PAAMA
Pennsylvania Association of Asphalt Material Applicators

2025 Annual Conference - Innovations in Pavement Preservation

A Tale of Two States

Mark Waits & Rex Eberly

www.paama.org

Alabama

- ***Mark Waits***

  - Former Alabama DOT Assistant Maintenance Engineer

  - Pavement Preservation Specialist for The National Center for Pavement Preservation

Alabama

WHY PAVEMENT PRESERVATION?

WHY PAVEMENT PRESERVATION?

Report: Alabama road conditions cost drivers $530M a year in vehicle repairs

Updated: Mar. 20, 2013, 6:05 p.m. | Published: Mar. 20, 2013, 5:05 p.m.

One-quarter of Alabama's more than 97,000 miles of public roads are in poor or mediocre condition, according to the American Society of Civil Engineers. This file photo shows the Alabama Department of Transportation's rehabilitation of Interstate 20/59 near Bessemer in 2012.

By Mike D. Smith | msmith@al.com

BIRMINGHAM, Alabama - One-quarter of the state's public roads are in "poor" or "mediocre" shape, and driving them costs Alabamians more than $500 million per year in vehicle repairs, a nationwide civil engineering study concluded.

The same study also gives Alabama high marks for working to reduce traffic fatalities and serious injuries on its highways.

WHY PAVEMENT PRESERVATION?

The figures come from the American Society of Civil Engineers, which this week released its

2013 Report Card for America's Infrastructure

.

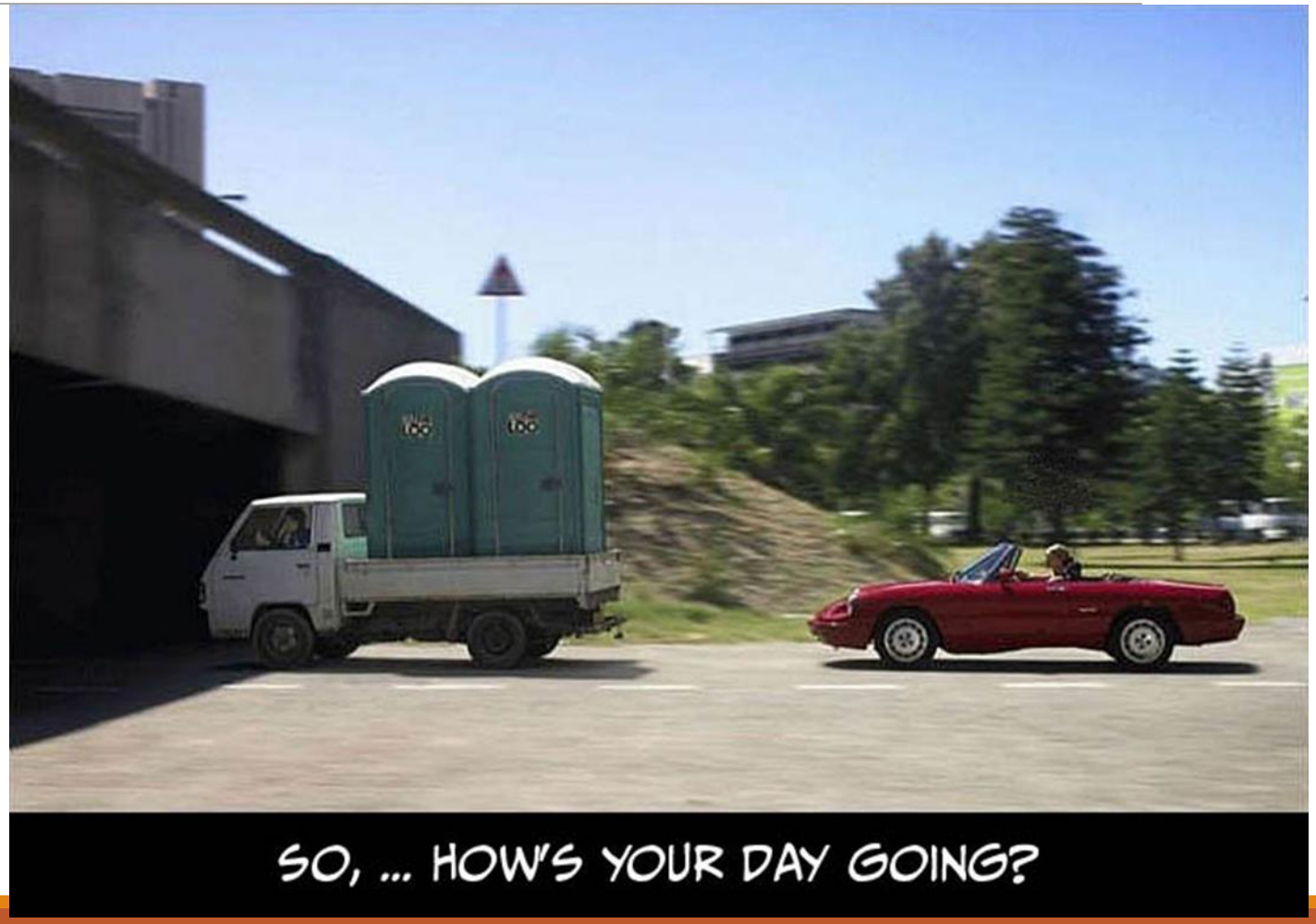
Every four years, the group grades conditions of the country's roads, bridges, drinking water systems, mass transit, schools and energy networks.

For Alabama, the report stated the following issues:

- 25 percent of the state's roadways are in "poor" or "mediocre" condition
- Driving Alabama's roads results in $530 million in vehicle repairs each year, or about $141 per motorist
- Alabama's gas tax of 20.9 percent has not been increased in 20 years
- Of the state's 16,070 bridges, 1,448, or 9 percent, are "structurally deficient"
- 2,205 of the state's bridges, or 13.7 percent, are "functionally obsolete"

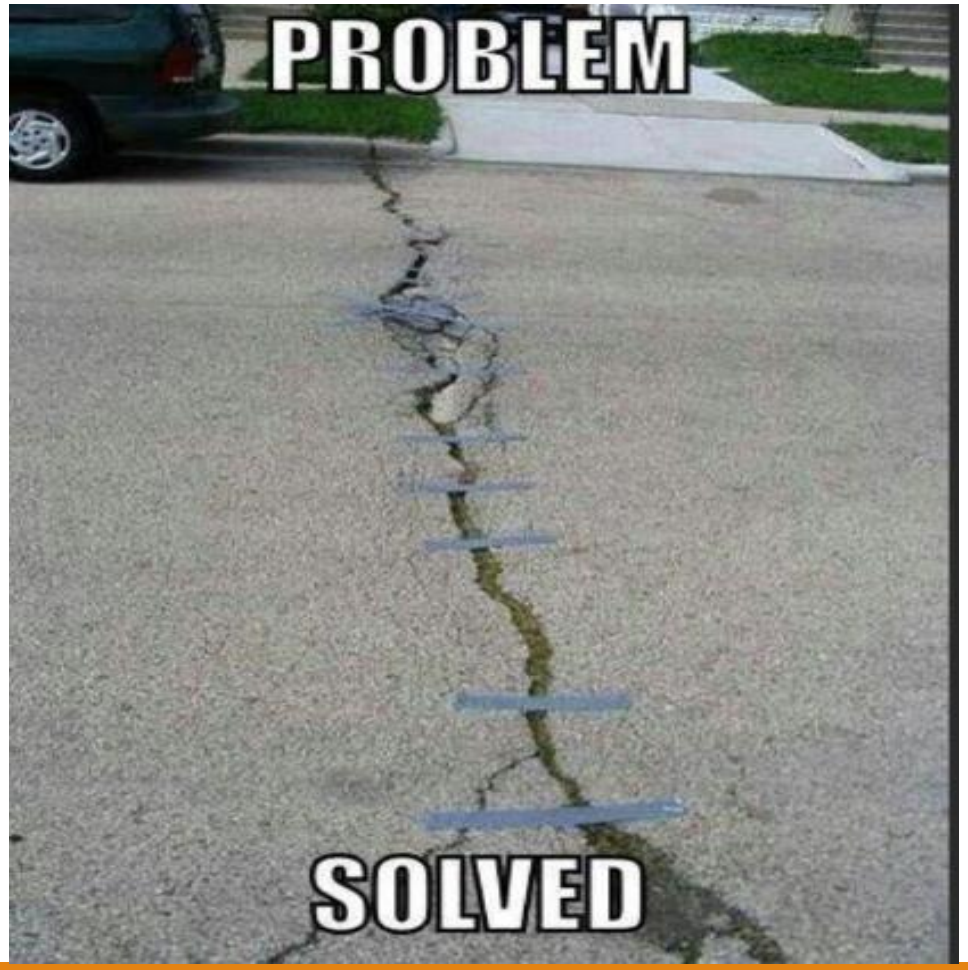
WHY PAVEMENT PRESERVATION?

What Now!?!



Alabama

WHY PAVEMENT PRESERVATION?



Alabama

WHY PAVEMENT PRESERVATION?

WHY PAVEMENT PRESERVATION?

WHY PAVEMENT PRESERVATION?

Alabama has Two Funding Sources for Roadway Surface Maintenance

- ***Federal Aid Maintenance*** **(FM)**
  - **Non- Interstate State maintained roadways**
- ***Interstate Maintenance*** **(IM)**

WHY PAVEMENT PRESERVATION?

Alabama's Interstate has approximately 1003 centerline miles or approximately *4,700 Lane Miles (IM)*

WHY PAVEMENT PRESERVATION?

- **Approximately 4,700 *Interstate Lane Miles***

FY2014 IM *Lane Mile Cost* was *$357k*

WHY PAVEMENT PRESERVATION?

Alabama has approximately *24,545*
Non-Interstate Lane Miles (FM)

WHY PAVEMENT PRESERVATION?

- **Approximately 24,545 *Non-Interstate Lane Miles***

FY2014 FM *Lane Mile Cost* was *$146k*

WHY PAVEMENT PRESERVATION?

- **Approximately 24,545 *Non-Interstate Lane Miles***
- **FY2014 *Lane Mile Cost* was *$146,159.73***

Alabama had been level funded at *$244* million for FM resurfacing

WHY PAVEMENT PRESERVATION?

- **Approximately 24,545 *Non-Interstate Lane Miles***
- **FY2014 *Lane Mile Cost* was *$146,159.73***
- **Alabama had been level funded at $244 million for resurfacing**

Approx. $3.6 Billion to resurface all FM lane miles in one FY ($146k x 24.6k lane miles)

WHY PAVEMENT PRESERVATION?

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- **FY2014 *Lane Mile Cost* was *$146,159.73***
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- **Approx. $3.6 Billion to resurface all lane miles in one FY ($146k x 24.6k lane miles)**

Approximately 15 years of level funding at $244 million to make one FM resurfacing "cycle".

WHY PAVEMENT PRESERVATION?

- **Approximately 24,545 *Non-Interstate Lane Miles***
- **FY2014 *Lane Mile Cost* was *$146,159.73***
- **Alabama had been level funded at $244 million for resurfacing**
- **Approx. $3.6 Billion to resurface all lane miles in one FY ($146k x 24.6k lane miles)**
- **Approximately *15 years* of level funding at $244 million to make one "cycle".**

What is a HMA Pavement design life is ???????

WHY PAVEMENT PRESERVATION?

- **Approximately 4,700 *Interstate Lane Miles***

FY2014 IM *Lane Mile Cost* was *$357k*

WHY PAVEMENT PRESERVATION?

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IM funding averaged $90 million

WHY PAVEMENT PRESERVATION?

- **Approximately 4,700 *Interstate Lane Miles***
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Approx. $1.7 Billion to resurface all IM lane miles in one FY ($357k x 4.7k lane miles)

WHY PAVEMENT PRESERVATION?

- **Approximately 4,700 *Interstate Lane Miles***
- ***FY2014 IM Lane Mile Cost was $357k***
- ***IM funding averaged $90 million***
- ***Approx. $1.7 Billion to resurface all IM lane miles in one FY ($357k x 4.7k lane miles)***

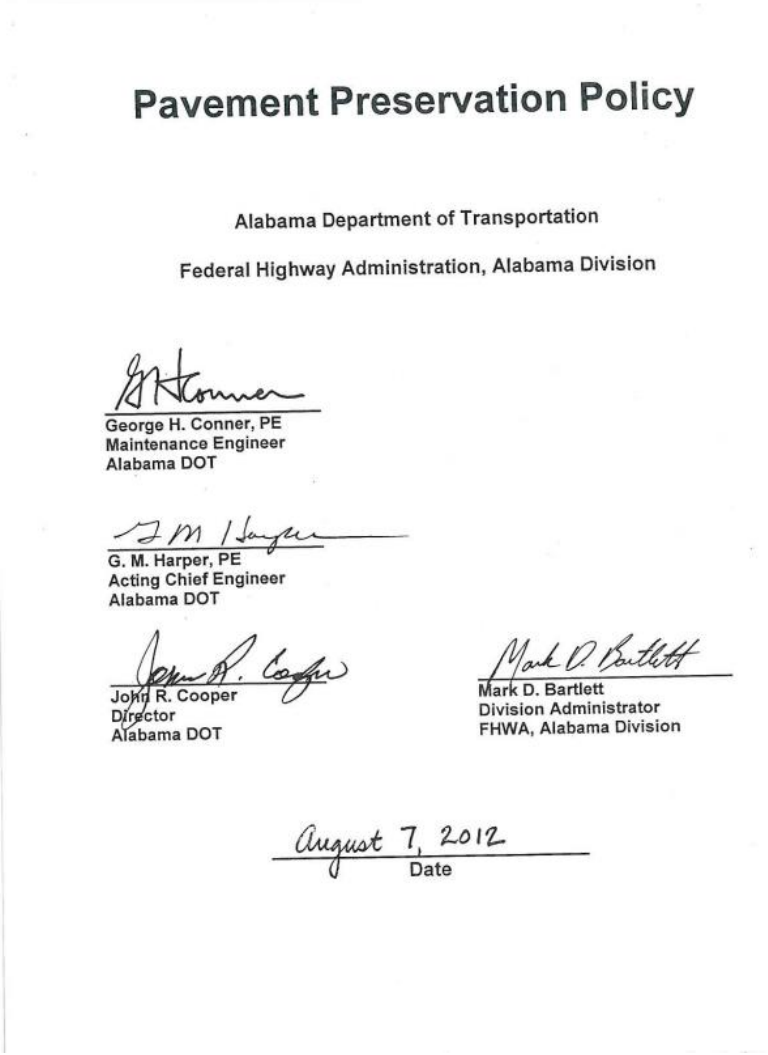
Approximately 19 years of level funding at $90 million to make one IM resurfacing "cycle".

WHY PAVEMENT PRESERVATION?

- **Approximately 4,700 *Interstate Lane Miles***
- ***FY2014 IM Lane Mile Cost was $357k***
- ***IM funding averaged $90 million***
- ***Approx. $1.7 Billion to resurface all IM lane miles in one FY ($357k x 4.7k lane miles)***

Started getting more IM funding, slowly increased up to $180 million

WHY PAVEMENT PRESERVATION?



Pavement Preservation Policy

Alabama Department of Transportation

Federal Highway Administration, Alabama Division

George H. Conner, PE
Maintenance Engineer
Alabama DOT

G. M. Harper, PE
Acting Chief Engineer
Alabama DOT

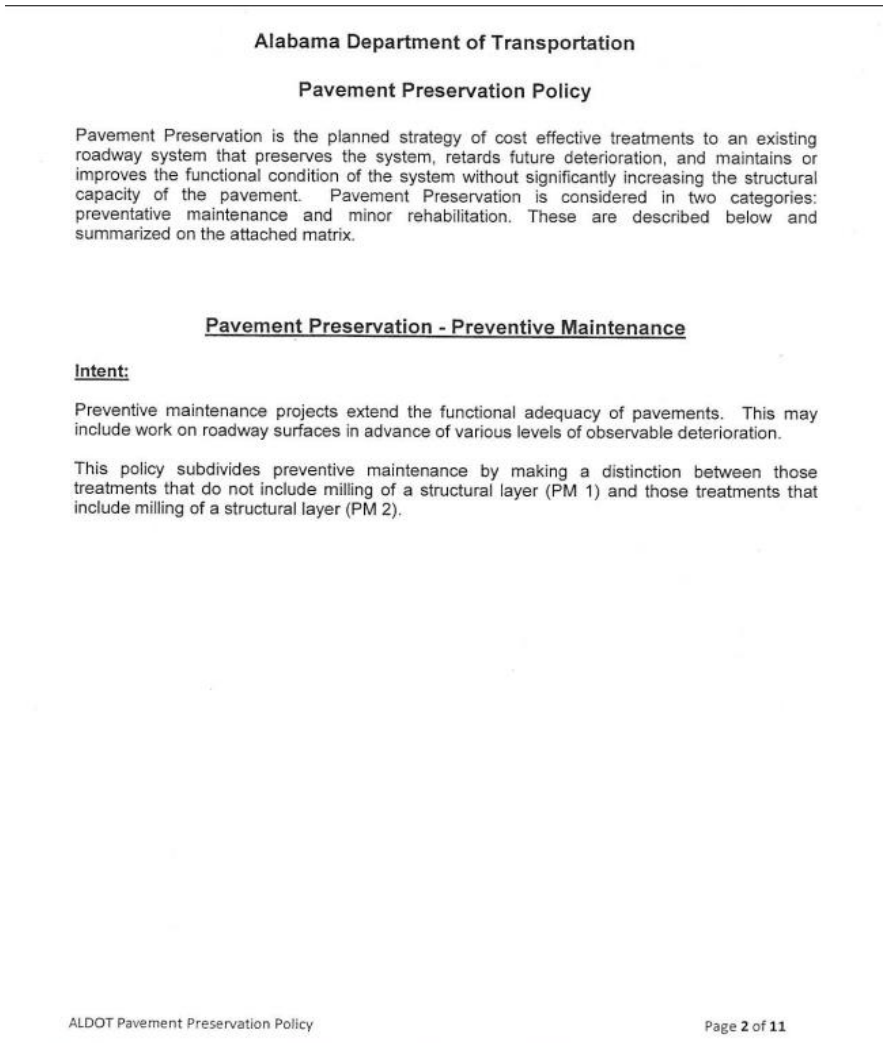
John R. Cooper
Director
Alabama DOT

Mark D. Bartlett
Division Administrator
FHWA, Alabama Division

August 7, 2012
Date

Existing 2012 PPP that allowed exemptions to some design standards when incorporating certain PP categories.

It did not address concrete paving!



Alabama Department of Transportation

Pavement Preservation Policy

Pavement Preservation is the planned strategy of cost effective treatments to an existing roadway system that preserves the system, retards future deterioration, and maintains or improves the functional condition of the system without significantly increasing the structural capacity of the pavement. Pavement Preservation is considered in two categories: preventative maintenance and minor rehabilitation. These are described below and summarized on the attached matrix.

Pavement Preservation - Preventive Maintenance

Intent:

Preventive maintenance projects extend the functional adequacy of pavements. This may include work on roadway surfaces in advance of various levels of observable deterioration.

This policy subdivides preventive maintenance by making a distinction between those treatments that do not include milling of a structural layer (PM 1) and those treatments that include milling of a structural layer (PM 2).

ALDOT Pavement Preservation Policy

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WHY PAVEMENT PRESERVATION?

Preventive Maintenance 1 – No Milling of Structural Layers

Eligible Funding Categories:

The following funding sources should be considered for pavement preservation projects. The Maintenance Bureau will publish each year the amount of funds available by Division in the first three categories.

- Federal aid resurfacing program funds
- State maintenance resurfacing program funds
- State special maintenance funds
- Interstate Maintenance program funds
- State construction funds

Project Scoping Team:

A scope of work inspection should be conducted on each resurfacing project by the Division. The scope team should consist of appropriate personnel as determined by the Division Engineer. FHWA should be included as a member of the scope team on full involvement federally funded projects. An on-site review should be conducted by the scope team of the entire project limits. For interstate routes, the Division scope team should submit to the Maintenance Bureau for review and approval the recommended treatment along with the supporting engineering data.

Consideration for All Funding Categories:

Environmental Document:
Categorical exclusion applies.

Pavement Condition Ratings
Review the most current pavement condition ratings available from Materials and Tests Bureau.

Preventive maintenance treatments should be considered for pavements that need their functional adequacy extended or maintained until a more appropriate treatment can be scheduled.

Selection of preventive maintenance treatments must consider whether the in-place pavement structure is satisfactory.

Selected preventive maintenance treatments must accommodate the maintenance of existing traffic volumes.

Preventive maintenance treatments are not appropriate when significant rutting and/or significant cracking is present.

Established a Preventative Maintenance Category *PM1*. Basically, allowed up to 1" overlay and milling 50% of existing *safety* layer.

Milling:
Single layer of any safety surface that may be present may be milled. Micro milling is required for milling depths of 1.0" or less. Milling of the safety layer may extend into the wearing layer between 0.25" and 0.50" (maximum) to scarify the surface and ensure that no remnant "scabs" remain.

Overlays:
Limited to 1.0" of thickness or less not counting any safety layer that may be added. Actual overlay depth is dependent on treatment selected. Safety layers are limited to 1.0" of thickness or less.

Selection of Treatments:
The following pavement treatments are available for preventive maintenance. The scope team is to select the most appropriate treatment for the condition of the pavement.

- Crack Seal
- Fog Seal
- Scrub Seal
- Chip Seal
- Double Surface Treatment (DG)
- Slurry Seal (micro-surfacing)
- Safety Layer (OGFC or Paver Laid Surface Treatment)

Safety (General):
Selection of pavement treatments should consider the frictional characteristics of both the existing pavement and proposed applications.

Eligible safety items identified by the scope team as desirable should be addressed in separate projects as funding is available.

Superelevation and Cross-slope:
Not a required consideration - outside the purview of preventive maintenance.

Americans with Disabilities Act:
Not a required consideration - outside the purview of preventive maintenance.

Pavement Width:
Not a required consideration - outside the purview of preventive maintenance.

Roadway Geometries:
Not a required consideration - outside the purview of pavement preservation.

Additional Considerations for Federal Aid funding:

Bridge Rails:
Not a required consideration - outside the purview of preventive maintenance.

WHY PAVEMENT PRESERVATION?

Preventive Maintenance 2 – Limited Milling of Structural Layers

Eligible Funding Categories:

The following funding sources should be considered for pavement preservation projects. The Maintenance Bureau will publish each year the amount of funds available by Division in the first three categories.

- Federal aid resurfacing program funds
- State maintenance resurfacing program funds
- State special maintenance funds
- Interstate Maintenance program funds
- State construction funds

Project Scoping Team:

A scope of work inspection should be conducted on each resurfacing project by the Division. The scope team should consist of appropriate personnel as determined by the Division Engineer. FHWA should be included as a member of the scope team on full involvement federally funded projects. An on-site review should be conducted by the scope team of the entire project limits. For interstate routes, the Division scope team should submit to the Maintenance Bureau for review and approval the recommended treatment along with the supporting engineering data.

Consideration for All Funding Categories:

Environmental Document:
Categorical exclusion applies.

Pavement Condition Ratings
Review the most current pavement condition ratings available from Materials and Tests Bureau.

Preventive maintenance treatments should be considered for pavements that need their functional adequacy extended or maintained until a more appropriate treatment can be scheduled.

Selection of preventive maintenance treatments must consider whether the in-place pavement structure is satisfactory.

Selected preventive maintenance treatments must accommodate the maintenance of existing traffic volumes.

Preventive maintenance treatments are not appropriate when significant rutting and/or significant cracking is present.

Also established a Preventative Maintenance Category *PM2*. Basically, allowed up to 2" overlay and milling 50% of existing layer.

Milling:
Single pass of up to fifty percent (50%) of the in-place wearing layer thickness, not counting any safety layer that may be present, except that in no case shall a remnant wearing layer of less than three-quarters of an inch (3/4") be allowed to remain. Micro milling is required for milling depths of 1.0" or less.

Overlays:
Limited to 2.0" of thickness or less not counting any safety layer that may be added. Actual overlay depth dependent on treatment selected. Safety layers are limited to 1.0" of thickness or less.

Selection of Treatments:
The following pavement treatments are available for preventive maintenance. The scope team is to select the most appropriate treatment for the condition of the pavement.

- Hot Mix Asphalt (HMA)
- Warm Mix Asphalt (WMA)
- Safety Layer (OGFC or Paver Laid Surface Treatment)

Safety (General):
Selection of pavement treatments should consider the frictional characteristics of both the existing pavement and proposed applications.

Eligible safety items identified by the scope team as desirable may be included as part of the preventive maintenance project but should not exceed five percent (5%) of the total project cost. Otherwise, safety items should be addressed in separate projects as funding is available.

Superelevation and Cross-slope:
Not a required consideration - outside the purview of preventive maintenance.

Americans with Disabilities Act:
Install curb cuts and curb ramps along existing curb-and-gutter sections in urbanized areas.

Pavement Width:
Not a required consideration - outside the purview of preventive maintenance.

Roadway Geometries:
Not a required consideration - outside the purview of pavement preservation.

Additional Considerations for Federal Aid funding:

WHY PAVEMENT PRESERVATION?

FY	Total IM	IM PM1 %	IM PM2 %	IM MR %	Total FM	FM PM1 %	FM PM 2 %	FM MR %
2014	12	0/0%	2/17%	10/83%	124	3/2%	29/23%	92/75%
2015	16	3/18%	3/18%	10/64%	109	0/0%	52/48%	57/52%
2016	12	6/50%	2/17%	4/33%	114	1/1%	53/46%	60/53%
2017	18	8/44%	0/0%	10/56%	127	6/5%	64/50%	57/45%
2018	20	6/30%	8/40%	6/30%	110	7/6%	50/46%	53/48%
Total	78	23/30%	15/19%	40/51%	584	17/3%	248/42%	319/55%

WHY PAVEMENT PRESERVATION?

FY	IM PM1/PM2/MR	IM Lane Mile Cost	FM PM1/PM2/MR	FM Lane Mile Cost	Total Lane Mile Cost
2014	0/2/10= 12	$357K	3/29/92	$150K	$212K
2015	3/3/10= 16	$313K	0/52/57	160	$196K
2016	6/2/4= 12	$257	1/53/60	$150K	$172K
2017	8/0/10= 18	$257	6/64/57	$142K	$175K
2018	6/8/6= 20	Not to Let	7/50/53	Not to Let	Not to Let

WHY PAVEMENT PRESERVATION?

IM 2018-2023

FY	PCR	Budget	PM 1	PM 2	MR	Actual IM Budget
2018	**82.6**	$179M	$23.5M (13%)	$58.6M (33%)	$98.9M (54%)	**$192M** ($179M for pavement/ $13M for other)
2019	86.5	$132M	$20M (15%)	$95M (72%)	$17M (13%)	**$174M** ($132M flexible/$30M Conc/$12M other)
2020	87.9	$110M	$40M (36%)	$70M (64%)	$0 (0%)	**$176M** ($78M flexible/$120M Conc)
2021	88.3	$130M	$124M (95%)	$6M (5%)	$0 (0%)	
2022	91.1	$131M	$125M (96%)	$6M (4%)	$0 (0%)	
2023	**92.9**	$137M	$132M (96%)	$5M (4%)	$0 (0%)	

WHY PAVEMENT PRESERVATION?

Impact of 2017 PP Training

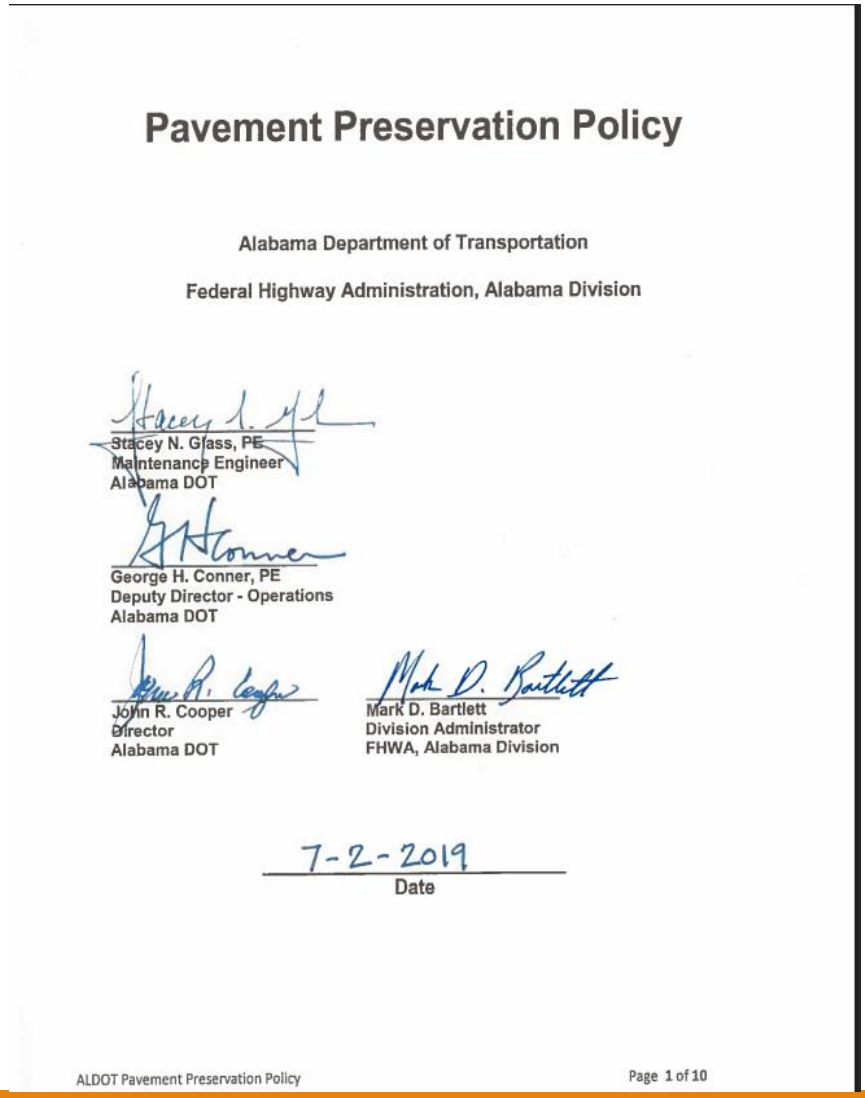
FM Resurfacing Program			
	PM 1	PM 2	MR
FY 2019	7	55	45
FY 2020	10	76	19
FY 2021	15	70	24
FY 2022	11	72	14
FY 2023	9	63	20

WHY PAVEMENT PRESERVATION?

2023 Refresher Training reflected in FY 2024 FM Program

FY 2024 FM Program				
Type	Number	Est. Total	% of program	% of Budget
PM1	19	$29.2m	18%	11%
PM2	77	$168m	72%	67%
PMR	12	$54m	11%	22%
Total	108	$251m	100%	93%

WHY PAVEMENT PRESERVATION?



Pavement Preservation Policy

Alabama Department of Transportation

Federal Highway Administration, Alabama Division

Stacey N. Glass, PE
Maintenance Engineer
Alabama DOT

George H. Conner, PE
Deputy Director - Operations
Alabama DOT

John R. Cooper
Director
Alabama DOT

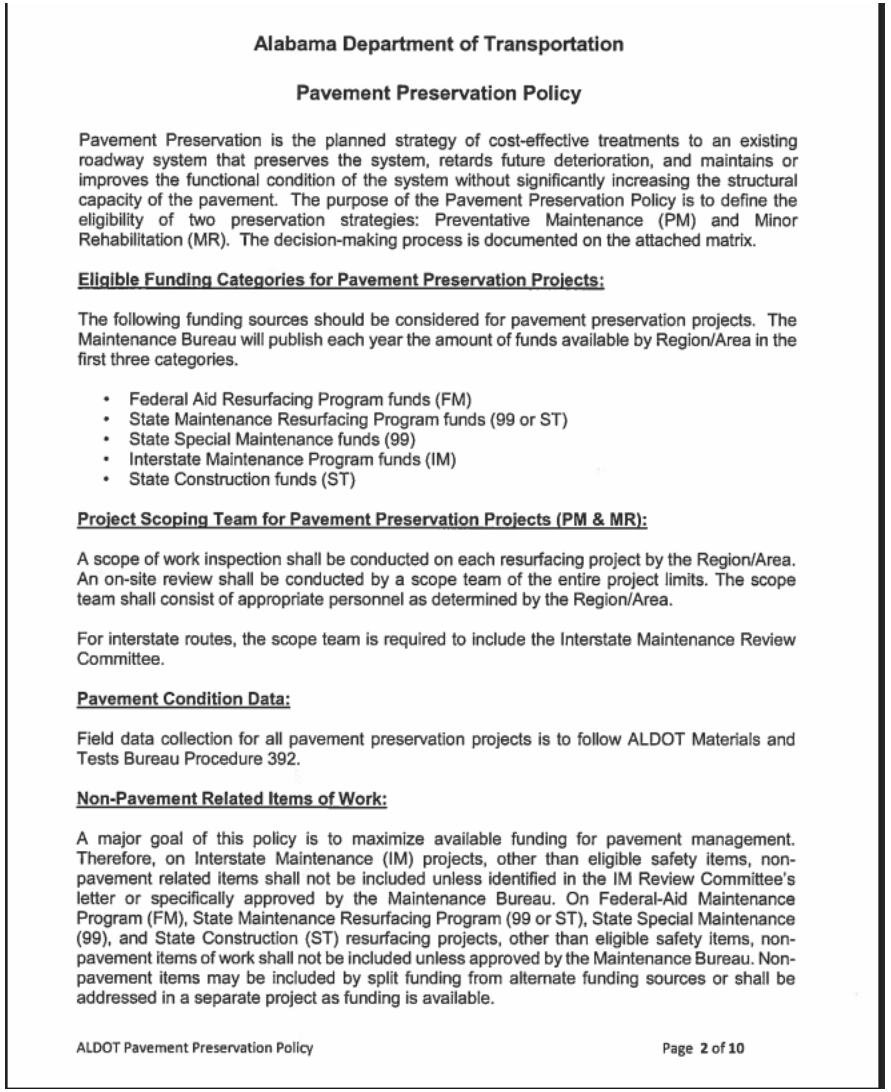
Mark D. Bartlett
Division Administrator
FHWA, Alabama Division

7-2-2019
Date

ALDOT Pavement Preservation Policy Page 1 of 10

A new 2019 PPP addressed needs due to design changes, safety needs, and provided more flexibility for pavement corrections.

It also included concrete pavement.



Alabama Department of Transportation

Pavement Preservation Policy

Pavement Preservation is the planned strategy of cost-effective treatments to an existing roadway system that preserves the system, retards future deterioration, and maintains or improves the functional condition of the system without significantly increasing the structural capacity of the pavement. The purpose of the Pavement Preservation Policy is to define the eligibility of two preservation strategies: Preventative Maintenance (PM) and Minor Rehabilitation (MR). The decision-making process is documented on the attached matrix.

Eligible Funding Categories for Pavement Preservation Projects:

The following funding sources should be considered for pavement preservation projects. The Maintenance Bureau will publish each year the amount of funds available by Region/Area in the first three categories.

- Federal Aid Resurfacing Program funds (FM)
- State Maintenance Resurfacing Program funds (99 or ST)
- State Special Maintenance funds (99)
- Interstate Maintenance Program funds (IM)
- State Construction funds (ST)

Project Scoping Team for Pavement Preservation Projects (PM & MR):

A scope of work inspection shall be conducted on each resurfacing project by the Region/Area. An on-site review shall be conducted by a scope team of the entire project limits. The scope team shall consist of appropriate personnel as determined by the Region/Area.

For interstate routes, the scope team is required to include the Interstate Maintenance Review Committee.

Pavement Condition Data:

Field data collection for all pavement preservation projects is to follow ALDOT Materials and Tests Bureau Procedure 392.

Non-Pavement Related Items of Work:

A major goal of this policy is to maximize available funding for pavement management. Therefore, on Interstate Maintenance (IM) projects, other than eligible safety items, non-pavement related items shall not be included unless identified in the IM Review Committee's letter or specifically approved by the Maintenance Bureau. On Federal-Aid Maintenance Program (FM), State Maintenance Resurfacing Program (99 or ST), State Special Maintenance (99), and State Construction (ST) resurfacing projects, other than eligible safety items, non-pavement items of work shall not be included unless approved by the Maintenance Bureau. Non-pavement items may be included by split funding from alternate funding sources or shall be addressed in a separate project as funding is available.

ALDOT Pavement Preservation Policy Page 2 of 10

We Must be doing something right?

Nov 7, 2023, AL.COM article

https://www.al.com/news/2023/11/alabama-has-the-third-best-roads-in-the-us-survey-says.html

Alabama has the 3rd best roads in the US, survey says

Updated: Nov. 07, 2023, 11:26 a.m. | Published: Nov. 07, 2023, 11:22 a.m.

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By William Thornton | wthornton@al.com

Alabama has the third best road system in the United States, according to a new analysis by Insider Monkey, a financial services website.

The survey compiled a list of 15 states with the best roads, with four of the top five in the South.

Leading the way was Georgia, followed by Florida, then Alabama. North Carolina placed fourth, followed by Nevada.

According to the analysis, Alabama's urban pavement has a roughness of 5%, while its rural roughness is 1%.

Stories by **William Thornton**

The 'Kick Six' sent a woman into labor - her son turns 10 this year

'Screw him. He lost,' Democrat says of Tuberville plan to end military promotion blockade

Feds: Koch Foods unfairly charges penalties to growers who switched to rivals

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We Must be doing something right?

Updated: Nov. 07, 2023, 11:26 a.m. | Published: Nov. 07, 2023, 11:22 a.m.

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By William Thornton | wthornton@al.com

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According to the analysis, Alabama's urban pavement has a roughness of 5%, while its rural roughness is 1%.

According to the analysis, the state has undertaken 140 road improvements since 2020.

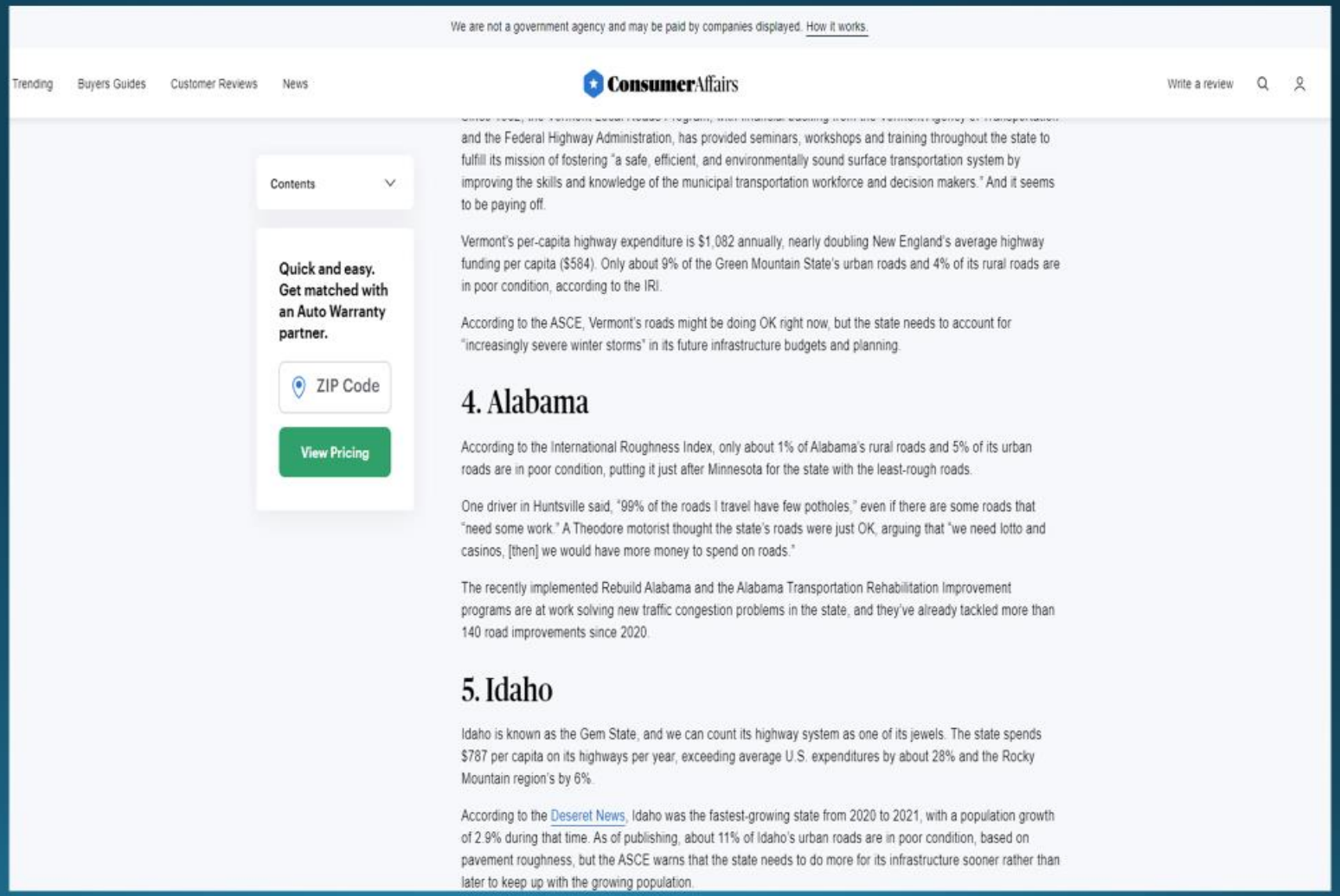
To rank the states, the site looked at 2020 highway statistics from the Federal Highway Association dealing with road quality, according to the International Roughness Index, which is calculated using several data points.

The analysis studied both rural and urban roads, with priority to rural pavement roughness, as urban roads are generally in better condition and crashes on rural roads also tend to be severe.

We Must be doing something right?

March 20, 2023, Consumer Affairs article

https://www.al.com/news/2023/11/alabama-has-the-third-best-roads-in-the-us-survey-says.html



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and the Federal Highway Administration, has provided seminars, workshops and training throughout the state to fulfill its mission of fostering "a safe, efficient, and environmentally sound surface transportation system by improving the skills and knowledge of the municipal transportation workforce and decision makers." And it seems to be paying off.

Contents

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Vermont's per-capita highway expenditure is $1,082 annually, nearly doubling New England's average highway funding per capita ($584). Only about 9% of the Green Mountain State's urban roads and 4% of its rural roads are in poor condition, according to the IRI.

According to the ASCE, Vermont's roads might be doing OK right now, but the state needs to account for "increasingly severe winter storms" in its future infrastructure budgets and planning.

4. Alabama

According to the International Roughness Index, only about 1% of Alabama's rural roads and 5% of its urban roads are in poor condition, putting it just after Minnesota for the state with the least-rough roads.

One driver in Huntsville said, "99% of the roads I travel have few potholes," even if there are some roads that "need some work." A Theodore motorist thought the state's roads were just OK, arguing that "we need lotto and casinos, [then] we would have more money to spend on roads."

The recently implemented Rebuild Alabama and the Alabama Transportation Rehabilitation Improvement programs are at work solving new traffic congestion problems in the state, and they've already tackled more than 140 road improvements since 2020.

5. Idaho

Idaho is known as the Gem State, and we can count its highway system as one of its jewels. The state spends $787 per capita on its highways per year, exceeding average U.S. expenditures by about 28% and the Rocky Mountain region's by 6%.

According to the Deseret News, Idaho was the fastest-growing state from 2020 to 2021, with a population growth of 2.9% during that time. As of publishing, about 11% of Idaho's urban roads are in poor condition, based on pavement roughness, but the ASCE warns that the state needs to do more for its infrastructure sooner rather than later to keep up with the growing population.

We Must be doing something right?

March 20, 2023, Consumer Affairs article

https://www.al.com/news/2023/11/alabama-has-the-third-best-roads-in-the-us-survey-says.html

4. Alabama

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WHY PAVEMENT PRESERVATION?

States with the worst (and best) road conditions

Updated 21 February 2025

By: En

ConsumerAffairs
JOURNAL OF CONSUMER RESEARCH

Whether you're one to take the road less traveled or are more prone to thinking that "life is a highway," chances are you've hit at least a few potholes over the years. Depending on where you live, poor road conditions may be an occasional inconvenience or a daily frustration. Either way, they accelerate wear and tear on your car, leading to costly repairs that may not be covered by an extended auto warranty.

In fact, the American Society of Civil Engineers estimates that nationwide, drivers spend a whopping $130 billion each year on extra vehicle repairs and operating costs because of deteriorating roads. The price tag for poor-quality roadways doesn't stop there: the U.S. has a backlog of approximately $435 billion in projects to repair existing roads, and by 2040, rising temperatures are expected to add an estimated $19 billion each year to pavement repair costs. But where are our roads the roughest?

The ConsumerAffairs Research Team identified the states with the worst roads by analyzing metrics including rural and urban road roughness and traffic fatalities. Read on to see how we conducted our analysis.

Cite Download PDF

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Outline Figures (2)

States with the worst roac

States with the best road

Full data

2. Alabama

Alabama ranks second in overall road conditions, with 96.5% of its urban roads and 98.7% of its rural roads in acceptable condition. This strong road quality aligns with ongoing infrastructure investments, including the Rebuild Alabama Act, which has generated $320 million annually for road and bridge improvements since 2019.

In 2024, Gov. Kay Ivey announced over $40 million in additional state funding through the ATRIP-II program, supporting infrastructure projects across Alabama. These continued investments contribute to the state's ability to maintain its extensive road network.

Check out these metrics:

- **Percentage of urban roads in poor condition:** 3.5%
- **Percentage of rural roads in poor condition:** 1.3%
- **Traffic fatalities per 100M miles traveled:** 1.38

WHY PAVEMENT PRESERVATION?

Questions!

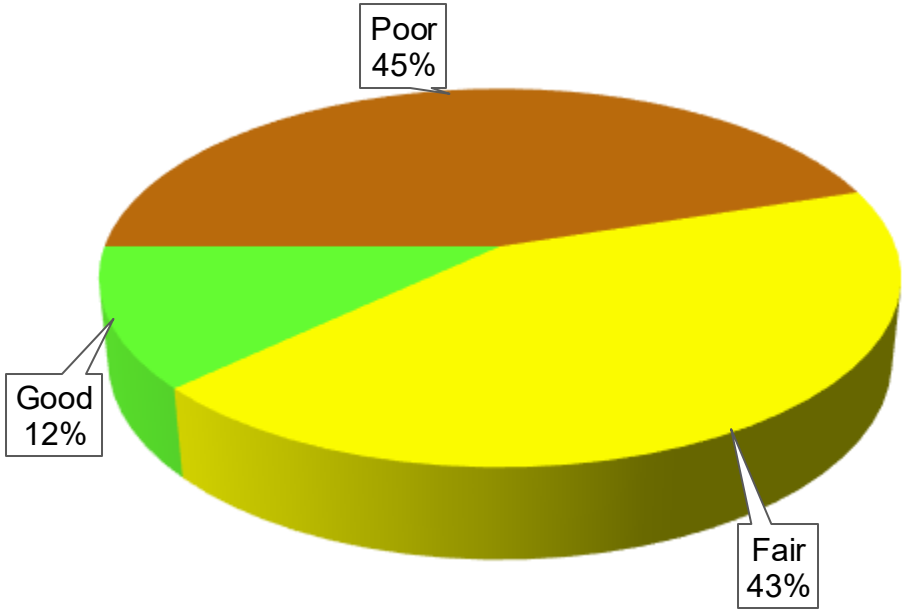
New Jersey

- Rex Eberly
  - Pavement Preservation Specialist for The National Center for Pavement Preservation.
  - Executive Director of PAAMA

- Thank you to Mr. Robert Blight, New Jersey Department of Transportation for allow us to use these slides.

Where We Started

2002 Functional Adequacy of NJ State Highway System
(Based on Roughness & Distress)



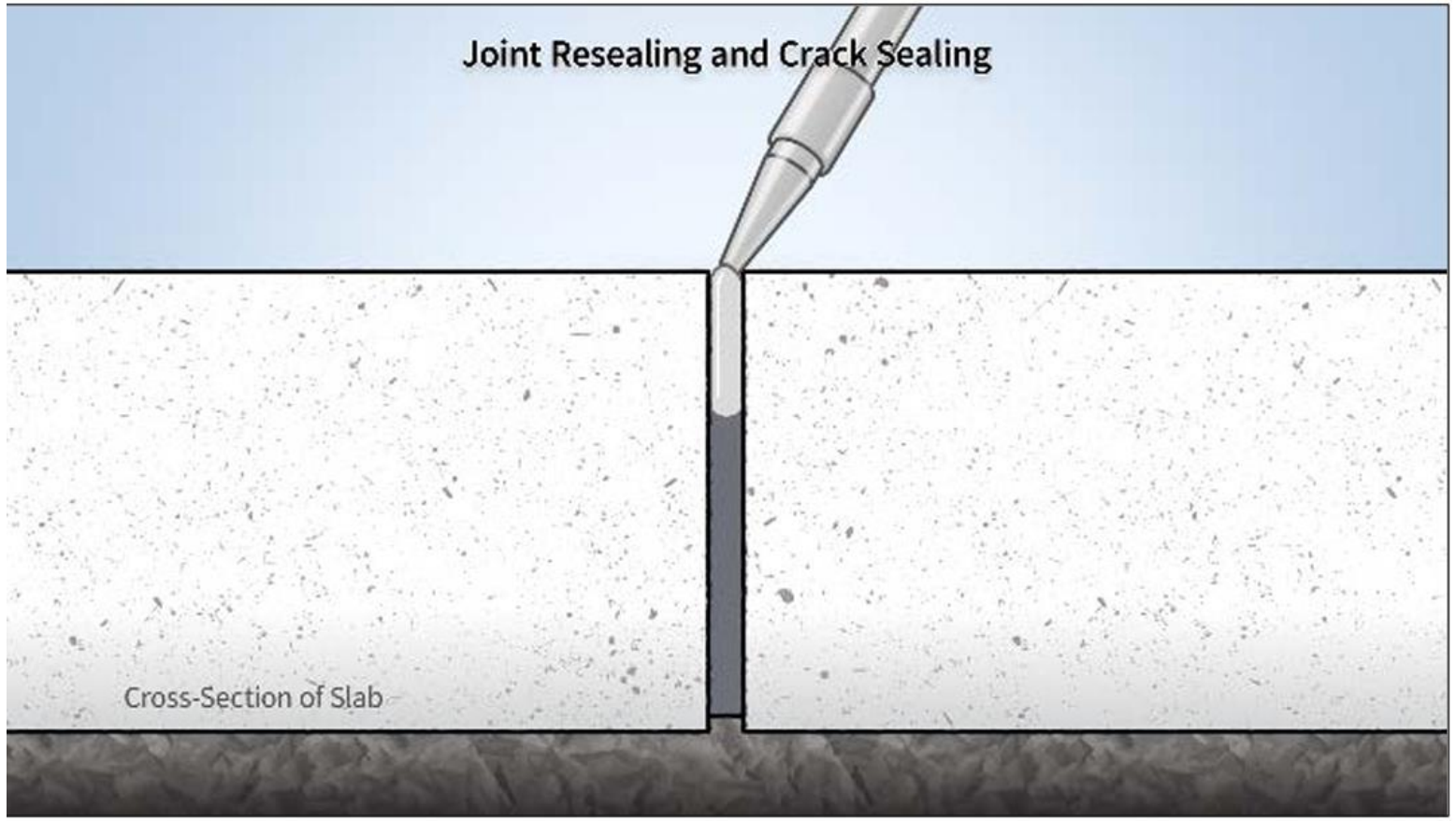
Source: NJDOT Pavement Management System

Where we Started

2002 – 1st Concrete Preservation

2003 – 1st Microsurfacing & NCPP Founded

Concrete Preservation
Joint and Crack Sealing



Microsurfacing

Micro-surfacing and slurry seal

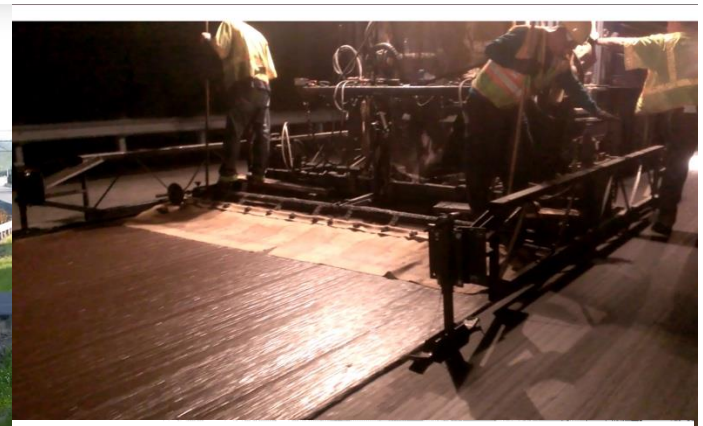
Cold applied mixture of:

- **High quality aggregate (4.75mm NMAS)**
- **Polymer modified asphalt emulsion** (CQS-1hP w/ SB, SBS, SBR or natural latex polymer)
- Mineral filler, Water, and Additives

Typical application rate of 20 lbs/SY aggregate and 0.30 gallons/SY asphalt emulsion

Approximately ¼ inch thick

Micro-surfacing and slurry seal



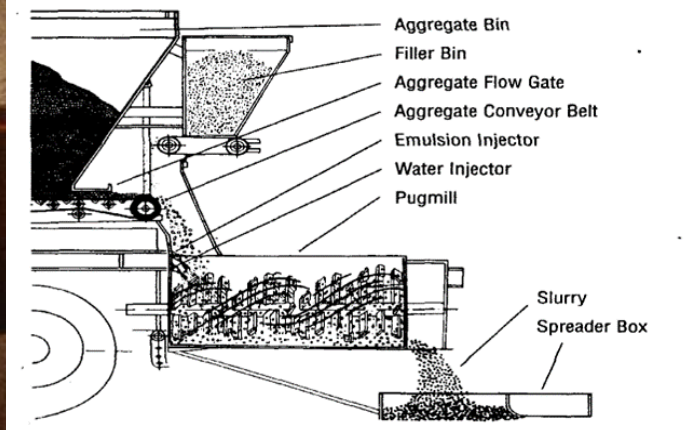


Figure 6.3 Flow Diagram of a Typical Slurry Seal Mixer

Renew road surface and fast open to traffic

Capable of being spread in variable cross-sections:

- Fill Ruts, Longitudinal joints and rumble strips (micropaving joints)
- **Scratch or intermediate layer**

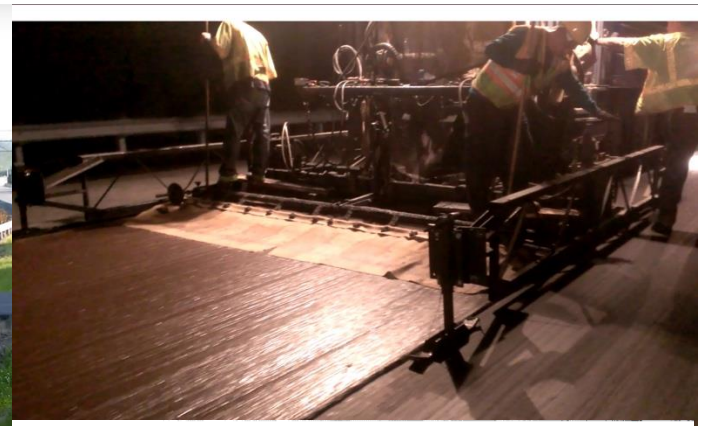
Minimize RAP (micro-milling under structures only)

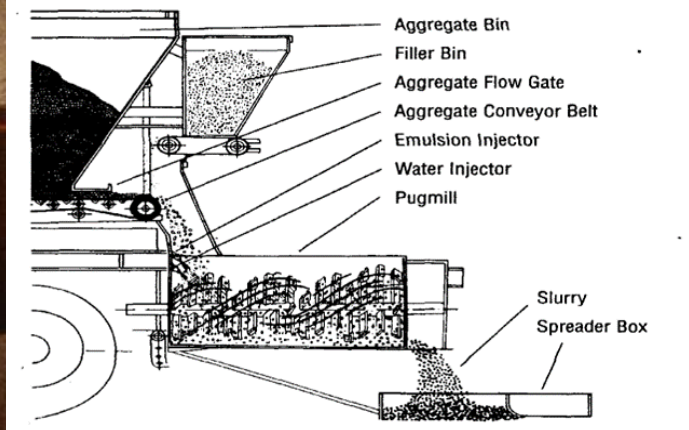
Improves wet weather skid resistance by 15-25%

Improves ride quality by 15-20%

5 – 8 Years Life Extension

Micro-surfacing and slurry seal





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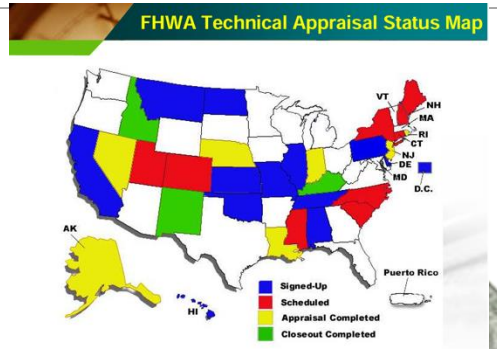
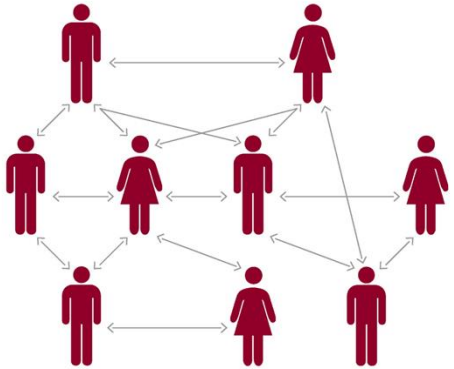
Where we Started

2002 – 1st Concrete Preservation

2004 – NJDOT merger of Pavement Management with Pavement Design



2003 – 1st Microsurfacing & NCPP Founded



2005 – NCPP/FHWA Preservation Technical Appraisal of NJDOT and Rutgers CAIT Pavement Support Program

Where we started (circa 2005)

Much of the network in “Poor” Condition

Using “Worst First” Approach

- Resurfacing
- Some Major Rehab & Reconstruct

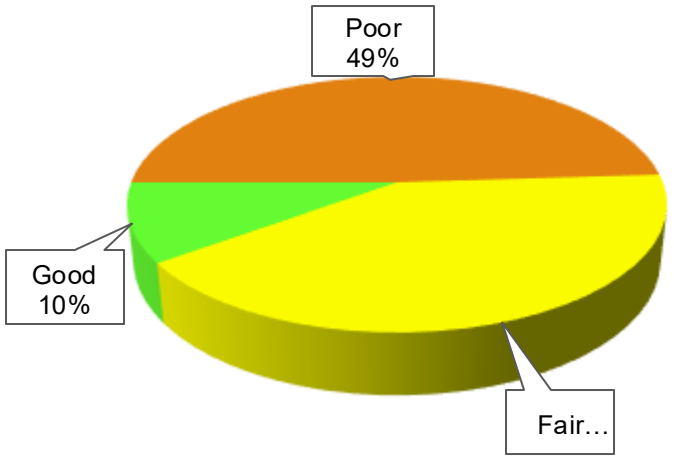
Reactive Maintenance

Inadequate and inconsistent funding

Very little Preservation

Where we started (circa 2005)

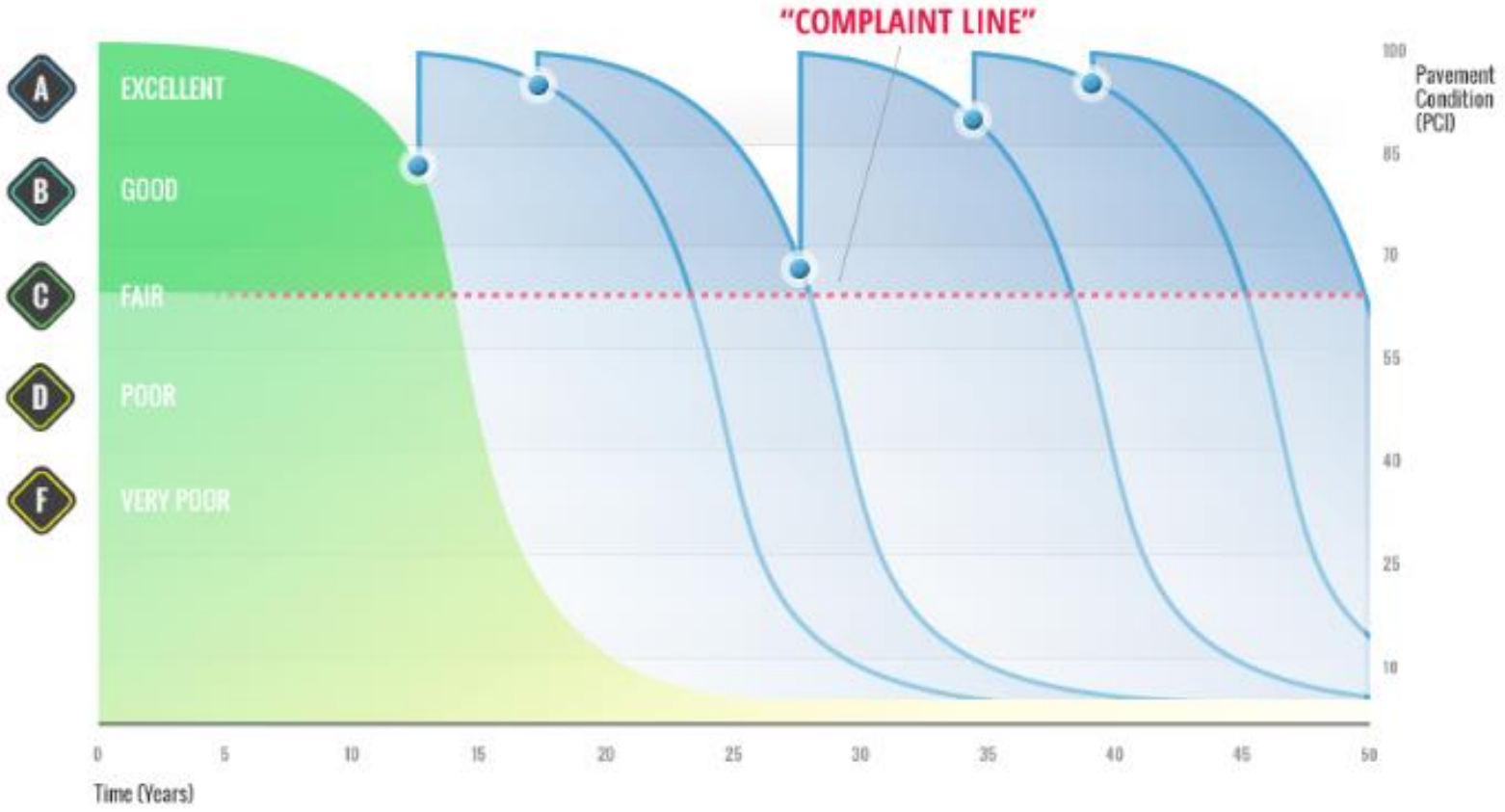
2005 Functional Adequacy of NJ State Highway System (Based on Roughness & Distress)



Source: NJDOT Pavement Management System

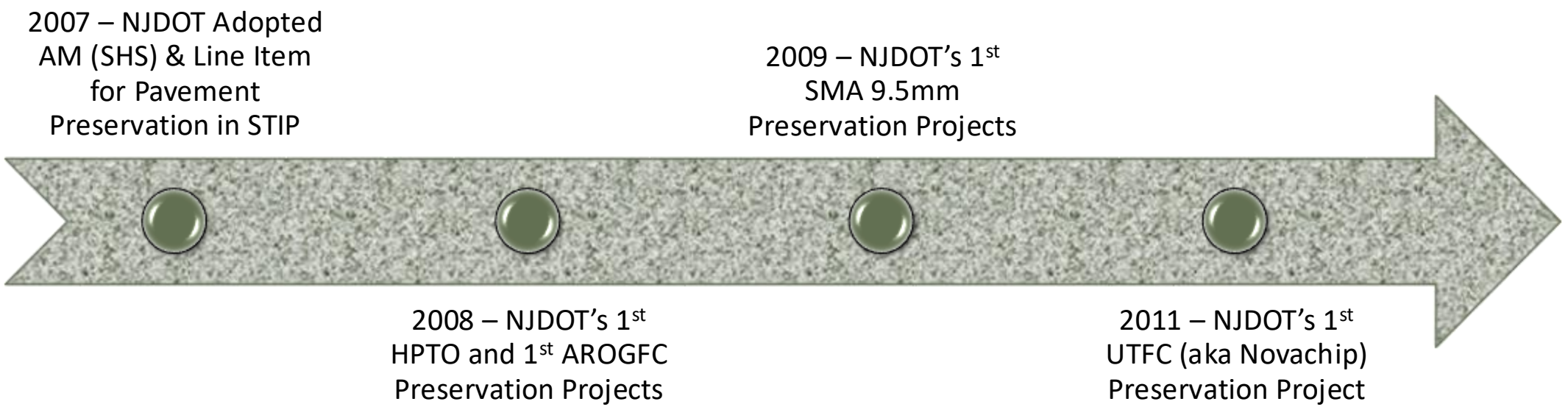
American Society of Civil Engineers (ASCE) Report Ranked NJ Roads among the **WORST** in the nation.

PAVEMENT PRESERVATION

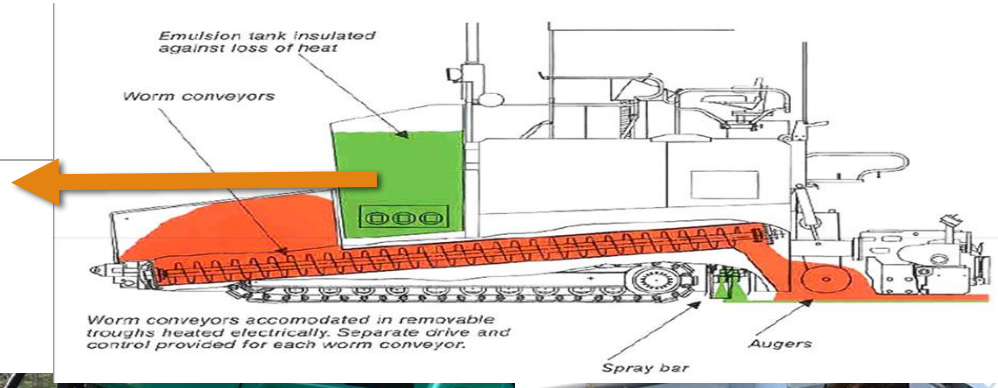


A well-implemented pavement preservation approach achieves maximum efficiency by increasing the average condition of your pavement while decreasing your average spend per square yard.

State Developments



Ultra-Thin Friction Course (UTFC)



¾ inch thick Thin Bonded Hot Mix Asphalt (HMA) Overlay

- 9.5 mm nominal maximum size **high quality** aggregate
  - Gap/open graded HMA
  - Flakiness Index (cubicle aggregate)
- 4.9 – 6.0 % polymer modified (PG 64E-22) asphalt binder

Constructed with a **spray paver**

- Polymer Modified Emulsified Asphalt Tack Coat (CRS – 1P @ application rate of 0.15 – 0.25 gallons per SY)

UTFC Benefits

Renew road surface

Quick open to traffic (300 feet!!)

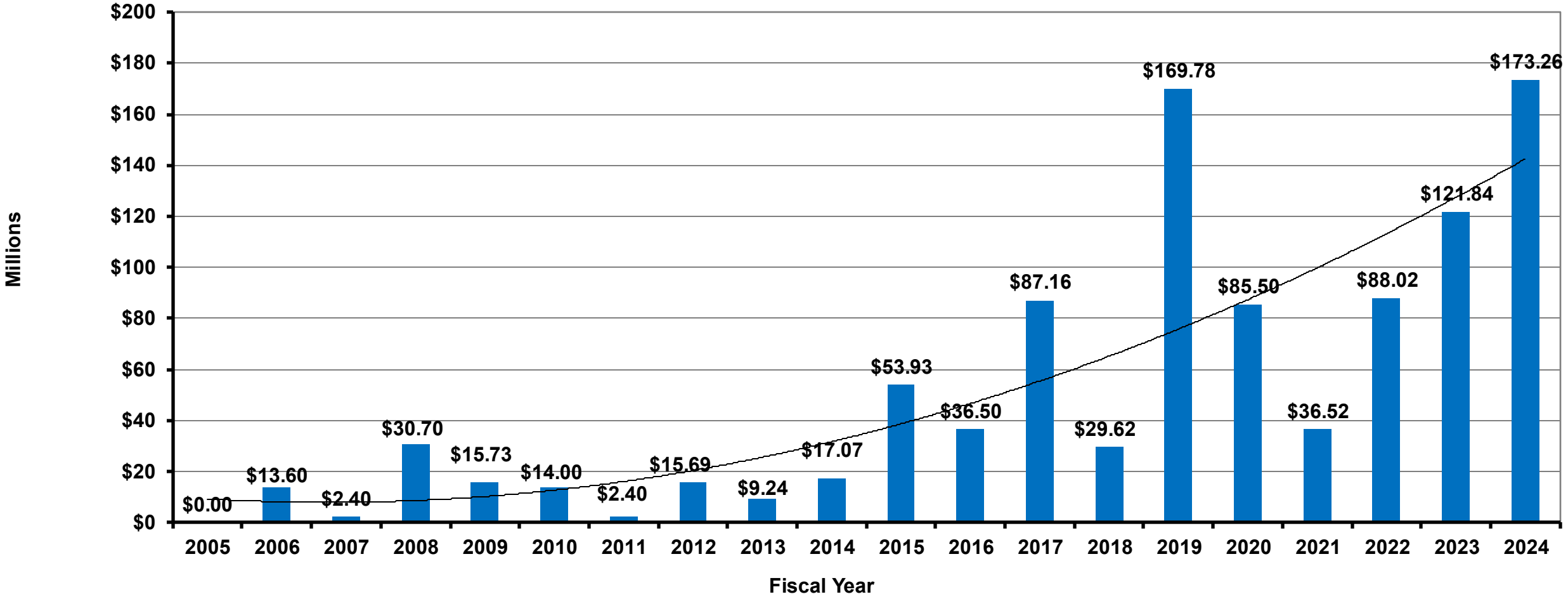
Improves wet weather skid resistance 15-20% and reduces wet weather tire spray/splash

Minimize RAP (micro-milling as needed)

Improves ride quality (30-40%)

Superior bond with spray paver and heavy tack coat application = Good Performance (8-10 years)

NJ State Highway System
Annual Preventive Maintenance Pavement Investment



Chip Seal

Asphalt binder application

- Started w/ Rubber modified PG64-22 (wet process)
- Polymer modified asphalt binder
  - PG88-22FR
  - PG94-22 applied at 0.40 – 0.5 gallons/SY

High quality aggregate

- Started w/ 3/8 inch size
- Changed to ¼ inch size
- clean and cubicle shape
- 20 – 30 lbs. per SY

Rolled w/ Pneumatic Rollers

Vacuum Sweep

Chip Seal

Fast renewal road surface and opening to traffic

Seals out water

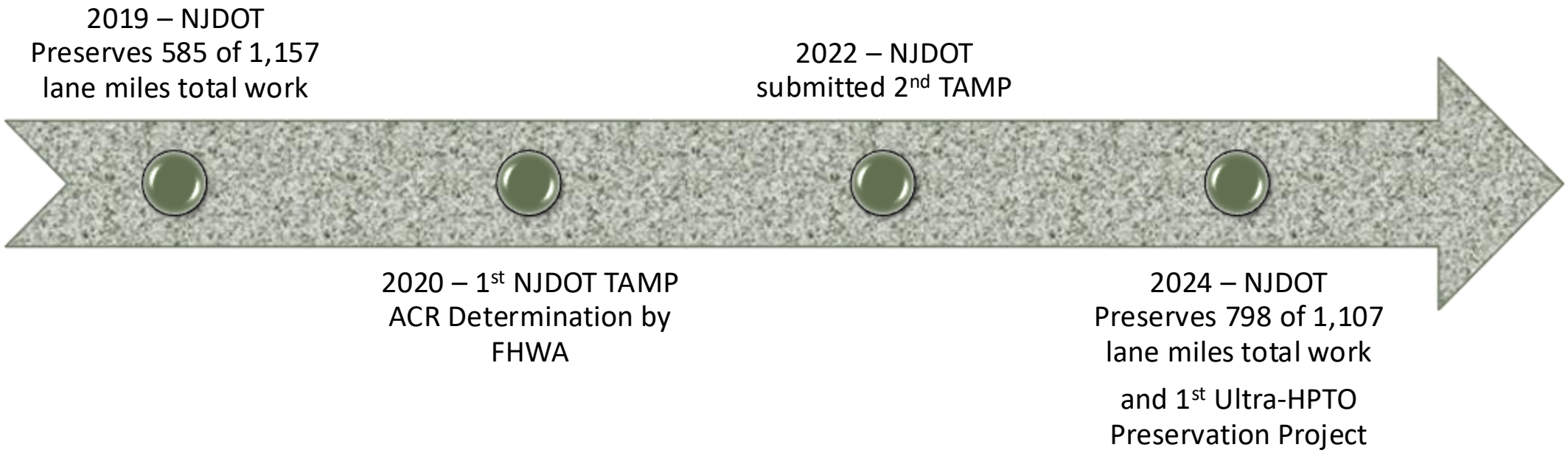
No Milling Required = No RAP

Maintains existing ride quality (no improvement)

Improves wet weather skid resistance (15-25%)

5 – 7 Years Life Extension

State Developments continued…



PRESERVATION BOOST

Benefits of Preservation

Federally Eligible – Preservation line item

Faster Delivery – Limited Scope Preservation

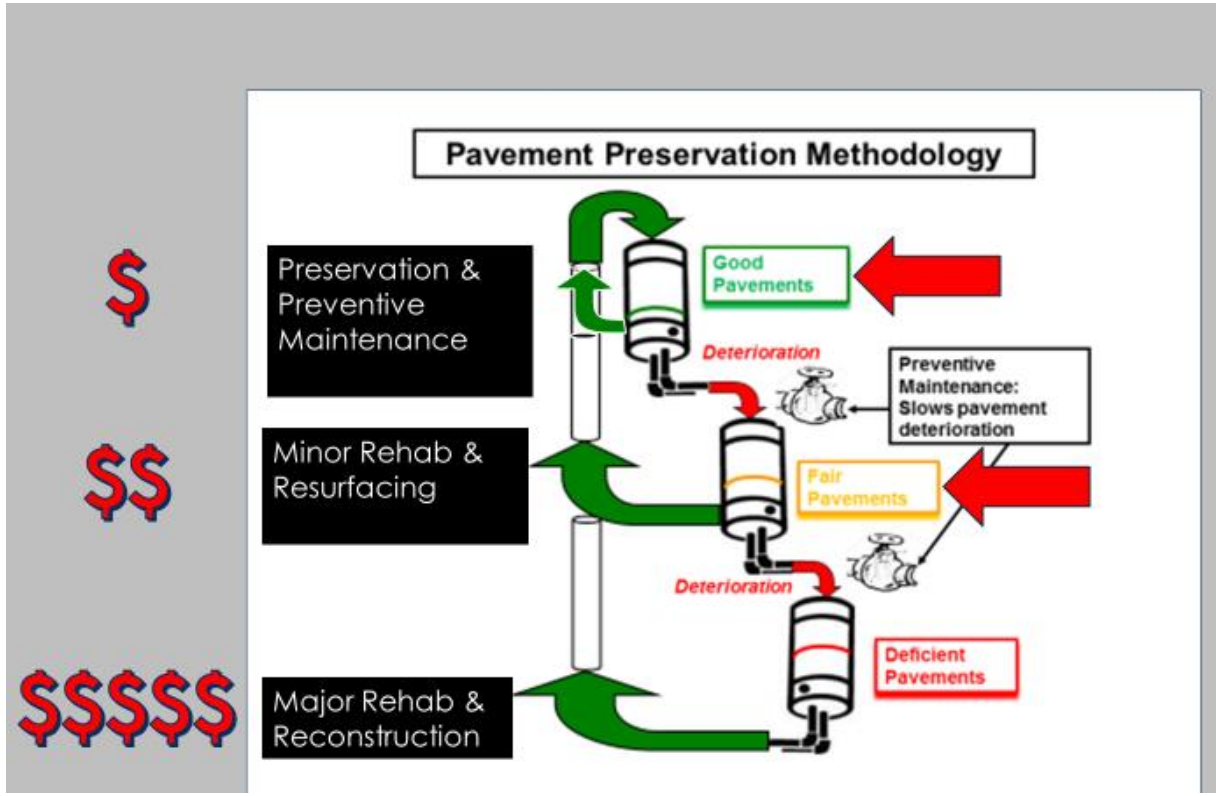
Lower overhead in Design (in-house) and Delivery Costs

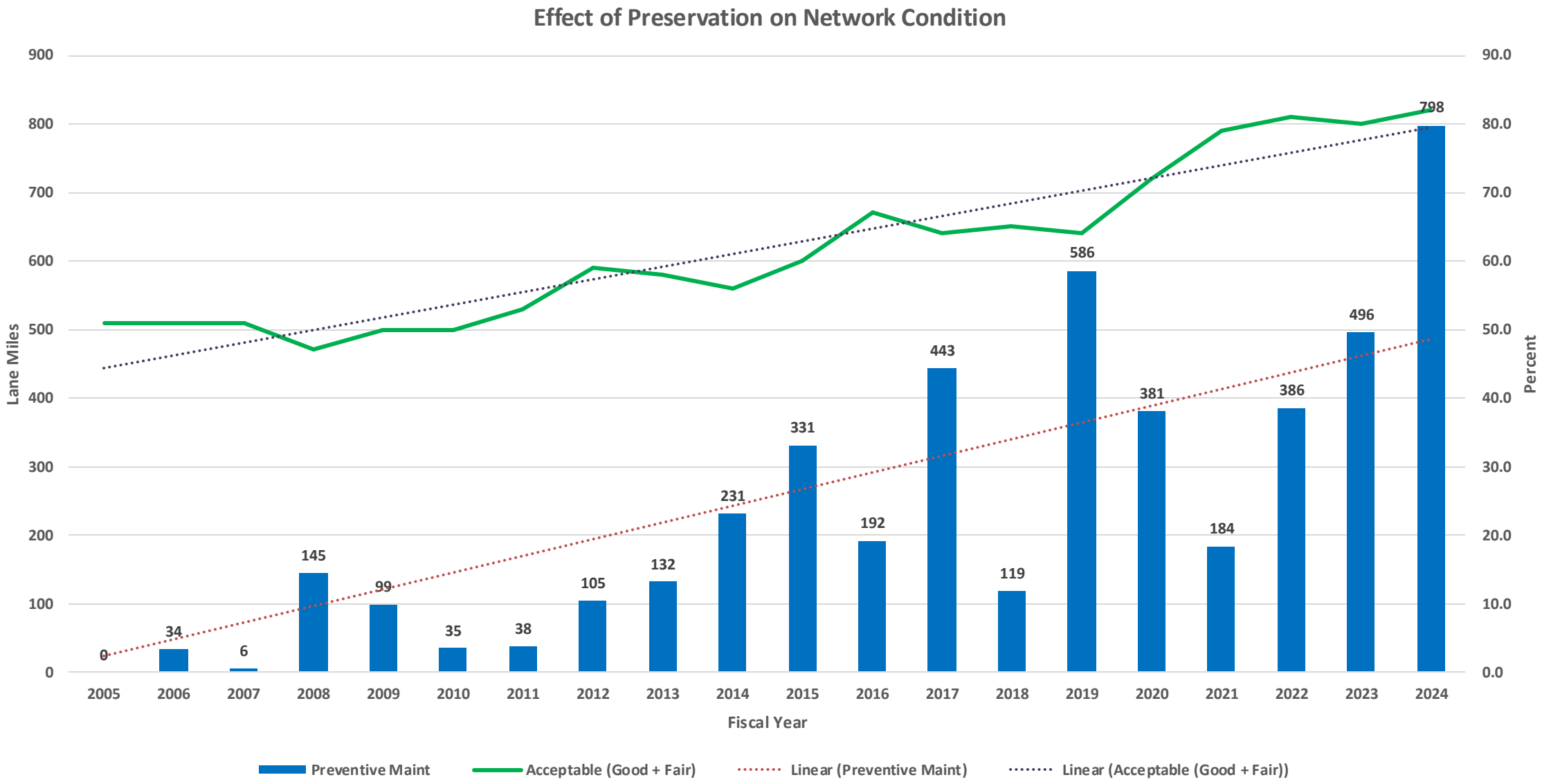
Good Shelf Projects to Maximize unforeseen funding opportunities

More Programming flexibility than Resurfacing/Rehab/Recon

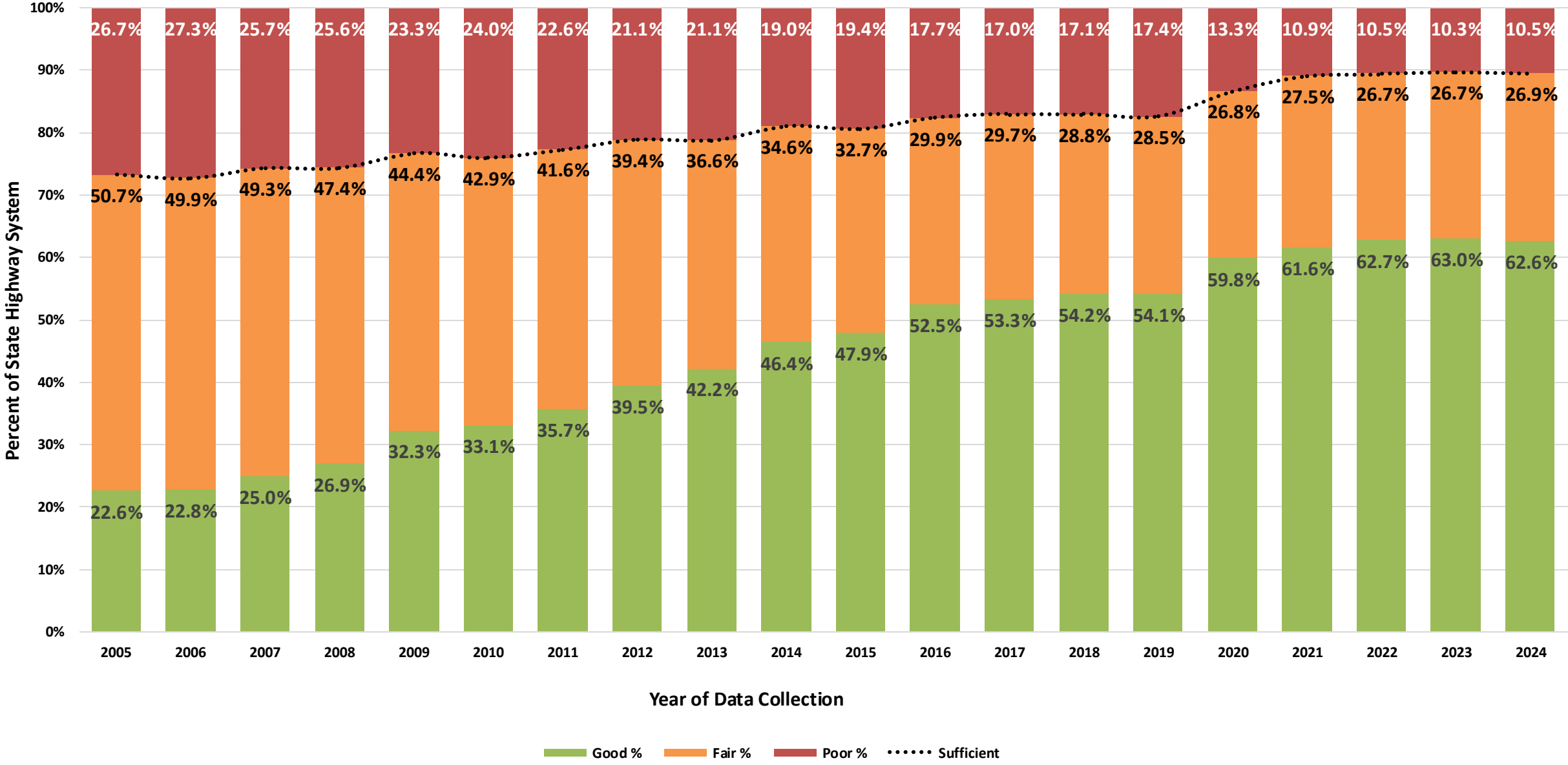
Environmentally friendly

- Reduces rap (Reclaimed Asphalt Pavement)
- Reduced traffic impacts/Fuel consumption



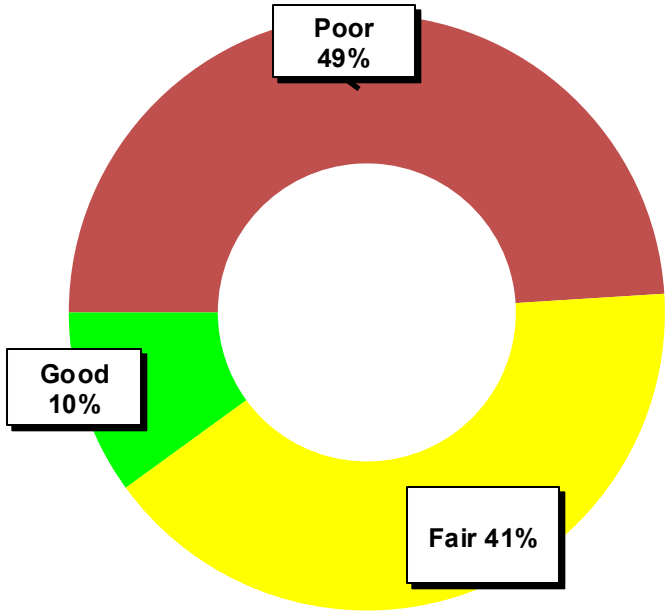

Effect of Preservation on Network Condition
Lane Miles
Percent
Fiscal Year
900
800
700
600
500
400
300
200
100
0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
0
34
6
145
99
35
38
105
132
231
331
192
443
119
586
381
184
386
496
798
Preventive Maint
Acceptable (Good + Fair)
Linear (Preventive Maint)
Linear (Acceptable (Good + Fair))

NJ State Highway System International Roughness Index (IRI) Good/Fair/Poor



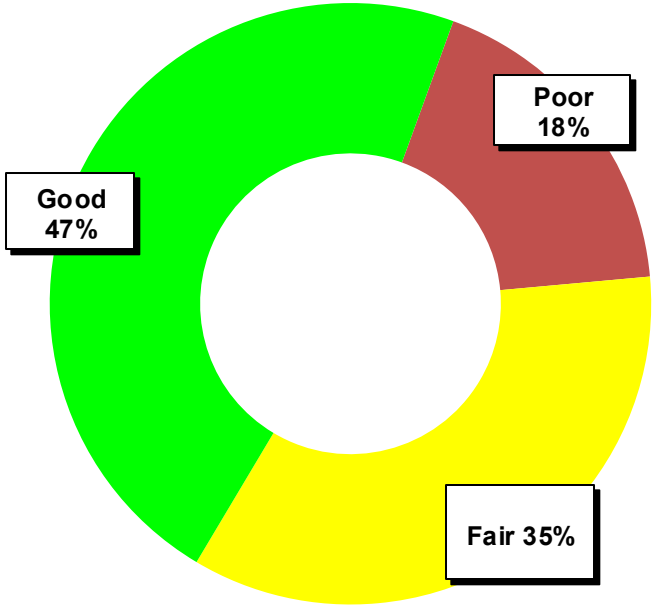
20 Years of Pavement Preservation at NJDOT

2005 Functional Adequacy of NJ State Highway System (Based on Roughness & Distress)



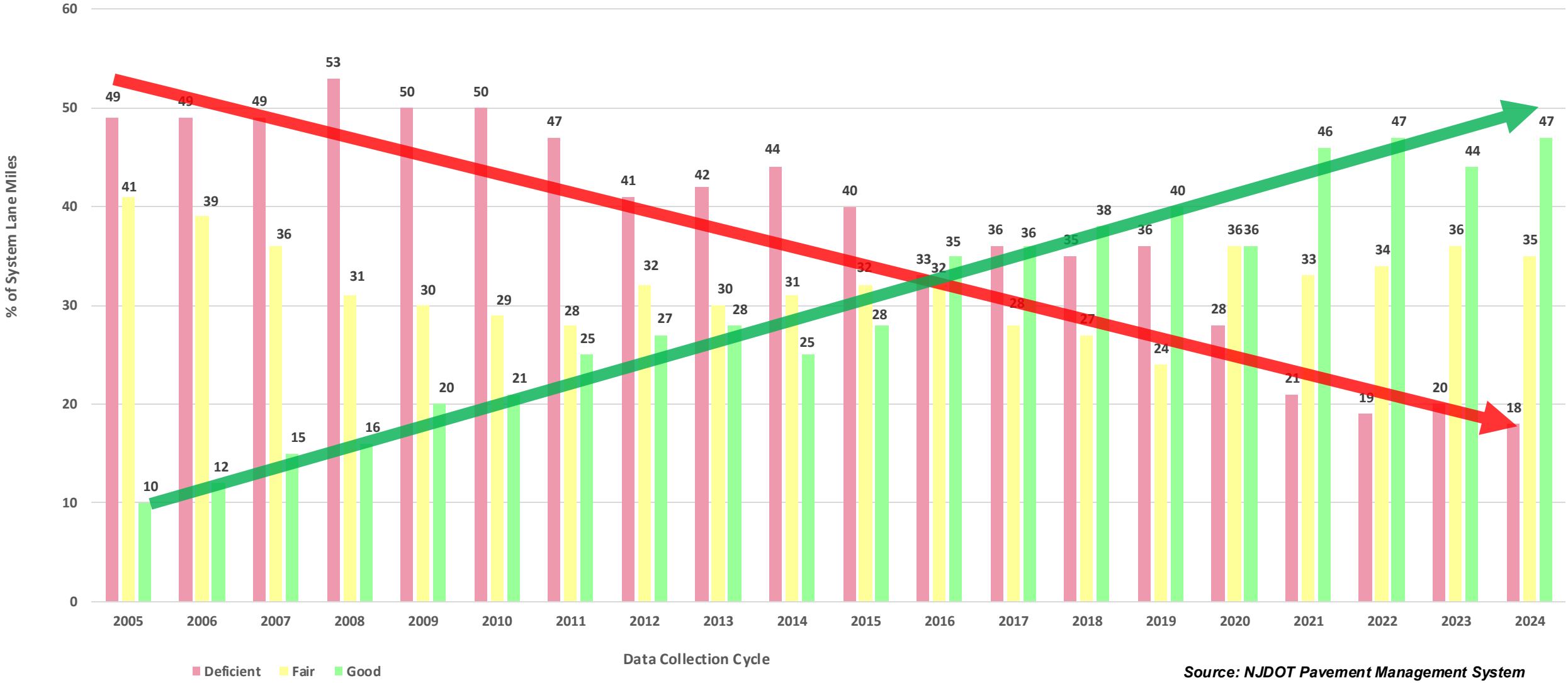
Source: NJDOT Pavement Management System

2024 Functional Adequacy of NJ State Highway System (Based on Roughness & Distress)



Source: NJDOT Pavement Management System

Multi-Year Status of State Highway System



Source: NJDOT Pavement Management System

Thank You Again To Mr. Robert Blight NJDOT

Questions?