

# **Pavement Management for Local Agencies**

## **How to Justify M&R Budgets?**

**Northwest Conference**  
**Seattle, WA**  
**Oct 2014**

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# Pavement Management in the “Good Old Days”

(Ref LA)

- Routine Maintenance Cycles.
- Prioritize On A “Worst First” Basis.
- Citizen Complaint.
- Political Priority.
- Recommendation From The “Old Superintendent”.



However, today things have changed...

# Pavement Management

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- **Network-Level:**

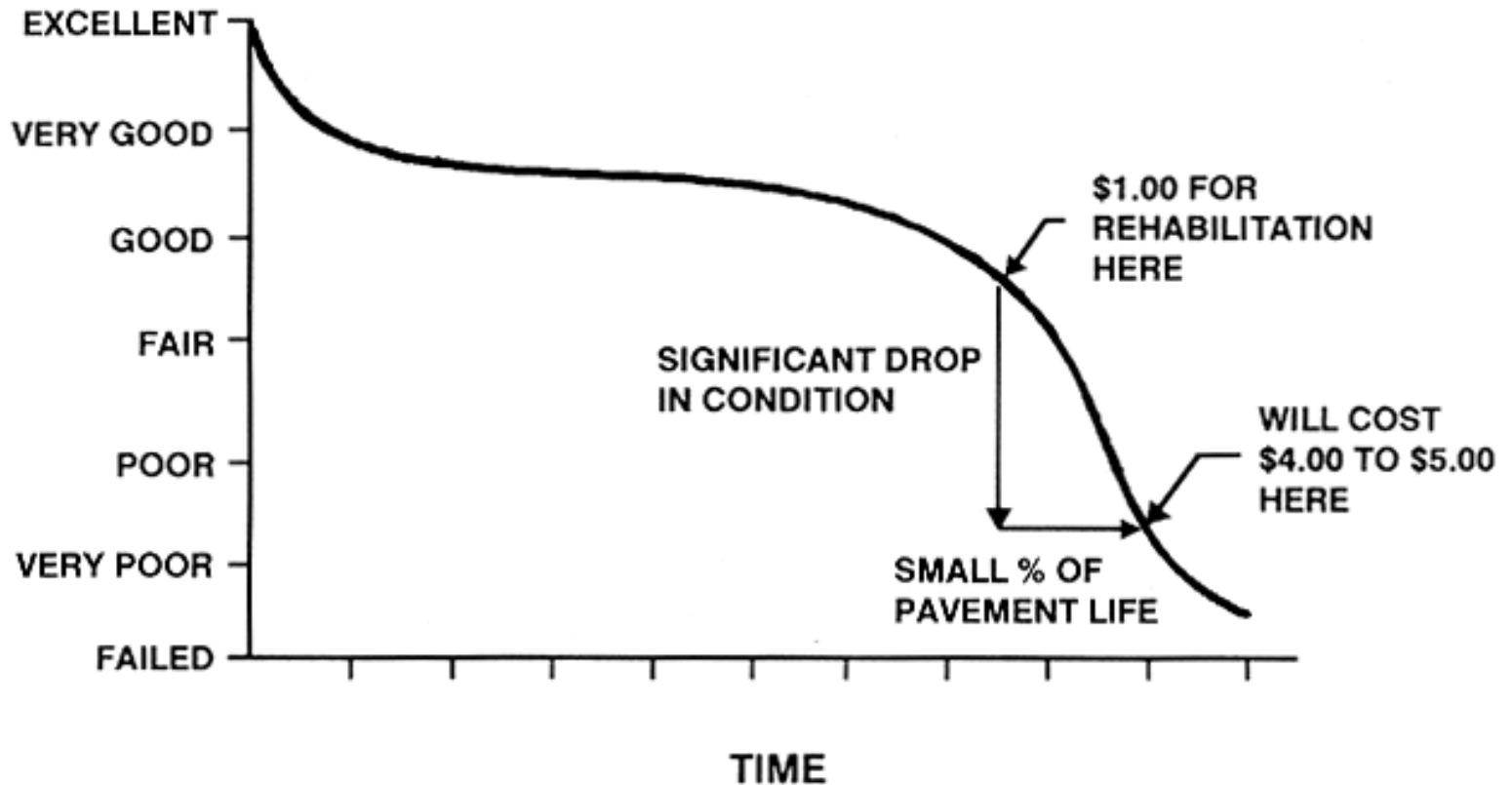
A systematic approach to inventory the pavement network, analyze pavement performance, ensure optimum return on investment, meet mission requirements, and identify M&R requirements.

- **Project-Level:**

Detailed project definition that may include in-depth pavement evaluation (often structural). It includes the selection and design of specific M&R type(s), such as overlay or surface reconstruction.

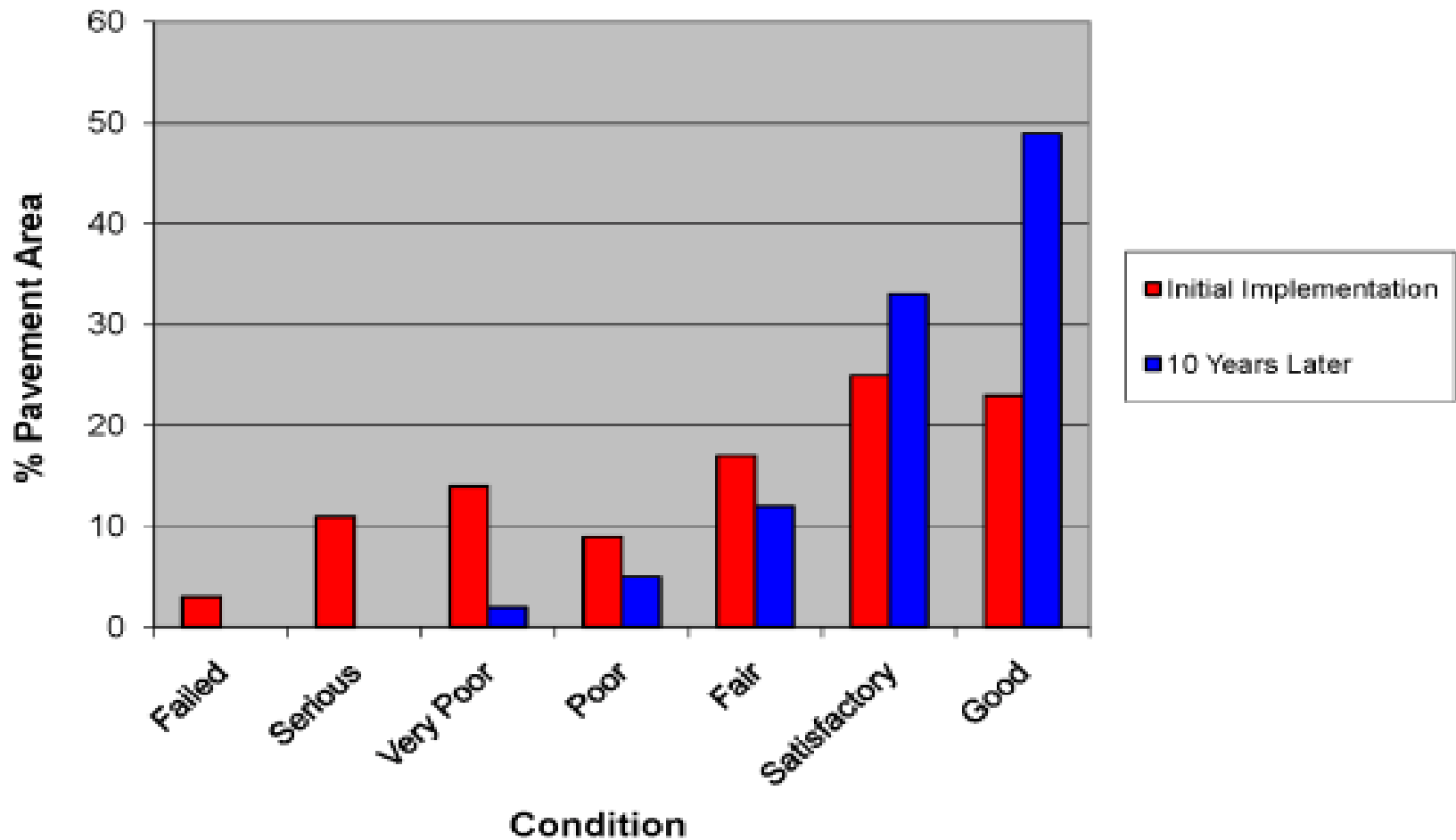
# Why Use Pavement Management?

## PAVEMENT CONDITION RATING



Pavements need to be managed, not simply maintained.

# Benefits of Pavement Management?



# Pavement Management Components

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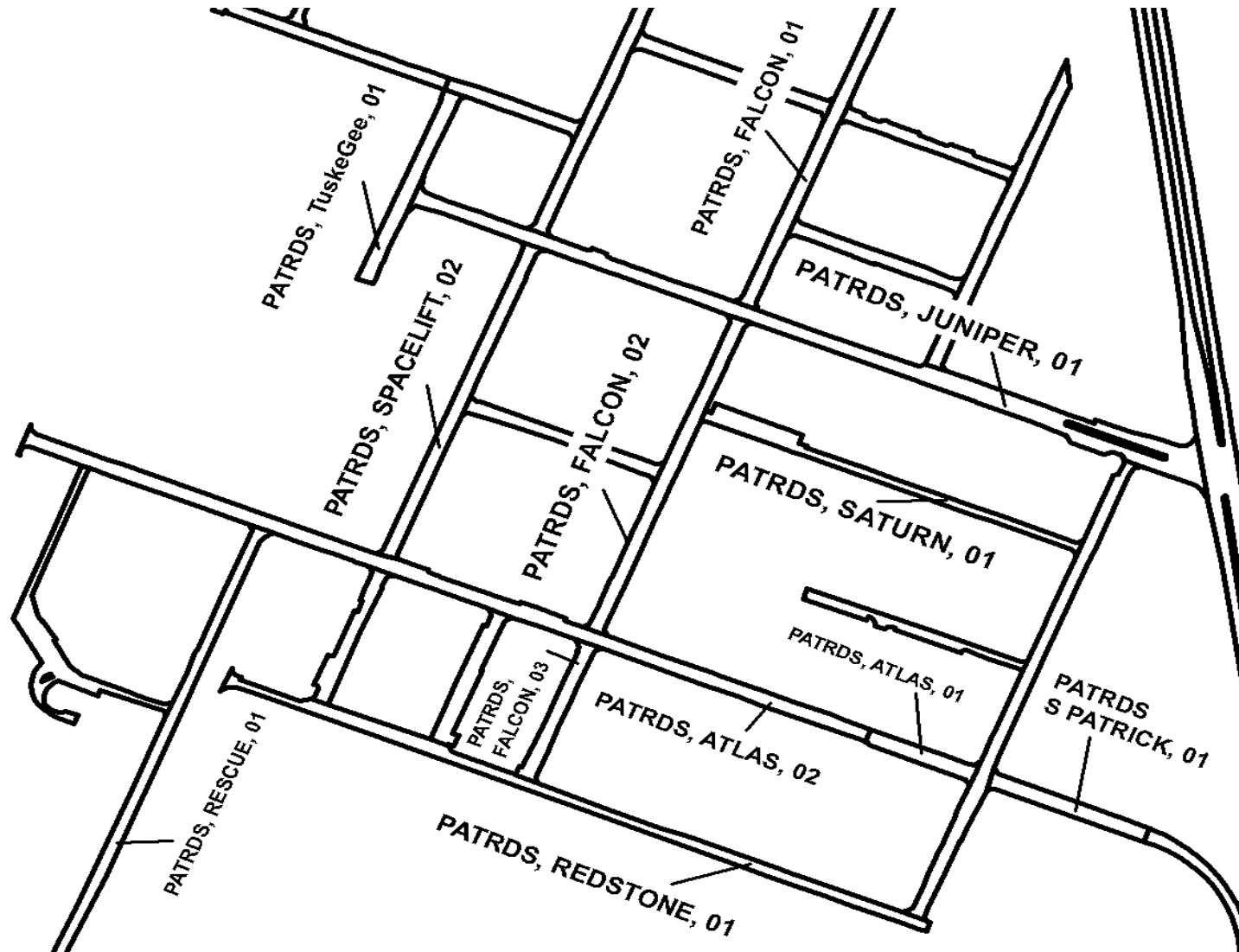
- Inventory Definition
- Condition Assessment
- Condition Prediction
- Performance Analysis
- Annual M&R Category Assignment for each Section
- Project Formulation using M&R Types
- Risk Analysis

# Network Definition

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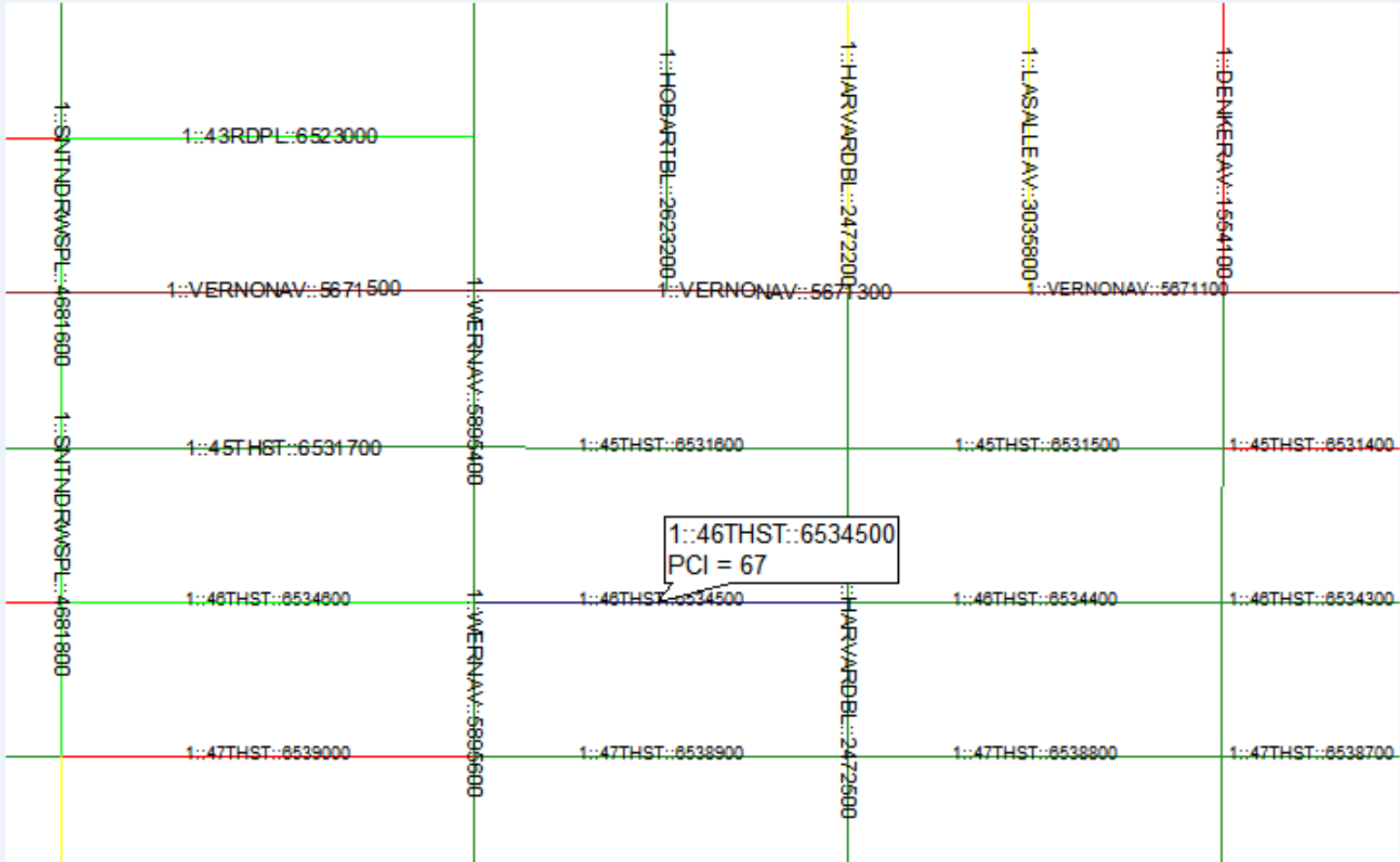
- **Network:** A logical grouping of pavements that will usually be managed together.
- **Branch:** A readily identifiable part of the pavement network that has a distinct use.
- **Section:** The smallest management unit when considering the application of Major M&R.

# Example Road Network Definition





# Inventory



# GIS Network Definition



# GIS Attribute Table

	FID	Shape *	OBJECTID	NETWORKID	BRANCHID	SECTIONID	FROM_	TO	LENGTH	WIDTH	RANK	SURFACE	STRUEAREA
	0	Polygon ZM	63	JBLMH	REDWOOD	01	BIRCH ST	FIR ST	1435	22	T	AC	39325.11069
	1	Polygon ZM	53	JBLMH	N12TH	04	VIEW DR	N 9TH RD	937	17	T	AC	20521.78956
	2	Polygon ZM	58	JBLMH	EAGLE	01	BLAINE AV	EAGLE CIR	2138	25	T	AC	57034.60084
	3	Polygon ZM	60	JBLMM	SI	01	JACKSON AV	PERRY AV	2942	51	P	AC	207258.06428
	4	Polygon ZM	40	JBLMH	N5TH	01	CRARY AV	IDAHO AV	927	30	S	AC	34175.33447
	5	Polygon ZM	0	JBLMN	DUPONT	01	END	DUPONT	3680	38	P	AC	161903.19529
	6	Polygon ZM	67	JBLMN	NORTHGATE	01	EAST DR	END	8376	23	P	AC	206419.96804
	7	Polygon ZM	67	JBLMN	NCOBEACH	01	SAN FRANCISCO AV	END	5286	48	S	AC	211472.61012
	8	Polygon ZM	67	JBLMN	EAST	03	DUPONT-STEILACOOM	NORTH GATE RD	2295	43	P	AC	80952.65707
	9	Polygon ZM	67	JBLMN	20TH	01	DUPONT-STEILACOOM	32ND DIVISION DR	1912	20	S	AC	40930.113

# Condition Assessment

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## **Condition Indicators:**

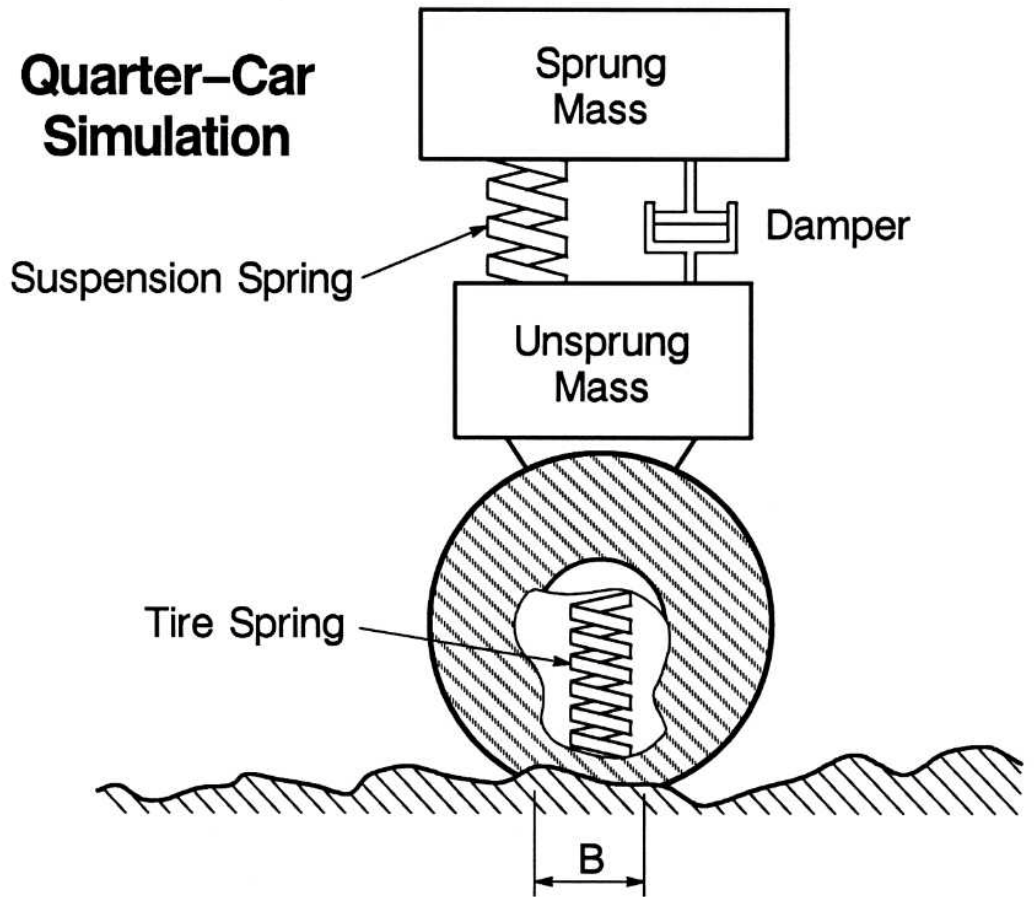
**– Roughness**

**– Skid**

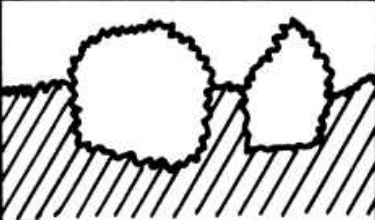
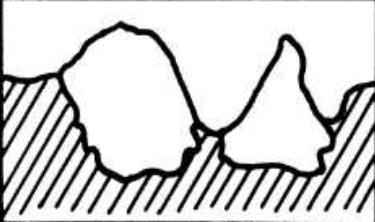


**– Structural**

**– Distress**

# Roughness Evaluation, IRI



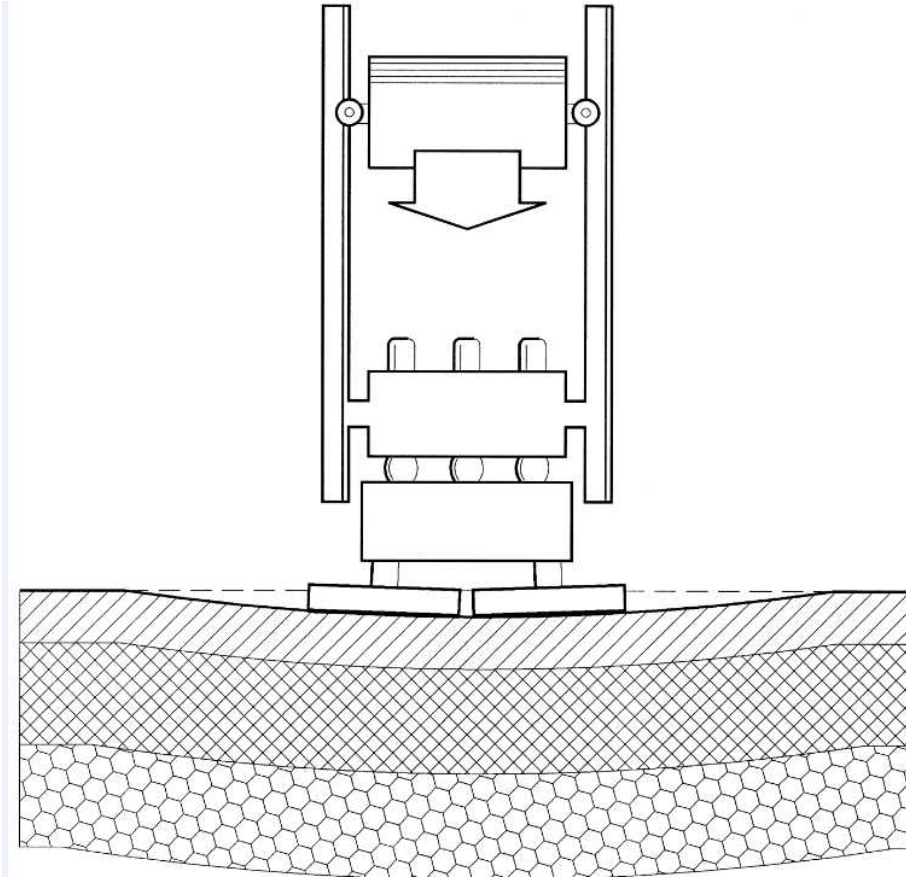
# Skid Resistance

SURFACE		Scale of Texture	
		Macro (Large)	Micro (Fine)
A		Rough	Harsh
B		Rough	Polished
C		Smooth	Harsh
D		Smooth	Polished

# City Falling Weight Deflectometer (FWD)



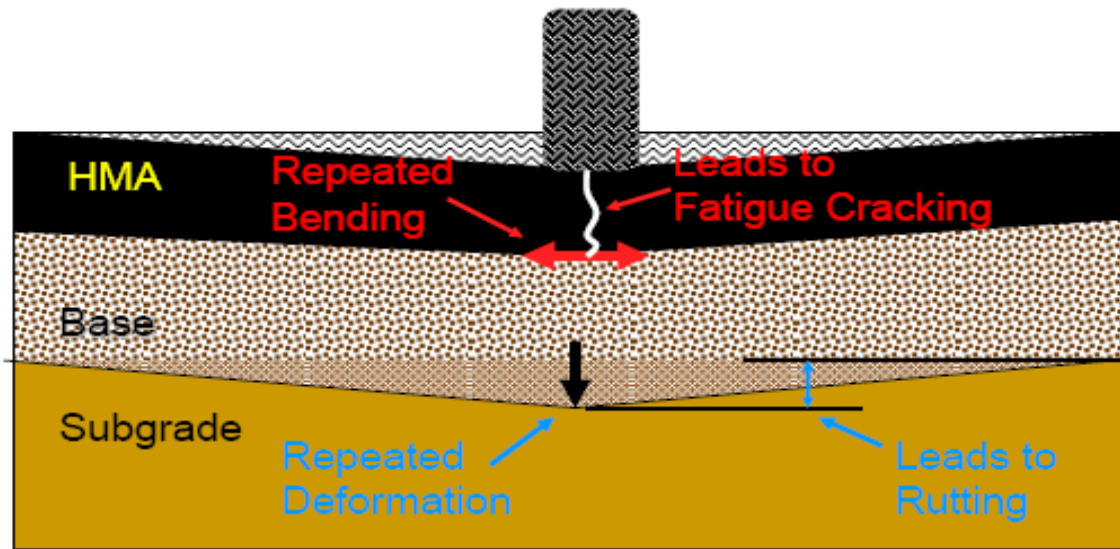
# Structural Evaluation





# Cause of Pavement Fatigue

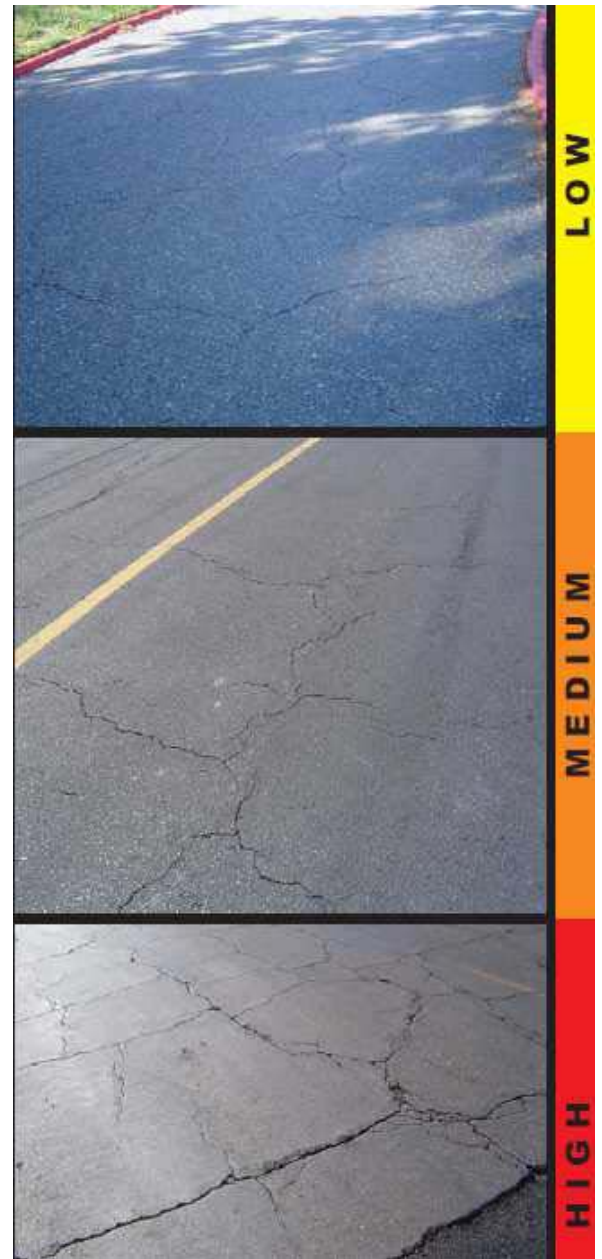
Design Goals - Control These



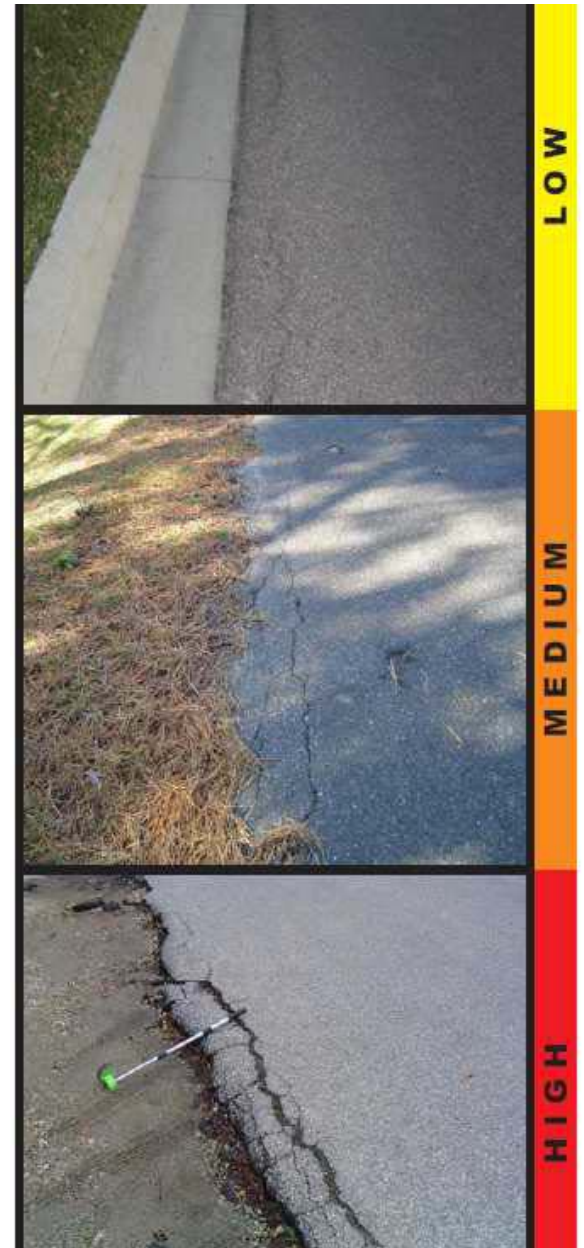
# Alligator Cracking



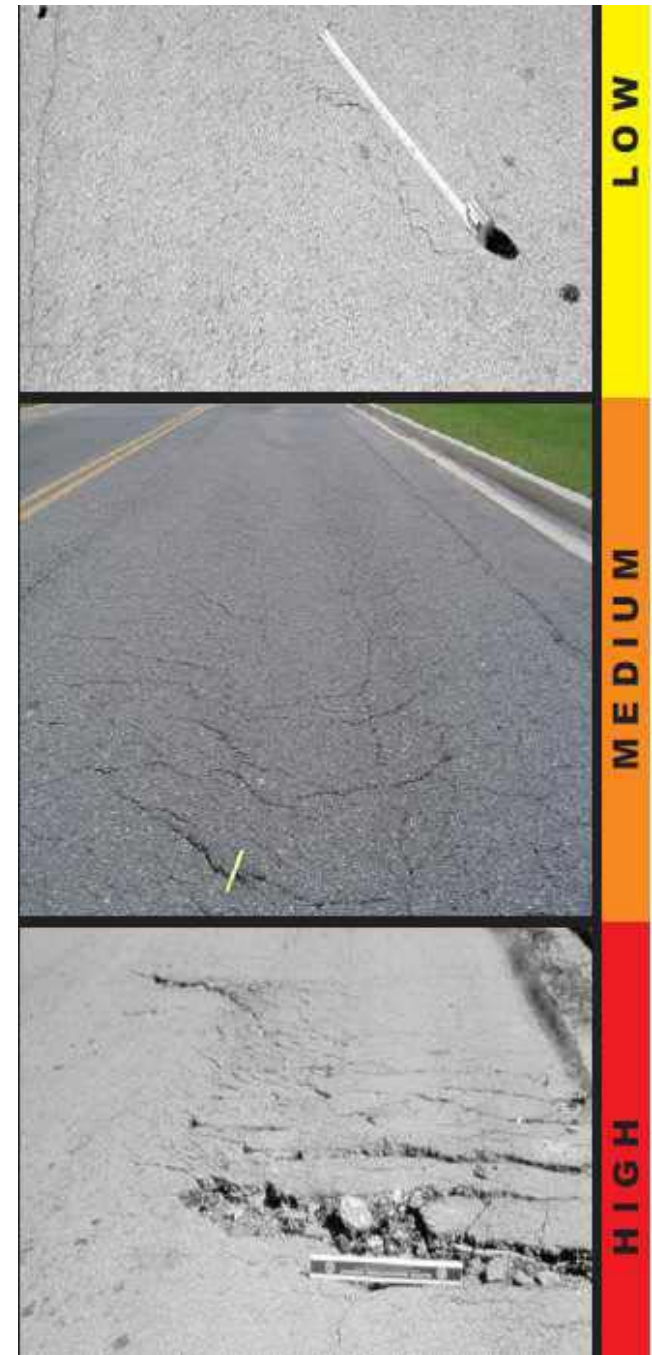
# Block Cracking



# Edge Cracking

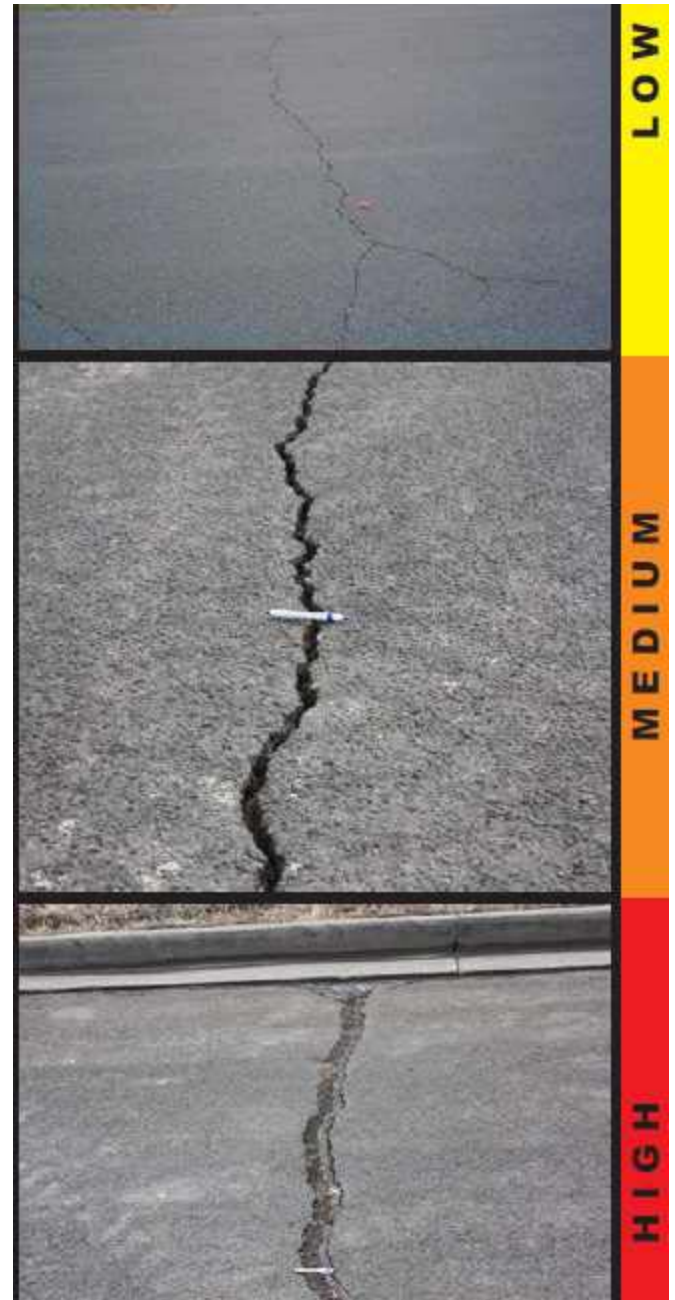


# Slippage Cracking





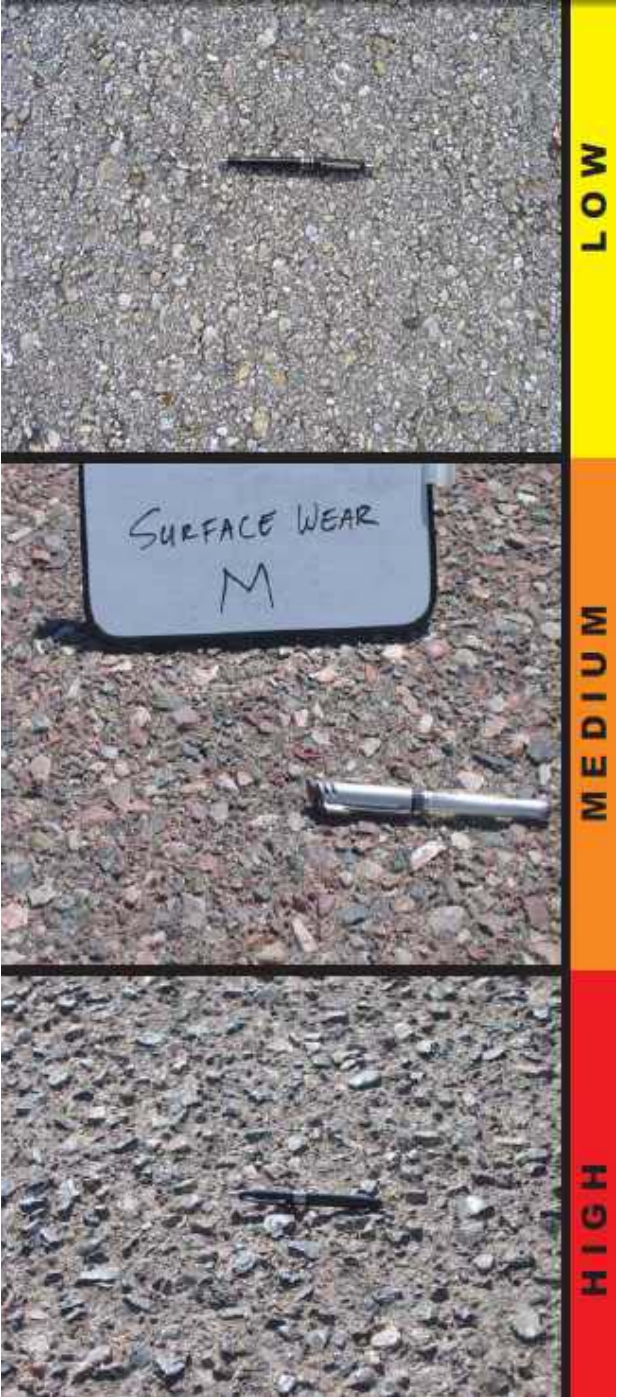
# Linear Cracking



# Bumps and Sags



# Weathering

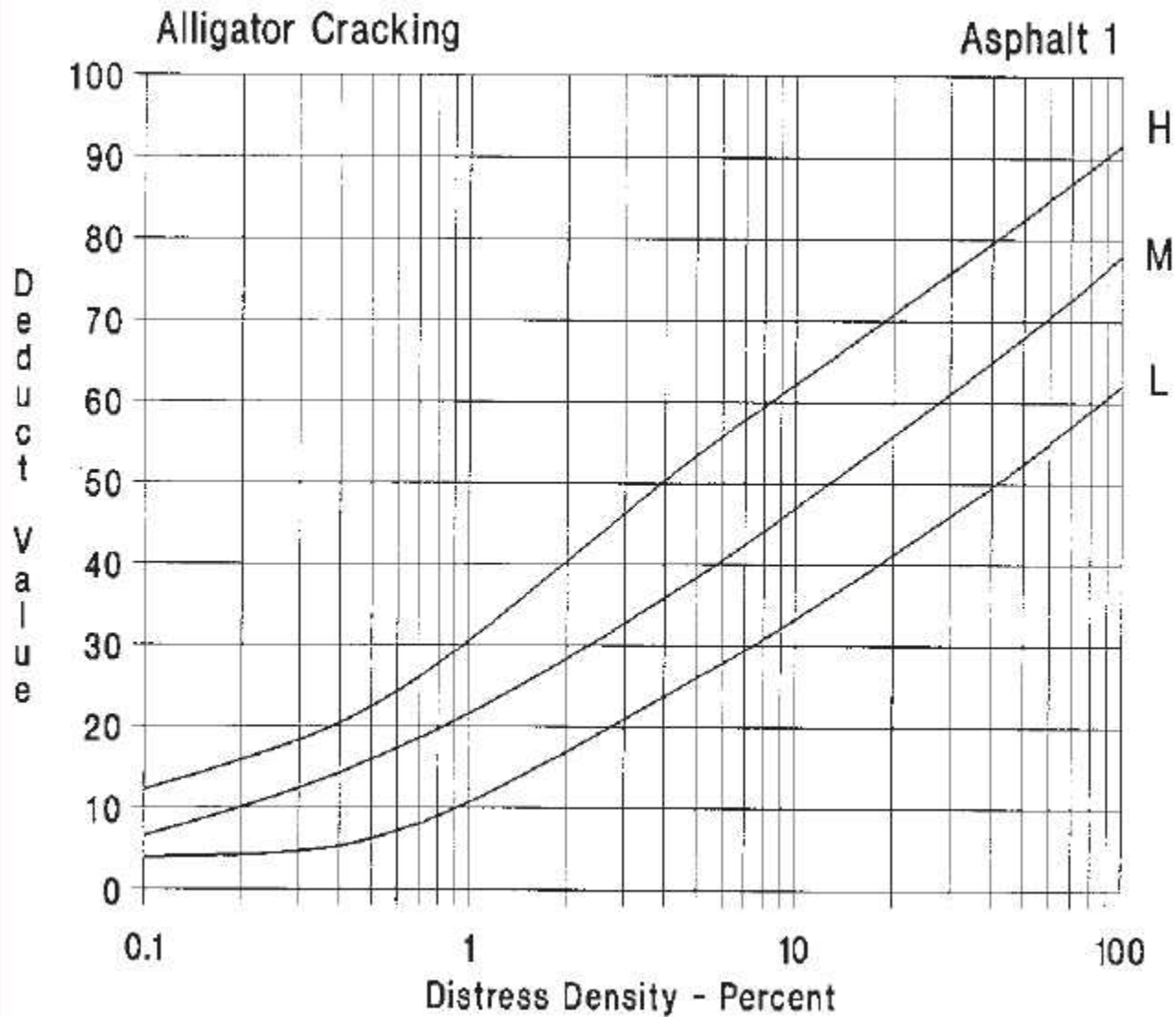




# Patching / Utility Cut



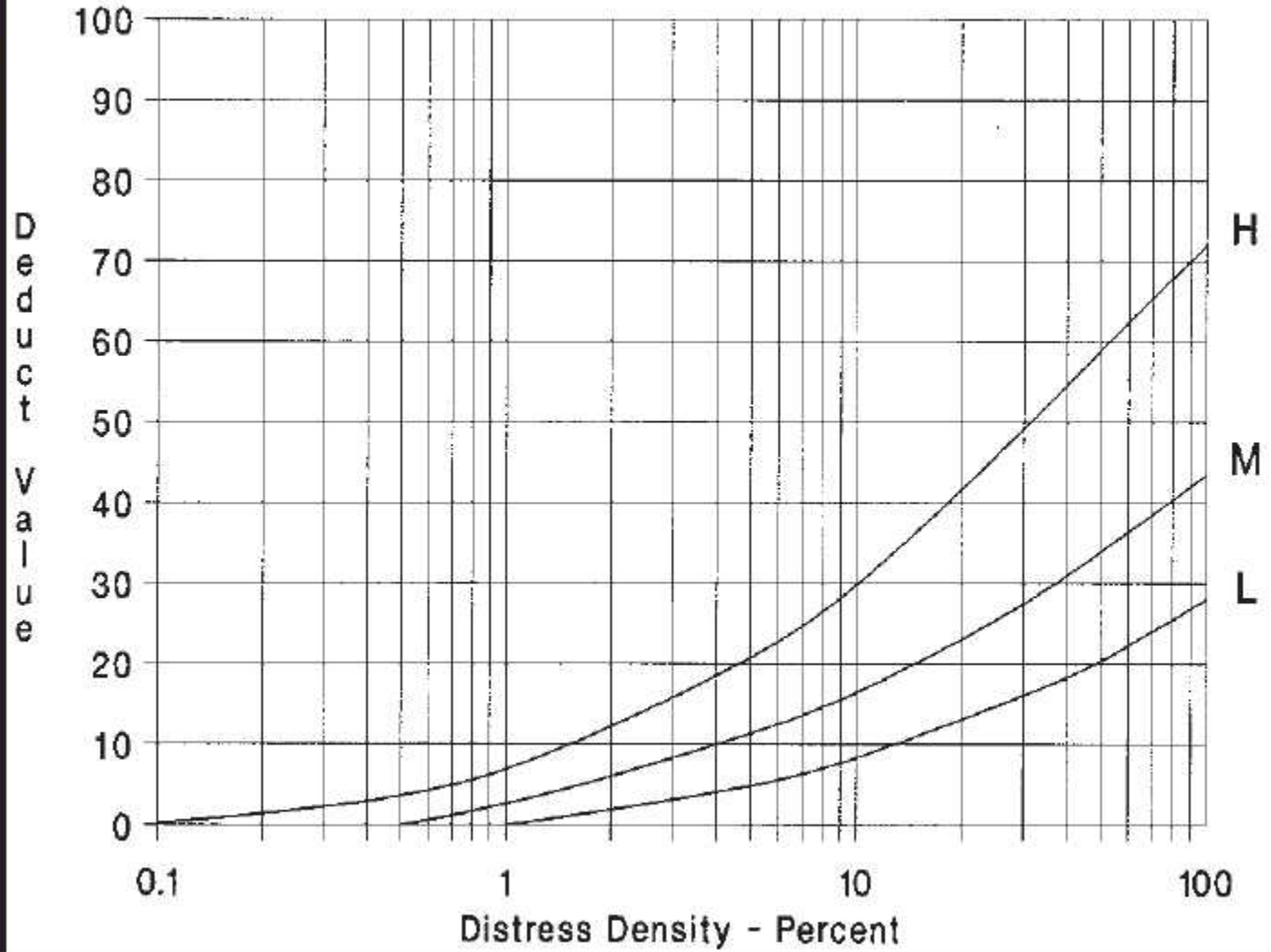
# ALLIGATOR (1)



# BLOCK CRACKING (3)

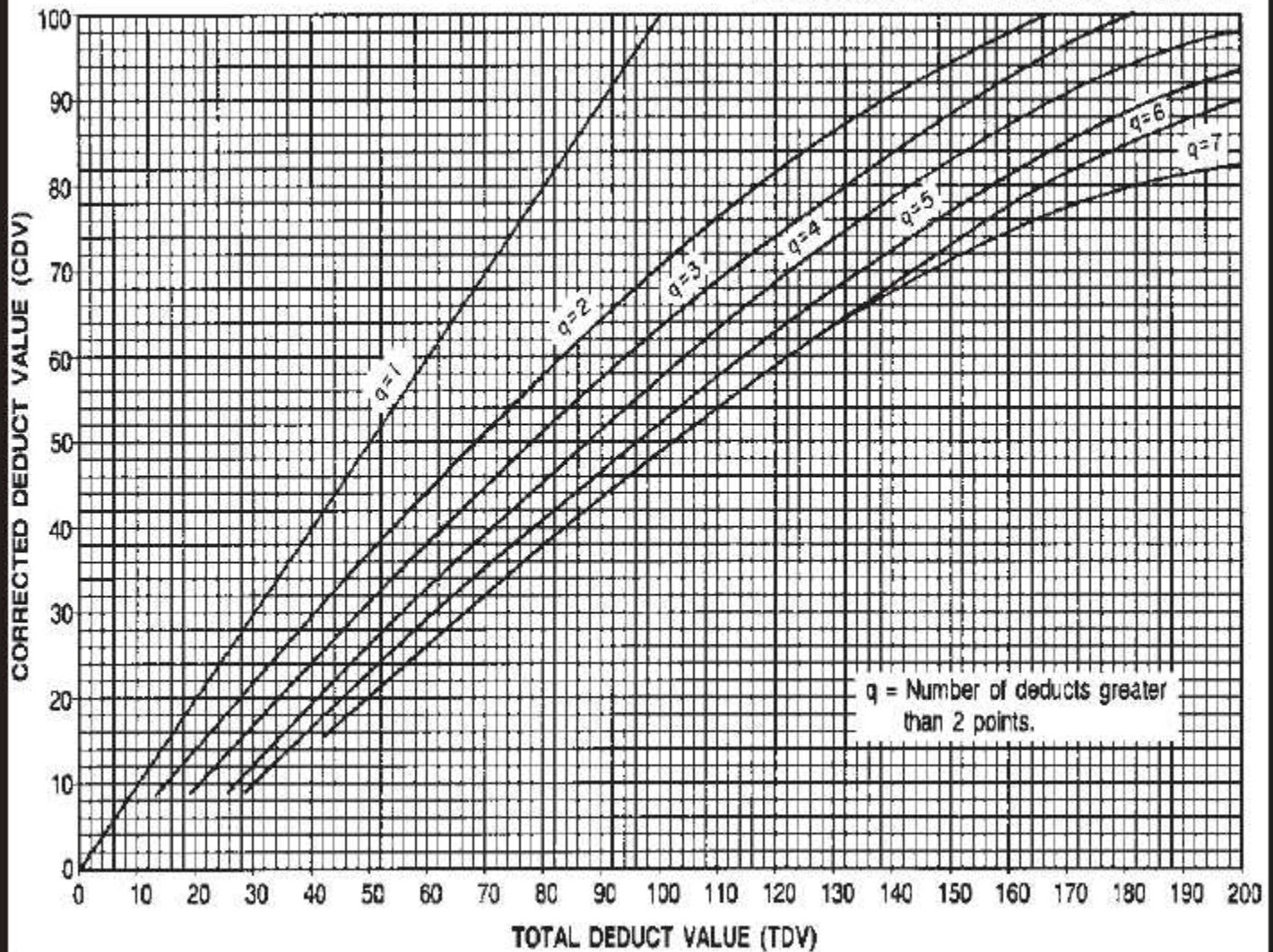
Block Cracking

Asphalt 3

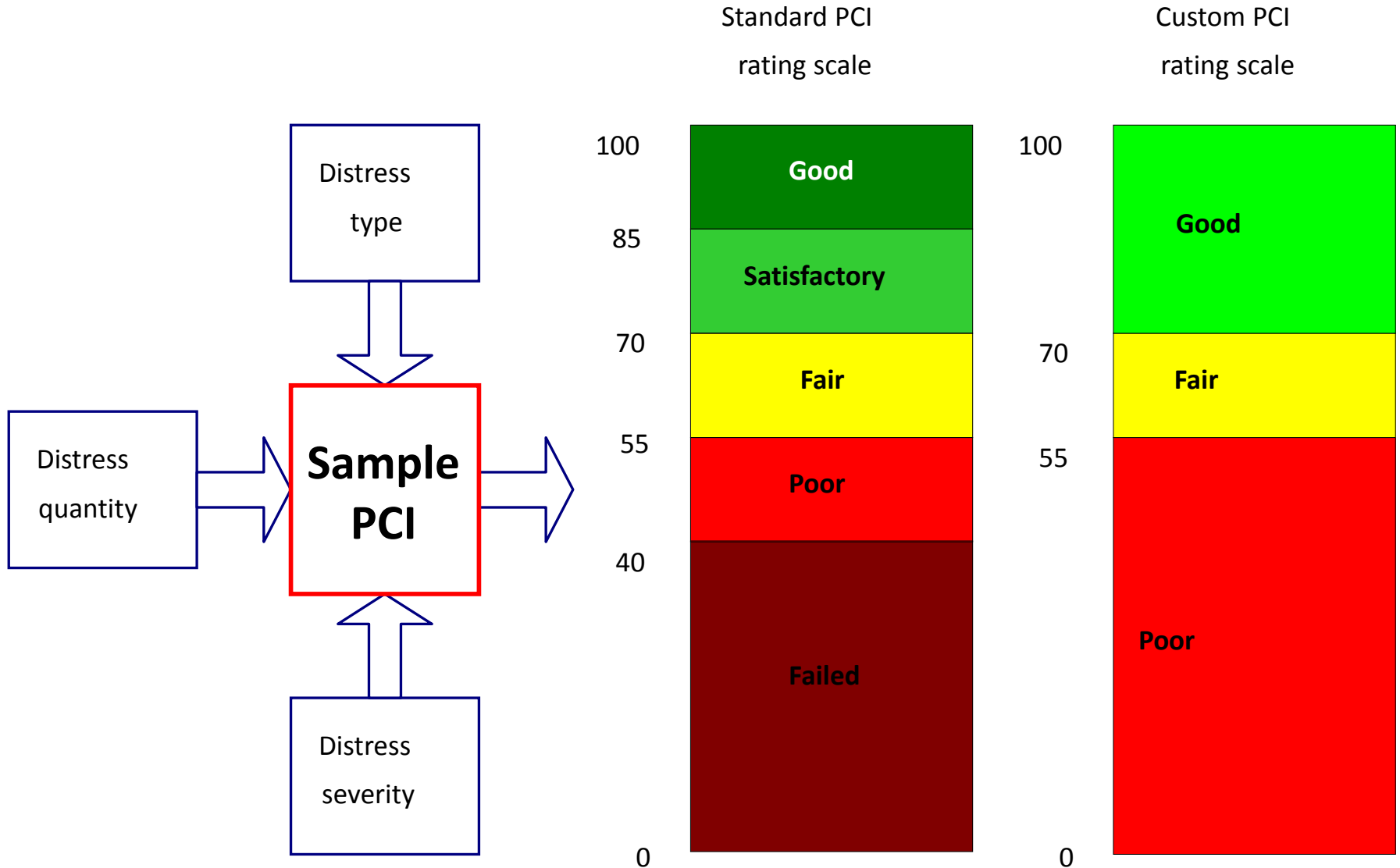


# CORRECTED DEDUCTS

## ROADS AND PARKING LOTS: ASPHALT



# Pavement Condition Index (PCI)





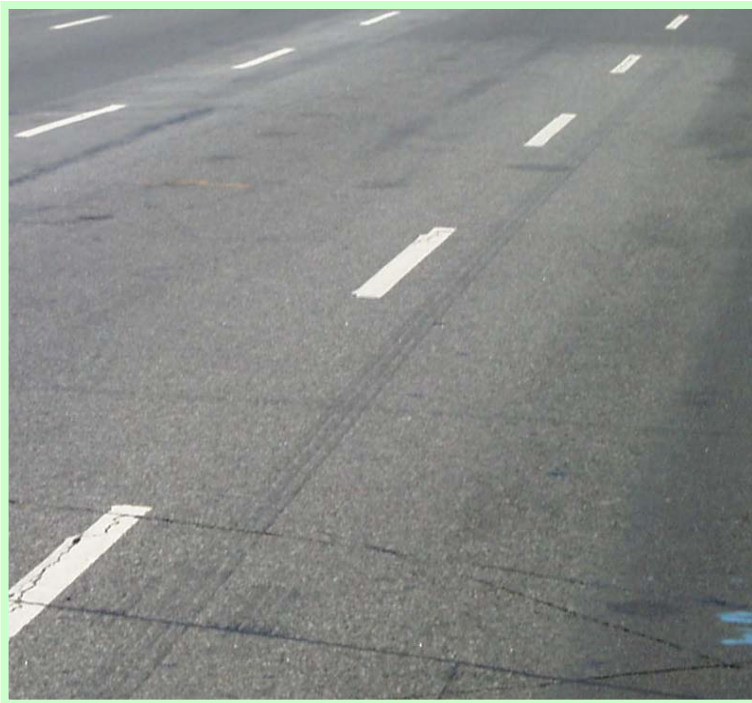
# ASTM Standards

PCI for:

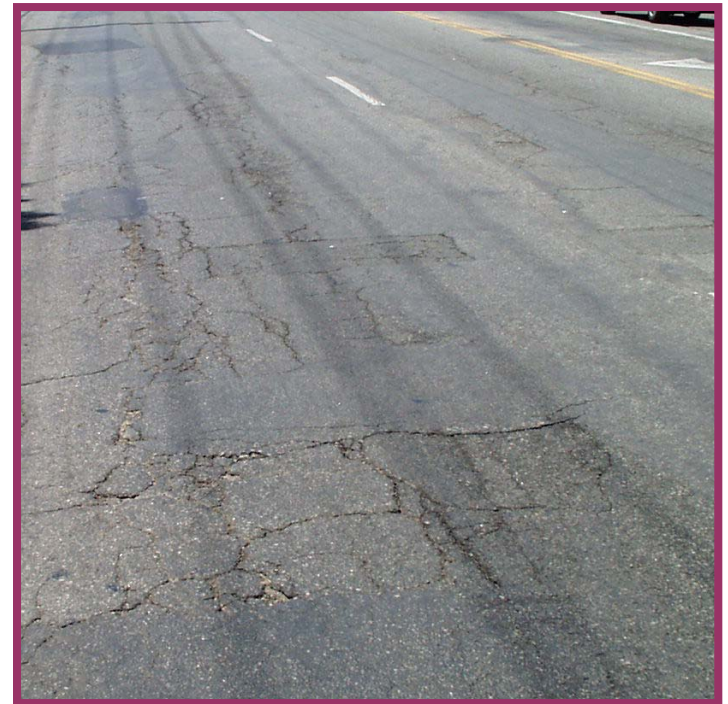
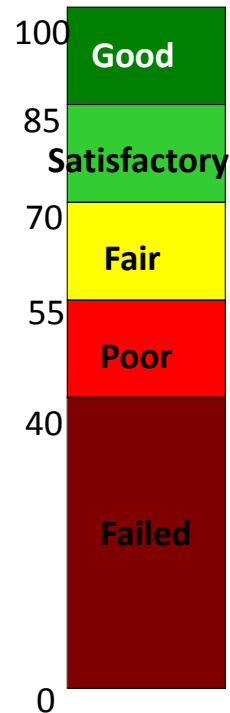
- Airfields: D 5340 11
- Roads & Parking Lots: D 6433 11

# Example Pavement Conditions

(Ref. LA)

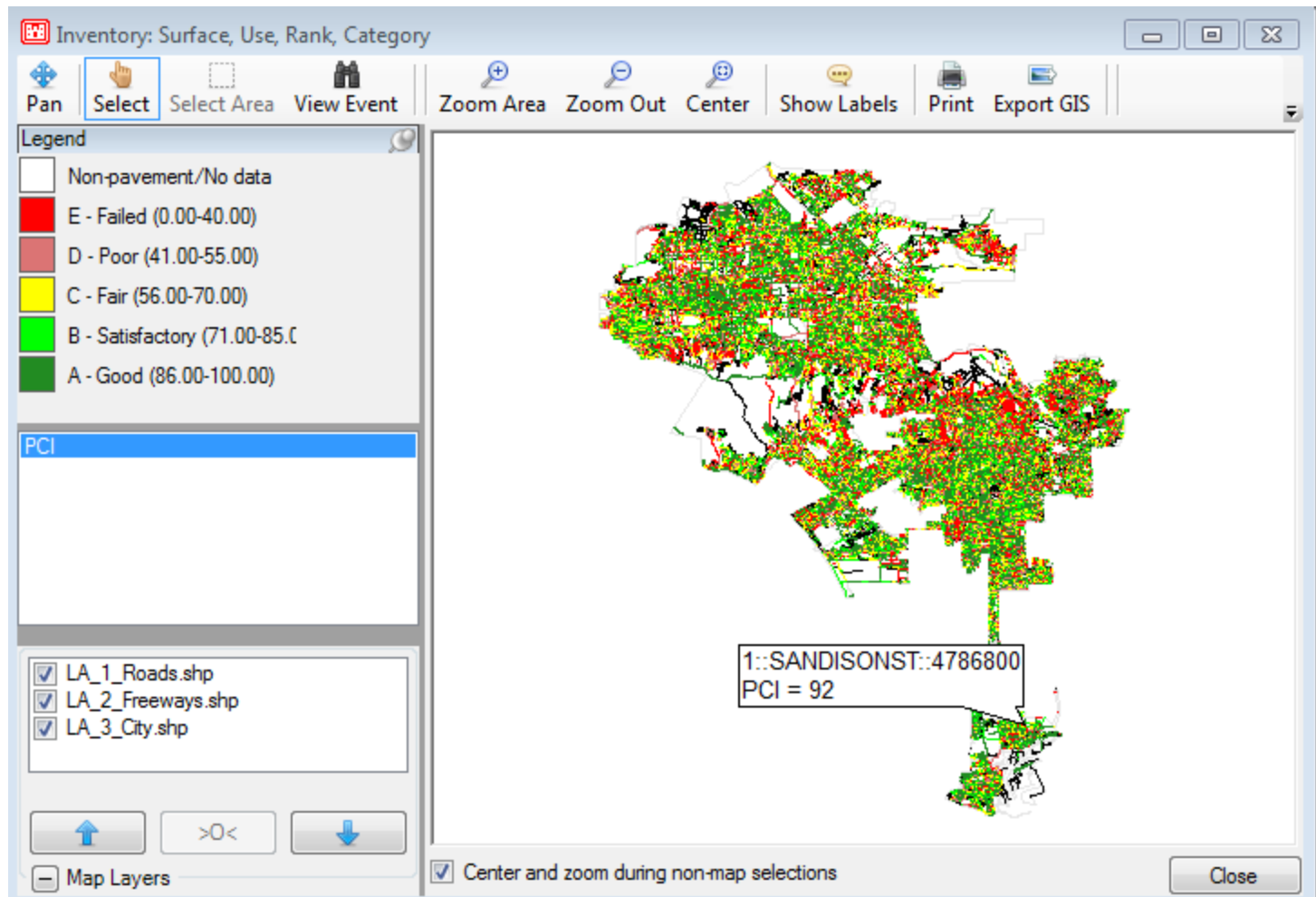


PCI: 71- Satisfactory  
07/12/2013



PCI: 51 - Poor  
07/12/2013

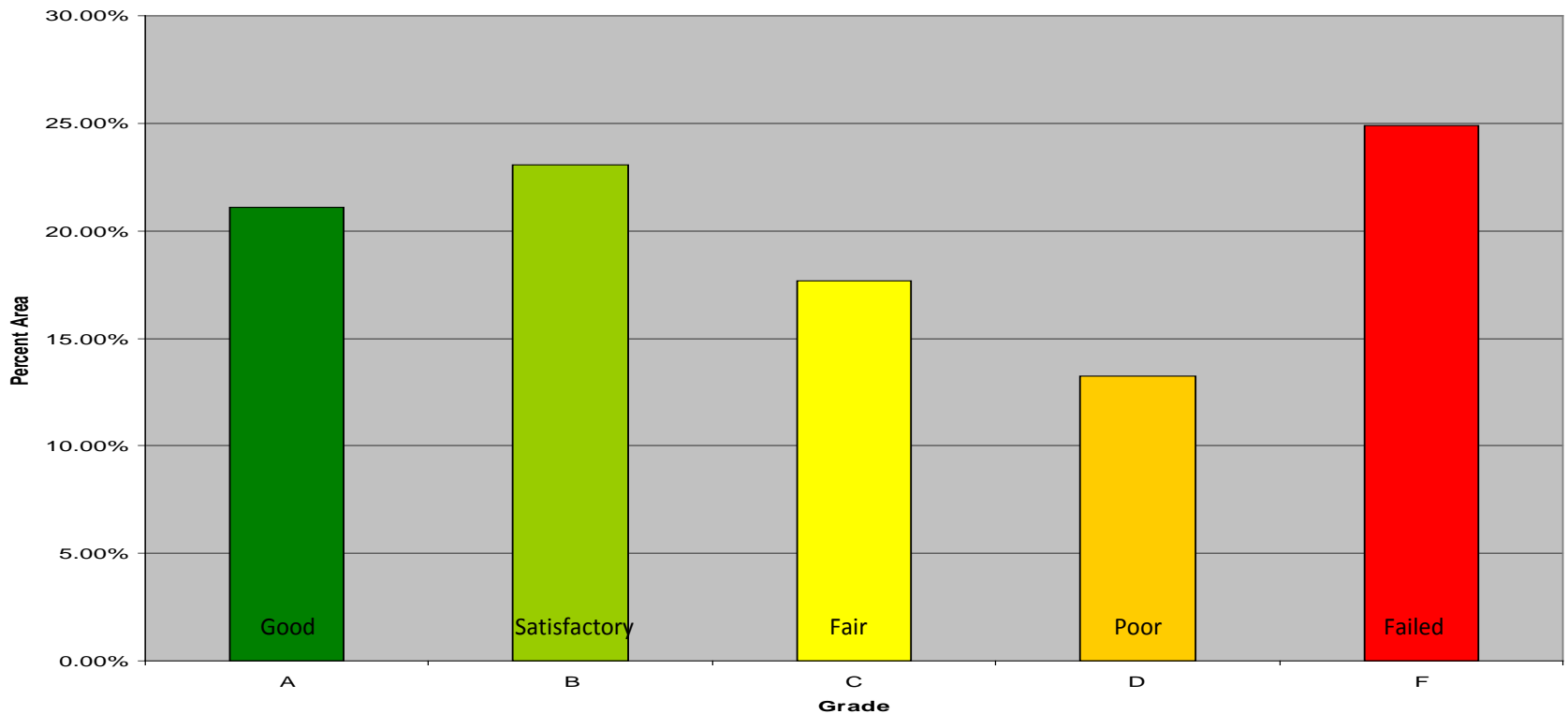
# Condition Map



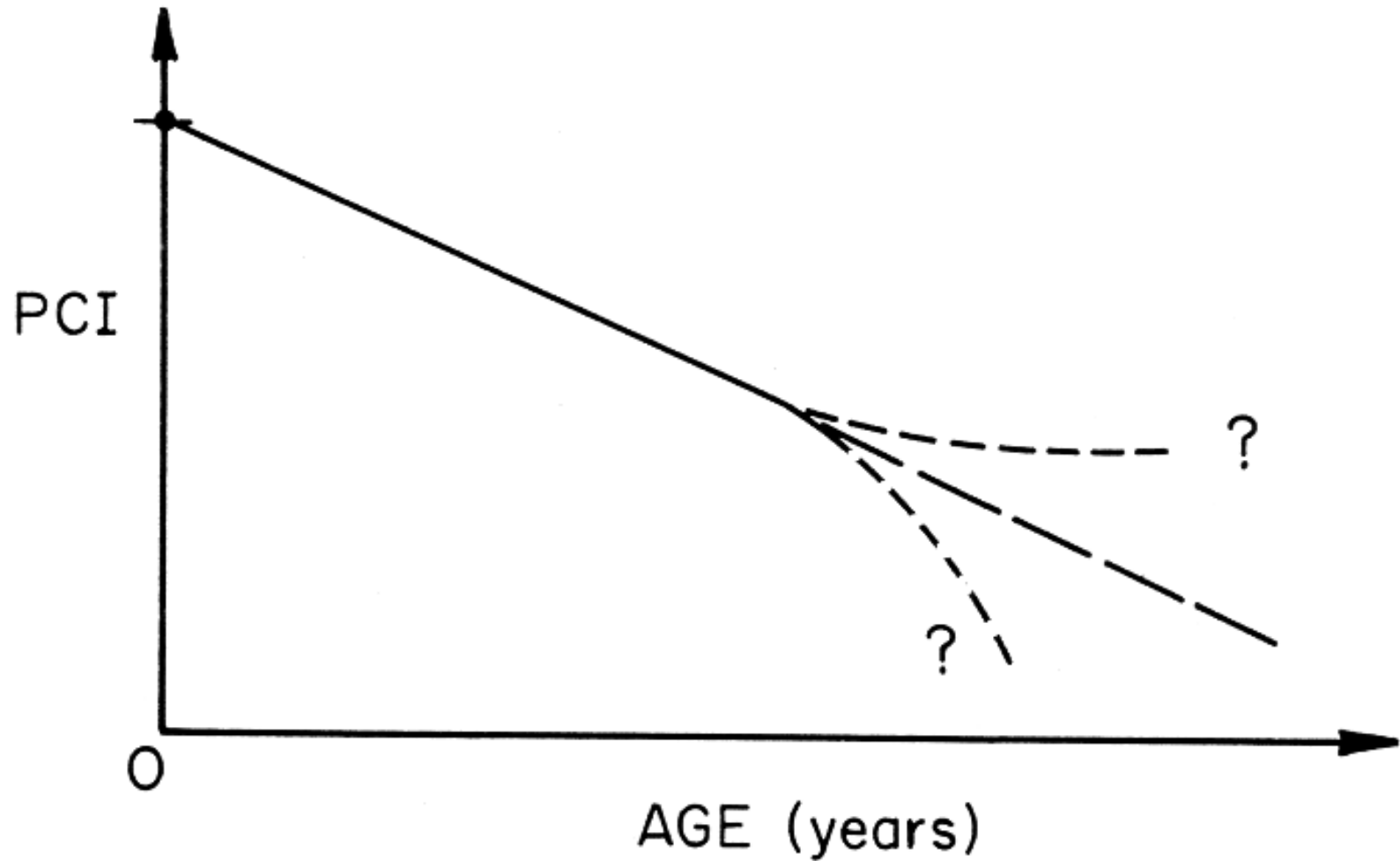


# Current Condition of Los Angeles Streets

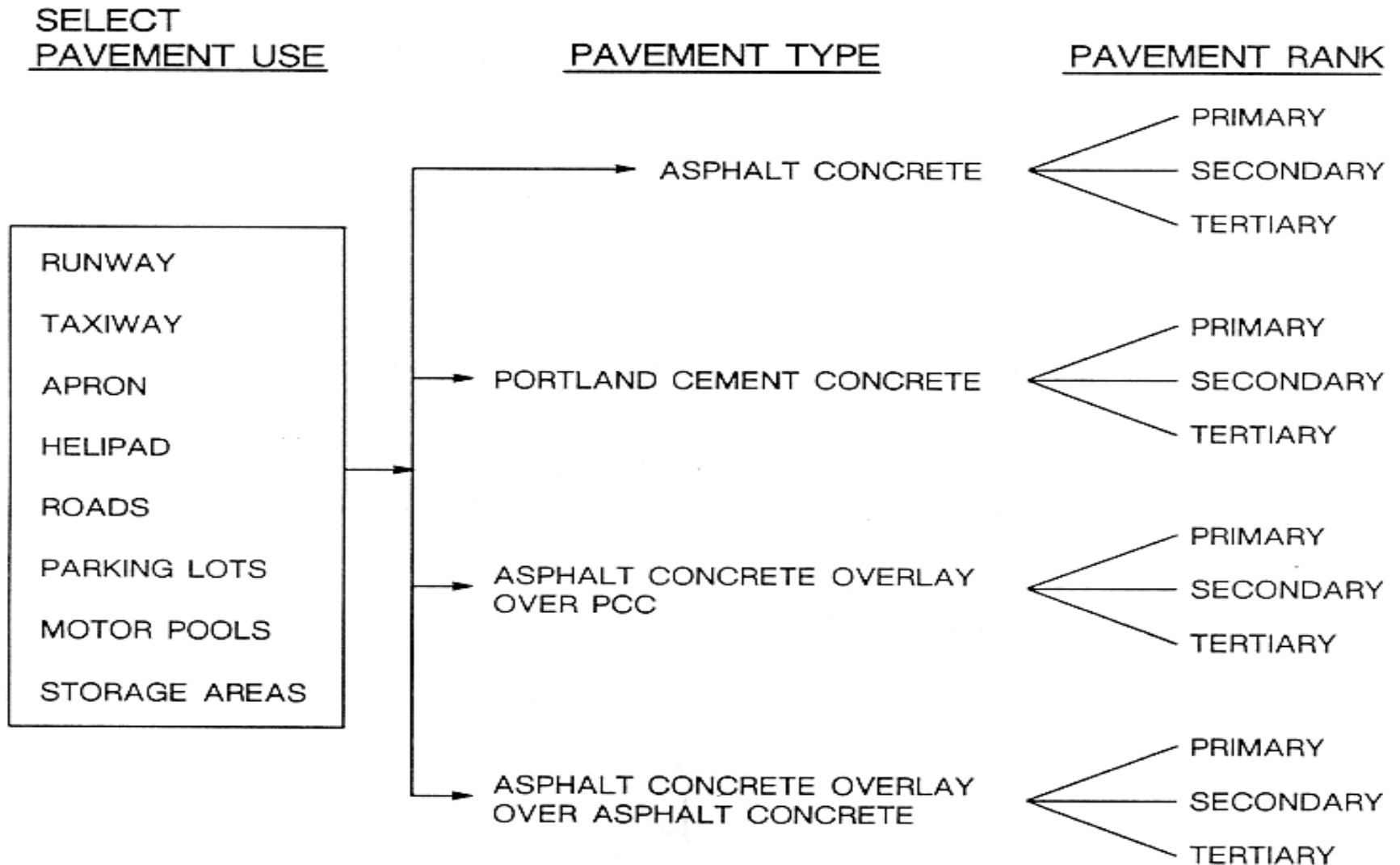
Decades of deferred maintenance created a street network that currently has approximately 25% of our streets in a failed condition (Grade F), where they will cost up to five times more to reconstruct and rebuild than normal resurfacing.



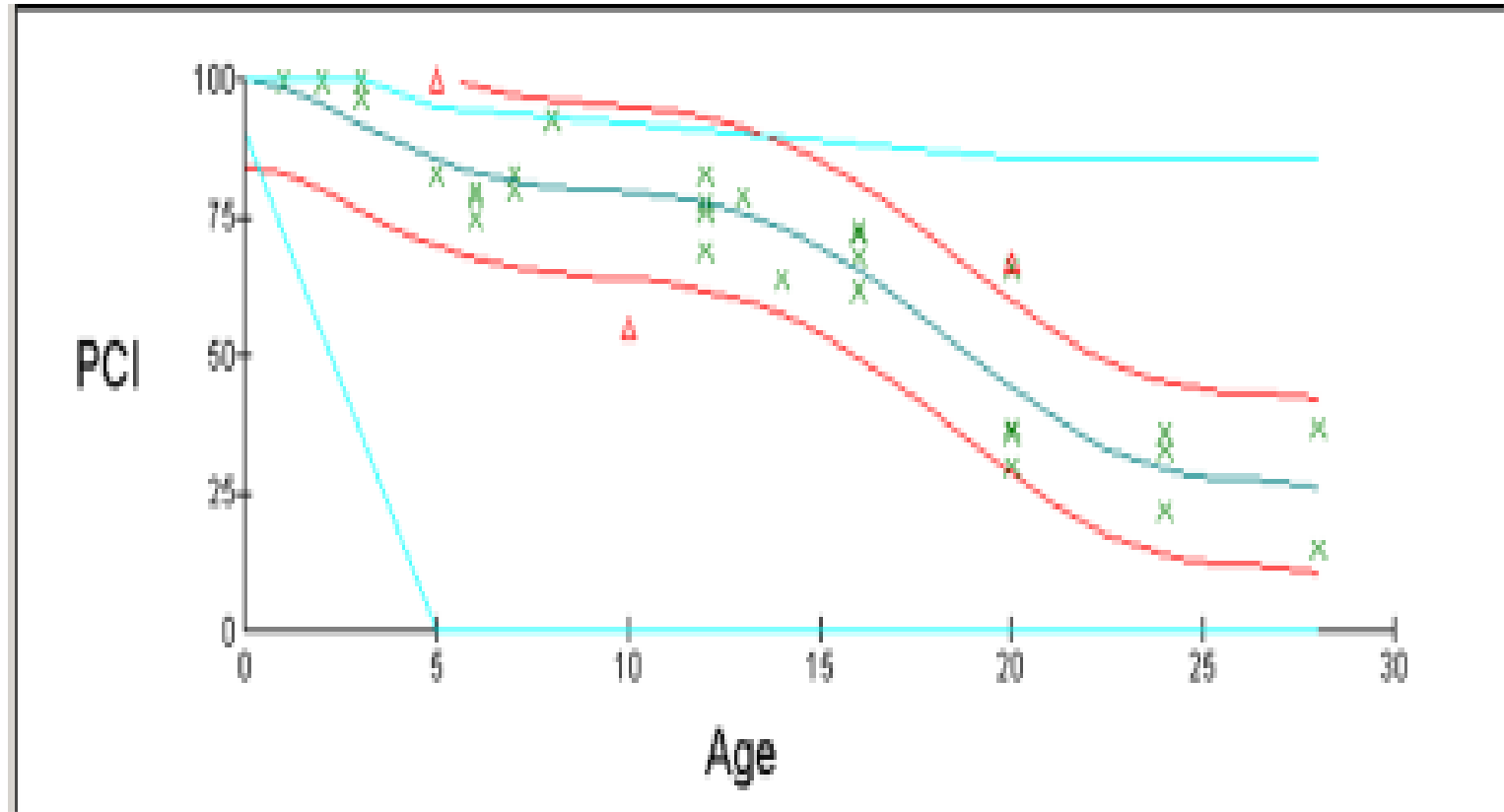
# Condition Prediction



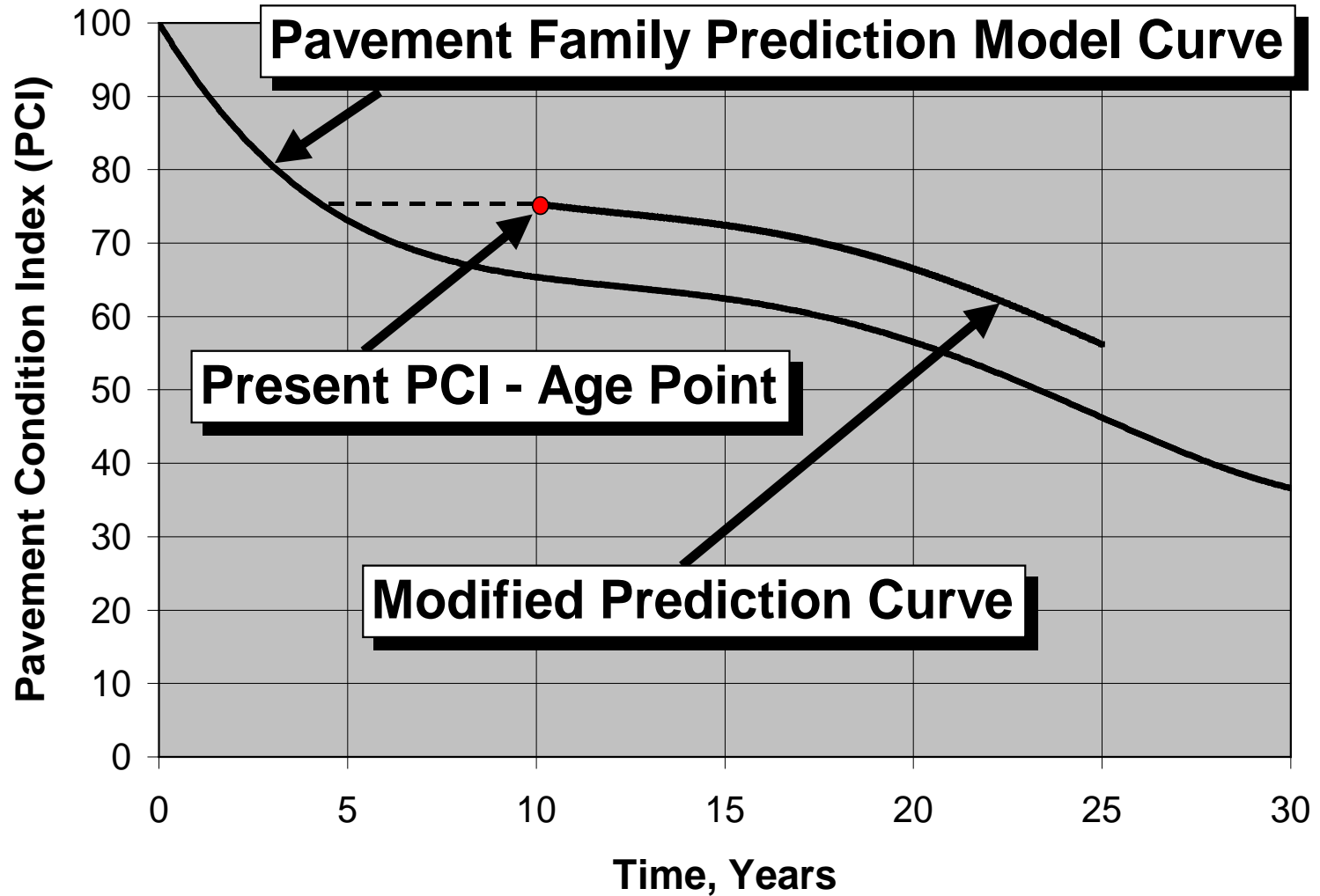
# Group Similar Pavements (Create Families)



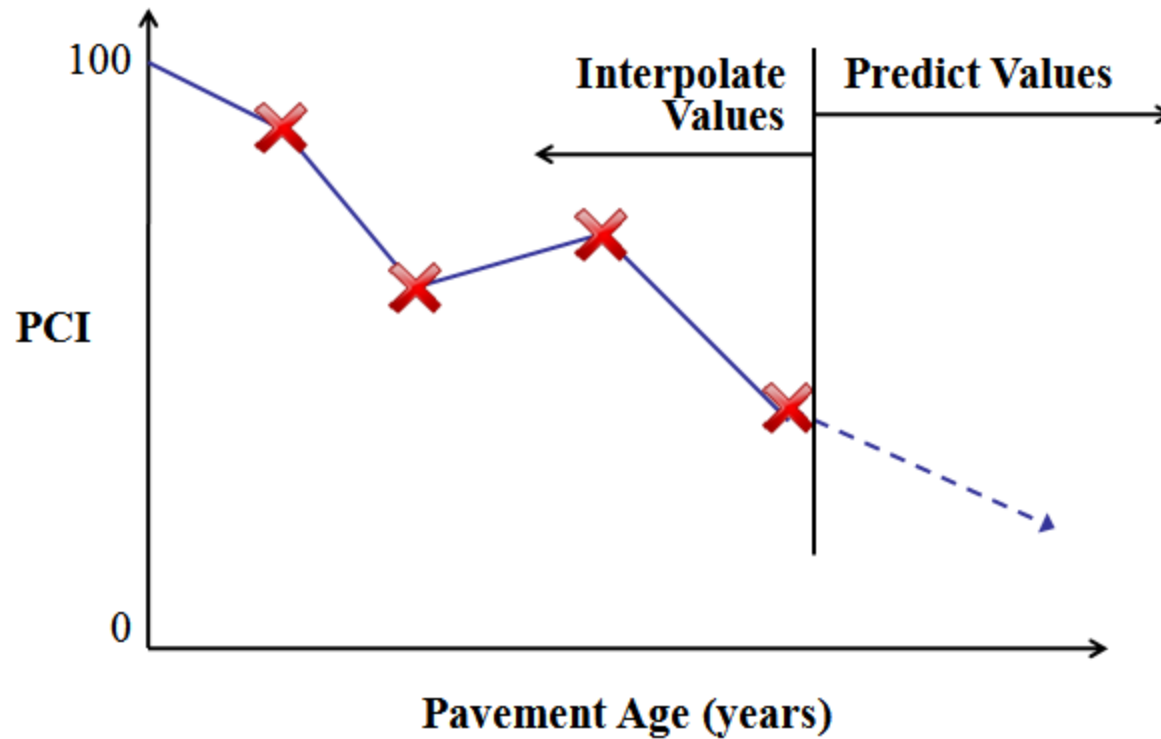
# Develop Family Trend



# Predict Section Condition based on Family

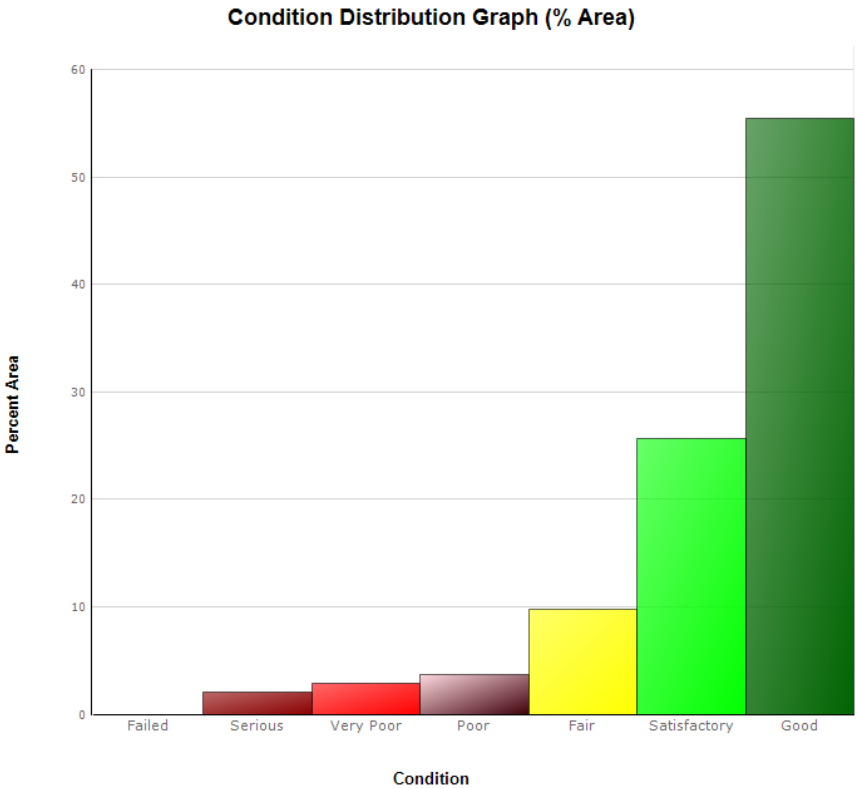


# Performance Analysis

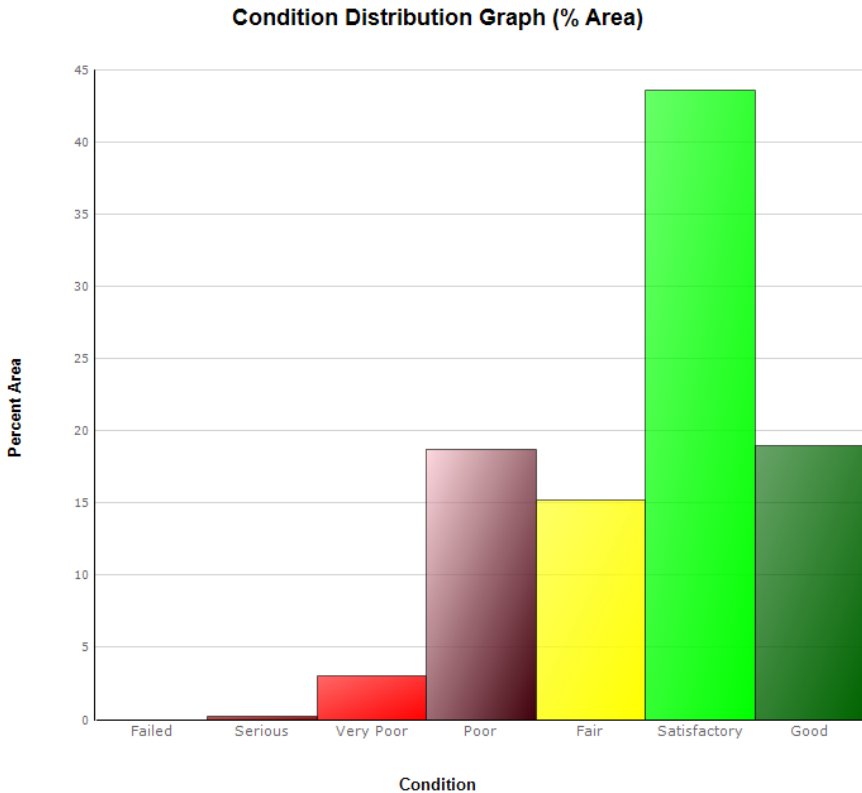


# Condition Distribution

2007



2016



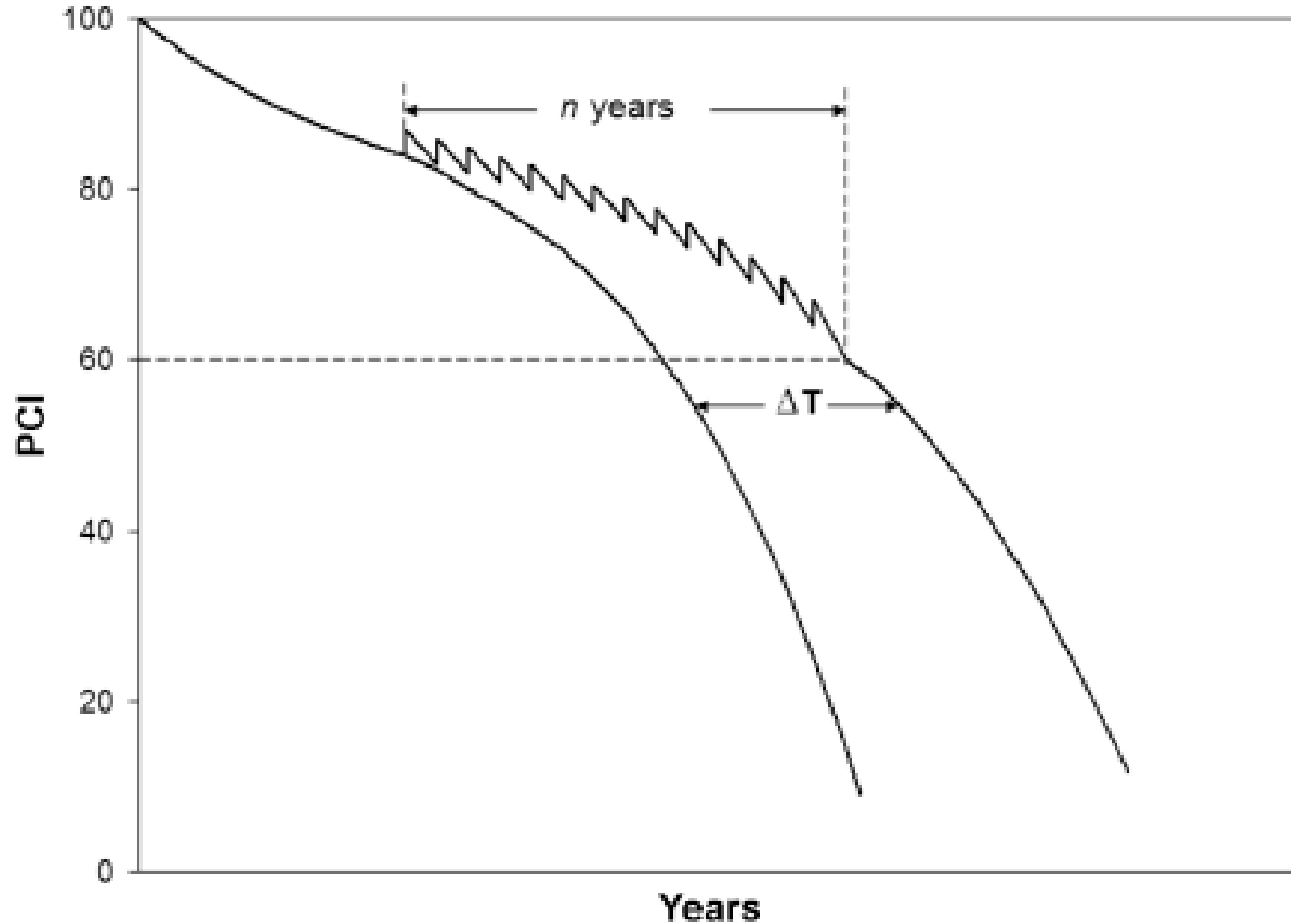
# M&R Categories

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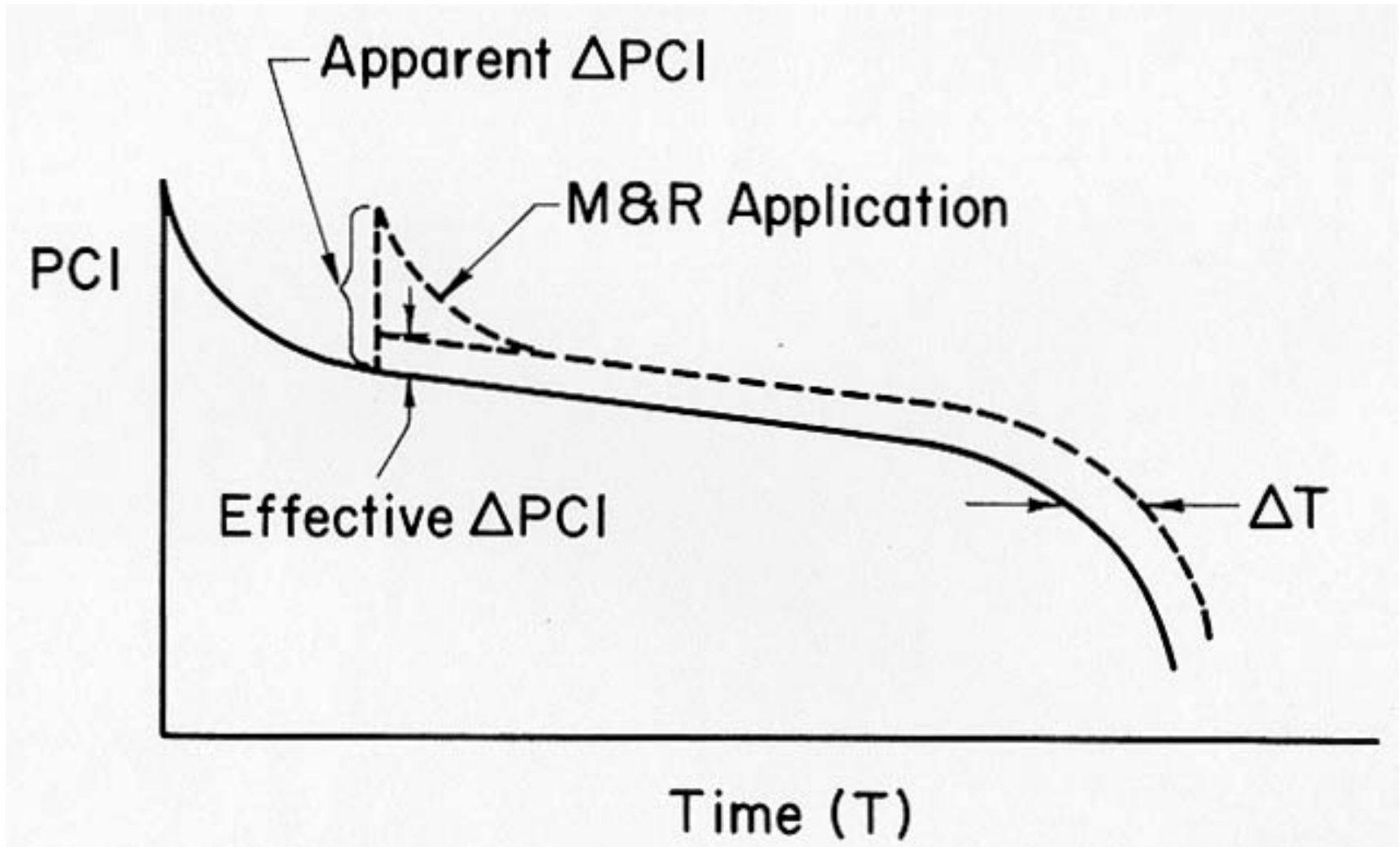
- **Localized:**
  - Preventive, PCI > critical
  - **Localized Safety, PCI < critical**
- **Global: Micro Surfacing, etc.**
- **Major:**
  - PCI > critical
  - **PCI < critical**



# Effect of Localized Preventive M&R on PCI



# Effect of Global M&R on PCI



# Rubberized Slurry Seal Application

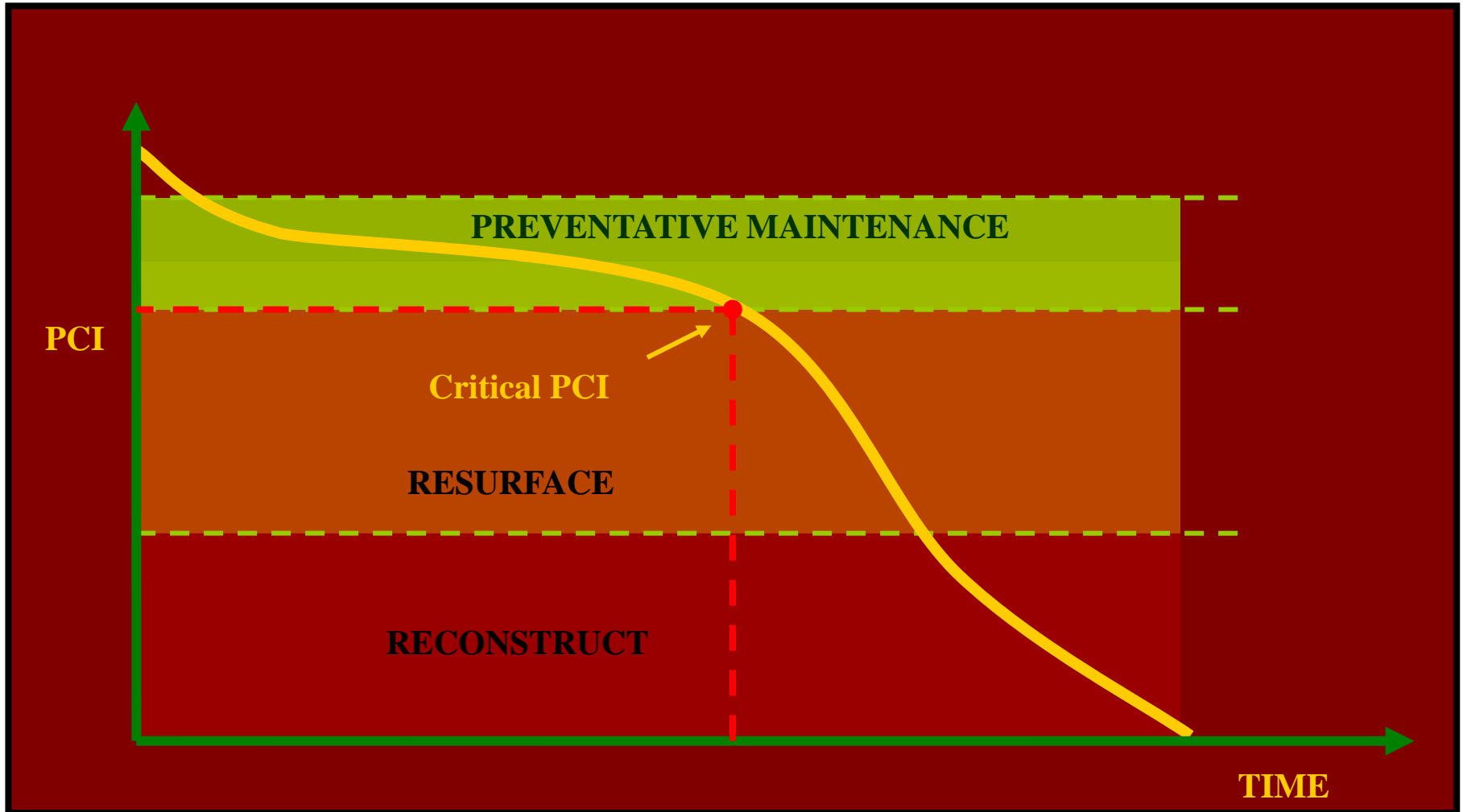


# Major M&R

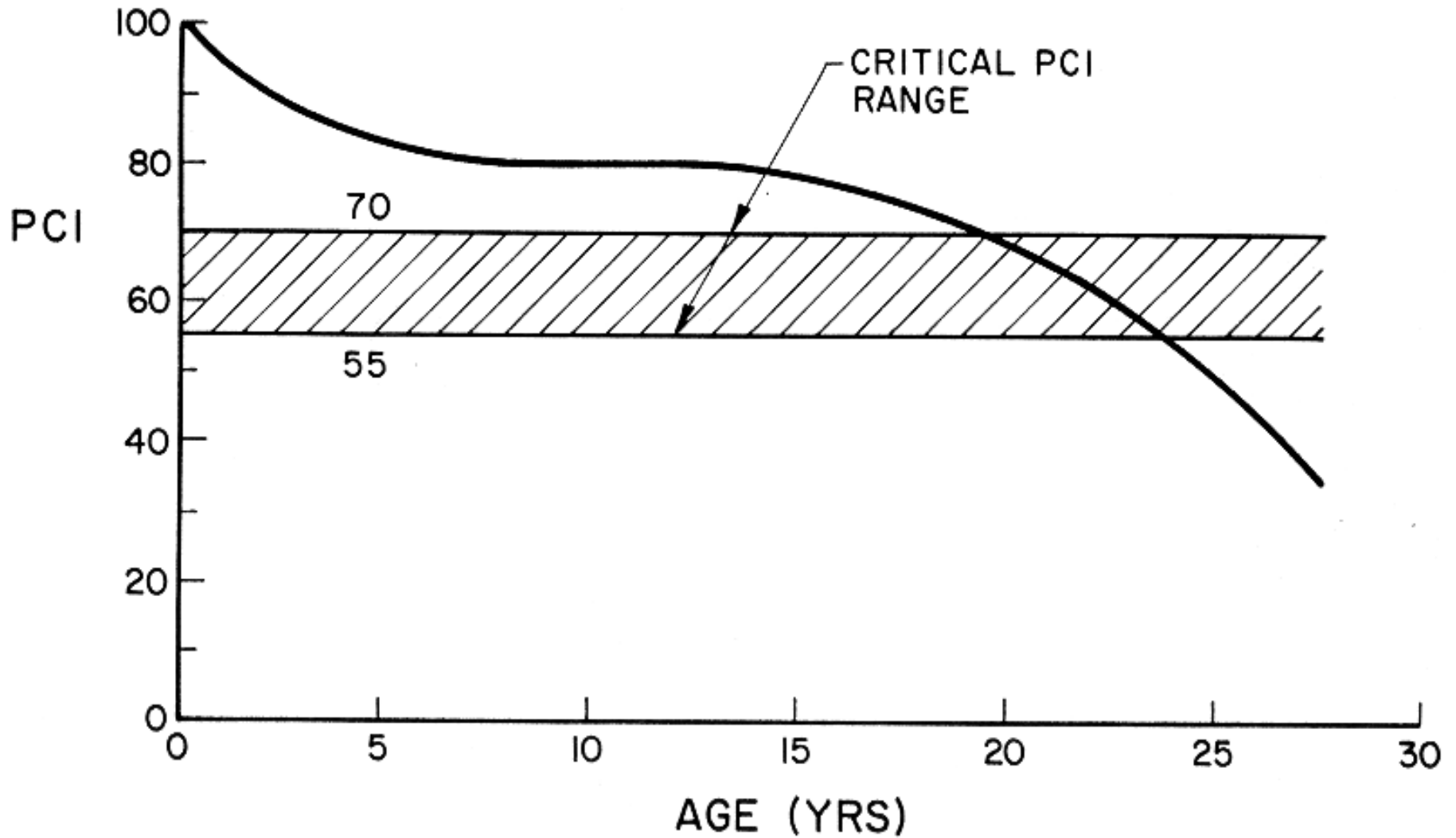
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Resets PCI to 100

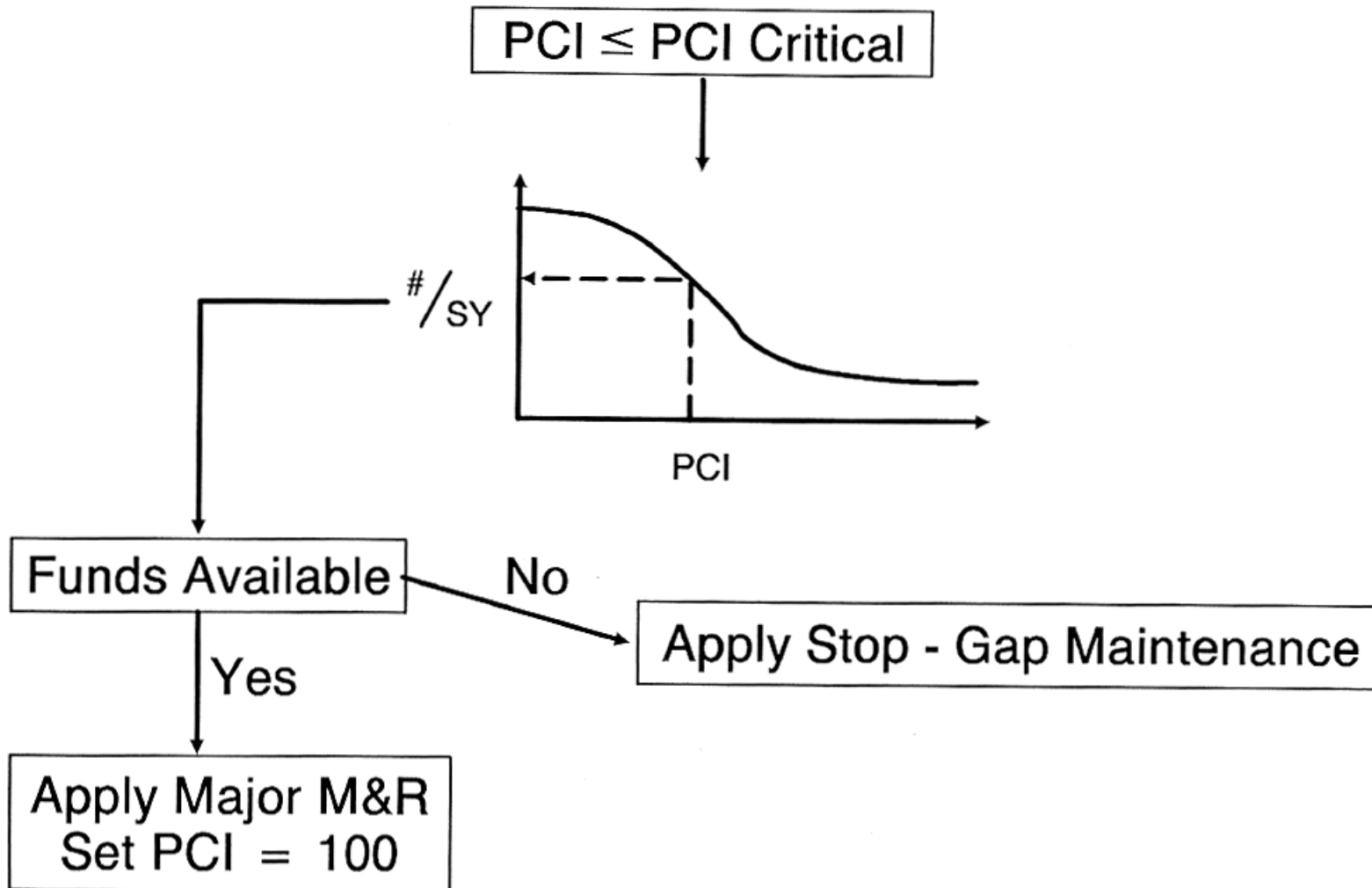
# M&R Rehabilitation Policy



# Critical PCI



# M&R Assignment *Below Critical PCI*



# List of Structural Distresses

## Asphalt Pavement

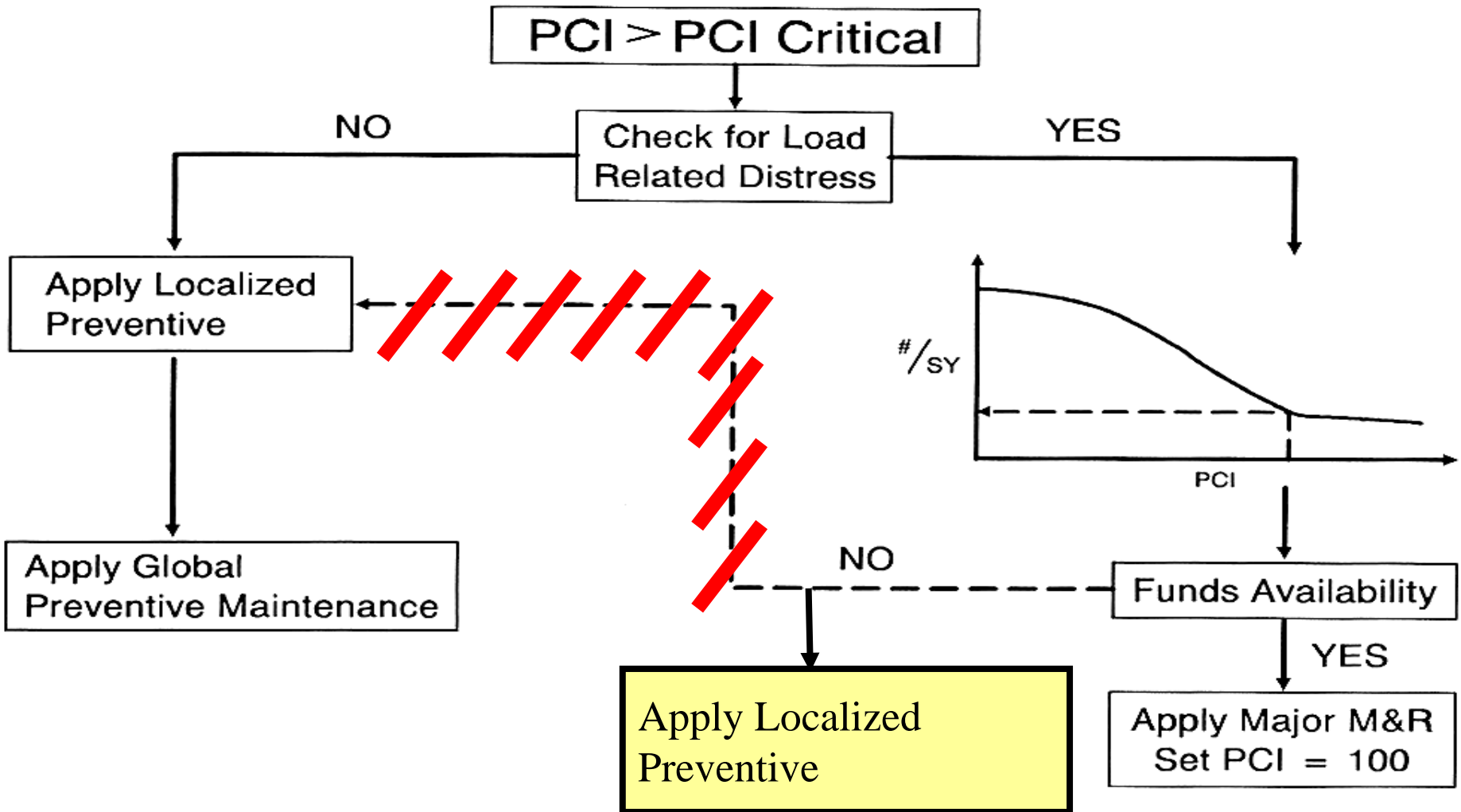
Alligator Cracking		L + M + H	> 0.5%
Patching		M + H	> 10%
Potholes		L + M + H	> 0.1%
Rutting	M + H		> 1.0%

## Concrete Pavement

Large Patching	M + H		> 10%
Corner Break		L + M + H	> 5%
Divided (shattered) Slab			
Punchout			



# M&R Assignment Above Critical PCI



# Work Planning Options

**Determine Budget Consequence:** Consequence of different budgets on condition and backlog of M&R

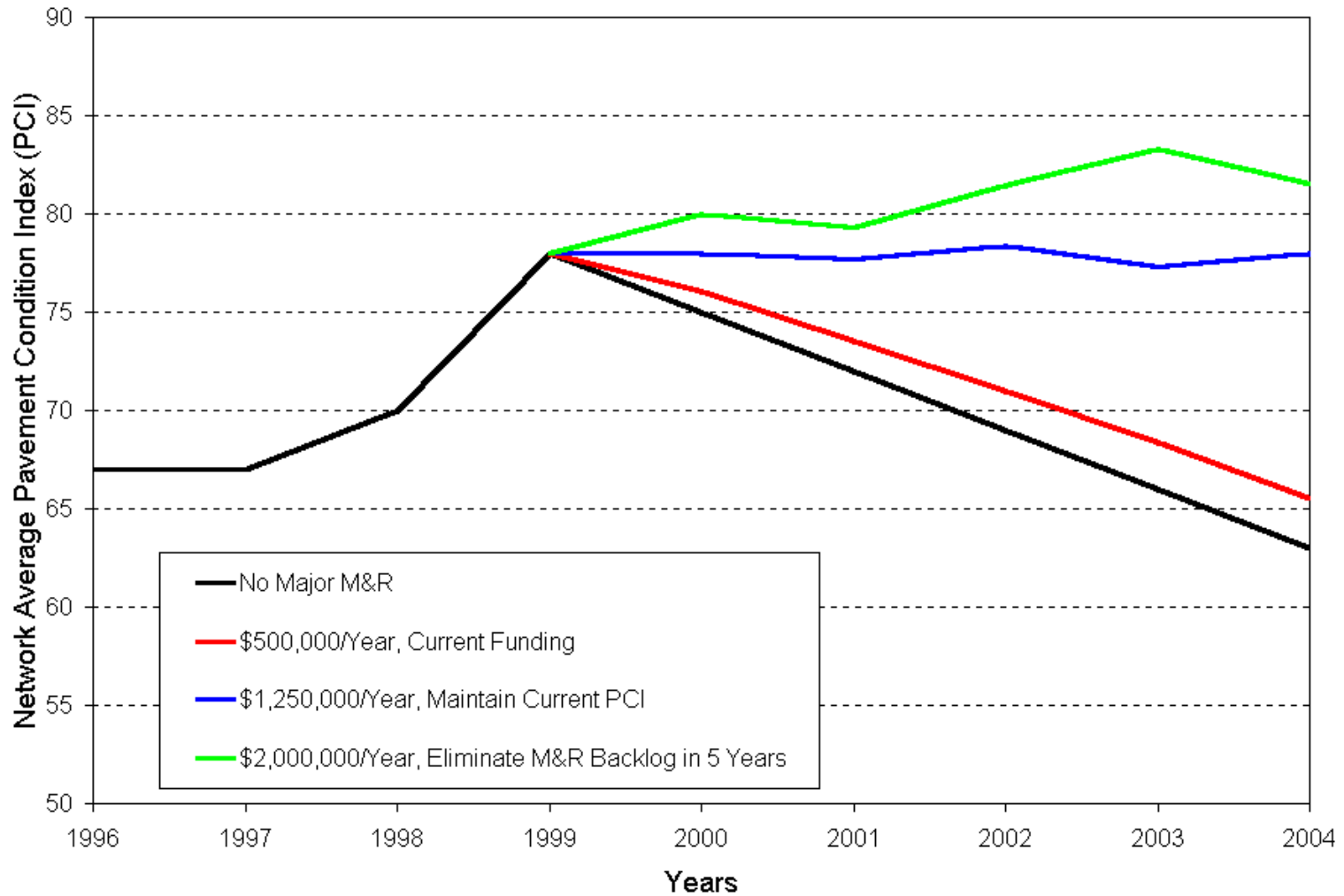
**Determine Budget Requirement:**

Eliminate backlog of major M&R in a specified period of time

Maintain current area-weighted PCI over a specified period of time

Reach desired area-weighted PCI in a specified period of time

# Work Planning



# Priorities of M&R Categories

A > B > C

## A. M&R Category

1. Localized Safety
2. Localized Preventive
3. Global
4. Major  $\geq$  Critical
5. Major  $<$  Critical

## B. Example Use/Rank Priority Table

RANK USE	Arterial	Collector	Residential
Roadway	1	3	6
Parking	2	5	8
Other	4	7	9

## C. Proximity to the Critical PCI

- Example:
  - Assuming a critical PCI of 60, a pavement with PCI of 55 will have a higher priority than Pavement with a PCI of 20.

# Work Planning Options

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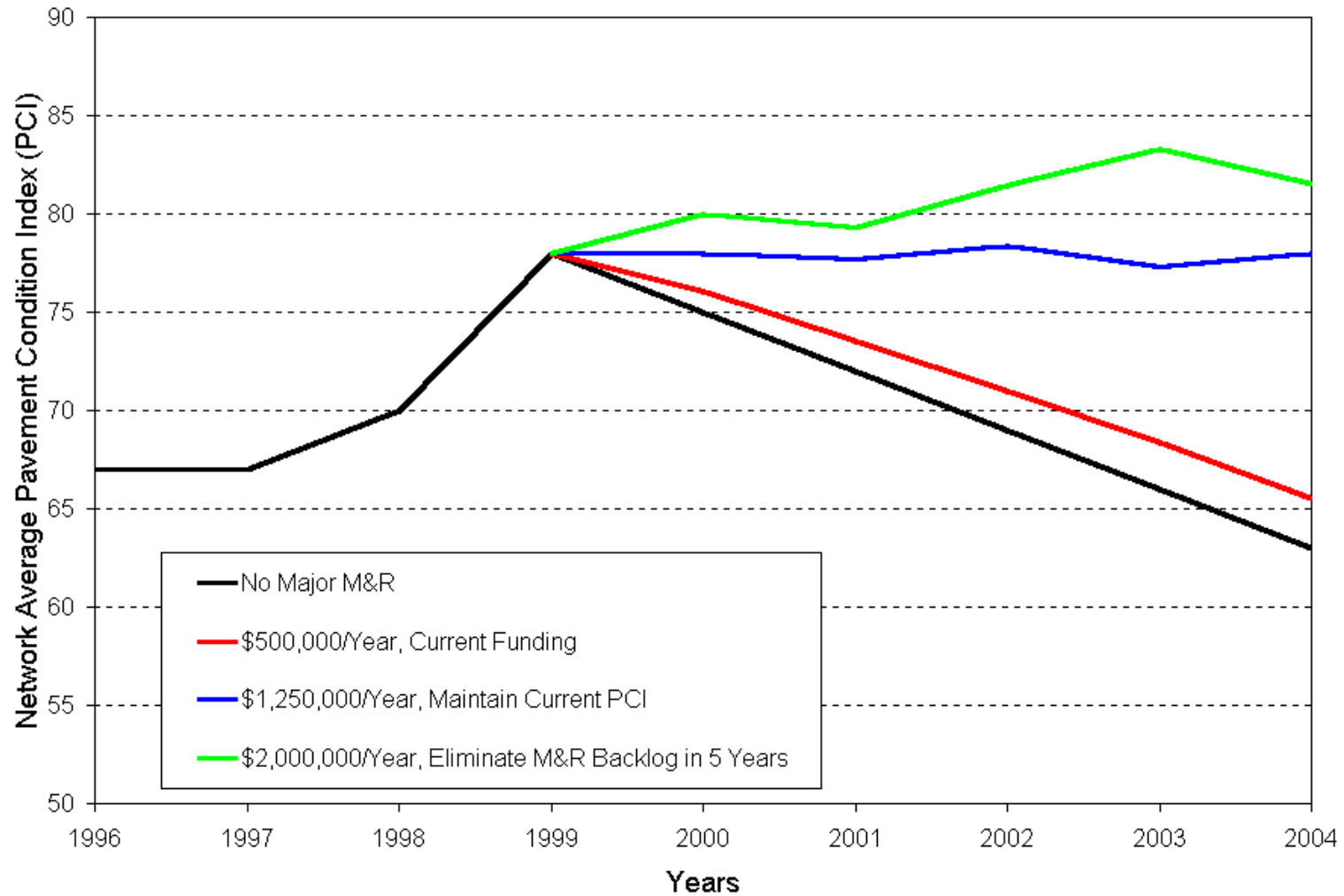
## **Determine Budget Consequence:**

Consequence of different budgets on condition and backlog of M&R

## **Determine Budget Requirement:**

- Eliminate backlog of major M&R in a specified period of time
- Maintain current area-weighted PCI over a specified period of time
- Reach desired area-weighted PCI in a specified period of time

# Work Planning

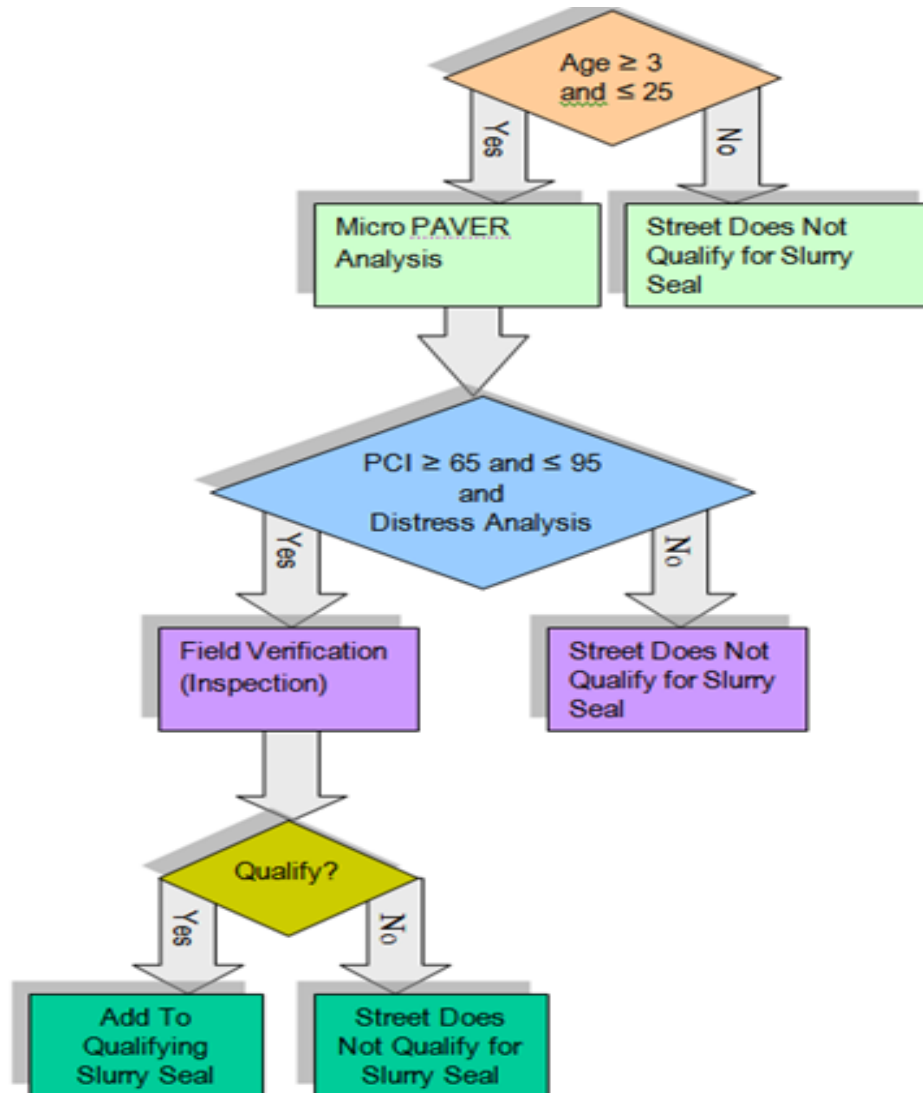




# Project Formulation

- ✓ Select section to be included in the project using any of the selectors based on condition, proximity, etc.
- ✓ Select work items to be performed and assign work date and unit costs.
- ✓ Add/delete work items for individual sections.
- ✓ Re-execute the work plan

# Slurry Seal Decision Flow Chart



# Cold In-Place Recycling (CIR)

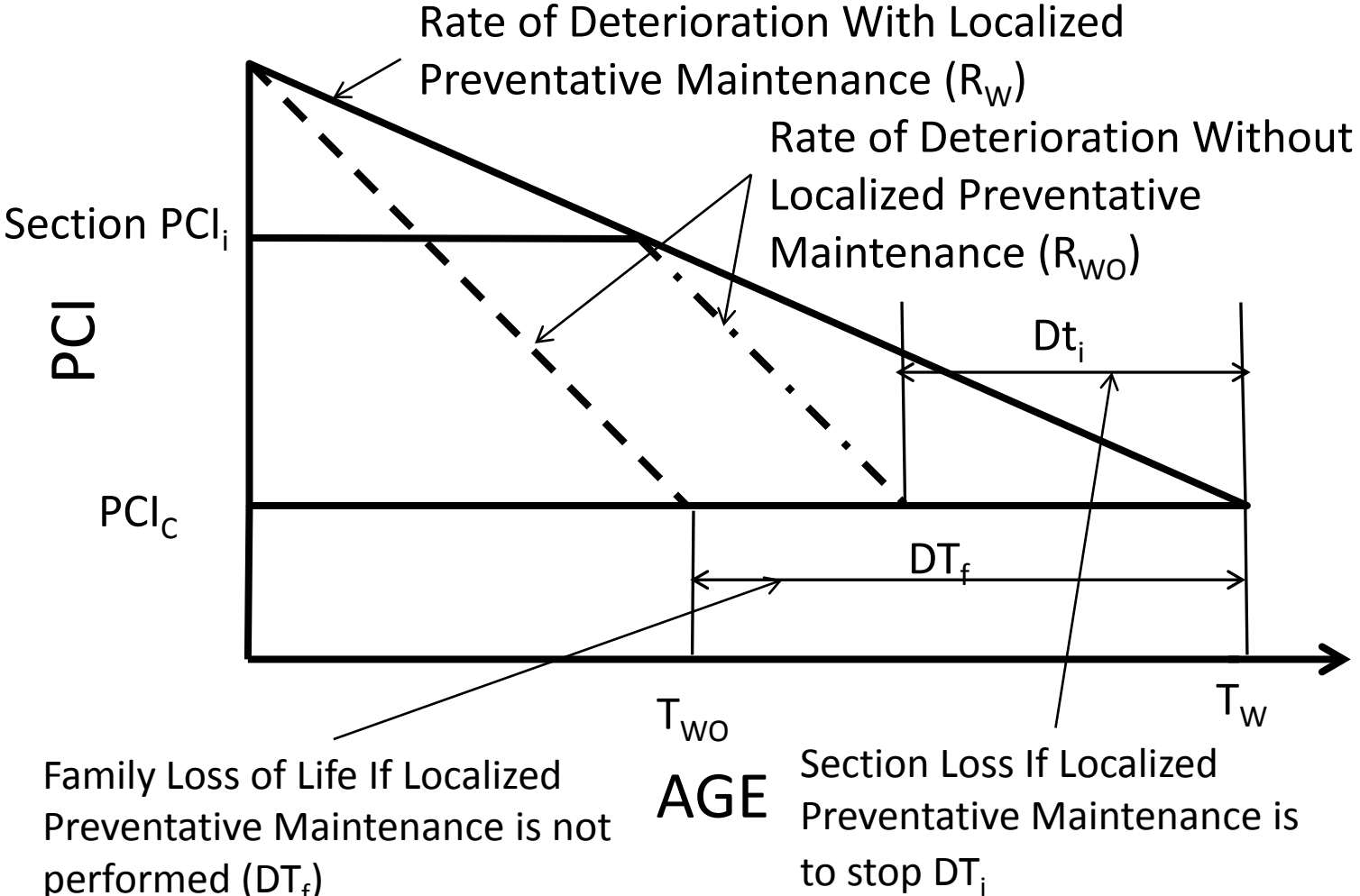


# Risk of Not Performing Preventive Localized Repair



- Defined as the decrease in pavement life and thus increase in the overall pavement M&R cost as a result of not performing the required localized preventative M&R

# Background: Pavement Deterioration



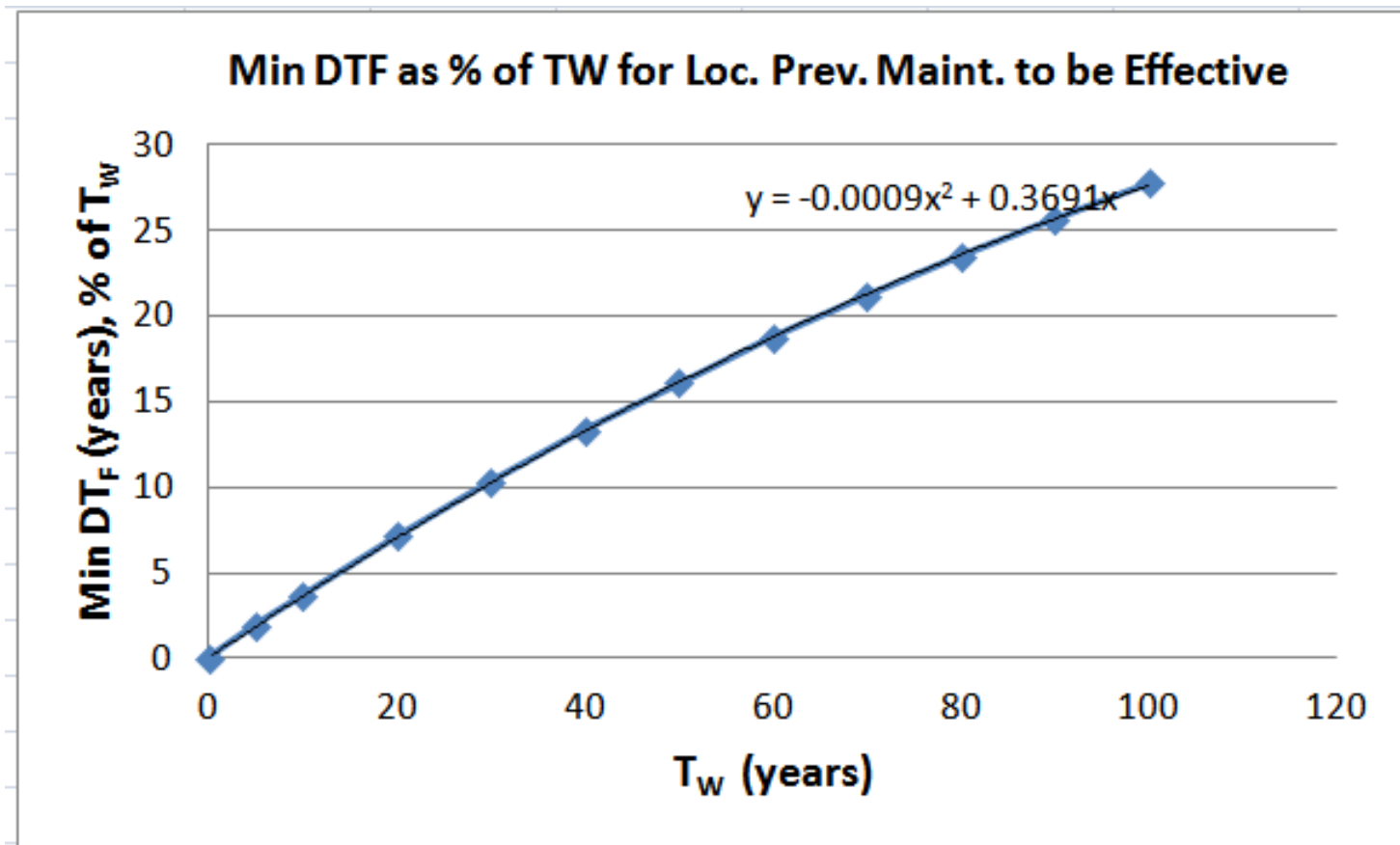
# Procedure: Loss in Pavement Family Life

- The value of  $DT_f$  depends on several factors including; pavement life with localized preventative maintenance ( $T_w$ ), pavement type (i.e. asphalt vs. concrete), climate, and traffic
  - Recommended  $DT_f$  when  $T_w$  is 20 years:

Climate	$DT_{f20}$ , years
Dry/No Freeze	5
Wet/No Freeze-Dry/ Freeze	7.5
Wet/Freeze	10

# Procedure: $DT_f$ for any other $T_w$

- $DT_f @ T_w = DT_{f20} * (.3691 T_w - .0009 T_w^2) / 7.13$



# Procedure: $DT_f$ Calculation Example

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- For example, if  $T_w = 25$  years, then  $DT_f$  for Dry/No Freeze is calculated as:

$$DT_{f20} * (.3691 T_w - .0009 T_w^2) / 7.13,$$

$$= 5 * (.3691 * 25 - .0009 * (25^2)) / 7.13$$

$$= 6.08 \text{ years}$$



# Cost Due to Loss of Pavement Life

## $EUAC_{LOSS}$

---

$$EUAC_{LOSS} = EUAC_{Alt2} - EUAC_{Alt1},$$

Where,

$$EUAC_{Alt2} = (\$_{Annual-Major-Alt2}) + \$_{Annual-operational},$$

$$EUAC_{Alt1} = (\$_{Annual-Major-Alt1}) + \$_{Annual-Preventive}$$

# EUAC<sub>Loss</sub> Example - Localized Preventive

Given:

- Major M&R = \$ 20/ SM
- Annual Preventive = \$0.09/ SM
- Annual Operational, Safety = \$0.04/ SM

Then:

- ✓  $\$_{\text{Annual-Major-Alt1}} = \$ 20 / 25 = \$ 0.8 / \text{SM} / \text{YR}$
- ✓  $\$_{\text{Annual-Major-Alt2}} = \$ 20 / (25 - 6.08) = \$ 1.0571 / \text{SM} / \text{YR}$
- ✓  $\text{EUAC}_{\text{Alt2}} = \$ 1.0571 + \$ 0.04 = \$ 1.0971 / \text{SM} / \text{YR}$
- ✓  $\text{EUAC}_{\text{Alt1}} = \$ 0.8 + \$ 0.09 = \$ 0.89 / \text{SM} / \text{YR}$
- ✓  $\text{EUAC}_{\text{LOSS}} = \$ 1.0971 - \$ 0.89 = \$ 0.2071 / \text{SM} / \text{YR}$

# Loss in Cost For Each Section ( $C_i$ )

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$C_i = \text{EUAC}_{\text{Loss}} * T_W * \text{section area in SM,}$   
where

$Dt_i = \text{loss in life for section } i$

In the example,

- $\text{EUAC}_{\text{Loss}} = \$0.2071 / \text{SM} / \text{YR}$
  - $Dt_i = 3.04 \text{ years}$
  - Assume section area = 5000 SM
- ✓  $C_i = \$ 0.2071 * 25 * 5000 = \$ 25,887$

# Risk of Not Performing Global Preventive Maintenance

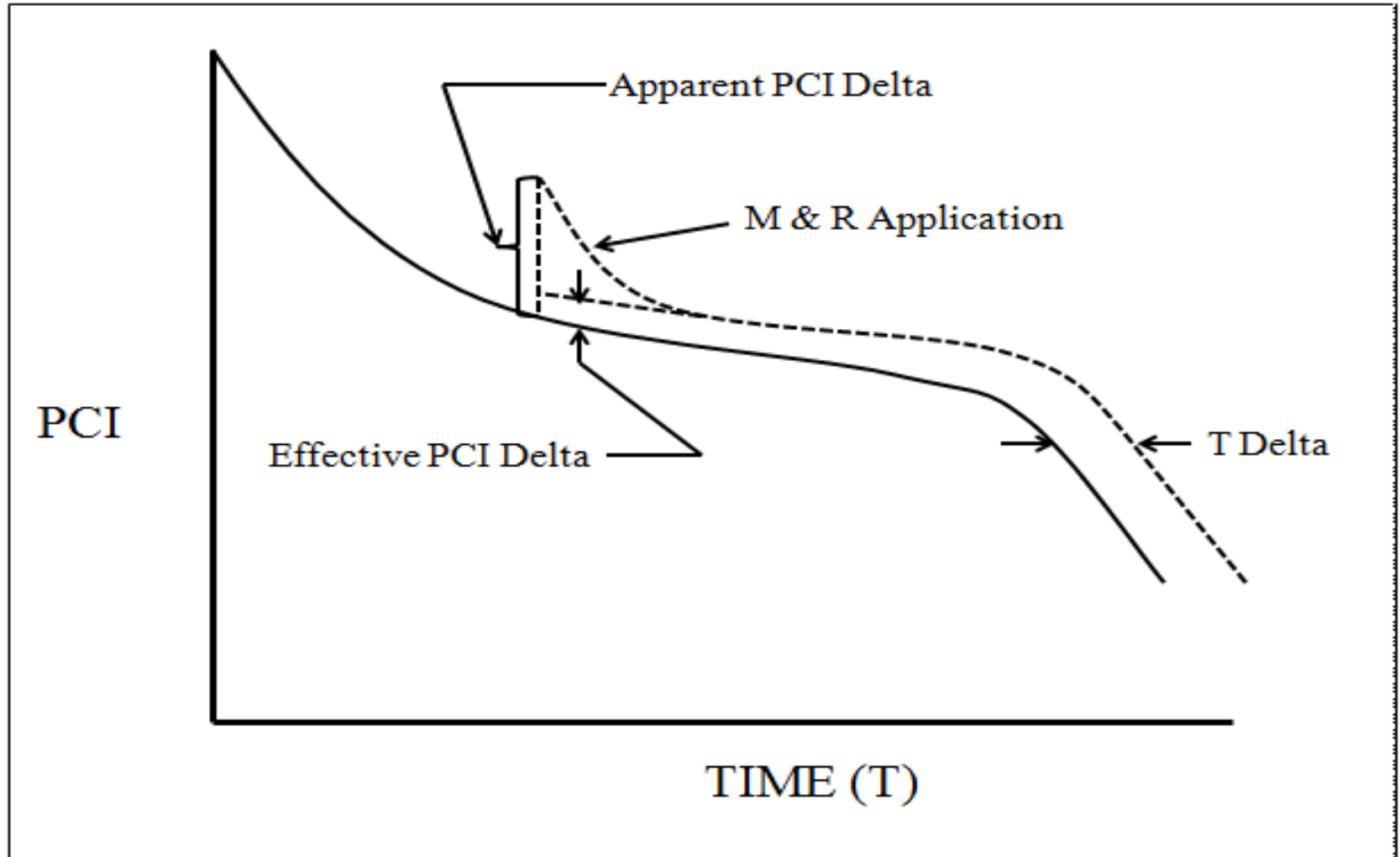


# Background: Global Preventative M&R

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- Typically, global preventative maintenance is applied for pavements above the Critical PCI at an appropriate frequency throughout the life of pavement
- Examples of global preventive types are: fog seals, rejuvenators, and slurry seals
- Risk is defined as the decrease in pavement life and thus increase in the overall section M&R cost as a result of not performing the required global preventative M&R.
- The procedure presented is for determining the risk for a single application.

# Background: Effect of Global Preventive M&R on Pavement Condition



# Procedure: Calculate Age to PCI<sub>C</sub> Assuming No Global (T<sub>WO\_G</sub>)

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$$T_{WO\_G} = (100 - PCI_C) / R_{WO\_G}$$

Example,

- $PCI_C = 60$
- $R_{WO\_G} = 2$  PCI Points per Year,

$$T_{WO\_G} = (100 - 60) / 2 = 20 \text{ years.}$$

# Procedure: Estimate Delta ( $D_T$ )

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- Delta T ( $D_T$ ) is the effective increase in pavement life due to the application of the global treatment
- The value of  $D_T$  is a function of a variety of factors including pavement condition, climatic conditions (such as solar radiation), as well as the type of treatment being applied. It normally ranges from 2 to 7 years.



# Procedure: Guidelines for Estimating $D_T$

- Use the midpoint of the range unless local experience and condition indicate other values within the range are more appropriate

Type of Seal Coat	$D_T$ , years
Fog Seal	2-3
Rejuvenator	3-5
Slurry Seal/ Chip Seal	4-6
Microsurfacing	5-7

# Procedure: Calculate Age to PCI<sub>c</sub> Assuming Global(T<sub>W\_G</sub>)

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$$T_{W_G} = T_{WO_G} + D_T$$

- In the example above, assuming DT = 5years,

$$T_{W_G} = 20 + 5 = 25 \text{ years.}$$

# Cost Due to Loss of Pavement Life

## $EUAC_{LOSS}$

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$$EUAC_{LOSS} = EUAC_{Alt2} - EUAC_{Alt1},$$

Where,

- $EUAC_{Alt2} = \$_{Major-critical} / T_{WO\_G}$
- $EUAC_{Alt1} = (\$_{Major-critical} / T_{W\_G}) + \$_{Global}$
- $\$_{Major-critical} =$  Major M&R cost at critical PCI
- $T_{WO\_G} =$  Pavement life without Global
- $T_{W\_G} =$  Pavement life with Global
- $\$_{Global} =$  Treatment Unit cost/ $T_{W\_G}$

# EUAC<sub>Loss</sub> Example - Global Preventive

Given:

- $\$_{\text{Major-critical}} = \$ 20/ \text{SM}$
- $T_{\text{WO}_G} = 20 \text{ years}$
- $T_{\text{W}_G} = 25 \text{ years}$
- Global Treatment Cost=  $\$2/ \text{SM}$

Then:

- ✓  $\text{EUAC}_{\text{Alt2}} = 20 / 20 = \$ 1.0/ \text{SM/ YR}$
- ✓  $\text{EUAC}_{\text{Alt1}} = (20 / 25) + (2/ 25) = \$ 0.88/ \text{SM/ YR}$
- ✓  $\text{EUAC}_{\text{LOSS}} = \$ 1.0 - \$ 0.88 = \$ 0.12/ \text{SM / YR}$

# Loss in Cost For Each Section ( $C_i$ )

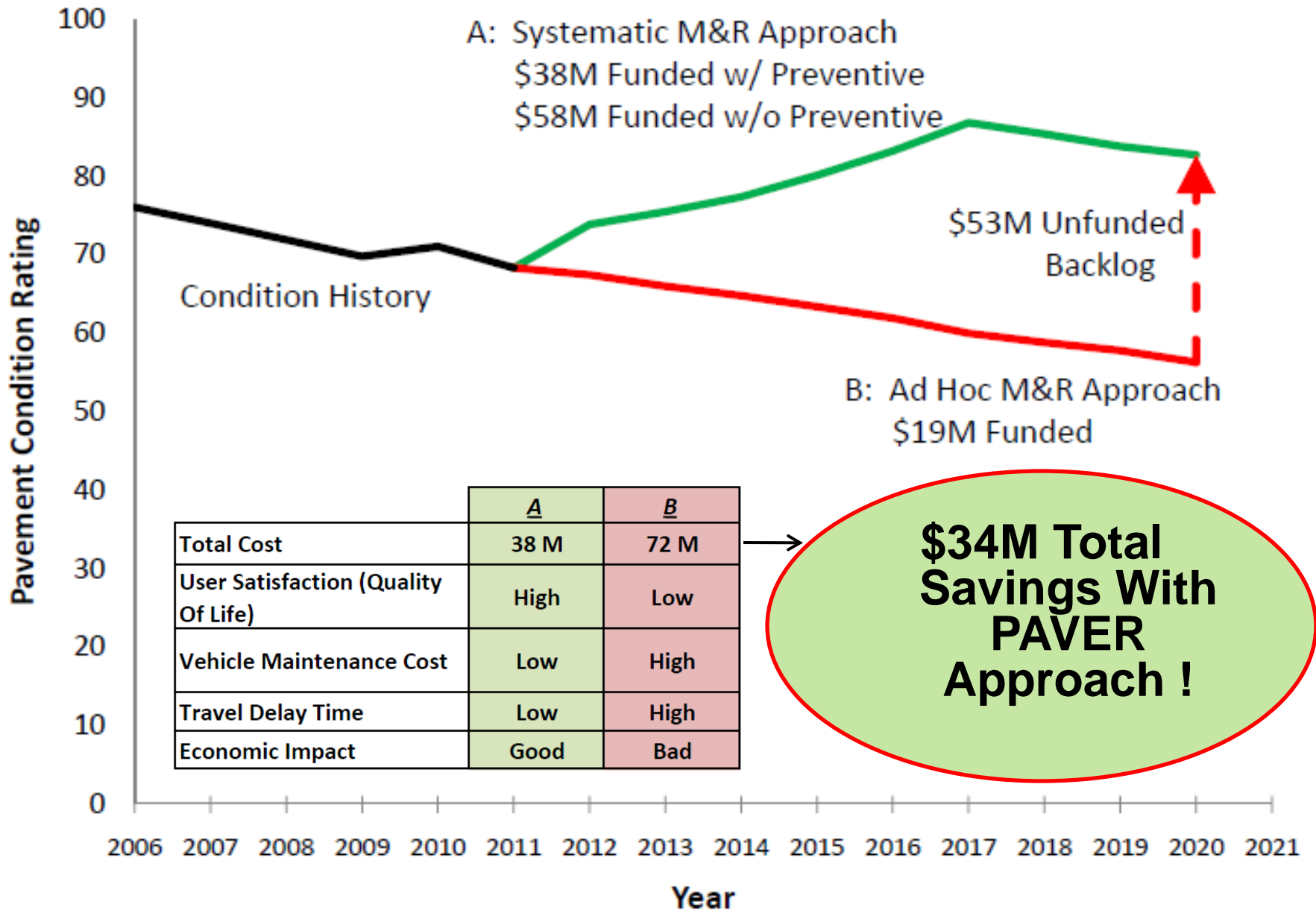
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$$C_i = \text{EUAC}_{\text{Loss}} * T_{W\_G} * \text{Section area in SM}$$

In the example,

- $D_T = 5$  years
  - $\text{EUAC}_{\text{Loss}} = \$0.12 / \text{SM} / \text{YR}$
  - Assume section  $i$  is 5000 SM
- ✓  $C_i = \$ 0.12 * 25 * 5000 = \$ 15,000.00$

# Quantifying the Benefits of Pavement Management



# PAVER™ version 7.0



# V7 - Personal PC Install

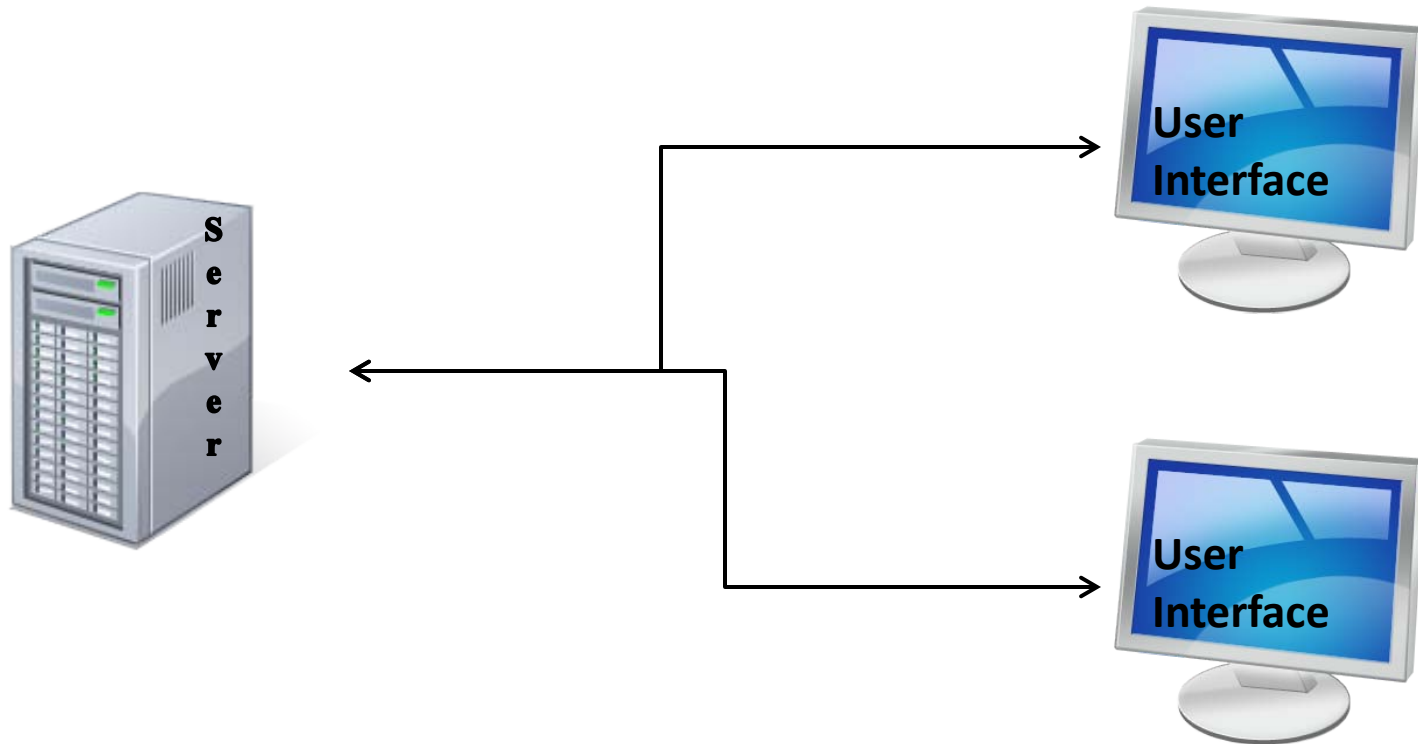
PAVER<sup>TM</sup> is installed onto a single machine just as it is in version 5 and 6 currently.





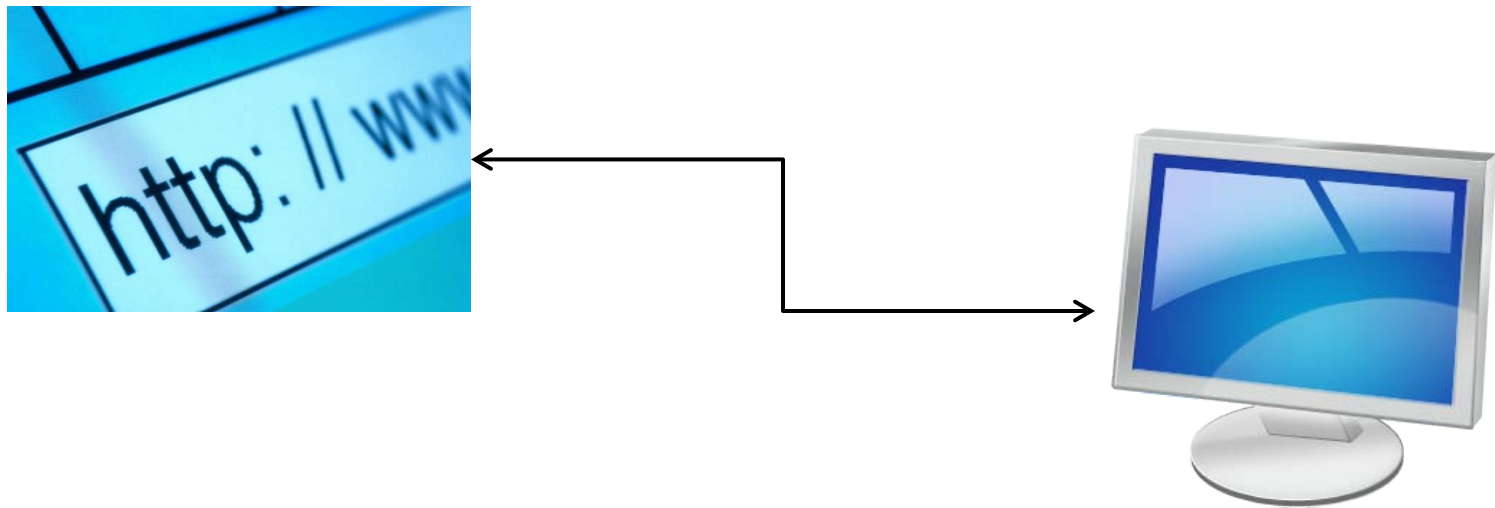
# V7 - Client – Server Install

The engineering rules and PAVER™ data are installed on a server, and users access it via individual computers that have the user interface installed on it (“thick client”).

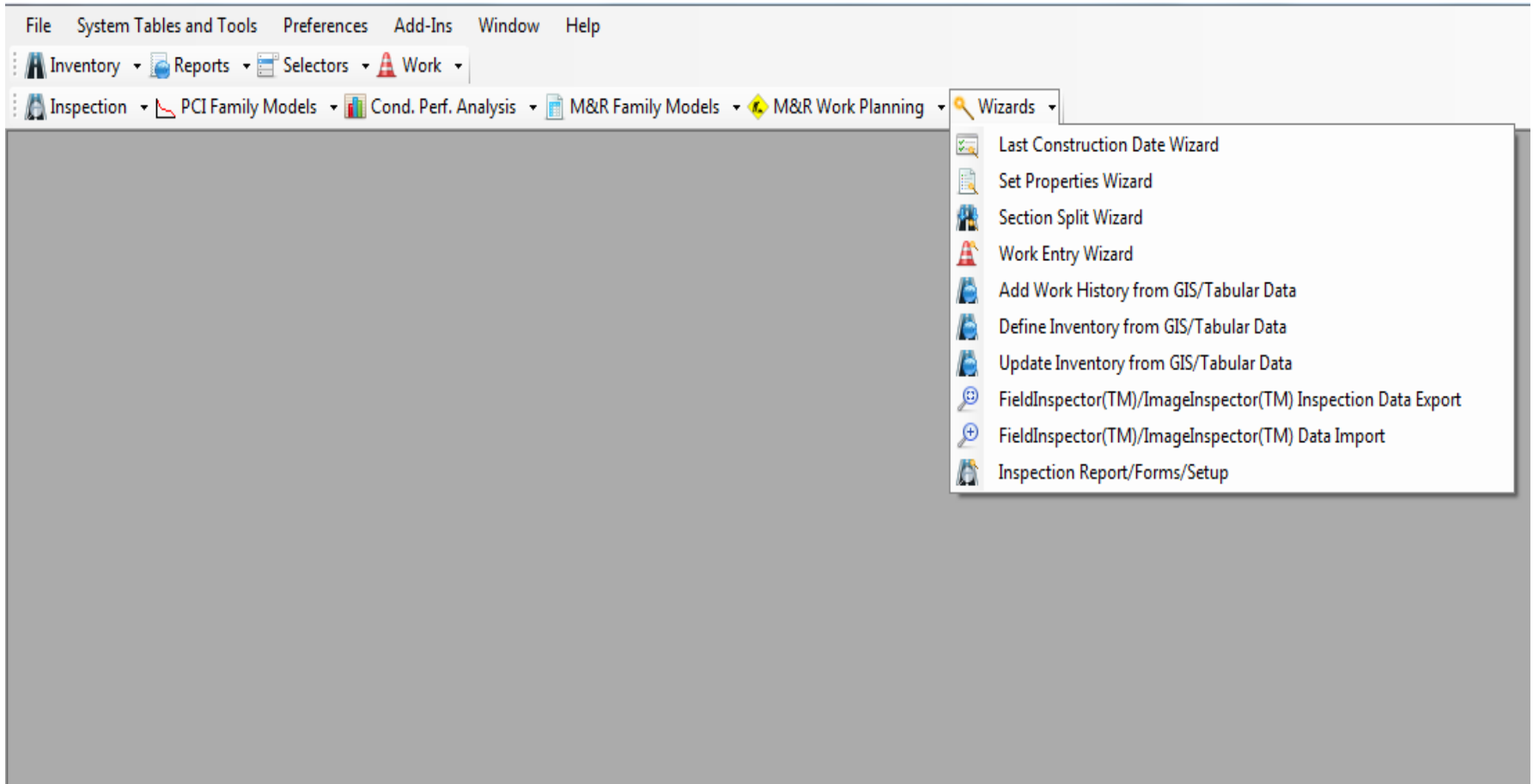


# V7 - WebPAVER™ Install

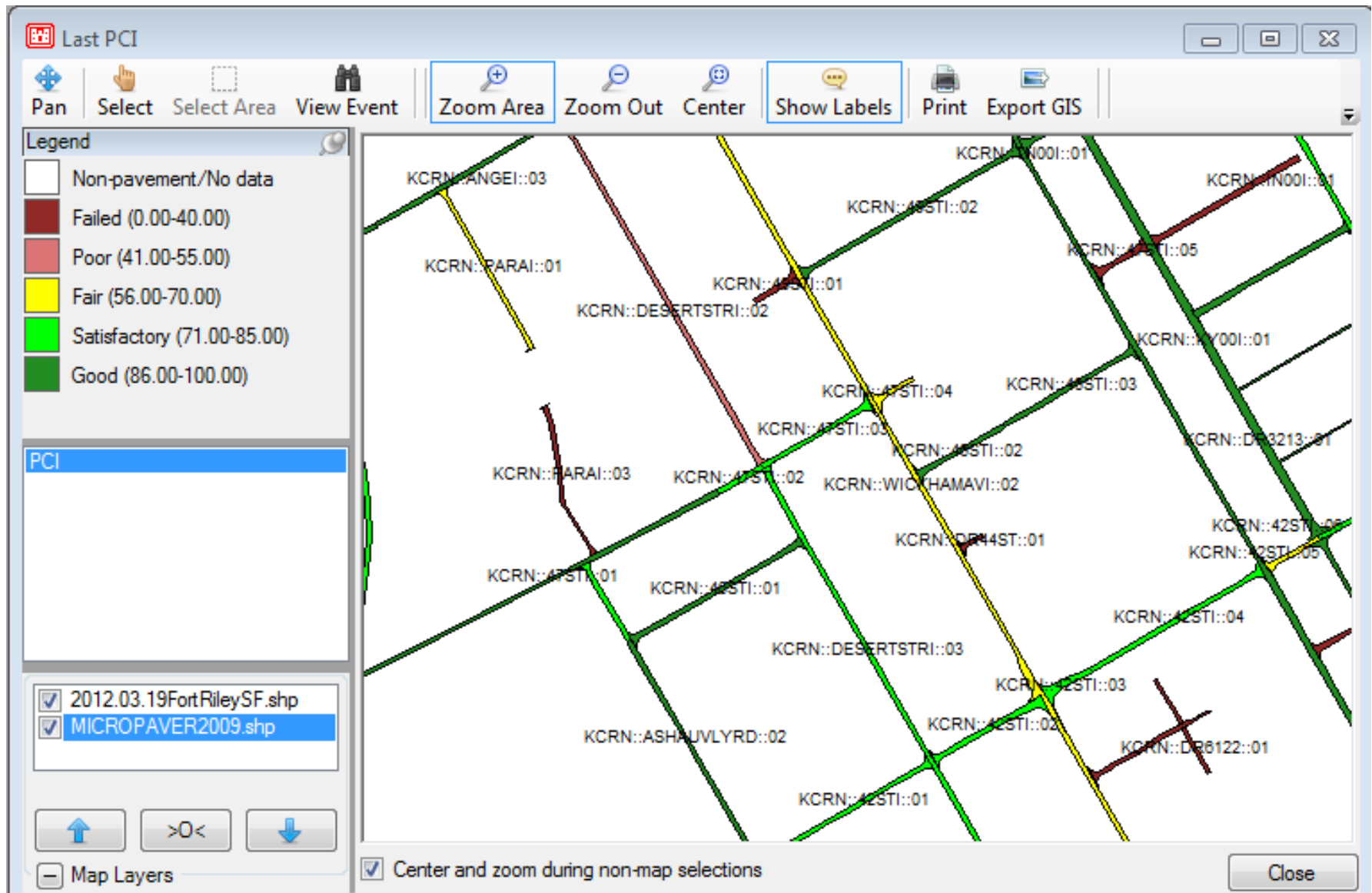
PAVER™ is accessed over the internet so that the thick client, or user interface does not need to be present on the computer in use.



# PAVER 7 Desktop – Menu Driven



# Example GIS PCI Condition Report



# French Translation

Editer l'Inspection (MANSFIELD::APRON::A (FBO))

**Donnees Sommaires au moment de l' Inspection**  
 Branche **APRON** Type de **AC** Rang **S**  
 Longueur **482.00 Ft** Largeur **163.50 Ft** Zone Reelle **84,685.00 SqFt**

**Inspection**  
 Date **5/9/2006** [Calculer les Conditions] [+] [Pencil] [X] [Print] [Camera] 0

**Echantillon**  
 Unite **02** [Up] [Down] PCI **24** **Serious** [+] [Pencil] [X] [Print] [Camera] 0  
 Pas de Detresses Trouvees sur l'Echantillo Les echantillons restants n'ont pas de detresse [Nombre Total d]

**Selection de Detress**

Dist	Description	L	M	H	N
41	FAIENCAGE LZ...				
42	SAIGNEMENT				
43	BLOC/CRACQU...				
44	ONDULATION				
45	DEPRESSION				
46	JET BLAST				
47	DEGR CHAUS S...				
48	L&T CRACQUA...				
49	FIOUL RENVER...				
50	PATCHER				
51	AGRGT POLI				
52	DESENROBAGE				
53	ORNIERAGE				
54	POUSSER				
55	GLISSMT FISSU...				
56	GONFLEMENT				
57	PELADE				

**Detresses**

Detresse	Description	Gravite	Quantite	Units	Densite
41	FAIENCAGE LZ...	Medium	679.99	SqFt	16.39
43	BLOC/CRACQU...	Medium	3,469.97	SqFt	83.61

Quantite

Rt

1 2  
4 5  
7 8  
C 0

+ \$


HTML Viewer

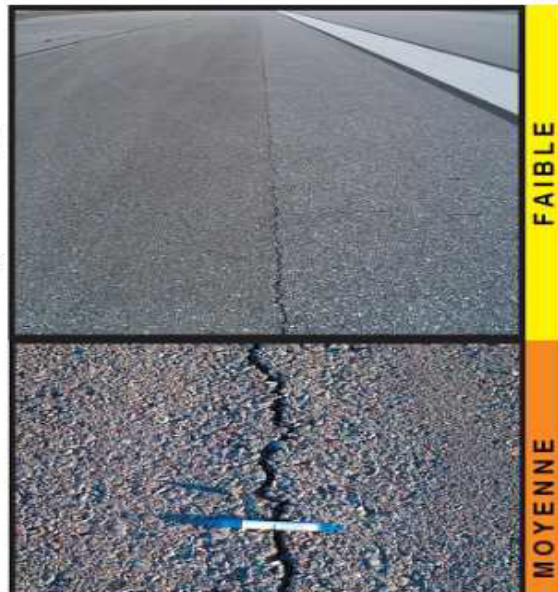
## FISSURATION LONGITUDINALE ET TRANSVERSALE (48) (PAS DE JOINT PCC REFLECTIVE)

**Description**

Les fissures longitudinales sont paralleles a l'axe de la chaussée ou vers la direction de la pose. Elles peuvent être causées par (1) un joint de la voie de pavage mal construit, (2) retrecissement de la surface AC en raison de basses temperatures ou du durcissement de l'asphalte, ou (3) une fissure reflective causee par les fissurations des dalles en PCC (mais pas au niveau des joints). Les fissures transversales se prolongent a travers la chaussée approximativement aux angles droits de l'axe de la chaussée ou vers la direction de la pose. Elles peuvent être causées par les points 2 et 3 ci-dessus. Ces types de fissures ne sont pas habituellement associees a la charge, la fissure est dite d' être ecailee.

**Niveaux de Gravite**

 Les fissures ont soit un ecaillage minime (peu ou pas de potentiel FOD). Les



Inspection PCI

# Arabic Translation

[-] ar\_\_Inspection

ar\_\_Dat e 
ar\_\_Calc. Conditions
ar\_\_Extrpl Distress
+ ✎ ✖ 📄
📷 0

[-] Echantillon

Unite  ↑ ↓
ar\_\_PCI  
+ ✎ ✖ 📄
📷 0

Taille 2,100.00 SqFt

Les Echantillons Restants n ont pas de detresse
ar\_\_Sum Distr

**ar\_\_Distress selection**

Distress	Description	L	M	H	N
1	شروع مساحه	○	●	○	○
2	نزيف الإسفلت	○	○	○	○
3	شروع شبكيه	○	○	○	○
4	ارطافات و انخفاضات	○	○	○	○
5	تسويات	○	○	○	○
6	شقوق	○	○	○	○
7	شروع الحواف	○	○	○	○
8	شروع يعكسه من الـ	○	○	○	○
9	شقوق اكشاف	○	○	○	○
10	شروع طوليه و عرضيه	○	○	○	○
11	ترقيع	○	○	○	○
12	حجاره باصمه	○	○	○	○
13	حفره	○	○	○	○
14	مقاطع مع سكه حديد	○	○	○	○
15	تخلد	○	○	○	○
16	زق	○	○	○	○
17	شروع انزلاكيه	○	○	○	○
18	الانفاس	○	○	○	○
19	شكك	○	○	○	○
20	تتريه الحجاره	○	○	○	○

**ar\_\_Quantity**

1 2 3  
4 5 6  
7 8 9  
C 0 .

450.00 SqFt

+ ↻ ✖

**ar\_\_Distresses**

العيب	الوصف	الشده	الكليه	Units
1	شروع مساحه	Medium	450.00	SqFt
10	شروع طوليه و عرضيه	Low	150.00	Ft

ar\_\_PCI Inspection ar\_\_Non PCI Inspection





# PAVER™ FieldInspector™





# PAVER Field Inspector - Asphalt PCI



Edit Inspection (ROADPARK::NORTH::1)

**Summary data at time of inspection**

Branch Use **ROADWAY** Surface Type **AC** Rank **S**  
 Length **924.00 Ft** Width **27.00 Ft** True Area **24,156.00 SqFt**

**Inspection**

Date **10/24/2013** Calc. Conditions Extrl Distress

**Sample**

Unit **1** PCI **36** **Failing**  
 Unit Size **2,400.00 SqFt**  
 No distresses found on sample Remaining samples have no distress Distress Totals

**Distress selection**

L **M** H

1 ALLIGATOR CR	2 BLEEDING	3 BLOCK CR	4 BUMPS/SAGS
5 CORRUGATION	6 DEPRESSION	7 EDGE CR	8 JT REF. CR
9 LANE SH DROP	10 L & T CR	11 PATCH/UT CUT	12 POLISHED AG
13 POTHOLE	14 RR CROSSING	15 RUTTING	16 SHOVING
17 SLIPPAGE CR	18 SWELL	19 RAVELING	20 WEATHERING

**Quantity**

1	2	3
4	5	6
7	8	9
C	0	.
SqFt		
+	↻	×

**Distresses**

DISTRES	Description	Severity	Quantity	Units	Density	Deduct	Comment
4	BUMPS/SA...	Medium	24.00	Ft	1.00	23.67	Add
1	ALLIGATO...	Medium	100.00	SqFt	4.17	36.25	Add
15	RUTTING	Medium	200.00	SqFt	8.33	41.74	Add

**HTML Viewer**

**ALLIGATOR OR FATIGUE CRACKING (1)**

**Description**

Alligator or fatigue cracking is a series of interconnecting cracks caused by fatigue failure of the asphalt concrete surface under repeated traffic loading. Cracking begins at the bottom of the asphalt surface (or stabilized base) where tensile stress and strain are highest under

PCI Inspection Non PCI Inspection





# Asphalt Non PCI Inspection



Edit Inspection (ROADPARK::NORTH::1)

**Summary data at time of inspection**

Branch Use	<b>ROADWAY</b>	Surface Type	<b>AC</b>	Rank	<b>S</b>
Length	<b>924.00 Ft</b>	Width	<b>27.00 Ft</b>	True Area	<b>24,156.00 SqFt</b>

**Inspection**

Date:

**Selected Non-distress Conditions**

Traffic Signs (Numeric from 1 to 10) Traffic Signs	
Pavement Striping (Numeric from 1 to 10) Pavement Striping	

PCI Inspection  
Non PCI Inspection



# Concrete PCI Inspection



**Edit Inspection (IRP::IRESE::01)**

**Summary data at time of inspection**

Branch Use **ROADWAY**    Surface Type **PCC**    Rank **S**

Length **400.00 Ft**    Width **28.00 Ft**    True Area **11,200.00 SqFt**

**Slab Properties**  
 Length **20.0**    Width **14.0 Ft**  
 Total Slabs **40**

**Inspection**

Date **7/30/2011**

**Sample**

Unit **1**            PCI **42**    **Poor**               

Unit Size    **16 Slabs**

No distresses found on sample

No distress on Slab

Distress	Description	L	M	H	N	Comment
21	BLOW UP	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
22	CORNER BREAK	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
23	DIVIDED SLAB	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
24	DURABIL CR	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
25	FAULTING	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
26	JT SEAL DMG	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		Add
27	LAND SH DROP	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
28	LINEAR CR	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
29	LARGE PATCH	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
30	SMALL PATCH	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
31	POLISHED AG				<input type="radio"/>	
32	POPOUTS				<input type="radio"/>	
33	PUMPING				<input type="radio"/>	
34	PUNCHOUT	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
35	RR CROSSING	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
36	SCALING	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
37	SHRINK CR				<input type="radio"/>	
38	CORNER SPALL	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
39	JOINT SPALL	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>		Add

**Slab Tools**  
 Select     Relocate

\*Joint Seal Damage applies to entire Sample.

PCI Inspection



# PAVER™ ImageInspector™

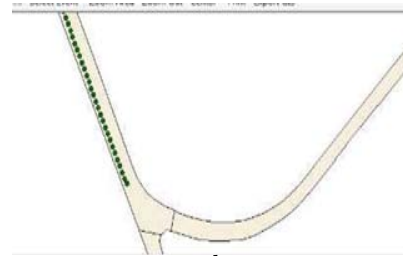


## Image Interpretation Workstation

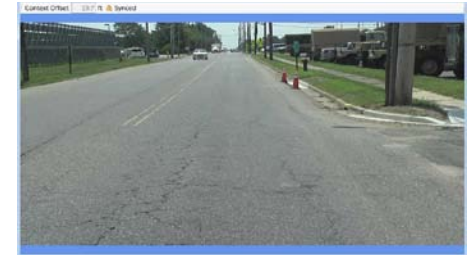
Inventory from  
PAVER (.i70)



Assign Images to  
PID



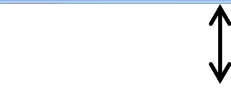
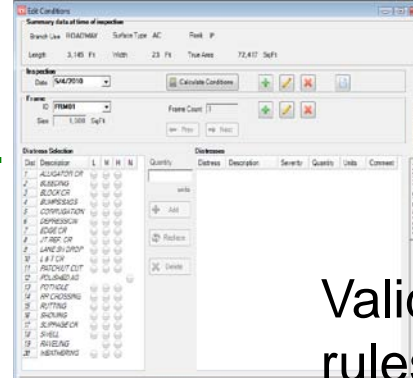
Right of  
way Image



Images and  
GPS Data



Inspection



Downward View



XML Distress Data to  
PAVER  
(Import Tool)



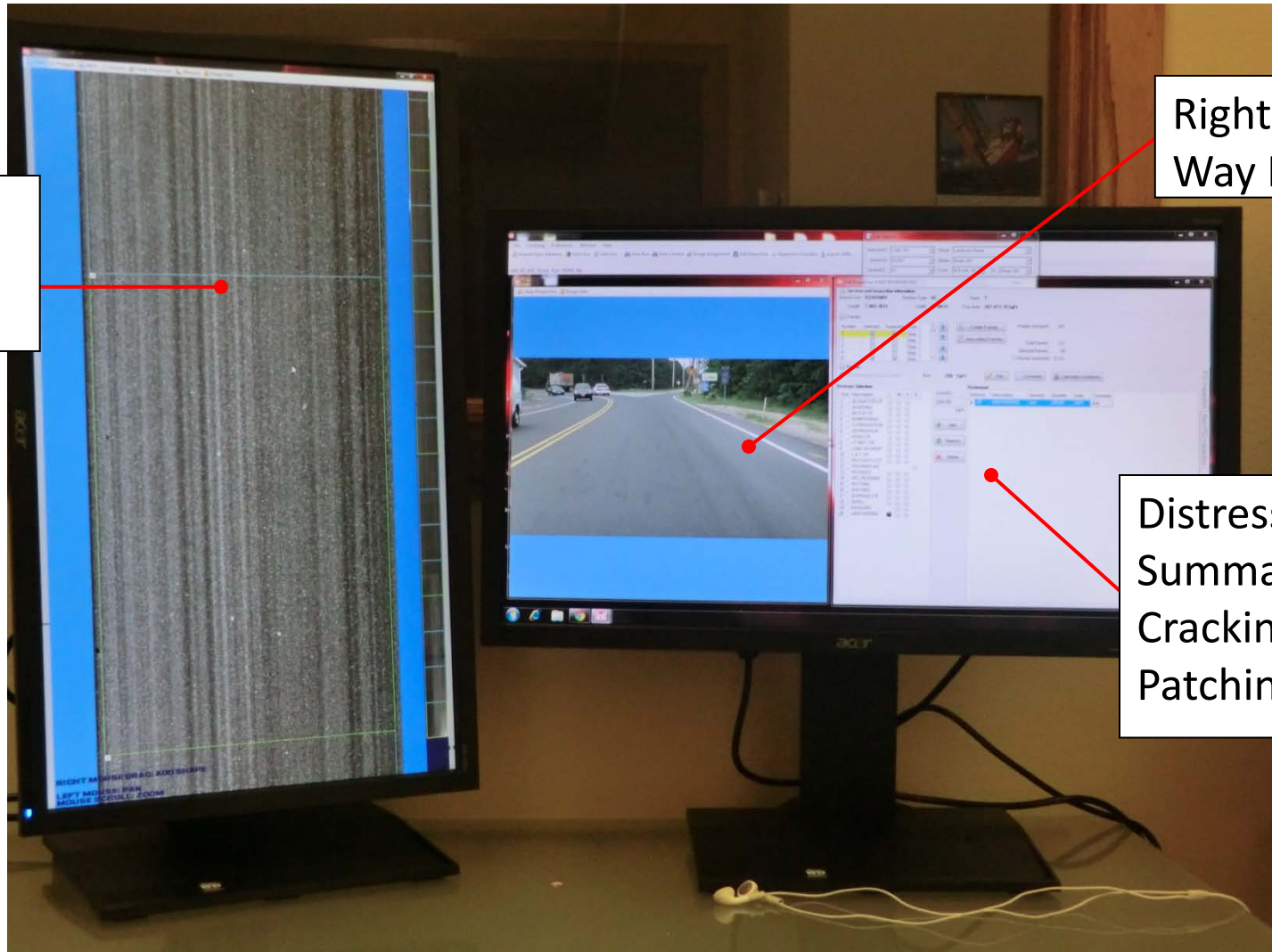
Validation  
rules







# Pavement Distress Interpretation



Pavement  
Downward  
Image

Right Of  
Way Image

Distress  
Summary:  
Cracking/  
Patching/ etc.

# PAVER Users



# Universities

