



PAVEMENT MANAGEMENT & USING RECYCLED RUBBER TIRES IN PAVING

GREENROADS WORKSHOP



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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?

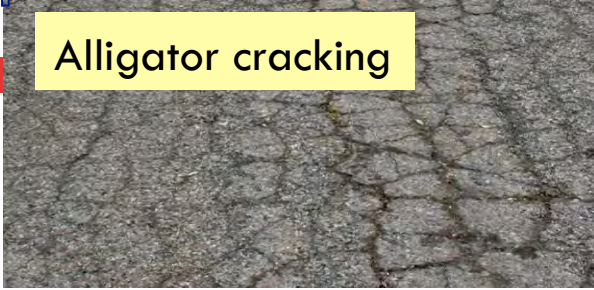
- ❑ Inventory
 - ▣ How many miles? How old?
 - ▣ Functional classes? Federal aid eligible?
 - ▣ Bus or truck routes?
- ❑ Condition
 - ▣ Collect pavement distress data
 - ▣ Measure “health” of network



Typical Pavement Distresses

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Alligator cracking



Patches



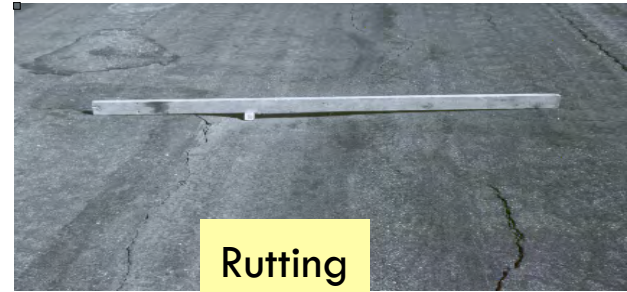
Block cracking



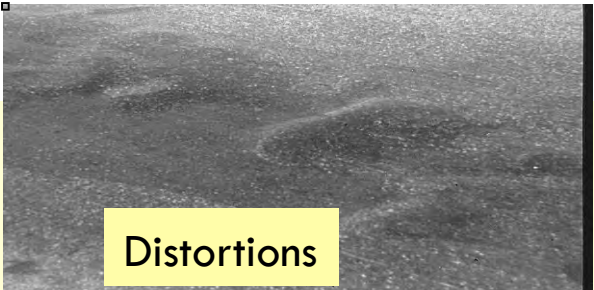
Longitudinal or
transverse
cracking



Rutting



Distortions



Weathering & raveling



Pavement Preservation Strategies

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

▣ Slurry Seal



▣ Chip Seal



Rubberized Chip Seals

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□ 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

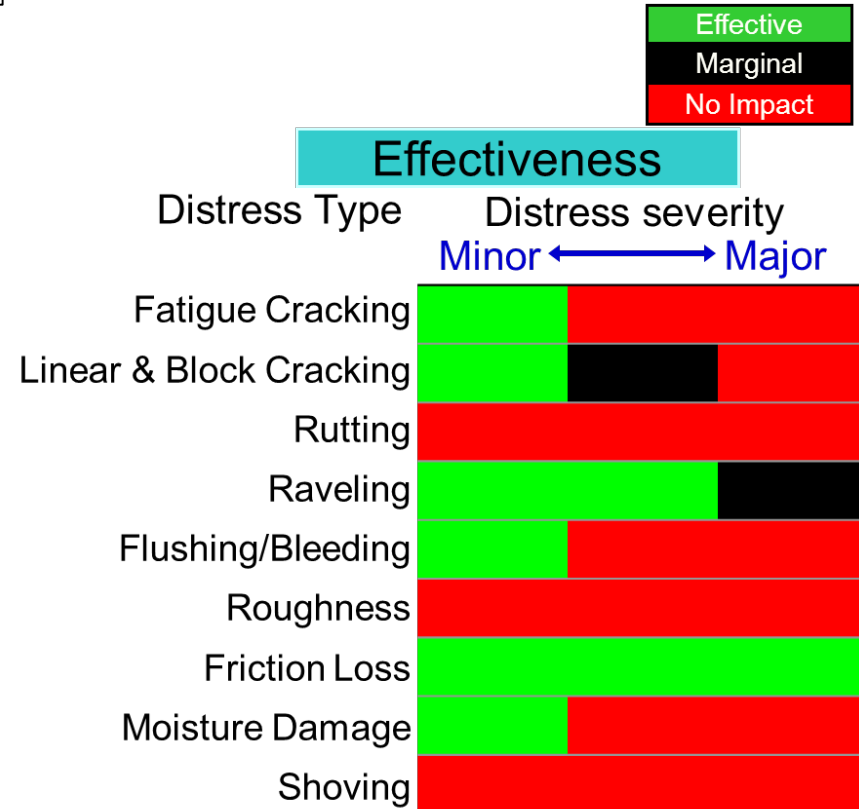
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□ Pros:

- ▣ Equipment is common
- ▣ Can quickly open to low-speed traffic

□ Cons:

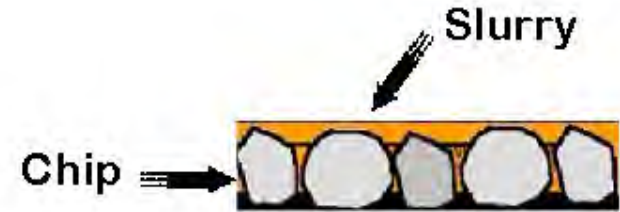
- ▣ Application process needs attention
- ▣ Requires frequent adjustments on application rates, chip loss, bleeding etc.
- ▣ Windshield damage
- ▣ Dust problems



Cape Seals

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- 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



Cape Seals

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□ 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

□

Effective

Marginal

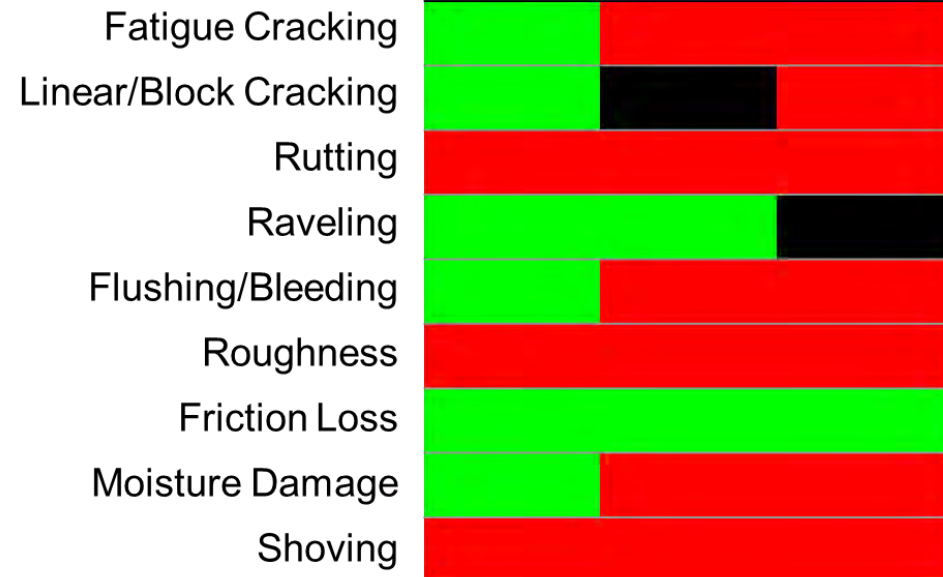
No Impact

Effectiveness

Distress Type

Distress severity

Minor ↔ Major



Asphalt Rubber Aggregate Membrane (ARAM)

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- ❑ 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



Rubberized Asphalt Concrete (RAC)

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□ 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

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Does Rubber *Really* Help Performance?

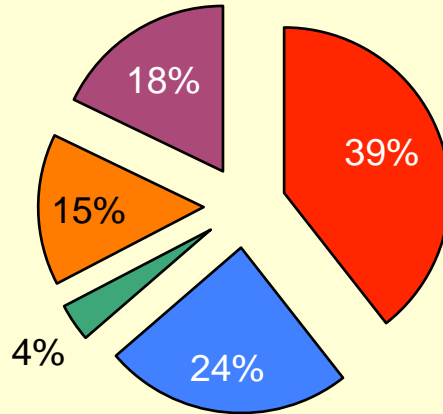
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- ❑ Find out using your pavement management system to:
 - ▣ Monitor performance
 - ▣ Establish custom performance curves
 - ▣ Determine cost-effectiveness



PMS Software in California (by City)

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

- StreetSaver
- MicroPaver
- Cartegraph
- Other
- No PMS

First, Record Construction Activity

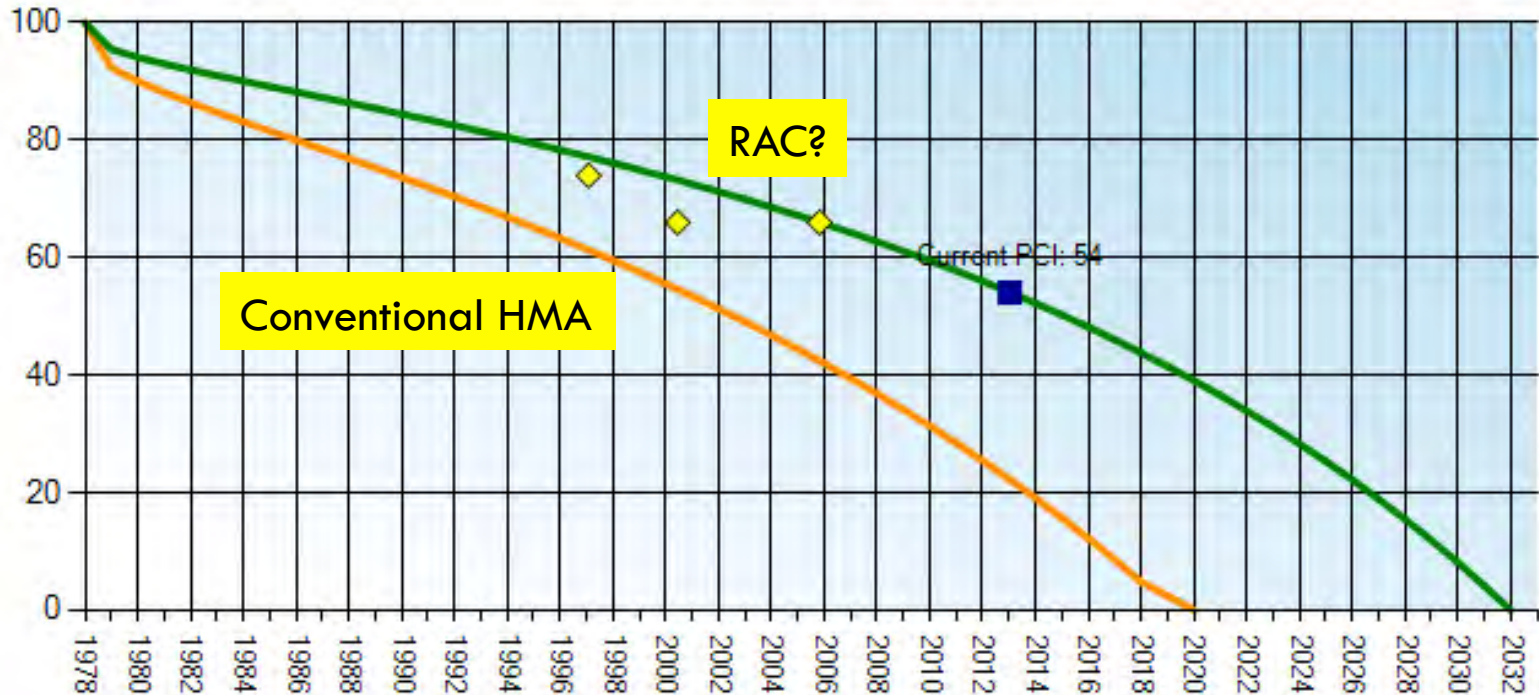
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- Identify types of treatments
- Identify streets and locations of work
- Enter into PMS regularly (e.g. quarterly)
- Determine changes in pavement condition

Maintenance & Rehabilitation History						
Maintenance Date	Treatment	Thickness	Area	Cost	New PCI	Old PCI
8/1/1996	SHALLOW PATCH	0	0	\$0	64	57
9/1/1997	THIN OVERLAY w/FABRIC	4	0	\$0	100	61

Performance Curves Tell the Story

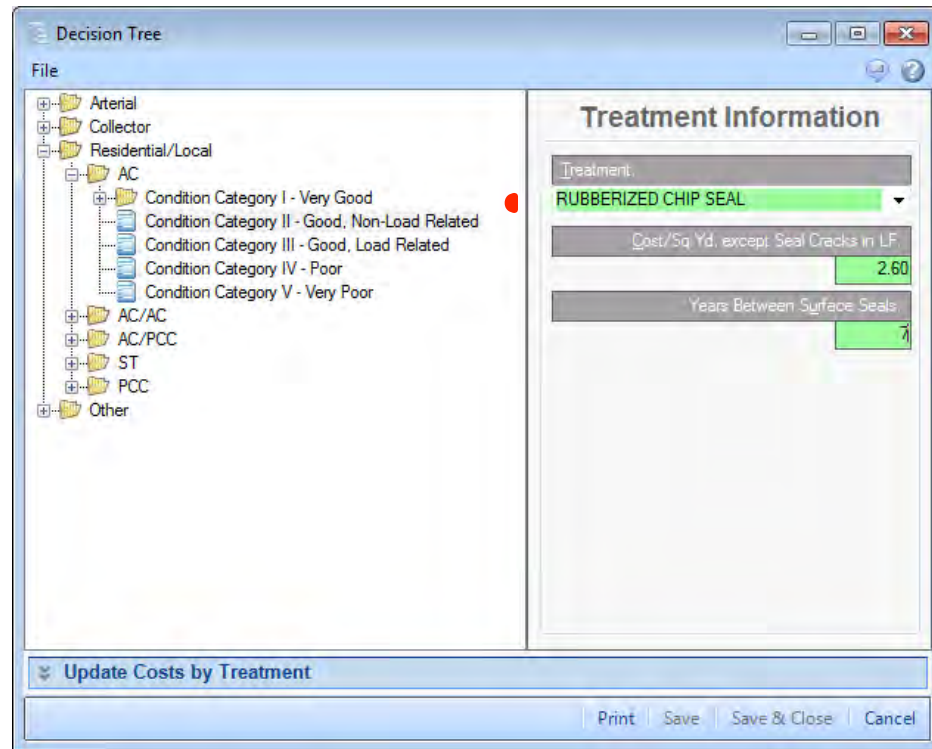
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Second, Add Rubber Treatments to PMS

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- ❑ 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

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



Questions?

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