

Contribution of Vehicles To Overall Air Pollution in Asia

Concluding Workshop Reducing Vehicle Emissions

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Overview

- ✍ Vehicles Are Already a Large and Growing Source Of Air Pollution in the Region
- ✍ Vehicle Characteristics Different Than in Highly Industrialized Countries
- ✍ Some Progress Occurring in Reducing Emissions

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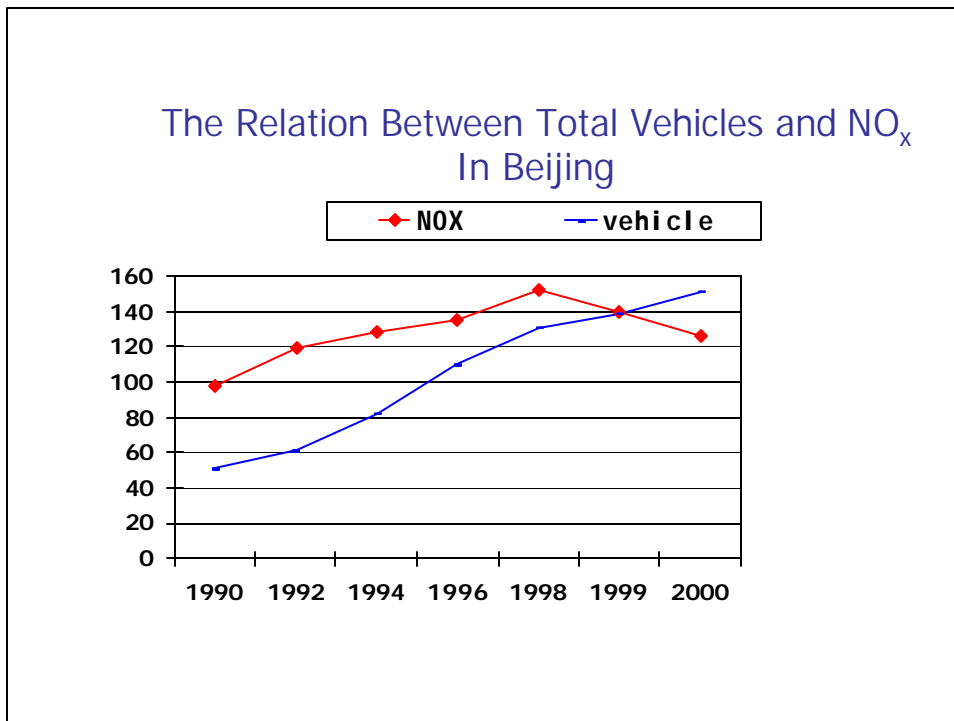
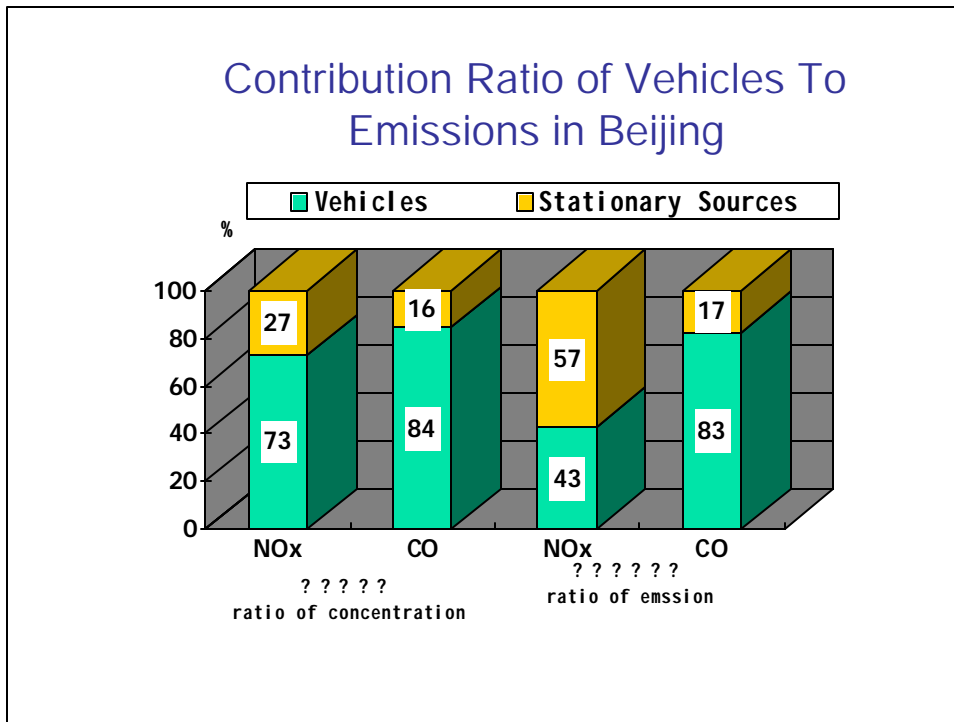
Major Vehicle/Fuel Emissions

- ⚡ Carbon Monoxide
- ⚡ Diesel Exhaust
- ⚡ Particulate Matter (PM)
- ⚡ Lead
- ⚡ Nitrogen Oxides (NOx) and Hydrocarbons (HC)
 - ⚡ *Precursors to Ozone and PM*
- ⚡ Nitrogen Dioxide
- ⚡ Air Toxics
 - ⚡ Aldehydes
 - ⚡ formaldehyde
 - ⚡ acetaldehyde
 - ⚡ others
 - ⚡ Benzene
 - ⚡ 1,3-butadiene
 - ⚡ Methanol
 - ⚡ Polycyclic organic matter (e.g. PAHs)

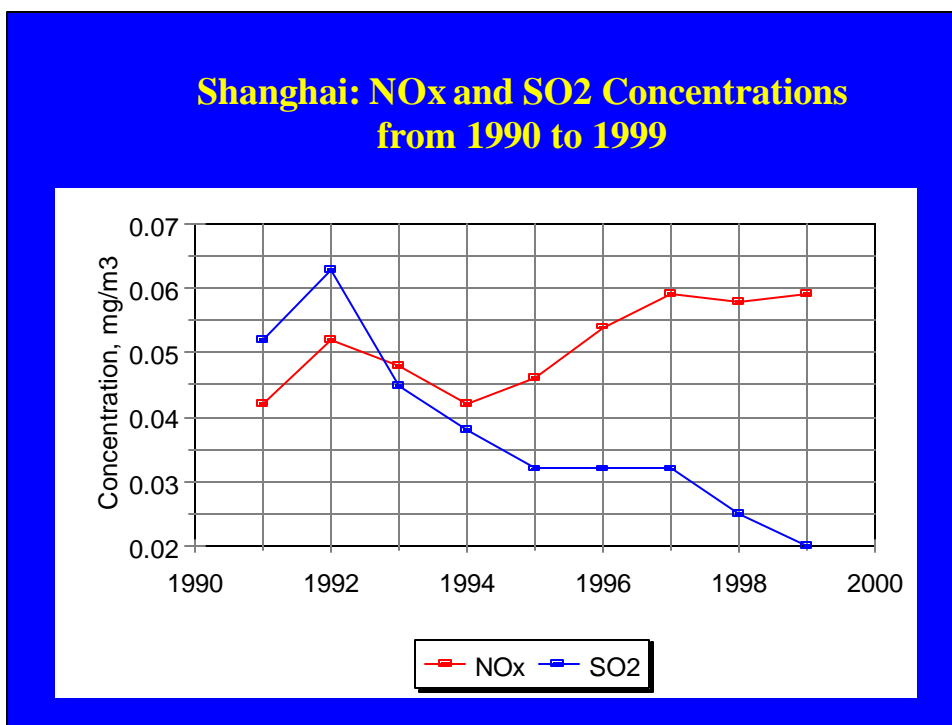
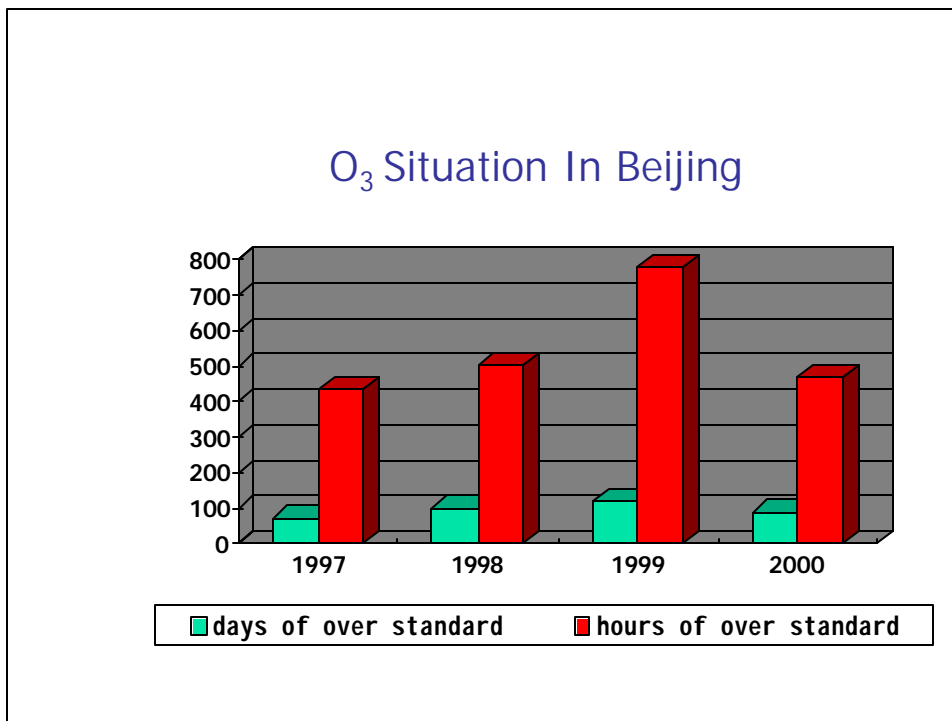
Virtually Every Major City in the Region Has A Serious Motor Vehicle Related Pollution Problem



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Motor Vehicle Pollution in Chongqing

- Vehicle Pollution Contribution in Urban Area
 - On main traffic road in 6 districts of urban area:

CO: 85.8%; NO: 86.3%; THC: 36.6%?

Vehicle Contribution on Air Pollution in 2001

Area	CO	NOx
Yuzhong Dist.	74.35	60.56
Jiangbei Dist.	44.97	52.92
Nan An Dist.	31.68	44.38
Shapingba Dist.	37.55	40.86
Jiulongpo Dist.	22.89	36.09
Dadukou Dist.	26.81	47.27

Motor Vehicle Pollution in Urban Areas in China

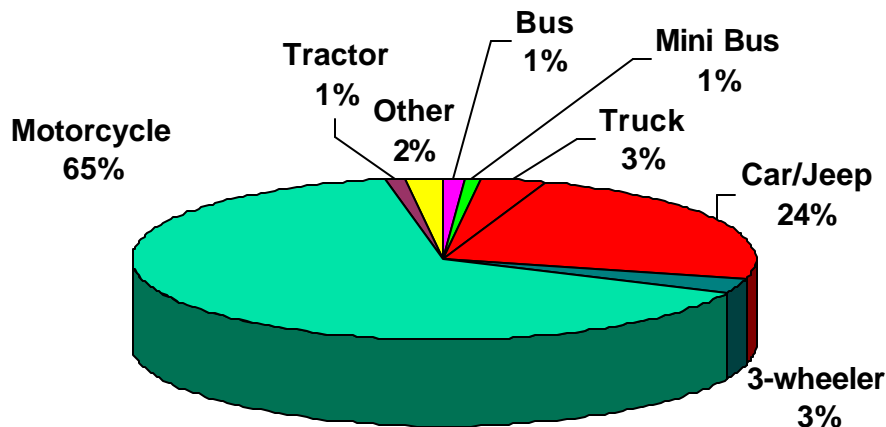
- Motor vehicles contribute nearly 50% of NOx emissions in metropolitan cities
- About 1/3 of Major Cities Exceed ambient NOx NAAQS;
- CO concentration generally higher than national standard in traffic areas;
- Photochemical pollution emerging in big cities;
- Vehicles becoming a main source of air pollution in urban areas.

Source: SEPA

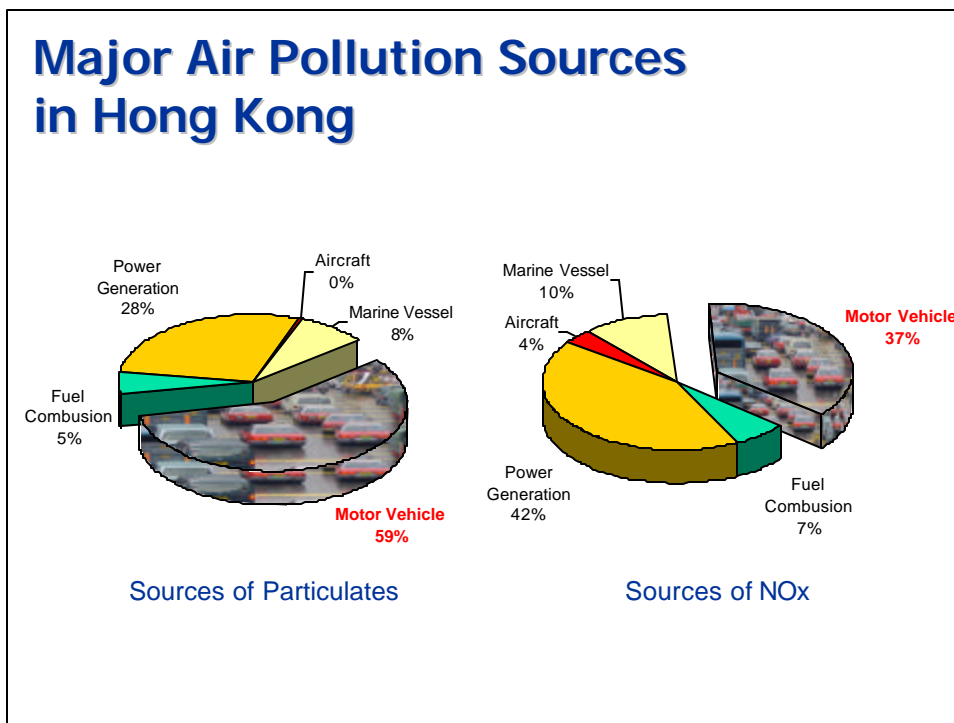
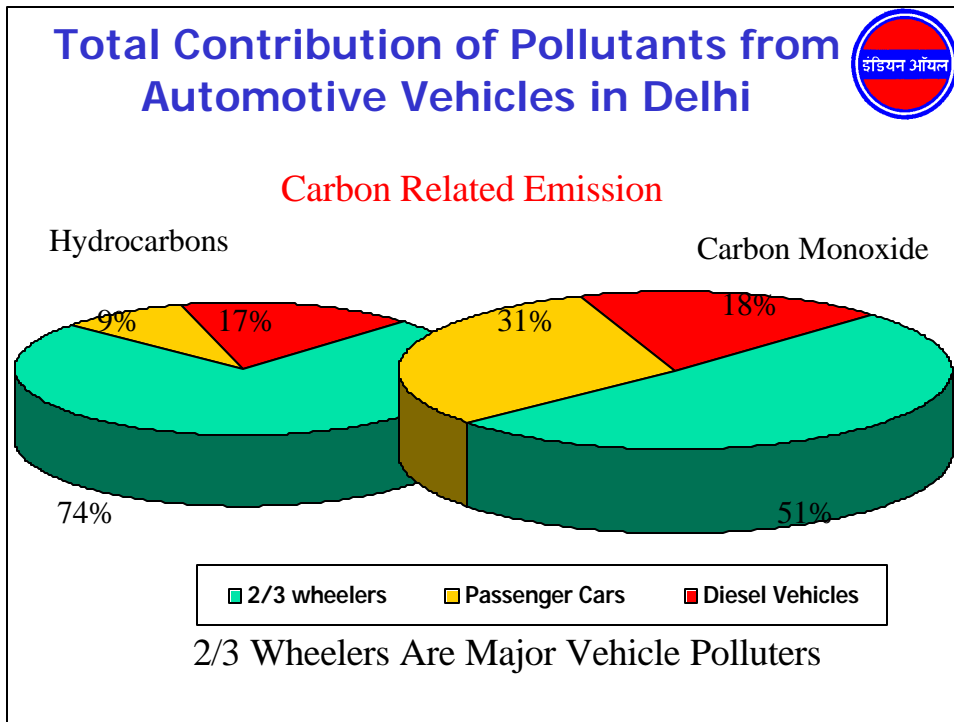
Vehicle Emission in Kathmandu

- ✦ Major sources of air pollution - Cement Factory, brick kilns and vehicle emission
- ✦ 171,678 vehicles in 1260 km of road
- ✦ Increasing at 21%/ year in past two years
- ✦ Highest increase in two-wheelers (25%)
- ✦ About one third of 2-wheelers have 2-stroke engines

Vehicles in Kathmandu

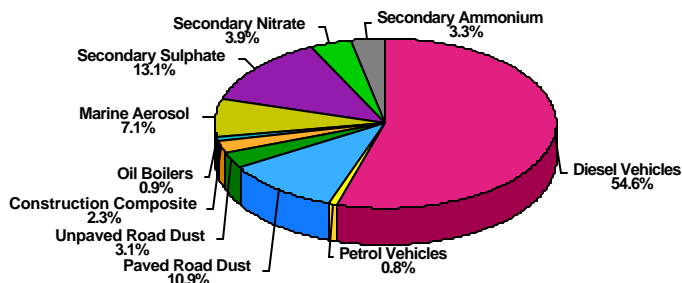


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Source Contribution for RSP (1994) Mong Kok Annual Average

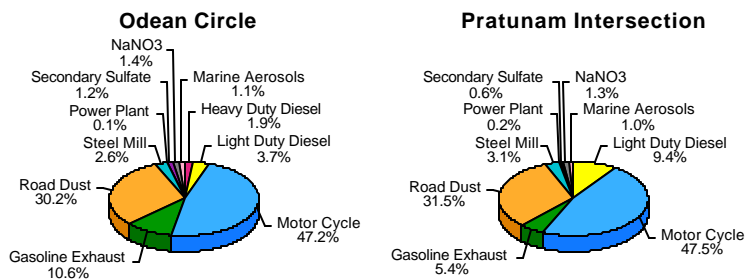


70-80% OF AIR POLLUTION IN METRO MANILA IS CAUSED BY MOTOR VEHICLE EMISSION

- BUSES AND JEEPNEYS ARE MOSTLY DIESEL-FED AND OPERATE DURING MOST HOURS OF THE DAY
- MOTORIZED TRICYCLES USING 2-STROKE ENGINES ARE BECOMING A CONCERN OF LOCAL GOVERNMENT UNITS

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Sources of PM Emissions in High Traffic Areas of Bangkok - 1996



Source: PM Abatement Strategy for the Bangkok Metropolitan Area
Draft Final Report
Radian International

Conclusions

- Motor Vehicle Pollution Is A Serious Problem Throughout Region
- Motorcycles, especially 2 stroke, Autorikshaws and Diesel Vehicles Need Priority Attention

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