Explicit statements of the efficacy of pavement and bridge treatments, in terms of the asset condition ratings and other performance indicators, is generally essential to asset performance monitoring and feedback and for evaluating and comparing alternative treatments. Also, in asset performance modeling and prediction, such effectiveness values are important because asset managers use them to determine the expected incremental change of asset condition resulting from a future application of a specific maintenance treatment. That way, the agency can update its asset performance curves in software simulation to reflect maintenance application at any future year and to identify the most cost-effective treatments.

In response to these needs, the Indiana Department of Transportation (INDOT) commissioned this study to

- synthesize the literature on how standard asset maintenance treatments have affected asset surface ratings;
- use INDOT asset performance data to quantify the effectiveness of such treatments in order to identify the factors that influence such effectiveness; and
- use cost and performance data to estimate the cost, effectiveness, and cost-effectiveness of these treatments.

This report addresses these objectives.

The report presents a set of averages or models that represent the impacts (performance jump, post-treatment performance-vs.-age relationship, and cost) of each standard treatment type typically applied to INDOT’s pavement and bridge assets. The performance impacts are expressed in terms of the requisite performance indicators. The performance jump models showed that the asset’s functional class and pre-treatment condition and the treatment type are major significant predictors of the performance jump and post-treatment performance loss. The first deliverable from this project is the average (mean) impact for each treatment type under investigation. The second deliverable is the overall statistical description of the impact of each treatment, namely the minimum and maximum impact and the range and standard deviation of impact, as well as a statistical model that predicts the impact as a function of asset and treatment attributes. The third deliverable is a set of charts that describe the sensitivity of the treatment impact to factors related to the asset or the treatment. The report also presents the development of cost models for each of the pavement and bridge treatments and shows how these were used to assess the long-term cost-effectiveness of the treatments.

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