



Collection and Evaluation of On-Road Vehicle Emission and Activity Data

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Abstract

In this project, the newly developed on-road emission measurement device OEM-2100 was employed to collect the emission data in Houston area. The device was developed by the Clean Air Technology International, Inc. and is capable of measuring the second-by-second fuel consumption and emissions of NO_x, HC, CO, CO₂, and PM.

Emission data under a total of 170 different test conditions (or called 170 bags) were collected in Houston covering freeways, arterials, intersections and also idling. Testing vehicles included rental cars and trucks, as well as the volunteers' personal cars. GPS data were collected simultaneously when the emission data were collected.

All the collected data were stored in text format (GPS data is in the format of .gps, which can be used as text files.) The large amount of data were processed in EXCEL. Emissions for trucks and for cars were summarized based on different test conditions (arterial road, freeway, feeder, intersection, and idling.) The spatial and temporal distributions of both vehicle speed and emissions were plotted, and the relationships between the emissions and model variables (speed, acceleration, and engine rpm) were drawn. The measured emissions were compared with the

EPA MOBILE6.2 estimates sorted on test conditions, emission factors, and vehicle types; and significant differences were found.

It is recommended that more emission data be collected in Houston for the established data base. Also recommended is to develop a user-friendly EXCEL-based utility for the fast processing of collected data for both general purpose and for specific utilization.