PAVEMENT MANAGEMENT & USING RECYCLED RUBBER TIRES IN PAVING

GREENROADS WORKSHOP

Presented by: Margot Yapp, P.E.
What is Pavement Management?

- A decision-making tool to answer questions:
  - What do I have? What condition is it in?
  - What repair strategies should I select? Are they working?
  - How much money do I need?
  - When should I spend it?
  - What if ....???
What do I Have/Condition?

- **Inventory**
  - How many miles? How old?
  - Functional classes? Federal aid eligible?
  - Bus or truck routes?

- **Condition**
  - Collect pavement distress data
  - Measure “health” of network
Typical Pavement Distresses

- Alligator cracking
- Block cracking
- Distortions
- Longitudinal or transverse cracking
- Patches
- Rutting
- Weathering & raveling
Pavement Preservation Strategies

- Philosophy - keep good roads good!
- Examples of typical strategies
  - Rubber modified chip and cape seals
  - ARAM
  - Rubberized AC
Rubberized Chip Seals

- **Definition**
  - Application of asphalt, rubber and aggregate chips rolled onto the pavement

- **Purpose**
  - Seal the surface of a pavement with non load-associated cracks
  - Improve surface friction
  - Wearing course
Rubberized Chip Seals

- **Pros:**
  - Equipment is common
  - Can quickly open to low-speed traffic

- **Cons:**
  - Application process needs attention
  - Requires frequent adjustments on application rates, chip loss, bleeding etc.
  - Windshield damage
  - Dust problems
Cape Seals

- **Definition**
  - Combines chip seal and slurry seal (or microsurfacing) to form a single, more durable surface

- **Purpose**
  - Retard reflection cracking
  - Durability against snowplow blades
  - Improve surface friction
Pros:
- Increases the life of a chip seal by enhancing binding of the chips and by protecting the surface.
- Cape seal surface does not have any loose aggregate and creates a dense mat.

Cons:
- Requires both chip-seal and slurry-seal equipment.
- The construction process is longer than either a chip-seal or a slurry-seal treatment.
Asphalt Rubber Aggregate Membrane (ARAM)

- 3/8” asphalt rubber membrane made out of asphalt cement & crumb rubber

Pros
- Extended service life
- Reduced reflection cracking
- Different application alternatives
  - Cape seal
  - Interlayer between pavement layers (retards reflection cracking)

Cons
- High temperature application
- High initial cost

http://www.westernpma.org/
Rubberized Asphalt Concrete (RAC)

- **Pros**
  - Resistance to reflective cracking
  - Higher thickness equivalency than HMA for reflective crack retardation (Caltrans)
  - Environmentally friendly

- **Cons**
  - Higher cost (average 18%)
  - Rutting concerns (Max thickness limited to 0.20 foot)
  - Temperature sensitive
HMA vs. RAC

Dense graded

Gap or open-graded
Does Rubber Really Help Performance?

- Find out using your pavement management system to:
  - Monitor performance
  - Establish custom performance curves
  - Determine cost-effectiveness
PMS Software in California (by City)

92% of total local road miles are included in a PMS

- StreetSaver: 39%
- MicroPaver: 18%
- Cartegraph: 15%
- Other: 4%
- No PMS: 24%
First, Record Construction Activity

- Identify types of treatments
- Identify streets and locations of work
- Enter into PMS regularly (e.g. quarterly)
- Determine changes in pavement condition
Performance Curves Tell the Story

Conventional HMA

RAC?
Second, Add Rubber Treatments to PMS

- M&R decision tree must have treatments identified
- Make sure it’s in the right treatment for the right street
- Need unit costs
Third, Develop Work Plan

- Determine paving budget
- Perform budgetary analyses
- Fine-tune and develop work plan
- Re-inspect periodically after construction
Questions?

Contact
Margot Yapp, P.E.
Vice President
Nichols Consulting Engineers, Chtd.
myapp@ncenet.com