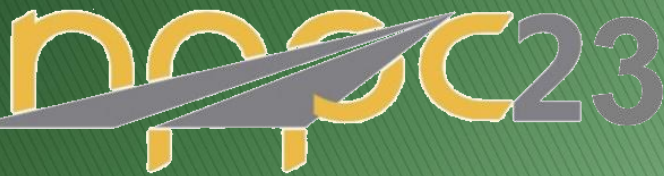


The Asphalt-Based Preservation Toolbox

Stan Williams, P.E.
Technical Marketing Manager
Ergon Asphalt & Emulsions, Inc.

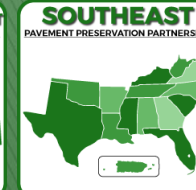
National Pavement Preservation Conference

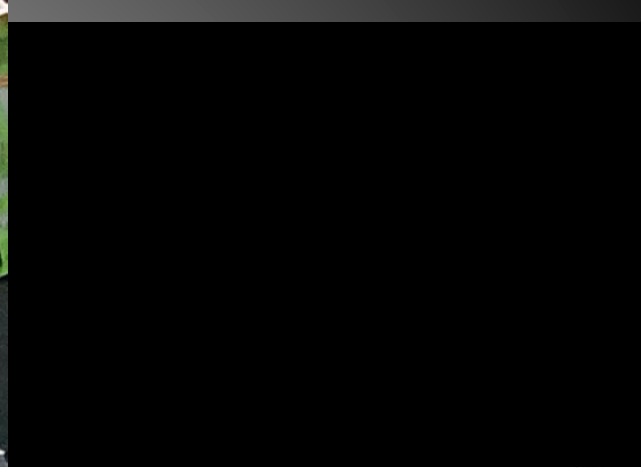


IMPACTS AND BENEFITS FROM PAVEMENT PRESERVATION
September 18-21 • J.W. Marriott Hotel • Indianapolis, Indiana



MICHIGAN STATE
UNIVERSITY





YEAR 1

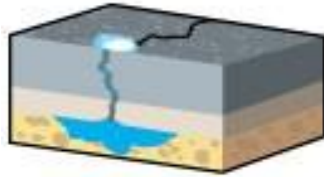
YEAR 7

YEAR 15

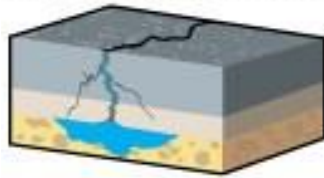
YEAR 20



Soon after the ribbon is cut on a new highway, weather and constant traffic – especially large, heavy trucks – begin to cause surface cracks.



1. If left untreated, the cracks get deeper and completely break through the asphalt, letting water seep into the rock and soil beneath it.



2. Eventually this underlying layer softens, making it less able to support the pavement. Additional cracks occur more easily.



3. In winter, the water below the asphalt freezes and expands, buckling the road.



4. When it thaws, it leaves a gap that, when broken through by a tire, becomes a pothole.



5. Patches and repaving temporarily smooth the surface, but the underlying problem remains.

Asphalt
Base
Soil



Beneath the surface, the Beltway crumbles

- The Washington Post , March 30, 2013

www.infrastructurereportcard.org

- 2021 Grade = D
- 43% of public roadways are in mediocre to poor condition
- \$130 billion spent on vehicle repairs and operating costs
- “poor” condition roads have increased from 15% to 17%



Pavement Deterioration

GOOD

PAVEMENT CONDITION

POOR



Routine Maintenance



Structural Rehabilitation
Or Reconstruction

Point of Accelerated
Deterioration

TIME



Service Cycle

Assume: 100 mile network & \$500,000 budget

Pavement life = 15 years Road Rehabilitation = \$180,000



$100 \text{ miles} / 15 \text{ years} = 6.7 \text{ miles/yr}$

$6.7 \text{ miles} / \$1,200,000$

$\$500,000 / \$180,000 = 2.7 \text{ miles}$

37 years needed for
entire network

Park Avenue

Neighbor

2004: 2" Mill & Fill

Fairfield, CT

2004: 2" Mill & Fill

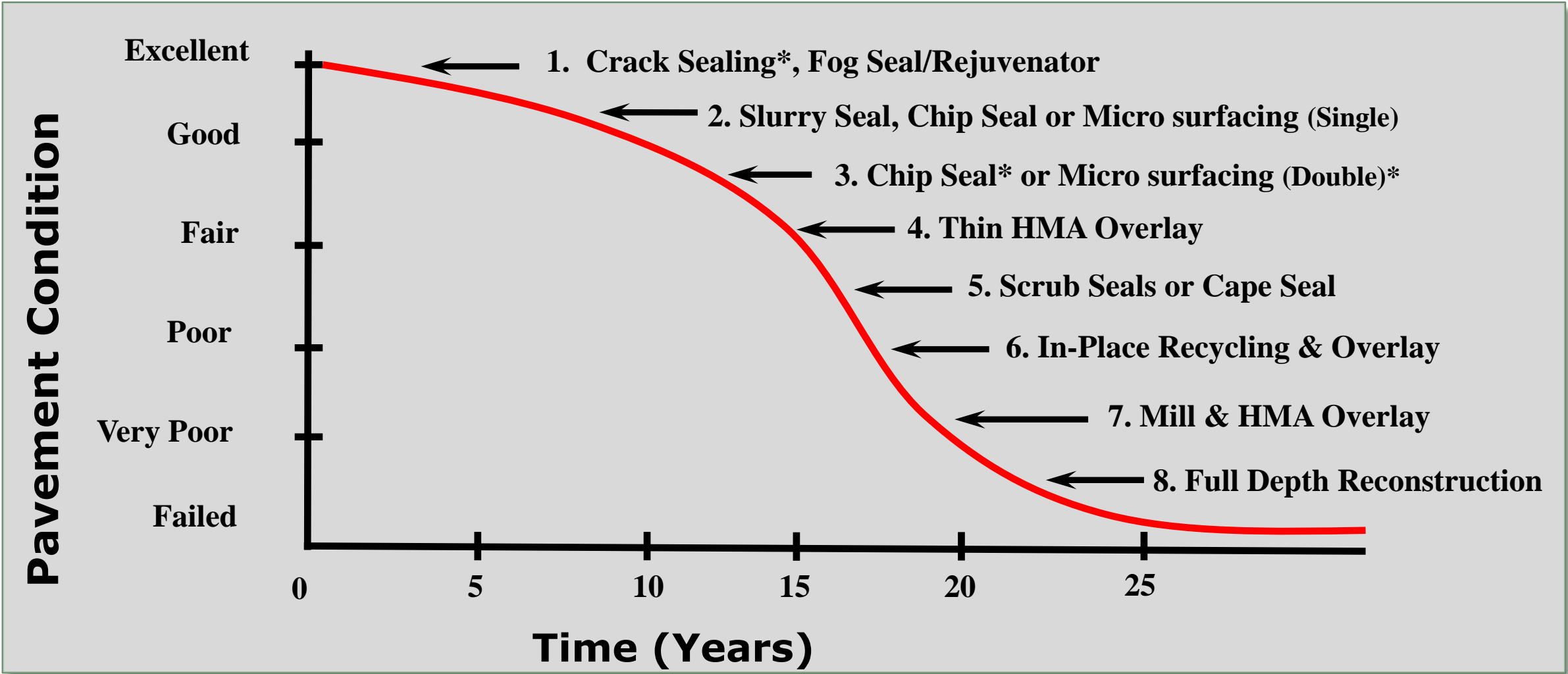
2010: Crack Seal &
Microsurfacing



House Example



Applying the Right Treatment to the Right Road at the Right Time



*** Crack Sealing is also be used in conjunction with other applications and as needed**

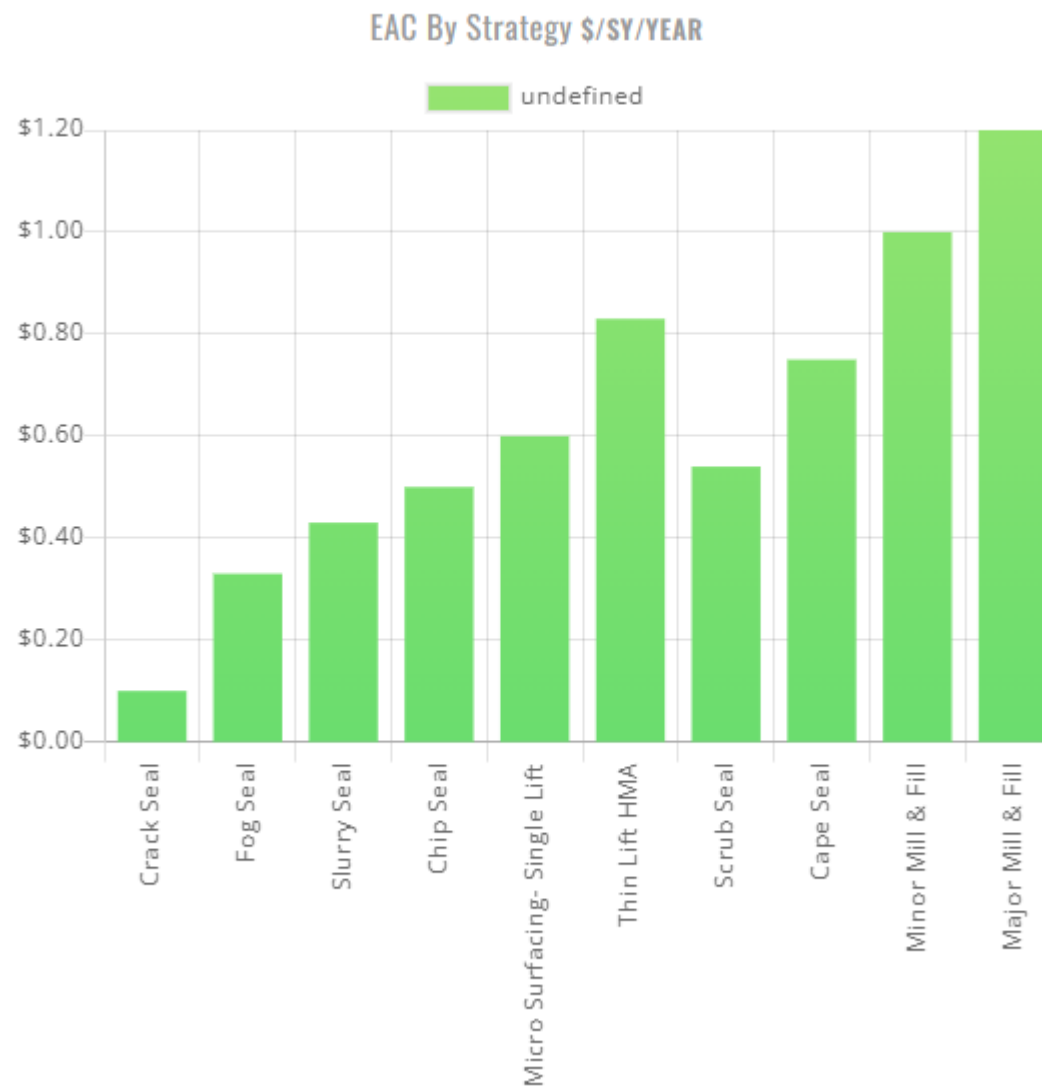
Cost Comparison

Treatment	Life Extension	Cost, (\$/yd²)
Crack Seal	3 - 5	2.00/Linear foot
Fog Seal	2 - 4	0.50 - 1.00
Chip Seal	5 - 7	2.50 - 4.50
Scrub Seal	6 - 7	3.25 - 5.25
Micro Surfacing	6 - 8	3.75 - 5.75
Cape Seal	8 - 10	7.00 - 10.00
Thin Overlay	5 - 10	6.50 - 8.00
Mill & Fill	8 - 10	15.00 - 20.00

🇺🇸 yd

Treatment Type	Cost Per Sq Yard	Life Extension	EAC \$ SY/YEAR
Crack Seal	0.50	5	0.10
Fog Seal	1.00	3	0.33
Slurry Seal	3.00	7	0.43
Chip Seal	3.50	7	0.50
Micro Surfacing- Single Lift	4.20	7	0.60
Thin Lift HMA	7.50	9	0.83
Scrub Seal	3.80	7	0.54
Cape Seal	7.50	10	0.75
Minor Mill & Fill	12.00	12	1.00
Major Mill & Fill	18.00	15	1.20

ADD ROW



[Clear Data / Chart Your Own](#)

[Equivalent Annual Cost Calculator | RoadResource.org](https://roadresource.org)

<https://roadresource.org/network/eac>

EAC Example

Roadway Network = 48 Centerline Miles
 Average Paved Width = 12 Feet
 Total Paved Area = 337,920 Square Yards

	Preservation Approach	Traditional Approach
Project	\$1.1 Million	\$4.5 Million
Network Area	÷ 337,920 Square Yards	÷ 337,920 Square Yards
Avg. Life Extension	<u>÷ 7 Years</u>	<u>÷ 15 Years</u>
Average EAC	\$ 0.47/SY/yr or \$3273/lane mile/yr	\$0.89/SY/yr or \$6250/lane mile/yr

Save Money...Keep Good Roads Good!

EAC Example

Roadway Network = 48 Centerline Miles
 Average Paved Width = 12 Feet
 Total Paved Area = 337,920 Square Yards

	Preservation Approach	Traditional Approach
Project	\$1.1 Million	\$4.5 Million
Network Area	÷ 337,920 Square Yards	÷ 337,920 Square Yards
Avg. Life Extension	<u>÷ 4 Years</u>	<u>÷ 15 Years</u>
Average EAC	\$ 0.82/SY/yr or \$5730/lane mile/yr	\$0.89/SY/yr or \$6250/lane mile/yr

Save Money...Keep Good Roads Good!

2020 Preservation Performance Award

12 miles of 4-Lane
Double Micro
\$1,100,000 Project

First lift - 25 lbs/sy
Second lift - 20 lbs/sy

14 yrs of extended life

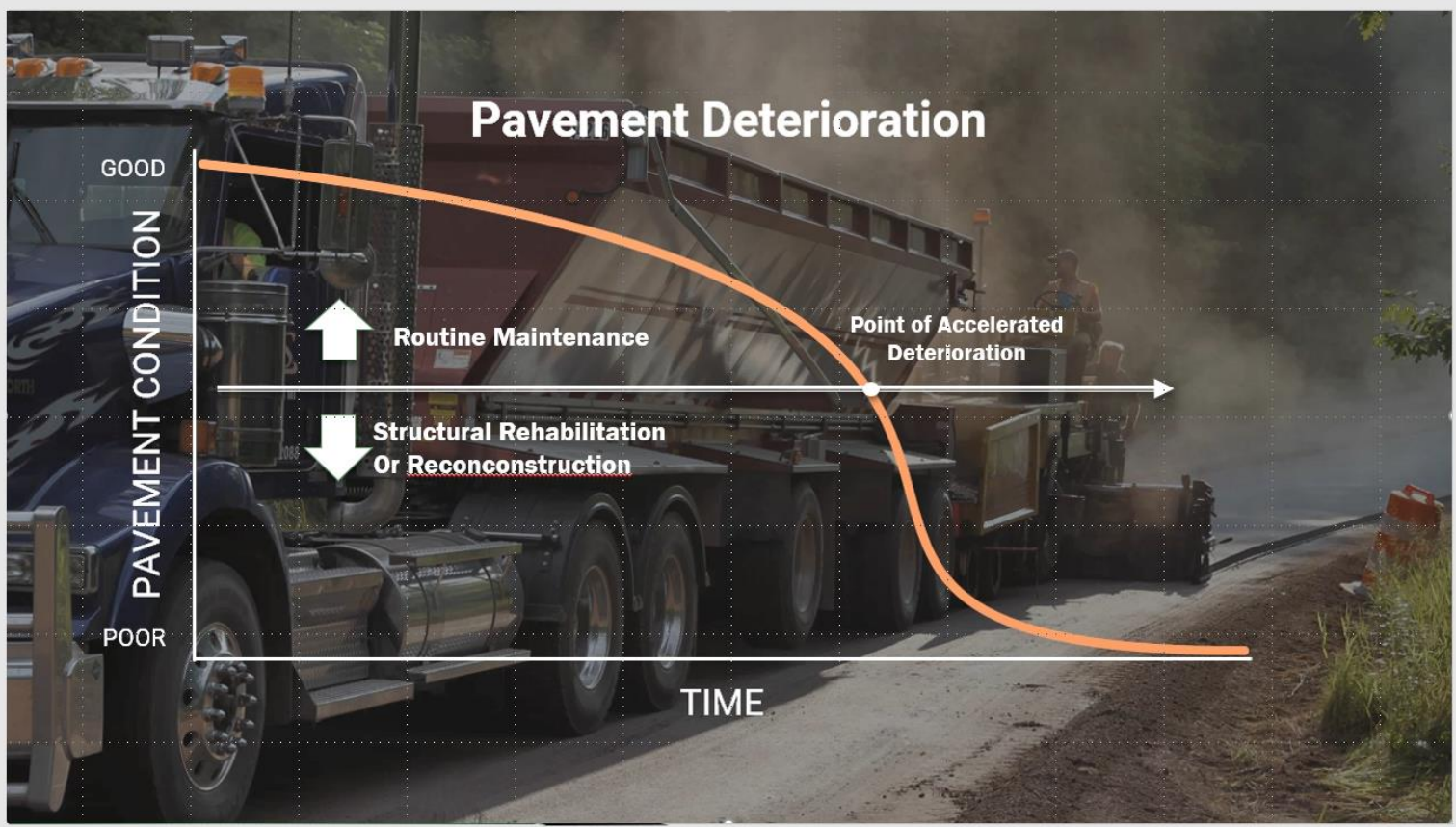
\$1637 / lane mile / yr
\$0.24 / lane mile / yr



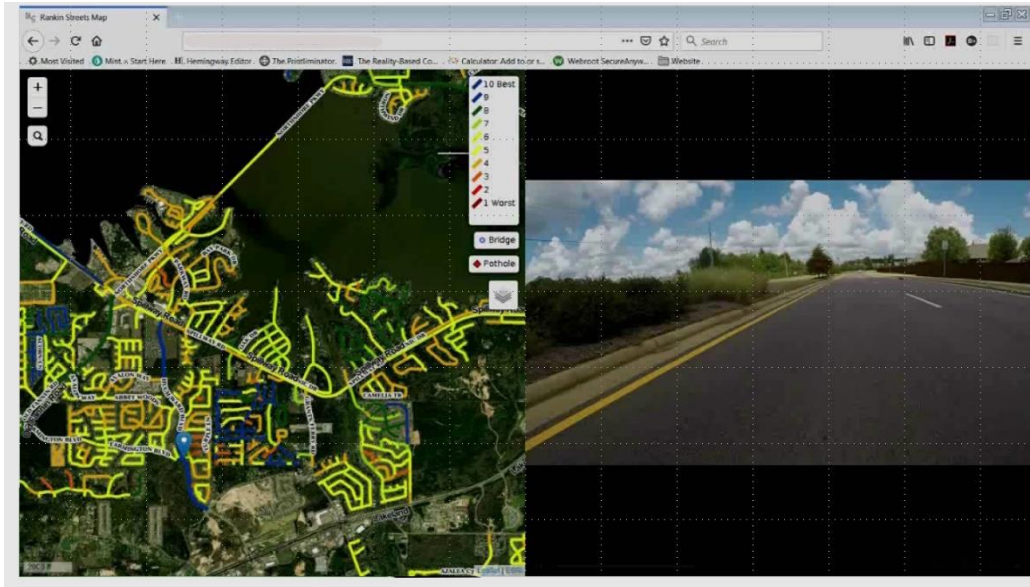
REVIEW

Keep our pavements at the top of the curve

Put More Life into Your Network than You Lose



Tools for the Toolbox

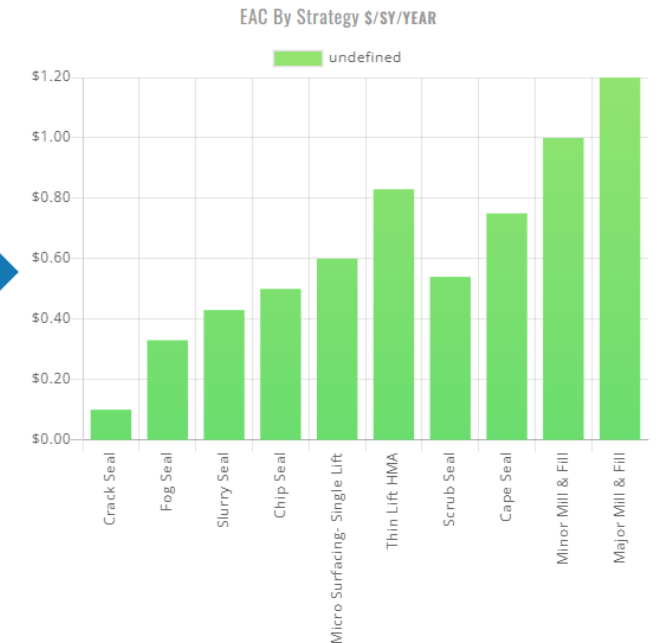


Develop a Pavement Management Plan

Treatment Type	Cost Per Sq Yard	Life Extension	EAC \$ SY/YEAR
Crack Seal	0.50	5	0.10
Fog Seal	1.00	3	0.33
Slurry Seal	3.00	7	0.43
Chip Seal	3.50	7	0.50
Micro Surfacing- Single Lift	4.20	7	0.60
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Minor Mill & Fill	12.00	12	1.00
Major Mill & Fill	18.00	15	1.20

[Clear Data / Chart Your Own](#)

Know Treatments Available in Your Area



Use a Method to Identify the Best Treatment for the Job

Overview

Condition & Capacity

Funding & Future Need

Public Safety

Resilience, Operations & Maintenance

Innovation

Raising The Grade



Raising the Grade

Solutions that Work

🕒 **Focus resources on preserving** a state of good repair as the nation will never be able to fully build its way out of congestion. Policies and efforts focused on improving travel time reliability will need to be implemented to maximize the capacity of the existing road network. This should be done in coordination with the acceleration of the development and deployment of new technologies that promote an integrated, multimodal transportation system.

🕒 **Increase funding from all levels of government and the private sector** to address the condition and operations of the roadway system to maintain a state of good repair and ensure safety for all users.

🕒 **Fix the federal Highway Trust Fund by raising the federal motor fuels tax by five cents each year over five years.** To ensure long-term, sustainable funding for the federal surface transportation program, the current user fee of 18.4 cents per gallon on gasoline and 24.4 cents per gallon on diesel should be tied to inflation to restore its purchasing power, fill the funding deficit, and ensure reliable funding for the future.

🕒 **Develop state and local level comprehensive transportation asset management plans** that link asset management efforts to long-term transportation planning and incorporate the use of life-cycle cost analysis.

🕒 **Create dedicated federal investments to build resilience** into the nation's road and bridge infrastructure and integrate resilience planning into State Transportation Asset Management Plans.

Park Avenue

Neighbor

2004: 2" Mill & Fill

Fairfield, CT

2004: 2" Mill & Fill

2010: Crack Seal &
Microsurfacing

Questions?



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