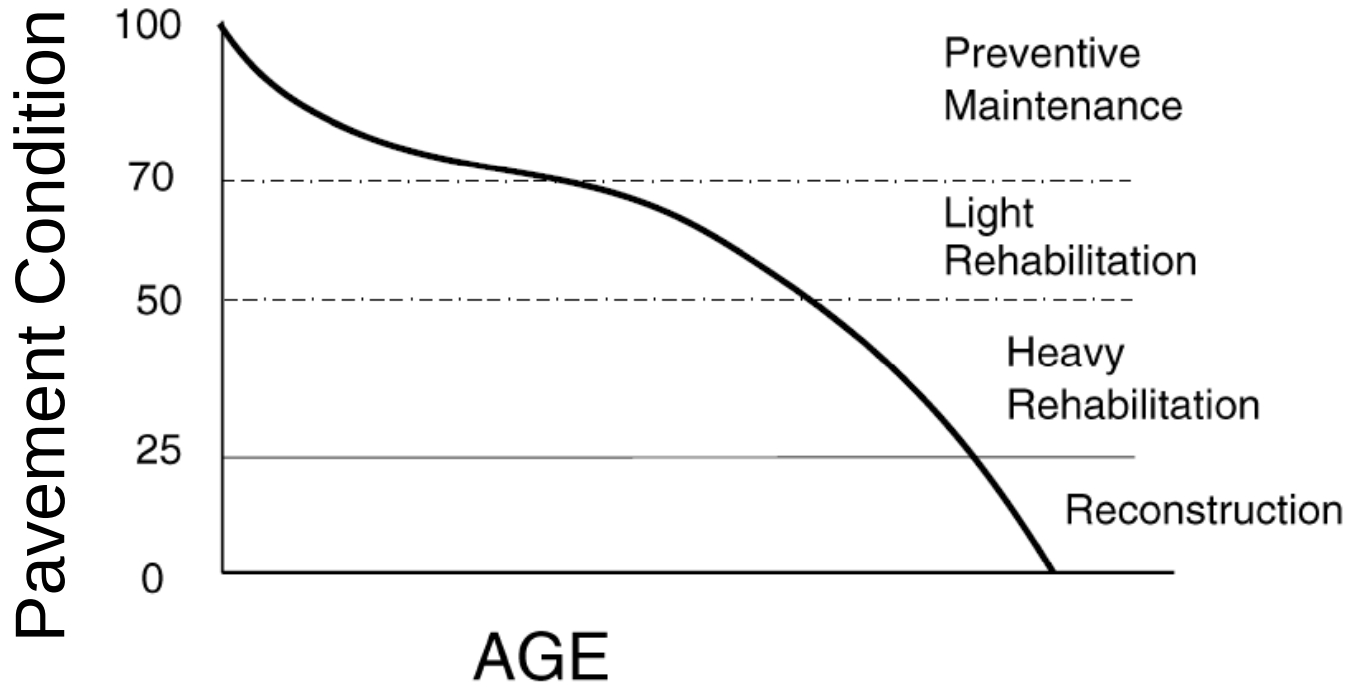
Treatment Strategies and Performance Models

Section 4

Criteria for Treatment Strategies

- Pavement condition
- Surface type/pavement materials
- Functional classification
- Level of condition that will “trigger” or initiate a treatment

Example of Trigger Values



Preventive Maintenance

- Treatments that extend the life of the pavement by preserving the existing structure.
  - Fog seal
  - Chip seal
  - Slurry seal
  - Micro surface
  - High-density mineral bond

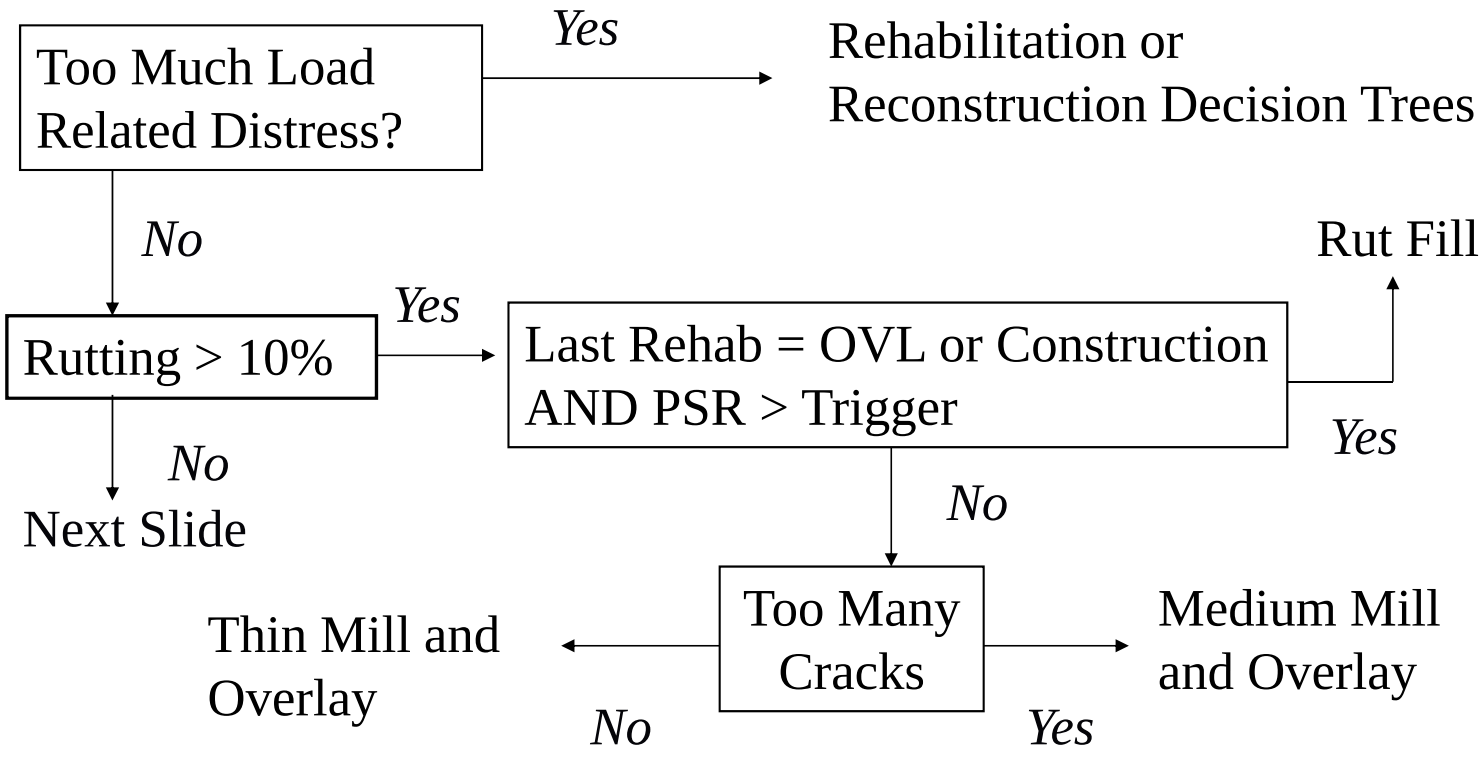
Light Rehabilitation

- Treatments that typically replace the wearing surface of the existing pavement but may not provide any structural capacity increase
  - Thin bonded overlays
  - Open-graded friction course
  - Cape seals

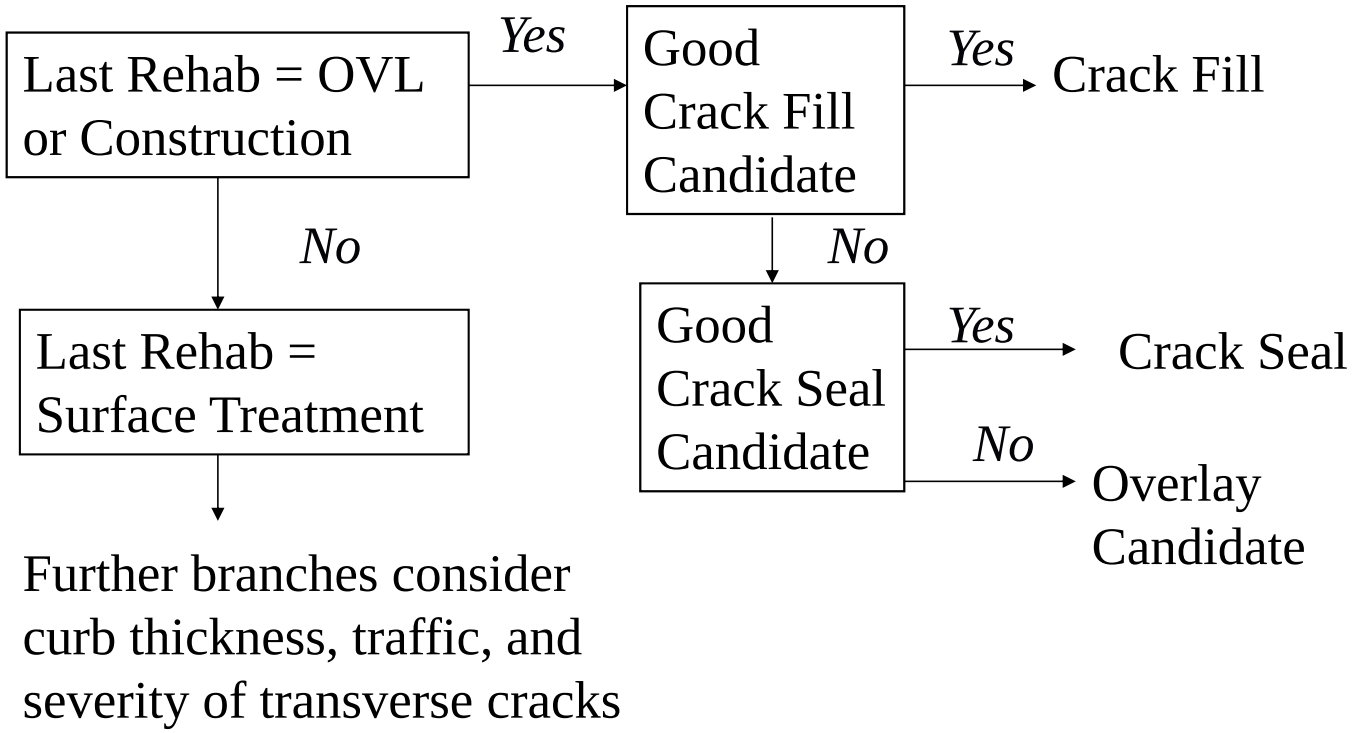
Heavy Rehab and Reconstruction

- Treatments that partially or fully restore and/or increase the structural and functional capacity of pavements
  - Thick overlays
  - White-toppings
  - In-place recycling
  - Full-depth reclamation
  - Complete reconstruction

Example-Minnesota Decision Tree – Part 1



Example-Minnesota Decision Tree – Part 2



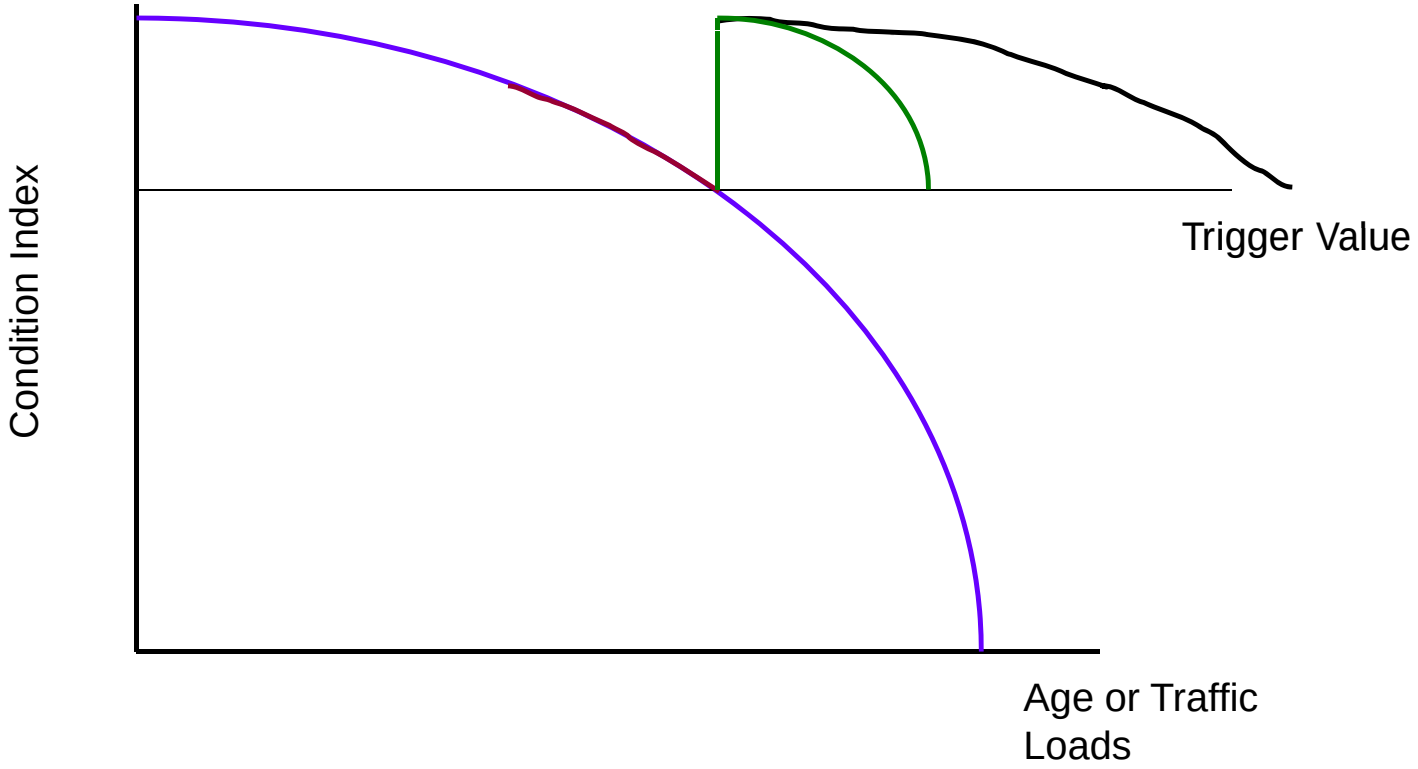
Example-Excerpts From CDOT's Treatment Rules

- Micro Surface
  - Pavement Type <= "2", IRI >=65, RSL equal to or between 11 and 20, Rut, Block and Fatigue between 50 and 85
- Thin Overlay (2 in)
  - Pavement Type <= "2", SHLDRT "C", RSL equal to or between 3 and 15, IRI <=65 or Rut <=75, Block and Fatigue >=65

Impact Rules

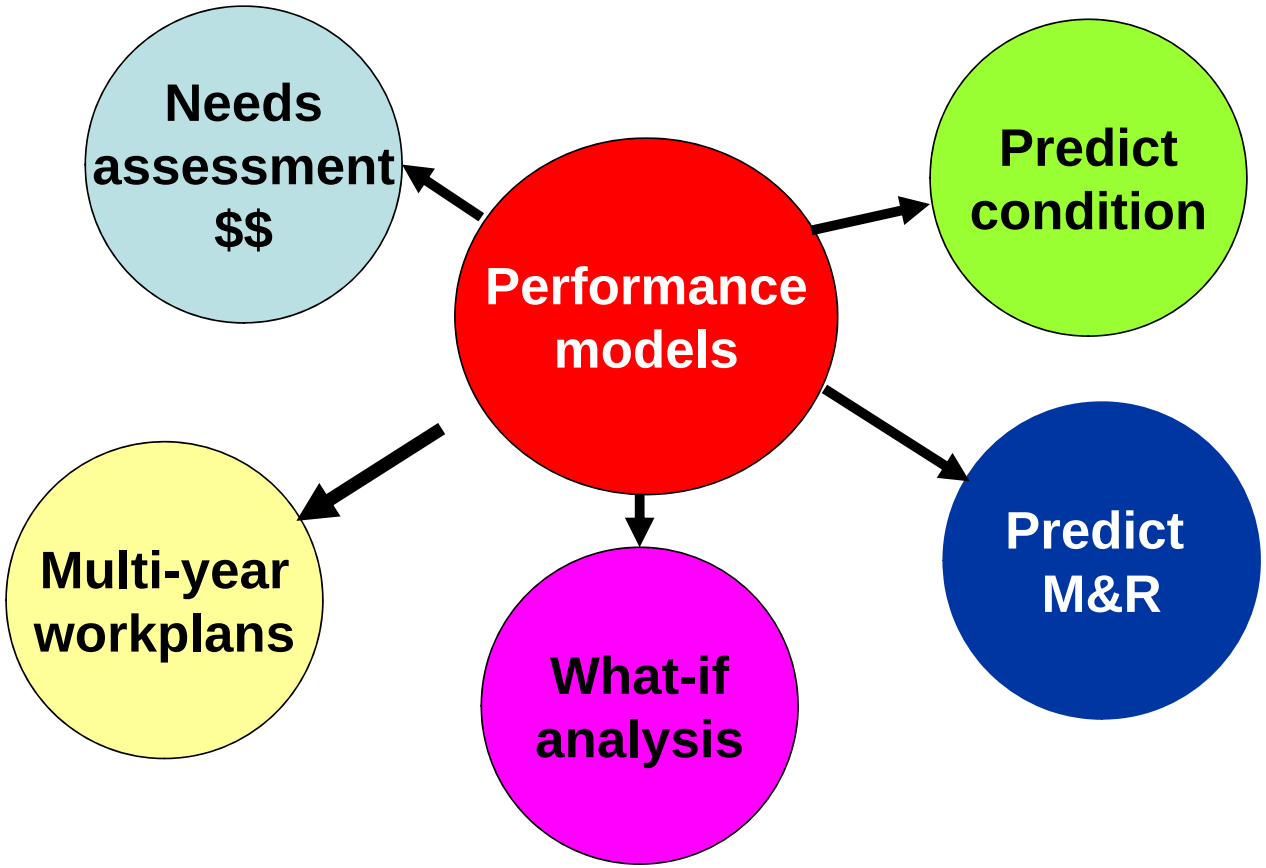
- Impact on condition indexes (or distress) immediately after treatment
- Change in surface type
- Future rate of deterioration

Impact Rules



Pavement Performance Models

Why Use Performance Models?



Reliable Model **Requirements**

- Need an adequate database
- Must include all factors that affect performance
- Need to select appropriate functional form
- Include a method to assess precision & accuracy of model

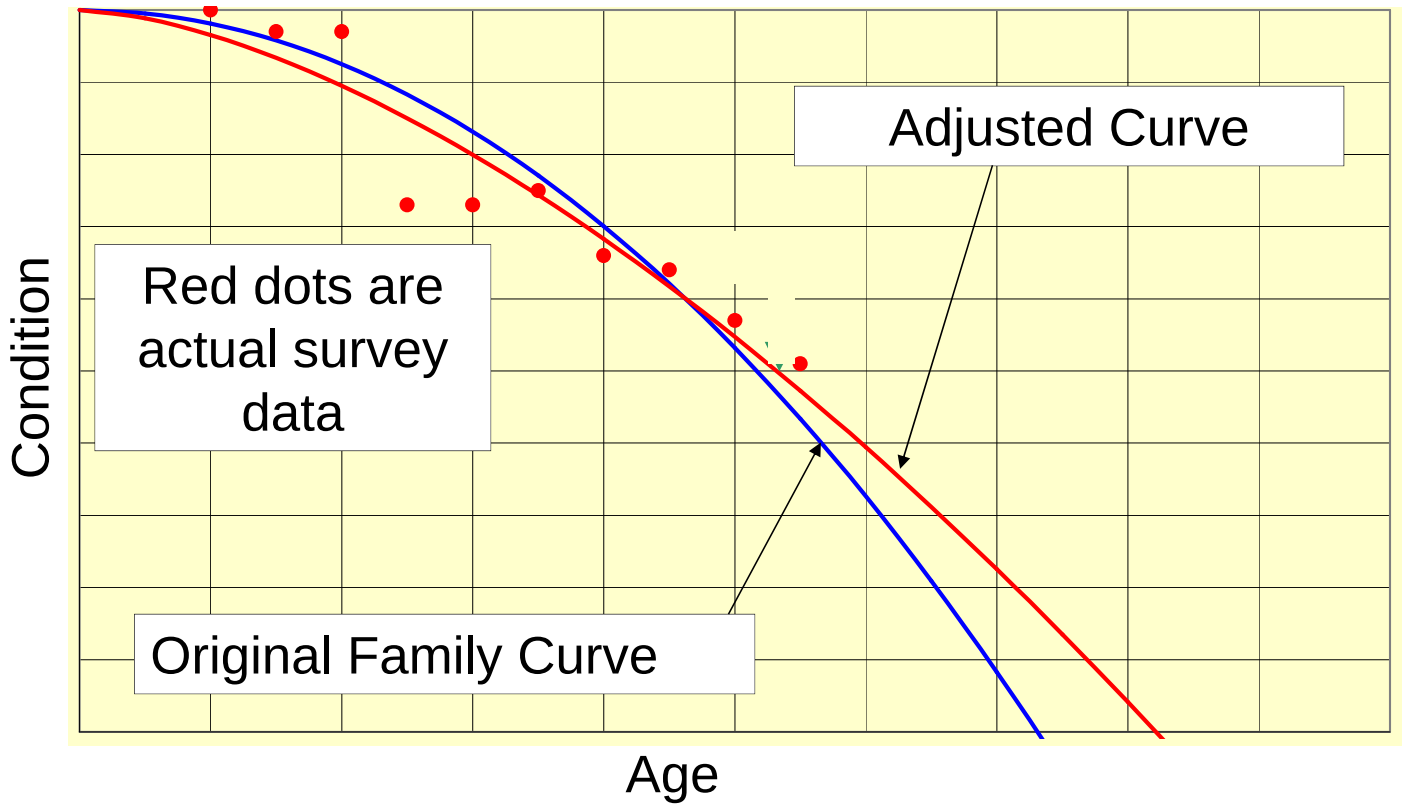
Most Common Performance Models

- ***Deterministic (empirical) the most common***
- Easy to develop & understand, but limited to same pavement sections that it was based on
- ***Probabilistic***
- More representative of performance, but difficult to develop

Family Models

- Group pavement sections by characteristics
- Reduces number of variables and models
- Assume similar deterioration
- Reflects average deterioration for family
- Allows ranges of values to be used for developing families

Example - WsDOT SR2



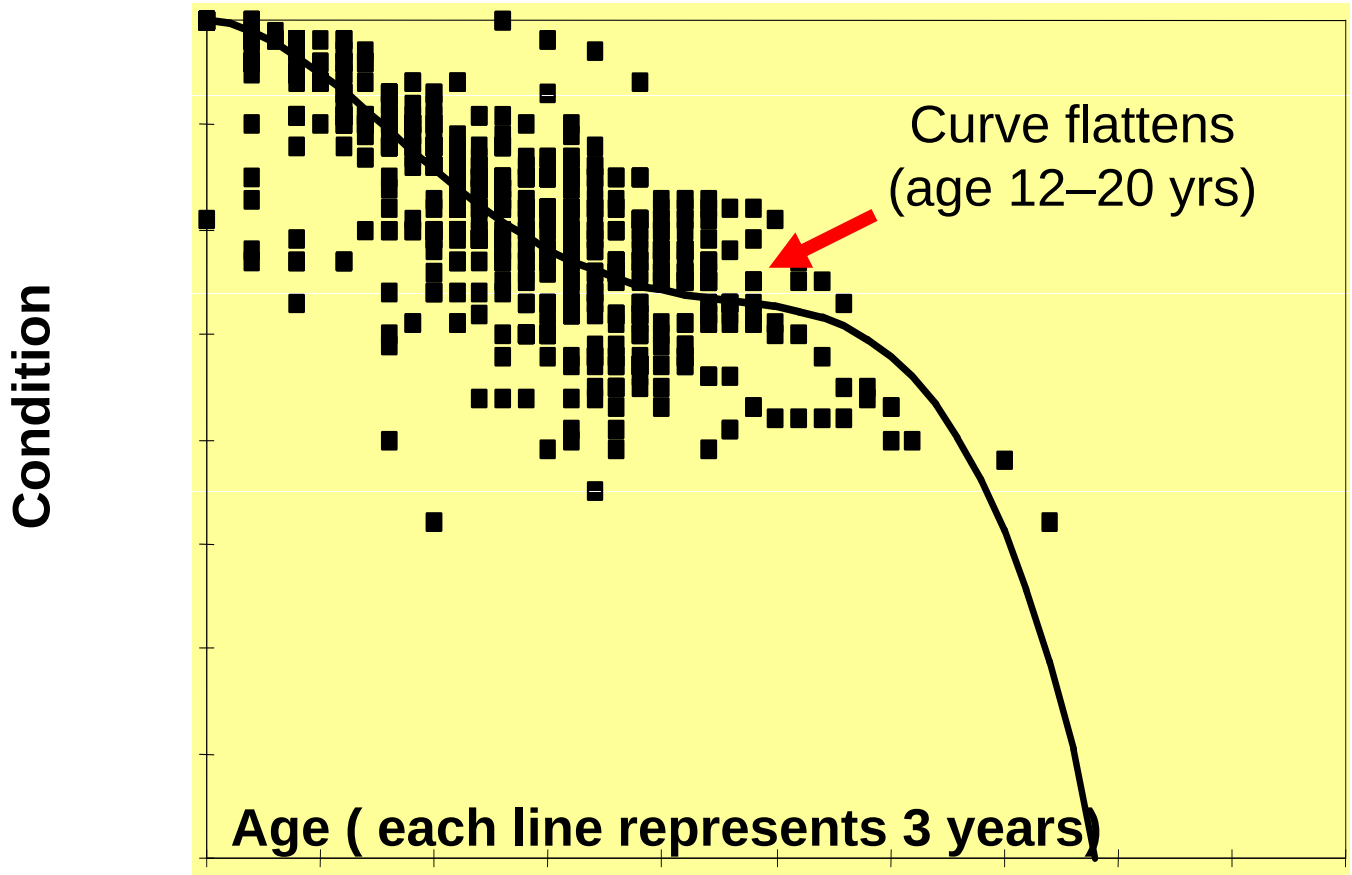
Pros & Cons of Family Models

PROS	CONS
Easy to develop & interpret	Does not explicitly deal w/ errors in data or model form
Less variables	Difficult to measure effect on independent variables
Allows ranges of variables	

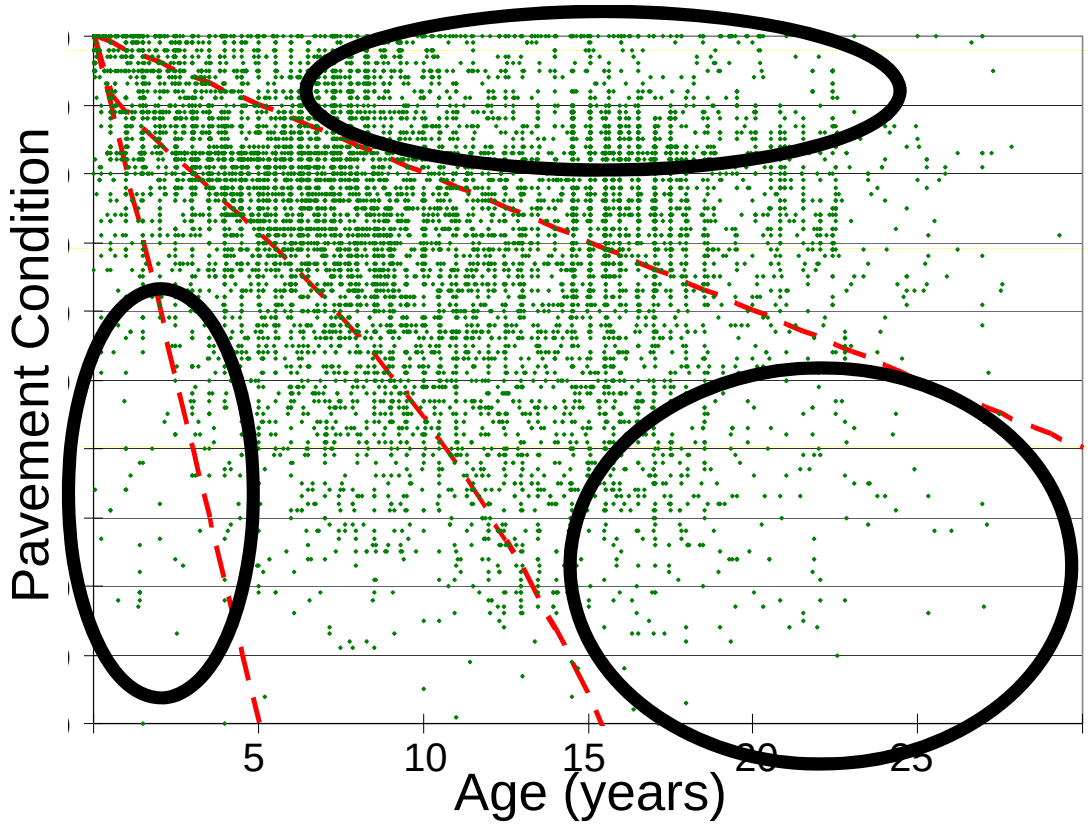
Typical Challenges

- Lack of historical construction data
- Lack of data in useable format
- Lack of accurate & reliable data
- Lack of representative data
- Data variability

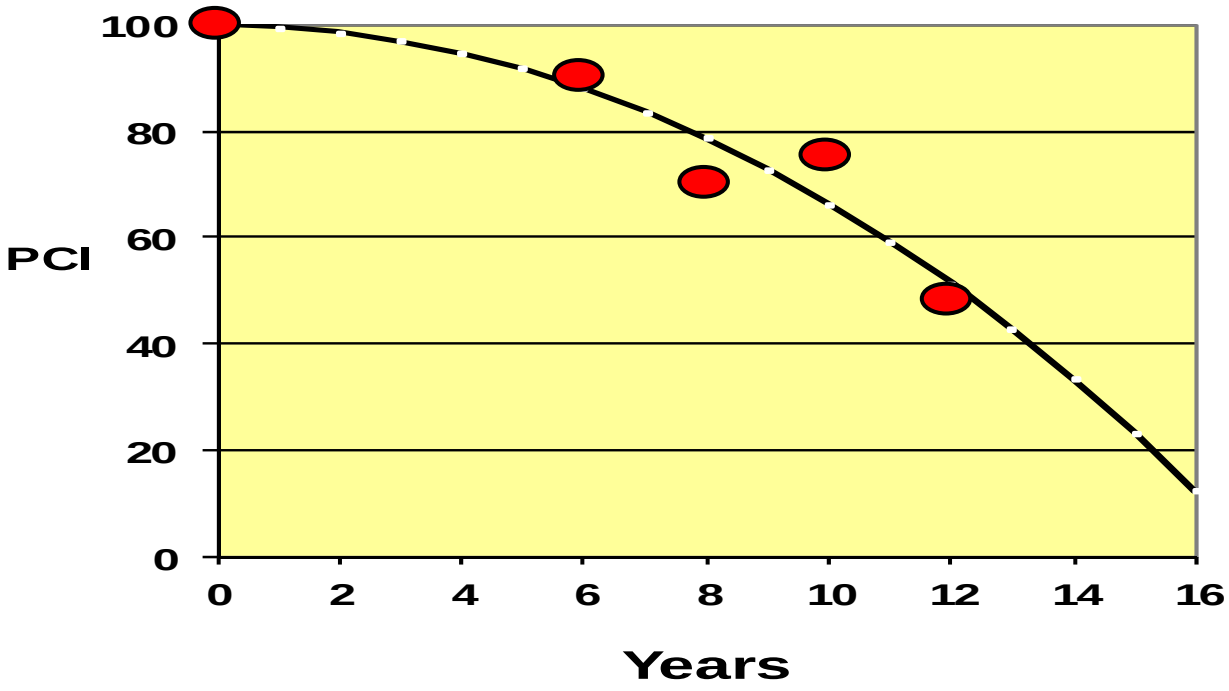
Example - IDOT



Example of Data Variability



Why Do We Need Good Data?



Model Improvements

- Must be updated regularly
- Feedback loops to link models with engineering practices