

Development of performance curves for thin bonded concrete overlays on asphalt in Minnesota

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ABSTRACT

Whitetoppings, now commonly referred to as bonded concrete overlays on asphalt (BCOA), are growing in popularity as an option for rehabilitating existing asphalt pavements. Various design procedures have been developed for BCOA over the past few decades, but few are based on long term evaluation of field performance. It was the objective of this study to develop predictive performance models, based on measured performance of existing whitetopping projects in Minnesota, which will eventually be adopted into Minnesota Department of Transportation's (MnDOT) pavement management project selection process. In this project, 26 whitetopping projects in service throughout Minnesota from 1993 to 2017 were examined to determine their historical performance to date. To gather supplemental performance data, each of the projects was visited periodically from 2015 to 2017. From this and other historical data, performance curves were developed to highlight the current trends in Minnesota whitetopping performance in terms of MnDOT's standard pavement index parameters. An analysis of the effect of specific design parameters on BCOA performance was also carried out. Finally, several predictive performance models, based on International Roughness Index (IRI) values, were developed for undoweled whitetoppings in Minnesota. From these models, the estimated design life of whitetoppings in Minnesota was determined.