

## **Abstract**

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 experts to build smooth, cost effective, and long-lasting pavement that requires little maintenance and satisfies user needs. Many characteristics are used to evaluate the pavement performance. Among these characteristics is the pavement roughness. In 1986, the Long-Term Pavement Performance (LTPP) project was established as a part of Strategic Highway Research Program (SHRP) and 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 pavement roughness. The data from 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 thickness on the expected service life is negligible for the conditions of low traffic, dry environment, and medium temperature.