CLIMATE INITIATIVE COLD IN PLACE RECYCLING WORKSHOP
2012

Cold-in-Place Recycling
Los Angeles County’s’s Experience

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Version 3.1
4th generation PMS
Oracle database platform
The County’s Green Approach

Key Elements:

1) Pavement Preservation- “Good Roads first”

2) Use recycled materials

3) Utilize in-place materials
Cape Seals: 140 lane miles
Micro-surfacing: 13 lane miles
Slurry Seals: 166 lane miles
Chip Seals: 90 lane miles
Bonded Wearing Course: 50 lane miles

460 lane miles of roads preserved
(Contract Cost: $20.4 million)
Microsurfacing on Scrub Seal
Piuma Road, Et al
2: Use Recycled Materials

- Rubberized Asphalt Concrete (RAC)
- Reclaimed Asphalt Pavement (RAP)
- Crushed Miscellaneous Base (CMB)
Rubberized Asphalt Concrete (RAC)

- Used in early 1990’s
- County DPW placed over 700,000 tons of RAC
- Diverted into 1.5 million scrap tires from landfills (Recycles 2000 tires/lane mile)
- Long term performance (40-60% longer)
- Little or no maintenance
- High durability, skid, less rutting, and shoving
- Effective against reflective cracking
- Noise reduction
“Asphalt Rubber uses approximately 2000 tires per lane mile on a 2 inch overlay”
RAP SLURRY
3: Utilize In-place Materials

- Cold In Place Recycling (CIR)
- Cold Central Plant Recycling (CCPR)
- Full Depth Reclamation
- Soil Stabilization
Benefits of In-place Materials

- Up to 50% less than traditional methods
- 90% reduction in construction truck traffic
- Shorter construction working days
- Reduced construction impacts to the public and environment
Angeles Forest Highway
6 miles – Cold-In- Place Recycling (CIR)

- **Rural Major Collector:**
  Best described mountain rural road.
  Passing through the protected Angeles National Forest. Distance and environmental impacts must be carefully considered.

- **Length:** 26 miles (6.0 miles of CIR)
- **Width:** 26 - 48 feet
- **Average Pavement Condition Index (PCI):** 47
  Minimum: 31 (64% of total area)
  Maximum: 69 (36% of total area)

**Predominant Distress:**
- Severe to moderate alligator cracking (45-60%),
- Moderate longitudinal and transverse cracking (30%-60%)
Angeles Forest Highway 
6 miles – Cold-In-Place Recycling (CIR)

- **Traffic Index (10 yr):** 8.0
- **Existing AC Thickness:** 3.5” – 5”
- **Subgrade:** Gravelly Sandy Soil (CBR: 50-70)
- **FWD 80% Deflection (mils):**
  - Before: 34
  - After: 25 (26% reduction)
- **Contract Cost:** $1.9M
  - 3” CIR = $6/sy (3” AC base is $14/sy)

43% Cost Savings!
Angeles Forest Highway – Before (Average PCI=47)
Angeles Forest Highway
After PCI = 100
Angeles Forest Highway - After
Upper Big Tujunga Canyon Road
4 miles – Cold-In- Place Recycling (CIR)

- **Rural Major Collector:** Rural Mountain Road. Passing through the protected Angeles National Forest, distance and environmental impacts must be carefully considered.

- **Length:** 9.1 miles (4.0 miles of CIR)

- **Width:** 24-36 feet

- **Average Pavement Condition Index (PCI) prior to chip seal:** 58

- **Predominant Distress:** severe to moderate moderate longitudinal and transverse cracking
Traffic Index (10 yr): 5.5

Existing AC Thickness: 3"

Subgrade: Gravelly Sandy Soil (CBR: 50-70)

Contract Cost:
3” CIR = $6/sy (3” AC base is $14/sy)  
Microsurfacing = $0.25/sf
Upper Big Tujunga Cyn Rd - After

PCI = 100
Conclusions

- Changing the philosophy from “worst first” to “pavement preservation” was foremost in modifying the way we managed our network and prioritized our road projects.

- Going Green is not only Good for the environment, but it is also Cost Effective:
  - Pavements preservation treatments cost 5 to 10 times less
  - RAC lasts 40-60% longer
  - 40% savings can be achieved by reusing in-place materials

Utilization of a robust and reliable pavement management system is a pre-requisite to a pavement preservation and sustainable program.
Thank you!