

“Overview of the iMEPDG”

National Pavement Management Conference

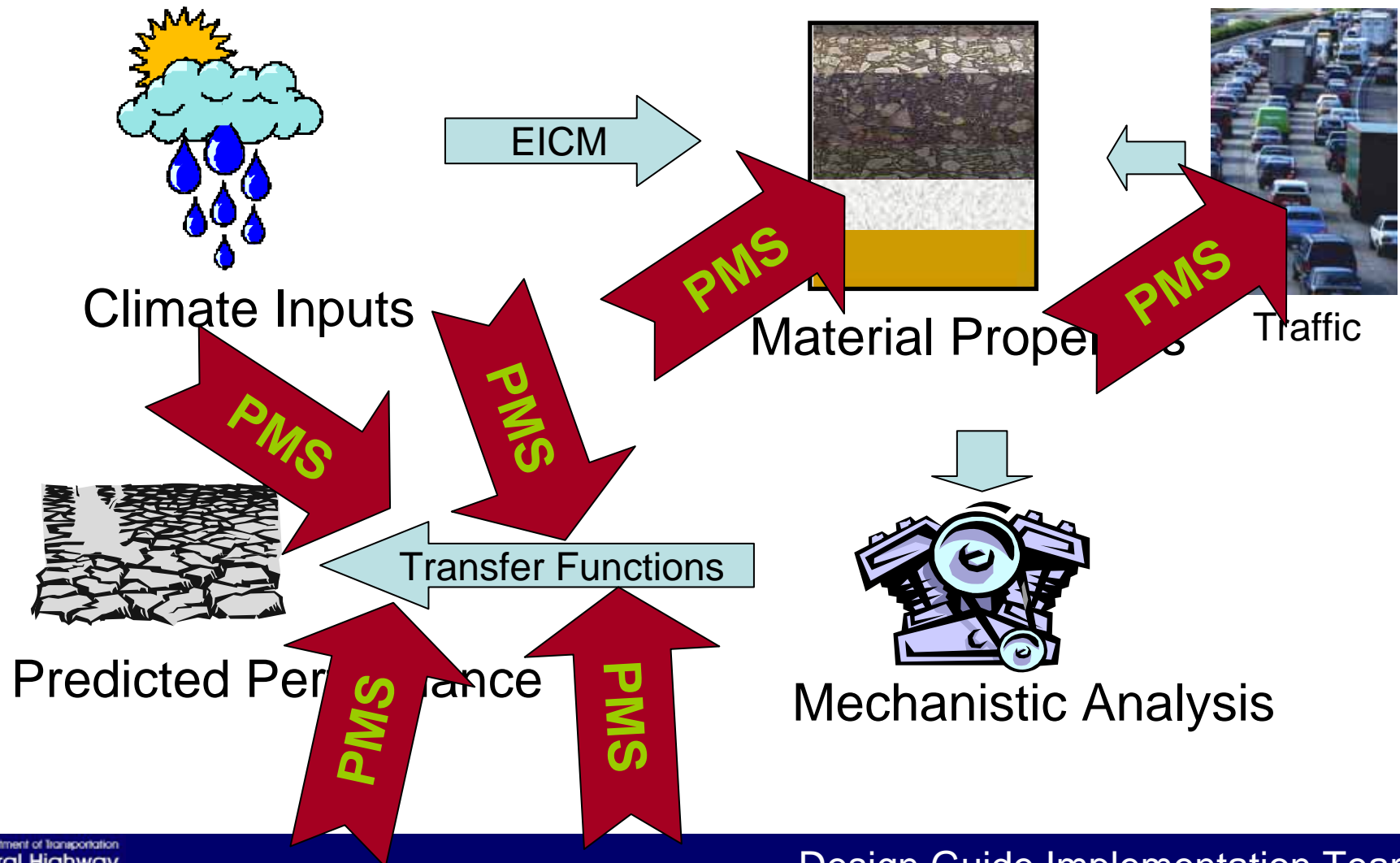
Norfolk, VA
May 6-9, 2007

Why ME ?

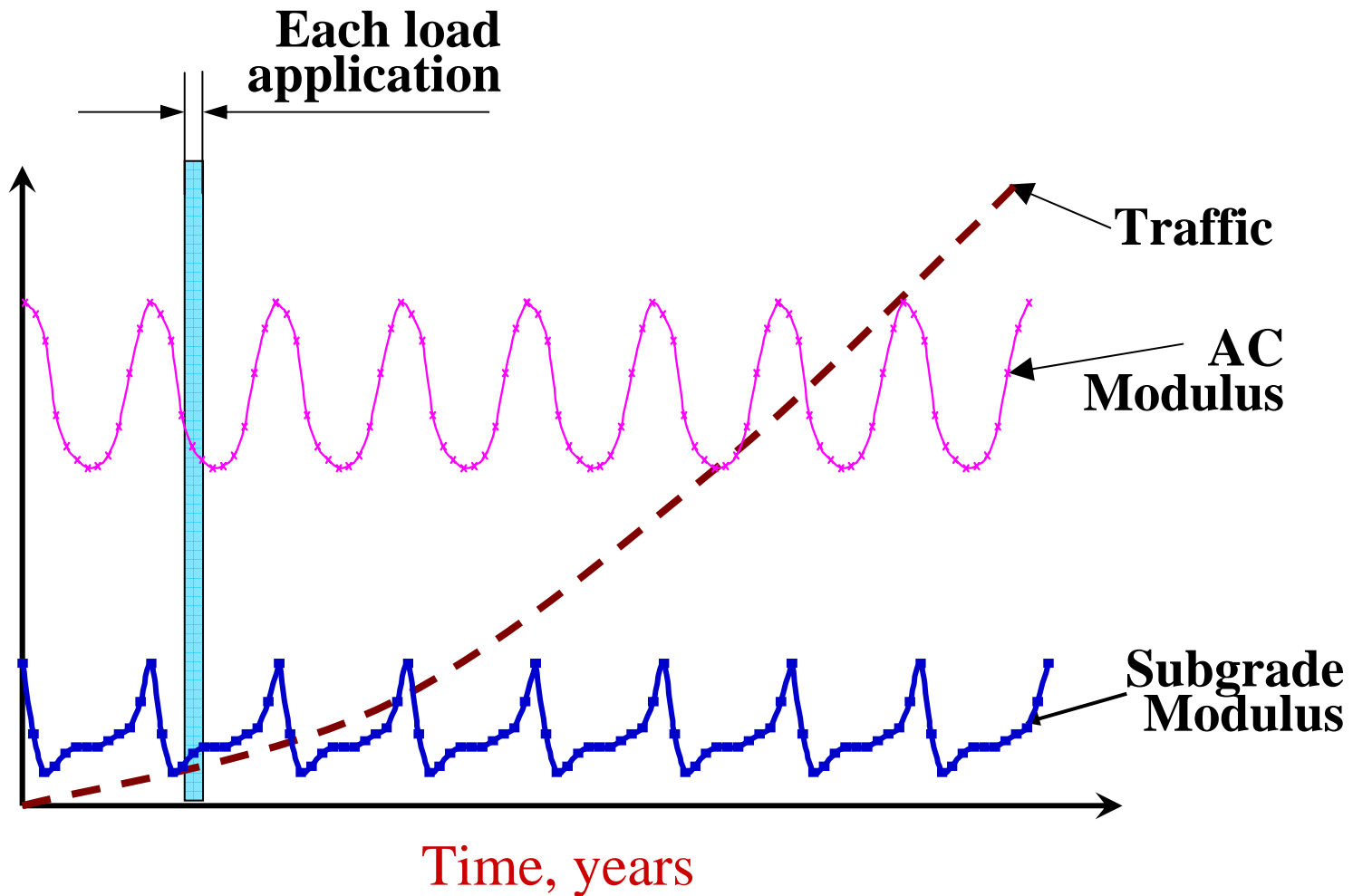
- Based on fundamental engineering principles
- Climate linked to design and materials
- Enhanced definition of material properties
 - Ability to relate material properties to performance
- Improved traffic characterization
- Excellent pavement forensic tool
- Modular system that allows for incremental enhancement
- Ability to design and calibrate for local conditions

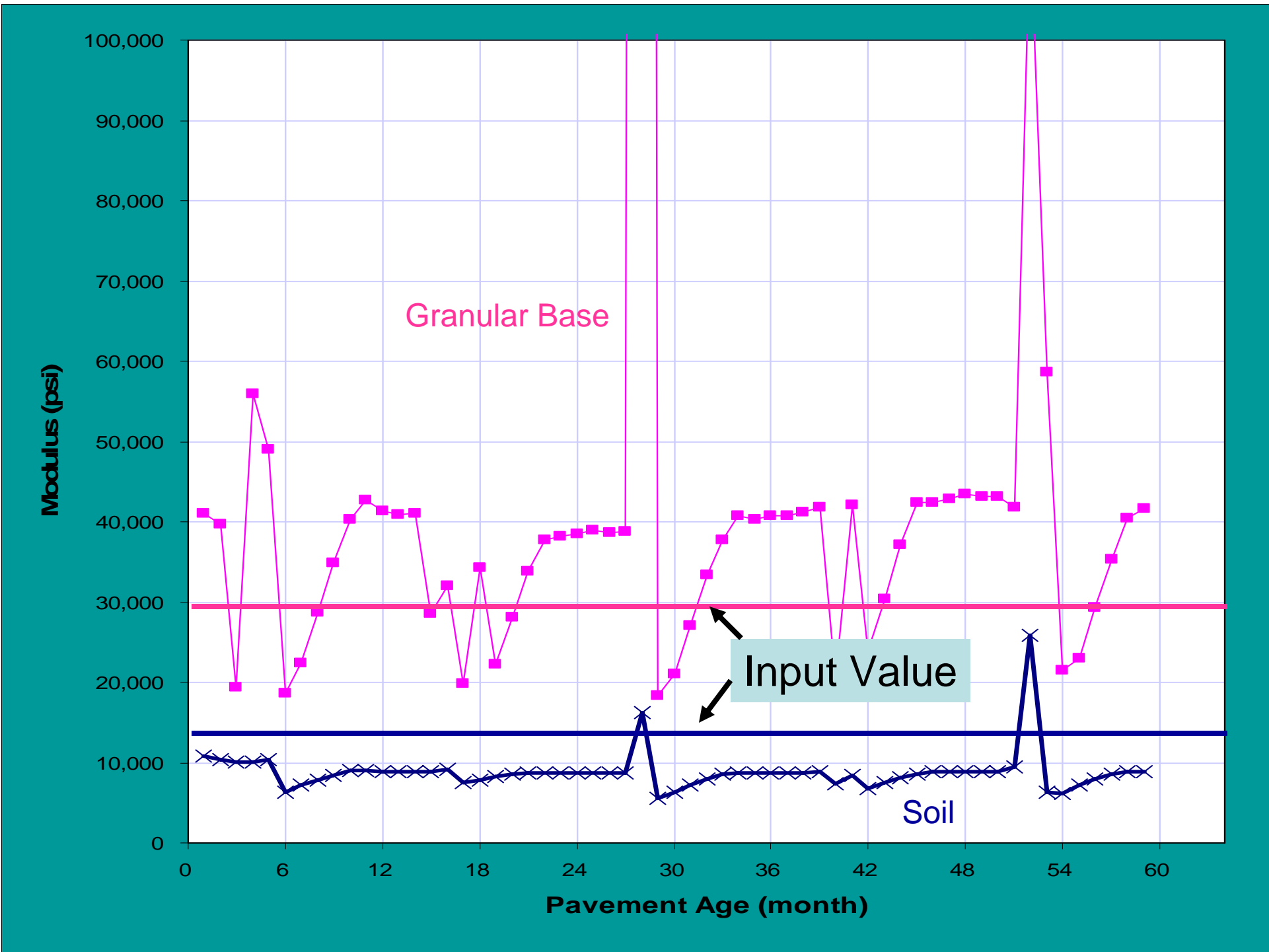
- Relates to all ME Procedures -

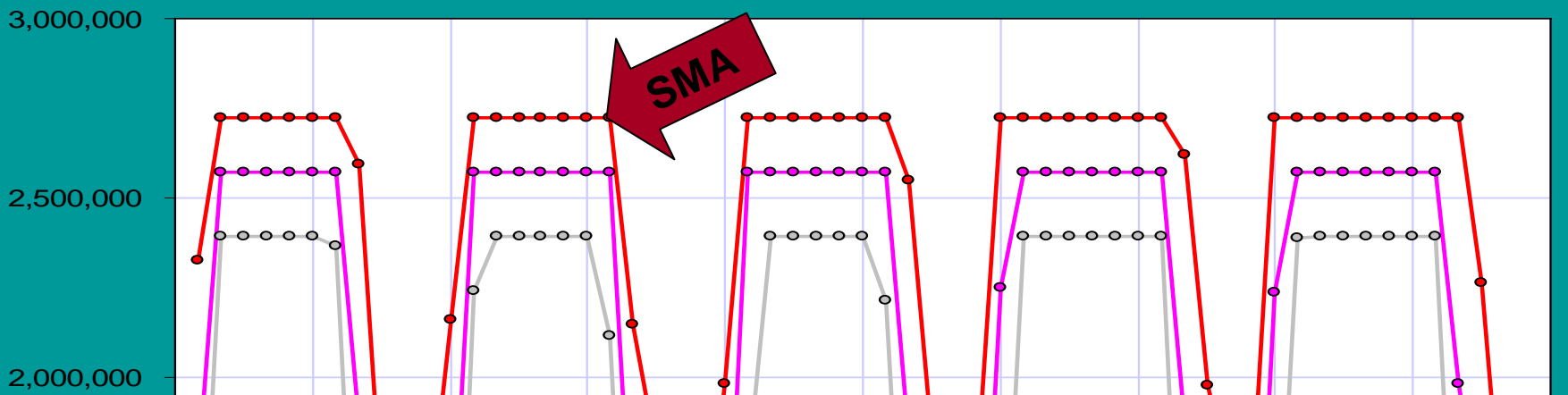
Fundamental Engineering



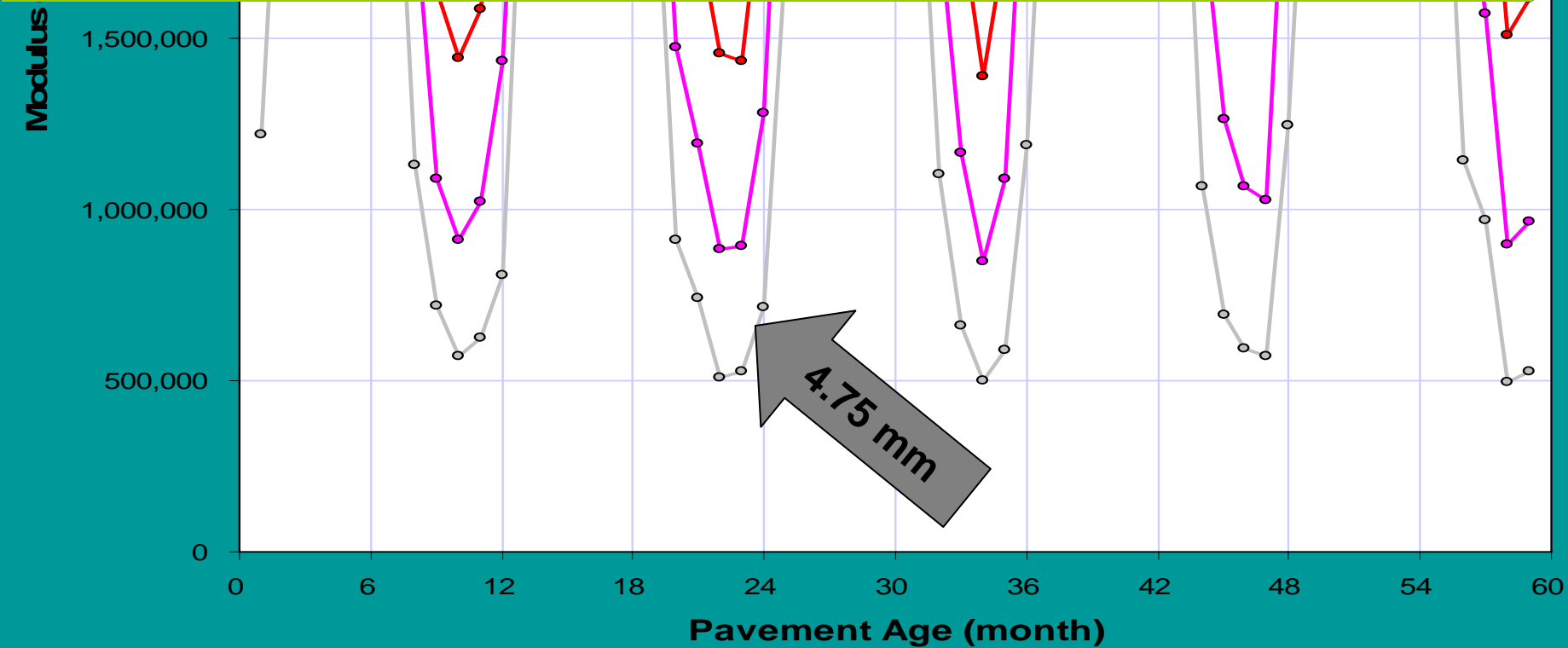
Climate and Materials



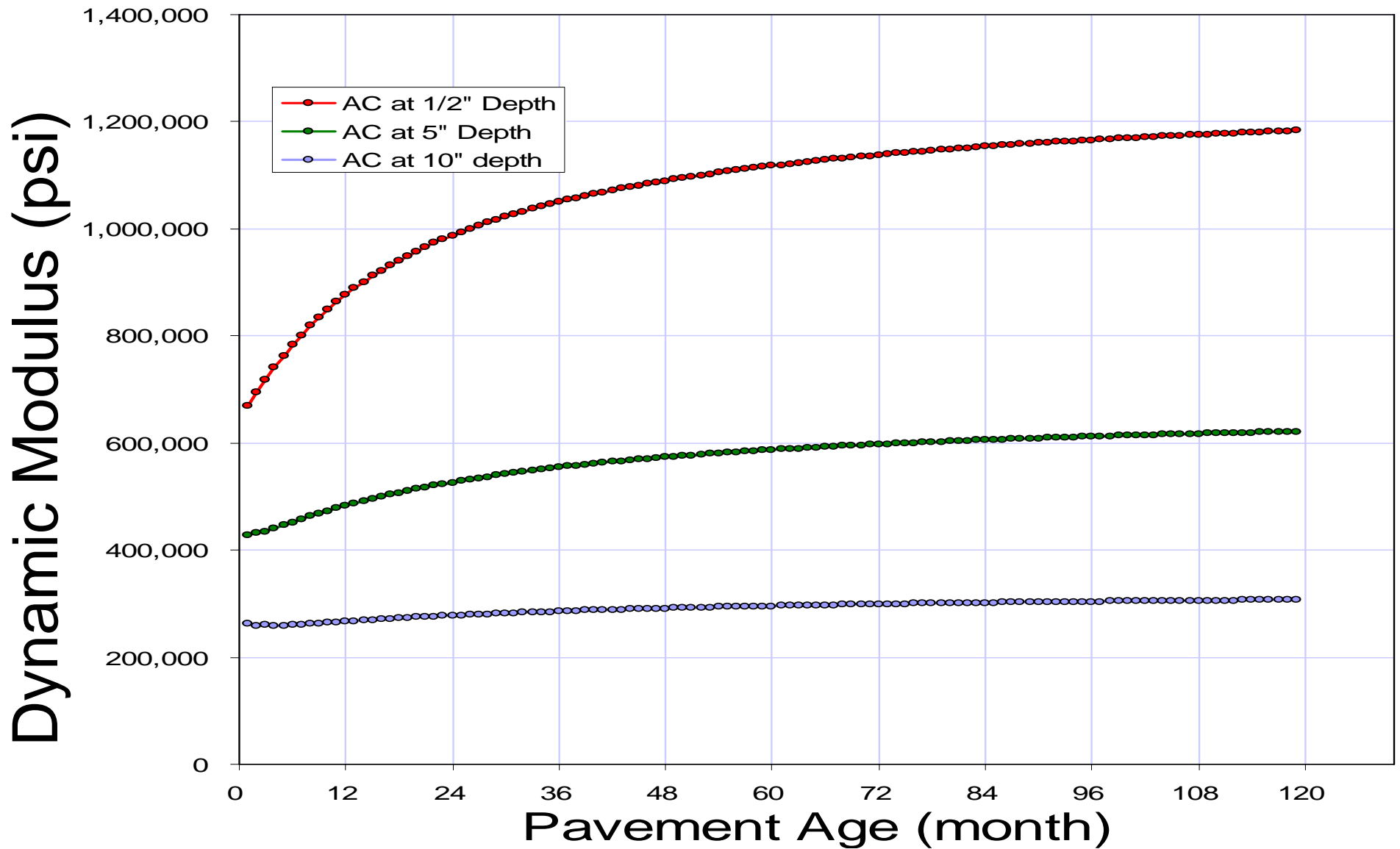




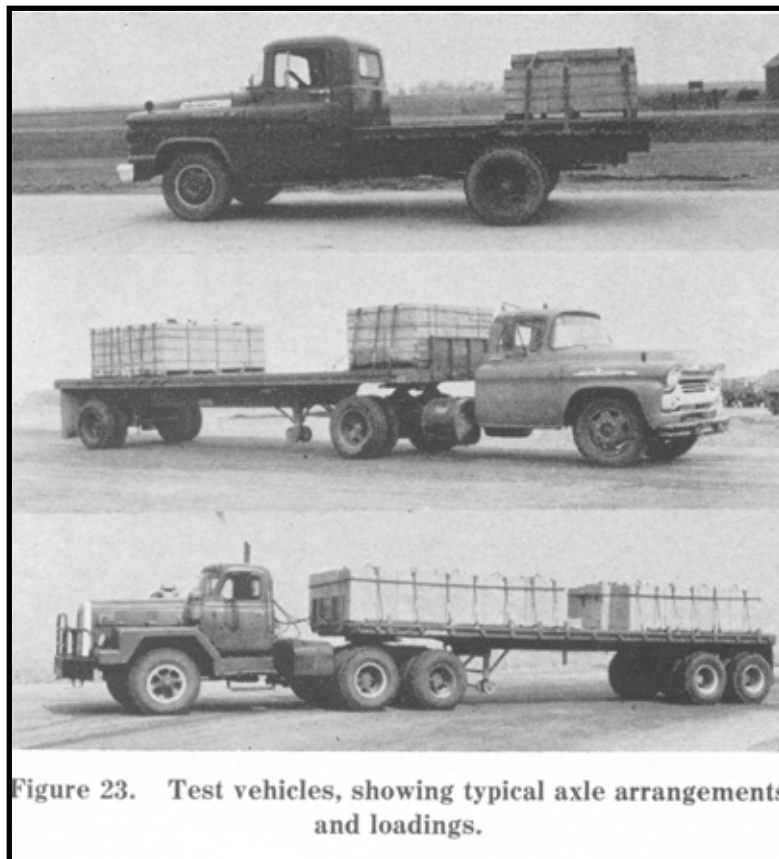
Where is the Layer Coefficient = 0.44 ?



Aging



Equivalence Load Factors



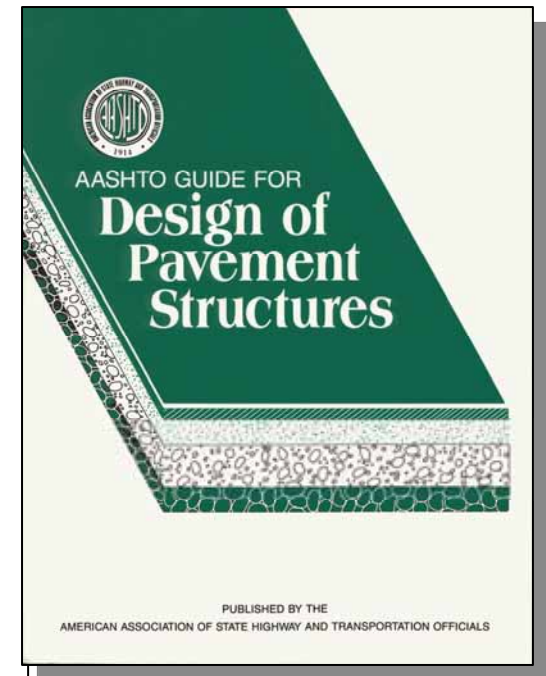
- Based on the performance of the AASHO Road Test
 - Different for PCC and ACC
- “Extrapolations beyond these total load applications should be used with caution.”

Pg 7: AASHTO '72

Requirements for an ESAL



- **Truck Volume**
 - Lane Distribution
 - Direction Distribution
 - Class Distribution
 - Growth Factors
- **Truck Weight**
 - Axle Weight
 - Axle Configuration (Single, Tandem)
- **Traffic Equivalence Load Factors**

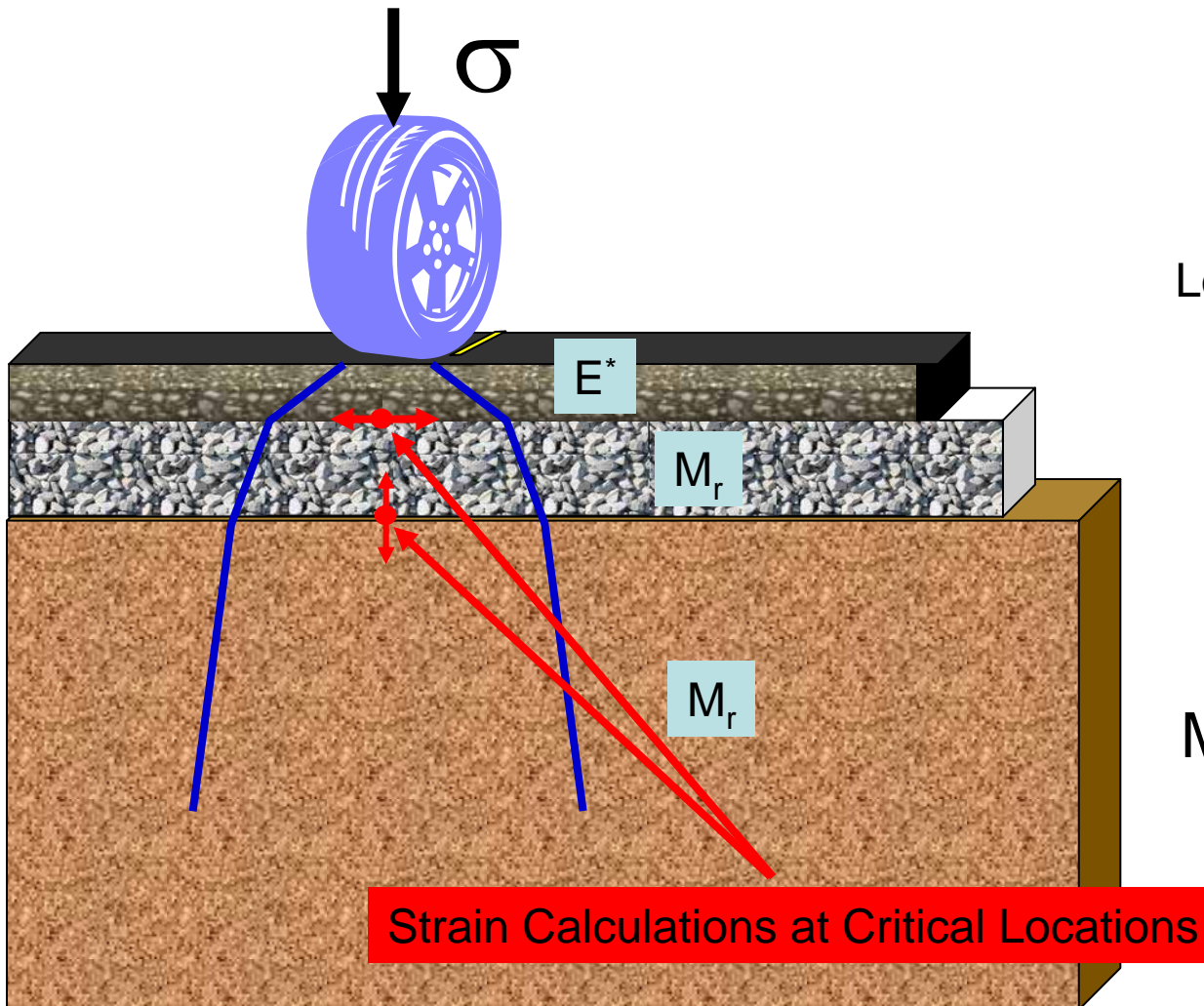


Pg 63: AASHTO '72

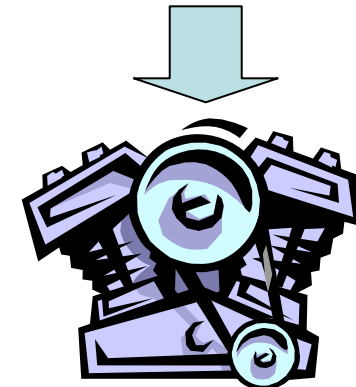
Load Spectra

- **Truck Volume**
 - Lane Distribution
 - Direction Distribution
 - Class Distribution
 - Growth Factors
- **Truck Weight**
 - Axle Weight
 - Axle Configuration (Single, Tandem,)
- ~~**Traffic Equivalence Load Factors**~~
 - Wander, Speed
 - Wheel Base Configurations





Loads and Layer Stiffness

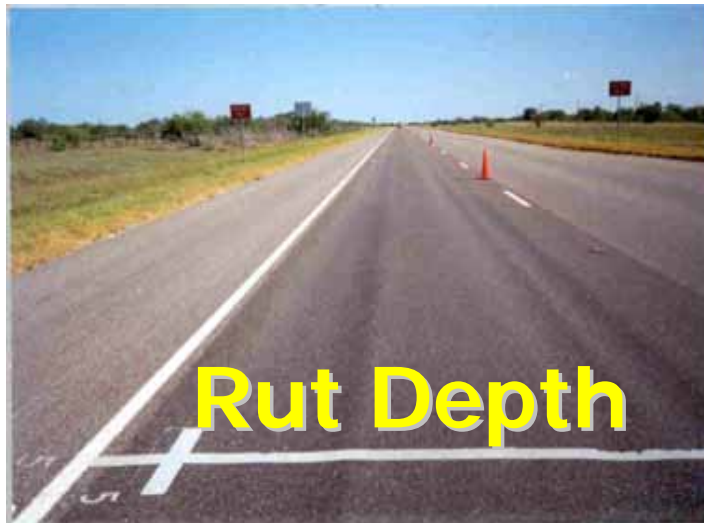
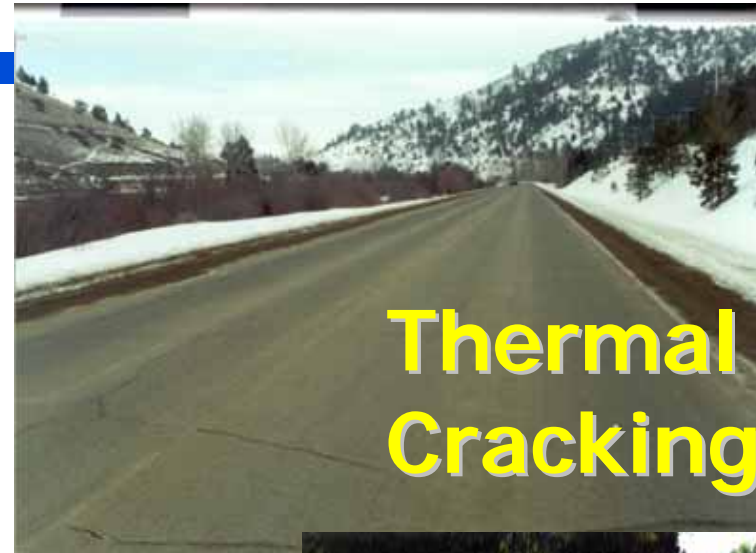


Mechanistic Analysis

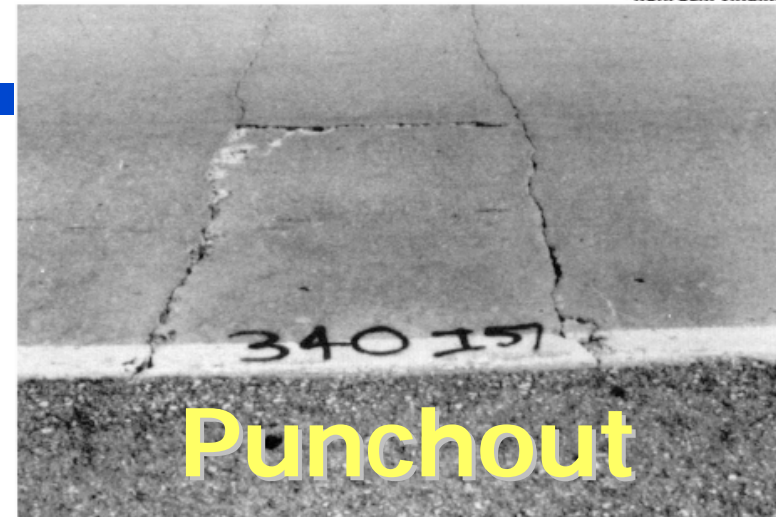
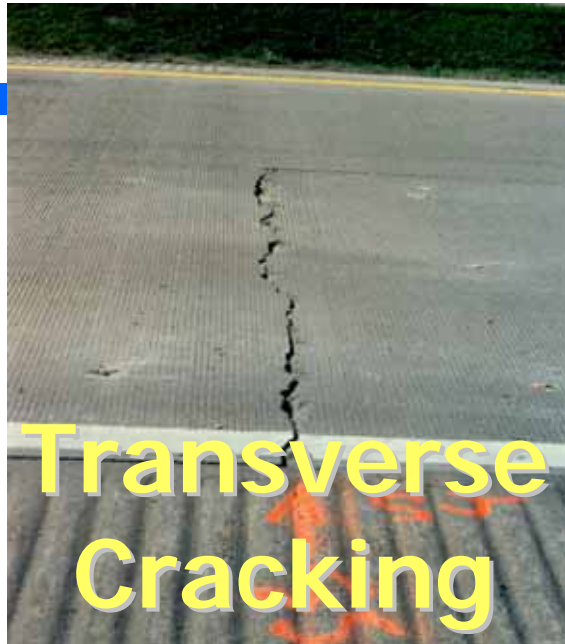
Layered Elastic Analysis

$$E = \sigma / \epsilon$$

M-E Guide Outputs: Flexible

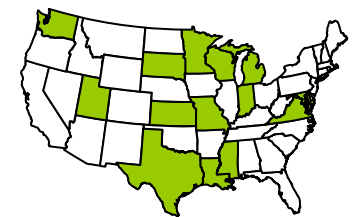


M-E Guide Outputs: Rigid

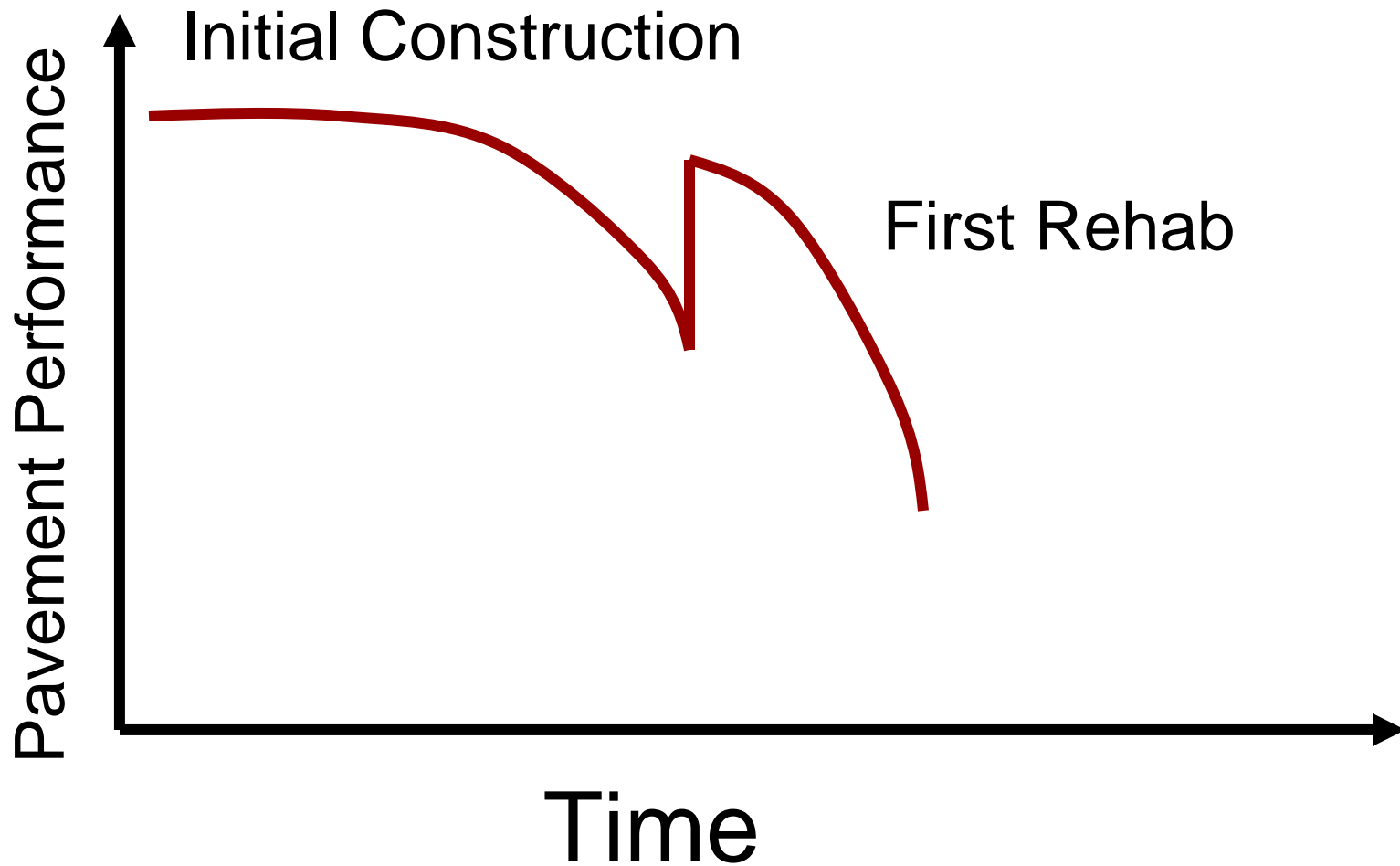


Reasons for Change

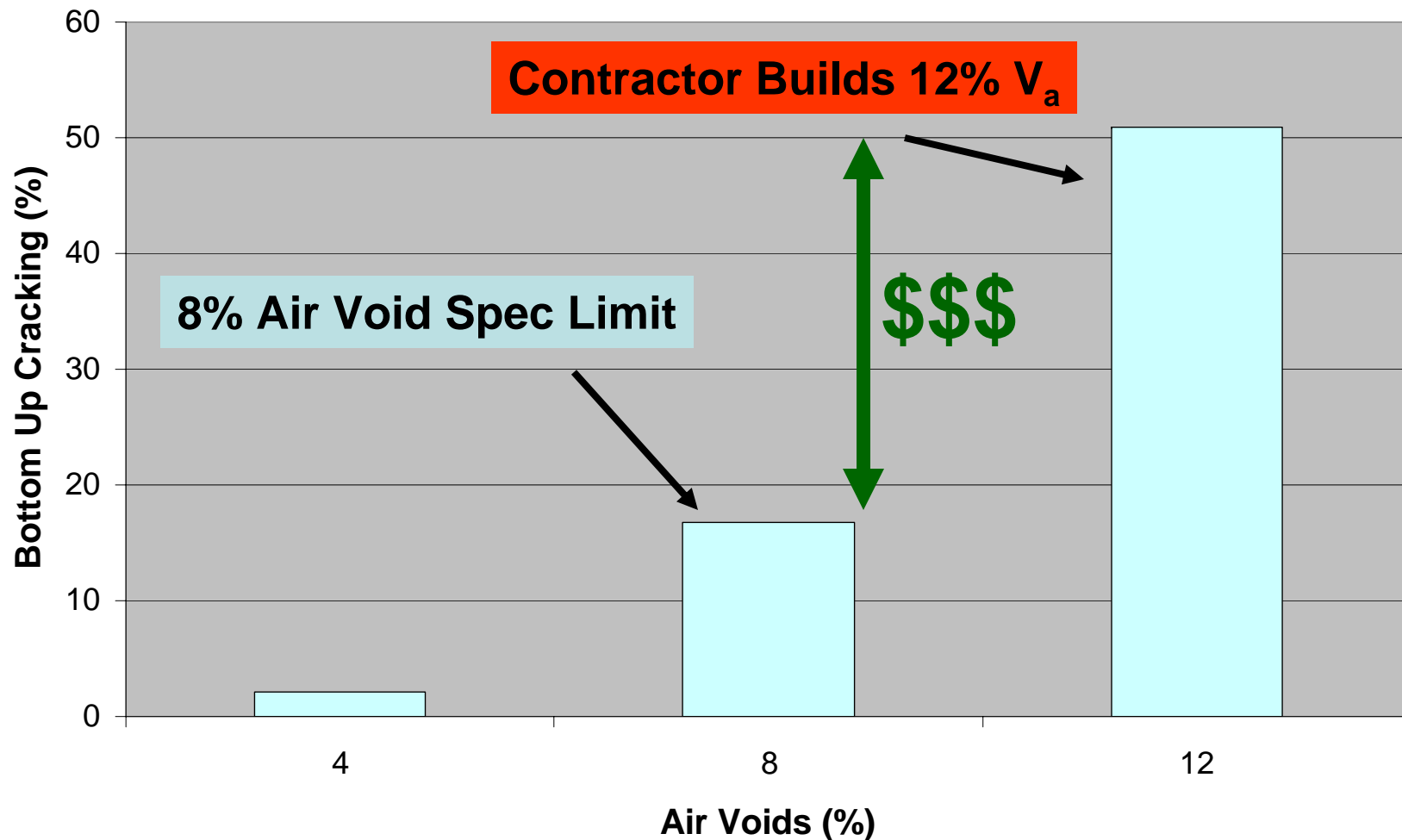
- Reduce Over-and-Under Design Costs
- Legislative Mandate
- Consider Alternative Designs/Unique Conditions
- Rational Basis for Warranties, LCCA, PRS, QA/QC, Pay Factors
- Forensic Investigations
- Impact of Management Decisions on Pavement System
- Tie Design to Construction



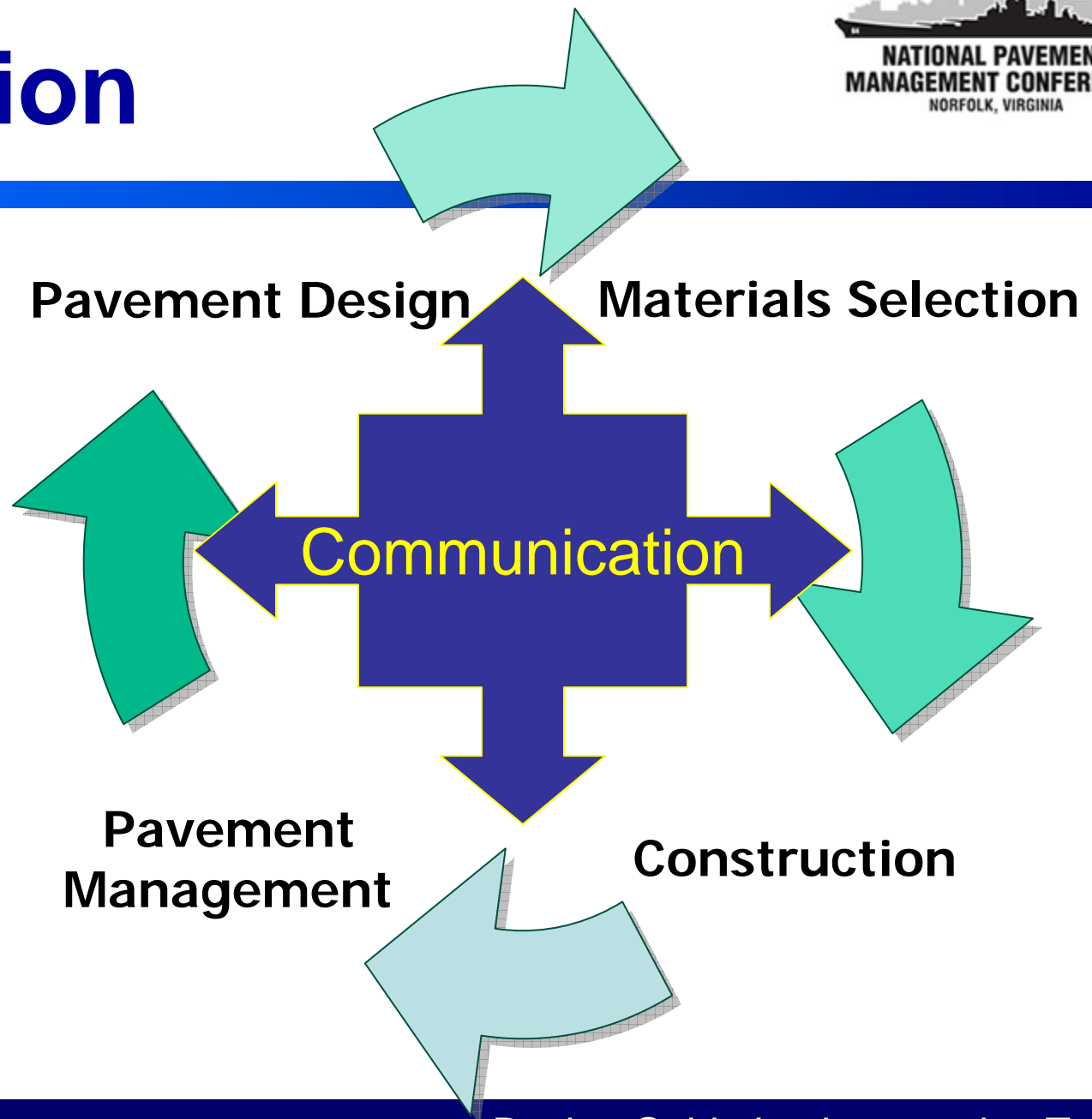
LCCA



PRS Example



Integration



Things to remember

- All pavement design systems need:
 - Quality Materials Characterization
 - Recognizes Climate with Design
 - Quality Traffic Data
 - Calibrated to local conditions
- The MEPDG has raised the bar for each of these criteria.....

Questions ??



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