



Minnesota
Pollution
Control
Agency

Metro District,
Community and
Area-wide
Programs

Causes of Motor Vehicle Pollution

Air/2-23/March 2000

In Minnesota, like the rest of the United States, motor vehicles are a significant source of pollutants in urban air. Motor vehicles give off *more than half* of all carbon monoxide and hydrocarbon emissions in Minnesota (see graphs on pages 1 and 2). Although vehicles manufactured since 1968 have had to meet tougher emissions standards, federal testing of vehicles currently on the road show that their emissions often violate these standards.

Poor Maintenance = Worse Pollution

Maintaining a car properly is one of the best ways to lower emissions of unhealthy air pollutants such as carbon monoxide, hydrocarbons and toxic air pollutants.

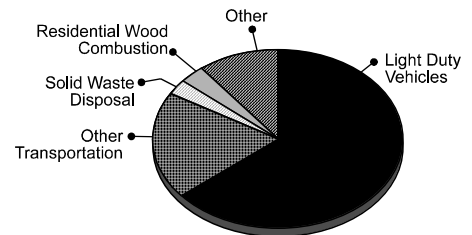
Carbon Monoxide

There are many reasons for high carbon monoxide emissions, including incomplete fuel combustion due to poor vehicle maintenance. A car emitting high levels of carbon monoxide may have an improper air/fuel mixture, a dirty air filter, a stuck choke, a broken air pump or control valve, an improper idle speed or a faulty computer chip.

About 70 percent of carbon monoxide emitted in Minnesota comes from motor vehicles. When inhaled, carbon monoxide affects the body's ability to absorb oxygen.

This can result in slowed reflexes and drowsiness and, in high exposures, unconsciousness and death.

Sources of Carbon Monoxide



Graph from Minnesota Air Quality and Emission Trends, MPCA, 1997

Hydrocarbons

Hydrocarbon emissions from motor vehicles can result from partially-burned fuel emitted through the tailpipe and from fuel evaporations from the crankcase, carburetor and gas tank. In addition, hydrocarbons are released from gasoline fuel vapor when vehicles are re-fueled at gas stations and when bulk storage tanks are refilled.

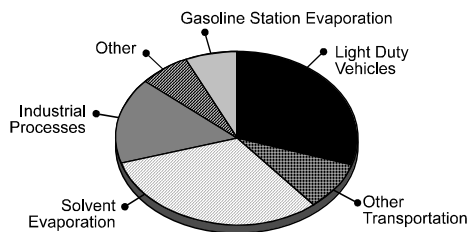
When exposed to sunlight, hydrocarbons contribute to formation of ozone, also known as smog. (Unlike the protective layer of ozone present in the upper atmosphere, ozone produced at ground level can have serious health effects on people who suffer from lung diseases, asthma or emphysema.)





High hydrocarbon emissions from a vehicle may be caused by improper ignition timing, faulty ignition, misfiring problems, vacuum leaks, worn piston rings or valves or an exhaust gas recirculation system incorrectly operating at idle. One fouled spark plug can result in extremely high hydrocarbon emissions.

Sources of Hydrocarbons



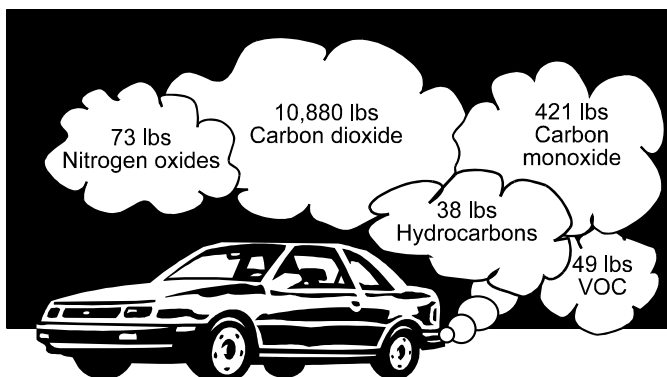
Graph from Minnesota Air Quality and Emission Trends, MPCA, 1997

Toxic air pollutants

Toxic air pollutants associated with motor vehicles result from fuel evaporation and the fuel-burning process. More than 50 percent of toxic air emissions in Minnesota come from motor vehicles. Larger amount of toxics like benzene, formaldehyde and volatile organic compounds (VOCs) are emitted if vehicles are not maintained to achieve the highest level of fuel economy.

Toxic air pollutants include a variety of chemicals known to cause cancer, poisoning and other ailments. These chemicals can be inhaled or may accumulate in the soil and human food chains.

Pollution Caused Annually by One Twin Cities Car



1997 estimates from the Minnesota Pollution Control Agency.

Here's what a typical Twin Cities car puts into the air each year. Information is based on a car which has a catalytic converter, travels 12,000 miles each year and is traveling an average of 30 mph in 44-degree weather.

Tampering = Poor Performance and Worse Pollution

It doesn't help mileage or performance and it's against federal and state law.

Some people illegally tamper with their vehicle's emission control system because they mistakenly think it will increase the vehicle's mileage or performance. Today's cars, though, are designed to work together with pollution control equipment to provide top fuel economy while emitting fewer pollutants. Tampering with the catalytic converter does not improve a vehicle's performance -- it can even reduce vehicle performance -- but it does drastically increase a vehicle's carbon monoxide and hydrocarbon emissions.

Driving More = Polluting More

The more we drive, the more pollutants we put into the air.

Air pollution from motor vehicles depends on the number of vehicles on the road and the amount of pollutants emitted by each vehicle. Traffic flow, local topography and weather conditions are other factors that can affect carbon monoxide levels.

The introduction of vehicles with better pollution control systems has meant that, in general, metro-area pollution from motor vehicles has declined. However, at the same time, traffic increases are expected each year in the future. Minnesotans drive more than 123 million miles every day -- that's the distance to the sun and halfway back again -- and that number keeps increasing.

As a result, air pollution from motor vehicles is projected to increase over time, because even though cars are cleaner, Minnesotans are driving more every year.

Where Can I Call to Find Out More?

Brainerd	(218) 828-2492
Detroit Lakes	(218) 847-1519
Duluth	(218) 723-4660
Mankato	(507) 389-5235
Marshall	(507) 537-7146
Rochester	(507) 285-7343
St. Paul	(651) 296-6300
Toll Free	(800) 657-3864
Willmar	(320) 214-3786

MPCA Website: <http://www.pca.state.mn.us>