Pavement Preservation and Other Treatment Decisions: Comparing the Pavement Condition Index to Individual Distresses

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NATIONAL PAVEMENT PRESERVATION CONFERENCE
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IMPACTS AND BENEFITS FROM PAVEMENT PRESERVATION
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Overview

- Distress indexes
- Pavement Condition Index (PCI)
- Individual distresses
- Pavement treatment decisions based on indexes and distresses
- Some suggestions

Distress Indexes

- Combine multiple performance measures into a single value
- Examples: PSI, PCI, OCI, CRS, PASER
- Values reported on various scales

  e.g., 0 – 100, 1 – 5, 1– 9

Distress Indexes (continued)

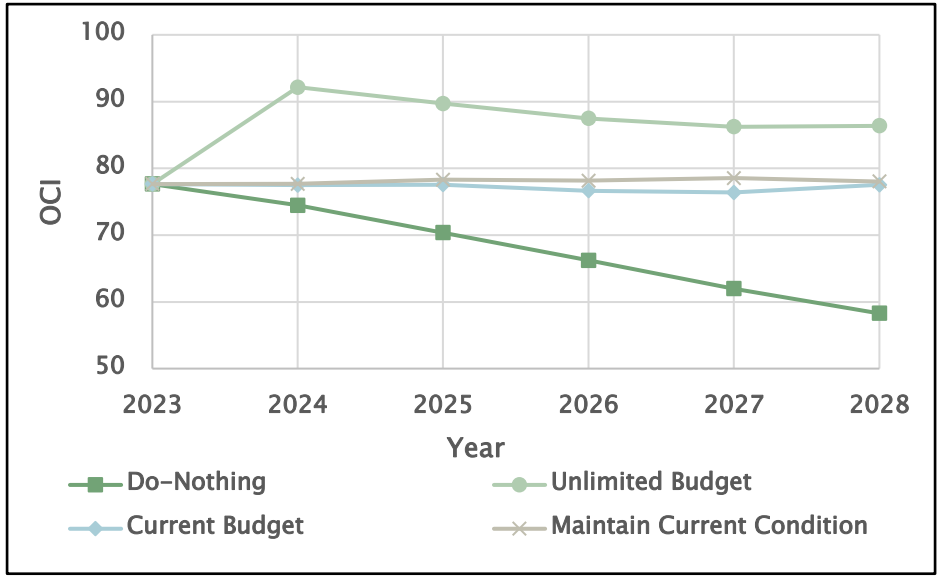
- Performance measures may include
  - Various defined distresses for different pavement types, perhaps further distinguished by severity levels and quantity
  - Subjective rating based on visual observation
  - Ride
  - Friction

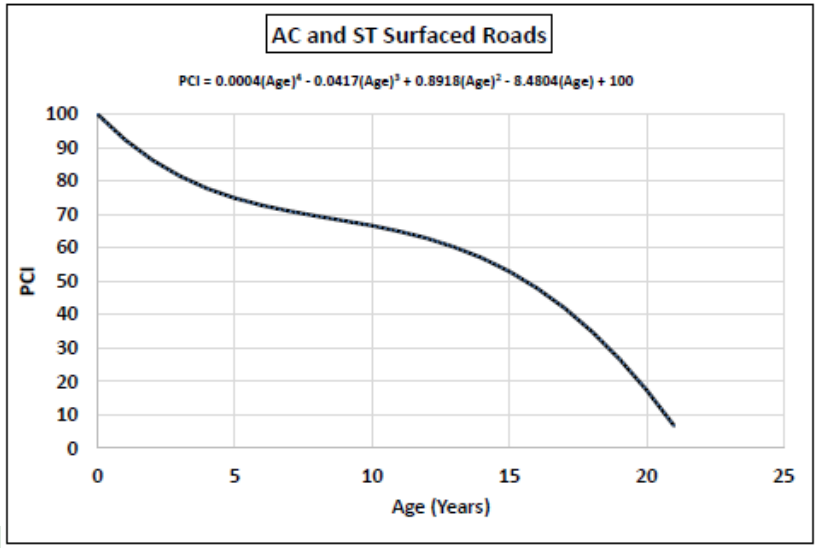
Distress Index Uses

- Present overall pavement conditions in an easy-to-understand manner
- Monitor and track pavement network decisions over time
- Make comparisons among networks
- Make treatment decisions (discussed later)

Distress Index Use Illustrated

PCI Range	Condition Category
100 to 86	Good
85 to 71	Satisfactory
70 to 56	Fair
55 to 41	Poor
40 to 26	Very Poor
25 to 11	Serious
10 to 0	Failed





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Pavement Condition Index (PCI)

- ASTM standard (D-5340, D-6433)
- D-6433 for roads and parking lots includes
  - 20 distresses defined for flexible pavements
  - 19 distresses defined for rigid pavements
- In addition to distress definition, most have different severity levels and quantity measures (e.g., number, linear, areal, or present Y/N)

PCI Calculation

- Based on total quantity of each distress type at each severity level
- Density of each distress type and severity level
- “Deduct Value” for each distress type and severity
- Maximum corrected Deduct Value

Individual Distresses

Defined by many

- PCI procedure
- FHWA LTPP Distress Identification
- Agency-specific definitions

Using Individual Distresses

- Quantify, estimate cost of repairs
  - Linear measure of cracks or joints for sealing
  - Area measure of partial, full-depth patching
- Identify and understand causes of deterioration
  - Construction
  - Materials
  - Environment
  - Load
  - Other

Using Individual Distresses (continued)

- Project selection
- Treatment selection

Image from roadresource.org

Using Overall Ratings to Select Projects/Treatments

- Consider 70 to 100 = Good, preservation candidate
- 40 to 69 = Fair, rehabilitation candidate
- < 40 = Poor, candidate for heavy rehabilitation or reconstruction

Infinite Ways to Reach PCI from 70 to 100

- 100% Low Weathering = 95
- 100% Low Block Cracking = 72
- 8% Low Alligator Cracking = 70
- 12% Low Rutting = 70
- 3.2% Medium Rutting = 70
- 1 Medium Pothole = 81

Infinite Ways to Reach PCI from 40 to 69

- 100% Medium Raveling = 56
- 50% Medium Raveling & Weathering = 63
- 100% Medium Raveling & Weathering = 54
- 90% Low Alligator Cracking or 30% Medium or 20% Medium and 10% Low = 40
- 1 High Pothole = 62

Infinite Ways to Reach PCI from 0 to 39

- Adding one or more distresses to previous examples of PCI = 40
- Increasing severity levels of distresses
- 30 to 100% High Longitudinal and transverse cracking = 14

Suggestions About an Index

- Condition index is useful simplification
  - Monitoring
  - Comparing
  - Planning
  - Categorizing
- An index, by itself, should not be used for treatment/selection decisions

Potential Misuse of an Index

- Is rehabilitation needed for an occasional pothole?
- Is preservation appropriate for 8% Low alligator cracking?
- Is reconstruction the right choice for Medium raveling and weathering and small amount of alligator cracking?

Suggestions About Distresses

- Properly identified and categorized, they provide good indication of performance of pavement
- Provide essential insights into causes of performance
- May be effectively used in project and treatment selection processes

Thank You


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