



U.S. Department  
of Transportation  
**Federal Highway  
Administration**

# Memorandum

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Subject: **INFORMATION**: Updated Interim  
Guidance on Mobile Source Air Toxic  
Analysis in NEPA Documents

Date: January 18, 2023

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In Reply Refer To:  
HEPN-10

To: Division Administrators  
Federal Lands Highway Division Engineers

## **PURPOSE**

The purpose of this memorandum is to update the October 2016, Interim Guidance that advised Federal Highway Administration (FHWA) Division Offices on when and how to analyze Mobile Source Air Toxics (MSAT) within the National Environmental Policy Act (NEPA) review process for proposed highway projects.

This update was prompted by recent changes in the emissions model required for conducting emissions analysis. In 2021, the U.S. Environmental Protection Agency (EPA) released MOVES3,<sup>1</sup> the latest major update of the Motor Vehicle Emissions Simulator (MOVES) vehicle emissions model, and started a 2-year grace period to phase in the requirement of using MOVES3 for transportation conformity analysis. Beginning January 9, 2023, project sponsors should use MOVES3 to conduct emissions analysis for both transportation conformity determinations and for NEPA purposes.

This Updated Interim Guidance incorporates new analysis conducted using MOVES3. Based on FHWA's analysis using MOVES3, diesel particulate matter (diesel PM) remains the dominant MSAT of concern for highway projects. We have also provided an update on the status of scientific research on air toxics. This Updated Interim Guidance supersedes the October 2016 Interim Guidance and should be referenced in NEPA documentation.

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<sup>1</sup> Federal Register, Vol. 86, No. 4, page 1106, January 7, 2021. Available at:  
<https://www.govinfo.gov/content/pkg/FR-2021-01-07/pdf/2021-00023.pdf>

## BACKGROUND

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the U.S. Environmental Protection Agency (EPA) regulate 188 air toxics, also known as hazardous air pollutants. The EPA assessed this expansive list in its rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007), and identified a group of 93 compounds emitted from mobile sources that are part of EPA's [Integrated Risk Information System](#) (IRIS).<sup>2</sup> In addition, EPA identified nine compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers or contributors and non-cancer hazard contributors from the [2011 National Air Toxics Assessment](#) (NATA).<sup>3</sup> These are *1,3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter (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.

### Motor Vehicle Emissions Simulator (MOVES)

According to EPA, MOVES3 is a major revision to MOVES2014 and improves upon it in many respects. MOVES3 includes new data, new emissions standards, and new functional improvements and features. It incorporates substantial new data for emissions, fleet, and activity developed since the release of MOVES2014. These new emissions data are for light- and heavy-duty vehicles, exhaust and evaporative emissions, and fuel effects. MOVES3 also adds updated vehicle sales, population, age distribution, and vehicle miles travelled (VMT) data. In the November 2020 EPA issued [MOVES3 Mobile Source Emissions Model Questions and Answers](#)<sup>4</sup> EPA states that for on-road emissions, MOVES3 updated heavy-duty (HD) diesel and compressed natural gas (CNG) emission running rates and updated HD gasoline emission rates. They updated light-duty (LD) emission rates for hydrocarbon (HC), carbon monoxide (CO) and nitrogen oxide (NO<sub>x</sub>) and updated light-duty (LD) particulate matter rates, incorporating new data on Gasoline Direct Injection (GDI) vehicles.

Using EPA's MOVES3 model, as shown in Figure 1, FHWA estimates that even if VMT increases by 31 percent from 2020 to 2060 as forecast, a combined reduction of 76 percent in the total annual emissions for the priority MSAT is projected for the same time period.

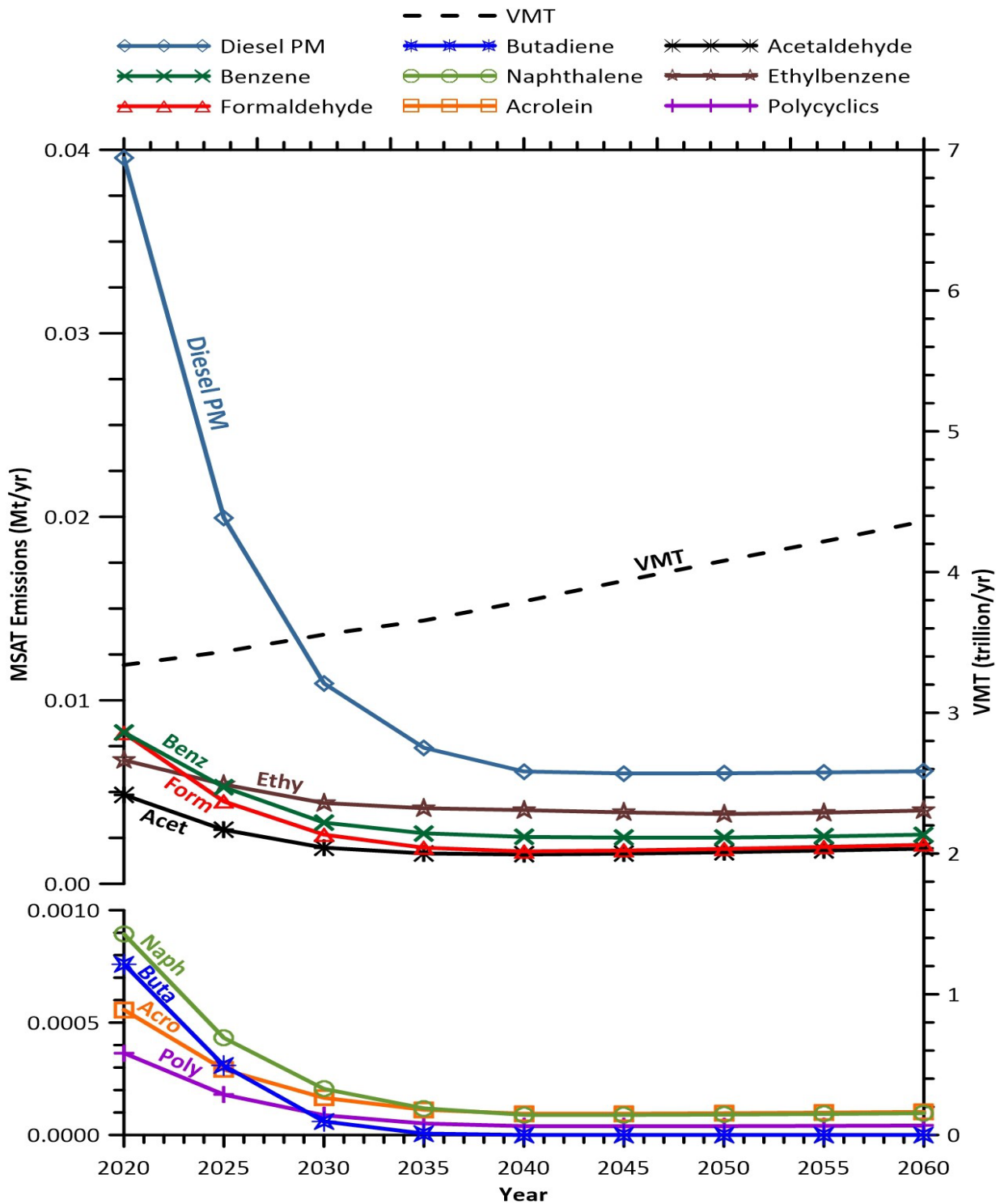
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<sup>2</sup> <https://www.epa.gov/iris>

<sup>3</sup> <https://www.epa.gov/national-air-toxics-assessment>

<sup>4</sup> <https://nepis.epa.gov/Exec/zyPDF.cgi?Dockey=P1010M06.pdf>

### FHWA PROJECTED NATIONAL MSAT EMISSION TRENDS 2020 – 2060 FOR VEHICLES OPERATING ON ROADWAYS



Note: Trends for specific locations may be different, depending on locally derived information representing vehicle-miles travelled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors.  
 Source: EPA MOVES3 model runs conducted by FHWA, March 2021.

Diesel PM is the dominant component of MSAT emissions, making up 36 to 56 percent of all priority MSAT pollutants by mass, depending on calendar year. Users of MOVES3 will notice some differences in emissions compared with MOVES2014. MOVES3 is based on updated data on some emissions and pollutant processes compared to MOVES2014, and also reflects the latest Federal emissions standards in place at the time of its release. In addition, MOVES3 emissions forecasts are based on slightly higher VMT projections than MOVES2014, consistent with nationwide VMT trends.

### **MSAT Research**

Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how potential public health risks posed by MSAT exposure should be factored into project-level decision-making within the context of NEPA.

Nonetheless, air toxics concerns continue to arise on highway projects during the NEPA process. Even as the science emerges, the public and other agencies expect FHWA to address MSAT impacts in its environmental documents. The FHWA, EPA, the Health Effects Institute, and others have funded and conducted research studies to try to more clearly define potential risks from MSAT emissions associated with highway projects. The FHWA will continue to monitor the developing research in this field.

### **NEPA CONTEXT**

The NEPA requires, to the fullest extent possible, that the policies, regulations, and laws of the Federal Government be interpreted and administered in accordance with its environmental protection goals, and that Federal agencies use an interdisciplinary approach in planning and decision-making for any action that adversely impacts the environment (42 U.S.C. 4332). In addition to evaluating the potential environmental effects, FHWA must also take into account the need for safe and efficient transportation in reaching a decision that is in the best overall public interest (23 U.S.C. 109(h)). The FHWA policies and procedures for implementing NEPA are contained in 23 USC 139 and 23 CFR Part 771.

### **CONSIDERATION OF MSAT IN NEPA DOCUMENTS**

The FHWA developed a tiered approach with three categories for analyzing MSAT in NEPA documents, depending on specific project circumstances:

- (1) No analysis for projects with no potential for meaningful MSAT effects;
- (2) Qualitative analysis for projects with low potential MSAT effects; or
- (3) Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects.

For projects warranting MSAT analysis, all nine priority MSAT should be considered.

***(1) Projects with No Meaningful Potential MSAT Effects, or Exempt Projects.***

The types of projects included in this category are:

- Projects qualifying as a categorical exclusion under 23 CFR 771.117;
- Projects exempt under the Clean Air Act conformity rule under 40 CFR 93.126; and
- Other projects with no meaningful impacts on traffic volumes or vehicle mix.

For projects that are categorically excluded under 23 CFR 771.117, or are exempt from conformity requirements under the Clean Air Act pursuant to 40 CFR 93.126, no analysis or discussion of MSAT is necessary. Documentation sufficient to demonstrate that the project qualifies as a categorical exclusion and/or exempt project will suffice. For other projects with no or negligible traffic impacts, regardless of the class of NEPA environmental document, no MSAT analysis is recommended. However, the project record should document in the EA or EIS the basis for the determination of no meaningful potential impacts with a brief description of the factors considered. Example language, which must be modified to correspond with local and project-specific circumstances, is provided in Appendix A.

***(2) Projects with Low Potential MSAT Effects***

The types of projects included in this category are those that serve to improve operations of highway, transit, or freight without adding substantial new capacity or without creating a facility that is likely to meaningfully increase MSAT emissions. This category covers a broad range of projects.

We anticipate that most highway projects that need an MSAT assessment will fall into this category. Examples of these types of projects are minor widening projects; new interchanges; replacing a signalized intersection on a surface street; and projects where design year traffic is projected to be less than 140,000 to 150,000 annual average daily traffic (AADT).

For these projects, a qualitative assessment of emissions projections should be conducted. This qualitative assessment should compare, in narrative form, the expected effect of the project on traffic volumes, vehicle mix, or routing of traffic and the associated changes in MSAT for the project alternatives, including no-build, based on VMT, vehicle mix, and speed. It should also discuss national trend data projecting substantial overall reductions in emissions due to stricter engine and fuel regulations issued by EPA. Because the emission effects of these projects typically are low, we expect there would be no appreciable difference in overall MSAT emissions among the various alternatives.

Appendix B includes example language for a qualitative assessment, with specific examples for four types of projects: (1) a minor widening project; (2) a new interchange connecting an existing roadway with a new roadway; (3) a new interchange connecting new roadways; and (4)

minor improvements or expansions to intermodal centers or other projects that affect truck traffic. The information provided in Appendix B should be modified to reflect the local and project-specific situation.

In addition to the qualitative assessment, a NEPA document for this category of projects must include a discussion of information that is incomplete or unavailable for a project specific assessment of MSAT impacts, in compliance with the Council on Environmental Quality (CEQ) regulations (40 CFR 1502.21(b)). This discussion should explain how current scientific techniques, tools, and data are not sufficient to accurately estimate human health impacts that could result from a transportation project in a way that would be useful to decision-makers. Also, in compliance with 40 CFR 1502.21(b), this discussion should contain information regarding the health impacts of MSAT. See Appendix C.

### ***(3) Projects with Higher Potential MSAT Effects***

This category includes projects that have the potential for meaningful differences in MSAT emissions among project alternatives. We expect a limited number of projects to meet this two-pronged test. To fall into this category, a project should:

- Create or significantly alter a major intermodal freight facility that has the potential to concentrate high levels of diesel particulate matter in a single location, involving a significant number of diesel vehicles for new projects or accommodating with a significant increase in the number of diesel vehicles for expansion projects; or
- Create new capacity or add significant capacity to urban highways such as interstates, urban arterials, or urban collector-distributor routes with traffic volumes where the AADT is projected to be in the range of 140,000 to 150,000<sup>5</sup> or greater by the design year;

*And also*

- Be proposed to be located in proximity to populated areas.

Projects falling within this category should be more rigorously assessed for impacts. If a project falls within this category, you should contact the Office of Natural Environment (HEPN) and the Office of Project Development and Environmental Review (HEPE) in FHWA Headquarters for assistance in developing a specific approach for assessing impacts. This approach would include a quantitative analysis<sup>6</sup> to forecast local-specific emission trends of the priority MSAT for each alternative, to use as a basis of comparison. This analysis also may address the potential for cumulative impacts, where appropriate, based on local conditions. How and when cumulative impacts should be considered would be addressed as part of the assistance outlined above. The

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<sup>5</sup> Using EPA's MOVES3 emissions model, FHWA determined that this range of AADT would result in emissions significantly lower than the Clean Air Act definition of a major hazardous air pollutant (HAP) source, i.e., 25 tons/yr. for all HAPs or 10 tons/yr. for any single HAP. Variations in conditions such as congestion or vehicle mix could warrant a different range for AADT; if this range does not seem appropriate for your project, please consult with the contacts from HEPN and HEPE identified in this memorandum.

<sup>6</sup> FHWA MSAT Policy and Guidance [https://www.fhwa.dot.gov/environment/air\\_quality/air\\_toxics/policy\\_and\\_guidance/](https://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/)

NEPA document for this project should also include relevant language on unavailable information described in Appendix C.

If the analysis for a project in this category indicates meaningful differences in levels of MSAT emissions among alternatives, mitigation options should be identified and considered. See Appendix E for information on mitigation strategies.

You should also consult with HEPN and HEPE if you have a project that does not fall within any of the types of projects listed in category 3 above, but you think has the potential to substantially increase future MSAT emissions.

## **CONCLUSION**

What we know about mobile source air toxics is still evolving. As the science progresses FHWA will continue to revise and update this guidance. The FHWA is working with Stakeholders, EPA and others to better understand the strengths and weaknesses of developing analysis tools and the applicability on the project-level decision documentation process. The FHWA wants to make project sponsors aware of the implications of the transition to the MOVES3 model and that FHWA will be issuing updates to this interim guidance when necessary. Additional background information on MSAT-related research is provided in Appendix D.

The FHWA Headquarters and Resource Center staff, Victoria Martinez (787) 771-2524, James Gavin (202) 366-1473, and George Noel (978) 758-5824, are available to provide information and technical assistance, support any necessary analysis, and limit project delays. All MSAT analysis beginning on or after January 9, 2023, should use the MOVES3 model. Any MSAT analysis initiated prior to that date may continue to operate under the previous guidance and utilize MOVES2014. The FHWA offices and staff listed above are available to answer questions from project sponsors.

## **APPENDICES**

Appendix A – Prototype Language for Exempt Projects

Appendix B – Prototype Language for Qualitative Project Level MSAT Analysis

Appendix C – The Council on Environmental Quality (CEQ) Provisions Covering Incomplete or Unavailable Information (40 CFR 1502.21) including a discussion of unavailable information for project-specific MSAT Health Impacts Analysis

Appendix D – FHWA Sponsored Mobile Source Air Toxics Research Efforts

Appendix E – MSAT Mitigation Strategies