



MOBILE5

Information Sheet #2:

Estimating Idle Emission Factors Using MOBILE5

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US EPA, NVFEL, AQAB, 2565 Plymouth Road, Ann Arbor, Michigan 48105 (313) 668-4325

I. Introduction

MOBILE5 Information Sheets are a series of documents intended to give users detailed information about techniques that can be used to more accurately model highway mobile source emissions and avoid potential errors. When referring to MOBILE5 in this and other Information Sheets, we will mean the latest officially released version of the MOBILE model, unless otherwise specifically noted. At the time of this Information Sheet, the latest version of the model was MOBILE5a, released March 26, 1993.

All of the MOBILE5 Information Sheets will be made available on the Technology Transfer Network (TTN) bulletin board system (BBS) in the OMS section. Any micro-computer with a modem can be used to download the files. The phone number for the TTN BBS is (919) 541-5742. All files are made available to users as soon as they answer a few registration questions. The TTN BBS can be called at any time, 24 hours a day, 7 days a week, except Monday mornings from 8 a.m. to noon (EST) when the system is down for maintenance.

If you would like to be added to our mailing list, please fill out the information described in the last section of this Information Sheet. This only needs to be done once. You do not need to send in this information if you are already on our mailing list.

II. Problem Description

When MOBILE5 was originally released in December of 1992, there were questions as to what the model should estimate for idle emission factors. Some work had been begun in the model to allow MOBILE5 to estimate idle emission levels, but there was no new information on the idle emissions from vehicles to support changes in the idle emission rates. Some crude idle estimates were included in draft release of MOBILE5, however, there were major errors and inconsistencies in the draft MOBILE5 estimates. It was decided to

release MOBILE5 without the capability of estimating idle emission factors rather than delay the release of the model. When it was decided that changes needed to be made quickly in the model to correct errors and include recent rulemakings, there was not time to include changes to the idle emission rates in MOBILE5a.

As a interim solution, areas that require the use of idle emission factors were directed by EPA to use the MOBILE4.1 model to estimate the idle emission rates. This requires many areas to support both MOBILE5 and MOBILE4.1 and perform duplicate computer runs using both models in order to estimate emissions for roadway intersections. While this is not the situation we would prefer, it was more important that the model be made available as soon as possible to continue work on the State Implementation Plans and the requirements of the Clean Air Act Amendments of 1990.

In practice, this approach has not worked well and has caused considerable confusion. In consultation with the Office of Air Quality Planning and Standards, we have agreed that the best solution would be to determine idle emission rates directly from MOBILE5 exhaust emission estimates. This MOBILE5 User Information Sheet describes how that can be done.

III. Remedy

Idle emission rates can be calculated directly from the exhaust emission factors from a MOBILE5 run with a speed of 2.5 miles per hour. The exhaust emission factors for HC, CO and NO_x will be in grams per mile. To convert these gram per mile emissions to idle emission factors in grams per hour, simply multiply each emission factor times the speed (2.5 miles per hour). It is important that the speed be 2.5 miles per hour, since at this speed the MOBILE5 exhaust emission factors contain the most time at idle. Be sure not to include any of the non-exhaust emissions (such as evaporative, running losses, resting losses and refueling emissions) in the HC emission factor used to determine idle emissions.

Since the exhaust emission factor used to determine the idle emission factors are already adjusted for fuel, temperature, hot and cold starts, inspection programs and changes in emission standards, the resulting idle emission factors should not require any additional adjustments if the MOBILE5 input has been properly prepared. The MOBILE5 input should be identical to the corresponding input used for exhaust emissions except for the speed being set to 2.5 miles per hour.

Now that idle emission factors can be determined directly from MOBILE5, we are recommending that all further emission estimates that require idle emission rates be determined using the method in this User Information Sheet. Any emission estimates already completed using MOBILE4.1 idle emission factors will continue to be acceptable to EPA in any official submittal, however, all new work should be done with MOBILE5. In any event, the ability to use MOBILE5 for idle emission estimates is meant to facilitate future air quality planning and is not intended to disrupt any ongoing work.

IV. Background

The lowest speed allowed as an input into MOBILE5 is 2.5 miles per hour. This trip contains the most idle time of any speed cycles used for the MOBILE5 model. Idle emissions are expressed in grams per hour, this can be determined directly from the grams per mile by multiplying the estimate by 2.5 miles per hour.

A comparison of the idle emission rates estimated using the 2.5 mile per hour exhaust emission rates and the idle emission factors from the MOBILE4.1 model shows that, while there is sometime disagreement between the two estimates of idle emissions for individual model years, the idle emission rates estimated from the 2.5 mile per hour emission rates are reasonable. In general, the MOBILE5-based idle emission rates will tend to be higher, reflecting the higher exhaust emission rates.

V. Other Information Sheets

The following are all of the MOBILE5 Information Sheets created as of the date of this document:

<u>Number</u>	<u>Title</u>	<u>Date</u>
1	Caution for Batch Mode Users	4/30/93
2	Estimating Idle Emission Factors Using MOBILE5	7/30/93

If you would like to be on our MOBILE5 user mailing list please fill out the following information and send it to:

MOBILE5 User Mailing List (AQAB)
U.S. EPA, National Vehicle Fuels & Emissions Laboratory,
Emission Planning & Strategies Division,
Air Quality Analysis Branch
2565 Plymouth Road
Ann Arbor, Michigan 48105

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