



GAF Cool Community Project:

PACOIMA, CA

Observational Report 12-Month Summary

EXECUTIVE SUMMARY:

The GAF Cool Community Project is a public-private partnership and multi-phased initiative aimed at developing insights into ways cities can address urban heat at a community-wide level by assessing the effects of cooling strategies. GAF collaborated with partners to launch an unprecedented approach in the Pacoima neighborhood of Los Angeles. The first phase of the Pacoima activity was initiated in March 2022 to establish baseline values for surface reflectiveness and temperature, followed by installation of GAF StreetBond's solar reflective, or "cool," pavement coatings in July 2022. After 12 months of data collection, micrometeorological analysis and atmospheric modeling indicates that GAF's solar reflective pavement coatings can be an effective tactic for reducing a community's ambient temperature without negative consequences.

Building on the success of the first phase, the cool pavement coatings will be extended an additional 500,000 ft² and cool roofs are being added to residential homes within the community.



GAF



streetbond[®]

THE GAF COOL COMMUNITY PROJECT ENCOMPASSED:

- Installation of over 700,000 ft² of cool pavement coatings onto dark asphalt surfaces within a 10 block perimeter. This includes streets, a school playground, a street mural, a basketball court, and two parking lots (see Figure 1) with observable pre-/post-installation impacts (see Figures 2 and 3 on next page).
- Altostratus Inc., developer of the State of California's Urban Heat Island Index, created a research plan to measure the effects of cool pavement coatings at the scale of the surface, person, and atmospheric levels via observation and modeling.* The methodology will advance the existing research base through increased quantity and duration of data capture, variables studied, higher spatiotemporal resolutions, and multimodal monitoring methods.
- This project is a first of its kind in terms of scope—with installation of cool coatings on- and off-street within the same contiguous area, and its research approach—continuous data capture over a large area and a year in duration, and multi-scale observational analysis and high-resolution atmospheric modeling, making it one of the most comprehensive studies of an urban cooling intervention to-date.
- Observations of GAF's cool pavement coatings impact:
 - Increases in albedo are significant and relevant during daytime hours on sunny days
 - Some reduction in temperature carries over into night (both surface and ambient)
 - Mitigation of urban heat is meaningful
 - No negative impacts have been observed to date

Figure 1: Project Scope of StreetBond Installation

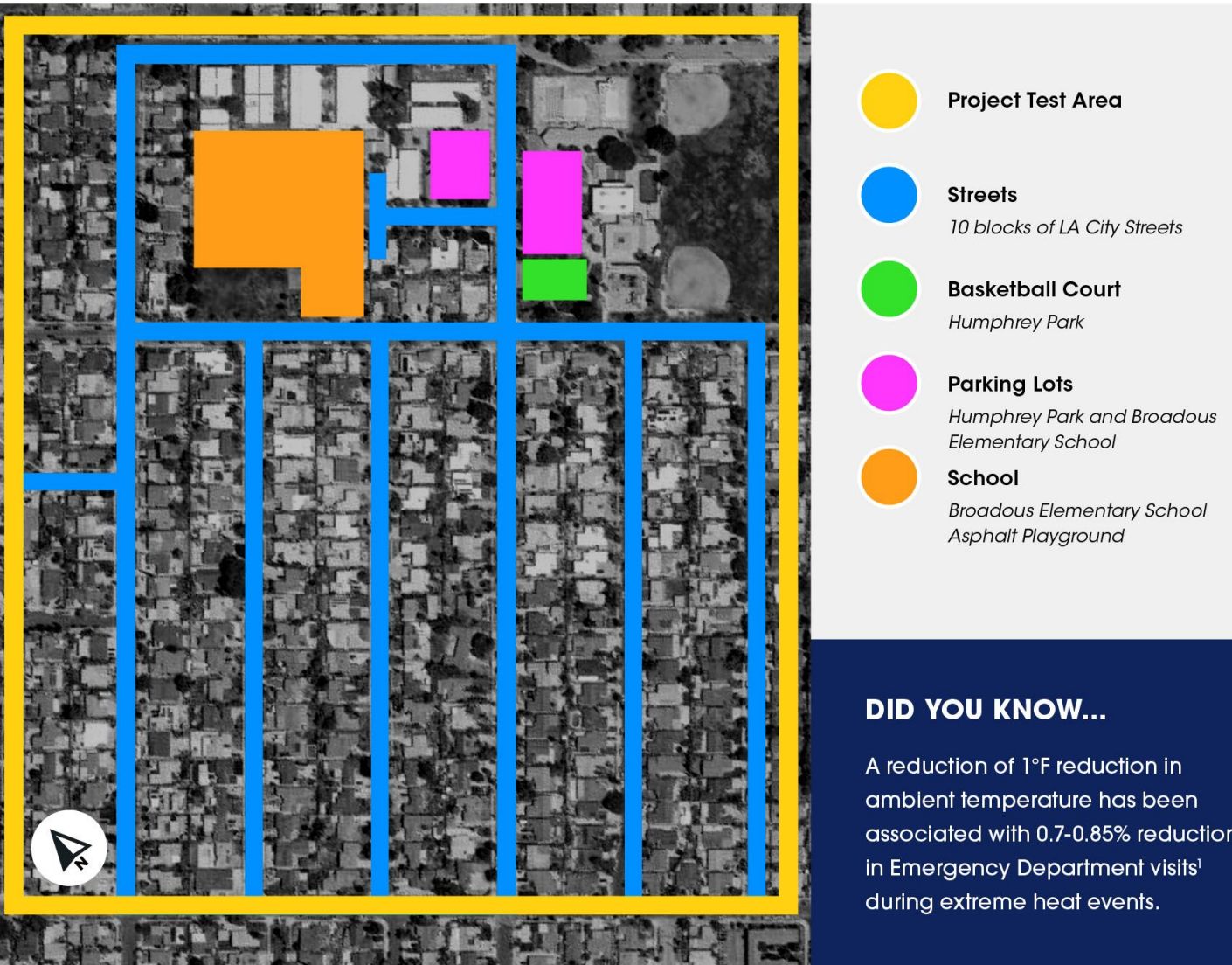


Figure 2: Filmore Street Pre-/Post-Installation



Figure 3: Basketball Court Pre-/Post-Installation



KEY FINDINGS TO-DATE:

Data from 60 high-resolution transects have been collected and analyzed from 12 months of observation. Various conditions have been monitored, including an extreme heat-wave event, typical summer weather, cold/overcast conditions, nighttime, and different seasons, to ensure the robustness of the results. All results have been made in comparison to the adjacent neighborhood acting as a reference area with equivalent structural and environmental morphology where no cool pavement coatings were installed. StreetBond solar reflective coatings:

DID YOU KNOW...

- On surfaces >125°F, burns can occur in just 60 seconds²
- The maximum temperature—not the average temperature, that a pavement experiences is the major driver of pavement service life³



Public Health

- Reduced 25-50% of the local census-tract urban heat island effect during temperature peaks and 13-21% considering all day and night hours.
- Reduced ambient air temperature (<6') on average by 2.1°F during the daytime on sunny days, up to 3.5°F during the daytime of an extreme heat event, and an average of 0.5 °F during the night during summer months.
- Reduced surface temperature on average by 10°F during the daytime on sunny days.



Environmental

- Increased the albedo⁴ of various surfaces by significant amounts— an increase of up to 0.22 during the daytime on sunny days, which is higher than previous studies. By bringing the albedo of surfaces up from 0.05 (streets) to values that are more comparable to those of natural systems or the earth-atmosphere albedo (around 0.30), there is a significant energy balance implication for urban areas.
- No anticipated negative local photochemistry and ozone air-quality impacts.



Community

- No negative thermal comfort impacts on average during the daytime on sunny days based on two standard industry metrics (MRT and PET).
- Pavement warms up slower pre-solar noon and/or cools down faster post-solar noon.
- No increase of glare for drivers based on spectral analysis.
- Community members have asked for more coatings implemented.

Note: The findings are high-level averages over all the transects. There is significant variability (due to sun position, shading, road conditions, and weathering), and results are evaluated on a case-by-case basis and are subject to change upon completion of all the transects.

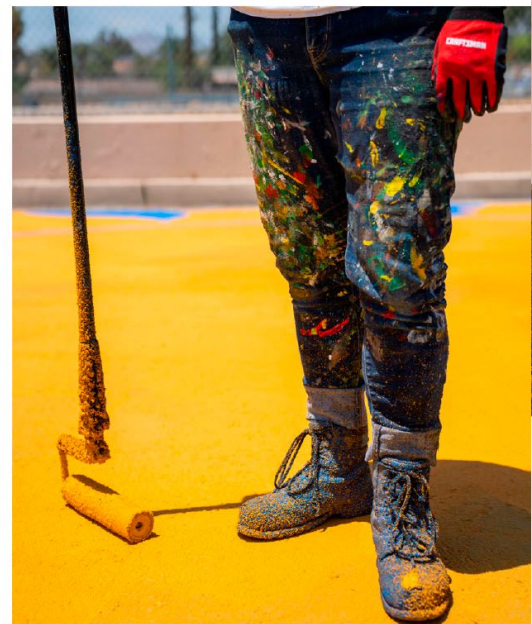
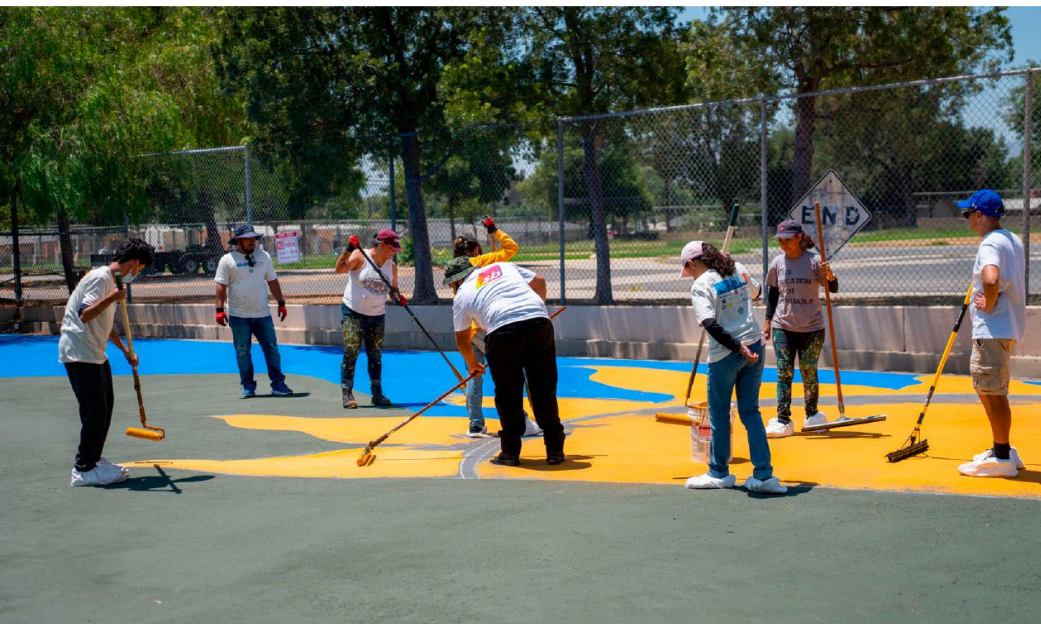
* Modeling performed using an Altostratus-modified version of the highly-urbanized parameterizations in the WRF model.

1. The 2006 California Heat Wave: Impacts on Hospitalizations and Emergency Department Visits, *Environmental Health Perspectives* (2009)

2. Thermal Contact Burns From Streets and Highways, *JAMA* (1970)

3. A Review of the Fundamentals of Asphalt Oxidation, *TRB* (2009)

4. Albedo: Reflectance of the Earth's surface. Albedo can be measured at the top of the atmosphere, in which case the absorption and reflection of the atmosphere (including clouds) impacts the value. When measured at the bottom of the atmosphere, it refers only to the reflectance of the surface (though, the spectrum of sunlight being reflected will have been altered by atmospheric absorption). Albedo is a fractional value ranging from 0 (no reflectance) to 1 (perfect reflectance).



Thank you to our partners

If you have questions, please reach out to the GAF StreetBond team: streetbond@gaf.com



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gaf.com/coolcommunity
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