

# CONTRACTOR WARRANTY

## GOAL

Incorporate construction quality into the public low-bid process through the use of warranties.

## CREDIT REQUIREMENTS

The project construction contract shall include, as a minimum, a 5-year warranty for constructed portions of the pavement structure to include surfacing (e.g., hot mix asphalt, portland cement concrete, etc.) as well as any underlying layers (e.g., granular base material). Other items may also be included in the warranty but are not required to be for this credit.

The terms of the warranty shall be defined by the owner and may include contractor input if desired. As a minimum, the contractual warranty specifications shall include:

- Definition of what product(s) are warranted
- Length of the warranty period
- Responsibilities of the owner
- Responsibilities of the contractor
- Responsibility for maintenance
- Conflict resolution process
- Contractor quality control plan
- Measurement methods
- Performance based requirements and associated threshold levels that require corrective action by the contractor
- Requirements for remedial corrective action
- Requirements for elective or preventative actions
- Basis of payment
- Final warranty acceptance

### Details

The intention of this credit is to include a short-term 5-year pavement warranty in the contract specifications. This warranty duration is intended to be long enough to cover any pavement performance issues due to poor quality construction but short enough so as not to create warranty bonding issues associated with contractor assumption of risk for unduly long periods of time.

Ultimately, warranties must meet all applicable local and federal regulations. Federal regulations are described in 23 CFR 635, Subpart D, Section 413, *Guarantee and Warranty Clauses*.

## DOCUMENTATION

- A copy of the warranty specifications included in the contract.



CA-8

3 POINTS

### RELATED CREDITS

- ✓ PR-4 Quality Control Plan
- ✓ PR-9 Pavement Management System
- ✓ CA-1 Quality Management System
- ✓ PT-6 Pavement Performance Tracking

### SUSTAINABILITY COMPONENTS

- ✓ Ecology
- ✓ Economy
- ✓ Extent
- ✓ Expectations
- ✓ Experience

### BENEFITS

- ✓ Increases Service Life
- ✓ Reduces Lifecycle Costs
- ✓ Improves Accountability

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## APPROACHES & STRATEGIES

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Develop a standard warranty policy (or a specific one for the project in question) that has been vetted with industry that includes:

- The types of work to be covered by the warranty (i.e. the surface course or entire pavement section)
- The warrantee guarantee and bonding requirements
- An outlet for conflict resolution for both contractor and owner
- Pavement distress thresholds and remedial action
- Agency Maintenance Responsibilities
- Method of performance based measurement for monitoring the pavement
- Final warranty acceptance
- A selection process of projects for which warranties will be included

The NCHRP Project 10-68 “Guidelines for the Use of Highway Pavement Warranties” final report should serve as an excellent source for viable approaches when released. As of October 2010, it is still in final editing.

### Example: Wisconsin Department of Transportation Asphalt Pavement Warranty

*NCHRP Report 451* (Anderson & Russell, 2001) describes a standard process model for warranty contracting (Figure CA-8.1) and then shows a case study of Wisconsin Department of Transportation (DOT) warranted asphalt pavements in its Appendix A as an example.

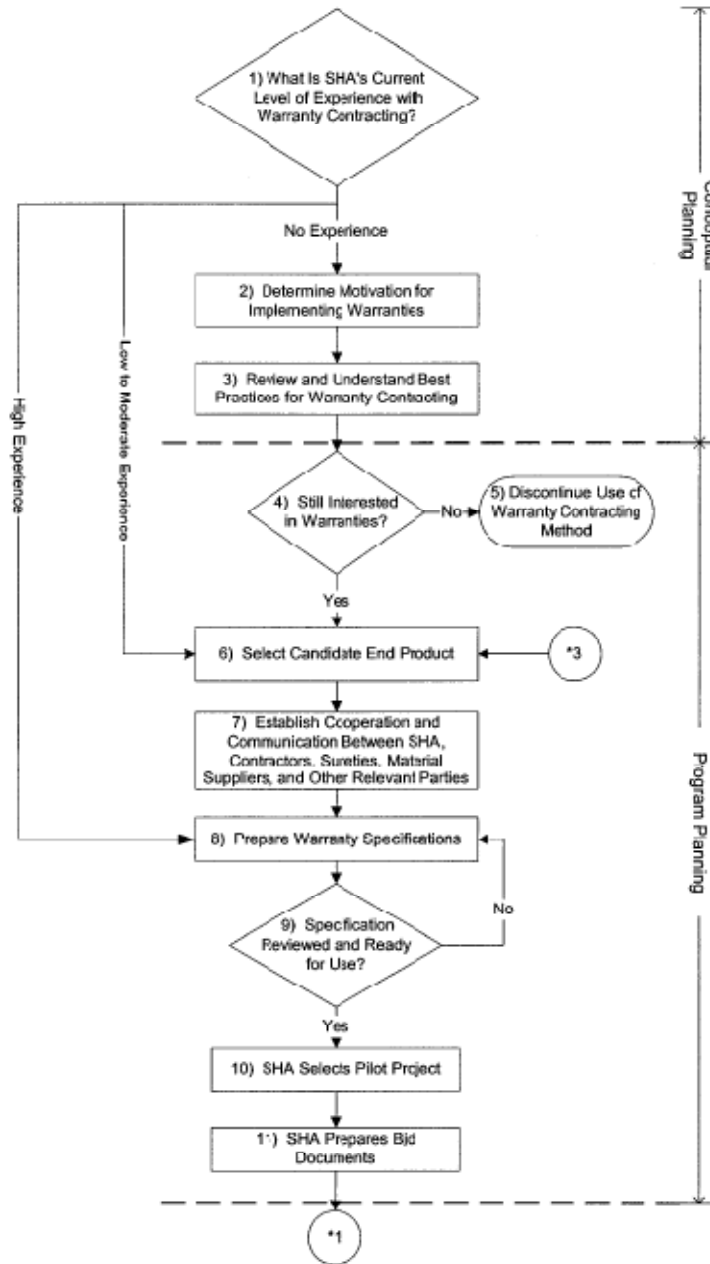


Figure CA-8.1: Flowchart process model for warranty contracting (from Anderson & Russell, 2001).

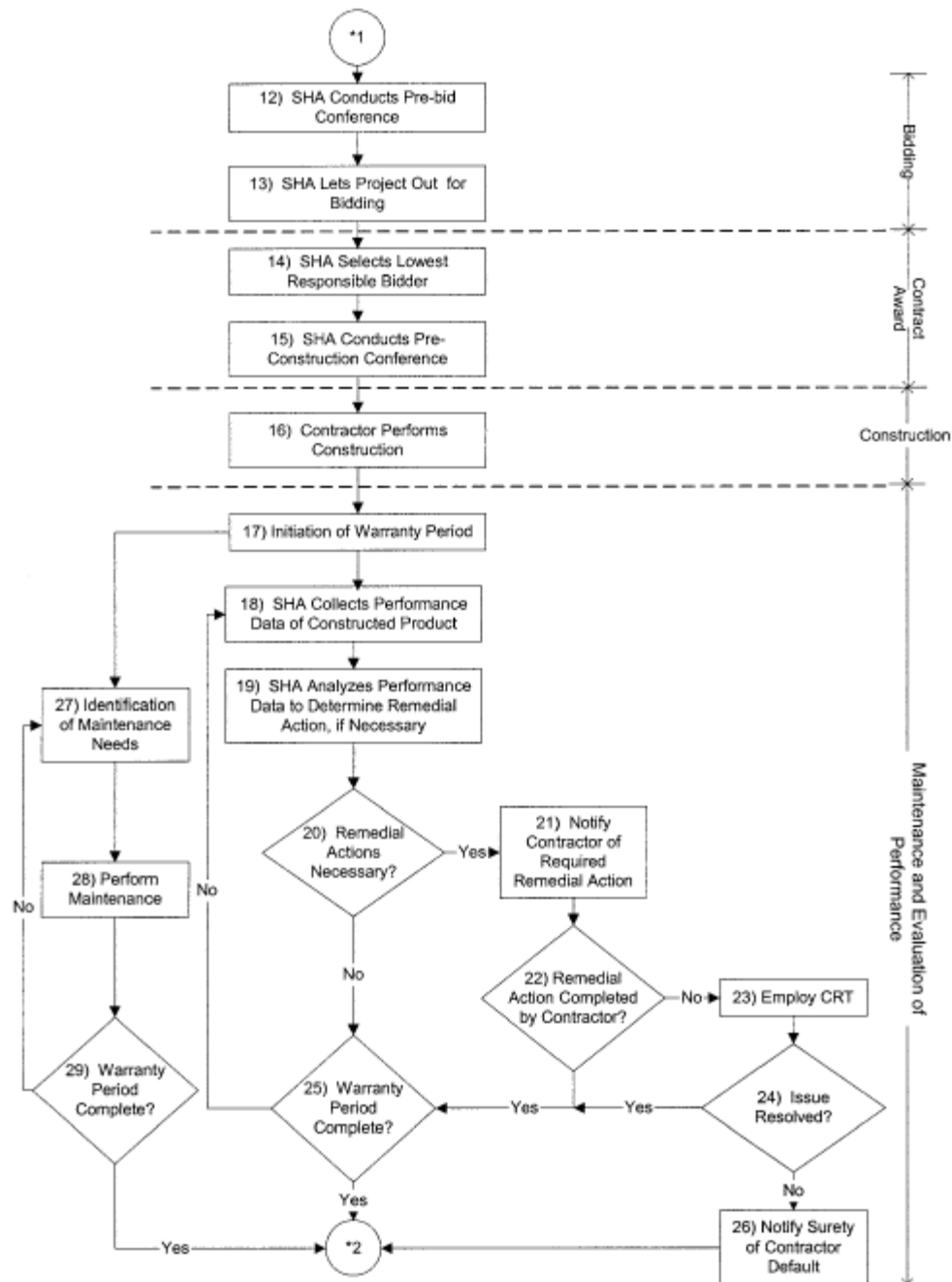


Figure CA-8.1 (continued): Flowchart process model for warranty contracting (from Anderson & Russell, 2001).

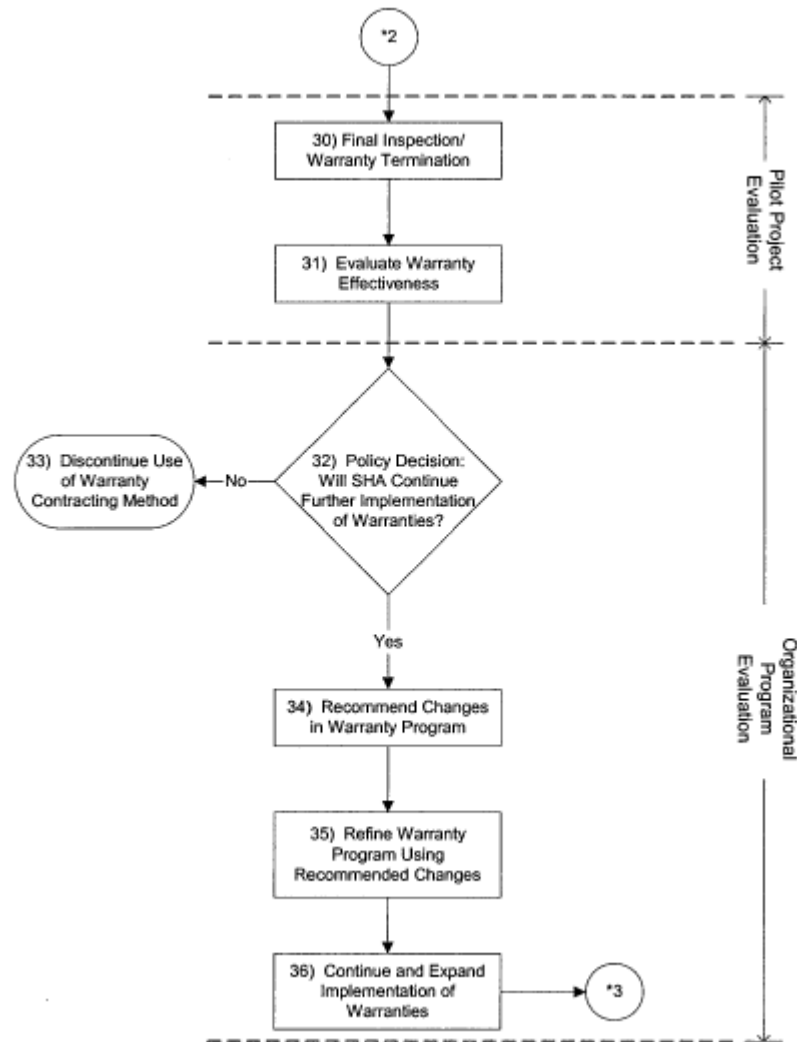


Figure CA-8.1 (continued): Flowchart process model for warranty contracting (from Anderson & Russell, 2001).

Specifics of the case study can be viewed at: [http://144.171.11.40/news/blurb\\_detail.asp?id=5476](http://144.171.11.40/news/blurb_detail.asp?id=5476).

## POTENTIAL ISSUES

1. Using a warranty clause in roadway construction contracts is typically a programmatic decision (must be implemented as standard practice within an owner agency) and not a project-specific one.
2. Warranty provisions as a matter of standard practice can reduce contractor competition as sureties decide which contractors to bond and which ones not to. Experience to date has been that bonding for short-term warranties (like the 5-year warranty in this credit) have not been an issue when done correctly.
3. Long-term performance warranties can reduce contractor bonding capacity because of the increased risk they must carry on their books.
4. Warranties are not free. They are generally priced based on the risk or perceived risk they transfer to the contractor.
5. Performance measures on which a completed project is to be judged can be difficult to agree upon. It can also be difficult to firmly establish a link between contractor construction and performance parameter measurement.

6. Instituting a new warranty program can be difficult because of the learning period involved where both contractors and owners adjust to the warranty clause, its implementation and interpretation.
7. A warranty does not guarantee improved quality, however, most research to date cites better quality as an outcome of contractor warranty programs.

## RESEARCH

A warranty is a fairly common tool in consumer transactions. Essentially, a warranty is an assurance by the seller that property or goods are as represented or promised. This assurance is often backed by a specifically stated remedy in the event the property or good fails to meet the warranty.

### A Brief History

In roadways, warranties have been used in association with pavements for quite some time. The earliest pavement warranties arose in the late 1800s; one example being the 15 year warranty offered by the Warren Brothers Company on their patented Warrenite Bitulithic Pavement (FHWA, 2009). In the 1900s warranties fell out of favor. For instance, prior to 1991 a longstanding FHWA policy used to restricted warranties on federal-aid projects to electrical and mechanical equipment because it was felt that without this restriction federal funds could be used for routine maintenance, which was illegal (FHWA, 2007). In the 1990s pavement warranties began to make a comeback. Rule changes and an evolving view of warranties led to several agencies experimenting with and then using warranties on a regular basis. Although they are still more common elsewhere (e.g., Europe) warranties are common for some owner agencies in the U.S. For other agencies, they are either not used or expressly forbidden.

### Reasons for Warranty Use

Warranty use can be viewed as driven largely by two forces: (1) the desire to improve pavement quality and durability, and (2) the desire to reduce owner oversight during construction (AGC, n.d.). The first concern (improved quality) can also be addressed by other non-warranty solutions such as a quality control specification or tighter specifications. Also, a warranty requirement does not directly ensure any greater quality; it only requires a contractor to provide a remedy if certain parameters (e.g., smoothness, cracking, rutting) are not met. As with all warranties, a pavement warranty is priced and bid accordingly. In an extreme situation, a contractor may choose to include the cost of an entire overlay or partial reconstruction into the bid price to mitigate the risk of corrective actions required by the warranty. The second reason (reduced oversight) may not be realized because owner personnel are usually needed to oversee warranted pavements (AGC, n.d.).

### Types of Warranties

In general, there are three basic types of pavement warranties:

- **Materials and workmanship.** Almost all construction is covered by a short duration (usually 1 year) materials and workmanship warranty. This type of warranty assigns risk to the contractor for following agency specifications in regards to materials and workmanship. If a problem or defect is detected within the warranty period, the agency usually uses a forensic analysis to determine the cause. If it is determined that specification non-compliance caused the problem, it is repaired at the contractor's expense. Otherwise, the agency assumes repair costs. This type of warranty is almost universal, rarely collected on and is usually covered by sureties at no additional charge to the contractor.
- **Short-term performance.** A warranty based on the performance of the finished pavement product that lasts for 2-7 years. These warranties specify a number of performance parameters that the pavement must meet over time. If they are not met the contractor is required to repair/replace the poor-performing pavement. The general intent of these short-term performance warranties is to place the risk of poor construction on the contractor. In most situations, poor pavement construction will manifest itself in poor pavement condition within about 2-5 years.
- **Long-term performance.** A warranty based on the performance of the finished pavement product that lasts for up to 20 years and beyond. These warranties specify a number of performance parameters that the pavement must meet over time. If they are not met the contractor is required to repair/replace the poor-performing

pavement. These long-term performance warranties essentially make the contractor responsible for maintenance and rehabilitation of the pavement in question.

### Benefits and Market Realities of Warranties

Most often, owners pursue warranties because of a perceived benefit. However, the use of contracted warranties also creates a number of market conditions that may or may not negate any perceived benefits. The following is a brief listing of warranty benefits and market realities.

#### Benefits

**Allow evaluation based on performance.** Warranty contracts often provide little direction in materials and methods and rely instead on defining performance over time as the key contract element. This allows owner agencies and contractors to concentrate their efforts on end results rather than methods. This aligns owner evaluation of construction with the public perception of the construction as well as allows contractors substantial latitude to innovate since methods are not defined in the contract.

**Improved quality.** In 2004, Bayraktar et al. (2004) showed 13 states were experienced with warranty contracting with varying degrees of success. Michigan, Ohio, Florida, and South Carolina had the highest amount of warranty contracts each having a 10 to 30 percent of construction contracts containing a pavement warranty. In the same study, 69 percent of the state departments of transportation that responded, noted an improvement in the overall quality of the final product (Bayraktar M. et al., 2004).

**Reduced owner risk.** Warranties tend to place more of the risk of poor construction on the contractor. Typically, even a poorly constructed pavement is likely to last 1 year (the typical duration of a materials and workmanship warranty) in fairly good condition. With a warranty, an owner can collect from a contractor for poor construction based on pavement condition measured over the life of the warranty.

**Inclusion of construction quality in a competitive bid.** In most traditional competitively bid design-bid-build pavement contracts, pavement quality is assumed to be a minimum standard to be met rather than the subject of contractor competition. Warranty requirements usually will require contractors to build their perceived cost of the warranty (their price for the risk incurred) into their competitive bid. Therefore, contractors that build high quality pavement and have good knowledge of their construction quality are theoretically able to reduce their bid amount because of a known lower risk. In essence, pavement quality becomes a competitively bid item.

#### Market Realities (AGC, n.d.)

**Limiting competition.** Asking contractors to assume risk for pavements after they are built generally means that sureties are required to provide warranty bonds. Sureties can be selective in their issuance of warrant bonds, which may limit competition.

**Reduced bonding capacity.** The value of the warranty bonds a contractor carries can reduce its bonding capacity, thus limiting the number and value of jobs it can bid. Long-term pavement warranties can especially tax bonding capacity and sureties because the long duration they must be carried. Also, there is considerable pressure on sureties; those who bond contractors. With a warranty essentially holding a contractor at risk for the warranty period, the surety will also be held liable for the warranty period. The requirement of a separate warranty bond has been the common practice for contractors participating in pavement warranty contracts. Sureties have a very different responsibility when evaluating contractors bidding on warranty contracts. Some sureties view the process as a difficult situation. For instance, they are essentially required to predict that the contractors that they insure will be in business for the entire warranty period. For sureties, the major sources of risk when evaluating contractors for warranty projects include warranty period, financial strength, project experience, and past performance (Bayraktar et al., 2006).

**Increased cost.** Warranties may increase construction costs because (1) higher quality construction may cost more because better materials or more meticulous methods are used, or (2) the cost of warranties are bid into

contracts. Ultimately, a warranty transfers risk to the contractor and that risk is priced. The inclusion of a warranty provision can increase contract costs by 5-10% (Bayraktar M. et al., 2004). However, warranties have also led to lower pavement life cycle costs (Singh et al., 2007). Specifically in Indiana, some estimates have shown an increase of over thirty percent in the expected cost effectiveness of a warranty program (Singh et al., 2007).

**Difficulty in setting objective performance measures.** It is difficult to settle on an objective set of performance measures by which an owner can judge a pavement and determine if defects are due to contractor construction. Typical performance measures can be roughness, rut depth, surface friction and cracking. It is often difficult to establish that such items are directly related to construction quality and not some other factor such as heavier than anticipated loading or poor subgrade.

**Difficulting in starting a warranty program.** Outside states using warranties regularly, contractor experience is limited. The majority of owner agencies using warranties have seen a similar number of bidders on projects compared to projects without warranties. However, when West Virginia began its warranty program, it had many projects that contained a single bidder (Bayraktar M. et al., 2006). Contractors showed a tendency to either not bid due to being concerned about the risk, or to charge more on a given bid. Ultimately, there may be some time involved where contractors and owner agencies become familiar with the terms of warranties and how these terms are enforced. During this time, it is not uncommon for contractors to bid higher to compensate for increased risk.

### State of the Practice

The Federal Highway Administration (FHWA) maintains a website on construction warranties in federal-aid contracts. They also include a subsection on pavement warranties (FHWA, 2009). Table CA-8.1 lists various states with warranty experience in roadway construction.

**Table CA-8.1: Warranty Provisions Used by Various States (FHWA 2007)**

HMA/Rubberized HMA	3-8 years	AL, CA, CO, FL, IN, ME, MI, MO, MS, OH, NM, UT, WI
HMA Crack Treatment	2 years	MI
PCC Pavement	5-10 years	KY, ME, MI, MS, UT, WI
Bridge Components	5-10 years	WA, ME, NM
Bridge Painting	2-10 years	IN, MA, MD, ME, MI, NH
Chip Sealing	1-2 years	CA, MI
ITS Components/Buildings	2-3 years	VA, NC
Landscaping/Irrigation	1 year	WY
Microsurfacing	2 years	CO, MI, NV, OH
Pavement Marking	2-6 years	FL, MT, OR, PA, UT, WV
Sign Sheeting	7-12 years	WV
Roofing	10 years	HI

For further discussion of warranty contracting, see *NCHRP Report 451 Guidelines for Warranty, Multi-Parameter, and Best Value Contracting* (Anderson & Russell, 2001).

## GLOSSARY

<b>Warranty</b>	A collateral assurance or guarantee by a seller that a property or goods are as represented or promised. This assurance is often backed by a specifically stated remedy in the even the property or good fails to meet the warranty.
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