

**Description of General Input Values  
for MOBILE3 Model**

Variable Description	Variable Range	Variable Range Emission Factor Calculations
Region for which emission factors are to be computed	1 - Low Altitude, non-California 2 - Low Altitude, California 3 - High Altitude, non-California	1
Calendar year for which emission factors are to be calculated, last two digits only.	1960 - 2020	Depends on year (s) of analysis
The single average route speed for which emissions are being calculated, in miles per hour	5 to 55	Depends on speed (s) used in analysis
Ambient temperature, in degrees Fahrenheit.	0 to 110	20.0
Percent of VMT accumulated in cold start mode by non-catalyst equipped vehicle types (PCCN)	0 to 100	See <a href="#">FDM 22-20 Attachment 5.2</a>
Percent of VMT accumulated in hot start mode by catalyst equipped vehicle types (PCHC).	0 to 100	See <a href="#">FDM 22-20 Attachment 5.2</a>
Percent of VMT accumulated in cold start mode by catalyst equipped vehicle types (PCCC).	0 to 100	See <a href="#">FDM 22-20 Attachment 5.2</a>
Vehicle Mix	-----	Calculated by user or use program default
I/M Characteristics	-----	See <a href="#">FDM 22-20 Attachment 5.3</a>

-----  
1 Vehicle speeds may be measured, or estimated by someone familiar with the area. Vehicle speeds associated with freeways and multilane or two lane rural highways must be calculated for future conditions. To determine vehicle speeds for various roadway and traffic characteristics, it is first necessary to calculate the volume to capacity ratio and determine the resulting level of service, utilizing the procedures outline in the "Highway Capacity Manual," (HCM), dated 1985, Transportation Research Board Special Report 204. Following the calculation of the level of service, the operating speed can be determined by using the appropriate table in the HCM. The correct chapter, within the HCM, which corresponds to the particular characteristics (i.e., freeway, multilane or two lane rural highway) of the roadway segment under study must be utilized. For urban arterials, including delay at intersections, the average running speed or posted speed is used to calculate the excess emissions.

**Description of Percent Hot/Cold Start Input Values  
For MOBILE3 Model**

To use MOBILE3, it is necessary to determine the percentage of vehicle miles traveled for the various hot/cold start modes. This includes the percent in the cold start mode for noncatalyst equipped vehicles (PCCN), the percent in the hot start mode for catalyst equipped vehicles (PCHC) and the percent in the cold start for catalyst equipped vehicles (PCCC). A cold start is defined as a vehicle start up after a four hour engine off period for noncatalyst equipped vehicles or a one hour engine off period for catalyst equipped vehicle.

Reasonable estimates for morning peak, evening peak and eight hour hot/cold starts are as follows:

Morning Peak Hour			Evening Peak Hour			Eight Hour		
PCCN	PCHC	PCCC	PCCN	PCHC	PCCC	PCCN	PCHC	PCCC
45.5	21.8	22.0	28.3	28.7	41.7	30.1	30.2	43.9
22.7	17.4	27.3	19.0	19.0	24.7	16.1	20.5	25.1
5.0	11.3	12.0	12.0	12.0	11.0	7.9	11.9	11.5
45.5	22.0	51.8	28.3	28.7	41.7	30.1	30.2	43.9
5.0	11.3	12.0	3.0	12.0	11.0	7.9	11.9	11.5
13.6	10.0	14.4	10.2	8.4	13.8	7.9	11.9	11.5
5.0	11.3	12.0	2.0	12.4	10.5	7.9	11.9	11.5

- A. Large Urban Areas (Greater than 100,000 population)
  - Local Streets
  - Arterial Streets
  - Expressways/Freeways
- B. Medium Size Urban Areas (20,000 - 100,000 population)
  - Local & Arterial Sts.
  - Expressways/Freeways
- C. Rural Areas (Less than 20,000 population)
  - Local & Arterial Sts.
  - Expressways/Freeways

NOTE: These estimates should be used unless, using engineering judgment, it is determined that this number is not appropriate. The publication entitled "The Determination of Vehicular Cold and Hot Operating Fractions for Estimating Highway Emissions," by George W. Ellis, William T. Camps, and Alton Treadway, published by the Federal Highway Administration (FHWA) in September 1978, discusses in greater detail the determination of the percentage of hot/cold starts based on average trip length.

**Description of I/M Input Values  
For MOBILE3 Model**

<b>Variable Description</b>	<b>Variable Range</b>	<b>Input Values for Wisconsin Emission Factor Calculations</b>
Year of I/M program implementation, last two digits only	1960 to 2020	84
Stringency level of I/M program, in percent	10 to 50	23
Mechanic training flag, indicating whether mechanic training is an integral part of the I/M program	1 - No 2 - Yes	1
Earliest model year included in the I/M program, last two digits only	1941 to 2020	Applies to previous 15 model years
Latest model year included in the I/M program, last two digits only	1941 to 2020	89
The type of vehicles to be affected by I/M	1 - LDGV 2 - LDGV & LDGT1 3 - LDGV & LDGT2 4 - LDGV, LDGT1 & LDGT2	4
The type of I/M test being implemented for 1981 and later light duty vehicles	1 - Idle 2 - Tow-Speed Idle Test 3 - Loaded Test	1
The standards used in conjunction with the I/M short test for 1981 and later light-duty vehicles	1 - 0.5% CO/100 ppm HC 2 - 1.2% CO/220 ppm HC 3 - 3.0% CO/300 ppm HC	1
The data flag which indicates whether or not alternative I/M credits are used in the MOBILE3 analysis.	1 - No alternative I/M credits 2 - Alternative Technology I and II I/M credits 3 - Alternative Technology IV I/M credits 4 - Alternative I/M credits for all Technologies	