



COMMONWEALTH OF KENTUCKY  
TRANSPORTATION CABINET

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Matthew G. Bevin  
Governor

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## MEMORANDUM

TO: KYTC Prequalified Consultants; DEA Staff;  
District Environmental Coordinators

FROM: David M. Waldner, P.E., Director   
Division of Environmental Analysis

DATE: April 22, 2016

SUBJECT: Updated Guidance: "How to Address Transportation Air Quality in NEPA Documents"

KYTC and FHWA have worked together to produce updated guidance for addressing air quality in NEPA documents. The document is called "Kentucky Guidelines: How to Address Transportation Air Quality in NEPA Documents", and it replaces the previous guidance produced in 2008: "NEPA Documentation - Air Quality". The document can be found at the DEA Air Quality web page.

The guidance reflects all changes to federal rules which have occurred up to the current date including EPA designations of air quality attainment status, FHWA changes to the categorical exclusion list, and changes to FHWA guidance for Mobile Source Air Toxics in NEPA. Appendix A of the document is an updated version of the PM 2.5 project checklist. This updated version of the checklist should be used to complete the PM 2.5 Interagency Coordination for any projects that require it and have not already completed coordination.

Questions regarding project-level air quality can be directed to Daniel Burgin in the Division of Environmental Analysis at 502-564-7250.



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Kentucky Guidelines

# How to Address Transportation Air Quality in NEPA Documents

Updated March 2016





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# AIR QUALITY IN NEPA DOCUMENTS



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# AIR QUALITY IN NEPA DOCUMENTS



This checklist will help the reader determine whether the required air quality information is included in the NEPA documentation. This checklist is only intended as a tool to assist the reader and does not replace regulatory requirements.

## 1. GENERAL REQUIREMENTS

As the NEPA document is a public disclosure document, as well as a regulatory document, the Air Quality portion of the NEPA document should contain a brief discussion of all transportation-related air quality concerns in the project area, including:

- Transportation Criteria Pollutants,
- Climate Change and the Impact of Green House Gases (GHG),
- Land Use adjacent to the project where those land uses may impact air quality,
- Mitigation (if required), as well as a discussion of
- Cumulative and Indirect Impacts.

## 2. TRANSPORTATION CRITERIA POLLUTANTS

National Ambient Air Quality Standards (NAAQS) have been established for the following transportation criteria pollutants and their precursors (pollutants that contribute to the formation of other pollutants): The NEPA document should address all transportation pollutants listed in Table 1.

Table 1. Transportation Criteria Pollutants

Criteria Pollutant	Direct Emissions	Precursors			
		NO <sub>x</sub>	VOC*	NH <sub>3</sub> *	SO <sub>2</sub>
CO	X				
O <sub>3</sub>		X	X		
PM <sub>2.5</sub>	X	X	X	X	X
PM <sub>10</sub>	X	X	X		
NO <sub>2</sub>		X			

\*If deemed significant by the State Air Quality Agency.

The following pages provide some sample dialogue for each of the items listed above.

**IF** the project is in a transportation air quality *nonattainment* or *maintenance* area for any of the criteria pollutants,

**THEN** include a discussion of the designation and attainment status for each pollutant.

**IF** the project is in a transportation air quality *nonattainment* or *maintenance* area for PM<sub>2.5</sub>,

**THEN** include a project-level conformity determination for PM<sub>2.5</sub> in the final NEPA document.



## 2.1. Carbon Monoxide (CO)

**IF** a Federal project is:

- A signalized intersection with a projected open to traffic year average daily traffic (ADT) greater than 80,000 vehicles per day, or
- Controversial,

**THEN**

- A CO project level analysis should be made using an approved dispersion model (CAL3QHC, AERMOD Modeling System, or other approved model).
- Include model results

**ELSE**

- Include the following statement:

***“Based on the Kentucky CO Screening Criteria, this project does not meet the criteria requiring a CO project level analysis and will not produce a projected violation of the CO standard.”***

*Primary Standard: 8-hr average < 9 ppm; 1-hr average < 35 ppm, not to be exceeded more than once per year.*

*Secondary Standard: None*

## 2.2. Ozone (O<sub>3</sub>)

**IF** a federal project is located in an area that requires a conformity determination for Ozone,

**THEN**

- Specify area and include discussion of 8-hr Ozone designation and attainment status,
- Indicate which Transportation Control Measures (TCMs) are included in the State Implementation Plan (SIP), and (*NOTE: Currently there are no TCMs in the SIP.*)
- List name of **“Conforming”** TIP and plan, or STIP. Include the page number on which project is listed. The project’s design concept and scope **must** be consistent with the project as modeled for TIP and plan.

**ELSE**

- Include the following statement, ***“This project is located in an Ozone attainment area and is not a project-level concern.”***

*Primary Standard: Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years < 0.070 ppm*

*Secondary Standard: Same as primary*



## 2.3. Particulate Matter<sub>2.5</sub> (PM<sub>2.5</sub>)

**IF** a federal project is located in an area that requires a conformity determination for PM<sub>2.5</sub>,

### THEN

- Specify the area and include discussion of PM<sub>2.5</sub> designation and attainment status.
- Indicate which Transportation Control Measures (TCMs) are included in the State Implementation Plan (SIP). *(NOTE: Currently there are no TCMs in the SIP.)*
- PM<sub>2.5</sub> Project Level Checklist (Appendix A) and Interagency Consultation verifications must be completed and added to NEPA document appendices.
- Include discussion of project type based on completion of the PM<sub>2.5</sub> checklist (“Exempt”, “Not Exempt, Not of Concern” or “Of Concern”).
- List name of “**Conforming**” TIP **and** plan, or STIP. Include the page number on which project is listed. The project’s design concept and scope **must** be consistent with the project as modeled for TIP and plan.
- For non-exempt projects, include a summary of the conclusions of the PM<sub>2.5</sub> hotspot analysis prepared pursuant to Appendix A.

### ELSE

- Include the following statement, “***This project is located in a PM<sub>2.5</sub> attainment area and it is not a project-level concern. Therefore, the conformity procedures of 40 CFR 93 do not apply to this project.***”

Primary Standard: **Annual mean, averaged over 3 years < 12.0 µg/m<sup>3</sup>**  
**Daily, 24-hr average, 98<sup>th</sup> percentile, averaged over 3 years < 35 µg/m<sup>3</sup>**  
Secondary Standard: **Annual mean, averaged over 3 years < 15.0 µg/m<sup>3</sup>**  
**Daily, 24-hr average, 98<sup>th</sup> percentile, averaged over 3 years < 35 µg/m<sup>3</sup>**

## 2.4. Particulate Matter<sub>10</sub> (PM<sub>10</sub>)

**IF** a federal project,

### THEN

- Include the following statement, “***All areas in Kentucky are in attainment for PM<sub>10</sub>. Therefore, the conformity procedures of 40 CFR 93 do not apply to this project.***”

Primary Standard: **Daily, 24-hr average < 150 µg/m<sup>3</sup>, not to be exceeded more than 1x/ year on average over 3 years.**  
Secondary Standard: Same as Primary



## 2.5. Nitrogen Dioxide (NO<sub>2</sub>)

**IF** a federal project,

**THEN**

- Include the following statement, “***All areas in the Kentucky are in attainment for Nitrogen Dioxide (NO<sub>2</sub>).***”

*Primary Standard:* **98<sup>th</sup> percentile of 1-hr daily maximum concentrations, averaged over 3 years < 100 ppb**

**Annual mean over a calendar year < 0.053 ppb**

*Secondary Standard:* **Annual mean over a calendar year < 0.053 ppb**



## 3. MOBILE SOURCE AIR TOXICS (MSATs)

**IF** a federal project,

**AND**

- Project is a(n)
  - Categorical Exclusions under 23 CFR 771.117 (c) (see Appendix B) or,
  - Exempt Project under 40 CFR 93.126 (see Appendix C) or,
  - Project with no meaningful impacts on traffic volumes or vehicle mix,

**THEN**

- Project is considered to be ***“No Potential for Meaningful MSAT Effects”***.
- Analysis is not required.
- Include an explanation of why the project qualifies under this category. Guidance and example language can be found in FHWA MSAT Guidance-Appendix A (see Appendix D of this document).



**ELSE IF** a federal project,

**AND**

- Project is NOT considered to be a(n)
  - “Exempt or No Potential for Meaningful MSAT Effects”, or
  - “Higher Potential for Meaningful MSAT Effects”

**THEN**

- Project is consider to be ***“Lower Potential for Meaningful MSAT effects”***
- A **Qualitative Analysis** is required. Example language can be found in FHWA MSAT Guidance-Appendix B (see Appendix D of this document).
- **Discussion of information that is incomplete or unavailable** is required. Example language can be found in FHWA MSAT Guidance-Appendix C (see Appendix D of this document).



## MOBILE SOURCE AIR TOXICS (MSATs) (continued)

**ELSE IF** a federal project,

**AND**

- Project will either
  - 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 or additional capacity to urban highways such as interstates, urban arterials, or urban collector-distributor routes with traffic volumes where the highest AADT, anywhere along the project corridor, is projected to be **140,000 to 150,000 AADT or greater by the design year**,

**And also**

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

**THEN**

- **Project is considered “Higher Potential for Meaningful MSAT effects”.**
- An **Assessment of Impacts** with input from FHWA-HQ is required.
  - **Contact Division Office (502-223-6729)** to work with
    - FHWA-HQ’s Office of Natural Environment (HEPN) and the
    - FHWA-HQ’s Office of Project Development and Environmental Review (HEPE).
  - A **Quantitative Analysis** is required to forecast local-specific emissions trend of the priority MSATS for each alternative, for comparison purposes.

The **Seven Priority MSATs** are:

- |   |  |
|---|--|
| <input type="checkbox"/> Acrolein (C <sub>3</sub> H <sub>4</sub> O)     | <input type="checkbox"/> Formaldehyde (CH <sub>2</sub> O)              |
| <input type="checkbox"/> Benzene (C <sub>6</sub> H <sub>6</sub> )       | <input type="checkbox"/> Naphthalene (C <sub>10</sub> H <sub>8</sub> ) |
| <input type="checkbox"/> 1,3-Butadiene (C <sub>4</sub> H <sub>6</sub> ) | <input type="checkbox"/> Polycyclic organic matter                     |
| <input type="checkbox"/> Diesel Particulate Matter                      |  |

*(NOTE: Analysis may address potential for cumulative impacts and identification of mitigation options.)*

- **Discussion of information that is incomplete or unavailable** is required. Example language can be found in FHWA MSAT Guidance-Appendix C (see Appendix D of this document).

*Regulation: Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA, 12/06/12*

*MSAT FAQ’s: [www.fhwa.dot.gov/environment/air\\_quality/air\\_toxics/policy\\_and\\_guidance/](http://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/)*



## 4. CLIMATE CHANGE AND IMPACTS OF GREEN HOUSE GASES (CO<sub>2</sub>)

### Information Only:

Climate change is a critical national and global concern. Carbon dioxide (CO<sub>2</sub>) is the largest component of greenhouse gas emissions; other prominent emissions include methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O) and hydrofluorocarbons (HFCs). These emissions are different from criteria air pollutants since their effects in the atmosphere are global rather than localized, and also since they remain in the atmosphere for decades to centuries, depending on the species.

Greenhouse gas emissions have accumulated rapidly as the world has industrialized, with concentration of atmospheric CO<sub>2</sub> increasing from roughly 300 parts per million in 1900 to over 400 parts per million today. Over this timeframe, global average temperatures have increased by roughly 1.5 degrees Fahrenheit (1 degree Celsius), and the most rapid increases have occurred over the past 50 years. Scientists have warned that significant and potentially dangerous shifts in climate and weather are possible without substantial reductions in greenhouse gas emissions. They commonly have cited 2 degrees Celsius (1 degree Celsius beyond warming that has already occurred) as the total amount of warming the earth can tolerate without serious and potentially irreversible climate effects. For warming to be limited to this level, atmospheric concentrations of CO<sub>2</sub> would need to stabilize at a maximum of 450 ppm, requiring annual global emissions to be reduced 40-70% below 2010 levels by 2050.<sup>1</sup> State and national governments in many developed countries have set GHG emissions reduction targets of 80 percent below current levels by 2050, recognizing that post-industrial economies are primarily responsible for GHGs already in the atmosphere. As part of a 2014 bilateral agreement with China, the U.S. pledged to reduce GHG emissions 26-28 percent below 2005 levels by 2025; this emissions reduction pathway is intended to support economy-wide reductions of 80 percent or more by 2050.<sup>2</sup>

GHG emissions from vehicles using roadways are a function of distance travelled (expressed as vehicle miles travelled, or VMT), vehicle speed, and road grade. GHG emissions are also generated during roadway construction and maintenance activities.

<sup>1</sup> IPCC, 2014: [Climate Change 2014: Synthesis Report Summary for Policymakers](#). Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.

<sup>2</sup> "U.S.-China Joint Announcement on Climate Change," White House, Office of the Press Secretary, November 11, 2014, on the White House website, <https://www.whitehouse.gov/the-press-office/2014/11/11/us-china-joint-announcement-climate-change>, accessed June 5, 2015.



## 5. MITIGATION

If mitigation is needed or being considered to address PM<sub>2.5</sub> hotspot conformity requirements, MSAT impacts, construction impacts, or other air quality issues, the final environmental document should include a discussion of the proposed mitigation measures. Mitigation adopted to satisfy the Clean Air Act (CAA) conformity requirements must include enforceable written commitments from the agency(s) responsible for implementing it.

## 6. CUMULATIVE AND INDIRECT IMPACTS

For **indirect impacts**, include basic information (e.g., if a new interchange is going to facilitate development of a new shopping mall, make sure that the traffic estimates for the build scenarios include the activity associated with the mall).

For **cumulative impacts**, include qualitative analysis (e.g. use state air agency emissions inventories or MPO conformity projections).

*Regulation: Clean Air Act (CAA), National Environmental Policy Act (NEPA)*



## REFERENCES

1. "Kentucky CO Screening Procedure for NEPA Background Documentation", Kentucky Transportation Cabinet, Division of Planning, 11/08/07.



## APPENDIX A: KENTUCKY'S PM<sub>2.5</sub> CHECKLIST

The purpose of this checklist is to provide the required **PROJECT LEVEL** documentation to aid the interagency consultation group in the determination of project type, i.e.

- 1) **Exempt** - Exempt from PM<sub>2.5</sub> project-level conformity determination,
- 2) **Not Exempt, Not of Concern**- Not Exempt, but not of local air quality concern (does not require further analysis), or
- 3) **Of Concern** - Of local air quality concern and, therefore, requiring a hot-spot analysis.

*This checklist is only intended as a tool to assist with the PM<sub>2.5</sub> project-level conformity determination and does not replace regulatory requirements in the Transportation Conformity Rule (40 CFR Part 93) or associated guidance. Any decisions regarding a particular conformity determination or hot-spot analysis will be made based on the statute and regulations, after appropriate public input.*

**A statement regarding the PM<sub>2.5</sub> hot-spot consideration should be included as an element in NEPA documentation. This completed and signed checklist, along with a copy of the PM<sub>2.5</sub> project-level conformity determination, if required, should also be included. Additionally, proof of interagency consultation and public involvement, if required, as well as any other supporting documentation, should be included.**

**Use the “Tab” or “Page Down” key to maneuver within this document.**

### STEP 1: PROJECT IDENTIFICATION

**A. KYTC Six Year Plan Item Number:**

**B. Project Name/Short Description:**

**C. County** (click on box & select from drop-down menu):

**D. PM<sub>2.5</sub> Nonattainment or Maintenance Area** (click on box & select from drop-down menu)

**E. PM<sub>2.5</sub> Designation** (click on box & select from drop-down menu):

**F. PM<sub>2.5</sub> Standard Associated with Designation** (click on box & select from drop-down menu):

**G. Additional Project Information:**

Information should include, but is not limited to:

- a. Purpose and need of the project.
- b. Route name, route number, project length, and mile point locations
- c. Number of current and future lanes (clearly indicate if any lanes are “turn lane only”)
- d. Identify as “Capacity Adding” or “Non Capacity Adding” project
- e. Identify intersecting roads that will be impacted

**H. NEPA Document Type** (click on box & select from drop-down menu):

**I. Project Sponsor** (click on box & select from drop-down menu): (if “other”, describe)

**J. Included in a “Conforming” MPO TIP or STIP?**

(MPO-Metropolitan Planning Organization; Transportation Improvement Program (TIP); State Transportation Improvement Program (STIP))

**K. Location of project in TIP/STIP** (list document and page number or amendment number):



# AIR QUALITY IN NEPA DOCUMENTS



## STEP 2: EXEMPT STATUS

**NOT AN EXEMPT PROJECT. Go to STEP 3.**

**EXEMPT PROJECT** (those listed in 40 CFR 93.126 and traffic signal synchronization projects under 93.128).

*IAC review and approval are required to confirm that project is exempt. Select one from the list below. Include IAC review and approval documentation with this checklist, but no PM<sub>2.5</sub> project-level conformity is required and no further documentation is needed. Go to STEP 6.*

### Air Quality

- Bicycle and pedestrian facilities.
- Continuation of ride-sharing and van-pooling promotion activities at current levels.

### Mass Transit

- Construction of new bus or rail storage/maintenance facilities categorically excluded in 23 CFR part [771](#).
- Construction of small passenger shelters and information kiosks.
- Construction or renovation of power, signal, and communications systems.
- Operating assistance to transit agencies.
- Purchase of new buses and rail cars to replace existing vehicles or for minor expansions of the fleet.  
*NOTE: In PM<sub>10</sub> and PM<sub>2.5</sub> nonattainment or maintenance areas, such projects are exempt only if they are in compliance with control measures in the applicable implementation plan.*
- Purchase of office, shop, and operating equipment for existing facilities.
- Purchase of operating equipment for vehicles (e.g., radios, fareboxes, lifts, etc.).
- Purchase of support vehicles.
- Reconstruction or renovation of transit buildings and structures (e.g., rail or bus buildings, storage and maintenance facilities, stations, terminals, and ancillary structures).
- Rehabilitation of transit vehicles.  
*NOTE: In PM<sub>10</sub> and PM<sub>2.5</sub> nonattainment or maintenance areas, such projects are exempt only if they are in compliance with control measures in the applicable implementation plan.*
- Rehabilitation or reconstruction of track structures, track, and trackbed in existing rights-of-way.

### Safety

- Adding medians.
- Bridge Reconstruction (no additional travel lanes)
- Emergency relief ([23 U.S.C. 125](#)).
- Emergency truck pullovers.
- Fencing.
- Guardrails, median barriers, crash cushions.
- Highway Safety Improvement Program (HSIP) implementation.
- Increasing sight distance.
- Lighting improvements.
- Pavement marking.
- Pavement resurfacing and/or rehabilitation.
- Projects that correct, improve, or eliminate a hazardous location or feature.
- Railroad/highway crossing.
- Railroad/highway crossing warning devices.
- Safer non-Federal-aid system roads.
- Safety roadside rest areas.
- Shoulder improvements.
- Skid treatments.
- Traffic control devices and operating assistance other than signalization projects.
- Truck climbing lanes outside the urbanized area.
- Widening narrow pavements (no additional travel lanes).

### Other

- Acquisition of scenic easements.
- Directional and informational signs.
- Emergency or hardship advance land acquisitions (23 CFR [710.503](#)).
- Engineering to assess social, economic, and environmental effects of the proposed action or alternatives to that action.
- Noise attenuation.
- Plantings, landscaping, etc.
- Repair of damage caused by natural disasters, civil unrest, or terrorist acts, except projects involving substantial functional, locational or capacity changes.
- Sign removal.
- Specific activities which do not involve or lead directly to construction, such as:
  - o Federal-aid systems revisions.
  - o Grants for training and research programs.
  - o Planning activities conducted pursuant to titles 23 and 49 U.S.C.
  - o Planning and technical studies.
- Transportation enhancement activities (except rehabilitation and operation of historic transportation buildings, structures, or facilities).



## STEP 3: TRAFFIC INFORMATION

### A. Worst Case Scenario

- a. **Location** (usually an intersection or interchange):
- b. **Year** (usually the open-to-traffic year):
- c. **Justification for worst case year chosen** (include forecasting assumptions):

### B. Project Data

#### a. Project Data for Current Year

(Use worst case scenario; if at an intersection, include both roadways individually and in total; if at an intersection, average AADT on either side of intersection to obtain AADT for roadway at intersection)

- i. **Annual Average Daily Traffic (AADT):**
- ii. **Percentage and/or number of diesel vehicles (trucks and buses):**
- iii. **Intersections at Level of Service D, E, or F:**  
**Level of Service (LOS)** refers to a standard measurement used by transportation officials which reflects the relative ease of traffic flow on a scale of A to F, with free-flow being rated LOS-A and congested conditions rated as LOS-F.

#### b. Project Data for Worst Case Year for “No Build” Scenario

(Use worst case scenario; if at an intersection, include both roadways individually and in total)

- i. **Annual Average Daily Traffic (AADT):**
- ii. **Percentage and number of diesel vehicles (trucks and buses):**
- iii. **Intersections at Level of Service D, E, or F:**  
**Level of Service (LOS)** refers to a standard measurement used by transportation officials which reflects the relative ease of traffic flow on a scale of A to F, with free-flow being rated LOS-A and congested conditions rated as LOS-F.

#### iv. **Impact of No Action:**

#### c. Project Data for Worst Case Year for “Build” Scenario

(Use worst case year and location; if at an intersection, include both roadways individually and in total)

- i. **Annual Average Daily Traffic (AADT):**
- ii. **Percentage and number of diesel vehicles (trucks and buses):**



### iii. Intersections at Level of Service D, E, or F:

**Level of Service (LOS)** refers to a standard measurement used by transportation officials which reflects the relative ease of traffic flow on a scale of A to F, with free-flow being rated LOS-A and congested conditions rated as LOS-F.

### iv. Impact of Project:

## STEP 4: AIR QUALITY CONCERN DETERMINATION

**NOT PROJECT OF AIR QUALITY CONCERN.** *Hot-spot analysis is NOT required. However, InterAgency Consultation (IAC) approval is required. Provide checklist and other relevant documentation to IAC. IAC will determine level of public involvement required. Use space provided to summarize data and rationale for this conclusion.*

*(Refer to March 10, 2006 rule (71 FR 12491), and FHWA's FAQ document, for complete details).*

**Go to STEP 6.**

**PROJECT OF AIR QUALITY CONCERN.** *Select one from the list below. Hot-spot analysis IS required. Convene interagency consultation (IAC) meeting and begin to create the hot-spot analysis document. **Go to STEP 5.***

New highway or expressway that serves a significant volume of diesel truck traffic, such as facilities with greater than 125,000 AADT and 8% (10,000) or more of such AADT is diesel truck traffic.

**Note:** The example of 125,000 AADT and 10,000 (8%) diesel truck traffic are not exact threshold values and should not be viewed as such. A "significant increase" in the number of diesel transit buses and diesel trucks under either 40 CFR 93.123 (b) (1) (ii) or (iv) would need to be determined through interagency consultation.

Project affecting intersections that are at LOS D, E, or F with a significant number of diesel vehicles, or those that will change to LOS D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project.

New bus and rail terminals and transfer points that have significant number of diesel vehicles congregating at a single location.

Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location.

Projects in or affecting locations, areas, or categories of sites which are identified in the PM<sub>10</sub> and PM<sub>2.5</sub> applicable implementation plan or implementation plan submissions, as appropriate, as sites of violation or possible violation.



## STEP 5: ANALYSIS AND DOCUMENTATION (for Project of Air Quality Concern)

*The following is a summary of documentation to be included for PM<sub>2.5</sub> hot-spot analysis and does not replace information that will be provided for a full quantitative analysis if this analysis is required.*

### Documentation to be Included for the PM<sub>2.5</sub> Hot-spot Analysis

- ❑ Description of project (location, design and scope; date project is expected to be open, i.e., what part of 93.123(b) (1) applies)
- ❑ Description of type of emissions considered in the analysis
- ❑ Contributing Factors
  - Air Quality
  - Transportation and traffic conditions
  - Built and natural environment
  - Meteorology, climate and seasonal data
  - Adopted emissions control measures
- ❑ Consider full time frame of area's LRTP
- ❑ Description of existing conditions
- ❑ Description of changes resulting from project
- ❑ Description of method chosen
- ❑ Description of analysis years
- ❑ Examine year in which emissions are expected to peak
- ❑ Profession judgment of impact
- ❑ Discussion of why project will not cause a violation of either the annual or 24-hour standard
- ❑ Discussion of any mitigation measures
- ❑ Written commitments for mitigation
- ❑ Conclusion on how project meets 40 CFR 93.116 and 93.123

## STEP 6: MEETING, NOTICES, DATES

### A. IAC Approval Date:

(Project sponsor is lead; attach meeting minutes, if applicable, and/or hard copies of applicable e-mails showing IAC review request and approval)

### B. Public Involvement

- a. Public review & comment period (should be consistent with NEPA process; list dates, and if applicable, attach copy of public notice and newspaper proof of publication):
  
- b. Public concerns addressed (if applicable include hard copy or e-mails with cc to IAC):

## STEP 7: SIGNATURES

Project Manager

Date

Division of Environmental Analysis Representative

Date



## APPENDIX B: 23 CFR § 771.117 FHWA CATEGORICAL EXCLUSIONS

**(a)** Categorical exclusions (CEs) are actions which meet the definition contained in 40 CFR [1508.4](#), and, based on past experience with similar actions, do not involve significant environmental impacts. They are actions which: do not induce significant impacts to planned growth or land use for the area; do not require the relocation of significant numbers of people; do not have a significant impact on any natural, cultural, recreational, historic or other resource; do not involve significant air, noise, or water quality impacts; do not have significant impacts on travel patterns; or do not otherwise, either individually or cumulatively, have any significant environmental impacts.

**(b)** Any [action](#) which normally would be classified as a CE but could involve unusual circumstances will require the FHWA, in cooperation with the [applicant](#), to conduct appropriate [environmental studies](#) to determine if the CE classification is proper. Such unusual circumstances include:

- (1) Significant environmental impacts;
- (2) Substantial controversy on environmental grounds;
- (3) Significant impact on properties protected by section 4(f) of the DOT Act or section 106 of the National Historic Preservation Act; or
- (4) Inconsistencies with any Federal, State, or local law, requirement or administrative determination relating to the environmental aspects of the [action](#).

**(c)** The following actions meet the criteria for CEs in the CEQ regulations (40 CFR [1508.4](#)) and § [771.117\(a\)](#) and normally do not require any further NEPA approvals by the FHWA:

- (1) Activities which do not involve or lead directly to construction, such as planning and research activities; grants for training; engineering to define the elements of a proposed [action](#) or alternatives so that social, economic, and environmental effects can be assessed; and Federal-aid system revisions which establish classes of highways on the Federal-aid highway system.
- (2) Approval of utility installations along or across a transportation facility.
- (3) Construction of bicycle and pedestrian lanes, paths, and facilities.
- (4) Activities included in the State's *highway safety plan* under [23 U.S.C. 402](#).
- (5) Transfer of Federal lands pursuant to [23 U.S.C. 107\(d\)](#) and/or [23 U.S.C. 317](#) when the land transfer is in support of an [action](#) that is not otherwise subject to FHWA review under NEPA.
- (6) The installation of noise barriers or alterations to existing publicly owned buildings to provide for noise reduction.
- (7) Landscaping.
- (8) Installation of fencing, signs, pavement markings, small passenger shelters, traffic signals, and railroad warning devices where no substantial land acquisition or traffic disruption will occur.
- (9) The following actions for transportation facilities damaged by an incident resulting in an emergency declared by the Governor of the State and concurred in by the Secretary, or a disaster or emergency declared by the President pursuant to the Robert T. Stafford Act ([42 U.S.C. 5121](#)):
  - (i) Emergency repairs under [23 U.S.C. 125](#); and
  - (ii) The repair, reconstruction, restoration, retrofitting, or replacement of any road, highway, bridge, tunnel, or transit facility (such as a ferry dock or bus transfer station), including ancillary transportation facilities (such as pedestrian/bicycle



## 23 CFR § 771.117 FHWA CATEGORICAL EXCLUSIONS (continued)

paths and bike lanes), that is in operation or under construction when damaged and the action:

- (A) Occurs within the existing right-of-way and in a manner that substantially conforms to the preexisting design, function, and location as the original (which may include upgrades to meet existing codes and standards as well as upgrades warranted to address conditions that have changed since the original construction); and
- (B) Is commenced within a 2-year period beginning on the date of the declaration.

(10) Acquisition of scenic easements.

(11) Determination of payback under [23 U.S.C. 156](#) for property previously acquired with Federal-aid participation.

(12) Improvements to existing rest areas and truck weigh stations.

(13) Ridesharing activities.

(14) Bus and rail car rehabilitation.

(15) Alterations to facilities or vehicles in order to make them accessible for elderly and handicapped persons.

(16) Program [administration](#), technical assistance activities, and operating assistance to transit authorities to continue existing service or increase service to meet routine changes in demand.

(17) The purchase of vehicles by the [applicant](#) where the use of these vehicles can be accommodated by existing facilities or by new facilities which themselves are within a CE.

(18) Track and railbed maintenance and improvements when carried out within the existing right-of-way.

(19) Purchase and installation of operating or maintenance equipment to be located within the transit facility and with no significant impacts off the site.

(20) Promulgation of rules, regulations, and directives.

(21) Deployment of electronics, photonics, communications, or information processing used singly or in combination, or as components of a fully integrated system, to improve the efficiency or safety of a surface transportation system or to enhance security or passenger convenience. Examples include, but are not limited to, traffic control and detector devices, lane management systems, electronic payment equipment, automatic vehicle locaters, automated passenger counters, computer-aided dispatching systems, radio communications systems, dynamic message signs, and security equipment including surveillance and detection cameras on roadways and in transit facilities and on buses.

(22) Projects, as defined in [23 U.S.C. 101](#), that would take place entirely within the existing operational right-of-way. Existing operational right-of-way refers to right-of-way that has been disturbed for an existing transportation facility or is maintained for a transportation purpose. This area includes the features associated with the physical footprint of the transportation facility (including the roadway, bridges, interchanges, culverts, drainage, fixed guideways, mitigation areas, etc.) and other areas maintained for transportation purposes such as clear zone, traffic control signage, landscaping, any rest areas with direct access to a controlled access highway, areas maintained for safety and security of a transportation facility, parking facilities with direct access to an existing transportation facility, transit power substations, transit venting structures, and transit maintenance facilities. Portions of the right-of-way that have not been disturbed or that



## 23 CFR § 771.117 FHWA CATEGORICAL EXCLUSIONS (continued)

are not maintained for transportation purposes are not in the existing operational right-of-way.

(23) Federally-funded projects:

- (i) That receive less than \$5,000,000 of Federal funds; or
- (ii) With a total estimated cost of not more than \$30,000,000 and Federal funds comprising less than 15 percent of the total estimated project cost.

**(d)** Additional actions which meet the criteria for a CE in the CEQ regulations (40 CFR [1508.4](#)) and paragraph (a) of this section may be designated as CEs only after the FHWA approval. The [applicant](#) shall submit documentation which demonstrates that the specific conditions or criteria for these CEs are satisfied and that significant environmental effects will not result. Examples of such actions include but are not limited to:

- (1) Modernization of a highway by resurfacing, restoration, rehabilitation, reconstruction, adding shoulders, or adding auxiliary lanes (e.g., parking, weaving, turning, climbing).
- (2) Highway safety or traffic operations improvement projects including the installation of ramp metering control devices and lighting.
- (3) Bridge rehabilitation, reconstruction or replacement or the construction of grade separation to replace existing at-grade railroad crossings.
- (4) Transportation corridor fringe parking facilities.
- (5) Construction of new truck weigh stations or rest areas.
- (6) Approvals for disposal of excess right-of-way or for joint or limited use of right-of-way, where the proposed use does not have significant adverse impacts.
- (7) Approvals for changes in access control.
- (8) Construction of new bus storage and maintenance facilities in areas used predominantly for industrial or transportation purposes where such construction is not inconsistent with existing zoning and located on or near a street with adequate capacity to handle anticipated bus and support vehicle traffic.
- (9) Rehabilitation or reconstruction of existing rail and bus buildings and ancillary facilities where only minor amounts of additional land are required and there is not a substantial increase in the number of users.
- (10) Construction of bus transfer facilities (an open area consisting of passenger shelters, boarding areas, kiosks and related street improvements) when located in a commercial area or other high activity center in which there is adequate street capacity for projected bus traffic.
- (11) Construction of rail storage and maintenance facilities in areas used predominantly for industrial or transportation purposes where such construction is not inconsistent with existing zoning and where there is no significant noise impact on the surrounding community.
- (12) Acquisition of land for hardship or protective purposes. Hardship and protective buying will be permitted only for a particular parcel or a limited number of parcels. These types of land acquisition qualify for a CE only where the acquisition will not limit the evaluation of alternatives, including shifts in alignment for planned construction projects, which may be required in the NEPA process. No project development on such land may proceed until the NEPA process has been completed.
  - (i) Hardship acquisition is early acquisition of property by the [applicant](#) at the property owner's request to alleviate particular hardship to the owner, in contrast to others, because of an inability to sell his property. This is



### 23 CFR § 771.117 FHWA CATEGORICAL EXCLUSIONS (continued)

justified when the property owner can document on the basis of health, safety or financial reasons that remaining in the property poses an undue hardship compared to others.

(ii) Protective acquisition is done to prevent imminent development of a parcel which may be needed for a proposed transportation corridor or site. Documentation must clearly demonstrate that development of the land would preclude future transportation use and that such development is imminent. Advance acquisition is not permitted for the sole purpose of reducing the cost of property for a proposed project.

**(e)** Where a pattern emerges of granting CE status for a particular type of [action](#), the FHWA will initiate rulemaking proposing to add this type of [action](#) to the list of categorical exclusions in paragraph (c) or (d) of this section, as appropriate.

[52 FR 32660, Aug. 28, 1987; 53 FR 11066, Apr. 5, 1988, as amended at [70 FR 24469](#), May 9, 2005; [74 FR 12529](#), Mar. 24, 2009; [78 FR 8983](#), Feb. 7, 2013; [78 FR 11602](#), Feb. 19, 2013; [79 FR 2118](#), Jan. 13, 2014]



### APPENDIX C: 40 CFR § 93.126 EXEMPT PROJECTS LIST

Notwithstanding the other requirements of this subpart, highway and transit projects of the types listed in table 2 of this section are exempt from the requirement to determine conformity. Such projects may proceed toward implementation even in the absence of a conforming transportation plan and TIP. A particular action of the type listed in table 2 of this section is not exempt if the MPO in consultation with other agencies (see § [93.105\(c\)\(1\)\(iii\)](#)), the EPA, and the FHWA (in the case of a highway project) or the FTA (in the case of a transit project) concur that it has potentially adverse emissions impacts for any reason. States and MPOs must ensure that exempt projects do not interfere with TCM implementation. Table 2 follows on the next page.

[[62 FR 43801](#), Aug. 15, 1997, as amended at [69 FR 40081](#), July 1, 2004; [71 FR 12510](#), Mar. 10, 2006; [73 FR 4441](#), Jan. 24, 2008]



## 40 CFR § 93.126 EXEMPT PROJECTS LIST (Continued)

### Table 2—Exempt Projects

#### Air Quality

- Bicycle and pedestrian facilities.
- Continuation of ride-sharing and van-pooling promotion activities at current levels.

#### Mass Transit

- Construction of new bus or rail storage/maintenance facilities categorically excluded in 23 CFR part [771](#).
- Construction of small passenger shelters and information kiosks.
- Construction or renovation of power, signal, and communications systems.
- Operating assistance to transit agencies.
- Purchase of new buses and rail cars to replace existing vehicles or for minor expansions of the fleet.  
*NOTE: In PM10 and PM2.5 nonattainment or maintenance areas, such projects are exempt only if they are in compliance with control measures in the applicable implementation plan.*
- Purchase of office, shop, and operating equipment for existing facilities.
- Purchase of operating equipment for vehicles (e.g., radios, fareboxes, lifts, etc.).
- Purchase of support vehicles.
- Reconstruction or renovation of transit buildings and structures (e.g., rail or bus buildings, storage and maintenance facilities, stations, terminals, and ancillary structures).
- Rehabilitation of transit vehicles.  
*NOTE: In PM10 and PM2.5 nonattainment or maintenance areas, such projects are exempt only if they are in compliance with control measures in the applicable implementation plan.*
- Rehabilitation or reconstruction of track structures, track, and trackbed in existing rights-of-way.

#### Safety

- Adding medians.
- Bridge reconstruction (no additional travel lanes).
- Emergency relief ([23 U.S.C. 125](#)).
- Emergency truck pullovers.
- Fencing.
- Guardrails, median barriers, crash cushions.
- Highway Safety Improvement Program (HSIP) implementation.
- Increasing sight distance.
- Lighting improvements.
- Pavement marking.
- Pavement resurfacing and/or rehabilitation.
- Projects that correct, improve, or eliminate a hazardous location or feature.
- Railroad/highway crossing.
- Railroad/highway crossing warning devices.
- Safer non-Federal-aid system roads.
- Safety roadside rest areas.
- Shoulder improvements.
- Skid treatments.
- Traffic control devices and operating assistance other than signalization projects.
- Truck climbing lanes outside the urbanized area.
- Widening narrow pavements (no additional travel lanes).

#### Other

- Acquisition of scenic easements.
- Directional and informational signs.
- Emergency or hardship advance land acquisitions (23 CFR [710.503](#)).
- Engineering to assess social, economic, and environmental effects of the proposed action or alternatives to that action.
- Noise attenuation.
- Plantings, landscaping, etc.
- Repair of damage caused by natural disasters, civil unrest, or terrorist acts, except projects involving substantial functional, locational or capacity changes.
- Sign removal.
- Specific activities which do not involve or lead directly to construction, such as:
  - o Federal-aid systems revisions.
  - o Grants for training and research programs.
  - o Planning activities conducted pursuant to titles 23 and 49 U.S.C.
  - o Planning and technical studies.
- Transportation enhancement activities (except rehabilitation and operation of historic transportation buildings, structures, or facilities).



## APPENDIX D: INTERIM MSAT GUIDANCE



### Memorandum

U.S. Department of Transportation  
Federal Highway Administration

#### **Subject: INFORMATION: Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA**

**From:**  
*Original Signed by:* April Mardese  
Director, Office of Natural Environment

**Date:** December 6, 2012

**Reply to:** HEPN-10

**To:**  
Division Administrators  
Federal Lands Highway Division Engineers

#### **PURPOSE**

The purpose of this memorandum is to update the September 2009 interim guidance that advised Federal Highway (FHWA) Division offices on when and how to analyze Mobile Source Air Toxics (MSAT) under the National Environmental Policy Act (NEPA) review process for highway projects.

This update reflects recent changes in methodology for conducting emissions analysis and updates of research in the MSAT arena. The U.S. Environmental Protection Agency (EPA) released the latest emission model, the Motor Vehicle Emissions Simulator (MOVES) in 2010, and started a 2-year grace period to phase in the requirement of using MOVES for transportation conformity analysis. On February 8, 2011, EPA issued guidance on [Using the MOVES and Emission FACTors \(EMFAC\) Models in NEPA Evaluation](#) that recommended the same grace period be applied to project-level emissions analysis for NEPA purposes. At the end of this grace period, i.e. beginning December 20, 2012, project sponsors should use MOVES to conduct emissions analysis for NEPA purposes. To prepare for this transition, FHWA is updating the September 2009 Interim Guidance to incorporate the analysis conducted using MOVES. Based on FHWA's analysis using MOVES2010b, the latest version of MOVES, diesel particulate matter (diesel PM) has become the dominant MSAT of concern. We have also provided an update on the status of scientific research on air toxics. The update supersedes the September 2009 Interim Guidance and should be referenced as a whole in NEPA documentation.

**NOTE:** *The current emissions model is now MOVES2014a.*



## INTERIM MSAT GUIDANCE (continued)

### 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 has assessed this expansive list in their latest 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 listed in their Integrated Risk Information System (IRIS) (<http://www.epa.gov/iris/>). In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA) (<http://archive.epa.gov/airtoxics/nata1999/web/html/>). These are acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), 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. The 2007 EPA rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines.

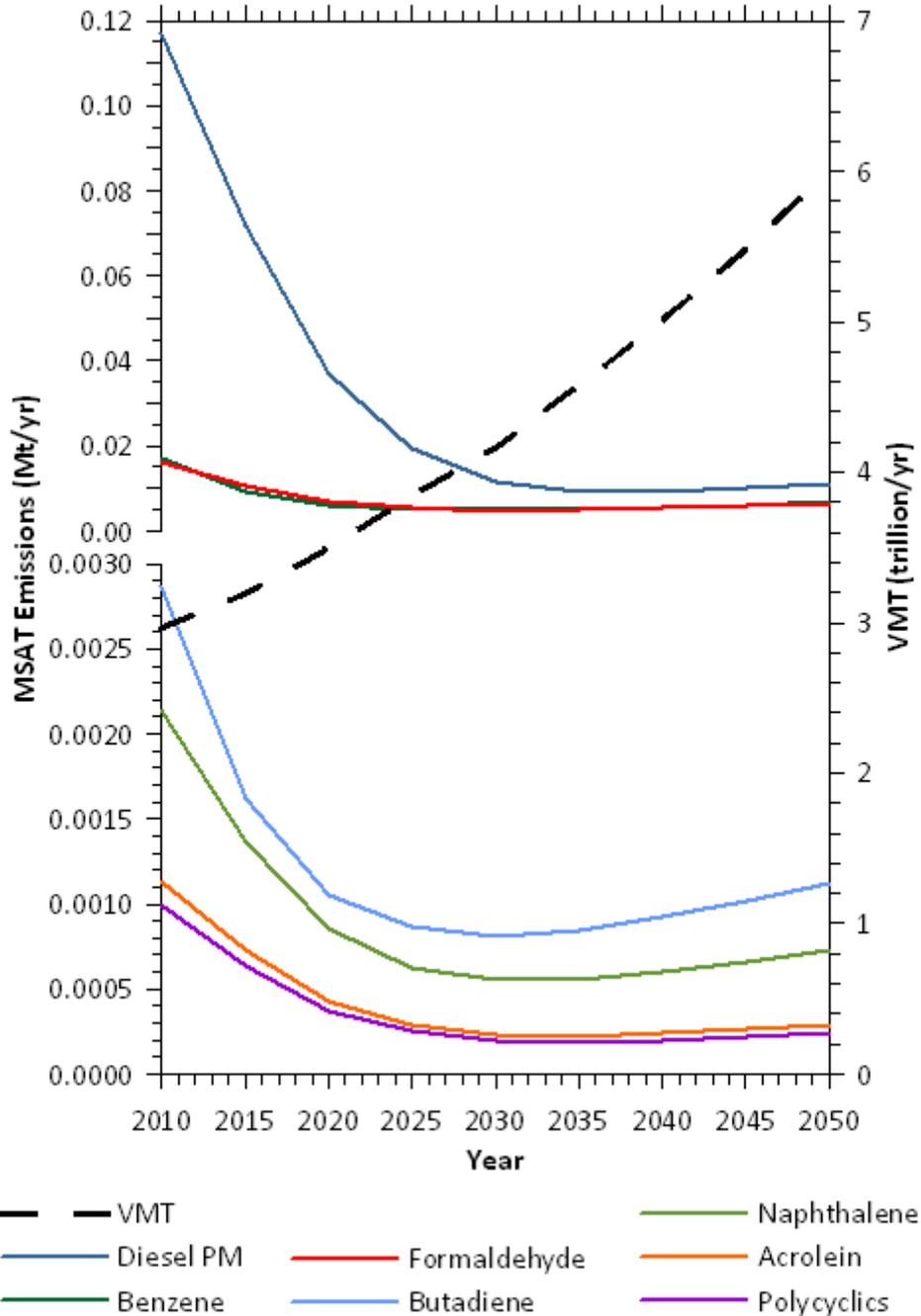
### Motor Vehicle Emissions Simulator (MOVES)

According to EPA, MOVES improves upon the previous MOBILE model in several key aspects: MOVES is based on a vast amount of in-use vehicle data collected and analyzed since the latest release of MOBILE, including millions of emissions measurements from light-duty vehicles. Analysis of this data enhanced EPA's understanding of how mobile sources contribute to emissions inventories and the relative effectiveness of various control strategies. In addition, MOVES accounts for the significant effects that vehicle speed and temperature have on PM emissions estimates, whereas MOBILE did not. MOVES2010b includes all air toxic pollutants in NATA that are emitted by mobile sources. EPA has incorporated more recent data into MOVES2010b to update and enhance the quality of MSAT emission estimates. These data reflect advanced emission control technology and modern fuels, plus additional data for older technology vehicles.

Based on an FHWA analysis using EPA's MOVES2010b model, as shown in Figure 1, even if vehicle-miles travelled (VMT) increases by 102 percent as assumed from 2010 to 2050, a combined reduction of 83 percent in the total annual emissions for the priority MSAT is projected for the same time period.

## INTERIM MSAT GUIDANCE (continued)

**Figure 1: NATIONAL MSAT EMISSION TRENDS 1999 - 2050 FOR VEHICLES OPERATING ON ROADWAYS USING EPA's MOVES2010b MODEL**



**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 MOVES2010b model runs conducted during May - June 2012 by FHWA.



## INTERIM MSAT GUIDANCE (continued)

The implications of MOVES on MSAT emissions estimates compared to MOBILE are: lower estimates of total MSAT emissions; significantly lower benzene emissions; significantly higher diesel PM emissions, especially for lower speeds. Consequently, diesel PM is projected to be the dominant component of the emissions total.

### 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 be raised on highway projects during the NEPA process. Even as the science emerges, we are duly expected by the public and other agencies to address MSAT impacts in our 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. The NEPA also requires Federal agencies to use an interdisciplinary approach in planning and decision-making for any action that adversely impacts the environment. The NEPA requires and FHWA is committed to the examination and avoidance of potential impacts to the natural and human environment when considering approval of proposed transportation projects. In addition to evaluating the potential environmental effects, we must also take into account the need for safe and efficient transportation in reaching a decision that is in the best overall public interest. The FHWA policies and procedures for implementing NEPA are contained in regulation at 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, the seven priority MSAT should be analyzed.



## INTERIM MSAT GUIDANCE (continued)

### (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(c) (subject to consideration whether unusual circumstances exist under 23 CFR 771.117(b));
- Projects exempt under the Clean Air Act conformity rule under 40 CFR 93.126; or
- Other projects with no meaningful impacts on traffic volumes or vehicle mix.

For projects that are categorically excluded under 23 CFR 771.117(c), 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.<sup>1</sup> However, the project record should document 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. Any projects not meeting the criteria in category (1) or category (3) below should be included in this category. Examples of these types of projects are minor widening projects; new interchanges, replacing a signalized intersection on a surface street; or 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 would 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 would 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 must 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 1502.22(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



## INTERIM MSAT GUIDANCE (continued)

way that would be useful to decision-makers. Also in compliance with 40 CFR 150.22(b), it 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>2</sup> or greater by the design year;

And also

- 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 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 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 above, but you think has the potential to substantially increase future MSAT emissions.



## INTERIM MSAT GUIDANCE (continued)

### 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. 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. FHWA wanted to make project sponsors aware of the implications of the transition to the MOVES model and that we 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, Bruce Bender (202) 366-2851, and Michael Claggett (505) 820-2047, are available to provide information and technical assistance, support any necessary analysis, and limit project delays. All MSAT analysis beginning on or after December 20, 2012, should use the MOVES model. Any MSAT analysis initiated prior to that date may continue to operate under the previous guidance and utilize MOBILE6.2. We are available to answer questions from project sponsors as we transition to MOVES.

### APPENDICIES

[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 1502.22) 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

<sup>1</sup> The types of projects categorically excluded under 23 CFR 771.117(d) or exempt from certain conformity requirements under 40 CFR 93.127 does not warrant an automatic exemption from an MSAT analysis, but they usually will have no meaningful impact.

<sup>2</sup> Using EPA's MOVES2010b emissions model, FHWA staff 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.



## INTERIM MSAT GUIDANCE (continued)

### Appendix A of MSAT Guidance – **Prototype Language for Exempt Projects**

The purpose of this project is to (*insert major deficiency that the project is meant to address*) by constructing (*insert major elements of the project*). This project has been determined to generate minimal air quality impacts for CAAA criteria pollutants and has not been linked with any special MSAT concerns. As such, this project will not result in changes in traffic volumes, vehicle mix, basic project location, or any other factor that would cause an increase in MSAT impacts of the project from that of the no-build alternative.

Moreover, EPA regulations for vehicle engines and fuels will cause overall MSAT emissions to decline significantly over the next several decades. Based on regulations now in effect, an analysis of national trends with EPA's MOVES model forecasts a combined reduction of over 80 percent in the total annual emission rate for the priority MSAT from 2010 to 2050 while vehicle-miles of travel are projected to increase by over 100 percent. This will both reduce the background level of MSAT as well as the possibility of even minor MSAT emissions from this project.

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## INTERIM MSAT GUIDANCE (continued)

### Appendix B of MSAT Guidance – **Prototype Language for Qualitative Project Level MSAT Analysis**

The information in this Appendix is for projects with low potential MSAT effects - any non-exempt project that does not meet the threshold criteria for higher potential effects, as described in the interim guidance, should be considered for treatment provided here. The types of projects that fall into this category are those that improve operations of highways, or freight facilities without adding substantial new capacity. Examples include minor widening projects or new interchanges replacing signalized intersection on surface streets.

The following are some examples of qualitative MSAT analyses for different types of projects. Each project is different, and some projects may contain elements covered in more than one of the examples below. Analysts can use the example language as a starting point, but should tailor it to reflect the unique circumstances of the project being considered. The following factors should be considered when crafting a qualitative analysis:

- For projects on an existing alignment, MSAT are expected to decline due to the effect of new EPA engine and fuel standards.
- Projects that result in increased travel speeds will reduce MSAT emissions per VMT basis, although previously, the effect of speed changes on diesel particulate matter was not accounted for in the MOBILE6.2 model, however, MOVES does provide this estimation and should be accounted for accordingly. This speed benefit may be offset somewhat by increased VMT if the more efficient facility attracts additional vehicle trips.
- Projects that facilitate new development may generate additional MSAT emissions from new trips, truck deliveries, and parked vehicles (due to evaporative emissions). However, these may also be activities that are attracted from elsewhere in the metro region; thus, on a regional scale there may be no net change in emissions.
- Projects that create new travel lanes, relocate lanes, or relocate economic activity closer to homes, schools, businesses, and other populated areas may increase concentrations of MSAT at those locations relative to No Action.

**Other elements related to a qualitative analysis are a** discussion of information that is incomplete or unavailable for a project specific assessment of MSAT impacts and a discussion of any MSAT mitigation measures that may be associated with the project.

### INTRODUCTORY LANGUAGE FOR QUALITATIVE ANALYSIS FOR ALL PROJECTS

A qualitative analysis provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*, found at:

[www.fhwa.dot.gov/environment/air\\_quality/air\\_toxics/research\\_and\\_analysis/methodology/methodology00.cfm](http://www.fhwa.dot.gov/environment/air_quality/air_toxics/research_and_analysis/methodology/methodology00.cfm)



## INTERIM MSAT GUIDANCE (continued)

### **(1) Minor Widening Project**

***(For purposes of this scenario, minor highway widening projects are those in which the design year traffic is predicted to be less than 140,000 - 150,000 AADT. Widening projects that surpass these criteria are subject to a quantitative analysis.)***

For each alternative in this EIS/EA (*specify*), the amount of MSAT emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for each of the Build Alternatives is slightly higher than that for the No Build Alternative, because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. Refer to Table \_\_\_\_ (*specify*). This increase in VMT would lead to higher MSAT emissions for the preferred action alternative along the highway corridor, along with a corresponding decrease in MSAT emissions along the parallel routes. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to EPA's MOVES2010b model, emissions of all of the priority MSAT decrease as speed increases. Because the estimated VMT under each of the Alternatives are nearly the same, varying by less than \_\_\_\_ (*specify*) percent, it is expected there would be no appreciable difference in overall MSAT emissions among the various alternatives. Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by over 80 percent between 2010 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

*(The following paragraph may apply if the project includes plans to construct travel lanes closer to populated areas.)*

The additional travel lanes contemplated as part of the project alternatives will have the effect of moving some traffic closer to nearby homes, schools, and businesses; therefore, under each alternative there may be localized areas where ambient concentrations of MSAT could be higher under certain Build Alternatives than the No Build Alternative. The localized increases in MSAT concentrations would likely be most pronounced along the expanded roadway sections that would be built at \_\_\_\_ (*specify location*), under Alternatives \_\_\_\_ (*specify*), and along \_\_\_\_ (*specify route*) under Alternatives \_\_\_\_ (*specify*). However, the magnitude and the duration of these potential increases compared to the No-Build alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. In sum, when a highway is widened, the localized level of MSAT emissions for the Build Alternative could be higher relative to the No Build Alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSAT will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.



## INTERIM MSAT GUIDANCE (continued)

### **(2) New Interchange Connecting an Existing Roadway with a New Roadway**

*(This scenario is oriented toward projects where a new roadway segment connects to an existing limited access highway. The purpose of the roadway is primarily to meet regional travel needs, e.g., by providing a more direct route between locations.)*

For each alternative in this EIS/EA (*specify*), the amount of MSAT emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. Because the VMT estimated for the No Build Alternative is higher than for any of the Build Alternatives, higher levels of MSAT are not expected from any of the Build Alternatives compared to the No Build. Refer to Table \_\_\_\_ (*specify*). In addition, because the estimated VMT under each of the Build Alternatives are nearly the same, varying by less than \_\_\_\_ (*specify*) percent, it is expected there would be no appreciable difference in overall MSAT emissions among the various alternatives. Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by over 80 percent from 2010 to 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in virtually all locations.

Under each alternative there may be localized areas where VMT would increase, and other areas where VMT would decrease. Therefore, it is possible that localized increases and decreases in MSAT emissions may occur. The localized increases in MSAT emissions would likely be most pronounced along the new roadway sections that would be built at \_\_\_\_ (*specify location*), under Alternatives \_\_\_\_ (*specify*), and along \_\_\_\_ (*specify route*) under Alternatives \_\_\_\_ (*specify*). However, even if these increases do occur, they too will be substantially reduced in the future due to implementation of EPA's vehicle and fuel regulations.

In sum, under all Build Alternatives in the design year it is expected there would be reduced MSAT emissions in the immediate area of the project, relative to the No Build Alternative, due to the reduced VMT associated with more direct routing, and due to EPA's MSAT reduction programs.

### **(3) New Interchange Connecting New Roadways**

*(This scenario is oriented toward interchange projects developed in response to or in anticipation of economic development, e.g., a new interchange to serve a new shopping/residential development. Projects from the previous example may also have economic development associated with them, so some of this language may also apply.)*

For each alternative in this EIS/EA (*specify*), the amount of MSAT emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for each of the Build Alternatives is slightly higher than that for the No Build Alternative, because the interchange facilitates new development that attracts trips that would not otherwise occur in the area. Refer to Table \_\_\_\_ (*specify*). This increase in VMT means MSAT under the Build Alternatives would probably be higher than the No Build Alternative in the study area. There could also be localized differences in MSAT from indirect effects of the project such as associated access traffic,



## INTERIM MSAT GUIDANCE (continued)

emissions of evaporative MSAT (e.g., benzene) from parked cars, and emissions of diesel particulate matter from delivery trucks (*modify depending on the type and extent of the associated development*). Travel to other destinations would be reduced with subsequent decreases in emissions at those locations.

Because the estimated VMT under each of the Build Alternatives are nearly the same, varying by less than \_\_\_\_ (*specify*) percent, it is expected there would be no appreciable difference in overall MSAT emissions among the various Build Alternatives. For all Alternatives, emissions are virtually certain to be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by over 80 percent from 2010 to 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future than they are today.

*(The following discussion would apply to new interchanges in areas already developed to some degree. For new construction in anticipation of economic development in rural or largely undeveloped areas, this discussion would be applicable only to populated areas, such as residences, schools, and businesses.)*

The travel lanes contemplated as part of the project alternatives will have the effect of moving some traffic closer to nearby homes, schools and businesses; therefore, under each alternative there may be localized areas where ambient concentrations of MSAT would be higher under certain Alternatives than others. The localized differences in MSAT concentrations would likely be most pronounced along the new/expanded roadway sections that would be built at \_\_\_\_\_ (*specify location*), under Alternatives \_\_\_\_\_ (*specify*), and along \_\_\_\_\_ (*specify route*) under Alternatives \_\_\_\_\_ (*specify*). However, the magnitude and the duration of these potential increases cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. Further, under all Alternatives, overall future MSAT are expected to be substantially lower than today due to implementation of EPA's vehicle and fuel regulations.

In sum, under all Build Alternatives in the design year it is expected there would be slightly higher MSAT emissions in the study area relative to the No Build Alternative due to increased VMT. There also could be increases in MSAT levels in a few localized areas where VMT increases. However, EPA's vehicle and fuel regulations will bring about significantly lower MSAT levels for the area in the future than today.

### ***(4) Minor Improvements or Expansions to Intermodal Centers or Other Projects that Affect Truck Traffic***

*(The description for these types of projects depends on the nature of the project. The key factor from an MSAT standpoint is the change in truck and rail activity and the resulting change in MSAT emissions patterns.)*

For each alternative in this EIS/EA (*specify*), the amount of MSAT emitted would be proportional to the amount of truck vehicle miles traveled (VMT) and rail activity, assuming that other variables (such as travel not associated with the intermodal center) are the same for each alternative. The truck VMT and rail activity estimated for each of the Build Alternatives are higher than that for the No Build Alternative, because of the additional activity associated with the expanded intermodal center. Refer to Table \_\_\_\_ (*specify*). This increase in truck VMT and rail activity associated with the Build Alternatives would lead to higher MSAT emissions (particularly diesel particulate matter) in the vicinity of the intermodal center. The higher emissions could be offset somewhat by two factors: 1) the decrease in regional truck traffic due to increased use of rail for inbound and outbound freight; and 2) increased speeds on area highways due to



## INTERIM MSAT GUIDANCE (continued)

the decrease in truck traffic. The extent to which these emissions decreases will offset intermodal center-related emissions increases is not known.

Because the estimated truck VMT and rail activity under each of the Build Alternatives are nearly the same, varying by less than \_\_\_\_ (*specify*) percent, it is expected there would be no appreciable difference in overall MSAT emissions among the various alternatives. Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by over 80 percent from 2010 to 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the EPA-projected reductions are so significant (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future as well.

*(The following discussion may apply if the intermodal center is close to other development.)*

The additional freight activity contemplated as part of the project alternatives will have the effect of increasing diesel emissions in the vicinity of nearby homes, schools, and businesses; therefore, under each alternative there may be localized areas where ambient concentrations of MSAT would be higher than under the No Build alternative. The localized differences in MSAT concentrations would likely be most pronounced under Alternatives \_\_\_\_ (*specify*). However, as discussed above, the magnitude and the duration of these potential differences cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific health impacts. Even though there may be differences among the Alternatives, on a region-wide basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will cause substantial reductions over time that in almost all cases the MSAT levels in the future will be significantly lower than today.

*(Insert a description of any emissions-reduction activities that are associated with the project, such as truck and train idling limitations or technologies, such as auxiliary power units; alternative fuels or engine retrofits for container-handling equipment, etc.)*

In sum, all Build Alternatives in the design year are expected to be associated with higher levels of MSAT emissions in the study area, relative to the No Build Alternative, along with some benefit from improvements in speeds and reductions in region-wide truck traffic. There also could be slightly higher differences in MSAT levels among Alternatives in a few localized areas where freight activity occurs closer to homes, schools, and businesses. Under all alternatives, MSAT levels are likely to decrease over time due to nationally mandated cleaner vehicles and fuels.

### MSAT MITIGATION STRATEGIES

Although there is no obligation to identify and consider MSAT mitigation strategies as part of a **qualitative analysis, such strategies may be part of a project's design. Refer to the examples provided in (4) Minor Improvements or Expansions to Intermodal Centers or Other Projects that Affect Truck Traffic, or Appendix E.** For these and similar circumstances, MSAT mitigation strategies should be discussed as part of a qualitative analysis.

### CEQ PROVISIONS COVERING INCOMPLETE OR UNAVAILABLE INFORMATION (40 CFR 1502.22)

The introductory language for qualitative analysis should be followed by a 40 CFR 1502 assessment of incomplete or unavailable information. Refer to Appendix C for details.



## INTERIM MSAT GUIDANCE (continued)

### Appendix C of MSAT Guidance – **Incomplete or Unavailable Information** (40 CFR 1502.22)

When an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an environmental impact statement and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking.

- a. If the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the environmental impact statement.
- b. If the information relevant to reasonably foreseeable significant adverse impacts cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known, the agency shall include within the environmental impact statement:
  1. a statement that such information is incomplete or unavailable;
  2. a statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment;
  3. a summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment; and
  4. the agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community. For the purposes of this section, "reasonably foreseeable" includes impacts that have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason.
- c. The amended regulation will be applicable to all environmental impact statements for which a Notice to Intent (40 CFR 1508.22) is published in the Federal Register on or after May 27, 1986. For environmental impact statements in progress, agencies may choose to comply with the requirements of either the original or amended regulation.

### **INCOMPLETE OR UNAVAILABLE INFORMATION FOR PROJECT-SPECIFIC MSAT HEALTH IMPACTS ANALYSIS**

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The U.S. Environmental Protection Agency (EPA) is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, <http://www.epa.gov/iris/>). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are; cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma.



## INTERIM MSAT GUIDANCE (continued)

Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, <http://pubs.healtheffects.org/view.php?id=282>) or in the future as vehicle emissions substantially decrease (HEI, <http://pubs.healtheffects.org/view.php?id=306>).

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts - each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (<http://pubs.healtheffects.org/view.php?id=282>). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA (<http://www.epa.gov/risk/basicinformation.htm#g>) and the HEI (<http://pubs.healtheffects.org/getfile.php?u=395>) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.



## INTERIM MSAT GUIDANCE (continued)

### Appendix D of MSAT Guidance – FHWA Sponsored Mobile Source Air Toxics Research Efforts

Human epidemiology and animal toxicology experiments indicate that many chemicals or mixtures termed air toxics have the potential to impact human health. As toxicology, epidemiology and air contaminant measurement techniques have improved over the decades, scientists and regulators have increased their focus on the levels of each chemical or material in the air in an effort to link potential exposures with potential health effects. The EPA's list of 21 mobile source toxics represents their prioritization of these chemicals or materials for further study and evaluation. The EPA's strategy for evaluating air toxic compounds effects is focused on both national trends and local impacts. The FHWA has embarked on an air toxics research program with the intent of understanding the mobile source contribution and its impact on local and national air quality. Several of studies either initiated or supported by FHWA are described below<sup>1</sup>.

Air toxics emissions from mobile sources have the potential to impact human health and often represent a regulatory agency concern. The FHWA has responded to this concern by developing an integrated research program to answer the most important transportation community questions related to air toxics, human health, and the NEPA process. To this end, FHWA has performed, funded or is currently managing several research projects. Many of these projects are based on an Air Toxics Research Workplan that provides a roadmap for agency research efforts<sup>2</sup>. These efforts include:

#### THE NATIONAL NEAR ROADWAY MSAT STUDY

The FHWA, in conjunction with the EPA and a consortium of State departments of transportation, studied the concentration and physical behavior of MSAT and mobile source PM 2.5 in Las Vegas, Nevada and Detroit, Michigan. The study criteria dictated that the study site be open to traffic and have 150,000 Annual Average Daily Traffic or more. These studies were intended to provide knowledge about the dispersion of MSAT emissions with the ultimate goal of enabling more informed transportation and environmental decisions at the project-level. These studies are unique in that the monitored data was collected for the entire year. The Las Vegas, NV report revealed there are a large number of influences in this urban setting and researchers must look beyond the roadway to find all the sources in the near road environment. Additionally, in Las Vegas, meteorology played a large role in the concentrations measured in the near road study area. More information is available at [http://www.fhwa.dot.gov/environment/air\\_quality/air\\_toxics/research\\_and\\_analysis/near\\_road\\_study/](http://www.fhwa.dot.gov/environment/air_quality/air_toxics/research_and_analysis/near_road_study/).

#### TRAFFIC-RELATED AIR POLLUTION

##### Going One Step Beyond: A Neighborhood Scale Air Toxics Assessment in North Denver (The Good Neighbor Project)

In 2007, the Denver Department of Environmental Health (DDEH) issued a technical report entitled Going One Step Beyond: A Neighborhood Scale Air Toxics Assessment in North Denver (The Good Neighbor Project). This research project was funded by FHWA. In this study, DDEH conducted a neighborhood-scale air toxics assessment in North Denver, which includes a portion of the proposed I-70 East project area. Residents in this area have been very concerned about both existing health effects in their neighborhoods (from industrial activities, hazardous waste sites, and traffic) and potential health impacts from changes to I-70.

<sup>1</sup> The information provided here is an update to research work discussed in the 2009 release of this interim guidance. The current title of each research activity is followed by the title used to describe the activity previously.

<sup>2</sup> Available at [http://www.fhwa.dot.gov/environment/air\\_quality/air\\_toxics/research\\_and\\_analysis/workplan/index.cfm](http://www.fhwa.dot.gov/environment/air_quality/air_toxics/research_and_analysis/workplan/index.cfm)



## INTERIM MSAT GUIDANCE (continued)

The study was designed to compare modeled levels of the six priority MSATs identified in FHWA's 2006 guidance with measurements at existing MSAT monitoring sites in the study area. MOBILE6.2 emissions factors and the ISC3ST dispersion model were used (some limited testing of the CALPUFF model was also performed). Key findings include: 1) modeled mean annual concentrations from highways were well below estimated Integrated Risk Information System (IRIS) cancer and non-cancer risk values for all six MSAT; 2) modeled concentrations dropped off sharply within 50 meters of roadways; 3) modeled MSAT concentrations tended to be higher along highways near the Denver Central Business District (CBD) than along the I-70 East corridor (in some cases, they were higher within the CBD itself, as were the monitored values); and 4) dispersion model results were generally lower than monitored concentrations but within a factor of two at all locations.

### Mobile Source Air Toxic Hot Spot

Given concerns about the possibility of MSAT exposure in the near road environment, The Health Effects Institute (HEI) dedicated a number of research efforts at trying to find a MSAT "hotspot." In 2011 three studies were published that tested this hypothesis. In general the authors confirm that while highways are a source of air toxics, they were unable to find that highways were the only source of these pollutants and determined that near road exposures were often no different or no higher than background or ambient levels of exposure, and hence no true hot spots were identified. These links provide additional information <http://pubs.healtheffects.org/getfile.php?u=659> page 137, <http://pubs.healtheffects.org/getfile.php?u=656> page 143, and <http://pubs.healtheffects.org/getfile.php?u=617> page 87, where monitored on-road emissions were higher than emission levels monitored near road residences, but the issue of hot spot was not ultimately discussed.

### Traffic-Related Air Pollution: A Critical Review of the Literature on Emissions, Exposure, and Health Effects

In January 2010, HEI released Special Report #17, investigating the health effects of traffic related air pollution. The goal of the research was to synthesize available information on the effects of traffic on health. Researchers looked at linkages between: (1) traffic emissions (at the tailpipe) with ambient air pollution in general, (2) concentrations of ambient pollutants with human exposure to pollutants from traffic, (3) exposure to pollutants from traffic with human-health effects and toxicologic data, and (4) toxicologic data with epidemiological associations. Challenges in making exposure assessments, such as quality and quantity of emissions data and models, were investigated, as was the appropriateness of the use of proximity as an exposure-assessment model. Overall, researchers felt that there was "sufficient" evidence for causality for the exacerbation of asthma. Evidence was "suggestive but not sufficient" for other health outcomes such as cardiovascular mortality and others. Study authors also note that past epidemiologic studies may not provide an appropriate assessment of future health associations as vehicle emissions are decreasing overtime. The report is available from HEI's website at <http://www.healtheffects.org/>. The FHWA provides financial support to HEI's research work.

### HEI SPECIAL REPORT #16

In November 2007, the HEI published Special Report #16: Mobile-Source Air Toxics: A Critical Review of the Literature on Exposure and Health Effects. The purpose of this Report was to accomplish the following tasks:

- Use information from the peer-reviewed literature to summarize the health effects of exposure to the 21 MSATs defined by the EPA in 2001;



## INTERIM MSAT GUIDANCE (continued)

- Critically analyze the literature for a subset of priority MSAT; and
- Identify and summarize key gaps in existing research and unresolved questions about the priority MSAT.

The HEI chose to review literature for acetaldehyde, acrolein, benzene, 1,3-butadiene, formaldehyde, naphthalene, and polycyclic organic matter (POM). Diesel exhaust was included, but not reviewed in this study since it had been reviewed by HEI and EPA recently. In general, the Report concluded that the cancer health effects due to mobile sources are difficult to discern since the majority of quantitative assessments are derived from occupational cohorts with high concentration exposures and some cancer potency estimates are derived from animal models. The Report suggested that substantial improvements in analytical sensitivity and specificity of biomarkers would provide better linkages between exposure and health effects. Noncancer endpoints were not a central focus of most research, and therefore require further investigation. Subpopulation susceptibility also requires additional evaluation. The study is available from HEI's website at <http://www.healtheffects.org/>.

### **KANSAS CITY PM CHARACTERIZATION STUDY (KANSAS CITY STUDY)**

This study was initiated by EPA to conduct exhaust emissions testing on 480 light-duty, gasoline vehicles in the Kansas City Metropolitan Area (KCMA). Major goals of the study included characterizing PM emissions distributions of a sample of gasoline vehicles in Kansas City; characterizing gaseous and PM toxics exhaust emissions; and characterizing the fraction of high emitters in the fleet. In the process, sampling methodologies were evaluated. Overall, results from the study were used to populate databases for the MOVES emissions model. The FHWA was one of the research sponsors. This study is available on EPA's website at: <http://www.epa.gov/otaq/emission-factors-research/documents/420r08009.pdf>

### **ESTIMATING THE TRANSPORTATION CONTRIBUTION TO PARTICULATE MATTER POLLUTION (AIR TOXICS SUPERSITE STUDY)**

The purpose of this study was to improve understanding of the role of highway transportation sources in particulate matter (PM) pollution. In particular, it was important to examine uncertainties, such as the effects of the spatial and temporal distribution of travel patterns, consequences of vehicle fleet mix and fuel type, the contribution of vehicle speed and operating characteristics, and influences of geography and weather. The fundamental methodology of the study was to combine EPA research-grade air quality monitoring data in a representative sample of metropolitan areas with traffic data collected by State departments of transportation (DOTs) and local governments.

Phase I of the study, the planning and data evaluation stage, assessed the characteristics of EPA's ambient PM monitoring initiatives and recruited State DOTs and local government to participate in the research. After evaluating and selecting potential metropolitan areas based on the quality of PM and traffic monitoring data, nine cities were selected to participate in Phase II. The goal of Phase II was to determine whether correlations could be observed between traffic on highway facilities and ambient PM concentrations. The Phase I report was published in September 2002. Phase II included the collection of traffic and air quality data and data analysis. Ultimately, six cities participated: New York City (Queens), Baltimore, Pittsburgh, Atlanta, Detroit and Los Angeles.

In Phase II, air quality and traffic data were collected. The air quality data was obtained from EPA AIRS AQS system, Supersite personnel, and NARSTO data archive site. Traffic data included ITS (roadway surveillance), Coverage Counts (routine traffic monitoring) and Supplemental Counts (specifically for research project). Analyses resulted in the conclusion that only a weak correlation existed between PM<sub>2.5</sub> concentrations and traffic activity for several of the sites. The existence of general trends indicates a relationship, which however is primarily unquantifiable. Limitations of the study include the



## INTERIM MSAT GUIDANCE (continued)

assumption that traffic sources are close enough to ambient monitors to provide sufficiently strong source strength, that vehicle activity is an appropriate surrogate for mobile emissions, and lack of knowledge of other factors such as non-traffic sources of PM and its precursors. A paper documenting the work of Phase II was presented at the 2004 Emissions Inventory Conference and is available at <http://www.epa.gov/ttn/chief/conference/ei13/mobile/black.pdf>.

### Appendix E of MSAT Guidance – MSAT Mitigation Strategies

Lessening the effects of mobile source air toxics should be considered for projects with substantial construction-related MSAT emissions that are likely to occur over an extended building period, and for post-construction scenarios where the NEPA analysis indicates potentially meaningful MSAT levels. Such mitigation efforts should be evaluated based on the circumstances associated with individual projects, and they may not be appropriate in all cases. However, there are a number of available mitigation strategies and solutions for countering the effects of MSAT emissions.

#### Mitigating for Construction MSAT Emissions

Construction activity may generate a temporary increase in MSAT emissions. Project-level assessments that render a decision to pursue construction emission mitigation will benefit from a number of technologies and operational practices that should help lower short-term MSAT. In addition, the Federal Highway Administration has supported a host of diesel retrofit technologies in the Congestion Mitigation and Air Quality Improvement (CMAQ) Program provisions - technologies that are designed to lessen a number of MSATs.<sup>1</sup>

Construction mitigation includes strategies that reduce engine activity or reduce emissions per unit of operating time, such as reducing the numbers of trips and extended idling. Operational agreements that reduce or redirect work or shift times to avoid community exposures can have positive benefits when sites are near populated areas. For example, agreements that stress work activity outside normal hours of an adjacent school campus would be operations-oriented mitigation. Verified emissions control technology retrofits or fleet modernization of engines for construction equipment could be appropriate mitigation strategies. Technology retrofits could include particulate matter traps, oxidation catalysts, and other devices that provide an after-treatment of exhaust emissions. Implementing maintenance programs per manufacturers' specifications to ensure engines perform at EPA certification levels, as applicable, and to ensure retrofit technologies perform at verified standards, as applicable, could also be deemed appropriate. The use of clean fuels, such as ultra-low sulfur diesel, biodiesel, or natural gas also can be a very cost-beneficial strategy.

The EPA has listed a number of approved diesel retrofit technologies; many of these can be deployed as emissions mitigation measures for equipment used in construction. This listing can be found at: <http://www.epa.gov/cleandiesel/technologies/retrofits.htm>.

#### Post-Construction Mitigation for Projects with Potentially Significant MSAT Levels

Travel demand management strategies and techniques that reduce overall vehicle-mile of travel; reduce a particular type of travel, such as long-haul freight or commuter travel; or improve the transportation system's efficiency will mitigate MSAT emissions. Examples of such strategies include congestion pricing, commuter incentive programs, and increases in truck weight or length limits. Operational strategies that focus on speed limit enforcement or traffic management policies may help reduce MSAT emissions even beyond the benefits of fleet turnover. Well-traveled highways with high proportions of heavy-duty diesel truck activity may benefit from active Intelligent Transportation System programs, such as traffic management centers or incident management systems. Similarly, anti-idling



## INTERIM MSAT GUIDANCE (continued)

strategies, such as truck-stop electrification can complement projects that focus on new or increased freight activity.

Planners also may want to consider the benefits of establishing buffer zones between new or expanded highway alignments and populated areas. Modifications of local zoning or the development of guidelines that are more protective also may be useful in separating emissions and receptors.

The initial decision to pursue MSAT emissions mitigation should be the result of interagency consultation at the earliest juncture. Options available to project sponsors should be identified through careful information gathering and the required level of deliberation to assure an effective course of action. Such options may include local programs, whether voluntary or with incentives, to replace or rebuild older diesel engines with updated emissions controls. Information on EPA diesel collaborative around the country can be found at <http://www.epa.gov/otaq/fuels/dieselfuels/index.htm>.

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<sup>1</sup>[http://www.fhwa.dot.gov/environment/air\\_quality/cmaq/policy\\_and\\_guidance/2013\\_guidance](http://www.fhwa.dot.gov/environment/air_quality/cmaq/policy_and_guidance/2013_guidance)