



# **SA Climate Ready & Cool Neighborhoods: A Data-Driven Approach to Climate Action & Heat Mitigation**

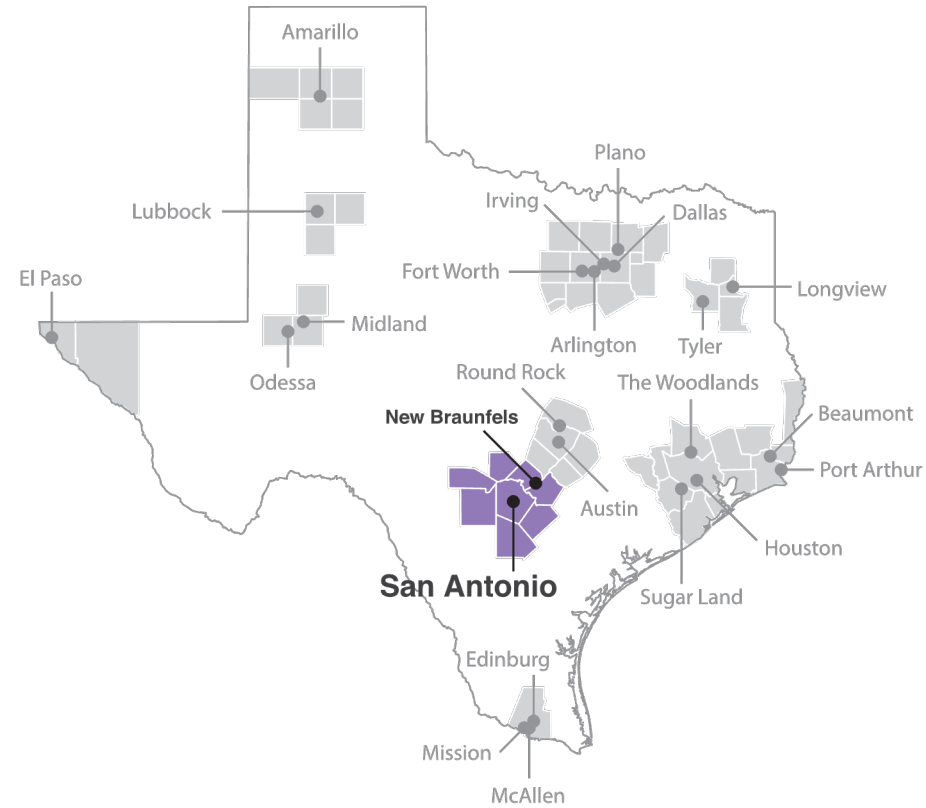


*CRRC Annual Meeting  
June 11, 2025*

*Douglas Melnick, Chief Sustainability Officer*

# San Antonio Background

- 2024 Population - 1.5M
- 7<sup>th</sup> largest city in the country
- Largest minority-majority city in the country
- One of the fastest growing cities in the country
- 17% of population below poverty level (2018-22 ACS)
- Military City USA



**34**  
Median Age

**>64%**  
Population  
Hispanic or Latino

**36%**  
Educational Attainment  
(Associates Degree & Higher)

**19.4%**  
Population Growth  
(2010 - 2020)

**130**  
People  
that move to San Antonio daily

**2,000**  
Veterans  
Transition out of the military here and 25% stay

**160K**  
Students  
Enrolled in 15 area colleges and universities

# SA CLIMATE READY: A PATHWAY FOR CLIMATE ACTION & ADAPTATION



Adopted by City of San Antonio City Council  
October 17, 2019



## SA Climate Ready

- ❑ 2017: City Council set a goal to become carbon neutral by 2050 & to adapt to climate impacts.
- ❑ 2019: City Council approved the Climate Action and Adaptation Plan (CAAP).
- ❑ The CAAP is the City's roadmap to achieve carbon neutrality and to adapt to current and future climate impacts.



CLEAN AIR



PUBLIC HEALTH



WATER QUALITY &  
CONSERVATION



GOOD JOBS



TRANSPORTATION  
CHOICES



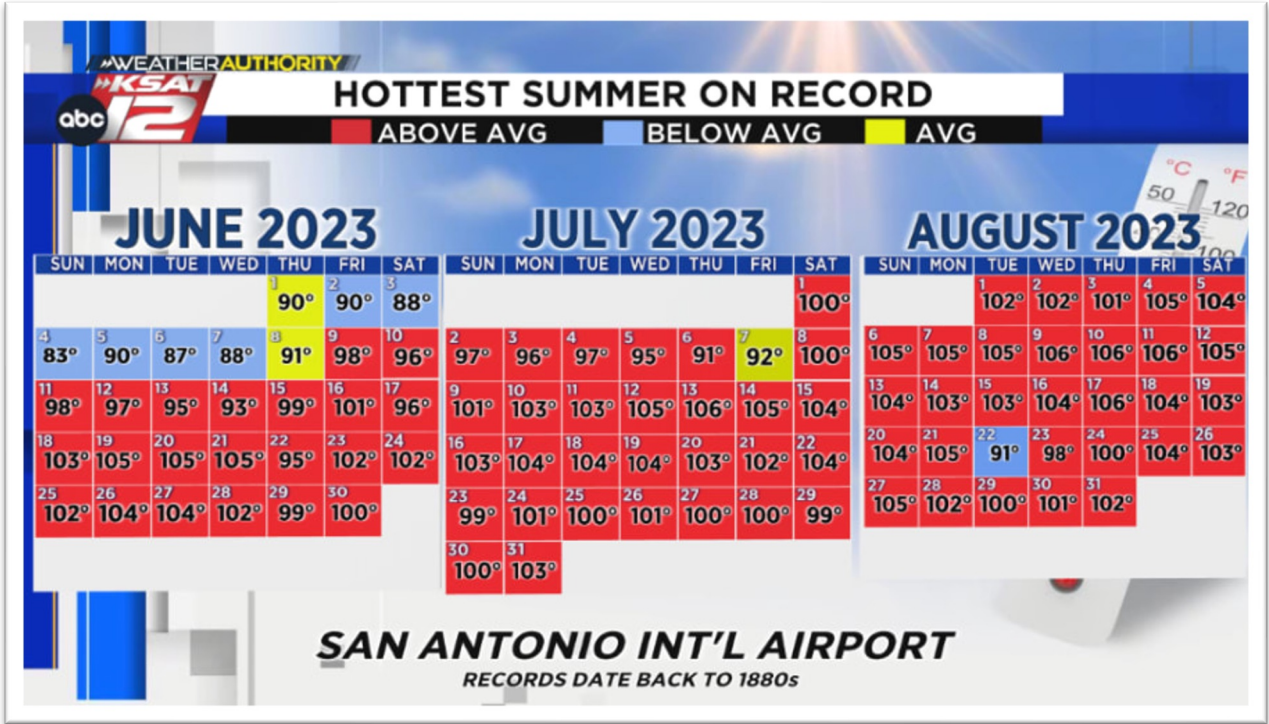
CLEAN & SECURE  
ENERGY



RESILIENCE & EMERGENCY  
PREPAREDNESS



# Record Breaking Heat



Year	Rank	Days >= 100 °F
2023	1	75
2022	3	58
2021	83	3
2020	12	36
2019	42	17
2018	25	27
2017	47	15
2016	75	6
2015	53	12
2014	45	16

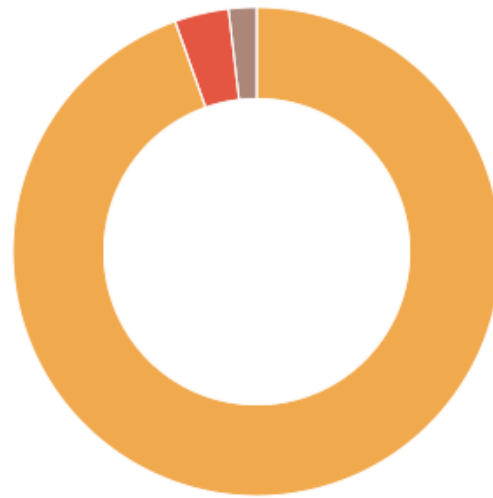
2018 SA Climate Ready Mid-Century (2041-2070) Projections for days over 100 degrees – 61 days

Hottest heat index ever recorded in SA - 117° F on June 4, 2024



*Have you noticed summers in your neighborhood getting hotter?*

# Neighborhood Heat Survey



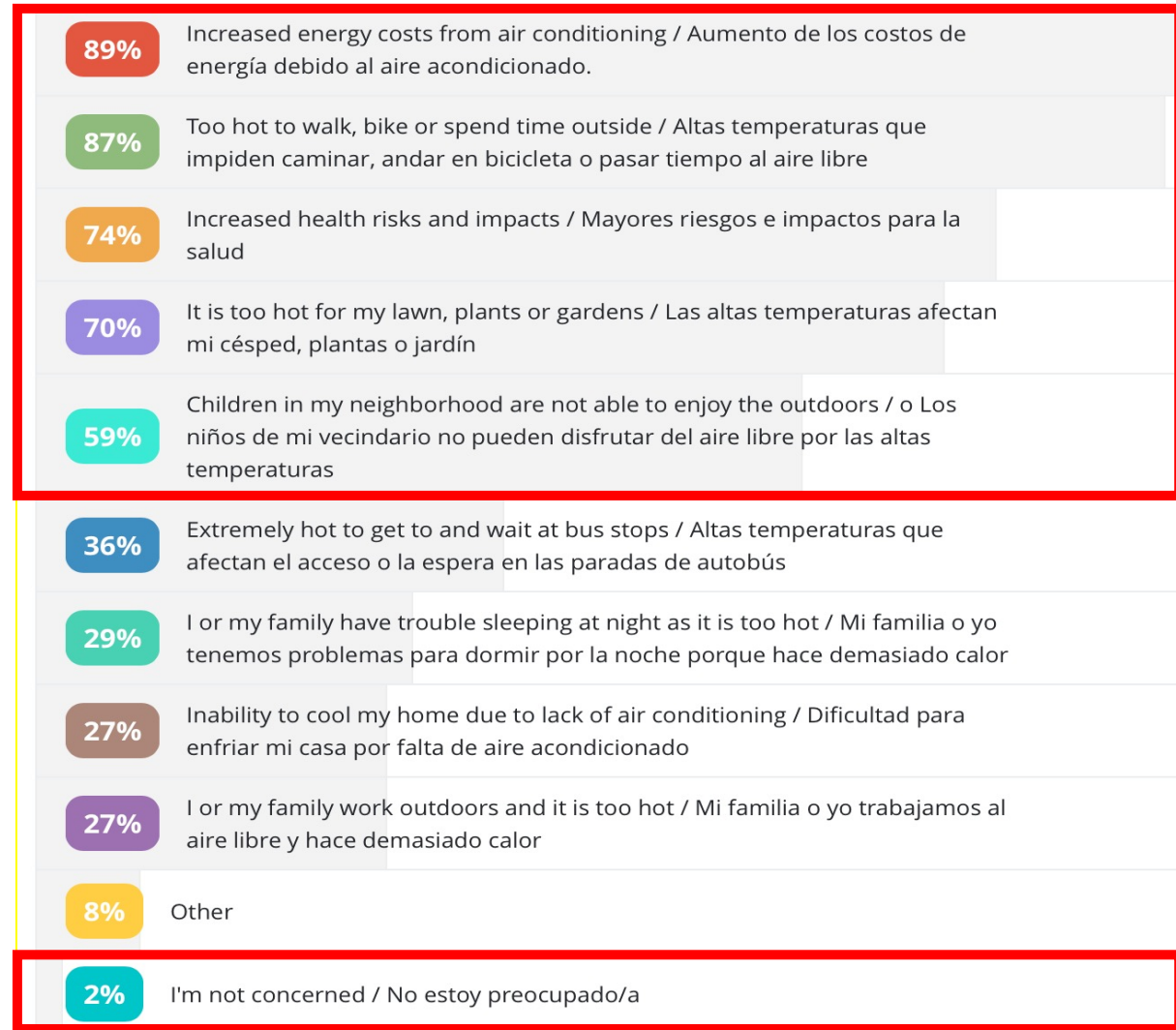
865 respondents

95 Yes / Sí  
4% No / No  
2% I don't know / No lo sé



*What are  
your  
concerns  
about  
extreme  
heat?*

# Neighborhood Heat Survey



# Neighborhood Heat Survey

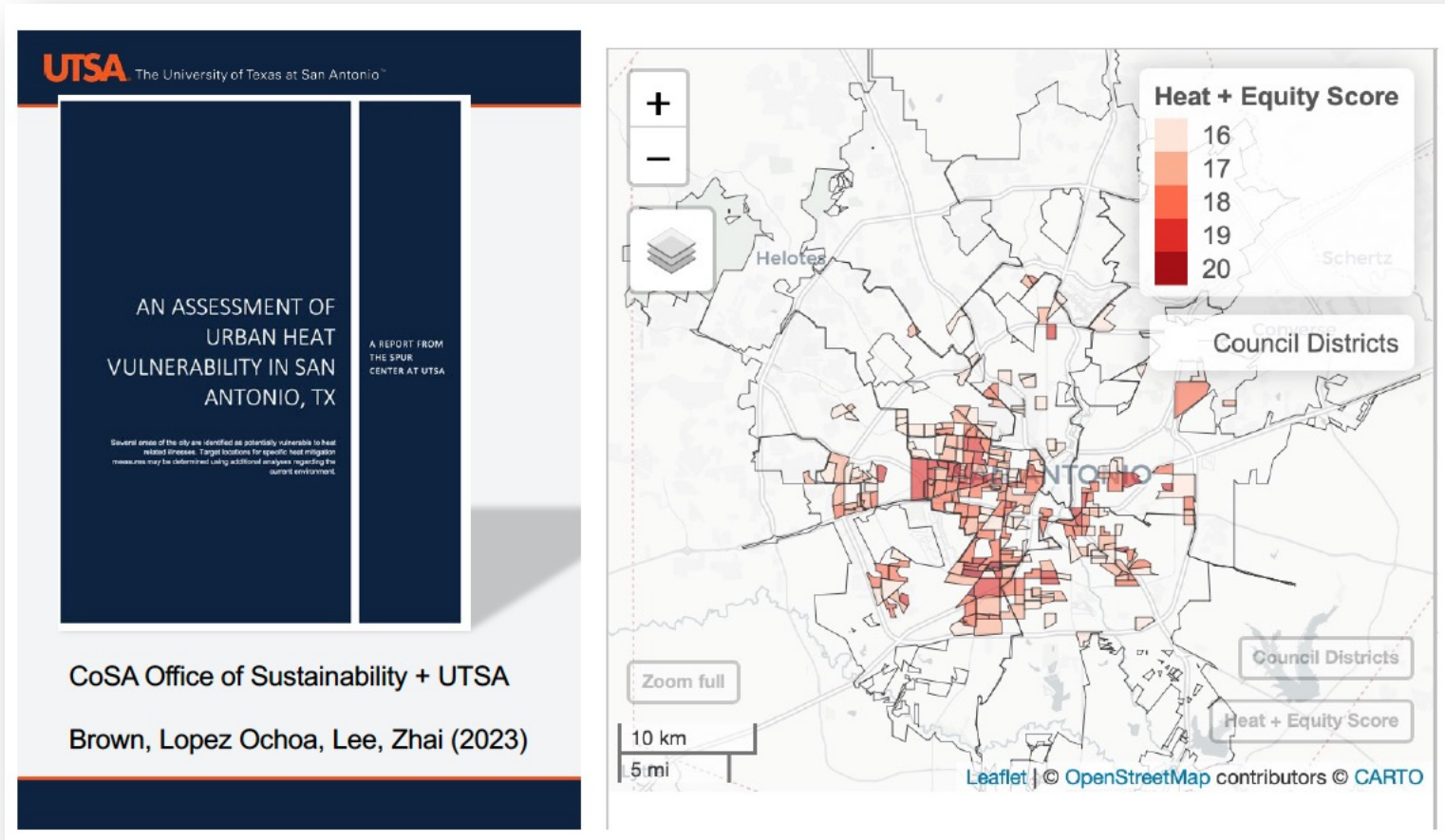
*Would you be interested in financial incentives for the following?*

78%	Trees and vegetation / Arboles y vegetacion	511 ✓
75%	Weatherization assistance to improve the energy efficiency of your home. / Asistencia de climatización para mejorar la eficiencia energética de su hogar.	491 ✓
73%	Reflective roofs that can help reduce the amount of heat being absorbed by your home / Techos reflectantes que pueden ayudar a reducir la cantidad de calor que absorbe su hogar	480 ✓
69%	Shade structures / Estructuras de sombra	454 ✓
57%	Air conditioning and fans / Aires acondicionados y ventiladores	374 ✓
8%	Other/Otro	51 ✓

656 Respondents



# Heat Mapping

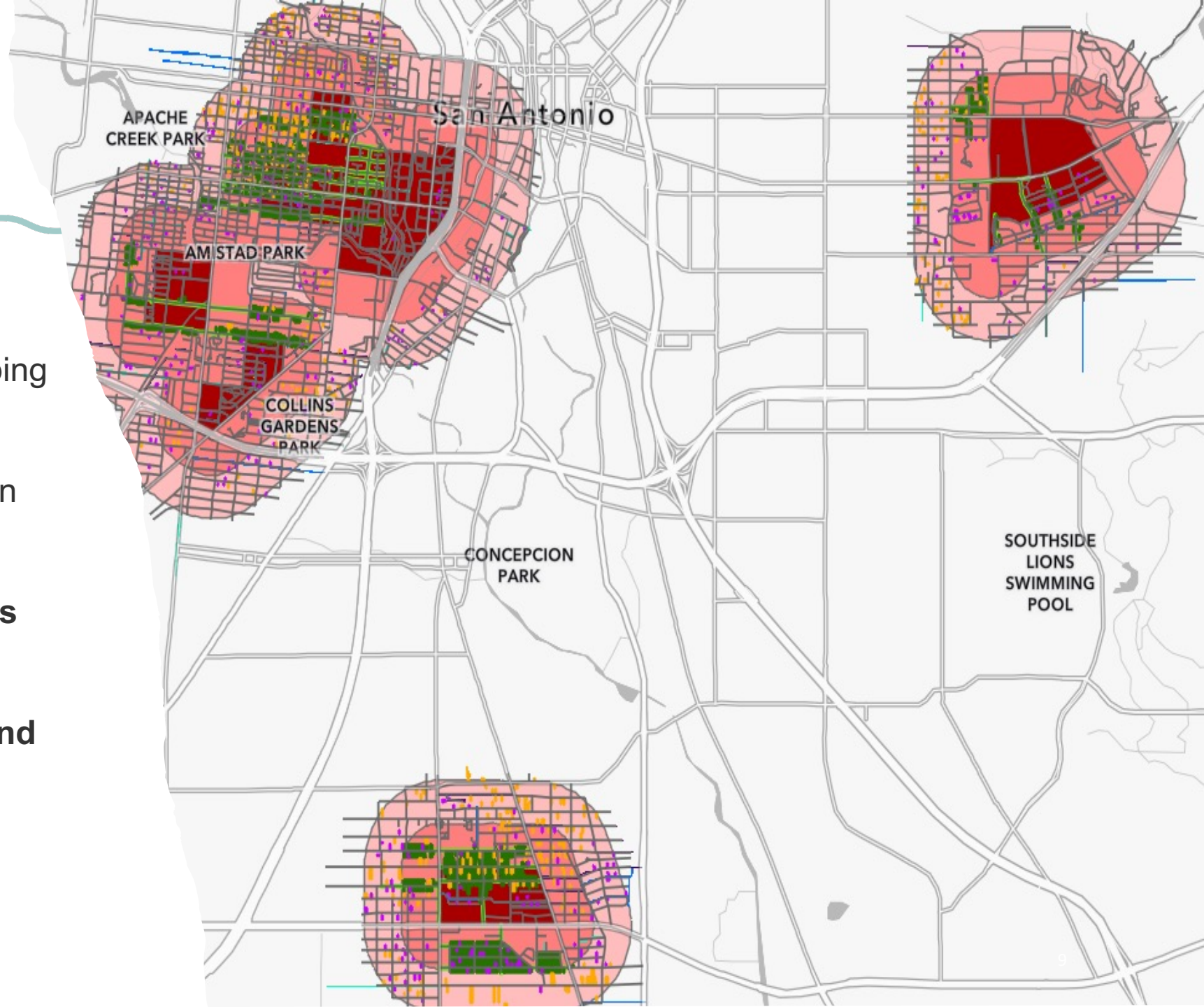


The City partnered with the University of Texas at San Antonio's Sustainable Pervasive Urban Resilience Center (SPUR) to help direct resources toward the areas most impacted by extreme heat. UTSA faculty used the program operated by the USGS and NASA to measure relative heat, then combined this data with other factors, such as income and race, to determine urban heat vulnerability across the city.

# Cool Neighborhoods Program

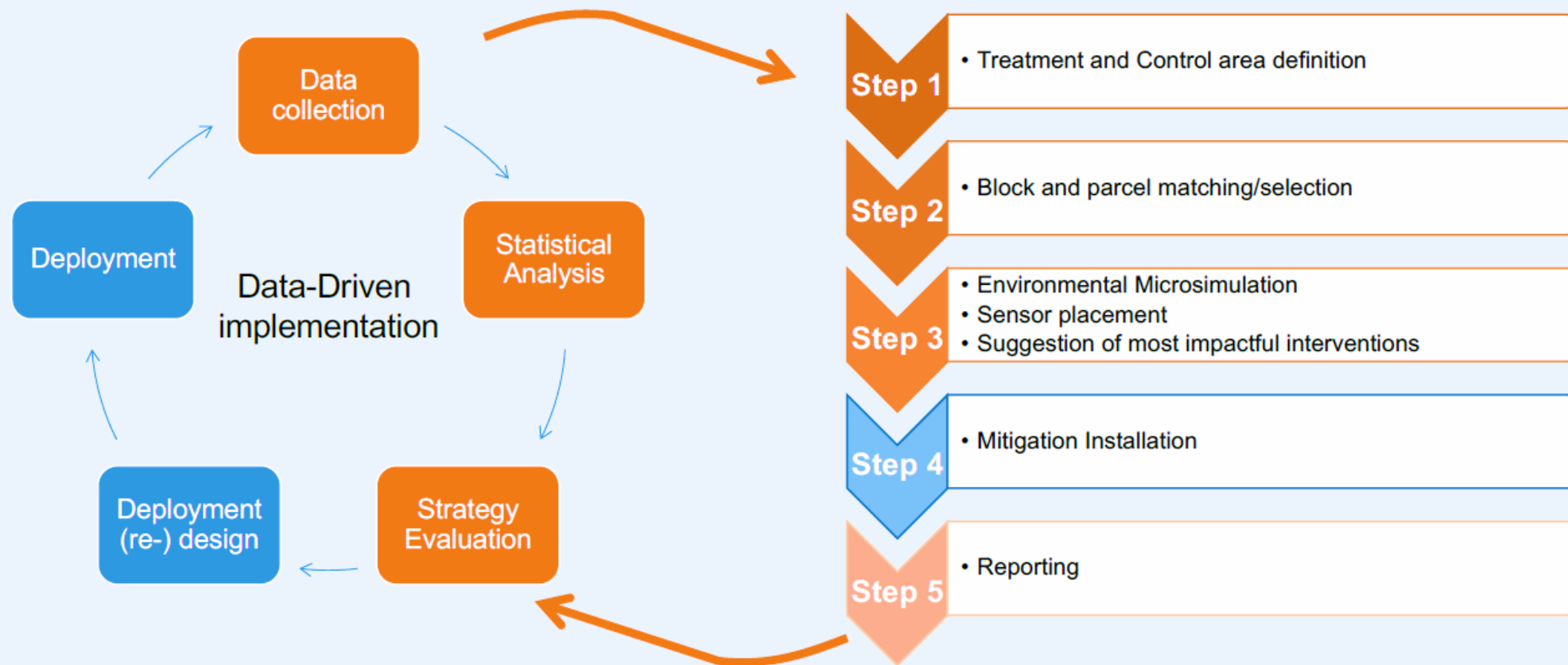
- 4 neighborhoods
- Identified through UTSA Heat Mapping and Heat Vulnerability Assessment.
- Targeted deployment of City and partner agency heat-related mitigation initiatives to:

- maximize community benefits
- leverage resources
- create efficiency
- promote interdepartmental and interagency coordination
- evaluate effectiveness of solutions through UTSA monitoring technology and methodology.



# Cool Neighborhoods Methodology

## Experimental design approach





# Cool Pavement Program

**UTSA** The University of Texas at San Antonio

## Cool Pavement Program

In 2021, San Antonio became the first City in Texas to use Cool Pavement, a water-based asphalt treatment that reflects more sunlight and absorbs less heat. The City expanded its initiative in 2023, applying [Cool Pavement](#) products to sections of roadway in all 10 Council Districts and partnering with UTSA to study the locations for their potential to cool the city down. Explore the interactive map to see all project sites.



### EVALUATION OF COOL PAVEMENT SURFACE TREATMENTS USING FRICTION, TEXTURE AND ADHESION PROPERTIES



**THE TRANSTEC GROUP**  
The World's Pavement Engineering Specialists  
6118 Balcones Drive Austin, Texas 78731 USA  
+1 (512) 433-8233 www.TheTranstecGroup.com

PREPARED FOR:  
City of San Antonio

REPORT DATE  
February 12, 2024

### Evaluating the Urban Heat Mitigation Potential of the San Antonio Cool Pavement Pilot Program

Neil Debbage, Wei Zhai, Esteban López Ochoa, Ryan Jung Lee, Allison Pineda, Emma Jones, Tabytha Clearwater, Sam Rueda, Tyler Pursch, Jasmine Renteria, and Matt Kenney  
Final Report - Submitted to the City of San Antonio Office of Sustainability  
February 8, 2024

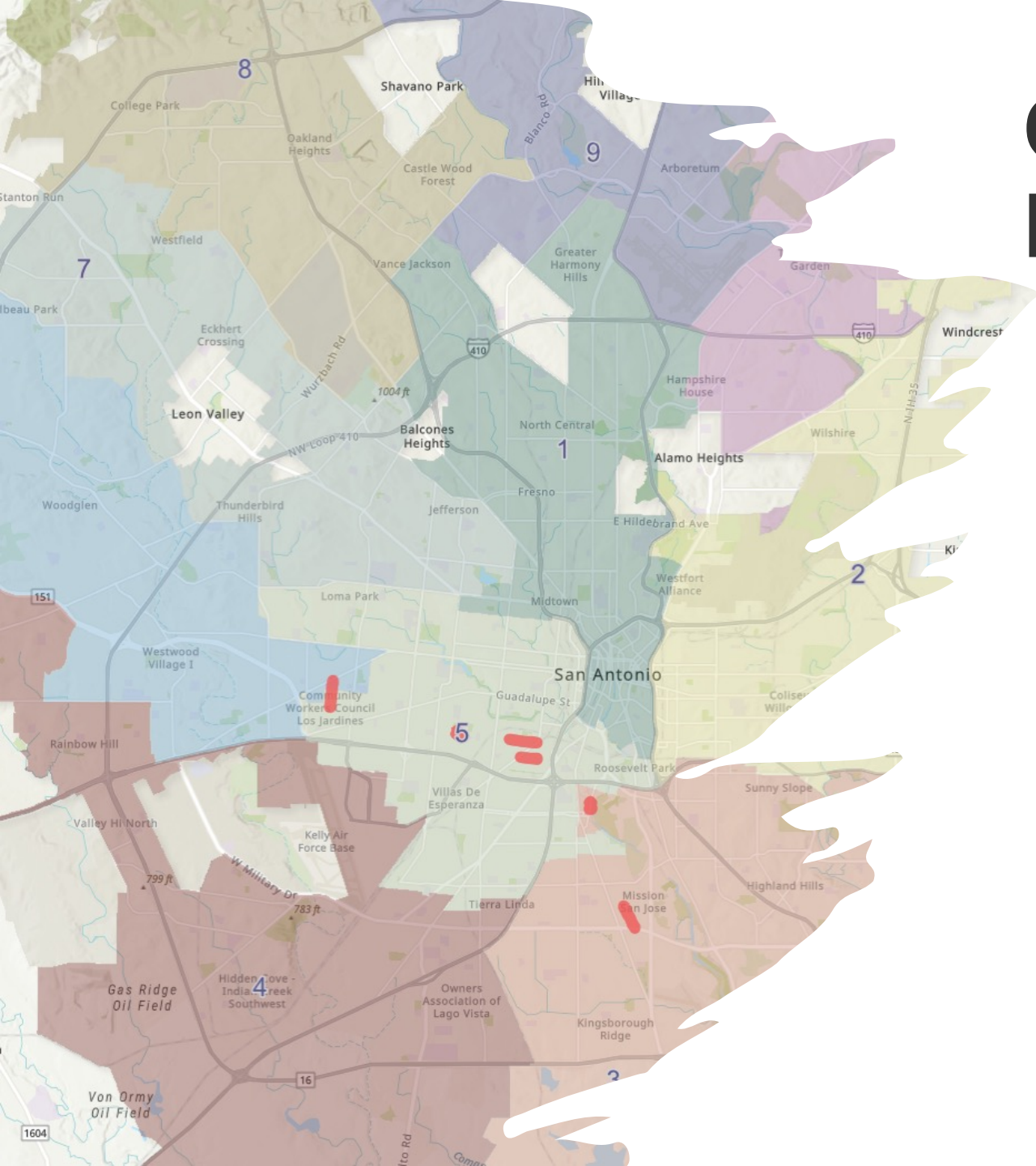
#### EXECUTIVE SUMMARY

Extreme heat is one of the most pressing climate hazards that urban areas face. Elevated temperatures threaten public health, the environment, and urban infrastructure. One mitigation strategy that has gained increasing popularity across cities is the usage of cool pavement. The City of San Antonio, Texas, as part of its broader climate action and adaptation plan, conducted a cool pavement pilot program in 2023 in collaboration with the University of Texas at San Antonio.



Drone photo looking southeast with downtown San Antonio in the background and the Grant Avenue cool pavement installation in the foreground (Image Credit: AccuWeather)

Evaluate how the various cool pavement products were influencing surface temperature, air temperature and the wet bulb globe temperature relative to a representative non-treated street & evaluate friction, texture and adhesion properties.



# Cool Pavement Pilot: Round One (2023)

## Materials Tested

- Pave Tech - PlusTi
- GAF Streetbond - Durashield
- SealMaster – SolarPave
- GuardTop\* - Iron

Miles Installed: 2.7

*\* Temperatures not tested due to installation issues.*

# Cool Pavement Pilot: Round One 2023 Research Results



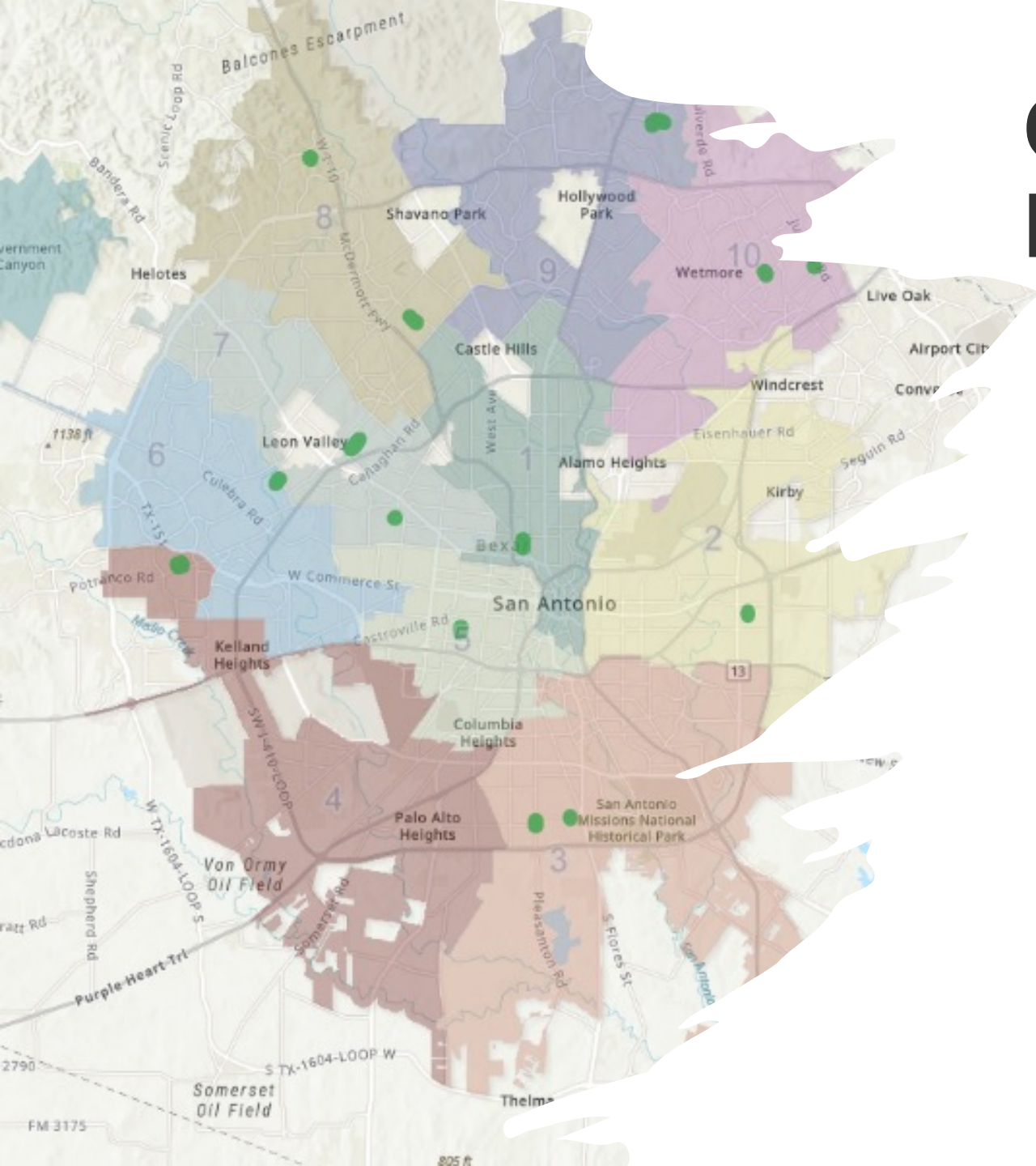
## Temperature Findings

- 6 test sites citywide
- 3 products evaluated
- Surface temperature reductions averaged approximately 3.58°F .
- The findings raised additional questions for additional investigation.
  - What is the most appropriate control surface against which cool pavement performance should be evaluated?
  - How does the GuardTop product compare to the materials evaluated in this study?
  - Does tree canopy at each test site impact results?

## Performance Findings

- 7 test sites evaluated
- 4 products evaluated
- From the pavement preservation prospective, treatment with GAF seemed to provide the most desirable surface characteristics with improved skid resistance and friction over control sites.
- Seal Master and GuardTop occasionally dropped the surface properties below recommended thresholds in the wheelpath areas. It is expected for these properties to recover over a period of time with oxidation of applied treatment.





# Cool Pavement Pilot: Round Two (2024)

## Materials Tested

- GAF Streetbond - Durashield
- SealMaster – SolarPave
- GuardTop\* - Iron

Miles Installed: 2.2

*\* Temperatures not tested due to installation issues.*

# Cool Pavement Pilot: Round Two 2024 Research Results



## Temperature Findings

- 5 test sites citywide
- 3 products evaluated
- Surface temperature reductions averaged approximately 6°F - 12°F in 2024.
- This large difference in surface temperature reductions between 2023 and 2024, resulted from control streets receiving fresh applications of asphalt slurry.
- Overall, the results from 2024 were in general agreement with the 2023 report and studies conducted in Phoenix and Los Angeles, which also documented the clear potential for cool pavement to reduce surface temperature while simultaneously highlighting its more modest impact on air temperature.

## Performance Findings

- 5 test sites evaluated
- 3 products evaluated
- From the pavement preservation prospective, treatment with GAF seemed to provide the most desirable surface characteristics with improved skid resistance and friction over control sites. \*
- Seal Master and GuardTop occasionally dropped the surface properties below recommended thresholds in the wheelpath areas. It is expected for these properties to recover over a period of time with oxidation of applied treatment.\*



# Cool Pavement Pilot: Round Three (2025)

## Materials Tested\*

- GAF Streetbond - Durashield
- SealMaster – SolarPave
- GuardTop - Iron

Miles Installed: 22.35

*\* Current RFP is in progress to determine final products.*



# CITY OF SAN ANTONIO UNDER 1 ROOF PROGRAM



NEIGHBORHOOD &  
HOUSING SERVICES

## PROGRAM PURPOSE



Improve energy  
efficiency and  
reduce utility bills



Maintain house integrity  
by addressing roofing  
needs

## PROGRAM INCEPTION

FY 2016

## ENERGY-EFFICIENT MATERIALS



Solarhide radiant  
barrier roofing  
underlayment



Owens Corning 3-  
tab shingle in Shasta  
White

Total Investment

\$26M+

## POST-INSTALLATION RESULTS

From 2018 study conducted by UTSA

Average Electricity Use  
Intensity dropped

**7.3%**

Average attic temperature  
dropped

**10.1°F**

ROOFS REPLACED

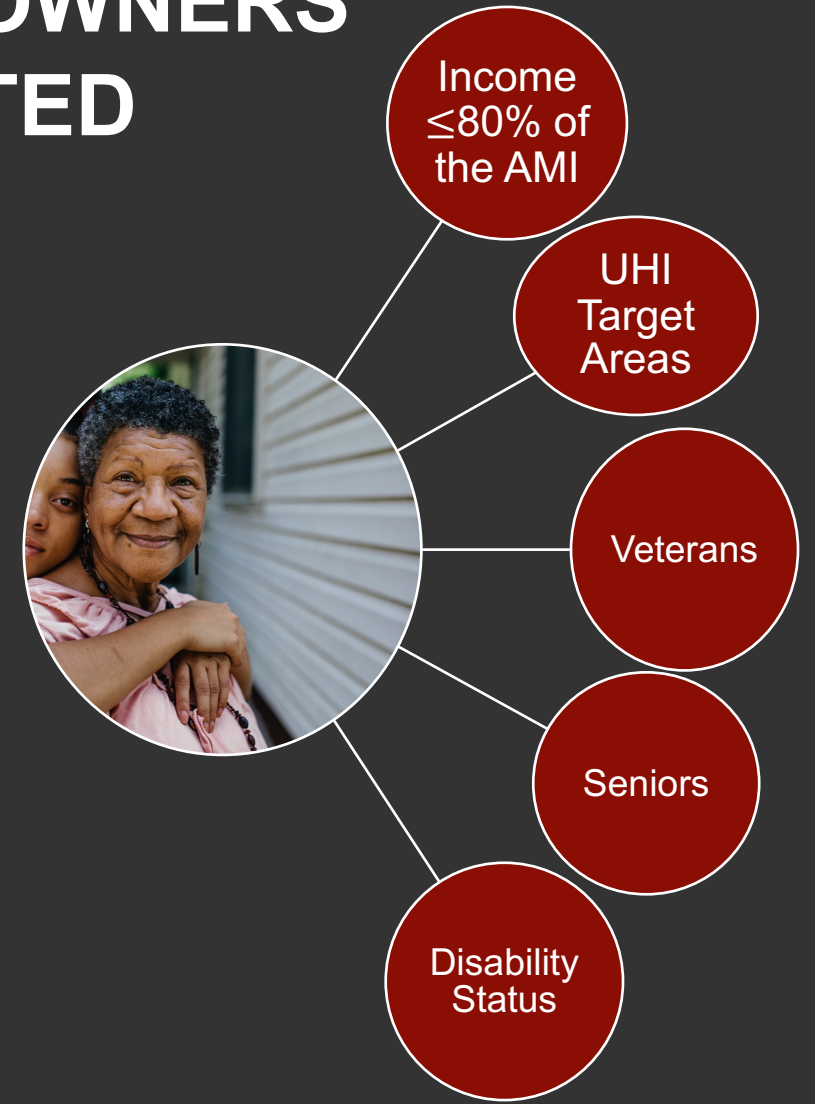
2000+

# BEST PRACTICES

- Refer homes in need of structural repairs beyond roof replacement to appropriate programs
- File five-year restrictive covenant to ensure affordability and prevent homeowner displacement



# HOMEOWNERS ASSISTED



# Under One Roof: Performance Results (2018)



2018



## Under 1 Roof: Performance Assessment of High-Solar Reflectance Roofs in San Antonio

**PREPARED BY:**  
The University of Texas at San Antonio's Center for Cultural Sustainability  
College of Architecture, Construction and Planning

**PRINCIPAL INVESTIGATOR:**  
Dr. Hazem Rashed-Ali

**Co-Principal Investigators:**  
Professor William Dupont | Dr. Jae Suk | Mohamed Abo Issa

**PROJECT SPONSOR:**  
The City of San Antonio



501 César E. Chávez Blvd. San Antonio, TX 78207 | 210-458-3178 | [ccs@utsa.edu](mailto:ccs@utsa.edu)

1

## Study Goals

- Monitor home attic temperatures pre- and post-installation of the cool roof to determine the impact of the roof on average attic temperatures.
- Collect and analyze home electricity use information to assess the impact of the cool roof installation on electricity use.
- Conduct a home-owner survey to identify any external factors that may have affected electricity use.

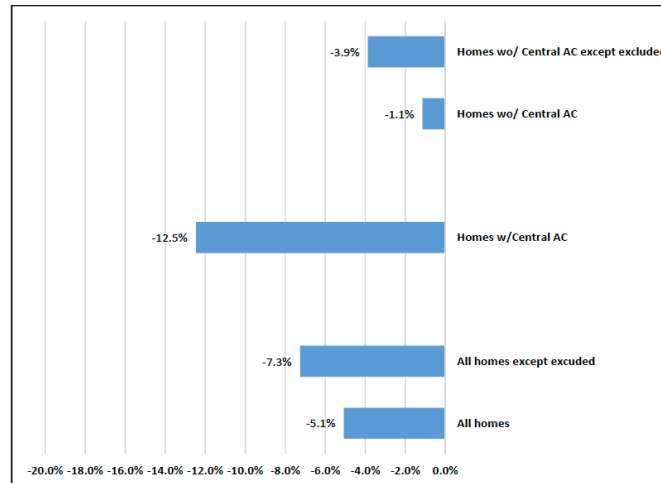


Fig. 12: Percentage of Reduction in EUI for Phase I Homes

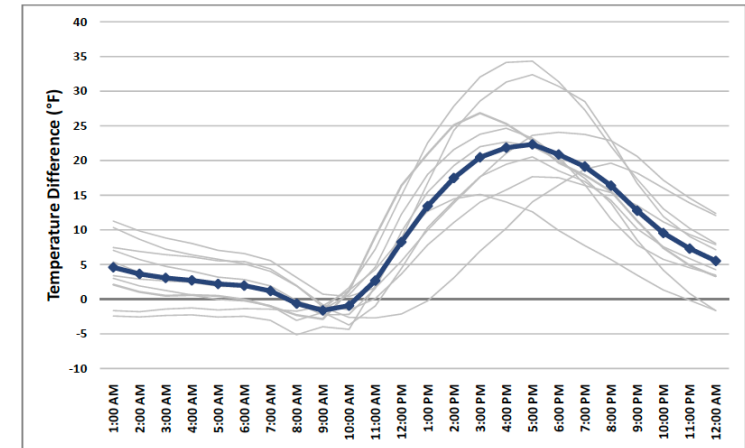


Fig 3. Average Summer Temperature Difference between Attic & Outdoor – Pre-Installation

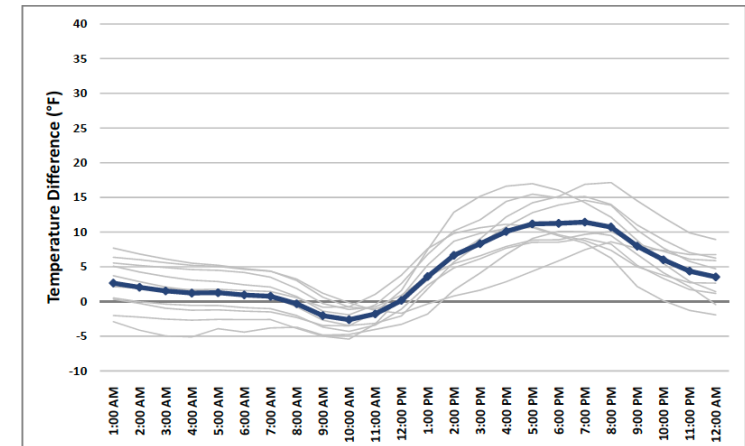
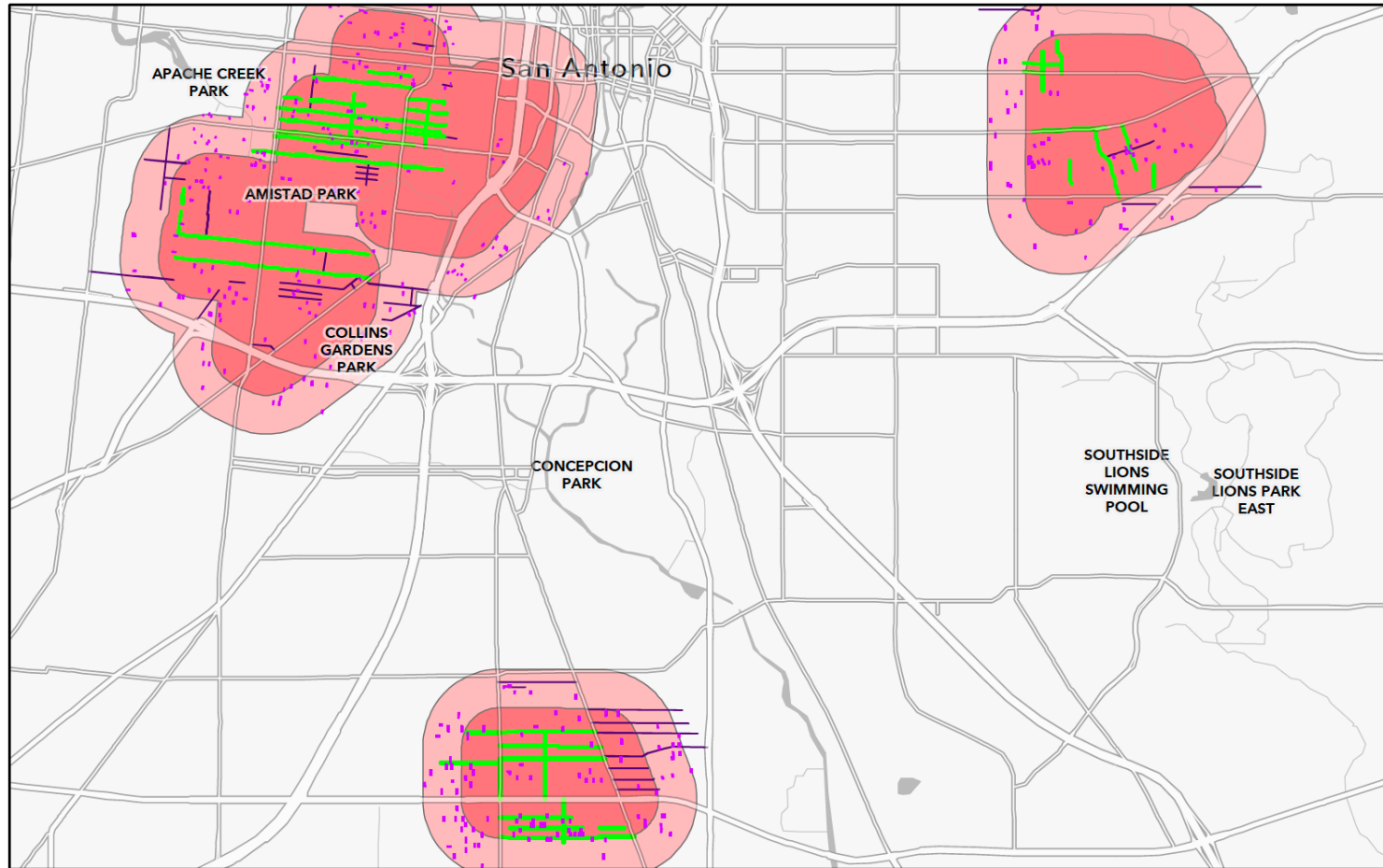
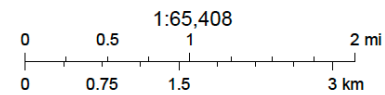


Fig 4. Average Summer Temperature Difference between Attic & Outdoor – Post-Installation



6/4/2025

■ coolroofs   
 ■ cool\_pavement   
 ■ control\_area  
— treestree   
■ treated\_area



Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community. Sources: Esri, TomTom, Garmin,

## Cool Neighborhoods Next Steps



Douglas Melnick, *Chief Sustainability Officer*

[douglas.melnick@sanantonio.gov](mailto:douglas.melnick@sanantonio.gov)

100 W. Houston Street, 7<sup>th</sup> Floor | San Antonio, TX 78205

O: 210.207.1721

**THANK YOU!**



# SA – Climate Ready: Climate Action and Adaptation Plan (CAAP)

Mitigation and adaptation actions identified in the CAAP include:

## MITIGATION



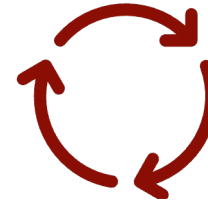
Increase carbon-free energy



Reduce building energy consumption



Reduce transportation energy consumption



Advance the circular economy



Promote biodiversity and healthy ecosystems



Educate and empower

## ADAPTATION



Increase infrastructure resilience



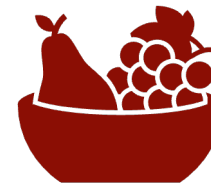
Strengthen public health systems



Enhance emergency management and community preparedness



Promote, restore, and protect green infrastructure and ecosystems



Protect local food security



Increase resilience awareness and outreach



Ensure equity in adaptation