

Attachment B

Inspection and Maintenance (I/M) Program Performance  
Standard Modeling (PSM) for the Proposed I/M Program in the  
Bexar County 2015 Ozone Nonattainment Area

2026 Program Implementation Year

Proposed Program Assessment

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## CHAPTER 1: INTRODUCTION

On November 7, 2022, the EPA published the final approval of Determinations of Attainment by the Attainment Date, Extensions of the Attainment Date, and Reclassification of Areas Classified as Marginal for the 2015 Ozone National Ambient Air Quality Standards (87 FR 60897). This rule requires states to provide a demonstration that the existing or proposed I/M program for a newly designated or reclassified ozone nonattainment area meets the emissions reduction benchmarks specified for the area's ozone NAAQS classification level. The EPA interprets the I/M performance requirement to mean upon designation or reclassification that a proposed or existing I/M program must meet the I/M performance benchmark.

The TCEQ performed the required performance standard modeling analysis of the Bexar County 2015 ozone nonattainment area using the requirements in the EPA guidance document, *Performance Standard Modeling for New and Existing Vehicle Inspection and Maintenance (I/M) Programs Using the MOVES Mobile Source Emissions Model* (EPA-420-B-22-034, October 2022). The TCEQ specifically used the Basic Performance Standard that reflects the I/M program design elements as specified in 40 Code of Federal Regulations §51.352(e). The assessment uses a 2026 analysis year, the Bexar County program implementation year under the 2015 ozone NAAQS. The documentation of the PSM assessments is provided in Chapter 2. A summary of the results is provided in Chapter 3.

## CHAPTER 2: PERFORMANCE STANDARD MODELING FOR THE PROPOSED BEXAR COUNTY I/M PROGRAM SCENARIO AND FOR THE EPA BASIC PERFORMANCE STANDARD SCENARIO

### 2.1 MODELING BACKGROUND

The PSM analysis was performed in a manner consistent with all the SIP requirements for the Bexar County area and the EPA guidance document, *Performance Standard Modeling for New and Existing Vehicle Inspection and Maintenance (I/M) Programs Using the MOVES Mobile Source Emissions Model*. This report provides documentation that supports the conclusion that the Bexar County area I/M program meets the Basic Performance Standard. This documentation includes:

- A description of the proposed Bexar County area I/M program that includes the geographic scope, tests performed and inspection frequency, vehicles covered including model years, weight classes, fuel types, etc., and other coverage information such as waiver programs;
- A description of the Basic Performance Standard I/M program that includes the geographic scope, tests performed and inspection frequency, vehicles covered including model years, weight classes, fuel types, etc., and other coverage information such as waiver programs;
- A description of the analysis for 2026, which is the program implementation year under the Bexar County area 2015 ozone NAAQS;
- A reference to the emissions model, MOVES3.1, that is used;
- MOVES3.1 Run Specification (RunSpec) files (available upon request) – these files define the scope of the MOVES3.1 run by defining elements such as time period(s), geographical area, source types, etc. included in the modeling;
- MOVES3.1 Input Databases (available upon request) – input databases provide vehicle characteristics, vehicle activity, and other local conditions;
- MOVES3.1 Output Databases (available upon request) – output databases contain the results of the MOVES3.1 analysis; and
- Post-processing calculations that demonstrate how the I/M program meets the applicable performance standard in the I/M regulations.

### 2.2 PROPOSED BEXAR COUNTY I/M PROGRAM

Bexar County has been reclassified to moderate nonattainment under the 2015 ozone NAAQS. In this SIP revision the TCEQ is proposing a vehicle emissions testing program for Bexar County to meet the EPA's requirements for I/M programs in moderate nonattainment areas. The program implementation year is 2026. Texas I/M program requirements are codified in 30 Texas Administrative Code §114, Subchapter C. The design elements of the Bexar County I/M program include the following.

- Subject Vehicles and Test Frequency: Gasoline vehicles model-year 2 to 24 years old are required to have an annual emissions inspection beginning with the vehicle's second anniversary.
- Inspection Method: Model-year 1996 and newer vehicles are subject to on-board diagnostics (OBD) inspections.
- Timing: Annual test required.

- 2026: OBD inspections will begin in Bexar County.
- Testing Network: All inspection stations are required to offer OBD inspections.
- Waivers: Waivers and time extensions are available for eligible vehicle owners.
- Vehicles must successfully pass both the emissions and safety portions of the inspection before receiving a passing vehicle inspection report, which is required in order to renew the vehicle's annual registration and obtain a vehicle registration sticker.

An I/M program is characterized in MOVES3.1 through a table in the input county database file called the *IMCoverageTable*. The MOVES3.1 inputs used in the *IMCoverageTable* for the proposed Bexar County program scenario are consistent with the I/M program as proposed in this SIP revision. The input values used to model the Bexar County I/M program design requirements in MOVES3.1 are discussed in Section 2.5: *I/M Program Parameters for Input County Database Tables (IMCOVERAGETABLE)*.

### 2.3 MOVES3.1 RUN SPECIFICATION

The 2026 Bexar County PSM analysis included modeling of two scenarios:

1. Proposed Bexar County program scenario - this scenario represents the I/M program that is covered by this Bexar County SIP and is consistent with all the 2026 Bexar County local area parameters, control measures, and the inputs that define the proposed Bexar County I/M program; and
2. Basic Performance Standard benchmark scenario - this scenario models the Basic Performance Standard EPA defined benchmark program and is consistent with all the 2026 Bexar County local area parameters, control measures and an I/M program with the elements of the required I/M performance standard.

For the 2026 Bexar County PSM analysis using MOVES3.1, the MOVES3.1 graphical user interface (GUI) was used to develop run specification (RunSpec) files for each scenario. The PSM RunSpec selections include the following.

- Description Panel: The description panel was used to document each of the two PSM scenarios for Bexar County.
- Scale Panel: On-road; County; and Inventory.
- Time Spans Panel: 2026; July; weekday; all hours.
- Geographic Bounds Panel: 1 geographic scenario, Bexar County is selected, the only county in the 2026 PSM assessment for the Bexar County area.
- On-road Vehicle Equipment Panel: All fuel type/source type combinations.
- Road Type Panel: All road types.
- Pollutants and Processes Panel: volatile organic compounds (VOC), nitrogen oxides (NOx), all the pollutants and emission processes that MOVES3.1 needs to calculate VOC, and with refueling emissions unchecked.
- General Output Panel: Output database specified with naming convention consistent with county, year, and PSM scenario; tons; miles; include distance traveled.
- Output Emissions Detail Panel: 24-Hour Day.
- Create Input Database Panel: existing input county databases (CDBs) are selected, see Section 2.4 *MOVES3.1 Input County Databases*; the option to create an input CDB is not used for the PSM runs.

- Advanced Performance Features Panel: not used for PSM scenarios.

The MOVES3.1 run specification files are provided in Electronic Attachment 2: *MOVES3.1 Run Specification Files for Bexar County 2015 Ozone NAAQS PSM*.

## 2.4 MOVES3.1 INPUT COUNTY DATABASES

The input county databases for the 2026 Bexar County PSM assessment include local activity, local meteorology, and local fuel parameters for Bexar County. The TCEQ developed, under contract to the Texas A&M Transportation Institute, MOVES3.1 input county database (CDB) files for each Texas county, for each MOVES3.1 analysis year. The MOVES3.1 input CDBs include local activity information consistent with the analysis year, local meteorological information, local fuel parameters, and existing I/M program parameters, Electronic Attachment1: *MOVES3 On-Road Trend Emissions Inventories for 1990 and 1999 through 2060* is the Final Project Report and documents development of the county input CDB used for the 2026 Bexar County PSM modeling.

Two input CDBs are required to compete the PSM MOVES3.1 runs: 1) an input CDB with the proposed Bexar County I/M program, and 2) a CDB with the EPA’s Basic Performance Standard I/M program. Both input CDBs must include the local activity and conditions. MOVES3.1 input CDBs for Bexar County reflecting existing 2026 Bexar County control programs, the proposed program *IMCoverageTable*, local activity, and local conditions are used for the proposed Bexar County I/M PSM scenario. For the benchmark EPA Basic Performance Standard PSM MOVES3.1 runs, all tables in the input CDB are the same except for the *IMCoverageTable*. The *IMCoverageTable* is modified for the benchmark runs to be consistent with the Basic Performance Standard program provided in the EPA guidance. A summary of the *IMCoverageTable* for each scenario is provided in the next Section, Section 2.5 *I/M Program Parameters for Input County Database Table (IMCoverageTable)*.

The MOVES3.1 input county database files are provided in Electronic Attachment 3: *MOVES3.1 Input County Database Files for Bexar County 2015 Ozone NAAQS PSM*.

## 2.5 I/M PROGRAM PARAMETERS FOR INPUT COUNTY DATABASE TABLES (IMCOVERAGETABLE)

I/M programs are characterized in MOVES3.1 through an input called the *IMCoverageTable*. The *IMCoverageTable* consists of 13 parameters including: *polProcessID*; *stateID*; *countyID*; *yearID*; *sourceTypeID*; *fuelTypeID*; *IMProgramID*; *inspectFreq*; *testStandardsID*; *begModelYearID*; *endModelYearID*; *useIMyn*; and *complianceFactor*. The input parameters for the two PSM scenarios are summarized in Table 2-1 and Table 2-2.

**Table 2-1: Bexar County 2026 MOVES3.1 I/M Descriptive Inputs for Proposed Program for Subject County**

Bexar			
Modeling Year 2026			
I/M Program ID	140	160	MOVES3.1
Pollutant Process ID	101, 102, 201, 202, 301, 302	112	MOVES3.1

<b>Bexar</b>			
<b>Modeling Year 2026</b>			
Source Use Type	21, 31, 32	21, 31, 32	MOVES3.1
Begin Model Year	2002	2002	Annual testing; program specifications
End Model Year	2024	2024	Annual testing; program specifications
Inspect Frequency	1	1	Annual testing; program specifications
Test Standards Description	Exhaust OBD Check	Evaporative Gas Cap and OBD Check	Annual testing; program specifications
Test Standards ID	51	45	MOVES3.1
I/M Compliance	95.77% for source use type 21, 92.05% for source use type 31, and 72.08% for source use type 32		Program design criteria for Compliance Rate, Waiver Rate and Failure Rate; and, MOVES3.1 default values for RCCA See Section 2.6

**Table 2-2: Bexar County 2026 MOVES3.1 I/M Descriptive Inputs for EPA’s Basic Performance Standard Program for Subject County**

<b>Bexar</b>				
<b>Modeling Year 2026</b>				
I/M Program ID	111	143	151	
Pollutant Process ID	101, 102, 301, 302	112	101, 102, 301, 302	Basic Performance Standard Program
Source Use Type	21	21	21	Basic Performance Standard Program
Begin Model Year	1968	2001	2001	Basic Performance Standard Program
End Model Year	2000	2025	2025	Basic Performance Standard Program
Inspect Frequency	1	1	1	Basic Performance Standard Program
Test Standards Description	Unloaded Idle Test	Evaporative System OBD Check	Exhaust OBD Check	Basic Performance Standard Program
Test Standards ID	11	43	51	MOVES3.1
I/M Compliance	100% for source use type 21			Basic Performance Standard Program

**2.6 SOURCES OF DATA FOR COMPLIANCE FACTOR CALCULATION**

The calculation of the I/M compliance factors is consistent with the definitions, equation, and recommendations in the most recent MOVES3 Technical Guidance, Section 4.9.6, Compliance Factor. The compliance factor entered in MOVES3.1 is calculated as:

$$CF = CR \times (1 - WR \times FR) \times RCCA$$

Where:

- CF = Compliance factor
- CR = Compliance rate
- WR = Waiver rate
- FR = Failure rate
- RCCA = Regulatory class coverage adjustment

For the proposed program in the Bexar County area the I/M program values used for the failure rate, waiver rate, and compliance rate are based upon default and assumed values using recommendations from the EPA guidance document, *Performance Standard Modeling for New and Existing Vehicle Inspection and Maintenance (I/M) Programs Using the MOVES Mobile Source Emissions Model*, in conjunction with the I/M program design criteria from the TCEQ Mobile Source Programs Team. A compliance rate of 96.00 percent can be assumed for programs that include centralized monitoring of testing, and registration denial. A three percent waiver rate and an eight percent failure rate can be used as default values until program historical information is available.

The MOVES3.1 Bexar County area compliance factor values used for this PSM assessment were developed for calendar year 2026, the implementation year for the Bexar County area I/M program. The calculations use proposed program compliance, waiver, and failure rates and regulatory class coverage adjustment (RCCA) factors from Appendix A of the most recent MOVES3 Technical Guidance. The results of the MOVES3.1 Compliance Factor calculations are summarized in Table 2-3: *Bexar County Proposed I/M Program Compliance Factors for MOVES3.1*.

**Table 2-3: Bexar County Proposed I/M Program Compliance Factors for MOVES3.1**

<b>MOVES3.1 Modeling Parameter</b>	<b>Passenger Car</b>	<b>Passenger Truck</b>	<b>Light Commercial Truck</b>
Compliance Rate (CR)	96.00%	96.00%	96.00%
Waiver Rate (WR)	3.00%	3.00%	3.00%
Failure Rate (FR)	8.00%	8.00%	8.00%
Regulatory Class Coverage Adjustment (RCCA)	100.00%	96.12%	75.26%
<b>MOVES3.1 I/M Compliance Factor</b>	<b>95.77%</b>	<b>92.05%</b>	<b>72.08%</b>

## 2.7 PROCESSING MODEL OUTPUT FOR THE BASIC PERFORMANCE STANDARD ASSESSMENT

Evaluating whether a proposed program meets the Basic Performance Standard requires showing that the proposed program area-wide emissions for NO<sub>x</sub> and VOC are less than the area-wide emissions of the benchmark program. To perform this evaluation, the TCEQ compared MOVES3.1 output emissions in tons per day for each scenario. The MOVES3.1 output county database files are provided in Electronic

Attachment 4: *MOVES3.1 Output County Database Files for Bexar County 2015 Ozone NAAQS PSM*. A summary of the results for the Bexar County 2015 ozone nonattainment area is provided in Chapter 3: *Summary of Results for Performance Standard Modeling*.

### CHAPTER 3: SUMMARY OF RESULTS FOR PERFORMANCE STANDARD MODELING

The TCEQ performed MOVES3.1 runs and post-processing for the proposed Bexar County I/M Program and the Basic Performance Standard. The assessment uses a 2026 analysis year. The PSM analysis includes Bexar County, the only county in which the Bexar County area I/M program is required to operate. All required documentation for the I/M program performance standard benchmark assessment is provided in Chapter 2: *Performance Standard Modeling for the Proposed Bexar County I/M Program Scenario and for the EPA Basic Performance Standard Scenario.*

Evaluating whether a proposed I/M program meets the basic performance standard requires demonstrating that the proposed program emissions for NO<sub>x</sub> and VOC do not exceed the benchmark program's emissions. The analysis demonstrates that the proposed Bexar County area I/M program emissions are lower than the performance standard benchmark emissions. Therefore, the Bexar County area I/M program performance requirement is met. A summary of the Bexar County 2026 I/M PSM analysis is provided in Table 3-1: *Summary of 2026 Performance Standard Evaluation for the Bexar County 2015 Ozone NAAQS Nonattainment Area Proposed I/M Program*

**Table 3-1: Summary of 2026 Performance Standard Evaluation for the Bexar County 2015 Ozone NAAQS Nonattainment Area Proposed I/M Program (tons per day)**

Pollutant	Proposed I/M Program Emissions	Performance Standard Benchmark Basic I/M Program Emissions	Does Proposed Program Meet I/M Performance Standard?
NO <sub>x</sub>	15.01	15.16	Yes
VOC	8.85	9.41	Yes

*Electronic attachments available at:* <https://www.tceq.texas.gov/downloads/air-quality/sip/ozone/san-antonio/2015-naaqs/bexar-im-sip-electronic-attachments-1-2-3-4.zip>