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Al-Muthanna University

College of Engineering

Department of Civil Engineering

Evaluation of Pavement Condition Using GIS in Samawah City

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Summary

Pavement deterioration significantly impacts transportation efficiency and safety. Effective pavement management systems (PMS) are crucial for maintaining road networks in good condition. This research investigates the potential of Geographic Information Systems (GIS) to enhance pavement management and condition assessment in selected regions of Samawah City in Iraq as a case study.

A case study approach was employed, focusing on a specific region in Samawah city. Road sections within the study area were chosen based on criteria such as traffic volume, road type, and reported maintenance history. The Overall Condition Index (OCI) was used to assess pavement condition. Data collection involved visual inspection and standardized evaluation methods. ArcGIS software was utilized to generate maps of the study area, with color coding representing different pavement condition states. The study area was then divided into four zones based on the OCI rating.

The research revealed a critical gap in current practices, as most road agencies in Samawah, particularly within the case study area, lack established maintenance and management plans. Reactive, "emergency" maintenance is the norm, with interventions only occurring when roads are severely deteriorated or pose significant safety hazards. The GIS-based approach facilitated the visualization of pavement conditions across the entire study area, enabling the identification of critical sections requiring immediate attention.

The findings of this research demonstrate the value of GIS technology for pavement management in Samawah City. By survey and data collection providing a centralized platform for data collection, analysis, and visualization which is represented by the program ArcGIS.

The initial area, Al-Hussein neighbourhood (region A), is marked as being in fair condition. Roads in the Al-Sadr neighbourhood range from fair (yellow) to poor (red), with deterioration attributed to insufficient monitoring and lack of a proper maintenance plan, resulting in neglect by responsible authorities. In contrast, roads in the Officers' Quarter and the Politics District are in good to very good condition, thanks to recent maintenance efforts.

Proactive maintenance strategies can be implemented based on insights gained from the GIS database. Regular updates to the system will allow for continuous monitoring and informed decision-making regarding pavement repairs and improvements. This approach can significantly improve road safety, reduce maintenance costs, and optimize resource allocation for Samawah road agencies.

وزارة التعليم العالي والبحث العلمي

جامعة المثنى

كلية الهندسة

قسم الهندسة المدنية

تقييم حالة التبليط باستخدام GIS في مدينة السماوة

رسالة مقدمة الى مجلس كلية الهندسة في جامعة المثنى وهي جزء من متطلبات الحصول على درجة الماجستير في علوم الهندسة المدنية

من قبل

حنين فالح حسن

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بإشراف

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