

ASPHALT PAVEMENT PRESERVATION

Are Hot Mix and Chip Seal my only Options??

**Let's look at Measures to Build a Strong Preservation Program
and Preserve one of the County's Most Valuable Assets.**

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The background of the slide is a light gray gradient with several realistic water droplets of various sizes scattered across it. The droplets have highlights and shadows, giving them a three-dimensional appearance. The title 'LEARNING OBJECTIVES' is centered in a bold, dark brown font.

LEARNING OBJECTIVES

- ❖ **Realize the Value of Assets**
- ❖ **Overcome Challenges and Utilize Available Resources**
- ❖ **Add Processes to my TOOLBOX to Develop a Strong Preservation Program**

Agency's Assets



Event Centers

Buildings

Water

Street Lights

Sewer

Emergency Management

Environmental Services

Fleet

Criminal Justice

Sidewalks

Community Facilities

ROADS

So, What is the value of all my roads??

For Scale: Kenedy County(Pop. 340) has 19 LM - Harris County (Pop.4,728,000) has 12,877 LM
(52% > 1000 LM, 8% > 2000 LM)

Let's use an example for a county that has 1,000 Lanes Miles of Asphalt Roads

Assumptions: All roads are Asphalt (2" Thick) in "FAIR to GOOD" Condition.

All roads have 2 – 12' lanes.

JUST LOOKING AT THE COST TO MILL AND OVERLAY ALL THE ROADS!

$$(1,000 \text{ LM} \times 5,280 \text{ LF}) \times 12 \text{ FT} = 63,360,000 \text{ SF}$$

$$63,360,000 \text{ SF} / 9 = 7,040,000 \text{ SY}$$

$$(7,040,000 \text{ SY} \times 110 \text{ lbs/SY/In} \times 2\text{in}) / 2000 = 774,400 \text{ Tons of HMAC}$$

$$774,400 \text{ Tons} \times \$90/\text{Ton} = \$69,696,000 \text{ (For Overlay)}$$

$$7,040,000 \text{ SY} \times \$2.50/\text{SY} = \$17,600,000 \text{ (Milling)}$$

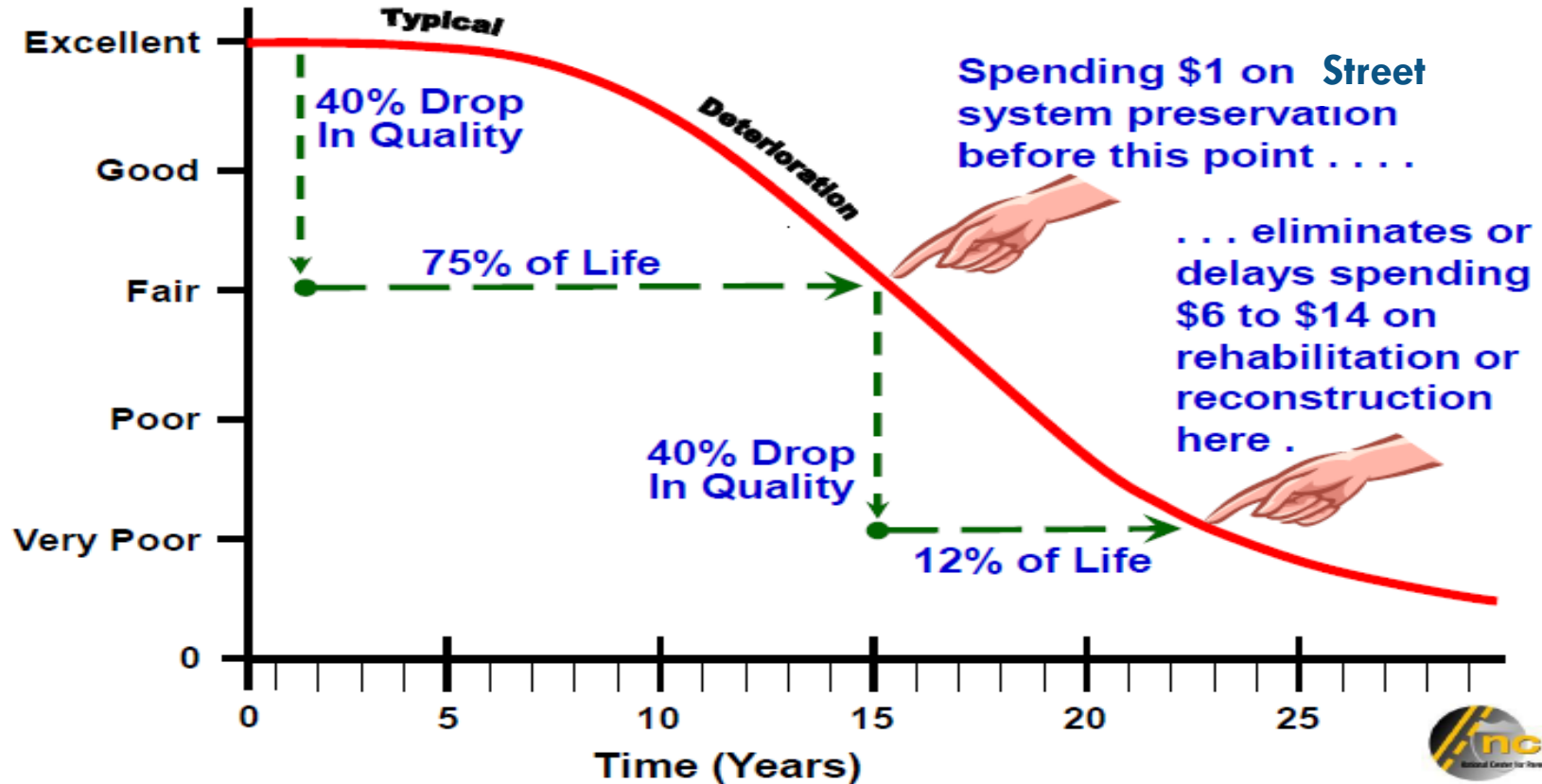
$$\text{Total} = \mathbf{\$87,296,000}$$

Annual Road Budget: \$4,500,000

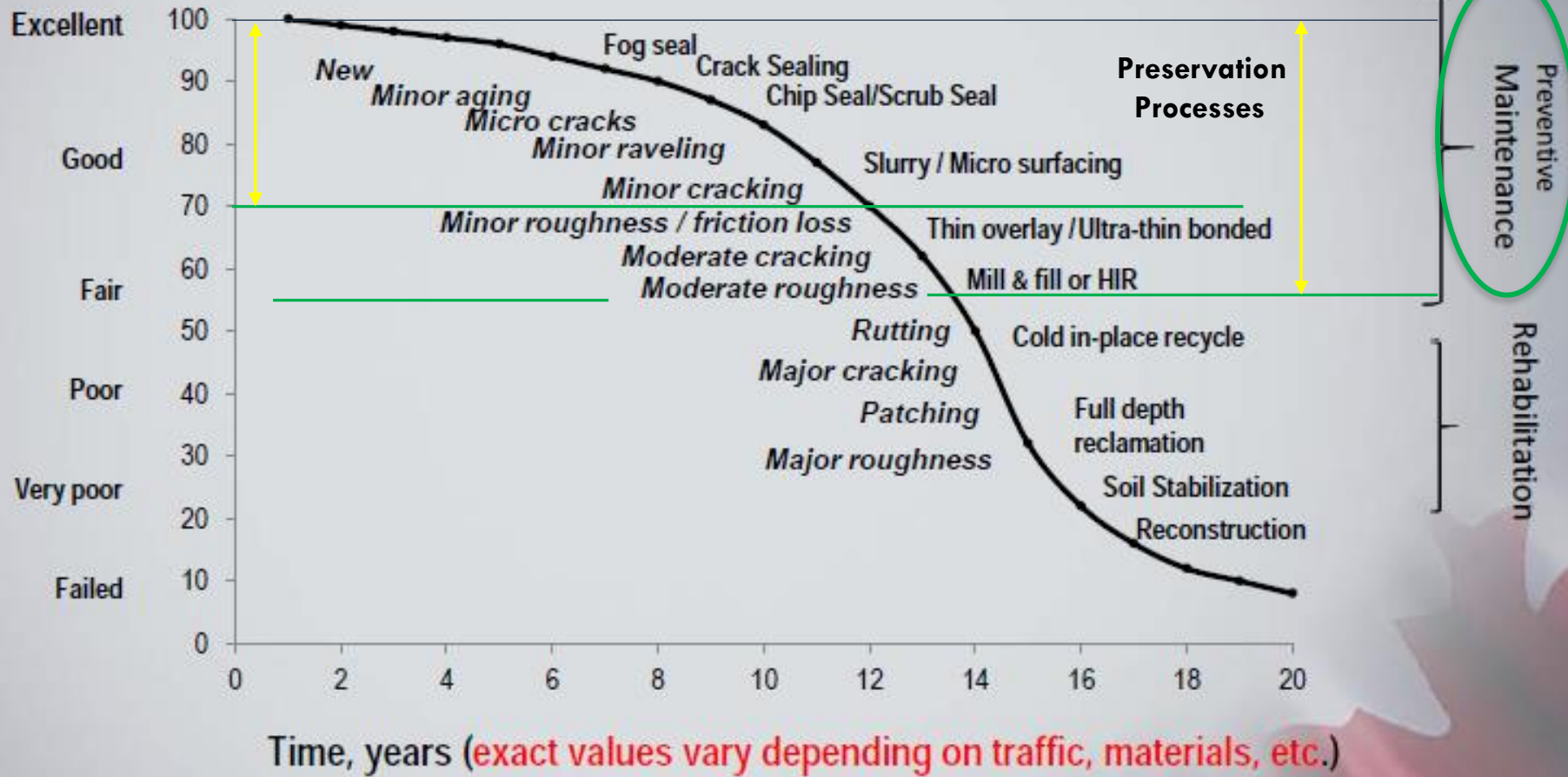
If entire Annual Budget was spent on resurfacing roads, **and the costs never increased,**
it would take over **19** years to complete!

Asphalt Pavement Preservation is Cost Effective

Asphalt Pavement Condition

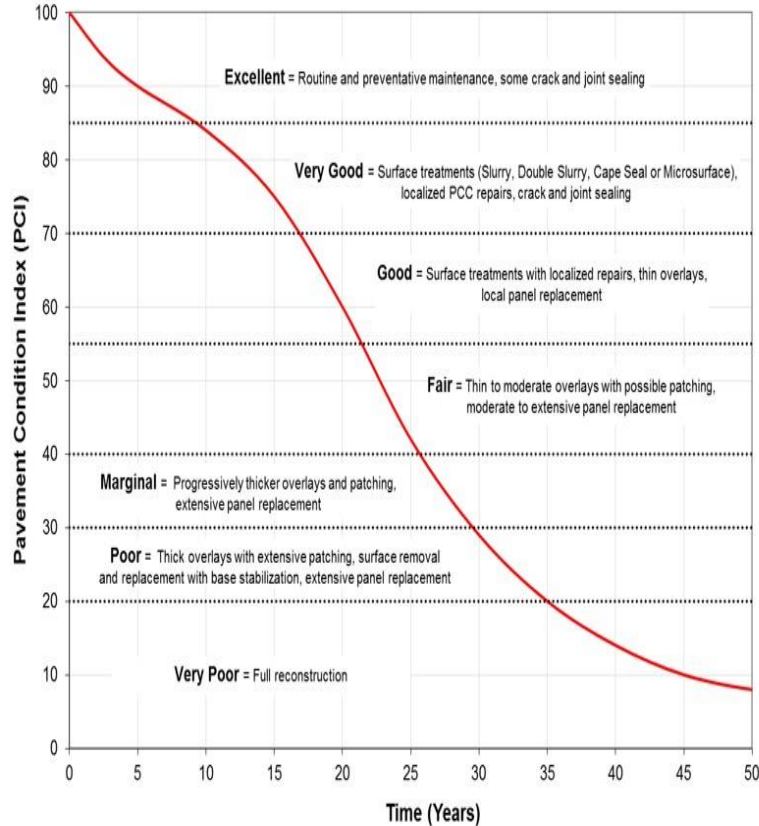


Keeping GOOD Roads GOOD!



Understand the Pavement Condition Score

The following illustration compares Pavement Condition Index (PCI) to commonly used descriptive terms. The divisions between the terms are not fixed, but are meant to reflect common perceptions of condition.



The general idea of what these condition levels mean with respect to remaining life and typical rehabilitation action is included in the following table:

PCI Range	Description	Relative Remaining Life	Definition
85-100	Excellent	15 to 25 Years	Like new condition - little or no maintenance required when new; or routine maintenance such as crack and joint sealing. Sweeping & Herbicide
70-85	Very Good	12 to 20 Years	Routine maintenance such as patching, crack sealing with possible surface treatments - chip seals, seal coats, slurries, or micro-surfacing.
55-70	Good	10 to 15 Years	Heavier surface treatments and thin overlays. Localized panel replacements.
30-55	Fair to Marginal	7 to 12 Years	Progressively thicker overlays with localized repairs. Moderate to extensive panel replacements.
20-30	Poor	5 to 10 Years	Sections will require very thick overlays or surface replacement, base reconstruction, and possible subgrade stabilization.
0-20	Very Poor	0 to 5 Years	High percentage of full reconstruction.

Research indicates that PCI values can drop around 2.5 – 5.0 points per year with no preservation measures taken. 90 PCI could drop to 55 in 7-14 years!







CHALLENGES (HURDLES) to OVERCOME to Build a Strong Preservation Program

**STRONG
PAVEMENT
PRESERVATION
PROGRAM**

EXPERIENCE/KNOWLEDGE OF PROCESSES

- May still have some vintage employees (If so, use their knowledge)
- Very Young Workforce
- Never exposed to new processes
- Lack of Resources
- Totally Clueless

BUDGET

- May have more Money than you can spend
- Typical a Common Challenge
- Very Limited Funds
- Never enough
- Change Distribution of available Funds

ADMINISTRATION

- Could be Fully On-Board
- Set in their ways
- (Do what we've always done)
- Micro-manager (Dictate \$ and Processes without input from staff)
- Totally Clueless

ASSET Management

In-House or with a Management Firm

In-House: Rate your roads and develop a program using internal resources. If you are fortunate enough to still have an experienced staff or crew, draw from their knowledge and experiences working the roads to help build a program. They probably know a lot about the make up of the roads along with problem areas that need to be addressed.

Management Firm: Make sure you have Administrative and Financial backing which will support the findings and recommendations of the Asset Study before you contract with a Firm. Use the results of the study as **GUIDELINES** to build your program. Use a commonsense approach to structuring your program so that it can be easily tracked and followed by others, especially after there are staffing changes.

(Ex.)

STRUCTURED PAVEMENT PRESERVATION PROGRAM



(Compared to a 2" Mill and Overlay after 15 years at a cost of ~ \$16.00 to \$20.00/SY)

CRACK SEAL ALONG THE ENTIRE LIFE OF THE PAVEMENT AS NEEDED.



FAIRLY COMMON SITUATIONS

Desire (Need) to Start a Preservation Program

Wanting to try new Processes

Limited Budget – Small Quantity Projects

Have a tight Timeframe to get work done (End of Budget year/Special Event)

INTER-LOCAL AGREEMENTS – “PIGGYBACKING” or COOPERATIVE PURCHASING

- **Avoid costs such as: Preparing Plans, Advertising, Administration**
- Cost to get project to Bid and then evaluate Bids & Awarding Process**
- **Get projects on the ground in a shorter timeframe**
- **Avoid dealing with past issues over and over**
- **Secure services from a Trusted, Quality, Contractor**
- **Get consistent Quality Product and Performance**
- **Build strong relationships**

USE THE POLICIES TO YOUR ADVANTAGE

Laws and regulations may differ from State to State,
but two (2) advantages that Cities and Counties in Texas have over State Agencies are:

1. Ability to choose Best Value Bid in Lieu of Lowest Bid

- a. Use of a formal RFP or RFQ process
- b. Use the ability to choose Best Value

“Owner reserves the right to reject any and all Bids, including non-conforming, non-responsive, or conditional Bids. The Owner may also reject the Bid of any Bidder if the Owner believes that it would not be in the best interest of the Owner to make an award to that Bidder. The Owner reserves the right to waive all formalities.”

2. Set up Multi-year Contracts

- a. If you get a “Good” Contractor on board, keep them for the duration of the years in the contract. It would be the Fair thing to set up an Escalator to account for material and labor increases over time.
- b. If the Contractor isn’t performing, you are not tied to them past the first year, or if they are really bad, cancel the contract whenever justified.
- c. Re-bid the Contract and if previous contractor is “Low” again simply award to second bidder due to “cause”.

WHO HAVE WE SERVICED in TEXAS -2012 to 2023?

ABILENE (FTU)
ALLEN (5) *
AMARILLO (2)
ARGYLE (FTU)
AUSTIN (ACTIVE) (5) * (2023)
BARTONVILLE (2) (FTU)
BAYTOWN (7) (FTU) *
BIG BEND NATIONAL PARK
BEXAR COUNTY (ACTIVE) (6) * (2025)
BONHAM (2) (FTU)
BURKBURNETT (2) (FTU)
BURLESON (FTU) *
CANYON (3) (FTU) *
CANYON WEST HOA (FTU)
CASTLE HILLS (4) *
COLLEYVILLE (3)
COPPERAS COVE (FTU)
COPPER CANYON (FTU)
DALLAS (2)
DENISON (3) (FTU)
DENTON (2)
DENTON COUNTY (FTU)
DOUBLE OAK (FTU)
DUMAS
EL PASO
FAIR OAKS RANCH (3) (FTU) *
FOSSIL CREEK (HOA) (FTU)
FT. WORTH (2)
GARLAND (3) (FTU) *
GRAPEVINE (5) (FTU)
GOODFELLOW AFB (2)

GRAHAM (3) * (FTU)

GRAYSON COUNTY (FTU)

HAYS COUNTY (3)

HELOTES (2) (FTU) *

HICKORY CREEK (FTU)

HIGHLAND PARK (FTU)

HUDSON OAKS (3) (FTU)

HURST

KILLEEN *

KERRVILLE (4) (FTU)

LAGO VISTA (3) (FTU) *

LAKE WORTH (FTU) (3)

LAMPASAS

LEON VALLEY

LUBBOCK (8) *

LUBBOCK COUNTY (FTU) *

MANOR

MANSFIELD (2) (FTU)

MIDLAND (4) *

MESQUITE

MOUNT PLEASANT (FTU)

NEW BRAUNFELS (2) *

NORTH RICHLAND HILLS (8) (ACTIVE) * (2024)

NORTHLAKE (FTU)

PANTEGO (2) (FTU)

PECAN PLANTATION (HOA)

PROPWASH AIRPORT (FTU)

RAINTREE WOODS (HOA) (FTU) *

RED OAK (FTU)

RICHLAND HILLS

ROCKWALL (4) *

SAN ANTONIO (5) ** (2023)

SAN MARCOS (5)

SEGUIN (2)

STEPHENVILLE (3)

TARRANT CO. PCT. 1 (5) (FTU) *

TARRANT CO. PCT. 3 (4) (FTU)

THE FOUNTAINS (HOA) (FTU) *

TxDOT (6) *

VICTORIA (FTU)

WEATHERFORD (8) *

WESTLAKE (FTU)

WEST HOUSTON AIRPORT

WEST OAK – HOA (FTU)

WESTOVER HILLS (FTU)

WICHITA FALLS (FTU)

WOODWAY (3)

75 Agencies

50% “Piggyback”

LEGEND

“GREEN” = PIGGYBACK

“BLACK” = LOW BIDDER

“ORANGE” = RFP (GRADED BID)

“RED” = PRIVATE

(FTU) = 1ST TIME USER

“*” = ACTIVE CONTRACT

NUMBER IN () = YEARS SERVICED

“RED” = LAST YEAR OF ACTIVE CONTRACT



PPRA™

Pavement Preservation & Recycling Alliance

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Build A Better Network

With the Optimized Approach



IMPROVE YOUR
OVERALL NETWORK
CONDITION



GET THE LOWEST
LIFE CYCLE COST
PER ROAD



MAXIMIZE
YOUR ECO
BENEFIT

Treatment Resource Center

Apply Treatments With Confidence & Success

This resource is a combined effort from experts across the industry. It includes the most current guidelines, process information, research, success stories, and in-depth quality assurance recommendations to equip you with the tools you need to ensure treatment success.

The PPRA Treatment Resource Center is an index of common treatments under various progressive pavement management disciplines. For specific questions contact a [contractor or supplier](#) in your region.

SURFACE TREATMENTS

Fog Seal

Rejuvenating Fog Seal

Slurry Seal

Micro Surfacing

Ultra Thin Lift HMA

Cape Seal

Chip Seal

Crack Seal

Scrub Seal

PRE-TREATMENTS

Tack Coat

Prime Coat

RECYCLING & RECLAMATION

Cold Planing & Micro Milling

Hot In-Place Recycling

Cold In-Place Recycling

Cold Central Plant Recycling

Full Depth Reclamation

BASE TREATMENTS

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](#)[APPLICATION](#)

QUALITY ASSURANCE

[INSPECTION](#)[TESTING PROTOCOL](#)[TROUBLESHOOTING](#)[ACCEPTANCE](#)






RESEARCH & PERFORMANCE

SUCCESS STORIES

PHOTO GALLERY

FOR PAVEMENT CONDITION **A** **B** (PCI of 70 or greater)

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
- Rutting
- Lack of uniform color for restriping

Attributes

- Increases skid resistance
- Improves color contrast between pavement and striping
- Restores surface characteristics
- Protects the structure from moisture intrusion
- Protects the structure from oxidation
- Maintains drainage patterns and curb reveal
- Restores road profile (within limitations)
- Resistant to rutting and shoving

Common Combinations

- Crack seal + micro surfacing
- Rut filling with micro surfacing + surface course of micro surfacing
- Leveling/scratch course of micro surfacing + surface course of micro surfacing
- Cape Seal: (Chip seal + Micro surfacing)
- Scrub Cape Seal (Scrub seal + Micro surfacing)

Explore by Pavement Criteria

PAVEMENT CRITERIA

PAVEMENT PHOTOS

This tool is designed to explore cost-effective solutions to pavement at varying levels of distress. Input your pavement criteria for potential solutions relevant to you.

Though these tools use distress to identify potential treatment solutions, the savviest pavement managers are stretching budgets further by preventatively addressing deterioration before it starts. Link treatments together to make pavement last 40 years or more, or consider using innovative recycling methods to cost-effectively reengineer your pavement cross-section to meet increased load or traffic requirements and increase strength and longevity.

PAVEMENT CONDITION B (PCI 70-84)

PRIMARY DISTRESS FATIGUE CRACKING - LOW

ROAD TYPE URBAN: LOCAL ROAD

SURFACE TYPE DENSE GRADE HMA

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



Explore by Pavement Criteria

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PAVEMENT CONDITION B (PCI 70-84)

PRIMARY DISTRESS FATIGUE CRACKING - MODERATE

ROAD TYPE URBAN: LOCAL ROAD

SURFACE TYPE DENSE GRADE HMA

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



RSL Calculator

How to use this Tool

Use the calculator below to explore how different treatment combinations can be varied to inject maximum life into your network and use your resources more wisely. See examples and learn more about remaining service life [here](#).

Total Network Lane-Miles

1000

Average Lane Width (ft)

12

Total Budget

\$ 4500000

Remaining Budget

\$349

Treatment Type	Category	Life Extension	Lane-Miles* Treated	Lane-Mile-Years	Unit Cost	Total Cost
Full Depth Remove & Replace	Reconstruction	25.0	5	125	39.01	\$1,373,162
Minor Mill & Fill	Rehabilitation	11.0	24	264	9.80	\$1,655,808
Thin Lift HMA	Preservation	11.0	22.5	247.5	6.97	\$1,104,048
Crack Seal	Preservation	3.0	108.5	325.5	0.48	\$366,643
Select...				0	0.00	\$0
Select...				0	0.00	\$0
Select...				0	0.00	\$0
Select...				0	0.00	\$0
Select...				0	0.00	\$0
ADD ROW						

Total Lane-Miles Treated
160

Total Lane-Mile-Years
962

Total Cost
\$4,499,651



ABOUT US

TREATMENT TOOLBOX

NETWORK OPTIMIZATION

PAVEMENT PRESERVATION

RECYCLING

EMULSIONS

RESOURCES

Find a Contractor

Multiple Calculators

General Information

Build A Better Network

With the Optimized Approach

Structural Number Calculator



IMPROVE YOUR
OVERALL NETWORK
CONDITION



GET THE LOWEST
LIFE CYCLE COST
PER ROAD



MAXIMIZE
YOUR ECO
BENEFIT

Processes to help you build a strong program!

- ✓ **FOG SEALS (CSS-1H, ONYX, HA-5, GSB-88, eFog, Reclamite, ETC.)**
- ✓ **CRACK SEALING - (HOT RUBBER or COLD)**
- ✓ **CHIP SEAL - (AC or EMULSION)**
- ✓ **SCRUB SEAL – (Mass Crack Sealing Process)**
- ✓ **SLURRY SEAL – A105 or A115**
- ✓ **MICRO-SURFACING – SINGLE OR DOUBLE – A143**
- ✓ **CAPE SEAL - (CHIP OR SCRUB)**
- ✓ **HMAC Overlays**

**“It Takes a Village”
You need a
“Toolbox” full of
Tools.
You can’t Maximize
your successful
using just One!**

FOG SEALS

(DILUTED EMULSIONS)

- INEXPENSIVE WAY TO SEAL PAVEMENTS,
LOCK DOWN AGGREGATE
- SITE SELECTION CRITICAL (GOOD
CONDITION, CHIP SEAL, RUMBLE STRIPS,
SLURRY SEAL, ETC.)
- SLOW SETTING EMULSION DILUTED UP TO 3
PARTS WATER, NO COVER AGGREGATE USED
MOST COMMON – CSS-1 OR CSS-1H
- APPLICATION RATE VARIES W/SURFACE)
(0.1-0.15 GAL/SY) (0.03-0.05GAL/SY RESIDUAL
- LIFE SPAN 1-3 YEARS, CAN RE-APPLY



(REJUVENATING FOG SEALS)

- SLIGHTLY MORE EXPENSIVE THAN SIMPLE DILUTED EMULSION FOG SEALS.
- ARE TYPICALLY CATIONIC EMULSIONS THAT ARE A BLEND OF MALTENES (LIGHT FRACTIONS) AND POSSIBLY MODIFIED WITH ASPHALT AND POLYMER. THE PRIMARY PURPOSE IS TO SOFTEN THE STIFFNESS OF THE OXIDIZED AC PAVEMENT SURFACE AND FLUX WITH THE ASPHALT BINDER TO EXTEND THE LIFE OF THE PAVEMENT SURFACE BY ADJUSTING PROPERTIES OF THE AC MIXTURE. MAXIMUM ABSORBANCE OF THE REJUVENATOR IS IDEAL.
- REJUVENATING SEAL TO PAVEMENTS IN THE 1-4 YEAR AGE TO EXTEND PAVEMENT LIFE BEFORE THE USE OF A WEAR COURSE SEAL IS REQUIRED.



Reclamite



Biorestor



Paverx



eFog



Delta Mist

National Center for Asphalt Technology (NCAT) – University of Auburn

Test Track = 1.7 miles long.



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Asphalt Technology News

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Don Watson Inducted

Evaluation of Rejuvenating Fog Seals



Delta Mist rejuvenator is applied to Section 53 of the NCAT Test Track.

Table 1. Rejuvenating products used on the NCAT screening study.

Surface Treatment Product	Composition	Application Rate (gal/yd2)	Dilution Rate
CMS-1PF	Polymer Modified	0.08	30% residual
Regen-X	---	0.07	2:1
RejuvaSeal	Aromatic oils & solvents	0.06	100% residual
Delta Mist	Plant-based rejuvenator	0.10	30% residual
Biorestor	Bio-based rejuvenator	0.03	1:1
Replay	Polymers and soybean rejuvenator	0.015	100% residual
Reclamite	Maltene-based from naphthenic (large % of cycloparaffins) crude base	0.08	1:1

Table 2. Performance-based classification of rejuvenating products.

Grade	Surface Treatment Product
A	Biorestor
	Replay
B	Regen-X
	Delta Mist
	Reclamite
C	CMS-1PF
	RejuvaSeal

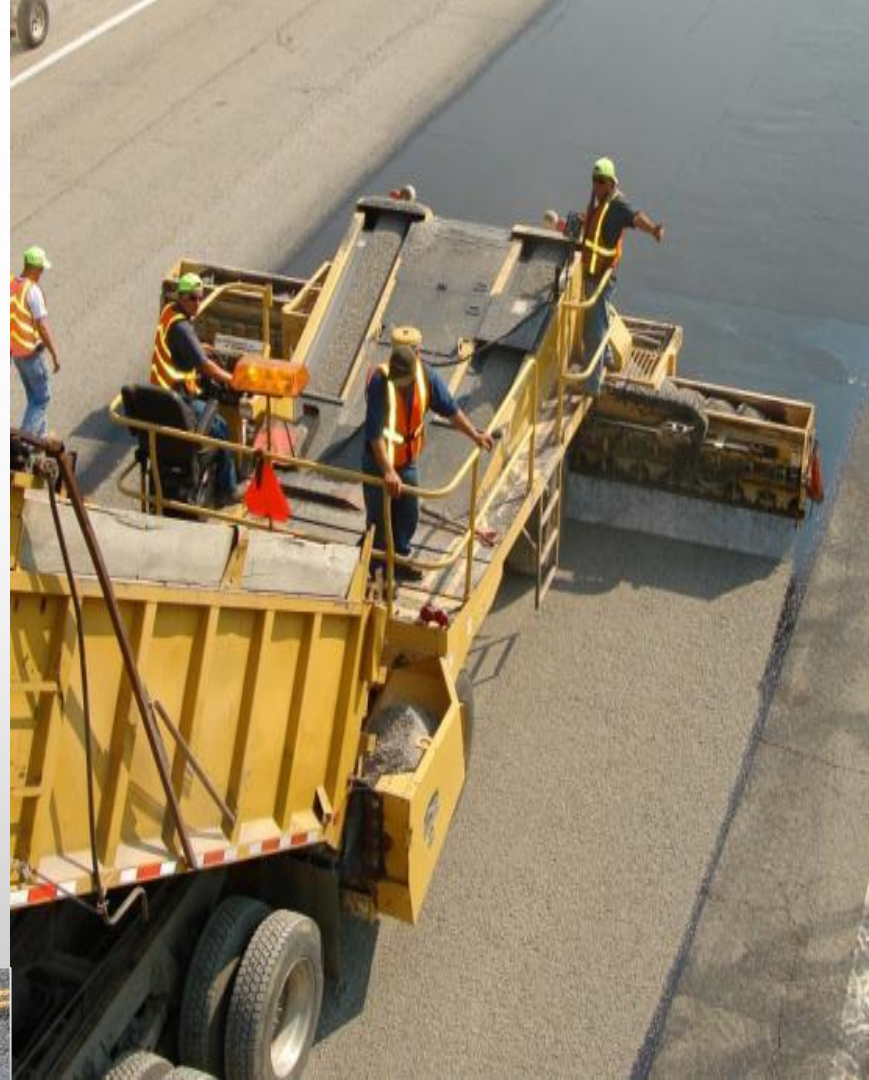
CRACK TREATMENTS

- CRACK FILLING – NON-WORKING CRACKS
- CRACK SEALING – WORKING (THERMAL) CRACKS, ROUT FOR LONGER LIFE
- TYPICALLY, HOT APPLIED
 - ASPHALT RUBBER
 - FIBER ADDED TO PG GRADED ASPHALT
 - CURE TIME – 1 MONTH TO 1 SEASON
- COLD POUR POLYMER SEALING MATERIAL
(COVER SOONER, NO “SHADOWING”)
- WATERPROOF PAVEMENT PRIOR TO OTHER TREATMENTS (TOP-DOWN WATER)



CHIP SEALS

- Uniform application of asphalt binder on a sound surface followed by placement of cover aggregate then seated with roller
- Seal surface from water intrusion
- Can be placed in multiple layers using different sized aggregate
- Used as SAMI layer prior to other treatments (Cape Seal, HMA)
- Most Economical full width resurfacing process.
- Not a Fan Favorite of road users.



TxDOT Maintenance Conference

Session Presentation Title:

TxDOT Roadways - Chip Seals & Hot Mix
Are the two applications comparable? / Benefits & Drawbacks

CHIP SEAL:

Benefits

Extends the life of an existing asphalt surface by protecting it from oxidation and deterioration ✓

Stretches maintenance dollars and is a strong return on investment ✓

Seals and resists reflection of small surface cracks ✓

Reduces future cracking, distress and potholes that eventually start to appear ✓

Improves skid-resistance and safety with a high friction surface ✓

Protects asphalt layer from damage ✓

MICRO-SURFACING

Drawbacks

Cure Time

Traffic ready in 1 hour

Flying Chips (aggregate)

Little, to No, Aggregate loss

Noise Considerations

One of the quietist processes

Weather Consideration

Micro can handle rain after being down for 20-30 minutes

Performance

Proven History (if applied properly and on good candidates)

Will not improve ride quality

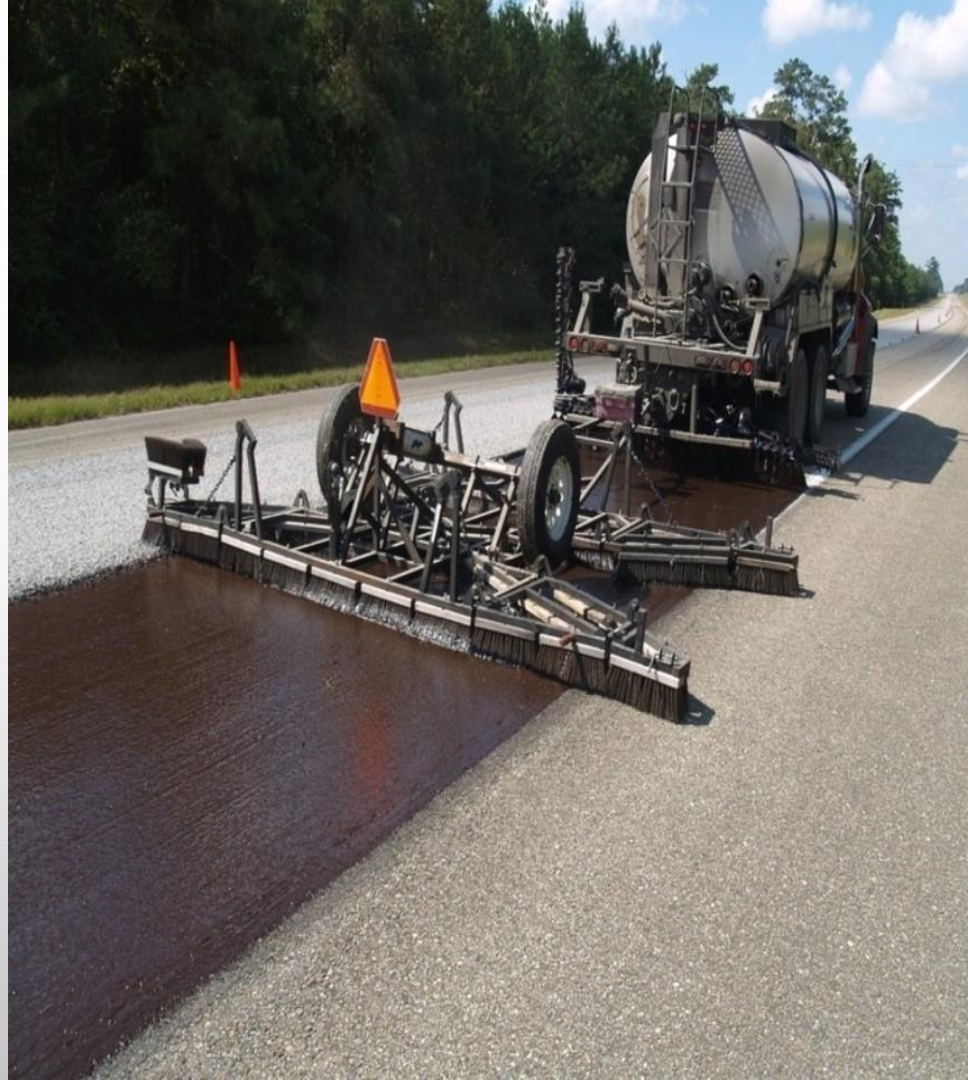
Can definitely improve ride IRI values

Public Complaints

HMAC appearance

SCRUB SEAL

- APPLICATION OF A HIGHER VISCOSITY EMULSION WHICH IS BROOMED OR “SCRUBBED” INTO THE CRACKED SURFACE
- REJUVENATION EMULSION
- HELPS ENSURE THAT EMULSION GETS INTO ALL THE CRACKS
- USED WHEN CRACK FREQUENCY CAN’T BE ADDRESSED IN A COST EFFECTIVE MANNER USING CONVENTIONAL CRACK SEALING METHODS
- CAN SOMETIMES RESULT IN A NON-UNIFORM FINISHED SURFACE, BLOTCHY.



GOOD SCRUB SEAL CANDIDATES



SLURRY SEAL *

- BLEND OF CRUSHED AGGREGATE (#10 STONE) & ASPHALT EMULSION
- MATCH AGGREGATE TO DESIRED TEXTURE (TY I, II, III)
- TYPICALLY, ONE AGGREGATE THICKNESS
- MIXED AND SPREAD IN A MOBILE OPERATION AS THIN WEARING SURFACE
- CAPE SEALS
- CAN BE USED AS A SAMI
- OVER OLD SLURRY
- ISSA – A105, A115

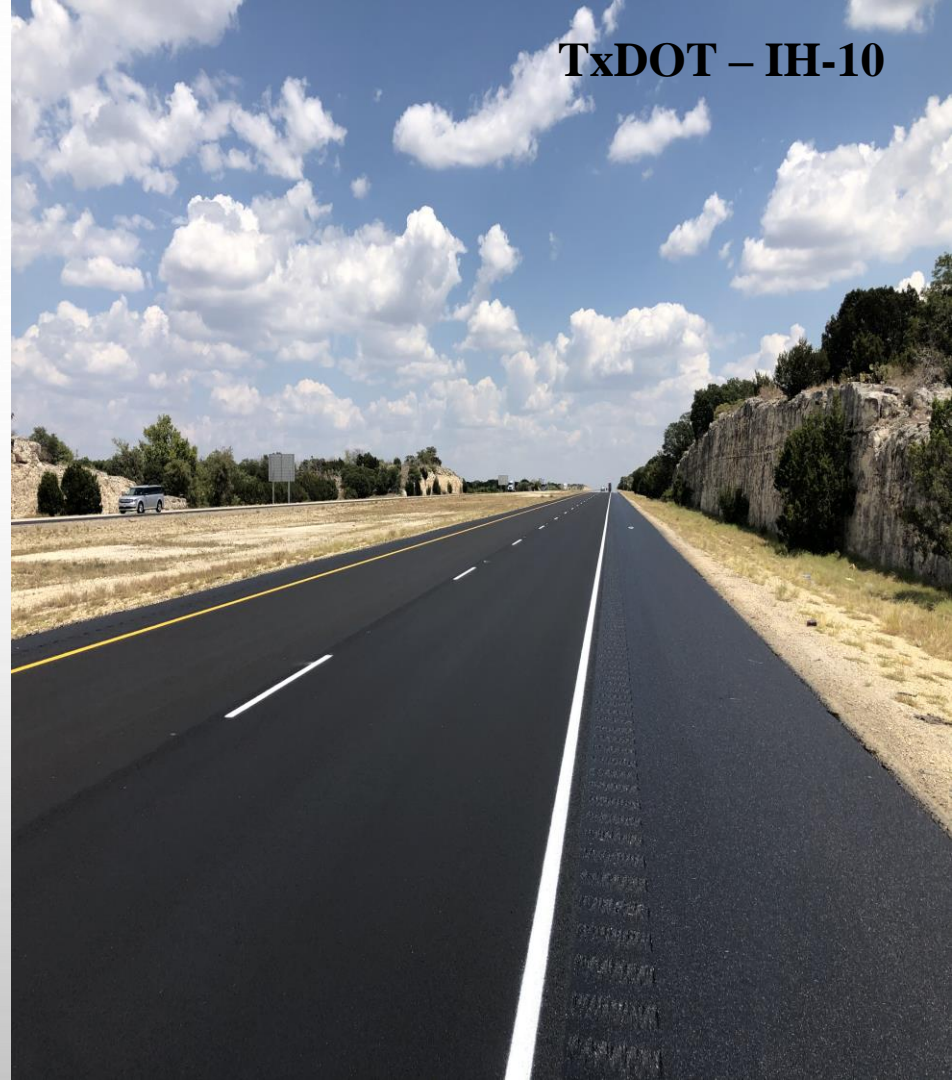
* (DEFINITION)



MICRO-SURFACING

TxDOT – IH-10

- SIMILAR IN MANY WAYS TO SLURRY WITH REGARD TO SITE SELECTION, CAPE SEALS ON BUSIER ROADS
- ALWAYS POLYMER MODIFIED EMULSION
- CAN PLACE MULTIPLE LIFTS, USING DIFFERENT SIZED AGGREGATES
- ISSA – A143
- HIGHER PROFILE AREAS
- LEVEL CONSOLIDATION RUTS PRIOR TO HMA OR CHIP SEAL
- ADDRESS FRICTION & BLEEDING ISSUES

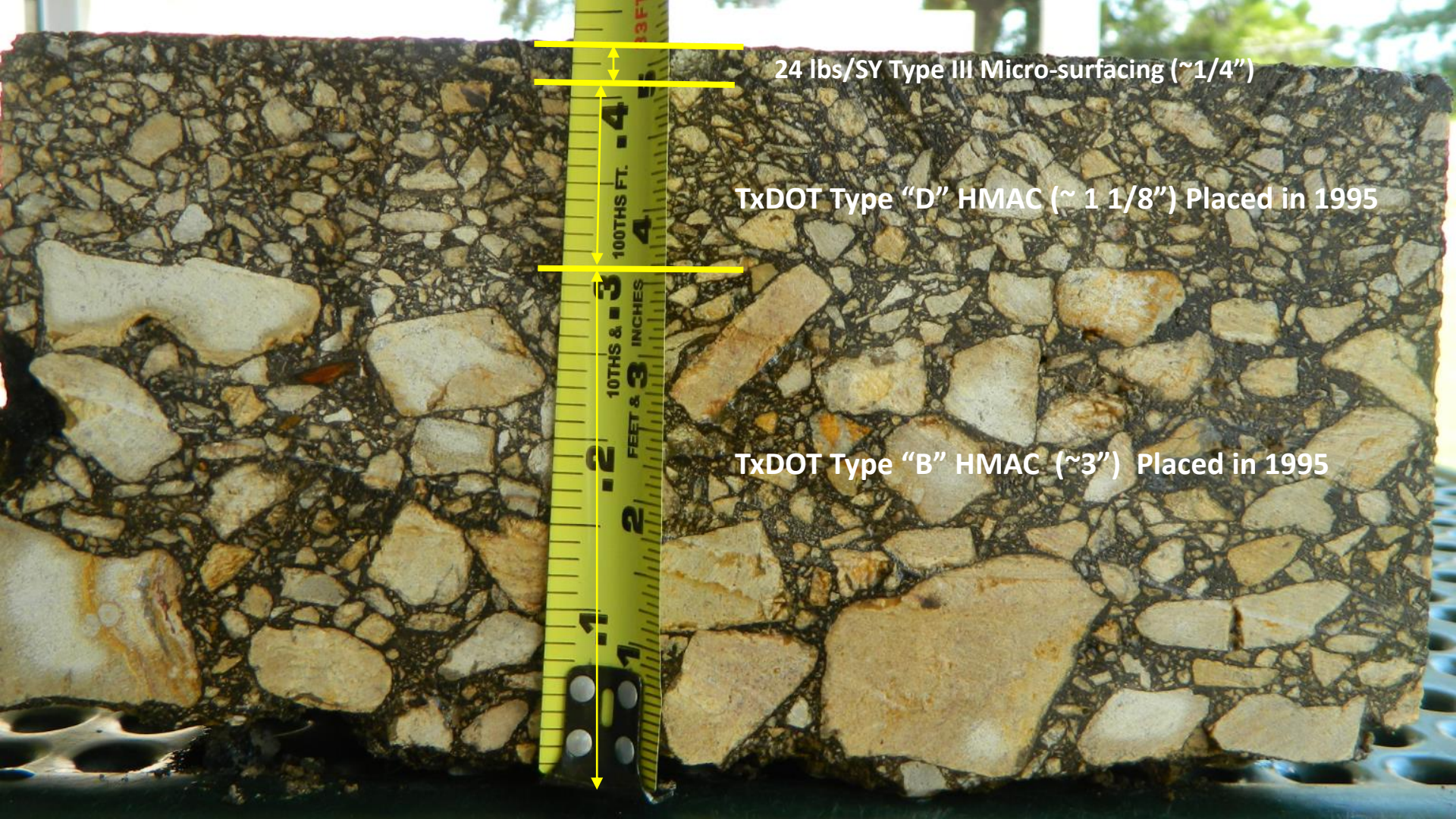


MICRO-SURFACING - RUT FILLING





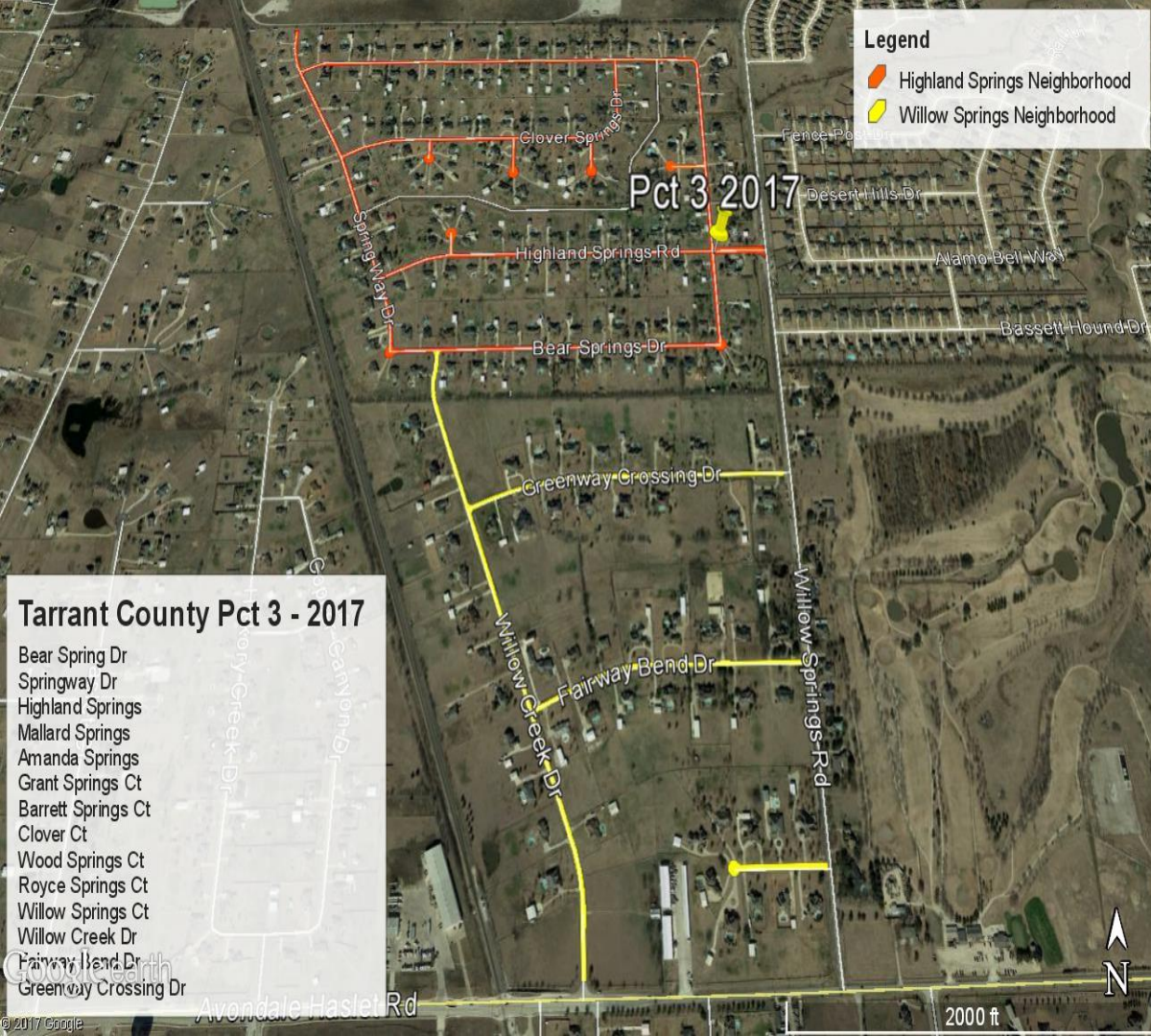
Abilene, TX



24 lbs/SY Type III Micro-surfacing (~1/4")

TxDOT Type "D" HMA (~ 1 1/8") Placed in 1995

TxDOT Type "B" HMA (~3") Placed in 1995



Micro-surfacing over existing surface.



Micro-surfacing will fade out much like HMAC.



**Existing Condition prior
to resurfacing in 2016**



**Photo taken
2017**

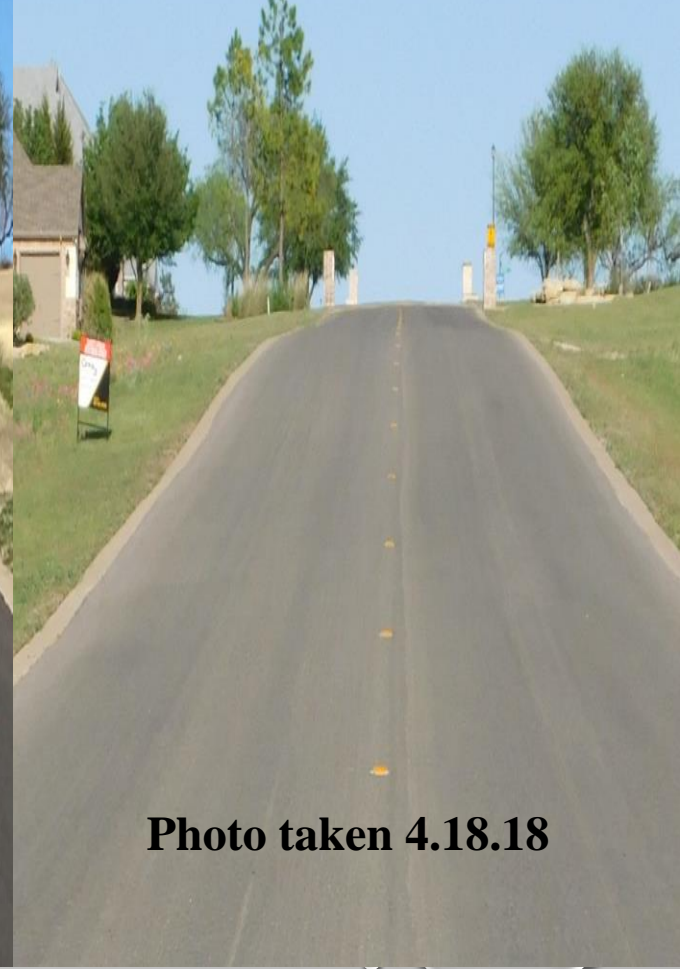
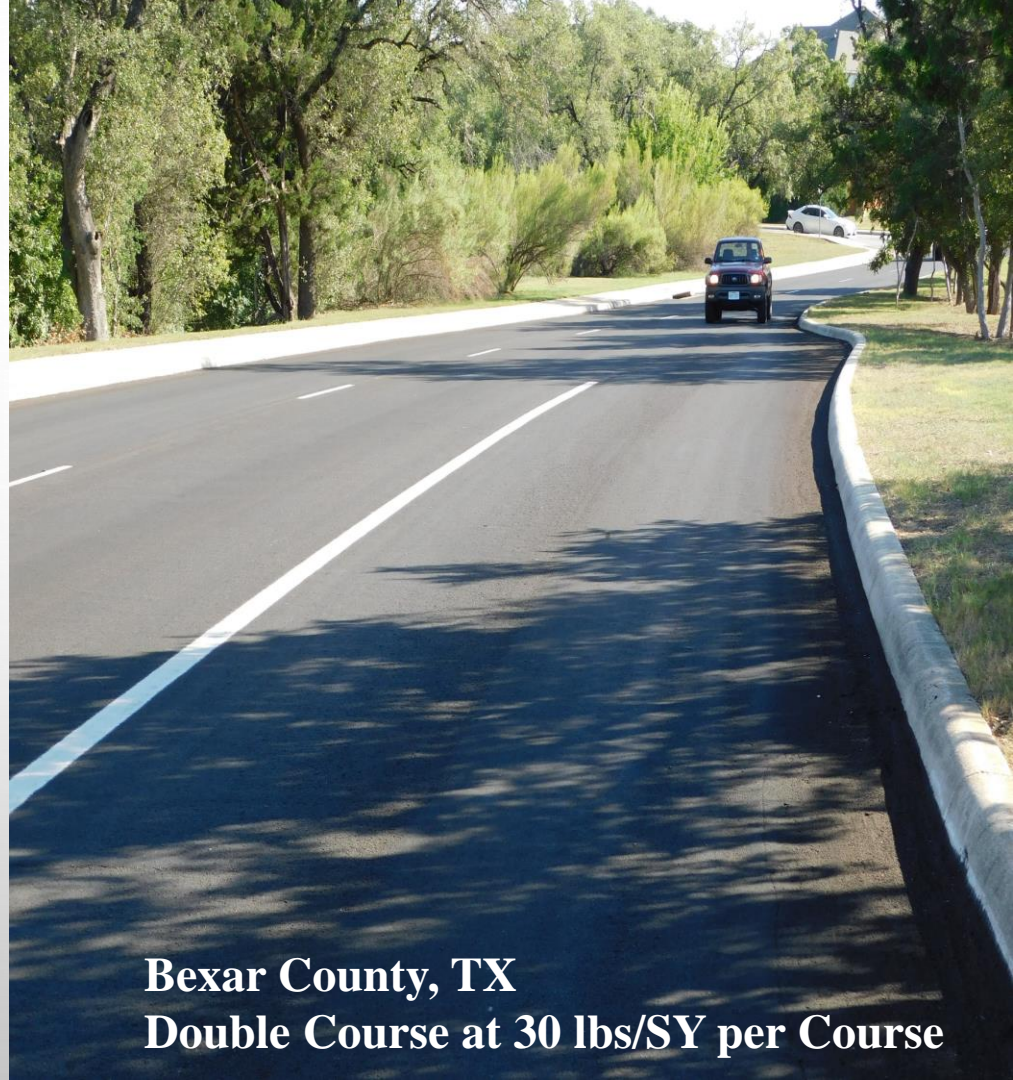


Photo taken 4.18.18

DOUBLE COURSES OF MICRO-SURFACING

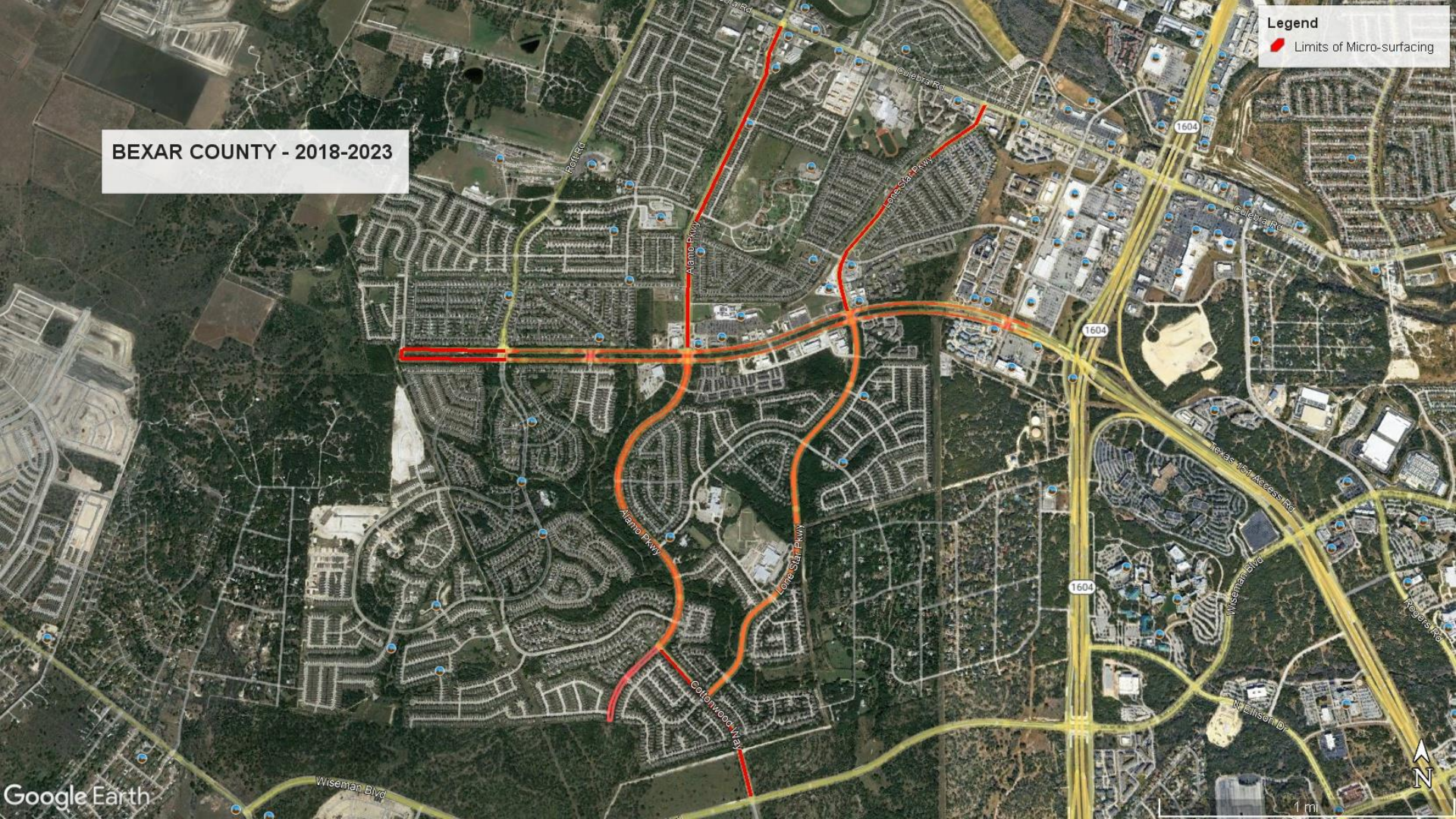
- FIRST COURSE WILL HELP LEVEL AND FILL DEPRESSIONS ON THE EXISTING SURFACE
- SECOND COURSE PROVIDES A WEARING SURFACE THAT HAS A UNIFORM THICKNESS OVER THE LOWER LAYER
- TYPICALLY USE A COARSER GRADATION ON THE BOTTOM COURSE TO FILL VOIDS AND PROVIDE A STABLE FOUNDATION
- FINER GRADATION ON THE SECOND COURSE PROVIDES A SMOOTH RIDING SURFACE
- EXPONENTIALLY MORE EFFECTIVE THAN A SINGLE COURSE



Bexar County, TX
Double Course at 30 lbs/SY per Course

Legend
Limits of Micro-surfacing


BEXAR COUNTY - 2018-2023



Double Courses of Micro-surfacing



**Lynn St – 2016
Existing Condition**



**Two lifts – 25#/SY
Scratch
22#/SY Surface**



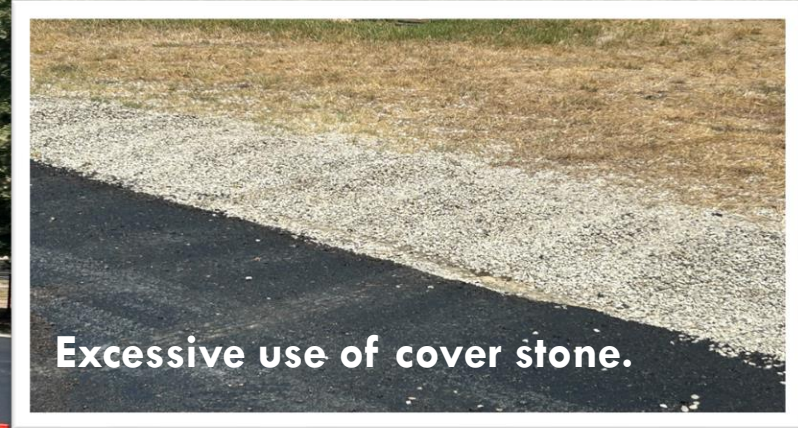
APRIL 2018

CAPE SEALS *

- THE COMBINATION OF A CHIP SEAL OR SCRUB SEAL WITH A SLURRY SEAL OR MICRO-SURFACING
- PROVIDES A GOOD MEMBRANE SEAL WHICH ADDRESSES MODERATE TO SEVERE SURFACE CRACKING
- PROVIDES A SMOOTHER SURFACE OVER THE AGGREGATE CHIP SEAL
- ADDRESS ROADS WITH LOWER PCI SCORES IN LIEU OF MORE COSTLY OPTIONS

* PUBLIC COMPLAINTS





Denton County 2023

Micro-surfacing to top off Chip Seal (Creating a Cape Seal) on reconstructed roads to provide a smooth HMAC appearance.

PAVEMENT PRESERVATION

*** Typical Life Extension(Years)**

SOURCE - NCAT

TREATMENT	GOOD CONDITION	FAIR CONDITION	POOR CONDITION
	(PCI=80)	(PCI=60)	(PCI=40)
FOG SEAL	3-5	1-3	1-2
CHIP SEAL	7-10	3-5	1-3
SLURRY SEAL	7-10	3-5	1-3
MICRO-SURFACING	8-12	5-7	2-4
THIN HMA	10-12	5-7	2-4

Results from NCAT Study on Crack Reduction Testing Several Asphalt Preservation Processes over an 8 Year Test Period.

Treatment	Poor	Fair	Good
Rej. Fog Seal	4	3	10
Single Micro	17	5	7
Double Micro	70	40	33
Single Chip	28	23	16
Double Chip	45	33	29
Triple Chip	63	38	32
Fiber Chip	54	33	30
Virgin Thinlay	67	40	33
Cape Seal	70	39	32
50% RAP Thinlay	28	16	13
5% RAS Thinlay	8	19	5

COMPARING COSTS OF DIFFERENT PROCESSES

(Average pricing will vary based on location and project size!)



Chip Seal - \$2-\$3 per Square Yard = \$35,200/Mile



Scrub Seal - \$2.5-\$3.5 per Square Yard = \$42,240/Mile



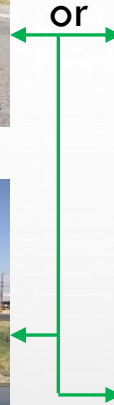
Micro-surfacing - \$3.5-\$4.5 per Square Yard = \$56,320/Mile



Cape Seal - \$6.5-\$8.5 per Square Yard = \$105,600/Mile



HMAC Overlay (1½") - \$8-\$10 per Square Yard = \$126,720/Mile



(Based on 24' roadway width)

READ THIS!



Thanks!
QUESTIONS?

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Development
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IF YOU EXPECT IT, THEN INSPECT IT!
IF YOU INSPECT IT, THEN YOU'LL GET IT!

