

# JOINT TRANSPORTATION RESEARCH PROGRAM

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## Performance of Warranted Asphalt Pavements: Smoothness and Performance of Indiana Warranted Asphalt Pavements

### Introduction

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Warranted asphalt pavements have been placed in Indiana, on a trial basis, since 1996 in an attempt to improve pavement performance, increase quality, and prevent premature failures. However, in terms of initial capital costs they are more expensive when compared to similar non-warranted asphalt pavements. Thus, to assess the benefits of warranted asphalt pavements, their performance life and the initial and maintenance costs should be evaluated simultaneously.

### Findings

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This study reviewed different types of warranties, the benefits and concerns related to warranted projects, and experiences with warranties in various states, including Indiana. Data from the warranted asphalt pavements constructed in Indiana were analyzed and compared to data from non-warranted pavements in a variety of ways.

In the first section of analysis, this study examined the performance impacts of asphalt pavement warranties by comparing International Roughness Index, rutting data, and friction numbers for both warranted and non-warranted asphalt pavements. The distributions of rutting, friction, and smoothness data were investigated and deterioration curves were developed. Initial costs, as well as short- and long-term maintenance expenditures for both types of projects, were estimated and compared. The results indicate that, overall, warranted asphalt pavements perform more economically than similar non-warranted asphalt pavements. Warranted asphalt pavements deteriorate more slowly and their

service lives can be 10 to 14 years longer than traditional non-warranted asphalt pavements. When initial capital costs are considered, warranted asphalt pavements are 15–40% and 47–61% more cost-effective over short- and long-term comparisons with non-warranted asphalt pavements.

In the second section of analysis, five asphalt pavements built with a warranty specification in Indiana that had been evaluated in a previous study were selected. These pavements range in age from approximately 12 to 17 years. Each warranty pavement was identified by functional class, design traffic volume, and cross-section type. In addition, conventionally constructed pavements of the same ages, functional class, traffic level, and cross-section types were identified for comparison purposes. Results of five sets of pairwise comparisons indicate that in terms of service life, warranted pavements actually outlasted the comparable non-warranted pavements by 1 to 7 years and performed more effectively during their service life.

### Implementation

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Results of this study revealed that warranted asphalt pavements perform superior to and more cost-effectively than similar non-warranted pavements. Both projected and actual service lives were found to be greater for warranted pavements. Based upon the findings of this study, it would be prudent for the Indiana Department of Transportation to consider reinstating an asphalt pavement warranty program. Recommendations are provided regarding how such a program might be established and administered.

## Recommended Citation for Report

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