

DEVELOPMENT OF A VEHICLE EMISSIONS INVENTORY FOR SRI LANKA

by
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A thesis submitted to the Department of Civil Engineering University of Moratuwa in partial fulfillment of the requirements for the degree of Master of Engineering



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Dedication

My dear

Father and mother,

*When I was in a difficult situation
You console me,*

& you encourage me to achieve my aspiration

*You have dedicate your valuable time
To give me healthy, wealthy*

And educated life in this globe

My dear teachers & lecturers

*You have guided me to move along the right path
& achieve my objectives*

Otherwise I myself will not be here



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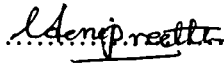
*This thesis
As one of my great harvest of my life,
I dedicate to:*

***My dear parents,
Teachers & lecturers***

From the bottom of my heart.

DECLARATION

This research is a report on the research work carried out in the Department of Civil Engineering, University of Moratuwa, Sri Lanka, during June 2003 to June 2005. This submission is original and does not have any materials previously published or written by any others any where, except where citing is made.

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ABSTRACT

Estimates available to date in Sri Lanka shows that the transport sector is responsible for majority share of the most of the gaseous emissions to the environment with compared to any other sector such as industry, agriculture, fisheries etc. Sri Lanka has adopted emission standards for all vehicles, but those standards are yet to be effectively enforced. Further, there is no mechanism to evaluate the benefits due to emission control strategies as no reliable emission inventory is available, specially to estimate local concentration levels.

This paper discusses the development of a vehicle emission inventory that could be used for estimating vehicle emission with respect to special distribution. This inventory has developed with provision to accommodate improved vehicle emission factors for different vehicle types and traffic conditions in the future. This inventory is capable of estimating emission load due to traffic on any road link categorized as a National road. Provision is available to estimate the hourly emission load distributions and inventory out puts can be presented in a GIS platform.

Transportation Engineering Division (TED) of the Department of Civil Engineering, University of Moratuwa maintains a road inventory and socio economic database covering the entire country except certain parts in the North & the East. Transport planning model "Transplan" has been developed to estimate the daily vehicle volumes and average operating speeds of vehicles on all main roads in the Colombo Metropolitan Area (CMR) and all national roads (A & B Class) in the other provinces except certain parts in North & East. Transplan model was extended to estimate the vehicle emission load for a given set of vehicle emission factors for different vehicle types and operating conditions (average speed). Manual classified count carried out at select locations in the island was used to estimate the vehicle types and their distribution over the time at each of the road link. Vehicle registration information available was used to arrive at the diesel & petrol vehicle distribution. At present the hourly vehicle emission load along each road link is estimated based on approximate vehicle emission factors. The model is capable of accommodating accurate vehicle emission factors for different vehicle types and traffic conditions when available.

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