Prediction of Pavement Deterioration Based on FWD Results

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Abstract

Prediction models for pavement deterioration of major roads in Miyazaki Pre-fecture, Japan, using falling weight deflectometer (FWD) data are presented. The models would be incorporated in a pavement management system (PMS), for the prefecture, which is under development. At first, a relation between Japanese maintenance control index (MCI) and cumulative equivalent single axle loads (CESAL) was established. MCI was computed using variables that were automatically measured by a vehicle mounted with laser beam, cameras and profilometers. AASHO performance equation provided the basis for the development of these new models. Strength (deflection) factor was introduced into the coefficient that controls the slope of the performance curve through multiple regression analysis. Given FWD deflection and CESAL, these models could predict the trend of future pavement deterioration. This method increases the range of applicability of FWD data and may complement pavement condition rating systems that provide a measure of current pavement conditions only.

Keywords: Falling Weight Deflectometer (FWD), Pavement Deflection, Prediction, Pavement Deterioration, Pavement Performance