

Evaluation of the Impact of Pavement Roughness on Vehicle Emissions by HDM-4

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Abstract : Vehicular emissions have increased in recent years due to rapid growth in world traffic resulting in an increase in associated problems such as air pollution and climate change, therefore it's necessary to control vehicle emissions. This study looks at the effect of road maintenance on vehicle emissions. The Highway Development and Management Tool (HDM-4) was used to find the effect of road maintenance on vehicle emissions. Key data collected were traffic volume and composition, vehicle characteristics, pavement characteristics and climate data of the study area. Two options were analysed using the HDM-4 software; the base case or do nothing while the second is overlay maintenance. The study also showed a strong correlation between average roughness and yearly emission levels in both the alternatives. Finally, the study showed that proper maintenance reduces the roughness and emissions.

Keywords : vehicle emissions, road roughness, IRI, maintenance, HDM-4, CO2

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