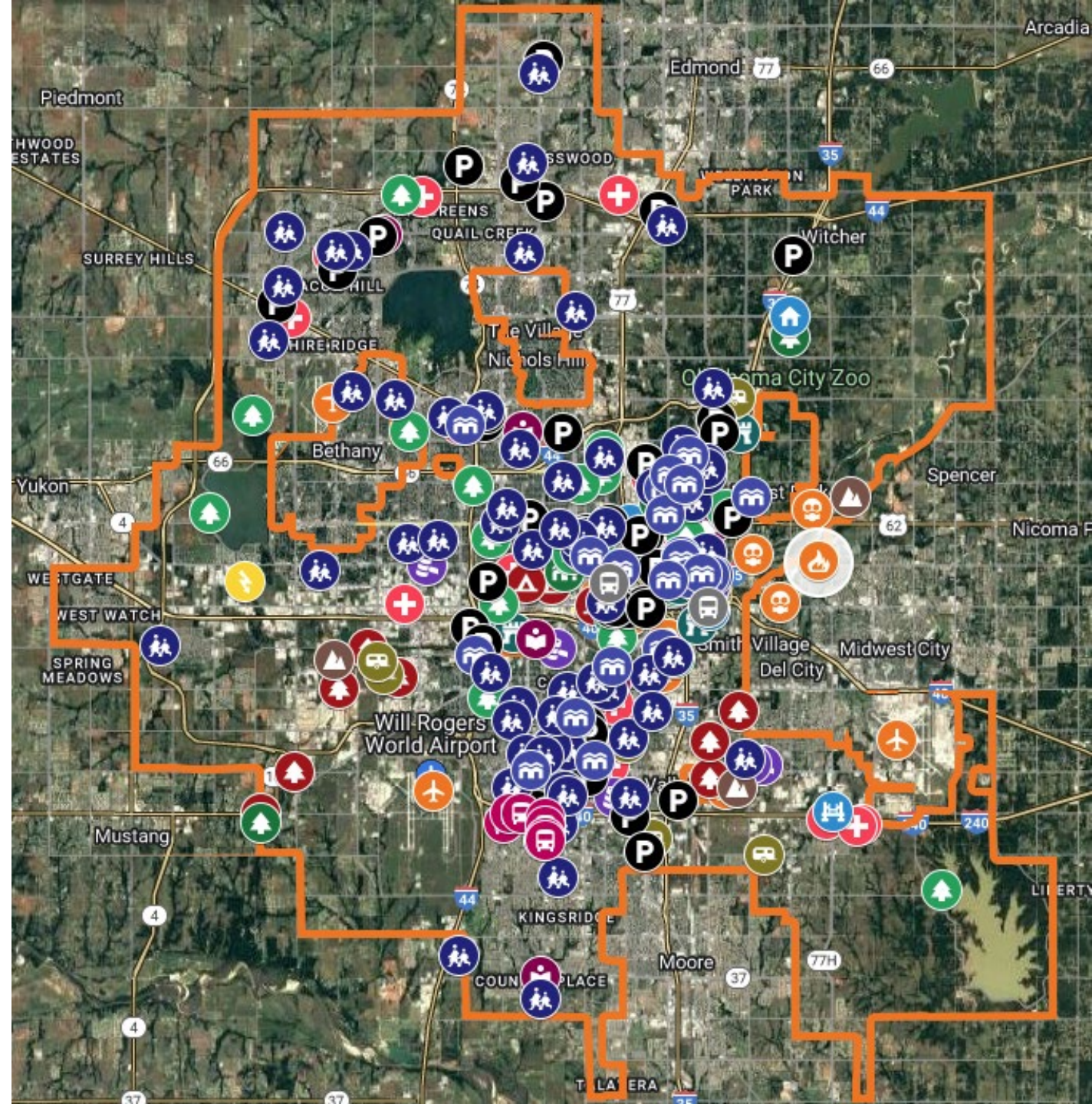


ROUTE DESIGN

263

Places of Interest

Extremely hot
and not hot places

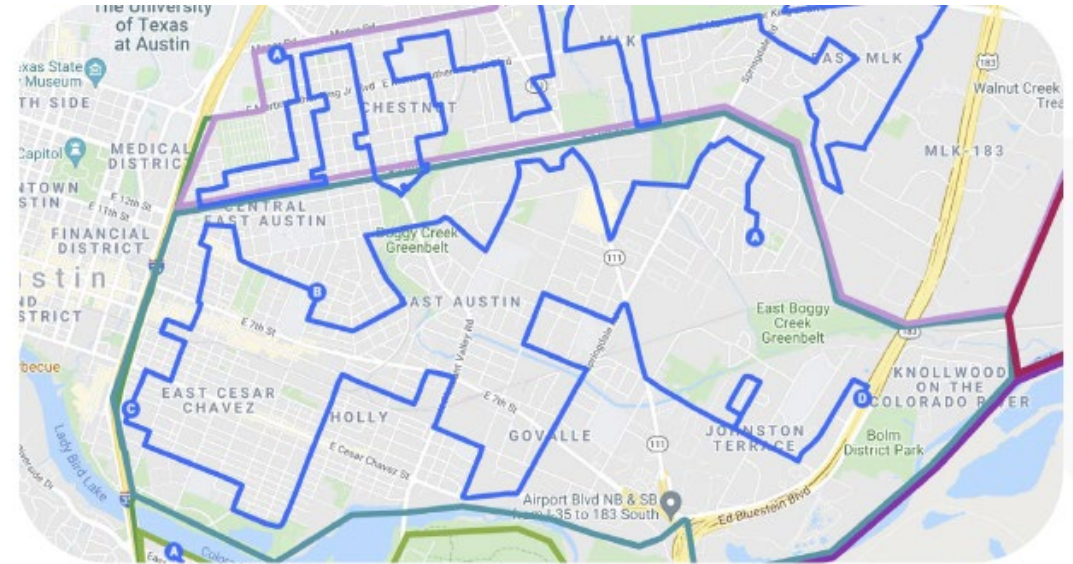


ROUTE DESIGN

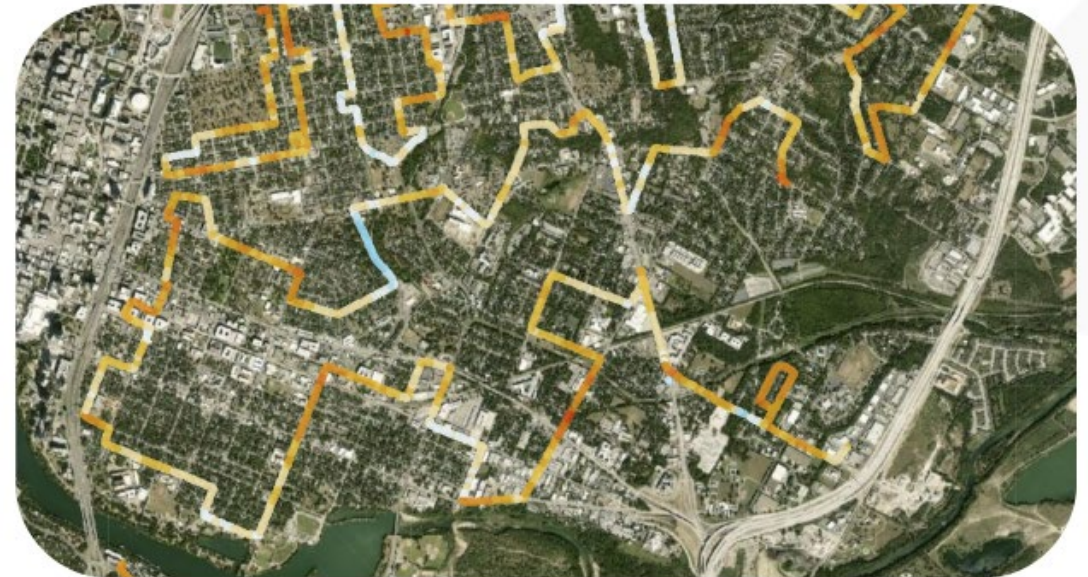
35

Routes

x 3 volunteers per shift
=
105 per shift



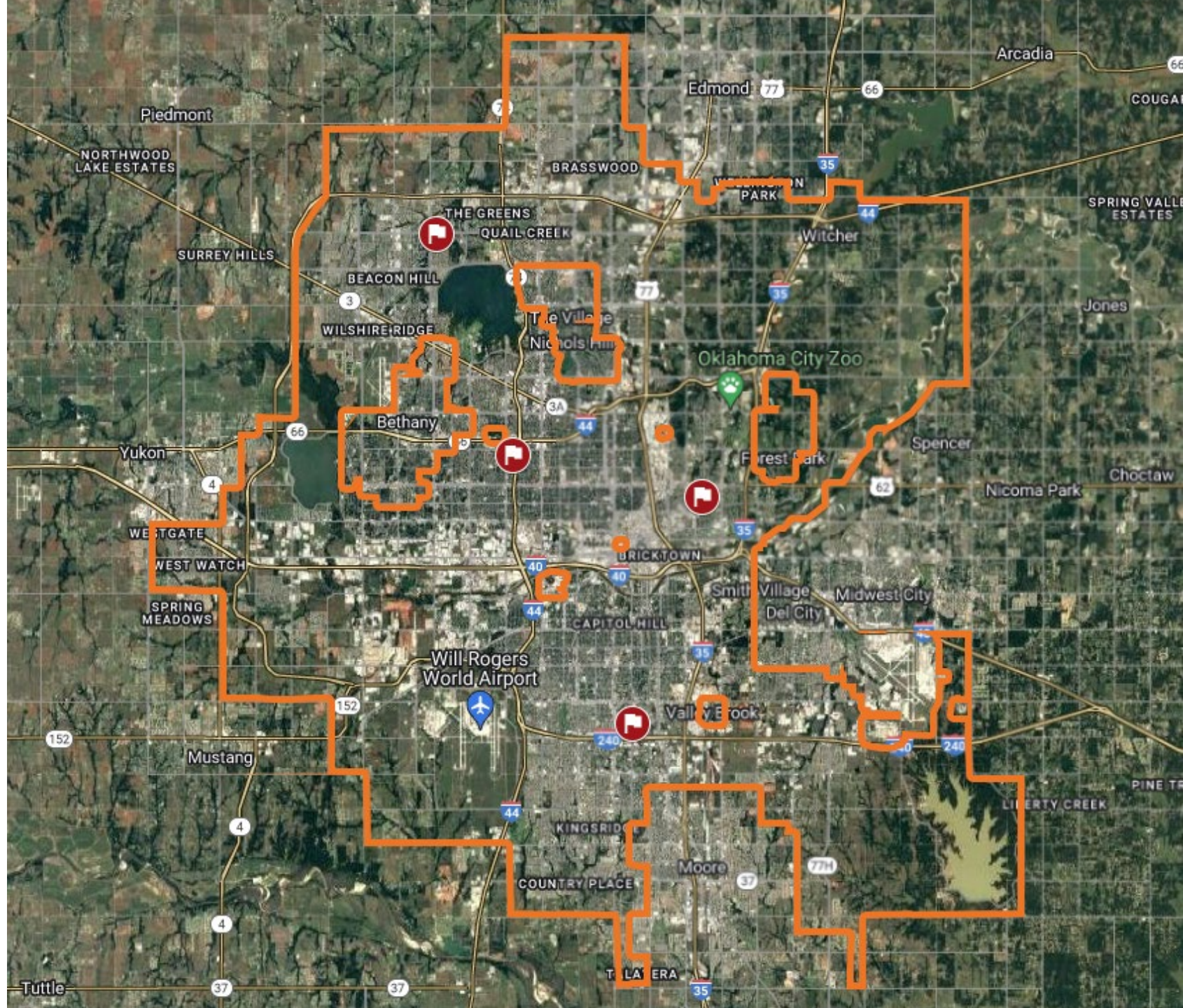
Data collection routes as planned (in blue).



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

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



DATA COLLECTION

Sensor Head:

Measures the air while also blocking direct sunlight.

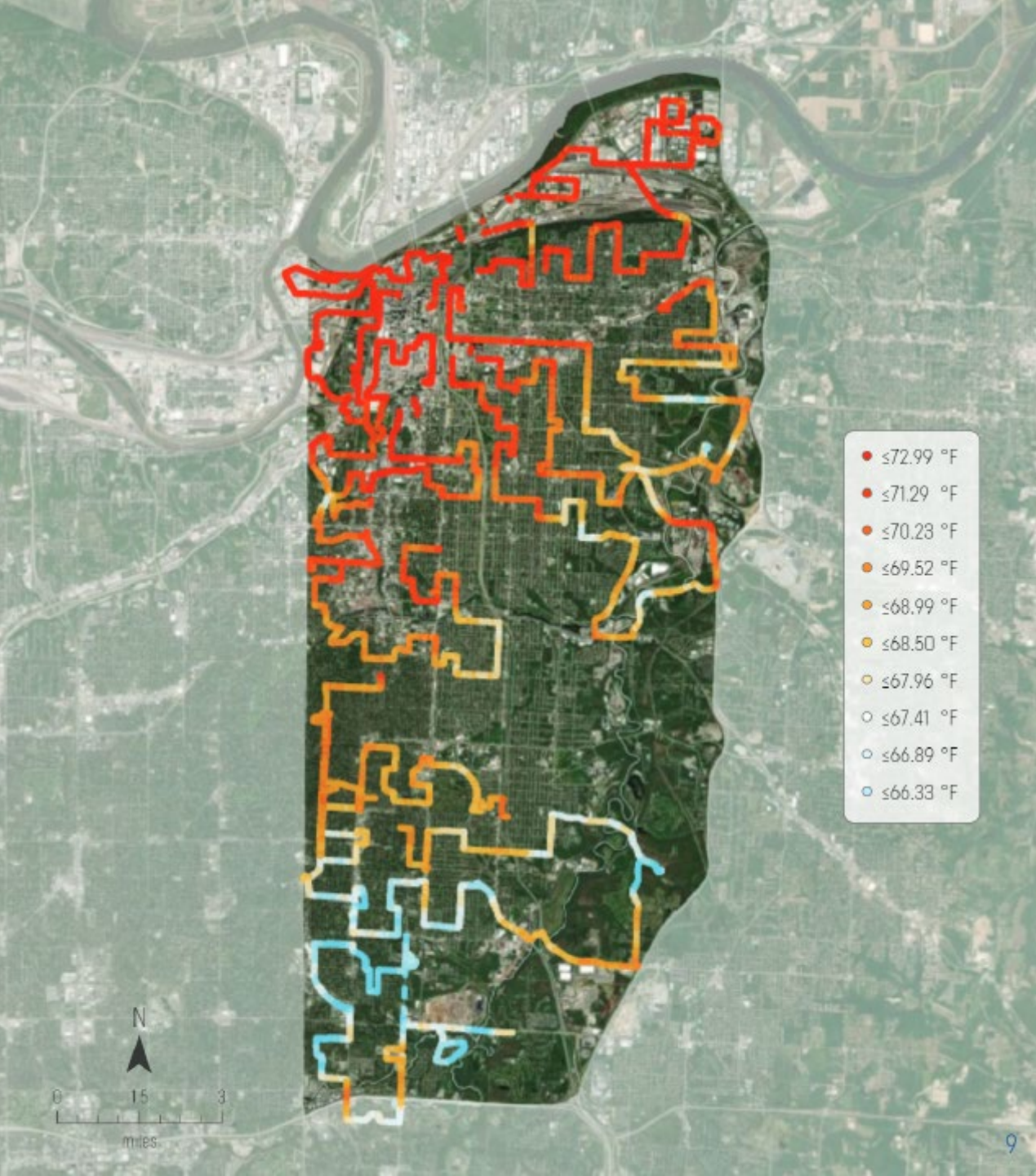
Sensor Tube:

Places sensor at distance from vehicle & transfers data.

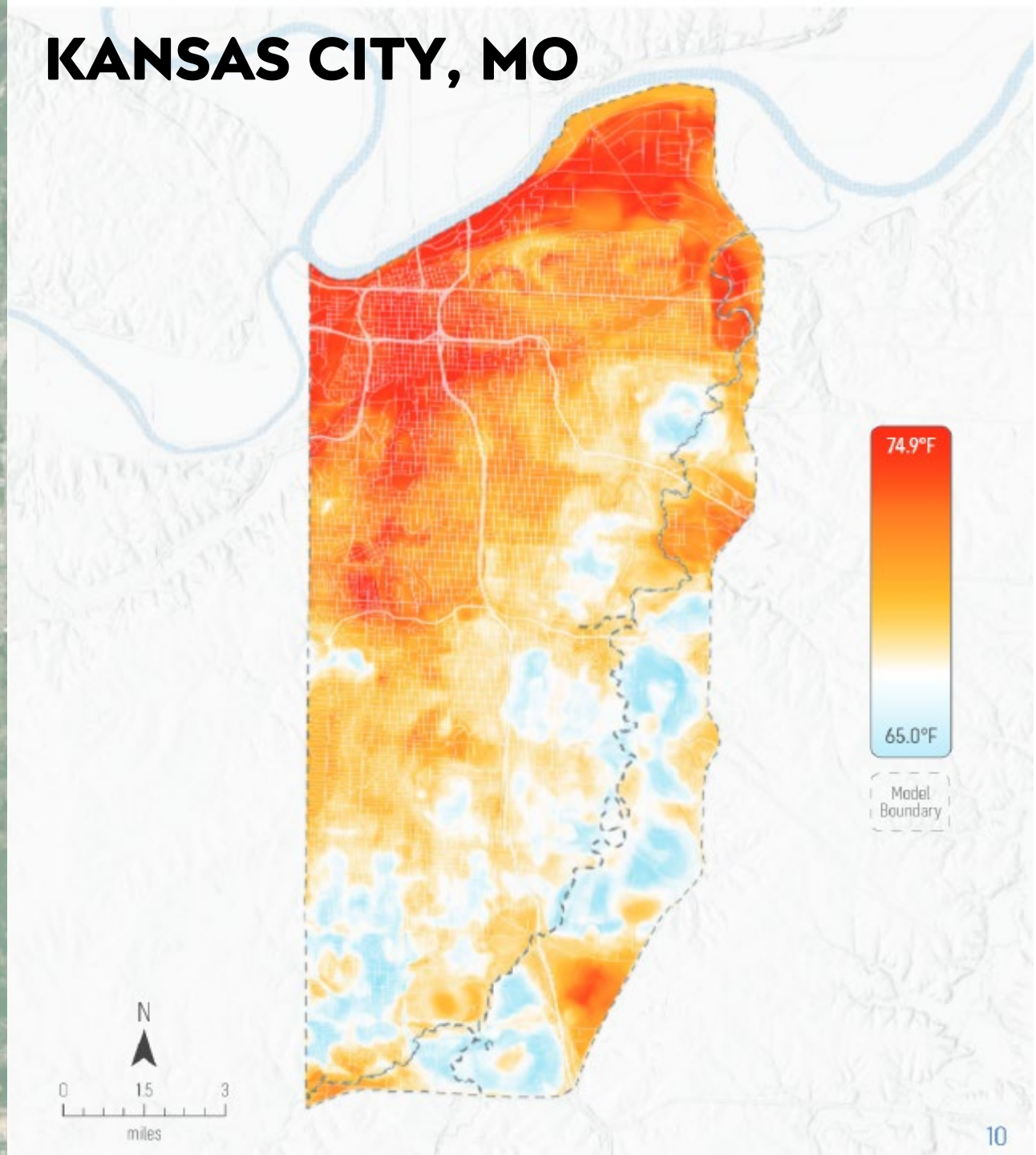
Sensor Base:

Mounted on Passenger-side Window ONLY.





KANSAS CITY, MO



FINAL REPORT

Summary of Data

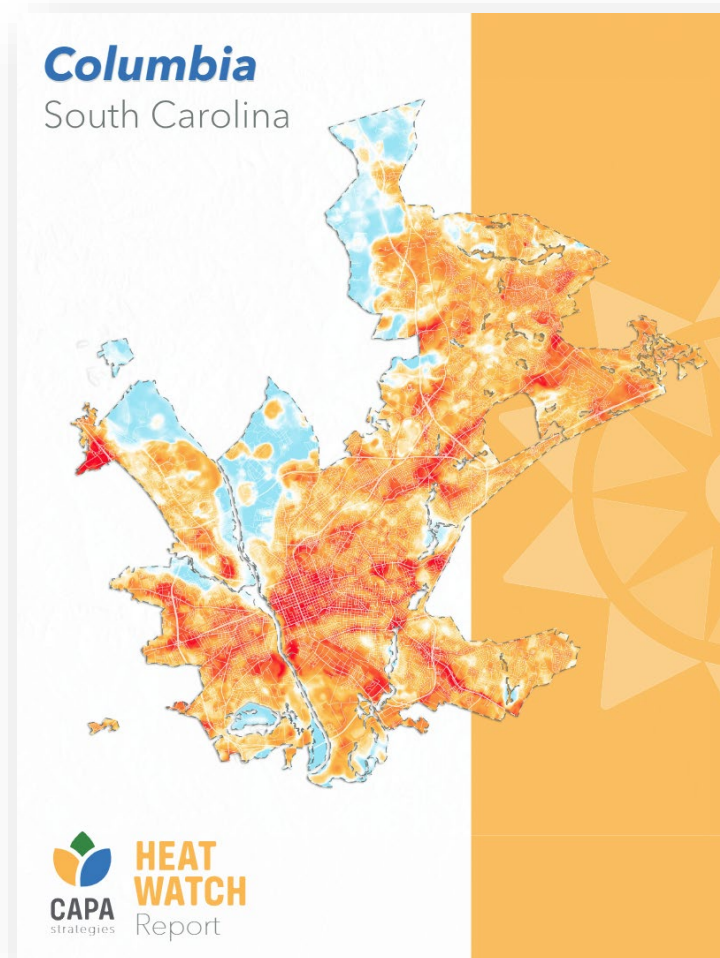
Methodology

Observations

Surveys

Media

Analysis

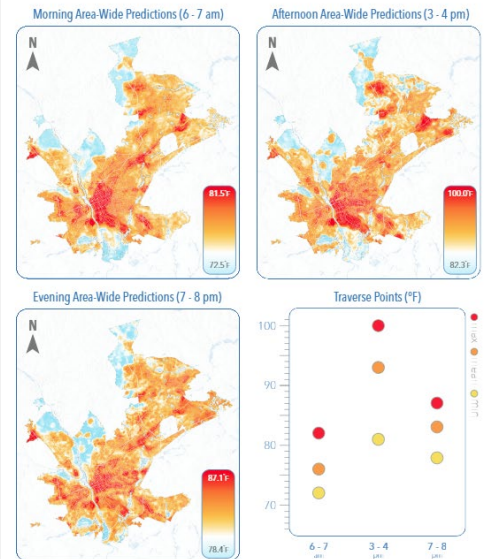


Executive Summary

Major thanks to all of the participants and organizers of the Urban Heat Watch program in Columbia, SC. After months of collaboration and coordination, local organizers and volunteers collected thousands of temperature and humidity data points in the morning and afternoon of August 6th and evening of August 7th, 2022.

According to the National Weather Service station at the Columbia Metropolitan Airport, there was a brief period (5 to 10 minutes) of light-to-heavy rain during the beginning of the afternoon traverse hour. This brief event may coincide with lower temperature measurements in some regions of the study area, though it is difficult to determine these exact locations. While the afternoon modeling results are relatively consistent with the morning and evening models, interpretations from this period should be made in the context of these weather conditions.

Rainshowers on the afternoon of the 6th are likely to have cooled temperatures in northern/ northwest areas. Therefore, there is greater confidence in the high afternoon values than the low afternoon values particularly in those regions. Due to rain on the evening of the 6th, the 7-8 pm mapping was done on Sunday the 7th. While the daytime highs were 93°F and 87°F respectively for the 6th and 7th, the underlying patterns of heating are consistent and can be compared.



Study Date

August 6-7th, 2022

188 mi²
Study Area

37
Volunteers

16
Routes

71,872
Measurements

100.2°
Max Temperature

18.5°
Temperature
Differential



Learn more about the background and goals of each Heat Watch 2022 campaign city at <https://nhihs.cpa-nasa.gov/UrbanHeatWatch/Mapping/Campaign/CampaignCities>

TRAINING REQUIREMENTS



VOLUNTEER
TRAINING

[Link to Video](#)



KNOWLEDGE
CHECK

[Link to
Google Form](#)



LIABILITY
WAIVER

[Link to Liability
Waiver](#)

COMMUNICATION



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

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...

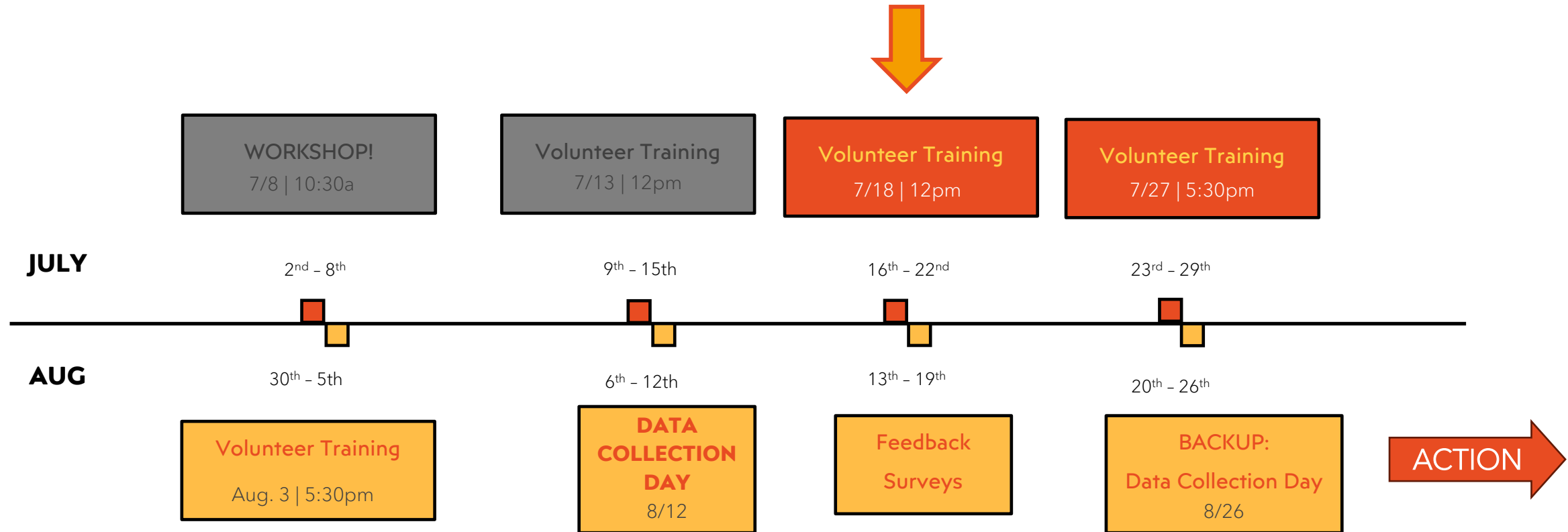


1. Route & Heat Hub Assignment
2. Information Sheets
 - A. Checklist
 - B. Sensor Information
 - C. Accessing Route Directions
 - D. Day-of Reminders



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