NCDOT Air Quality Handbook

Appendix B
CO and PM Language Guidance Document

(Note – This section provides details on air quality modeling procedures for carbon monoxide and particulate matter and is taken from the NCDOT Air Quality Manual, Version 1.0 (July 20, 2016). Because modeling for these pollutants is no longer required in NC, this document will have very limited applicability, but is provided here for information in the event it is needed.

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL ANALYSIS UNIT
TRAFFIC NOISE & AIR QUALITY GROUP

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1 Technical Procedures for CO Modeling

1.1 Appropriate Level of Analysis

As stated in section 2 of this document, project-level CO hot-spot analyses are no longer required in North Carolina as part of the NEPA/SEPA process, unless they are deemed necessary to respond to public or agency comments.

1.1.1 Qualitative Analysis

A qualitative analysis should be performed for transportation improvement projects that are determined to be insignificant from an air quality perspective, per 40 CFR 93.126. For exempt projects, a qualitative analysis will consist of a project description, and a general overview of the existing and future CO air quality. For non-exempt projects, qualitative analyses may be adequate if a project is not expected to adversely impact project-level air quality levels.

1.1.2 Quantitative Analysis

A quantitative analysis should be performed only for projects that meet special approval by NCDOT. A quantitative analysis will consist of a detailed hot-spot analysis. Detailed micro-scale CO modeling uses site-specific and area-specific data to predict CO concentrations under actual operating conditions.

1.1.2.1 Detailed Micro-Scale CO Modeling

Detailed air quality modeling consists of running the EPA emission factor model (MOVES) in conjunction with the highway dispersion model (CAL3QHC/CAL3QHCR). This detailed modeling approach will account for all modeling parameters and provide the analyst with a more accurate representation of existing and future worst-case CO levels within the corridor.

1.2 EPA / FHWA Approved Models

The micro-scale CO modeling process relies on EPA-approved air quality models to simulate pollutant emissions of highway sources and the dispersion of those pollutants to near-by receivers. This section of the document describes the applicable air quality emission and dispersion models and provides guidance for completing detailed micro-scale CO modeling studies in North Carolina.

1.2.1 MOVES2014

EPA's MOVES software replaces the previous model, MOBILE6.2, for estimating on-road mobile source emissions. MOVES2014, the latest version of the software, can be used to estimate air pollution emissions from cars, trucks, motorcycles, and buses. MOVES2014 is approved for use in official state implementation plan (SIP) submissions to EPA and for transportation conformity analyses. It can also be used to estimate the benefits from a range of mobile source control strategies, for more general analyses of national or local emissions trends, and for policy evaluation. MOVES2014 is EPA's best available tool for quantifying criteria pollutant and precursor emissions, as well as for other emissions analyses of the transportation sector. MOVES2014 is EPA's approved motor vehicle emission factor model for estimating volatile organic compounds, nitrogen oxides, carbon monoxide, particle pollution, and other pollutants and precursors from cars, trucks, motorcycles, and buses by state and local agencies outside of California. EPA has established a grace period ending October 7, 2016, for using MOVES2014 instead of the previous version, MOVES2010b, for regional transportation conformity purposes and transportation conformity hot-spot analyses.

Reference: http://www.epa.gov/otaq/stateresources/transconf/policy.htm#models.

1.2.2 CAL3QHC / CAL3QHCR

CAL3QHC is an EPA-approved mobile source dispersion model used to predict CO (and other inert pollutants) concentrations at sensitive locations adjacent to roadways and roadway intersections. The CAL3QHC model is an effective tool for predicting pollutant concentrations due to motor vehicles operating under free-flow conditions, as well as from idling vehicles under stop-and-go conditions (near signalized intersections). The model considers roadway geometries, receptor locations, meteorological conditions, and vehicular emission rates. Additionally, it incorporates intersection-specific parameters and detailed signal information (e.g., signal timing and intersection lane assignments) to predict pollutant concentrations at near-by sensitive receivers. The current version of the CAL3QHC model is available for download from EPA's web site (see link below).

CAL3QHCR is a refined version of the original CAL3QHC program that was developed as a modeling tool to predict roadside CO concentrations. CAL3QHCR can be used to estimate ambient CO concentrations and to process hourly meteorological data over a year, hourly emissions, traffic volume, and signal data. To run CAL3QHCR, the air quality analyst needs meteorological, traffic, and vehicle emissions data at specified intervals over some time period, such as hourly average data for a year. The line source dispersion model CAL3QHCR can be obtained from the EPA website below.

Reference: http://www.epa.gov/scram001/dispersion_prefrec.htm

1.3 Micro-Scale CO Modeling Guidance

If micro-scale CO modeling is required based on the project scoping, the detailed emission/dispersion analysis should be performed using the EPA/FHWA approved models described in the previous section and the modeling parameters described below. Additional EPA guidance for micro-scale CO modeling is provided in EPA-420-B-15-028, *Using MOVES2014 in Project-Level Carbon Monoxide Analyses*, March 2015 and in EPA-454/R-92-005, *Guidelines for Modeling Carbon Monoxide from Roadway Intersections*, November 1992.

1.3.1 Consideration of Areas Sensitive to Air Quality Impacts

Consideration of areas sensitive to air quality should be identified during the scoping phase of the project. As a general rule, the modeling analysis should focus on those areas where the general public has continuous access and where maximum project-related pollutant concentrations are likely to occur. For projects that include signalized intersections, the three intersections with the worst-case levels of service (only including those operating at LOS D or worse in the peak hour) in the project design year build condition should be selected for the analysis. The intersections should be modeled for the existing year, opening year, and design year under no build conditions. The intersections should be modeled for the opening year and design year under build conditions. The project's design should mitigate any air quality concentration exceedances in both the opening year and design year.

1.3.2 Receptor Locations

An important step for the air quality analyst is selecting reasonable locations for air quality receptors. Generally, these locations are places where the general public has continuous access and where maximum total project-related CO concentrations are likely to occur. Since the highest CO concentrations tend to occur near signalized intersections, sidewalks are often a good choice when identifying reasonable receptor locations.

In general, receptors should be placed at each approach on both sides of the road (refer to EPA-454/R-92-005 for additional guidance). Receptors should be placed at 1.8 meters (5.9 feet) above the ground to represent the typical breathing height of the general public.

The following are all examples of reasonable receptor sites:

- Sidewalks which the general public can access
- Portions of a nearby parking lot to which pedestrians have access
- Residences, hospitals, rest homes, schools, playgrounds and the entrances and ground-level air intakes to all other buildings

The following are unreasonable receptor site locations:

- Roadway medians
- Locations within the right-of-way on limited access highways
- Within intersections or in intersection crosswalks
- Tunnel approaches
- Tollbooths

1.3.3 Determination of Analysis Years

The air quality analysis should model the no build alternative for existing year, opening year, and design year traffic conditions and the build alternative for opening year and design year traffic conditions. Prior to the effective date of this Handbook, the air quality analysis was required to include both the no build and build alternatives for the opening year, opening year plus five years, and design year.

1.3.4 Determination of Background Concentrations

The project-level CO modeling analysis must consider not only pollutant concentrations associated with the proposed project, but also background CO concentrations that may be present in a given area. In order to determine background CO concentrations in a given project area, a number of different methods or assumptions can be used. For the purposes of this guidance, the following sections are recommended when determining background CO concentrations.

1.3.4.1 Department of Environmental Quality Data

NCDEQ/DAQ maintains a network of air quality monitoring stations across North Carolina. The goals of North Carolina's ambient air monitoring program are to evaluate compliance with federal and state air quality standards, provide real-time monitoring of air pollutant episodes, develop data for trend analysis, support the development and implementation of air quality regulations, and provide information to the public on daily air quality conditions. NCDEQ/DAQ monitors air quality in areas having high population densities, high levels of expected contaminants, or a combination of both factors. There are currently a total of three CO monitoring sites located throughout the state.

Reference: https://xapps.ncDEQ.org/aq/ambient/AmbtPollutant.jsp

Whenever possible or practical, the air quality analyst should reference the closest NCDEQ/DAQ monitoring station to document the second-highest one-hour and eight-hour CO concentration during the last reporting year at the nearest monitoring site. In the event that the monitoring site is located more than 20 miles from the project site or does not adequately represent the project area, a default value should be assumed. **TABLE 3** provides these locally-specific background concentrations. The following section discusses appropriate default background concentrations for both urban and rural areas.

Temperature data (for use in CO modeling) is also available from each of the NCDEQ/DAQ monitoring stations. Historic weather data is also available from a host of on-line sources in the event that no NCDEQ/DAQ monitoring sites are present in proximity to a given project area.

Reference: http://climate.ncsu.edu/

Reference: http://www.nws.noaa.gov/view/states.php?state=NC

1.3.4.2 Default Background Assumptions

In the event that air quality monitoring data is not available or appropriate for the project corridor, a default background level should be assumed. In North Carolina, typically a one-hour background concentration for rural conditions should be assumed at 2.9 parts per million (ppm). For urban and suburban conditions, a typical one-hour background concentration of 2.7 ppm should be assumed. For eight-hour CO predictions, a background concentration of 2.3 ppm should be assumed for those areas where no NCDEQ/DAQ CO monitoring data is available. These assumed background levels are intended to represent worst-case ambient conditions based on review of recent conditions and trends at current monitoring stations throughout the state.

In all cases, either monitored or assumed background CO concentrations should be added to project-specific CO predictions after the modeling protocol is complete and worst-case project-level CO concentrations are predicted. This applies to both the estimation of both one-hour and eight-hour CO levels.

1.3.5 NAAQS for CO and Required Averaging Periods

The NAAQS for CO are 35 ppm and 9 ppm for the second-highest one-hour and eight-hour periods, respectively. These are “primary standards” adopted to protect against adverse health effects to the general public, including sensitive populations such as asthmatics, children, and the elderly.

Consistent with these EPA standards, total CO concentrations (i.e., the sum of project-level and background concentrations) for project-level analyses should be projected to represent worst-case one-hour and eight-hour averaging periods. The air modeling emission/dispersion analysis should be conducted using a one-hour averaging period. Eight-hour concentrations should be derived by applying a “persistence” factor to the one-hour level to predict eight-hour levels.

The concept of a persistence factor represents a combination of the variability in both traffic and meteorological conditions, focusing on one-hour and eight-hour durations. FHWA guidance for the calculation of project-specific persistence factors is provided in FHWA Southern Resource Center, Manual for Air Quality Considerations in *Environmental Documents*, January 2001, as well as in EPA-454/R-92-005, *Guidelines for Modeling Carbon Monoxide from Roadway Intersections*, November 1992.

For the purposes of most project-level air quality modeling assessments, air quality impacts are not anticipated (i.e., project does not have the potential for causing a violation of the one-hour or eight-hour NAAQS for CO). EPA supports the concept of using a worst-case assumed persistence factor to simplify the conversion of one-hour concentrations to eight hour concentrations. EPA recommends the use of a default factor of 0.7 to convert from peak one- hour concentrations to peak eight-hour concentrations, while NCDEQ/DAQ recommends a persistence factor of 0.79 NCDEQ/DAQ's persistence factor is reasonably conservative based on review of state-wide CO monitoring data. Generally, this approach will be adequate to show compliance with the NAAQS for most CO modeling analyses. NCDOT requires the use of a persistence factor of 0.79 for all CO modeling.

TABLE 1. BACKGROUND CO CONCENTRATIONS AND PERSISTENCE FACTORS

County City	Site Location	Site Average		Regional Average	
		Background (ppm)	Persistence Factor	Background (ppm)	Persistence Factor
Cumberland Fayetteville	1705 Owen Dr	2.9	0.78	2.9	0.78
Forsyth Winston-Salem	1401 Corporation Pkwy	2.8	0.81	2.7	0.80
Forsyth Winston-Salem	100 SW Stratford Rd	2.8	0.73	2.7	0.80
Guilford Greensboro	401 W Wendover Ave	2.4	0.86	2.7	0.80
Mecklenburg Charlotte	301 N Tryon St	2.6	0.82	2.6	0.82
New Hanover Wilmington	Oleander St & College Rd	2.4	0.73	2.4	0.73
Wake Raleigh	420 S Person St	3.8	0.81	2.9	0.79
Statewide	-	-	-	2.9	0.79

Site average background and persistence factors are valid only if the project is located within 1000' of the monitor site; regional or statewide averages are applicable elsewhere.

If the conversion from one-hour to eight-hour concentrations using a persistence factor of 0.79 leads to total CO concentrations above the NAAQS (i.e., has the potential for contributing to a violation of the NAAQS for CO), more refined (less conservative) techniques are available. These more refined techniques rely on the review of area-specific CO monitoring data, project-specific traffic data, or more refined modeling practices to avoid unrealistically high eight-hour predictions (above the NAAQS).

1.3.6 Micro-scale Modeling Defaults

EPA-454/R-92-005, *Guidelines for Modeling Carbon Monoxide from Roadway Intersections*, November 1992 provides guidance for the appropriate meteorological conditions (and other model defaults) that should be specified for dispersion modeling (CAL3QHC/CAL3QHCR). **TABLE 4** provides a general summary of the input parameters that should be used for CO modeling purposes in North Carolina.

TABLE 2. CAL3QHC DEFAULT VALUES

Modeling Parameter	Default Value
Temperature	Minimum, maximum, and/or average temperatures for January conditions
Wind Speed	1.0 meter per second (m/s)
Wind Direction	Varying wind direction 0 to 350 degrees at 10 degree increments
Atmospheric Stability Class	Urban – stability class D; Rural – stability class E
Mixing Height	1000 meters
Surface Roughness	Refer to EPA guidance
Saturation Flow Rate	1600 vphg (when value is not available)
Clearance Time Lost	2 seconds (average driver)
Arrival Rates	Average progression
Receptor Heights	1.8 meters (5.9 feet)
Settling Velocity	0 for carbon monoxide
Deposition Velocity	0 for carbon monoxide

1.3.7 Data Needs

In order for the air quality analyst to accurately predict CO concentrations for all project scenarios, an array of information is required. Data needs include but are not limited to the following:

- **Detailed Traffic Data Reports** – Detailed traffic software (including HCS, Synchro, TransModeler, VISSIM, etc.) reports provide the air quality analyst with total traffic volumes, turning movement volumes, saturation flow rates, cycle lengths, and signal phasing. The air quality analyst will need to obtain the data for existing year no build, opening year no build and build, and design year no build and build conditions.
- **Detailed Intersection Schematics** – The air quality analyst will need to obtain the existing and proposed intersection design plans for the study intersections to ensure the analysis accurately represents the no build and build roadway geometry.
- **MOVES Inputs** – The air quality analyst will need to coordinate with the appropriate MPO, NCDEQ/DAQ, or NCDOT to obtain the most recent MOVES2014 inputs for a particular region. This information is crucial for accurately predicting CO emissions in those areas where detailed Inspection/Maintenance (I/M) and anti-tampering programs exist. MOVES2014 input data (used for regional air quality conformity evaluations) should be requested from the appropriate agency to assist in the development of project-specific MOVES2014 input parameters. In situations where local/regional air quality control information is not available, worst-case input variables should be assumed to yield worst-case CO results.
- **Temperature Data** – The analyst will need to coordinate with NCDEQ/DAQ (or other applicable sources) for region-specific temperature data for use in MOVES2014 modeling. In order to ensure worst-case predictions, all CO modeling in North Carolina should be performed to simulate the current date of the analysis conditions, the time of year when CO emissions are generally greatest due to the incomplete combustion of fossil fuels in cold conditions. Therefore, the air quality analyst

should request the minimum, maximum, and average temperatures for the most recently available January conditions.

1.4 Compliance with NAAQS for CO

At the completion of the micro-scale air quality modeling analysis, total CO concentrations (i.e., the sum of project-level and background concentrations) for existing, opening, and design years, for each alternative evaluated (including the no build option) should be compared to the NAAQS for CO. The NAAQS for CO are 35 ppm and 9 ppm for the second-highest one-hour and eight-hour periods, respectively.

1.5 Model Refinement and Air Quality Impact Mitigation

Generally, due to its worst-case nature, mobile source air quality modeling typically over-predicts CO concentrations when compared to actual operating conditions. These over-predictions do not pose a problem as long as predicted levels fall below the NAAQS. In this case, the modeling exercise is used to ensure a proposed project does not have the potential for causing a violation of the NAAQS for CO. If a detailed micro-scale modeling analysis predicts CO concentrations above the NAAQS, refined modeling techniques are available to more accurately predict real-world conditions. Refined modeling techniques may include the use of local meteorological data or development of area- and project-specific (eight-hour) persistence factors.

If refined modeling techniques are necessary, consultation with NCDOT and NCDEQ/DAQ is recommended. In the event that refined modeling still predicts CO concentrations above the NAAQS, the addition of air quality impact mitigation measures as part of the project’s design may be necessary.

Although relief strategies are somewhat limited, any activity which reduces congestion or increases facility speeds will typically improve local air quality. Some possible relief strategies include roadway/intersection design modifications (e.g., adding or removing turning lanes), intersection operational changes (e.g., signal coordination, retiming, or re-phasing), or other congestion management strategies. Such considerations should be coordinated with the project’s highway and traffic engineering staff.

2 Technical Procedures for Particle Pollution Analyses

2.1 Introduction

On March 10, 2006, the EPA published a Final Rule (40 CFR 93.116) that establishes transportation conformity criteria and procedures for determining which transportation projects must be analyzed for localized impacts in $PM_{2.5}$ and PM_{10} nonattainment and maintenance areas. The rule was followed by a March 29, 2006, guidance document issued jointly by the EPA and FHWA that provides information for state and local agencies to meet the hot-spot requirements established in the final transportation conformity rule. Currently, a "quantitative" analysis is required for those projects determined to be of air quality concern. There is guidance published in the Federal Register for completing a $PM_{2.5}$ quantitative analysis for projects of air quality concern.

2.2 Qualitative Analyses

To meet statutory requirements, the March 10, 2006, final rule requires $PM_{2.5}$ and PM_{10} hot-spot analyses to be performed for projects of air quality concern. Through the final rule, EPA determined that projects not identified in 40 CFR 93.123(b)(1) as projects of air quality concern have also met statutory requirements without any further hot-spot analyses (40 CFR 93.116(a)).

2.3 Quantitative Analyses

Once a quantitative analysis is deemed necessary for a project, the air quality analyst should coordinate with NCDOT to establish the analysis methodology and parameters. Interagency consultation with NCDOT, NCDEQ, and FHWA will be necessary to ensure compliance with national best practices and procedures.

The EPA has released final guidance for quantifying the local air quality impacts of certain transportation projects and comparing them to the $PM_{2.5}$ and PM_{10} NAAQS. This guidance, "Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas," is to be used by state and local agencies to conduct quantitative "hot-spot" analyses for new or expanded highway or transit projects with significant increases in diesel traffic. See the Federal Register notice of availability for more information on EPA's approval. EPA developed this guidance in coordination with the Department of Transportation, state and local agencies, and other stakeholder groups.

2.3.1 Purpose of the Guidance

This guidance describes how to complete quantitative PM hot-spot analyses. A hot-spot analysis is an analysis of a transportation project's impact on future localized pollutant concentrations and a comparison of those concentrations to the relevant NAAQS. These analyses are required only for new or expanded highway or transit projects with significant increases in diesel traffic. While this guidance addresses quantitative PM hot-spot analyses for transportation conformity purposes, certain sections of this guidance may be applicable when completing air quality analyses for transportation projects for other purposes.

The following sections describe how to estimate project emissions using EPA's MOVES model, California's EMFAC model, and other methods. It also outlines how to apply air quality models (AERMOD and CAL3QHCR) for PM hot-spot analyses.

2.3.2 Background

Transportation conformity is a Clean Air Act requirement that ensures that federally-supported highway and transit projects are consistent with state air quality implementation plans. Conformity helps protect public health through early consideration of the air quality impacts of transportation decisions in places where air quality does not currently meet the NAAQS or has not met them in the past.

2.3.3 Completing a Quantitative Particle Pollution Hot-Spot Analysis

The basic steps for completing a quantitative PM hot-spot analysis is described in EPA's final guidance. In general, a hot-spot analysis compares the air quality concentrations with the proposed project (the build scenario) to air quality concentrations without the project (the no build scenario). For either scenario, it is necessary to consider emissions from the project and any nearby sources, as well as determine background concentrations. From this information, design values can be calculated to determine if a project conforms. If the build design values are less than or equal to the relevant NAAQS, the project is considered to be conforming. A project will also conform if the build scenario design values are greater than the NAAQS but less than or equal to the design values for the no build scenario.

3 Technical Procedures for MSAT Analyses

To assist in determining the required level analysis please see Project Level Air Quality Analysis Determination Flow Chart in **Appendix A** of the handbook. MSAT discussion and analysis only applies to EA and EIS level documents.

If a NEPA document is being prepared, a qualitative analysis should be completed consistent with Section 3.2.2 of this Manual. If the future AADT is 140,000 or more, a more rigorous analysis may be needed, and FHWA should be consulted for additional guidance.

If a SEPA document is being prepared, a qualitative analysis should be completed consistent with Section 3.2.2 of this Manual; however, if the future AADT is 140,000 or more, the Traffic Noise and Air Quality Group should be consulted for additional guidance

3.1 Background

The Clean Air Act identified 188 air toxics referred to as hazardous air pollutants. The EPA has assessed this list of toxics and identified a group of 21 as Mobile Source Air Toxics. The EPA also identified a subset of this list that is now considered as the seven priority MSAT. These are acrolein, benzene, 1,3-butidiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. While these MSAT are considered the priority transportation toxics, the EPA has indicated that the lists are subject to change in future rulings.

Relative to project-level analysis, the tools and techniques for assessing project-specific health impacts from MSAT are limited. These limitations restrict NCDOT's and FHWA's ability to evaluate how MSAT health risks should factor into project-level decision-making under NEPA. It is anticipated that the EPA will provide further clarification and analytical tools for assessing MSAT on a project-level in the future.

FHWA recognizes that air toxics continue to be an area of concern on transportation projects during the NEPA process. As such, FHWA has issued the *Updated Interim Guidance on Air Toxic Analysis in NEPA Documents* (October2016) to provide guidance on how MSAT should be addressed in NEPA documents for highway projects. This interim guidance and an expanded discussion of MSAT can be referenced on the FHWA’s website:

https://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/msat/index.cfm

3.2 MSAT Analytical Procedures

There are currently no established criteria for determining the scope of MSAT emissions analyses. Therefore, a range of options should be considered when addressing this issue in NEPA documentation. FHWA has developed a tiered approach for analyzing MSAT 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

- Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects

3.2.1 Projects with No Meaningful Potential MSAT Effects or Exempt Projects

Three types of projects included in this category are:

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

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

3.2.2 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. Most highway projects that need an MSAT assessment will fall into this category. Examples of these types of projects are minor widening projects, new interchanges, replacing a signalized intersection on a surface street, or projects where the design year traffic is projected to be less than 140,000 to 150,000 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, no appreciable difference in overall MSAT emissions among the various alternatives is expected.

The Interim Guidance appendix 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 the FHWA Interim Guidance appendix should be modified to reflect the local and project-specific situation.

In addition to the qualitative assessment, a NEPA document for this category of projects must include a discussion of information that is incomplete or unavailable for a project specific assessment of MSAT impacts, in compliance with the Council on Environmental Quality (CEQ) regulations (40 CFR 1502.22(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 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. The FHWA Interim Guidance appendix contains more information.

3.2.3 Projects with Higher Potential MSAT Effects

This category includes projects that have the potential for meaningful differences in MSAT emissions among project alternatives. A limited number of projects are expected 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 or greater by the design year, and
- Proposed to be located in proximity to populated areas

Once a quantitative analysis is deemed necessary for a project, the air quality analyst should coordinate with NCDOT to establish the analysis methodology and parameters. Interagency consultation with NCDOT, NCDEQ, and FHWA will be necessary to ensure compliance with national best practices and procedures. Projects falling within this category should be more rigorously assessed for impacts. If a project falls within this category, the air quality analyst should contact NCDOT and the Office of Natural Environment and the Office of Project Development and Environmental Review in FHWA Headquarters for assistance in developing a specific approach for assessing impacts.

Reference:

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 provided in the appendix of the FHWA Interim Guidance.

Should a quantitative analysis be deemed necessary, air quality modeling should be done using EPA's MOVES software which replaced the previous model, MOBILE6.2, for estimating on-road mobile source emissions. MOVES2014b, the latest version of the software, can be used to estimate air pollution emissions from cars, trucks, motorcycles, and buses. MOVES2014 is approved for use in official state implementation plan (SIP) submissions to EPA and for transportation conformity analyses. It can also be used to estimate the benefits from a range of mobile source control strategies, for more general analyses of national or local emissions trends, and for policy evaluation. MOVES2014 is EPA's best available tool for quantifying criteria pollutant and precursor emissions, as well as for other emissions analyses of the transportation sector. MOVES2014 is EPA's approved motor vehicle emission factor model for estimating MSATs and other pollutants and precursors from cars, trucks, motorcycles, and buses by state and local agencies outside of California. MOVES2014 is updated by the EPA when needed, and therefore the Air Quality analyst must consult the EPA website prior to modeling for projects to ensure any updates have been downloaded.

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 of the FHWA Interim Guidance for information on mitigation strategies.

In the case of a project that does not fall within any of the types of projects listed, but may have the potential to substantially increase future MSAT emissions, consult the Traffic Noise and Air Quality Group.