# MODELING EFFECTS OF TIRE INFLATION PRESSURE ON RIGID PAVEMENT RESPONSES

**S. A. Galal[1] and S. A. El-Kholy[2]**

**ABSTRACT**

The Mechanistic-Empirical (M-E) design method for rigid pavement employs mechanistic models to calculate a huge number of pavement responses due to a spectrum of traffic loading. One major assumption frequently associated with the mechanistic models is the uniform tire-pavement contact stress distribution over a circular contact area with the contact stress simply equal to the tire inflation pressure. However, experimental measurements and recent studies have demonstrated that the actual tire pavement contact stress (loading condition) is non-uniform and depends on the tire construction, tire load and tire inflation pressure. In this study, calculated non-uniform tire-pavement contact stress data for different tire load and inflation pressure conditions were used to predict rigid pavement responses through a finite element (FE) procedure. The objective was to establish a procedure on how wheel load can be considered in currently mechanistic models to represent the non-uniformity of tire contact stress. Finally, a comparison was conducted between the two different contact stress distribution (uniform and non-uniform). The data generated from this study illustrated that there is a significant difference between the responses computed with uniform (conventional assumption) and non-uniform contact stress distributions.

[1] Associate Professor of Highway and Traffic Engineering, Fayoum University
[2] Assistant Professor of Structural Engineering, Fayoum University