



# Standard Operating Procedure

## Complying with MSAT Analysis Requirements

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Review Authority: HE Work Team Leader, Jackie Ploch

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### Purpose of this SOP

This standard operating procedure (SOP) assists project sponsors in complying with National Environmental Policy Act (NEPA) and Environmental Protection Agency (EPA) requirements in regards to mobile source air toxics (MSAT) emissions at the project level. Specifically, the SOP explains when to conduct a qualitative or quantitative MSAT analysis, how to conduct a quantitative MSAT analysis, and how to prepare and coordinate a quantitative MSAT technical report, if necessary.

### Subject Overview

NEPA requires that all “major federal actions significantly affecting the quality of the human environment” shall include a “detailed statement” on “the environmental impact of the proposed action.” In its [interim MSAT guidance](#), the Federal Highway Administration (FHWA) stated that either a qualitative or quantitative MSAT analysis may be necessary to comply with this NEPA requirement.

### Toolkit

Use the following tools, which are available in the Texas Department of Transportation (TxDOT) [Air Quality Toolkit](#).

- Emissions Table
- Documentation Standard for a Quantitative MSAT Technical Report
- SOP for Preparing Air Quality Statements

### Personnel

The audience for this SOP includes project sponsors, contractors, and consultants responsible for preparing valid documentation that a project complies with NEPA air quality requirements; in particular, MSAT requirements.

### Applicable Models

Emission rates for a quantitative MSAT analysis are developed using the current EPA approved emission factor model, Motor Vehicle Emissions Simulator (MOVES).

Traffic data used to support the project’s need and purpose may also be used for the MSAT analysis. At a minimum, if a quantitative MSAT analysis is anticipated at project scoping, both build and no-build traffic data should be requested.

### Procedure

1. Determine whether the project is exempt from a MSAT analysis by identifying whether the project meets either of the following:
  - The project qualifies as a FHWA Categorical Exclusion (CE) under [23 CFR 771.117](#); or

- It is a project type that is listed in [40 CFR 93.126](#).

If so, proceed to Step 9. If not, continue to Step 2.

2. Determine whether this project will require a qualitative MSAT analysis by completing Steps 2.1 through 2.5 as directed.
  - 2.1. Determine if the project affects a major intermodal facility or port located in proximity to a populated area. If so, proceed to Step 3. If not, continue to Step 2.2.
  - 2.2. Identify whether public concern has been raised regarding MSAT emissions associated with the project<sup>1</sup>. If so, proceed to Step 3. If not, continue to Step 2.3.
  - 2.3. Determine if the project is adding capacity<sup>2</sup>. If so, continue to Step 2.4. If not, **the project is exempt from a MSAT analysis**; proceed to Step 9.
  - 2.4. Determine if the project is a FHWA and/or Federal Transit Administration (FTA) project. If so, continue to Step 2.5. If not, **a qualitative MSAT analysis is required**; proceed to Step 9.
  - 2.5. Determine if the project's design year annual average daily traffic<sup>3</sup> (AADT) is greater than 140,000 vehicles per day. If so, continue to Step 3. If not, **a qualitative MSAT analysis is required**; proceed to Step 9.
3. When requesting traffic, make sure to obtain the base and design year data for both the build and the no-build alternatives. Continue to Step 4.
4. Initiate and document an MSAT conference call by completing Steps 4.1 through 4.5 as directed.
  - 4.1. Obtain the following information, and continue to Step 4.2.
    - The project description
    - The environmental document type
    - An aerial map identifying the project
    - Any available schematics, and
    - Build and no-build base and design year traffic data
  - 4.2. Schedule a MSAT conference call with the following participants, provide them with the information collected in the previous step, and continue to Step 4.3.
    - The Environmental Affairs Division (ENV) air specialist
    - A TxDOT district traffic expert
    - The local TxDOT district environmental coordinator
    - The local TxDOT district project manager
    - The contractor responsible for preparing the MSAT analysis

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<sup>1</sup> Public concern regarding MSAT does not automatically necessitate a quantitative MSAT analysis, but such concerns will be taken into account along with other project specific information in the MSAT conference call in order to make a reasoned decision as to whether a quantitative MSAT would be beneficial.

<sup>2</sup> Typically includes but is not limited to constructing new location roadways, adding main lanes, adding through lanes, adding auxiliary lanes longer than 1 mi, or otherwise having a meaningful impact on traffic volumes or vehicle mix.

<sup>3</sup> This refers to the AADT for the entire cross-section of the roadway, including main lanes and frontage roads.

- 4.3. Lead and take meeting minutes for the MSAT conference call, which includes discussing the following items, and continue to Step 4.4.

For All Projects:

- Identify whether the project is a CE
- A brief description of the project
- The reason for initiating the conference call
- A decision about whether the project will require a quantitative MSAT analysis

For Projects that will Require a Quantitative MSAT Analysis:

- What NEPA traffic data is available
- Whether the traffic data includes both build and no-build alternatives
- Whether the traffic data includes a study area or corridor that is larger than just the links of the project
- Obtaining VMT breakdowns for various timeframes (peak and off-peak hours at a minimum)
- Obtaining congested speeds for each timeframe (peak and off-peak hours at a minimum)
- The project's anticipated environmental approval date
- The estimated time to completion (ETC) year
- The appropriate base year and design year<sup>4</sup> to analyze in the MSAT analysis
- An identification of whether an interim year<sup>5</sup> is recommended for the project
- The methodology to use for determining the affected network<sup>6</sup>
- The emissions model that will be used
- An identification of whether MSAT emission rate tables are available or, if not, an identification of the appropriate methodology for the contractor to use in developing the emission rates

- 4.4. Distribute the meeting minutes to each participant for comments and corrections. Retain the final approved meeting minutes in the project file. Continue to Step 4.5.

- 4.5. Identify whether the result of the MSAT call was that a quantitative analysis is required. If so, then **a quantitative MSAT analysis** is required, continue to Step 5. If not, **a qualitative MSAT analysis is required**; proceed to Step 9.

5. Obtain the applicable MSAT emission rates by reviewing the meeting minutes and completing Steps 5.1 and 5.2 as directed.

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<sup>4</sup> The design year can be either the ETC year + 20 years or the horizon year of the applicable transportation plan.

<sup>5</sup> The interim year is typically the same as the ETC year.

<sup>6</sup> At a minimum this will consist of the links of the project; however, in cases where the NEPA traffic analysis is more robust than just the project links, one or more of the options in FHWA's [Frequently Asked Questions for Conducting Quantitative MSAT Analysis for FHWA NEPA Documents](#) may be used to further refine the affected network for non-project links.

- 5.1. Determine if a current applicable emissions table<sup>7</sup> contains MSAT emission rates for the appropriate TxDOT district. If so, use those rates, and proceed to Step 6. If not, continue to Step 5.2.
- 5.2. Develop applicable emission rates for each priority MSAT using the MOVES emission factor model. Continue to Step 6.
6. Conduct the quantitative MSAT analysis by completing Steps 6.1 through 6.4 as directed.
  - 6.1. Develop an affected network for the base, interim<sup>8</sup>, and design years using the methodology established in the MSAT conference call minutes<sup>9</sup>. Continue to Step 6.2.
  - 6.2. For each affected network, multiply the applicable emission rate for each priority MSAT by the VMT for each time period for each network link. Aggregate the results to determine the total priority MSAT emissions for each network link. Continue to Step 6.3.
  - 6.3. For each of the affected networks, aggregate the VMT for each of the affected network links to determine the total VMT. Continue to Step 6.4.
  - 6.4. For each of the affected networks, aggregate the emissions for each priority MSAT to determine the total MSAT emissions. Continue to Step 7.
7. Analyze the modeling results by completing Steps 7.1 through 7.3 as directed.
  - 7.1. Determine whether the total MSAT emissions in the future years analyzed are less than the total MSAT emissions in the base year. If so, proceed to Step 8. If not, continue to Step 7.2.
  - 7.2. Consult with the ENV air specialist to determine if there was a flaw in the analysis. If so, correct the flaw, and return to Step 6.2. If not, continue to Step 7.3.
  - 7.3. Identify appropriate MSAT mitigation measures in consultation with the ENV air specialist. Continue to Step 8.
8. Prepare a technical report and submit it for review by completing Steps 8.1 through 8.4 as directed.
  - 8.1. Prepare a technical report for the analysis in accordance with the Documentation Standard for a Quantitative MSAT Technical Report. Continue to Step 8.2.
  - 8.2. Submit the quantitative MSAT technical report to the ENV air specialist for review. Continue to Step 8.3.
  - 8.3. Address the specialist's comments appropriately, then resubmit the technical report to the ENV air specialist for approval. If the analysis was not approved, repeat this step. If the analysis was approved, continue to Step 8.4.
  - 8.4. Retain the approved quantitative MSAT technical report in the project file. Continue to Step 9.
9. Prepare a statement with the applicable MSAT disclosure language by completing Steps 9.1 and 9.2 as directed.

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<sup>7</sup> Both TxDOT and some MPOs have an emissions table.

<sup>8</sup> During the MSAT conference call, it will be determined if an interim year is required.

<sup>9</sup> Often this will only be the links of the project.



- 9.1. Use the SOP for Preparing Air Quality Statements to select and customize<sup>10</sup> an appropriate statement based on the project specifics and any analysis results. Continue to Step 9.2.
- 9.2. Include the statement in the environmental review document or the technical report<sup>11</sup> as appropriate.

**The procedure is complete.**

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<sup>10</sup> Not all statements require customization.

<sup>11</sup> If an environmental review document is not required, the statement is included in a technical report and is retained in the project file. Otherwise, the statement is included only in the environmental review document.

## Appendix A: Acronyms and Definitions

### Acronyms

Acronym	Full Name
Assignment MOU	Memorandum of Understanding between FHWA and TxDOT Concerning State of Texas' Participation in the Project Delivery Program Pursuant to 23 USC 327
AADT	Annual Average Daily Traffic
CFR	Code of Federal Regulations
CO	Carbon Monoxide
ENV	TxDOT Environmental Affairs Division
EPA	Environmental Protection Agency
ETC	Estimated Time to Completion
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
HE	Human Environment Team
MOVES	Motor Vehicle Emissions Simulator
MPO	Metropolitan Planning Organization
MSAT	Mobile Source Air Toxics
MTP	Metropolitan Transportation Plan
NATA	National-Scale Air Toxics Assessment
NEPA	National Environmental Policy Act
NOx	Nitrogen oxides
PM	Particulate Matter – subscript 2.5 and 10 refer to particle size

Acronym	Full Name
SOP	Standard Operating Procedure
TDM	Travel Demand Model
TPP	TxDOT Transportation Planning and Programming Division
TxDOT	Texas Department of Transportation
USC	United States Code
VMT	Vehicle Miles Travelled
VOC	Volatile Organic Compounds

**Definitions**

Term	Definition
Base Year	The initial year of the MSAT analysis for which both traffic data is available and the project has not yet been constructed.
Design Year	The final year of the MSAT analysis, which can be either the ETC year + 20 or the out-year of the current MTP.
ETC Year	The year in which the entire project, as described in the environmental review document, is expected to be open to traffic.
FHWA/FTA Project	These projects use FHWA/FTA funding, need a FHWA/FTA decision, or were assigned to TxDOT under the <a href="#">Assignment MOU</a> .
Interim Year	An MSAT analysis year, if required, would be consistent with the ETC year for the project,
MSAT	EPA identified nine compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers in their <a href="#">2011 National Air Toxics Assessment (NATA)</a> . These are acetaldehyde, acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules.



<b>Term</b>	<b>Definition</b>
MOVES	<a href="#">MOVES</a> is the EPA’s approved mobile source emissions model. This model uses data on temperature, fleet mix, fleet ages, appropriate inspection-maintenance, and vehicle operating modes to calculate VOC, CO, NOx, and MSAT emission rates for different speeds and years.
NEPA traffic data	The traffic data developed and used in support of the project’s Need and Purpose. Typical sources of the traffic data include from the Transportation Planning and Programming (TPP) division or from a consultant. TPP’s Form 2124 can be used to both request traffic data from TPP or to submit a consultant packet for review. The NEPA traffic data may need to be refined to obtain parameters specific to air quality analyses.
VMT	Vehicle miles travelled is calculated by multiplying the AADT of the roadway by the length of the road segment.





## **Appendix B**

The following table shows the revision history for this document.

<b>Revision History</b>	
<b>Effective Date Month, Year</b>	<b>Reason for and Description of Change</b>
February 2019	Version 3 was released. Updates to change from using the MPO's TDM traffic data to using the NEPA traffic analysis. It also clarifies how to develop emissions for different timeframes for each network link.
January 2017	Version 2 was released. Updates based on FHWA's updated Interim MSAT Guidance which was released on October 18, 2016.
October 2015	Version 1 was released.