Analytical study of road pavement performance models for a sample of roads in Syria

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Abstract

Pavement performance prediction models are the main part of the pavement management systems which are considered as the engine for it. It can be used for the data analysis and reporting on the network condition in order to establish the maintenance needs. The performance prediction and distress performance models are the most important models for the pavement management systems. Main concept of pavement performance depends on the pavement surface type, construction methods, traffic volumes and environmental factors [8]. Maintenance and rehabilitation are very important to achieve a certain level of the road surfaces and pavement quality, so it is very important for the road agencies to know what is the required maintenance action and what is the right time to apply that maintenance [15]. The main objective of this paper is to develop the pavement condition performance models and study the pavement condition evaluation of the network samples for Syrian highway network under this paper objective which include road inventory and distresses visual survey and roughness measurements. The study output is the relation between the condition evaluation indices and the effective factors on pavement performance and how much the effectiveness on it. Statistical models were used to establish the performance models, and PCI & PSI are dependent variables where the other factors (Pavement Age, Traffic Volume,) are independent variables. As a result a group of Prediction models were established taking care of the Road classifications and Maintenance type which was done on the road. Suggestion and recommendation were to use the prediction models which was using the age of the pavement and the maintenance type as effecting factors on the pavement condition as an preferable models to be used for the performance prediction along with the pavement age. These prediction models help in the plan for the maintenance works that are more efficient economically. To achieve the paper goals mentioned above a complete work was done by the researcher which included road inventory and distresses survey and roughness measurement. The data were used to calculate the Present serviceability index (PSI). The recommended performance models were tested by the comparison between the actual data and calculated ones to validate the models output. Three categories of the road as classified by the MOT, two types of maintenance traffic volume, pavement age and environmental factors were used in the study phases and the analysis to understand its effects on the pavement performance.