

Warranties 101

**NESMEA Conference
Portland, Maine**

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Washington, DC**

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...**

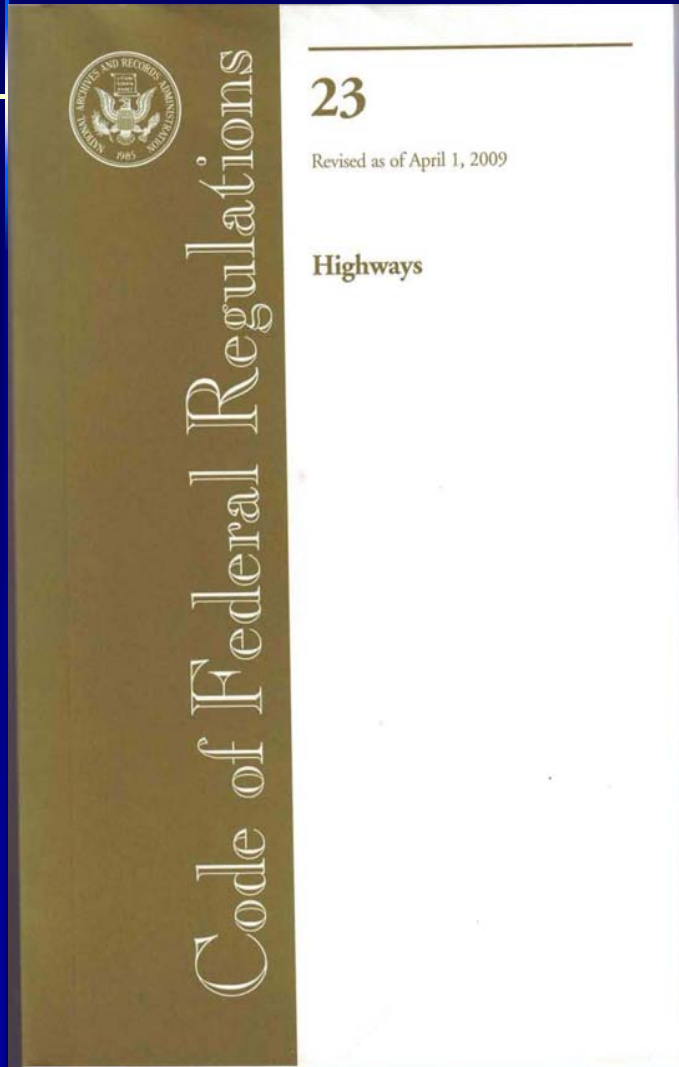


- Guaranty of better performance
- Incentive for quality construction
- Quality based initiative
- Another contracting option
- Incentive for innovation

**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

The screenshot shows a Microsoft Internet Explorer browser window displaying the FHWA Pavement Warranties page. The address bar shows the URL: <http://www.fhwa.dot.gov/pavement/warranty/index.cfm>. The page header includes the U.S. Department of Transportation Federal Highway Administration logo and a search/feedback link. The main content area is titled "Pavements" and features a navigation menu with tabs for Research, Design, Construction, Preservation, Maintenance, Management, and Rehabilitation. The "Warranty" tab is selected, leading to the "Pavement Warranties" page. The page content is organized into three columns: a left sidebar with navigation links, a central main text area, and a right sidebar with "Events", "More Information", and "Contact" sections. The main text area contains two paragraphs of text. The bottom of the browser window shows the Windows taskbar with the Start button and several open applications.

Pavement Warranties

Pavement warranties began in the United States in the late 1800's as local agencies began to pave all weather roads to improve the lives of millions of Americans. Fred Warren, of the Warren Brothers Company, was an entrepreneur of the times. On June 4, 1901, the Warren Brothers Company patented their product called "Warrenite Bitulithic Pavement," and offered 15-year warranties. Early concrete pavements also came with warranties. In 1889, George W. Bartholomew initiated the first Portland Cement Pavement warranty in Bellefontaine, Ohio. Warranties remained in use for several years, but as competition increased they were no longer offered. The Warren Brothers Company continued to offer warranties until the early 1920's.

In the 1950's when the Interstate construction expansion began, the use of warranties was explicitly disallowed. The federal government participated in the cost of building highways but maintenance was completely a state function. The Bureau of Public Roads (Federal Highway Administration) determined that warranties fell under the category of maintenance activities and were therefore not permitted.

For the next 40 years warranties had limited use with States and local agencies, but they surfaced again on highway projects in the 1990's. Federal regulations were revised in 1995 to improve the long-term quality of roadways. Since then, several agencies have used different types of warranties with varying degrees of success. In some states legislative mandates have required the use of warranties. In addition, other state agencies have chosen to use them to achieve a higher quality product.

Events

- View all Upcoming Pavements Events

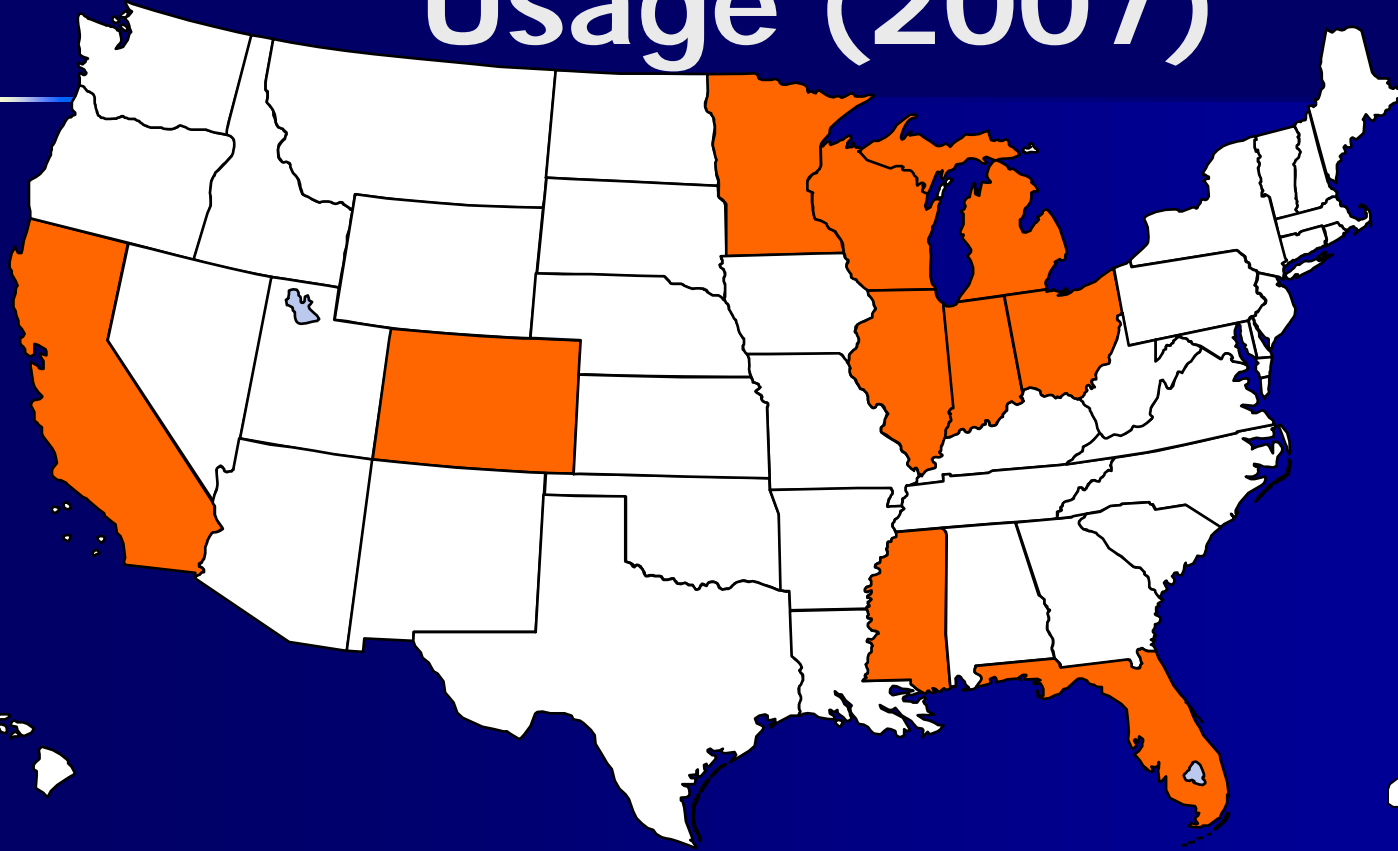
More Information

- Pavement Publications
- Warranties

Contact

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E-mail Lee

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

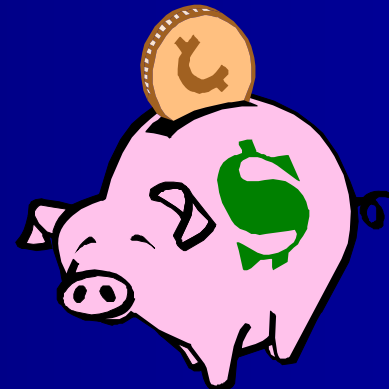


NCHRP Study 2008:

- 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!

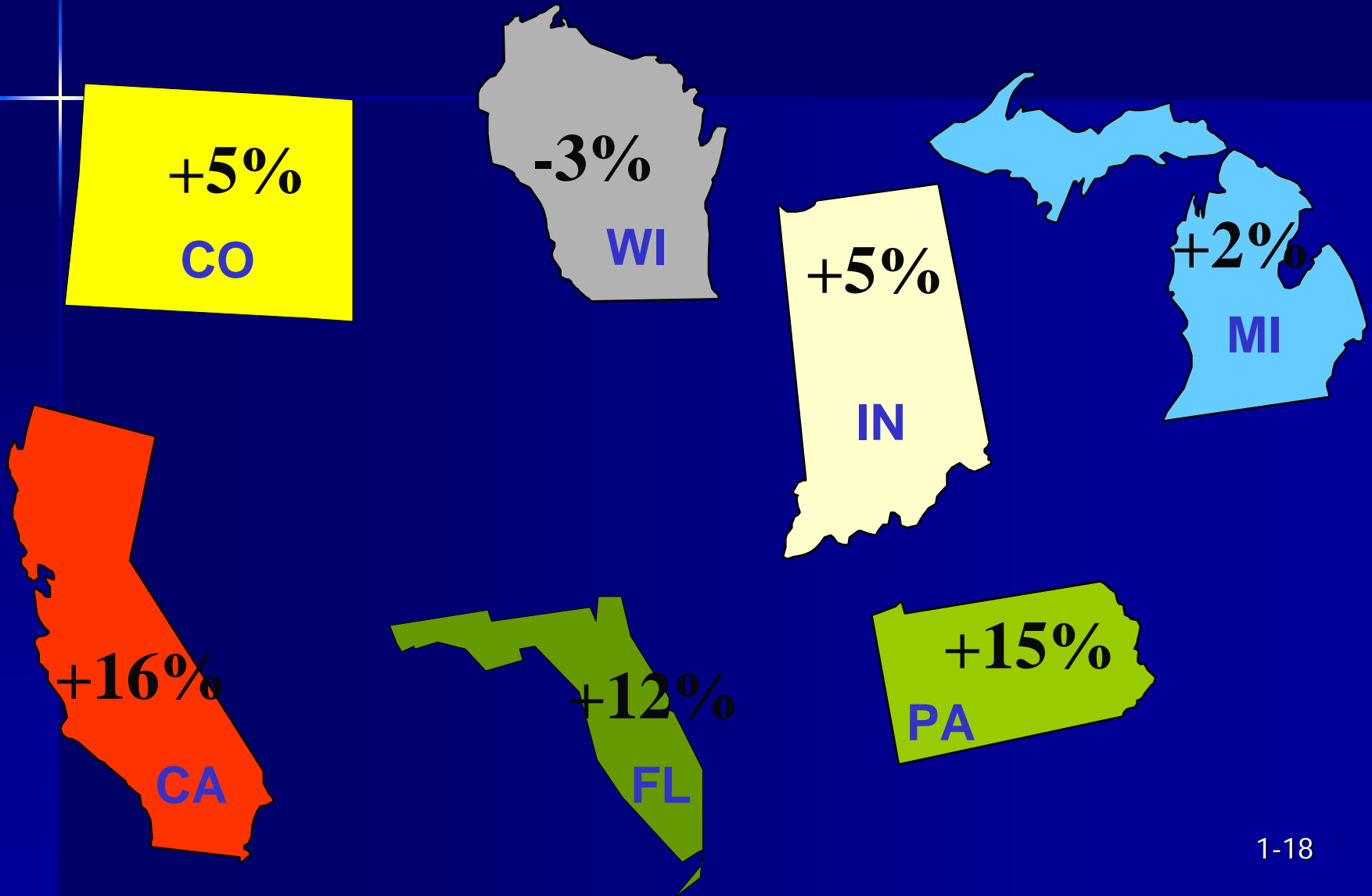
...how are the rules written???

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 developed₁₋₁₇

Cost of Warranties



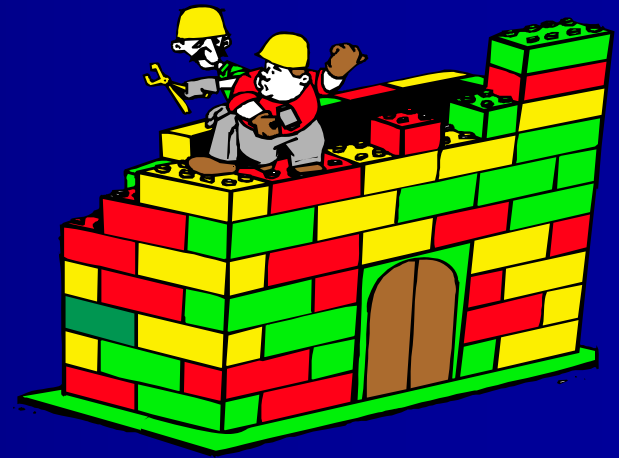
Cost of Warranties

- 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

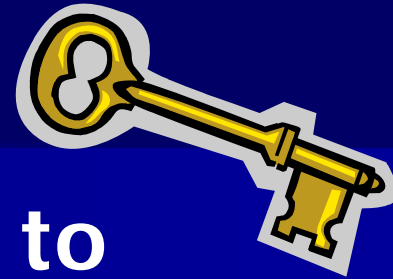
- ❑ Contract Administrative requirements
- ❑ Distress identifiers and applicable thresholds
- ❑ Distress remediation
- ❑ Quality programs for binders, aggregate, production and laydown
- ❑ Restrictions, traffic monitoring and evaluation of the pavement/project
- ❑ Bonding/guarantees



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

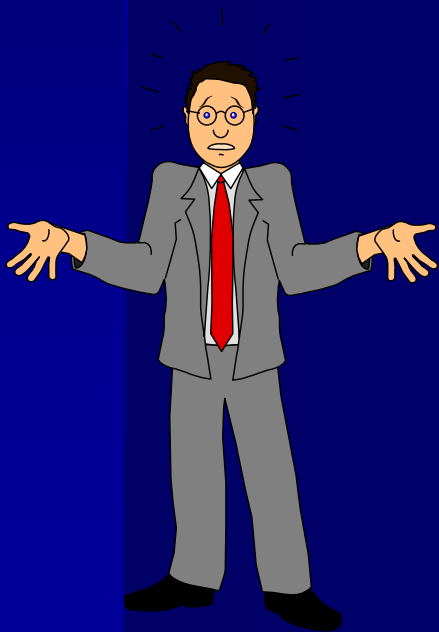
- Agency provides
 - Traffic characteristics
 - Performance threshold values
 - Other potential requirements
 - Minimum grade of binder
 - Aggregate requirements
 - Structural design, typical section, and quantities
 - Project phasing
- Contractor provides
 - Quality management plans

Example: HMA Warranty Items

**Materials &
Workmanship**

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

Performance



Do Warranties Work?

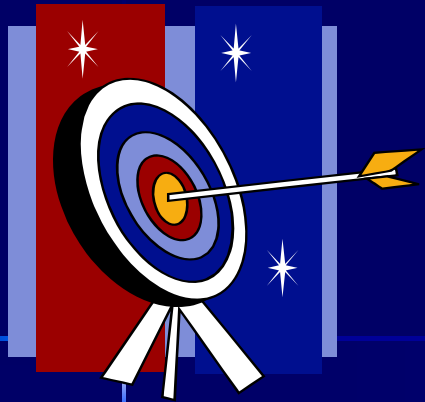
Yes – now let's define – “**working**”

“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

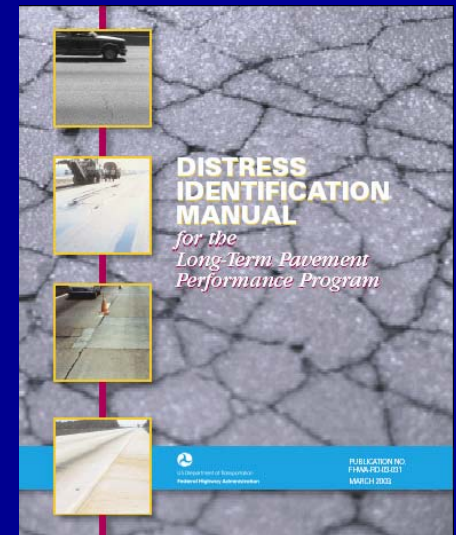
3. Performance Threshold Values - (5-7 Years)

- Example*

- Ride (IRI) 75 in/mile
- Rut 0.25 in
- Friction 35

- Cracking

- Longitudinal 0 ft
- Transverse 0 ft

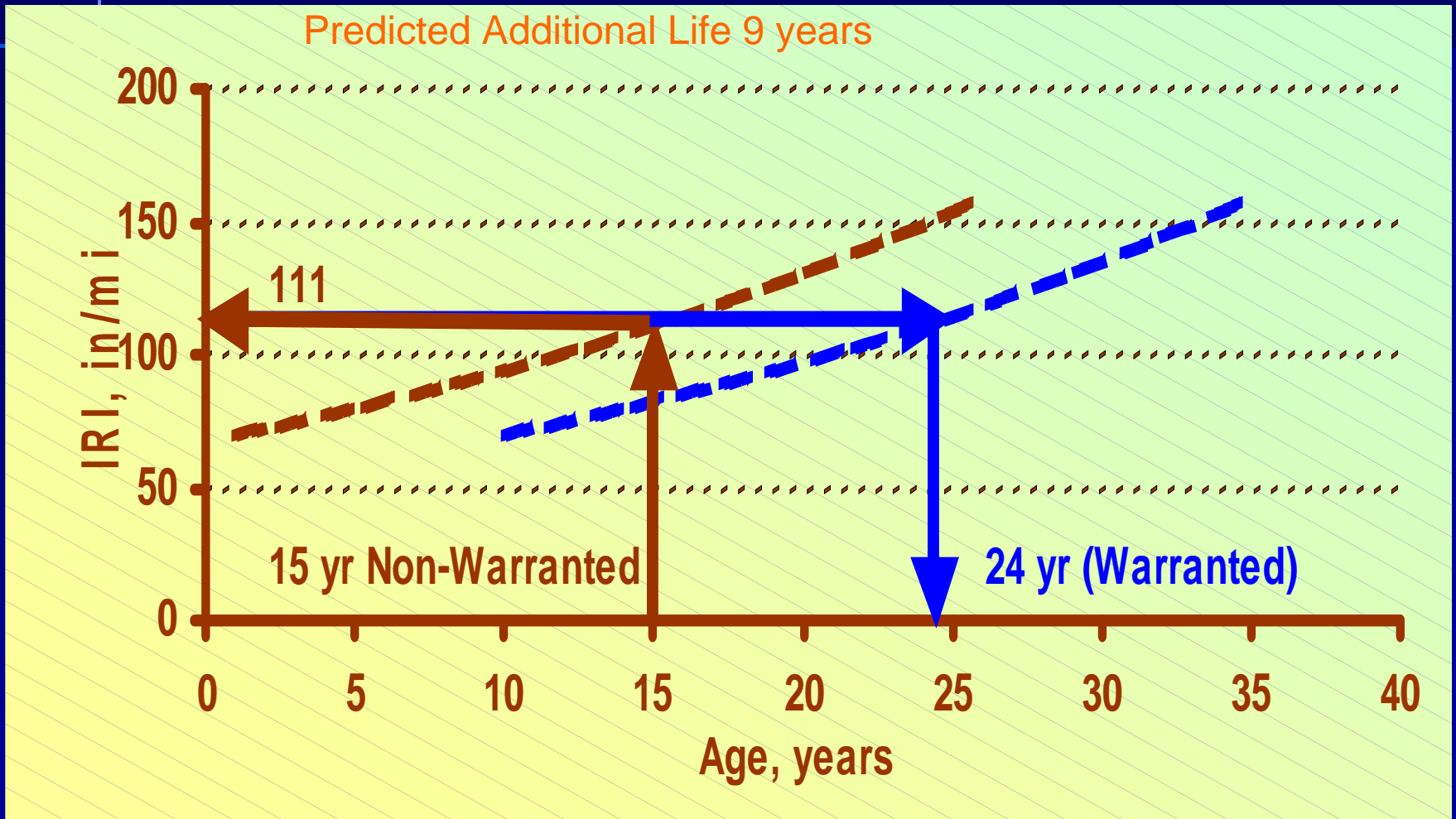


* based on 520 feet (0.1 mile) evaluation sections

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)



Agency Verification and Evaluation

- At a minimum, the agency needs to evaluate the project to determine its status at time zero, and a full evaluation at the end of the project.
- Depending on the agency & contractor 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 improve agency and contractor confidence in the program.

Performance Warranty Verification Program

Example Performance Indicator

Rutting

- Measure rutting during Pavement Management System condition survey.



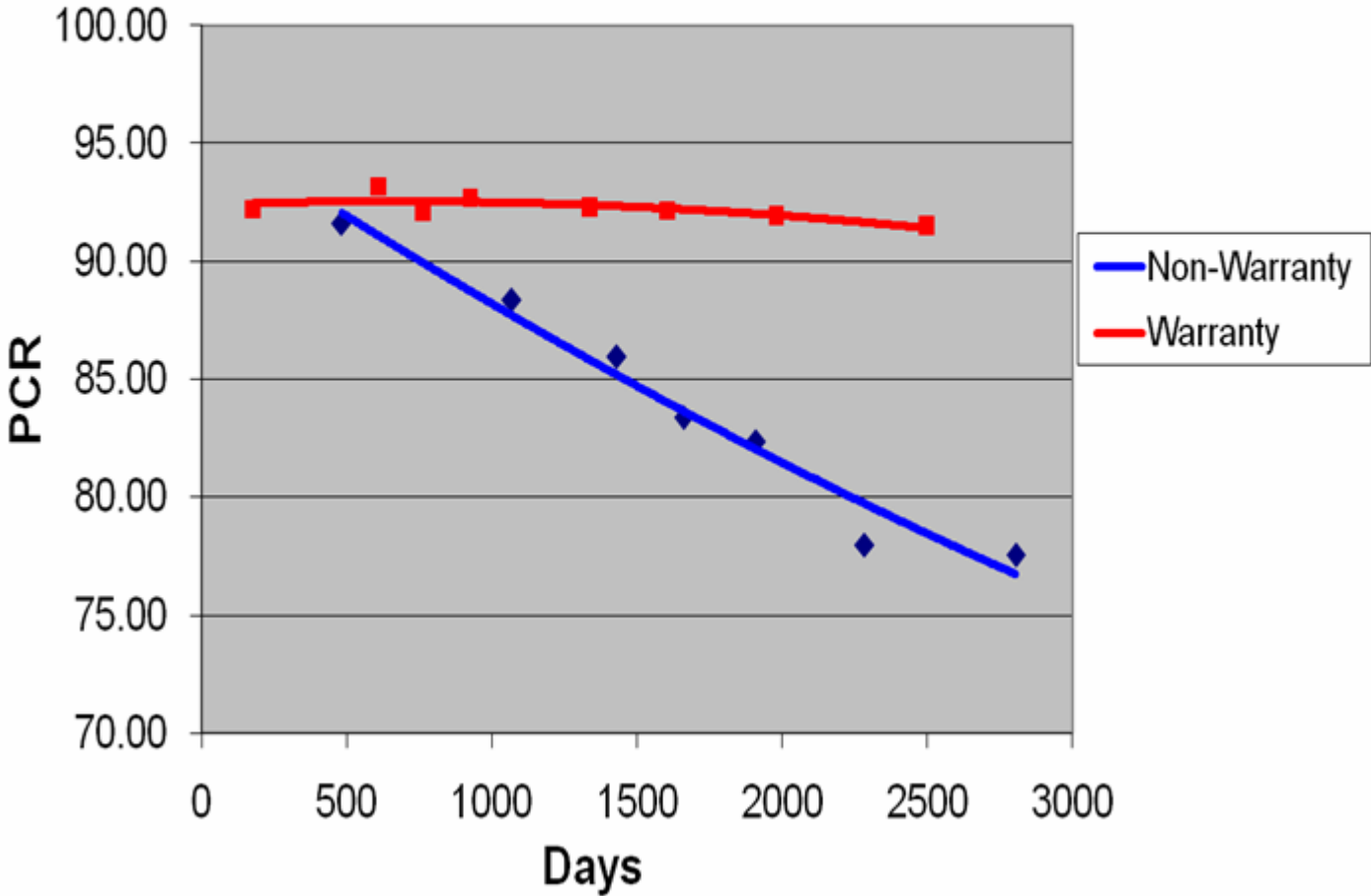
What makes a successful Warranty????

- 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



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

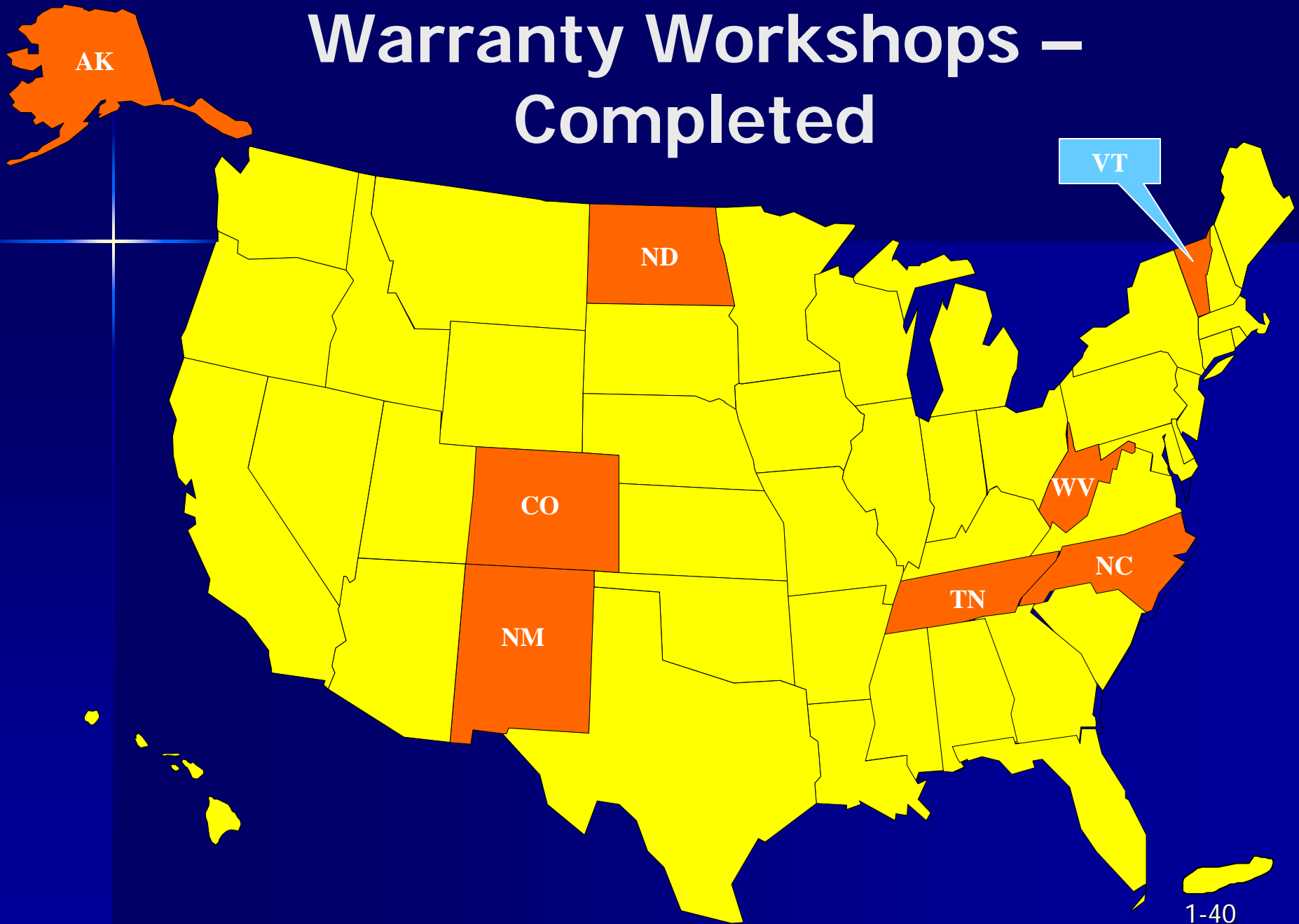
Contact Lee Gallivan, HIPT, 317-226-7493

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Warranty Workshops – Completed



Warranties for 21st Century

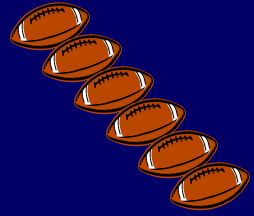
- Changed definition of success
- Improve quality (performance)
- Balance risk
- Reward innovation
- Non-confrontational construction

**“The Game is played
the way the rules are
written.”**





Indianapolis - Colts



Thank you

