

Abstract

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Investigation of Factors Affecting Pavement Roughness

Asphalt concrete pavement is the most common type of pavements used in Egypt and around the world. Several factors can affect the pavement performance. A good understanding of these factors would enable pavement specialist to build smooth, cost effective, long-lasting pavement that requires little maintenance; satisfies user needs. Several methods can be used to evaluate the pavement performance. Among these methods is the pavement roughness. In 1986, the Long-Term Pavement Performance (LTPP) project was established as a part of Strategic Highway Research Program (SHRP); it was aiming to construct a large scale database to satisfy a wide range of pavement information needs. This project was designed to allow for a comparison of the performance of different pavement sections under various sets of loading and environmental conditions. The main objective of this research is to evaluate the effect of service life and pavement thickness on the pavement roughness. The data from the LTPP database were used to develop mathematical models correlating the pavement thickness, service life, environmental conditions, traffic levels, and subgrade type to pavement roughness. These models recommended that the effect of increasing the thickness on the expected service life is negligible for the conditions of low traffic, dry environment, and medium temperature. Traffic level does not have a considerable effect on deterioration rates of pavement roughness in case of coarse subgrade and dry environment.