

PAVEMENT PRESERVATION FOR GENERAL AVIATION AIRPORTS

2011 ASU MATERIALS/PAVEMENT CONFERENCE

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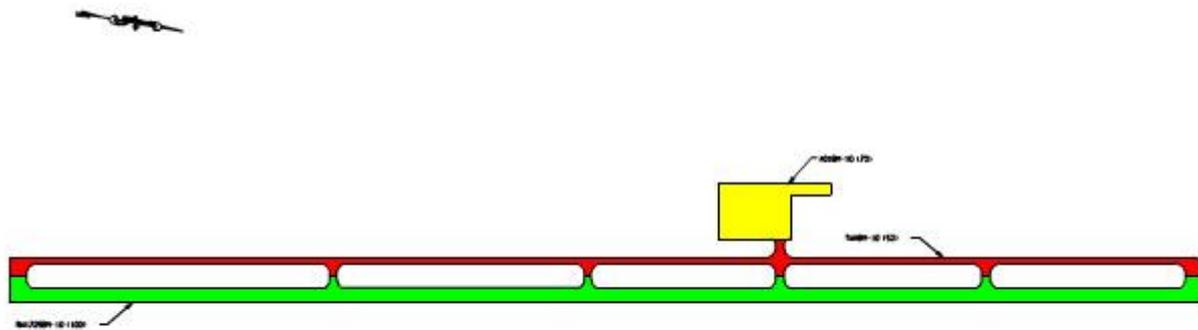
Overview

- The Problem
- Typical Types of Distress
- Elements of pavement preservation program.
 - Pavement Management
 - Tool box

Situation

- *80 to 85% of the airfield pavements are Hot Mix Asphalt*
- *The Majority of these are General Aviation Airfields*
- *Limited Funding for Maintenance and Repairs*

General Aviation



**What is the primary distress
and what is its Extent?**

Non-Load Related Distress

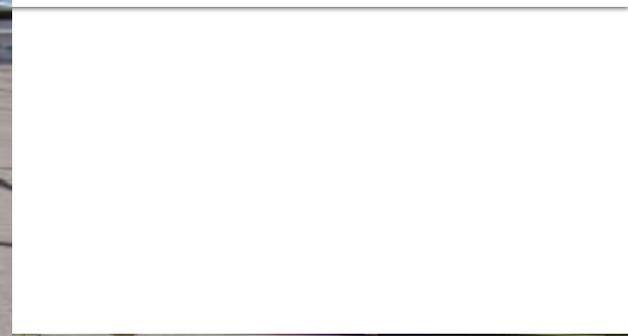
- Transverse Cracking
- Block Cracking
- Raveling

Usually the result of significant hardening of the asphalt binder

Transverse Cracking



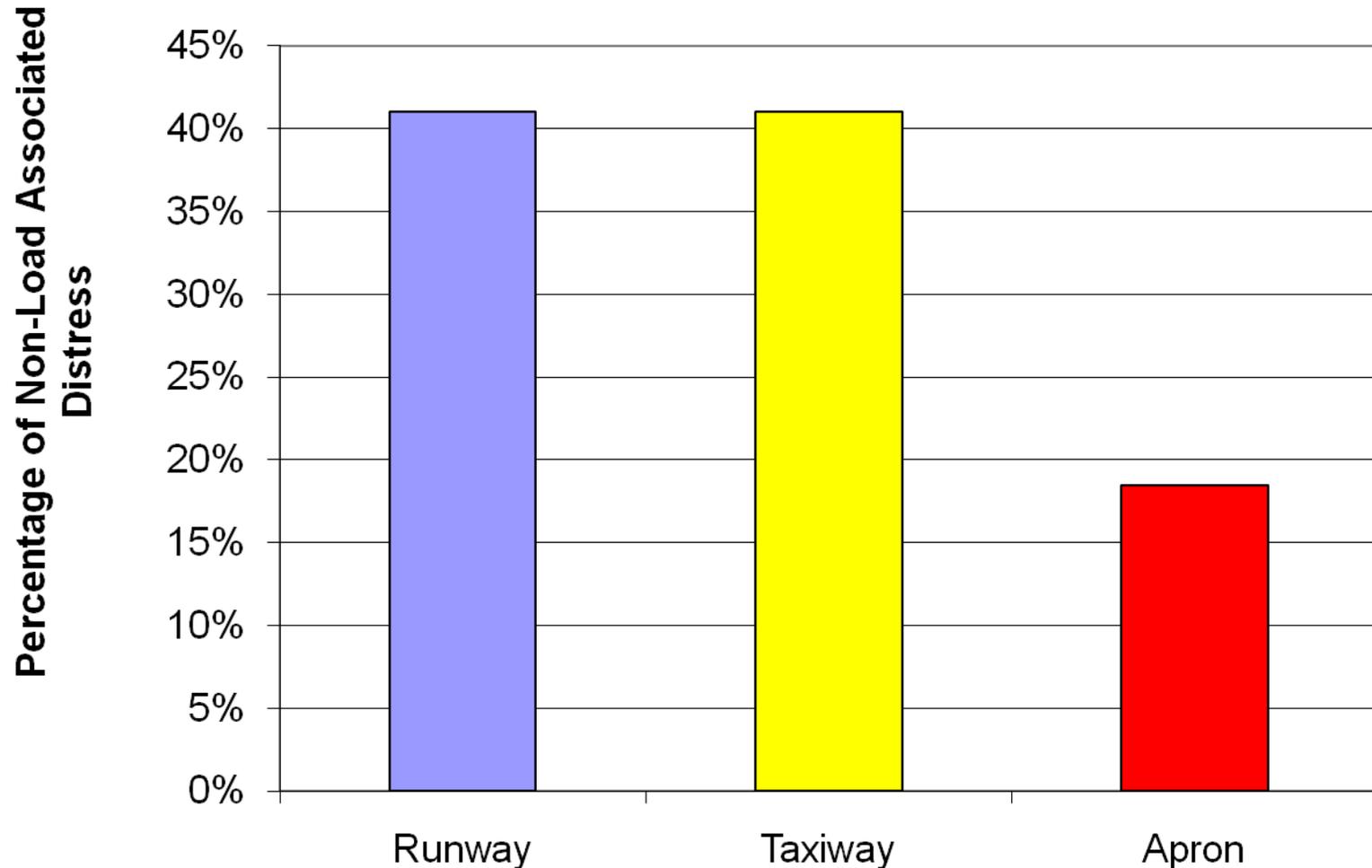
Block Cracking



Raveling and Weathering



Where does Non-Load Distress Occur?



Mitigation of Non-Load Associated Distress

Management of the Problem

The Goal

To Mitigate Non-Load related distress an Airport Owner must:

“At the right time apply the right treatment”

Airport Pavement Management

Asset Management

- Governed by FAA Advisory Circular AC150/5380-7A
- Benefits
 - An objective & consistent evaluation of network
 - A systematic and documentable engineering basis for maintenance and rehabilitation needs
 - Identify budget needs
 - Provide documentation for present and future condition of network
 - Develop life-cycle costs

MicroPAVER

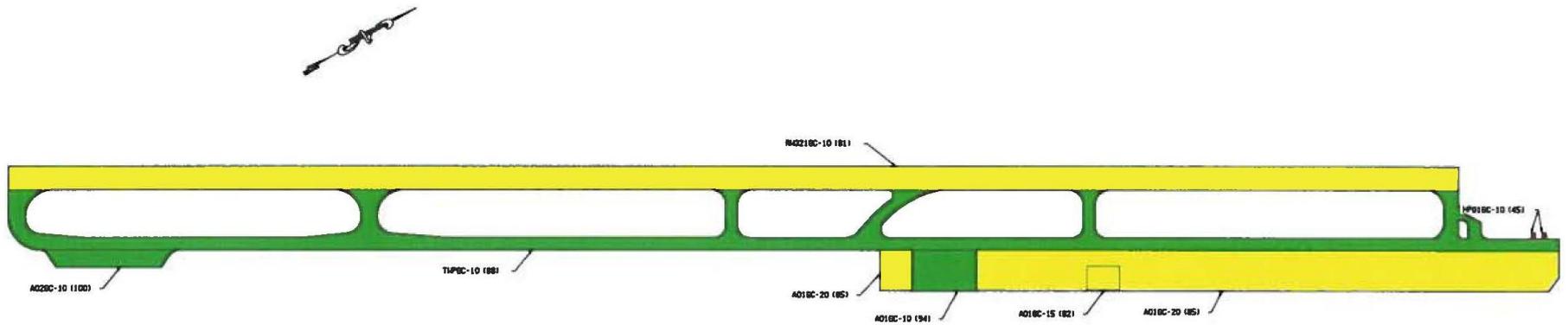
- *MicroPAVER* was developed by the Corps of Engineers initially for airports and now has been expanded to street systems.
- The *MircoPAVER* database can be used to document the following:
 - The location, dimensions and pavement types of all runways, taxiways and aprons.
 - The year of construction and the major pavement preservation techniques.
 - The results of periodic pavement surveys.

PAVEMENT CONDITON INDEX (PCI)

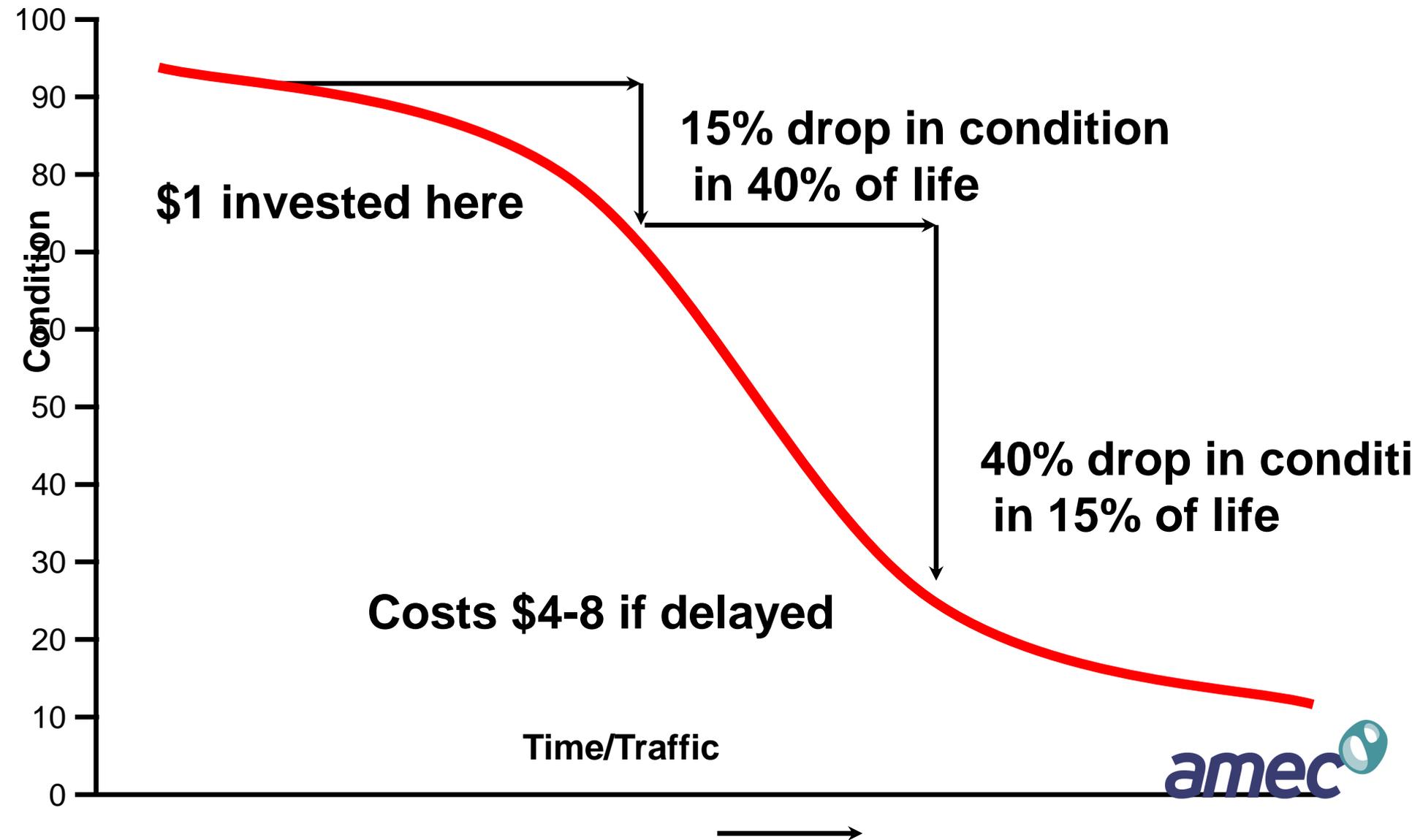


Airport Pavement Management

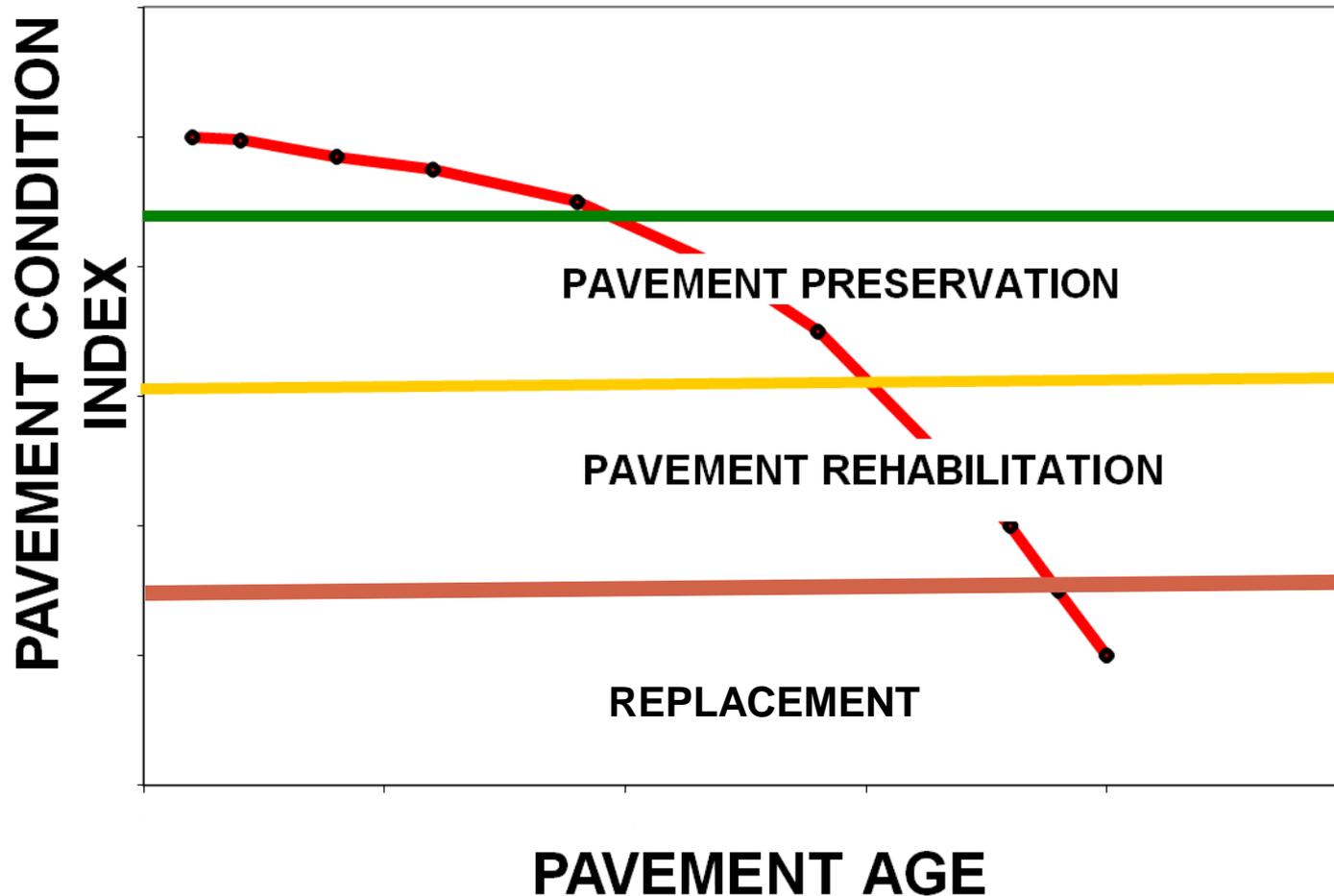
Grand Canyon Airport



Pavement Performance



Pavement Deterioration Curve & Trigger Points



Example of a Statewide Application

PCI Value	Action Taken
85 – 100	No action
70 – 85	Slurry seal
55 - 70	Place an overlay
Less than 55	Replace

Mitigation of Non-Load Related Distress Techniques or Tools

Unique Considerations



Unique Consideration



**FUEL
DAMAGE**



Techniques to be Discussed

- Spray Applied Seals
- Slurry Surfacing Seals
- Thin Overlays

Spray Applied Sealers



Spray Applied Sealers Materials

- Asphalt Sealers
- Asphalt Rejuvenators – FAA Spec P-632
- Sealer/Rejuvenators – Engr. Bulletin - 44
- Gilsonite sealer binders
- Coal-Tar emulsion sealers – FAA Spec P-631

Spray Applied Sealers

- Function
 - Reduce the rate at which surface properties change with aging
- Advantages/Disadvantages
 - Reduces the permeability of the surface
 - If applied too heavily to a nonporous surface – can leave pavement slippery and unsafe

Spray Applied Sealers

Life Expectancy

Life expectancy depends on the condition of the HMA pavement prior to placement

- PCI 80 – Good condition – 3 to 5 years
- PCI 60 – Fair condition – 1 to 3 years
- PCI 40 – Poor condition – 1 to 2 years

Slurry Sealing



Slurry Sealing Types

- Standard Slurry seal
- Polymer-modified slurry seal
- Microsurfacing
- Evolving technology
 - Rubber-emulsion aggregate slurry (Flexseal)
 - Coal tar slurry (Grip-Flex)

Slurry Sealing

Function

Slurry seal or microsurfacing is used for the following:

- Seal sound pavements
- Restore the surface texture in a pavement by providing a skid-resistant surface
- Reduce the permeability of the surface
- Correct raveling
- To fill ruts in an HMA pavement (microsurfacing)

Slurry Sealing

Advantages/Disadvantages

Advantages

- Seal sound pavements
- Restore the surface texture to provide a skid-resistant surface
- Reduce permeability of the surface

Disadvantages

- No structural value
- Requires specialized equipment
- Turning movements can result in loose rock causing a FOD problem

Slurry Sealing

Life Expectancy

- Life expectancy depends on the condition of the HMA pavement prior to placement of the standard slurry seal
 - PCI – 80, good condition – 7 to 10 years
 - PCI = 60, fair condition – 3 to 5 years
 - PCI = 40, poor condition – 1 to 3 years

Thin Overlays



Thin Overlays

Function

Thin Overlays are used to

- Restore the skid-resistant surface of the surface
- Reduce the permeability of the surface thus minimizing the moisture damage due to water infiltration
- Provide some structural improvement

Thin Overlays

Advantages/Disadvantages

Advantages

- Increases structural capacity
- Restore the surface texture to provide a skid-resistant surface
- Does not require specialized equipment
- Long life

Disadvantages

- More expensive

Thin Overlays

Life Expectancy

- Life expectancy depends on the condition of the HMA pavement prior to placement of the standard slurry seal
 - PCI – 80, good condition – 10 to 12 years
 - PCI = 60, fair condition – 5 to 7 years
 - PCI = 40, poor condition – 2 to 4 years

THANK
YOU