

Developing a Prediction Model of Present Serviceability Index Using Fuzzy Inference System

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A B S T R A C T

Pavement maintenance and rehabilitation prioritization are conducted based on the accessibility of overall measures for evaluating the condition of each section in the pavement network. Regularly, the pavement condition of each section has been evaluated by some common condition indicators. One of the most important indicators is the present serviceability index (PSI) which is adapted to depict the functional performance regarding ride quality. The main aim of this study is to develop a prediction model of ride quality for flexible pavement using the fuzzy logic technique. The data of input variables are extracted from the database of Long-Term Pavement Performance (LTPP). The research involved 36 pavement sections with 319 data samples for pavement networks of different states in the USA. The ride quality measure which is PSI estimated by the AASHTO equation represents the output variable, whereas patching area, cracking length, slope variance, and rut depth are considered input variables. The results showed that the fuzzified model of ride quality prediction has a decent accuracy with a high determination coefficient. In addition, based on the testing results, the developed prediction model showed a strong accuracy to predict the ride quality index.