

**Increase the life of your  
asphalt by 30+ years!**

**2024 TEAM Conference**

**April 13-15, 2024**

**Branson, Missouri**

**Brett Gaither**

**IT'S NOT YOUR FAULT**

**IT'S YOUR ASPHALT!**

**Here's What You Can Do About it.**



# WHY ARE U.S. ROADS SO BAD?



It's not your grandfather's hot-mix



# Crude Oil Distillation



# RECYCLED SHINGLES & MILLINGS





# OXIDATION

- ▶ UV RAYS
- ▶ Environmental temps/Water!
- ▶ Lesser quality oils
- ▶ More RAP & RAS
- ▶ 300-degree cooking
- ▶ Makes for brittle asphalt





# WHAT CAN YOU DO?

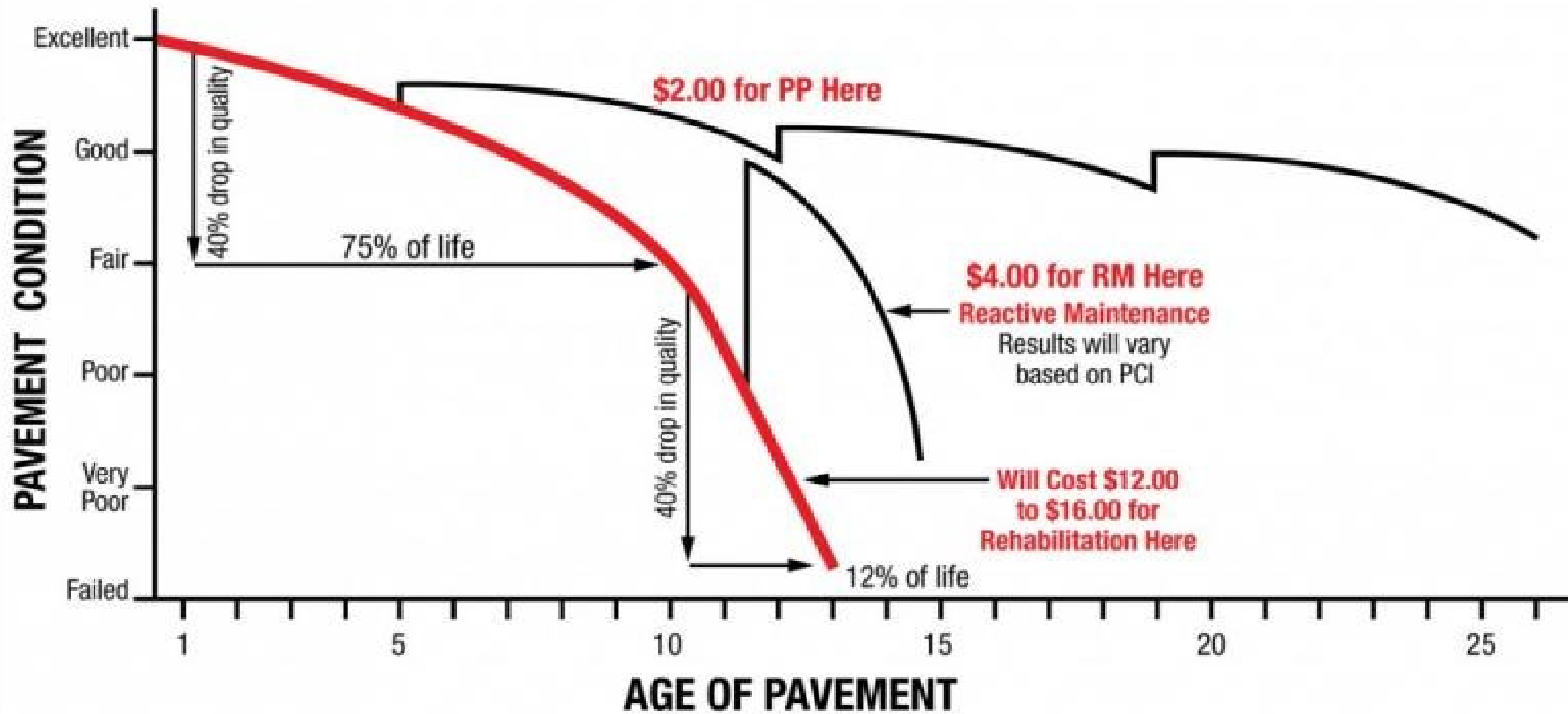
## ▶ NEW CONSTRUCTION

- ▶ Stabilize the subgrade
- ▶ Add FIBERS to HMA
- ▶ Lower RAP & RAS
- ▶ Design correctly

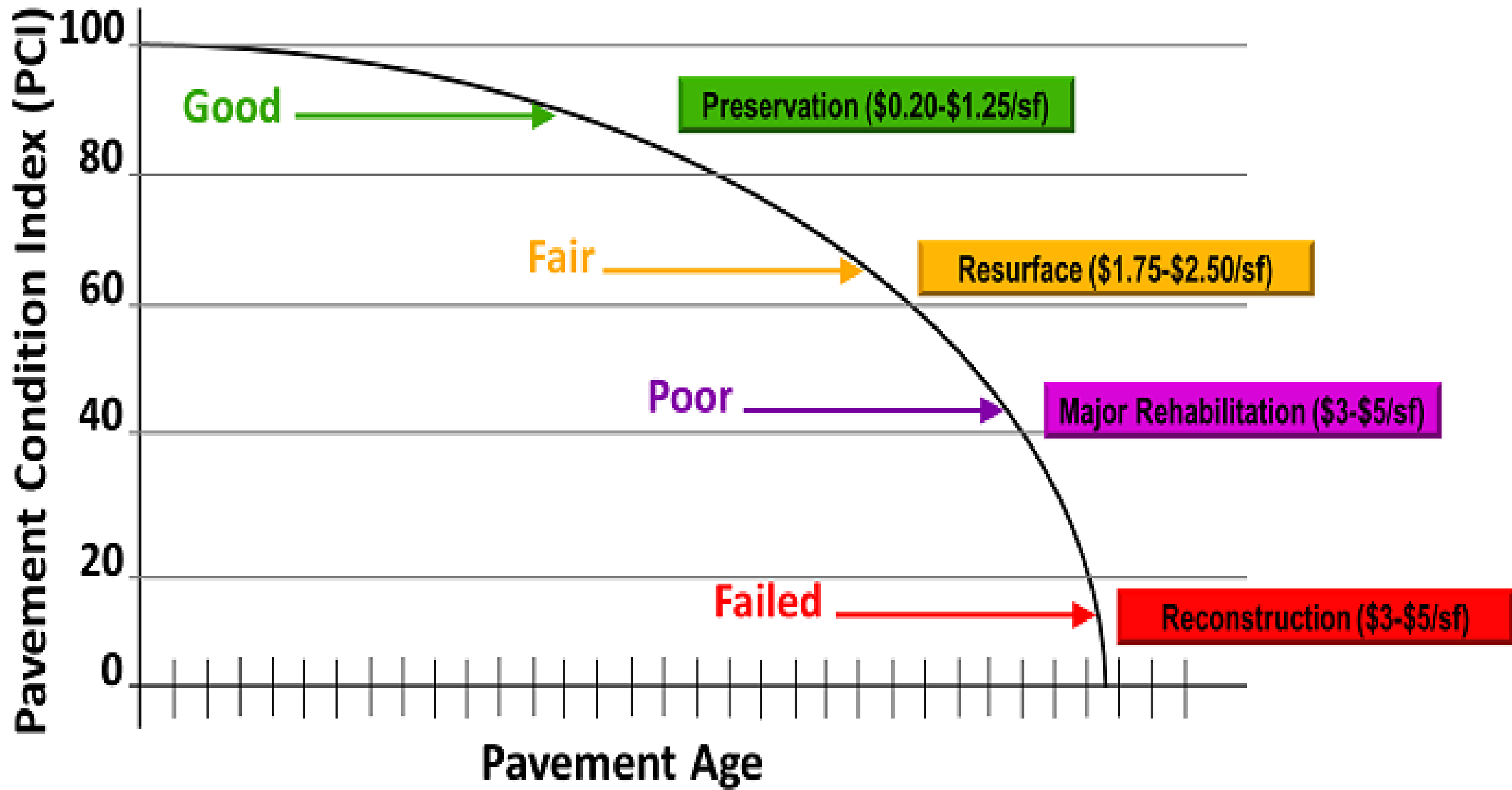
## ▶ EXISTING CONSTRUCTION

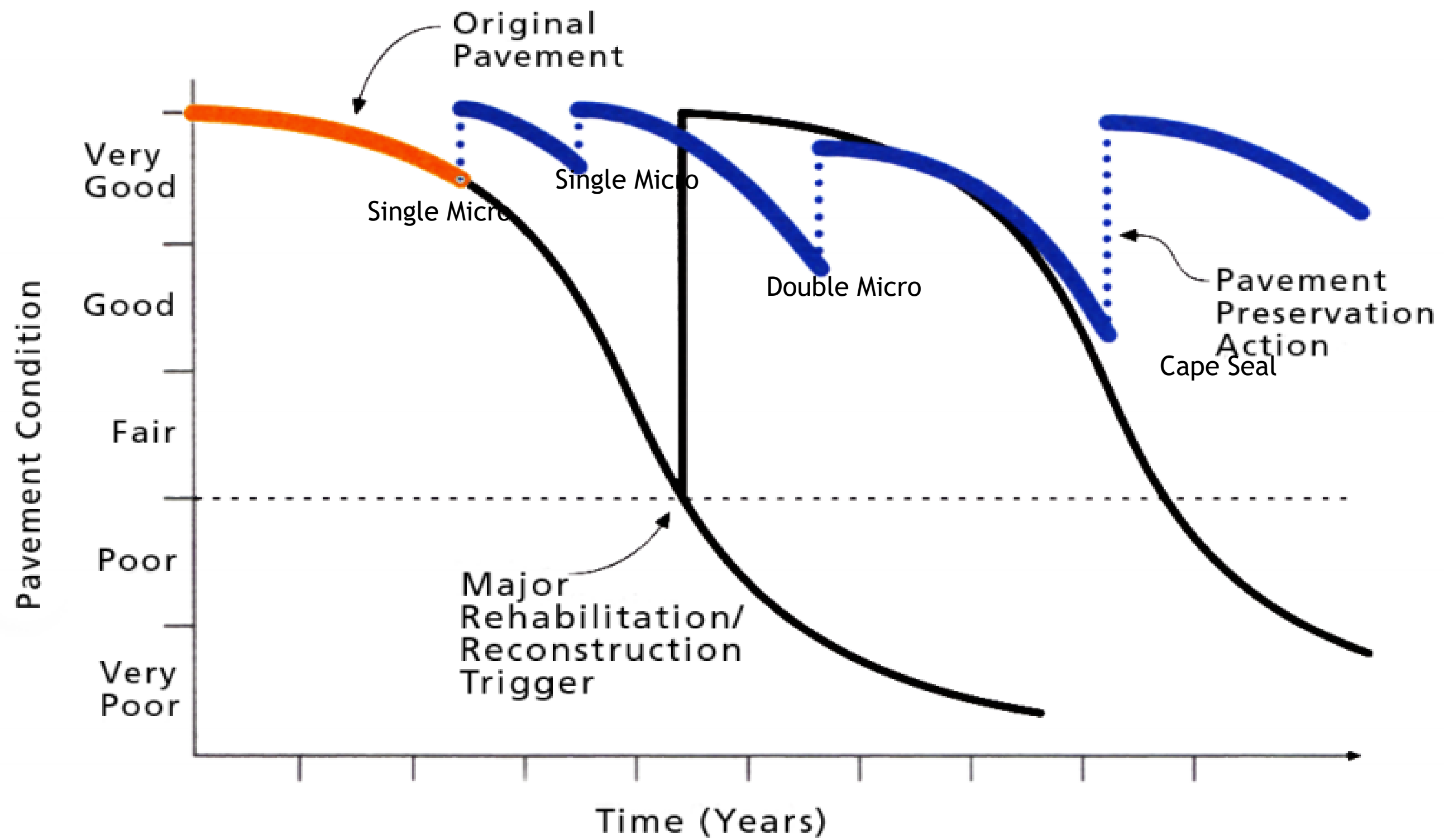
- ▶ Apply Rejuvenators
- ▶ Crack fill
- ▶ Fog Seal
- ▶ Chip Seal
- ▶ Micro-Surface
- ▶ Cape Seal
- ▶ Thin overlays
- ▶ FDR

# PAVEMENT CONDITION INDEX

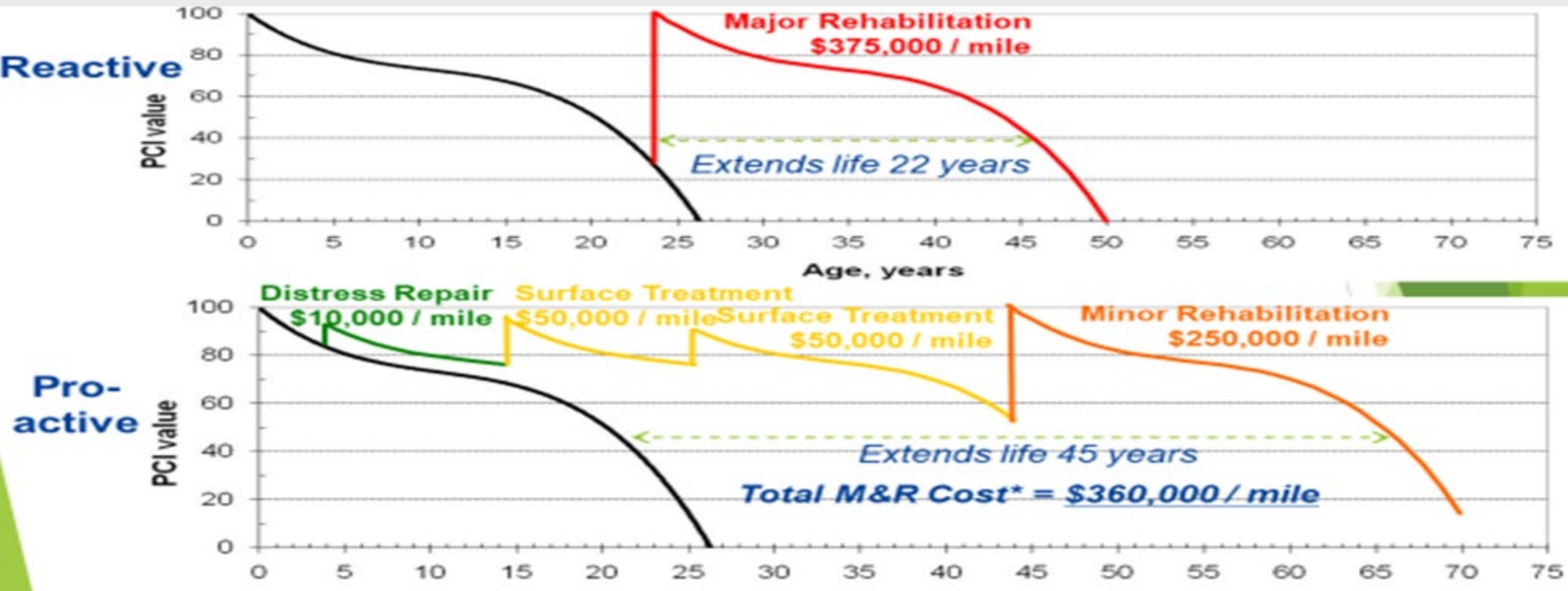


PP = Pavement Preservation RM = Reactive Maintenance





# Cost Savings + Higher Service Level



Year	Treatment Type	Cost in Constant Dollars	Future Cost	Present Value
0	Major Mill & Fill	16.64	16.64	16.64
10	Major Mill & Fill	16.64	27.10	21.17
20	Major Mill & Fill	16.64	44.15	26.94
30	Major Mill & Fill	16.64	71.92	34.29
40	Major Mill & Fill	16.64	117.15	43.63
ADD ROW		\$83.20	\$276.96	\$142.67

Net Present Value: **\$142.67 / SY**  
 Total Life Cycle Cost: **\$2,853,400**

Year	Treatment Type	Constant Dollars	Future Cost	Present Value
0	Full Depth Reclamation + 4"	28.54	28.54	28.54
1	Rejuvenating Fog Seal	0.67	0.70	0.69
5	Crack Seal	0.48	0.61	0.54
6	Micro Surfacing- Single Lift	2.77	3.71	3.20
10	Crack Seal	0.48	0.78	0.61
16	Cape Seal	5.20	11.35	7.65
26	Minor Mill & Fill	9.80	34.85	18.34
30	Crack Seal	0.48	2.07	0.99
32	Micro Surfacing- Single Lift	2.77	13.20	5.99
40	Cape Seal	5.20	36.61	13.63
ADD ROW		\$56.39	\$132.42	\$80.18

Net Present Value: **\$80.18 / SY**  
 Total Life Cycle Cost: **\$1,603,600**

# KEEP YOUR GOOD ROADS GOOD!

▶ PRESERVE WHAT YOU HAVE...



▶ DO NOT WASTE MONEY TRYING TO FIX BAD ROADS...LET THEM GO...



Select a baseline, number, that represents the measurement of healthy roadway network. This will make it easier to communicate with the elected officials and with the public.

Set a network target to be at then the funding to get the roads there.



# WATERPROOF THE SURFACE!!!



Jump on it! The sooner the better!



# Apply Rejuvenator ASAP



Rejuvenators seal the pavement surface preventing the intrusion of air and moisture.



# Rejuvenator Applied



# CRACK FILL



Effective crack filling will keep water out of the asphalt and the subgrade...preventing potholes.



# Fog Seal





# Emulsified Asphalt Fog Seals



- ▶ Light application of diluted, slow-setting asphalt emulsion without aggregate cover.
- ▶ PURPOSE:
  - ▶ Seal pavement
  - ▶ Inhibit Raveling
  - ▶ Enrich Hardened/Oxidized Asphalt
  - ▶ Provide Delineation with Shoulder

# Emulsified Asphalt Fog Seals

- ▶ Seals the pavement surface and provide a temporary blackening to the pavement.
- ▶ Fill void in raveled pavements and lock in remaining surface aggregate.

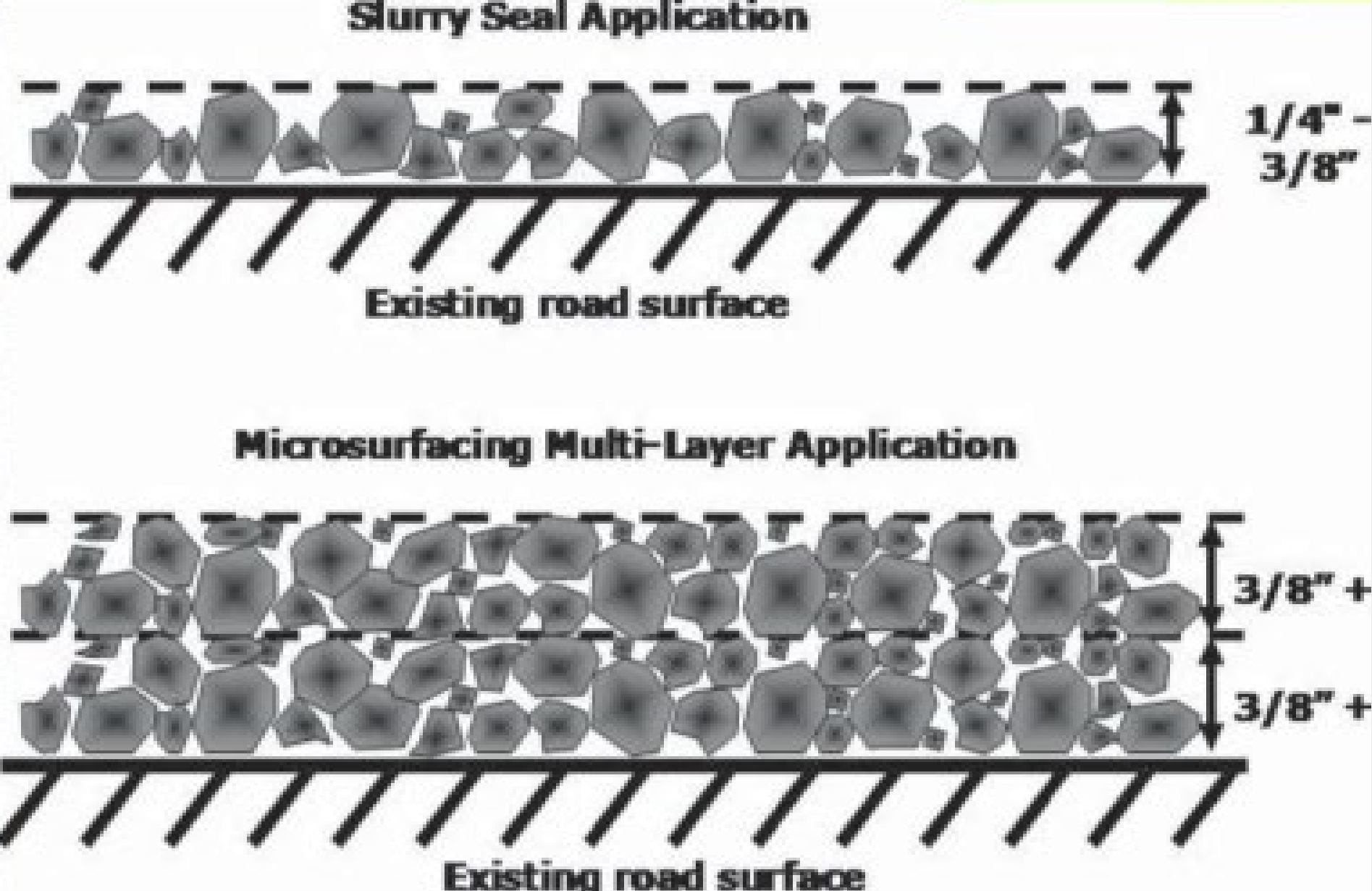


# Micro-Surfacing





# Aggregate





Park Avenue  
*September 22, 2016*

Neighbor in CT

**2004:** 2" MIII & FIII

Fairfield, CT

**2004:** 2" MIII & FIII

**2010:** Crack Sealing &  
Micro Surfacing

# St. Louis, MO- Both Sides Milled and Overlaid Right Side Micro-Surfaced.



# Micro-Surfacing (left) Centerline HMA (right)







# Chip Seal with Micro-Surfacing = Cape Seal



A cape seal is a **combination treatment consisting of a chip seal covered with either a slurry seal or micro-surfacing**. Once the chip seal has been placed, the road should be reopened to traffic until a full cure has been obtained before placing the slurry seal or micro-surfacing.

# Cape Seal 2014



# Excellent construction joint repair option



# Milled Joint = 2 Cracks to Maintain!



# When you can do this for \$5.50 SY

Before



During



After

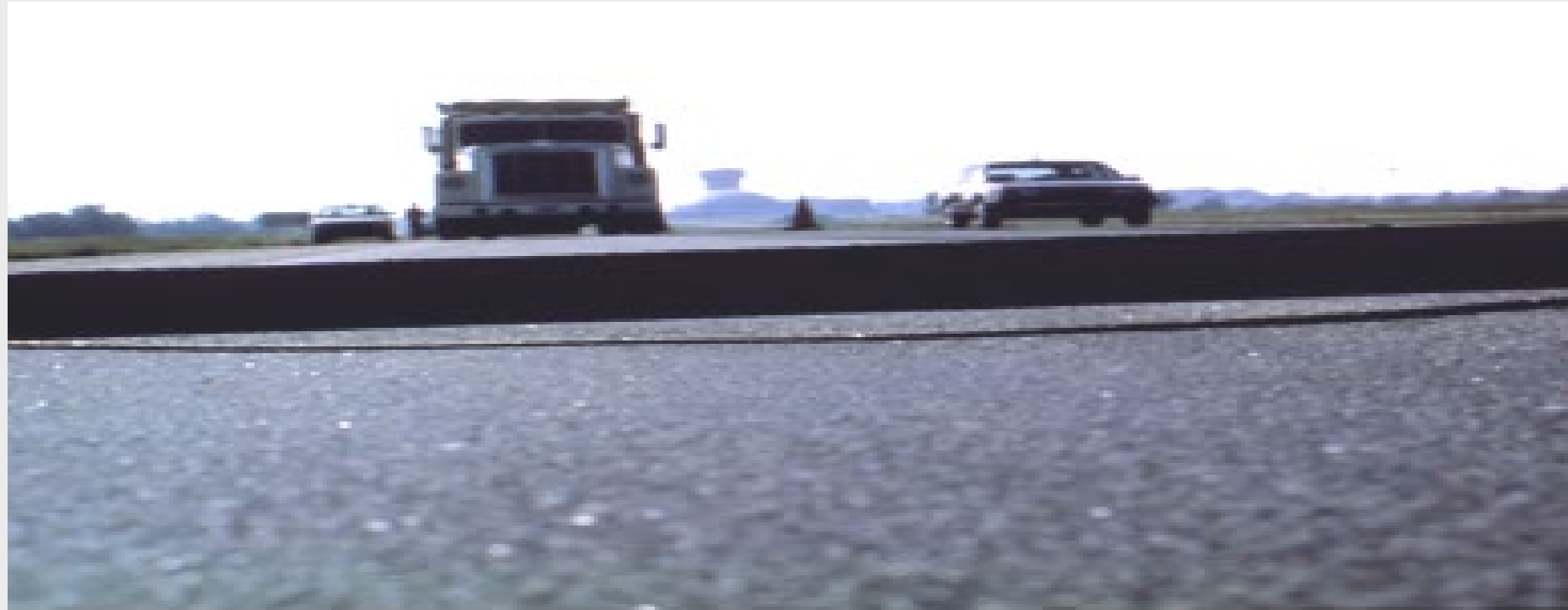


# 2-Foot Centerline Joint Repair





# Corrects Rutting Issues



Before



After

# Micro-Surfacing

- ▶ NO ADA adjustments - single pass
- ▶ Fast to apply and open roads (1 hour)
- ▶ Excellent rut filler
- ▶ Excellent friction course
- ▶ Excellent material for centerline joint repair (2-foot pass)

# Micro-Surfacing

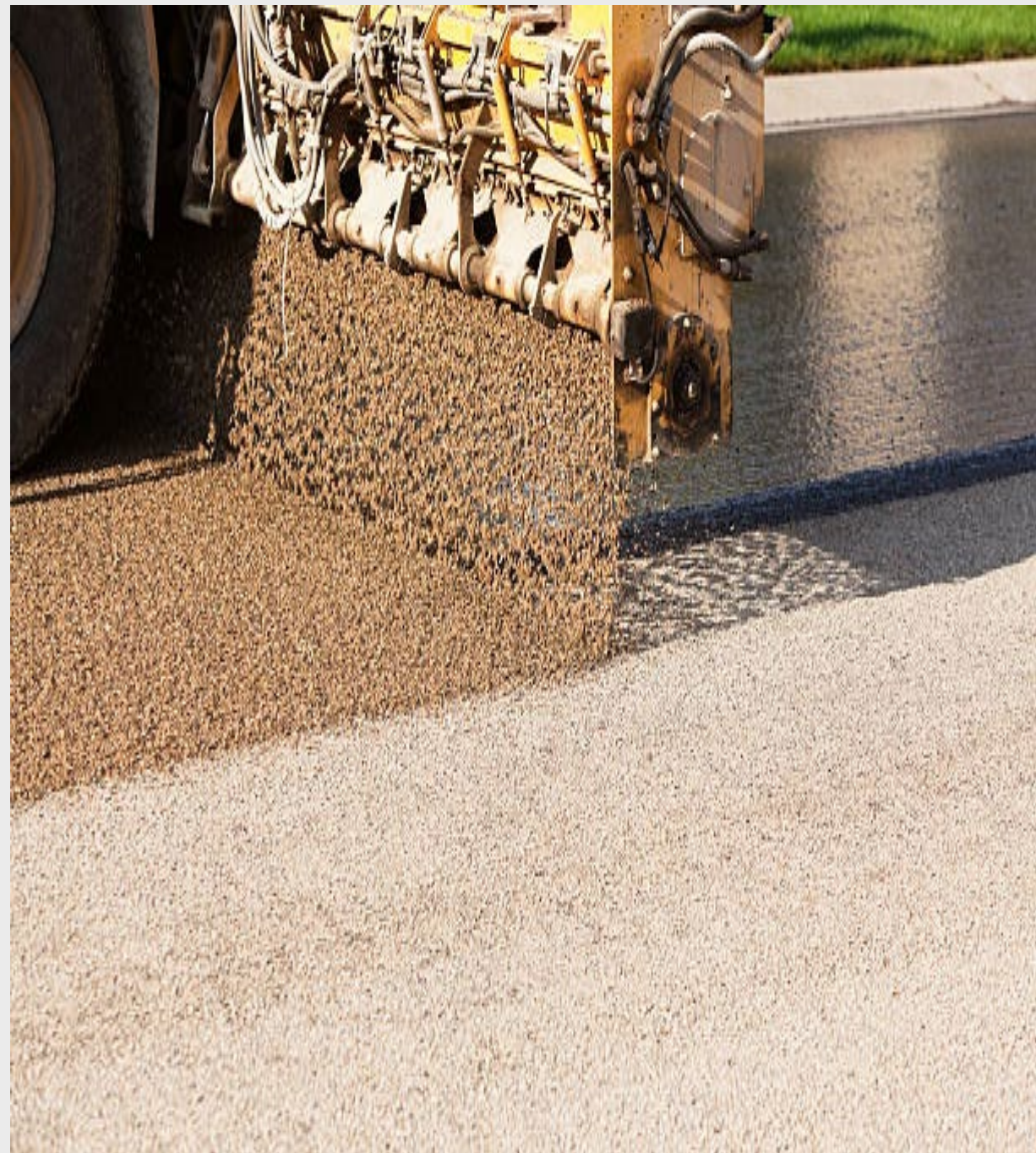
- ▶ Long lasting - can add fibers to retard cracks
- ▶ May be applied in several lifts
- ▶ Can be applied during the day/night
- ▶ Excellent for low, medium, and high-volume roads
- ▶ Affordable
- ▶ Extends the life of your pavement 6 to 8 years.

# CHIP SEAL





# Most Used Surface Treatment in the World.



- ▶ Waterproof the surface
- ▶ Fills cracks ¼" or less
- ▶ Slows oxidation
- ▶ Extends the life of the pavement 5 to 10 years

# Ultra Thin Asphalt Overlays



- ▶ Thick tack coat to “seal” asphalt
- ▶ 1.5” to half inch
- ▶ Fast construction time
- ▶ Smooth Surface
- ▶ No loose stone
- ▶ Restores friction

# Pavement Preservation Treatments

<u>Treatments</u>	<u>PCI</u>	<u>Costs</u>
Asphalt Rejuvenators	80-100	\$1.40 sy
Crack Seal	Maintenance	\$1.00 LF
Micro-Surfacing (single)	65-75	\$3.60 sy
Micro-Surfacing (double)	60-75	\$5.50 sy
Chip Seal	65-75	\$3.50 sy
Chip Seal (double)	60-75	\$5.35 sy
Cape Seal (micro/chip)	55-70	\$8.10 sy



# Pavement Preservation Treatments

<u>Treatments</u>	<u>PCI</u>	<u>Costs</u>
Thin HMA Overlay	55-65	\$11.50 sy
Hot-in-Place	50-70	\$14.00 sy
Mill & HMA Overlay	50-65	\$18.40 sy
Cold-in-Place	20-60	\$26.00 sy
FDR	0-50	\$39.10 sy

# Pavement Preservation Treatments

Typical Life Extensions (Years)

TREATMENT	GOOD CONDITION (PCI =80)	FAIR CONDITION (PCI=60)	POOR CONDITION (PCI=40)
Fog Seals	3-5	1-3	1-2
Chip Seals	7-10	3-5	1-3
Slurry Seals	7-10	3-5	1-3
Micro-Surfacing	8-12	5-7	2-4
Thin HMA	10-12	5-7	2-4

PAVEMENT CONDITION ⓘ

PRIMARY DISTRESS ⓘ

PAVEMENT CRITERIA

PAVEMENT PHOTOS

PLEASE SELECT

PLEASE SELECT

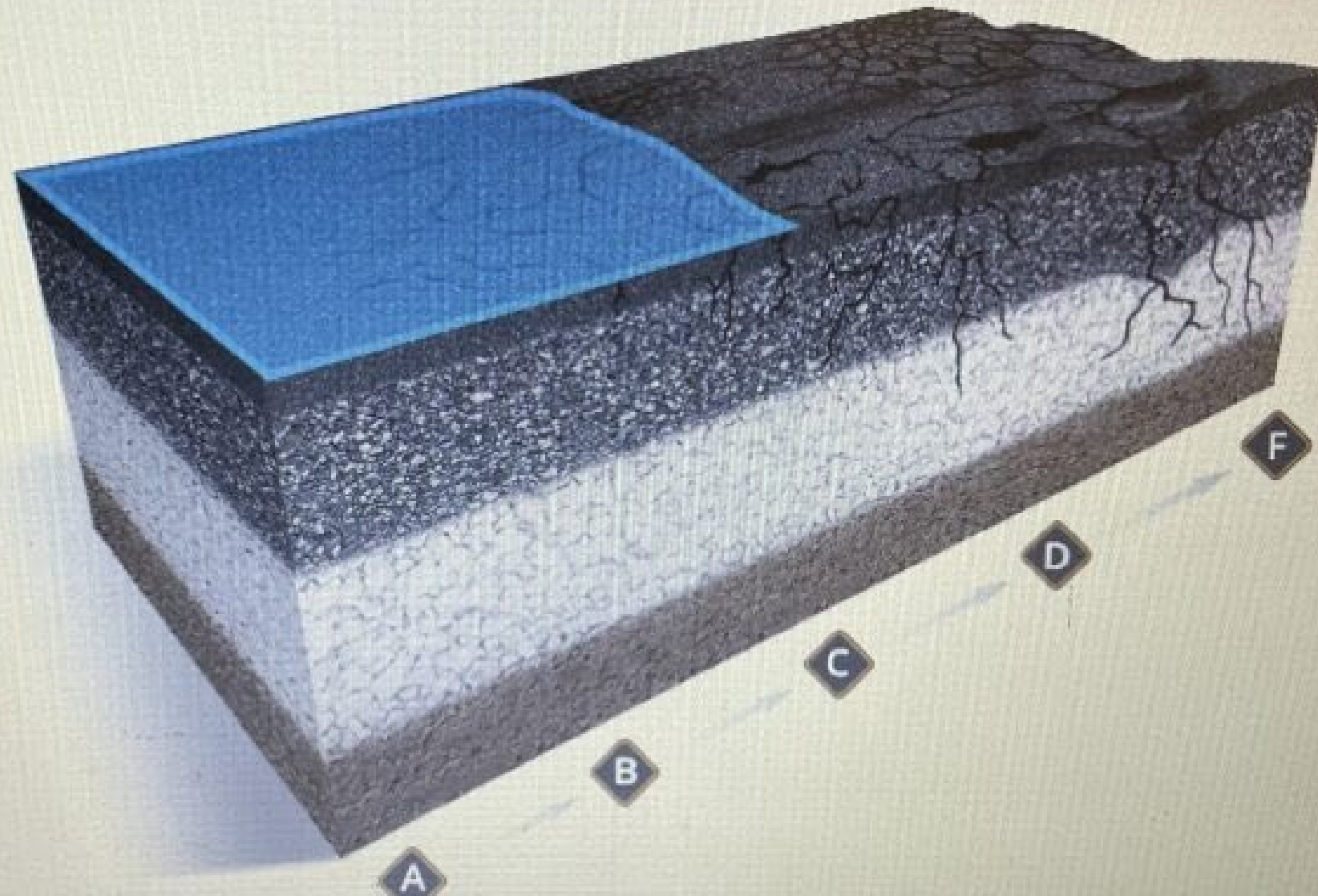
PLEASE SELECT

PLEASE SELECT

OTHER FACTORS TO CONSIDER



- FOG SEAL
- REJUVENATING FOG SEAL
- SLURRY SEAL
- MICRO SURFACING
- CAPE SEAL
- ULTRA THIN LIFT HMA
- CHIP SEAL
- CRACK SEAL
- SCRUB SEAL
- TACK COAT
- PRIME COAT
- COLD PLANING & MICRO MILLING
- HOT IN-PLACE RECYCLING
- COLD IN-PLACE RECYCLING
- COLD CENTRAL PLANT RECYCLING
- FULL DEPTH RECLAMATION
- BASE STABILIZATION
- SOIL STABILIZATION & SOIL MODIFICATION



## OVERVIEW

### ABOUT

PROCESS & VARIATIONS

EXPECTATIONS

COST

HISTORY

BEST PRACTICES

### PRE-CONSTRUCTION

SITE SELECTION

MATERIAL SELECTION

MIX DESIGN

SPECIFICATION REVIEW

### CONSTRUCTION

PREPARATION

WEATHER REQUIREMENTS






EQUIPMENT

CALIBRATION

TRAFFIC CONTROL

## FOR PAVEMENT CONDITION A B

Micro surfacing is a surface treatment designed to extend the life of asphalt pavements in good condition by providing skid resistance, restricting moisture intrusion, protecting the structure from further oxidation and raveling, and restoring a uniform black appearance. It is the most economical choice when leveling is required. Micro surfacing boasts quick construction times and minimal disruption to the traveling public.

-  Reduces life-cycle costs by 25 - 45% compared to traditional resurfacing methods.
-  Reduces greenhouse gases by 44% or more, and energy use by 54% or more compared to traditional resurfacing methods.
-  Reduces raw materials by 35% or more compared to traditional resurfacing methods.
-  Return to traffic within 1 hour.
-  Adds 6 - 8 years or more when applied for optimum preservation performance.

#### Issues Addressed

- Loss of friction
- Oxidation
- Uneven surface profile
- Raveling

#### Attributes

- Increases skid resistance
- Improves color contrast between pavement and striping
- Restores surface characteristics
- Protects the structure from moisture intrusion

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# ASSHTO STANDARDS & Free Specifications

[HTTP://TSP2-ETF.ORG](http://TSP2-ETF.ORG)



**THANK YOU!**

**Brett Gaither**

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Micro-Surfacing Contractors**

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