IDENTIFICATION OF A METHODOLOGY TO ESTIMATE VEHICLE EMISSIONS IN SRI LANKA

J M S J Bandara[1] and N J G J Bandara[2]
[1]University of Moratuwa
[2]University of Sri Jayewardenepura

Estimates available to date in Sri Lanka show that the transport sector is responsible for majority share of the gaseous emissions to the environment when compared to any other sector such as industry, agriculture, and fisheries. This pattern is applicable to most of the countries all over the world. Many countries have taken steps towards controlling vehicle emissions and Sri Lanka is seriously considering actions to control vehicle emissions.

In order to have an effective control system it is necessary to identify different emissions and the significance of their effects to the environment and health. The main pollutant gases emitted from vehicles are Carbon dioxide, Nitrogen oxides, Carbon monoxide, volatile organic compounds and Sulfur oxides. As the effects and the significance could change from place to place and also depend on different concentration levels, it is very important to estimate the emission to the environment to some accuracy.

Numbers of different techniques have been used for the emission estimates. They include very approximate methods such as fuel sales to very sophisticated techniques such as remote sensing measurements and simulation models. Whereas the simple techniques require little base line data and equipments, more sophisticated techniques would require considerable amount of base line information and equipment

The technique employed today in Sri Lanka is only a simple method based on emission factors. This quantification is done taking into account the emission factors roughly estimated for each type of vehicle and on the total number of vehicles in the entire country. Only this can be used because of the difficulty faced in estimating the emission factors at a particular time and because of the lack of use of basic data on vehicle transportation. From this technique the automobile emissions at a particular location at any given time cannot be estimated.

However automobile emissions will vary according to the age of the vehicle, its travel speed and location. In order to incorporate these factors into the main estimation basic data on the number of vehicles at each place and their travel speeds have to be known.

The objective of this research is to identify a suitable methodology incorporating the available data on traffic movement patterns to estimate vehicle emissions in Sri Lanka and to identify required development in the future to improve the estimating and monitoring procedure. In this paper effects of different types of emissions, their significance and relevance to the local conditions are discussed. Methodologies available to measure and estimate selected types of emissions are also discussed. Based on this knowledge and depending on the technology and information available locally, a suitable procedure to estimate vehicle emissions that will be useful for any future control and monitoring is identified.