

Multi-Types of Flexible Pavement Deterioration Prediction Models

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A B S T R A C T

The development of an accurate pavement deterioration tool is necessary for active pavement management in order to produce an accurate and timely repair intervention plan and thus minimize repair costs. This study shows the development of network level condition prediction models for flexible pavement on arterial roads. Three types of models are developed: distress based deterministic, age based probabilistic, and distress based artificial intelligence. The historical condition data in the Long-term Pavement Performance (LTPP) database is adopted to create a deterioration trend in pavement condition index (PCI). In development of both deterministic and artificial intelligence models, pavement cracks, age, traffic loading and maintenance effects are considered as input parameters, whereas for the probabilistic model pavement deterioration versus age is formulated using a Markov chain method. It was found that the comparison of the three models with each other; the artificial intelligence-based prediction models are more accurate in estimating future condition of asphalt pavement in all climatic zones. This can be an effective tool to be implemented in pavement asset management.