



Airing it Out

1. IDENTIFY THE CONTEXT

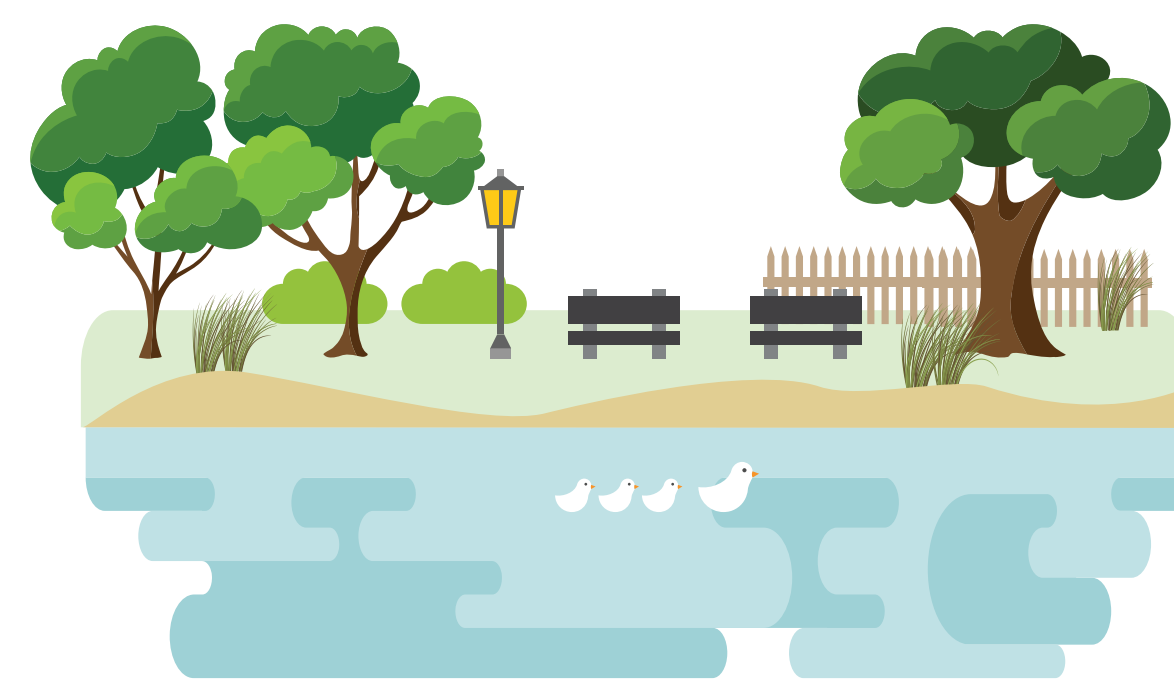
Air quality describes how clean or polluted air is. The burning of fossil fuels for transportation, building energy consumption, and industrial sites can make air quality worse which can negatively impact health for residents. Some air pollutants like ground level ozone and carbon dioxide also contribute to climate change. Trees and other vegetation can act to clean the air of these pollutants.

3. EXPERIENCE THE SYSTEM



O₃ MORE HIGH OZONE DAYS

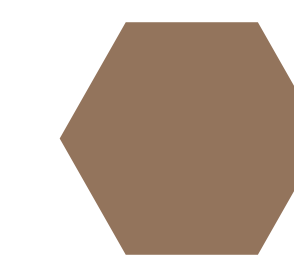
Ozone occurs naturally in small amounts in the upper atmosphere. Ozone is also released in small amounts at a ground level from plants and soil. Ground-level ozone becomes harmful when there are high amounts. Ozone is very likely to reach unhealthy levels on hot days when there is low wind. High-levels of ozone can have adverse health effects including making it difficult to breath causing coughing, and even inflammation of people's lungs. People with asthma, young children, and the elderly are most vulnerable to ozone's effects.



O₃ LOCATION

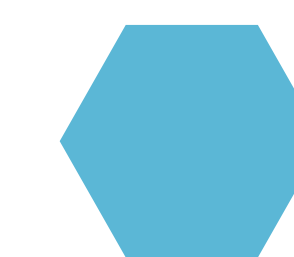
Evanston's unique geographic location influences air quality. Evanston has many trees and trees clean the air by absorbing air pollutants like carbon dioxide CO₂. On the other hand, our proximity to the Lake Michigan shoreline increases our ground-level ozone concentration. This is due to the flow of NO_x and VOC's from a large metropolitan Chicago area to locations over the lake at night, and then the flow of ozone from over Lake Michigan back onto land locations in afternoon. However, overall benefits of our proximity to this large body of freshwater outweigh these risks.

2. UNDERSTAND THE TOOLS



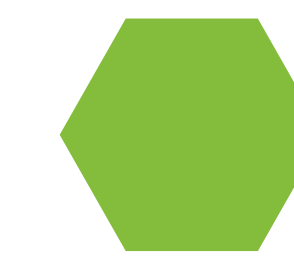
CARBON DIOXIDE (CO₂)

This gas is a naturally occurring gas and a necessary part of the Earth's ecosystem, however, if too much is released, as is happening now because of the burning of coal, natural gas and oil, it can cause global temperatures to rise contributing to the climate crisis.



OZONE (O₃)

Ozone in the upper atmosphere is good as it shields us from the Sun's harmful ultraviolet rays. Ground level ozone is a harmful pollutant made from a reaction between Volatile Organic Compounds (VOC's) and Nitrogen Oxides (NO_x) in the presence of sunlight. Ozone can cause respiratory and breathing issues.



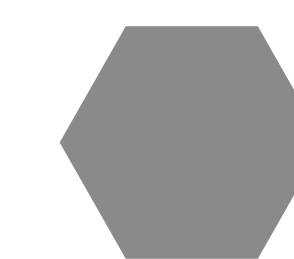
VOLATILE ORGANIC COMPOUNDS (VOCs)

Volatile organic compounds, or VOC's, are gases that are emitted into the air from burning gasoline, wood, coal, or natural gas. They can also be released from consumer products like cigarettes, paints, and office machines. They can react with other gases and form air pollutants.



NITROGEN OXIDES (NO_x)

These pollutants form when fuel is burned at high temperatures. NO_x pollution is emitted by cars, trucks and various non-road vehicles (e.g. construction equipment, boats, etc.) as well as industrial sources such as power plants, industrial boilers, and cement kilns.



PARTICULATE MATTER (PM)

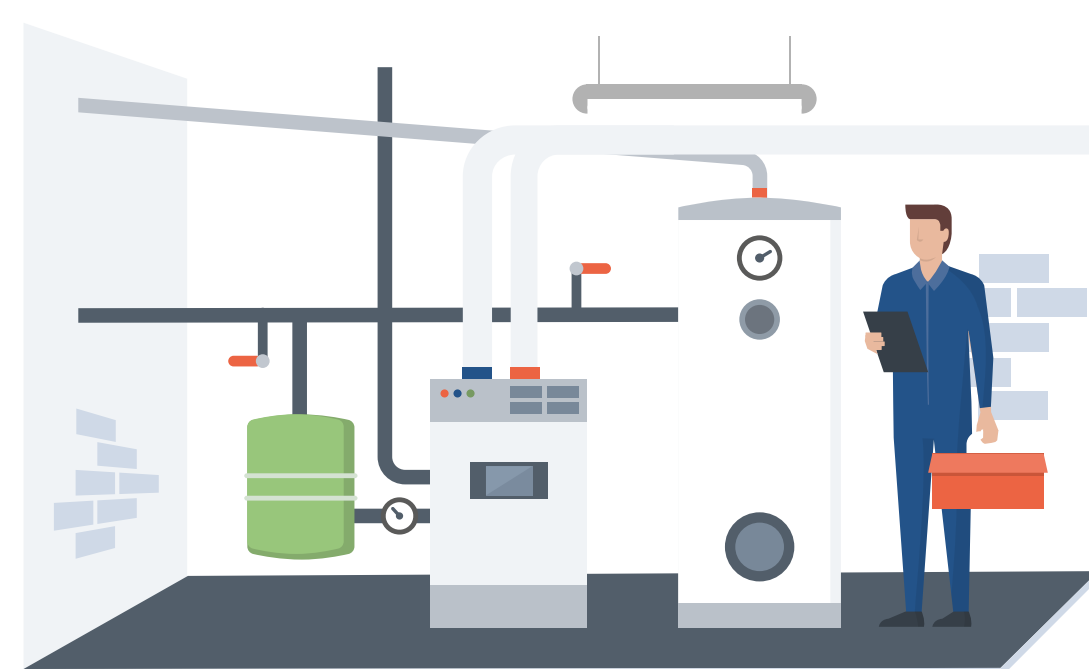
A mixture of solid particles and liquid droplets found in the air. Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye. Others are so small they can only be detected using an electron microscope. Particulate matter may be released by vehicles, trucks, machinery and even natural gas boilers and furnaces in buildings. Particulate matter can settle in people's lungs and negatively impact health.



CARBON MONOXIDE (CO)

A colorless, odorless gas that forms when carbon based fuels like oil, natural gas, coal, and wood are burned. Long term exposure to high levels of carbon monoxide can lead to heart and breathing issues.

4. TAKE ACTION



PM CO CO₂ HEATING AND POWERING BUILDINGS

Buildings in Evanston account for 80% of Evanston's greenhouse gas emissions! They use lots of energy to keep the lights on and to keep them cool in the summer and warm in the winter. The biggest way buildings contribute to air pollution in Evanston is through burning of natural gas for heating and cooking.



VOCs NO_x INDUSTRIAL SITES

Industrial sites, like waste transfer stations and manufacturing plants, can generate air pollutants. While it is not known if the quantities of these air pollutants are harmful, multiple air pollutants have been measured near the Church Street waste transfer station such as, particulate matter and ozone. Additionally, the constant through traffic of large diesel waste trucks can generate particulate matter from fuel combustion.



VOCs NO_x PM CO₂ CARS, TRUCKS AND MACHINERY

Vehicles and machinery (lawn mowers, construction equipment, etc.) are a significant source of air pollution in Evanston. Transportation accounts for 17% of Evanston's greenhouse gas emissions. Cars, trucks, busses, and machinery emit air pollutants such as VOC's, Nitrogen Oxides, and Particulate Matter through their exhaust. These particles can be detrimental to health as they can settle in lungs and may increase risks of asthma or other respiratory illnesses.

