

- Use water-based or solvent free paints whenever possible and buy products that say “low VOC.”
- Seal containers of household cleaners, workshop chemicals and solvents, and garden chemicals to prevent VOCs from evaporating.
- Open Burning: Think about it. Burn when only legally. Never burn hazardous materials such as tires, rubber products, plastics, chemicals, and household garbage.
- Limit barbecue emissions by using an electric, natural gas or propane grill.
- Cut grass late in the evening or on a cool or overcast day. The USEPA estimates that a gasoline powered lawn mower emits 11 times the air pollution of a new car for each hour of operation.

### Resources

FHWA website: <http://www.fhwa.dot.gov/>

EPA website: <http://www.epa.gov/>

DAQ website: <http://eec.ky.gov/>



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Updated: March 2019

# AIR QUALITY

## FAQs

## Air Quality Frequently Asked Questions

### Sunlight + NOx + VOC = Ozone

The 200 million and more cars and light trucks on American roads account for over 30% of air pollution nationwide. Auto exhaust is a major contributor to NOx levels. Fuel evaporation is a source of VOC. Diesel emissions are a major contributor to PM<sub>2.5</sub>.

### How is Bad Air Identified?

Air quality is determined by readings from monitors that have been placed at strategic locations. A region can be designated as **nonattainment** for one or more pollutants based on monitor readings that fail to meet the NAAQS. Each designated area can have different nonattainment classifications, based upon the severity of violations. The worse the monitor reading, the more severe the air quality designation. The CAA requires that each State develop a **State Implementation Plan (SIP)** for each nonattainment pollutant. The SIP indicates how and when the State intends to meet the standards. Once the monitors show the air is improved, the area may be redesignated to **attainment with an approved maintenance plan**. However, such an area must demonstrate that it will continue to meet the NAAQS. The SIP details how much pollution is legal yet still be safe. This is referred to as an Emission Budget.

### What is an Emission Budget?

Pollution sources are generally classified into one of three different categories – stationary, area, and mobile. **Stationary sources** are relatively large, fixed sources of pollution, such as manufacturing facilities or power plants. **Area sources** consist of other fixed, but smaller facilities, such as gas stations or dry cleaners. **Mobile sources** include on-road sources of pollution, such as cars and trucks, and are linked to the highway and transportation infrastructure. In maintenance areas, each source category is assigned an emission reduction target. **For the mobile source**

### What are the Air Quality Standards?

In response to the **Clean Air Act (CAA)**, the **U.S. Environmental Protection Agency (EPA)** established **National Ambient Air Quality Standards (NAAQS)**. These pollutants adversely affect human health and welfare. Listed are the standards for the principal transportation-related criteria pollutants.

Pollutant	Violation Criteria
Ozone (O3) (8-hour)	< 8-hour average 0.070 ppm based on a 3 year average of annual 4 <sup>th</sup> -highest daily maximum.
Particulate (PM <sub>2.5</sub> )	< Annual mean 12µg/m <sup>3</sup> based on a 3 year average
Sulfur Dioxide (SO <sub>2</sub> )	99 <sup>th</sup> percentile of 1-hour daily maximum, averaged over 3 yrs
Carbon Monoxide (CO)	< Annual average 1-hour of 35ppm not to exceed more than once per year
Nitrogen Dioxide (NO <sub>2</sub> )	< Annual mean 53ppb
Lead	Rolling 3 month average Not to exceed .15µg/m <sup>3</sup>

While upper atmosphere ozone is good, ground level ozone is harmful to human health. Ozone is not emitted, but is created by a chemical reaction of NOx and VOC in the presence of sunlight.

**category, the emission target is referred to as the “motor vehicle emissions budget or MVEB”** and is spelled out in the SIP for current and future years for each area of air quality concern.

The MVEB represents the level of emissions allowed emitted by the area’s transportation system. The emissions for future years are determined by running the air quality model: MOTO Vehicle Emission Simulator or MOVES. This is accomplished by using input forecasted information such as population, employment growth, and all projects in the 20-year regional transportation plan.

Areas with an air quality concern must identify ways to offset any emissions increases and expected increases in traffic.

### What is Transportation Conformity?

**Transportation Conformity** is an analytical process required by the CAA to ensure that the planned transportation projects, in a nonattainment or maintenance area, are in compliance with the SIP. The process involves using EPA developed computer emission factor models (MOVES) or dispersion models (CAL3QHC) to determine theoretical on-road mobile source emissions for the area. Inputs to the air quality models include transportation information such as traffic volumes, vehicle types, and average speeds, as well as local climate information. Additionally, the models calculate air quality improvements for various implemented programs such as the use of alternative fuels and vehicle emission testing. In order for the transportation plan to be in transportation conformity, the models must predict emissions less than the allowable MVEB as set out in the SIP.

Transportation Conformity analysis is done by the Metropolitan Planning Organization (MPO) or the Kentucky Transportation Cabinet (KYTC) in consultation with EPA and Kentucky’s Division of Air Quality (DAQ), and approved by U.S. Department of Transportation (DOT). This

analysis is done at a minimum of every 3 years or when the 20 year transportation plan is modified.

Under the metropolitan planning requirements, projects cannot be approved, funded, advanced through the planning process, or implemented unless those projects are fiscally constrained and part of a conforming transportation plan. Additionally, in the PM2.5 nonattainment or maintenance areas, all projects must meet project level (or hotspot) conformity. Basically, a project must not contribute to or cause a PM2.5 violation.

### What is Transportation Conformity Lapse? What are the Consequences?

An area that cannot show transportation conformity is said to be in **Conformity Lapse**. No new highway or transit projects may advance. The only exceptions are “exempt projects”, which include non-capacity adding highway projects such as bridge replacements, signalizations, transit, bicycle and pedestrian facilities, safety improvements, and routine maintenance.

If a transportation plan or project does not meet conformity requirements, transportation officials have the following options:

- Add new measures to improve air quality.
- Delete projects that reduce air quality.
- Work with the appropriate state agency to modify the SIP to offset the plan, program, or project emissions.

### What is the Transportation Cabinet’s Role in Reducing Emissions?

Transportation officials participate in decision making for the SIP. The conformity regulation requires that federal, state, and local agencies establish formal procedures to ensure interagency coordination. Transportation officials are responsible for finding ways to reduce emissions from on-road mobile sources.

Emission reduction of mobile sources can be achieved through:

- Programs that address vehicle emissions: gas cap replacements, reformulated gasoline, implementation of Inspection and Maintenance programs.
- Changing travel patterns: ridesharing or use of transit.
- Transportation investments to reduce congestion: signal synchronization programs, adding turning lanes and incident management.
- Diesel idle reduction programs.

The State seeks EPA’s approval to revise SIP strategies if it cannot meet its commitments to reduce emissions from EPA-approved SIP strategies. It is important that the level of emission reductions assigned to each of the major pollution sources be achieved through the implementation of approved programs.

Additionally, KYTC has the responsibility for administering the Congestion Mitigation and Air Quality improvement Program (CMAQ) through the Office of Local Programs as legislated by Map-21. This program provides funding for project areas with air quality concerns.

CMAQ Projects include intersection improvements, traffic signal synchronization, leaking gas cap replacements and various transit projects. Intelligent Transportation Systems such as the OHGO System (<http://www.ohgo.com/Dashboard/sw-ohio>) in the Northern Kentucky/Cincinnati and TRIMARC in the Louisville area.

### Can we Forecast Pollution Levels?

Models taking into account wind patterns, forecasted temperatures, and other weather conditions, have been created to forecast ozone levels for up to 48 hours ahead. During ozone season, some metropolitan areas include the air quality forecast as part of their evening weather forecast. Based on these forecasts,

individuals can make decisions and take actions that either reduce their health risk and/or reduce air pollution. During the ozone season, the Lexington, Louisville, and Northern Kentucky area ozone forecasts are available at <http://lexareampo.org/what-we-do-air-quality/>, <https://louisvilleky.gov/government/air-pollution-control-district/services/check-air-quality-louisville> and [www.oki.org](http://www.oki.org), respectively. Additionally, you can view regional and national forecasts at the EPA AIRNOW website: [www.epa.gov/airnow](http://www.epa.gov/airnow).

### What does AQI Stand for?

AQI stands for **Air Quality Index**. This index was created for reporting daily air quality. AQI is calculated for each pollutant and ranges from 0 to 500, with a value of 0 being good and 500 being hazardous. An AQI value of 100 generally corresponds to the NAAQS for the pollutant, which is the level EPA has set to protect public health. Typically, the AQI is reported as the highest value occurring among all pollutant. You can find more information regarding AQI at [www.epa.gov/airnow](http://www.epa.gov/airnow).

### What Can I do to Reduce Air Pollution?

The following are a few of the things YOU can do to improve air quality:

- Car pool
- Consolidate trips
- Use public transportation
- Bike and walk.
- Keep your automobile well maintained.
- Do not spill gasoline when filling up your car or lawn and garden equipment.
- Participate in your local utilities energy conservation programs.