

Using Traffic Micro-Simulation to Assess the Benefits of Accelerated Pavement Construction for Reducing Traffic Emissions

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Abstract : Pavement maintenance, repair, and rehabilitation (MRR) processes may have considerable environmental impacts due to traffic disruptions associated with work zones. The simulation models in use to predict the emission of work zones were mostly static emission factor models (SEFD). SEFD calculates emissions based on average operation conditions e.g. average speed and type of vehicles. Although these models produce accurate results for large-scale planning studies, they are not suitable for analyzing driving conditions at the micro level such as acceleration, deceleration, idling, cruising, and queuing in a work zone. The purpose of this study is to prepare a comprehensive work zone environmental assessment (WEA) framework to calculate the emissions caused due to disrupted traffic; by integrating traffic microsimulation tools with emission models. This will help highway officials to assess the benefits of accelerated construction and opt for the most suitable TMP not only economically but also from an environmental point of view.

Keywords : accelerated construction, pavement MRR, traffic microsimulation, congestion, emissions

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