

AARYANYA / Air pollution and health risks due to vehicle traffic

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Introduction:

Air pollution in India is a serious health issue. Of the 30 most polluted cities in the world, 21 were in India in 2019. As per a study based on 2016 data, at least 140 million people in India breathe air that is 10 times or more over the WHO safe limit and 13 of the world's 20 cities with the highest annual levels of air pollution are in India. 51% of pollution is caused by industrial pollution, 27 % by vehicles, 17% by crop burning and 5% by fireworks.

Air pollution contributes to the premature deaths of 2 million Indians every year. Emissions come from vehicles and industry, whereas in rural areas, much of the pollution stems from biomass burning for cooking and keeping warm. In autumn and winter months, large-scale crop residue burning in agriculture fields – a cheaper alternative to mechanical tilling – is a major source of smoke, smog and particulate pollution. India has a low per capita emissions of greenhouse gases but the country as a whole is the third-largest greenhouse gas producer after China and the United States.

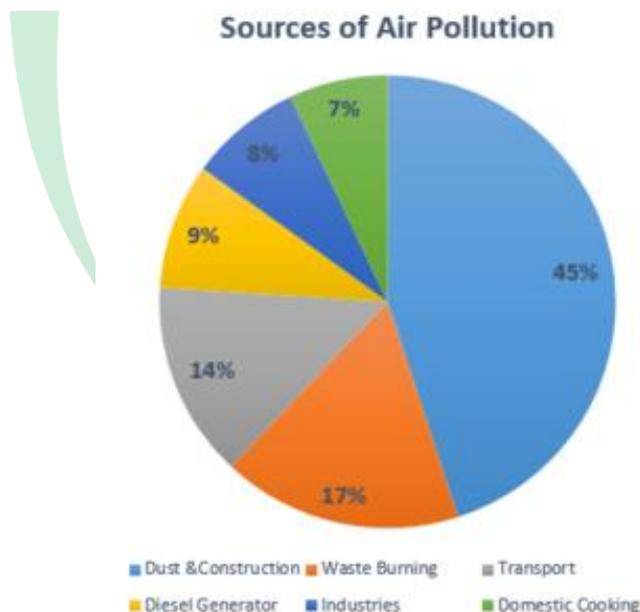
A 2013 study on non-smokers has found that Indians have 30% weaker lung function than Europeans. The Air (Prevention and Control of Pollution) Act was passed in 1981 to regulate air pollution but has failed to reduce pollution because of poor enforcement of the rules. Experts say on average a vehicle stops at a red light for 15-20 minutes in a day consuming 200 mL of fuel. This creates so much pollution. If 10 lakh vehicles switch off the engine at a red light, 1.5 tons of PM 10 and 0.4 tons of PM 2.5 will be prevented every year. Switching off vehicle engines will not only stop pollution but also result in a saving of Rs 7,000 per vehicle per year.

The government official said air pollution rises in Delhi this time of the year due to stubble burning and expressed concern over the health of residents of villages where it is practiced. The Delhi government has made all possible efforts such as launching an anti-dust drive, use of bio-decomposer to stop crop stubble burning, tree plantation and formulating an

electric vehicle policy to check air pollution. The Delhi people have helped reduce pollution by 25 percent in five years. If 30-40 lakh vehicles come on the road every day and keep idling at traffic signals, it increases air pollution levels in the city.

In 2015, the Government of India, together with IIT Kanpur launched the National Air Quality Index. In 2019, India launched 'The National Clean Air Programme' with a tentative national target of 20%-30% reduction in PM2.5 and PM10 concentrations by 2024, considering 2017 as the base year for comparison. It will be rolled out in 102 cities that are considered to have air quality worse than the National Ambient Air Quality Standards. There are other initiatives such as 1,600-kilometre-long and 5-kilometre-wide the Great Green Wall of Aravalli green ecological corridor along with Aravalli range from Gujarat to Delhi which will also connect to Shivalik hill range with the planting of 1.35 billion (135 crores) new native trees over 10 years to combat the pollution.

In December 2019, IIT Bombay, in partnership with the McCelvey School of Engineering of Washington University in St. Louis, launched the Aerosol and Air Quality Research Facility to study air pollution in India.



Traffic Signal

The major vehicular pollutant's that have an adverse effect on human health and life are:

- Carbon monoxide
- Carbon dioxide

- Hydrocarbon
- Oxides of nitrogen
- Oxides of Sulphur
- Particulates matter

Carbon monoxide is an odourless and colourless and poisonous gas formed by the combustion of fossil fuels such as gasoline and is emitted primarily from cars and trucks. The number of vehicles in India is quickly increasing as a growing middle class can now afford to buy cars. India's road conditions have not kept up with the exponential growth in the number of vehicles.

Various causes for this include:

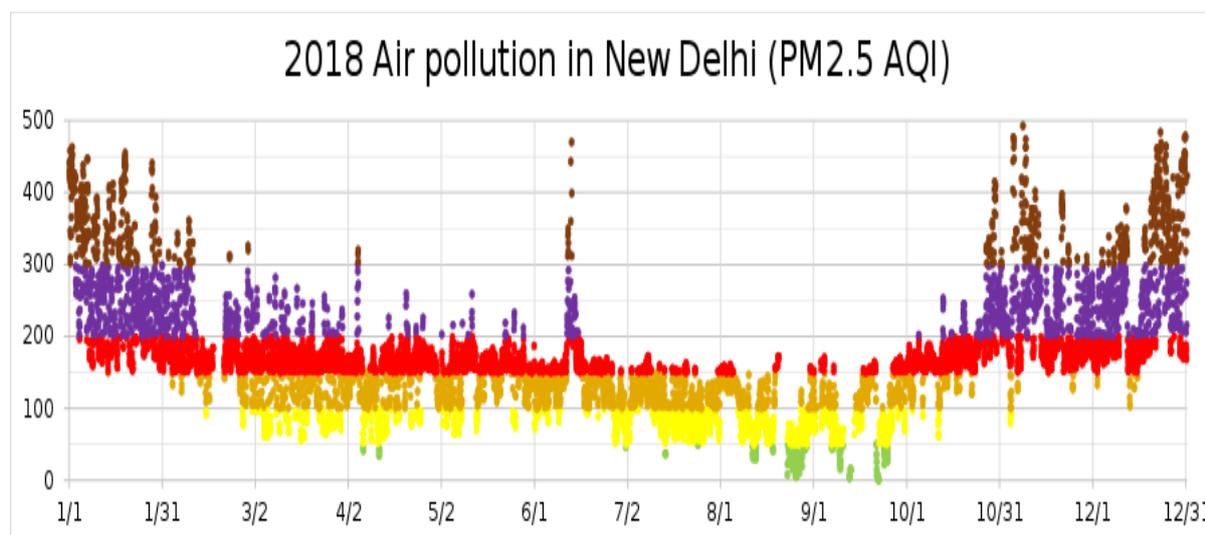
- Private encroachments.
- Non cooperation among drivers.
- Unscientific road design.
- Lack of freeways/exit ways where local roads and main roads intersect.
- Lack of demarcated footpaths.
- Lack of bus bays.
- Lack of cycle tracks.
- Lack of coordination among various government departments (e.g. digging of roads by telecom/water department and leaving it open).

Traffic congestion

Traffic congestion is severe in India's cities and towns. Traffic congestion is caused by several reasons, some of which are:

- ❖ Increase in the number of vehicles per kilometer of available roads.
- ❖ A lack of intra-city divided-lane highways and intra-city expressway networks.
- ❖ Lack of inter-city expressways.
- ❖ Traffic accidents and chaos due to poor enforcement of traffic laws.
- ✚ Traffic congestion reduces the average traffic speed. At low speeds, scientific studies reveal that vehicles burn fuel inefficiently and pollute more per trip. For example, a study in the United States found that for the same trip, cars consumed more fuel and polluted more if the traffic was congested than when traffic flowed freely.

- ✚ At average trip speeds between 20 and 40 kilometers per hour, the car's pollutant emission was twice as much as when the average speed was 55 to 75 kilometers per hour. At average trip speeds between 5 and 20 kilometers per hour, the car's pollutant emissions were 4 to 8 times as much as when the average speed was 55 to 70 kilometers per hour. Fuel efficiencies similarly were much worse with traffic congestion.
- ✚ Traffic gridlock in Delhi and other Indian cities is extreme. This has been shown to result in a buildup of local pollution, particularly under stagnant conditions. The average trip speed on many Indian city roads is less than 20 kilometers per hour; a 10-kilometer trip can take 30 minutes, or more.
- ✚ At such speeds, vehicles in India emit air pollutants 4 to 8 times more than they would with less traffic congestion; Indian vehicles also consume a lot more carbon footprint fuel per trip, than they would if the traffic congestion was less.
- ✚ Emissions of particles and heavy metals increase over time because the growth of the fleet and mileage outpaces the efforts to curb emissions.
- ✚ In cities like Bangalore, around 50% of children suffer from asthma.



Traffic management:

Use of so-called intelligent transportation systems, which guide traffic:

- ✚ Traffic reporting, via radio, GPS and mobile apps, to advise road users.
- ✚ Variable message signs installed along the roadway, to advise road users.



- ✦ Navigation systems, possibly linked up to automatic traffic reporting.
- ✦ Traffic counters permanently installed, to provide real-time traffic counts.
- ✦ Automated highway systems, a future idea that could reduce the safe interval between cars (required for braking in emergencies) and increase highway capacity by as much as 100% while increasing travel speeds.
- ✦ Parking guidance and information systems providing dynamic advice to motorists about free parking.
- ✦ Active traffic management system opens up UK motorway hard shoulder as an extra traffic lane; it uses CCTV and VMS to control and monitor the traffic's use of the extra lane.

Some of the ways on how to reduce vehicle pollution are as follows:

1. **Burn less fuel:** One of the important things to remember is to use your vehicle only when you are needed to. If you have more than one vehicle – best advised to use only one and pick or drop your family member to their destination or opt for local transportation. If your coworker travels with you – carpool whenever you can. This way not only you will save on the fuel but also contribute to your surrounding in a better and sensible way.
2. **Choose a fuel-efficient vehicle:** These days everyone owns a car. And the ones who have a car want to upgrade to the next model available in the market. However, it is always a good idea to keep in mind to go for a car or any motor vehicle that is fuel-efficient. That means the vehicle with low greenhouse gas emissions. Effects of vehicular pollution on human health are unbelievably dangerous. Fuel-efficient vehicles promise to help the environment, and also saving the cost of fuel at the fuel pumps.
3. **Keep a check on the fuel filter and car air filter:** According to the India Environmental Portal, more than 3500 motor vehicles are on the move per minute on the city roads, which emits various pollutants in the city air. In today's time, the gasoline and diesel used in motor vehicles contain a large number of sulfur and other chemical compounds that make fuel filters to keep the car clean. Make sure to keep a regular check on the fuel filter and get a pollution check certification from the Indian Government on a timely basis. Also, installing the



best car air filter in the car will ensure good indoor car air quality for healthy and safe driving.

4. **Drive less, opt for public transportation:** We understand we all are entirely dependent on our motor vehicles for traveling wherever we want and whenever we wish to. However, given the fact vehicular pollution is one of the major contributors to the urban city's pollution level, it is our duty to act smart and responsible when we easily can. Taking public transportation is a good option during high traffic days which is naturally also a high pollution day. Take the city metro or bus or even locals to save time, fuel and cost.
5. **Shut the engine off when required:** While waiting for the traffic light to turn green, it is always smart to turn the engine off. Not only it saves you some fuel but also helps in controlling the pollution in the location you're driving. Imagine, if all the 50 cars in that particular road traffic from your destination shut their engine off during red-light traffic – how much the pollution level can come down to.

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