Cold In-Place Recycling In Sonoma County

Western States Regional In-Place Recycling Conference

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County of Sonoma
Department of Transportation and Public Works
Unincorporated Sonoma County

- 2,764 lane miles of roadway
- Average System PCI is 40
- Current funding levels are insufficient maintain PCI
- Established Primary Road system of 198 miles of high volume, regionally significant roads to focus federal funding
- The Community and Board recognize critical state of infrastructure
Primary Road System of Unincorporated Sonoma County
Approved by the Board of Supervisors, April 2012
Pavement Preservation

PMS Recommendations

Field Assessment

Right Road, Right time, Right Treatment
CIR Candidate

- Fatigue Cracking
- Large Thermal Cracking
- Surface Maintenance Not Effective
- Raveling, Potholes or Poor Ride Quality
Adobe Road Existing Road Conditions

ADT - 12,000

3”-6” of Existing AC

Average PCI = 45

Alligator Cracking

Grader Patch

Pothole Mix

Minor Hydraulic Issues
Project Alternatives

CIR Section

- 1.8" RHMA
- 3" - CIR

Traditional HMA Section

- 1.8" RHMA
- 1.8" HMA
- 1.2" - Leveling (HMA)
- Dig Outs
### Project Costs Analysis

#### Cold In Place Recycling Costs (as bid)

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Quant.</th>
<th>Unit Price</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIR Mix Design</td>
<td>LS</td>
<td>1</td>
<td>$10,000.00</td>
<td>$10,000</td>
</tr>
<tr>
<td>CIR</td>
<td>SF</td>
<td>342,025</td>
<td>$0.33</td>
<td>$112,868</td>
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<tr>
<td>Quality Control</td>
<td>LS</td>
<td>1</td>
<td>$13,000.00</td>
<td>$13,000</td>
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<tr>
<td>Emulsified Recycling Agent</td>
<td>Ton</td>
<td>184</td>
<td>$700.00</td>
<td>$128,800</td>
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<tr>
<td>Cement Additive</td>
<td>Ton</td>
<td>57</td>
<td>$260.00</td>
<td>$14,820</td>
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<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td>$279,488</td>
</tr>
</tbody>
</table>

Cost per Sq. Ft. $0.82
Cost per Sq. Yd. $7.35

#### Traditional HMA Project Alternative (estimated)

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Quant.</th>
<th>Unit Price</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remove and Replace</td>
<td>CY</td>
<td>325</td>
<td>$425.00</td>
<td>$138,125</td>
</tr>
<tr>
<td>3/8 Leveling Course (.10 ft.)</td>
<td>Ton</td>
<td>2,565</td>
<td>$108.00</td>
<td>$277,020</td>
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<tr>
<td>1/2&quot; HMA (.15 ft.)</td>
<td>Ton</td>
<td>3,848</td>
<td>$100.00</td>
<td>$384,800</td>
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<td><strong>Total</strong></td>
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<td>$799,945</td>
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</table>

Cost per Sq. Ft. $2.34
Cost per Sq. Yd. $21.05
Adobe Road GHG Reduction

- Adobe Road - 4.4 Lane Miles
- CIR replaced approximately 6,500 tons of new AC
- Adobe Road GHG reduction
  - 88 lbs CO2 reduction per Ton of AC replaced
  - 572,000 lbs CO2
  - *(the equivalent of about 48 cars removed from Sonoma County roads)*
Two Unit CIR Train
Typical Pickup Machine
Placement and Laydown

Paver equipped with grade control can smooth out profile and reestablish cross slope
Compaction 25 Ton Pneumatic

Break down and Finish Roller with Steel Vibratory
Construction Issues

Trees

Intersections

Trains !
Construction Issues

Dealing with Thin Section
Add RAP!

Enthusiastic equipment operators
Construction Issues

It never rains in California!
Construction Issues

CIR will find your lost valve boxes!
Construction Issues

Make sure to provide for soft spots in bid items
Construction Issues

The CIR mat is tender until it cures

But tougher than you might think!
Wearing Course

- 0.15 ft. of RHMA-G (Gap Graded)
Benefits of Cold-In Place Recycling

- Reduces the Consumption of Natural Resources – uses our urban quarry!
- Reduces Energy Consumption
- Reduces GHG Emissions
- Reduces Truck Traffic
- Reduces Project Impacts for Users and Environment
Challenges

- Organizational
  - Internal resistance
  - Not invented here
  - Departmental Silos

- Public
  - Fix the worst first
  - That road’s not broken!
  - Managing expectations

- Contractors
  - Contractor Experience
  - CIR as Sub vs. as CIR Prime
Tough Choices...

Status Quo?

Alternative Surfaces?
Conclusions

- New financial reality – Managing Less with Less
- Need to respond by using cost effective processes to maintain our transportation systems
- Pavement Preservation Approach
  - Cost 5 to 10 times less
  - 40% to 60% savings by reusing in-place materials
- Develop and maintain relationships with major funding decision makers
True sustainability means not only seeking new ideas, but searching for innovative alternatives to existing methods.

Thank you!