Towards Developing Environmental Sustainability Performance Measures for Pavement Asset Management Practice

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INTRODUCTION

- Improved lifecycle environmental performance of pavements, reduced climate change impacts and human health effect underscore the need to incorporating environmental sustainability into pavement management practice.
- Reducing virgin material consumption and air pollution throughout the lifecycle of a road pavement facilitates improved productivity in the optimal allocation of resources and reduced road user cost.

However current paradigm of asset management decisions made within pavement management systems only prioritizes resource allocation policies that maximizes the technical performance of the road network with no consideration of the environmental sustainability.

OBJECTIVE

- Unveil the challenges in environmental performance assessment of innovative pavement technologies
- Define relevant environmental performance measures
- Develop a framework to incorporate the relevant environmental performance measures into network-level pavement management

APPROACHES FOR QUANTIFYING ENVIRONMENTAL SUSTAINABILITY

Life Cycle Inventory and Impact Assessment: Environmental performance modelling with three pavement LCA tools:
- PaLATE,
- Athena Highway Impact Estimator
- ECORCEM

RESULTS CONT.

Energy Consumption: The impacts for each mix differ largely among the tools. The results from Athena are much higher compare to PaLATE and ECORCEM, for example HMA - 60% CRCA show up approx. 250% and 600% higher respectively.

RESULTS

- There is need to enhance the quality of data based on regional practice to better understanding of impacts
- Future work includes developing a core set of environmental performance measures and sustainability assessment framework considering all aspects of the pavement lifecycle

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