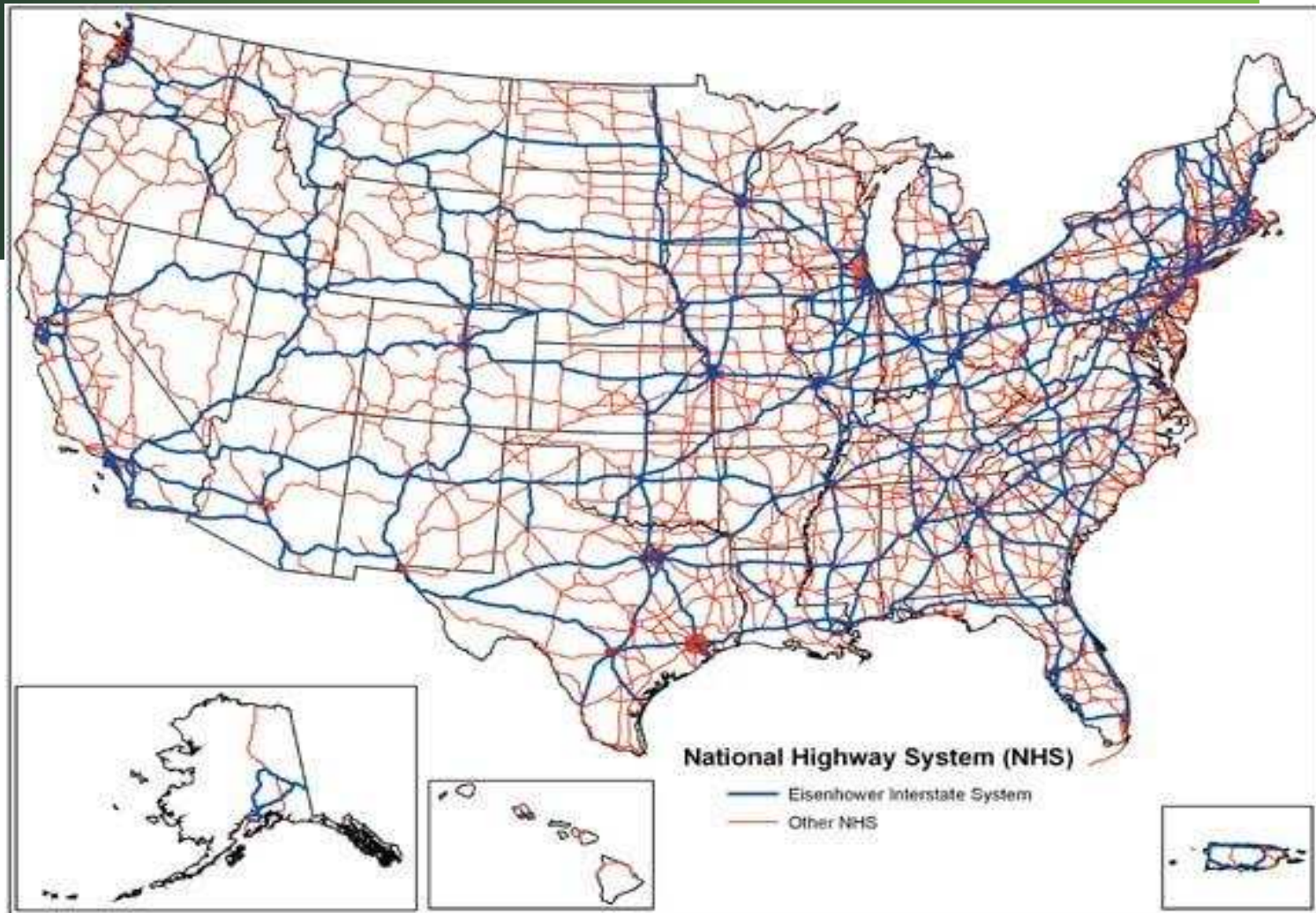


Integration of Pavement Management and Preservation

Do the Right Treatment
On The Right Road
At the Right Time

National Statistics: 3,963,262 miles of Roads & 590,000 Bridges



PRESERVATION GOALS

RIGHT TREATMENT

Crack Sealing
Surface Seals
Recycling
CIR/HIR
Milling & Thin
OL's
Drainage Maint.
Joint Sealing
Grinding/Grooving
Patching –
Partial/Full
DBR
Whitotopping

RIGHT ROAD

**GOOD
STRUCTURE**

**“Acceptable”
Distresses
Age
Expected
Rehab
Traffic
Environment**

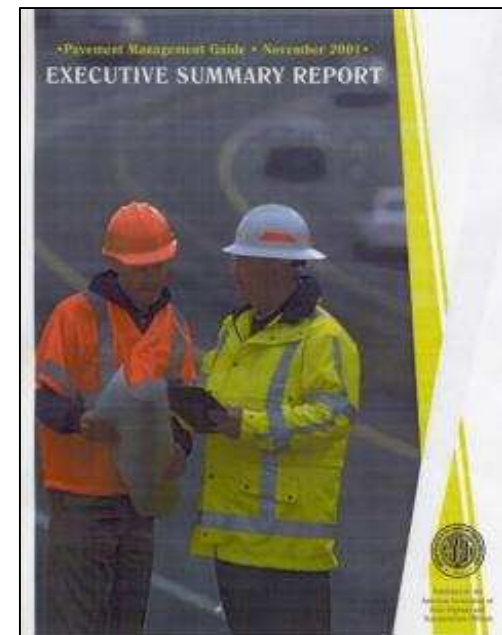
RIGHT TIME

**PAVEMENT
MANAGEMENT
SYSTEM**

**LIFE
CYCLE
COST
ANALYSIS**

2001 AASHTO Pavement Management Guide

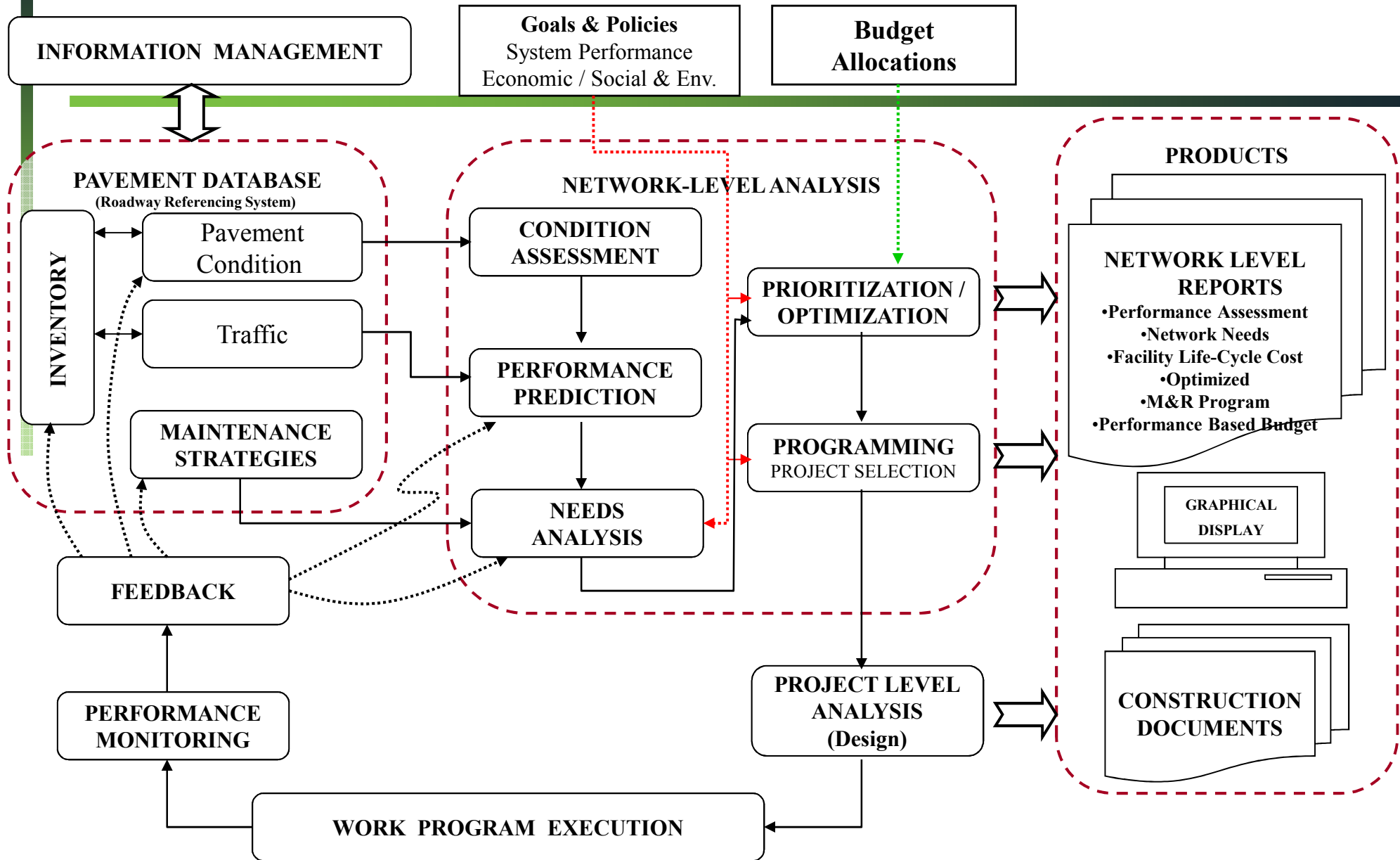
A Pavement Management System (PMS) is a set of tools that assist decision-makers in finding optimum strategies for providing, evaluating, and maintaining pavements in a serviceable condition over a period of time.



In Other Words

- Pavement management supports an agency's decision processes
- Today, that means more than ever before with the increased demands associated with:
 - Preserving our Infrastructure with Less
 - Performance based Fed-Aid Program
 - Accountability Requirements

PMS FLOWCHART



5 Core Questions

- What is the current state of my pavements?
- What is the required level of service?
- Which pavements are most critical to achieving our performance objectives?
- What are the best strategies for Maintenance & Operations and Capital Improvement investments?
- What is the best long-term funding strategy?

Role of Pavement Management in a Preservation Program

- Assist with project and treatment **selection**
- Determine best project **timing**
- Establish program **funding** needs
- Build program **support**
- Provide **accountability**



Project and Treatment Selection

- Analyze pavement performance
 - Assess type of deterioration present
 - Assess extent of deterioration present
- Identify factors that lead to the selection of preventive maintenance treatments

Analyzing Pavement Performance

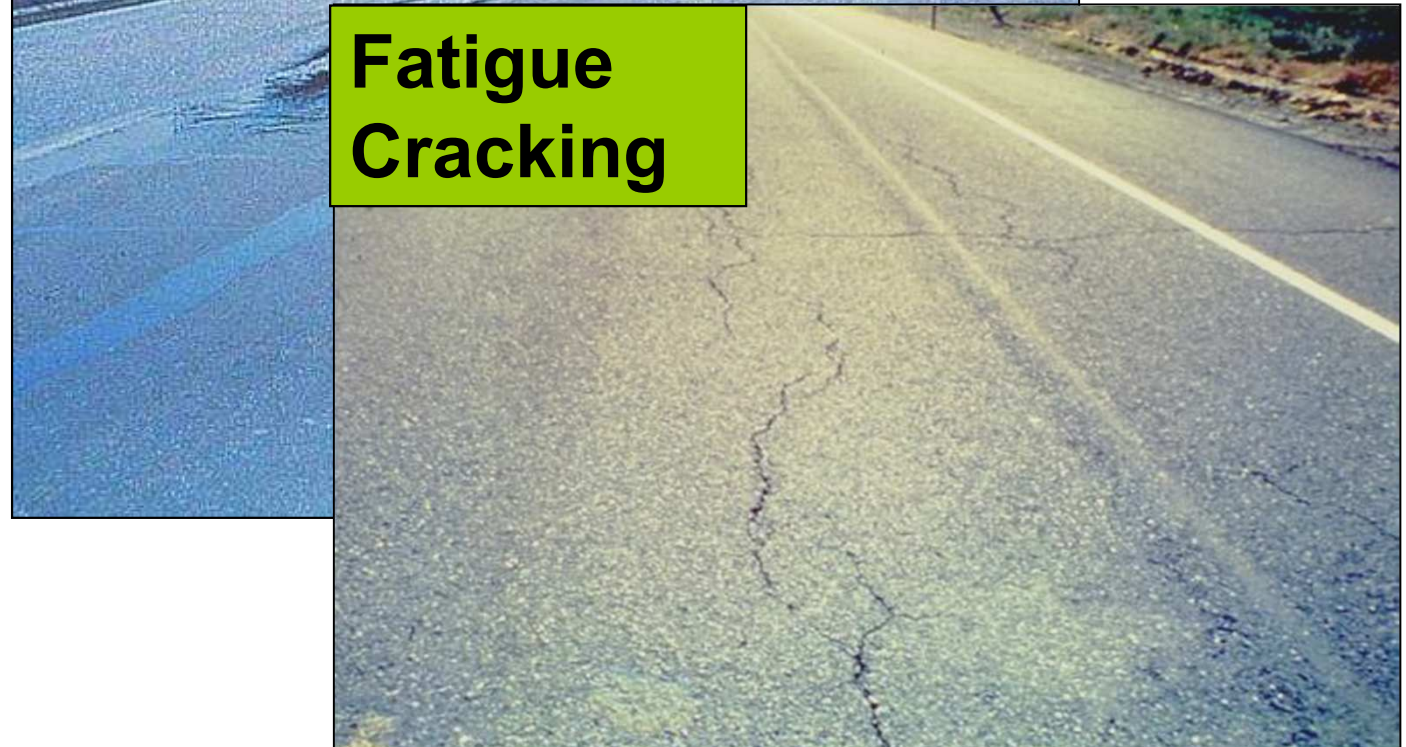


Pavement Condition Survey Equipment



Structural HMA Distress

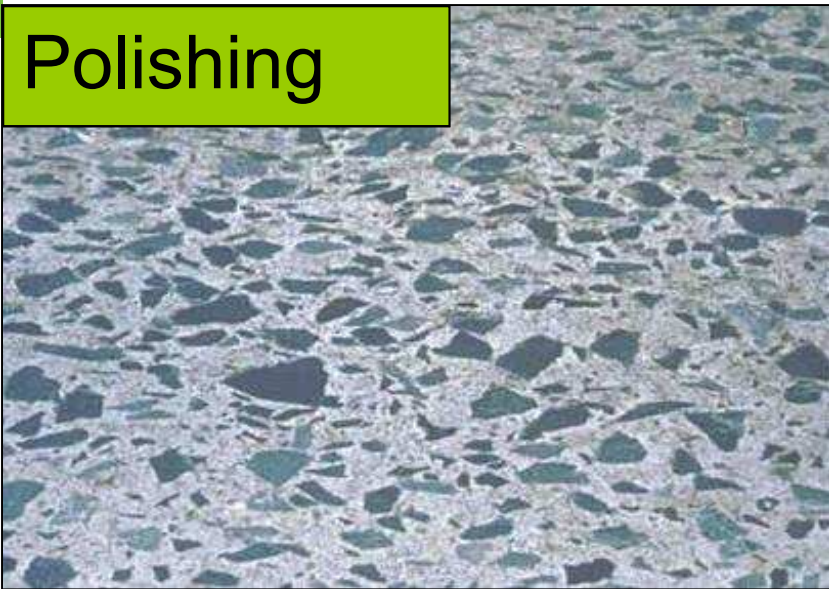
•Load
↓
Plastic
Deformation



Functional Deterioration

- Most pavement surface distress somehow affects a pavement's function by increasing roughness or reducing friction

Polishing



Bleeding/Flushing

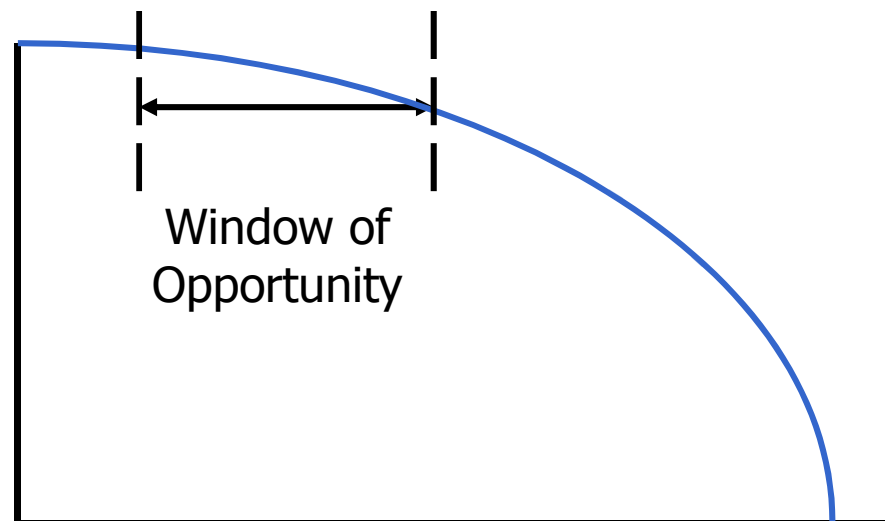


Treatment Selection Guidelines

HMA Distresses	Low		Moderate		High	
	Occasional	Frequent	Occasional	Frequent	Occasional	Frequent
Fatigue Cracking	Fog Seal, Do Nothing	Fog Seal, Chip Seal	Chip Seal, Fog Seal, Thin HMA Overlay	Chip Seal, Slurry Seal	Patching, Chip Seal, Thin HMA Overlay	Recon, Patching
Edge Cracking	Do Nothing, Crack Seal or Fill	Crack Seal or Fill, Do Nothing	Crack Seal, Patching	Crack Seal, Patching	Patching	Patching
Longitudinal Cracking	Crack Seal, Do Nothing	Crack Seal, Chip Seal, Do Nothing	Crack Seal, Chip Seal	Crack Seal, Chip Seal	Patching, Crack Seal, Chip Seal	Chip Seal, Crack Seal, Patching
Bleeding	Do Nothing	Do Nothing, Chip Seal	Chip Seal, Do Nothing, Mill	Chip Seal, Mill	Mill + Chip Seal	Mill + Chip Seal, Thin HMA Overlay

Project Timing

- Predict pavement deterioration
- Estimate when a more substantial treatment will be needed



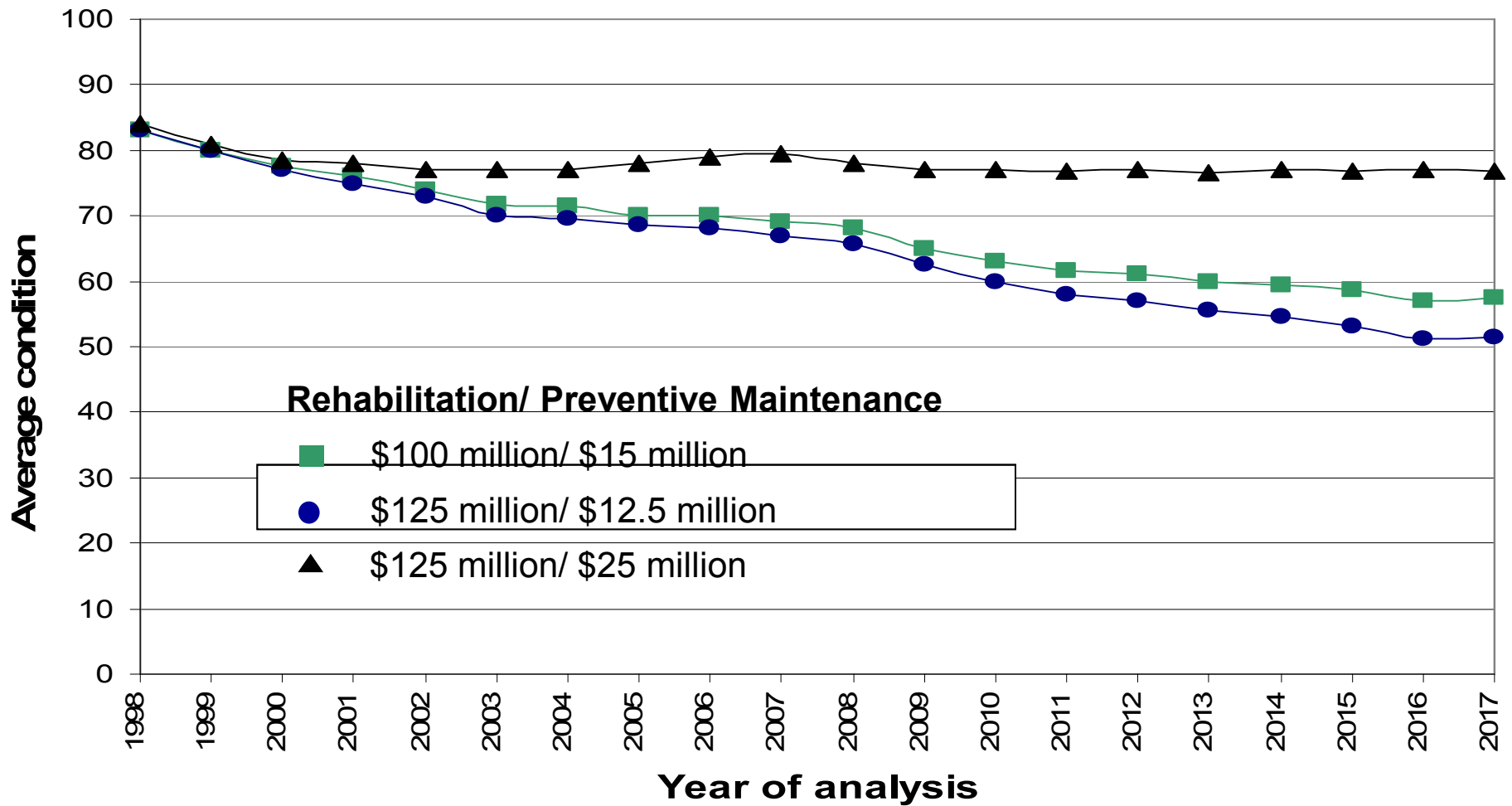
Time-Based Schedule Example

New York State Initial Guidelines for Treatment Application Cycles

Treatment Type	Appl. Cycle, yrs
• PCC pavement joint and crack sealing	8
• HMA pavement crack sealing	4
• Thin HMA overlays (38 mm [1.5 in])	12
• Surface treatments of HMA pavements	4
• Surface treatments of shoulders	4
• Clean drainage	10

Program Funding

From Indiana DOT for its Interstates

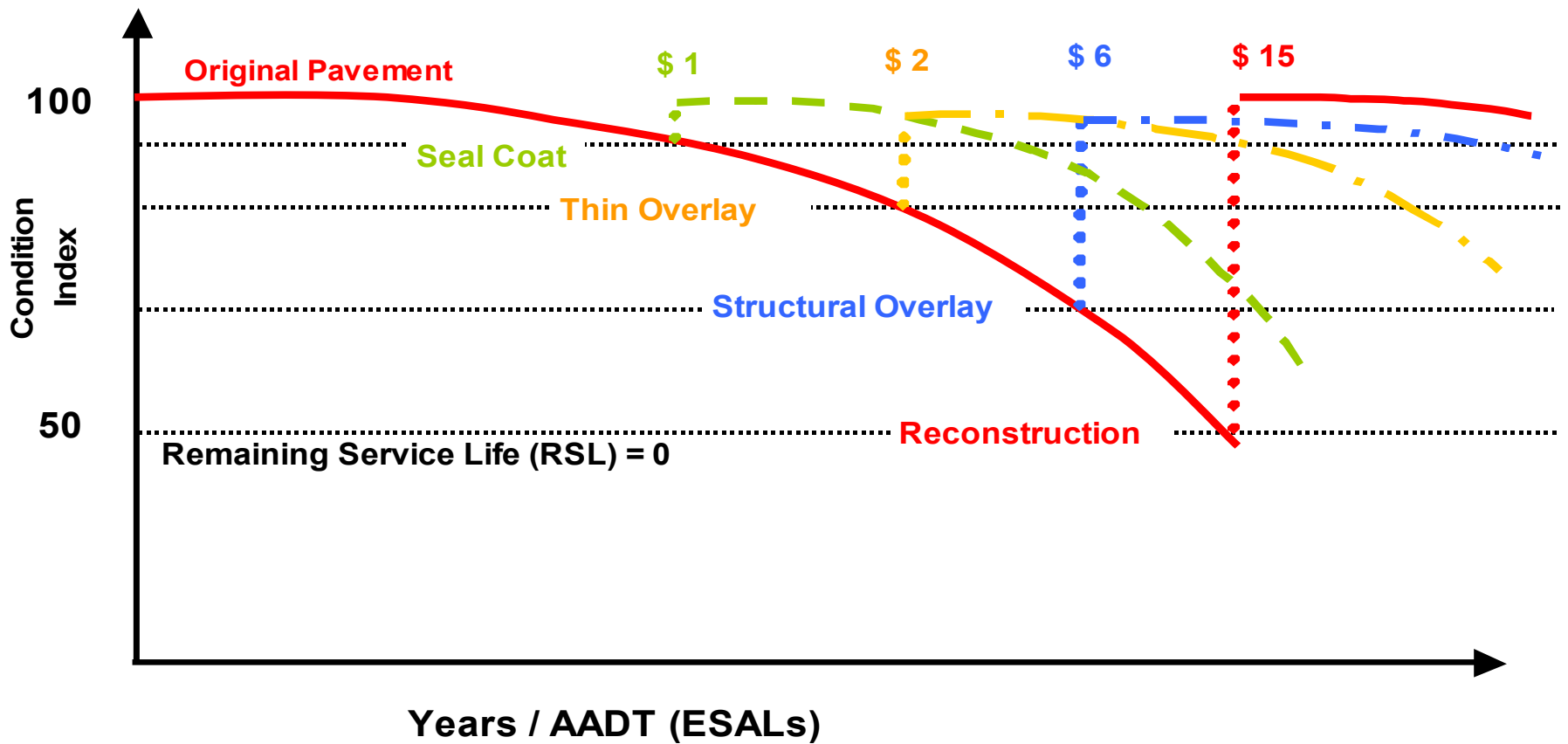


Program Support

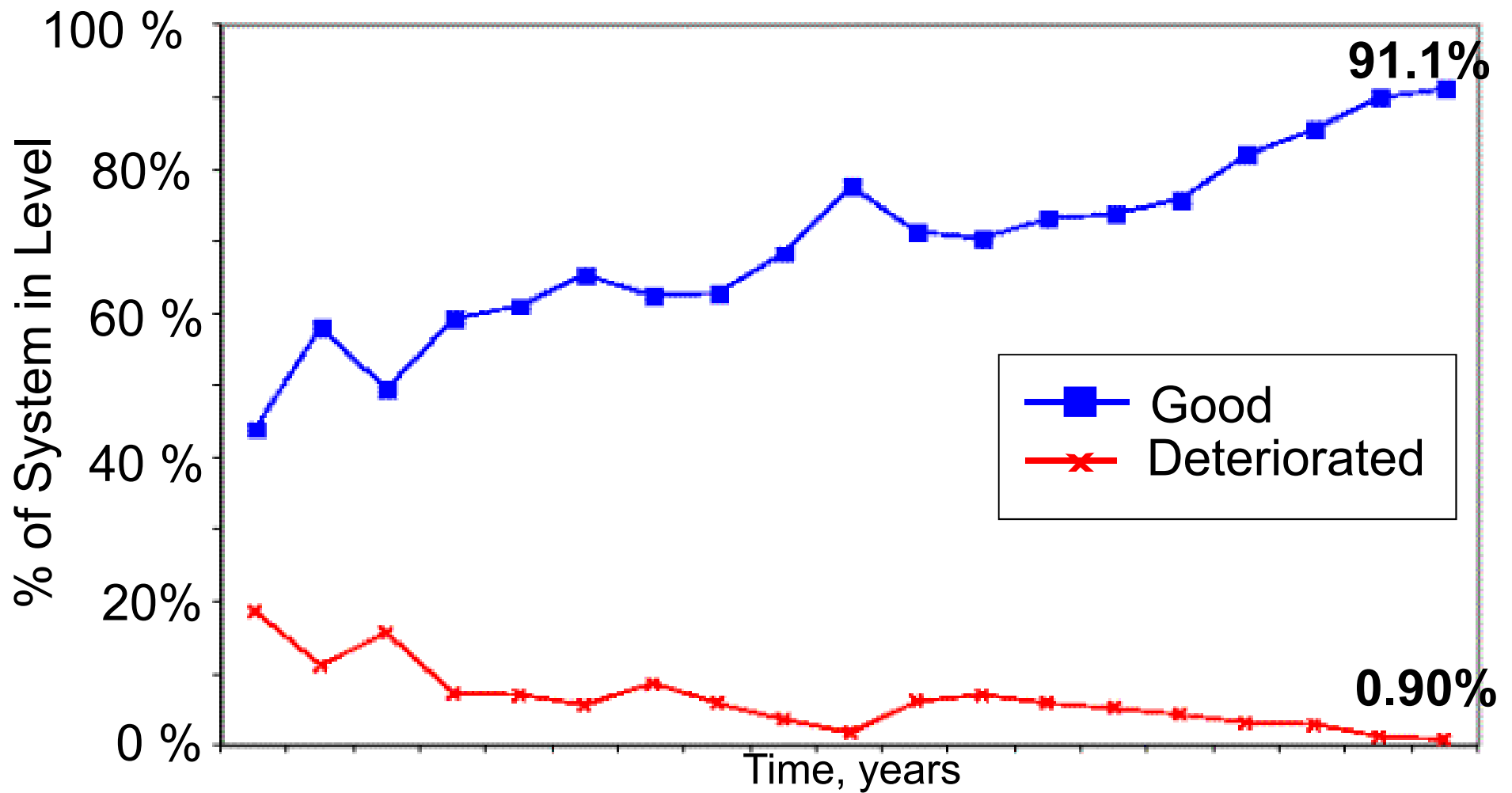
- Promote concepts
- Demonstrate cost effectiveness
- Illustrate impacts with and without preventive maintenance
- Justify expenditures

Good Roads Cost Less

Condition Deterioration & Treatment Triggers / Resets



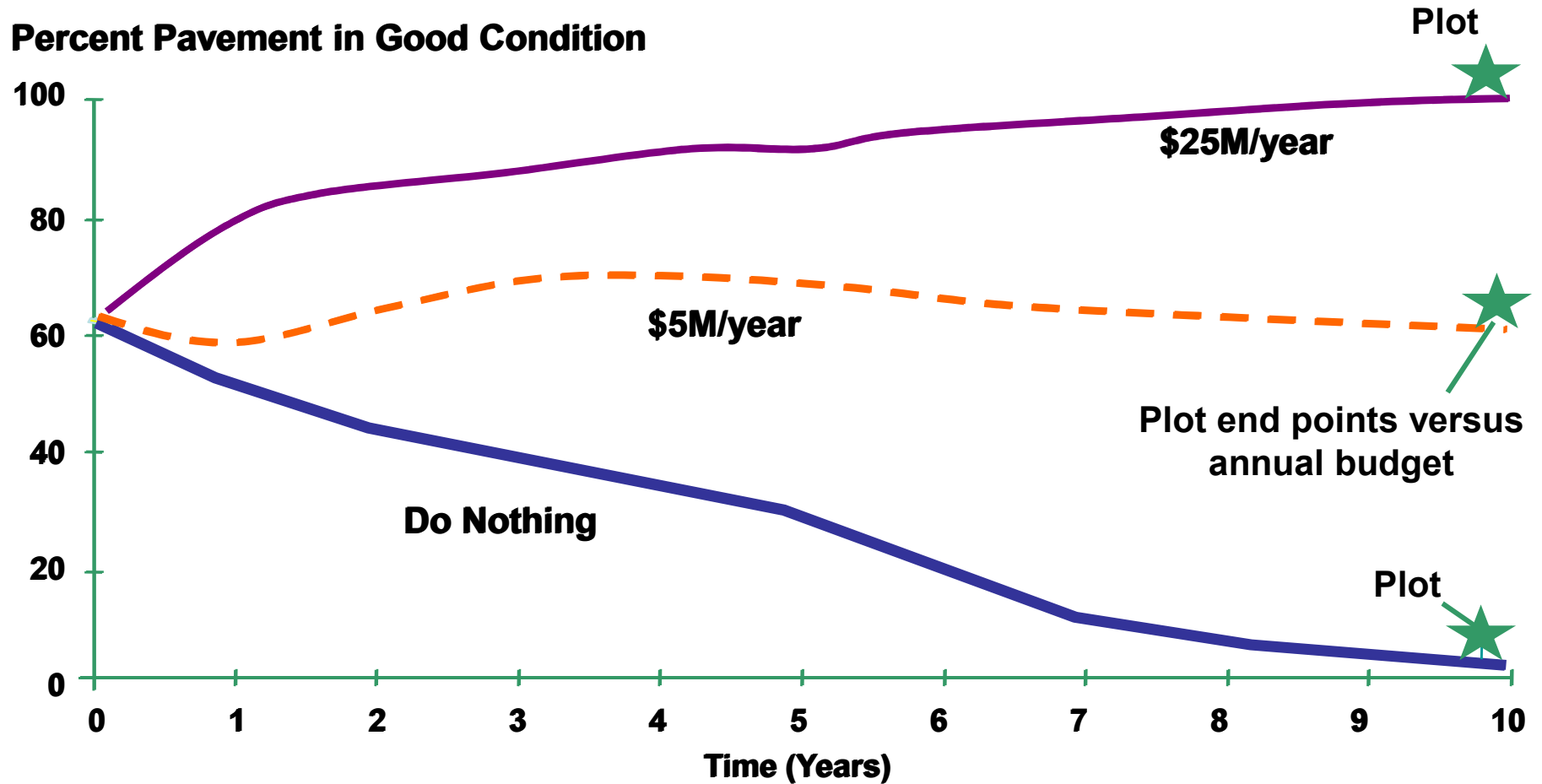
Kansas DOT



Accountability

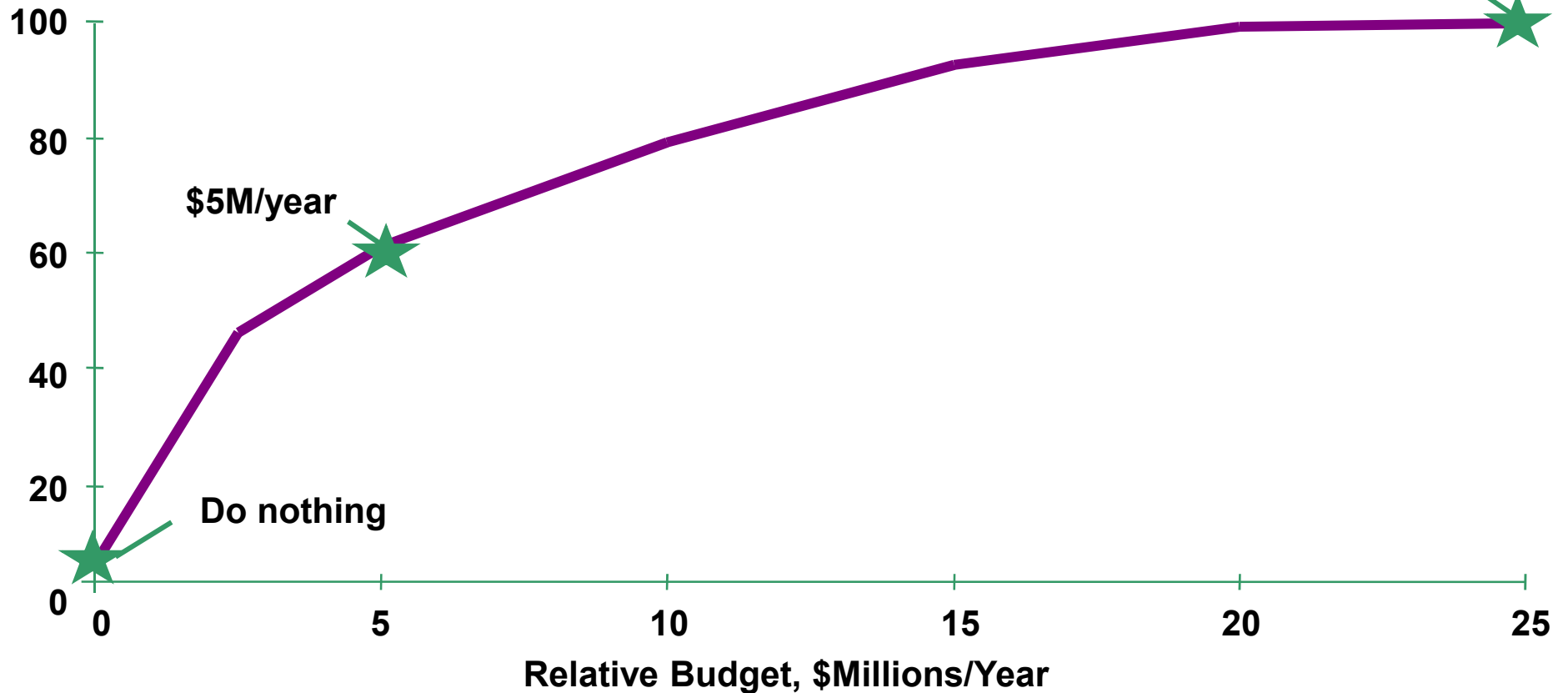


Setting Performance Targets



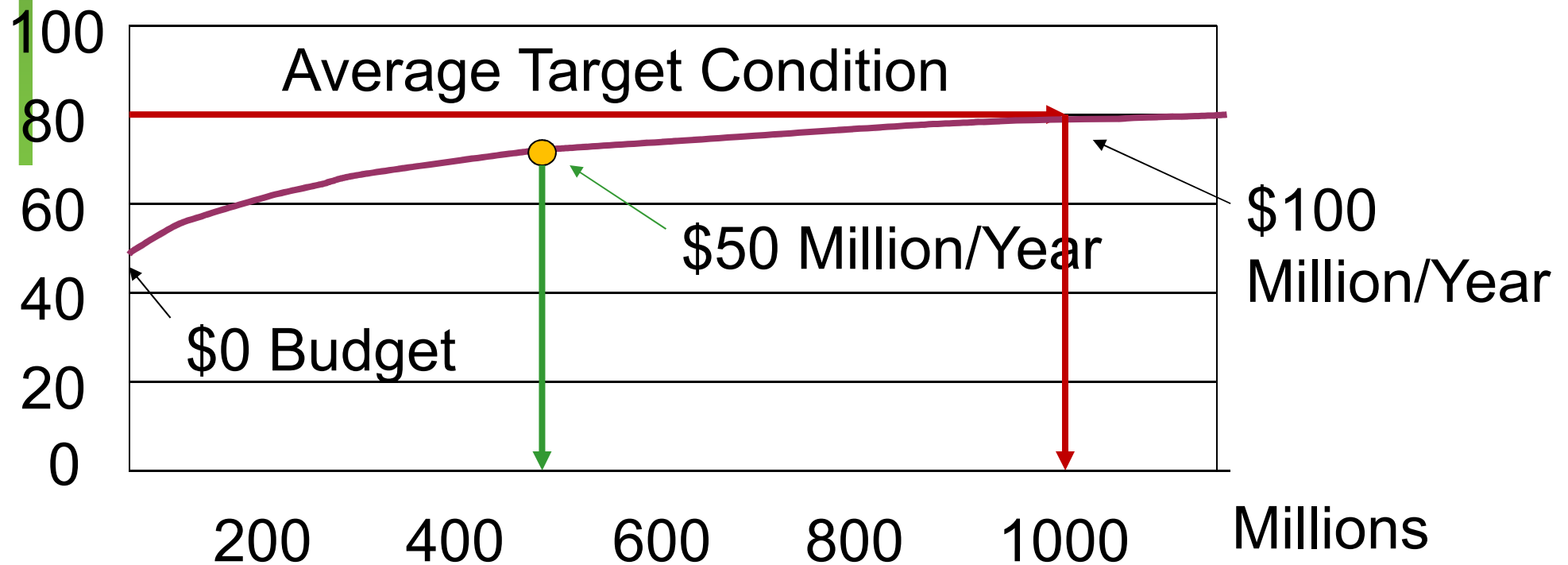
Setting Performance Targets

Percent Pavement in Good Condition in 10 Years



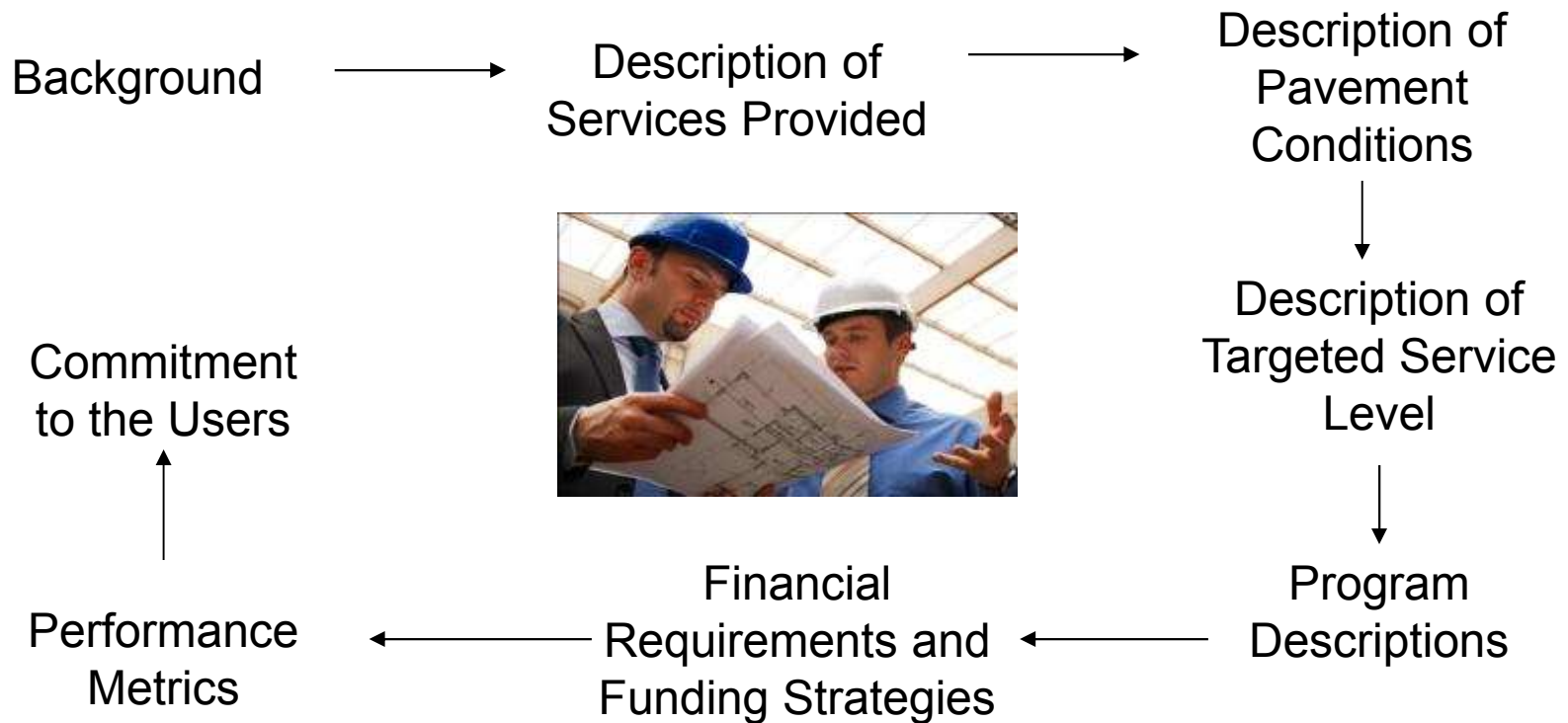
Setting Investment Levels

Pavement Condition in 10 Years

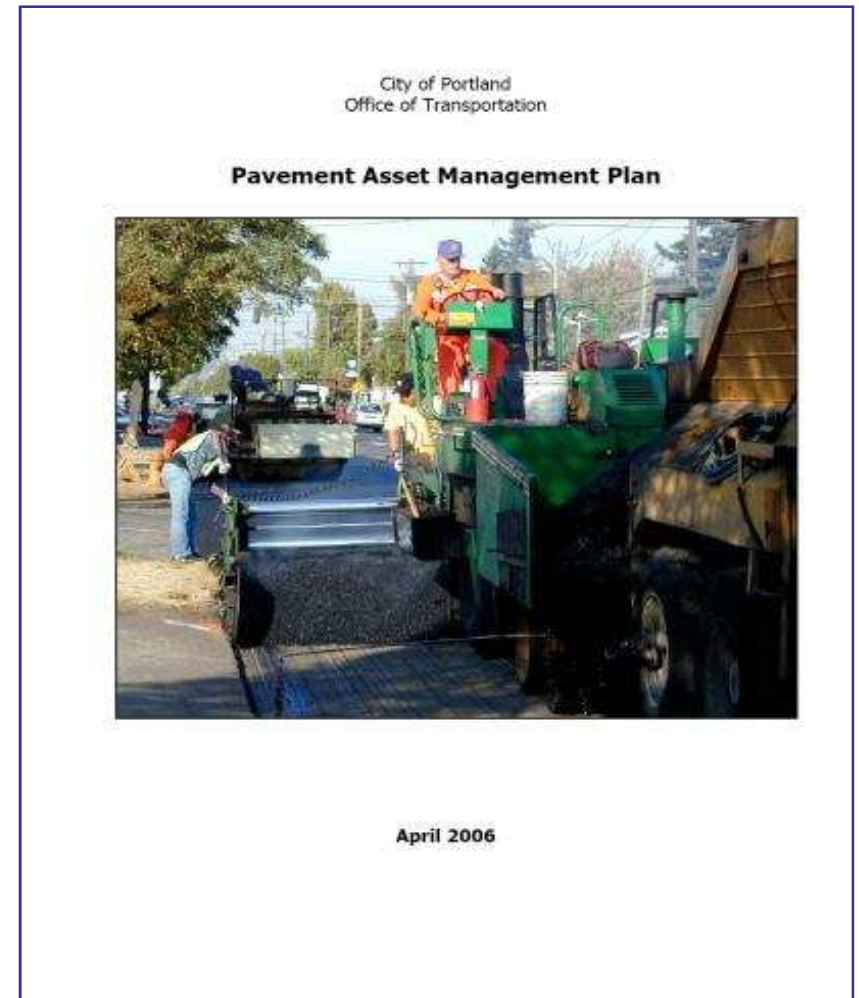
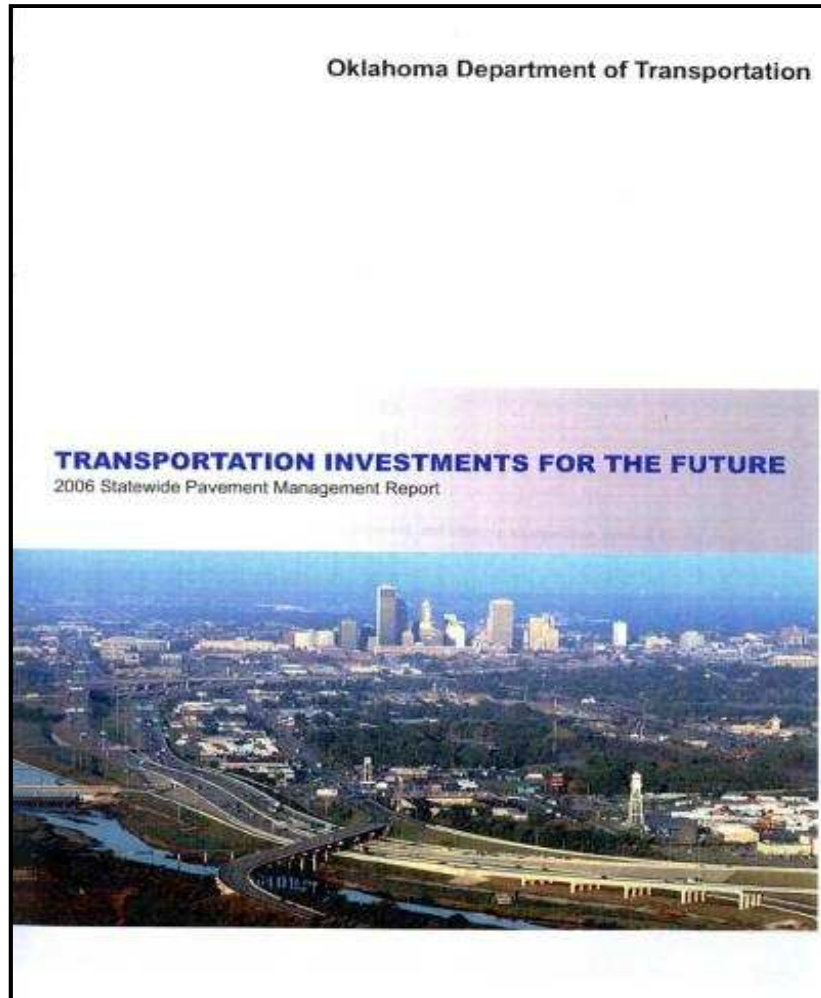


Enhance Accountability

- Pavement Management Plans



Pavement Management Plan



April 2006

Benefits of Integrating Pavement Preservation to Pavement Management

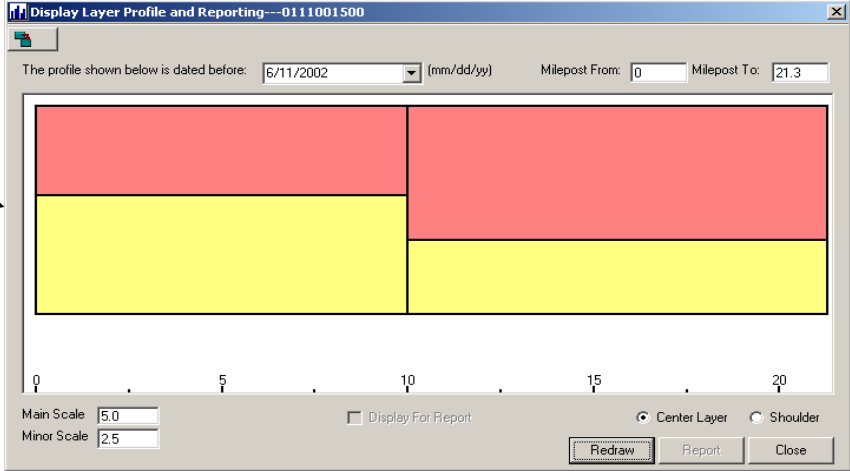
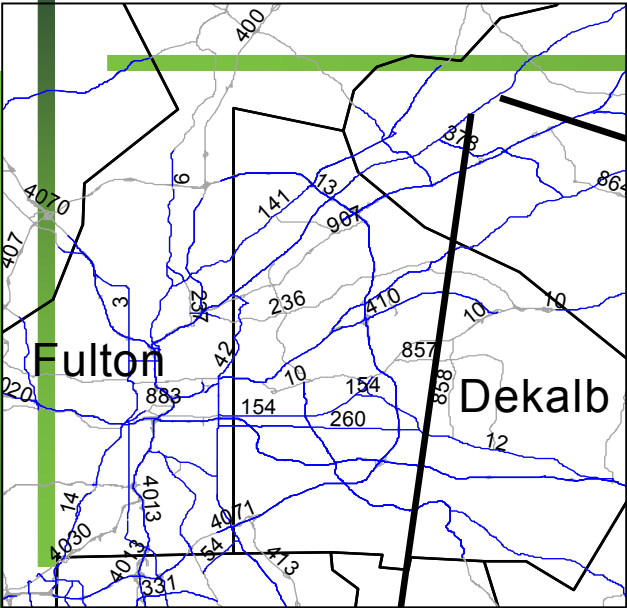
- Help Identify the factors that trigger preventive maintenance treatments
- Help you track performance of preventive maintenance applications
- Help you establish the “window of opportunity”
- Can establish guidelines on the amount of deterioration that can be addressed with preventive maintenance treatments

Benefits of Integrating Pavement Preservation to Pavement Management

- Help you identify appropriate funding level for your pavement preservation program
- Help you link funding levels to performance targets
- Help you prepare Pavement Management Plans showing what type of treatment, where, when and how much is needed for each section of the network.

Additional Benefits of Pavement Management

Pavement Information Availability



Pavement Sample Property Logging System --- 0111001500-2000-061102-01

Sample ID: 0111001500-2000-061102-01 Current Layer: 2 Layer Number: 2 Total Thickness: 7.00

Material: ASPHALT CONCRETE Thickness (inch): 4.5

Air Void %: 0.5 Viscosity (poises): Size (% Passing): 1/2" 75 # 4 10

Tensile Strength (psi): 20 AC Content %: 0.12 3/8" 15 # 8 0

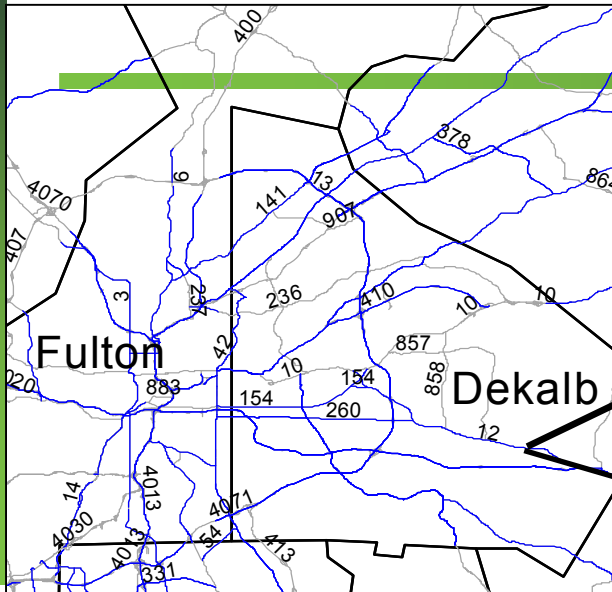
Remarks: Bottom layer is rotted

Layer No	Sample ID	Material	Thickness	Void	Tensile Str
2	0111001500-2000-01	ASPHALT CONCRETE	4.5	0.5	
1	0111001500-2000-01	BITUM. TREATED E	2.5		

Buttons: Add, Update, Delete, Reset, Exit

Sample Profile: UP, DOWN, 4.5 Layer 2, 2.5 Layer 1

Integrate and Relate Data Collected to Pavement Performance Using GIS



Performance



Construction

Pavement Design Data for 1234 : To Add New Data

Design Loading
 Rigid Pavement Flexible Pavement **Traffic Data (AADT)**

Rigid Pavement:
 LDF Trucks 18 k ESAL
 MV % % %
 SV % % %
 Others % % %

Flexible Pavement:
 LDF Trucks 18 k ESAL
 % % %

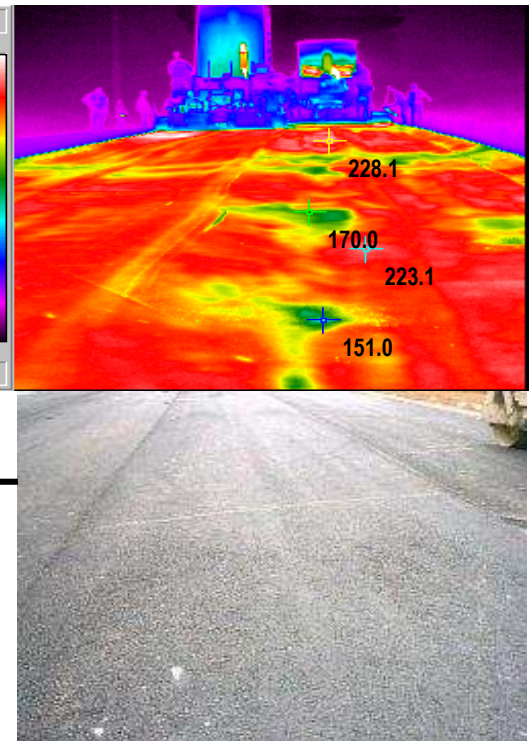
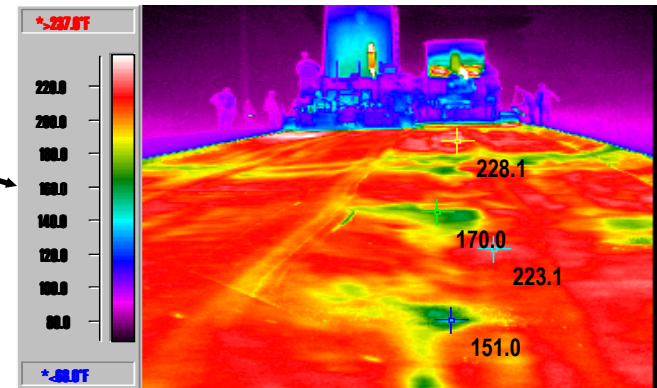
Traffic Data (AADT):
 Year AADT
 Current Year AADT
 Design Year AADT

Truck Percentage:
 Multiple Unit Truck %
 Single Unit Truck %
 24 Hour Truck %

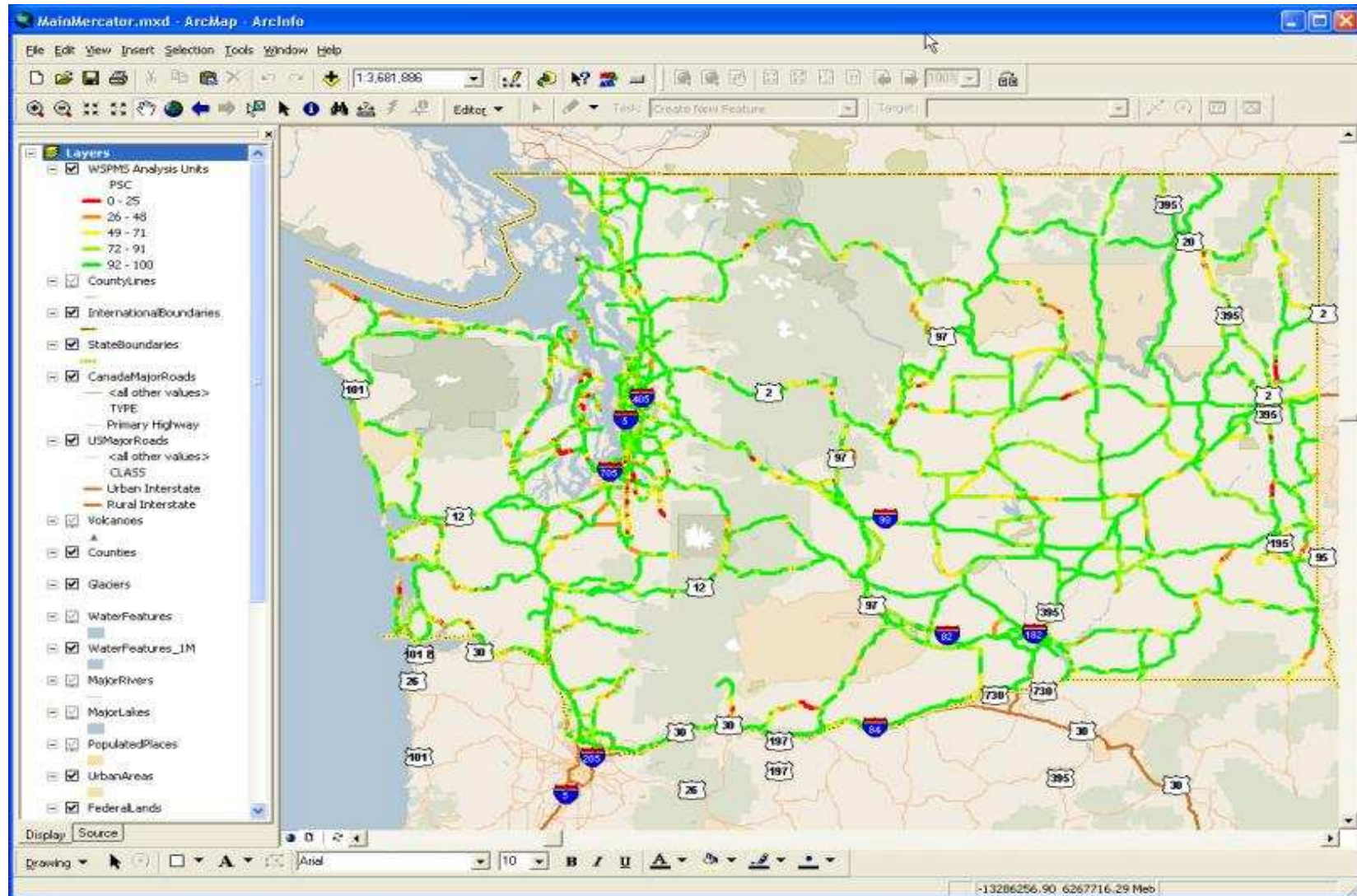
Terminal Serviceability Index (pt) =
 Soil Support =
 Regional Factor =
 Modulus of Subgrade Reaction K (pci) =
 Composite K =

Clear Add Cancel

Material and Structural Design Info



Show Network Condition



Historical and Structural Information

WSDOT - WSPMS Road Viewer - Microsoft Internet Explorer

File Edit View Favorites Tools Help


Back Forward Stop Home Search Favorites Media Print Mail News Site Index Contact WSDOT WSDOT Home

Washington State Department of Transportation

TRAFFIC & ROADS PROJECTS BUSINESS ENVIRONMENTAL MAPS & DATA

MATERIALS LABORATORY

ROUTE LOCATION



ROUTE VIEWER

- [Browse Routes](#)
- [Search Routes](#)
- [Exit](#)

ACTIVE SEGMENT

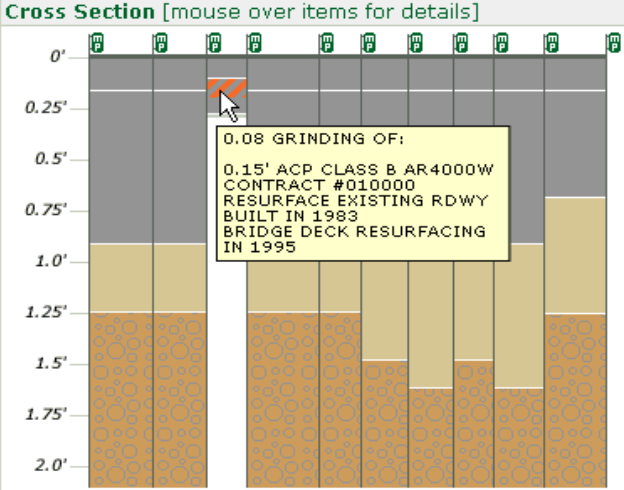
SR: 90
Dir.: D | I
MP: 12.99 - 15.45
ARM: 11.05 - 13.52
Unit: Analysis Project Complete Custom
[Previous](#) [Next](#)

State Route: 90 Route Type: Mainline Direction: Increasing
Mileposts: 12.99 - 15.45 ARM: 11.05 - 13.52 Length: 2.47 [miles]

Details Condition Media Projects Traffic Road Log Tools Notes
Description Layout **Structure**

Roadway Structure

Cross Section [mouse over items for details]



Legend

- Milepost Marker
- ACP
- BST
- Crushed Stone
- Fabric Interlayer
- Grinding
- PCCP
- Base
- N/A
- Earth

Options

Show Grinding

Done Local intranet

Making Improvements

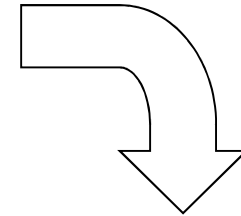
- Address the core questions
- Identify factors to which pavement preservation can be integrated into your pavement management system
- Enhance the capabilities of your Pavement Management System.
- Creating a Pavement Preservation Engineer position
- Keep moving forward!

5 Core Questions

- What is the current state of my pavements?
- What is the required level of service?
- Which pavements are most critical to achieving our performance objectives?
- What are the best strategies for Maintenance & Operations and Capital Improvement investments?
- What is the best long-term funding strategy?

Moving Forward

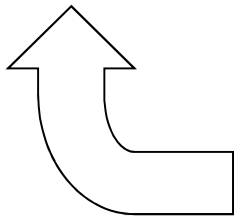
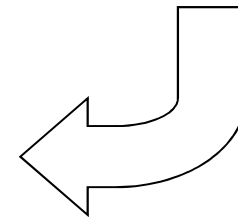
Identify Your Needs



Determine What's Available

Develop A Plan For Addressing Gaps

Identify Any Gaps



Useful Resources

- FHWA Pavement Preservation:
www.fhwa.dot.gov/preservation
- FHWA Asset Management:
www.fhwa.dot.gov/infrastructure/asstmngmt
- National Center for Pavement Preservation:
www.pavementpreservation.org

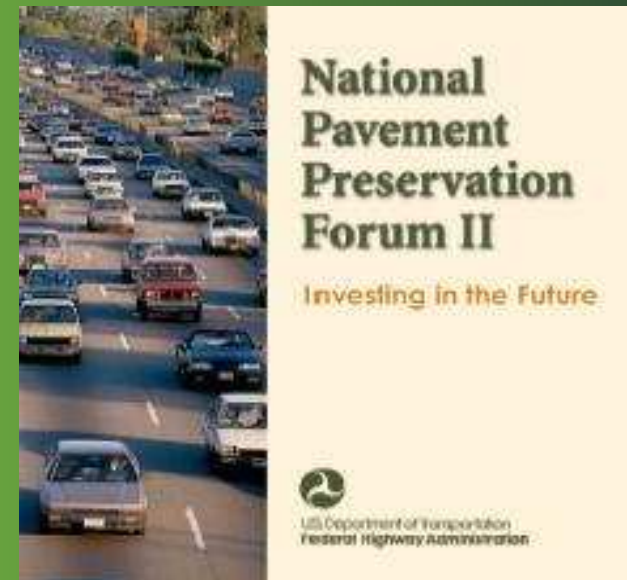


CD's

Pavement Preservation 2: State of the Practice

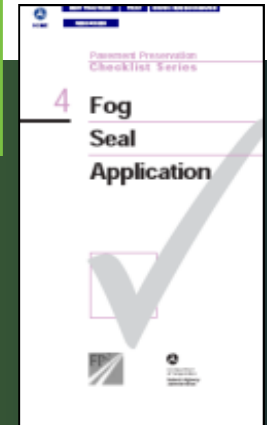
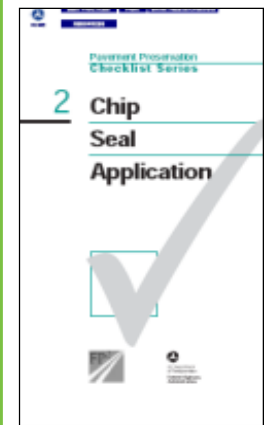


National Pavement Preservation Forum II



CHECKLISTS

1. Crack Seal Application
2. Chip Seal Application
3. Thin Hot-Mix Asphalt Overlay
4. Fog Seal Application
5. Microsurfacing Application
6. Joint Sealing PCC Pavement
7. Diamond Grinding
8. Dowel Bar Retrofit
9. Partial-Depth Repair
10. Full-Depth Repair



“Anytime you have an opportunity to make things better and you don’t, then you are wasting your time on this earth.”

Roberto Clemente



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