Abstract

Falling Weight Deflectometer (FWD) is a popular equipment being used for non-destructive pavement evaluation. Efforts have been made in this thesis to backcalculate the in-situ elastic moduli from synthetically derived FWD deflections at seven equidistant points. Artificial Neural Network (ANN) is used as a tool for backcalculation in this work. ANN is observed to backcalculate layer moduli, both from normal as well as noisy deflection basins with better accuracy compared to EVERCALC and ExPaS. EVERCALC is a popularly used backcalculation software downloaded from internet and ExPaS is a backcalculation algorithm developed in-house, based on 'search and expand' approach. Works have been extended further to develop ANN models which can predict a possible rigid layer at the bottom of the pavement, and can predict the remaining life of the pavement, directly, without backcalculating the layer moduli. Finally, a reliability analysis is done to quantify the performance of ANN backcalculation.