Cool Pavements

Public Works Commission

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Introduction

- Urban Heat Island Effect
  - Urban metropolitan areas are typically warmer than the surrounding suburban or rural areas
- Reduction Strategies:
  - Shade and tree coverage
  - Reducing heat absorption
  - Increasing heat dissipation

Cool Pavement

- Beverly Hills:
  - Streets & Alleys: 15% of area
  - Tree canopy coverage: 26% of area
- Cooler Pavement methods:
  - Light colored pavement: Reflects more light than conventional pavement, leading to a cooler pavement temperature
  - Permeable or porous pavement: Increases the dissipation rate of heat from pavement

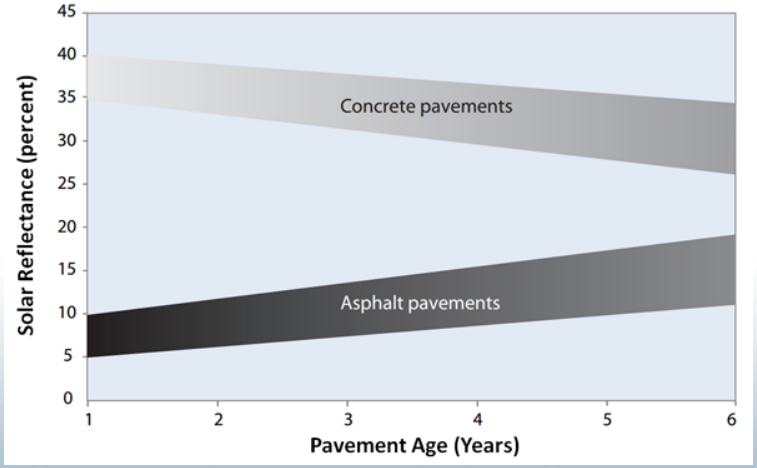
Cool Pavement

- Albedo: Percent of Solar Energy Reflected on a scale from 0.00 to 1.00 *(1.00 = Fully reflected)*

Pavement Surface Type	Average Albedo
Asphalt Concrete	0.10
Concrete Pavement	0.25
Asphalt Concrete with Reflective Coating	0.25

Considerations

- A pavement's reflectivity changes as it ages
  - Asphalt reflectivity increases as it's color fades
  - Concrete and cool pavement coating reflectivity decreases as the color darkens
- Shade cover over the pavement reduces the impact of cool pavements on temperature reduction



Cool Pavement Materials

- Various materials capable of reducing pavement temperatures
  - Concrete, High reflectivity aggregate in asphalt, Porous asphalt, Reflective coatings
- Los Angeles “CoolLA” projects
  - Pilot project at select locations in all 15 districts of Los Angeles, construction ongoing, 2017-present
  - Pilot uses the CoolSeal reflective coating over AC
  - Experimenting with other products

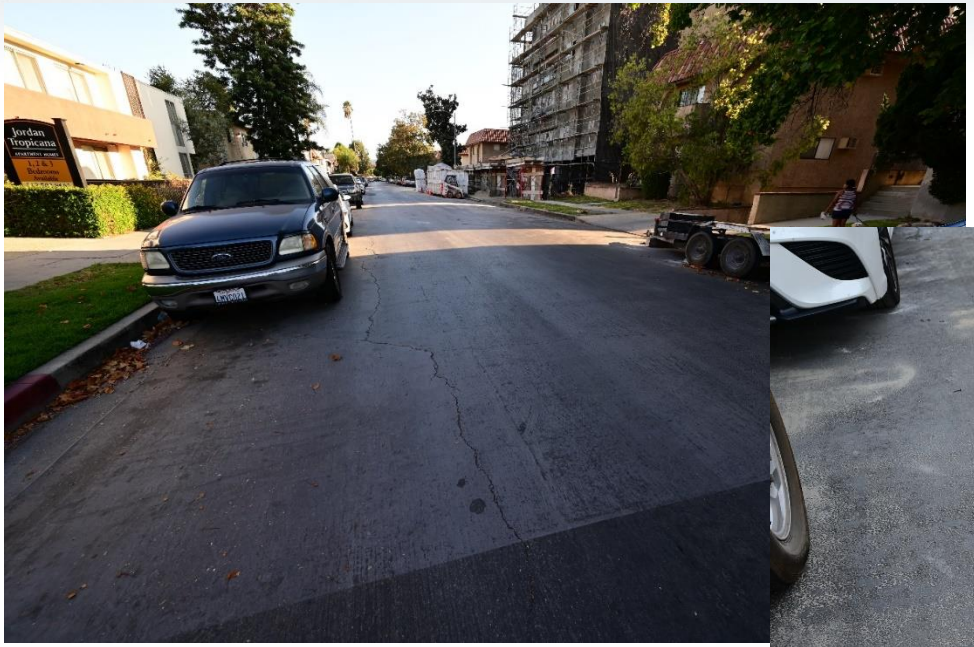
Negatives of Cool Pavement

- Loss of reflectivity over time
  - Long term effectiveness and maintenance needs are unknown
- Reflective coatings may cause glare
- Aesthetics
  - Visible wear and staining on travel path within a few months
  - Tire marks, oil, and cracks easily visible

Negatives of Cool Pavement

- Life span
  - Manufacturer claims a 7 year life span; No field data available at this time, but observations suggest 3-5 yrs.
- Cost
  - Roughly $110,000 per mile on top of any typical maintenance costs. Current cool pavement coatings provide little structural or maintenance benefit.
- Environmental Impact
  - Estimated carbon reductions may be offset by the impacts of production and installation.

Photos: Canoga Park



Coating Applied: May 2017
Photos Taken: September 2019

Photos: Beachy Ave

Coating Applied: June 2017

Photo Taken: September 2019

Photos: Selma Ave

Coating Applied: April 2018
Photos Taken: September 2019

Photos: Winnetka

Coating Applied: May 2019
Photos Taken: September 2019

Recommendations

- Current coatings are not ready
- Continue monitoring pilot projects and the development of materials
- Implement other cooling strategies:
  - Tree Canopy (UFMP)
  - Green Streets (EWMP)
  - Complete Streets