

Air Quality Considerations for Local Governments

As the population of the Front Range continues to grow, and our air quality continues to be compromised, it is critical that we collaborate to protect and improve the air we breathe. As the lead air quality planning organization for the Denver Metro Area, the Regional Air Quality Council is committed to assisting local governments in both incorporating air quality improvement strategies into your planning and internal management processes and in communicating with your constituents about air quality issues and what residents can do to help.

This document provides an overview of the air quality issues facing our region and a list of air quality improvement strategies for your consideration in future decision-making. Additionally, you will find an introduction to the various programs and tools the RAQC offers to local governments. We encourage you to visit our website for more detailed information, as well as access to links, checklists and other tools referenced in this guide to help you in your efforts to reduce air pollution in our communities.

Local governments are a critical partner in maintaining our air quality and, therefore, our quality of life here in the region. We appreciate your partnership and want you to know that we are here to help.



What are the Major Pollutants Affecting the Denver Metro/Front Range Area?



GROUND-LEVEL OZONE: THE AREA'S BIGGEST AIR QUALITY CONCERN

What is it? Ground-level ozone is formed when Volatile Organic Compounds (VOCs) and Nitrogen Oxides (NOx) combine and “cook” in the heat and sunlight. The highest ozone levels are usually recorded in summer months on hot, stagnant days with little wind.

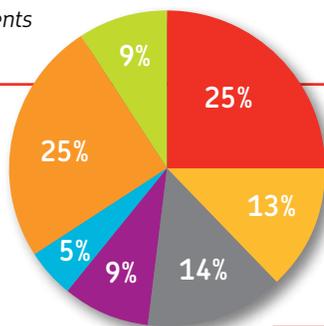
Why is it bad? Unlike the good, protective ozone layer in the stratosphere, ground-level ozone is a harmful air pollutant that affects all of us – particularly the young and elderly. Those who are active and exercising outdoors may experience breathing difficulties and eye irritation. Prolonged exposure may result in reduced resistance to lung infections and colds. Ozone can also trigger attacks and symptoms in individuals with pre-existing conditions such as asthma, or other respiratory diseases like chronic bronchitis and Chronic Obstructive Pulmonary Disease (COPD).

Pollutant status: *The nine-county Denver Metro/Front Range Area is out of compliance with federal air quality standards for ozone. RAQC-sponsored projects such as Every Trip Counts, Clean Air Fleets and the OzoneAware campaign aim to reduce ozone-causing emissions.*

Volatile Organic Compounds (VOCs)

VOCs are natural (organic) emissions from plant material or related solvents from industrial processes.

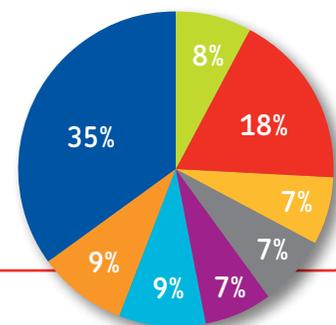
- Point Sources
- Oil & Gas Condensate Tanks
- Oil & Gas Point & Area Sources
- Area Sources
- Lawn & Garden Sources
- Non-Road Mobile Sources
- On-Road Mobile Sources



Nitrogen Oxides (NOx)

A mix of nitric oxide and nitrogen dioxide, NOx are highly reactive gases primarily formed by high-temperature combustion processes such as those occurring in automobiles and power plants.

- Point Sources
- Electric Generating Units
- Oil & Gas Point Sources
- Oil & Gas Area Sources
- Area Sources
- Construction Sources
- Non-Road Mobile Sources
- On-Road Mobile Sources



More Major Pollutants.

CARBON MONOXIDE (CO)

What is it? Carbon Monoxide is a colorless, odorless gas that is formed from the incomplete burning of fuel (combustion). It is emitted directly into the air from vehicle exhaust pipes and typically occurs when vehicles are first started up or when they are not properly started.

Why is it bad? Carbon Monoxide reduces oxygen delivery to the body's organs and tissues.

Pollutant status: *While the region is not in violation of CO standards, the RAQC has several programs in place to help reduce vehicle emissions and keep this pollutant in check.*

PARTICULATE MATTER (PM)

What is it? Particulate matter (PM) consists of airborne particles that can be inhaled by humans. PM comes in sizes ranging from 2.5 to 10 micrometers in diameter.

Why is it bad? Recent Environmental Protection Agency (EPA) studies suggest that PM is harmful to human health because small particles less than 10 micrometers in diameter are too small to be filtered by the nose and lungs and can get deep into the lungs and into the bloodstream. Particle pollution exposure has been linked to serious health problems involving the lungs and heart.

PM 2.5 – PM 2.5 is fine particulate matter measuring only 2.5 micrometers. It is so small that it can be detected only with an electron microscope. PM 2.5 is created from combustion processes, including those from motor vehicles, power generation, residential wood burning, forest fires, agricultural processes and some industrial processes.

Pollutant status: *The Denver metro region is currently in compliance with PM 2.5 standards. The RAQC's Clean Air Fleets program aims to reduce PM 2.5 levels in the region.*

PM 10 – PM 10 is coarse particulate matter measuring between 2.5 micrometers and 10 micrometers. PM 10 is created from windblown dust, unpaved roads, street sand, and crushing and grinding operations.

Pollutant status: *The Denver metro region has been in compliance with PM 10 standards since 1993. RAQC-sponsored projects such as wood-burning fireplace/stove change out and street sweeping programs have helped the region to lessen PM 10 and, therefore, reduce the amount of particles contributing to the "Brown Cloud" in the winter.*

What Causes Air Pollution?

THE SOURCES OF AIR POLLUTION

A number of sources – activities that cause pollution to be emitted into the air – contribute to poor air quality and ground-level ozone formation. Human-generated sources are categorized as follows:

MOBILE SOURCES: Mobile sources are classified as on-road and non-road vehicle sources. On-road sources include vehicles traveling on roads to transport passengers or freight. Non-road sources include gas and diesel powered vehicles, engines and other equipment used for aircraft, construction, agriculture, recreation, and more.

PEOPLE: Nearly two-thirds of ozone-causing emissions come from the direct actions of people who live and work in the region and the services they require.

AREA SOURCES: Area sources are smaller emissions sources that collectively account for a significant portion of air pollution. These include producers such as lawn mowers, certain types of trees, home and personal care products, after-market auto care products, paints and solvents, residential and commercial heating, and breweries and other small production businesses, among others.

STATIONARY/POINT SOURCES: Stationary sources are fixed-site producers of pollution such as power plants, chemical plants, oil refineries, manufacturing facilities, small industrial processes, and other industrial operations. Large sources that have specific locations and release pollutants in quantities above a certain threshold are known as point sources. The State of Colorado requires that the producers of these sources file an Air Pollution Emission Notice (APEN) with the Colorado Department of Public Health and Environment, which maintains a Stationary Source Emissions Inventory.

HOW GROUND-LEVEL OZONE FORMS



What Can Local Governments Do to Help Reduce Air Pollution?

MOBILE SOURCE STRATEGIES

Fleet Management:

- Take advantage of the technologies available to fleets via the RAQC's Clean Air Fleets Program. This can include retrofitting older diesel vehicles – including public works vehicles and school buses – with emissions and idle reduction technologies
- Reduce fuel use with GPS technologies and idle reduction programs and policies
- Regularly inspect and maintain vehicles
- Provide eco-driving education to drivers
- Fuel vehicles after 5 p.m. in summer
- Combine/reduce auto trips
- Employ the RAQC's Street Sanding Program

Alternatively Fueled Vehicles:

- Purchase electric and alternatively fueled vehicles for local fleets and encourage citizens to purchase these vehicles as well
- Incorporate the provision of charging and alternative fuel stations for vehicles into projects at the beginning of the development phase

Land Use and Planning:

- Develop and implement land use regulations that facilitate walking and biking instead of driving a car. This can include mixing types and densities of housing, mixing types of uses, decreasing parking requirements, emphasizing the connectivity of walking and biking facilities, ensuring the provision of bike parking and storage facilities, expanding bike and walking facilities, etc.
- Use the Mixed-Use Development—Trip Generation/Air Quality Analysis Tool to more accurately estimate vehicle trips from mixed-use developments
- Include air quality in considerations in the project review process through the use of the Land Use/Air Quality Checklist

- Incorporate traffic signal timing/coordination into local traffic operations

Transportation Demand Management:

- Expand local participation in transportation demand management (TDM) programs such as the RAQC's Every Trip Counts program
- Implement bike and car sharing programs
- Combine/reduce auto trips

PEOPLE-ORIENTED STRATEGIES

- Inform citizens about the changes they can make in their behaviors to decrease polluting emissions
- Utilize tools and information offered by the RAQC's OzoneAware program to help spread the word

AREA SOURCE STRATEGIES

- Use low-emission lawn and garden equipment and encourage citizens to do the same
- Limit painting and staining projects to spring and fall seasons and encourage citizens to do the same
- Implement tree planting guidelines
- Reduce emissions from off-road equipment by implementing idling policies and utilizing the RAQC's retrofit programs for qualifying equipment
- Apply construction mitigation measures to reduce emissions from new developments/large projects

STATIONARY/POINT SOURCE STRATEGIES

- Implement energy efficiency/renewable energy policies and programs and encourage local businesses to do the same
- Take advantage of state and federal assistance programs

Please visit www.raqc.org to learn more.

We're Here to Help with Programs, Tools and Information.

OzoneAware

Unlike the good, protective ozone layer in the stratosphere, ground-level ozone is a harmful air pollutant that affects all of us. The OzoneAware summer ozone education and outreach program is designed to increase public understanding and awareness of the causes and solutions for ozone pollution, with the goal of getting the region's residents to change ozone-causing behaviors.

www.ozoneaware.org

Clean Air Fleets

The Clean Air Fleets program provides information about and funding for simple diesel retrofit technologies, global positioning systems (GPS) and alternatively fueled vehicles — including compressed natural gas (CNG), electric vehicles and electric vehicle supply equipment — to reduce emissions in public and private fleets. The Clean Air Fleets website provides the latest program information, as well as resources on emissions control, idling reduction technology, alternative fuels, electric vehicles, engine and fuel standards, advances in diesel engines and more.

www.cleanairfleets.org

Every Trip Counts

Not driving your car during the summer ozone months is one of the best ways you can help reduce ozone-creating pollutants. The Every Trip Counts program provides incentives to people who choose to leave their car at home and bike, walk, or use the bus a minimum of two days per week during the summer.

www.everytripcounts.org

Street Sanding Program

In conjunction with local and state street maintenance departments, the RAQC developed a street sanding program, which has achieved a weighted average region-wide emissions reduction of approximately 58% and has allowed us to comply with the PM 10 federal standard since 1993. Our goal now is to help

local governments maintain current street sanding practices in the face of increasing vehicle traffic and significant budget constraints in some jurisdictions.

http://raqc.org/programs/more/street_sanding_program

State Implementation Plans

The RAQC is tasked with helping to develop state implementation plans (SIPs) for the Denver area to comply with federal air quality standards. When the Denver metropolitan region fails to meet these standards, the RAQC and its partners pull together in a series of stakeholder meetings to determine what measures will be included in the SIP for that pollutant.

http://raqc.org/programs/more/state_implementation_plans/

Land Use Planning and Air Quality Analysis

The RAQC has several tools available to assist local planners in incorporating the analysis of air quality with respect to proposed developments:

[Mixed-Use Development—Trip Generation/Air Quality Analysis Spreadsheet Tool](#)

This spreadsheet-based tool allows planners to quickly and easily analyze the trips generated by mixed-use developments.

http://www.epa.gov/dced/mxd_tripgeneration.html

[Checklist for Air Quality](#)

This checklist ensures that pedestrian, bicycle and transit connections are being made and preserved through the site planning process. The checklist also provides reminders to ensure a mix of land uses to encourage non-motorized travel.

http://raqc.org/images/uploads/Checklist_for_Air_Quality_-_Planning.pdf

[Resource Library](#)

Check out our resource library for ideas, images, reports and analyses of mixed-use developments, transit-oriented developments, and other types of developments that encourage non-motorized travel.

<http://raqc.org/localgov/library>

Please visit www.raqc.org to learn more.