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Pavement Preservation

It just makes ¢ent$

David R. Johnson, P.E.
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When you come to the end of your rope, tie a knot and hang on.

— Franklin D. Roosevelt

Time for some maintenance?

Pavement Preservation

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Pavement Preservation is "a program employing a network level, long-term strategy that enhances pavement performance by using an integrated, cost-effective set of practices that extend pavement life, improve safety and meet motorist expectations." ***Source: FHWA Pavement Preservation Expert Task Group***

Pavement Preservation

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Pavement Preservation is "a program employing a network level, long-term strategy that enhances pavement performance by using an integrated, (a) cost-effective set of practices that extend pavement life, (and) improve safety and meet motorist expectations." ***Source: Dave Johnson's Shortened Version***

The Components of Preservation

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- Pavement Design
  - Mix Design
  - Pavement Structural Design
  - Perpetual Pavements
- Construction
  - Contracting
  - Quality Control
  - Quality Assurance
- Maintenance
  - Reactive
  - Preventive

Maintenance

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- Reactive – Traditional Approach
  - Worst first
  - Waits for distress to appear
  - Costs more
  - Shortens pavement life
- Preventive – More Recent Approach
  - Proactive
  - Preformed based on triggers
  - Pavement Management System
    - Not a cure all
    - Goals

PMS Defined

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A Pavement Management System (PMS) is a set of tools for providing, evaluating, and maintaining pavements in a serviceable condition over a period of time—AASHTO

PMS Process

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- **Strategic Level** – usage of PMS to support the long-term goals of an agency at a management level.
- **Network Level** – the entire transportation infrastructural system managed by the PMS. (Big Picture)
- **Project Level** – and individual project for which a plan-of-action is developed to address its specific need. (Focused Perspective)

Preventive maintenance and Pavement Management CANNOT effectively stand alone!

Preventive Maintenance

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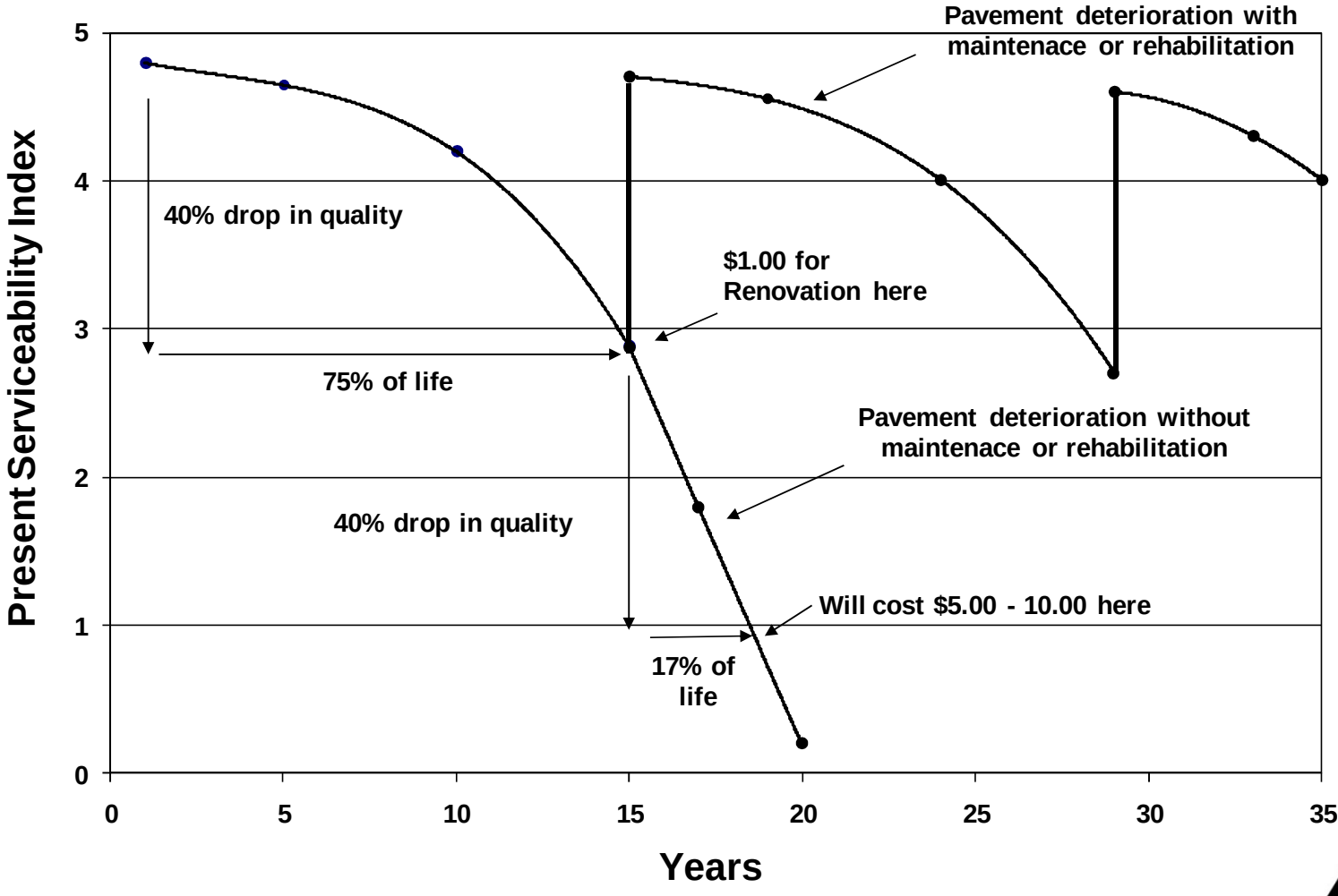

Preventive Maintenance

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- Pavement Preservation
  - Improves the overall condition of the pavement network
  - Extends pavement life
  - Reduces user delays
  - Improves road safety
  - **SAVES MONEY**

Categories of Pavement Preservation

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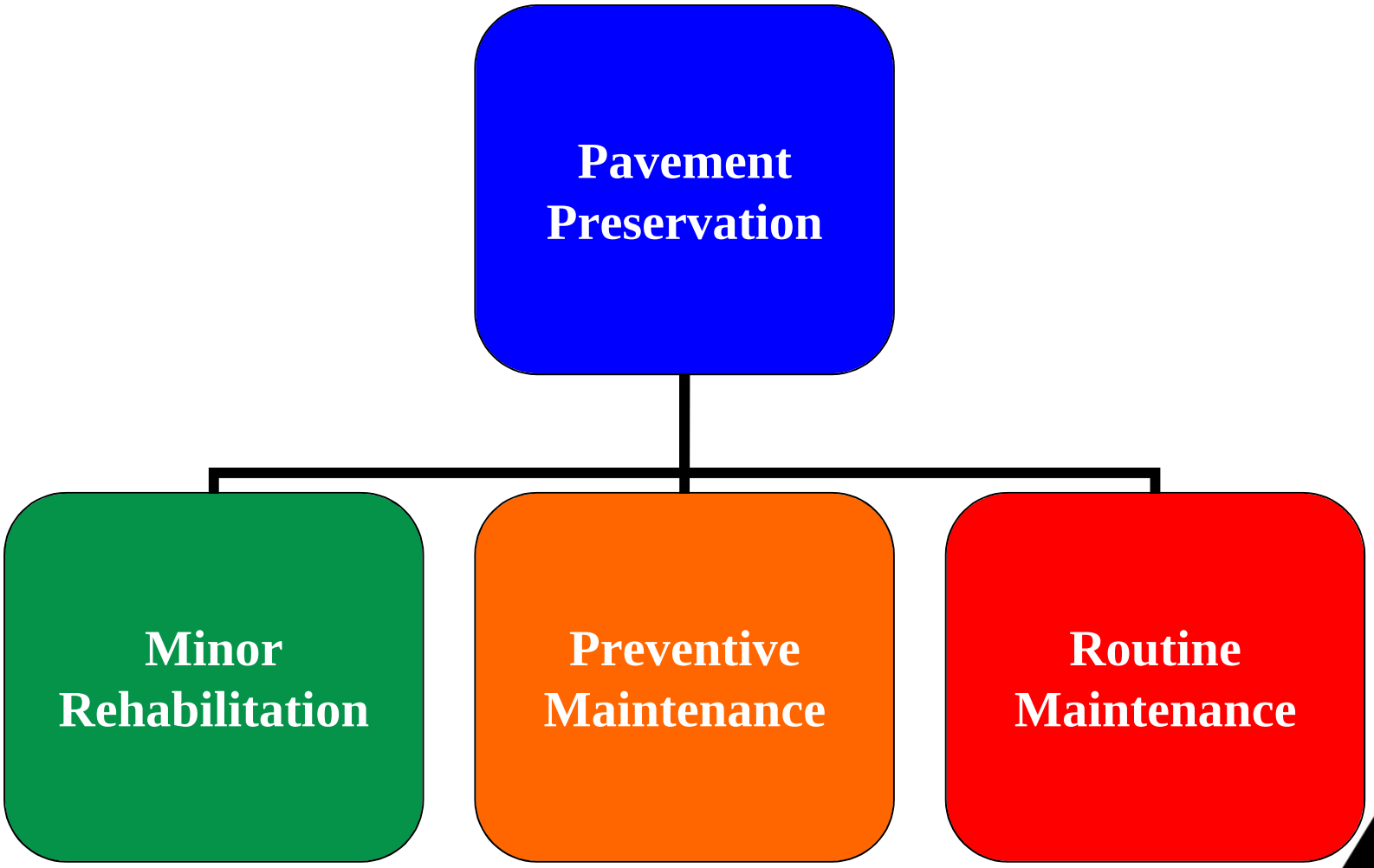
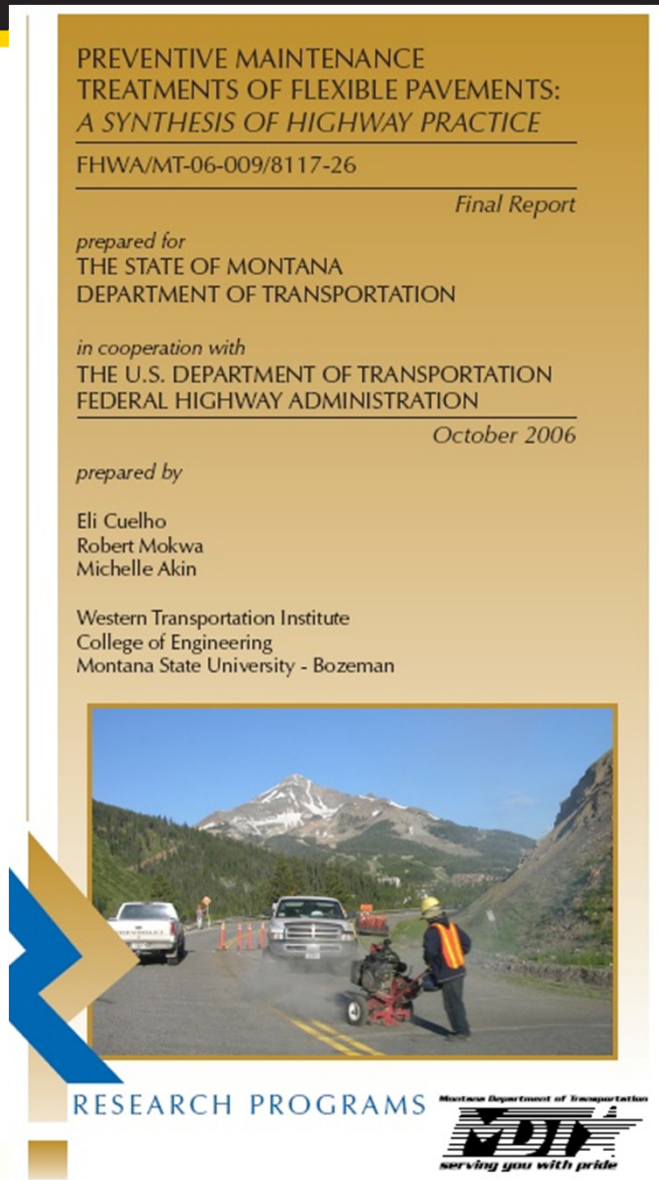


Pavement Preservation Guidelines

	Type of Activity	Increase Capacity	Increase Strength	Reduce Aging	Restore Serviceability
	New Construction	X	X	X	X
	Reconstruction	X	X	X	X
	Major (Heavy) Rehabilitation		X	X	X
	Structural Overlay		X	X	X
Pavement Preservation	Minor (Light) Rehabilitation			X	X
Pavement Preservation	Preventive Maintenance			X	X
Pavement Preservation	Routine Maintenance				X
	Corrective (Reactive) Maintenance				X
	Catastrophic Maintenance				X

Preventive Maintenance



- Published in 2006
- Reviews numerous preventative maintenance operations

http://www.mdt.mt.gov/other/research/external/docs/research_proj/prevent_maint/final_report.pdf

Pavement Distresses

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- Ride (International Roughness Index – IRI)
- Cracking
  - Transverse
    - Reflective
    - Shrinkage (cold weather)
  - Longitudinal
  - Fatigue (Alligator)
  - Edge
  - Block
- Potholes
- Patches
- Surface Deformations
  - Rutting
  - Shoving
- Surface Defects
  - Bleeding/Flushing
  - Polished Aggregate
  - Raveling

LTPP Distress Identification Manual

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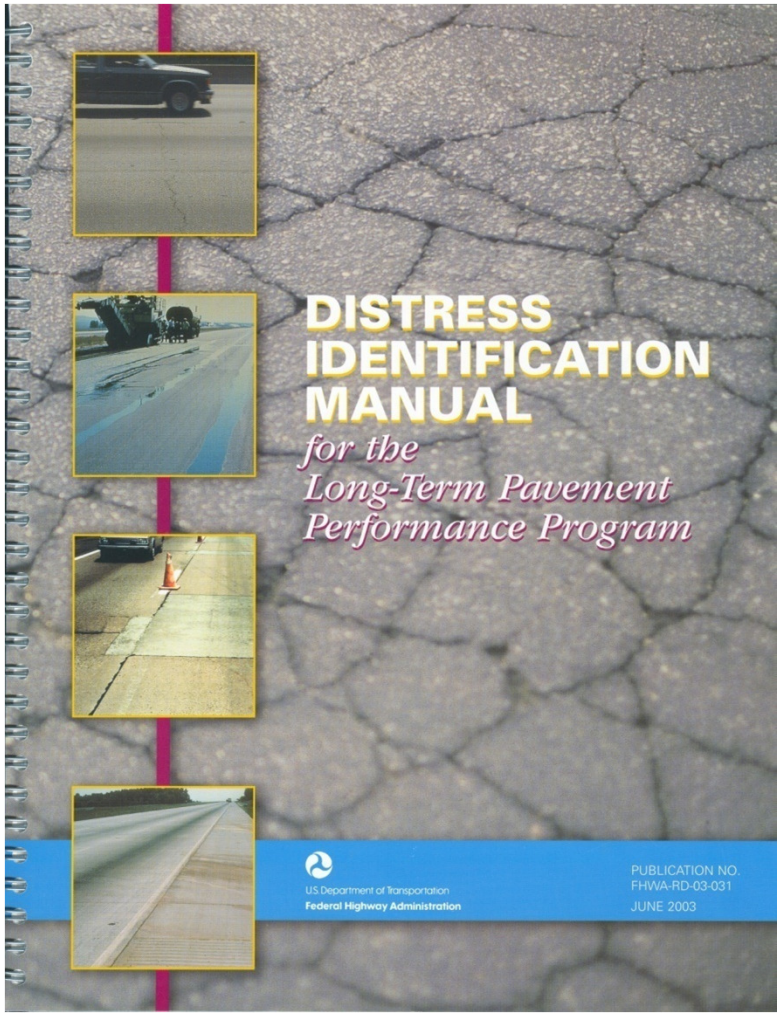

- All pavement types
- Distress definitions
  - Description
  - Severity levels
  - How to measure
- Schematic drawings
- Color Photographs
- Data collection forms

www.tfhrc.gov/pavement/ltpp/reports/03031/index.htm

FHWA Preservation Methods

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- Crack Sealing*
- Fog Seals*
- Sand Seal
- Chip Seal*
- Slurry Seal*
- Microsurfacing*
- Thin-Lift Overlay*
- Fabric Interlayer*

*FHWA Checklist Available at:
http://www.fhwa.dot.gov/pavement/pub_listing.cfm?areas=Preservation

Additional Preservation Methods

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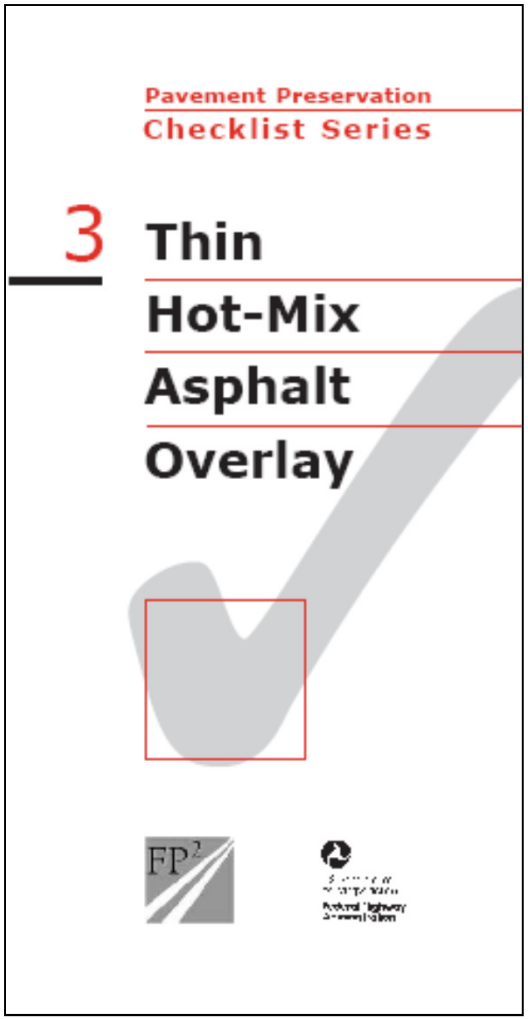
- Cape Seals
- Patching
- Rejuvenation
- Ultrathin Overlay

Example FHWA Checklist



- Preliminary Responsibilities
  - Project Review
  - Document Review
  - Material Requirements
- Inspection Responsibilities
  - Equipment Inspections
  - Surface Inspection
- Project Operational Considerations
- Common Problems and Solutions

http://www.fhwa.dot.gov/pavement/pub_listing.cfm?areas=Preservation

Preventive Maintenance

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- Identify available methods
- Select method
- Predict the results
- Run additional iterations
- This is generally done within a PMS

Treatment Selection

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- Factors Affecting Selection
  - Methods available
  - Pavement distresses
  - Distress severity
  - Maintenance goals
  - Available dollars
- Selection both an engineering and economic decision.

Real World Example - WSDOT

- Mid-1960s—began collecting pavement condition ratings.
- 1974—WSDOT implemented its first version of WSPMS.
- 1993—legislature required project selection based on lowest LCCA.
- Based on LCCA, determined there is a 2-3 year window when flexible pavements can be rehabilitated (12-13 years old).

Real World Example - WSDOT

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- Hot-mix asphalt pavement: 10,776 lane-mi, 60 percent of network.
- Bituminous surface treatment: 4,843 lane-mi, 27 percent of network.
- Concrete pavement: 2,262 lane-mi, 13 percent of network.

Real World Example - WSDOT

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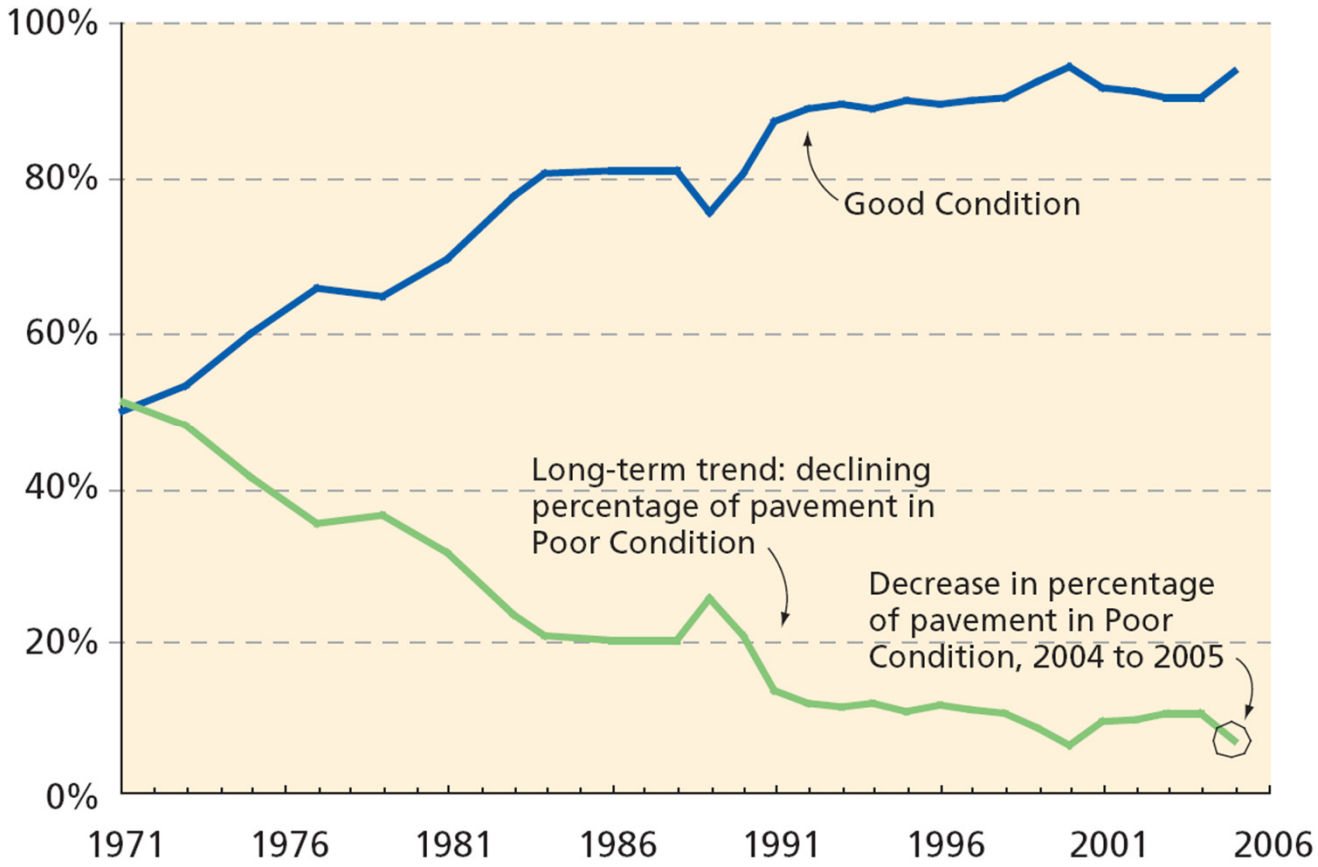

From: FHWA Pub. IF-08-010

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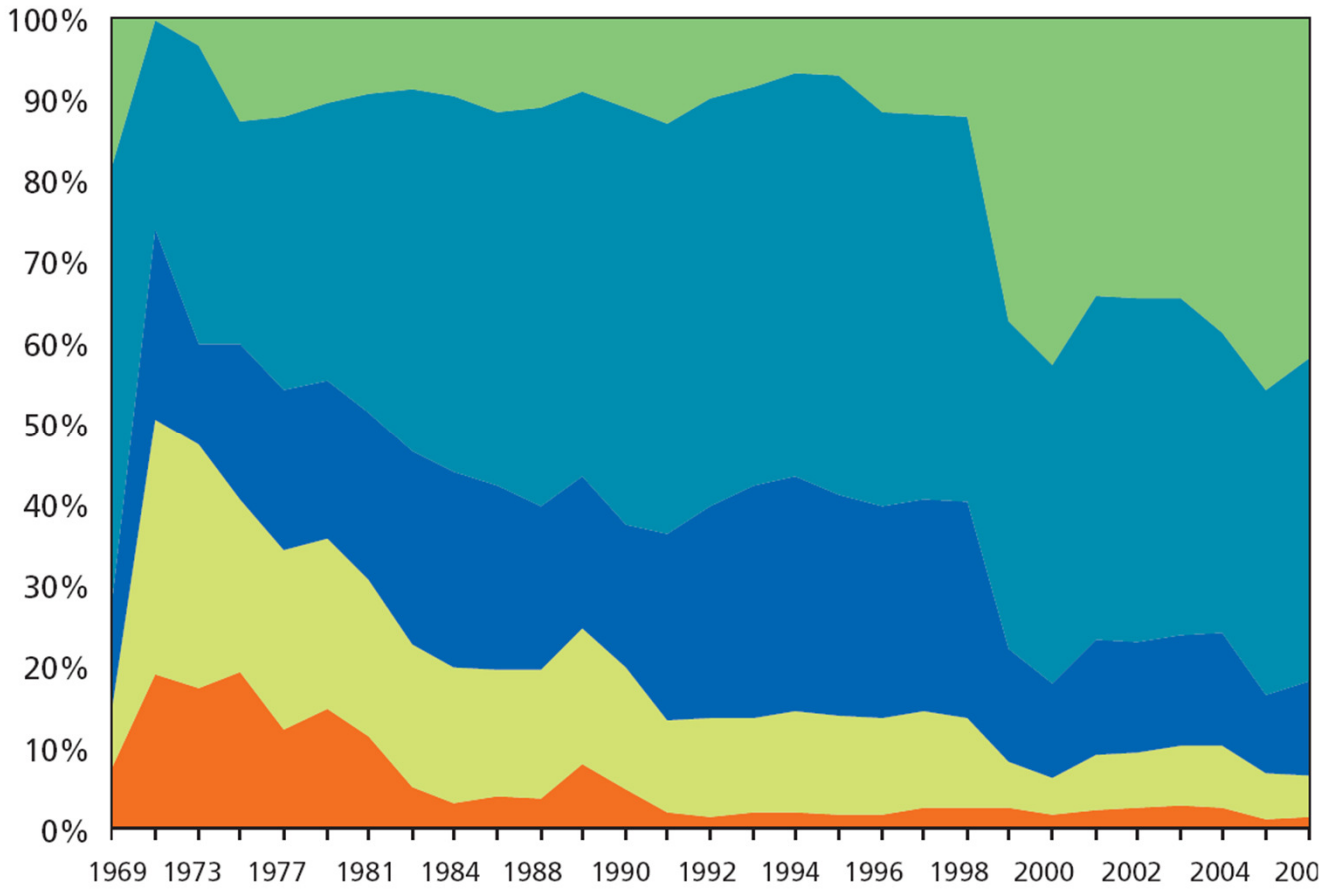

From: FHWA Pub. IF-08-010

Example Payoffs

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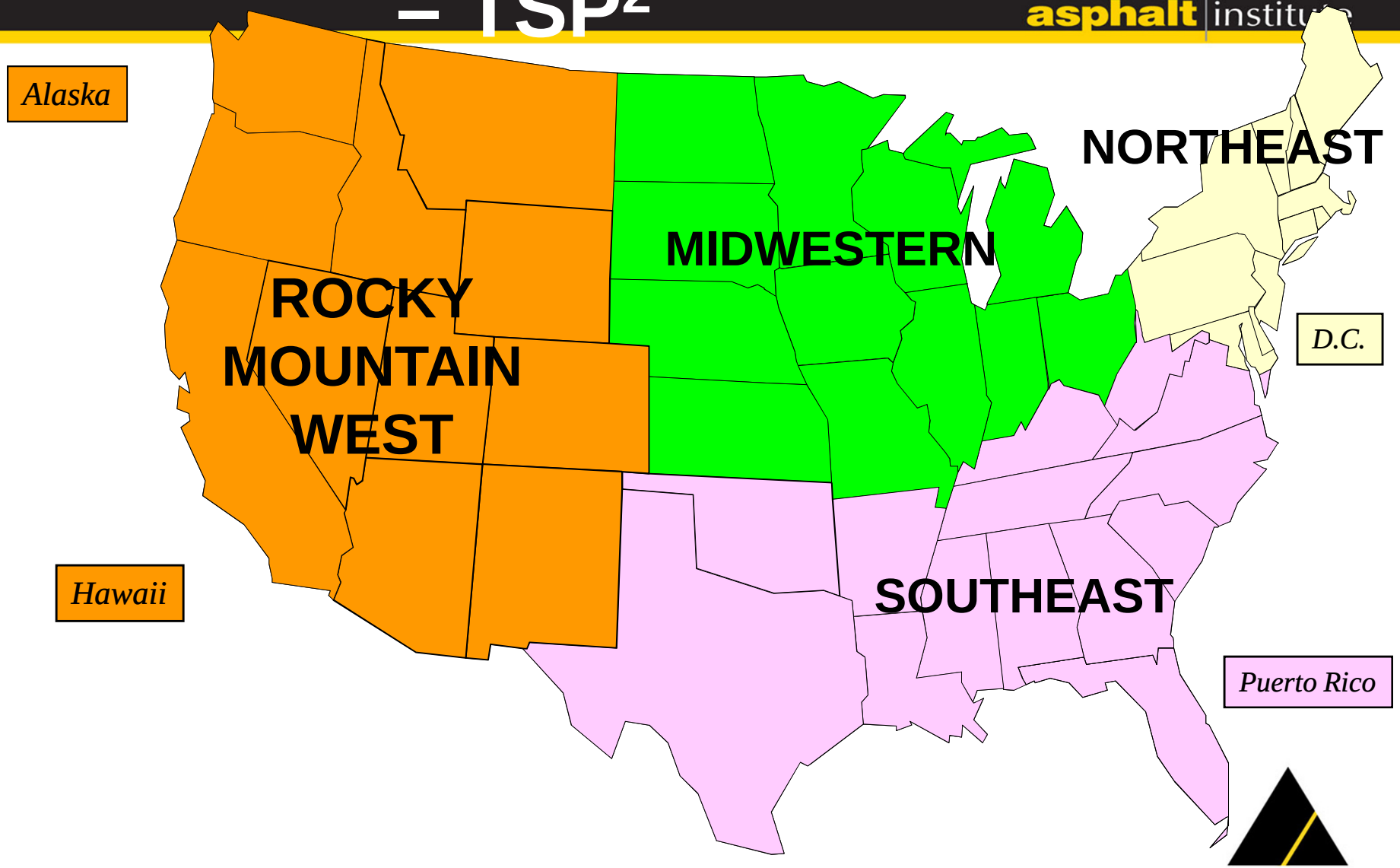
- Michigan
  - 1992-1997 – $80 million on preventive maintenance
  - Estimated traditional cost – $700 million
- Georgia
  - $70-80 million annually
  - 1992-1997 – 300% improvement in pavement smoothness

Preservation Partnerships – TSP²



Training Opportunities

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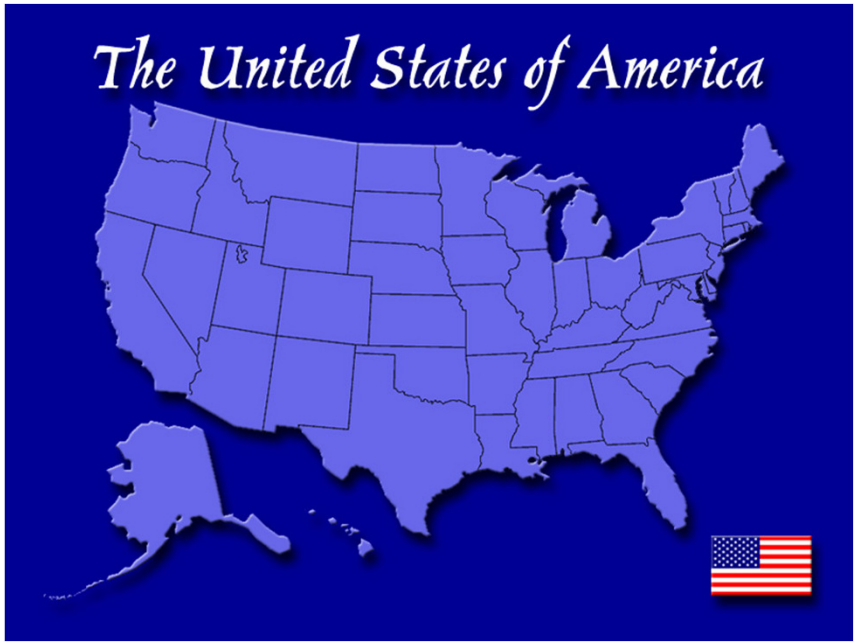
- Mix Design Methods for Slurry Seal/ Microsurfacing and for Chip Seals - $85 (Nov. 3)
- Combining Preservation Treatments - $85 (Nov. 10)
- ISSA Inspectors Manual - $85 (Nov. 17)

http://www.asphaltinstitute.org/public/asphalt_academy/Webinars/index.asp

- Asphalt Institute publications that involve Pavement Preservation
  - MS-4 ***Asphalt Handbook***
  - MS-16 ***Asphalt in Pavement Preservation and Maintenance***
  - MS-19 ***Basic Asphalt Emulsions Manual***

http://www.asphaltinstitute.org/store_category_browse.asp?ic_id=11



Thank you – Questions

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