

# PAVEMENT PRESERVATION

PRESENTED BY: Aaron Roy

*Prepared for the Association of Modified Asphalt Producers Training Program*



# OUTLINE

Rational for pavement preservation?

When and Where to do pavement preservation

Common surface treatments for pavement preservation

Pavement preservation as an overall pavement management system

Pay less now to preserve or pay more later!



# HIGHWAY OWNERSHIP

Total highway miles*	Miles	Percentage
<b>National Highway System (NHS)</b>	164,000	4**
<b>Paved Roads</b>	2,678,000	66
<b>Unpaved Roads</b>	1,394,000	34
<b>Total Roads***</b>	4,072,000	100

**\*Estimated Asset value: US\$ 2 trillion; about US\$6,150/capita or 10% of US GDP**

US GDP = US\$19.4 Trillion; Population ~ 325 million; per Capita US\$ 59,692

\*\* A percentage of Total Roads; \*\*\* includes the NHS



# THE ROAD TO PRESERVATION

**1963**– International Slurry Surface Association

**1992**– The Foundation for Pavement Rehabilitation and Maintenance Research  
(a 501(c) (3) organization  
(public charity)

**1997**–ETG on Pavement Preservation established

**2000**–The Foundation for Pavement Preservation is formed

**Founded as the research arm of ISSA**

**6/2001**–First Pavement Preservation Research Problem Statements

**2003**–The National Center for Pavement Preservation (NCPPI)

Since 2004 under AEMA, ISSA, ARRA have joint meetings as an alliance  
PPRA(pavement preservation recycling alliance)

**Four regional groups for Pavement Preservation: NEPPP, MPPA, SEPPP,  
RMWPPP and Regional Preservations**

**Legislation (MAP-21: PRESERVATION part of infrastructure asset)**

**Five-year , \$305 billion Fixing America's Surface Transportation (FAST)  
Act (Dec 3, 2015) for Fiscal Year 2016-2020**



# WHAT IS PAVEMENT PRESERVATION?

It is a long-term planned strategy of pavement management to extend pavement service life, improve safety and focused at structurally sound pavements

It is not rehabilitation

It is not reconstruction (structural capacity increase)

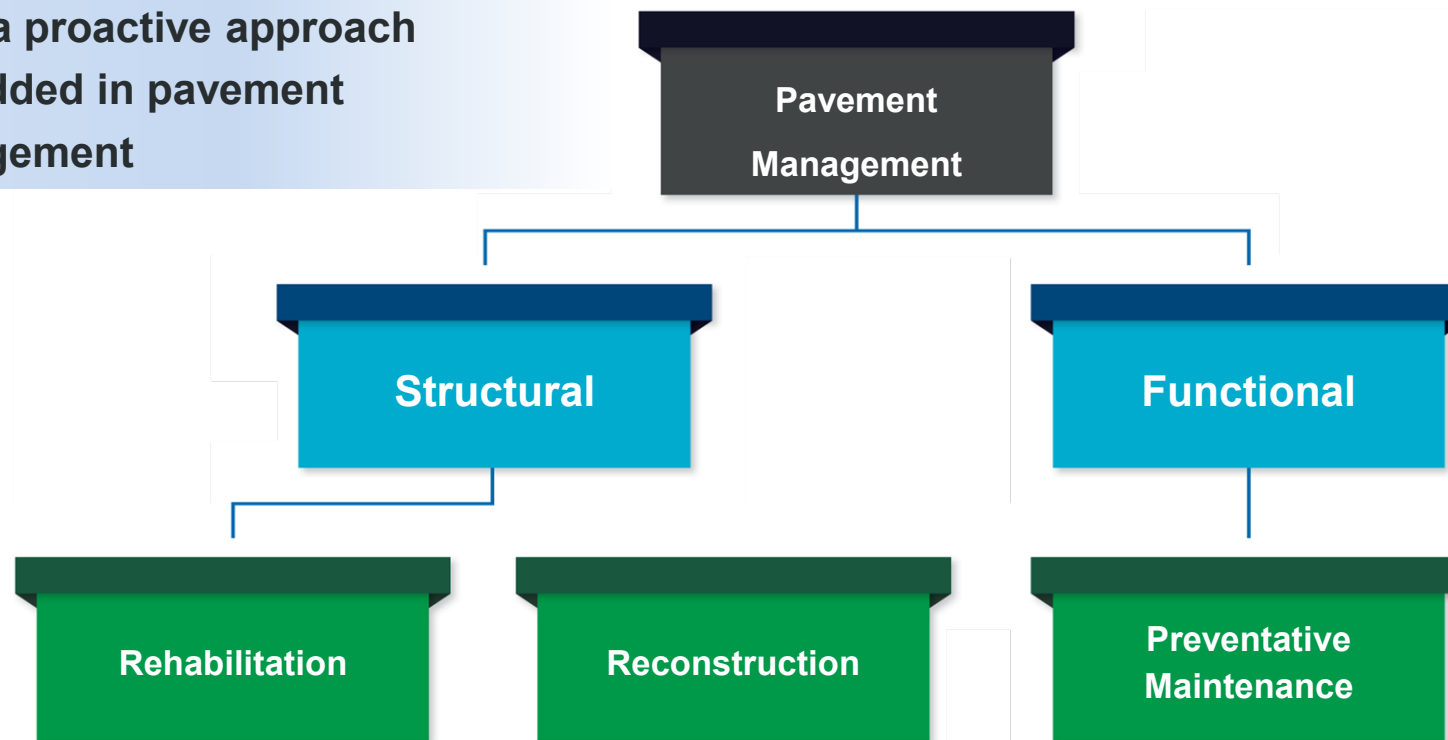


# PAVEMENT PRESERVATION

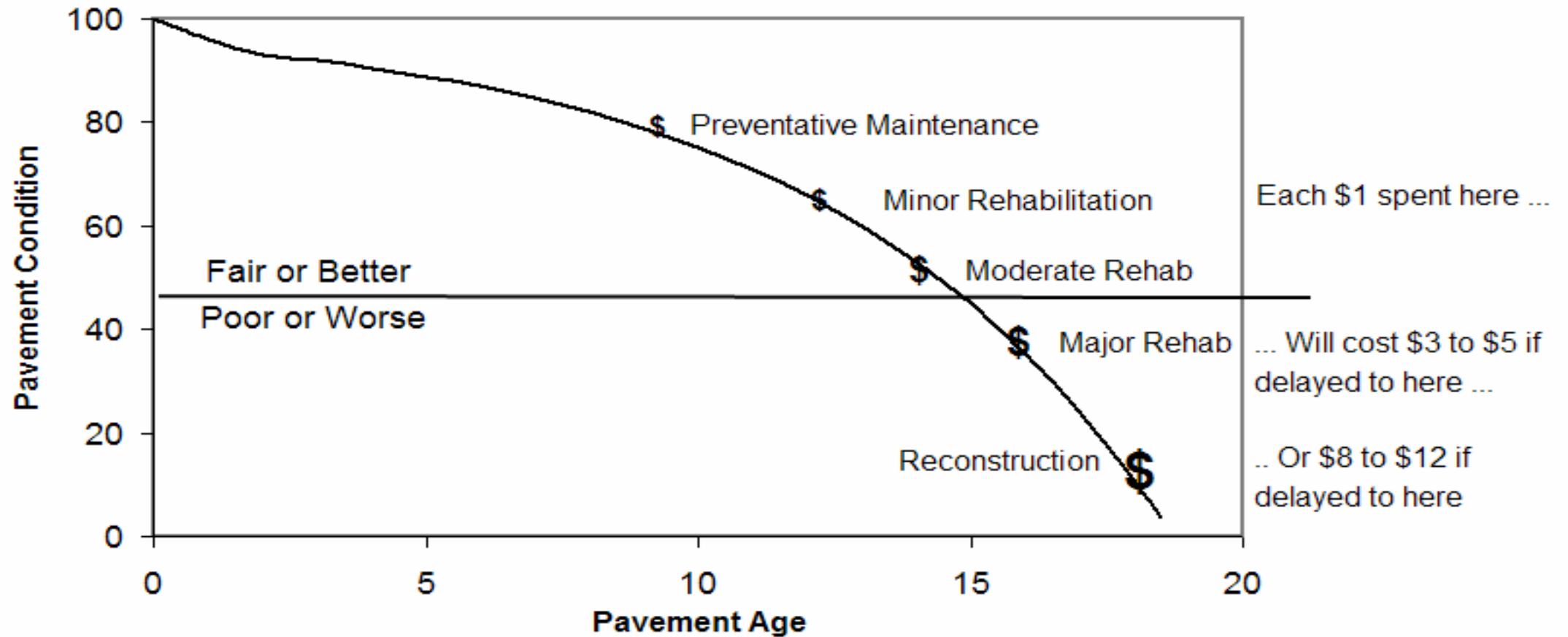


# WHAT IS A PAVEMENT PRESERVATION SYSTEM?

PP is a proactive approach embedded in pavement management

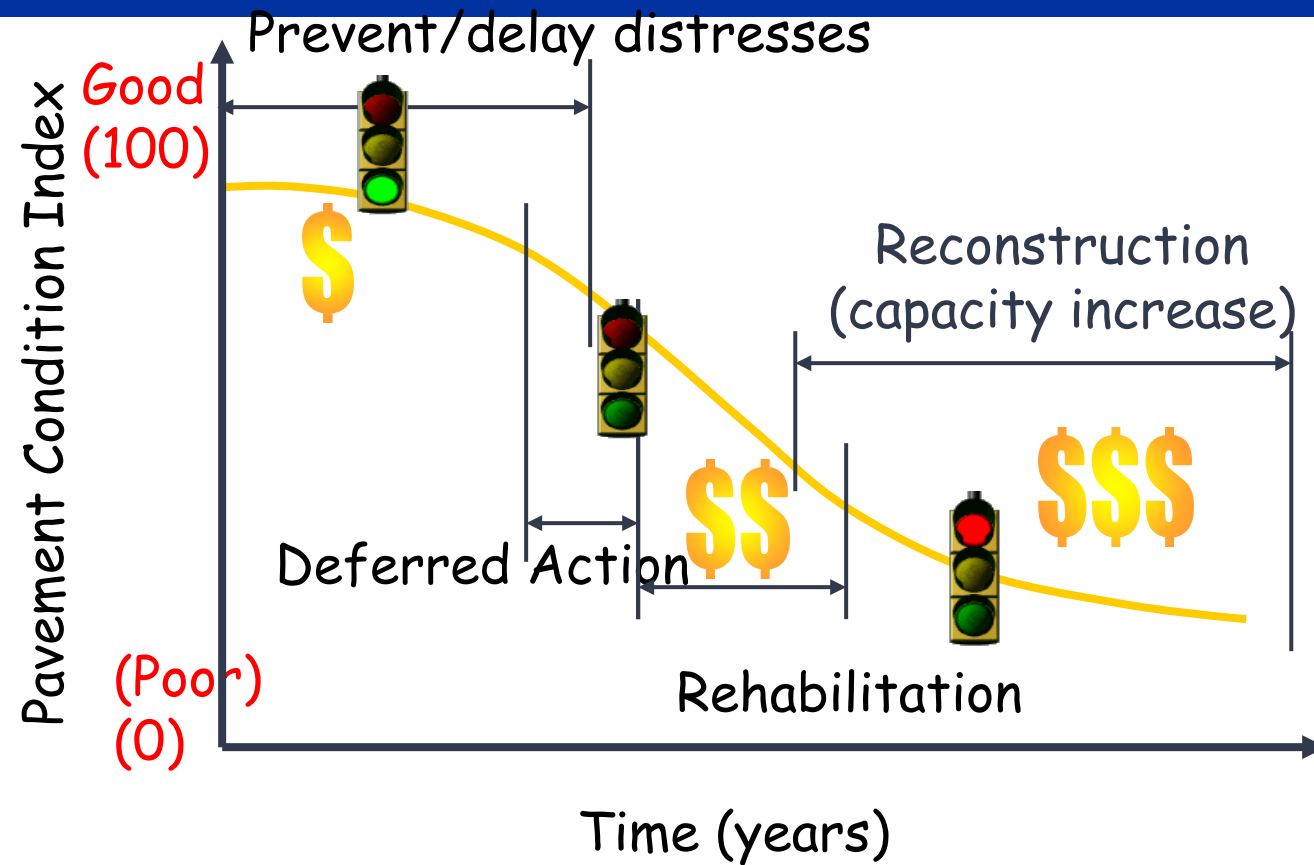


# TYPICAL PAVEMENT DETERIORATION CURVE AND COST TO MAINTAIN





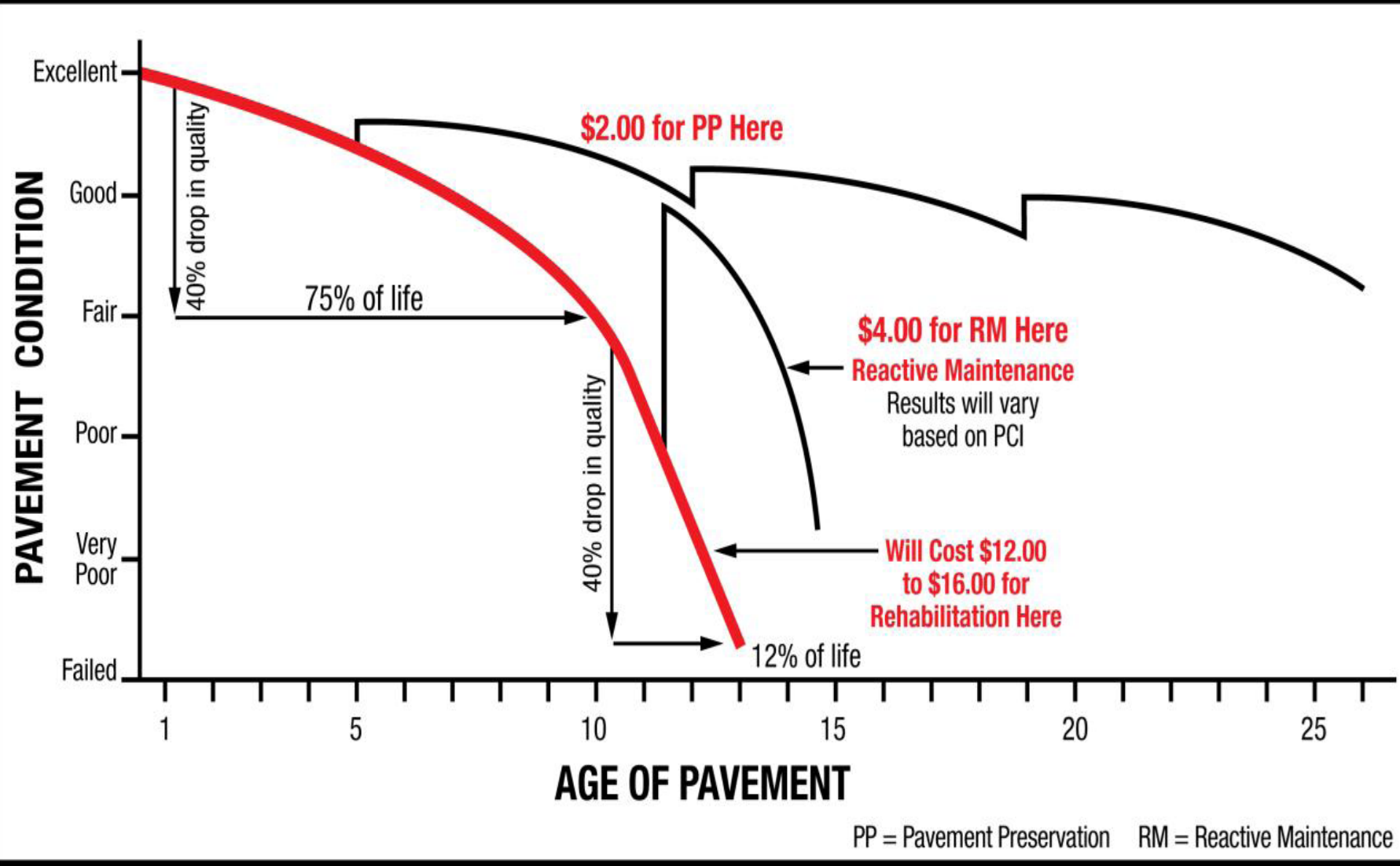
# TYPICAL VARIATION OF A PAVEMENT CONDITION AS A FUNCTION OF TIME AND WHERE PRESERVATION IS CRITICAL



Source: US Department of Transportation Federal Highway Administration, Selecting a Preventive Maintenance for Flexible Pavements, August, 2000, FHWA-IF-00-027,.



# PAVEMENT CONDITION INDEX



# PRESERVATION TREATMENTS

## **Asphalt:**

Crack Sealing

Fog Seals

Chip Seals

Slurry Seals

Micro Surfacing

Cape Seals

Thin Overlays

Profile Milling

## **PCC:**

Joint Resealing

Crack Sealing

Spall Repair

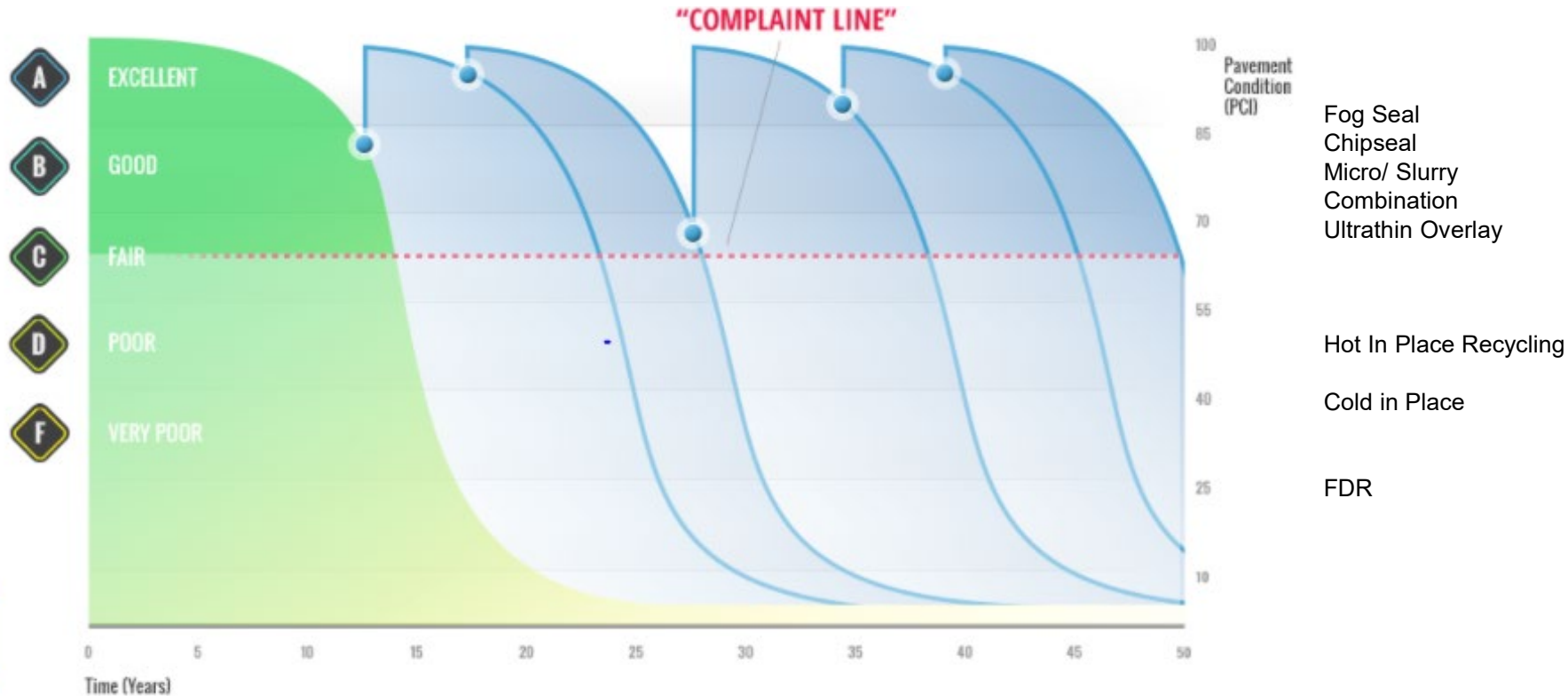
Dowel Bar Retrofit

Full and Partial Depth  
Repair

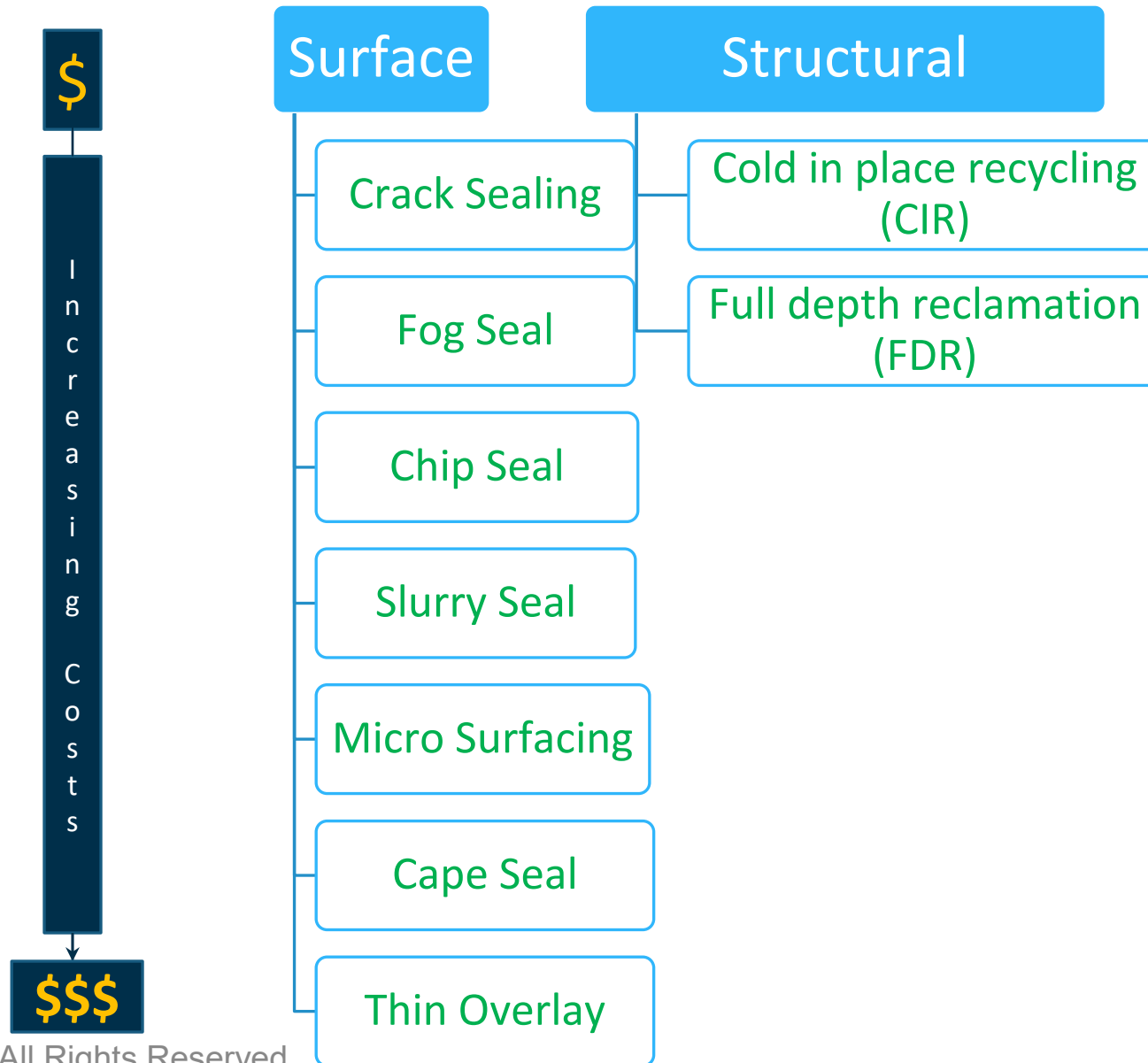
Diamond Grinding



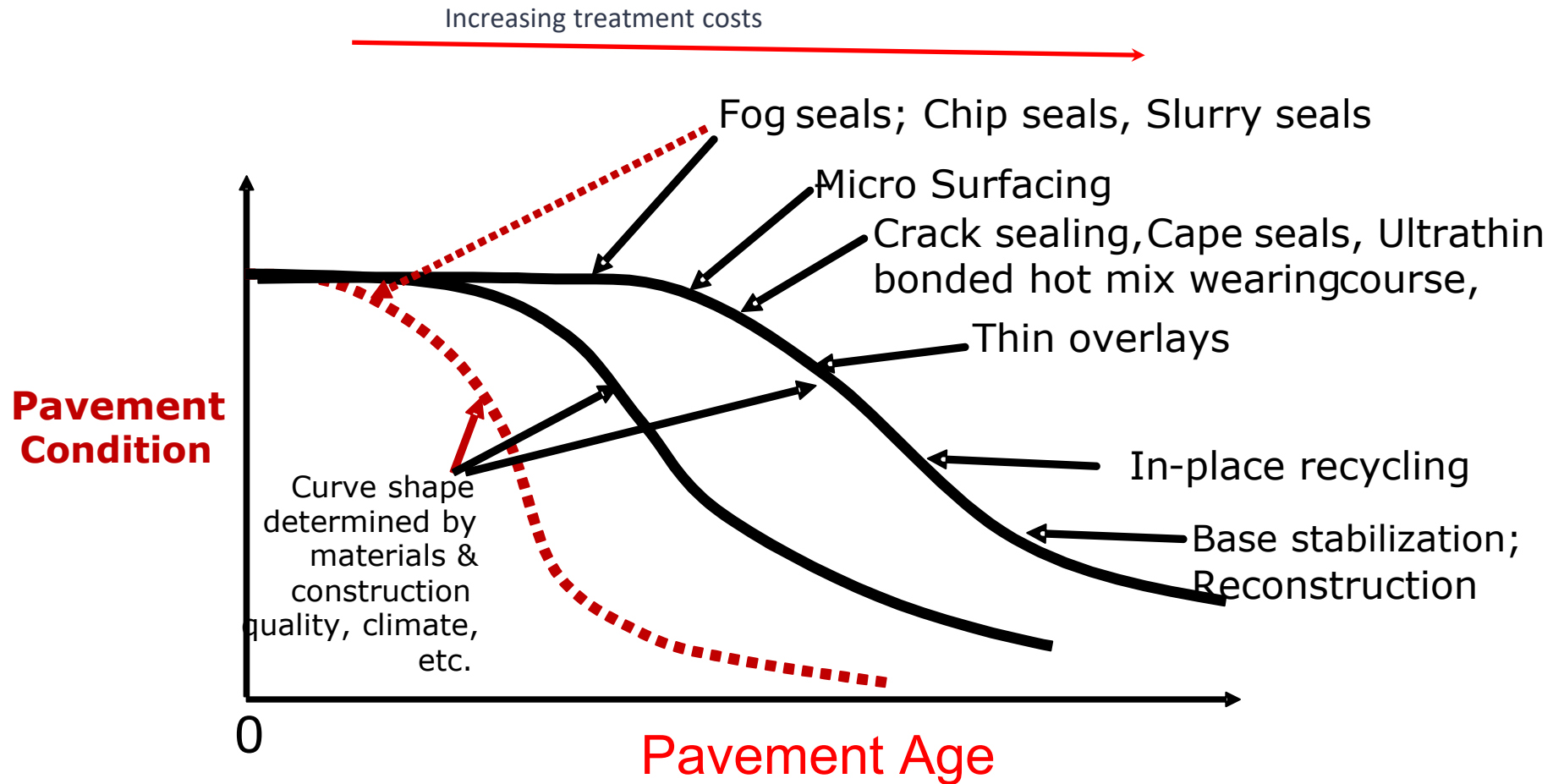
# PRESERVATION TREATMENTS



# TYPICAL TREATMENTS



# TIMING OF MAINTENANCE TREATMENTS



# PRESERVATION TREATMENTS



Fog Seal



Crack Seal





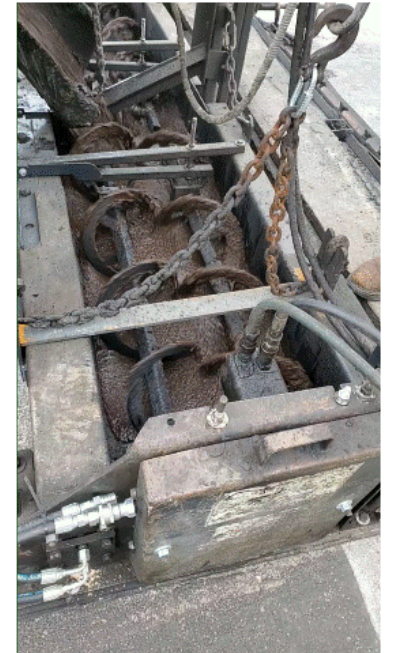
# PRESERVATION TREATMENTS



Chip Seal



Micro



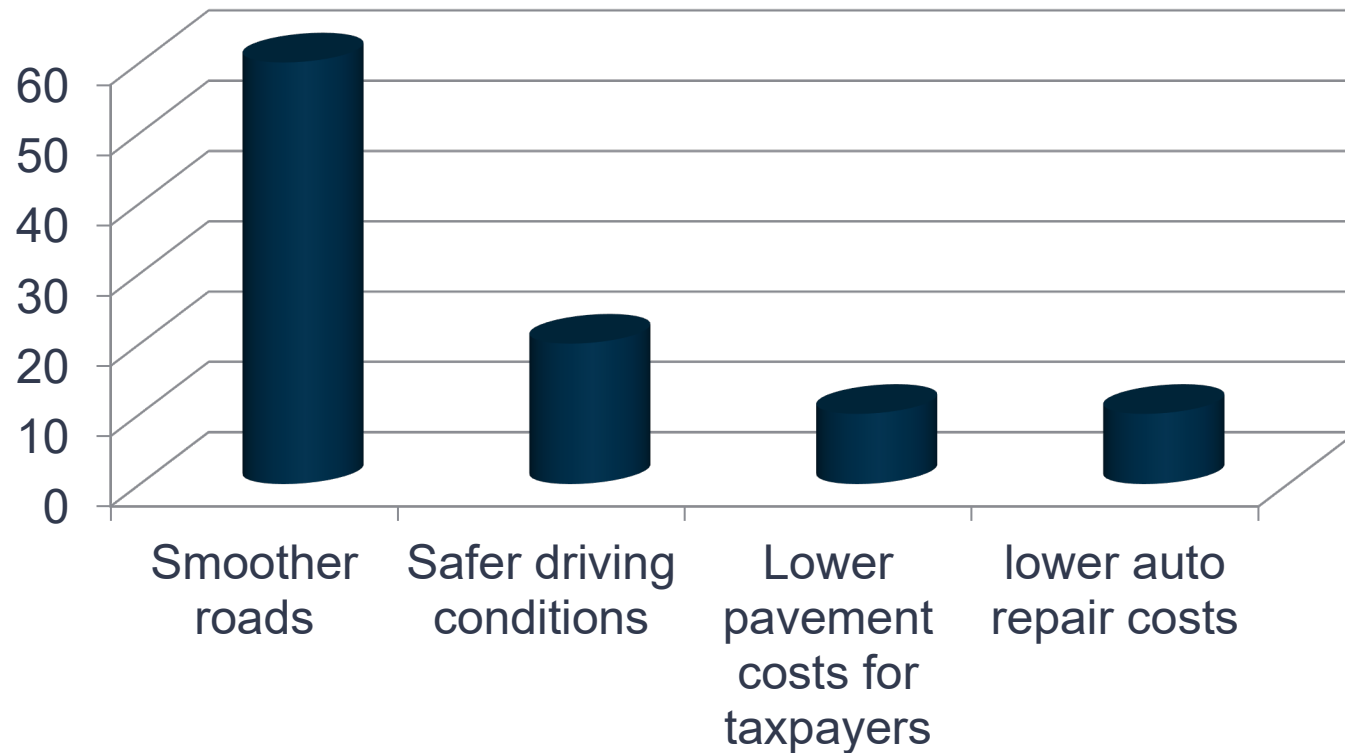


# AGENCIES COLLECT A GREAT DEAL OF DATA FOR PAVEMENTS

- ❑ Highway Performance Monitoring System (HPMS)
- ❑ HERS-ST Highway Economic Requirements System - State Version
- ❑ Reporting requirements of Government Accounting Standards Board 34 (GASB 34): since 1999.
  - International Roughness Index (IRI)-
  - Rutting
  - Cracking



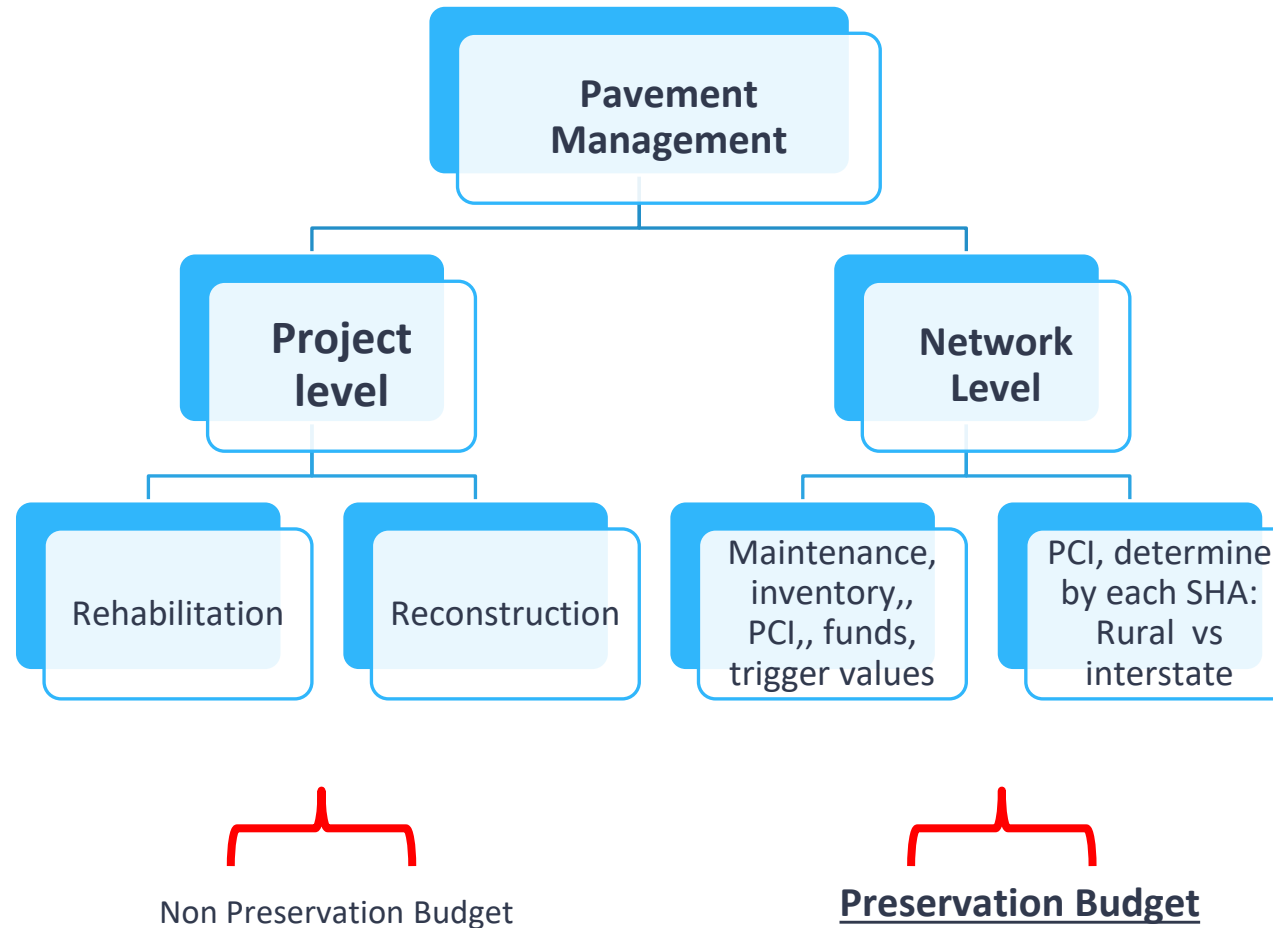
# Respondents' perception of what consumers value most about strong Preservation Program(2011)

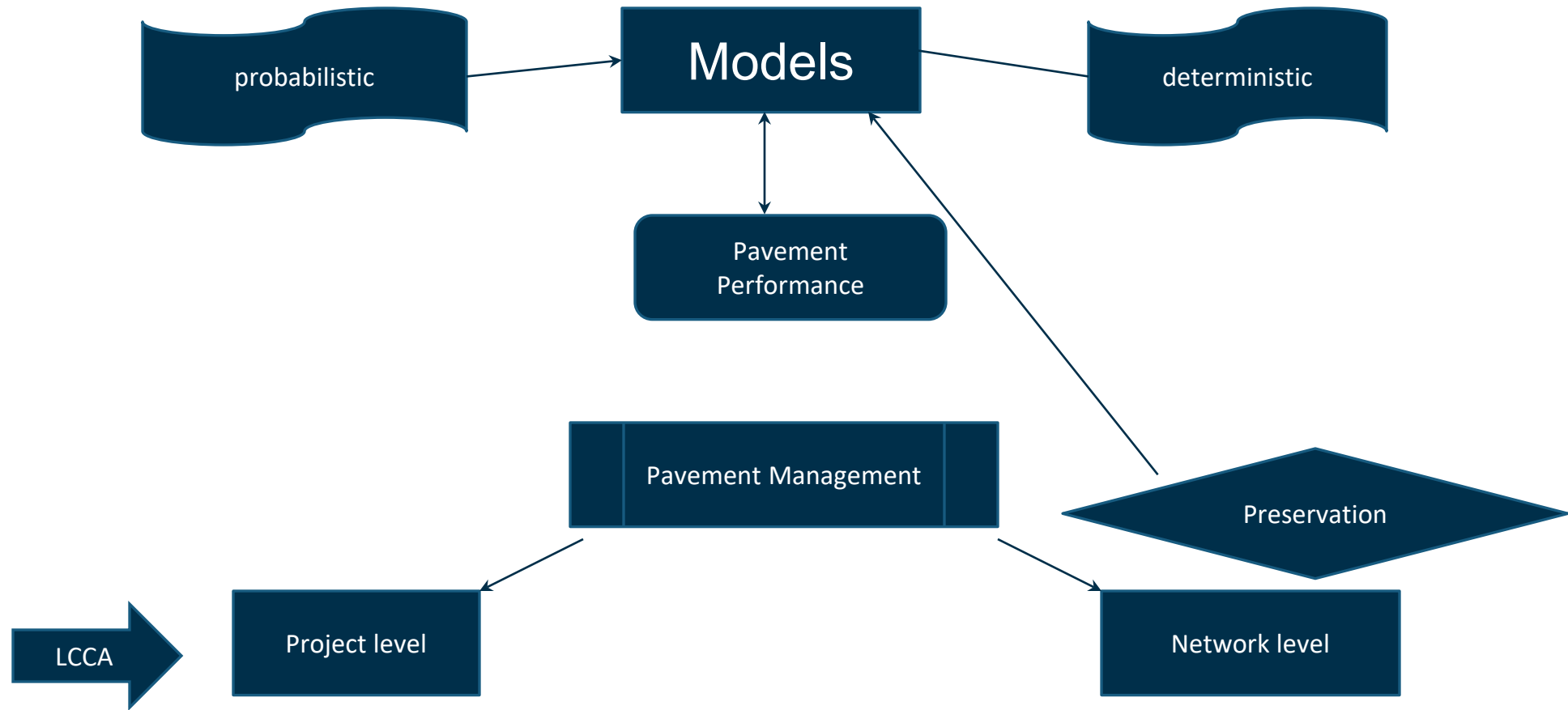


**Source:** State DOT Survey//NCHRP Report 742: Communicating the value of Preservation



# WHERE TO FOCUS PAVEMENT PRESERVATION





# ISSUES AND CHALLENGES

No lack of technologies to treat pavements (selection of right treatment)

No lack of data gathering (selection of right pavement)

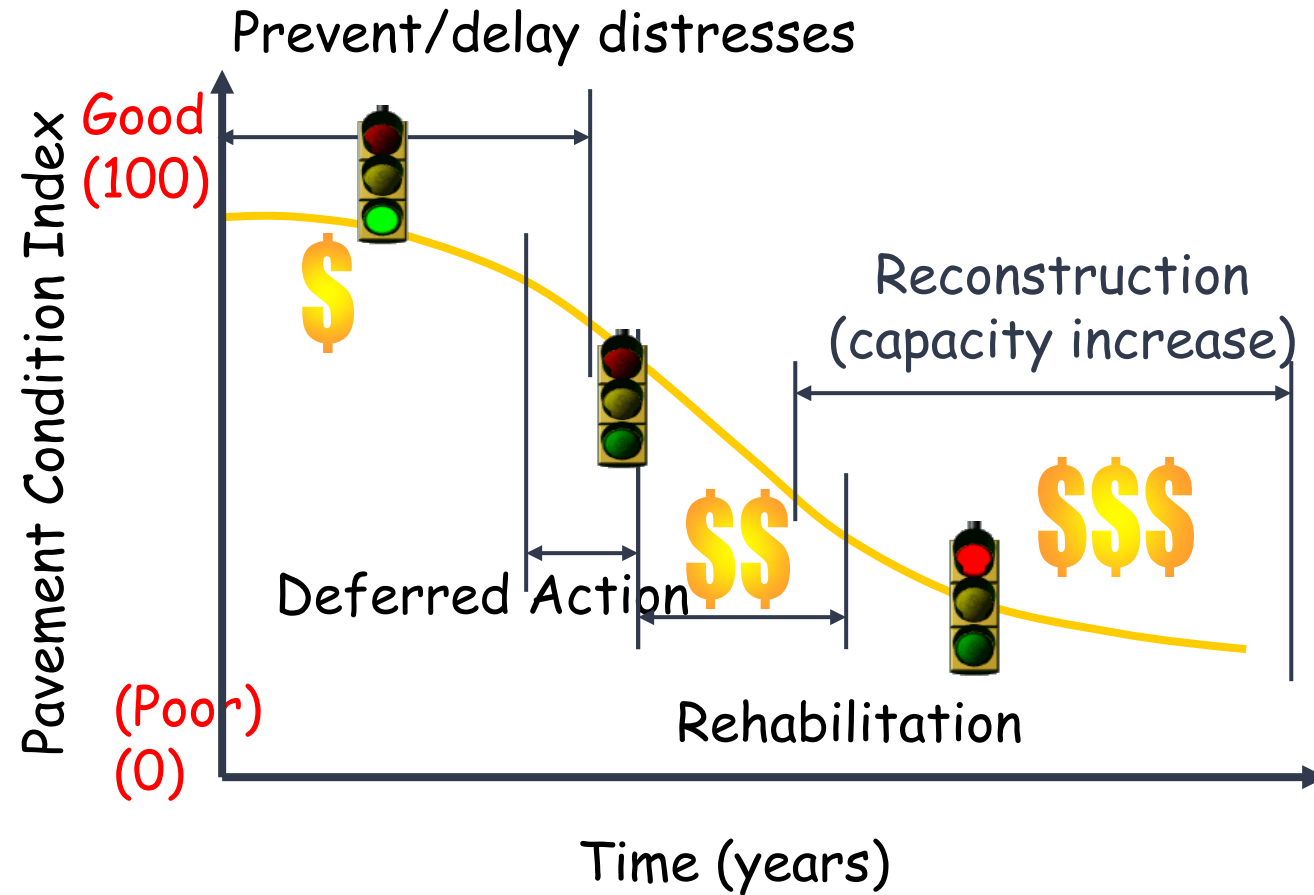
Determine trigger values for Pavement Preservation treatments (the right time)

Needs integration of Pavement Management Systems with pavement preservations

Reorganization of organization to facilitate technology transfer



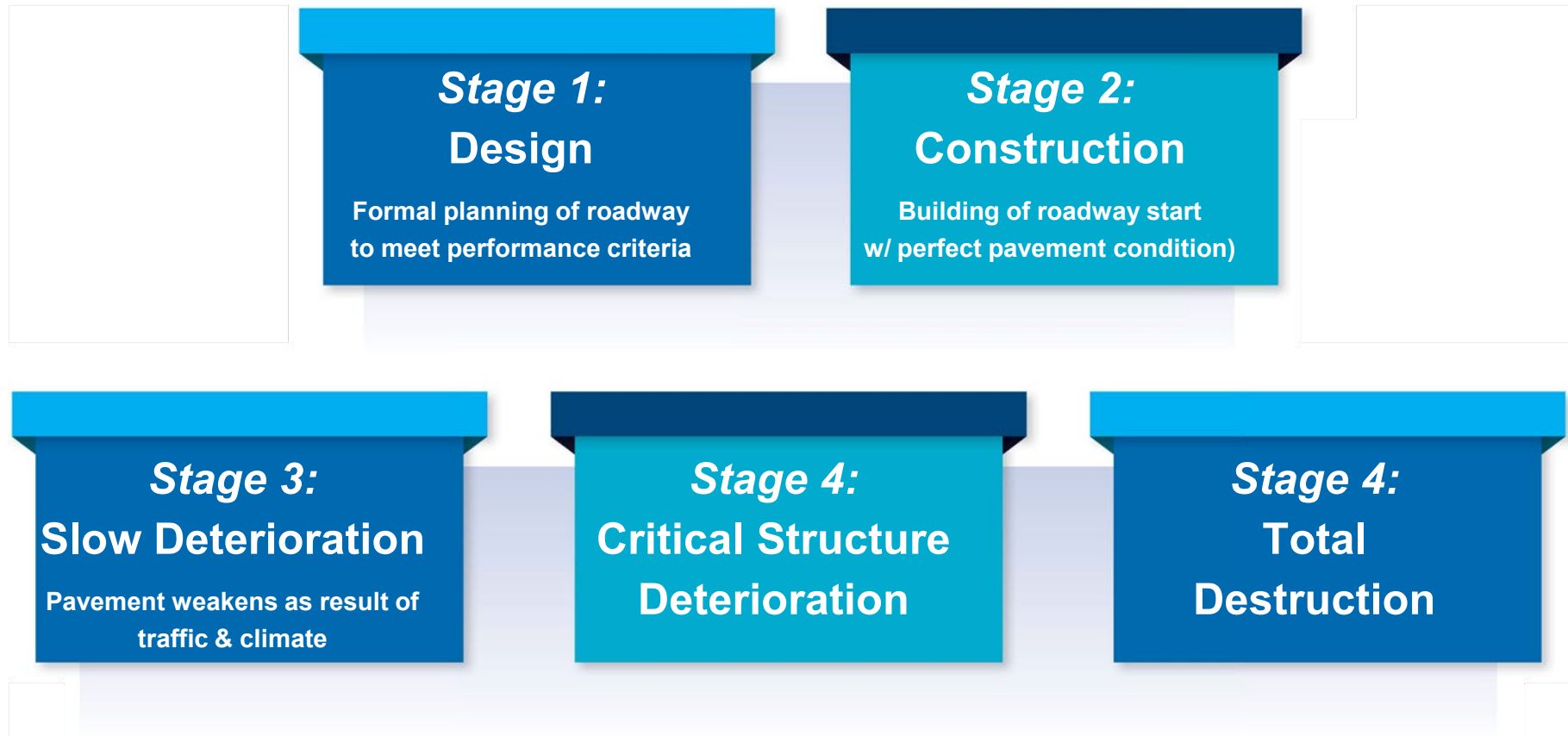
# PAY NOW OR PAY MUCH MORE LATER!



Source: US Department of Transportation Federal Highway Administration, Selecting a Preventive Maintenance for Flexible Pavements, August, 2000, FHWA-IF-00-027,.



# DESIGN LIFE STAGES OF US HIGHWAYS\*

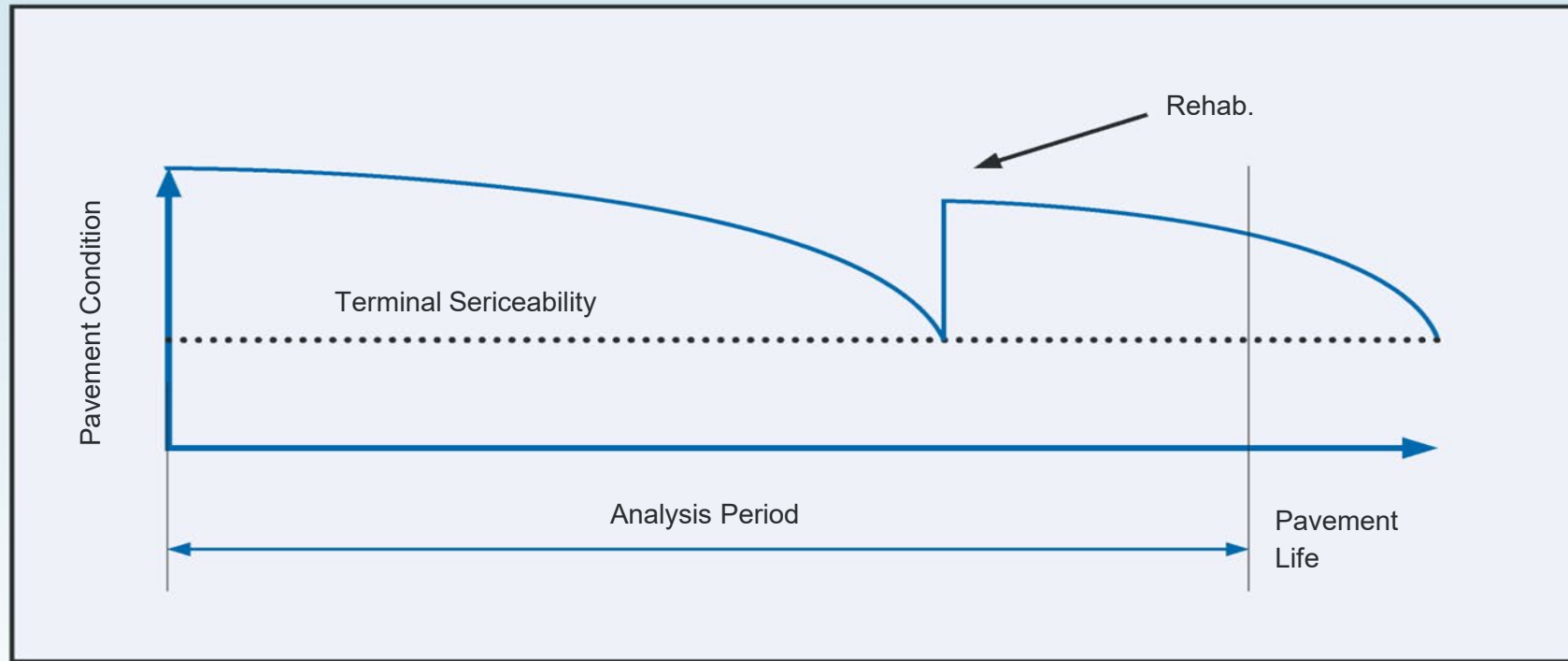


\*"At the Crossroads preserving our Highway Investment"



# LIFE-CYCLE COST ANALYSIS

## Analysis Period For A Pavement Design Alternative

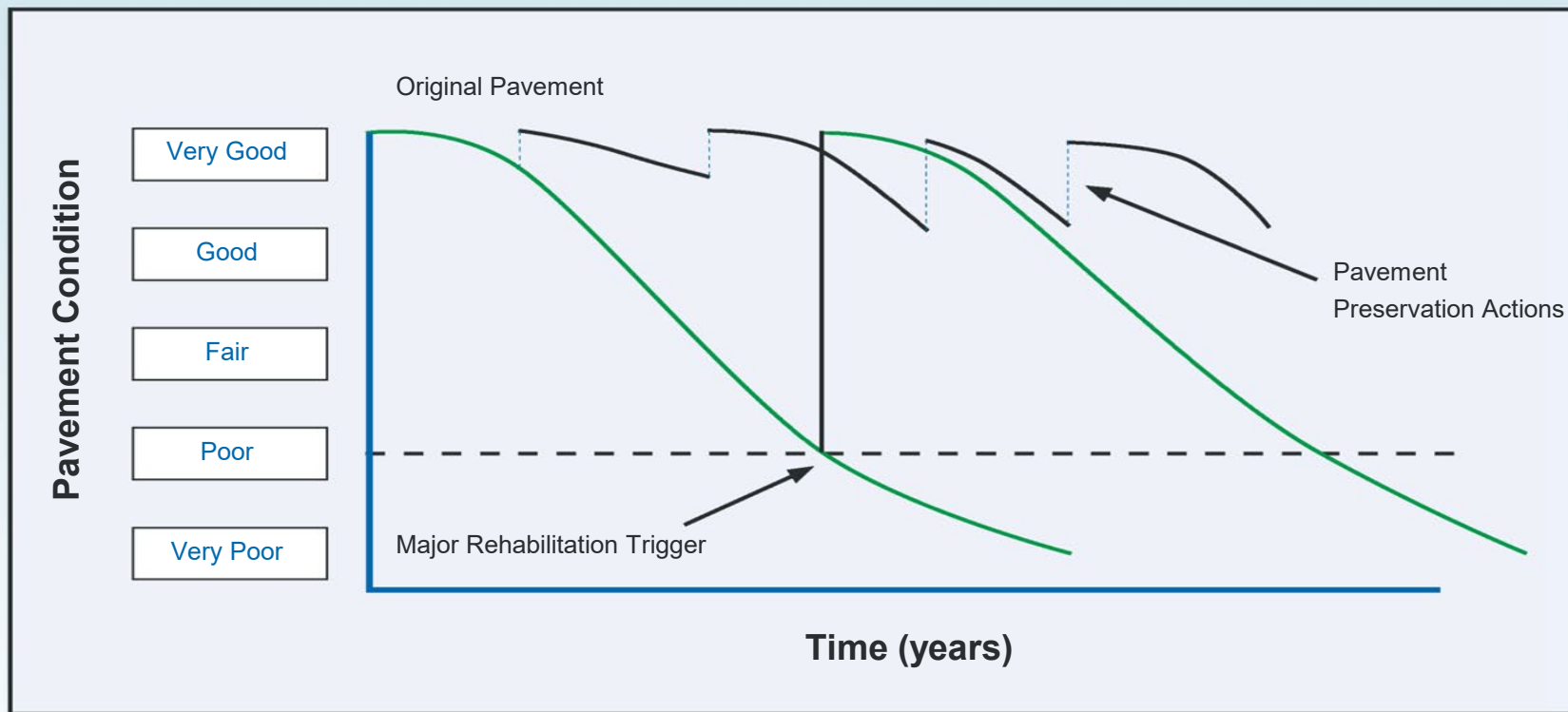


FHWA, "Life Cycle Cost Analysis in Pavement Design,"





# PAVEMENT PRESERVATION CONCEPT\*



\*"At the Crossroads-Preserving Our Highway Investment"



# REFERENCES

- ❑ Standard Method of Test for Evaluation of Oxidation Level of Asphalt Mixtures by a Portable Infrared Spectrometer: AASHTO TP 128-17, August, 2017
- ❑ Improving Quality Control of Asphalt Pavement with RAP Using a Portable Infrared Spectroscopy Device, D. Salomon and I. Yut , RP 269, Idaho Transportation Dept., April, 2016
- ❑ NCHRP Report 742 (Project 14-24) : Communicating the Value of Preservation: A Playbook: Crossett, Schneweis, McDonnell, Parris Communications, Smith , 2012
- ❑ Guidelines for the Preservation of High-Traffic Volume Roads: SHRP 2 Renewal Research, Report S2-R26-RR-2 : Peshkin, Smith, Wolters, Krstulovich, Moulthrop, Alvarado, June, 2011.
- ❑ Transportation System Preservation Research, Development, and Implementation Roadmap (January, 2008): FP<sup>2</sup>, AASHTO,
- ❑ Pavement Preservation: Practices, Research Plans, and Initiatives: NCHRP 20-07, Task 184 (Peshkin & Hoerner): May 2005
- ❑ NCHRP Report 523: Optimal Timing of Pavement Preventive Maintenance Treatment applications, Peshkin, Hoerner, Zimmerman, 2004



# Questions?

**Nouryon**

**Aaron Roy**

Midwest Sales Manager-Construction  
Surface Chemistry

E aaron.roy@nouryon.com

M +1 513 720 7525

**Visiting address**

131 S Dearborn Street • Chicago, IL 60603 • US

