

Cold In-Place Recycling In Sonoma County

Western States Regional In-Place Recycling Conference



U.S. Department of Transportation
Federal Highway Administration



Stephen B. Urbanek, P.E.

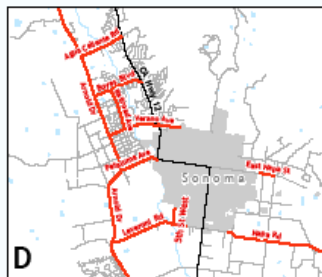
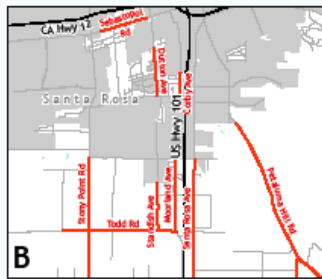
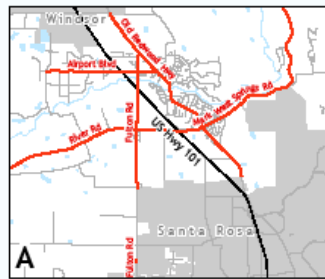
**County of Sonoma
Department of Transportation and Public Works**

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

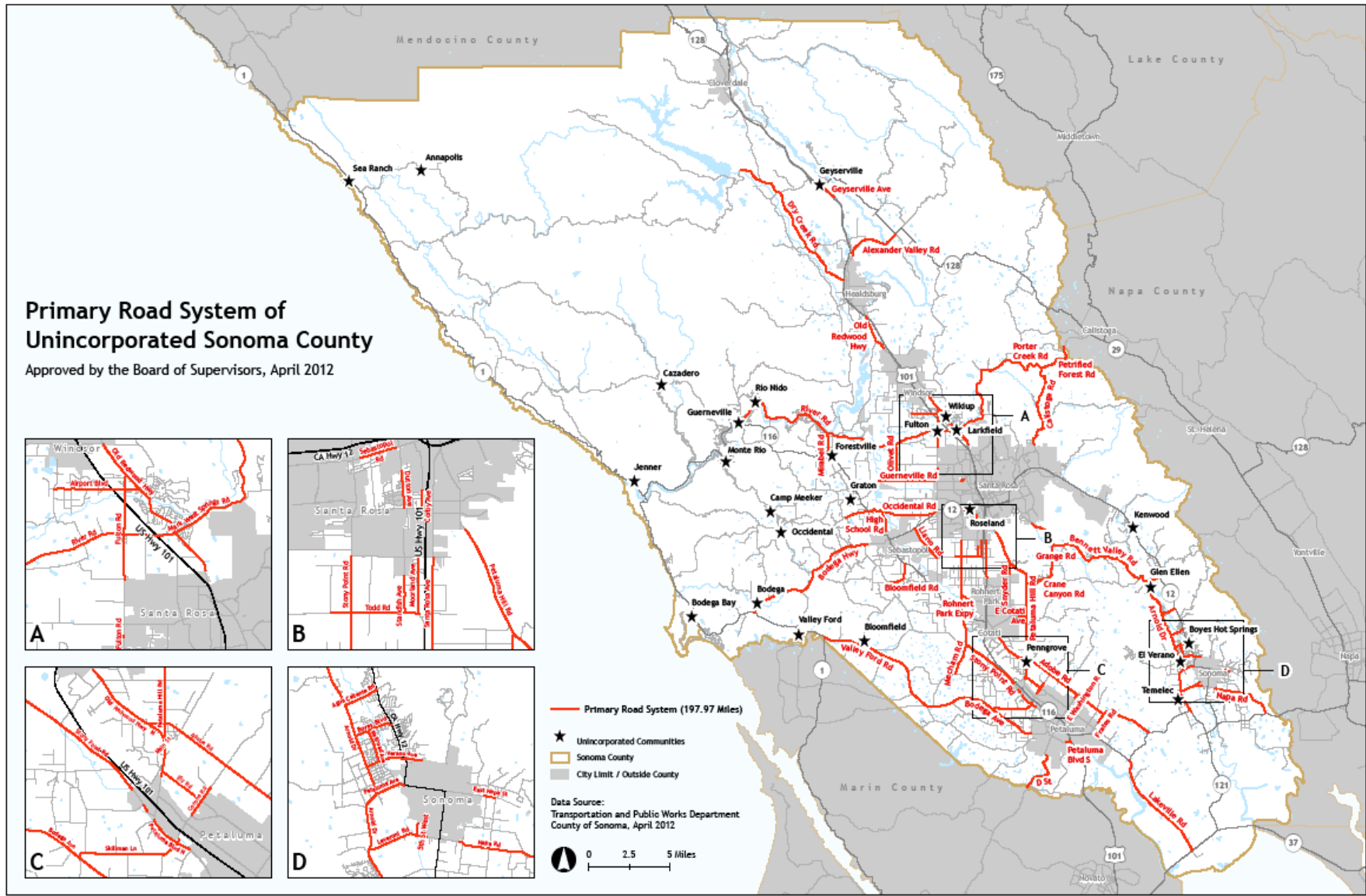
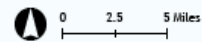
Approved by the Board of Supervisors, April 2012



— Primary Road System (197.97 Miles)

- ★ Unincorporated Communities
- Sonoma County
- City Limit / Outside County

Data Source:
Transportation and Public Works Department
County of Sonoma, April 2012

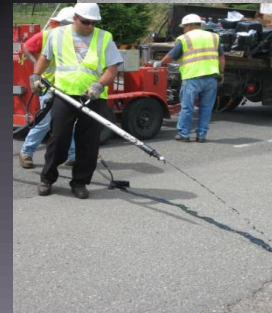


Pavement Preservation

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

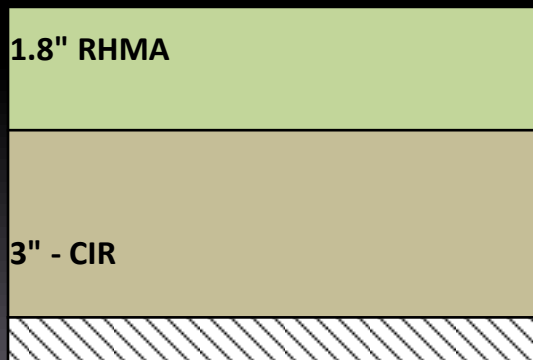
Pothole Mix

Minor Hydraulic Issues

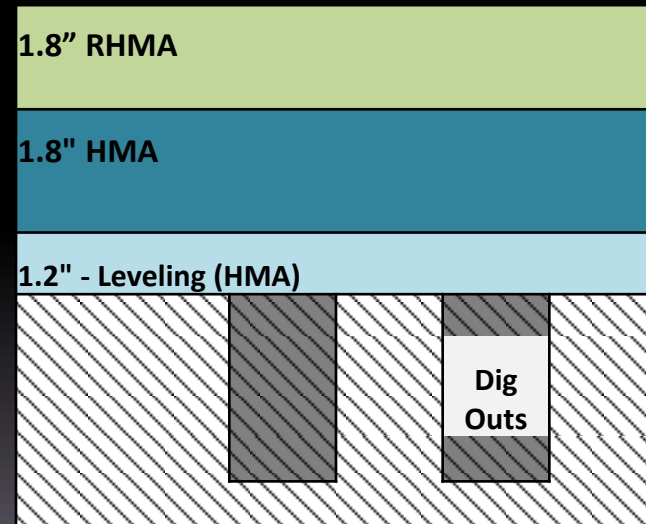


Project Alternatives

CIR Section



Traditional HMA Section



Project Costs Analysis

Cold In Place Recycling Costs (as bid)

Item	Unit	Quant.	Unit Price	Total
CIR Mix Design	LS	1	\$ 10,000.00	\$ 10,000
CIR	SF	342,025	\$ 0.33	\$ 112,868
Quality Control	LS	1	\$ 13,000.00	\$ 13,000
Emulsified Recycling Agent	Ton	184	\$ 700.00	\$ 128,800
Cement Additive	Ton	57	\$ 260.00	\$ 14,820
Total				\$ 279,488
Cost per Sq. Ft.				\$ 0.82
Cost per Sq. Yd.				\$ 7.35

Project Cost savings using CIR is approximately \$118,000 per lane mile over traditional HMA approach

Traditional HMA Project Alternative (estimated)

Item	Unit	Quant.	Unit Price	Total
Remove and Replace	CY	325	\$ 425.00	\$ 138,125
3/8 Leveling Course (.10 ft.)	Ton	2,565	\$ 108.00	\$ 277,020
1/2" HMA (.15 ft.)	Ton	3,848	\$ 100.00	\$ 384,800
Total				\$ 799,945
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



Trains !

Intersections



Construction Issues



Enthusiastic equipment operators

Dealing with Thin Section

Add RAP!



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!