SUPPORTING PRESERVATION WITH ROBUST DATABASES

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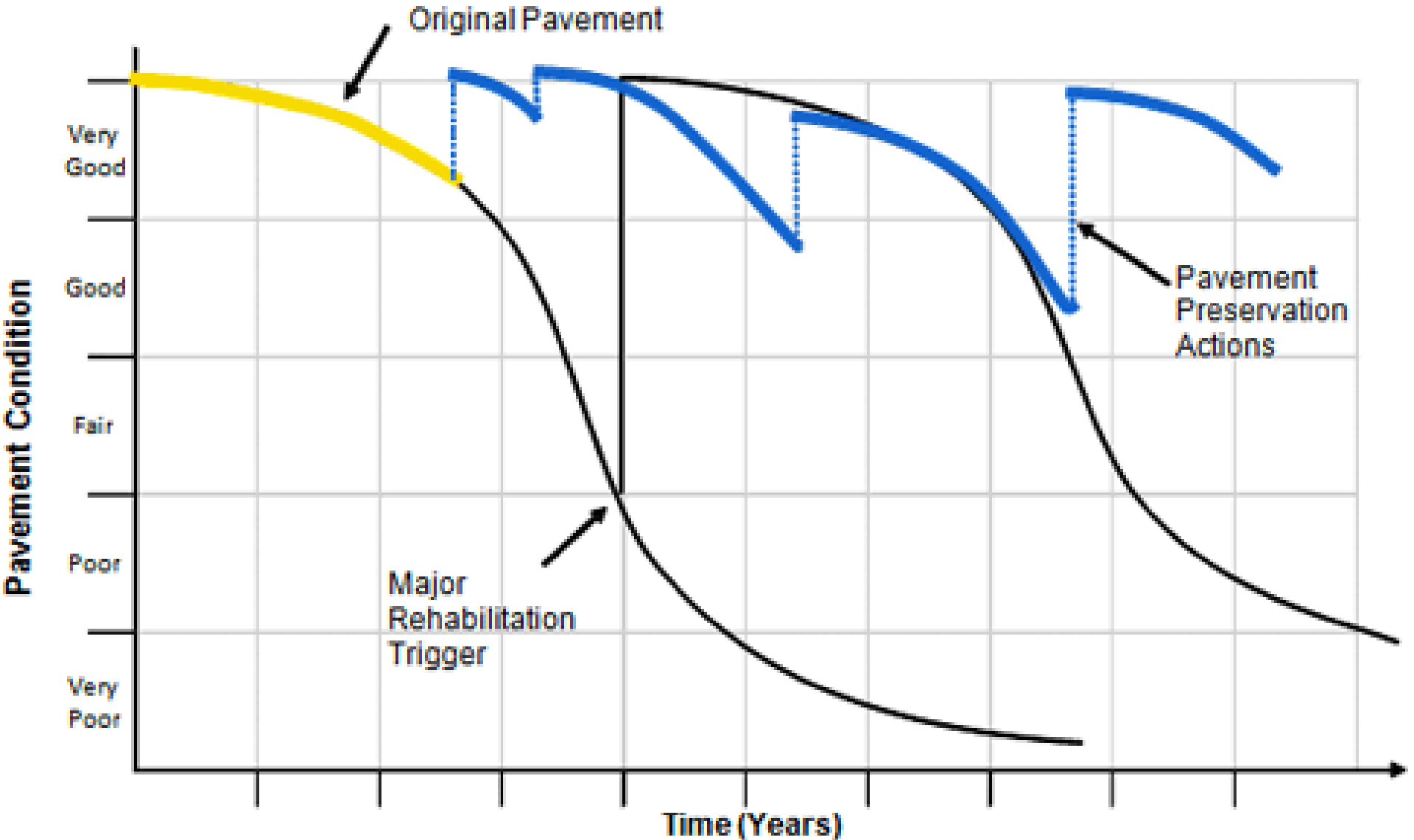
OPTIMIZE PRESERVATION

- Right Treatment
- Right Time
- Right Pavement

Concept of Pavement Preservation



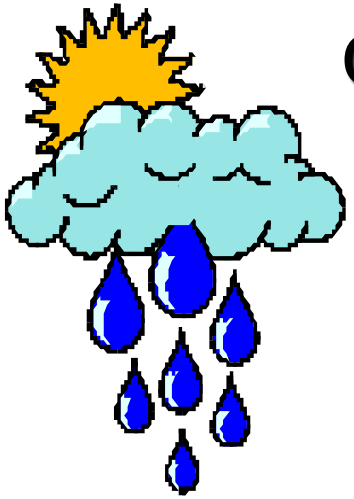
OVERVIEW

- HISTORICAL APPROACHES
- TYPES OF DATA RECOMMENDED
- MONITORING ACTIVITIES
- FUTURE RESEARCH AND PLANNING

HISTORICAL APPROACHES

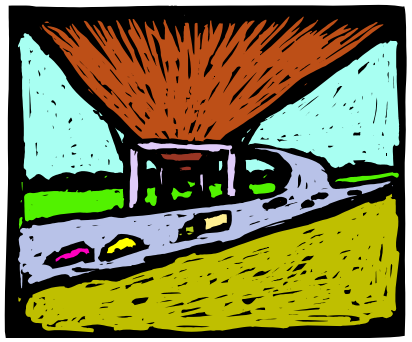
- Experience of maintenance personnel
- Fixed timing of treatments
- Set to specific budgets
- Set to productivity of in-house resources

TYPES OF RECOMMENDED DATA



Climate

Traffic

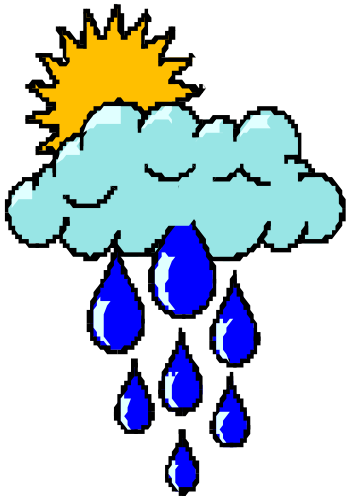


Inventory Data

Materials / Construction

Pavement Performance

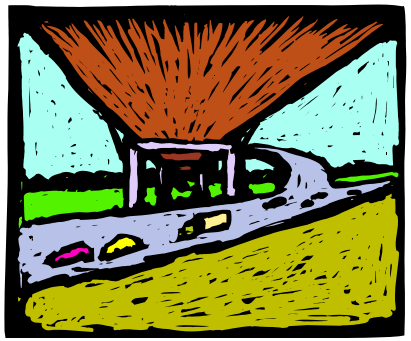
CLIMATE DATA



- Temperature
- Precipitation
- Solar Radiation

TRAFFIC DATA

- Volume
- Weight
- User Delays



INVENTORY DATA

- Data of Construction
- Maintenance and Rehabilitation History
- Type of Pavement / Cross Section
- Location

MATERIALS / CONSTRUCTION DATA

- Temperature at time of construction
- Application rates
- Mix designs
- QC/QA data
- Equipment

PERFORMANCE DATA

- Distress
- Surface Friction
- Ride Quality

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PERFORMANCE DATA

Functional Capacity: ride quality

- Roughness (IRI)
- Surface Friction

Structural Capacity: Load carrying capacity

- Distress Survey (Fatigue / Rutting)
- Deflection Testing

DATA COLLECTION SYSTEMS

Photolog

GPR

Geometry & Spatial

- HPMS curve
- Grade
- Cross slope
- Centerline mapping
- Spatial referencing for GIS integration

Pavement Condition

- Roughness
- Texture
- Rutting
- Surface Distress

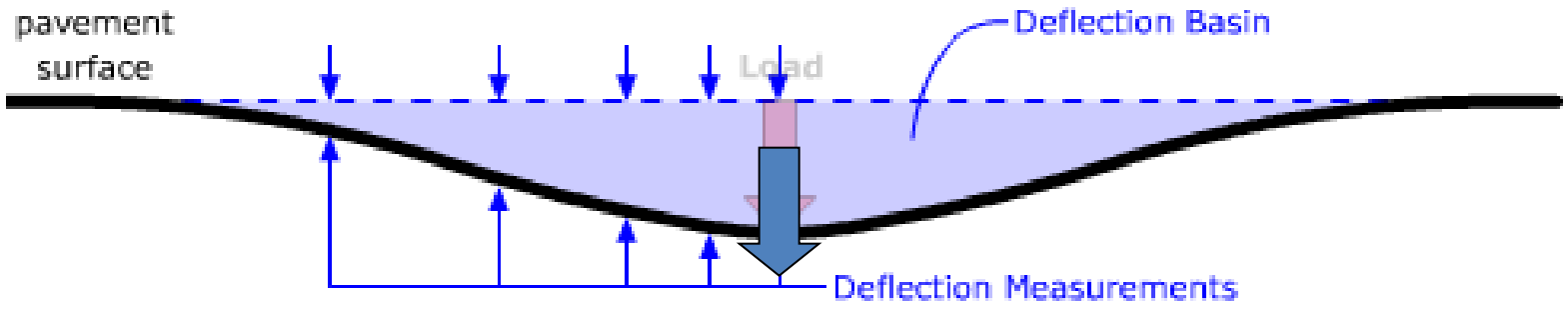
Assets

- Inventory
- Location
- Offset
- Height & Width
- Condition

SURFACE FRICTION

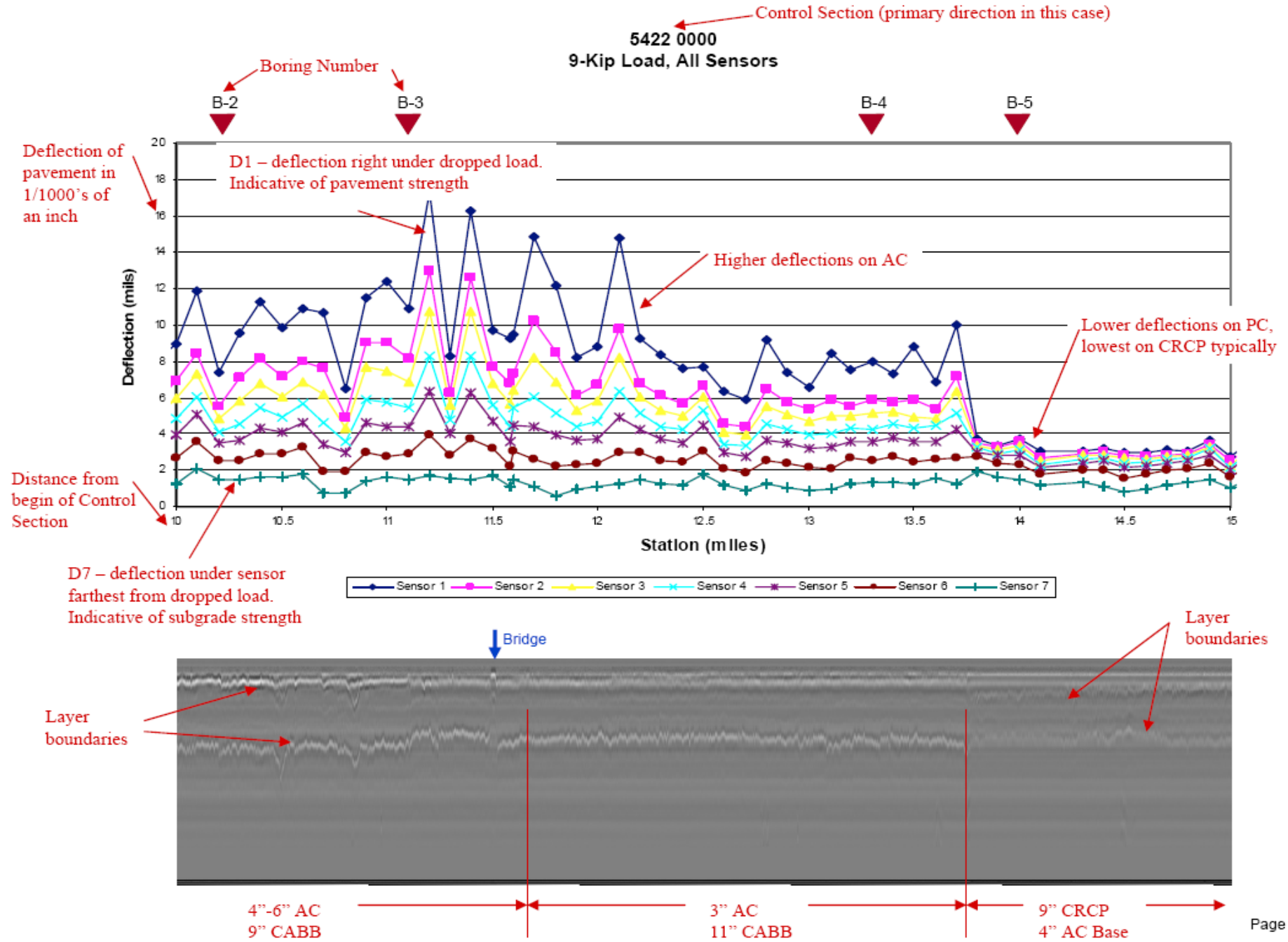
- AASHTO T 242: Frictional Properties of Paved Surfaces Using a Full-Scale Tire
- ASTM E 274: Skid Resistance of Paved Surfaces Using a Full-Scale Tire

Structural Evaluation



Types of Deflectometers:

- Benkleman Beam
- Falling Weight Deflectometer
- Traffic Speed Deflectometer


Control Section (primary direction in this case)
5422 0000
9-Kip Load, All Sensors
Boring Number
B-2
B-3
B-4
B-5
Deflection of pavement in 1/1000's of an inch
D1 – deflection right under dropped load. Indicative of pavement strength
Higher deflections on AC
Lower deflections on PC, lowest on CRCP typically
Deflection (mils)
Distance from begin of Control Section
D7 – deflection under sensor farthest from dropped load. Indicative of subgrade strength
Station (miles)
Sensor 1
Sensor 2
Sensor 3
Sensor 4
Sensor 5
Sensor 6
Sensor 7
Bridge
Layer boundaries
Layer boundaries
4"-6" AC
9" CABB
3" AC
11" CABB
9" CRCP
4" AC Base

Core Logs

FUGRO

Coring Log

County	Okfuskee		
Control Section	5422 0000		
Bore Number	5	☐ Recored?	
Date Cored	3/16/2005		
Highway	I-40		
Milepost	14		
Nearest Town	Pharoah		
Lane Direction	East		
GPS:	Latitude 35.42961667	Longitude	-96.2024667

Core Data

Surface Material Type	○ AC	○ PCC	◉ CRC
Stripping or Separation in Asphalt	○ Stripping	○ Separation	◉ N/A
Honeycomb or "D" Cracking in PCC	○ Honeycomb	○ "D" Cracking	◉ N/A
Reinforcing Fabric Present ☐	Depth		

Other Notes: Rebar at 4.25 in.

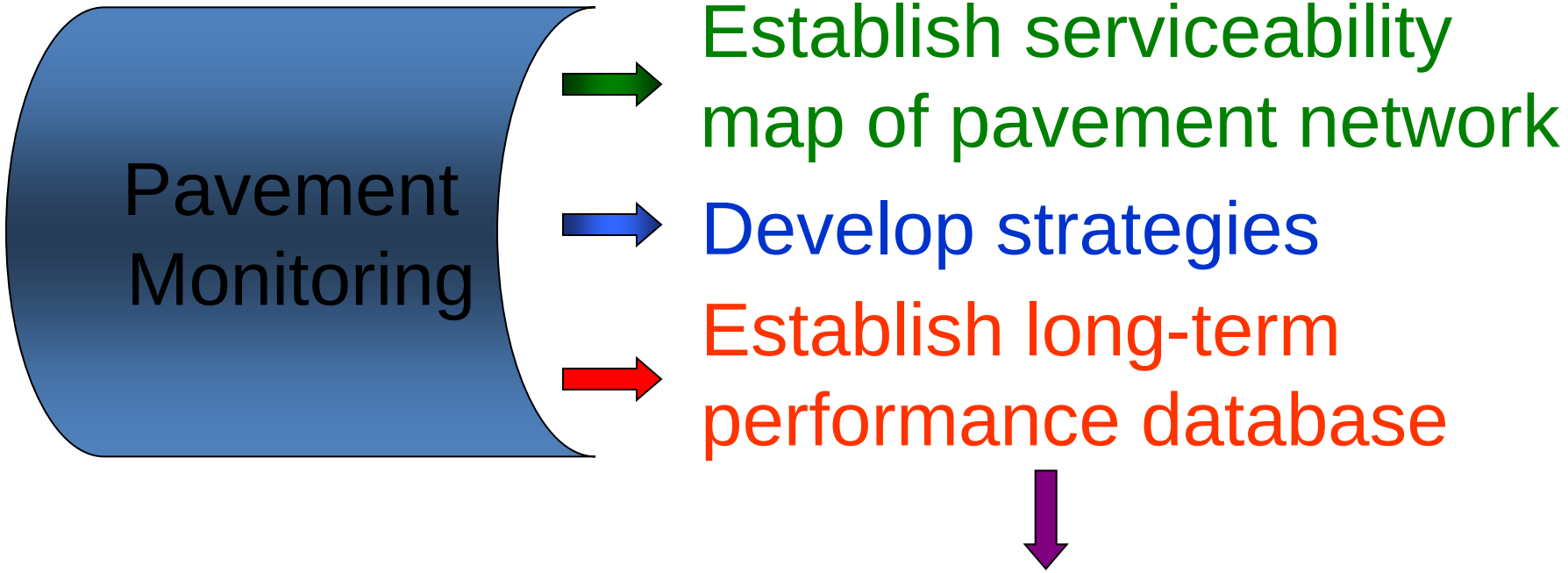
Core Layer Data (From Top to Bottom)

Layer Type	Thickness (in.)	Layer Characteristics	Deterioration of Layer Materials?
PCC	9.50	CONTINUOUSLY REINFORCED CONCRETE	☐
AC	3.50	TYPE B	☐
SUBGRADE		CLAYEY SILT	☐
Total Core Thickness	13.00		

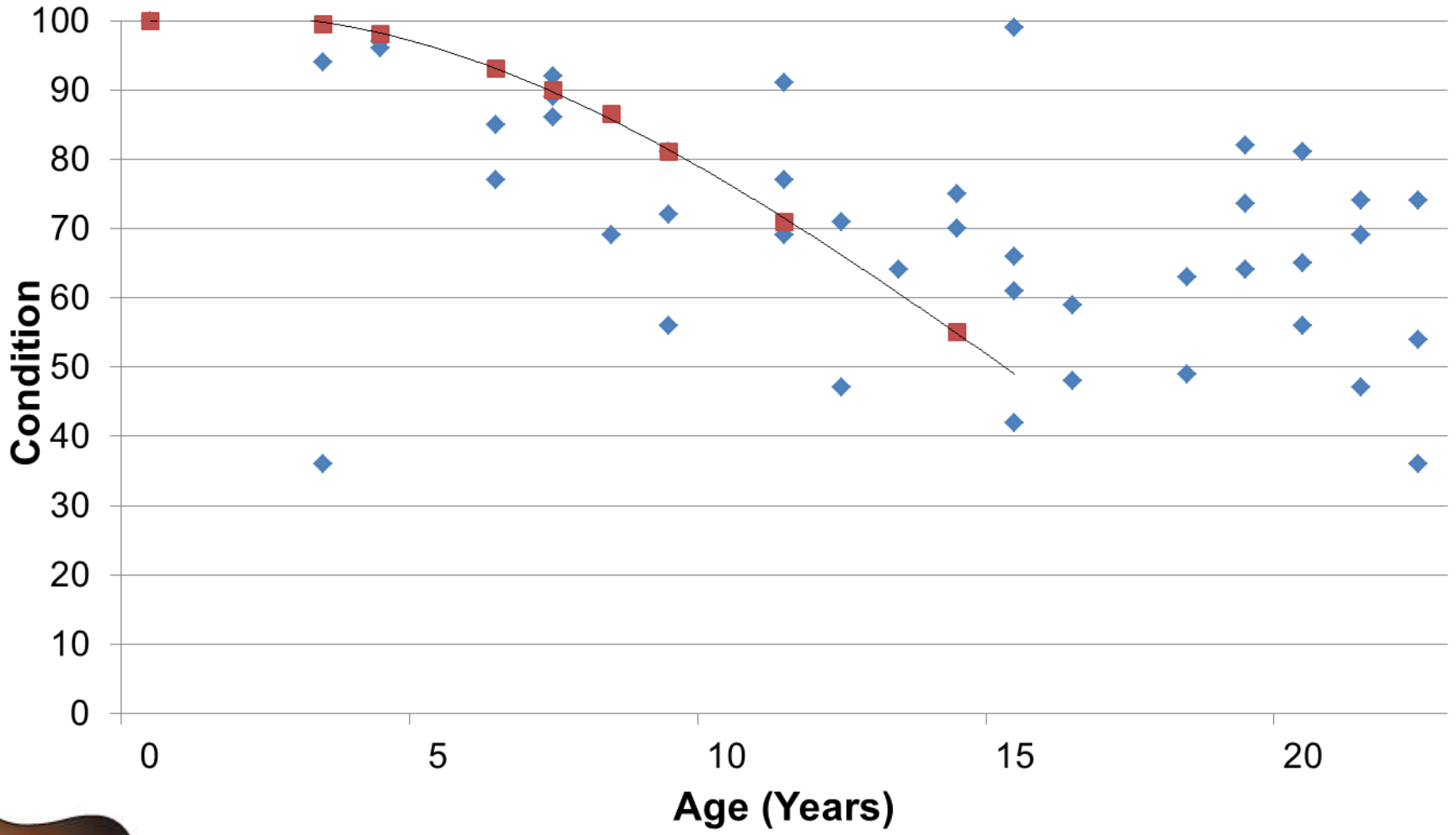
Stabilized Subgrade Beneath Pavement or Sub-base? ○ Yes ◉ No ○ Unknown

Pavement Monitoring

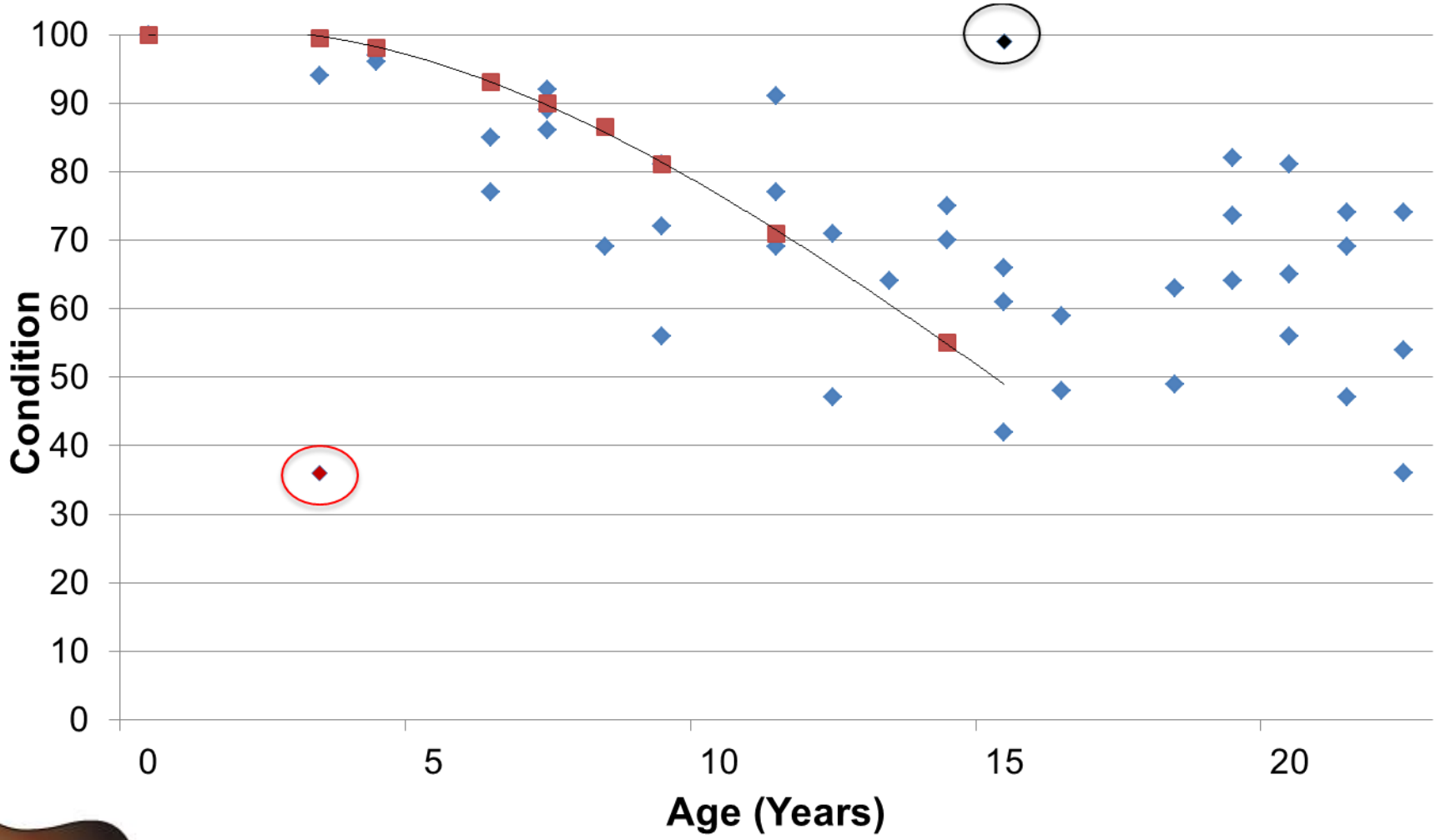
Consistent Pavement Evaluation data helps:



Performance Modeling

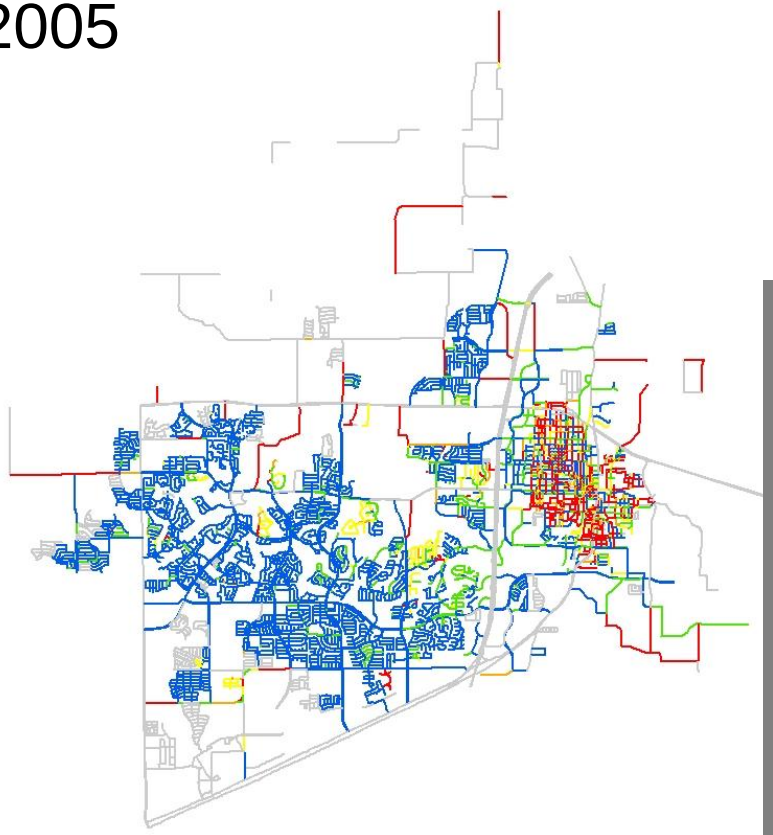


Outliers



Monitoring of Network

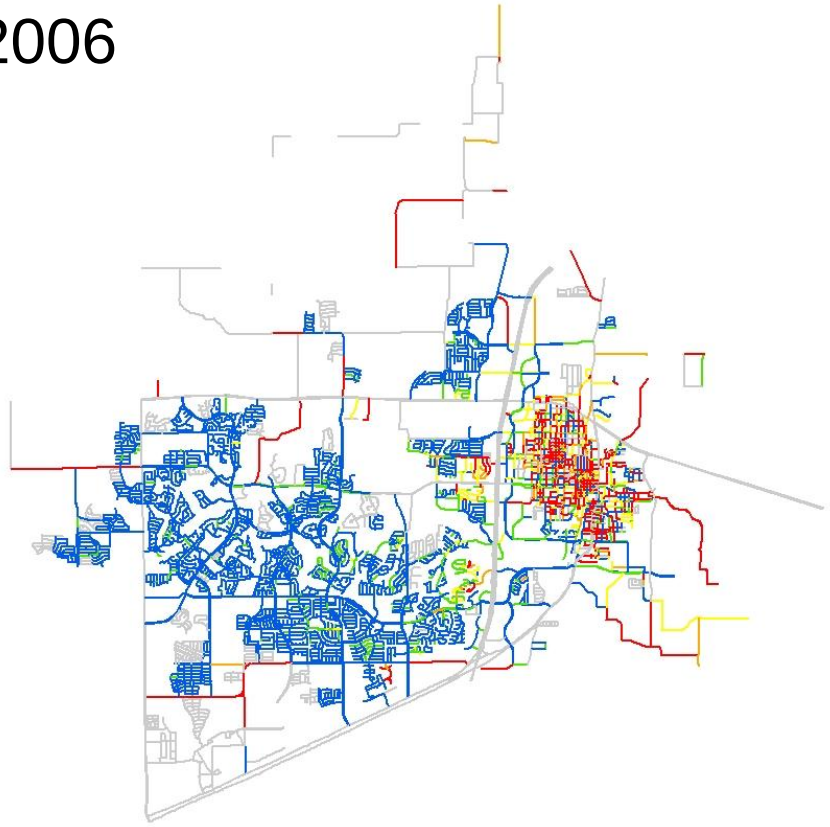
2005



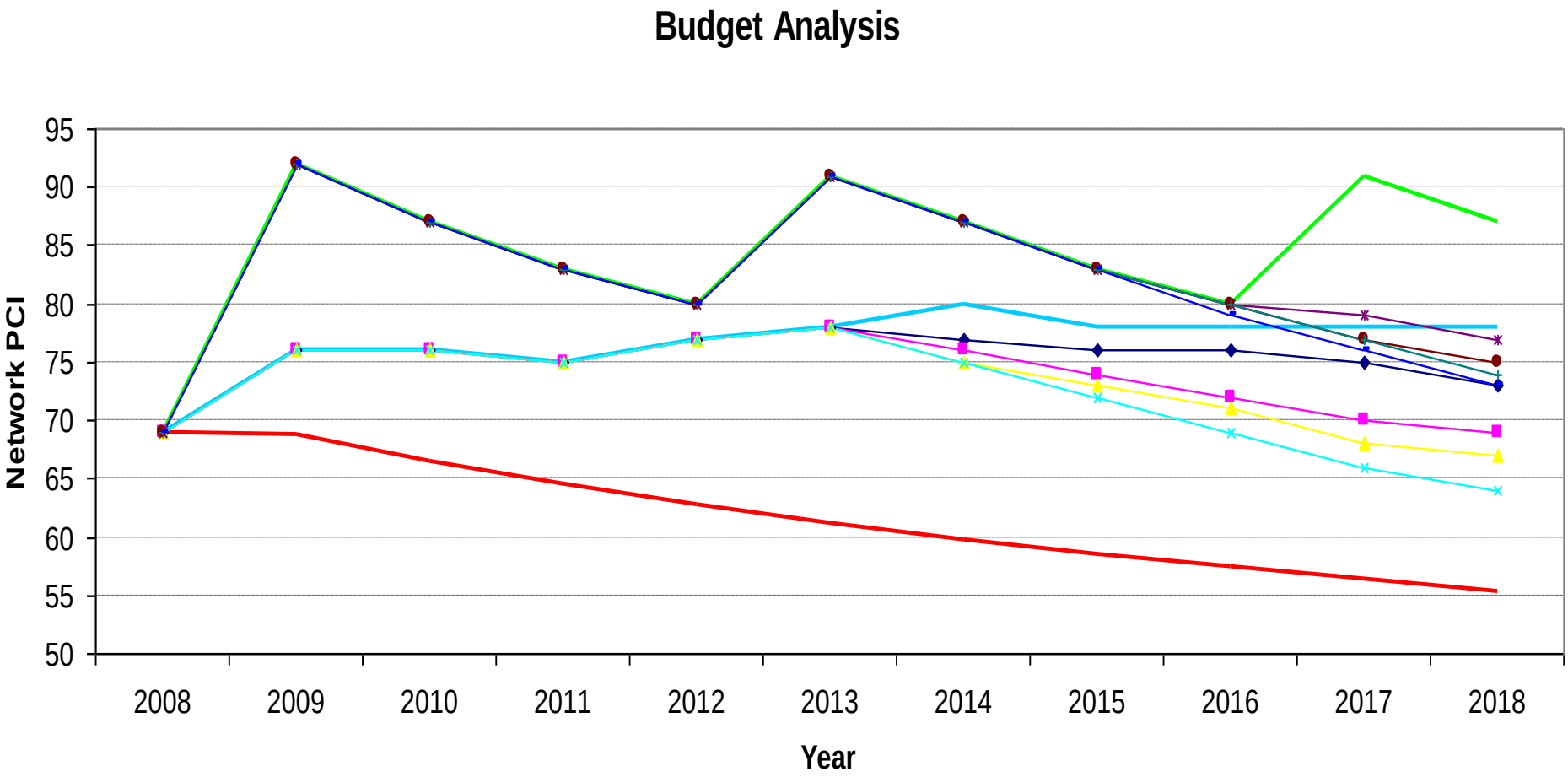
GIS Distress Condition Maps

McKinney, Texas

2006



Budget Scenarios



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Preservation Treatments for various distresses

Asphalt-Surfaced Pavement:

- Chip Seals
- Fog Seals
- Slurry Seals
- Micro-Surfacing
- Thin Overlays
- Profile Milling
- Crack Sealing

PCC-surfaced Pavement:

- Joint Resealing
- Crack Sealing
- Spall Repair
- Dowel Bar Retrofit
- Full and Partial Depth Repair
- Diamond Grinding and Grooving

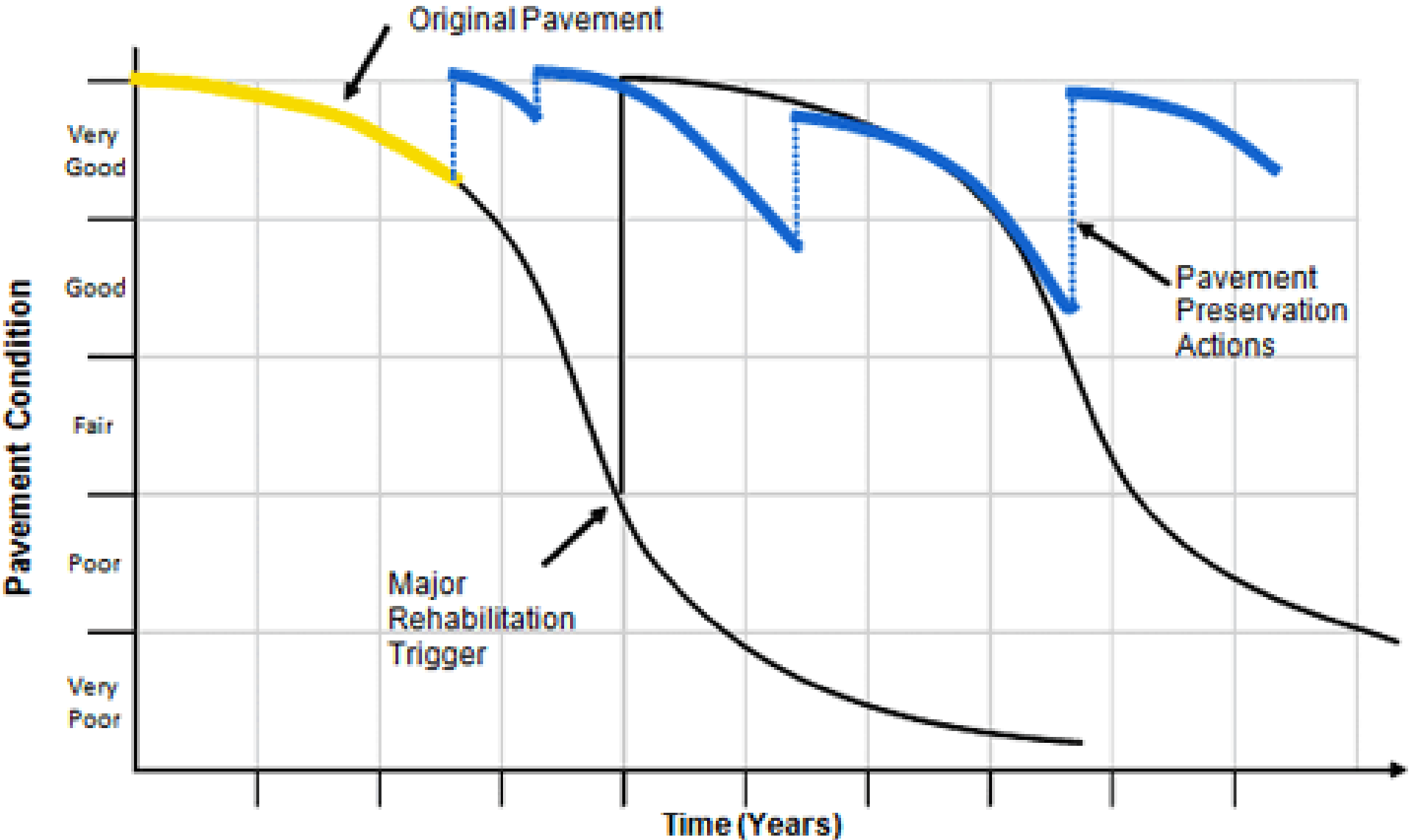
FUTURE RESEARCH & PLANNING

- LTPP Pavement Preservation Experiments
- NCHRP Research Activities
- NCPP and FPP Initiatives
- Academia

RESEARCH AND PLANNING GOALS

- Quantify Return on Investment
- Life Cycle Cost Analysis
- Comparisons to current methods

RESEARCH AND PLANNING



“If you don’t know where you are going, you will wind up somewhere else.”

Yogi Berra

QUESTIONS?

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