



Air Pollution from Traffic Emissions: Major pollutants and their health impact

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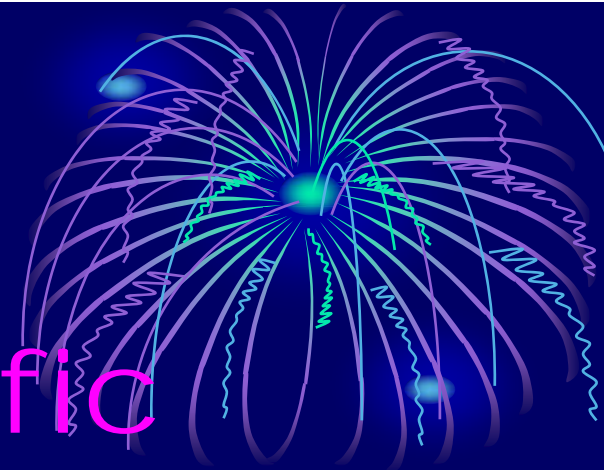
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Introduction

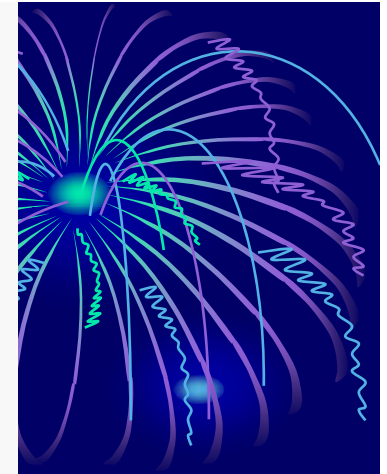
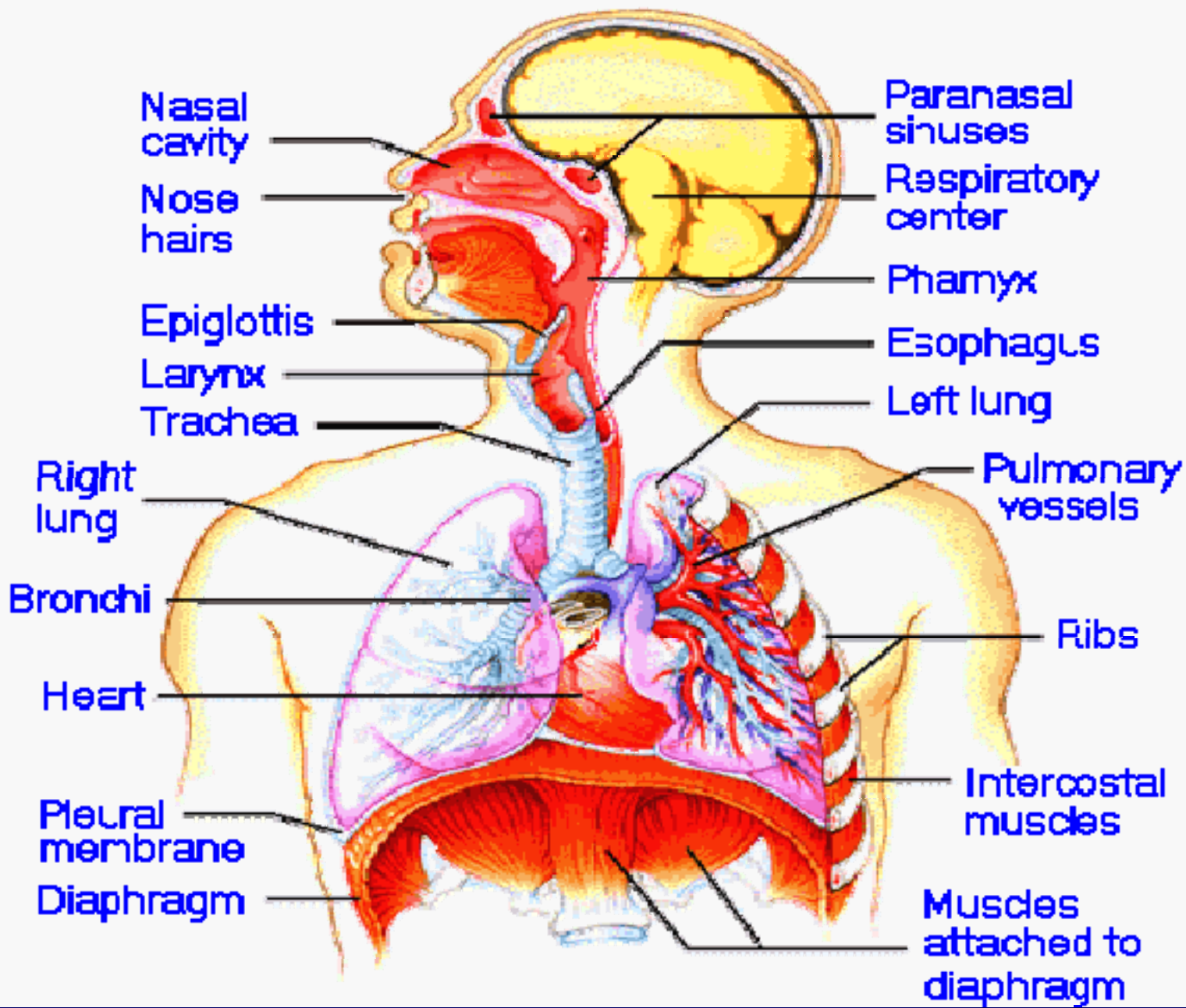


Air is the only basic life commodity a businessman cannot be able to package and sell to us. However, it can easily be used to kill us.

Dry air - Nitrogen- 0.78, Oxygen - 0.21, Argon -0.0093 and other trace gases.

Atmospheric water vapour (H_2O) is in amounts that range between 10^{-6} - 0.01

Any other input, gaseous and particulate, into the atmosphere in excess of the known concentration of air composition or an additional species is a contaminant.



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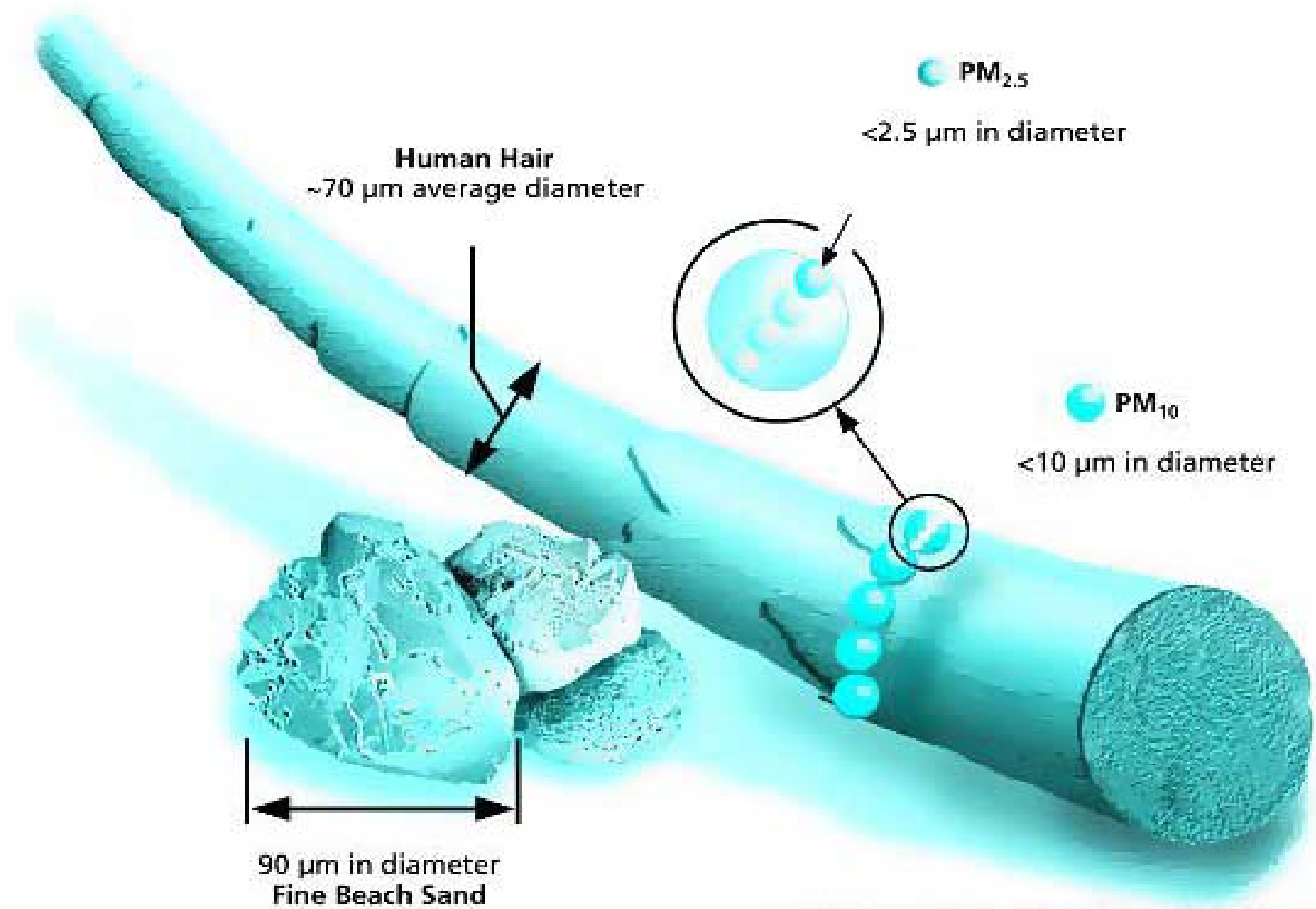


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Air Quality & Traffic Emissions



Air quality is commonly assessed in terms of concentrations of seven air pollutants:

(1) Carbon monoxide (CO), (2) Lead (Pb), (3) Nitrogen dioxide (NO₂), (4) Ozone (O₃), (5 & 6) Particulate matter (PM₁₀ and PM_{2.5}) and (7) Sulphur dioxide (SO₂).

These are referred to as criteria pollutants since they are common, injurious to human health, causes harm to the environment and they damage property.

Air Quality & Traffic Emissions



Urban air pollution is dominated by gaseous and particulate pollutants that are associated with motor transport: The most important in perspective of Human health are CO, NO₂, Pb, SO₂, PM, and mono and polycyclic aromatic Hydrocarbons.

Concentrations of some of these pollutants in Nairobi are comparable to those measured in Cairo and other Mega City's in the world.

Diesel & Petrol:
Burnt in the Engine:
High Temperature
conditions Created



Carbon Monoxide

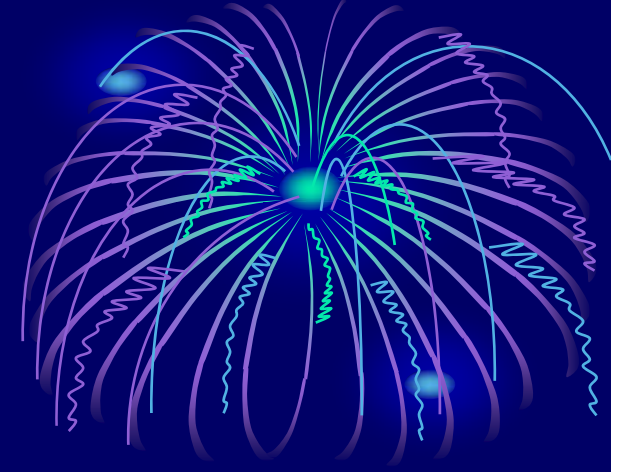
Nitrogen oxide

C-particles

Hydrocarbons (gaseous & particulate)

Sulphur Dioxide

Lead



Exhaust



Air Quality & Traffic Emissions



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Direct Human Health Effects



CO: Bonds to Hemoglobin and reduces the oxygen (O_2) carrying capacity in blood.

Pb: Perturbs body cell chemistry; inhibits certain enzymes; High exposure is known to cause chronic damage to the brain and the nervous system. has effects on kidneys, joints and reproductive systems.

NO₂: Activates the natural allergens in the airways and causes inflammation. High exposure to children increases risks of respiratory infection and poorer lung functions.

Direct Human Health Effects



O₃: A secondary pollutant:- In the upper atmosphere it protects us from UV light. In the troposphere it is a health problem - damages lung tissue and reduces the lung functions making it more sensitive to other irritants.

SO₂: A potent respiratory irritant:- stimulates nerves in the lining of the nose, throat and airways of the lungs.

VOCs: Benzene and Butadiene are carcinogens; some Polycyclic Aromatic Hydrocarbons (PAHs) are suspected to be carcinogenic.

Direct Human Health Effects

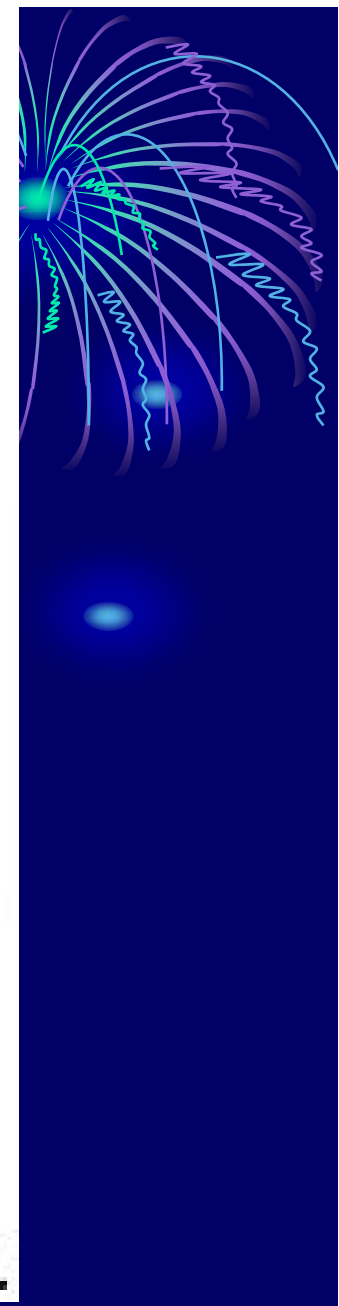
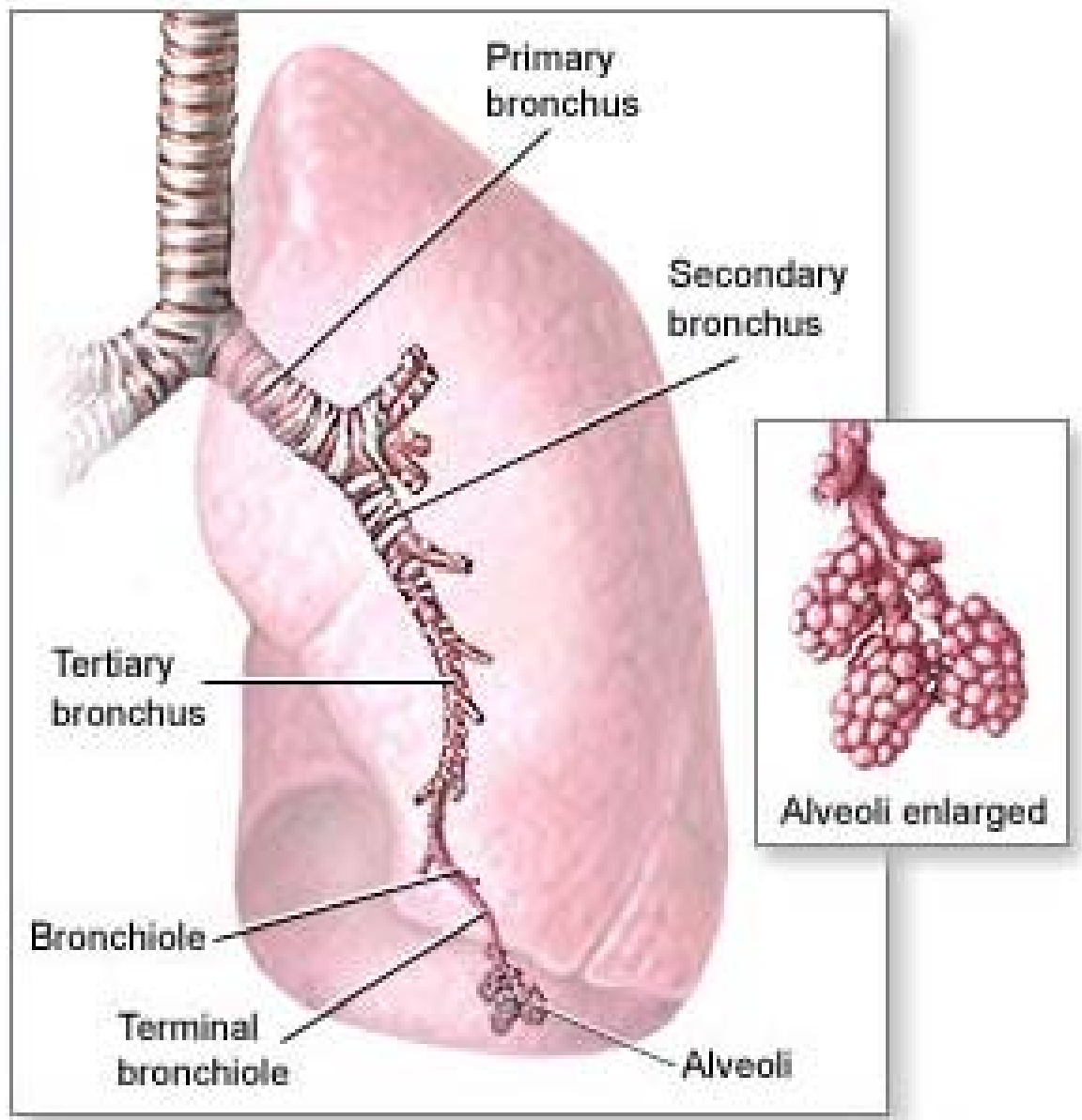
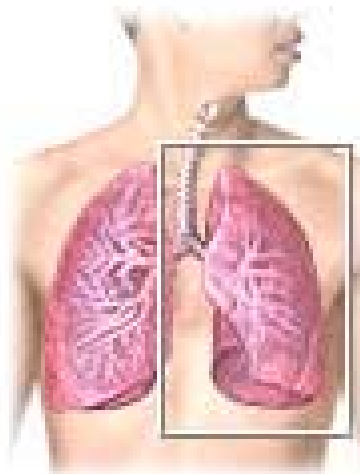


Particulate matter:

(PM₁₀ from particles with aerodynamic diameter less than 10 µm and PM_{2.5} with less than 2.5 µm)

Causes acute respiratory diseases and impairs breathing. The smaller particles are able to penetrate deeper into the lungs.

Urban particles are mainly in fugitive dust and exhaust emissions which include primary carbon particles, and secondary sulfate and Nitrate including a wide range of hydrocarbons.



ADAM.

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Indirect Human Health Effects

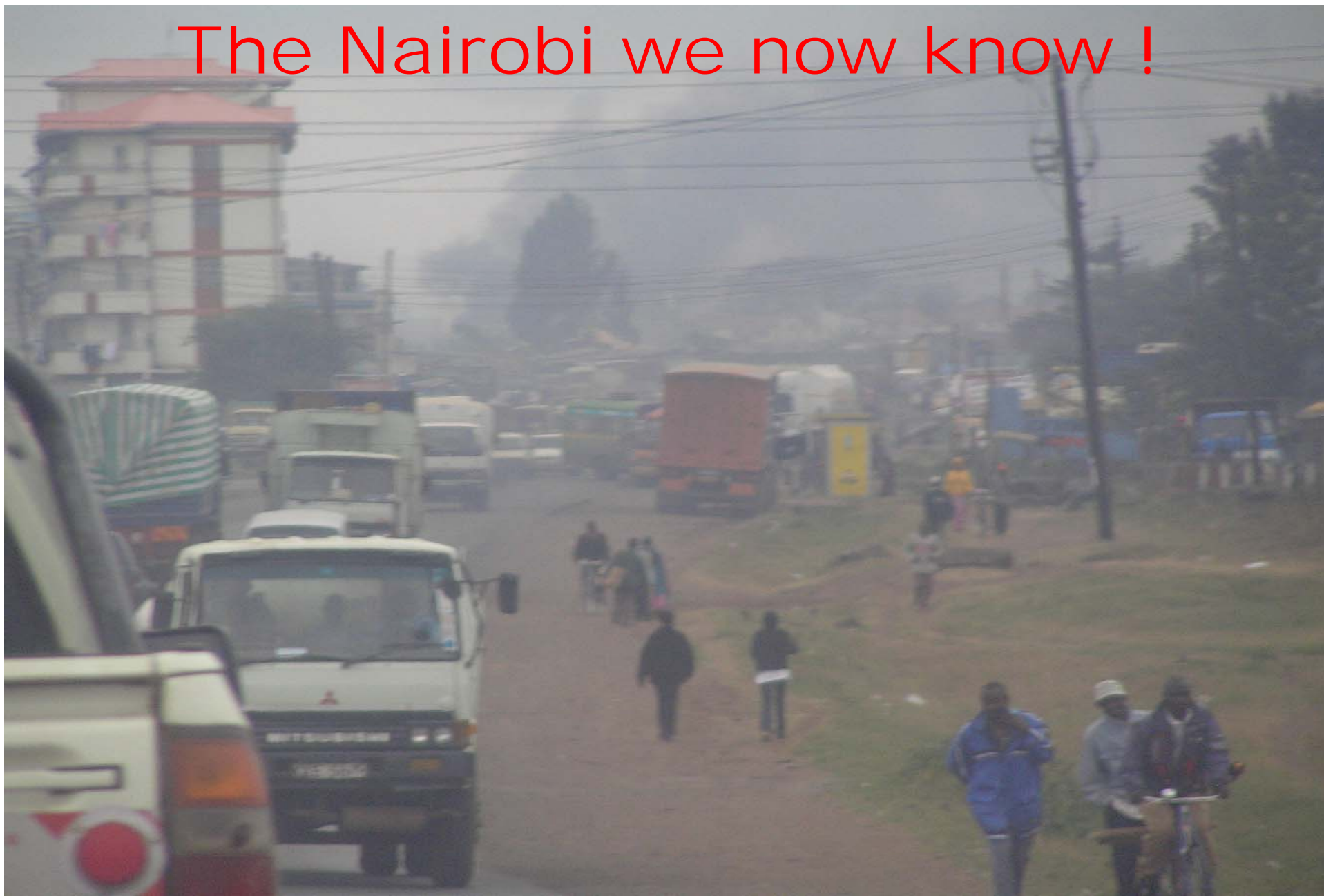


NOX ($\text{NO} + \text{NO}_2$) and SO_2 are converted to nitric and sulphuric acid, respectively, in the atmosphere. The acids cause disastrous damage to our environment while O_3 destroys vegetation.

CO is a precursor of CO_2 : A major greenhouse gas with serious implications in global warming. Climate change impacts have serious indirect impact on human health and the total global habitat.

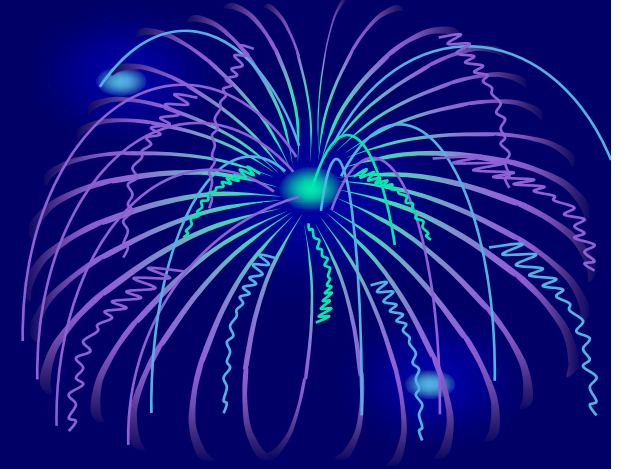
In a nutshell; traffic emissions have both direct and serious indirect impacts on human health.

The Nairobi we now know !



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THANK YOU



*For Your
Attention !!*

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