

REVISED ACTION PLAN

FOR

CONTROL OF AIR POLLUTION

IN

Pune

Part-I



Maharashtra Pollution Control Board
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PREFACE

Hon'ble Supreme Court of India is considering a Public Interest Litigation **W.P.13029/1985** regarding the pollution in some cities in India. Solapur and Pune have been subsequently included in the above writ petition and directions have been given by the Apex Court to prepare Action Plans for these cities which inter-alia should include the pollution reduction strategy in those cities.

MPCB had earlier prepared Action Plans for Pune and submitted it to Environmental Pollution Control Authority (Bhurelal Authority). Based on these plans certain directives have been given by the Apex Court during the hearings, which need to be implemented by various authorities including MPCB. Directions have also been issued to prepare the final action plan for Pune in the uniform format prescribed by Bhurelal Authority for all the cities included in the Supreme Court directives. Bhurelal Authority has been appointed for reviewing the actions taken by the respective States/ SPCBs on the implementation of the directives of the Hon'ble Supreme Court of India to control the RSPM and SPM levels in Pune city.

Govt. of Maharashtra has appointed Member Secretary Maharashtra Pollution Control Board as the Coordinator to facilitate the preparation of Action plan for Pune and its implementation through various agencies. MPCB has been following up the implementation of those directives with all the concerned agencies/ authorities so as to know the compliance from time to time.

It was recommended by MPCB to the Govt. that a Task force, either under the Chairmanship of Secretary (Environment) or Chief Secretary, be appointed to oversee the implementation of the action plans in view of the plurality of the agencies that are involved in the actual implementation of the plan and the directives of the Apex Court from time to time. Accordingly a Task force under the Chairmanship of Principal Secretary (Environment) has been appointed in June 2004 to oversee the implementation of the Action Plan for air pollution control in Pune and Pimpri Chinchwad Municipal Corporation areas.

MPCB has revised the earlier plan, in conformity with directions given by Bhurelal Authority, based on the inputs received from various implementing agencies. The Action Plan is prepared in the format desired by the Authority and is presented in two parts (Part A and Part B) in the following pages.

PART A

Scale & Magnitude of the air pollution problem
Status of action taken so far

Introduction:-

The Hon'ble Supreme Court of India in their Order dated 9th May, 2002 in W.P. No. 13029 of 1985 directed that a scheme be prepared for improvement of air environment with special reference to vehicular pollution in cities other than Delhi, which are equally or more polluted. In this regard, Inter-ministerial discussions were held in New Delhi as also in the conference of State Environment Secretaries and Chairpersons of Pollution Control Boards/Committees, to draw a plan of action to reduce the air pollution due to vehicles.

Directives were given by the Hon'ble Supreme Court of India to include Pune City, as one of the four cities, which further studies in order to prepare an action needed plan as per those directives for an air quality improvement.

Detailed discussions were held by Maharashtra Pollution Control Board with the State Environment Department, Home (Transport), Public Sector Oil Companies, Municipal Commissioner, Pune to draw a plan of action. Member Secretary, MPCB has been appointed as a Convener to prepare the action plan for Pune city. Accordingly, a Plan was jointly drawn which was submitted to the Ministry of Environment & Forests, Government of India, vide MPCB letter No.BO/APAE/TB/B-3521, dated 05-09-2002.

Government of India in Ministry of Environment & Forests further directed the State Government and MPCB vide their letter No.Q-16011/10/2002-CPA, dated 1st April, 2003 to revise the Plan taking into consideration of Industrial Pollution in Pune city and surrounding areas including Pimpri-Chinchwad Municipal Corporation area. Since Pimpri –Chinchwad is very close to Pune

city, inter- city air pollution is bound to affect the air quality in both the cities. Hence, the pollution load of both vehicular and industrial area of PCMC has also been included in this report. The measures taken by various agencies viz. Ministry of Road Transport and Highways and Transport Department, Pune Municipal Corporation, Ministry of Petroleum and Natural Gas, Pune Municipal Transport (PMT), local offices of the Oil Companies, MPCB, Dist. Supply Office, Regional Transport Offices at Pune and Pimpri Chinchwad and PCMC have been incorporated in the revised Action Plan to control air emissions in Pune and Pimpri Chinchwad cities.

This revised plan is prepared keeping in mind the directives of Environment Protection Control Authority (EPCA) to submit the Action Plan in the format prescribed by the authority, to maintain uniformity while making submissions before Hon'ble Supreme Court of India. The Pune city, for the purposes of this Action plan, includes the areas under Pune Municipal Corporation and Pimpri-Chinchwad Municipal Corporation. A map showing the areas under this Action Plan is attached to this report.

A. Brief Description of the City Concerned

Pune district is located between 17.5 to 19.2° degrees North & 73.2° to 75.1° East. The district is bounded on North & East by Ahmednagar district, by Satara district on South & by Raigad district on the West.

The total geographical area of Pune district is 15642 Sq. Kms. This is about 5% of the total area of Maharashtra State. Out of the total geographical area, 11% is forest area, 7% is covered by grazing land. 74% is cultivated area which is about 1157506 ha. About 10.70% is non- cultivated area.

In Pune district there are two municipal corporations, namely Pune Municipal Corporation & Pimpri-Chinchawad Municipal Corporation. There are about 14 Talukas & 13 Panchayat Samitis in Pune district. It covers about 25 urban areas out of which there are 2 Municipal corporations, 3 Cantonment boards & 11 Municipal councils. There are about 1866 villages in the district.

Total road length of Pune district is 13,642 kms. The average rainfall of district is 600 to 700 mms.

Total population of Pune district is 72.24 lakhs, out of which 37.68 lakhs are men & 34.56 lakhs are women as per 2001 census .

The major crops in district are Jowar, Bajara, Wheat & Rice.

The major river of the district is Bhima and minor rivers are Karha, Kukadi, Pavana, Meena, Shivganga etc.

Pune City:

Geographical Status:

Pune city is located at 559 mtrs. from the mean sea level. It is located between 18.32° North and 73.51° East . Pune city is located in the Deccan Plateau and is about 100 kms east from Konkan coast and at a distance of about 160 kms from Mumbai. It is located at the confluence of Mula-Mutha river. There is hilly area on western side of Pune and on south side Sinhagad-Katraj hilly area is observed. About 12% area of the city is hilly area. The total geographical area of Pune is 450.69 Sq. kms. Out of the total area, 38.6% is residential area, 1.8% is commercial area, 9.5% is defense area, 11% is Industrial area, 9.7% is recreational area etc.

Pimpri Chinchwad is located at the West of Pune city & touching to Pune Mumbai National highway. The corporation covers the area of Akurdi, Pimpri,

Chinchwad, Bhosary etc. The said area is developed by MIDC as an industrial zone.

Climatic Conditions:

The temperature of city ranges between Minimum 12°C & Maximum 37°C. The average rainfall recorded is 600 to 700 mm. The maximum rainfall is observed in June to September months.

Socio-Economic Status:

In Pune there are two cantonment areas. Pune city is well connected to Nashik, Mumbai, Ahamadnagar, Solapur & Bangalor cities. Due to hilly areas in city the climate of Pune city is good & cool. Due to these nature gifts city has got the name 'Deccan Queen'.

Population of Pune city is around 31, 57,000 as per 2001 census. Area of Pune Municipal Corporation has been increased from 145.92 Sq. kms to 450.69 Sq. kms due to the increase in number of villages joining Pune city.

I. Air Quality of Pune City

Ambient Air Quality monitoring results in Pune:

The ambient air quality in Pune city was monitored from October 2001 to May 2002 under the National Ambient Air Quality Monitoring Program of Govt. of India. The parameters that were measured for the above period include sulphur dioxide, oxides of nitrogen, suspended particulate matter and respirable suspended particulate matter, at two locations viz. Majur Adda and Yeshwantrao Chavan Natyagriha, Pune. The analysis report is as follows.

The period of monitoring is from October 2001 to May 2002.

	Near Majur Adda				Near Yashwantrao Chavan Natyagriha			
	PM ₁₀	SPM	NO _x	SO ₂	PM ₁₀	SPM	NO _x	SO ₂
Maximum	169.42	222.36	96.34	58.72	110.34	-	74.29	49.51
Minimum	103.47	137.79	50.27	20.19	55.16	-	29.33	19.67
Average	132.32	173.05	78.94	40.48	83.57	-	49.68	30.21

From these results, it is seen that the RSPM, NO_x values near Majur Adda are exceeding the prescribed limits which is mainly due to the dense vehicular traffic in that area. PM₁₀ values at Yashwantrao Chavan Natyagriha were slightly higher and the NO_x values are just touching the boundary limits. These values are attributable to the vehicular movement in the area.

Air quality Monitoring Stations:

Apart from the data gathered through the NAAQAM program in Pune city, Maharashtra Pollution Control Board also carried out Ambient Air Quality monitoring at the following monitoring stations (3) to re-assess the RSPM values in Pune.

Ambient air quality was monitored at two stations under NAAQAM and an additional station was also added in the MPCB program on Air Quality monitoring.

- 1) Majur Adda
- 2) Yashwantrao Chavan Natyagriha
- 3) Jog Centre Building, Mumbai-Pune Road

Month-wise ambient air quality results are given below:

Ambient Air Quality Monitoring Stations in Pune:

Month-wise Air Quality results at Majur Adda

Month	PM10	SPM	NOx	SO ₂
November 01	128	100	106	57
December 01	153	102	103	56
January 02	136	86	92	42
February 02	156	93	114	67
March 02	119	78	107	53
April 02	111	71	91	44
May 02	115	75	76	34
Average	131	87	98	50

Month-wise Air Quality results at Yashwantrao Chavan Natyagriha

Month	PM10	NOx	SO ₂
December 01	86	89	34
January 02	71	64	34
February 02	100	69	52
March 02	90	59	37
April 02	78	50	36
May 02	75	44	31
Average	83	62	37

**Air pollution testing at Jog Centre Building,
Mumbai-Pune Road, Wakdewadi, Pune-3.**

Sr.No.	Month	SO ₂	NO _x	SPM
1	Jan-02	23.26	36.10	280.70
2	Feb-02	21.50	30.85	573.01
3	Mar-02	14.97	33.12	660.40
4	April-02	30.15	44.70	149.70
5	May-02	39.56	28.79	180.48
6	June-02	----	----	----
7	July-02	----	----	----
8	Aug-02	----	----	----
9	Sept-02	48.49	62.74	68.95
10	Oct-02	61.66	34.27	90.20
11	Nov-02	25.99	24.12	141.24
12	Dec-02	13.50	18.58	135.41
13	Jan-03	9.60	32.95	82.50
14	Feb-03	8.23	28.84	99.54
15	Mar-03	17.96	38.36	228.14
16	April-03	23.73	46.03	194.20
17	May-03	16.76	31.98	194.17
18	June-03	10.31	23.43	202.65
19	July-03	14.29	30.73	----
20	Aug-03	16.26	29.63	88.93
21	Sept-03	17.81	28.35	104.56
22	Oct-03	17.08	18.57	----
23	Nov-03	21.58	41.80	----
24	Dec-03	18.60	31.48	----
25	Jan-04	15.79	26.77	271.42
26	Feb-04	----	-----	----
27	Mar-04	23.50	35.50	----
28	April-04	30.96	35.08	----

From the above results, it is seen that the SO₂ and NO_x levels are within the prescribed limits, but SPM levels have exceeded and have reached up to 660.40 in March 2002 at Jog Center, Mumbai Pune Road. The increased SPM values were probably due to heavy vehicular movement on National Highway No.4 as well as re-suspension of the dust and construction activity in the area. The maximum values of RSPM at Majur Adda were observed in

February and minimum in April. Similarly near Yashwantrao Chavan Natyagriha, the maximum values of RSPM were observed in February and minimum in January. The SPM levels at Majur Adda were maximum in December 2001 and minimum in April 2001.

The Ambient air quality is also monitored at Bhosary, Nal Stop & Swargate stations under NAAQM program of CPCB for year 2003-2004. The average results obtained are as below (Source: Pune University)

Monitoring Station	Annual Average ($\mu\text{g}/\text{M}^3$)			
	SO ₂	NO _x	SPM	RSPM
Bhosari	31.75	36.92	160.25	88.58
Nal Stop	36.33	71.92	453.92	170.08
Swargate	34.17	65.00	384.58	195.58

From the above results, it is seen that the SO₂ and NO_x levels are within the prescribed limits, but SPM and RSPM levels have exceeded at Nal Stop and Swargate. This may be due to heavy vehicular traffic.

Month-wise Air Quality results at Karve Road from Sept-2004

Sr.No.	Month	SO ₂	NO _x	SPM
1	Sept-04	13.62	21.31	104.00
2	Oct -04	19.13	25.69	105.34
3	Nov-04	18.00	27.80	107.60

From the above results, it is seen that the SO₂ and NO_x levels are within the prescribed limits. The SPM levels were also found to be within prescribed limits.

Ambient Air Quality Monitoring in Pimpri–Chinchwad:

Maharashtra Pollution Control Board has also carried out ambient air quality monitoring in Pimpri-Chinchwad area in the Industrial, Commercial, Residential and Silence zones. The ambient air quality parameters that were monitored in those zones include Suspended particulate matter, Oxides of Nitrogen and sulfur dioxide. The results obtained are as below:

A. INDUSTRIAL ZONE:

Sr. No.	Place/Site	SPM	SO₂	NOx	Remarks
1	TELCO	725	62	52	SPM levels are beyond permissible limits.
2	Bhosari	685	56	58	
3	Ruston Hornsby	732	80	62	
4	Garware	594	58	66	
5	Hindustan Antibiotics	545	62	59	
	Permissible limits	500	120	120	

B. COMMERCIAL ZONE:

Sr. No.	Place/Site	SPM	SO₂	NOx	Remarks
1	Raka Gas	535	56	52	At Raka Gas site & Garware Nylon site SPM levels are exceeding the permissible limits.
2	PCMC	460	59	72	
3	Garware Nylon	552	64	69	
4	Kalewadi	338	38	75	
5	Dapodi	412	52	73	
	Permissible limits	500	120	120	

C. RESIDENTIAL ZONE:

Sr.No.	Place/Site	SPM	SO ₂	NO _x	Remarks
1	TELCO Colony	226	65	48	At Indiranagar and Telco Colony, SPM levels are slightly exceeding the permissible limits.
2	Century Enka Colony	160	62	49	
3	H.A. Colony	112	57	60	
4	Pradhikaran	185	55	59	
5	Indiranagar	218	60	70	
	Permissible limits	200	80	80	

D. SILENCE ZONE:

Sr.No.	Place/Site	SPM ug/Nm ³	SO ₂ ug/Nm ³	NO _x ug/Nm ³	Remarks
1	TELCO Road	94	39	42	SO ₂ & NO _x levels are beyond the permissible limits.
2	Lokmanya Hospital	110	47	52	
3	Talera Hospital	90	52	55	
4	Jijamata Hospital	87	58	49	
5	Mata Temples	93	48	43	
	Permissible limits	100	30	30	

Further monitoring of the Ambient Air Quality to measure performance efficiency can be undertaken once the action plan is approved. The agencies viz. Pune Municipal Corporation, MPCB, University of Pune and PCMC, will be chosen in consultation with CPCB to intensify the ambient air quality monitoring activities. The parameters that will be monitored shall include PM₁₀, SPM, NO_x, CO and SO₂. Efforts shall also be made to disseminate the gathered information on Ambient Air Quality to all concerned authorities so that effective steps can be taken by these authorities to reduce the air pollution in Pune and Pimpri-Chinchwad municipal areas.

II. Sources of air pollution in the City

The major contributory sources of air pollution in Pune city are

1. Vehicular Pollution
2. Industrial Pollution

1. Vehicular Pollution:

The observed ambient air quality trend in Pune is certainly very disturbing. This is because approximately 6,800 new vehicles are introduced on Pune roads per month. (Source – Environment Status Report – PMC).

The already existing large number of vehicles and a monthly addition of the high number of vehicles in Pune and adjoining areas result in slow traffic movement with speed of the vehicles between 15 km/hr to 35 km/hr. This is further compounded by acceleration and de-acceleration of the vehicles on the congested roads, which aggravates the situation. The direct mal-effect of this situation is the increased air pollution in the city.

The key traffic and transportation problems in Pune Municipal area and PCMC area can be broadly identified as under:-

- [i] A disproportionate rise in the number of vehicles during last few years; more particularly in the Two wheelers;
- [ii] Heterogeneous traffic conditions with limited road carriage capacities making segregation of traffic very difficult
- [iii] Absence of a ring road despite radial expansion of the city,
- [iv] Insufficient road capacities in the congested area;
- [v] Crowded intersections leading to air and noise pollution;
- [vi] Various encumbrances on roads such as encroachments,

unauthorized constructions particularly of religious nature etc.

[vii] Absence of parking facilities at important locations leading to street parking and road congestion.

[viii] The inadequacy of footpaths and their diversion to other uses and joy walking leads to obstruction of vehicular traffic.

Inventory of emissions load from vehicles is done in Pune city & PCMC by Central Institute of Road Transport [CIRT], Pune, in 2002, is as follows:-

VEHICULAR INVENTORY OF POLLUTION LOAD IN PMC								
Vehicle Type	No. of vehicles	CO	NOx	SO₂	HC	TSP	PM₁₀	Total
Cars	71,771	20.20	2.32	0.034	3.80	0.30	0.20	26.854
2 Wheelers	560,359	36.10	0.30	0.058	19.20	0.90	0.70	57.258
Rickshaws	30,785	28.00	0.75	0.036	18.40	0.90	0.70	48.786
Taxis	1,633	2.70	0.25	0.002	0.50	0.03	0.02	3.502
Buses	6,602	9.20	9.72	0.903	1.80	1.42	1.11	24.153
Trucks	10,367	7.50	9.51	0.724	1.20	1.38	1.09	21.404
Total	681,517	103.70	22.85	1.757	44.90	4.93	3.82	181.957
All figures of pollutants are in Tonnes per day.								

VEHICULAR INVENTORY OF POLLUTION LOAD IN PCMC								
Vehicle Type	No. of Vehicles	CO	NOx	SO₂	HC	TSP	PM10	Total (Tons/Day)
Cars	27,224	7.66	0.90	0.012	1.44	0.11	0.07	10.192
2 Wheelers	211,837	13.64	0.11	0.021	7.20	0.34	0.26	21.57
Rickshaws	10,203	9.27	0.24	0.011	6.10	0.30	0.23	16.15
Taxis	587	0.94	0.09	0.0007	0.17	0.01	0.007	1.21
Buses	214	0.30	0.31	0.03	0.06	0.04	0.35	1.09
Trucks	18,492	13.37	16.96	1.30	2.14	2.46	1.94	38.17
Total	268,557	45.18	18.61	1.37	17.11	3.26	2.85	88.38
All figures of pollutants are in Tones per day.								

2. Industrial Pollution Scenario in Pune:

In Pune there are 12 nos. of Large & Medium scale Industries & 876 nos. of Small scale Industries. These industries are not having high Air pollution potential. There are total 56 no. of air polluting industries in Pune corporation area.

The total fuel consumption from these units is as below :(Source-MPCB, SRO, Pune-I)

Sr. No.	Type of Fuel	Consumption (Lit/Day)	Sulphur Content (Kg/Day)	SO ₂ emission (Kg/Day)
1	LDO	58,428	1051.7	2103.4
2	Furnace Oil	62,152	2796.84	5593.68
3	HSD	2,841	28.41	56.82
4	Diesel	1,980	19.80	39.60
5	TOTAL	1,25,401	3896.75	7793.50

Sub-Regional office, Pune has monitored the major air polluting industries. The ambient air quality in these industrial areas generally meets the standards as prescribed by MPCB except on one or two occasions. The industries have installed the air pollution control devices like dust collectors, scrubbers etc. The Board has taken the action on defaulting industries from time to time.

In Pimpri-Chinchawad area there are total 705 industries. Out of total 41 are large scale, 35 are medium scale & 629 are small-scale industries. There are total 67 air polluting industries in Pimpri-Chinchwad corporation area. The

industries have installed the air pollution control devices like dust collectors, cyclones, etc. Total fuel consumption (FO/LDO/HSD) from these units is 3, 51,361 lit/day. Sub-Regional office, Pimpri-Chinchwad has monitored ambient & stack air quality of the industries. The average concentration of SO₂ observed is 35.04 µg/Nm³, NO_x concentration is 43.68 µg/Nm³, SPM concentration is 102.68 µg/Nm³, and RSPM concentration is 113.64 µg/Nm³.

III Status of Public Health

There has been no systemic survey conducted on the impacts of air and noise pollution on the health of population residing within Pune city limits by the Medical college or any other institutions in the city or NGOs and therefore no data is available to understand the ill effects of the SPM and RSPM levels that have been recorded in the city during the course of the Ambient Air Quality monitoring studies.

IV Details with Regard to Different Sources of Pollution

A. Vehicles:

The vehicular population in Pune city is rising tremendously, which is creating serious problem in Pune. The pollution due to vehicles is creating bad impact on the public health. The vehicular pollution is giving rise to respiratory diseases like Asthma, Bronchitis etc. The Two wheeler vehicles are increasing rapidly in Pune. Number of two wheelers increased from 1313 in 1960 to 7, 88,191 in 2003.

Two wheelers are covering about 80% of the road while public vehicles are covering only 0.8% of the road. PMT buses are for public transportation.

Following chart indicates information about Pune Municipal Transport

Particular	1997-98	1998-99	1999-2000	2000-2001	May 2001
Total buses	799	779	750	824	822
Janata buses	-	-	-	-	24
Diesel Consumption/day for buses only	50,548	49,881	48,603	98,524	45,466
No. of passengers per day	5,14,833	4,71,098	4,29,355	4,19,141	4,04,070

1. Number & Percentage share of vehicles:

Pune city has a Regional Transport Office which keeps record of the vehicle registration in the city. The information provided by the RTO Pune is given in the table below showing the numbers of the different category of vehicles and their share in the total number of vehicles in Pune & Pimpri-Chinchwad area in the years 2000, 2001, 2002 and 2003 respectively.

Type of Vehicles	PMC			
	2000	2001	2002	2003
1. Total Two Wheelers	6,09,497	6,65,232	7,23,247	7,88,191
2. Three Seaters	49,478	51,798	54,181	55,129
3. Light Motor Vehicles	97,279	1,06,183	1,17,659	1,29,059
4. Heavy Vehicles	74,355	79,061	78,466	85,000
TOTAL	8,30,609	9,02,274	9,76,553	10,57,379

Type of Vehicles	PCMC			
	2000	2001	2002	2003
1. Total Two Wheelers	1,64,598	1,86,514	2,11,837	2,36,301
2. Three Wheelers	4,413	4,816	5,288	5,415
3. Light Motor Vehicles	21,011	24,106	27,883	30,242
4. Heavy Vehicles	20,543	22,239	23,577	25,041
TOTAL	2,10,565	2,37,760	2,68,585	2,97,499

From the above table, it may be noticed that two wheelers are the main contributing category of vehicles for most of the air pollution in Pune and PCMC areas. The percentage contribution of pollution by different category of vehicles is shown below:

			PMC	PCMC
1]	Two Wheelers	74.54%	79.43%
2]	Three Wheelers	5.21%	1.82%
3]	Light Motor Vehicles	12.20%	10.16%
4]	Heavy Vehicles	8%	8.42%

The two-wheelers and the three-wheelers have shown a steep rise in the last three years.

2. Present status of vehicle emissions control programme underway:

The National ambient air quality standards notified in June 1997 are reproduced below. It is planned that the air quality targets will be maintained to meet the National Ambient Air Quality Standards.

National Ambient Air Quality Standards

Pollutants	Time weighted Average	Connection in Ambient Air		
		Industrial Areas	Residential (Rural & Other) Areas	Sensitive Areas
Sulphur di-Oxide (SO ₂)	Annual Average	80 ug/m ³	60 ug/m ³	15 ug/m ³
	24 hours	120 ug/m ³	80 ug/m ³	30 ug/m ³
Oxides of Nitrogen (NOX)	Annual Average	80 ug/m ³	60 ug/m ³	15 ug/m ³
	24 hours	120 ug/m ³	80 ug/m ³	30 ug/m ³
Suspended Particulate Matter (SPM)	Annual Average	360 ug/m ³	140 ug/m ³	70 ug/m ³
	24 hours	500 ug/m ³	200 ug/m ³	100 ug/m ³
Respirable Particulate Matter (RSPM) size <10µ	Annual Average	120 ug/m ³	60 ug/m ³	50 ug/m ³
	24 hours	150 ug/m ³	100 ug/m ³	75 ug/m ³
Lead (PB)	Annual Average	1.0 ug/m ³	0.75 ug/m ³	0.50 ug/m ³
	24 hours	1.5 ug/m ³	1.0 ug/m ³	0.75 ug/m ³
Carbon Monoxide (CO)	8 hours	5.0 ug/m ³	2.0 ug/m ³	1.0 ug/m ³
	1 hours	10.0 ug/m ³	4.0 ug/m ³	2.0 ug/m ³

- a) Efforts shall be made to meet the air quality standards stipulated by CPCB in its National Ambient Air Quality Standards published in June, 1997.
- b) The background levels of pollution in Pune are already known, since PMC and MPCB had undertaken sufficient measures/efforts in the past to assess those values through monitoring in the sensitive areas.

About 60% of roads in Pune Municipal Corporation area & Pimpri-Chinchwad Municipal Corporation are congested whereas remaining 40% roads in the fringe area have relatively lower traffic volumes. Various initiatives taken by

the Pune Municipal Corporation to ease traffic congestion in the city area are primarily based on the following initiatives:

- 1] Decongest the city roads;
- 2] Segregate directional traffic and vehicular and pedestrian movement;
- 3] Provide parking facility to traffic;
- 4] Encourage public transport while discouraging the personalized modes;

There is a lot of scope for improvement in the public transport system in Pune city. Due to largely unreliable frequency of PCMC and PMT buses, it is estimated that approximately 2.0 to 2.5 Lakh commuters have switched over to personalized modes of transportation, i.e. two wheelers. The year wise dwindling commuter support to Public transportation in PMC and PCMC is highlighted in the table below. The figures of the number of commuters using the public transport for the years 2003 – 2004 are not readily available. However, the discussions with the municipal authorities reveal that the number of the commuters is steadily dwindling.

**TABLE SHOWING NUMBER OF COMMUTERS WHO TRAVELLED BY
PMT and PCMC BUSES**

No.	YEAR	PMC	PCMC
COMMUTERS			
1	1997-1998	470,844	80,352
2	1998-1999	427,955	80,272
3	1999-2000	385,475	60,893
4	2000-2001	355,557	60,989
5	2001-2002	343,173	49,590

However, in spite of overwhelming public support to use the public transport and best efforts on part of PMT, it may still not be possible for the Pune Municipal Transport to substantially fulfill the entire public transportation requirements/demands of the city population in the near future. Presently, most of the transportation needs are fulfilled primarily by the people themselves through the privately owned vehicles. The remaining commuting needs are supplemented by the PCMC & Pune Municipal Transport services and the other public transportation modes.

For the reduction in vehicular pollution, steps like improvement in PUC system and compulsory I & M practices for on-road vehicles have been taken by the concerned authorities as mentioned below:

- i] RTO has banned six seater rickshaws within PMC area.
- ii] Only petrol driven rickshaws are permitted within PMC area.
- iii] No diesel rickshaw is permitted as a replace vehicle to the existing one.
- iv] No new rickshaw permits are being granted from 26-11-1997.
- v] All intent letters for the rickshaw permits have been cancelled from 29-04-1999.
- vi] Vehicles are checked regularly for PUC certificates and if found exceeding the emission limits, the registration of such vehicle is suspended till satisfactory repairs are carried out. Penal compounding fees are also recovered from such defaulting

vehicles. Grant of PUC Renewal certificate is considered only after observing satisfactory performance of the vehicle. Around 50% vehicle comes for inspection & approximately 05% is failure rate. Periodical & surprised check of PUC center by Dept. In Pune, there are 99 nos. of PUC centers for Petrol, 15 nos. for diesel & 53 nos. for petrol & diesel. In Pimpri Chinchawad, there are total 53 nos. of PUC centers. (As reported by Transport Dept.)

- vii] Switch over of two wheelers from 2 strokes to 4 strokes is being done in phases. It is considered not to permit new two wheeler with 2S engines.

Institutional plans for implementation of gaseous fuel programme:

There are 5 LPG outlets in Pune of which two are operated by BPCL, Two by HPCL and One by IOCL. IOCL Pune is setting up one more auto LPG dispensing station and the work on it is in progress. Besides, IOCL has plans to set up three additional stations in Pune subject to availability of suitable sites with statutory approvals. HPCL also has similar plans to set up two more stations subject to above conditions. However, the actual implementation of the above planed LPG outlets would depend on the availability of the gas, suitable retail outlet sites and the demand for the auto LPG. At present there is no CNG outlet in Pune. Expected CNG will be available up to 2005. Joint Venture is being formed with BPCL for supply of CNG in Pune.

Vehicle Taxation in Pune:

The vehicles in Maharashtra are taxed based on the provisions in the Bombay Motor Vehicle Tax Act 1958, which extends to whole of Maharashtra including Pune. Principally the tax structure is based on the laden weight or unladen weight of the vehicle. In case of lightweight motor vehicles one time tax has been made compulsory which is seven times more than the annual rate of the tax. On the motorcycles the tax is based on the cost of the vehicle, which is 7% & is levied at the time of initial registration similarly for car it is 4% of the vehicle cost & levied at time of initial registration. For the buses the tax is based on the sitting capacity & is levied annually. For the small vehicles like auto rickshaws etc., which are used for carrying passengers, the tax is based on the carriage capacity & is levied annually.

B. Industry:

The Pune city is surrounded by 7 Nos. of Talukas including Pimpri-Chinchwad Municipal Corporation area. The industrial scenario and the pollution load is given below: (Source MPCB)

Name of Area	No. of LSI/MSI	SO ₂ (Kg/Day)	SPM (u/Nm ³)	
Pune City	12	9,410	700 (Max. Avg.)	152 (Min. Avg.)
PCMC	76	19,393	351 (Max. Avg.)	57 (Min. Avg.)
Khed Taluka	13	1,618	-	-
Maval Taluka	10	14,606	-	-
Junner & Ambegaon Taluka	3	6,535	-	-
Shirne Taluka	17	4,497	-	-
Mulshi & Haveli	17	6,411	-	-
Total	147	53,060	-	-

The small-scale industries mainly belong to service category.

The large and medium scale industries are very few. These industries are not having high air pollution potential (HAPPI). The industries by far have taken measures for emissions control.

It may thus be seen that a basic inventory of industries in Pune city and surroundings is already completed. The watch is kept on the pollution control activities in such industries. More frequent power failures in recent years have given rise to higher use of alternative power supply like D.G. sets. MPCB has commenced imposing very elaborate conditions for controlling the pollution from the usage of D.G. sets. These conditions are specifically

prescribing the stack height commensurate with installed KVA and barricading the noise generated by the D.G.sets.

The compliance is continuously verified through regular vigilance and the action taken against the defaulters. Continuous efforts are being made for installation and improvement of Pollution Control Systems to minimize the pollution load.

In Pimpri Chinchwad there are two stone crushers & there are about 23 stone crushers in Mulshi & Chowiasawadi area, which falls under Pimpri Chinchwad Corporation. All these stone crushers are in operation. In the said area it has been observed that SPM levels are exceeding the prescribed limits. The Board has started action to shift the stone crushers of Chinchwad area.

MPCB has adopted -

[i] River Regulation Zone (RRZ) policy for sitting of industries as declared by Government of Maharashtra, vide Govt. Resolution No. MMV-2000/326/22/TB-3 dated 15-07-2000. Accordingly the river catchments have been categorized in 4 categories. The abstract of the restriction is as under.

Classes	No. Development zone for any type of industries	Only green & orange category of industries with pollution control devices	Any type of industries with pollution control devices.
A-I	3 Km on the either side of river	From 3 Km to 8 Km from river (H.F.L.) on either side	Beyond 8 Km from river (H.F.L.) on either side.

A-II	1 Km on the either side of river	From 1 Km to 2 Km from river (H.F.L.) on either side	Beyond 2 Km from river (H.F.L.) on either side.
A-III	0.5 Km on the either side of river	From 0.5 Km to 1 Km from river (H.F.L.) on either side	Beyond 1 Km from river (H.F.L.) on either side.
A-IV	0.5 Km on the either side of river	From 0.5 Km to 1 Km from river (H.F.L.) on either side	Beyond 1 Km from river (H.F.L.) on either side.

- [ii] Sitting criteria for stone crusher: The Board has laid down the distance criteria for the existing and new stone crushers. It was then accordingly decided that No stone crushers should be allowed within 500 mtrs. from National Highway, 200 mtrs from State Highway and 100 mtrs. from other Roads whether it is MDR, ODR or V.R. The distance criteria of 500 mtrs. from human habitation shall be maintained.

C. Power Plants:

There are no thermal power plants within Pune city limits and therefore the pollution load contribution from this source is nil. However, the industries in Pune and Pimpri-Chinchwad have set up D.G. sets to meet the power requirements of the respective industries particularly during the load shedding and weekly power holidays. The Gensets are regulated under the provisions of the Air (P and CP) Act, 1981 and the conditions about the emission standards as per the EP Rules are imposed in the consents granted to the industries for establishing the D.G.sets. MPCB regularly monitors the

emissions from this power generating source. The total number of D.G.sets established by the industries in Pune and PCMC area is about 120.

There is no proposal under consideration of the State Govt. and M.S.E.B. to set up power plant in Pune and PCMC area.

Because of the power shortage experienced in this region, the shop keepers and households are using small generators to meet their power requirement. These are mostly Kerosene powered and hence are a non-point source of air emissions. The details on the number of small D.G.sets is not available nor they are regulated by the MPCB.

D. Other Sources:

1. Domestic Pollution:

The population of Pune city is increasing day by day. Since the first census of independent India and then onwards up to 1991, the population of the city has shown a constant gradual increase ranging between 60 to 75%. While the city population was 1, 33,227 in 1921, it grew to 4, 88,419 in 1951 (the first census of independent India). The figures stood at 6, 06,777 (1961), 8, 56,105 (1971), 12, 03,351 (1981) and 15, 66,651 in 1991. However, the census of 2001 reveals that the city population has reached phenomenal figure of 25, 40,069 indicating record rise by 62.13% from 1991 census. The male to female percentage of the population is 52.28% and 47.72%, respectively.

Scarcity of an affordable housing stock has resulted in growth of slums and shanties on unguarded lands all around the city. Almost 40% of the city population resides in slums.

In 1817, Pune city was located on area of 5 sq.kms, however slowly the city area expanded and according to 1997 figures, the city is occupying almost 243.96 sq.kms. The chronology of the city expansion is given below:-

AERIAL EXPANSION - PUNE CITY AND PUNE URBAN AREAS

YEAR	PUNE CITY AREA (Sq.Mtrs)	Reason for Expansion
1817	5.00	
1860	34.71	Formation of Pune Municipality
1950	125.75	Pune Municipal Corporation formed.
1997	243.96	Merging of 38 fringe villages into Pune.

The rapid urbanization and industrialization with better job opportunities has attracted migrants from various parts of the country to Pimpri-Chinchwad resulting in expansion of the settlements in Pimpri-Chinchwad. Since the first census of independent India and then onwards up to 1991, the population of the Pimpri Chinchwad has shown a constant gradual increase ranging between 59.24 to 78%. The figures stood at 83,542 (1971), 1, 49,364 (1981), 6, 31,875 (1991). However, the census of 2001 reveals that the city population has reached phenomenal figure of 10,06,253 indicating a record rise by 159.24% compared to 1991 census. Out of the recorded population, 53.99% are male while 46.01% are female, respectively. The Pimpri-Chinchwad Municipal Corporation reportedly proposes to launch a massive programme for controlling the population under Integrated Population and Development Project. It is indeed difficult to get accommodation to such high

number of residents in decent and healthy houses. Scarcity of an affordable housing stock has resulted in growth of slums and shanties on unguarded lands all around the city. Almost 11.15% of the city population resides in slums. The area covered by the declared slums is around 294148 Sq.Mtr. & undeclared 182324 Sq.Mtr. total 476472 Sq.Mtr.

It is necessary to initiate study pertaining to survey of slums in the city, in order to offer them basic civic amenities.

The slum eradication is not possible and hence the slum improvement will have to be undertaken. The organized housing sectors are found to rely on non-polluting liquid fuel for cooking. However, the same cannot be said about the slum dwellers. Many of them are suspected to use any fuel, which becomes available to them such as wood, bagasse, sawdust, waste paper/boards or any sundry waste. The smoke- less chulha is a concept, which has not reached to the depth where it should have. Thus, domestic fuel in slum areas is an area, which needs further study, more accurate quantification and a thrust for improvement offering acceptable option.

PMC & PCMC will be well advised to take precautions that no more slum or slum like structure gets created in the newly 38 merged villages.

Pune Regional Emissions Inventory Study (US-EPA):

Within Pune region, air quality monitoring shows that the national air quality standards for particulate matter (PM) are regularly exceeded. When the PM

standards are exceeded, people are exposed to levels of particulate matter that have been shown harmful to health.

To develop a PM emissions inventory for the Pune region, a diverse team of 40 participants from several of India's governmental and educational institutions such as NEERI, MPCB and a U.S. EPA representative came together in Pune during March 2004. Following seven days of intensive, hands on effort, the project team successfully developed the first ever comprehensive PM emissions estimates for the majority of the emissions sources in the Pune region. In addition, the team created an extensive relational database system to store, query, and report the emissions inventory data.

The PM emissions estimates developed during the project provide a foundation for evaluating the sources of particulate matter air pollution within Pune, and will assist in prioritizing future PM emissions reduction and research efforts. In addition, the database system is sufficiently sophisticated to serve as a prototype for statewide and national emissions inventories. The outstanding efforts by the dedicated participants and cooperating agencies provide a crucial foundation for further improving air quality and public health within Pune.