



COOL COMMUNITY PACOIMA PLAYBOOK

April 2023

Document Purpose

This document serves two purposes. First, it describes the project in Pacoima and the cool pavement technology. Second, it guides the user in how to replicate this type of project in another location experiencing urban heat island impacts. This document is a broad overview of the project steps and components, focusing on the key elements from start to finish. These steps and components allow for an inclusive, successful, and meaningful project to address climate change at the local level. The intended audience is any municipality, group, or individual looking to combat the impacts of climate change with and for the local community.

This document was developed by Climate Resolve, a local climate change non-profit organization based in Los Angeles. Climate Resolve worked closely with multiple partners (see opposite page) to guide the implementation of this project in Pacoima and is grateful for the contributions across agencies, the private sector, and other non-profit organizations to make this project a reality.

For more information, contact Climate Resolve at www.climateresolve.org/contact-us.



LA City Councilwoman Monica Rodriguez and project partners cut the ribbon to open the basketball court at Hubert H. Humphrey Park in Pacoima

Project Partners

- **GAF/ Streetbond**
GAF/Streetbond develops colorful products to help preserve, cool, and beautify city and residential surfaces. GAF/Streetbond launched this initiative to develop insights into ways cities can address urban heat at the community level by assessing the effects of cooling strategies.
- **Climate Resolve**
Climate Resolve builds collaborations to champion equitable climate solutions in Southern California.
- **StreetsLA**
StreetsLA formerly known as the Bureau of Street Services is a division with the Public Works Department in the City of Los Angeles. StreetsLA has been working on cool pavement projects since 2015 throughout the city of Los Angeles.
- **LA City Councilwoman District 7, Monica Rodriguez**
Councilwoman Rodriguez has represented the Northeast San Fernando Valley on the LA City Council since 2017. The councilwoman has focused on increasing investment and expanding city services in the historically under resourced district.
- **Pacoima Beautiful**
Pacoima Beautiful was founded in 1996 by five relentless mothers who became distraught by the unpleasant sight of trash and toxic smells they endured while walking their young children to school. Since then, Pacoima Beautiful has built on this environmental justice work to advocate for a healthier and safer community in the Northeast San Fernando Valley.



A community member who helped with the street mural wears a project t-shirt with logos from partner organizations during the ribbon cutting ceremony

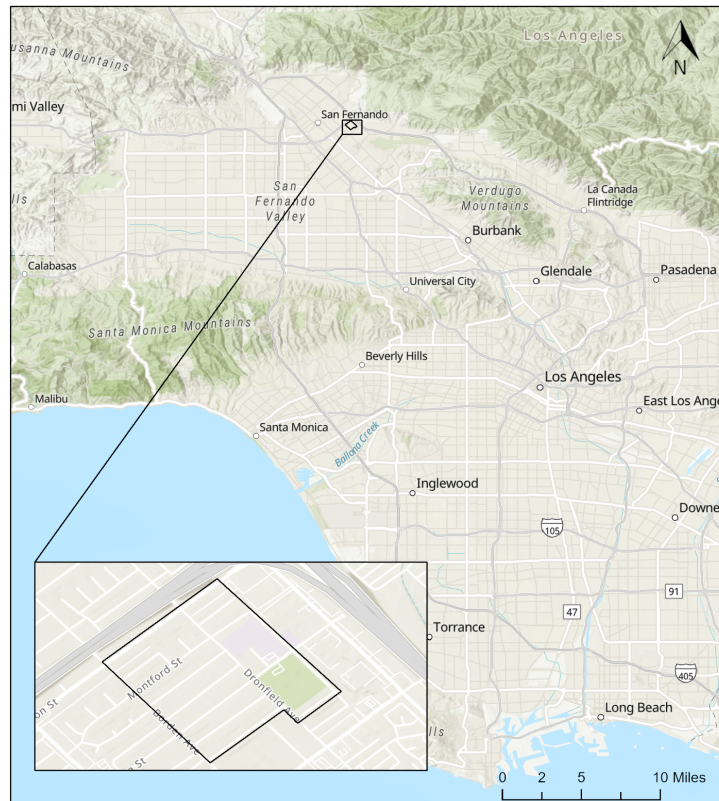
Project Partners

- **City of Los Angeles Department of Recreation and Parks (DPR)**
The City of Los Angeles Department of Recreation and Parks, stewards to over 16,000 acres of parkland, offering extensive recreational, social and cultural programs at 559 park sites in every Los Angeles neighborhood from the valley to the sea.
- **City of Los Angeles Bureau of Street Lighting (BSL)**
The Bureau of Street Lighting designs, constructs, and maintains approximately 223,000 streetlights across the City of Los Angeles. Additionally, the Bureau of Street Lighting has runs the Smart City Portfolio since 2012 where it hosts additional devices such as sensors, meters, and car chargers across the city.
- **Los Angeles Unified School District (LAUSD)**
Los Angeles Unified School District is the second largest district in the nation, the Los Angeles Unified School District enrolls more than 565,000 students in kindergarten through 12th grade. The District covers 710 square miles and includes Los Angeles as well as all or parts of 25 smaller municipalities plus several unincorporated sections of Los Angeles County.
- **Urban Semillas**
Urban Semillas is a social conscientious and community-based consulting firm. Our work is grounded on social and environmental justice issues. Our goal is to empower people at the grassroots-level and across sectors to participate in local and statewide issues that impact the communities they live in.
- **Altostratus Inc.**
Altostratus Inc. is a California certified small business providing highly-specialized services in atmospheric modeling and research with applications in climate, emissions, air quality, thermal environment, and energy as well as in fine-scale forecasting of microclimates and site-specific weather.
- **Creative Paving Solutions**
Creative Paving Solutions is a leading decorative asphalt company in applying Solar-Reflective asphalt coating systems. The Creative Paving team has developed machines, equipment, application methods and advancements for over 20 years.
- **Members of the Community**
Without contributions, input, and support from members of the community this project would not have been possible. Thank you!

Project Map



Aerial photo showing the different types of surfaces after coating



Project Location Map

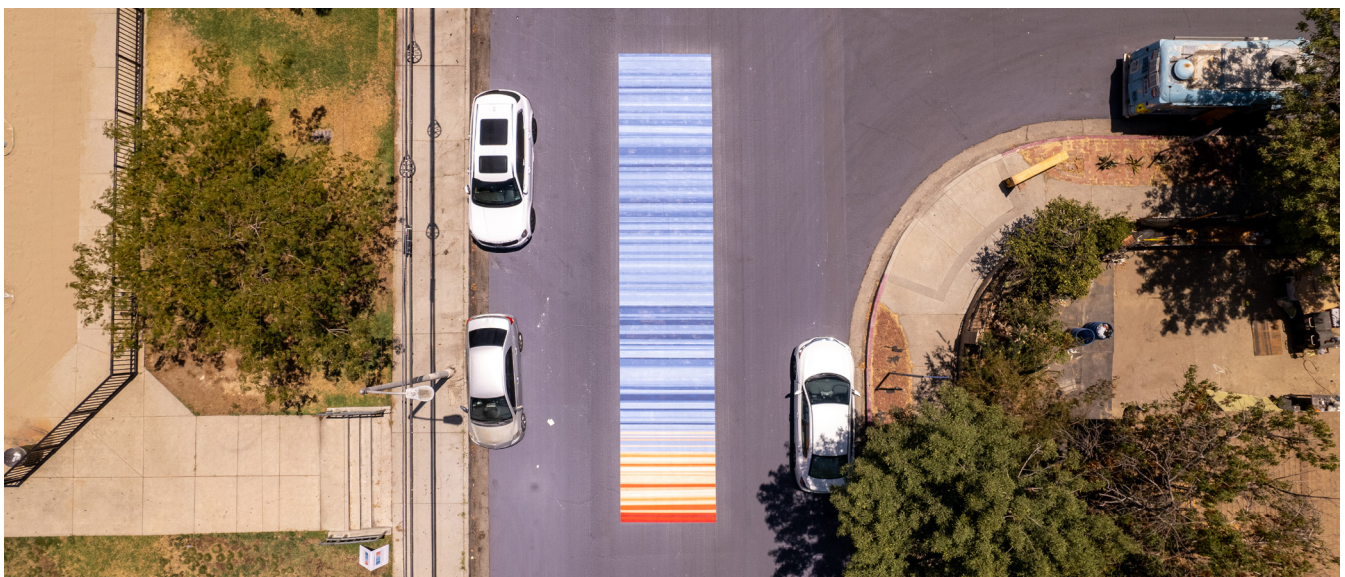
What is the Cool Community Pacoima Project?

COOL COMMUNITY PACOIMA

The Cool Community Project, is an initiative designed to assess and reduce the impact of urban heat on a community. GAF has partnered with Climate Resolve, local community organizations and municipal government partners to conduct a multi-phased research project to understand the impacts of urban heat and cooling solutions have on the livability of the Los Angeles neighborhood of Pacoima. GAF provided funding for multiple components of this project including the coating, community outreach, coordination, and research.

The Cool Community Project-Pacoima began by coating 10 square blocks of street, a school playground, a street mural and a recreation center parking lot with a cool pavement coating for a total of over 660,000 square feet. This coating is a water-based epoxy pavement coating that blocks the pavement from absorbing much of the sun's radiation, thus reducing surface temperature.

The goal of the coating is to lower ambient air temperatures to reduce impacts on human health throughout the day



A warming stripes mural with a stripe showing the average temperature each year in the city of Los Angeles from its founding in 1781 (top) to 2021 (bottom). Darker blue represents cooler years with a gradient to red for the hottest years.

What are the Goals and Benefits of the Cool Community Pacoima Project?

The goals of the project include:

- Community outreach before, during, and after the cool pavement coating application.
- Coating 10 square blocks of public streets, a school playground, a street mural, a warming stripes mural, a basketball court, and a recreation center parking lot with Streetbond pavement coatings with Invisible Shade™ technology (“cool pavement coatings”).
- Capture scientific research to analyze the impact of the cool pavement coatings.
- Demonstration that cool pavement coatings in a large area next to each other can address the human impacts from urban heat.
- Bouncing sunlight back into space, and dispersing heat along with it.

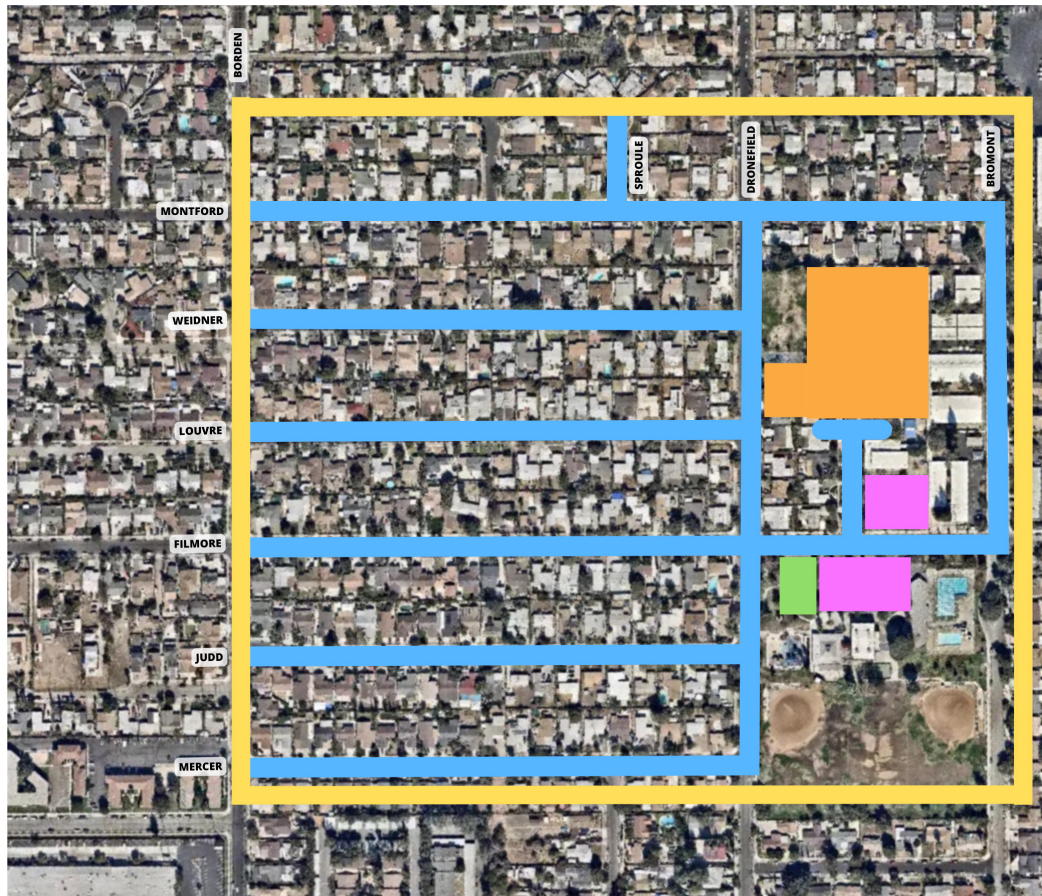
The anticipated benefits of the project are:







- Reduction in the urban heat island from the Streetbond coating, and even a small reduction in the greenhouse effect that is causing climate change.
- Fewer heat related health problems for local residents.
- Providing additional beauty in the community through working with local artists and community members with colorful murals, art and storytelling.
- Scientific data supporting the benefits of Streetbond cool pavement at the person and community level.



Local artists, community members and GAF/StreetBond Staff take a break from the cool street mural to pose for a photo

Project Coating Areas



-  Project Area
-  Streets | 10 blocks of Los Angeles City Streets
-  Basketball Court | Humphrey Park
-  Parking Lots | Humphrey Park and Broadous Elementary
-  School | Broadous Elementary School Asphalt Playground
-  North

Technical Information | Cool Pavement Coatings

Cool pavement coating is a durable surface coating that goes on top of asphalt pavement. Asphalt pavement is commonly used on roadways, parking lots, driveways, and outdoor recreation areas. Cool pavement coatings work by reflecting sunlight back into the atmosphere through use of an additive that reflects non-visible light spectrum radiation.

Asphalt has a solar reflectivity (SR) of 0.05 to 0.4, meaning it reflects between 5% and 40% of the sunlight that it receives (source: Environmental Protection Agency, EPA). The SR of existing asphalt in Pacoima was around 0.05. Cool pavement coatings increased the SR values of the coated surfaces to between 0.15 and 0.33. This means that the asphalt previously reflected 5% of sunlight and now the surfaces reflect between 15% and 33% of sunlight. Because the sunlight is not absorbed by the asphalt, in theory this will make the asphalt stay cooler and then not emit as much heat into the ambient air. The research component of this project is gathering data for the Streetbond coating performance to further support this concept. In addition to providing cooling benefits, cool pavements also extend the life of asphalt and can beautify the area when one or more of the colors are used.



Surface temperature before coating

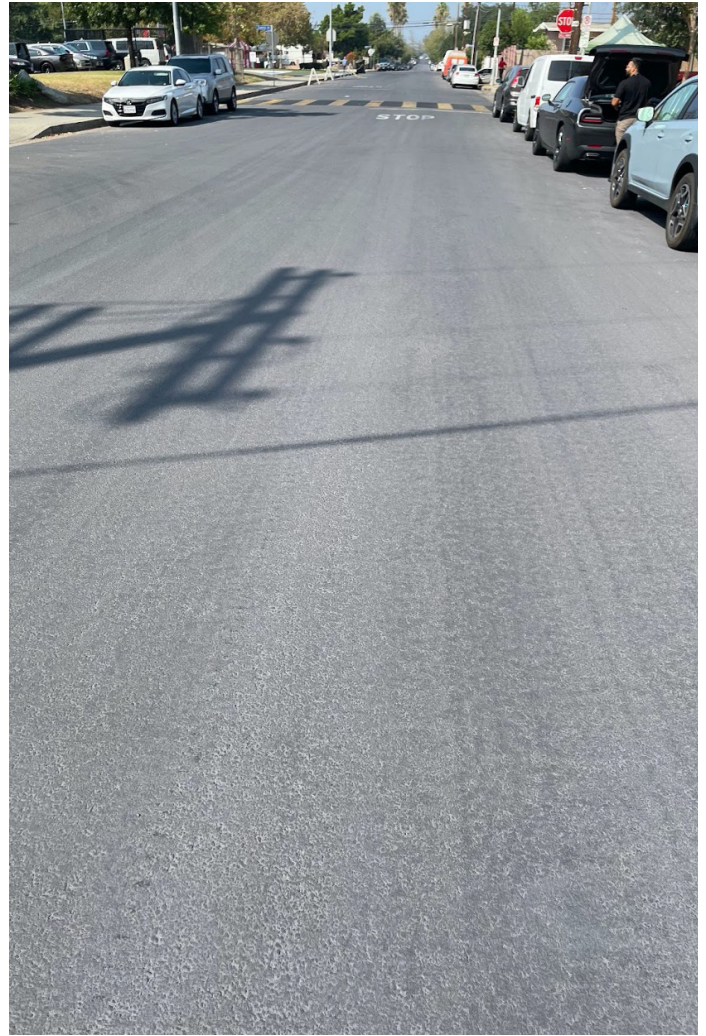


Surface temperature after coating

Project Elements | Street Coating



BEFORE



AFTER

Approximately 10 square blocks of city owned asphalt streets were coated with Streetbond in Pacoima as part of this project. The streets were all in a residential area and in relatively good condition. Coating occurred over a period of three weeks in July and August of 2022.

“The Cool Pavement Program is not only seen as a way to reduce the heat island effect, but is also seen as a sustainable pavement treatment. Cool pavement coating combined with trees and bus and shade structures will be considered in all future projects. Best management practices will combine these elements and other multi benefits used in the City of LA urban environment.”

– StreetsLA Executive Director Keith Mozee

Project Elements | Warming Stripes Street Mural



A Warming Stripe Street mural was added to the project area to showcase a different use of the cool pavement coating and to demonstrate the changing temperatures in Los Angeles County since 1971 ([NOAA](#)). [Warming Stripes](#) were originally developed by scientist Ed Hawkins and can be customized for different locations and time periods.

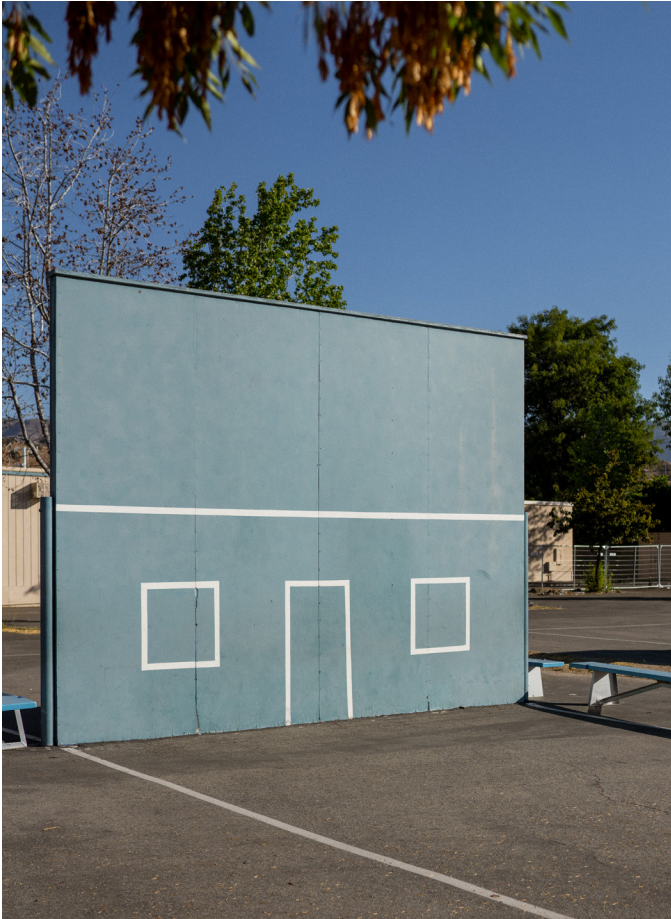
“The Cool Community Pacoima Project is a great example of innovative cool pavement technology benefiting both community health and preserving city streets. This project, and others like it, reduce urban heat islands to improve the lives of community members in Pacoima. Public private partnerships like this also serve to speed up the pace of change to accelerate climate adaptation. The community was involved in the project from the beginning including providing their input on the colors and design for the mural and basketball court.”

– StreetsLA Executive Director Keith Mozee



(Top) The warming stripes mural as viewed by a car or a pedestrian.
(Bottom) Another street mural in progress nearby.

Project Elements | School



**Broadous School
playground before coating**



**Broadous School
playground after coating**

Hillery T. Broadous School serves approximately 400 elementary students in the community of Pacoima. The school playground is home to multiple mature trees with a mix of green space, asphalt, and concrete play areas for students. The asphalt areas were covered with roughly 130,000 square feet of cool pavement coating.

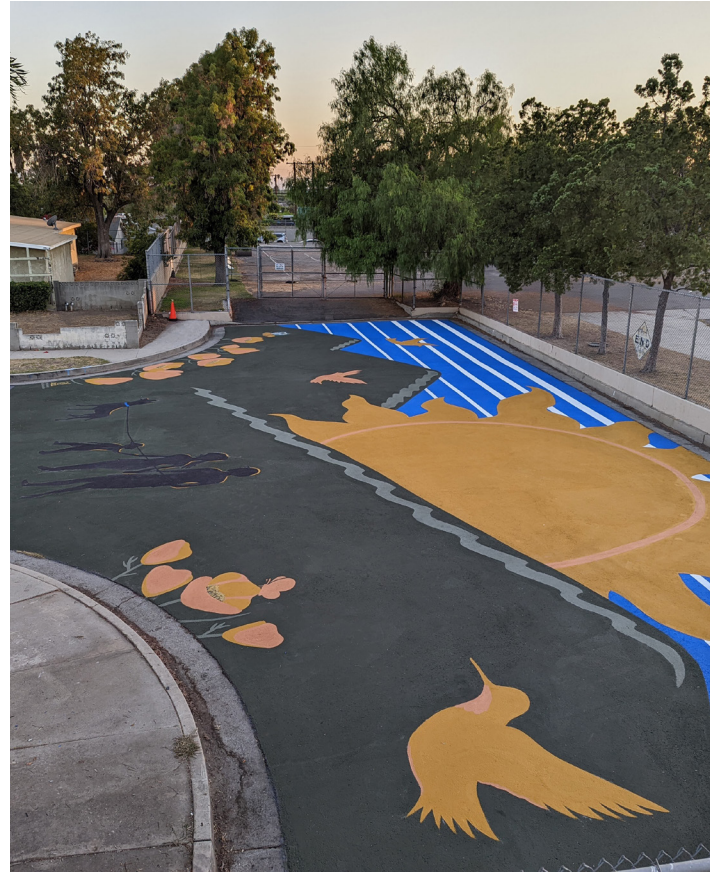
“We are all LOVING our new surface...and what a difference it has made with the heatwave we have been experiencing! We are so very grateful to have been a part of this project!”

– Victoria Littlejohn, Principal Broadous Elementary, LAUSD

Project Elements | Street Mural



Mural area before coating



Mural area after coating

A local artist, along with Pacoima Beautiful, performed community outreach to determine the content and colors for the street mural. The street mural was applied by a local artist over a period of five days using local volunteers. Each element requires four layers of Streetbond cool pavement coating and dried quickly in the warm summer weather.

Painting this mural using the cool pavement coating was not only fun but a great “scientific” experience. It was my first time using this product and I noticed its uniqueness right away. The paint dried very quickly due to the high heat temperatures which allowed us to experience the benefits of the pavement coating right away.

– Desiree Sanchez, Desiboo Creations

Project Elements | Basketball Court



Basketball court after coating



Thermal imagery of the basketball court after coating



Surface temperatures before (113 degrees F) and after (104 degrees F) coating.

The Streetbond cool pavement coating was applied on the basketball court at Humphrey Park in colors chosen by the community and park staff. Thermal imagery (see above right) shows that the cool pavement coating reduces surface temperatures (gray = cooler surface temperature) compared to other play surfaces (see red colored play area that did not receive the coating due to surface type in the back of image where red = warmer surface temperature).

“No se siente tan caliente como antes. Los niños juegan más, ahora que pintaron la cancha. [It does not feel as hot as before. The kids play more since they painted the court].”

– Humphrey Park Patron

“It looks great and welcoming. We have had an increase in the usage of the basketball courts since the project was finished.”

– Humphrey Park Staff

Sample Solar Reflective Coating Color Palette

Solar Reflective Colors



Sandstone

SRI = 37
Reflectance: 0.36
Emittance: 0.85



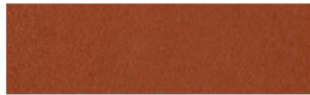
Irish Creme

SRI = 55
Reflectance: 0.48
Emittance: 0.89



Fawn

SRI = 31
Reflectance: 0.30
Emittance: 0.89



Brownstone

SRI = 32
Reflectance: 0.30
Emittance: 0.90



Khaki

SRI = 35
Reflectance: 0.33
Emittance: 0.88



White

SRI = 88
Reflectance: 0.72
Emittance: 0.88



Sun Baked Clay

SRI = 51
Reflectance: 0.45
Emittance: 0.90



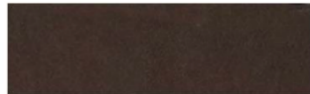
Terra Cotta

SRI = 34
Reflectance: 0.32
Emittance: 0.88



Evergreen

SRI = 36
Reflectance: 0.34
Emittance: 0.89



Slate

SRI = 29
Reflectance: 0.29
Emittance: 0.88



Mustard

SRI = 37
Reflectance: 0.35
Emittance: 0.88

NOTE: Reflectance values are measured in accordance with American Standard of Testing Methodology (ASTM) C1549. Emittance values are measured in accordance with ASTM C1371. The SRI values of StreetBond are calculated according to ASTM E1980-01.



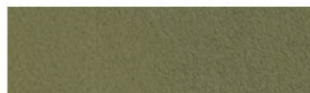
Safety Blue

SRI = 35
Reflectance: 0.34
Emittance: 0.87



Paprika

SRI = 41
Reflectance: 0.38
Emittance: 0.85



Limestone

SRI = 36
Reflectance: 0.33
Emittance: 0.90

The Streetbond color palette provides example colors currently available for cool pavement projects. The lighter colors may darken over time due to tire marks and dirt. cleaning may be needed depending on foot and vehicle traffic in your area.

Community Engagement

Community Engagement was led by [Pacoima Beautiful](#), a local community based organization. Multiple engagement opportunities occurred before, during, and after Phase 1, cool surfaces, was complete.



The team hosted two **community workshops** to introduce the 10-square block project to the local residents. Through these workshops the project team introduced the project, answered community questions, and addressed community concerns. The local residents also had an opportunity to provide feedback about the street murals.



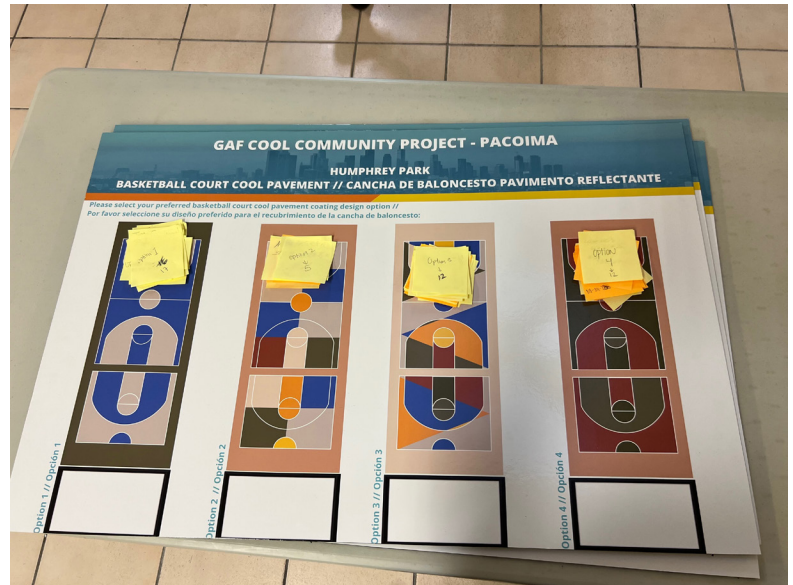
The outreach for the **ribbon cutting ceremony** included multiple engagement strategies. The team canvassed the neighborhood and conducted door to door outreach. The local residents received notices of the event in the mail, through phone calls and texts, and targeted social media ads. The text and phone banking effort included all residents living one to two miles from the project area. The mailers arrived a week and a half before the event and they were followed by a phone banking effort and social media campaign a week before the ribbon cutting ceremony.

Community Engagement Continued | Engagement Strategies

- Pacoima Beautiful conducted **door-to-door outreach** throughout the first phase of the project. The outreach team provided informational flyers to each home as they canvassed the community. The door-to-door effort also included **mailers** that were sent to each home within the area. This direct engagement strategy helped raise awareness of the community meetings. In total the team knocked on the doors of 410 homes.
- The Outreach team from Pacoima Beautiful reached out to the community through phone **calls and texts**. Through this effort the team discussed the purpose of the community meetings and extended invitations to those residents that wanted to provide feedback and participate in the community discourse. In total the team made 895 calls and sent 4,154 text messages for both community meetings.
- The Pacoima Beautiful outreach team conducted outreach during **tabling events** at urban gardening workshops as an additional point of engagement with the local community. The team distributed flyers and raised awareness of the second community workshop.
- **Coating notification outreach** started three days before the official notification went out to the community. The outreach team reached out to residents affected by the street closures at 7-day, 3-day, and 1-day before street closures. The team helped residents navigate concerns and frequently asked questions.



Pacoima Beautiful staff welcoming community meeting participants



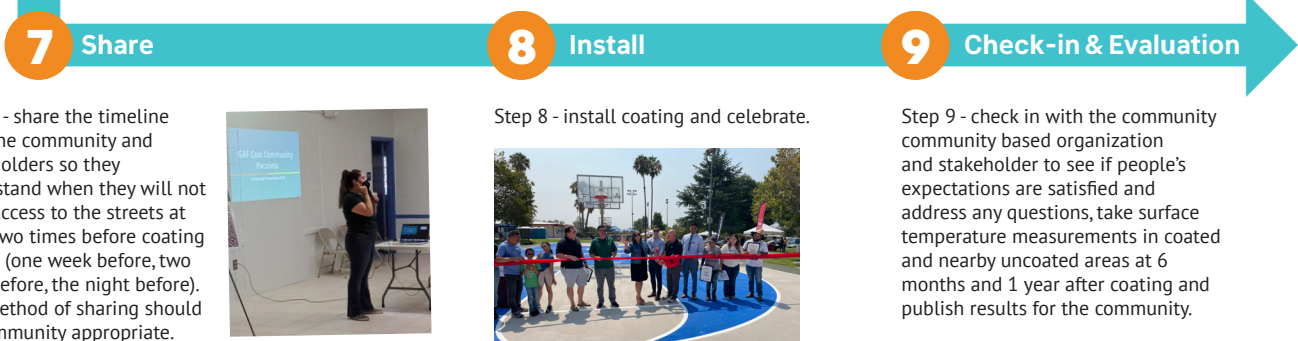
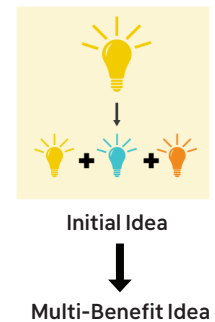
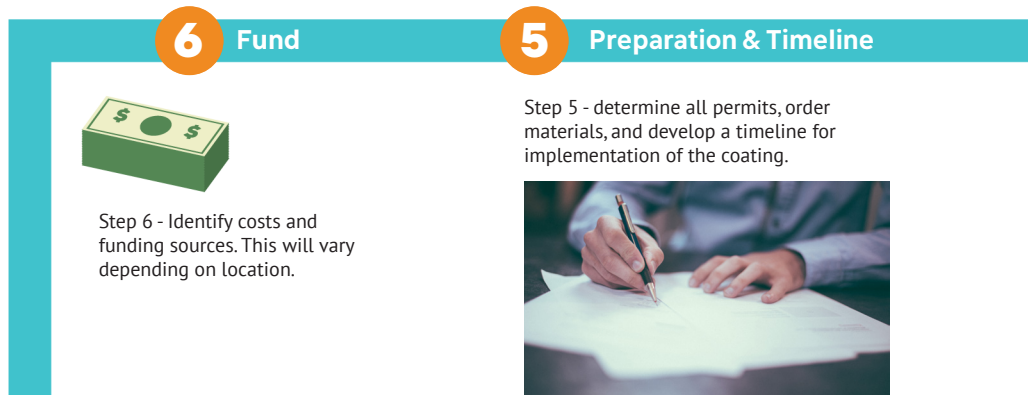
Community input on basketball court colors and design. Option 1 was the winner.

Cool Pavement Coatings | Lessons Learned and Best Practices



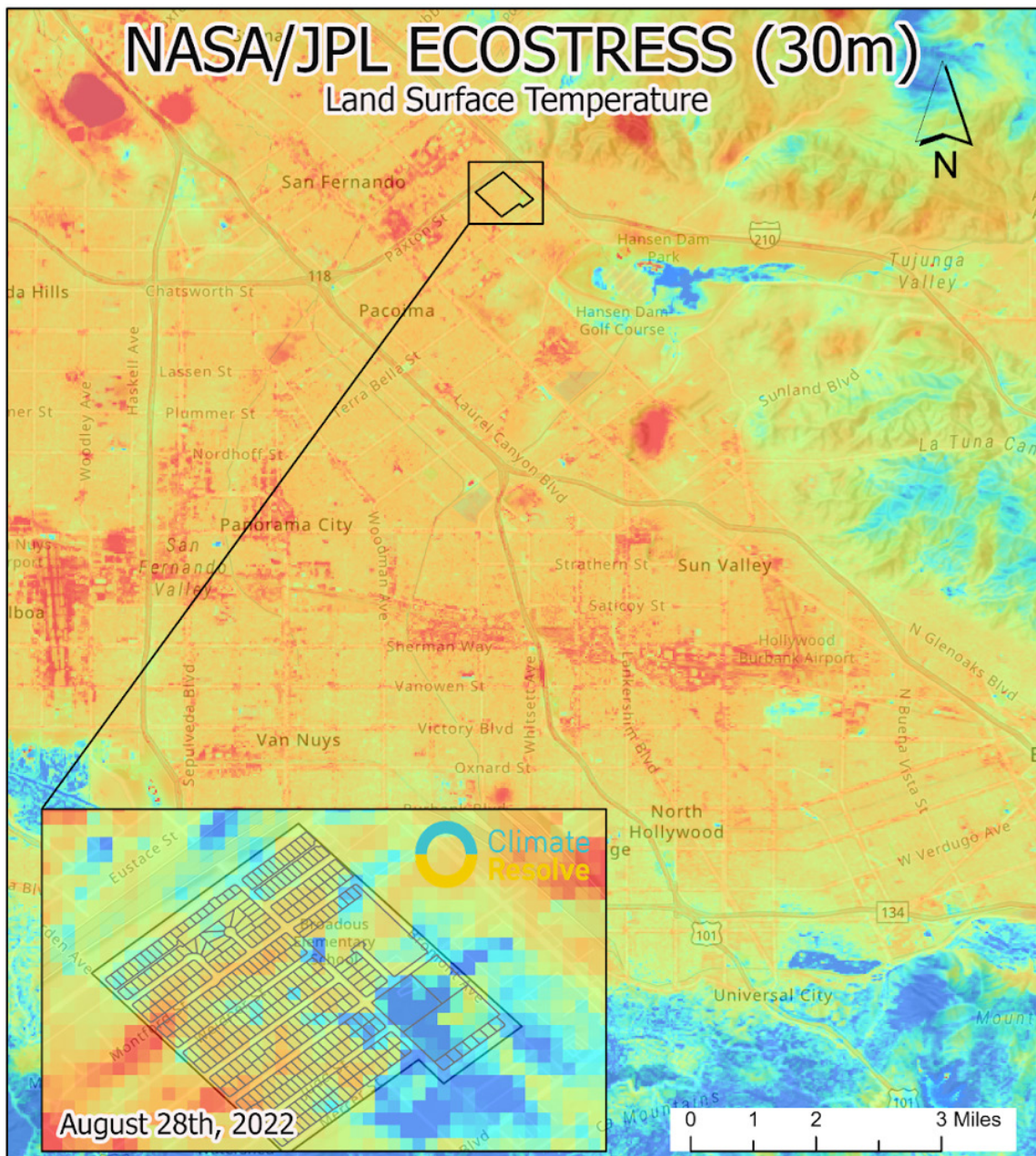
- Always include community input at each decision point
- Coordinate and collaborate early and often
- Look for opportunities for cool pavements beyond roadways into highly utilized asphalt areas in communities like playgrounds and sport courts, and outdoor gathering areas
- Use site specific data related to urban heat island, infrastructure, tree canopy, and roadways as available to make project decisions and communicate this information with the community and other stakeholders
- Coordination takes time and resources, plan accordingly
- Identify project roles and responsibilities and communicate them for new partnerships and concepts
- Explain what the purpose and benefits of cool pavement are to everyone involved
- Stay cool

Road Map for Cool Pavement in Your Community



Research | Overview

While cool pavement coatings have been around for decades and there has been research on performance, there has been little to no in-depth research on both the impact of cool pavement coating on micro-climates and on people. This project includes a robust multi-faceted research component to better understand the impacts of having a large amount of cool pavement in one area. Altostratus Inc, developer of the State of California's Urban Heat Island Index, created a research plan to understand the impacts of Streetbond at three different scales: surface, person, and atmospheric levels. This research is still underway and is expected to be completed in early 2024.



NASA ECOSTRESS Map showing cooling effects from the Streetbond coating after it was installed.

Research | Monitoring



Weather Station in the project area



Golf cart used to take measurements

The research was intended to help inform decisions related to climate adaptation, public health, and energy usage. This data is critical for decision-making because it provides metrics on the benefits of installing cool pavement to inform priorities for funding decisions. Monitoring began in June of 2022 and will continue through July 2023. This monitoring will capture air temperature, surface temperature, solar reflectance, solar radiation, and wind speed. Data were collected in two areas. The first area was where the coating was applied, known as the project area. The second area, called the control area, is immediately next to the project area but does not have the Streetbond coating. These two areas were chosen because they have similar characteristics and could be used for comparison across different weather conditions. This data will be collected in two ways.

First, the data will be collected with two weather stations, one in the project area and one in the control area. The weather stations provide information about weather conditions at about 20 feet above the surface.

Second, an electric golf cart with multiple scientific sensors will be driven through the project and control areas to measure the impacts of the Streetbond cool pavement coatings in real-time. The measurements will be taken at different times of the day, including at night, and under different weather conditions to understand how much the cool pavement coating impacts change with different weather conditions.



MONICA RODRIGUEZ
LA CITY COUNCILWOMAN, 7TH DISTRICT

