National Pavement Warranty Summary

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May 8th, 2006
Panama City, Fl.
2006 SE Pavt. Management & Design Conference
Outline

- Pavement Scan 2002
- NCHRP 10-68 Efforts
- FHWA Efforts
  - Recommended Procedures
  - Workshop
  - Long-Term Warranties
- SE States Efforts
Warranty Definitions

- **Warranty**
  - Performance-based contract
  - Guarantees the integrity of a product
  - Contractor responsible for replacement of defects

- **Warranty Period**
  - Pre-specified for repair defects in the product
  - Provide assurance of performance, but not to unnecessarily inflate contract prices
Warranty Definitions

- Materials and Workmanship
  - Method specifications
  - Includes distresses resulting from defective materials and/or workmanship

- Performance
  - Performance specification
  - Contractor designs some level of structural pavement and/or mix decisions
  - Includes full responsibility for pavement performance
Summary Observations

- Most European countries have a history warranties on pavement construction
- All have at least 1 to 4 year warranties of materials and workmanship
- Several have 5 year performance warranties
- Many countries trying 10 to 18 year Warranties
Summary Observations

- Motivation for Warranty Programs
  - Originally created between owners and industry
  - Recent change in European agencies from service providers to owners
  - Agencies staff size generally decreasing
Summary Observations

Duration of Warranty (years)

- Spain UK: 1-2
- Germany: 4
- Denmark Sweden UK: 5
- Denmark Sweden: 11-16
- Germany: 20
- Spain UK: 25-30

Materials and Workmanship
Materials and Workmanship
Performance
Pavement Performance Contracts
Pavement Performance Contracts “Functional”
Design-Build Finance Operate

Method Specification
Method Specification
End Result Specification
End Result Specification
End Result Specification
End Result Specification
Summary Observations

Material & Workmanship

- Design
- Const
- Maintenance

Warranty Involvement

Long-Term Performance

- Design
- Const
- Maintenance

Anticipated Maintenance

Warranty/Performance Involvement

Short-Term Performance

- Design
- Const
- Maintenance

Warranty Involvement

Design-Build Finance Operate

- Design
- Const
- Maintenance

Anticipated Maintenance

Warranty/Performance Involvement
Summary Observations

- Performance warranties typically cover ride, friction, rutting, cracking, and durability.
- The contractor designs the materials and structure to meet performance criteria.
Summary Observations

- No countries use low bid to award large project contracts
- Prequalification and Best-Value used by all countries
  - Criteria include design, safety, innovation, environment, and extended warranties
  - Panels evaluate the tenders based on set and transparent procedures
Summary Observations

- All host countries believe warranties have improved quality.
- Performance warranties have allowed some innovation by the contractor over materials and workmanship.
Project Scope Definition

- New, resurfacing, and reconstruction
- Dependent primarily on size of project
- Owner determined traffic loads and pavement condition data
- Prime contractor responsibility
- Some user delay costs
Pre-Contract Award

Procurement Similar in all Countries

- Pre-qualification processes
- Best-value selection

Noted as key to success in all countries
Bonding

Construction and warranty bonds were used, but varied in length

- Examples
  - Germany – 5% const. & 2% warranty
  - Denmark – 15% const., 10% year 1 and 2% for remaining warranty
  - Sweden – 10% construction
Design-Methods

- Both method and end results specifications are used
- Performance warranties involved more contractor design
- Concessions involved the most freedom of design
Operation and Maintenance

- Maintenance is “implicitly” included for material & workmanship and short-term performance contracts.
- Maintenance is “explicitly” included for long-term performance and concession contracts.
**Corrective Action**

- In all countries, prime contractor is responsible for corrective action.
- In Denmark, corrective action is paid for in a prorated amount.
- Conditions to void warranty exist (i.e. heavy traffic loads, owner error, etc.).
- In all countries, corrective action is noted in the next bid.
Project Performance

- Warranty performance measurements varied, but are similar to US:
  - IRI
  - Friction
  - Rutting
  - Longitudinal Cracking
  - Transverse Cracking
  - Faulting
Pavement Performance Contracts

- PPC are long-term resurfacing and maintenance contracts
- Length varied by country
  - Sweden – 5-8 years
  - Denmark – 11-18 years
  - Germany – 20 years
- Contractor is responsible for design, construction, maintenance, and some financing
Payment Model Long-Term

Year

Mill. Kr.

2/3 of contract period

Work delivered

Yearly payment
Long term Performance Contracts in the US

- Can we use them in the US?
- Can we use the European Model?
- What changes do we need to make them work?
- Performance Period?
- Performance Indicators?
NCHRP 10-68
“Guidelines for the Use of Highway Pavement Warranties”
NCHRP 10-68

- Trauner Consulting Services
  - Sid Scott – PI
- Started 7/7/05, Completed 3/31/07
- Objective
  - “..is to develop guidelines for the project-level application of pavement warranties.”
- Initial Panel Meeting – March 1-2, 2006
Panel Members

- Texas DOT
- Washington DC
- North Carolina
- Virginia
- Wisconsin
- Indiana DOT
- California DOT
- Maryland DOT
- New Mexico DOT
- FHWA
- TRB
- Industry & Agency
FHWA Efforts
FHWA Efforts

- Three Guidance Papers being developed.
  - Background for Pavement Warranties
  - Selection Procedures for Pavement Warranties
  - Management of Pavement Warranties
- Warranty Workshop – Fall 06-Spring 07
- Long-Term Pavement Warranties
Background for Pavement Warranties

- Who’s tried warranties - 35 States
- Definitions
  - Materials and Workmanship 2-4 yrs
  - Short Term Performance 5-10 yrs
  - Long-Term Performance 10-20 yrs
- International Scan Results
- Warranty Considerations: Cost Effectiveness, Improved Performance, Industry and Agency Concerns
Selection Procedures for Pavement Warranties

- Specifications Development
  - Contractor
- Bonding or Guarantee Issues
- Project Selection
- Acceptance Procedures
- Warranty Evaluations
- Warranty Experiences
Management of Pavement Warranties

- DOT Management of a Warranty Program
  - Who needs to do what during the warranty period
  - Recommended Warranty Data collection
  - Field Verification Process
SE States Efforts
SE States Efforts

- Virginia, West Virginia, North Carolina, South Carolina, Florida, Mississippi, Tennessee, and Louisiana
- Mostly Limited to M&W, Except Virginia
- Florida DOT Standard includes existing QC/QA requirements plus 3 yr warranty on certain elements
Thank You!