



Scrub Seals

Doug Olsen

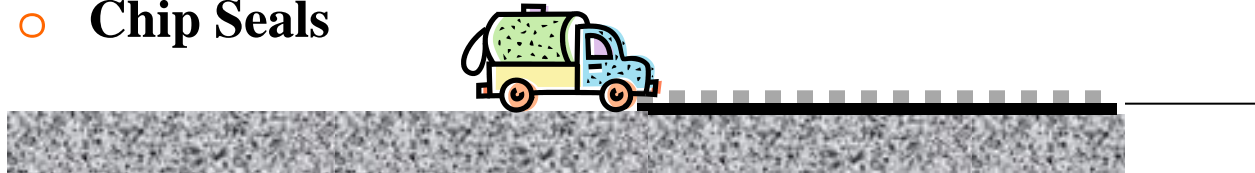
Terminology



- **Scrub Seals**



- **Chip Seals**



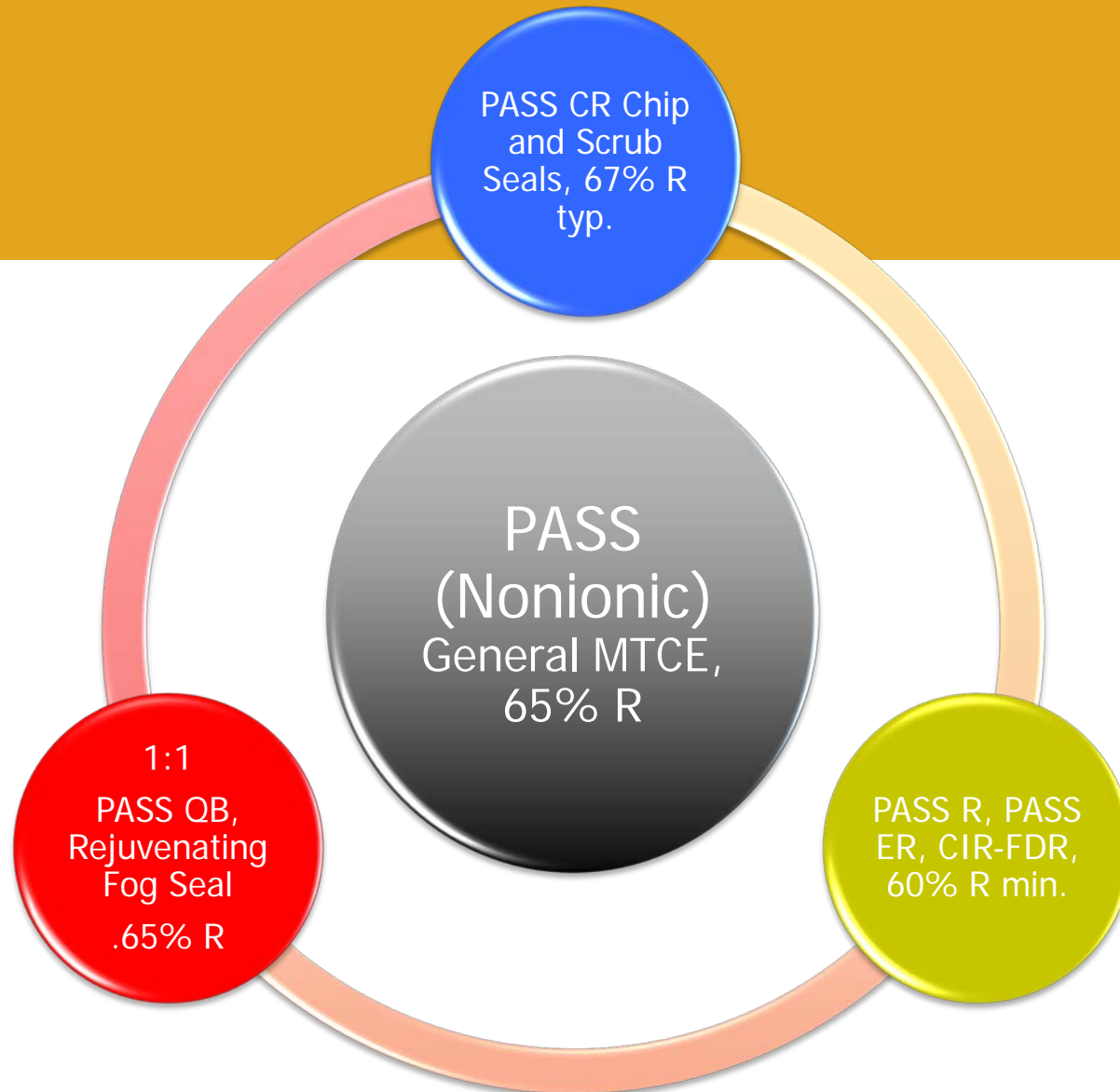
What is PASS ?

PASS is a Polymer Asphalt Surface Sealer used as a binder for aggregate chips while also sealing cracks in distressed pavements.

It contains.

- Asphalt
- Gilsonite
- Solvent-free rejuvenating agent (15%)
- High-quality emulsifier
 - (The emulsifier is changed to facilitate the end use)
- Tough Polychloroprene Polymer (3.5%) PA-AS-1

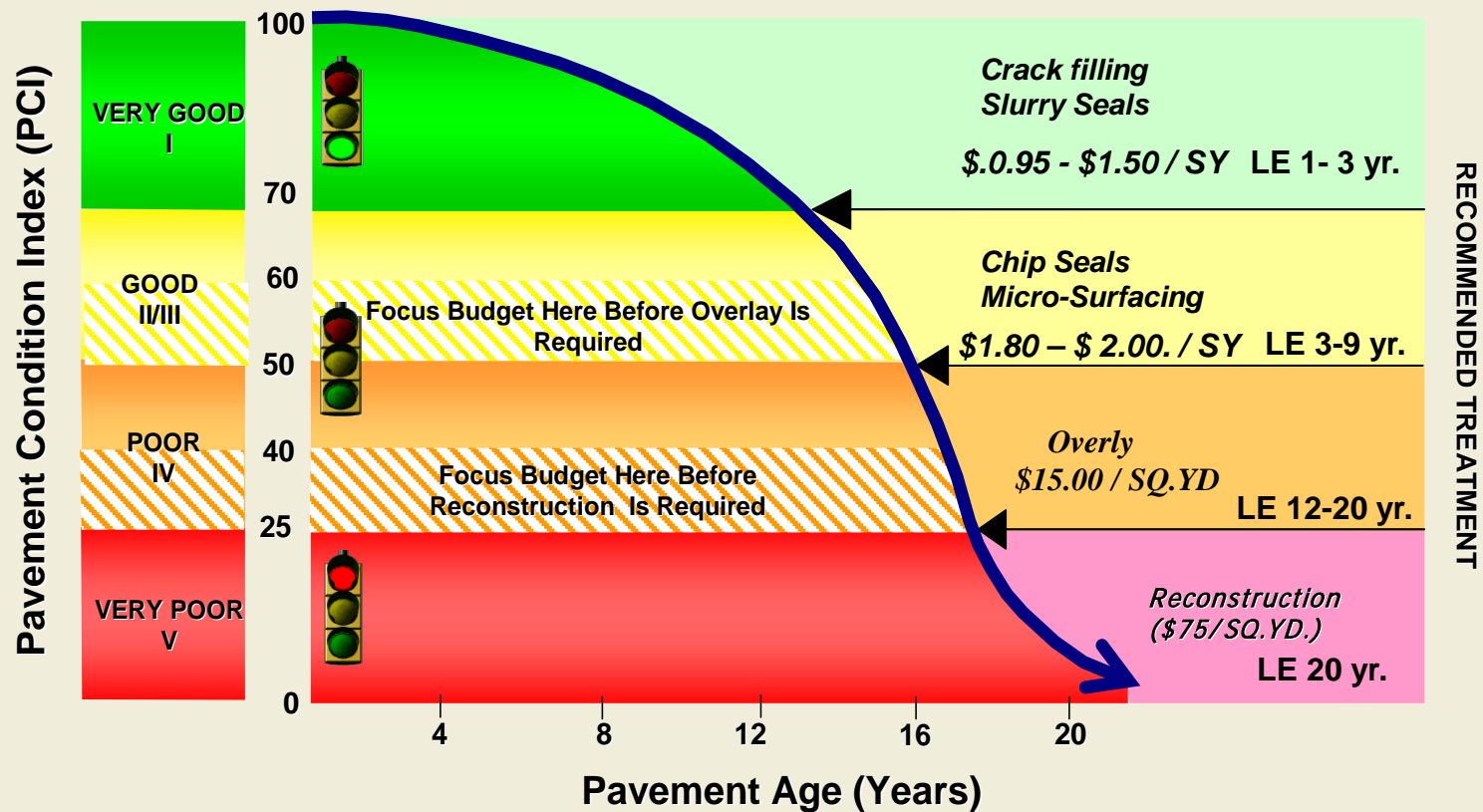
The PASS Family and Evolution



The Concept of Pavement Preservation

Traditional Approach

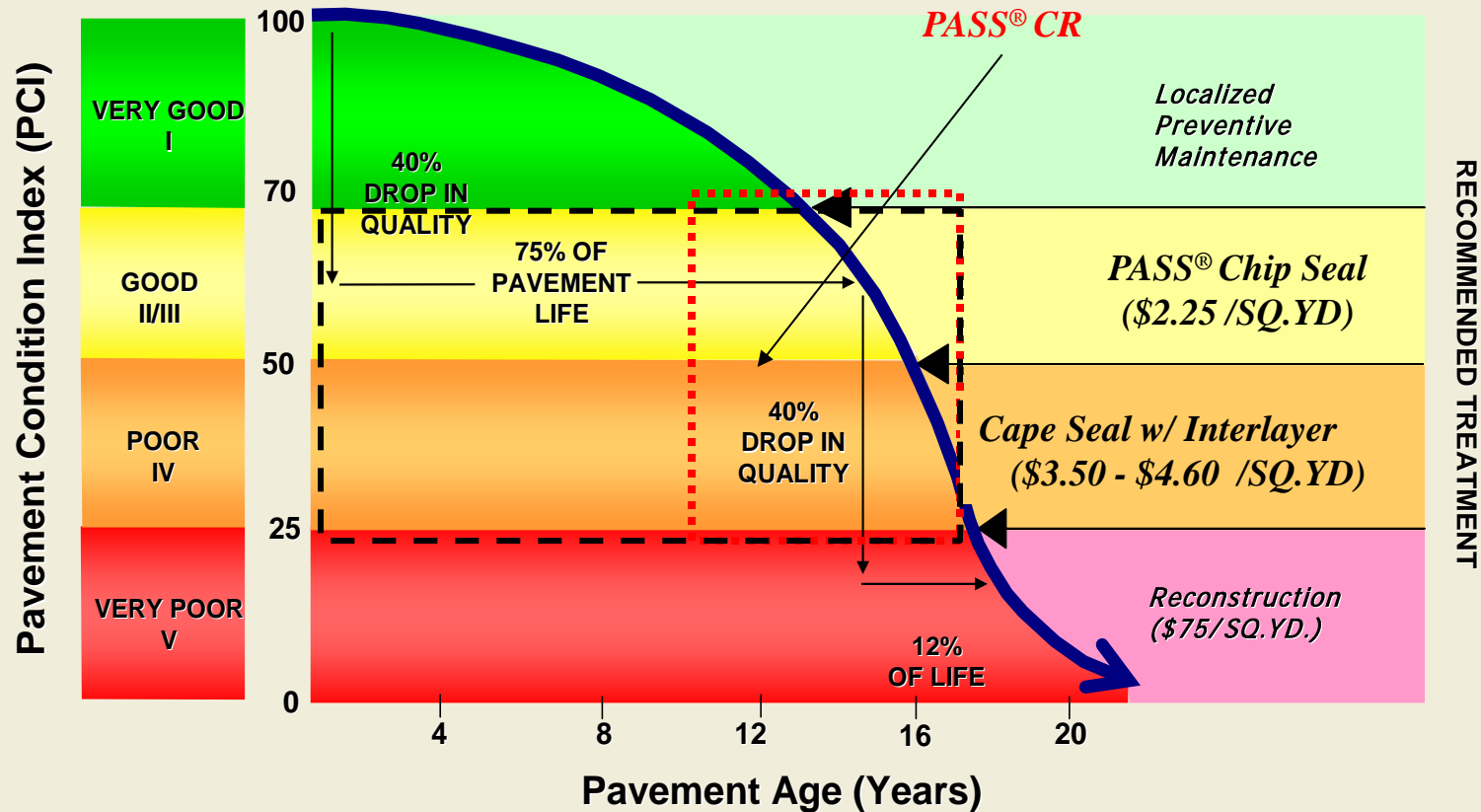
APPROACH - CATCH STREETS BEFORE THEY FAIL



PASS[®] MAXX CR- Chip Seals, Scrub Seals / Cape Seals

The Concept of Pavement Preservation Using PASS[®]

PAY NOW....OR PAY MUCH MORE LATER



Product Advantages: Compared to standard Emulsions

- ❑ **No Crack Filling is Required**

- ❑ **Can be applied at both low and high Temperature.**
 - **(40° F - 125° F)**

- ❑ **High Flexibility (3.5 % Polymer)**

- ❑ **Will work with dirty chips**

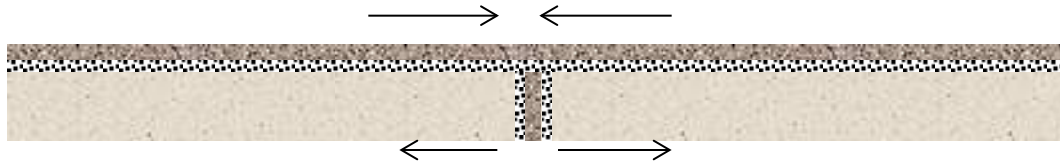


How does PASS Work

Mechanics

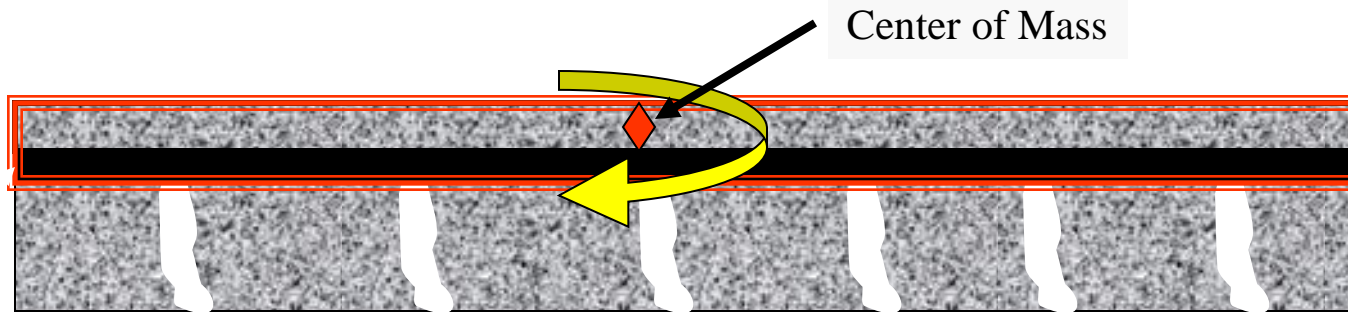


Zero Flexural Strength



The rejuvenator penetrates, rejuvenates and anneals to develop a permanent bond on the surface and on the walls of the crack.. The end result is the reconstruction of a structural beam able to withstand flexural loading.

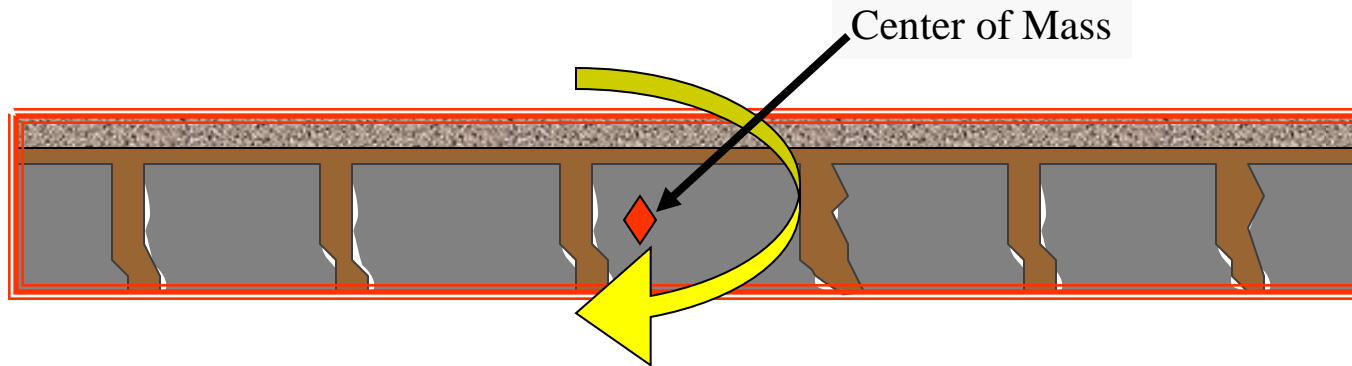
Comparing Treatment Alternatives



System boundary in red

Bridging Systems

Hot Rubber Chip and Fabric

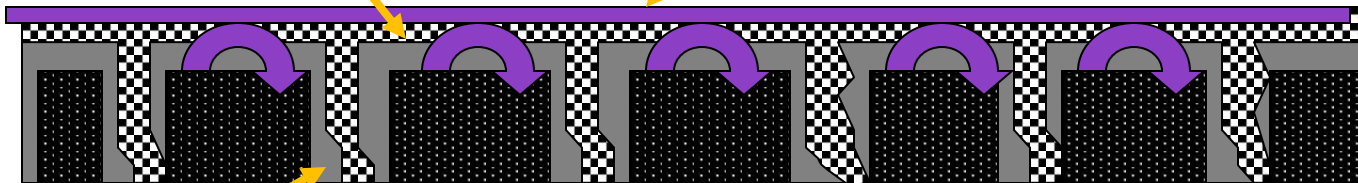


PASS[®] System

Polymer Mechanics

Chip and Asphalt

Polymer works independently to force the rejuvenator into the pavement



Rejuvenator

Rejuvenator in simple terms works independently to work on aged asphalt. If the rejuvenator breaks down the polymer two things happen:

- The polymer steals the rejuvenator and therefore no replacement of maltene's to aged and distressed asphalt.
- Become sticky and gooey.



Scrub Seals



Prospective Scrub Seal Candidates

- **Alligator Cracks**



- **Block Cracking**



- **Raveling**



- **Open Graded**



Prospective Seal Candidates

- ❑ **Some minor distress**
- ❑ **Aged AC or heavy oxidation**
- ❑ **Climatic conditions**
 - ❖ **In some geographical locations it is difficult to meet temperature requirements for standard emulsions.**



NOTE: Limitations

Structural failures need to be identified and repaired prior to application.



Application Steps

for

Scrub Seals

Set up **Traffic** Control



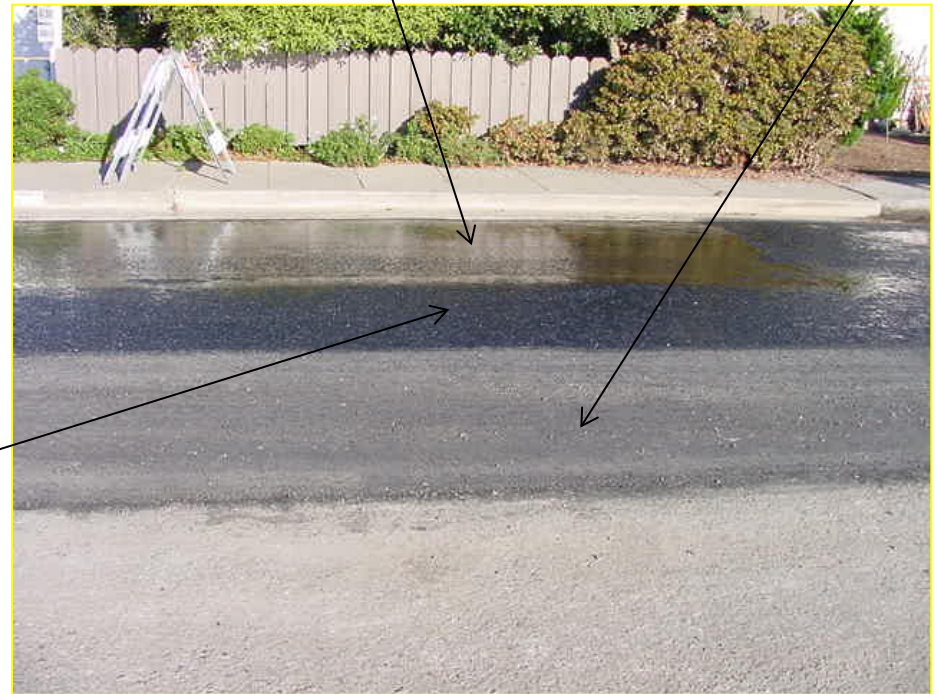
Sweep and Clean the Pavement Surface



Apply Fog Seal to all new patches < 3months old prior to sealing

New Patch without Seal

2nd application @ .30 gal / sy = total of .60 gals / sy



1st application @ .30 gal / sy

Apply and Scrub the Emulsion

- ❑ The size of the emulsion wave is a function of the number and severity of cracks.
- ❑ Application rates for PASS MAXX CR Scrub or Chip Seals are generally 10% lower than standard Emulsions.
- ❑ Scrub Seals generally require a higher application to afford the opportunity for the broom to build a wave of emulsion which is used to fill the voids of the distress.
- ❑ For roadways that are not distressed the broom is eliminated.



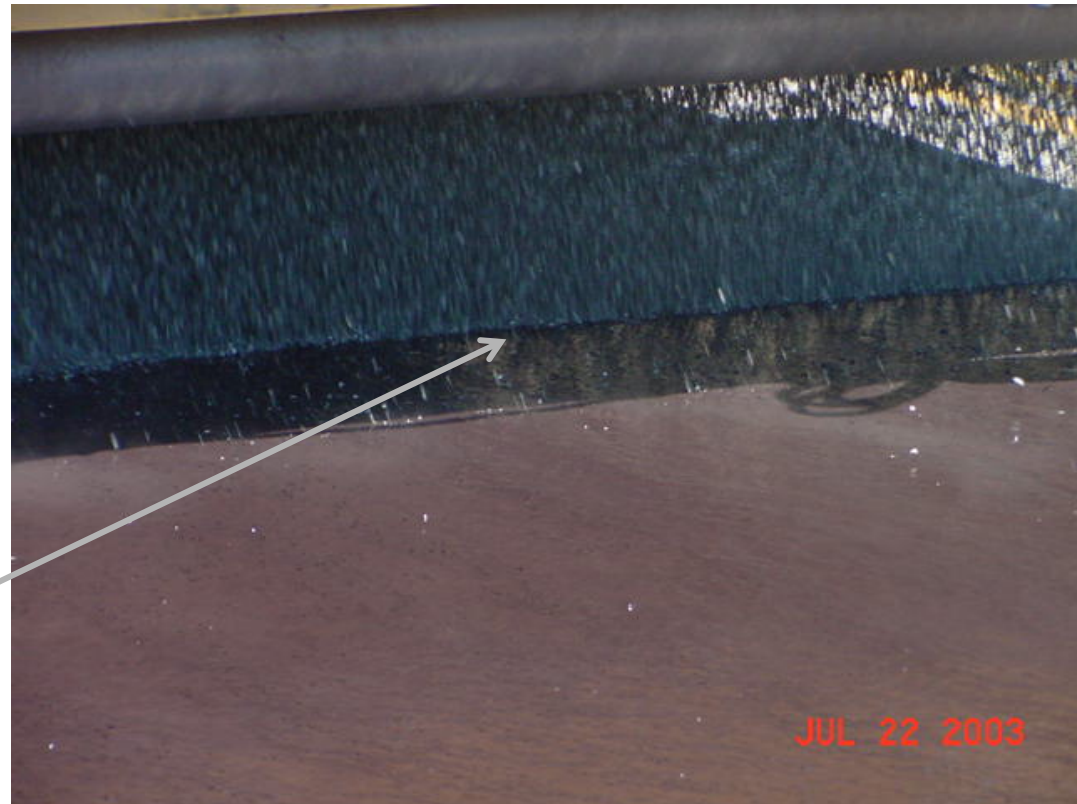
Broom dynamics



Apply the chips

Maximum chip retention is accomplished when the mean diameter chip is embedded 50-70%.

Another way to determine if chip embedment is going to be accomplished is to look for a small wave being pushed by the chips as they are applied.



Roll to set the chips

- Use Pneumatic tire rollers.
- Offset the rollers.
- Start at centerline and work toward shoulder.
- Roll 3 times.



Sweep up excess Chips

Consider:

- Re-claiming chips
- Broom efficiency
- Environmental requirements



Pick-Up Broom



Kick Broom

Open to Traffic



Some agencies prefer to fog seal chip seals or scrub seals after completion.

Benefits:

- Better chip retention**
- Provides good background for delineation**

“Re-Cap” of the Scrub Seal

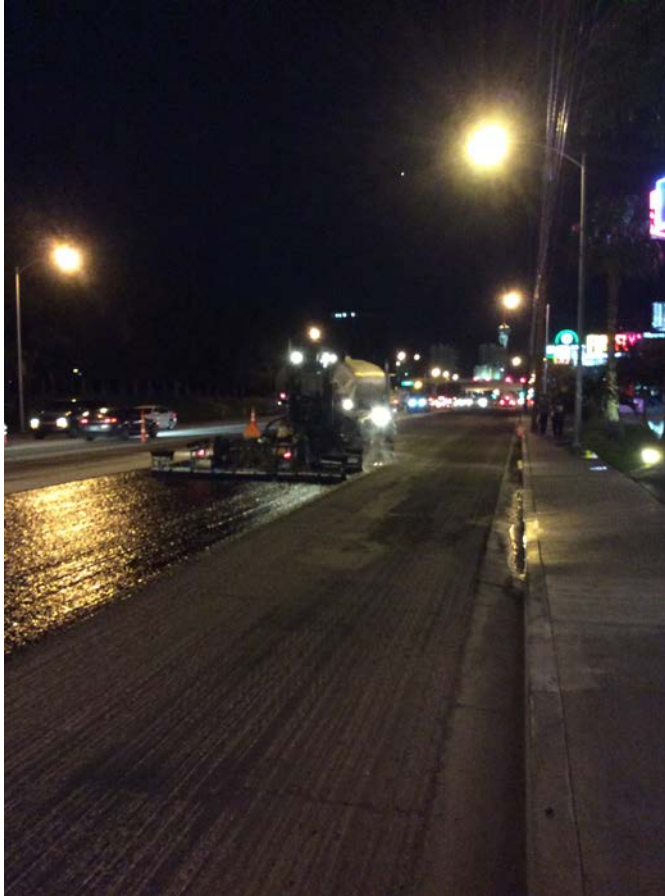


Scrub Seal placed as an Interlayer



- Emulsion rate was .33 gal. / SY
- Chip size 3/8"
- Chip application rate 23 lbs./SY

Scrub Seal placed as an Interlayer

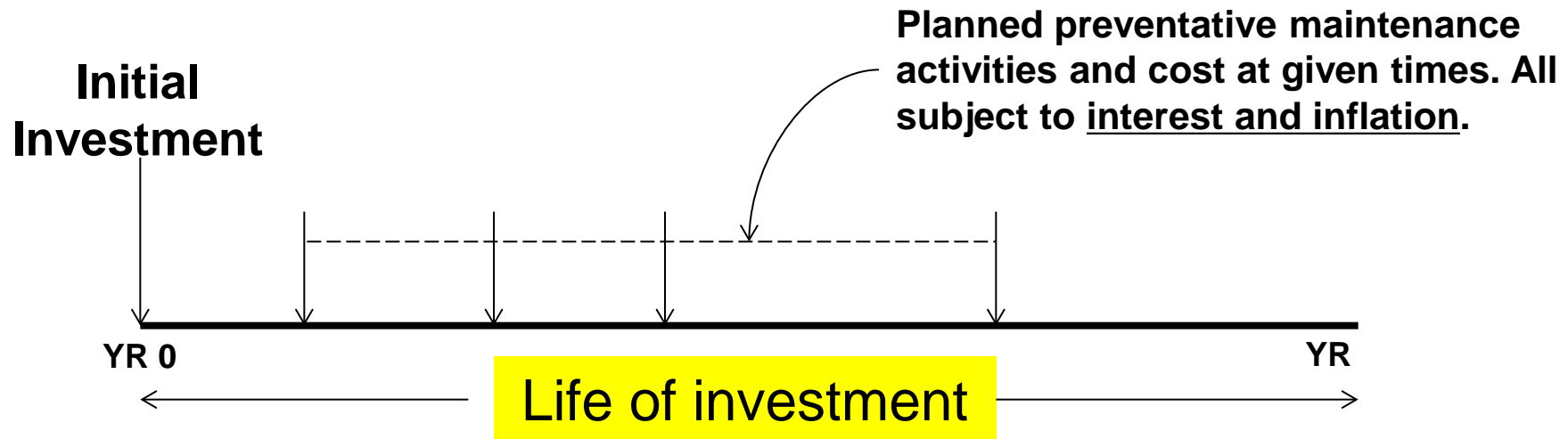


- Emulsion rate was .25 gal. / SY
- Chip size 1/4"
- Chip application rate 15 lbs./SY

A.C. Leveling Coarse Applied



Using Life Cycle Cost to evaluate and compare different Strategies



Given all cost over the life of the asset alternatives can be compared in today's cost. NPV = \$ / SY

<http://www.westernemulsions.com/savings-and-roi.php>

NDOT

Cal Trans

TXDOT

ADOT

ODOT

NMDOT

