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INTEGRATED ENVIRONMENTAL IMPACT OF VARIOUS INTERVENTION STRATEGIES FOR PAVEMENTS IN A LIFE CYCLE ASSESSMENT PERSPECTIVE

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Abstract

The transport sector in general, and the road transport in particular, represent significant pollution sources, with negative effects registered both locally and globally. This paper intends to evaluate the environmental impact associated with various maintenance and rehabilitation strategies of the asphalt pavements by identifying pollutant sources, their associated impact and potential solutions. The research involved the investigation of pavements technical condition, expressed by PCI (Pavement Condition Index), according to the requirements of ASTM standard D6433, on a representative road sector, located on the National Road DN24 Iasi – Sculeni. Various alternatives and strategies for maintenance and rehabilitation, have been obtained by using the specialized software PRAS (Pavement Rehabilitation Analysis System), developed by specialists from Maryland University. The environmental impact of each strategy has been evaluated in terms of CO_2e emissions, by using the asPECT (asphalt Pavement Embodied Carbon Tool) software, developed by the TRL (Transport Research Laboratory) from UK. The research outcome revealed a good correlation between timely efficient rehabilitation and maintenance interventions and their associated environmental impact, thus permitting the identification of the most eco-friendly intervention procedure.

Keywords: aspect, CO_2e emissions, maintenance and rehabilitation strategies, pavement technical condition, Pavement Condition Index (PCI)

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