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 \((1.00 = \text{Fully reflected})\)

<table>
<thead>
<tr>
<th>Pavement Surface Type</th>
<th>Average Albedo</th>
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</thead>
<tbody>
<tr>
<td>Asphalt Concrete</td>
<td>0.10</td>
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<tr>
<td>Concrete Pavement</td>
<td>0.25</td>
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<tr>
<td>Asphalt Concrete with Reflective Coating</td>
<td>0.25</td>
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</tbody>
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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