Chip Seals in Chula Vista

One City’s Experience
Chula Vista Facts

- 2011 Population est.: 247,535

<table>
<thead>
<tr>
<th>Category</th>
<th>Sections</th>
<th>Centerline Miles</th>
<th>Lane Miles</th>
<th>PCI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arterials</td>
<td>186</td>
<td>58.25</td>
<td>287.37</td>
<td>82</td>
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<tr>
<td>Collectors</td>
<td>277</td>
<td>77.67</td>
<td>223.24</td>
<td>73</td>
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<td>Local</td>
<td>2521</td>
<td>316.41</td>
<td>642.45</td>
<td>73</td>
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<tr>
<td>Alleys</td>
<td>106</td>
<td>10.58</td>
<td>21.98</td>
<td>51</td>
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<tr>
<td>TOTAL</td>
<td>3090</td>
<td>462.91</td>
<td>1175.54</td>
<td>74</td>
</tr>
</tbody>
</table>
The Four Quadrants of Chula Vista

PCI MAP
2006 PCI / 2012 PCI* - AVERAGE BY AREA

Northwest
76 / 73
17% Miles < 50 PCI (2012)

Northeast
80 / 77
7% Miles < 50 PCI (2012)

Southwest
75 / 68
25% Miles < 50 PCI (2012)

Southeast
83 / 84
5% Miles < 50 PCI (2012)

*CPI as visually rated by Nichols Consulting Engineers in 2006 & 2012

Includes Alleys
Chula Vista Chip Seal Crew

- Annual cycle: from first Monday after July 4\textsuperscript{th} to Labor Day
- Crew then did crack filling on next year’s list
- Used 6000 gal of emulsion per day on 24,000 SY of pavement
- Chip sealing was main street treatment for both residential and collector/arterial streets
- Seven year cycle by neighborhood
- 3/8” or 5/16” aggregate used for chips
- Discontinued in FY1993-94: budget cuts
Chula Vista began to use the StreetSaver pavement management system (PMS) in 2006.

Citywide inspections done in 2006 and 2011, giving a Pavement Condition Index for each street.

The City generates a seal list and an overlay list annually using the PMS.

PMS emphasizes use of the most cost-effective treatments for the network, emphasizing preventive maintenance, not “worst first”.

Ideally, preventive maintenance (particularly seals) should be 30 to 40 percent of our pavement rehabilitation budget.
How StreetSaver Works

- One or more representative sample units per street, generally 1000 square feet each, is randomly selected.
- These units are visually inspected for various distresses, including alligator cracking, longitudinal cracking, weathering, rutting and utility patches.
- Distresses are measured by area or length as low, medium or high severity.
- The results are downloaded into StreetSaver, which then calculates the Pavement Condition Index (PCI) (0 to 100).
- A particular treatment is associated with a PCI range; ex. chip seals for 70 to 85, cape seals with digouts for 50 to 70.
- The software will recommend the best annual program of streets for a given budget.
How Seals Improve the PCI
Funding for Seal Programs

- **TransNet**: ½% Regional Sales Tax. Only 30% of total can be used for non-congestion relief projects, including seals. Total annual allocation: about $5 million. About half used for pavement.
- **Gasoline Sales Tax (Prop. 42)**: In the past, about $2 million per year. Now combined with Gasoline Excise Tax. Has fewer restrictions regarding pavement projects.
- **Gasoline Excise Tax**: About $4 million per year. Currently used mainly to pay for City crews.
Conventional Chip Seal Program

- Now used for arterials and collectors only
- 5/16” aggregate
- Emulsion: 0.25 to 0.30 gallons/SY, cationic
- Binder temp.: 150 to 180 degrees F
- After first sweeping, apply fog seal coat (SS-1h or CSS-1h) at 0.10 to 0.13 gallons/SY, then sand seal at 1 to 3 lbs./SY.
- Issues regarding resurfacing bike lanes
Specs for Polymer Modified Asphalt Surface Seal (PASS)

- Conforming to Section 37-1 of Caltrans Standard Specs
- Emulsion applied at a rate of 0.25 to 0.40 gallons per SY
- Applied at minimum temperature of 110 degrees F
- After application to road surface, the material shall be scrubbed with a scrub broom to force the emulsion sealer into the existing surface
- Bid Results (08/08): $0.32/SF for PASS vs. $0.30/SF for Conventional Chip Seal
Scrub Broom for PASS Application

We tried out the broom, but it moved the emulsion from high spots into low spots, creating pools. We told the contractor to stop using it. The first contract was otherwise successful.
PASS Chip Seal Photos: E. Naples
PASS Chip Seal Problems (3rd Contract)
CalRecycle Rubberized AC Grant Program

- Applied for and received both RAC Overlay and Rubberized Chip Seal Grants for $250,000 each in FY2010-11
- Needed to provide a list of streets we would include in the program
- Binder must have a minimum of 15% by weight of crumb rubber from CA tires
- For first time chip seal grant, reimbursement is $1.00/SY
- Minimum 35,000 SY for chip seal
Specs for Rubber Chip Seal

- Decided to specify terminal blend asphalt rubber binder.
- Used 2012 Caltrans specs and contractor info
- Aggregate before coating with asphalt: mostly between 12.5 mm (1/2”) and 4.75 mm (No. 4 sieve)
- Pavement surface at least 55 degrees F; air temperature between 60 and 109 degrees F.
- Binder applied between 0.38 and 0.60 gallons/SY at temperature of 320 to 340 degrees F.
- Fog and sand seal not included.
Before and After: Rubber Chip
Rubber Chip Seal Raveling/Stripping
Findings on Rubber Chip Seal

- Contractor needed to sweep the streets several times
- Stripping occurred at joints (lane lines)
- The spray truck has overlapping nozzles in the middle of the application bar, not on outer edge. The contractor suggested that they need to make sure that there is overlap in the next pass.
- Fog and sand seal is included in the next rubber chip contract
Cool Pavement

- Cool Pavement Study Completed and Presented to Council in October 2012
- Many strategies are most appropriate for new facilities and/or parking lots, such as porous pavements
- Most feasible methodology for existing road pavements seems to be chip seals with light-colored aggregate
Questions?

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