

MODELING OF PAVEMENT ROUGHNESS PERFORMANCE USING THE LTPP DATABASE FOR SOUTHERN REGION IN THE U.S.

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ABSTRACT

The objective of this study is to develop a model to predict the pavement roughness deterioration. The focus is on 34 asphalt pavement test sections with bound base included in the General Pavement Study (GPS) 2 of the Long-Term Pavement Performance (LTPP) database for the southern region of the United States. The enhanced linear regression equation developed in this study with Pearson’s Correlation R of 0.498 includes initial International Roughness Index (IRI), pavement age, equivalent single axle load (ESAL) traffic, and design structural number, as well as a dichotomous variable for construction number. The validation results of the prediction had an average difference of -1.6% compared to the mean measured IRI value on 7 test sections. In contrast, AASHTO Mechanistic-Empirical Pavement Design Guide (MEPDG) method gave an average difference of 4.2%. Hence, the IRI predictions from the MEPDG will underestimate number of years to reach the acceptable target IRI value.