

ASPHALT SPECIALISTS



Multi Layer Pavement Preservation

Standard or advanced technologies used together for better performance, longer life and to address roads in poor shape



What is a Road?

A road is a load bearing structure for the purpose of allowing the conveyance of people, animals and vehicles

Once it is built it starts to deteriorate and needs to be maintained.

The overall structure of the road is very slow to deteriorate



Why Asphalt?



Why Asphalt?

What is its purpose?

Waterproofing

Dust Abatement

Aggregate Durability

Widely available

Non-hazardous, benign

Strength – it is part of a structural system



Three Forms of Asphalt

Asphalt Cement

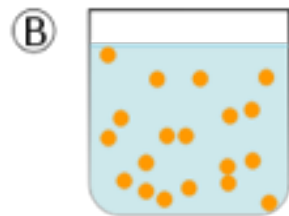
Cutback

Emulsion

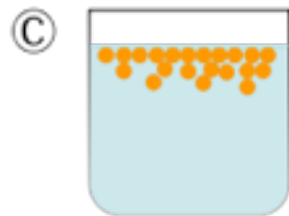




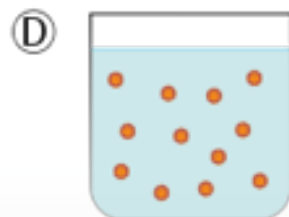
Two Immiscible Liquids



Unstable Emulsion



Separation begins



Stabilized with an emulsifier



Asphalt Emulsion



Three Forms of Energy

Mechanical
Thermal
Chemical



The Good Road

- **Safe**
- **Quiet**
- **Smooth**
- **Black**
- **Crack Free**
- **Skid Resistant**
- **Affordable**
- **Sustainable**
- **Durable**

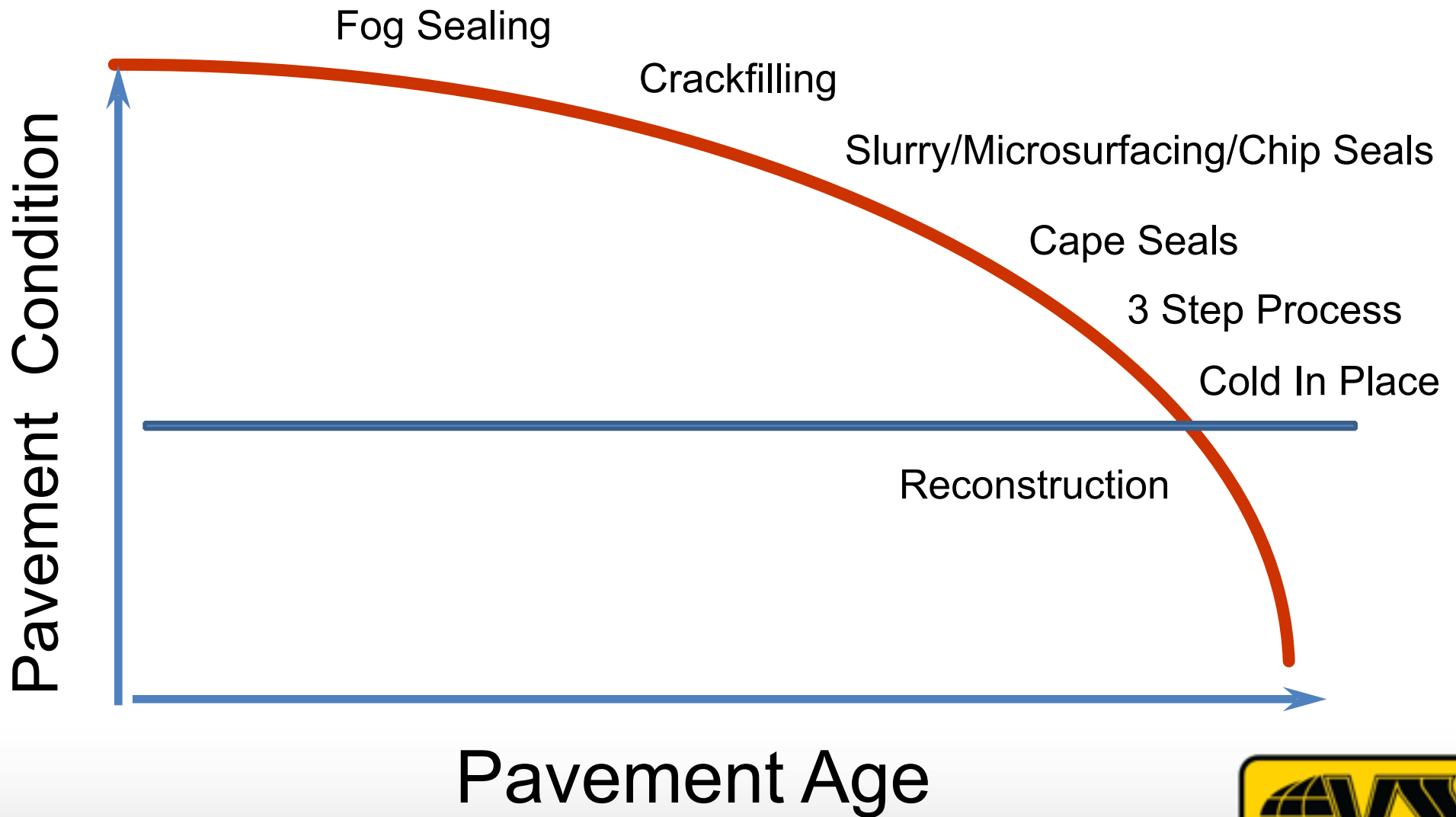


Great Mysteries...

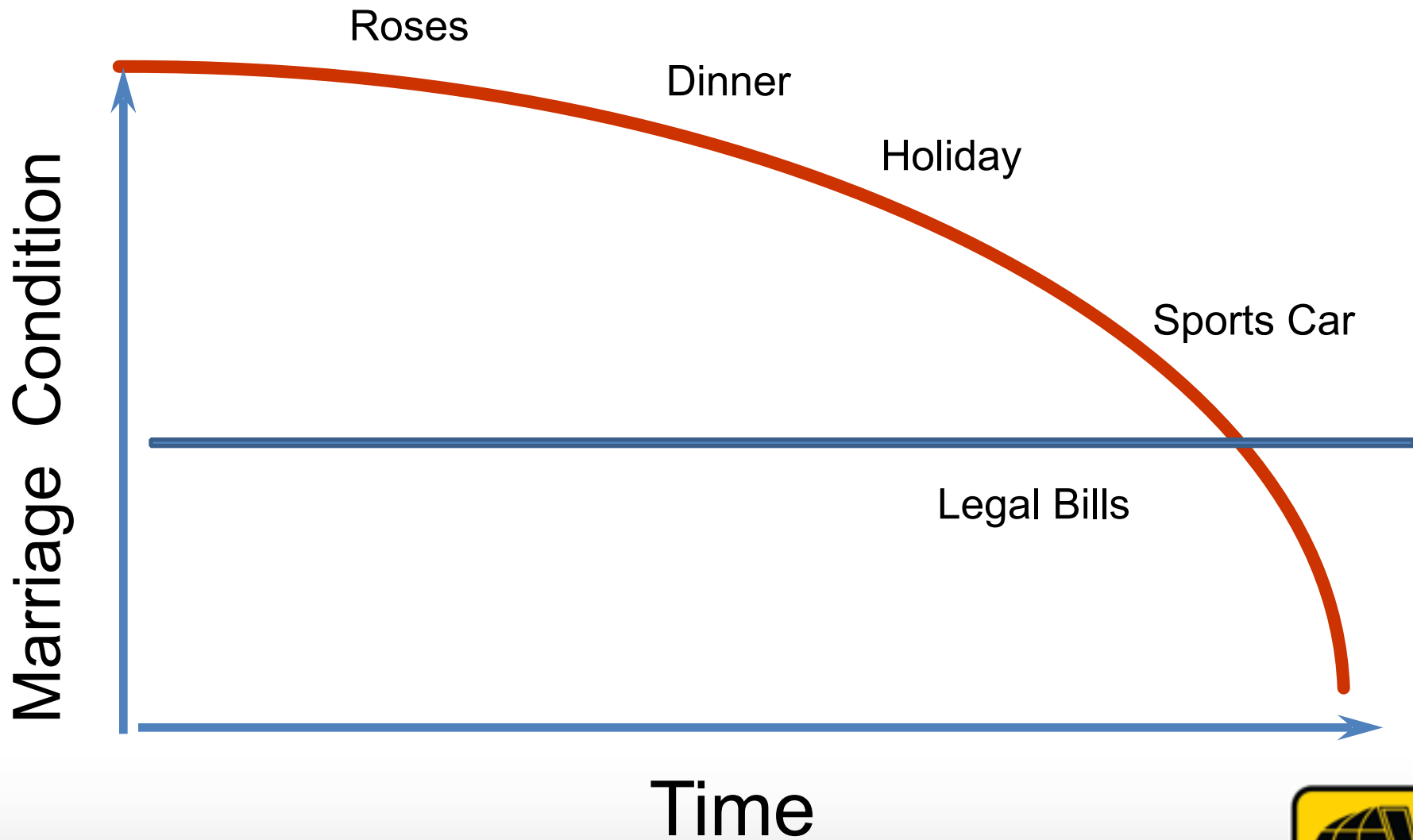
- How long will it last?
 - Its 2 years old, you can't tell me its going to last 7 years.
 - Its lasted 7 years, you can't tell me its going to last 8 years.
- It might have worked in ID, OR, TX, CA, NV, SK, AB, MB it wont' work here... because its too wet, too cold, too hot, too snowy...



Surface Treatments Moving Along the Curve



Marriage Condition Moving Along The Curve





Material Use Comparison

Technology	lb/sq yd Aggregate	tons/mile Aggregate	Gal/sq yd Binder	Equipment
3/8 " Chip Seal	23	148	0.21	Oil Spreader, Chip Spreader, 3 Rollers, One Chip truck per 10 tons of chip (10+), 3 - 5 sweepers
1/2" AR Chip Seal	30	193	0.60	Oil Spreader, Chip Spreader, 3 Rollers, One Chip truck per 10 tons of chip (10+), 3 - 5 sweepers
Type II Microsurfacing	18	116	0.21	3 Micropaver units, roller (optional), sweeper (optional)
2" HMA Overlay	205	1,317	1.43	Paver, 3 rollers, one HMA truck per 10 tons of HMA

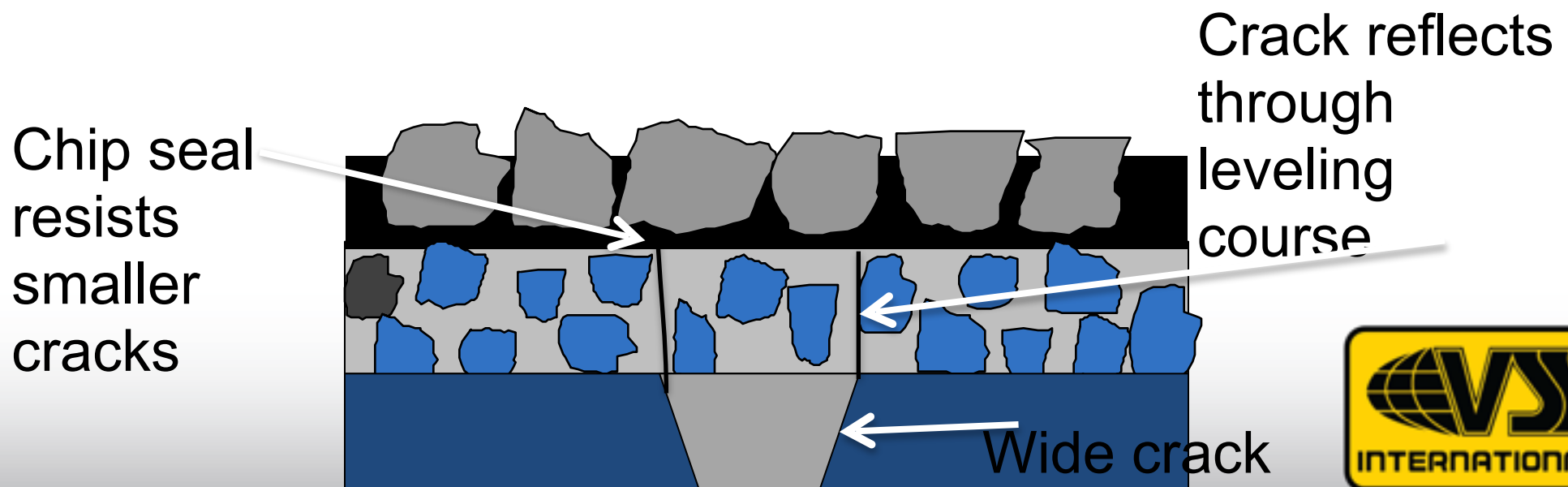


Composite Strategies

Slurry/micro - leveling course covers/fills the large cracks

Chip seal - resists reflective cracking from smaller cracks

Slurry/micro – wearing course, ascthetics and smoothness



AR Cape Seal Watsonville, CA - Before (2004)



City of Watsonville, CA - After (2009)



Richardson Ave NEB – Pre-Construction – Sept. 2005



Richardson Ave NEB – Multi-Layer– Dec. 2009



Richardson Ave NEB – Multi Layer May 2014



Micro Surfacing as a Mass Crack Filler



Cape Seal – First Layer (Binder Application)



Cape Seal – First Layer (Aggregate Application)



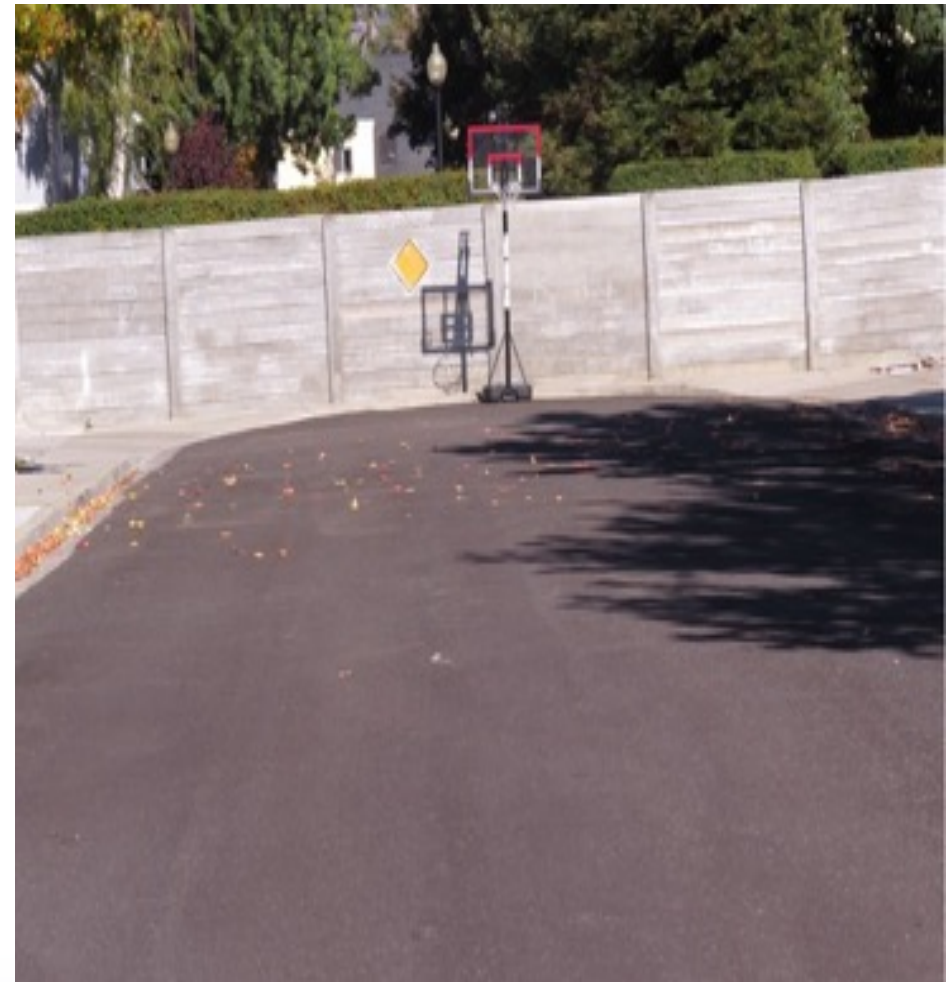
Cape Seal – Second Layer (Type II Slurry Seal)

Chip Seal

Slurry immediately after application



Fremont – 2014 Asphalt Rubber Cape Seal







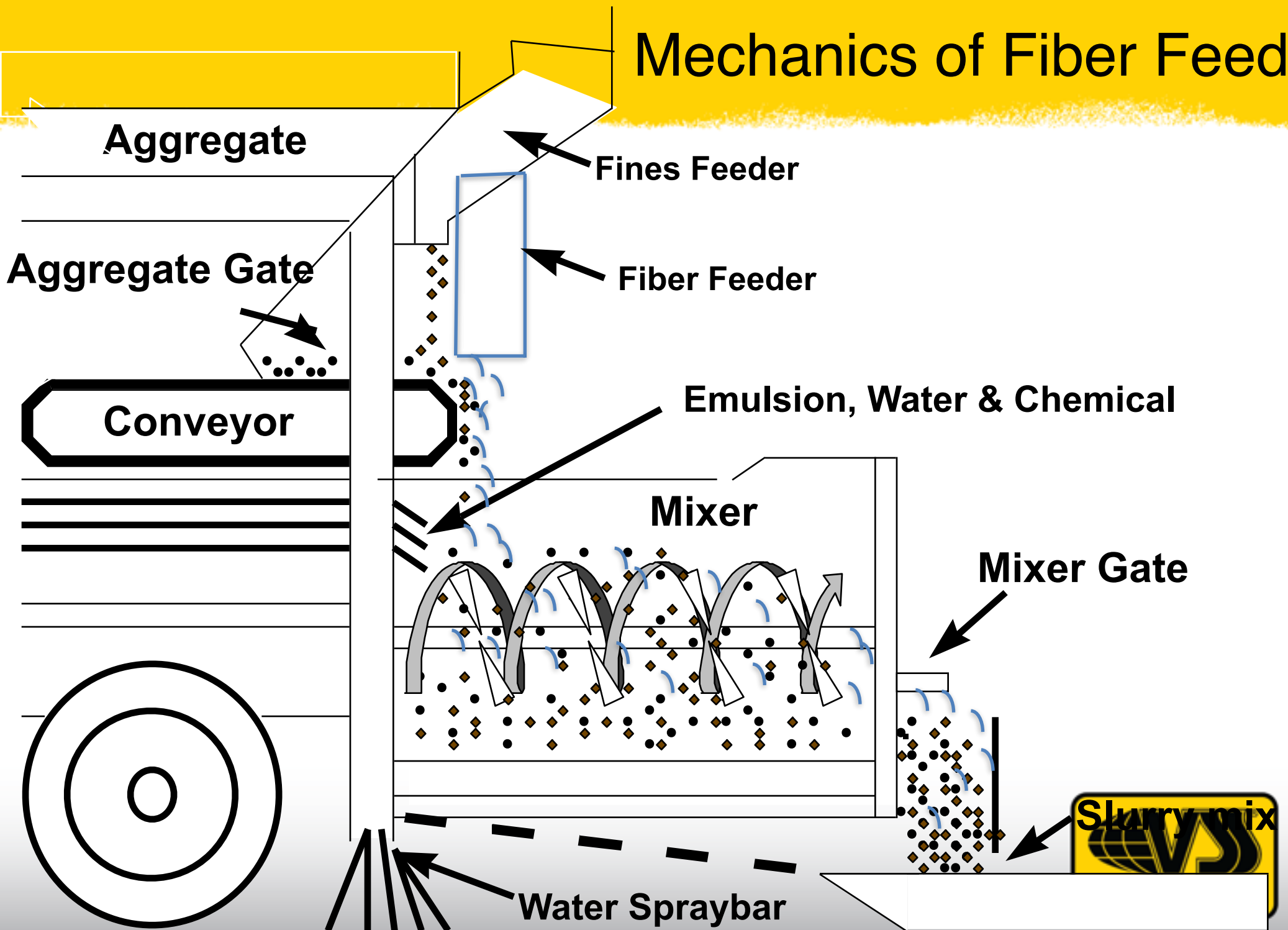
Fremont – October 2014



Fiber Modified Slurry Seal - Hillsborough, OR



Mechanics of Fiber Feed



Two Step Fiber Slurry in Lompoc, CA

Step 1: Apply Type III Slurry Seal with fiber reinforcement



Existing roadway conditions exhibit severe alligator cracking



Step 2: Apply Type II Slurry Seal with fiber reinforcement



Pocatello, ID - 2011



Before



Pocatello, ID - 2011



After



Pocatello | May 2013

2 Years Later



Martinez, CA | Nov. 2013 | Double Fiber Micro

Name	Begin Location	End Location	PCI	Length	Width	Area (SF)
<i>Arnold Dr.</i>	<i>Pacheco</i>	<i>Starflower (E)</i>	51	<i>930</i>	<i>37</i>	<i>34,410</i>
<i>Arnold Dr.</i>	<i>Starflower (E)</i>	<i>170 ft. W/O Starflower (W)</i>	56	<i>1,840</i>	<i>47</i>	<i>85,480</i>
<i>Arnold Dr.</i>	<i>170 ft. W/O Starflower (W)</i>	<i>845 ft. W/O Starflower (W)</i>	49	<i>675</i>	<i>37</i>	<i>24,975</i>
<i>Arnold Dr.</i>	<i>845 ft. W/O Starflower (W)</i>	<i>Glacier</i>	59	<i>240</i>	<i>37</i>	<i>8,880</i>
<i>Gilrix Dr.</i>	<i>Morello</i>	<i>Escondido</i>	33	<i>1,075</i>	<i>33</i>	<i>35,475</i>

From City of Martinez PMS report



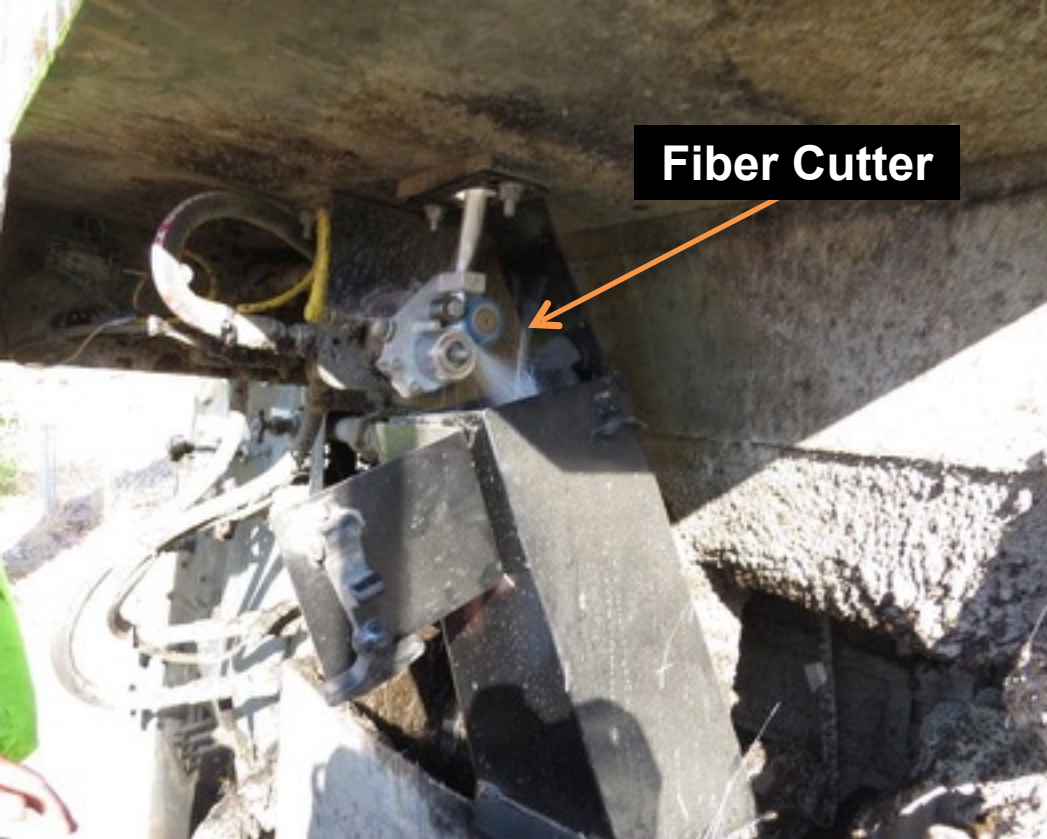
Arnold Drive I Martinez Oct 2013



PCI : 51

Arnold Drive I Layer 1 : Type III Fiber Micro





Fiber Cutter



**Shooter to
Macro Box**



Arnold Drive – Martinez Nov 2014



Gilrix – Martinez Oct 2013



Gilrix – Martinez Nov 2014



Gilrix Dr | Martinez, CA | Layer 1 | Type III Fiber Slurry



12% Emulsion Content | 32-35 lbs. Aggregate | 3 lbs. Fiber/Ton of Aggregate

Martinez

Step 1. Type III Micro Surfacing
with Fiber

Some cracks routed and blown
Some patching done
Pneumatic Roller

30 – 35 lbs per square yard
0.15% fiber

Step II Type II Micro
Surfacing with Fiber

15 lbs per square yard
.075 % Fiber



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Pavement Preservation Performance

Performance is a function of

- Starting Conditions
- Materials
 - ***What***
 - ***How much***
- Workmanship
- Technology Used





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