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# Chapter 18

## AIR QUALITY

### 18.1 NDOT AIR QUALITY ANALYSIS

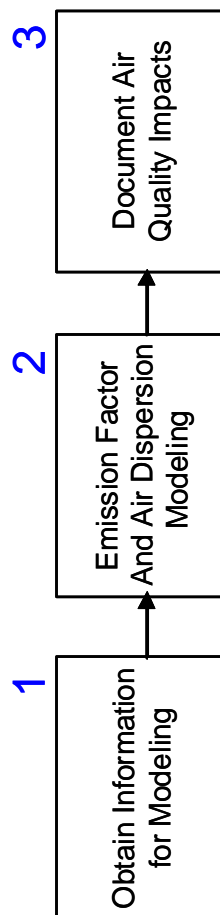


Figure 18.1-A — AIR QUALITY ANALYSIS

**PROJECT ACTIVITY**

Activity Title: Obtain Information for Modeling

Activity No.: 1

Activity Description:

To perform air quality dispersion modeling, the Environmental Services Division will obtain project design and traffic information, as follows:

1. Design Files. Digital files of roadway geometry for the existing condition (NO BUILD) and the design-year (BUILD) condition will be obtained. These files will be in MicroStation format, complete with elevation data. Design files for the project are obtained from NDOT's Design Division, NDOT's Project Management Division or the project consultant. These files are used by the air quality analyst to obtain coordinates for roadway links and model receptors.
2. Traffic Data. The Environmental Services Division will obtain link/roadway segment activity data for the design-year (i.e., NO BUILD and BUILD) traffic volume, and the free-flow speed data for each affected intersection or freeway link. For intersections, peak hour approach and departure volumes (veh/hr) are required. For freeway segments, directional peak-hour volumes are required. For intersection approach and departure links and freeway segments, the average peak hour free flow speed is required data. For intersections, the total cycle length, red time and delay time are required.

Traffic activity data is requested from NDOT's Traffic Information and Traffic Engineering Divisions or the project consultant.

Vehicle mix information (i.e., proportions of vehicle types) is not available for individual projects, but is available for the regional transportation system. The analyst will consult the local MPO or air quality agency to obtain vehicle mix data. NDOT's Traffic Information Division may have updated vehicular mix data, but the analyst must use the same vehicular mix data used by the local air agency or MPO.

3. Traffic Analysis Reports. Traffic Analysis Reports will be obtained, which include detailed traffic forecast and design alternative information for project corridors or regional-scale transportation systems. The Environmental Services Division will use these types of studies to perform mobile source air toxics (MSAT) emission inventories.

**PROJECT ACTIVITY**

Activity Title: Emission Factor and Air Dispersion Modeling

Activity No.: 2

Activity Description:

Emission factor modeling and air dispersion modeling will be performed for projects in CO, PM<sub>10</sub>, PM<sub>2.5</sub> and ozone non-attainment areas to demonstrate that the proposed project will not cause new violations, or exacerbate existing violations, of the National Ambient Air Quality Standards (NAAQS) for these pollutants.

Acceptable air dispersion models do not exist for PM<sub>10</sub>, PM<sub>2.5</sub> and ozone. Therefore, the Environmental Services Division will perform qualitative assessments of local factors to analyze air quality impacts for these pollutants. Quantitative modeling will be performed for CO as follows:

1. Emission Factor Modeling. To compute emission factors for various pollutants, the Environmental Services Division will use the Emission Factor Model, as approved by the US Environmental Protection Agency (USEPA), with the graphical-user interface (GUI).

The USEPA, after 2008, will release a new mobile source model (i.e., MOVES) and mandates its use for mobile-source emission factor modeling.

The Environmental Services Division will consult the local air quality agency or MPO for local inputs to be used in the emission factor model (e.g., Clark County Department of Air Quality and Environmental Management (DAQEM), Washoe County Air Quality Management Division (AQMD)). The local air quality agency may have emission factor tables that can be used in lieu of the emission factor model running.

2. Air Dispersion (Hot-Spot) Modeling. The Environmental Services Division will use the USEPA-approved model for CO dispersion modeling, with the GUI. The Environmental Services Division will use traffic activity data, plus the emission factors as inputs to run the dispersion model.

The dispersion model has functionality to calculate model PM<sub>10</sub> and PM<sub>2.5</sub> concentrations; however, its use is not endorsed by the FHWA or the USEPA to model these pollutants.

CO hot-spot modeling will be performed for the design-year BUILD condition for the preferred design alternative. If this first-pass analysis produces a model exceedance, then the design-year NO BUILD condition will be analyzed.

## PROJECT ACTIVITY

Activity Title: Emission Factor and Air Dispersion Modeling  
(Continued)

Activity No.: 2

Activity Description:

For quantitative CO modeling, the local background concentration will be added to the model concentrations for each receptor to determine compliance with the NAAQS. To derive background concentrations, the Environmental Services Division will use monitoring data from an EPA-approved network operated by the State or local air quality agency. This data is requested from the local agency, or retrieved from the USEPA's AirData website. The Environmental Services Division will plan each modeling task on a case-by-case basis, using best judgment and available guidance to determine the appropriate background value.

It is not unusual for BUILD model concentrations to be higher than NO BUILD concentrations. The reason for this is that model concentrations are dependent upon both the emission rate of CO and traffic activity. As long as the total impact for the design year (i.e. background + model concentrations) does not exceed the NAAQS, then no operational phase mitigation measures for the project are required.

3. Qualitative Assessments for PM<sub>10</sub> and PM<sub>2.5</sub>. Projects in PM<sub>10</sub> and PM<sub>2.5</sub> non-attainment and maintenance areas are subject to hot-spot analyses to determine air quality impacts. Dispersion modeling is not required, but the NDOT will perform a qualitative assessment of local factors to demonstrate the proposed project will not create new violations of the NAAQS.

Nevada is attaining the NAAQS for PM<sub>2.5</sub>, so a qualitative assessment for this pollutant is not required. However, both Clark and Washoe counties are in non-attainment for PM<sub>10</sub>. Therefore, impacts for these pollutants must be assessed for projects in the urban areas of Clark County and southern Washoe County.

The Environmental Services Division will follow USEPA guidance for qualitative PM<sub>10</sub> assessments. In 2005, the California Department of Transportation (CalTrans) released a PM<sub>10</sub> screening protocol, which the NDOT uses to complement the procedures outlined in the USEPA guidance.

4. Assessing Ozone Impacts. Ozone is an area-wide pollutant assessed as part of the development of state implementation plans (SIPs). State and local air quality agencies develop SIPs for non-attainment areas. In addition, ozone is evaluated as a regional pollutant by MPOs, using emissions inventories for its precursors, NO<sub>x</sub> and VOCs, as part of the regional conformity process. Ozone is not a concern as a hot spot pollutant.

## PROJECT ACTIVITY

Activity Title: Emission Factor and Air Dispersion Modeling  
(Continued)

Activity No.: 2

Activity Description:

5. Mobile Source Air Toxics (MSATs). The USEPA has established a list of 8 priority mobile-source air toxics (MSATs). The USEPA defines the priority MSATs as those most likely to present the highest risks to human health.

The priority MSATs include the following volatile organic compounds (VOCs): Benzene, formaldehyde, acetaldehyde, acrolein, 1,3 butadiene, naphthalene and polycyclic organic matter (POM). Diesel Particulate Matter (DPM), the eighth priority MSAT, is a fine aerosol composed of solid and liquid particles. MSATs are emitted from highway vehicles (e.g., cars, trucks, buses) and non-road sources (e.g., aircraft, marine vessels, construction equipment).

Air toxics analysis is an ongoing area of research by the USEPA and the Federal Highway Administration (FHWA), and they are developing strategies and procedures for modeling ambient concentrations of MSATs at the project level. Acceptable methods to model ambient concentrations of MSATs are not yet available.

In contrast to criteria pollutants, there are no ambient standards for MSATs. Therefore, it is not possible to determine whether project-specific MSAT emission levels should be considered significant. It is possible, however, to determine MSAT emission trends over time, and to determine whether meaningful differences in MSAT emission levels occur between project alternatives.

MSAT analyses are required for NEPA compliance. A quantitative MSAT analysis is required when any roadway segment for a project exceeds 150,000 ADT for the design-year BUILD scenario.

The USEPA's Emission Factor Model has functionality to calculate emission factors for the 8 priority MSATs, and its use is recommended by the FHWA for quantitative MSAT assessments. Emission factors for MSATs vary as a function of speed, vehicle mix, fuel composition and diurnal fluctuations in temperature.

To conduct an MSAT analysis, calculate emission factors for the pollutants (in grams/VMT), which are then multiplied by the daily vehicle-miles-traveled (VMT) for each affected roadway link or segment. This calculation gives the daily mass emission rate (in grams) for each of the pollutants, which are then summed to obtain the total daily MSAT emissions for that link or segment.

**PROJECT ACTIVITY**

Activity Title: Emission Factor and Air Dispersion Modeling  
(Continued)

Activity No.: 2

Activity Description:

The Environmental Services Division will follow the most recent guidance for performing and interpreting MSAT emissions inventories for transportation project alternatives.

Regulations and Guidance

CalTrans PM<sub>10</sub> Screening Protocol

Clark County Department of Air Quality and Environmental Management (DAQEM), 2004; *Nevada Air Quality Designations: Boundary Recommendations for the 8-hour Ozone NAAQS for Clark County, Nevada*

Clark County Department of Air Quality and Environmental Management (DAQEM), 2005; *Carbon Monoxide State Implementation Plan Revision: Las Vegas Valley Non-Attainment Area, Clark County, Nevada*

Claggett, M. and Miller, T.L., 2005; *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*; [www.fhwa.gov/environment/airtoxic/](http://www.fhwa.gov/environment/airtoxic/)  
Niemeier, D.; Nanzetta, K.; Eisinger, D.; Kear, T.; O'Loughlin, R.; Brady, M., 2005; *Technical Report: Particulate Matter and Transportation Projects, An Analysis Protocol*, UC-Davis-CalTrans Air Quality Project

USEPA, 1992; *Guideline for Modeling Carbon Monoxide from Roadway Intersections*, EPA 454/R-92-05

USEPA, 2006; *Transportation Conformity Guidance for Qualitative Hot-spot Analyses in PM<sub>2.5</sub> and PM<sub>10</sub> Nonattainment and Maintenance Areas*, EPA420-B-06-902

**PROJECT ACTIVITY**

Activity Title: Document Air Quality Impacts

Activity No.: 3

Activity Description:

The Environmental Services Division will prepare a statement of the air quality impacts and mitigation measures to be included in the NEPA document, and a technical memorandum or report for the administrative record. This is a summary report of air dispersion modeling results to show compliance with the NAAQS and to outline operational and construction phase mitigation measures that may be required. Each document is described below:

1. Outline for Technical Memorandum:

- Executive Summary. A 1-page summary of results and recommendations.
- Introduction. Summarize the project and the proposed action/alternative.
- Existing Conditions. Summarize the existing air quality conditions. Include tabulations of monitoring data and a statement of the attainment status of the various criteria pollutants.
- Operational Phase Impacts. Describe the CO modeling methodology and model results in tabular format. Describe the PM<sub>10</sub> qualitative analysis and assess PM<sub>10</sub> impacts. Write a short statement assessing ozone. Describe operational phase mitigation measures.
- Construction Impacts and Mitigation. Discuss that there may be short-term localized increases in CO and PM<sub>10</sub> due to construction activity. Mitigation for these impacts is done through enforcement of existing air quality regulations by State or local air quality agencies.
- Transportation Conformity. A statement that the two requirements for project-level transportation conformity have been satisfied.
- Mobile Source Air Toxics (MSATs). Discuss the results of the MSAT analysis.
- Appendices. Attach emission factor and dispersion model input and output files, plus maps of roadway geometry and model receptor points and the MSAT analysis.

**PROJECT ACTIVITY**

Activity Title: Document Air Quality Impacts  
(Continued)

Activity No.: 3

Activity Description:

2. NEPA Document. The NEPA document will contain pertinent information needed to support the analysis of air quality impacts of project alternatives and will include a discussion of mitigation measures for the air quality impacts.

See [Section 2.3 “Preparing An Administrative Record.”](#)

Regulations and Guidance

Federal Highway Administration (FHWA), 2006; *Interim Guidance on Air Toxic Analysis in NEPA Documents*



## **18.2 NDOT AIR QUALITY COMPLAINT RESPONSE & PERMITTING PROCESS**

The Environmental Services Division receives complaints from citizens and local air quality agencies. The most common complaints relate to fugitive dust. Each complaint is handled on a case-by-case basis.

The State and local air quality agencies enforce air quality regulations and standards. Contractors working for the NDOT are required to comply with air quality regulations and are responsible for knowing what air quality regulations apply, and what types of air quality permits are required.

NDOT employees comply with air quality regulations in the course of their day-to-day activities, as specified in the most recent guidance for maintenance personnel.

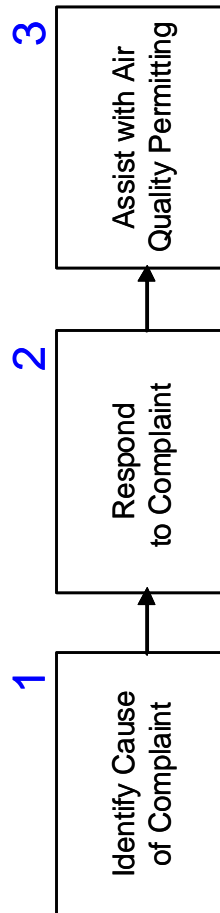


Figure 18.2-A — AIR QUALITY COMPLAINT RESPONSE & PERMITTING PROCESS

<b>PROJECT ACTIVITY</b>	
<u>Activity Title:</u>	Identify Cause of Complaint
<u>Activity No.:</u>	1
<u>Activity Description:</u>	
<p>The Environmental Services Division will determine whether the activities of a contractor, or the NDOT, precipitated the air quality complaint. Complaints to the Environmental Services Division come most commonly from air quality regulatory agencies.</p> <p>There are three agencies in Nevada tasked with enforcing air quality regulations:</p> <ul style="list-style-type: none"> <li>• the Nevada Division of Environmental Protection – Bureau of Air Pollution Control (NDEP/BAPC);</li> <li>• Washoe County Air Quality Management Division (AQMD); and</li> <li>• Clark County Department of Air Quality and Environmental Management (DAQEM).</li> </ul>	

**PROJECT ACTIVITY**

Activity Title: Respond to Complaint

Activity No.: 2

Activity Description:

1. Complaint Against a Contractor. If the actions of a Contractor prompt an air quality complaint, the Environmental Services Division will discuss the complaint with the Resident Engineer and/or the Project Manager, investigate and recommend remediation measures.
2. Complaint Against the Department. If the actions of NDOT employees prompt an air quality complaint, the Environmental Services Division will notify the District in which the alleged air quality violation occurred as to the nature of the complaint. The Air Quality Supervisor will investigate and advise the District as to what corrective actions may be taken to remedy the situation.

The Environmental Services Division will assist the Districts in resolving air quality disputes involving the actions of NDOT employees.

**PROJECT ACTIVITY**

Activity Title: Assist with Air Quality Permitting

Activity No.: 3

Activity Description:

The Environmental Services Division will assist NDOT districts with filing air quality permit applications, as dictated by the type of activity the districts perform. The following applies:

1. Clark County Dust Control Permit. The Environmental Services Division prepares and files an application for a variable-location dust control permit from the Clark County DAQEM. This permit is for NDOT's District I maintenance division, which covers activities by NDOT employees using NDOT equipment in Clark County. Contractors working for NDOT cannot operate under this permit.

The NDOT's variable-location dust control permit is renewed annually, and there is no charge to the NDOT for renewing the permit, which expires on July 4<sup>th</sup>. The renewal application is filed with the Clark County DAQEM in early June each year. The Assistant District I Engineer – Maintenance is the signatory on the permit application.

Neither the Washoe County AQMD or the NDEP/BAPC requires the NDOT to obtain dust control permits for routine maintenance activities elsewhere in the state.

2. Washoe County AQMD Permits. NDOT District II holds an air quality permit for its gasoline dispensing facility at Galletti Way in Sparks, Nevada. NDOT District II renews this permit annually, and the Environmental Services Division is not involved in managing or renewing this permit.
3. Contractor Permitting Requirements. The NDOT does not hold air quality permits on behalf of contractors. Contractors are required to pay for, obtain and comply with State and local entity permits for dust control. Contractors are required to obtain air quality permits for operating stationary source equipment (e.g., concrete batch plant, hot-mix asphalt plant, crushing/screening/conveyance plants).

