Planning Cooler Cities with Google's Cool Roofs Lab

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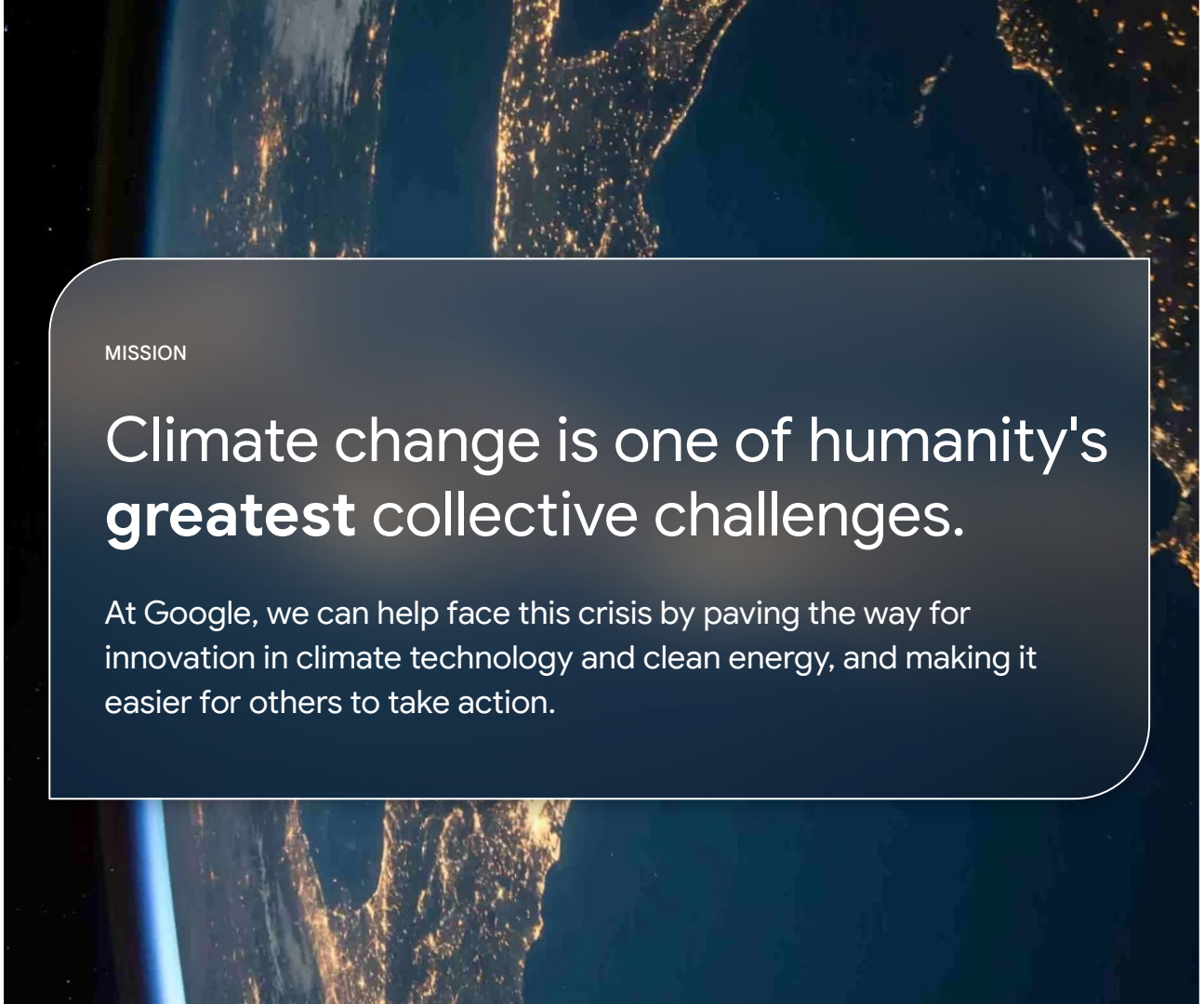
Google



MISSION

Climate change is one of humanity's **greatest** collective challenges.

At Google, we can help face this crisis by paving the way for innovation in climate technology and clean energy, and making it easier for others to take action.

Google

The need for climate resilience

1 in 6 Americans
at risk from wildfires

Washington Post

26% rise in US
flood risk by 2050

Carbon Brief.

5% of US population
at risk from rising heat

US Census Bureau

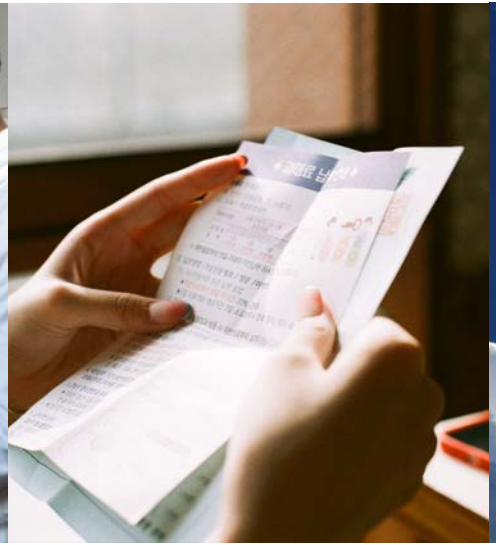
Extreme heat events are rising globally and projected to increase in frequency and intensity, posing a major threat to human health

Tackling heat islands

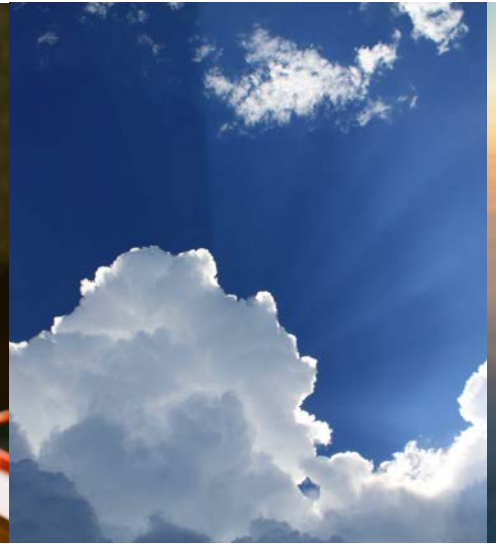
Weathered Galv Roofing
80+ °C
Cool Roof
20°C-40°C cooler

Cool roofs are one of the most cost effective solutions for mitigating the harmful effects of heat islands

Increase safety and comfort by reducing indoor air temperature



Reduce energy bills for households & reduce peak energy demand across a city by decreasing the need for air conditioners

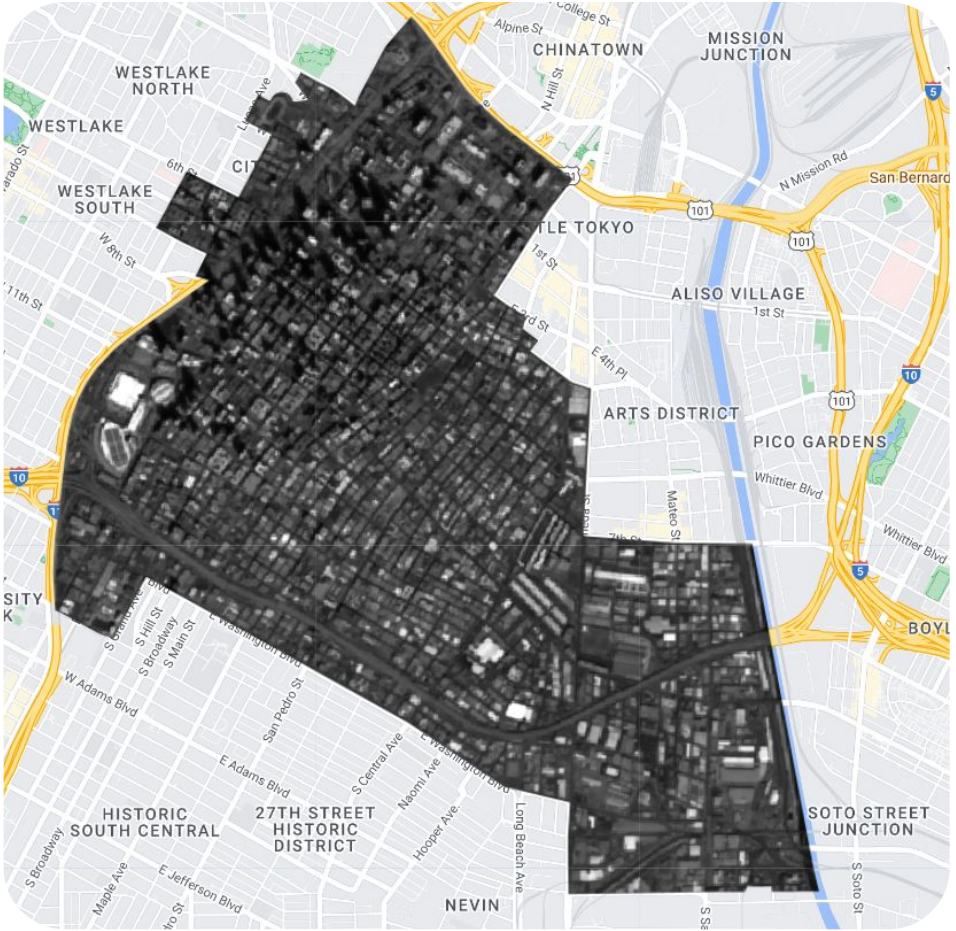


Reduce urban temperatures and improve a city's air quality

Offset carbon emissions

We hope to help local governments plan, advocate, and evaluate ways to increase cool roofs adoption to mitigate the harmful effects of urban heat

We start with Sentinel-2 surface reflectivity measurements at 10 meter resolution

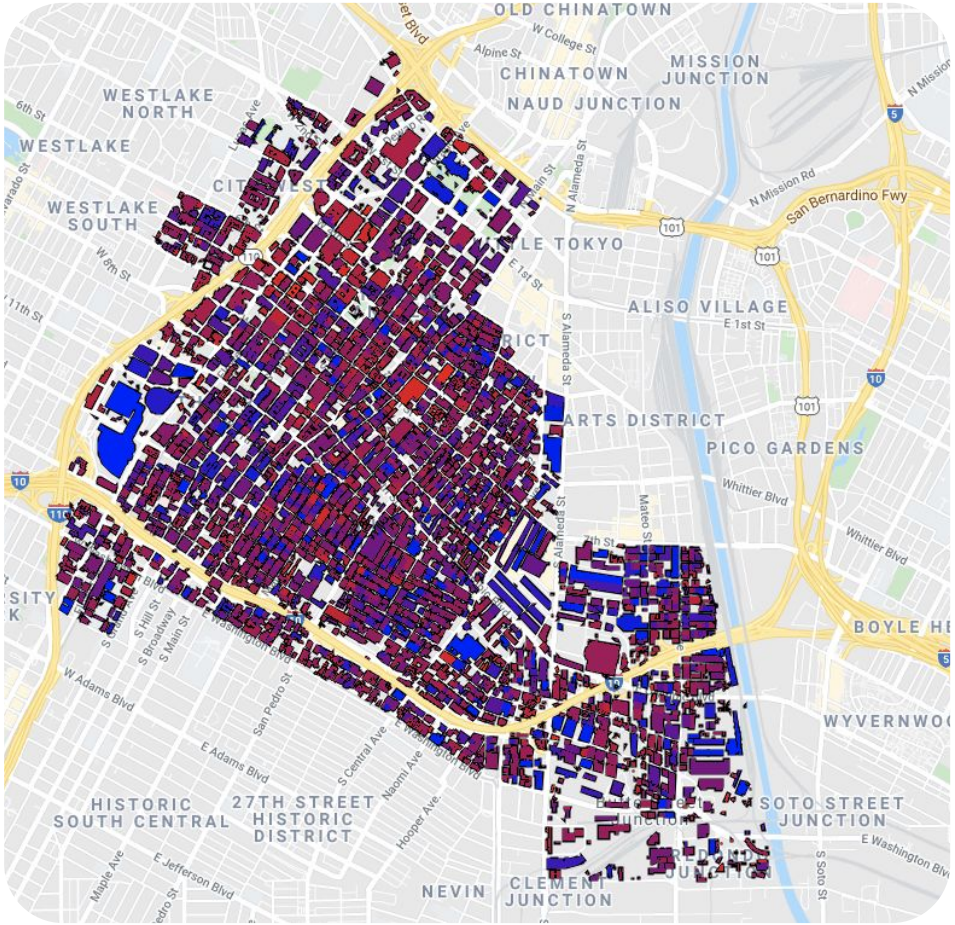


Sentinel-2 measurements

Using machine learning, we combine the 10 meter solar reflectance data with aerial imagery to infer reflectance at higher resolution

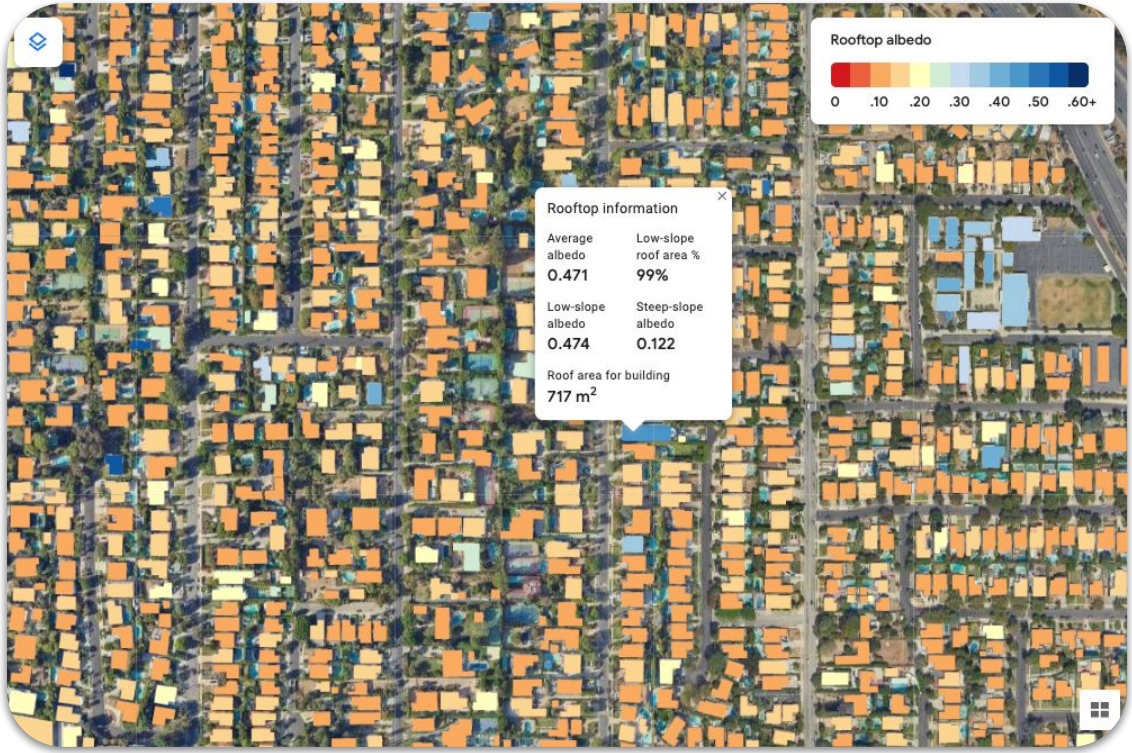
Aerial Imagery

... The result is an albedo (solar reflectance) map for each rooftop

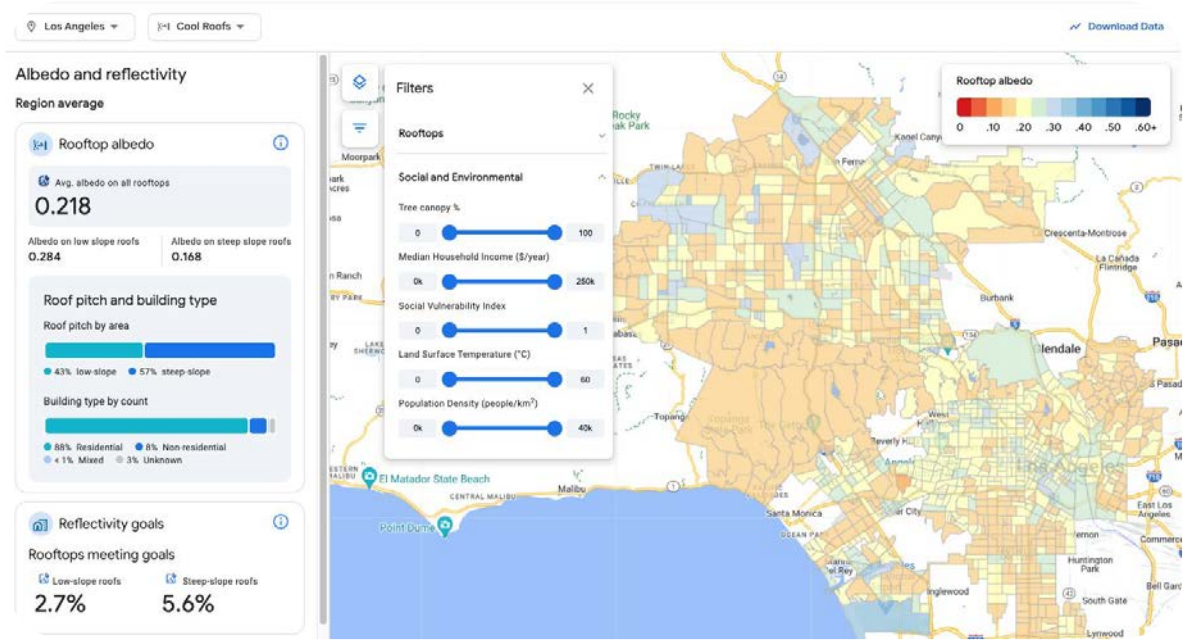


Albedo (reflectance) predictions

Our Cool Roofs Lab provides building level insights to help urban planners determine where to implement specific projects

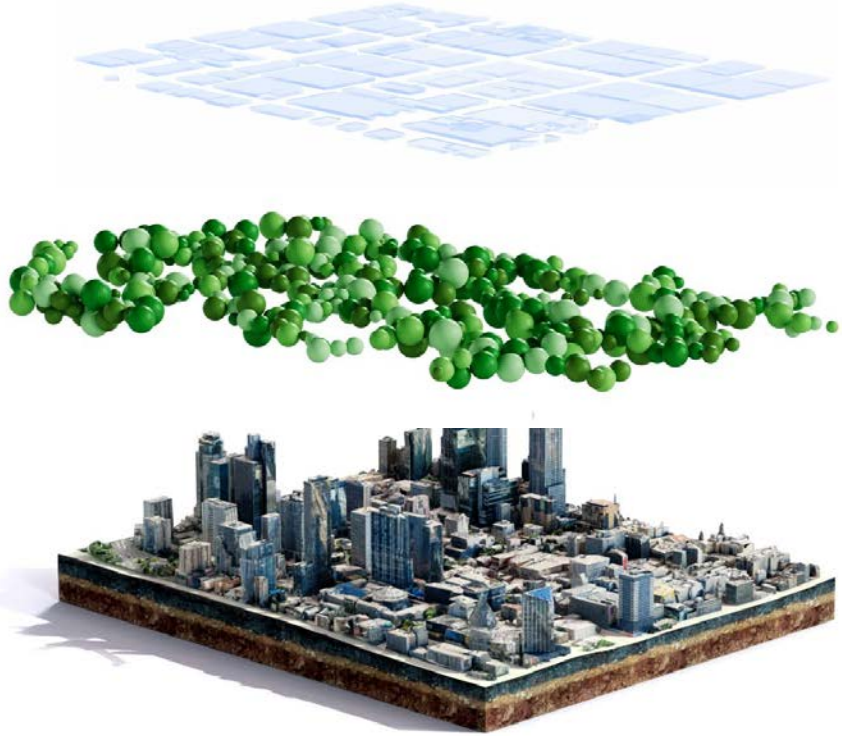


City and sub-city level aggregate albedo estimates combined with socioeconomic data can help prioritize neighborhoods for cool roofs interventions



Temperature effects

Estimating the temperature reduction potential of trees and cool roofs to empower decision makers with more capabilities and insights



Google’s EIE Cool Roofs Lab is currently live in 15 cites

- Los Angeles
- Phoenix
- Austin
- Miami-Dade County
- Baltimore
- Boston
- Boulder
- Colorado Springs
- Nashville
- New York
- San Antonio
- Stockton
- Tempe
- Washington DC
- Melbourne, Australia

Thank you