

# FUMES WE BREATHE IN BESIDES OXYGEN

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**Abstract:** *Managing air quality is important due to the potential impacts to human health, the environment and the economy. Poor air quality in general has been linked to many adverse health effects such as breathing difficulties, exacerbation of allergies, aggravation of respiratory or cardiovascular conditions, and in severe cases, premature death . Populations vulnerable to poor air quality include children, seniors and those with respiratory illnesses . The Provincial Health Officer's 2003 report on air quality and public health found that poor air quality (air pollution) can lead to an estimated \$85 million increase in health care costs and as many as 250 premature deaths every year. Environmental impacts of air pollution include effects on vegetation health and productivity, poor visibility due to smog, as well as contributing to global climate change .*

**IndexTerms - Component,formatting,style,styling,insert.**

## I. 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.

## II. AIR QUALITY OF 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 Yeshawantrao Chavan Natyagriha, Pune. The analysis report is as follows. The period of monitoring is from October 2001 to May 2002.

## III. SOURCES OF AIR POLLUTION

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.

2. Industrial Pollution: 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 :

SR.NO	TYPES OF FUEL	COMSUMPTIO N (Lit\Day)	SULPHUR CONTENT(Kg\Day)	SO2 EMISSION (Kg\Day)
1	LDO	58,428	1051.7	2103.4
2	FURNANCE 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

In Pimpri-Chinchwad 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.

#### IV. DETAILED STUDY

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.

The percentage contribution of pollution by different category of vehicles is shown below:  
(PMC)

- 1] TWO WHEELERS----- 74.54%
- 2] THREE WHEELERS-----5.21%
- 3] LIGHT MOTOR VEHICLES-----12.20%
- 4] HEAVY VEHICLES-----8%

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

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.

#### V. AIR QUALITY MONITORING

##### 3.1 INDUSTRIAL ZONE

Sr.no	PLACE	SPM	SO <sub>2</sub>	NO <sub>x</sub>	REMARKS
1	TELCO	725	62	52	SPM levels are beyond permissible limits
	BHOSARI	685	56	58	
3	RUSTON HORNSBY	732	80	62	
4	GARWARE	594	58	66	
5	HINDUSTAN ANTIBIOTICS	545	62	59	
6	PERMISSIBLE LIMITS	500	120	120	

##### 3.2 COMMERCIAL ZONE

Sr.no	PLACE	SPM	SO <sub>2</sub>	NO <sub>x</sub>	REMARKS
1	RAKA GAS	535	56	52	At Raka Gas site & Garware Nylon site SPM exceeding the permissible limits
2	PCMC	460	59	59	
3	GARWARE NYLON	552	64	69	
4	KALEWADI	338	38	75	
5	DAPODI	412	52	73	
	PERMISSIBLE LIMITS	500	120	120	

**3.3 RESIDENTIAL ZONE**

Sr.no	PLACE	SPM	SO2	NOx	REMARKS
1.	TELCO COMPANY	226	65	48	At Indiranagar and Telco Company ,SPM levels are slightly exceeding the permissible limits
2	CENTURY ENKS 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	

**3.4 SILENT ZONE**

SR.NO	PLACE	SPM	SO2	NOx	REMARKS
1	TELCO ROAD	94	39	42	SO2 &NOx 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	

**I. POLLUTION LOAD**

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

**3.1 MONTH-WISE AIR QUALITY MEASURE**

MONTH	PM10	SPM	NOx	SO2
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	PM10	NO <sub>x</sub>	SO <sub>2</sub>
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

### 3.2 CONTROLLING MEASURES

#### VEHICLE EMISSION CONTROL

- Efforts shall be made to meet the air quality by CPCB in its National Ambient Air Quality Standards published in June, 1997.
- 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:

- Decongest the city roads;
- Segregate directional traffic and vehicular and pedestrian movement;
- Provide parking facility to traffic;
- 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. 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.

#### INDUSTRIAL EMISSION CONTROL

Acidic emissions of sulphur dioxide and nitrogen oxides arise from many industrial sources as a result of combustion processes, power stations contributed 65% of all sulphur dioxide emitted in the city in 1999. Other industries were responsible for 22%. Industries also emit nitrogen oxides which can also cause rainfall to become more acidic. While road transport is the major source of nitrogen oxides (44% in 1999), power stations accounted for 21% and other industries 13% in 1999. There are many technologies which can be used in industry to reduce the emissions of pollutants to the atmosphere and these can be applied before, during or after combustion.

### 3.3 NEED TO REDUCE AIR POLLUTION

- It is estimated 1.5 million people died from the effects of air pollution, according to WHO data. Globally, air pollution – both indoor and outdoor – caused nearly 7 million deaths, or 11.6% of deaths, making it the world's largest single environmental health risk, according to World health statistics 2016.
- About 98% of cities in low- and middle-income countries with more than 100 000 inhabitants do not meet norms set out in the World Health Organization's (WHO) air quality guidelines, according to WHO's global urban air quality database.
- Reducing the deaths and ill-health from air pollution is one of the targets of sustainable development goal three and, last year at the United Nations climate change conference in Paris, governments recognized the need to curb emissions to reduce global warming.

**So the solution for the above mention issue is to create a model or a device which can atleast reduce the pollution or pollution rates, so that we can conserve our surroundings as well as non-renewable resources. This problem of air pollution is accelerated in magnitude with increasing urbanization. Thus polluted atmosphere has become as a part of urban life. Urbanization, industrialization and economic growth resulted in a profound deterioration of urban air quality. The only solution to the issue is that we need more efficient public transport, so that it discourages citizens to use private vehicles i.e. SOLAR VEHICLES.**

### 3.4.1 MEASURE TO CONTROL

- Unlike traditional motor vehicles, solar operated vehicles do not run on diesel or gasoline, therefore do not emit air pollutants. Furthermore, these vehicles are very economical—they help motorists reduce fuel consumption.
- Solar vehicles can be an effective solution to air pollution. But their potential to reduce air pollution in the city will not be fully realized if consumers will not support them.
- City governments must encourage people to use solar vehicles by making them affordable, easily accessible and reliable. If city governments were to succeed in doing this, then solar vehicles will be able to help address air pollution in the city and contribute to the transition towards fully replacing fossil fuel-based vehicles in the future.

### 3.4.2 CONCLUSION

Pune has witnessed enormous industrial growth during the last 10 years. Rapid urbanization in the recent past has put the city's travel infrastructure to stress. With a large number of units have come up both in small scale as well as in heavy & medium scale industry, etc., traffic in the city is expected to shoot up. Being thickly populated area, Pune's traffic needs cannot be met by only roadbased system. A detailed Environmental Impact Assessment Study has been carried out for the project. As a part of this Study, comprehensive environmental baseline data was collected, and both positive and negative impacts of the project were assessed in detail. The project has many positive environmental impacts like reduction in traffic congestion, saving in travel time, reduction in air and noise pollution, lesser fuel consumption, lesser road accidents etc, with a few negative impacts.

#### 3.4.2.1 REFERENCES

- "Air, Noise Pollution from Motor Vehicles" Monthly Bulletin, Institute of Road Transport, Feb. 1984.
- "Analysing and Interpreting Air Monitoring Data" Geneva, 1980.

