

# Air Quality Management

By  
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## City Air Management

Colombo is a city built by colonial rulers, who included the Portuguese from 1505 to 1656, the Dutch from 1656 to 1796 and the British from 1796 to 1948. Since 1948 the local rulers ruled the city. The colonial rulers seem to have paid greater emphasis to build the city focusing on the seaport of Colombo and related commercial activities to support their trade activities and administration. The development of city activities was mainly ad-hoc and unguided though eminent British Town Planners such as Sir Patrick Geddes and Sir Patrick Abercombi had prepared city development plans for Colombo during the early part of the 20<sup>th</sup> century.

The administrative area coming under the purview of Colombo Municipal Council (CMC) is relatively small in extent 37.32sq kms, which accommodates less than one million inhabitants. The Municipal Council of Colombo, which is responsible for managing the city affairs is headed by Mayor and a Council comprising of 53 elected members by the residents of the city. The Council is elected for a period of every ~~every~~ four years. The CMC exercises power and functions primarily derived from the Municipal Council Ordinance enacted in year 1885 which has been supplemented by hundreds of others acts, ordinances and by laws. The CMC has no authority for the provision of services such as education, public transport services and public hospitals etc since responsibilities in providing such services lie in the hands of the national level ministries. The operation and maintenance of civic amenities and services such as city roads, drainage, sewerage, water distribution, public parks, public toilets solid waste management, recreational and community health facilities are some of the service functions performed by the Municipality. The CMC has to provide its services to the city population within an environment of inherited limitations of authority and resources. The property rates have been the single most important revenue sources, which had generated an income ranging from 473.9 million in 1991 to 824.6 Million in the year 1996.\* (City Profile Colombo Sri Lanka) Lack of initiatives to identify new sources of revenues, lack of information and poor understanding of all the possible revenue sources within the city, inefficient collection of arrears and unfavourable political interference have been major problems and limitation that hinder property rate collection and enhancing other Revenue sources.

The city experienced a slow population growth rate i.e. annual growth rate during the period 1981-2001 was 0.4%. The current city resident population (as per population census of 2001) was 642,020 people, with nearly 50% of population living in only 6% of the land area. In addition, nearly 60% of the city dwellers live in poverty.

Colombo, like many other cities in the developing world is growing rapidly posing many complex problems to its city development. Apart from common problems such as inadequate physical and social infrastructure more complex problems are related to the quality of air.

During last few years the ambient air quality within the city of Colombo shows rapid deterioration. The focus of air-pollution regulation in Sri Lanka was initially on protecting ambient or outdoor air quality. This involved the control of number of specific criteria pollutants known to contribute to urban smog and chronic public health problems. Hazardous air pollutants are emitted in smaller amounts than are the criteria pollutants, usually from specific industrial activities. They also should be regulated by emission standards. Although the total emissions and the number of sources of these pollutants are small compared with those for criteria pollutants, hazardous air pollutants can pose an immediate health risk to exposed individuals and can cause other environmental problems.

*Owing to following reasons Colombo has become a City of Priority in terms of Air Quality Management;*

- Its population has grown over one million, with floating population.
- Out of that nearly 200,000 are school children,
- Many schools located by roadsides making school children more vulnerable to health effects of polluted air,
- 60% of all vehicles registered in the island are operated in Colombo Metropolitan Region,
- Highest number of 2 & 3 wheelers found in Colombo,

- In terms of air quality, Colombo has been identified as "Most Polluted Area" in the island
- Main cause of air pollution is vehicle emissions from leaded gasoline and diesel powered vehicles.
- Maximum concentration of SO (Sulfur Dioxide) exceeded only 5 times in 1997 in contrast to 82 times in 2000.

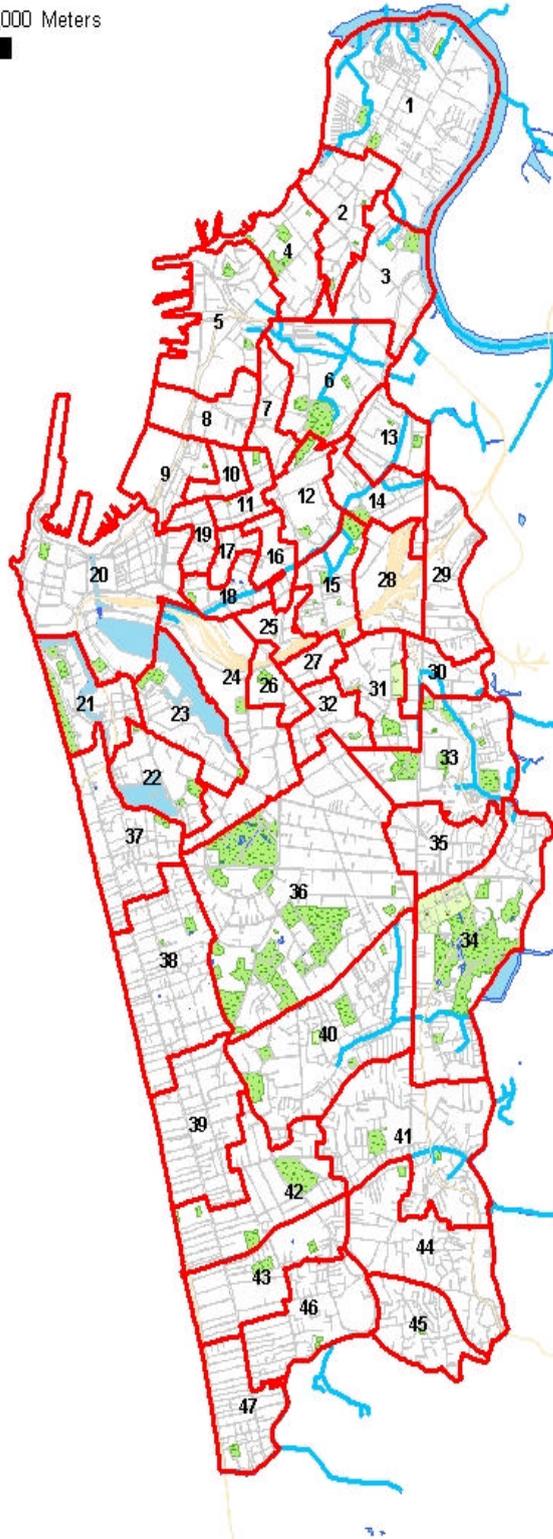
**Main criterion Pollutants found in excessive amounts in the city atmosphere**

- SO (Sulfur Dioxide)
- Particulate matter (P.M 10)
- Pb (Lead)
- Cl (Carbon Monoxide)
- NO (Nitrous Oxide)

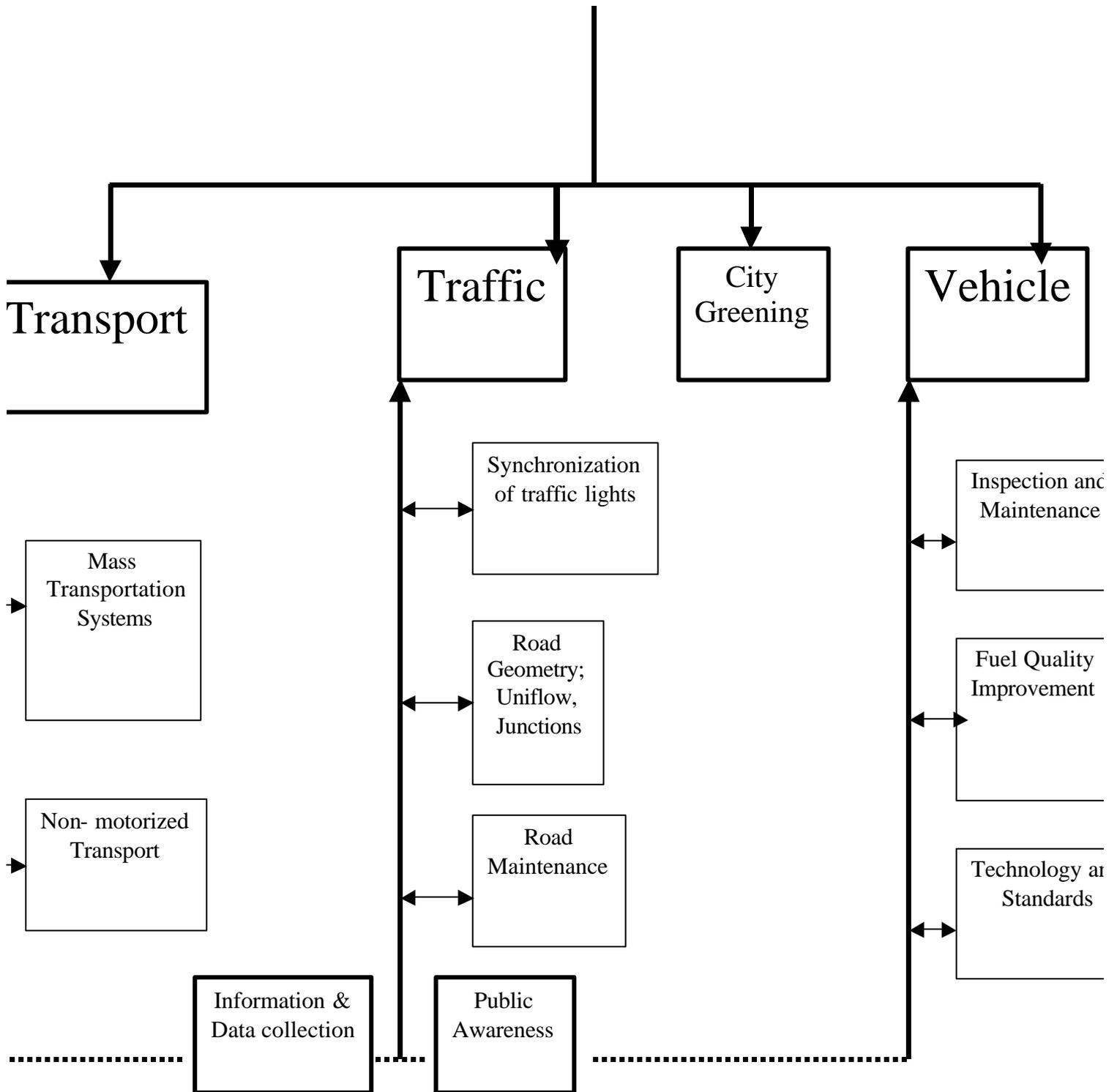
Some information about Colombo & Sri Lanka			
1	Total population (2001) in Colombo	680,000	
2	Population Density person/sq.km in Colombo	18,235	
3	Land Extent (sq.km) in Colombo	37.29	
4	Active Vehicle fleet in Sri Lanka (2000)		
	a) Diesel	309,604	27%
	b) Petrol (4 wheelers)	158,599	14%
	c) Petrol (3 wheelers)	120,086	10%
	d) Motor cycles	576,424	49%

		Average hourly max	National Std
5	Air Pollution Levels in Colombo Fort		
	a) CO Emission	2.132pm	26ppm
	b) SO <sub>2</sub> Emission	0.066ppm	0.08ppm
	c) NO <sub>2</sub> Emission	0.055ppm	0.13ppm
	d) Particulate matters PM <sub>10</sub>	112.3 g/m <sup>3</sup>	

0 750 1,500 3,000 Meters



# Managing Air Quality in Colombo



At the outset the **goal** of the initiative was *improving and maintaining ambient air quality of City of Colombo within permissible range of standards*. The initiative formulated following **objectives** to achieve the set goal;

1. To maintain ambient air quality within permissible range of standards set for criteria pollutants by minimising air pollution in Colombo coarea.
2. To develop integrated clean air management action plan for City of Colombo and its effective implementation through relevant stakeholder institutions.

### **Strategies**

1. Foster public, private and NGO participation in air quality management (AQM).
2. To establish a formal working group involving all the stakeholders, which will act also as an implementation body in addressing air quality management (AQM) issues.
3. To build partnership with other national and international agencies working in the field of AQM.

### **Key Elements of Clean Air Initiative of Colombo**

1. Air pollution source identification and making pollution inventory for the city.
2. Formulation of policy framework to improve air quality.
3. Planning air pollution prevention and control strategy for the City by a well represented stakeholder-working group.
4. Provision of institutional infrastructure needed to combat problem of air pollution.
5. Legislative empowerment of various stakeholder institutions and its enforcement.
6. Carrying out demonstration projects on air quality management.
7. Surveillance - continuous collection of ambient air quality data, its analysis and dissemination of collected air quality data.
8. Establishment of a sub-working group on traffic-related air pollution reduction and prevention.
9. Creation of an air quality database and incorporating that into the City GI System.
10. Public Education

## COLOMBO AIR QUALITY ACTION PLAN AT A GLANCE

- *Identify policy and management interventions for Air Quality Improvement*
- *Reduce traffic congestion to increase the travel speed in order to reduce emissions*
- *Prohibit open burning*
- *Introduce effective city greening program*
- *Public awareness & public participation*
- *Infrastructure for vehicle I&M*
- *Introduce high quality fuel*
- *Establish a comprehensive Monitoring Plan*

### *Policy Interventions Required At The City Level*

- Policy on fuel use in the core area
- Policy on roads rehabilitation
- Policy on city Greening
- Policy on Traffic management
- Policy on mass transport

### Interventions

#### ***I. Actions to Reduce Traffic Congestion***

##### **Short Term**

- Develop a compressive Traffic Mgt Plan - CMC/TMC/UDA/MoT
- Synchronisation of traffic lights - CMC/experts/Univ.
- Uniflow road system (selected roads) - Traffic Police/CMC
- Keep the foot walk free pedestrians - Police/UDA/CMC -ST
- Improve Junctions Geometry - CMC/RDA -ST
- Strict Enforcement of Traffic Regulations - Police

### **Long Term**

- Removal of security barriers - MoD/Police/CMC
- Proper Road maintenance - RCDC/RDA/CMC
- Computer Based Traffic Management System - CMC/PC/Univ./Traffic Police

## ***II. Actions to Prohibit Open Burning***

### **Short Term**

- Public awareness programs - CMC/NGOs/CEA/MoF&E
- Street sweeping - CMC
- Prosecutions - CMC/Police

### **Long Term**

- Improve Solid Waste Management - CMC/UDA/NGOs/Communities
- Encourage Private Sector Participation - CMC/CEA/NGOs

## ***III. Actions to effective city greening program***

### **Short Term/Long Term**

- Identify and plant appropriate species for greening the city - CMC/UDA/UNV./ NGOs/PVT SECTOR

## ***IV. Actions for Public Awareness and Participation***

### **Long/Short Term**

- Educate Traffic police - CMC/UNV/Police/NBRO/CEA
- Awareness programs for pedestrians and Drivers- NGOs/CMC/Police/National Transport Board
- General Public Awareness Program on Pollution Impact - CEA/NBRO/Univ./NIE
- Increase and strict fines for traffic violations - Police/MoD/MoJ
- Pvt Sector participation in Dissemination of AQM index - CEA/CMC
- Educate decision makers - CEA/CMC/NBRO/MoF&E/UDA

## ***V. Actions for developing infrastructure for Inspection and Maintenance programme***

### **Long Term**

- Introduction of pollution standard stickers - CEA/MoF&E
- Restriction of Diesel 3 Wheelers - CMC/MoT/MoT/MoF/Police
- Vehicle Testing Villages - RMU
- Spot checks for road worthiness & Emissions (Police/WPC/CMC
- Restricted access to (e.g. Port) for Heavy vehicles w/o green stickers - CMC/SLPA/Pvt Sector
- Regulations to implement above - CMC/WPC
- Actions to introduce low Sulfur fuel

### **Short Term**

- Develop a compressive Mgt Plan - CMC/TMC/UDA/MoT
- Computer Based Traffic Management System - CMC/PC/Univ./Traffic Police
- Uni-flow road system (selected roads)

## ***VI Actions to introduce low Sulphur fuel***

### **Short/Long Term**

- Use of imported low S diesel and unleaded petrol to Colombo City - WPC/CPC
- Encourage the use of hybrid vehicles CEA/MoF&E/MoT/DoNP

## ***VII Establishment of a Monitoring Program***

### **Long Term**

- Establishment for emission inventory for CMC area - CMC/CEA/NBRO/ITI
- Ambient AQ monitoring - CMC/CEA/NBRO/AEA
- Develop of AQ management model (suitable for Colombo) - Univ/CEA/NBRO/CMC/UDA

Even though the Municipal Council of Colombo spends considerable resources to improve the quality of air in the city, it lacks the technical guidance to monitor the progress and to introduce more cost effective sustainable innovative interventions. In addition the Public Health Officers should be trained to analyse the effectiveness of the programme with reference to the reduction in the air quality related diseases.

In conclusion, for a comprehensive approach to the problem should target the capacity development of the concerned officers for more effective evaluation and innovative improvements.