



ROAD TRAFFIC AND AIR POLLUTION

The Issue

Automotive vehicle engines produce a number of air pollutants that pose risks to your health.

Background

Cars, buses and trucks are a source of air pollution. When their engines burn fuels (gasoline or diesel), they produce large amounts of chemicals that are emitted in engine exhaust. In addition, some of the gasoline used by engines vaporizes into the air without having burned, and this also creates pollution.

Stringent regulations on engine performance and fuel formulation have brought about a decline in the amount of air pollution produced by individual vehicles. The overall amount of air pollution caused by road traffic in Canada has also gone down. However, there is still cause for concern because:

- The number of vehicles on Canada's roads and highways has increased over the years; and,
- More people are driving sport-utility vehicles (SUVs), which consume more fuel than cars and therefore cause more air pollution.

The Health Effects of Traffic-Related Air Pollution

The following is a summary of the main pollutants produced by road traffic and the way they may affect your health:

Nitrogen oxides: These are created when vehicle engines burn nitrogen that is present in the air and nitrogen compounds found in fossil fuels. Nitrogen oxides can irritate air-ways, especially your lungs.

Carbon monoxide: This gas is produced by incomplete combustion of gasoline and diesel fuel. All engine exhaust contains a certain amount of carbon monoxide, but the amount will increase if your vehicle engine is poorly maintained. Carbon monoxide decreases the ability of your blood to carry oxygen.

Volatile organic compounds (VOCs): These are a large family of carbon-containing compounds that evaporate easily. Engine exhaust contains a number of different VOCs. Some of them, such as benzene and 1,3-butadiene, are cancer-causing agents, although the risk at current levels in the environment is small.

Fine particulate matter: These tiny particles contain many substances, including metals, acids, carbon, and polycyclic aromatic hydrocarbons. Some of these particles are emitted in vehicle exhaust, while others are formed in the atmosphere through chemical reactions between the various pollutants found in exhaust. Particulates are known to aggravate symptoms in individuals who already suffer from respiratory or cardiovascular diseases.

Ground-level ozone: This is not emitted directly by vehicle engines, but is formed by chemical reactions between nitrogen oxides and VOCs. These reactions are stimulated by sunlight, and this is why concentrations of ground-level ozone are higher during the summer months. Ground-level ozone irritates airways and can trigger reactions in people who have asthma.

Ground-level ozone should not be confused with the ozone layer in the stratosphere, which provides protection from the sun's ultraviolet rays.



The air pollution from road traffic causes two types of effects on health:

Acute Effects: These effects occur rapidly (in a few hours or days) following exposure to high levels of pollutants. In certain cases, air pollution may worsen symptoms for people with existing heart and lung conditions. Scientific research carried out in Canada and in other countries has shown that the number of deaths and hospitalizations related to respiratory and cardiac conditions increases when the levels of ground-level ozone or fine particulate matter increase.

Chronic Effects: These occur over time following extended exposures (months or years). Scientific studies in Europe have shown that children living in areas with higher traffic density have more respiratory symptoms than other children.

Minimizing Your Risk

You can help to minimize risks for all Canadians by taking steps to reduce traffic-related air pollution.

- Whenever possible, use public transit, bicycle or walk instead of using your vehicle.
- If public transit is not available, try to car pool.
- Take fuel efficiency into account when you buy a vehicle. Natural Resources Canada produces a Fuel Consumption Guide. To obtain a copy, see the **Need More Info?** section below.
- Turn off the engine of your car when you stop for more than 10 seconds, unless you are in traffic or at an intersection.
- Keep your vehicles well maintained.

In addition, you can take steps to help minimize your risk of health effects from traffic-related air pollution:

- Pay attention to air quality forecasts in your community, and tailor your activities accordingly. Avoid or reduce strenuous outdoor activities when air pollution levels are high, especially in the afternoon during summer months when ground-level ozone reaches its peak. Choose indoor activities instead.
- Avoid or reduce exercising near areas where traffic is heavy, especially during rush hour.
- If you have a heart or lung condition, talk to your health care professional about additional ways to protect your health when air pollution levels are high.

Health Canada's Role

Health Canada's investigation of the acute health effects of air pollution has played an important role in the development of national air quality standards for particulate matter and ground-level ozone. This work also contributed to the development of regulations to lower the concentrations of sulphur in gasoline and diesel fuel, and this reduces the amount of fine particulate matter in engine emissions.

Health Canada continues to study the effects of air pollution on health. For example, Health Canada researchers are currently collaborating with university researchers on studies about the health effects of traffic-related air pollution.

Need More Info?

For further information please contact:

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Or visit Health Canada's Health and Air Quality Web site at http://www.hc-sc.gc.ca/hecs-sesc/air_quality/index.htm

See also:
Health Canada's Centre for Chronic Disease Prevention and Control Web site at:
http://www.hc-sc.gc.ca/pphb-dgspsp/ccdpc-cpcmc/crd-mrc/index_e.html

The It's Your Health article on Smog at:
<http://www.hc-sc.gc.ca/english/iyh/environment/smog.htm>

Environment Canada's Clean Air Web site, at:
http://www.ec.gc.ca/air/introduction_e.html

Natural Resources Canada's Idle-Free Zone, at
<http://oee.nrcan.gc.ca/idling/home.cfm?Text=N&PrintView=N>

For a copy of Natural Resources Canada's Fuel Consumption Guide, call 1-800-0-CANADA (1-800-622-6232) or visit:
<http://oee.nrcan.gc.ca/vehicles/guide/guide.cfm?Text=N&PrintView=N>

Additional It's Your Health articles can be found at:
www.healthcanada.ca/iyh
You can also call (613) 957-2991