

APPENDIX 17

Pre-Analysis Consensus Document

PRE-ANALYSIS CONSENSUS PLAN

1. Reasons for the Transportation Conformity Regional Emissions Analysis (40 CFR 93.104) Beginning 8/14/2017.

Table 1: Explanation

	New Metropolitan Transportation Plan (demographics, horizon year, etc.)
X	Modify Existing Metropolitan Transportation Plan (interim year adjustments)
X	New or Amended Transportation Improvement Program
X	State Implementation Plan (SIP) Requirement
X	Newly Designated Nonattainment Area
	Other

Conformity Rule link: <http://www.gpo.gov/fdsys/pkg/FR-2012-03-14/pdf/2012-6207.pdf>

This conformity determination is being prepared to support amendments to the 2040 Regional Transportation Plan (RTP) and 2017-2020 Transportation Improvement Program (TIP). Major elements of the amendments include:

- Adjustment to the scope, schedule, and funding of projects;
- Addition of projects funded in partnership with the Texas Transportation Commission, including the North Houston Highway Improvement Project; and
- Addition of TxDOT projects that are undergoing environmental review and seeking to advance project development activities.

Note: In accordance with 23 CFR§450.324, all projects are constrained by the financial resources estimated to be reasonably available within the RTP timeframe.

A complete listing of the projects in the amended RTP and TIP that affect this conformity analysis will be included in Appendix 3 of the conformity report.

This conformity will demonstrate compliance to the new emission budgets based on the revision to the air quality State Implementation Plan for the 2008 8-hr Ozone Standard due to the reclassification from marginal to moderate with attainment year 2017. The Reasonable Further Progress (RFP) SIP budget was found adequate by the Environmental Protection Agency (EPA) on June 6, 2017 with an effective date of June 21, 2017.

This conformity will comply with the potential future non-attainment designation for the 2015 8-hr Ozone Standard. The current deadline for EPA to promulgate initial designations for the 2015 ozone National Ambient Air Quality Standards (NAAQS) is October 1, 2017. Under the Clean Air Act demonstration of conformity is required within one year of designation.

This conformity is being performed to address necessary project changes to the RTP prior to the April 14, 2018 (23-CFR 450.340) deadline. After this date, the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) cannot issue a conformity determination for an RTP or TIP that has not been developed in accordance with the new performance measures rules.

Draft Timeline

- Pre-Consensus Conference Call #1 - Initiate Conformity: Aug 14, 2017
Deadline for approval of Pre-Consensus Document: Aug 28, 2017
- Model Network Review (H-GAC/TxDOT/METRO): Aug 21 – Sep 8, 2017
- Conference Call #2 (Modeling Discussion): Sep 18, 2017
- TDM Model Runs: Sep 15 – Oct 4, 2017
- MOVES Model Runs: Oct 4 – Oct 20, 2017
- TAC Conformity Preview: Oct 18, 2017
- TPC Conformity Preview: Oct 27, 2017
- Conference Call #3 (Public Comment Documents): Oct 24-26, 2017
- Public Comment Period (Conformity): Oct 30 – Nov 28, 2017
- Conference Call #4 (Public Comment Responses): Dec 5-7, 2017
- TAC Recommend Conformity & Transportation Plan: Dec 6, 2017
- TPC Approve Conformity & Transportation Plan: Dec 15, 2017
- Conference Call #5 (Request Partner Review/Approval): Dec 19-21, 2017
- **Target STIP Actions:**
Conformity Project Actions: February 2018 (Entered into eSTIP by Jan. 23, 2018)

2. Planning Detail (§93.110)

Table 2: Metropolitan Transportation Plan/Transportation Improvement Program

Plan or Program names	Years covered	Fiscally Constrained	Website
2040 Regional Transportation Plan	2015-2040	Yes	http://www.h-gac.com/tag/plan/2040/default.aspx
Transportation Improvement Program	2017-2020	Yes	http://www.h-gac.com/tag/tip/2017-2020-tip.aspx

Table 3: State Implementation Plan

SIP Element	Description
Title of Applicable SIP	<p>Houston-Galveston-Brazoria Reasonable Further Progress State Implementation Plan Revision for the 2008 Eight-Hour Ozone Standard Nonattainment Area MVEB were found adequate by EPA 6/6/2017 (effective 6/21/2017)</p> <p>2017 HGB 2008 Eight-Hour Ozone RFP SIP Revision (Project No. 2016-017-SIP-NR)</p> <p>https://www.tceq.texas.gov/airquality/sip/siplans.html/#sips</p>

Motor Vehicle Emissions Budgets	RFP SIP for 2008 8-hr Ozone Standard: 2017 NO _x = 121.81 tpd VOC= 68.04 tpd
Transportation Control Measures (The list of TCMs will be included in Appendix 12)	<ol style="list-style-type: none"> 1. 2000 HGB RFP and AD SIP, Approved Nov. 2001 ID#2000-0826-SIP 2. 2004 HGB Mid Course Review SIP, Approved Dec. 2004 ID# 2004-42-NR 3. TCM Substitution for HGB 2006 4. 2010 HGB AD SIP for the 1997 8-hr Ozone Standard (2009-017-SIP-NR)

Table 4: Conformity Analysis Years

Requirement	Years
Conformity Base Year	2012
Attainment Year*	2017 ¹ , 2020 ² , 2021 ³
Motor Vehicle Emissions Budget Years	2017
First Analysis Year	2017
Intermediate Analysis Years	2025, 2035
Last Year of RTP	2040

¹Attainment year 2017 for the 2008 8-hr Ozone Standard

² Attainment year 2020 for the 2015 8-hr Ozone Standard in case designations are made in 2017

³Attainment year 2021 for the 2015 8-hr Ozone Standard in case designations are made in 2018
Please note, depending EPA's designation date for the 2015 8-hr Ozone Standard, only one year (2020 or 2021) will be selected for the conformity analysis. The reason to have both years on this document is to have their parameters already approved to be ready to use in the calculations.

Table 5: Demographics Used in Conformity Analysis

Data Element	Detail and Source of Data
Population	<p>H-GAC uses an in-house model for regional econometric forecasting and feeds it into the UrbanSim model for local area forecasts. The base year demographic was developed on the basis of 2010 Census and American Community Survey (ACS) Public Use Microdata Sample (PUMS).</p> <p>The base year demographic is fed into an in-house demographic evolution model to simulate future population</p>
Employment	<p>H-GAC uses an in-house model for regional econometric forecast-supplied data as baseline and feeds this into the UrbanSim model for local area forecasts. H-GAC forecasts regional employment according to multiple sources such as Texas Workforce Commission, ACS PUMS, and Woods & Poole.</p>
Socio-economic	<p>H-GAC’s socio-economic model uses a 2010 base year. The forecast uses the following external data as input: Texas Workforce Commission, ACS PUMS, and Woods & Poole.</p>

3. Activity Detail

Table 6: Travel Demand Model

Model Factor	Detail and Methodology
Model Validation Year	2012
Software	Cube Voyager
Mode Split/Mode Choice	Updated and simplified model with help from Houston METRO
Vehicle Miles Travel (VMT) Highway Performance Monitoring System (HPMS) Adjustment	H-GAC will adjust the forecasted VMT to TxDOT's HPMS for all roadway facilities. The HPMS adjustment factor is calculated below and will be discussed in detail in Appendix 4 of the final report.
VMT adjustment -Seasonal Adjustment Factor	Refer to Table 6a below for factors.
Time Periods Designation	Refer to Table 6b below for designations.
Hourly Factors	Refer to Table 6c below
Counties Covered by Model	Harris, Galveston, Brazoria, Fort Bend, Montgomery, Liberty, Chambers and Waller.

The factor used to reconcile model estimated regional VMT to HPMS estimated regional VMT is calculated by dividing the HPMS estimated average non-summer weekday VMT as follows:

2012 HPMS Adjustment Factor Calculation

$$\begin{aligned}
 &= (\text{HPMS estimated ANSWT}) / (\text{Model estimated ANSWT}) \\
 &= (152,958,024) / (168,168,738) \\
 &= 0.90955
 \end{aligned}$$

Table 6a: Seasonal Adjustment Factors*

	County	Factors
Weekday summer June to August	Harris, Brazoria, Fort Bend, Galveston, Montgomery, and Waller	1.01245
	Liberty, Chambers	1.03746

*Data from Texas A&M Transportation Institute

Seasonal adjustment factors are used to adjust the Travel Demand Model (TDM) and estimated intrazonal VMT to summer weekday VMT. The adjustment factors were developed using aggregated Automated Traffic Recorder (ATR) data for the years 2006-2015. These factors, provided in Table 6a, were calculated by dividing the average day-of-week (weekday) count for the June – August episode by the Annual Non-Summer Weekday Traffic (ANSWT) count.

Two seasonal factors are needed because there are two different sources for data. The counties of Liberty and Chambers belong to the Beaumont TxDOT District while the counties of Harris, Brazoria, Ft. Bend, Galveston, Montgomery and Waller belong to the Houston TxDOT District.

Table 6b: Time Period Designations

Hours	Designations
12:00 a.m. – 12:59 a.m.	Overnight
1:00 a.m. – 1:59 a.m.	Overnight
2:00 a.m. – 2:59 a.m.	Overnight
3:00 a.m. – 3:59 a.m.	Overnight
4:00 a.m. – 4:59 a.m.	Overnight
5:00 a.m. – 5:59 a.m.	Overnight
6:00 a.m. – 6:59 a.m.	AM Peak
7:00 a.m. – 7:59 a.m.	AM Peak
8:00 a.m. – 8:59 a.m.	AM Peak
9:00 a.m. – 9:59 a.m.	Midday
10:00 a.m. – 10:59 a.m.	Midday
11:00 a.m. – 11:59 a.m.	Midday
12:00 p.m. – 12:59 p.m.	Midday
1:00 p.m. – 1:59 p.m.	Midday
2:00 p.m. – 2:59 p.m.	Midday
3:00 p.m. – 3:59 p.m.	PM Peak
4:00 p.m. – 4:59 p.m.	PM Peak
5:00 p.m. – 5:59 p.m.	PM Peak
6:00 p.m. – 6:59 p.m.	PM Peak
7:00 p.m. – 7:59 p.m.	Overnight
8:00 p.m. – 8:59 p.m.	Overnight
9:00 p.m. – 9:59 p.m.	Overnight
10:00 p.m. – 10:59 p.m.	Overnight

Hours	Designations
11:00 p.m. – 11:59 p.m.	Overnight

Table 6c: Hourly Factors*

Hours	Designations
12:00 a.m. – 12:59 a.m.	0.009248
1:00 a.m. – 1:59 a.m.	0.006140
2:00 a.m. – 2:59 a.m.	0.005752
3:00 a.m. – 3:59 a.m.	0.005840
4:00 a.m. – 4:59 a.m.	0.011497
5:00 a.m. – 5:59 a.m.	0.033883
6:00 a.m. – 6:59 a.m.	0.061409
7:00 a.m. – 7:59 a.m.	0.068134
8:00 a.m. – 8:59 a.m.	0.058246
9:00 a.m. – 9:59 a.m.	0.051847
10:00 a.m. – 10:59 a.m.	0.050457
11:00 a.m. – 11:59 a.m.	0.052583
12:00 p.m. – 12:59 p.m.	0.054470
1:00 p.m. – 1:59 p.m.	0.055308
2:00 p.m. – 2:59 p.m.	0.057945
3:00 p.m. – 3:59 p.m.	0.063378
4:00 p.m. – 4:59 p.m.	0.068398
5:00 p.m. – 5:59 p.m.	0.071814
6:00 p.m. – 6:59 p.m.	0.059602
7:00 p.m. – 7:59 p.m.	0.045778
8:00 p.m. – 8:59 p.m.	0.035547
9:00 p.m. – 9:59 p.m.	0.031370
10:00 p.m. – 10:59 p.m.	0.024642
11:00 p.m. – 11:59 p.m.	0.016712

*Data from Texas A&M Transportation Institute

Table 7: Projects

Project Element	Description
Regionally Significant Definition	Please see definition below
Projects that trigger conformity	Please see below
CMAQ projects	Not Applicable (N/A) H-GAC does not anticipate taking off-model credit for CMAQ projects within this conformity.
Non-Federal Projects	All RTP projects will be identified in Appendix 3, including regionally significant projects which do not require federal funds or other approvals.
Exempt Projects	All RTP projects will be identified in Appendix 3. A listing of activities eligible for grouping is contained in Appendix J of the 2017-2020 TIP as well as listing of grouped projects.
Other	All RTP projects will be identified in Appendix 3.

Regionally Significant Definition:

Regionally Significant Roadway Projects

Non-exempt projects¹ on regionally significant roadways will be treated as regionally significant projects if they:
 provide additional through traffic lanes greater than 1 mile in length;
 construct a bypass to a principal arterial/interstate along on a new alignment;
 add or extend freeway auxiliary/weaving lanes from one interchange to a point beyond the next interchange;
 construct a new interchange that provides access from or allows movement between facilities that was not previously possible; and/or
 remove an existing interchange and result in the elimination of access from or movement between facilities which previously existed.

Regionally significant roadways are limited to:

all freeways, tollways and other highways classified as principal arterial or higher; and select highways currently designated as minor arterials that serve significant interregional and intraregional travel, and connect rural population centers not already served by a principal arterial, or connect with intermodal transportation terminals not already served by a principal arterial.

¹ Non-exempt projects include all projects that are not identified under 40 CFR § 93.126 and 40 CFR § 93.127 as exempt or exempt from regional emissions analysis.

Regionally Significant Transit Projects

Any transit facility within an exclusive right-of-way (“fixed guideway”) that offers an alternative to regional highway travel including light rail, commuter rail, bus rapid transit, and barrier separated HOV lanes will be considered regionally significant.

Other Projects

The regional significance of non-exempt projects not addressed in the above statements will be decided on a case-by-case basis through the interagency consultation process. The consultation will occur before taking the plan to TPC (either plan or TIP revision), and prior to the environmental determination.

4. Emissions Detail (MOVES Air Quality Emission Model Information)

Table 8: MOVES2014a Modeled Pollutants

Command	Function/Description	Input Parameter Source/Value
Pollutant	Defines the basic set of pollutants to report.	NO _x , VOC

Table 9: Model External Conditions

Utility used	Spatial Emission Estimator (SEE) developed by ERG*
Emission Model Version	MOVES2014a
Analysis Year Runs	2017, 2020**, 2021**, 2025, 2035, 2040
Time Periods	AM, MD, PM, OV
Pollutants Reported	NO _x , VOC
Evaluation Month	July
Inputs to SEE for activity data to run MOVES at project level	Hourly VMT per link and speeds, link definitions, time period designation, road type and speed, and VMT mix. Inputs will be provided in Appendix 9 of the final report.

*Detailed information concerning SEE will be included in Appendix 8 of the final report

**Please note that depending on the date EPA does the designations for the 2015 8-hr Ozone Standard, only one year (2020 or 2021) will be selected for the conformity analysis.

Table 10: MOVES2014a Input Parameters and Source

Input Parameter Name	Description	Source
Source Type Population	Input the number of vehicles in the geographic area, which will be modeled for each vehicle type. A module is used to convert MOVES2014a based TXDMV registration data for each county into 13 MOVES SUT population	TXDMV registration data for July 2014 (latest available)
Source Type Age Distribution	Input that provides the distribution of vehicle counts by age for each calendar year and vehicle type. TXDMV registration data is used to estimate the age distribution of vehicle types up to 30 years. The distribution of Age fractions should sum up to 1.0 for all vehicle types for each analysis	TXDMV registration data for July 2014 (latest available); MOVES default used for buses
Vehicle Type VMT	County-specific VMT is distributed to 6 HPMS vehicle types.	NA
Average Speed Distribution	Input average speed data specific to vehicle type, road type, and time of day/type of day into 16 speed bins. The sum of speed distribution to all speed bins for each road type, vehicle type, and time/day type would be 1.0.	Travel Model Output
Road Type Distribution (VMT Fractions)	Input county-specific VMT by road type. VMT fraction is distributed between the road types and must sum to 1.0 for each source type.	Travel Model Output
Ramp Fraction	Input county-specific fraction of ramp driving time on rural and urban restricted roadway type.	Travel Model Output
Fuel Supply	Input to assign existing fuels to counties, months, and years, and to assign the associated market share for each fuel.	TCEQ, EPA Fuel Surveys and default MOVES input where local data unavailable. (Refer to Table 11)

Input Parameter Name	Description	Source
Meteorology	County-specific data on temperature and humidity.	RFP SIP revision for 2008 8-hr Ozone Standard for years 2017, 2020, 2021, 2025, 2035 and 2040 Appendix 10: Regional data from TCEQ. HGB area weather station data averages for the 2011 June through August period developed originally for the 2011 AERR inventories, TTI, August 2012. https://www.tceq.texas.gov/assets/public/implementation/air/sip/hgb/HGB_2016_AD_RFP/RFP/HGBRFP_Appendix_10.pdf
Fuel Formulation	Input county-specific fuel properties in the MOVES database.	TCEQ, EPA Fuel Surveys and default MOVES input where local data unavailable. (Refer to Table 12)
I/M Coverage	Input I/M coverage record for each combination of pollutants, process, county, fuel type, regulatory class and model year are specified using this input.	Refer to Tables 13, 14, 15, 16, 17 and 18
Fuel Engine Fraction / Diesel Fraction	Input fuel engine fractions (i.e. gasoline vs. diesel engine types in the vehicle population) for all vehicle types.	TXDMV registration data July 2014 (latest available); MOVES default used for light-duty vehicles and buses; county regional data applied for heavy-duty vehicles.

Table 11: MOVES2014a Fuel Supply

Fuel Formulation ID	Market Share
10005 (gasoline)	1
30011 (diesel)	1

Table 12: MOVES2014a Fuel Properties

Fuel Type	Units	2017 and Later RFG ¹	2017 and Later Diesel ²
Fuel Formulation ID	-	10005	30011
Fuel Subtype ID	-	12	20
RVP	psi	7.10	0
Sulfur Level	ppm	10	11
ETOH Volume	Vol. %	9.79	0
MTBE Volume	Vol. %	0	0
ETBE Volume	Vol. %	0	0
TAME Volume	Vol. %	0	0
Aromatic Content	Vol. %	16.30	0
Olefin Content	Vol. %	12.06	0
Benzene Content	Vol. %	0.59	0
e200	Vap. %	48.78	0
e300	Vap. %	84.36	0
T50	Deg. F	204.38	0
T90	Deg. F	328.56	0
BioDieselEster Volume	-	0	0
Cetane Index	-	0	0
PAH Content	-	0	0

¹ Fuel formulations developed by TTI (July 2017) using local summer fuel surveys sample data (EPA 2016 Houston RFG compliance sample data), with adjustments for expected future year regulatory effects (i.e., the average summer 2016 sulfur content value [of 29.41 ppm] was changed to 10 ppm Tier 3 standard for 2017 and later year analyses). Average RFG properties were composed of RFG grade averages (regular, mid-grade and premium) weighted by 2016 Annual Texas Prime Supplier RFG Sales Volumes (Energy Information Administration: http://www.eia.gov/dnav/pet/pet_cons_prim_dcu_stx_a.htm).

² The diesel fuel sulfur value was set consistent with the federal standard (conservatively between maximum observed from recent local surveys and average annual 15 ppm standard).

Tables 13, 14, 15, 16, 17 and 18 contain the MOVES2014a I/M descriptive inputs, by analysis year, for the area counties subject to I/M. Brazoria, Fort Bend, Galveston, Harris, and Montgomery Counties are subject to I/M, but Chambers, Liberty, and Waller are not.

Table 13: MOVES2014a I/M Descriptive Inputs for Analysis Year 2017

I/M Program ID (Identifies program number with MOVES database)	30	51	40	60
Pollutant Process ID (Identifies pollutant process with MOVES database)	101, 102, 201, 202, 301, 302	112	101, 102, 201, 202, 301, 302	112
Source Use Type (SUT)^{1,2} (Identifies vehicle type with MOVES database)	21, 31, 32	21, 31, 32	21, 31, 32	21, 31, 32
Begin Model Year (Calculated as YearID-24; OBD³ required for 1996 and newer vehicles)	1993	1993	1996	1996
End Model Year (Calculated as YearID-2; ASM⁴/evaporative gas cap check required for 1995 and older vehicles)	1995	1995	2015	2015
Inspection Frequency (Annual testing per program specifications)	1	1	1	1
Test Standards Description (Describes test type)	ASM 2525/5015 phase-in cut points	Evaporative gas cap check	OBD check	Evaporative gas cap and OBD check
Test Standards ID (Identifies test with MOVES database)	23	41	51	45
I/M Compliance (Expected compliance percentage by SUT)	SUT 21 = 93.12% SUT 31 = 91.26% SUT 32 = 86.60%	SUT 21 = 93.12% SUT 31 = 91.26% SUT 32 = 86.60%	SUT 21 = 93.12% SUT 31 = 91.26% SUT 32 = 86.60%	SUT 21 = 93.12% SUT 31 = 91.26% SUT 32 = 86.60%

¹ SUTs listed represent the following vehicle types: SUT 21 represents passenger cars; SUT 31 represents passenger trucks; and SUT 32 represents light commercial trucks.

² From TCEQ AERR, for heavy-duty gasoline vehicles (i.e., > 8,500 lbs. GVWR), MOVES does not contain any combinations of I/M factors and mean base rates that yield I/M effects, except for the evaporative tank venting process; for light-duty gasoline vehicles, MOVES includes both exhaust and evaporative I/M factors and mean base rates with I/M effects. Via the I/M compliance factor (note 1), the heavy-duty class I/M effects were not included – only light-duty gasoline vehicles (SUTs 21, 31, and 32) were flagged for use in the user input I/M

coverage records. The processes/pollutants affected by I/M are exhaust running and exhaust start THC, CO, NOx, and tank vapor venting THC.

³ On-board diagnostics

⁴ Acceleration simulation mode

Table 14: MOVES2014a I/M Descriptive Inputs for Analysis Year 2020¹

I/M Program ID (Identifies program number with MOVES database)	40	60
Pollutant Process ID (Identifies pollutant process with MOVES database)	101, 102, 201, 202, 301, 302	112
Source Use Type (SUT)^{2,3} (Identifies vehicle type with MOVES database)	21, 31, 32	21, 31, 32
Begin Model Year (Calculated as YearID-24)	1996	1996
End Model Year (Calculated as YearID-2)	2018	2018
Inspection Frequency (Annual testing per program specifications)	1	1
Test Standards Description (Describes test type)	OBD ⁴ check	Evaporative gas cap and OBD check
Test Standards ID (Identifies test with MOVES database)	51	45
I/M Compliance (Expected compliance percentage by SUT)	SUT 21 = 93.12% SUT 31 = 91.26% SUT 32 = 86.60%	SUT 21 = 93.12% SUT 31 = 91.26% SUT 32 = 86.60%

¹ Acceleration simulation mode (ASM) and evaporative gas cap check tests are no longer required.

² SUTs listed represent the following vehicle types: SUT 21 represents passenger cars; SUT 31 represents passenger trucks; and SUT 32 represents light commercial trucks.

³ From TCEQ AERR, for heavy-duty gasoline vehicles (i.e., > 8,500 lbs. GVWR), MOVES does not contain any combinations of I/M factors and mean base rates that yield I/M effects, except for the evaporative tank venting process; for light-duty gasoline vehicles, MOVES includes both exhaust and evaporative I/M factors and mean base rates with I/M effects. Via the I/M compliance factor (note 2), the heavy-duty class I/M effects were not included – only light-duty gasoline vehicles (SUTs 21, 31, and 32) were flagged for use in the user input I/M coverage records. The processes/pollutants affected by I/M are exhaust running and exhaust start THC, CO, NOx, and tank vapor venting THC.

⁴ On-board diagnostics

Table 15: MOVES2014a I/M Descriptive Inputs for Analysis Year 2021¹

I/M Program ID (Identifies program number with MOVES database)	40	60
Pollutant Process ID (Identifies pollutant process with MOVES database)	101, 102, 201, 202, 301, 302	112
Source Use Type (SUT)^{2,3} (Identifies vehicle type with MOVES database)	21, 31, 32	21, 31, 32
Begin Model Year (Calculated as YearID-24)	1997	1997
End Model Year (Calculated as YearID-2)	2019	2019
Inspection Frequency (Annual testing per program specifications)	1	1
Test Standards Description (Describes test type)	OBD ⁴ check	Evaporative gas cap and OBD check
Test Standards ID (Identifies test with MOVES database)	51	45
I/M Compliance (Expected compliance percentage by SUT)	SUT 21 = 93.12% SUT 31 = 91.26% SUT 32 = 86.60%	SUT 21 = 93.12% SUT 31 = 91.26% SUT 32 = 86.60%

¹ Acceleration simulation mode (ASM) and evaporative gas cap check tests are no longer required.

² SUTs listed represent the following vehicle types: SUT 21 represents passenger cars; SUT 31 represents passenger trucks; and SUT 32 represents light commercial trucks.

³ From TCEQ AERR, for heavy-duty gasoline vehicles (i.e., > 8,500 lbs. GVWR), MOVES does not contain any combinations of I/M factors and mean base rates that yield I/M effects, except for the evaporative tank venting process; for light-duty gasoline vehicles, MOVES includes both exhaust and evaporative I/M factors and mean base rates with I/M effects. Via the I/M compliance factor (note 2), the heavy-duty class I/M effects were not included – only light-duty gasoline vehicles (SUTs 21, 31, and 32) were flagged for use in the user input I/M coverage records. The processes/pollutants affected by I/M are exhaust running and exhaust start THC, CO, NOx, and tank vapor venting THC.

⁴ On-board diagnostics

Table 16: MOVES2014a I/M Descriptive Inputs for Analysis Year 2025¹

I/M Program ID (Identifies program number with MOVES database)	40	60
Pollutant Process ID (Identifies pollutant process with MOVES database)	101, 102, 201, 202, 301, 302	112
Source Use Type (SUT)^{2,3} (Identifies vehicle type with MOVES database)	21, 31, 32	21, 31, 32
Begin Model Year (Calculated as YearID-24)	2001	2001
End Model Year (Calculated as YearID-2)	2023	2023
Inspection Frequency (Annual testing per program specifications)	1	1
Test Standards Description (Describes test type)	OBD ⁴ check	Evaporative gas cap and OBD check
Test Standards ID (Identifies test with MOVES database)	51	45
I/M Compliance (Expected compliance percentage by SUT)	SUT 21 = 93.12% SUT 31 = 91.26% SUT 32 = 86.60%	SUT 21 = 93.12% SUT 31 = 91.26% SUT 32 = 86.60%

¹ Acceleration simulation mode (ASM) and evaporative gas cap check tests are no longer required.

² SUTs listed represent the following vehicle types: SUT 21 represents passenger cars; SUT 31 represents passenger trucks; and SUT 32 represents light commercial trucks.

³ From TCEQ AERR, for heavy-duty gasoline vehicles (i.e., > 8,500 lbs. GVWR), MOVES does not contain any combinations of I/M factors and mean base rates that yield I/M effects, except for the evaporative tank venting process; for light-duty gasoline vehicles, MOVES includes both exhaust and evaporative I/M factors and mean base rates with I/M effects. Via the I/M compliance factor (note 2), the heavy-duty class I/M effects were not included – only light-duty gasoline vehicles (SUTs 21, 31, and 32) were flagged for use in the user input I/M coverage records. The processes/pollutants affected by I/M are exhaust running and exhaust start THC, CO, NOx, and tank vapor venting THC.

⁴ On-board diagnostics

Table 17: MOVES2014a I/M Descriptive Inputs for Analysis Year 2035¹

I/M Program ID (Identifies program number with MOVES database)	40	60
Pollutant Process ID (Identifies pollutant process with MOVES database)	101, 102, 201, 202, 301, 302	112
Source Use Type (SUT)^{2,3} (Identifies vehicle type with MOVES database)	21, 31, 32	21, 31, 32
Begin Model Year (Calculated as YearID-24)	2011	2011
End Model Year (Calculated as YearID-2)	2033	2033
Inspection Frequency (Annual testing per program specifications)	1	1
Test Standards Description (Describes test type)	OBD ⁴ check	Evaporative gas cap and OBD check
Test Standards ID (Identifies test with MOVES database)	51	45
I/M Compliance (Expected compliance percentage by SUT)	SUT 21 = 93.12% SUT 31 = 91.26% SUT 32 = 86.60%	SUT 21 = 93.12% SUT 31 = 91.26% SUT 32 = 86.60%

¹ Acceleration simulation mode (ASM) and evaporative gas cap check tests are no longer required.

² SUTs listed represent the following vehicle types: SUT 21 represents passenger cars; SUT 31 represents passenger trucks; and SUT 32 represents light commercial trucks.

³ From TCEQ AERR, for heavy-duty gasoline vehicles (i.e., > 8,500 lbs. GVWR), MOVES does not contain any combinations of I/M factors and mean base rates that yield I/M effects, except for the evaporative tank venting process; for light-duty gasoline vehicles, MOVES includes both exhaust and evaporative I/M factors and mean base rates with I/M effects. Via the I/M compliance factor (note 2), the heavy-duty class I/M effects were not included – only light-duty gasoline vehicles (SUTs 21, 31, and 32) were flagged for use in the user input I/M coverage records. The processes/pollutants affected by I/M are exhaust running and exhaust start THC, CO, NOx, and tank vapor venting THC.

⁴ On-board diagnostics

Table 18: MOVES2014a I/M Descriptive Inputs for Analysis Year 2040¹

I/M Program ID (Identifies program number with MOVES database)	40	60
Pollutant Process ID (Identifies pollutant process with MOVES database)	101, 102, 201, 202, 301, 302	112
Source Use Type (SUT)^{2,3} (Identifies vehicle type with MOVES database)	21, 31, 32	21, 31, 32
Begin Model Year (Calculated as YearID-24)	2016	2016
End Model Year (Calculated as YearID-2)	2038	2038
Inspection Frequency (Annual testing per program specifications)	1	1
Test Standards Description (Describes test type)	OBD ⁴ check	Evaporative gas cap and OBD check
Test Standards ID (Identifies test with MOVES database)	51	45
I/M Compliance (Expected compliance percentage by SUT)	SUT 21 = 93.12% SUT 31 = 91.26% SUT 32 = 86.60%	SUT 21 = 93.12% SUT 31 = 91.26% SUT 32 = 86.60%

¹ Acceleration simulation mode (ASM) and evaporative gas cap check tests are no longer required.

² SUTs listed represent the following vehicle types: SUT 21 represents passenger cars; SUT 31 represents passenger trucks; and SUT 32 represents light commercial trucks.

³ From TCEQ AERR, for heavy-duty gasoline vehicles (i.e., > 8,500 lbs. GVWR), MOVES does not contain any combinations of I/M factors and mean base rates that yield I/M effects, except for the evaporative tank venting process; for light-duty gasoline vehicles, MOVES includes both exhaust and evaporative I/M factors and mean base rates with I/M effects. Via the I/M compliance factor (note 2), the heavy-duty class I/M effects were not included – only light-duty gasoline vehicles (SUTs 21, 31, and 32) were flagged for use in the user input I/M coverage records. The processes/pollutants affected by I/M are exhaust running and exhaust start THC, CO, NOx, and tank vapor venting THC.

⁴ On-board diagnostics

Table 19: MOVES2014a Emissions Factor Post-Processing to Be Performed by County and Year

Strategy and Post-Processing Result	Analysis Year	Counties
Texas Low Emission Diesel Fuel (TxLED)	2017,2020*,2021*,2025,2035,2040	Harris, Brazoria, Chambers, Fort Bend, Galveston, Liberty, Montgomery, Waller

Source: TCEQ, Texas A&M Transportation Institute.

* Please note that depending on the date EPA does the designations for the 2015 8-hr Ozone Standard, only one year (2020 or 2021) will be selected for the conformity analysis

The following table provides the TxLED reduction and the adjustment factors for the years 2017, 2020, 2021, 2025, 2035, and 2040. These factors were calculated using MOVES2014a and the July 2014 TXDMV registration, which it is the latest available.

Table 20: TxLED NO_x Reduction and NO_x Adjustment Factors by Source Use Type

Source Use Type	2017 Reduction	2020 Reduction	2021 Reduction	2025 Reduction	2035 Reduction	2040 Reduction	2017 Factor	2020 Factor	2021 Factor	2025 Factor	2035 Factor	2040 Factor
Passenger Car	5.17%	4.92%	4.92%	4.84%	4.80%	4.80%	0.9483	0.9508	0.9508	0.9516	0.952	0.952
Passenger Truck	5.08%	5.01%	4.97%	4.90%	4.80%	4.80%	0.9492	0.9499	0.9503	0.9510	0.952	0.952
Light Commercial Truck	5.35%	5.21%	5.20%	5.09%	4.80%	4.80%	0.9465	0.9479	0.9480	0.9491	0.952	0.952
Intercity Bus	5.69%	5.61%	5.56%	5.45%	4.80%	4.80%	0.9431	0.9439	0.9444	0.9455	0.952	0.952
Transit Bus	5.66%	5.51%	5.47%	5.32%	4.80%	4.80%	0.9434	0.9449	0.9453	0.9468	0.952	0.952
School Bus	5.67%	5.57%	5.52%	5.37%	4.80%	4.80%	0.9433	0.9443	0.9448	0.9463	0.952	0.952
Refuse Truck	5.38%	5.24%	5.13%	4.96%	4.80%	4.80%	0.9462	0.9476	0.9487	0.9504	0.952	0.952
Single Unit Short-Haul Truck	4.89%	4.85%	4.84%	4.82%	4.80%	4.80%	0.9511	0.9515	0.9516	0.9518	0.952	0.952
Single Unit Long-Haul Truck	4.90%	4.86%	4.85%	4.83%	4.80%	4.80%	0.9510	0.9514	0.9515	0.9517	0.952	0.952
Motor Home	5.38%	5.29%	5.26%	5.19%	4.80%	4.80%	0.9462	0.9471	0.9474	0.9481	0.952	0.952
Combination Short-Haul Truck	5.19%	5.11%	5.05%	4.92%	4.80%	4.80%	0.9481	0.9489	0.9495	0.9508	0.952	0.952
Combination Long-Haul Truck	5.26%	5.12%	5.05%	4.91%	4.80%	4.80%	0.9474	0.9488	0.9495	0.9509	0.952	0.952

Source: TTI, March 2016. TTI used the TxLED factor procedure from TCEQ (available in “mvs14-statewide-txled-analysis-06-12-17-18.zip” found at: <ftp://amdaftp.tceq.texas.gov/pub/EI/onroad/txled/>) in combination with the latest available data (i.e., statewide age distributions based on the latest available mid-year 2014 TxDMV vehicle registrations), and MOVES2014a (November 2016 update).

Emissions Controls Used for Conformity Credit

This conformity will not use any credits from voluntary mobile emission reduction programs since they are not needed to show conformity to the emission budgets.

Table 21: Emissions Controls Used for Conformity Credit

Emission Reduction Strategy and Years Covered	Modeling or Post- Processing Approach	Analysis Year
NA	NA	NA

VMT Mix

Table 22: VMT Mix Year/Analysis Year Correlations

VMT Mix Year	Analysis Years
2015	2013 through 2017
2020	2018 through 2022
2021	2018 through 2022
2025	2023 through 2027
2030	2028 through 2032
2035	2033 through 2040

The VMT mix designates the vehicle types included in the analysis, and specifies the fraction of on-road fleet VMT attributable to each vehicle type by MOVES road type.

The VMT mixes were estimated based on Texas A&M Transportation Institute's 24-hour average VMT mix method (*Methodologies for Conversion of Data Sets for MOVES Model Compatibility*. Texas A&M Transportation Institute, August 2009) estimated for each TxDOT district associated with the eight-county HGB area (i.e., Houston and Beaumont districts). The 24-hour VMT mix was developed using vehicle classification counts (2001-2014), end-of-year

registration data (2013), and MOVES defaults (where needed). This data will be included in Appendix 9 of final conformity report.

5. Interagency Consultation

Interagency consultation is a required element of the transportation conformity process according to 40 CFR §93.105. Consultation partners include H-GAC, TxDOT, TCEQ, EPA, FHWA, METRO and Texas A&M Transportation Institute. Consultation regarding this Pre-Analysis Consensus Plan and the conformity process will be documented in Appendix 14 of the final conformity report.

6. Public Participation

Public consultation is a required element of the transportation conformity process according to 40 CFR §93.105. The draft transportation conformity report, which will be based on this pre-analysis consensus plan, will undergo a 30-day public comment period. During the public comment period, H-GAC will hold two public meetings. Information concerning the public participation process will be documented in Appendix 15 of the final conformity report.

The following appendices will accompany the final transportation conformity report.

APPENDICES

Appendix 1: Resolution from Transportation Policy Council

Appendix 2: Applicable SIP Excerpts

Appendix 3: Project Listing

Appendix 4: Travel Model Validation

Appendix 5: Final RTP Link Listing

Appendix 6: MOVES information and Fact Sheets

Appendix 7: MOVES input parameters

Appendix 8: SEE Report

Appendix 9: MOVES input and output files

Appendix 10: Post Process (TxLED adjustment)

Appendix 11: Final MOVES emission factors

Appendix 12: Transportation Control Measures in the State Implementation Plan

Appendix 13: VMEPs

Appendix 14: Interagency Conformity Consultation Process

Appendix 15: Public Comment process

