

Moving Toward A Climate Ready San Antonio

Through Data and Equity

Anita Ledbetter
Executive Director, Build San Antonio Green





Our Mission

To protect and enhance the quality of life of the citizens of the metropolitan San Antonio area by developing standards by which to certify newly constructed and existing structures to green standards, and to provide leadership, expertise, and education for the wise, efficient, and sustainable use of energy and resources.

Green Building



Solar & EV



Community Engagement



Background

What is a Build San Antonio Green Home?

Energy Efficiency

These homes have been tested & verified for increased efficiency. This includes insulation, windows, & doors, HVAC, lighting, and appliances. Our homes are at least 15% more efficient than the average San Antonio home and are HERS rated and ENERGY STAR qualified.

Water Efficiency

Features like low-flow showerheads & dual-flush toilets save water while still performing at a high level. Xeriscaping and native plants are used to maintain an attractive landscape while minimizing water use.

Health

We spend up to 90% of our time indoors, so it is important to maintain optimal air quality. Paint and adhesives with low VOC (volatile organic compound), as well as approved carpets and padding minimize harmful off-gassing. High efficiency AC filters promote clean indoor air.

Materials

Materials used contain high recycled content & are from local sources whenever possible, minimizing the embodied energy. Materials are more durable & efficient than traditional materials, resulting in lower operation & maintenance costs.

Site

During Construction, trees must be protected & the site is minimally disrupted. Any removed vegetation must be mulched & reused on site. A construction waste plan minimizes the amount of material sent to the landfill. BSAG homes also require a limited amount of impervious cover.

bsa

- Founded by the City of San Antonio, Bexar County, & CPS Energy
- An Official Partner of the City of San Antonio
- The City's Affordable Green Building Program
- Designed Specifically for San Antonio
- Provide Unbiased Technical Expertise based in Building Science
- Focused on Adaptation, Resiliency, and Equity for San Antonio

BUILD SAN ANTONIO GREEN
HAS WORKED TO CERTIFY
42 MILLION
SQ FT OF GREEN BUILDINGS



SAVING
OUR CITY

29
MW



PEAK DEMAND
REDUCTION

PROTECTING
OUR AIR
FROM OVER

430

MILLION
LBS OF CO2



20,042

PROJECTS
CERTIFIED

20,026

SINGLE
FAMILY
HOMES

16

MULTIFAMILY
MIXED-USE
& COMMERCIAL

WHICH IS EQUIVALENT
TO REMOVING NEARLY

36,035
CARS



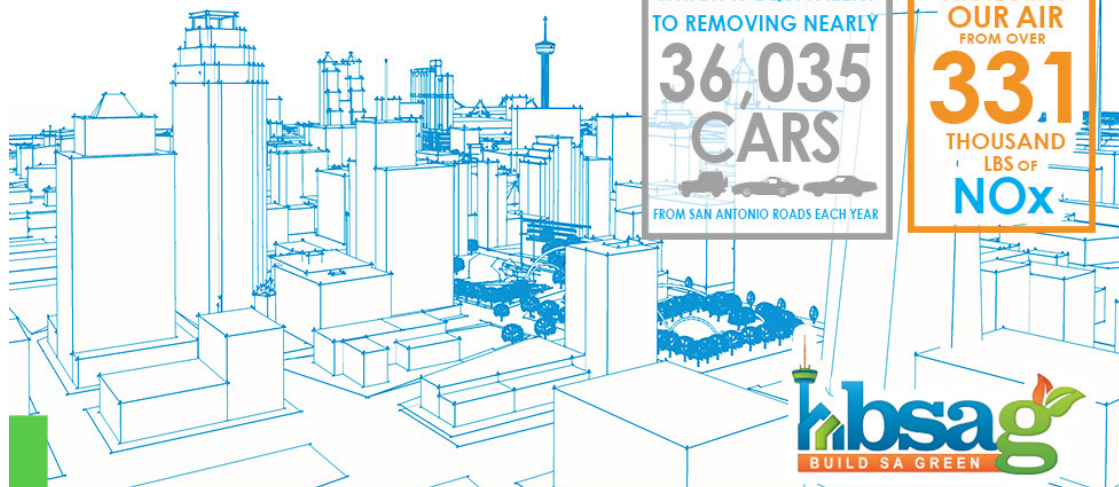
FROM SAN ANTONIO ROADS EACH YEAR

PROTECTING
OUR AIR
FROM OVER

33.1

THOUSAND
LBS OF

NOx



www.buildsagreen.org

We Love You San Antonio!

Understanding San Antonio

- Founded in 1718 (Over 300 Years Old!)
- 7th Largest City in the US
- Population of 1.47 million
- Almost 1 million more people by 2050
- 65.7% Latino or Hispanic
- 17.6% below the national poverty line
- Number 6 in Solar in the US!





- San Antonio's Climate Action & Adaptation Plan.
- Goal is to be Carbon Neutral by 2050.
- Mitigation & Adaptation in an Equity framework.
- Adopted by City Council October 2019

www.SAClimateReady.org

Mitigate Emissions & Focus on Adaptation

MITIGATION

Reducing or preventing emissions from greenhouse gases

EXAMPLE:

Increasing renewable energy

Reducing energy use in buildings

Increasing cleaner and more efficient vehicle use

ADAPTATION

Actions that help to reduce the negative effects of climate change

EXAMPLE:

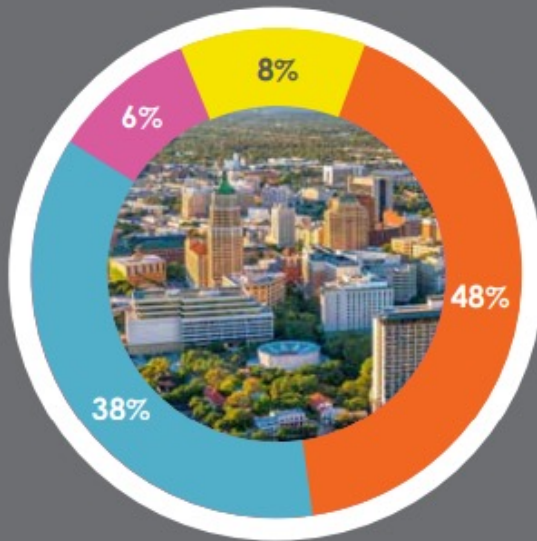
Flood-proof roadways & critical infrastructure

Develop a community wildfire protection plan

Increase tree canopy

Emissions are Not Enough

2016 SAN ANTONIO COMMUNITY GHG EMISSIONS



17.4 MtCO₂e total

48% STATIONARY, ENERGY USE IN BUILDINGS

- 27% Commercial and industrial buildings
- 18% Residential buildings
- 2% Industrial buildings
- 1% Energy industries within the city
- 0.2% Fugitive emissions from oil and natural gas system

38% TRANSPORTATION

- 34% Private transportation, i.e., heavy trucks, light trucks, and passenger cars
- 3% Off-road transportation
- 0.4% Public transit
- <0.1% Waterborne navigation

8% INDUSTRIAL PROCESS AND PRODUCT USE (IPPU)

- 8% Industrial processes occurring within the city

6% WASTE

- 2% Solid waste generated in the city
- 2% Closed landfills within the city
- 2% Active landfills within the city
- 0.1% Wastewater generated and treated within the city

The Changing San Antonio Climate

More days of Extreme heat.

- In the coming years San Antonio will be subject to more days of 100+ degree high temps and higher low temps. This will stress our infrastructure and the materials that make up the home, as well as, raise the energy consumption needs of buildings to maintain comfort and health inside the building.

More Severe Weather

- As the global temperatures rise there will be a corresponding increase in severe storms that produce damaging winds, flooding, and more lightning. This will also be a stress to the rooves, windows and exterior cladding of San Antonio homes.

Greater periods of Drought and Floods

- Based on climate models, San Antonio will have greater and more severe droughts as well as greater risks for severe flooding. These events will stress building foundations and the site around houses

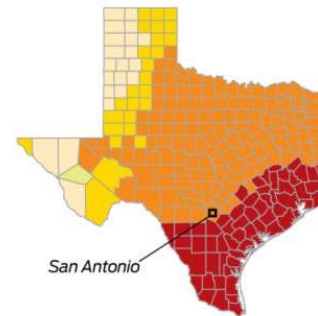
days annually with a heat index above 100 degrees.

AVERAGE DAYS PER YEAR WITH HEAT INDEX ABOVE 100 DEGREES



WITH NO ACTION ON CLIMATE CHANGE

Mid-century, 2036-2065



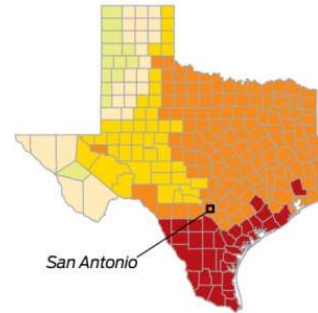
Late-century, 2070-2099



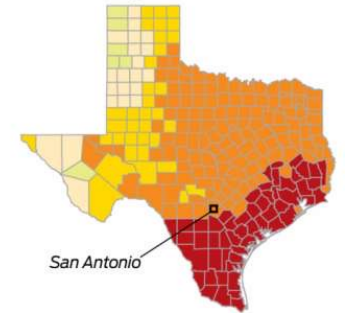
WITH SLOW ACTION

In this scenario, heat-trapping emissions continue to increase before starting to decline at midcentury. Global average temperatures warm by 4.3°F by 2100.

Mid-century, 2036-2065

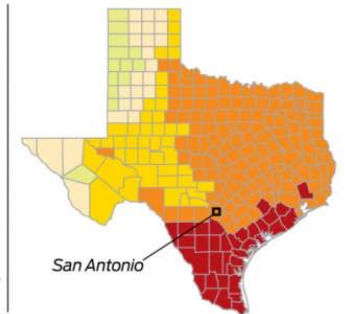


Late-century, 2070-2099



WITH RAPID ACTION

This scenario envisions actions to dramatically reduce heat-trapping emissions and limit future global average warming to 3.6°F above pre-industrial temperatures, the primary goal outlined in the 2015 Paris climate agreement.



Using Data as a Tool

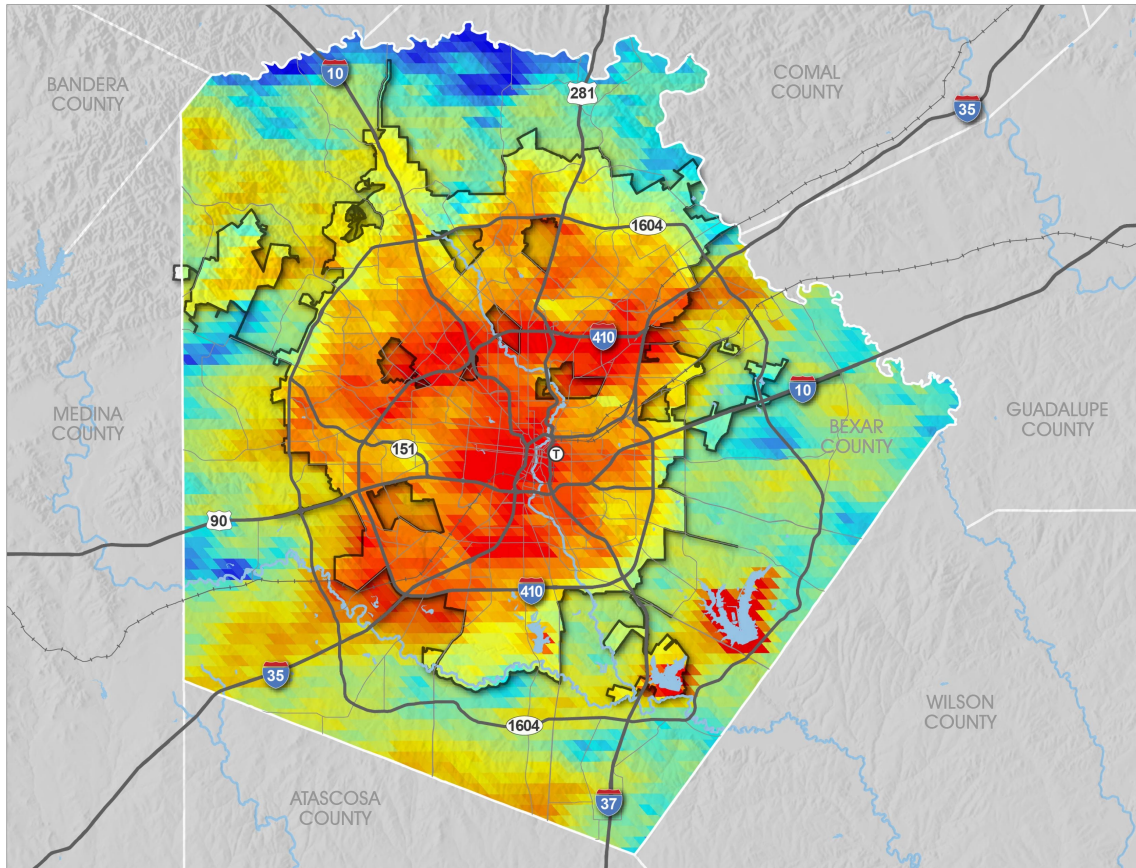


- Discover Vulnerabilities
- Understand Historic Inequities
- Predict Future Impacts

Urban Heat Island



Source: NASA MODIS 11A2 LST Night 1km



Legend

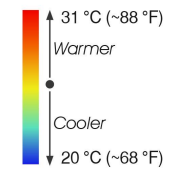
City of San Antonio

City Limits

Transportation

Major Highways

Land Surface Temperature (LST),
Night of August 18, 2014



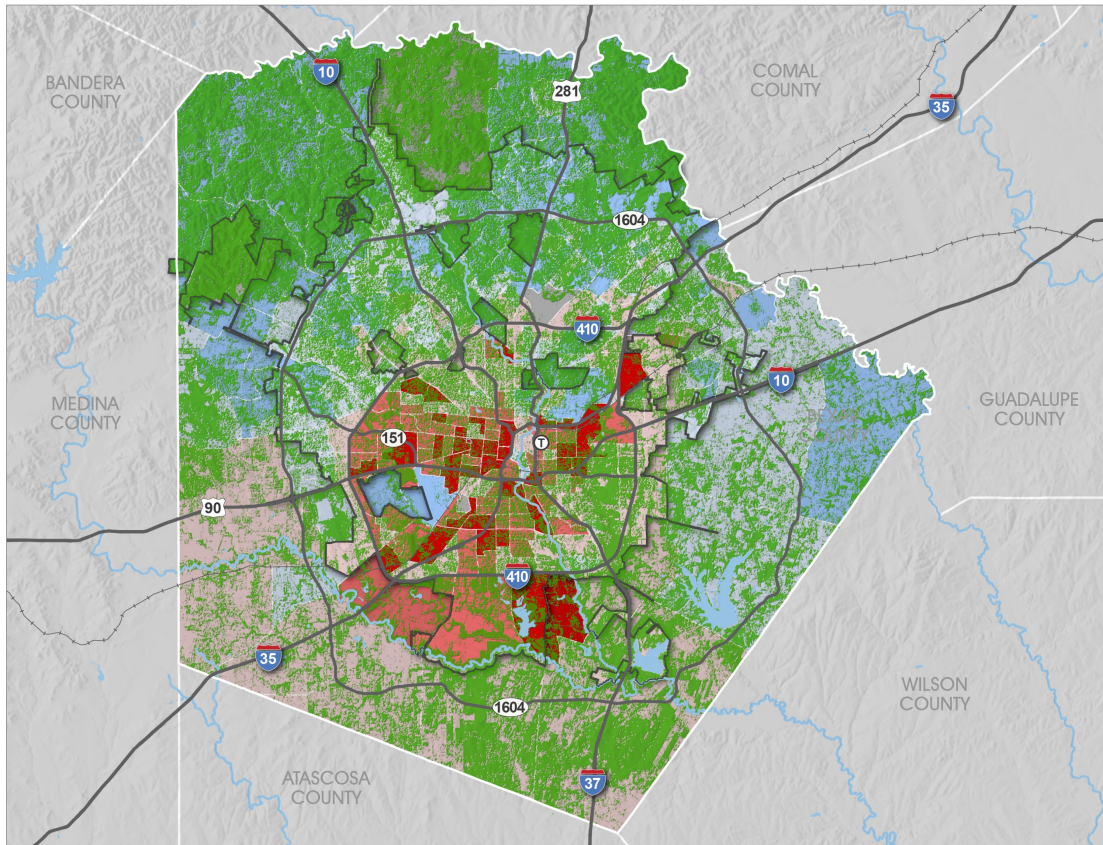
Urban Heat Island Effect



Tree Canopy



Source: US Census Bureau (2010); US CDC; Flanagan et al. (2011)



Legend

City of San Antonio

City Limits

Transportation

Major Highways

Social Vulnerability Index (SVI)
by Census Tract

- Most Vulnerable (SVI > 90%)
- Highly Vulnerable (SVI 75% - 90%)
- Somewhat Vulnerable (SVI 50% - 75%)
- Slightly Vulnerable (SVI 25% - 75%)
- Least Vulnerable (SVI < 25%)
- No Data

Tree Canopy

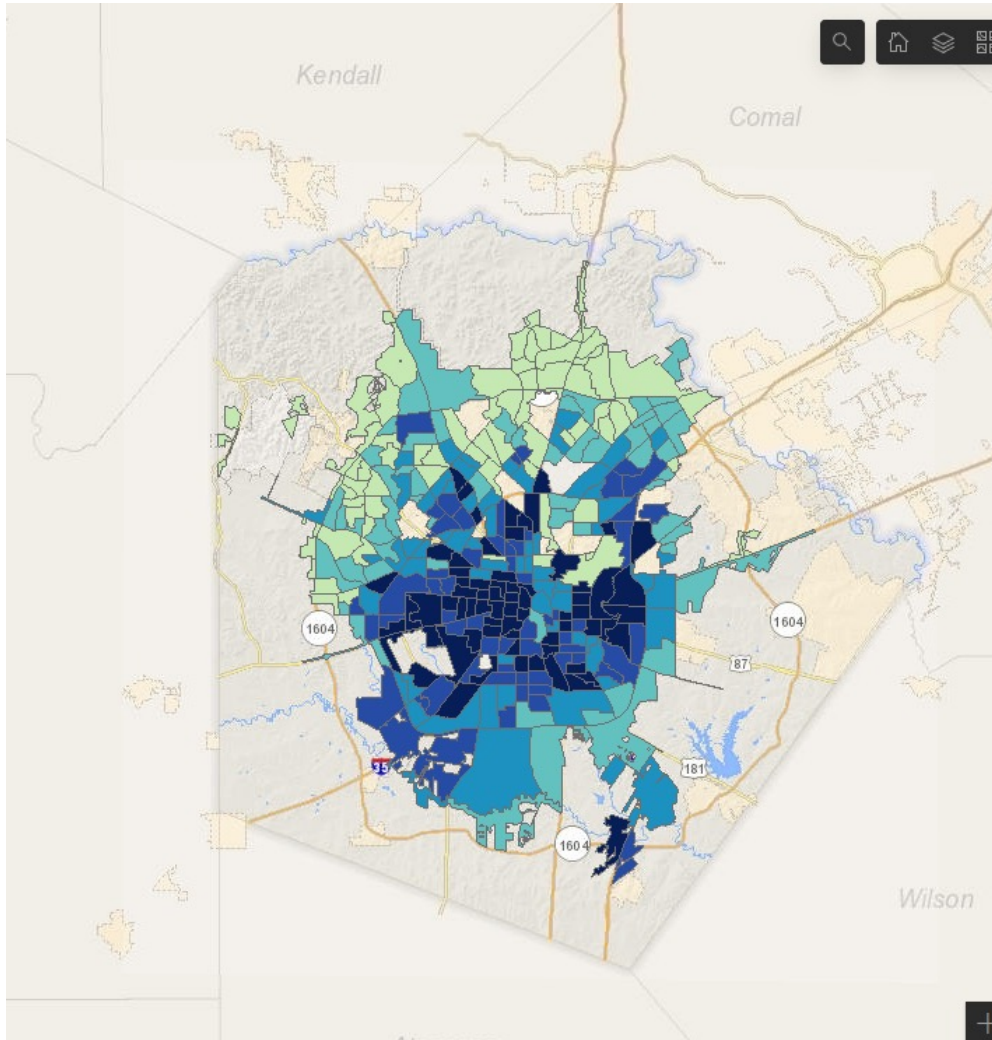
- Remotely Sensed Tree Canopy
at 1 meter Resolution



Social Vulnerability Index (SVI) with Tree Canopy



Household Income



Income

Each scored category represents 20% of the total population of the City of San Antonio. The total population of the census tracts included for this analysis is 1,474,944 people.

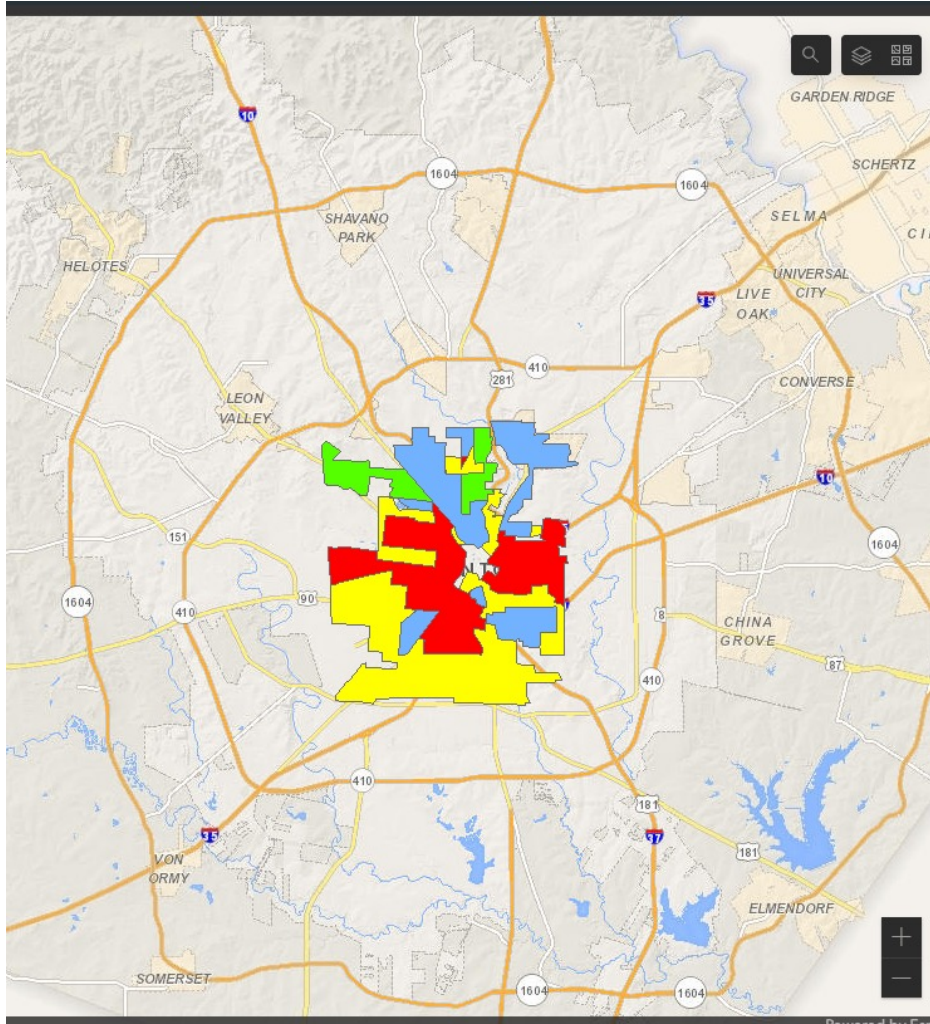
- A score of **5** indicates the median household income is between \$11,360 - \$35,900
- A score of **4** indicates the median household income is between \$35,981 - \$42,377
- A score of **3** indicates the median household income is between \$42,594 - \$55,351
- A score of **2** indicates the median household income is between \$55,543 - \$75,278
- A score of **1** indicates the median household income is between \$76,105 - \$148,654

EquityMatrix

Median Household Income

- 1
- 2
- 3
- 4
- 5

Historic Redlining



EquityMatrixRedline

HOLCRedline1936

- A - Best
- B - Still Desirable
- C - Definitely Declining
- D - Hazardous



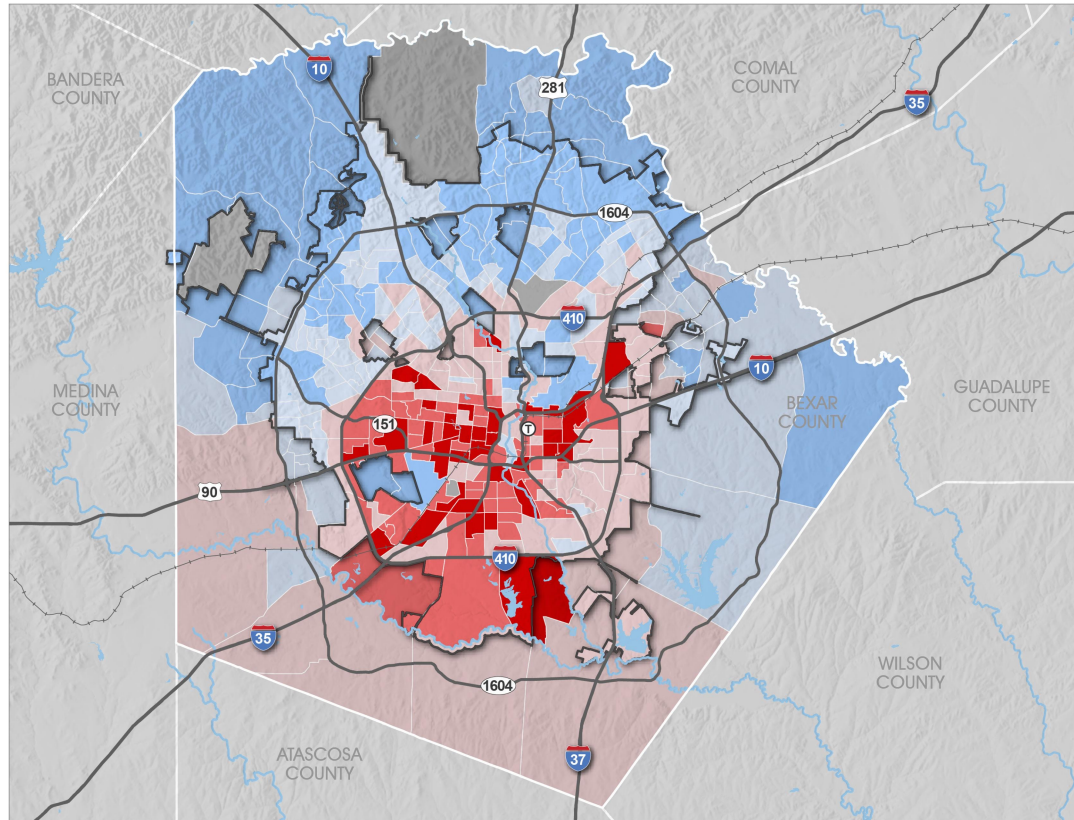
of Surveys

4

Social Vulnerability



Source: US Census Bureau (2010); US CDC; Flanagan et al. (2011)



Legend

City of San Antonio

City Limits

Transportation

Major Highways

Social Vulnerability Index (SVI)
by Census Tract

- Most Vulnerable (SVI > 90%)
- Highly Vulnerable (SVI 75% - 90%)
- Somewhat Vulnerable (SVI 50% - 75%)
- Slightly Vulnerable (SVI 25% - 75%)
- Least Vulnerable (SVI < 25%)
- No Data

Social Vulnerability Index (SVI)



Understanding Impacts

Climate Change disproportionately impacts vulnerable communities.

- Homes not ready extreme weather
- Lack of access to funds or financing for retrofits
- Aging infrastructure

DID YOU KNOW?



2 INCHES

We will soon start to see **summer nights where temperatures never drop below 80°F**, reaching a total of at least 10 of these nights by end of century.

100°F

By 2040 the average number of days with temperatures **exceeding 100°F** could quadruple to more than **30 days** per year, and by the end of the century we can expect to see **55-100 days** with maximum temperatures above 100°F.

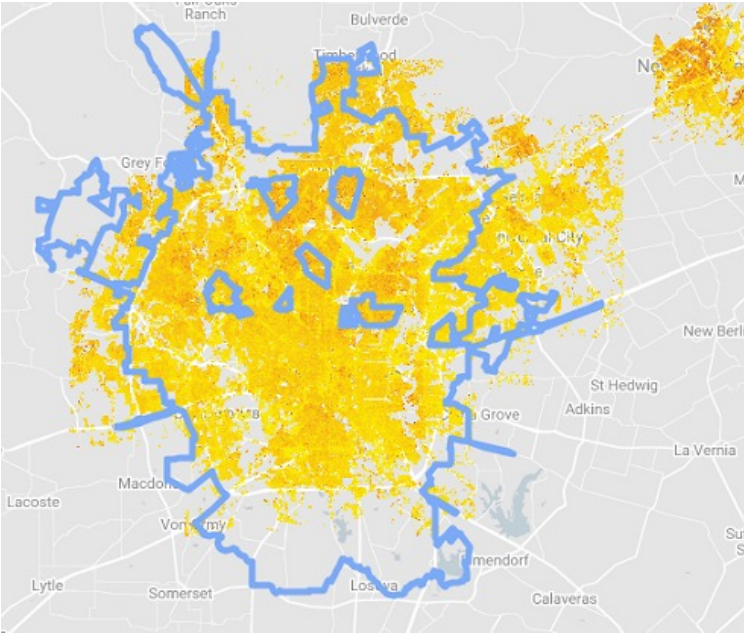
The average number of days with more than 2" of rainfall is expected to increase from once every two years during the near-term period (2011-2040) to four times every five years by the end-of-century.

Summer maximum temperatures are expected to increase by more than 4°F by 2040 and by more than 6-10°F by end-of-century.

BY THE END-OF- CENTURY SAN ANTONIO SHOULD EXPECT TO RECEIVE **3" LESS RAIN PER YEAR: A DECREASE OF 10 PERCENT.**

Using Data to fill the Solar Desert

Solar Potential



Solar PV Distribution by Median Income

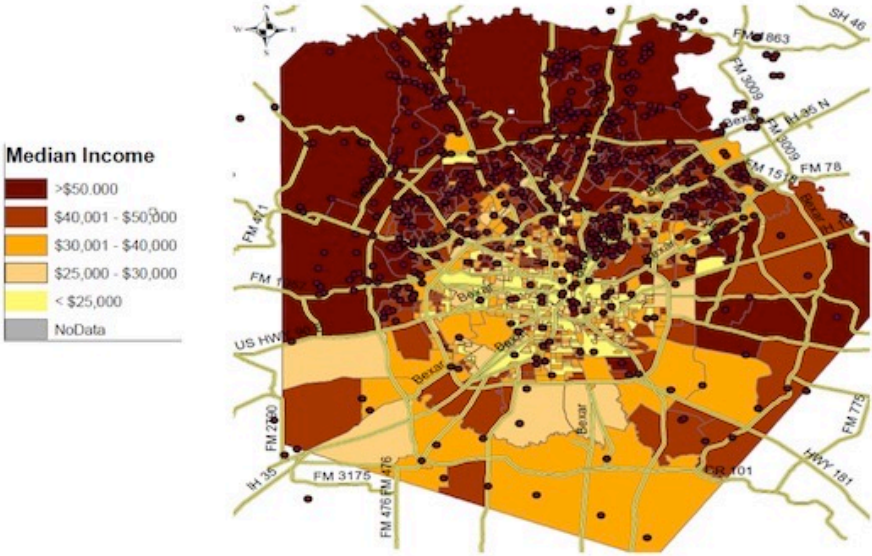


Image from Google Project Sunroof

Data as a Tool for Social Equity



- The City of San Antonio created a public, online [Equity Atlas](#) to help ensure that the City is making data-informed decisions which actively address disparities. Maps relating to basic demographic indicators such as race, income, and language are used to understand trends and gaps, with a goal of utilizing these maps in making more equitable policy decisions.



- Shift beyond energy efficiency to energy resilience
- Shift from water conservation to water security
- Protect the air & water inside the home from outside pollution
- Build with heat resistant & wind resistant materials
- Renewable Energy w/Battery Storage
- Water Storage & Purification
- Preparedness Plan



Climate Ready Building

A Climate Ready building is a BSAG home built above code with added elements that make it adaptable to our changing climate. Climate projections for San Antonio show that we can expect an increased number of hot days, greater floods, and longer periods of drought. A Climate Ready building also incorporates additional features that focus on preparedness for extreme weather events.