

**The State of New Jersey  
Department of Environmental Protection**

**Revisions to the Enhanced Inspection and  
Maintenance (I/M) Program for the State of New  
Jersey**

**Elimination of Tailpipe Testing and Other I/M  
Program Changes**

**I/M Program Modeling and USEPA Performance  
Standard Modeling**

**SIP Revision**

**Appendix II  
Modeling Parameters and Assumptions**

**September, 2016**

## Modeling Assumptions

Performance standard and I/M program evaluation modeling was conducted using the October, 2014 release version of MOVES2014. In addition, the modeling was performed in accordance with the USEPA guidance released in January, 2014. Assumptions and parameters to represent the USEPA performance standard I/M program are from the code of federal regulations Title 40 - Protection of the Environment, Part 51 – Requirements for Preparation, Adoption, and Submittal of Implementation Plans, Subpart S – Inspection/Maintenance Program Requirements (specifically 51.351(g) Alternate Low Enhanced IM Performance Standard).

Numerous changes in modeling methodology took place when the MOVES model replaced the MOBILE6 model. A major change was that emission inventories calculated using MOVES are now used to perform the performance standard and I/M program evaluations instead of emission rates calculated using the previous MOBILE6 model. Since New Jersey's I/M program is applied on a uniform basis in all 21 counties, New Jersey was able to conduct the performance standard and I/M program evaluations by performing MOVES runs for two representative counties (Middlesex County to represent the northern ozone non-attainment area and Mercer County to represent the southern ozone non-attainment area). Emissions calculated for the representative counties were scaled to statewide emission inventory estimates using county-level estimates of vehicle miles traveled (VMT).

## Modeling Parameters

Table 1 outlines the main program parameters of the USEPA alternate low enhanced performance standard model I/M program. In addition, this table presents New Jersey's enhanced I/M program design for both the existing and new programs for evaluation year 2018. The emissions were estimated for 2018 which is when the anticipated changes are expected to be in place.

**Table 1: Performance Standard and NJ Enhanced I/M Program Designs**

Program Element	USEPA Alternate Low Enhanced Performance Standard	New Jersey's Existing Enhanced I/M Program	New Jersey's New Enhanced I/M Program
Compliance Rate	96%	96%	96%
Waiver Rate	3%	0%	0%
Regulatory Class Coverage for Sourcetypes <sup>1</sup> : 21, 31 and 32	100% 94% 88%	100%	100% 97.0% 94.0%
Overall I/M Program Effectiveness for Sourcetypes <sup>2</sup> : 21, 31 and 32	93.12% 87.53% 81.95%	96%	96.00% 93.12% 90.24%
Program Start Date	1983	1974	1974
Test Frequency	annual	biennial except annual for commercial vehicles	Biennial except annual for commercial vehicles
New Vehicle Exemption	None	5 Years	5 Years
Model Year (MY) Coverage	1968 and later MY	all vehicles not specifically exempt	1996 and later MY
Vehicle Type Coverage	All light-duty gasoline-fueled vehicles and trucks up to 8,500 lbs. GVWR)	All gasoline-fueled vehicles and trucks (both light and heavy duty vehicles)	All gasoline-fueled vehicles and trucks except non-OBD equipped vehicles greater than 8,500 lbs. GVWR
Exhaust Emission Test	<u>Idle</u> - 1968-2050 MY	<u>OBD</u> - 1996 and later MY <u>Two-Speed Idle</u> - 1981-1995 MY <u>Idle</u> - pre-1981 and HDGVs	<u>OBD</u> - 1996 and later MY
Evaporative System Function Checks	None	<u>Gas Cap Testing</u> - 1971 - 2000 MY inclusive (beginning calendar year 1998)	None

Program Element	USEPA Alternate Low Enhanced Performance Standard	New Jersey's Existing Enhanced I/M Program	New Jersey's New Enhanced I/M Program
Evaluation Date	July, 2018	July, 2018	July, 2018

<sup>1</sup> Regulatory class coverages are calculated from the table of gasoline regulatory coverage adjustments in Appendix B of the USEPA guidance document "Performance Standard Modeling for New and Existing Vehicle Inspection and Maintenance (I/M) Programs Using the MOVES Mobile Source Emissions Model", January, 2014. It was assumed that 50% of the gasoline vehicles greater than 8,500 lbs. GVWR are equipped with OBD and will continue to be inspected while the 50% that are not equipped with OBD will no longer be inspected.

<sup>2</sup> Overall I/M program effectiveness is calculated as follows:

Compliance Factor = percent compliance rate X (100 – percent waiver rate) X regulatory class coverage adjustment.

The remainder of this section discusses in detail the various New Jersey program parameters used to model the existing and new enhanced I/M programs.

#### 1. Network Type:

New Jersey's enhanced I/M program is comprised of a hybrid network of both centralized test-only facilities and decentralized test-and-repair facilities. The network type is no longer part of modeling an I/M program because the difference between centralized and decentralized programs has become insignificant<sup>1</sup>.

#### 2. Start Date:

The I/M program start date is no longer a model input. It was removed as part of the general effort to streamline the number of required I/M inputs needed to run MOVES<sup>2</sup>.

#### 3. Test Frequency and New Vehicle Exemption Periods:

The current and proposed test frequency of New Jersey's enhanced I/M program is biennial (that is, vehicle inspections are required once every two years). The exception of this applies to certain classes of commercial vehicles, limousines, taxis and jitneys that receive annual (more frequent) inspections. The exemption period for new vehicles is 5 years for existing and new I/M programs. Commercial vehicles do not have a new vehicle exemption period.

<sup>1</sup> Performance Standard Modeling for New and Existing Vehicle Inspection and Maintenance (I/M) Programs Using the MOVES Mobile Source Emissions Model. EPA-420-B-14-006. January, 2014.

<sup>2</sup> Ibid., page 9.

4. Model Year, Vehicle Type Coverage and Test Types:

For New Jersey's existing I/M program vehicles receive different types of emission tests depending on the type and model year of the vehicle. Pre-1981 vehicles are given an idle exhaust emission test and model year 1981-1995 vehicles which are: classified as light-duty gasoline-fueled motor vehicles (LDGVs) or light-duty gasoline-fueled trucks 1 and 2 (LDGT1s and LDGT2s), and not specifically exempted<sup>3</sup> from emissions testing, are subjected to the two-speed idle (TSI) tailpipe test. All 1996 and newer vehicles receive an OBD inspection unless they are exempt from that test in which case they receive the applicable exhaust emissions test. The existing New Jersey I/M program also includes gas cap testing for vehicles of model year 2000 and older.

New Jersey's proposed I/M program consists of OBD inspections only.

5. Emission Control Device Inspections:

The emission control device inspections are no longer model inputs. They were removed as part of the general effort to streamline the number of required I/M inputs needed to run MOVES<sup>4</sup>.

6. Stringency:

Stringency is no longer a model input. It was removed as part of the general effort to streamline the number of required I/M inputs needed to run MOVES<sup>5</sup>.

7. Evaluation Date:

An evaluation date of July 1, 2018 is used for the performance standard runs. An evaluation date of July 1, 2018 is used for the performance standard and program evaluation runs because the anticipated changes to New Jersey's I/M program are expected to be in place by this date. Implementation of the new vehicle exemption period would likely be implemented during the calendar year 2016 inspection cycle resulting in it being fully in effect by July 1, 2018.

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<sup>3</sup> Specifically exempted vehicles are those vehicles which have been exempted from enhanced emission testing, or alternatively, from emission testing all together, through NJMVC regulations and statute. These vehicles include collector motor vehicles and historic motor vehicles.

<sup>4</sup> Performance Standard Modeling for New and Existing Vehicle Inspection and Maintenance (I/M) Programs Using the MOVES Mobile Source Emissions Model. EPA-420-B-14-006. January, 2014.

<sup>5</sup> Ibid., page 12.

## 8. Other Modeling Inputs:

In addition to the parameters and assumptions discussed previously in this section, the NJDEP had to make other assumptions in order to complete its performance standard and program evaluation modeling. The following table shows what those assumptions were and what values were used to complete the modeling:

**Table 2: Other Modeling Assumptions**

<b>Modeling Parameters</b>	<b>Values Used for Typical Summer Work Weekday MOVES Runs</b>
Hourly Temperatures and Humidity	Average for Summer Months of June, July and August
Activity Inputs (VMT, Speeds, Age Distributions, Vehicle Populations, etc)	New Jersey USEPA EIS MOVES Inputs for 2018
Early NLEV and NJ Low Emission Vehicle Program w/o ZEV Mandate	yes
Fuel Specifications	MOVES Defaults