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Sustainable Maintenance Model for Infrastructure in Egypt

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Abstract : Infrastructure maintenance is a great challenge facing sustainable development of infrastructure assets due to the high cost of passive implementation of a sustainable maintenance plan. An assessment model of sustainable maintenance for highway infrastructure projects in Egypt is developed in this paper. It helps in improving the implementation of sustainable maintenance criteria. Thus, this paper has applied the analytical hierarchy processes (AHP) to rank and explore the weight of 26 assessment indicators using three hierarchy levels containing the main sustainable categories and subcategories with related indicators. Overall combined weight of each indicator for sustainable maintenance evaluation has been calculated to sum up to a sustainable maintenance performance index (SMI). The results show that the factor "Preventive maintenance cost" has the highest relative contribution factor among others (13.5%), while two factors of environmental performance have the least weights (0.7%). The developed model aims to provide decision makers with information about current maintenance performance and support them in the decision-making process regarding future directions of maintenance activities. It can be used as an assessment performance tool during the operation and maintenance stage. The developed indicators can be considered during designing the maintenance plan. Practices for successful implementation of the model are also presented.

Keywords : analytical hierarchy process, assessment performance Model, KPIs for sustainable maintenance, sustainable maintenance index
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