Warranties 101

NESMEA Conference
Portland, Maine

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U.S. Department of Transportation
Federal Highway Administration

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Presentation Outline

- Types of Warranties
- What Warranties Are
- What Warranties Are Not
- Good Items to Include
- Areas to Avoid
- Best Practices

First: Establish Baseline

Webster's Definitions

- **What is a Warranty?**

  A written assurance that some product or service will be provided or will meet certain specifications.

- **What is Success?**

  An event that accomplishes its intended purpose

Second: What Warranties are not

- Guarantee of defect free pavement
- Throwing away the spec book
- A way to get rid of DOT employees
- Using current specifications with performance warranty on top
- A way to put small contractors out of business

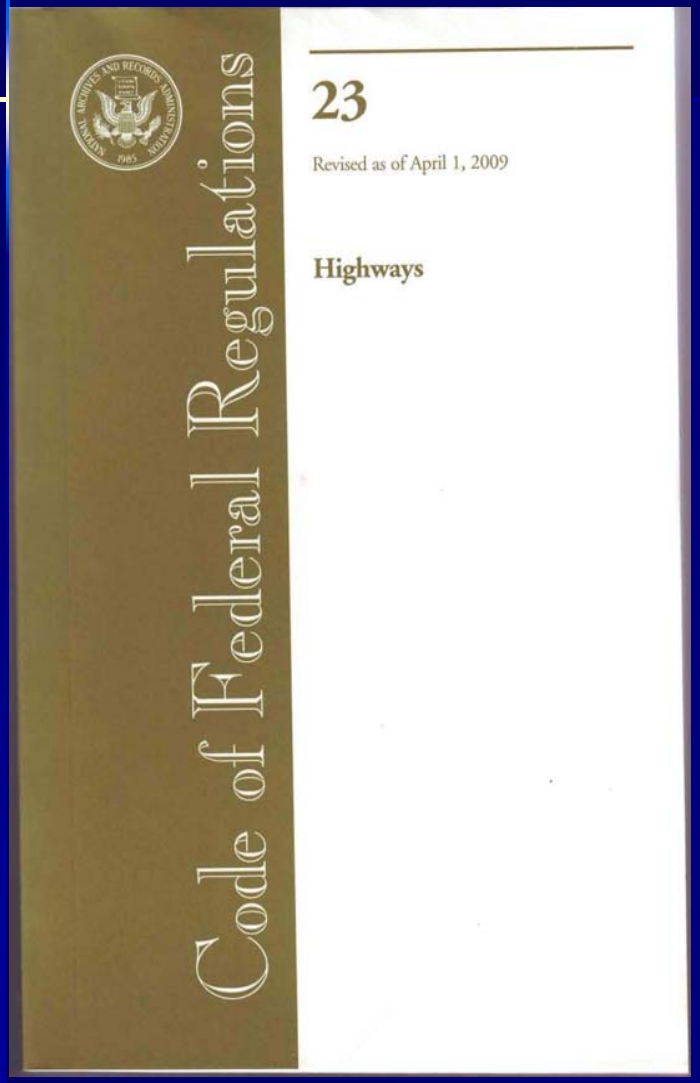
Warranties Are…

- Guaranty of better performance
- Incentive for quality construction
- Quality based initiative
- Another contracting option
- Incentive for innovation

Pavement Warranty Program in Wisconsin: 12-Year Evaluation, Dated June, 2009

Report Number: WI-03-09

Federal Regulations



- Warranties Covered in Title 23: Highways
- Code of Federal Regulations (CFR)
  - § 635.413 Guaranty and warranty clauses
- Interim Final Rule
  - August 25, 1995
- Amended December 2002

  (Design-Build)

FHWA Perspective on Warranties

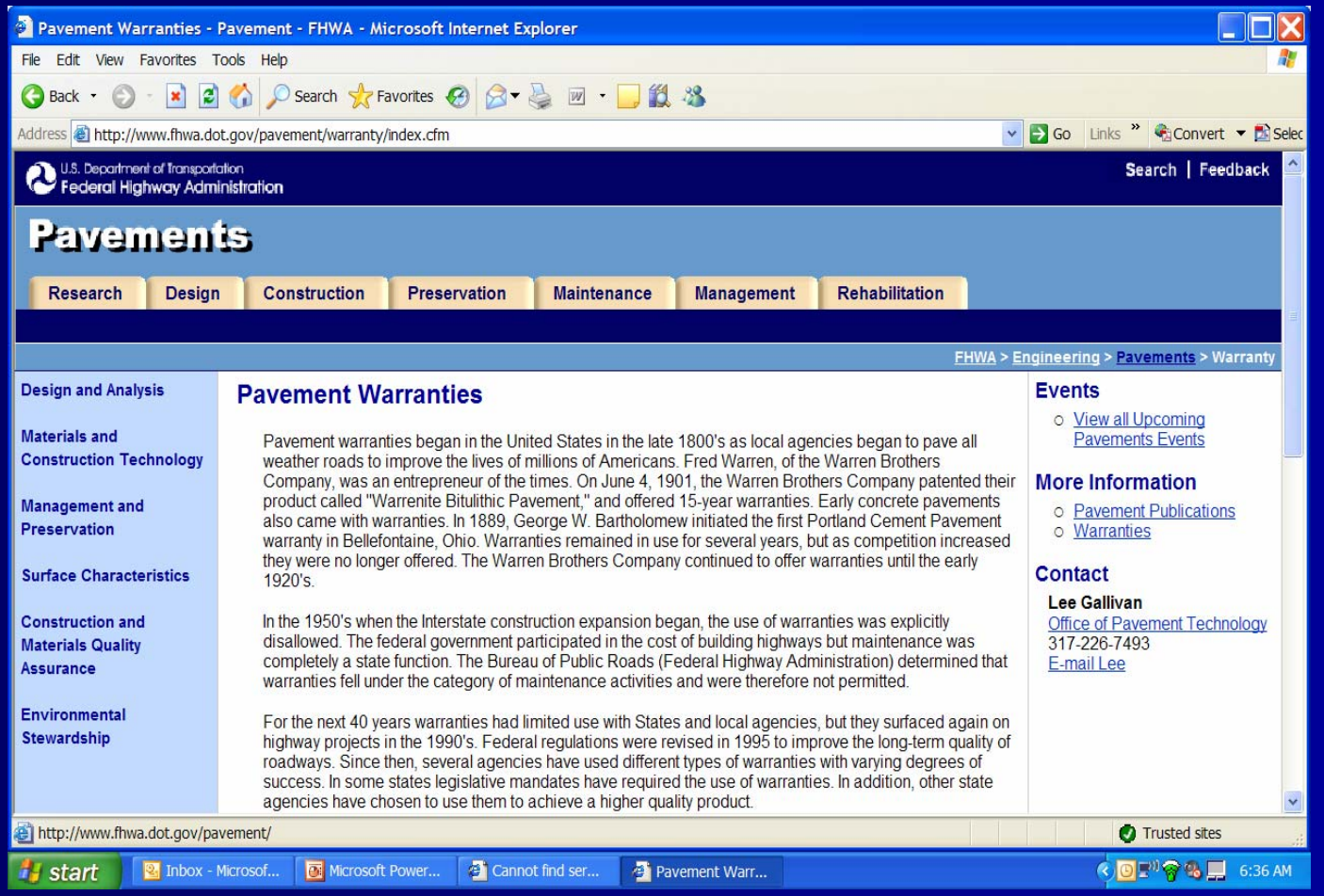
- ✓ Supports process
- ✓ Encourage as a contracting option
- ✓ Ensure shared risk by Agency and Contractor
- ✓ Contractor responsible for items they control
- ✓ Cannot participate in items defined as maintenance
- ✓ Approval by Division Office (NHS)

Pavement Warranties

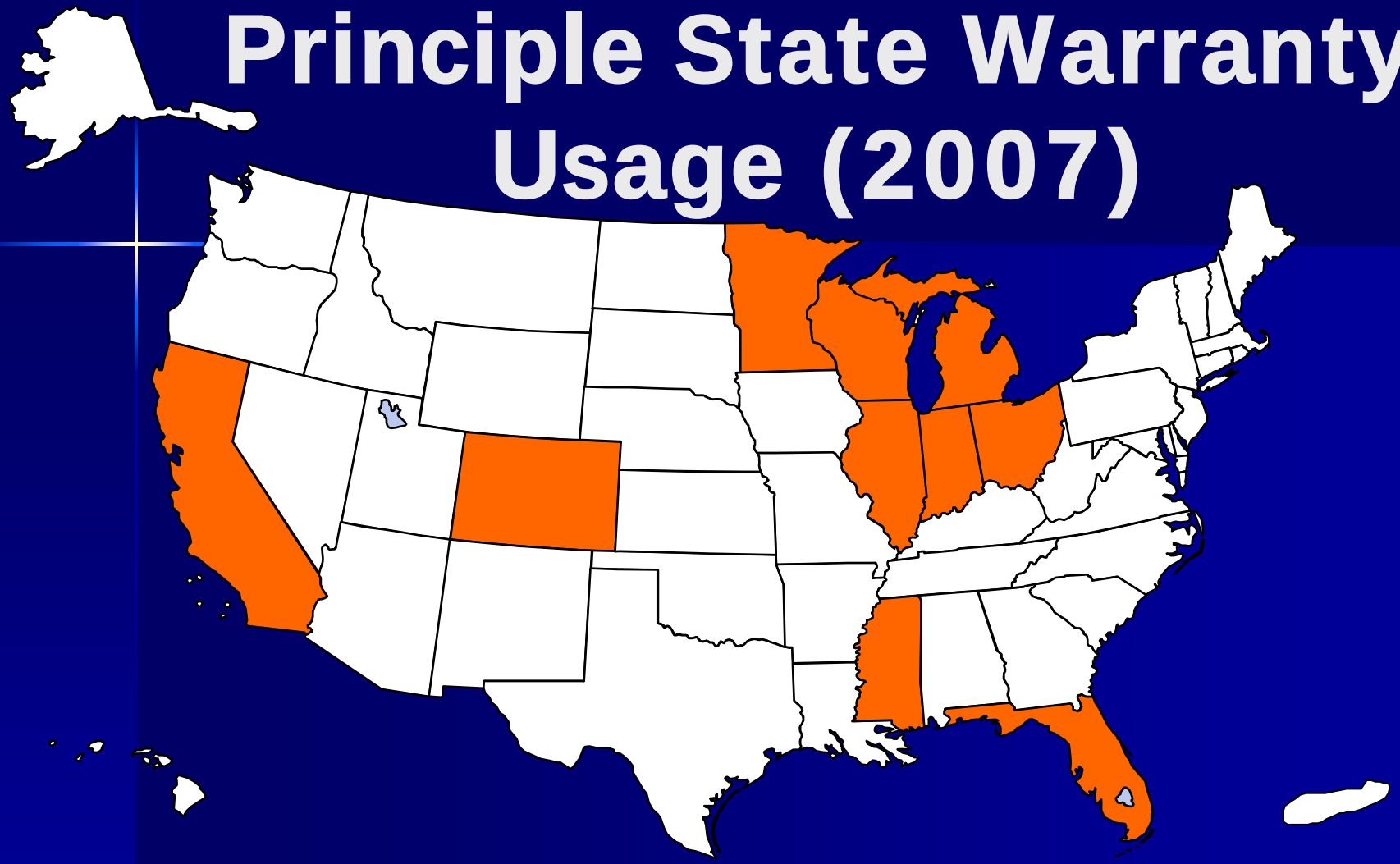
- 2150 ± warranties to date in 36 ± States
  - Mostly materials and workmanship
  - 100 or so short-term performance warranties
  - Handful of long-term performance warranties

- FHWA guidance documents on Pavements webpage
  - Background Information
  - Selection Procedures
  - Management Programs

www.fhwa.dot.gov/pavement/warranty



Principle State Warranty Usage (2007)



NCHRP 20-7(201)


Short Term (5 years) Warranty Project, Age 10 years

Types of Warranties

- Material and Workmanship 2-4 yrs
- Short-Term Performance 5-10 yrs
  - Workshop emphasis
- Long-Term Performance 10-20 yrs

- There are pluses and minus of each

Short-Term Performance Warranties

- Agency provides
  - Traffic characteristics
  - Project phasing
  - Structural design, typical section, and quantities
  - Performance threshold values
  - Other potential requirements
    - Minimum grade of binder
    - Aggregate requirements
- Contractor provides
  - Quality management plans

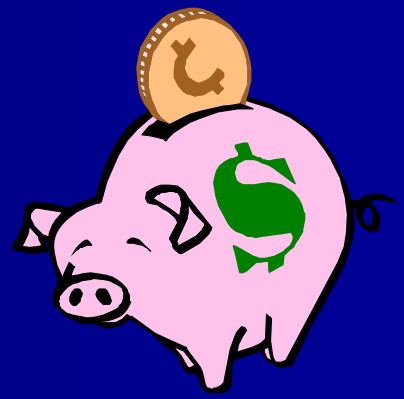
Cost and Quality

NCHRP Study 2008:

- **Majority of DOT's responded costs and quality were similar to non-warranted projects.**
- **Benefits to DOT**
  - **Reduced Disputes**
  - **More Knowledgeable Industry**
  - **More effective DOT Oversight**
  - **Better Performance**

What Affects Warranty Costs

- More restrictions = higher costs
- More contractor risk = higher costs
- Learning curve impacts costs



Pavement Warranties

- **Do they cost more???**
- **Are there any benefits??**

It DEPENDS!

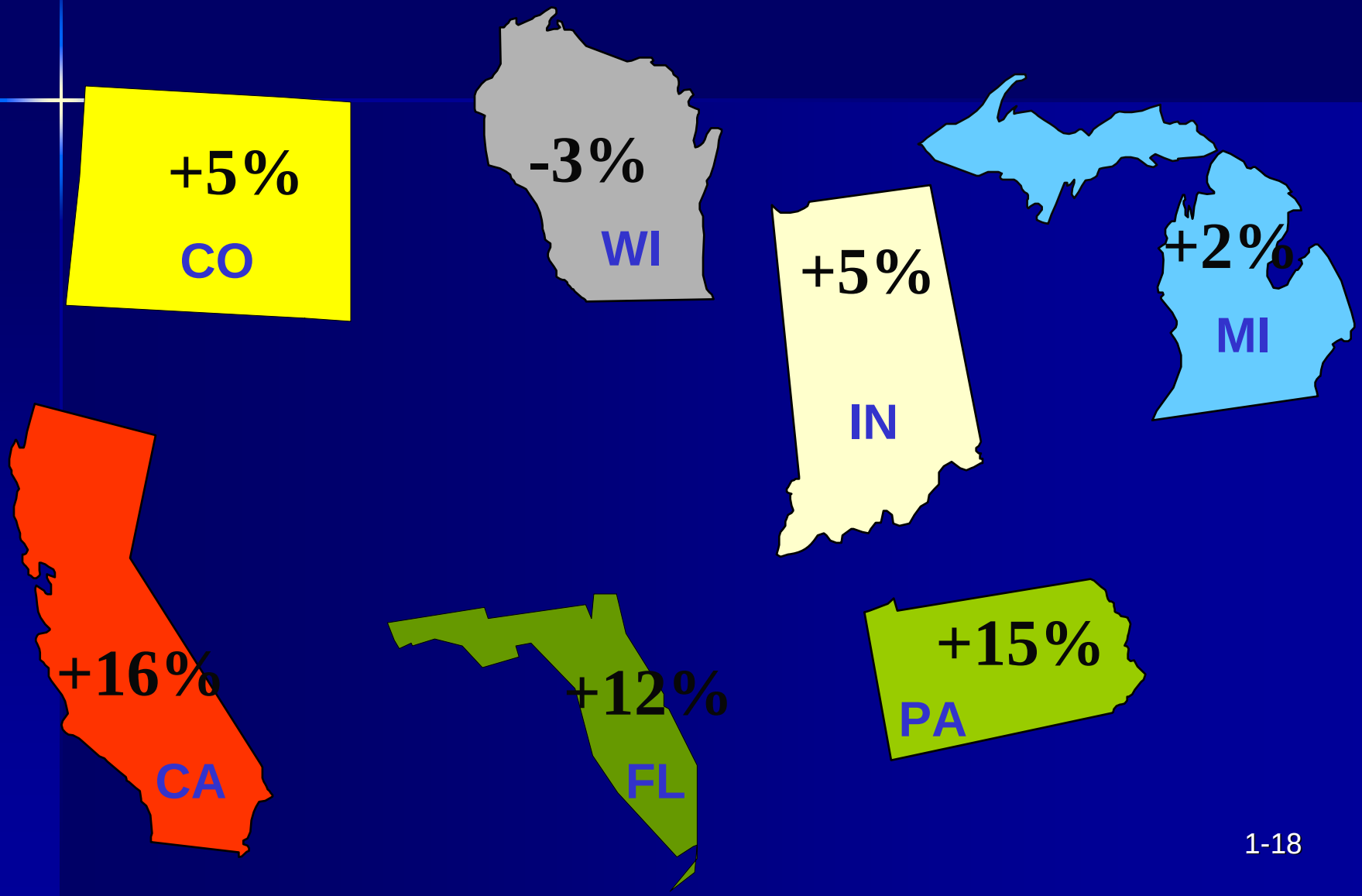
…how are the rules written???

Cost Effectiveness

Ask the following questions

1. Does it include the anticipated maintenance costs for the Agency for the life of the warranty?
2. Does it include the material testing i.e., administration costs for the Agency?
3. Does it include just the initial construction costs?
   - Initial costs are 3-8 percent higher
4. Metrics of Cost-Benefits needs to developed.

Cost of Warranties



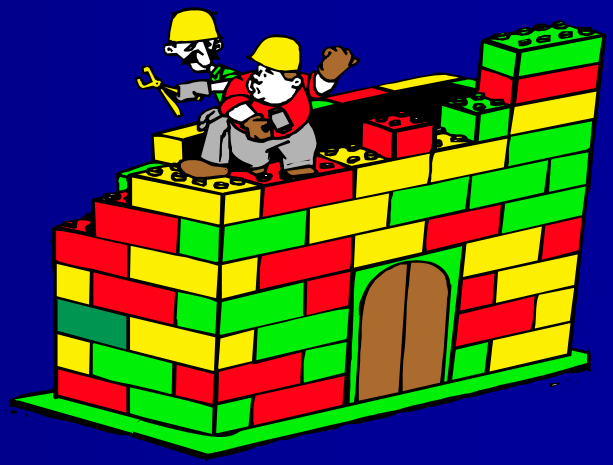
Cost of Warranties

- Related to the perceived risk by the contractor
- Unknowns, traffic, agency restrictions, contractor's past performance, production / processing, quality programs.
- Bonding / Guarantee's

- Number One reason for higher cost, is the clarity of the specifications

Six Building Blocks

Building Blocks for Warranties

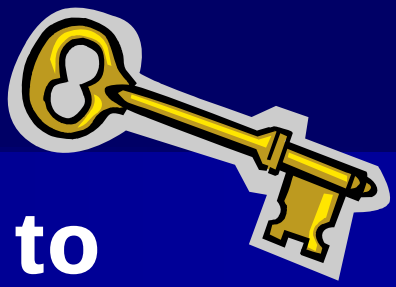


- Contract Administrative requirements
- Distress identifiers and applicable thresholds
- Distress remediation
- Quality programs for binders, aggregate, production and laydown
- Restrictions, traffic monitoring and evaluation of the pavement/project
- Bonding/guarantees

Objective vs. Subjective

- Acknowledge that there are distresses like raveling on HMA or joint deterioration on PCC is subjective.
- Subjective distresses should be limited
- Subjective determinations by the agency increases the cost (risk) to the contactor and results in higher costs of the warranty

Communication for Specification Development



- Agency and industry willing to communicate
  - Include FHWA Division Office
- Discuss everything openly
  - Potential pitfalls
  - Concerns
  - Experiences
  - Effectiveness of current programs

Performance Warranty Philosophy

- Contractor should control items related to materials and manufacturing since they are accountable for performance

- Agency retains ownership and responsibility for other items

Short-Term Performance Warranties

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  - Performance threshold values
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    - Minimum grade of binder
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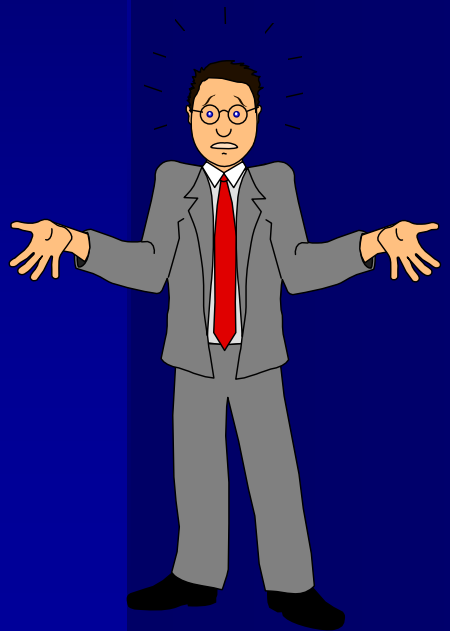
Example: HMA Warranty Items

Materials & Workmanship



- Deformation
- Cracking
- Raveling
- Rutting
- Ride quality
- Friction

Performance

Do Warranties Work?

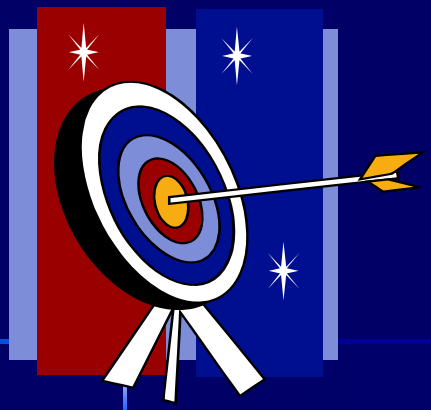
Yes – now let's define – "working"

"The Game is played the way the rules are written"

Best Practices for writing the "rules" include the six building blocks and …..

Core Elements in Performance Warranty Specifications

1. Description
2. Warranty Bond/Guarantee Requirements
3. Conflict Resolution Team
4. Highway Operation Permits
5. Distress Indicators, Thresholds, & Remedial Action
6. Elective/Preventive Actions
7. Agency Maintenance Responsibilities
8. Method of Measurement
9. Basis of Payment
10. Quality Control Plans
11. Verification and Evaluation – Objective vs. Subjective
12. Final Warranty Acceptance



Setting Performance Criteria

1. Select pavements of target age
2. Establish evaluation section length
3. Evaluate performance data
4. Establish performance indicators threshold values

1. Pavements of the Same Target Age

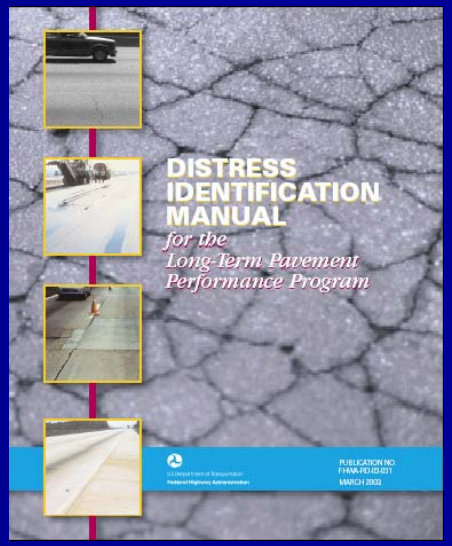
- Establish baseline thresholds by analyzing PMS project data based on
  - Age
  - Functional classification

2. Evaluation Segment Length

- PMS segments may be too long for evaluating warranty pavement condition
  - HPMS segments are typically 1.0 mile
  - Masks localized extreme values
- Recommendation: use 0.1 mile or less

3. Performance Threshold Values - (5-7 Years)

- Example*
  - Ride (IRI) 75 in/mile
  - Rut 0.25 in
  - Friction 35
- Cracking
  - Longitudinal 0 ft
  - Transverse 0 ft



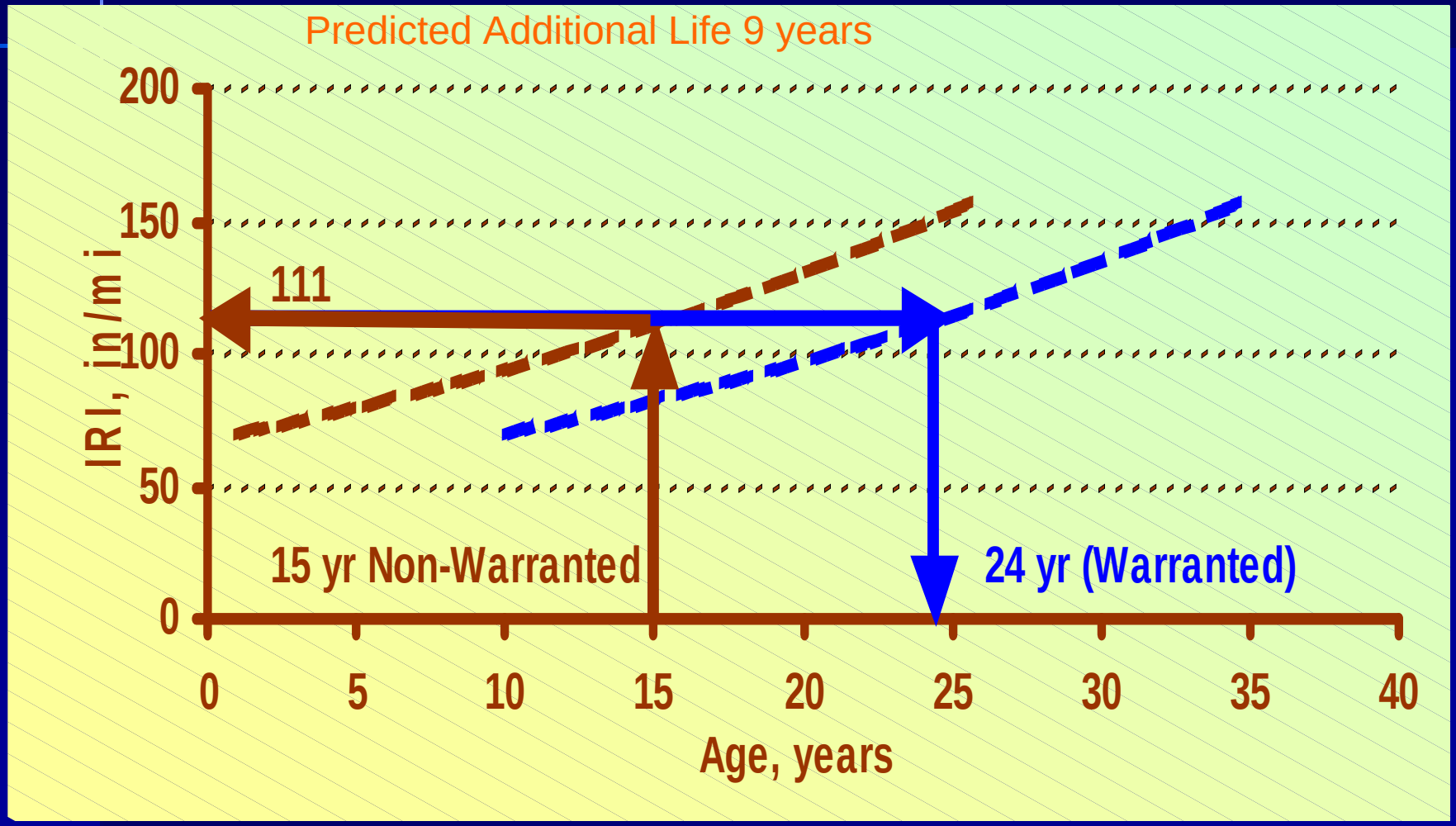
** based on* 520 feet (0.1 mile) *evaluation sections*

Benefits!!!

- Quality of the pavement is generally better when the Agency and Industry have balanced the Risk of warranties.

- Longer life “less defects” pavements are achievable. Remember, this does not mean no defects.

Longer Life (Indiana Study)



TRB Research Record 1891, 2004

Agency Verification and Evaluation

- At a minimum, the agency needs to evaluate the project to determined it status at time zero, and a full evaluation at the end of the project.
- Depending on the agency & contactor experiences, specified frequency of yearly or by yearly could be utilized.
- Risk is directly related to the contractor and cost of the warranty.
- Starting with more inspections will improved agency and contractor confidence in the program.

Performance Warranty Verification Program

Example Performance Indicator

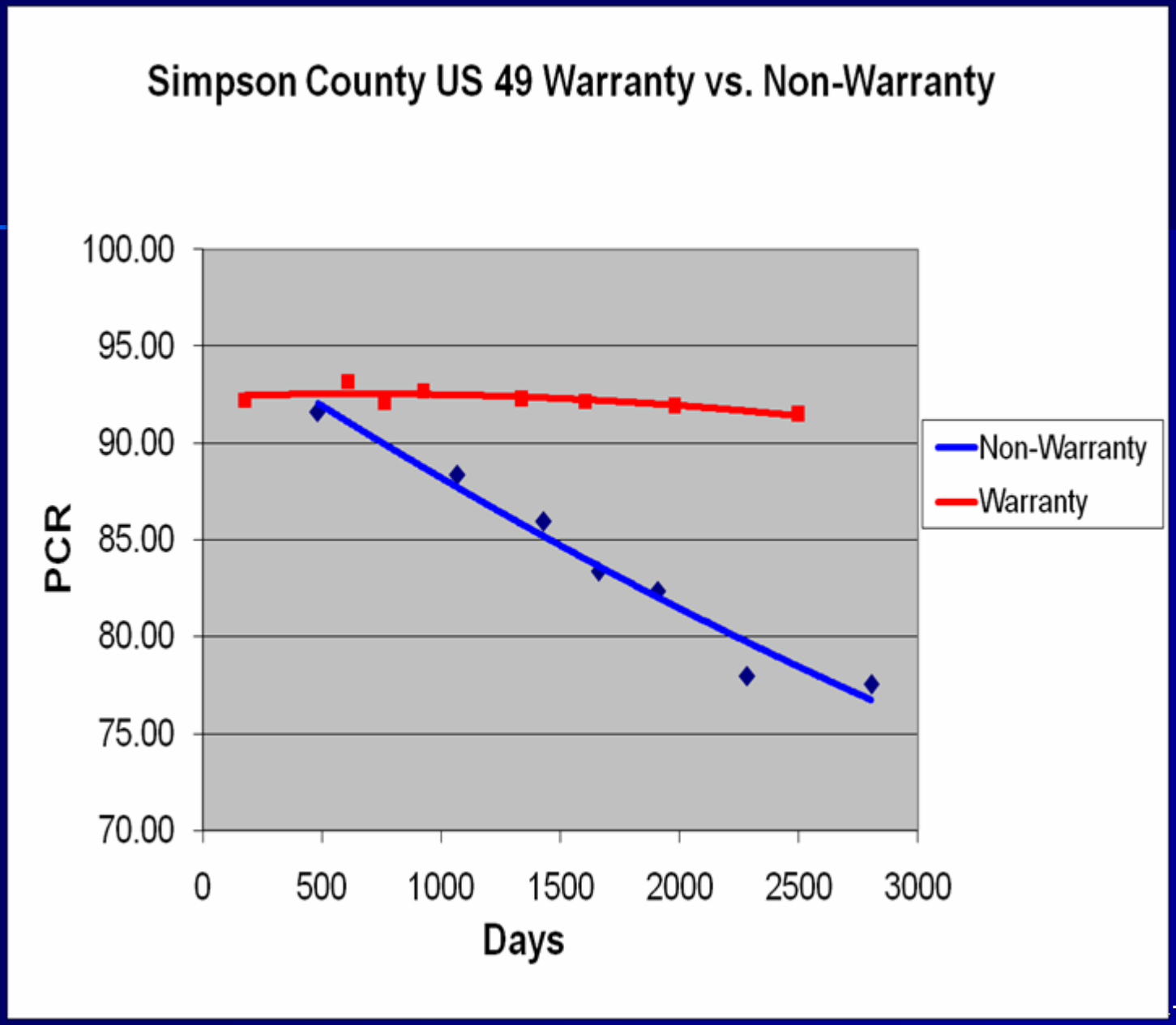
Rutting

- **Measure rutting during Pavement Management System condition survey.**

What makes a successful Warranty????

- The development of the specification jointly with industry is critical to ensure knowledge of the program by all parties
- Inclusion of the 12 basic key elements
- Agency ensures that required performance period reviews are completed in a timely period and results issued to allow contactor remediation within the same year.
- Agency establish and follow up with an open review and evaluation of the program.

Route US 49 - Mississippi


Simpson County US 49 Warranty vs. Non-Warranty
100.00
95.00
90.00
85.00
80.00
75.00
70.00
PCR
0
500
1000
1500
2000
2500
3000
Days
Non-Warranty
Warranty

Warranty Workshops

Basic Warranty Workshop for DOT / Industry

- Best Practices to develop warranty programs
- Experiences to evaluate and improve on current programs
- Provide specific assistance

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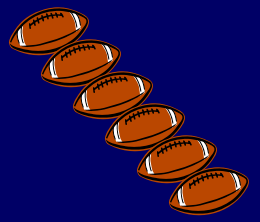
Warranty Workshops – Completed

Warranties for 21st Century

- Changed definition of success
- Improve quality (performance)
- Balance risk
- Reward innovation
- Non-confrontational construction

"The Game is played the way the rules are written."

Indianapolis - Colts



Thank you