U.S. Department of Transportation
Federal Highway Administration

Memorandum

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

Date: February 3, 2006

From: Cynthia J. Burbank
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Reply to
Attn. of: HEPN-10

To: Division Administrators

PURPOSE

The purpose of this guidance is to advise FHWA Division offices on when and how to analyze Mobile Source Air Toxics (MSAT) in the NEPA process for highways. This guidance is interim, because MSAT science is still evolving. As the science progresses, FHWA will update the guidance.

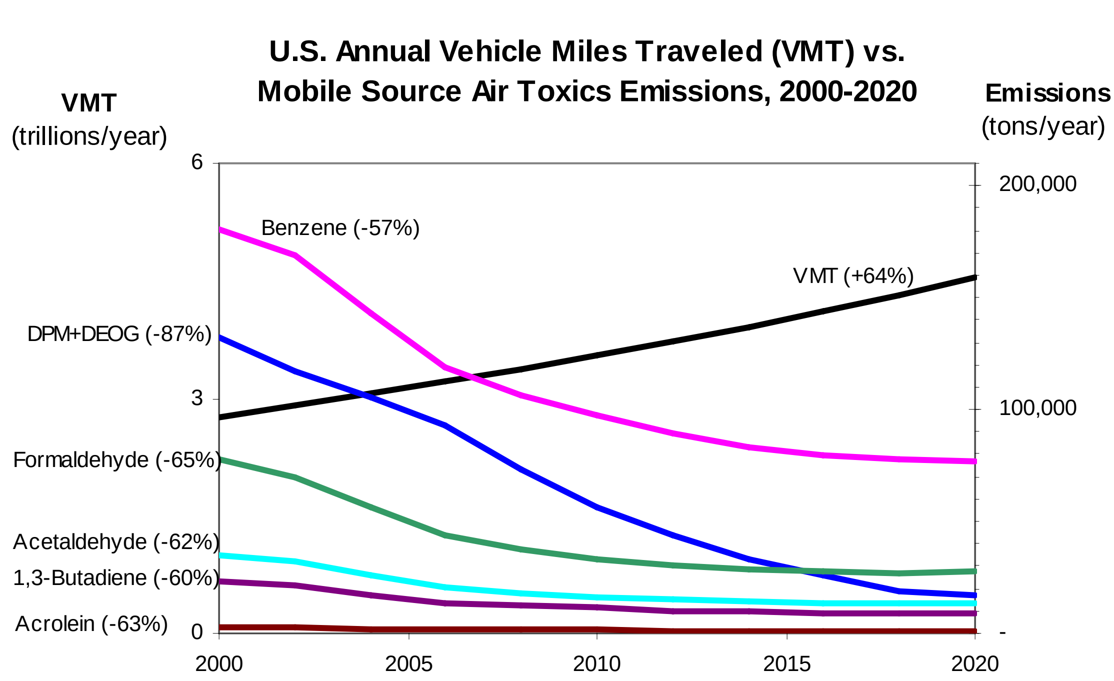
BACKGROUND

The Clean Air Act identified 188 air toxics, also known as hazardous air pollutants. The Environmental Protection Agency (EPA) has assessed this expansive list of toxics and identified a group of 21 as mobile source air toxics, which are set forth in an EPA final rule, *Control of Emissions of Hazardous Air Pollutants from Mobile Sources (66 FR 17235).* The EPA also extracted a subset of this list of 21 that it now labels as the six priority MSATs. These are *benzene, formaldehyde, acetaldehyde, diesel particulate matter/diesel exhaust organic gases, acrolein, and 1,3-butadiene.* While these MSATs are considered the priority transportation toxics, the EPA stresses that the lists are subject to change and may be adjusted in future rules.

The EPA has issued a number of regulations that will dramatically decrease MSATs through cleaner fuels and cleaner engines. According to an FHWA analysis, even if VMT increases by 64 percent, reductions of 57 percent to 87 percent in MSATs are projected from 2000 to 2020, as shown in the following graph:

Celebrating 50 Years 1956 50th 2006 Eisenhower Interstate System

BUCKLE UP AMERICA



Notes: For on-road mobile sources. Emissions factors were generated using MOBILE6.2. MTBE proportion of market for oxygenates is held constant, at 50%. Gasoline RVP and oxygenate content are held constant. VMT: *Highway Statistics 2000*, Table VM-2 for 2000, analysis assumes annual growth rate of 2.5%. "DPM + DEOG" is based on MOBILE6.2-generated factors for elemental carbon, organic carbon and SO4 from diesel-powered vehicles, with the particle size cutoff set at 10.0 microns.

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National trend information is provided as background. For specific locations, the trend lines may be different, depending on local parameters defining vehicle mix, fuels, meteorology and other factors.

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 impacts from MSATs are limited, as discussed in Appendix C. These limitations impede FHWA’s ability to evaluate how mobile source health risks should factor into project-level decision-making under the National Environmental Policy Act (NEPA). In addition, EPA has not established regulatory concentration targets for the six relevant MSAT pollutants appropriate for use in the project development process.

Nonetheless, air toxics are being raised more frequently on transportation projects during the NEPA process. As the science emerges, we are increasingly expected by the public and other agencies to address MSAT impacts in our environmental documents. We have several research projects underway to try to more clearly define potential risks from MSAT emissions associated with transportation projects. However, while this research is ongoing, we are issuing this interim guidance on how MSATs should be addressed in NEPA documents for highway projects. The FHWA will continue to monitor the developing research in this emerging field.

ANALYSIS OF MSATs IN NEPA DOCUMENTS

Given the emerging state of the science and of project-level analysis techniques, there are no established criteria for determining when MSAT emissions should be considered a significant issue in the NEPA context. Therefore, a range of responses may be appropriate for addressing this issue in NEPA documentation. The response may involve quantitative analysis of emissions to compare or differentiate among proposed project alternatives, qualitative analysis to explore the general nature of the project and inform interested parties, or no analysis depending on the circumstances as set out in this interim guidance. For projects warranting MSAT analysis, the six priority MSATs should be analyzed.

The FHWA has developed a tiered approach for analyzing MSATs in NEPA documents. Depending on the specific project circumstances, FHWA has identified three levels of analysis:

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

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

The types of projects included in this category are:

- Projects qualifying as a categorical exclusion under 23 CFR 771.117(c);
- 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 under the Clean Air Act pursuant to 40 CFR 93.126, no analysis or discussion of MSATs 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 required.[1] However, the project record should document the basis for the determination of "no meaningful potential impacts" with a brief description of the factors considered. Prototype language that could be included in the record is attached as 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 emissions. This category covers a broad range of projects.

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[1] The types of projects categorically excluded under 23 CFR 771.117(d) or exempt from conformity under 40 CFR 93.127 do not warrant an automatic exemption from an MSAT analysis, but they usually will have no meaningful impact.

We anticipate that most highway projects will fall into this category. Any projects not meeting the threshold criteria for higher potential effects set forth in subsection (3) below and not meeting the criteria in subsection (1) should be included in this category. Examples of these types of projects are minor widening projects and new interchanges, such as those that replace a signalized intersection on a surface street or where design year traffic is not projected to meet the 140,000 to 150,000 AADT criterion. [2]

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 MSATs for the project alternatives, 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 are low, we expect there would be no appreciable difference in overall MSAT emissions among the various alternatives. In addition, quantitative emissions analysis of these types of projects will not yield credible results that are useful to project-level decision-making due to the limited capabilities of the transportation and emissions forecasting tools.

Appendix B includes prototype language for a qualitative assessment, with specific examples for four types of projects: (a) a minor widening project; (b) an interchange with a new connector road; (c) an interchange without a new connector road; and (d) minor improvements or expansions to intermodal centers or other projects that affect truck traffic.

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 CEQ regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information. This discussion would explain how air toxics analysis is an emerging field and current scientific techniques, tools, and data are not sufficient to accurately estimate human health impacts that would result from a transportation project in a way that would be useful to decision-makers. Also in compliance with 40 CFR 150.22(b), it should contain a summary of current studies regarding the health impacts of MSATs. Prototype language for this discussion is contained in Appendix C.

(3) Projects with Higher Potential MSAT Effects

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

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[2] This guidance does not specifically address the analysis of construction-related emissions because of their relatively short duration. We will be considering whether more guidance is needed on construction activities in future versions of this guidance. We have also included a discussion of mitigation strategies for construction related activities in Appendix E.

- 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; or

- Create new 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[3], or greater, by the design year;

<u>And also</u>

- Be proposed to be located in proximity to populated areas or in rural areas, in proximity to concentrations of vulnerable populations (i.e., schools, nursing homes, hospitals).

Projects falling within this category should be more rigorously assessed for impacts. If a project falls within this category, you should contact Michael Koontz or Pamela Stephenson in the Office of Planning, Environment, and Realty in FHWA for assistance in developing a specific approach for assessing impacts. This approach would include a quantitative analysis that would attempt to measure the level of emissions for the six priority MSATs 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 would also include relevant prototype language on unavailable information included in Appendix C.

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

You should also consult with the Office of Planning, Environment and Realty 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. Although not required, projects with high potential for litigation on air toxics issues may also benefit from a more rigorous quantitative analysis to enhance their defensibility in court.

CONCLUSION

The guidance presented in this memorandum is interim. The guidance will be revised when FHWA completes studies underway to develop and evaluate better analytical tools for MSAT analysis and to better assess the health impacts of MSATs. The FHWA will continue to revise and update this guidance as the science on air toxic analysis continues to evolve. Additional background information on MSATs is attached to this memorandum as Appendix D.

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[3] Using EPA's MOBILE6.2 emissions model, FHWA technical staff determined that this range of AADT would be roughly equivalent to the CAA definition of a major HAP source, i.e. 25 tons per year (tpy) for all HAPs or 10 tpy for any single HAP. Significant 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 the Office of Planning, Environment and Realty identified in this memorandum.

The FHWA recognizes that some projects already are moving through the environmental analysis process and that immediate application of this interim guidance would be impractical. All future approvals of projects in “Category 1” (no meaningful MSAT effects) should include the information in Appendix A, commencing as soon as practicable after the date of this guidance. For projects already underway that would require qualitative or quantitative analysis of MSAT emissions (categories 2 and 3), the FHWA Division Offices should work to incorporate the appropriate analysis into the NEPA document if practicable, given the amount of resources already invested, the need for the project, and the stage of completion of the document. We expect that this guidance can be incorporated into any NEPA documents for which the completion of the DEIS, FEIS, or EA is more than 6 months from the date of this guidance. We recognize that in some cases this may not be possible for a variety of reasons (e.g., lack of necessary traffic data or emissions modeling expertise) and will rely on the judgment of the individual division offices to determine whether this guideline is reasonable for any given project. The FHWA Headquarters and Resource Center staff is available to provide guidance and technical assistance during this phase-in period to support any necessary analysis and limit project delays.

APPENDIX A—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 will not result in any meaningful changes in traffic volumes, vehicle mix, location of the existing facility, or any other factor that would cause an increase in emissions impacts relative to the no-build alternative. As such, FHWA has determined that this project will generate minimal air quality impacts for Clean Air Act criteria pollutants and has not been linked with any special MSAT concerns. Consequently, this effort is exempt from analysis for MSATs.

Moreover, EPA regulations for vehicle engines and fuels will cause overall MSATs to decline significantly over the next 20 years. Even after accounting for a 64 percent increase in VMT, FHWA predicts MSATs will decline in the range of 57 percent to 87 percent, from 2000 to 2020, based on regulations now in effect, even with a projected 64 percent increase in VMT. This will both reduce the background level of MSATs as well as the possibility of even minor MSAT emissions from this project.

APPENDIX B—Examples of Prototype Language for Qualitative Project Level MSAT Discussions, for Projects with Low Potential MSAT Emissions

The information in this Appendix is for projects with low potential MSAT emissions – projects that (a) do not qualify as having no or very minimal changes in MSAT emissions, but (b) are not expected to be associated with meaningful differences in emissions for project alternatives. The types of projects that fall into this category of low potential MSAT emissions are those efforts 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. Any non-exempt project that does not meet the threshold criteria for higher potential effects, as described in the policy, qualifies for treatment as described here in Appendix B.

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, MSATs are expected to decline unless VMT more than doubles by 2020 (due to the effect of new EPA engine and fuel standards).
- Projects that result in increased travel speeds will reduce emissions of the VOC-based MSATs (acetaldehyde, benzene, formaldehyde, acrolein, and 1, 3 butadiene); the effect of speed changes on diesel particulate matter is unknown. 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 sensitive receptors may increase concentrations of MSATs at those locations relative to No Action.

Introductory language for qualitative assessments for all projects:
[This introduction should be preceded by the prototype language in Appendix C, explaining what information is unavailable and incomplete.] Please also contact the Office of Environment, Planning and Realty (Michael Koontz or Pamela Stephenson) to obtain additional supporting documentation for review and inclusion in the administrative record.

As discussed above, technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. However, even though reliable methods do not exist to accurately estimate the health impacts of MSATs at the project level, it is possible to qualitatively assess the levels of future MSAT emissions under the project. Although a qualitative analysis cannot identify and measure health impacts from MSATs, it can give 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/airtoxic/msatcompare/msatemissions.htm

1) Minor Widening Projects

[**For purposes of this scenario, minor highway widening projects are those efforts for which the ultimate traffic level is predicted to be less than *150,000 AADT*. Widening projects that surpass this**

projection are considered major endeavors. Analyses of these major widening projects will be conducted on a case-specific basis].

For each alternative in this EIS/EA, the amount of MSATs 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. See Table ___. This increase in VMT would lead to higher MSAT emissions for the 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 MOBILE6 emissions model, emissions of all of the priority MSATs except for diesel particulate matter decrease as speed increases. The extent to which these speed-related emissions decreases will offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models.

Because the estimated VMT under each of the Alternatives are nearly the same, varying by less than ______ 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 MSAT emissions by 57 to 87 percent between 2000 and 2020. 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.

[This paragraph and the corresponding language in the next paragraph may apply if the road moves closer to receptors:] 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 MSATs 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 ________, under Alternatives ________, and along __________________ under Alternatives ______. However, as discussed above, the magnitude and the duration of these potential increases compared to the No-build alternative cannot be accurately quantified due to the inherent deficiencies of current models. In sum, when a highway is widened and, as a result, moves closer to receptors, 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, MSATs 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.

(This paragraph should also discuss any mitigation associated with the project such as cleaner construction equipment, truck stop electrification, buffers, etc. (See Appendix E))

2) New Interchange with new connector roadway

(This 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, the amount of MSATs 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 regional MSATs are not expected from any of the Build Alternatives compared to the No Build. See Table ____. In addition, because the estimated VMT under each of the Build Alternatives are nearly the same, varying by less than ______ 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 MSAT emissions by 57 to 87 percent from 2000 to 2020. 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.

Because of the specific characteristics of the project alternatives [i.e. new connector roadways], 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 ________, under Alternatives ________, and along __________________ under Alternatives ______. 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. In comparing various project alternatives, MSAT levels could be higher in some locations than others, but current tools and science are not adequate to quantify 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.

(This paragraph should also discuss any mitigation associated with the project such as cleaner construction equipment, truck stop electrification, buffers, etc. (See Appendix E))

3) New Interchange/ no new connector roadway
(This 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, the amount of MSATs 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 were not occurring in this area before. See Table ___. This increase in VMT means MSATs under the Build Alternatives would probably be higher than the No Build Alternative in the study area. There could also be localized differences in MSATs from indirect effects of the project such as associated access traffic, emissions of evaporative MSATs (e.g., benzene) from parked cars, and emissions of diesel particulate matter from delivery trucks, depending on the type and extent of development. On a regional scale, this emissions increase would be offset somewhat by reduced travel to other destinations.

Because the estimated VMT under each of the Build Alternatives are nearly the same, varying by less than ______ 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 MSAT emissions by 57 to 87 percent from 2000 to 2020. 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 areas where there are concentrations of sensitive populations, such as those found in nursing homes, schools, hospitals, and others.

The new ramps [and accel/decel lanes] [and additional lanes on the crossing arterial streets] 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 MSATs 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 ________, under Alternatives ________, and along __________________ under Alternatives ______. However, as discussed above, the magnitude and the duration of these potential increases cannot be accurately quantified because of limitations on modeling techniques. Further, under all Alternatives, overall future MSATs 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 higher MSAT emissions in the study area, relative to the No Build Alternative, due to increased VMT. There could be slightly elevated but unquantifiable changes in MSATs to residents and others in a few localized areas where VMT increases, which may be important particularly to any members of sensitive populations. 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.

(This paragraph should also discuss any mitigation associated with the project such as cleaner construction equipment, truck stop electrification, buffers, etc. (See Appendix E))

4) Expanded Intermodal Centers or other projects which impact truck traffic, but that do not reach the category three criteria of "major new intermodal center".

(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, the amount of MSATs 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. See Table ___. This increase in truck VMT and rail activity would lead to the Build Alternatives to have 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 the decrease in truck traffic (according to EPA's MOBILE6 emissions model, emissions of all of the priority MSATs except for diesel particulate matter decrease as speed increases). 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 ______ 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 MSAT emissions by 57 to 87 percent from 2000 to 2020. 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.

[This paragraph and the corresponding language in the next paragraph 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 MSATs would be higher than under the No Build alternative. The localized differences in MSAT concentrations would likely be most pronounced under Alternatives __. However, as discussed above, the magnitude and the duration of these potential differences cannot be accurately quantified because of current limitations in modeling. 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.]

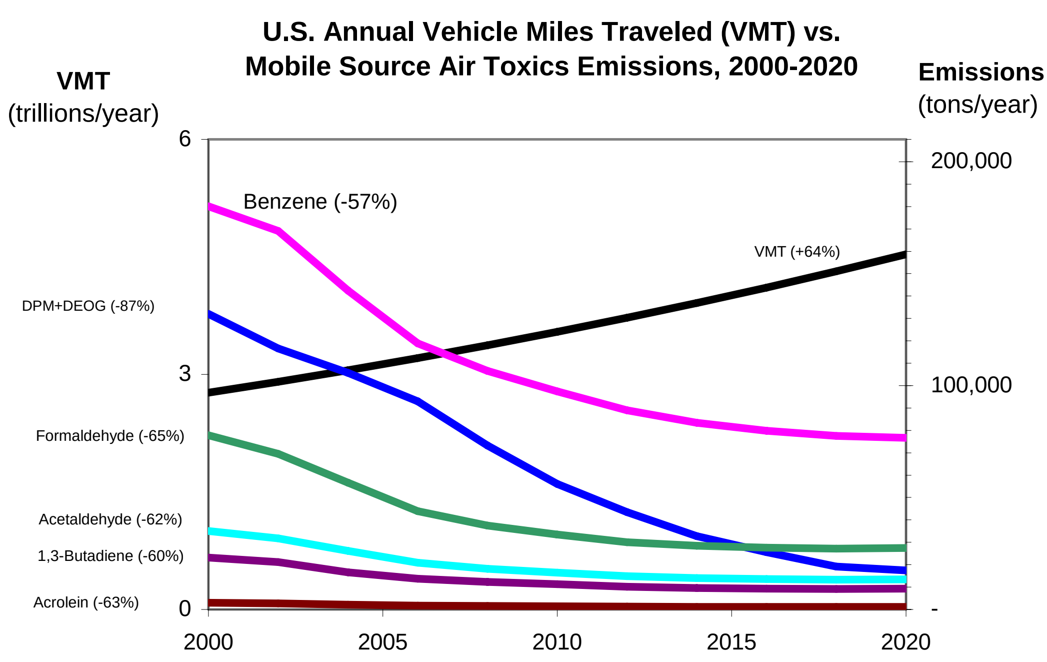
In sum, all Build Alternatives in the design year are expected to be associated with higher levels of MSAT emissions in the study area, relative to the No Build Alternative, along with some benefit from improvements in speeds and reductions in region-wide truck traffic. There could be slightly elevated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

APPENDIX C—Prototype Language for Compliance with 40 CFR 1502.22

Mobile Source Air Toxics
In addition to the criteria air pollutants for which there are National Ambient Air Quality Standards (NAAQS), EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries).

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act. The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

The EPA is the lead Federal Agency for administering the Clean Air Act and has certain responsibilities regarding the health effects of MSATs. The EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources. 66 FR 17229 (March 29, 2001). This rule was issued under the authority in Section 202 of the Clean Air Act. In its rule, EPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline (RFG) program, its national low emission vehicle (NLEV) standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 2000 and 2020, FHWA projects that even with a 64 percent increase in VMT, these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 percent to 65 percent, and will reduce on-highway diesel PM emissions by 87 percent, as shown in the following graph:



Notes: For on-road mobile sources. Emissions factors were generated using MOBILE6.2. MTBE proportion of market for oxygenates is held constant, at 50%. Gasoline RVP and oxygenate content are held constant. VMT: *Highway Statistics 2000*, Table VM-2 for 2000, analysis assumes annual growth rate of 2.5%. "DPM + DEOG" is based on MOBILE6.2-generated factors for elemental carbon, organic carbon and SO4 from diesel-powered vehicles, with the particle size cutoff set at 10.0 microns.

As a result, EPA concluded that no further motor vehicle emissions standards or fuel standards were necessary to further control MSATs. The agency is preparing another rule under authority of CAA Section 202(l) that will address these issues and could make adjustments to the full 21 and the primary six MSATs.

Unavailable Information for Project Specific MSAT Impact Analysis

This [EA or EIS] includes a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with the alternatives in this [EA or EIS]. Due to these limitations, the following discussion is included in accordance with CEQ regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information:

Information that is Unavailable or Incomplete. Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

1. Emissions: The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of MSATs in the context of highway projects. While MOBILE 6.2 is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE 6.2 is a trip-based model--emission factors are projected based on a typical trip of 7.5 miles, and on average speeds for this typical trip. This means that MOBILE 6.2 does not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE 6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects, and cannot adequately capture emissions effects of smaller projects. For particulate matter, the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Also, the emissions rates used in MOBILE 6.2 for both particulate matter and MSATs are based on a limited number of tests of mostly older-technology vehicles. Lastly, in its discussions of PM under the conformity rule, EPA has identified problems with MOBILE6.2 as an obstacle to quantitative analysis.

   These deficiencies compromise the capability of MOBILE 6.2 to estimate MSAT emissions. MOBILE6.2 is an adequate tool for projecting emissions trends, and performing relative analyses between alternatives for very large projects, but it is not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations.

2. Dispersion. The tools to predict how MSATs disperse are also limited. The EPA's current regulatory models, CALINE3 and CAL3QHC, were developed and validated more than a decade ago for the purpose of predicting episodic concentrations of carbon monoxide to determine compliance with the NAAQS. The performance of dispersion models is more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area. This limitation makes it difficult to predict accurate exposure patterns at specific times at specific highway project locations across an urban area to assess potential health risk. The NCHRP is conducting research on best practices in applying models and other technical methods in the analysis of MSATs. This work also will focus on identifying appropriate methods of documenting and communicating MSAT impacts in the NEPA process and to the general public. Along with these general limitations of dispersion models, FHWA is also faced with a

lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.

3. Exposure Levels and Health Effects. Finally, even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude us from reaching meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. There are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis.

Summary of Existing Credible Scientific Evidence Relevant to Evaluating the Impacts of MSATs. Research into the health impacts of MSATs is ongoing. For different emission types, there are a variety of studies that show that some either are statistically associated with adverse health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses.

Exposure to toxics has been a focus of a number of EPA efforts. Most notably, the agency conducted the National Air Toxics Assessment (NATA) in 1996 to evaluate modeled estimates of human exposure applicable to the county level. While not intended for use as a measure of or benchmark for local exposure, the modeled estimates in the NATA database best illustrate the levels of various toxics when aggregated to a national or State level.

The EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The EPA Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS database is located at http://www.epa.gov/iris. The following toxicity information for the six prioritized MSATs was taken from the IRIS database *Weight of Evidence Characterization* summaries. This information is taken verbatim from EPA's IRIS database and represents the Agency's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures.

- **Benzene** is characterized as a known human carcinogen.
- The potential carcinogenicity of **acrolein** cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.
- **Formaldehyde** is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.
- **1,3-butadiene** is characterized as carcinogenic to humans by inhalation.
- **Acetaldehyde** is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.

- **Diesel exhaust** (DE) is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases.
- **Diesel exhaust** also represents chronic respiratory effects, possibly the primary noncancer hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms, such as cough, phlegm, and chronic bronchitis. Exposure relationships have not been developed from these studies.

There have been other studies that address MSAT health impacts in proximity to roadways. The Health Effects Institute, a non-profit organization funded by EPA, FHWA, and industry, has undertaken a major series of studies to research near-roadway MSAT hot spots, the health implications of the entire mix of mobile source pollutants, and other topics. The final summary of the series is not expected for several years.

Some recent studies have reported that proximity to roadways is related to adverse health outcomes -- particularly respiratory problems[4]. Much of this research is not specific to MSATs, instead surveying the full spectrum of both criteria and other pollutants. The FHWA cannot evaluate the validity of these studies, but more importantly, they do not provide information that would be useful to alleviate the uncertainties listed above and enable us to perform a more comprehensive evaluation of the health impacts specific to this project.

Relevance of Unavailable or Incomplete Information to Evaluating Reasonably Foreseeable Significant Adverse Impacts on the Environment, and
Evaluation of impacts based upon theoretical approaches or research methods generally accepted in the scientific community. Because of the uncertainties outlined above, a quantitative assessment of the effects of air toxic emissions impacts on human health cannot be made at the project level. While available tools do allow us to reasonably predict relative emissions changes between alternatives for larger projects, the amount of MSAT emissions from each of the project alternatives and MSAT concentrations or exposures created by each of the project alternatives cannot be predicted with enough accuracy to be useful in estimating health impacts. (As noted above, the current emissions model is not capable of serving as a meaningful emissions analysis tool for smaller projects.) Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have "significant adverse impacts on the human environment."

In this document, FHWA has provided a quantitative analysis of MSAT emissions relative to the various alternatives, (or a qualitative assessment, as applicable) and has acknowledged that (some, all, or identify by alternative) the project alternatives may result in increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated.

[The Office of Environment, Planning and Realty can provide additional supporting documents for review and inclusion in the administrative record.]

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[4] South Coast Air Quality Management District, Multiple Air Toxic Exposure Study-II (2000); Highway Health Hazards, The Sierra Club (2004) summarizing 24 Studies on the relationship between health and air quality); NEPA's Uncertainty in the Federal Legal Scheme Controlling Air Pollution from Motor Vehicles, Environmental Law Institute, 35 ELR 10273 (2005) with health studies cited therein.

APPENDIX D - Mobile Source Air Toxics: Background for FHWA Interim Policy

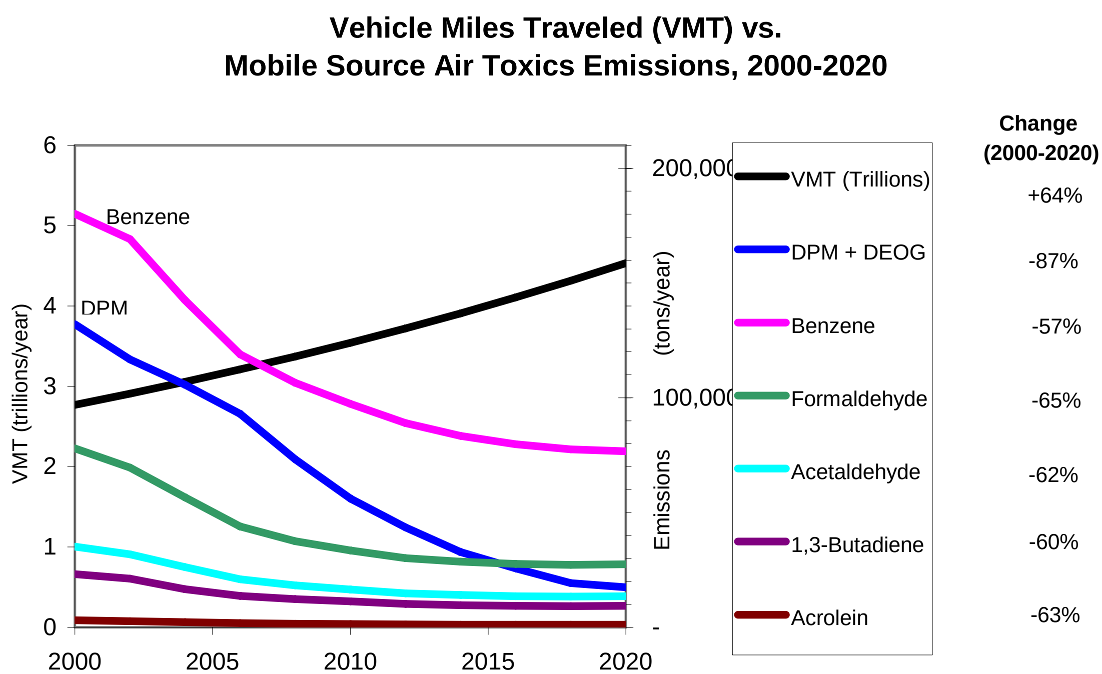
The EPA and the public health community are conducting research on a group of emissions called "air toxics" or "hazardous air pollutants." According to EPA, existing and newly promulgated rules will cause significant reduction in air toxics from mobile sources—in the range of 67 percent to 90 percent by 2020. This paper provides guidance on whether and how highway projects should be analyzed for air toxics through the NEPA process.

A. Background

The Clean Air Act identified 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list of toxics and selected a group of 21 that it considers mobile source air toxics (Attachment A). More recently, the agency has extracted a subset of this list of 21 and developed what EPA now labels the six priority MSATs. These are *benzene, formaldehyde, acetaldehyde, diesel particulate matter/diesel exhaust organic gases, acrolein, and 1,3-butadiene.* While EPA has identified these as the more significant MSATs, the agency has not proposed to establish ambient standards for any of these pollutants.

The EPA issued a final rule on *Control of Emissions of Hazardous Air Pollutants from Mobile Sources* in March 2001 under provisions of the Clean Air Act requiring EPA to characterize, prioritize, and control these emissions as appropriate. In addition to highlighting the 21 MSATs, the final rule summarized the mobile sources contribution to national inventories of hazardous air pollutants. Since MSATs can be loosely defined as volatile organic compounds, nonvolatile organics, diesel particulate matter/diesel exhaust gases, or metals, so the linkage with transportation vehicles and fuels is direct.

In the March 2001 rule, the EPA projected that the reductions in mobile source air toxic emissions via several existing and new control programs and technology-oriented vehicle standards would be considerable. That same final rule highlighted a number of emissions projections, including a 67 to 76 percent drop in benzene, acetaldehyde, and 1,3-butadiene between 1990 and 2020. For highway-related diesel particulate matter, the agency projects a 90 percent reduction by 2020. The following chart, produced by FHWA, takes a closer look at these projected MSAT reductions from 2000 to 2020:



Notes: For on-road mobile sources. Emissions factors were generated using MOBILE6.2. MTBE proportion of market for oxygenates is held constant, at 50%. Gasoline RVP and oxygenate content are held constant. VMT: *Highway Statistics 2000*, Table VM-2 for 2000, analysis assumes annual growth rate of 2.5%. "DPM + DEOG" is based on MOBILE6.2-generated factors for elemental carbon, organic carbon and SO4 from diesel-powered vehicles, with the particle size cutoff set at 10.0 microns. 1 short ton = 907,200,000 mg.

Projected MSAT Trends, 2000-2020

These steep drops expected for MSATs are slated against a backdrop of three decades of steady decreases in other highway emissions. Since 1970, the carbon monoxide from highway vehicles has dropped 43 percent. For hydrocarbons, on-road vehicle emissions fell just under 60 percent during the same period, while nitrogen oxides exclusively from passenger vehicles fell more than 30 percent since 1970.

Progressively tighter motor vehicle tailpipe standards have accounted for the lion's share of the mobile source emissions reductions occurring over the past 30 years. Other in-place or proposed programs are playing a strong role with further reductions in both the Clean Air Act criteria pollutants and MSATs expected in the next generation. Considerable air toxic emissions reductions are projected from these programs, which include:

- Reformulated Gasoline (RFG), a product of Clean Air Act legislation, targeting the nation's more acute ozone nonattainment areas
- National Low Emissions Vehicle (NLEV) standards
- Tier 2 motor vehicle emission standards and associated gasoline sulfur control requirements
- Heavy-duty engine standards and on-highway diesel sulfur control requirements, and
- Final rule for nonroad diesel engines, and proposals for marine and locomotive engines
- 2001 MSAT rule, toxic emissions performance standard

The EPA has committed to develop another rule to address mobile source air toxics. The agency has committed to propose this rule by February 28, 2006. While the long-term projections are impressive, the impacts of today's levels of mobile source air toxics have become a public health concern. Air toxics have been raised as an issue with several major highway projects around the country, resulting in lengthy deliberations and in some cases, litigation.

On a regional basis, the transportation conformity rule has been employed alongside the National Environmental Policy Act (NEPA) to provide the framework for analysis of mobile source emissions resulting from Federal-aid highway projects. However, the conformity process is applicable only to CAA nonattainment and maintenance areas—those areas designated by EPA due to violation of a National Ambient Air Quality Standard (NAAQS) for a criteria pollutant. Since EPA has not established ambient standards for air toxics, there are no nonattainment areas for air toxics. Also, for Federal programs such as those administered by FHWA, the USEPA has not yet developed national peer reviewed and approved guidance on how to conduct scientifically valid and reliable mobile source air toxics health assessments.

In the preamble to the March 2001 MSAT rule, EPA acknowledged significant gaps in its knowledge regarding exposure to toxics and the potential benefits of further reductions. It specifically stated that inclusion on the MSAT list is not itself a determination by EPA that emissions of the compound in fact present a risk to public health or welfare, or that it is appropriate to adopt controls to limit emissions. Rather, EPA identified the purpose of the MSAT list as providing "a screening tool that identifies those compounds emitted from motor vehicles or their fuels for which further evaluation of emissions controls is appropriate." See *Control of Emissions of Hazardous Pollutants from Mobile Sources*, 66 FR at 17234-35 (March 29, 2001).

In the March 2001 rule, it also concluded that preexisting vehicle-based emission controls already offer the "greatest degree of toxics control achievable at this time considering existing standards, the availability and cost of the technology and noise, energy, safety factors and lead time." 66 FR 17230. It further noted that the technology to reduce one type of pollutant reduces the other types as well. 66 FR at 17239-41.

Finally, in conjunction with the rule, EPA established a Technical Analysis Plan in which the agency committed to obtaining more data in critical areas and to improve its ability to estimate exposures. Specifically, it stated:

> To improve our ability to characterize [mobile toxic] exposures to highly exposed subpopulations requires better information regarding ambient concentrations of [mobile toxics] in hot spot areas and appropriate microenvironmental factor values for high-exposure microenvironments. The EPA is developing local-scale emissions and dispersion models for mobility sources to better inform the Agency and the public about potential hot spots. In addition, EPA is conducting spatially refined urban area modeling (including mobile sources). 66 FR at 17259.

Work on these models is still in progress.

B. Research on Air Toxics

This is an emerging area of research. While much has been completed to estimate the overall health risk of the major mobile source toxics, there is a knowledge gap in our ability to apply accurate dose-response relationships to many of the pollutants. Consequently, the transportation community is confronted with the challenge of assessing the impacts of these emissions without the benefit of standards similar to those set for the six criteria pollutants defined in the Clean Air Act. While past research has focused on waterborne toxic pollutants and on widely known carcinogens, such as benzene, today's research agenda is considerably more expansive and focuses much more attention on air toxics suspected to cause cancer or other serious health effects. A number of recent studies have centered on EPA's short list of 21 MSATs, including the FHWA research summarized in Attachment B.

C. Relevant Legal Requirements

The National Environmental Policy Act (NEPA) requires all Federal agencies to prepare an environmental impact statement for every major action significantly affecting the quality of the human environment. Implementing regulations from the Council on Environmental Quality (40 CFR 1500) and FHWA (23 CFR 771) specify how these responsibilities are to be carried out and how to handle actions that do not require the preparation of an EIS. These regulations stress the importance of evaluating issues that are relevant to agency decision-making and avoiding studies and analyses that are not relevant. Specifically, the CEQ regulations call for a scoping process to help determine which issues are significant in the preparation of an EIS and to eliminate from detailed study issues which are not significant.

In assessing environmental impacts for highway projects, FHWA has analyzed air quality at the project level. This is particularly true in nonattainment and maintenance areas where the concern about violating the National Ambient Air Quality Standards (NAAQS) is a significant issue. These assessments at the project level have centered, largely, on carbon monoxide and PM-10 "hotspots," a common term for confined, local area impacts where there is a concern about exceeding the NAAQS. However, given that national ambient air quality standards have not been established for MSATs and the evolving state of the science, there are no established criteria for determining when MSAT emissions should be considered a significant issue.

Regulations under the Council on Environmental Quality (CEQ) recognize that there will be situations encountered in the NEPA process for EISs in which very little or no information exists to allow a reasonably thorough analysis of cause and effect, impact, or potential environmental harm. When addressing potential MSAT impacts, these CEQ provisions must be met (see Attachment C). A description of the uncertainties of both the analytical processes and the interpretation of results should be included in addition to a clear explanation of how the analysis meets the CEQ requirements in 40 CFR 1502.22 covering incomplete or unavailable information. This latter discussion should detail why the information cannot be obtained - due either to exorbitant costs or unknown means to obtain it - and should cover all the elements outlined in 40 CFR 1502.22. It is critical that the decisions made regarding the type of analysis, its results and interpretation be clearly described in the environmental document (EIS or EA).

Attachment A--*List of Mobile Source Air Toxics*
(Priority MSATs in bold)

Acetaldehyde
Acrolein
Benzene
1,3-Butadiene
Diesel Particulate Matter &
Diesel Exhaust Organic Gases
Formaldehyde

Arsenic Compounds
Chromium Compounds
Dioxin/Furans
Ethylbenzene
n-Hexane
Lead Compounds
Manganese Compounds
Mercury Compounds
Methyl Tertiary Butyl Ether (MTBE)
Naphthalene
Nickel Compounds
POM
Styrene
Toluene
Xylene

Attachment B – ***FHWA Scientific Research on Air Toxics***

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 USEPA'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 effect 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 the studies most relevant to the highway community either initiated or supported by FHWA are described below.

Air toxics emissions from mobile source 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 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. These efforts include:

- **Air Toxics Supersite Study (Traffic and Ambient Concentration Study).** This study is designed to determine whether the contribution of vehicle-emitted air toxic compound concentrations to ambient air concentrations can be measured. The study is being conducted in conjunction with a particulate matter study to determine whether air toxic compounds (and PM) are local air quality impacts or regional concerns.
- **Air Toxics Monitoring and Modeling Study**. This study is designed to determine the reliability of emission models in predicting ambient measured air toxic concentrations. This is an important component of air toxics research since models are typically used for developing emission inventories and the resulting mitigation programs designed to limit emissions. Accurate forecasting of future emissions is essential to programs implemented to reduce toxic emissions.
- **Kansas City Study.** This study is designed to determine the distribution of PM emissions in a randomly selected fleet as well as identify the percent of high emitters in the fleet. The Kansas City Study was initiated by EPA to conduct exhaust emissions testing on 480 light-duty, gasoline vehicles in the Kansas City Metropolitan Area (KCMA). This project will also characterize gaseous and PM toxics exhaust emissions from a portion of these light-duty vehicles. Data obtained from this program will be used to evaluate and update emission models, evaluate existing emission inventories, and assess the representativeness of previous emissions studies.
- **Multiple Air Toxics Exposure Study Science and Uncertainty Review (MATES-II).** This study is designed to evaluate the scientific techniques of this influential Southern California study to determine whether these techniques would be appropriate for use today, and the scientific uncertainties associated with the 1998 study. There are two phases to the study. The first examines the transportation side (activity, emissions and concentrations), while the second looks at the toxicity and exposure assessments conducted as part of MATES-II. The FHWA wants to better understand how the results were obtained and how relevant they are to transportation planning.
- **Knowledge Gaps and Research Needs in Linking Mobile Source Air Toxics To Potential Public Health Risks.** This study, to be conducted by the independent Health Effects Institute (HEI), is designed to better understand the fundamental science and relationships between transportation vehicle emissions, potential and actual human health impacts, determine the technical strength of published studies, and identify data quality gaps and data gaps. The final study report will summarize concentration and dose-response relationships, toxic effects, and

their relation to actual human health impacts that could result from real-world exposures to the extent possible. Researchers will be asked to evaluate the quality of study findings for use in risk assessments and the quality of such data on risk assessment numerical findings. Research cooperators can then synthesize their technical findings to identify knowledge gaps and research needed to determine the strength of linkages between mobile source air toxics, potential public health risks as expressed in epidemiology or risk assessment studies, and frank health effects with clearly definable cause and effect relationships. Research cooperators will be asked to chemical and physical composition of MSAT, identify variability in MSAT, and identify the strength of relationships between MSAT related pollutants and their potential health effects.

Attachment C – ***CEQ Provisions Covering Incomplete or Unavailable Information (40 CFR 1502.22)***

Sec. 1502.22 Incomplete or unavailable information.

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.

Appendix E—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 MSATs. In addition, the SAFETEA-LU has emphasized a host of diesel retrofit technologies in the law's CMAQ provisions - technologies that are designed to lessen a number of MSATs.[5]

Construction mitigation includes strategies that reduce engine activity or reduce emissions per unit of operating time. Operational agreements that reduce or redirect work or shift times to avoid community exposures can have positive benefits when sites are near vulnerable populations. For example, agreements that stress work activity outside normal hours of an adjacent school campus would be operations-oriented mitigation. Also on the construction emissions front, technological adjustments to equipment, such as off-road dump trucks and bulldozers, could be appropriate strategies. These technological fixes could include particulate matter traps, oxidation catalysts, and other devices that provide an after-treatment of exhaust emissions. The use of clean fuels, such as ultra-low sulfur diesel, 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: www.epa.gov/otaq/retrofit/retroverifiedlist.htm

Post-Construction Mitigation for Projects with Potentially Significant MSAT Levels

Longer-term MSAT emissions can be more difficult to control, as variables such as daily traffic and vehicle mix are elusive. 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 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 areas of vulnerable populations. 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.

[5] SAFETEA-LU, Public Law 109-59, August 10, 2005