Environmental Engineering and Management Journal *February 2014, Vol.13, No. 2, 449-455*
http://omicron.ch.tuiasi.ro/EEMJ/

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EVALUATION OF THE ENVIRONMENTAL IMPACT OF ROAD PAVEMENTS FROM A LIFE CYCLE PERSPECTIVE

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Abstract

The road infrastructure has a major environmental impact by covering important land surfaces and consuming enormous amounts of raw materials for construction and maintenance. The impact of transport pavements needs to be considered from the design stage and to be examined during the whole life cycle of the infrastructure: raw materials extraction and initial transformation, manufacturing, placement on site, exploitation, maintenance, and demolition. This paper evaluates the impact of asphalt and concrete pavements. Two specific case studies, both involving alternatives available for the construction of pavements, namely the conventional flexible pavement designed according to national standard versus the modern steel fibre-reinforced roller-compacted concrete (SFR-RCC) pavement have been undertaken. These alternatives have been analysed, using the GaBi software, to assess their environmental aspects relating to the sustainability concept. After a detailed discussion of the main results obtained in these studies, conclusions and recommendations for an efficient selection of the construction alternatives are formulated.

Key words: energy consumption, environmental impact, life-cycle assessment, pavements

Received: September, 2013; Revised final: January, 2014; Accepted: January, 2014

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