

This analysis was performed  
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JTRP/INDOT RESEARCH PROGRAM

# Research Pays Off

## Practical Pavement Performance Prediction Model for Indiana Roads

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The Indiana road transportation network consists of approximately 11,000 miles of state and interstate highway. INDOT has made a great effort to maintain pavement conditions at an accepted level and rehabilitate those pavements with a poor quality of service so as to provide the traveling public a quality cost-effective highway system. To utilize the available budgets, INDOT is increasingly committed to pavement management systems (PMS) for planning routine pavement maintenance and rehabilitation activities. It is realized that successful implementation of PMS relies on practical models to predict pavement performance of various types of pavements under real-world conditions. Sound pavement performance models, consequently, are of importance to pavement engineers to provide realistic solutions to restore pavement service quality.

This research project was conducted during the period of 1993 through 1998. The main objective was to develop

practical pavement performance prediction models for Indiana highway pavements, including both asphalt pavements and jointed concrete pavements. Statistical approaches were utilized to determine the least number of independent variables that should be incorporated into models for predicting pavement performance index, such as international roughness index (IRI), pavement serviceability index (PSI), friction number and pavement condition rating. To investigate the effect of these variables on pavement performance, ninety-eight in-service road sections were selected throughout Indiana. Pavement performance data was collected in 1993, 1994, 1995, and 1996, respectively. Statistical analysis was performed to investigate the correlation between pavement performance and the selected variables such as average annual traffic data (AADT), pavement age and pavement type.

### Research Findings and Implementation

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It was found that the IRI could be predicted from the independent variables such as pavement age and AADT for both types of pavements. The results of the statistical analysis indicated that rutting was not affected by the accumulated application of traffic for Interstate pavements, nor was it necessary to col-

lect pavement condition rating data in order to predict pavement performance. Several pavement performance models developed by this study have been employed by the Program Development Division of INDOT. As future data becomes available, existing models will be further calibrated.

## Benefits

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It was demonstrated that the pavement performance models developed through the study were practical and could generate realistic performance predictions for Indiana highways, especially Interstates. As a result, the planning of pavement maintenance and rehabilitation

activities will be more cost-effective and the use of maintenance budgets optimized.

*Cost of Research*  
*\$45,000*

## Contacts

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- Sedat Gullen, Division of Research, INDOT
- John Weaver, Robert Woods, and W. F. Flora, Division of Roadway Management, INDOT
- V. L. Anderson, Department of Statistics, Purdue University