A RELIABILITY STUDY OF PAVEMENT PERFORMANCE PREDICTION

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ABSTRACT

The prediction of road pavement performance may be facilitated by models developed by analysing appropriate data sets. However, systematic or random errors in these data sets and incomplete data sets result in that the predictions made by the models may not be fully accurate and include a degree of uncertainty. Therefore, ideally the behavioural modelling of long-term pavement performance should include a procedure for taking into account the uncertainty in the data and quantify it accordingly. This paper presents such a methodology that first defines the reliability of pavement performance predictions and its associated risk using a probabilistic approach. It then demonstrates how the reliability of pavement performance predictions can be estimated by considering the variability of the parameters of the performance model using the Monte Carlo simulation. The analysis demonstrates that variability has a significant influence on predictions and shows how risk-related measures can be calculated. The methodology is validated using data sets held in an existing road management system.

KEY WORDS: Pavement performance modelling, Monte Carlo