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Life cycle assessment of pavements: Reviewing research challenges and opportunities

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Abstract

An extensive growth in pavement life cycle assessment studies is noticed in recent years. Current literature in pavement life cycle assessment demonstrates a wide range of implications on environmental burdens associated with the pavements. However, immature parts still remain, needing further research, in the next years, in different stages of pavement life cycle assessment. Most of these papers focused on the implementation of new technologies on pavements construction, the use of recycled materials, and the investigation of various phases of the pavement life cycle rather than improving the applicability and the adequacy of life cycle assessment methodology to the pavement problems. These stages are based on ISO 14040 and 14044 frameworks: the goal and scope definition, the inventory analysis, the life cycle impact assessment and interpretation. In this paper, a comprehensive review (i.e. a critical review and research gaps investigation) of life cycle assessment studies on pavements was conducted. The presentation comprises (not an extensive list) inventory analysis such as surface roughness, noise, lighting, albedo, carbonation, and earthwork in addition to

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