شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم

HANAA ALY

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جامعة عين شمس

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قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
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HANAA ALY

AIN SHAMS UNIVERSITY

FACULTY OF ENGINEERING

Public Works

Developing a Mathematical Model to Evaluate Asphalt Pavement Condition for Libyan Roads

A Thesis submitted in partial fulfilment of the requirements of the degree of

Master of Science in Civil Engineering

(Public Works)

by

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Bachelor of Science in Civil Engineering

(Public Works)

Faculty of Engineering, Omar Al-Mukhtar University, ٢٠١٥

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Cairo - (٢٠٢١)

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Date:٢١ December ٢٠٢١

Statement

This thesis is submitted as partial fulfilment of Master of Science in Civil Engineering Engineering, Faculty of Engineering, Ain shams University.

The author carried out the work included in this thesis, and no part of it has been submitted for a degree or a qualification at any other scientific entity.

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Abstract

Pavement evaluation is an essential step for pavement preservation. It is a major part of any pavement management system. The department of transportation must have an approved indicator to evaluate the pavement condition to determine the necessary maintenance procedures.

There are no methods to evaluate the Pavement in Libya; therefore, there is no pavement condition data in the competent authority. Therefore, the researcher suggests a technique for evaluating the flexible Pavement in Libya.

This study used indices of pavements evaluation such as Pavement Condition Index (PCI), International Roughness Index (IRI) and Present Serviceability Index (PSI) to obtain appropriate data. Moreover, it investigated their correlation with the Libyan Road Users' Opinion (LRUO); this was obtained by a questionnaire targeting road users.

The data showed that PSI has a moderate correlation with LRUO, while IRI did not show agreement with LRUO, but it indicated a strong relationship between the LRUO and PCI with a Pearson correlation coefficient (R) of ٠.٨٠٧ and coefficient of determination (R^2) of ٠.٦٥٢.

Moreover, the relations of PCI with other evaluation methods are strong, with a correlation coefficient of ٠.٨٢٨and -٠.٧٣٤ for PSI and IRI. Also, was developed a PCI model according to LRUO and IRI with R^2 of ٠.٩٥, Standard error of ٨.٩. Thus, the PCI can be determined more quickly and simply through LRUO and IRI.

Finally, a mathematical model was developed for the Libyan road pavement index(LRPI), based on PCI and IRI with R^2 of ٠.٩٠١ and a stander error of estimate of ٠.٤٥.

Keywords:

Pavement Evaluation, PCI, PSI, IRI, Road Users

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