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Chapter 1

THE CITY

Pune, the cultural capital of Maharashtra, is a historical city with golden heritage. From a small seventh century hamlet called Punawadi, the city has grown into an urban agglomeration occupying an area of about 700 km², and supporting more than four million people. An important military station (headquarters of the Southern Command), a major industrial town (considered to be the 'Detroit of India' - with six automobile giants-Telco, Bajaj Auto, Bajaj Tempo, Mercedes Benz, Fiat and Kinetic located around the city in addition to the software activities) make it a strategic urban centre. Also known as the 'Oxford of the East', Pune opens unlimited education avenues to the scholastic and intellectual Indians.

Located atop the Deccan plateau, at a height of about 560 Mts. above mean sea level, the city occupies the flood plain of Mula-Mutha. Called the 'Poona plain' by geo-morphologists, the area is surrounded on all sides by low hill ranges, the eastern front being more open. Most of the vegetation found around the hills today is planted. Small patches of deciduous forests are found in sheltered valleys of Katraj and Sinhgad.

The last tiger was heard near Paud in the early thirties. The only wildlife that remains today is an occasional hare or mongoose, small saunders of wild boar and a few troops of langurs who invade the well-wooded parts of the city when spring commences. The city is still holding diverse and rich bird life though. So far, more than 300 different bird species have been noted in and around the city. Lakes like Pashan, Katraj, Jambhulwadi and long stretches of the Mula-Mutha rivers experience noisy but lively scene when thousands of migratory birds-ducks, cormorants, herons, snipes, sandpipers, wagtails, terns, gulls and stilts adorn them.

Pune has survived many natural and manmade calamities. The last calamity, the Panshet disaster, had been responsible for the drastic changes in Pune post 1960 era. The physical growth of the city, especially along the Pune-Satara Road took place after the Panshet disaster only. Around the same time the Maharashtra Industrial Development Corporation established a large industrial estate at Pimpri-Chinchwad. This estate attracted major industrial houses and within a decade, Pune became an important industrial centre of the country.

Pune is also a prominent centre of education. Even during the days of Peshwa the city was a seat of learning. British rulers carried on the profile when many modern educational institutes came into existence. The Sanskrit College (1832, which in 1857 became the Deccan College) the Science College (1856 presently - the College of Engineering), Fergusson College (1885), the College of Agriculture (1907), S. P. College (1916), S. N. D. T. (1916), Tilak Maharashtra Vidyapeeth (1921) are all the early manifestations of the educational facilities.



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Pune University (at that time the University of Poona) was founded in 1949. Pune is also a home for diverse research and science institutions. The process of formation of Pimpri - Chinchwad New Municipal Council in 1970, its subsequent conversion to the Municipal Corporation in 1982, extension of the PMC and PCMC limits in 1997 has made the Pune agglomeration one of the largest in the country. A survey article in recent issue of 'India Today' mentions Pune as one of the future megapolises of the country. From its embryonic origin covering a small area around the Kasba Peth, like all other towns, Pune has grown in size by successive affiliations of peripheral areas and is now rated as the seventh largest urban agglomeration in the country. In 1960 and 1962 small pockets of lands from Katraj Dhankawadi, Dapodi, Lohegaon, Sutarwadi etc. were added, to increase the area within the Pune Municipal Corporations' limits to 138.05 sq. kms. The latest merger in 1997 proved to be extraordinary. The 38 peripheral villages/parts of villages were merged in the Corporations' limits having a total area of 305.03 sq. kms. Recently however, the Government of Maharashtra, in 2001, decided to de-link 15 villages and 5 villages partly from the PMCs' limit reducing the total area to 243.96 sq.km.



City's Satellite Imagery taken by Insat-2 C in early 2000

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Chapter 2

Physio Cultural Setting of Pune

The city, with 18° 31' N latitude and 73° 51' E longitude, is situated on the western margin of the Deccan Plateau at the confluence of Mutha and Mula rivers. Pune lies on the leeward side of the Western Ghats surrounded by hill ranges in the west and south and a gently sloping plane to the north. The general slope of the area is towards east and the altitude is around 560 meters above mean sea level.

Two more rivers Pavana and Indrayani traverse the north-western outskirts of the urban area. Mula-Mutha eventually merge into the Bhima river down stream of Pune. The city is surrounded by hills on the east, west and the south, and partially in the north. The Sinhgad-Katraj-Diveghat range is the southern boundary of the urban area. The highest point within the city is the Vetar hill (800 m).

♦ **Geology:**

Almost the entire morphological strata of the city comprises of stratified trap, beds of basalt and amygdaloid alternate, whose upper and lower planes are strikingly parallel to each other. Barometric measurements and the course of the rivers show a fall in level to the east, and Southeast.¹

♦ **Climate:**

Its height above the sea level, its freedom from alluvial deposits, and the prevalence of westerly breezes, make the climate of Pune dry and invigorating. During the cool seasons, Pune is subjected to a high frequency of anti-cyclone conditions that give rise to almost cloudless nights and abundant sunshine during the day. In this period, dry north-easterly land winds prevail during most of the day. The height above sea level and the leeward location with reference to the Western ghats have made the city climate moderate and salubrious. The Puneites did not even need fans during summer in the fifties!

♦ **Temperature:**

The mean daily maximum and the minimum temperatures for the hottest month i. e. May are 37°C and 23°C respectively. The evening sea breeze from west/north-west keeps the city summer nights at bearable levels. The same for the coldest month of December are 30°C and 12°C respectively. The relative humidity ranges from 36% in March to 81% in August.

♦ **Rainfall:**

Pune receives rain from the Southwest monsoon, which begins around the middle of June and lasts till the end of September. The return showers show inconsistency and vary from year to year. Three fourths of the annual rainfall of 70 cm occurs in just four months from June to September.

¹ Gazetteer of the Bombay Presidency, Poona district, Volume XVIII, Part I, 1889



◆ **Biodiversity:**

Pune urban area has been expanding at an average rate of about 500m per year for the last two decades. Human habitations are encroaching upon the farmland, orchards of the fringe villages. The most suffered habitat type has perhaps been riverine vegetation especially babul (*Acacia nilotica*) tree groves



Greenery of 'Naik Bet'

along the rivers Mula and Pavana. Grassland and

scrub in the eastern outskirts has also been severely destroyed. 'Naik Bet', an island in the centre of the city still has substantial vegetation cover, though. Table 2.1 presents the past and present landscape composition and ongoing changes.²

Table No. 2.1 - Habitat Dynamics of Pune Urban Area

Source: S. B. Nalawade-Pune City Wilderness.

HABITAT	AREA 1950	AREA 2000	CONVERTED INTO	TYPICAL AREAS
Forest	7%	5%	Plantations	Katraj, NDA, Law College Hills
Riparian forest	1%	-	Agriculture	Aundh
Scrub/grassland	10%	7%	Habitation	Malwadi, Nagar Road
Wastelands	2%	1%	Plantations	Nagar Road, Solapur Road
Agriculture	60%	40%	Habitation	Manjri
Plantations	-	3%	Habitation	Pachgaon
Wetlands	3%	2%	-	Pashan, Mula-Mutha
Habitation	15%	40%	Habitation	All over

◆ **Demography:**

The rapid urbanisation and industrialisation with better job opportunities has attracted migrants from various corners of the country to Pune resulting in expansion of the settlements of Pune. 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

¹ 9909.vvvv-q mv`-nq.ot md' kud.



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record rise by 62.13% from 1991 census. If the population covered by the Pune Cantonment Board and the Khadki Cantonment Board, 80,191 and 76,608 respectively, is added the total stands at 26,96,868 out of which 14,09,931 are male while 12,86,937 are female³. The Pune Municipal Corporation proposes to launch a massive program for controlling the population under Integrated Population and Development Project with the assistance of UNFPA from January 2003, to arrest the upward trend.

◆ **Accommodation:**

The housing feature of Pune mostly consists of apartments and bungalows in the urban areas, whereas, the heartland of the city consists of wadas and chawls. The newly merged villages have typical rural housing units, with a few being converted into apartments. Of the entire stretch of the 24396.55 hectares of area of the city, the area covered by the housing stands at 7401.38 hectares. Of this, 5070.50 hectares area is in the old limits of the city, while the remaining 2330.88 hectares area hails from the merged villages. The Pune Municipal Corporation's tax assessment department has assessed 4,70,000 tenements so far. During 2001-02, the PMC has assessed additional properties having an area of 1,66,52,894.00 sq. fts. against 1,36,54,549.00 for the year 2000-01 indicating 21.09 % growth in the real estate compared to the last year. These figures, however, do not include slums.



High Rise Buildings changing City's Skyline

◆ **Slums:**

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. The city has 503 slums out of which 353 are declared and 150 being undeclared. The area covered by the



Ramtekdi Slum Area : badly waiting for Slum Rehabilitation

² Bdmrt r nehm 9gso9.vvv -bdmrt r hmc -mcs



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declared slums is around 659 hectares. The total population in the slums (declared + undeclared) is 10,50,000 souls. As a part of the hygiene and sanitation drive Pune Municipal Corporation has undertaken construction work of public toilets on pay and use basis. The first phase of the program is devised to construct 220 toilet blocks with a seat capacity of 3438 units. Part of it is already completed and has become operational. In the second phase 221 toilet blocks with seat capacity of 3840 units would be constructed. In the third phase 37 toilet blocks for the newly merged villages and 105 toilet blocks in the old city area totalling 142 with a seat capacity of 2326 would be constructed. The Pune Municipal Corporation has also mobilised the works pertaining to survey of slums in the city existing as on 1.1.1995 vide the Government of Maharashtra resolution (11.7.2001) in order to offer them basic civic amenities.

Table No. 2.2 : Area Covered by the declared slums in the city:

Name of the Area	Area in m ²	Name of the Area	Area in m ²
Bopodi	129323.64	Ganesh Peth	64754.61
Aundh	77368.50	Bhavani Peth	787032.08
Pashan	21880.00	Ghorpadi	98499.67
Erandwane	1305209.74	Ganj Peth	2531.53
Kothrud	132106.16	Gurwar Peth	7017.61
Hingane	14519.00	Nana Peth	31062.85
Shivajinagar	202585.77	Somwar Peth / Rasta Peth	14854.00
Sadashiv Peth	9192.39	Tadiwala Road	68563.26
Parvati	1016861.39	Ghorpadi Gaon	1332667.92
Shukrawar Peth	6577.44	Mundhwa	25300.00
Dhankawadi / Bibvewadi	34381.225	Wanavadi	1058.00
Gultekadi	254065.17	Hadapsar	233257.87
Kondhwa	31065.59	Dhanori	29874.44
Mangalwar Peth	809778.69	Yerawada/Kalas	3568107.88
Kasba Peth	4626.29	Total	10314122.72

♦ **2.5 FSI Scheme for Slum Rehabilitation:**

The slum dwellers residing in the declared slums before 1st January, 1995 are provided tenement of 225 sq. ft. and are rehabilitated under this scheme with private participation. The developer is permitted additional FSI (as per the ratio given in 'Appendix-T' of the D. C. Regulations) in lieu of the area required for the slum redevelopment.



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Table No. 2.3 - The details of the schemes are as follows:



Particulars	Figures
Completed Schemes	06
Work in Progress	07
Objection raised by PMC but not fulfilled by the developers	27
Subjudice schemes	04
Plans for approval	07
Cancelled Schemes	02
Affected persons yet to be shifted	02
Plans approved but work not initiated	02
Total	57

Slum Rehabilitation Building :
Much more are required

Table No. 2.4 : Phase-wise program for construction of Toilet Blocks:

Name of the Non-Governmental Organisation	Phase I (Approx. Expenditure Rs. 22.50 Crores)		Phase II (Approx. Expenditure Rs. 19.00 Crores)	
	Number of Toilet Blocks	Number of Seats	Number of Toilet Blocks	Number of Seats
Shelter Associates	13	153	--	--
Spark	34	511	81	1310
Akhil Bharatiya Paryavaran Sanstha	32	491	--	--
Gramin Bahu-Uddeshya Shikshan Sanstha	88	1513	45	690
Civic International	37	584	--	--
City Clean Foundation	07	70	--	--
Mashal	04	62	--	--
Gramin Parisar	05	54	--	--
Hygiene	--	--	55	760
Janseva Labour Coop. Soc.	--	--	40	1080
Total	220	3438	221	3840

♦ **Lok Aawas Yojana:**

The Government of Maharashtra has decided to provide 2000 tenements for



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persons from the low income through Maharashtra Housing and Area Development Authority under the Lok Aawas Yojana. It is expected that the beneficiaries from the backward class will get Rs. 11,000 under National Slum Development Program and Rs. 9000 from the Social Welfare Department amounting to Rs. 20,000 while the non-backward class beneficiaries will receive Rs. 10,000 each.

♦ **Valmiki Ambedkar Aawas Yojana:**

The rehabilitation of 609 slum dwellers from Patil Estate Slum, Kamgar Putala and Aundh road affected by the road widening activity is being done under this scheme. The Pune Municipal Corporation and Maharashtra Housing Area Development Authority are jointly constructing ground houses of 270 sq. feet on survey no. 88 and 89, Hadapsar in this regard.

♦ **Change In Regional Landuse⁴ :**

During the 1970's the urban activities spilled beyond the erstwhile city limits and it was felt that for comprehensive and integrated planning, a metropolitan region converging on Pune be defined. Accordingly, Pune Metropolitan Region was established in July, 1967. Pune urban area or agglomeration as recognised by Central Government includes the areas under PMC and PCMC, Khadki and Dehu Road Cantonments and a few semi-urbanised villages on the periphery. The total Pune urban area is about 700 sq. km. The total area of Pune metropolitan region is 1605 sq. km.

Following changes appear striking between 1967 and 1998 in the land use pattern of Pune region:

1. The area under settlement has increased by 240% during these 30 years.
2. The area under Agriculture and Grassland-Scrub has decreased by 31% and 39% respectively.
3. The area under 'Hills and Forests' and watersheds remain apparently same, though there are some encroachments over some hill slopes, however, marginal in the regional context.
4. To conclude, the urban sprawl appears to be at the cost of Agriculture and Grassland-Scrub, especially the later.

Table No. 2.5 : Arial Expansion - Pune City and Pune Urban Areas.

Area (Sq. km.)			Reason for Expansion
Year	Pune City	Urban Area	
1817	5.0	-----	
1860	7.6	34.71	Formation of Pune Municipality, establishment of Pune and Khadki cantonments.

Source : Prof. S. B. Nalawade, Geography of Pune Urban Area

⁴ <http://www.ranwa.org/punealive/>



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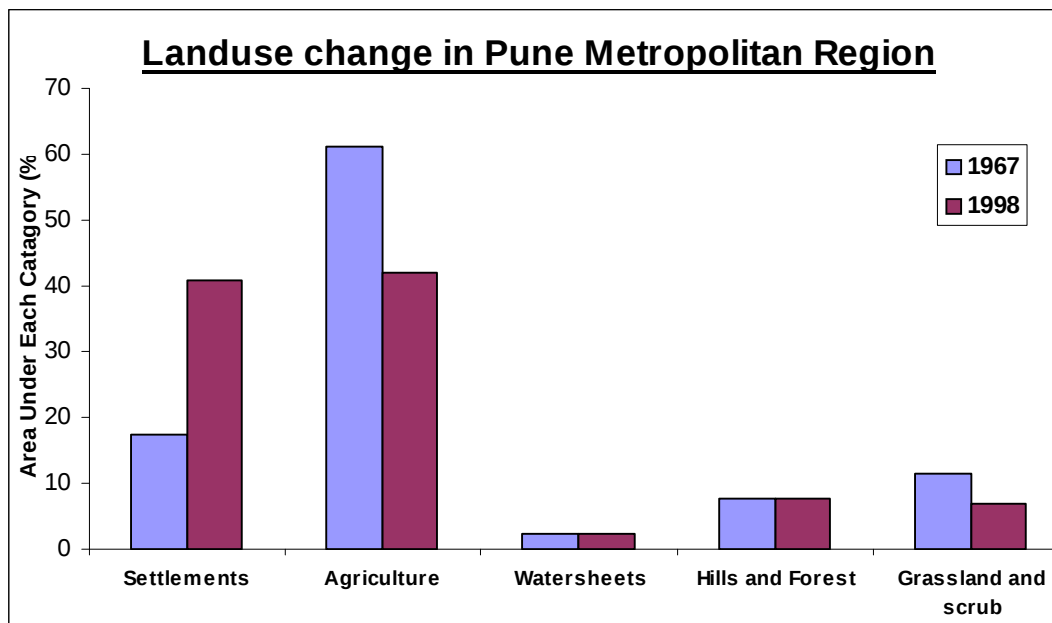


1940	18.84	81.95	Establishment of Dehuroad cantonment
1950	125.75	188.86	Pune Municipal Corporation formed
1970	138.76	266.88	Pimpri-Chinchwad Municipal Council established
1982	146.00	314.11	Pimpri-Chinchwad Municipal Corporation formed
1997	440.00	700.00	Merging of 38 & 18 fringe villages into Pune and Pimpri-Chinchwad Corporations respectively.

Table No. 2.6 : Landuse change in Pune Metropolitan Region.

Landuse Category	Area Under Each Category (%)	
	1967	1998
Settlements	17.33	41.00
Agriculture	61.26	42.11
Watersheets	02.25	02.25
Hills and Forest	07.64	07.64
Grassland and scrub	11.52	07.00
Total	100.00	100.00

Source : Prof. S. B. Nalawade, Geography of Pune Urban Area.



◆ **Economic Activity:**

After the Panshet disaster the city witnessed a sudden growth in the economic activity. It gained a momentum in the industrial sector with the setting up of major industries. The MIDC had set up an industrial estate in the vicinity of the city, which also contributed to the economic growth. Currently, service industry is the primary and foremost activity that supports the city life. Governmental agencies are also a major force, with the existence of more than 25 state headquarters of various government departments not to mention the massive



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defence establishments—namely the Southern Command and the Lohegaon Air



Growing economic activity

Base. Construction is another sector that has also witnessed a growth during the last two decades. Recent addition is the Information Technology and Biotechnology. With the radial expansion of the city, agriculture seems to have suffered a setback. Work Participation Ratio (WPR) is estimated at 30.80% with employment pattern of 2% primary, 27.5% secondary and 70.50% in tertiary or service sectors.

♦ **Urban Community Development Program:**

The 74th Constitutional amendment puts onus of social planning on the local bodies as well. The Pune Municipal Corporation has been on the forefront in implementing various schemes for Urban Community Development Program in this regard. As per the directive of Central and State Government, around 2000 neighbourhood groups each comprising 50 families are formed. These groups are presently working in 394 slums in the city. The Pune Municipal Corporation is implementing various programs such as providing self-employment for the youths below poverty line, women and child welfare scheme, backward class welfare scheme and Suvarna Jayanti Shahari Rojgar Yojana (SJSRY) in co-operation with the neighbourhood groups. Due to the formation of neighbourhood groups more number of beneficiaries are involved in this program. The civic body has achieved the target of distributing loans and imparting training to the families below poverty line under the Suvarna Jayanti Shahari Rojgar Yojana. Also, the Pune Municipal Corporation has started a vocational training centre at the N. V. Gadgil School covering 38 trades under the various welfare schemes.

In the year 2001-02 around 14,766 families are enlisted below poverty line. To facilitate upliftment through the Urban Community Development Program, the service centres have been established at various ward offices for providing services to the citizens at fixed rates. Thus, these service centres help in providing self-employment to beneficiaries from the training programs.

Under the backward class welfare scheme various programs such as providing educational aid, vocational training and aid for opening small business, aid for construction of individual toilet, water tap connection, repairs of hutment, power connection and group business etc. have been implemented.



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Under the Suvarna Jayanti Shahari Rojgar Yojana following schemes for families below poverty line were implemented by the Pune Municipal Corporation:

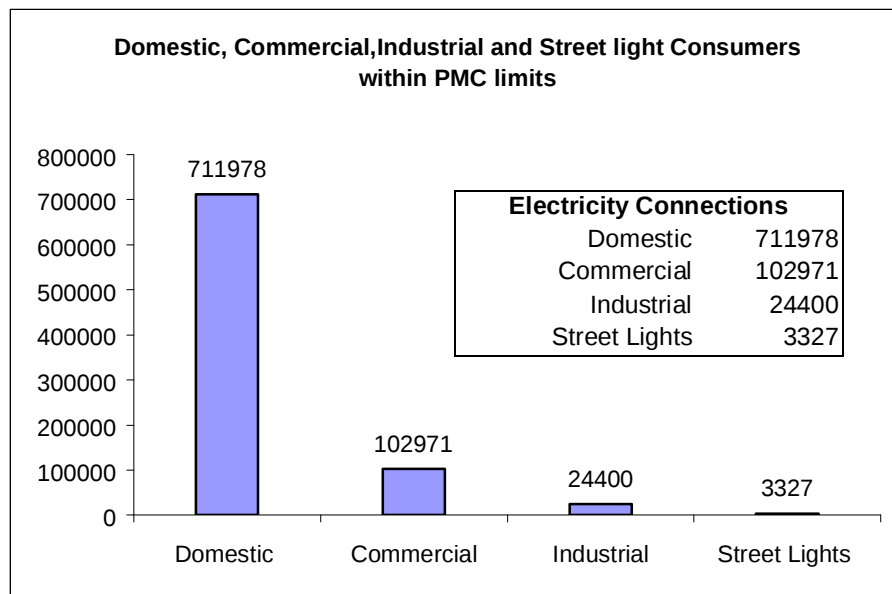
- | | |
|------------------------------|----------------------------|
| 1) Family Assistance Scheme, | 2) Assistance to Pregnancy |
| 3) Child Welfare Scheme | 4) Old-age Pension scheme |

Under the Urban Community Development Program, nine more service centres shall be set up in different ward offices. Also, to promote and market the article products of the beneficiaries two more SMILE centres are proposed to be set up. The Pune Municipal Corporation will initiate various schemes of urban community development for unemployed youth along with the families below the poverty line.

◆ **Power Supply:**

The city suffered heavily during the summer of 2002 on account of the operational difficulties faced by the Maharashtra State Electricity Board in power distribution. The Maharashtra State Electricity Board took around 15 days to restore the normalcy in power supply to the city. Consequently, the civic facilities in the form water supply, drainage pumping and the streetlights also suffered during the second half of the summer. Efforts must be taken to increase the power quota for the city by the Maharashtra State Electricity Board so that the load shedding is prevented. The MSEB finds it difficult to provide power supply to Pune urban area with its minimum demand of 750 MW. The MSEB must acknowledge the electricity needs of a vibrant city such as ours and take appropriate measures to prevent recurrence of the agonies of last summer.

Following graph depict the details of the consumers in Pune.



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CHAPTER 3

TRAFFIC AND TRANSPORTATION

♦ Transportation :



Cement Concrete road: Enhancing Traffic mobility

With a population of over 25 lakhs and the area of 243.96 square kilometres, the city requires a massive transportation system. The PMC has an estimated road length of around 750 Kms. (asphalted) and 100 Kms. (non-asphalted) occupying 5% of the land area in the city. Twelve roads in the city are identified as the arterial roads, which are presently undergoing transformation in the form of cement concretization. The total length of Cement

Concrete roads (completed) is 12.6 km. The construction work on other four is in progress; leading to another 5.00 kms. of concretization during 2002-03. The PMC has also undertaken construction of 24 fly-overs, Railway over-bridges, bridges over rivers in the city to ease the traffic congestion. Besides, additional DP roads of 21.40 Km length are constructed in 2001-02 by the Pune Municipal Corporation.

Table No. 3.1: Information regarding the cement concretization of roads.

Completed C. C. roads	Ongoing C. C. roads	Proposed C. C. roads
Mobo's Hotel to Bund Garden Road	Mangaldas Road, Wadia College to Jehangir Hospital to Railway over bridge	Pune-Nagar Road, Gunjan Theatre to Jakat Naka bridge
Satara Road-Panchami Hotel to Padmavati	Satara Road (Padmavati), Bharati Vidyapeeth to Katraj Dairy	Marketyard Chowk to Kondhwa Bibvewadi junction
Dandekar Bridge to old PMC limit	Bremen Chowk to Aundh Bridge	R.T.O Bridge to Sancheti Bridge
University Chowk to Bremen Chowk	Nehru Road, Dias plot to Marketyard	Karve Statue to Warje Jakat Naka
		Kondhwa-Bibvewadi Rd
		Golwalkar Guruji-Gajanan Maharaj Mandir to Satara Road



♦ **Bridges in Pune City :**

First Bridge in Pune City built by Nanasaheb Peshwe and formally known as “Lakdi Pool” was reconstructed as Arch Bridge in the year 1949 –50 by Pune Municipal Corporation. In order to cater to the needs of growing urbanisation and communication, the Pune Municipal Corporation took up the following bridge projects over Mula–Mutha river which have been successfully completed.

♦ Chhatrapati Rajaram Bridge
♦ Yashwantrao Chavan Bridge
♦ Bridge near Balgandharva.
♦ Dengale Bridge.
♦ Yerawada Bridge.
♦ S. M. Joshi Bridge.
♦ Kakasaheb Gadgil Bridge.
♦ Shivaji Bridge.
♦ Sangam Bridge.
♦ Harris Bridge.



Shri. Chhatrapati Rajaram Bridge: Waiting for connection from river side road

Some of the ongoing bridges are as follows: -

♦ Bridge near Sangam (R.T.O.)	♦ Bridge near Yerawada–Bund Garden.
♦ Bridge connecting Kalyani-Nagar to Koregaon Park.	♦ Bridge near Aundh on Mula River.

Besides, the Maharashtra State Road Development Corporation has undertaken construction of 24 roads in the city, which include fly over, ROBs, widening of roads etc. The PMC co-ordinates and acts as the facilitator for these works since it bears the task of land acquisition, shifting of service lines etc.

Maharashtra State Road Development Corporation (MSYDC) will implement the following projects in and around Pune.

A) Fly overs – (Expected approximate cost Rs.75 Crores) :

♦ Hadapsar – Saswad Phata	♦ Nalstop Junction
♦ Swargate	♦ Alka Talkies Junction
♦ Seven Love Chowk	♦ Panmala Sinhgad Road
♦ Balgandharva	♦ Mundhwa
♦ University & Senapati Bapat Road	♦ Sancheti Hospital Junction
♦ Simla Office Junction	♦ Vetal Chowk
♦ Rahul Talkies Junction	♦ Market Yard Junction
♦ Nehru Road Junction	



B) River Bridges (Expected approximate cost Rs. 25 Crores) :

♦ Sangamwadi	♦ Pavna River (Rawet)
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C) Railway Fly Overs (Expected approximate cost Rs. 59 Crores) :

♦ Fursungi	♦ Kiwale Truck Terminus
♦ Mundhwa	♦ Kirkee Railway Station
♦ Theur	♦ Ghorpadi Village
♦ Uday Baug Kawde Road	♦ Sasane Nagar
♦ Manjri	

D) Widening of Railway Fly overs (Expected approximate cost Rs. 05 Crores) :

- ♦ Wadia College

E) Road (Expected approximate cost Rs. 70 Crores) :

♦ Mundhwa- Kharadi road	♦ Tingre Nagar–Lohgaon road
♦ Katraj-Kondhwa-Hadapsar-Saswad road	♦ Wakad–Aundh road widening
♦ Hadapsar-Saswad-Loni Kalbhor road	♦ Baner road

♦ Traffic Control:

With introduction of approximately 6800 vehicles per month, the traffic congestion in the city is increasing alarmingly. About 60% of Pune Municipal Corporation roads in the heart of the city, are congested whereas remaining 40% roads in the fringe area have relatively lower traffic volumes. As a consequence, average speeds on the city roads are greatly impaired and range between 15 km/hr to 35 km/hr. Various initiatives taken by the Pune Municipal Corporation to ease traffic congestion are primarily based on the following objectives.

- < Decongest the city roads
- < Reduce accidents on city roads
- < Provide safe, convenient and pollution free atmosphere for vehicular and pedestrian traffic
- < Segregate directional traffic and vehicular and pedestrian movement
- < Provide parking facility to traffic
- < Encourage public transport and discourage personalised modes
- < Inculcate basic traffic discipline amongst the citizens

Ø Mobility Committee:

A mobility committee is set-up by the Pune Municipal Corporation to enhance the traffic mobility in the city. Apart from the civic officials, the city heads of the other government departments are nominated as the members of the Committee. Traffic issues ranging from bottlenecks on roads, encroachments,



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electricity and telephone poles obstructing the traffic, trees, parking lots, truck



Traffic Chaos on Sinhgad road

terminus, off-street parking, road-widening and related traffic problems come under the purview of the Committee. It meets every alternate Friday and takes decision on alleviating these problems. The ward offices of the Pune Municipal Corporation had identified 215 bottleneck spots in the city till December 2000 comprising problems concerning various utilities. The issues were discussed in the Committee threadbare

and eventually almost all the key bottlenecks were removed. Various development schemes such as square beautification, installation of road dividers and railings, count down timers at the signals, parking lots, construction of sub ways to enhance the traffic mobility are completed with a few of them through BOT initiative during 2001-02. The details are as follows:

Ø **Chowk Beautification :**

Dhanukar Colony Chowk, Blue Diamond Chowk, Katraj Chowk etc.



Bal Gandharva Chowk under more renovation



J.M. Road with additional road side parking

Ø **Road Dividers and Railings:**

Shivajinagar Court, Bibvewadi road, Central Building, Jangli Maharaj road, Kondhwa road etc.



Ø **Setting up of Timers at the Signal:**

Kunte Chowk, Vetal Chowk, Parihar Chowk, Modern Café Chowk, Good Luck Chowk, Sanas ground Chowk, etc.

Ø **Parking Lots:**

Work is in progress at the Patil Estate and Velnekar School. The first phase of the Hamalwada and Aryan Parking lots is completed while the construction of parking lot at the Pune Municipal Corporation main building is in progress.



Aaryan Parking: Finally opened for parking



Dhankawadi Truck Terminus

Ø **Sub-ways:**

The G. N. Bhosale sub-way near Modern High-School is completed while the construction work of Mahadev Mandir to Nalstop sub-way is in progress.



G. N. Bhosale Subwav at Modern High School: How do we persuade citizens for its use?

The details of the various proposed development schemes are as follows:

Ø **Chowk Beautification:**

Zilla Parishad Chowk, Blue Diamond Chowk and Katraj Chowk.



Ø **Road divider and railings:**

Baner road, Jangli Maharaj road and Kalyani nagar.

Ø **Parking Lots:**

Sangam ghat and Vetal Baba chowk to MIT college road, while Vishrambaugh wada-kavadi adda to be developed on BOT scheme.

Ø **Subway and Bridges:**

Subway at Shanipar and widening of Wellesly Bridge, Dengale Bridge and Calvert on Alandi road.

Ø **Sky Bus System:**

A mass transport in the form of Sky bus is promoted by the Konkan Railways to solve the problems of transportation in city area of Pune. In this scheme railway tracks will be laid on structures erected on the road dividers. Cable car operated bogies will travel on these tracks. Existing roads can be used for this system to obviate land acquisition and also without disturbing existing traffic system. The estimated construction cost of this system will be around Rs. 50 crore per Km. Budgetary allocation of Rs. 25 lakh is proposed in 2002-03 to carry out detailed engineering studies of the project.

Table No. 3.2: Summary of the routes to be developed under Sky Bus Project.

Route	Length (Km)	Approx. Cost (Crores)
♦ Agriculture College to Chinchwad	15.00	681.00
♦ Agriculture College to Warje	9.40	423.00
♦ Sambhaji Bridge to Hadapsar	11.70	535.60
♦ Wakdewadi to Loni Kand	24.00	1085.50
♦ Chapekar Memorial, C'wad to Agriculture College	17.20	775.30
♦ Pataleshwar Temple to Katraj	10.10	459.90
Total	87.40	3960.30

Ø **Area Traffic Control System:**

Electronics Research and Development Centre of India, (ER and DCI) Thiruvananthapuram, a scientific society under the department of Information Technology, Ministry of Communication and Information Technology, Government of India, in association with PMC has decided to develop an Area Traffic Control System (ATCS) on city roads. This will help in managing road traffic in Pune more efficiently and reduce frequent stops and delays. Such reductions have a direct impact on the level of pollution created by the automobiles and the fuel consumed by them. Savings on the travel time of an



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average citizen and reduction in idle time of vehicles are other indirect advantages of the system. The project is expected to cost Rs. 3.00 Crore and the Pune Municipal Corporation has already moved Hon'ble Minister for Information Technology, Government of India, to offer financial help to undertake it for Pune.

As a model case, Electronics Research, Development Centre of India and Pune Municipal Corporation had tried the Electronics Research and Development Centre of India developed Urban Traffic Management System (UTCS) at Senadutt Police Chowky Junction, Pune for 3 months duration (January 23, 2002 to April 12, 2002). The results of the trial are as follows:

- § 33% signal cycle time saving (reduced waiting time)
- § Estimated saving of about Rs. 4 lakh per annum on fuel (at one intersection)
- § Power saving of about 100 kWh per month (100 units)
- § Reduction in automobile pollution.

Ø Pune Municipal Transport :

The Pune Municipal Transport is no exception to the other public transport undertakings wherein the services are heavily subsidised. The tables below indicates the financial status of the Pune Municipal Transport (Table-A) along with the annual overdrafts that the Pune Municipal Corporation has to part with to facilitate running of the undertaking (Table-B).

Table-A

Year	Income	Expenditure	Loss
1991-92	389678473	434878473	45200000
1992-93	483181610	503781610	20600000
1993-94	567452295	604752295	37300000
1994-95	664415801	690415801	26000000
1995-96	726815694	817265694	90450000
1996-97	724654831	807654831	83000000
1997-98	841888470	964933470	123045000
1998-99	843759277	996859277	153100000
1999-00	848708682	980408682	131700000
2000-01	928236993	1056322039	128085046
2001-02 (Corrected estimate)	971353341	1186426596	215073255
2002-03 (Estimated)	1150689794	1339207514	188517720



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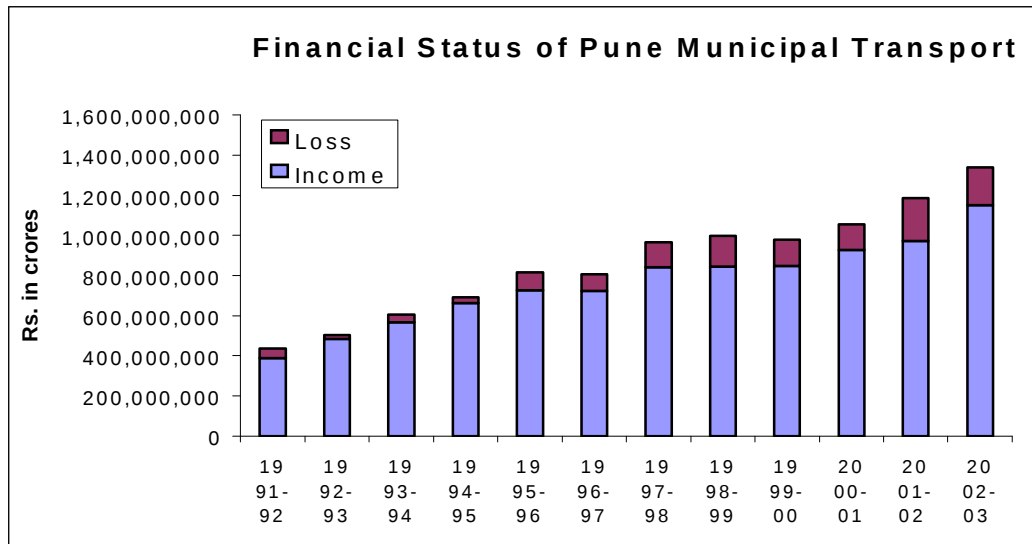


Table-B

Year	Amount (Rs. in Crores)
1996-97	14,00,00,000
1997-98	3,00,00,000
1998-99	6,75,00,000
1999-00	4,50,00,000
2000-01	2,50,00,000
2001-02	4,50,00,000
Total Rs.	35,25,00,000

The recoupement made by the Pune Municipal Corporation to the Pune Municipal Transport during the past five years have been provided for meeting the recurring costs and also for procurement of new fleet of buses. Nevertheless, the undertaking continues to give limited results for want of much needed up-gradation to cope with the rising demand indicates life of the present fleet operated by the Pune Municipal Transport while Table-D shows increase in the population and corresponding carrying capacities of Pune Municipal Transport during the last five years: Table-C below

indicates life of the present fleet operated by the Pune Municipal Transport.

Table-C

Sy. No.	Year of Manufacture	No. of Buses	Age (As on December, 2002)	Total
1.	1984	2	18	2
2.	1986	41	16	43
3.	1987	71	15	114
4.	1988	29	14	143
5.	1989	44	13	187
6.	1990	53	12	240
7.	1991	30	11	270
8.	1992	111	10	381
9.	1993	54	9	435
10.	1994	78	8	513
11.	1995	101	7	614



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12.	1997	50	5	664
13.	2000	136	2	800

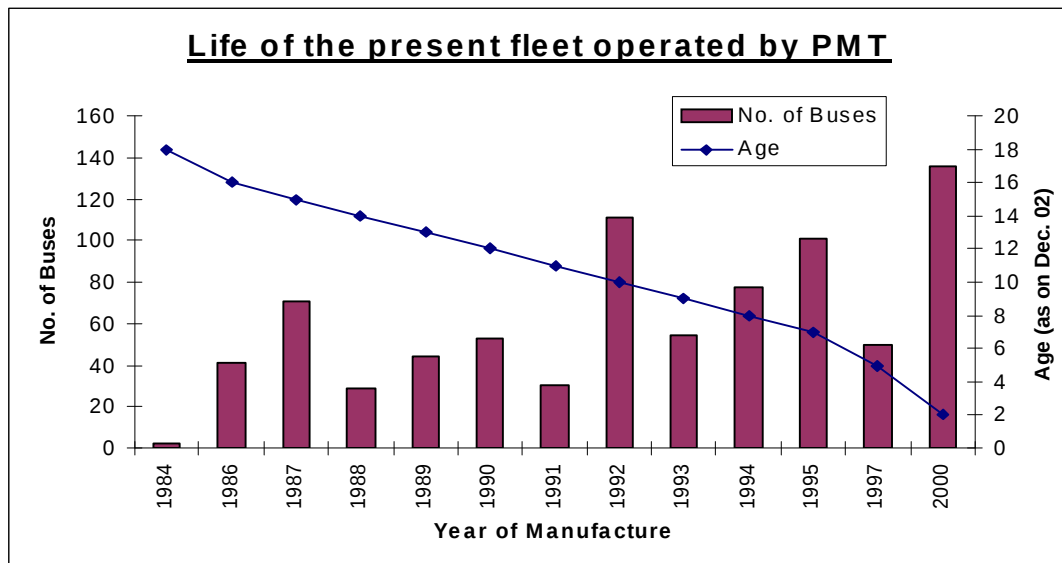
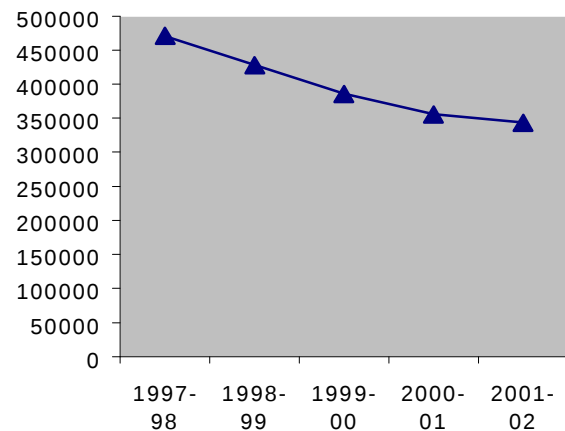


Table-D showing number of commuters travelling by PMT.

No.	Year	Commuters
1.	1997-98	4,70,844
2.	1998-99	4,27,955
3.	1999-00	3,85,475
4.	2000-01	3,55,557
5.	2001-02	3,43,173



Merely up-gradation of bus-stops will not help.

A thinner fleet, rising operational and maintenance costs thanks to periodic hikes in fuel prices, inventories and the establishment costs and decrease in the number of commuters, seriously impoverished the soundness of the Pune Municipal Transport. To add to the woes, the informal and unorganised public transportation in the form of diesel driven six seater



auto rickshaws came on scene about five years ago, bringing in its wake serious environmental implications particularly with respect to the ambient air quality parameters.



PMT's Challenger

Besides the six seaters have adversely affected the economic viability of the Pune Municipal Transport by posing to be its serious competitors. It is estimated that approximately 2.00 to 2.5 lakhs commuters have switched over to this alternative mode of transportation who otherwise would have resorted to the Pune Municipal Transport. It is also noteworthy that the six

seaters aggravate the already impaired traffic situation by occupying carriageways of the arterial roads affecting their capacities. The ambient air quality continues to be above the permissible levels due to the unchecked movement of six seaters and heavy vehicles. Against this backdrop, the Pune Municipal Corporation was compelled to take coercive measures against these vehicles by banning their movement on 14 roads in the city under Section 208 of the Bombay Provincial Municipal Corporation Act, 1949. In the first phase five roads are initially selected for implementing the decision of banning six seaters.

Accordingly, the Pune Municipal Corporation has started implementing the ban on six seaters in a phased manner from 10.10.2001, the latest being from 1st June 2002 on Nagar Road. Besides, the Pune Municipal Transport has taken a giant leap in self-sustenance by generating extra income to the extent of Rs. 2.5 lakhs per day on the three banned routes.

It is to be noted that the strengthening of the Pune Municipal Transport substantially complements the ambient air quality of the city. Restrictions on the movement of the six seaters have to be, however, matched by the commensurate improvement in the services of the Pune Municipal Transport so that the citizens' commuting needs are satisfied. Sizeable sections of the society have already been quite restive in expressing their concern about the inefficient delivery of services by the Pune Municipal Transport. Besides, some of the local representatives also have shown their propensity to rescind on their decision to ban the six seaters in absence of a citizen friendly Pune Municipal Transport.

The undertaking therefore, has outlined a comprehensive action plan for its improvement, wherein a major thrust is given on augmentation of its fleet. The



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requirement of new buses for the immediate need as well as for long term demand and the costing thereof is given below:

Table-E

Rs. in Lakhs

Type of Bus	Seating Capacity	No. of Buses to be purchased	Price of Chaises	Price of Body	Price of Per Bus	Total
Passenger Bus heavy Vehicle Mini Bus	35	40	5.50	4.00	9.50	380.00
Passenger Bus heavy Vehicle Medium Bus	43	45	5.90	4.25	10.15	456.75
Passenger Bus heavy Vehicle Large Bus	51	15	9.00	4.50	13.50	202.50
Total		100				1039.25

Accordingly, the Pune Municipal Corporation has decided to propose a credit of Rs. 10 Crores to the PMT in the month of July 2002, for purchase of 100 new buses and improve public transport facilities.

The average distance covered by the PMT buses is 159531.58 Kms.; the average diesel consumption by the buses is 47576.583 litres/day, giving a mileage of 3.53 K. M. per litre.

Table 3.3: Daily average PMT buses on road along with the Kms travelled and the diesel consumed during April 2001 to March 2002.

Month	Vehicles on road	Gross K. M.	Consumption of diesel in litres
April	651	162105	46558
May	628	156806	45466
June	599	145634	42758
July	629	154160	45647
August	666	167011	50775
September	653	161104	48546
October	673	164864	50558
November	643	159942	47987
December	648	159857	48579
January	671	164348	49558
February	659	159838	47657
March	647	158710	46830
Total Average	647	159531	47576.583



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However, the Pune Municipal Transport may not in the near future, substantially fulfil the entire transportation requirement of the city population. Presently the needs of the people are fulfilled primarily by the private vehicles and are supplemented by the Pune Municipal Transport and the other public transportation modes like the three and six-seater rickshaws. The two-wheelers and the three and six-seater rickshaws have seen a steep rise in the last three years. Following table and the figure below indicate vehicular distribution in the city.

Table No. 3.4: Number of vehicles registered with the Pune RTO during the last three years.

Type of Vehicles	2000	2001	2002
Motorcycle	258114	298267	344892
Scooters	220134	228414	238771
Mopeds	131249	138551	143978
Total 2-W	609497	665232	727641
Cars	66475	74957	85967
Jeeps	26088	27737	28357
Station Wagons	944	946	946
Taxis	3772	3736	3995
Autorickshaws			
3-seaters	49478	51798	54844
6-seaters	3775	3972	4133
Stage carriers	4922	4946	4974
Contract Carriers	1240	1313	1432
School Buses	64	64	64
Private Service Vehicles	1208	1212	1212
Ambulances	650	677	701
Trucks	21478	22016	22536
Tankers	2568	2654	2731
Delivery vans			
4-W	10293	11144	11884
3-W	9096	9978	11301
Tractors	11530	12801	13460
Trailers	9931	10850	11436
Others	1375	1406	1436
Total	8,34,384	9,07,439	9,89,050



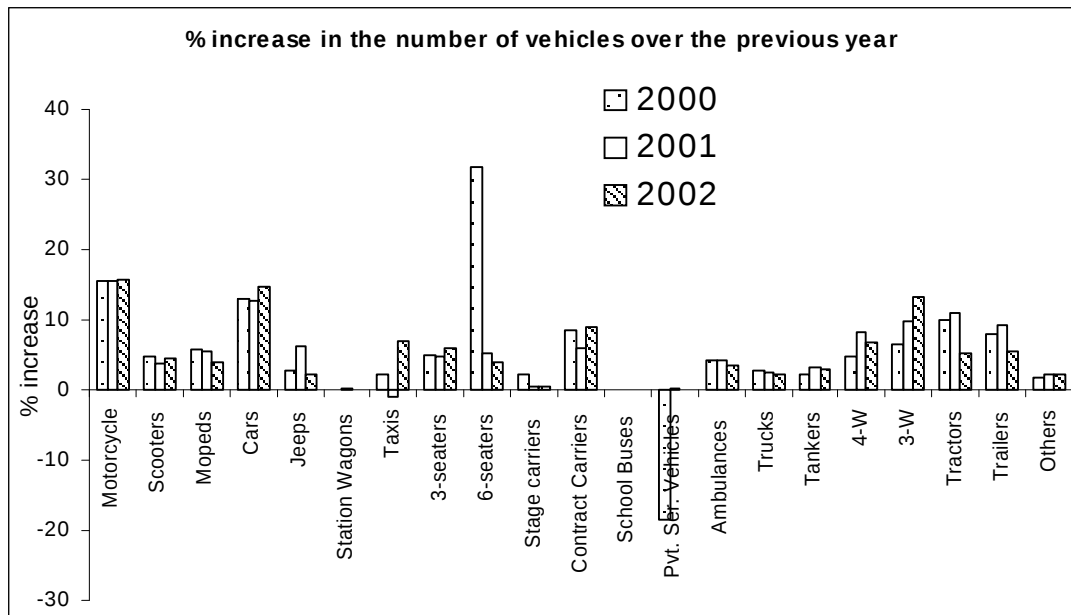
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Table No. 3.5- % increase in the number of vehicles over the last three years

Type of Vehicles	2000	2001	2002
Motorcycle	15.54	15.56	15.63
Scooters	4.78	3.76	4.53
Mopeds	5.64	5.56	3.92
Total 2-W	9.28	9.14	9.38
Cars	13.00	12.76	14.69
Jeeps	2.77	6.32	2.24
Station Wagons	0.11	0.21	0.00
Taxis	2.25	-0.95	6.93
3-seaters Autorickshaws	4.95	4.69	5.88
6-seaters Autorickshaws	31.72	5.22	4.05
Stage carriers	2.35	0.49	0.57
Contract Carriers	8.39	5.89	9.06
School Buses	0.00	0.00	0.00
Pvt. Ser. Vehicles	-18.43	0.33	0.00
Ambulances	4.17	4.15	3.55
Trucks	2.65	2.50	2.36
Tankers	2.27	3.35	2.90
4-W Delivery vans	4.74	8.27	6.64
3-W Delivery vans	6.51	9.70	13.26
Tractors	10.03	11.02	5.15
Trailers	7.92	9.25	5.40
Others	1.70	2.25	2.13
Total	8.71	8.76	8.99

% increase in the number of vehicles over the previous year





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Air pollution due to vehicular emissions is estimated at 181.957 tonnes per day and is increasing unabated.

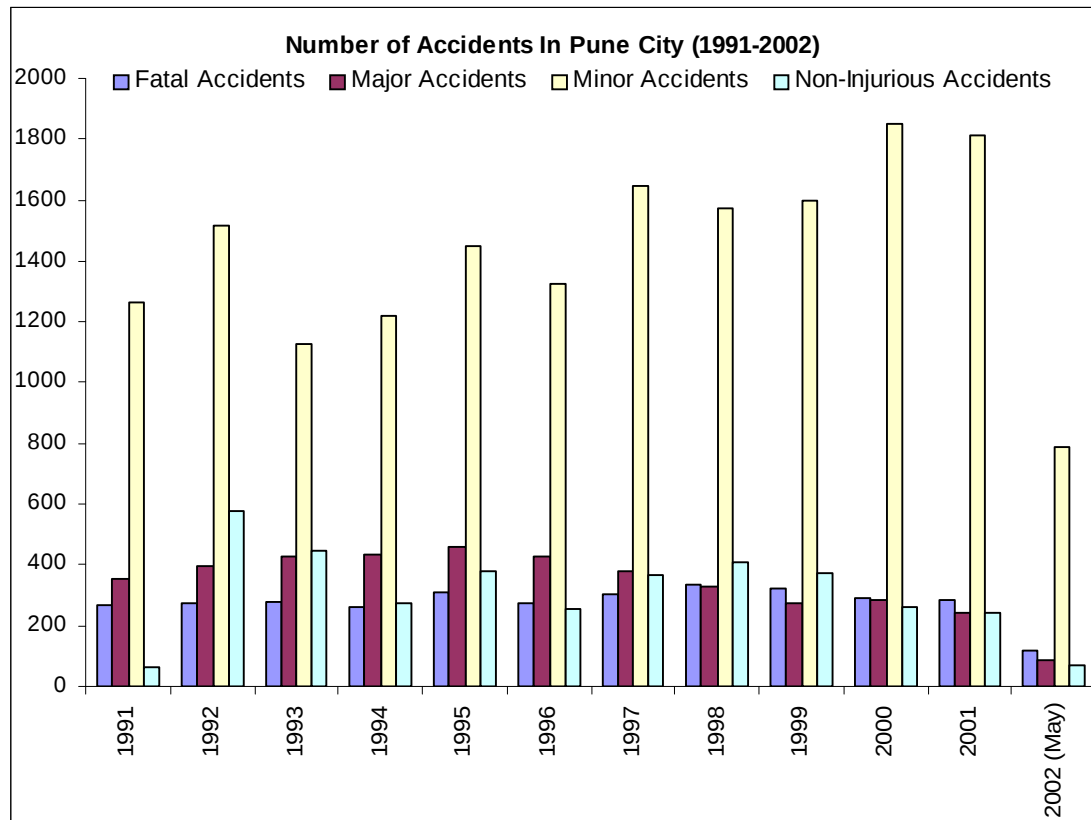
Following chart demonstrates that the number of fatal, major and non-injurious accidents are decreasing over the last few years. But there is a constant rise in the number of minor accidents. The city on an average registers about seven accidents every day. Most of the accidents caused in the city are due to the negligence in following traffic rules, e.g. dangerous overtaking, technical snags in vehicles and driving in inebriate condition along with poor road conditions. Traffic regulatory agencies also require massive overhauling. Merely 457 traffic police are deployed against the total requirement of 1200 for Pune Urban agglomeration. Nevertheless, the traffic police have initiated few laudable initiatives such as public announcement at intersections, erection of traffic booths at various intersections etc. The RTO, despite meager resources, have been able to regulate vehicular quality checks effectively. They however, need to derive a comprehensive policy for introduction of newer vehicles on city roads in consultation with Pune Municipal Corporation and traffic police and also should evolve an action plan for maintaining quality of old vehicles.

Table No. 3.6 - Number of fatal accidents, major accidents and non-injurious ones are decreasing over the last few years.

Year	Fatal Accidents	Major Accidents	Minor Accidents	Non-Injurious Accidents	Total
1991	268	351	1265	65	1949
1992	273	394	1517	573	2757
1993	278	430	1129	445	2282
1994	258	431	1220	275	2184
1995	308	459	1450	375	2592
1996	271	426	1328	254	2279
1997	302	376	1644	365	2687
1998	334	329	1574	407	2644
1999	325	273	1598	374	2570
2000	288	285	1851	260	2684
2001	282	241	1813	242	2578
2002 (May)	118	86	784	70	1058



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The key traffic and transportation problems can be broadly identified as under:

- u A disproportionate rise in the number of vehicles; more particularly in the two wheelers,
- u Growth of informal forms of mass transport,
- u A severely impaired Pune Municipal Transport,
- u Heterogeneous traffic conditions with limited road capacities making segregation of traffic impossible,
- u Absence of a ring road despite radial expansion of the city,
- u Insufficient road capacities in the congested area,
- u Crowded intersections leading to air and noise pollution,
- u Various encumbrances on roads such as encroachments, unauthorised constructions particularly of religious nature etc.
- u Limitations of DP roads to cater to the transport needs since vast stretches of developable lands in the DP do not have any plans for road networking,
- u Absence of parking facilities at important locations leading to street parking.
- u The inadequacy of foot paths, their diversion to other uses and joy-walking leads to obstruction of vehicular traffic.



Chapter-4

DEVELOPMENT PLANNING

The city is undergoing two distinct phases of urban development. The erstwhile old city, with an area of 146 sq. km. has a sanctioned development plan of 1987 whereas the developments in the newly added area with an area of 97.84 Sq. kms. are regulated by the sanctioned regional plan of Pune region. The PMC, being the planning authority has already embarked on the preparation of a draft development plan for the newly added area and the same is expected to be submitted to the PMC for publication by end of July, 2002. The development plan of the new area shall pave the way for an orderly urban development and will allow PMC to provide various civic amenities at par with the city limits. The existing land use pattern of the old and new area is separately mentioned in the following table.

Table No. 4.1 - Distribution of Land space in the old PMC limits.

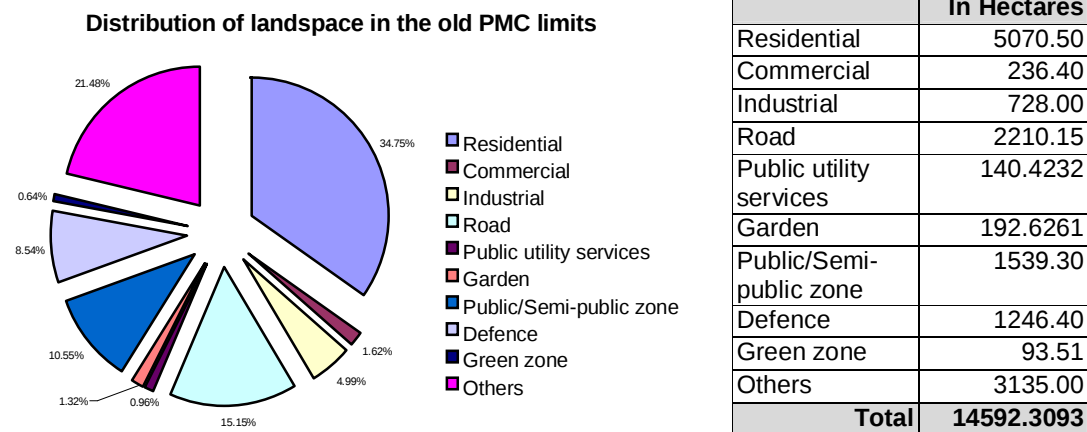
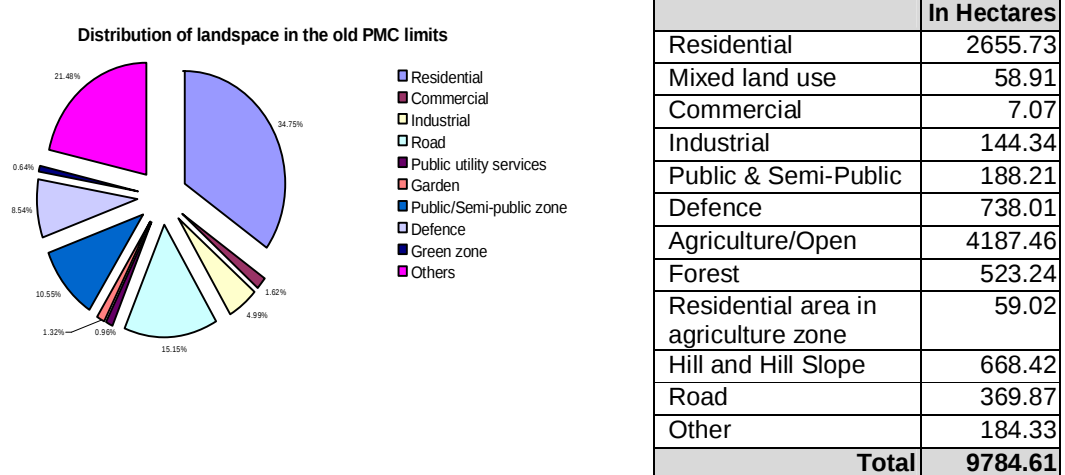


Table No. 4.2 : Distribution of Land space in the added according the Pune Regional Plan





It may be observed that the development potential of the outer newly added area is immense. Efforts must be made to enforce development controls vigorously so that once the development plan comes into existence, the area provides opportunity for an orderly development. The concept of Transferable Development Rights and Accommodation Reservation has only partly helped PMC to implement the DP of the old area. The PMC has been able to acquire land measuring 0.69 Sq. kms. so far through TDR and also develop 80 reserved sites through the concept of Accommodation Reservation which includes amenities such as shopping centres, EWS, parking facilities, cultural centres etc. Significantly, an area of 52.6057 hectares has come under the possession of PMC free of cost under 'Accommodation Reservation' meant for rehabilitation of DP affected people. It is estimated that the PMC has so far cumulatively been able to implement the sanctioned DP to the extent of 42.91%. The total numbers of reservations are 508 out of which 218 sites are acquired for development of civic amenities.

It is, however, prudent to discuss the existing status (problems) of the Development Plan and also to comment on the growth of the newly added area in absence of a Development Plan.

§ The DP was prepared on the basis of projected population of 18.25 lakh souls for 2001 as against the actual population of 25.40 lakh souls. Statistically, therefore the provisions of DP should increase by 39% in order to attain the objectives of the DP. Such change in the DP, however, can be made possible only through the revision of the plan.

§ Evaluation of TDR and Accommodation Reservation is necessary. While the TDR has led to further densification of the core area, the principle of Accommodation Reservation has reduced the quantum of the actual



**Karvenagar ward office building handed over to
PMC under 'Accommodation Reservation'**

reservation substantially, e.g. An original area of EWS housing has been cut down to merely 15% built up area. Parking reservations are severely affected, since instead of acquiring entire plots of reserved sites, which eventually could have been used for multi storied parking facilities, only built up area to the extent of the gross plot area is used for parking. Judicious

use of TDR based on the sustenance of the existing infrastructure must be made. Judicious use of TDR should aim at grant of TDR for only those acquisitions which are to be immediately developed by the PMC; correct



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interpretations of Development Control Rules regarding 'fixed' and 'floating' TDRs; and ensuring that 'lumping' of TDRs do not result in dense habitation which may overload the infrastructure. Pune Municipal Corporation's initiative in this regard will go a long way in easing congestion in the city. Till today, PMC has generated 6,88,481.72 sq.m. TDR out of which 5,08,333.37 sq.m. are utilised.

- § Vast chunks of land in the outer area of the old city are left uncovered by suitable DP roads. Consequently, the areas have grown with informal road pattern defying length and size norms. Besides, use of section 205 of the BMC Act for alignment of new roads has given limited results in absence of a comprehensive policy.
- § Although, 490.00 hectares in the agriculture zone have been converted to residential zone with an extensive micro planning exercise, the process of acquisition and development of reserved sites, thereon, is very slow and merits more attention.
- § Town Planning Schemes, a viable, time tested tool for the implementation of the DP presently cover a total area of 24.10 sq. km constituting merely 16.51% of the total city area. In absence of sufficient Development Plan roads and against the backdrop of un-authorised sub-divisions of land, the process of preparation of Town Planning Schemes is the only viable alternative that can be embarked upon.
- § The newly added area is deprived of the basic amenities of minimum standards because of absence of the Development Plan. Regional Plan can not address the micro level requirements of the area. There is an urgent need to prepare Development Plan for that area with a mechanism to implement it preferably through the Town Planning Schemes. Over dependence on TDR or Accommodation Reservation for the implementation of the plan might lead to further complications. In the meanwhile, however, the Pune Municipal Corporation is contemplating a massive afforestation program at Lohegaon and is also implementing the water supply and sewerage project exclusively for the newly added area.
- § While preparing the Development Plan for the newly affiliated villages, it should be ensured that the agricultural lands in these villages are not indiscriminately converted to residential areas. Instead, nodal development centres focussing around the "gaothans" of the newly merged villages, should be developed as small, self contained townships which will obviate the need for the residents of such areas to come to the inner city for their basic, daily needs.
- § Strict enforcement of DC rules must be observed. Illegal constructions measuring 78,581.94 sq. m. have been demolished during 2001-02 whereas new constructions admeasuring 6,04,326.00 sq. m. area have been permitted by the PMC in the same year. Unauthorised use of premises should attract severe punishment and also the non-conforming uses such as tiny industries,



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cattlesheds, potteries etc. must be shifted beyond the residential area in a time-bound manner. The Pune Municipal Corporation has already envisaged a plan to shift certain non-conforming commercial activities at Mundhwa during the course of the next year.

Ø Gunthewari System:



Gunthewari Act: Respite for many citizens

Crores through the regularisation process. The amount is required to be spent on development works in the respective areas.

The State Government has promulgated the Maharashtra Gunthewari Development Act of 2001 to regularise the existing Gunthewari constructions before 1.1.2001 empowering the development authority (The PMC) to levy charges to regularise these constructions. Accordingly, it is estimated that the PMC will generate an extra income of around Rs. 25

Ø No-Hawkers Zone:



A Choupati existed here at University Circle

rehabilitation before initiating such actions. The Pune Municipal Corporation, in absence of suitable Development Plan reservations, prioritised and declared the following 8 roads as no-hawkers zones and accordingly has started taking actions against them from 01.04.2002.

The sanctioned development plan has not identified facilities for hawkers. Consequently, the hawking activities have mushroomed in almost all parts of the city. In order to enhance the traffic mobility, the PMC issued a public declaration in local newspapers banning hawking along the roads. In

response, the hawkers union demanded proper

1. Jangli Maharaj road (Modern Café to Sambhaji Bridge)
2. Bajirao road (Nava pul Bdg. to Abhinav College Chowk)



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3. Ganesh Khind road (Sancheti hospital to University Chowk, Raj Bhavan)
4. Sinhgad road (Dandekar Bridge till PMC limit)
5. Shastri road (Alka Talkies Chowk to Dandekar Bridge)
6. Senapati Bapat Road (V. S. Khandekar Chowk to Chaturshrungi Chowk)
7. Fergusson road
8. Bund Garden to Circuit house

Table No. 4.3 - Information regarding action initiated for eradication of unauthorised constructions.

(Area in sq. ft.)

Year	Number of Constructions demolished	Constructions demolished
1/4/97 to 30/3/98	584	315444
1/4/98 to 30/3/99	1838	551382
1/4/99 to 30/3/00	851	351843
1/4/00 to 30/3/01	1953	1024867
1/4/01 to 30/3/02	2208	845856
Total	7434	3089392

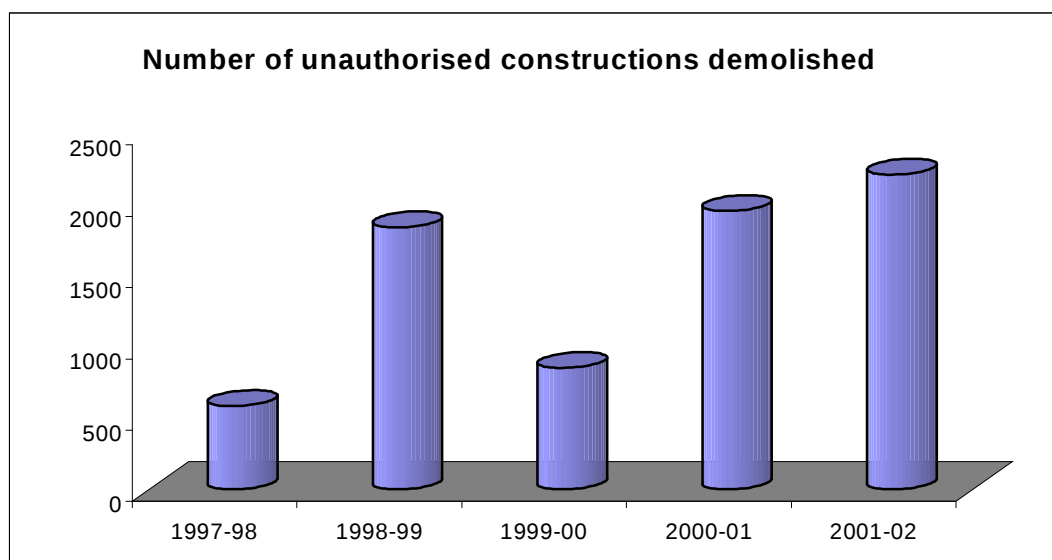


Table No. 4.4 - Information regarding demolition of unsafe constructions.

(area in sq. ft.)

Year	Number of demolished unsafe constructions	Area of unsafe constructions
1997-1998	110	55856
1998-1999	119	41252
1999-2000	95	18650
2000-2001	81	20356
2001-2002	97	23405
Total	502	159519



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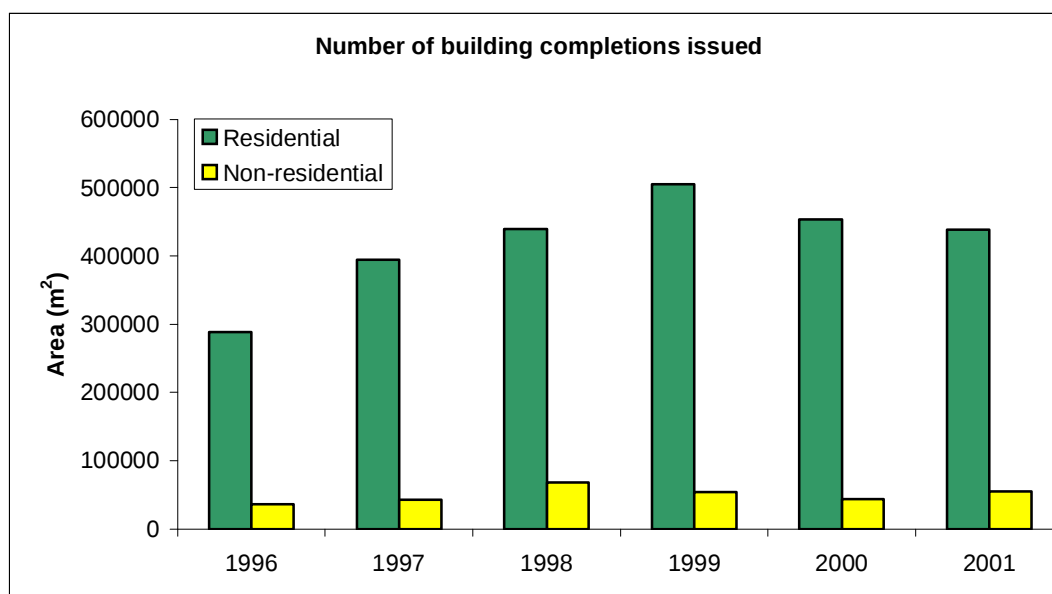


Table No. 4.5 : Details of actions taken by Anti-Encroachment Department.

Year	Handcarts	Squatters	Stalls	Other vehicles
2000-2001	5265	2128	80	66
2001-2002	6319	2493	197	168
Total	11584	4621	277	234

Table No. 4.6 - Number of building permissions and completions issued.

Year	Details of permissions			Details of completions Certificates				
	Resi-dential	Area (m ²)	Non-resi-dential	Area (m ²)	Resi-dential	Area (m ²)	Non-resi-dential	Area in (m ²)
1996	1388	568680	145	83065	1047	288545	103	36155
1997	1273	591175	182	12276	1506	394064	182	42594
1998	1201	641941	178	113073	1459	439291	364	67926
1999	1030	486695	176	90033	1679	505530	341	54341
2000	1326	416310	99	105325	792	453141	287	44166
2001	1446	519970	132	84356	853	438329	201	54969
Total	7664	3224771	912	488128	7336	2518900	1478	300151



G Heritage Structures and Precincts In Pune :

Pune City having rich cultural and historical background, has number of beautiful structures, that merit conservation. The Pune Municipal Corporation



has taken initiative in conserving buildings, artifact structures, areas and precincts, of historic and/or aesthetic and/or architectural and/or cultural significance (Heritage buildings and heritage precincts) and /or natural features of environmental significance. Pursuant to the State Government's directive dated 10th July, 1995, the PMC has formed Heritage Committee to consider various subjects related to heritage structures / precincts, including proposals about repairs, renovation and re-development of heritage structure, construction in close vicinity of the heritage structure etc. So far the heritage committee has sanctioned about 20 such proposals regarding the repairs / renovation of the heritage structures or developments in the vicinity of the heritage structures.

The structures, which require preservation in Pune City, are listed by the Committee, in consultation with the Director, Town Planning, Pune. The primary list of the heritage structures and the heritage precincts includes about 166 properties / precincts in the city limits, out of which 6 properties are Grade I heritage structures, 48 are Grade II and 112 are Grade III heritage structures / precincts. The grade of heritage structure is decided as per the historic, aesthetic, architectural and cultural prominence.

In order to monitor gradation system and conservation of the heritage structures / precincts, the committee has finalised Development Control Rules & Regulations for heritage structures. Along with the heritage structures the natural features of the city need conservation too. Committee has under taken detailed survey of natural features like hill top – hill slopes, green belts, lakes, riverside etc. Necessary permission of the State Government will be sought to declare these natural features as natural heritage features.

C Recreational Developments and Gardens :



Late Jayantrao Tilak Rose garden

The PMC has undertaken various garden development and urban afforestation projects in the city at 30 different locations. The city today boasts 52 public gardens. The Sahakarnagar Nalla-garden, the Wellesley garden, located at the once polluted lake, the late Raja Mantri Udyan are presently

few of the most beautiful spots of the city. Such

recent developments have immensely contributed to the beautification of the city and are also important in maintaining its ecological balance. The PMC has developed 6 gardens in addition to recreating 12 old gardens during the



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last year. There is about 15% increase in the number of gardens in the 2001-02. The Late Jayantrao Tilak Rose garden at Sahakarnagar, an Ayurvedic garden at Kondhwa, beautification of the grounds of Shaniwarwada, beautification of Lakaki Lake in Model Colony, development of jogging tracks at 10 places in the city are some of the projects completed during the year.



▲ Riverside plantation program

◀ Transplanted Trees Off Senapati Bapat road

The Pune Municipal Corporation's success of transplantation of over 1000 trees coming under road widening has a revealing effect on the road development projects. Two large projects of gardens at Parvati, survey No. 120 and 121 (P. L. Deshpande garden, Sinhgad road) and Kothrud (on the 27 acre piece of land where earlier garbage depot existed) have been undertaken by the Pune Municipal Corporation. The civic body has also undertaken afforestation projects at Lohegaon on a plot of 80 acres. Significantly, more than 50% of the gardens developed by Pune Municipal Corporation are irrigated by borewell, existing well, lakes/nallas. Almost all the roads are covered by plantation along the medians or the sides of roads by the Pune Municipal Corporation or through the BOT initiative. Annually the Tree Authority between June 15th to August 15th conducts a campaign for plantation in monsoon season wherein the Pune Municipal Corporation undertakes plantation drive of trees along the roadside and at other places in the city. The citizens are also encouraged to plant more trees in their own premises. The Pune Municipal Corporation offers plants/saplings at subsidised rates for such purposes at four different places in the city with necessary technical support, if required. The Tree Authority also formulates norms for the conservation of existing plantation. In order to increase awareness amongst the school children, various activities such as drawing competition; essay writing pertaining to ecological restoration etc. are undertaken by the Pune Municipal Corporation. An annual 'Harit Pune' award is given to the individual/institutions towards the work done in nature conservation. The Pune Municipal



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Corporation also organises flower shows every year to promote citizen participation. Large-scale plantation is carried out in collaboration with Forest Department, Government of Maharashtra along the Mutha river bank adding to its aesthetic beauty.

Number of reactional spaces in the city

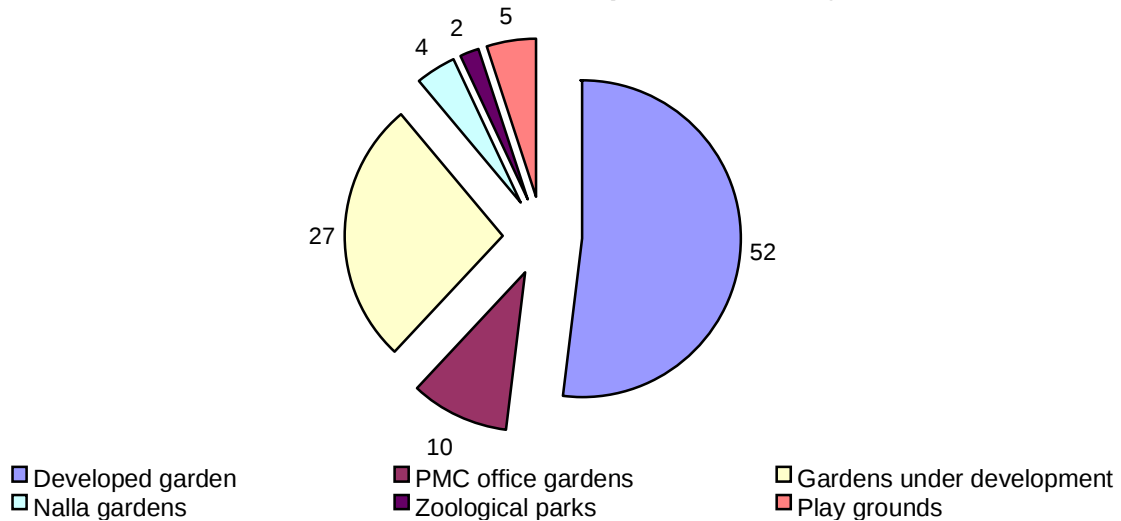


Table No. 4.7: List of Gardens developed in the city.

(in acre)

Name of the Gardens	Approx. Area
1. Sambhaji garden-Deccan Gymkhana, Shivaji nagar	12.0
2. Rajiv Gandhi Zoological park/Snake Park-Katraj	165.0
3. Kamla Nehru Park-Erandwane, botanical garden	4.0
4. Chittaranjan Vatika Garden- Shivajinagar, Harekrishna path, Senior Citizen Park	5.0
5. Narveer Tanaji Garden-Shivajinagar	1.0
6. Dr. Jaiprakash Narayan Garden-near Pune Railway Station	1.0
7. Dr. Babasaheb Ambedkar Garden-Sassoon road	0.5
8. Mahatma Gandhi Garden-Bund garden	7.0
9. Dr. Chima Garden- Yerawada	2.0
10. Jijamata Garden-Kasba Peth	1.5
11. Sarasbaug –Sadashiv Peth-Seasonal Flowers	9.0
12. Shrimant Ghorpade Peth Garden- Ghorpade Peth	4.0
13. Shahu Garden-Somwar Peth	2.5
14. LateTatyasaheb Thorat Garden-Kothrud	4.0
15. Kamalnayan Bajaj Garden-Pune-Mumbai Road	1.5
16. Marutrao Gaikwad Garden-Aundh	2.0
17. Chhatrapati Shivaji Garden-Bopodi	1.5
18. Late Shivarkar Garden-Vanawadi	2.0
19. MaharanaPratap Garden, Sadashiv Peth	2.5
20. Late Kakasaheb Gadgil Garden-Padmavati	1.0



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21. Savitribai Phule Garden-Tadiwala Road	1.0
22. Samarth Ramdas Garden-Wadarwadi	1.5
23. Sant Rohidas Garden-Guru Nanak Nagar	3.0
24. Late Yashwantrao Chavan Garden-Parvatidarshan	1.5
25. Late Rajivade Garden-Sahakarnagar No. 2	2.0
26. Hutatma Smarak-Yerawada	1.5
27. Limca Jogging Park-Bund Garden	3.5
28. Samarth Akalkot Swami Children's' Garden-Bhavani Peth	4.0
29. Late Vasantrya Bagul Garden-Sahakarnagar	1.5
30. Dr. Rammanohar Lohiya Garden-Hadapsar	8.0
31. Lokmanyagar Jogging Park	6.0
32. Late Raja Mantri Garden- Erandwane	3.0
33. Sy. No. 191, Yerawada Housing Board	1.0
34. Late Anusaya Bankar Garden, Hadapsar	1.5
35. Krantishalaka Aruna Asaf Ali Garden-Maharshinagar	1.5
36. Haji Gulam Rasul Abdul Pansare Children's Garden, Gultekdi	1.5
37. Gul Poonalwala Garden-Salisbury Park	2.5
38. Late Shankarrao Ramchandra Kawre Garden- Tawre Colony	1.5
39. Sachin Tendulkar Jogging Park-Rajendra Nagar	1.5
40. Late Sanjay Mahadev Nimhan Garden -Someshwarwadi	4.0
41. Hajrat Siddiqui Garden-B.J.Medical College,	3.5
42. Dr. Shamrao Kalmadi Garden-Ekbote Colony	1.0
43. Shahu Modak Garden-Koregaon Park	1.5
44. Damodar Galande Garden-Kalyani Nagar Jogging park	3.5
45. Late Meenatai Thakre Garden-Mangalwar Peth	1.5
46. Bharatratna Mother Teresa Garden-Duttwadi	1.5
47. Mahatma Jyotiba Phule-Phule Nagar	1.75
48. Jagatguru Maharshi Valmiki Garden-Mohan Wadi	1.0
49. Vijayanagar Colony Garden-Sadashiv Peth	2.5
50. Sant. Dnyaneshwar Garden-Erandwane	1.5
51. Late Jayantrao Tilak Rose Garden-Sahakarnagar	3.0
52. Sant Gajanan Maharaj Garden-Gokhalenagar	4.0

Table No. 4.8 - PMC office Gardens

		(in acre)
		Approx. Area
1. PMC, Shivajinagar		1.0
2. Vaikunth Crematorium		5.0
3. PMC, Press, Ghole road		1.5
4. Residence of Municipal Commissioner		2.0
5. Swargate Water Works		1.0
6. Sonawane Maternity Hospital		0.5
7. Kamla Nehru Hospital		0.5
8. Bal Gandharva Rang Mandir		1.0
9. Samata Bhoomi, Ganj Peth		0.5
10. Shaniwarwada		1.0



Table No. 4.9 - Gardens under development.

(in acre)

Location of the Garden	Approx. Area
1. Sy. No. 103, Shivaji Housing Soc. Gokhale Nagar	2.0
2. Lakaki, Lake Garden, Model Colony	5.0
3. Gokhale Nagar Hou. Board, Sy. No. 87	4.0
4. Sinhgad road, Sy. No. 120, 121A	35.0
5. Kothrud Garbage Depot, Sy. No. 92, 93	29.0
6. Jai Jawan Nagar Yerawada	3.0
7. Kondhwa, Sy. No. 12, Kausar Baug	4.5
8. Proposed Jijamata Garden, Kumbharwada	2.0
9. Ramtekdi,	4.0
10. TP Scheme No. 3, Sy. No.427D, part IV, Gultekdi	4.0
11. Sy. No.14, Dhankawadi	1.0
12. Upper Indira Nagar	1.0
13. Wakdewadi, Sy. No.20+22	2.5
14. Erandwane, Sy. No.21+11, Patwardhan Baug	3.5
15. Erandwane, Sy. No.37	0.5
16. Pashan Sy. No.111, part No. 18/1, Pashan lake	5.0
17. Pashan Sy. No. 140/6	2.0
18. Wanavdi, STP	6.0
19. Bibvewadi, Sy. No. 573, 575	1.0
20. Vijaynagar Colony, plot No. 32 & 32B	1.0
21. Shaniwar Peth, River Bank	4.0
22. Hadapsar Sy. No.137, Malwadi	--
23. Hadapsar Sy. No.165	--
24. Hingane, Sy. No. 61/1	--
25. Vimannagar, Sy. No. 205	--
26. Indraprastha, Yerawada	8.0

Table No. 4.10 - Nalla Gardens.

(in acre)

Name of the Place	Approx. Area
✓ Ambil Odha, beautification (Nalla Park)	6.0
✓ Bhairoba Nalla, beautification (Nalla Park)	5.0
✓ Nagzari Nalla, (opp. Gaonkose Maruti)	2.0
✓ Kothrud area (Two Nallas)	4.0

Table No. 4.11 - Zoological Parks

(in acre)

Name of the Zoo	Approx. Area
1. Peshwe Park Zoo	8.5
2. Rajiv Gandhi Zoo and Wildlife Research Centre, Katraj	165



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Table No. 4.12 - Play grounds

(in acre)

Name of the Place	Approx. Area
1. House No. 1064 to 1068, Sadashiv Peth, Kavthi Adda	1.0
2. Shukrawar Peth, Sy. No. 1154-59-62, (TP Scheme No. 3)	1.5
3. Tulshi Baughwale Colony, Sahakarnagar	3.0
4. Vimannagar	2.0
5. Mitramandal Chowk, Marathon Trust	1.5

xxxxxx



Chapter No. 5

WATER SUPPLY

Water forms the basic element of environment. Historically, the human settlement pattern is closely associated with the availability of water. Pune City has a perennial source of surface water in the form of a storage across Mutha river. Annual requirement of raw water is around 9.5 TMC (9500MCFT) against a cumulative storage capacity of 28 TMC in Khadakwasala, Panshet, Varasgaon and Temghar dams on Mutha river. The dams are maintained by the Krishna Valley Development Corporation, who have agreed to release an annual quota of 11.5 TMC for the drinking water requirement of Pune city. On an average PMC is supplying 200 litre per capita of water to the citizen of Pune daily. A work force of about 1500 is deployed by the PMC to manage the distribution system with pipe sizes ranging from 80 mm to 3000 mm covering a distance of around 1200 km.

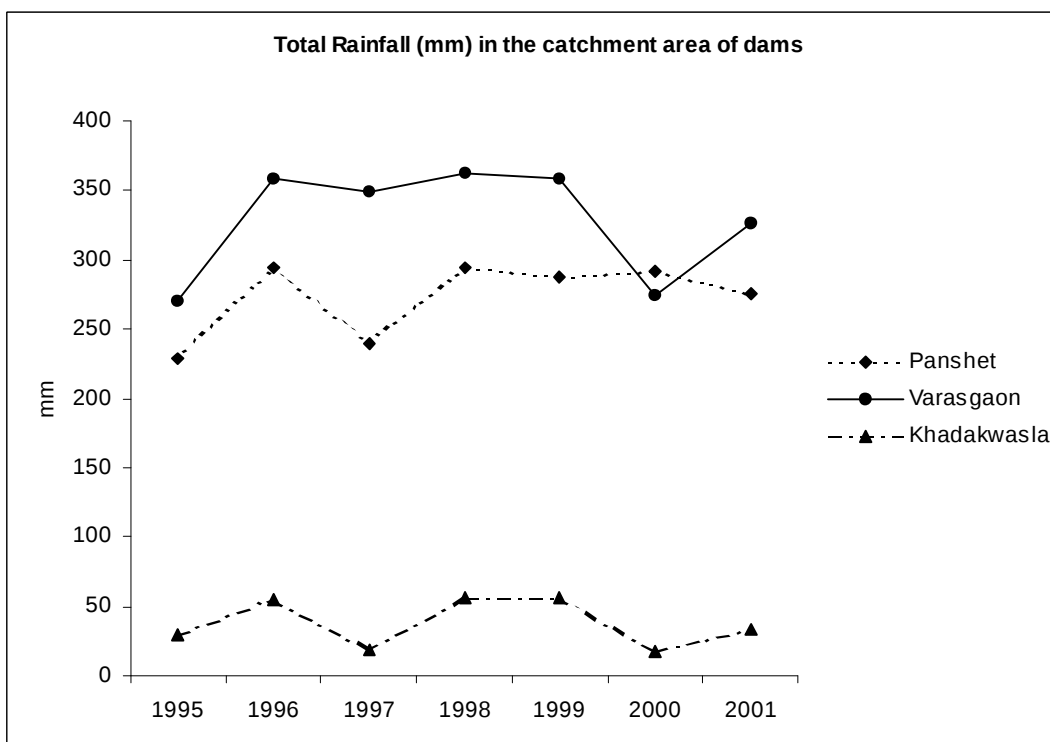
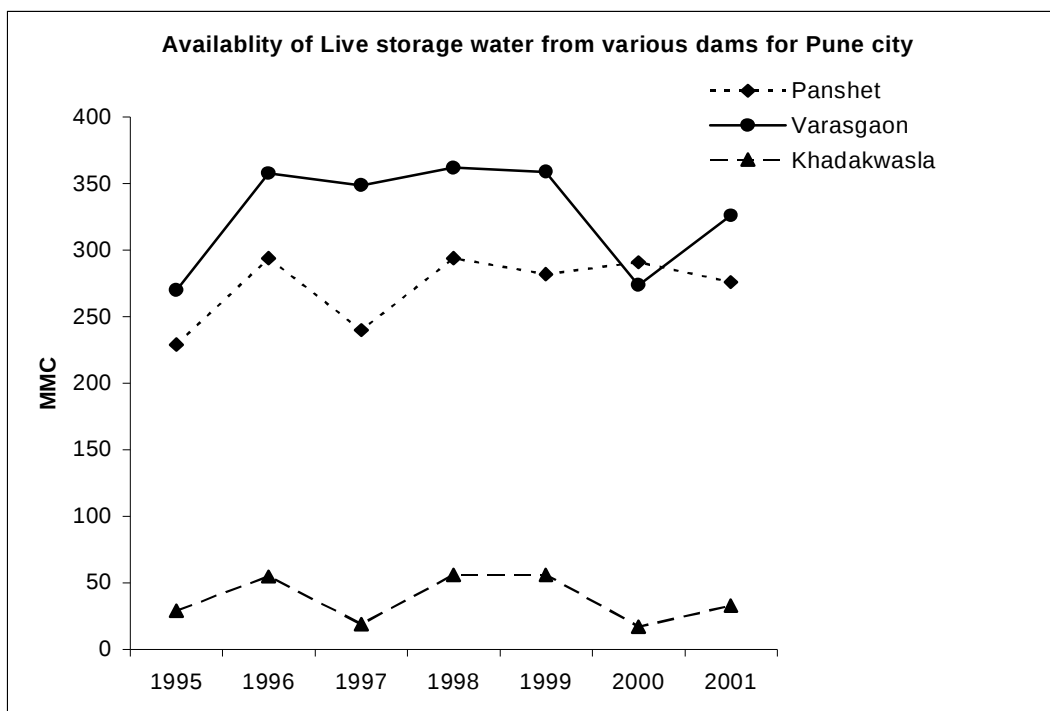
In the beginning of the last year, 51 locations were identified as the water scarcity areas due to uncontrolled growth and undulating topographical conditions. Most of the locations fall beyond the 16 water supply zones for which the existing water supply system is designed. Nevertheless, the Pune Municipal Corporation has undertaken a number of short term and long-term measures, to overcome the deficiency in water supply. Short-term measures include reducing leakage component by replacing existing PVC or AC lines and the pipelines under road widening, installation of booster pumping stations and supplementing water supply through tankers. Long-term measures include capital investments in developing the new water supply system including development of distribution network, pumping machinery etc. under ongoing water supply project.

Water Supply System in brief:

Area	243 sq. km.
Population	25 Lakh
Length of water lines	Approx. 1200 km
Raw water supply	750 MLD
Per Capita water supplied (net)	200 LPCD
Number of Water storage tanks	38
Total capacity of reservoirs	226 M.L
Number of major Pumping stations	16
Number of water zones	16
Water supply hours	Varying
Population under water zones	22 lakh
Population beyond water supply zone	3 lakh



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Ø **Features of existing water supply system:**

Ø **Raw water is conveyed to respective water treatment plants as follows:**

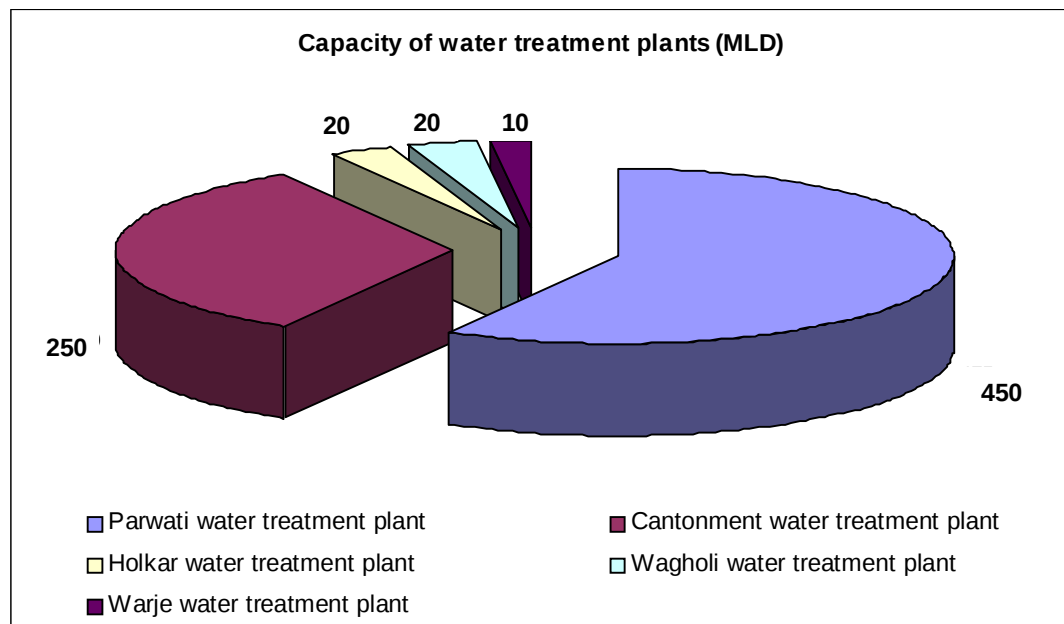
- Ø Khadakwasla dam to Parvati WTP through 3000 mm mild steel pipeline- Length 11 km.
- Ø Parvati to Cantonment water supply through 1600 mm dia. mild steel pipeline.- 5 km
- Ø Rawet on Pavana river to Chikhli WTP through 711 mm dia. mild steel pipelines – 7.17 km.
- Ø Khadakwasla dam to Warje WTP through 406 mm dia. pipeline – 7.4 km.

Ground water :

There are around 22 erstwhile rural water supply schemes on bore and dug wells.

Table No. 5.1 - Water Treatment Plants:

Sy. No.	Water treatment plant	Capacity MLD
1.	Parvati water treatment plant	450
2.	Cantonment water treatment plant	250
3.	Holkar bridge water treatment plant	20
4.	Wagholi water treatment plant	20
5.	Warje water treatment plant	10
	Total	750





Ø **Water pumping facilities:**



Raw and pure water pumping forms the largest cost component of the water supply budget of the PMC. The Pune Municipal Corporation annually spends Rs. 33.69 crores on account of energy bills forming 50.16% of total revenue expenditure. Undulating topography with ground elevations of population settlement ranging between 550 meter to 610 meter lead to a substantial expenditure on pumping. In an effort to optimise the expenditure towards power consumption, the PMC has decided to carry out the energy audit during the financial year of 2002-03.

◀ **3000 mm pipeline project from
Khadakwasla to Parvati Water Works**

There are 16 major pumping stations in Pune city with installed and operating capacities as follows.

Table 5.2 - Water works with their related pumping stations:

Pumping (HP)	Total	Parvati	Cantonment	Holkar Bridge	Wagholi	Warje
Installed	16,320	10,015	4,000	760	1,145	400
Operating	8,900	5,000	2,640	380	680	200

Ø **Quality of water:**



Quality of water is maintained as per IS 10500; 1991. The laboratory facilities at Parvati and cantonment waterworks are well equipped to carry out pertinent physical, chemical and bacteriological tests of raw water as well as the filtered water. Around 54 samples are tested per day to ensure potability of water. Out of these 26 are fixed samples taken from various reservoirs and 18 are random samples collected



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at varying locations. The samples from wells and tube wells are tested once in two weeks. Decision on additional online or step chlorination is taken subsequent to review of quality control tests. Since the watersupply system in the newly added area is under development, the existing systems are stretched beyond acceptable limits seriously affecting the water quality. Eastern areas such as Sasanenagar, Kale Padal in Hadpsar receive treated water after traversing a distance of 13-14 km without intermediate storage facilities. The entire population of the newly added area along Sinhgad Road survives on unfiltered water, but with adequate chlorination.

The PMC has resolved to prepare a profile of water quality across the existing distribution system to enable decision making with regard to preventive measures. Significantly, occurrence of water related diseases is extremely limited despite the absence of a well laid out water supply system, thanks to constant monitoring of water quality.

Table No. 5.3 - I. S. limits for drinking water:

Parameters	Desirable limit	Permissible limit
Turbidity	5 NTU (max.)	10 NTU
pH	6.5 – 8.5	6.5 – 8.5
Total hardness	300 ppm (max.)	600 ppm
Chloride	250 ppm (max.)	1000 ppm
Residual Chlorine	0.2 ppm (min.)	--
Nitrate	45 ppm (max.)	100 ppm
Alkalinity	200 ppm (max.)	600 ppm
Coliform	--	10/100 ml
E.Coli	--	0/100 ml

Table No. 5.4 - Well water Analysis in Pune city

Locations	pH	Nitrate (ppm)	Nitrite (ppm)	Alkalinity (ppm)	Hardness (ppm)	Chlorides (ppm)	Turbidity (NTU)
Katraj Gaonthan	7.33	--	--	340	320	45	--
Mangadewadi	7.41	--	--	270	240	30	--
Bhillarewadi	7.60	--	--	340	300	40	--
Ambegaon Khurd	7.26	--	--	270	240	25	--
Ambegaon Budhruk	7.50	--	--	250	230	30	--
Lohegaon (well No.1)	7.50	--	--	410	680	230	2.1
Lohegaon, Harantale wasti	7.68	--	--	320	390	80	2.0
Lohegaon, Pawar wasti	7.42	--	--	250	340	60	1.8
Undri	7.46	--	--	330	230	50	--
Hadapsar, Vitthalnagar	8.06	1.0	nil	200	160	30	--
Sasanenagar (well No. 1)	7.82	1.2	nil	170	210	65	--
Sasanenagar (well No. 2)	8.34	--	--	100	90	30	--
Sasanenagar (well No. 3)	8.23	1.2	nil	120	110	35	--
Mohamad Wadi (well No. 1)	7.82	1.0	nil	250	240	70	--
Mohamad Wadi (well No. 2, Barav)	8.2	1.1	nil	290	260	40	--



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Table No. 5.5 - Water analysis from the Pashan Lake (January, 2002)

Parameters	Raw water	After Filtration
pH	8.36	7.63
Turbidity (NTU)	6.5	0.7
Alkalinity (ppm)	340	330
Hardness (ppm)	295	325
Chlorides (ppm)	95	105
Nitrate (ppm)	0.1	0.1
Nitrite (ppm)	Nil	Nil
Coliform (MPN)	130	40
E.Coli (MPN)	25	2

Table No. 5.6 - Drinking water analysis before and after treatment at the Parvati water works (2001-2002)

Month	Raw Water					After Treatment				
	pH	Hard. (ppm)	Alk. (ppm)	Chl. (ppm)	Tur. (NTU)	pH	Hard. (ppm)	Alk. (ppm)	Free Cl ₂ (ppm)	Tur. (NTU)
April	7.96	25	32	12	3.1	7.78	24	30	0.7	1.2
May	8.21	24	30	12	2.6	7.92	23	29	1.0	1.0
June	7.90	25	29	11	2.9	7.80	23	26	1.1	0.8
July	7.72	28	32	11	4.4	7.62	27	31	1.2	1.1
August	7.84	50	60	14	4.3	7.87	48	58	1.1	1.2
September	8.10	56	51	14	2.4	7.90	56	50	1.1	1.4
October	8.29	49	60	11	2.6	8.12	46	56	1.0	1.1
November	8.12	56	76	12	2.9	7.97	54	76	1.0	1.6
December	8.09	38	49	12	2.7	8.03	36	49	1.0	1.2
January	8.15	2.8	34	12	2.6	8.09	26	31	1.2	1.4
February	7.96	25	32	12	3.2	7.68	24	32	1.0	1.8
March	7.87	24	34	12	3.0	7.71	23	33	0.8	1.9

Table No. 5.7 - Quality of raw water (Mutha Right Bank Canal and closed pipeline) from Khadakwasla dam:

Date	Open Canal			Date	Closed Pipeline		
	Turbidity	Coli.	E.Coli		Turbidity	Coli.	E.Coli
03/10/2000	6.2	1800+	1800+	01/11/2000	1.8	1800+	1800+
04/10/2000	6.0	1600	1600	02/11/2000	2.0	900	900
05/10/2000	6.4	1800+	1800+	03/11/2000	2.5	1800+	1800+
06/10/2000	6.0	1800+	1800+	04/11/2000	2.4	1800+	1800+
09/10/2000	5.2	1800+	1800+	06/11/2000	2.4	1800+	1800+
10/10/2000	5.0	1800+	1800+	07/11/2000	2.4	550	550
11/10/2000	4.8	1800+	1800+	08/11/2000	2.4	250	250
12/10/2000	5.2	1800+	1800+	09/11/2000	2.4	550	45
13/10/2000	3.0	1800+	1800+	10/11/2000	2.2	110	35
16/10/2000	4.0	1800+	1800+	13/10/2000	2.0	250	110
17/10/2000	3.6	1800+	1800+	14/11/2000	2.0	80	80
18/10/2000	3.2	1800+	1800+	15/11/2000	1.8	110	35
19/10/2000	3.2	1800+	1800+	16/11/2000	2.1	35	35
20/10/2000	2.8	1800+	1600	17/11/2000	2.1	80	80
21/10/2000	3.0	1800+	1800+	18/11/2000	2.0	140	140
23/10/2000	3.2	1800+	1800+	20/11/2000	2.0	350	250
24/10/2000	2.8	1800+	1800+	21/11/2000	2.0	140	110
25/10/2000	2.5	1800+	1800+	22/11/2000	2.0	350	250
27/10/2000	2.5	1800+	1800+	23/11/2000	2.0	350	350
30/10/2000	2.0	1800+	1800+	24/11/2000	1.8	350	350
31/10/2000	2.1	1800+	1800+	27/11/2000	1.8	350	250

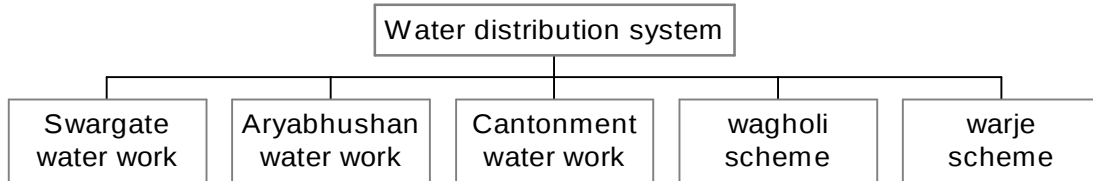


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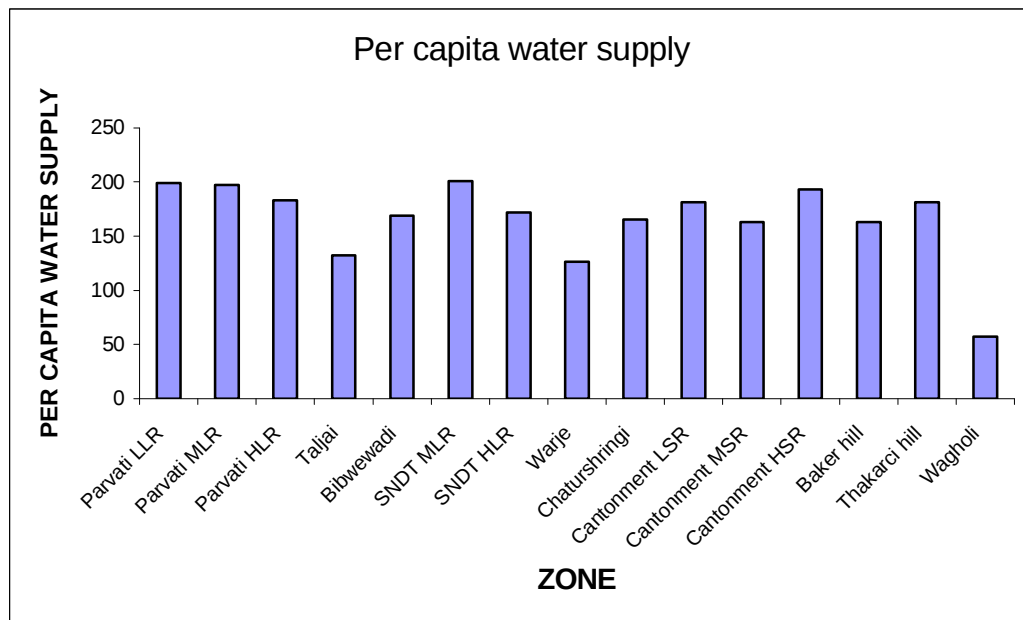


Ø **Water Distribution System:**

Water distribution system is divided in the following water distribution sections. Water supply in the water zones is fairly equitable. Wagholi project, by virtue of its status of Regional Water Supply Scheme, has lesser water consumption level at the rate of 57 lpcd.



Sr. No.	Water Supply Zones	Population in lakh	Per capita water supply
1.	Parvati LLR	3.8	199
2.	Parvati MLR	2.42	197
3.	Parvati HLR	0.26	183
4.	Taljai	1.68	132
5.	Bibvewadi	2.45	169
6.	Katraj	0.7	110
7.	SNDT MLR	0.95	201
8.	SNDT HLR	3.52	172
9.	Warje	0.5	126
10.	Chaturshringi	1.55	165
11.	Cantonment LSY	2.7	181
12.	Cantonment MSY	0.3	163
13.	Cantonment HSY	2	193
14.	Baker hill	1.8	163
15.	Thakarci hill	2.7	181
16.	Wagholi	1.27	57





Measures taken in year 2001-02 for ensuring equitable water supply:

- Reduction in the leakage component : Some of the major works undertaken in this regard are: Replacement of old pipeline in the parts of Senapati Bapat road, Bhau Patil road, rising main lines for SNTD water zone, and shifting of waterline on Ganeshkhind road.
- Use of booster pumps for areas at higher contour levels such as Kishkindhanagar, Hingne Home colony, Dhankawadi, Katraj, Anjaninagar and Rajiv Gandhi nagar.
- Use of water tankers for the water scarce areas: Water tanker trips were increased to the extent of 210 tankers per day to meet water demand in the peak of summer. In order to minimise loss of water at delivery point and also bring the much-needed transparency in the supply of tankers, HDPE water tanks of the capacity 2000 litres were placed at various locations. Also to ensure consistency in time and frequency of tanker trips, a time schedule is prepared and is being adhered to.
- Water scarcity and the predilection to take unauthorised connections complement each other. Thus, the extent of unauthorised connections is significantly high in the outer area beyond the water zones. The ward offices successfully launched a massive drive against such illegal connections, particularly in the areas under Warje and Wagholi regional water supply schemes.

Ø **Water Supply Project:**



Ongoing construction work of Vadgaon Water Treatment Plant

In order to provide equitable water distribution across the entire city and thereby to bring the developing area under the water supply zones, the PMC has started implementation of the first phase of the Water Supply Project costing Rs 201 Crores. Decentralised water systems shall be developed considering the geographical features in order to optimise the cost of water production and distribution. The work of Vadgaon water works is going on in full swing and the stalemate over Warje water treatment plant is likely to be over in the very near future.



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Area under Water supply project =450 sq. km.

Table No. 5.8 - Population forecast and corresponding water supply.

Phase	Year	Population forecast lakh	Designed Water supply in MLD
I	2005	34.60	791
II	2015	47.45	1074
III	2025	66.61	1506

Table No. 5.9 - Features of Water supply projects:

(in crore)

Name of work	Provision	Progress
Laying of water line from Khadakwasla dam to Warje water treatment plant—Length 8 Km.	9.80	50%
Laying of 1067 mm dia. rising main lines from Warje water treatment plant to Chandani chowk	4.75	60%
Laying of rising main water line 1067 mm dia. from Warje water treatment plant to SNTD HLR.- Length- 4.5 km	4.70	40%
Laying of 1296 mm dia. rising main water line from Cantonment Water work to Ramtekdi.	6.5	45%
Construction of 12.5 MLD water treatment plant at Wadgaon	9.84	15%
Construction of water storage tank of capacity 90 lakh liters at Ramtekdi, Hadapsar.	1	100%
Laying of rising main water line from Warje water treatment plant to Holkar pool Water works	9	30
Laying of rising main water line from Holkar Water work to Vidyanagar water tank.	3.5	Work in progress
Construction of water storage tank of capacity 60 lakh litres at Seminary hill, Bibvewadi.	0.8	Work in progress
Construction of water storage tank of capacity 22.5 lakh litres at Yerawada Thakarci hill.		Work completed
Construction of water treatment plant of capacity 100 MLD at s.no.19 Hingne.		Stopped on a/c of litigation regd. Land.

Ø Water Tariff:

The Pune Municipal Corporation has shifted to charging water in the form of water tax instead of water meters since 01.04.2000 for the residential and the mixed purpose properties. The meter system, however, continues for special domestic connections on medical ground and for rental properties besides commercial, industrial connections.



1) **Based on ratable value of the property: For the residential properties.**

Annual rateable value in Rupees	Water tax levied
a) For residential properties:	
Upto 1000	Rs. 900
1001-3000	Rs. 1000
3001-5000	Rs. 1100
5000 and above	25% or Rs.2500 whichever is minimum
b) For Commercial properties:	
1 to 10,000	Rs. 500
10000 and above	Rs. 1000

2) **Water meter system :**

Water supplied the areas other than PMC limits.

a) **Pune city area:**

Residential connection – Rs. 3.00 per kl.
Commercial connection– Rs. 16.00 per kl.

b) **Cantonment area:**

Residential connection – Rs. 3.75 per kl.
Commercial connection – Rs. 16.00 per kl.

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Chapter No. 6

DRAINAGE

The city generates around 451 MLD of waste water. Sewage collection system covers about 132 sq.km. area in the old Municipal limit. In the merged villages, about 49 sq.km. area would be covered by the sewer lines during 2002. The Pune Municipal Corporation has, during the last two years, enhanced the sewage carrying capacity by laying more drainage lines. A total of 88.96 Km length has been added to the existing drainage lines. The extent of sewage collection in the newly added area is far from satisfactory. The work of sewage collection system in the outer area forms one of the important components of the ongoing project. The details of sewers laid in last two years are as follows:

Table No. 6.1: Drainage lines laid during the year 2000-2001 to 2001-2002

Name of the Ward Office	Length of the Drainage in meters						length of rain water gutters in meters	
	250Ø	300Ø	450Ø	600Ø	900Ø	1200Ø	600Ø	900Ø
Bibvewadi	1885	4336	1500	--	300	--	--	--
Tilak Road	1723	1646	--	--	--	--	--	--
Sahakarnagar	2487	1145	1000	225	--	--	430	--
Vishrambaug	1045	2670	1825	--	--	92.50	80	125
Hadapsar	2875	3445	4595	2025	--	--	855	--
DholePatil Rd	155	565	102	--	--	--	172	--
Karve Road	7955	650	135	--	--	--	850	--
Bhavani Peth	2500	6000	925	350	--	--	1750	--
Ghole Road	680	3975	550	650	--	--	--	--
Yerawada	5570	5825	2175	2550	--	--	--	--
Kasba Peth	4080	4180	125	580	30	--	--	--
Aundh	450	850	--	750	1800	--	--	--
Total	31398	35287	12932	7130	2130	92.50	4137	125

Apart from the drainage lines, nallas also perform a major role in carrying the wastewater generated in the city. Out of the 451 MLD, 265 MLD sewage is carried through open gutters and nallas. However, the sewage flowing through nallas also carries wastewater generated by many sundry industries, community kitchens. This has led to an adverse impact on the environment in the surrounding areas through which the nallas flow. In an effort to mitigate pollution in nallas, their channelisation program has been undertaken. The details are as below:



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Table No. 6.2 - Nalla and its Channelization

(in meters)

Areas through which it flows	Name of the Nalla	Total Length	Channelized Length
Bibvewadi, Sahakarnagar & Tilak road	Ambil Odha	6435	1200
Kasba, Bhavani & Bibvewadi	Nagzari Nalla	7325	1850
--	Manik Nalla	1050	450
Bibvewadi	Bibvewadi Nalla	2495	620
Padmavati	Padmavati Nalla	600	60
--	Nerlekar Hospital Nalla	250	--
Bibvewadi, Wanori, Divyanagar	Bhairobha Nalla	11900	1900
Fatimanagar & Wanori	Fatimanagar Wanori Nalla	2000	--
--	Gadge Maharaj to Mutha river nalla	1350	1030
--	Koregaon Park Plot no.332	150	--
--	Mhatre Bdg. to Alankar chowk	2500	80
--	Alankar chowk to Naik Bdg.	1800	--
--	Naik Bdg. to Mahatma Soc.	2500	500
--	Naik Bdg. to Bhusari Clny.	300	400
--	Paud road More Vidyalya	750	250
--	Archana Soc. Pratik nagar	1200	700
Total		42605	9040

There are mainly five discharge points in the city carrying about 265 MLD of untreated sewage in the Mutha riverine system. Their details are as given in right side table.

Table : Discharge Points.

Name of the Nalla	Discharge in MLD
Ambil Odha	90
Nagzari Nalla	80
Bhairoba Nalla	30
Tanajiwadi	15
Kothrud Nalla	50

There are four sewage pumping stations in operation as under.

Table No. 6.3 - Details of Pumping Stations in the City.

Location	Capacity (quantum of incoming flow)	Area and Population served
Kasba Pumping Station	90 MLD	Shanivar Peth, Navi Peth, Sadashiv Peth, Bibvewadi, Parvati, Katraj & Dhankawadi with a population of about 6,50,000
Mangalwar Pumping Station	--	Somwar Peth, Rasta Peth, Mangalwar Peth and surrounding low lying area. (at present not in working condition)
Tanajiwadi Pumping Station	--	Mula road, Gokhale Nagar, Agriculture College, Patil Estate, Shivajinagar Rly. Stn. (at present not in working condition)
Bhairoba Pumping Station	32.3 MLD	Rasta Peth (partly), Bhavani Peth, Gurwar Peth, Bibvewadi (partly) Marketyard, Mukundnagar, Pune station (surrounding area), Meera Society, Swargate & Koregaon Park with a population of about 7,40,568



Two sewage treatment plants (STP) presently in operation in the city are-

1. Dr. Naidu STP :

The sewage pumped at Kasba pumping station is conveyed for treatment. The total capacity of the treatment plant is 90 MLD of which almost entire is utilised. The sewage generated in Shaniwar Peth, Navi Peth, Sadashiv Peth, Bibvewadi, Parvati, Katraj and Dhankawadi with a population of about 6,50,000 is treated using conventional sewage treatment with activated sludge process.



Revived Waste Water Treatment Plant at Dr. Naidu Hospital

2. Bhairoba STP:

The sewage pumped at Bhairoba pumping station is conveyed for treatment. The total capacity of the treatment plant is 32.3 MLD and about 30 MLD of sewage is treated by primary treatment. The sewage generated in Rasta Peth (partly), Bhavani Peth, Gurwar Peth, Bibvewadi (partly) Market Yard, Mukund Nagar, Pune Station (surrounding area), Meera Society, Swargate and Koregaon Park with a population of about 7,40,568 is carried to this plant.



Reading for commissioning by January 2003



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The composition of the sewage generated in the city is as follows:

Table No. 6.4 - Composition of the sewage before and after treatment:

	Pre-treatment (mg/l)	Post treatment (mg/l)
BOD at 20°C	250	< 20
COD	350	< 30
Suspended solids	300	< 30
Oil and grease	30	< 10
Residual Cl	--	< 1

The above statistics however pertain only to part of the sewage generated in the city. Large number of housing schemes in the outer area still depend on the on site sanitation in the form of septic tanks. The effluents in the nallas and rivers are affecting the ecological balance of the city. Urgent measures were required to build the sewage treatment plants and discharge treated effluents into the river and restore ecosystem. Accordingly, massive program to augment the sewage treatment capacity of the Pune Municipal Corporation is launched as under.

Table No. 6.5 - Sewerage Project.

Name of the STP	Area covered in Km ²	Population Benefited and Sewage Generation					
		Year 2005	MLD	Year 2015	MLD	Year 2025	MLD
Bhairoba + Kalyani Nagar	81.20	962800	130	1340239	175	1754387	200
Bopodi	15.00	125515	18	164234	18	210930	23
Erandawane	26.15	346002	50	505002	70	732034	100
Tophakhana	3.77	71610	8	85903	8	103017	24
Tanajiwadi	9.35	132141	17	152911	20	177189	24
Vitthalwadi	48.00	137015	20	223979	30	368338	60
Total	183.47	1775083	243	2472268	321	3345895	431



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As on date over 50% of the construction work of Bhairoba Nalla Sewerage Treatment Plant (largest in India) and Bopodi Sewerage Treatment Plant is completed and both will be commissioned by January 2003. About 40% civil work of Erandwane Sewerage Treatment Plant and 60% that of Tanajiwadi Sewerage Treatment Plant is completed and the plants will be commissioned by March, 2003 and October 2002 respectively. In the newly merged villages 545 km length of sewage collection systems is planned; of which 80 km has been already laid while another 163 kms will be laid in the coming year.

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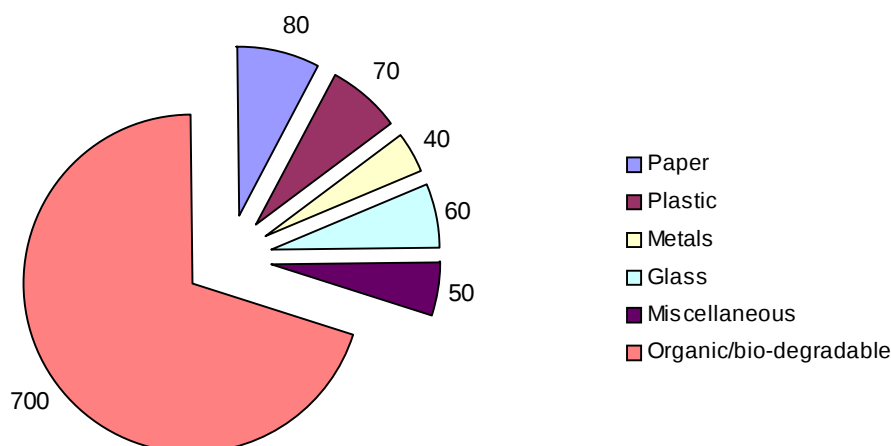


Chapter -7

Solid Waste Management and other Municipal Services

*S*olid waste management includes all activities that seek to minimise the health, environmental and aesthetic impacts of solid wastes. There are different types of solid waste depending on their source. On an average about 1000 metric tons of solid waste is generated daily in Pune City, which amounts to about 400 to 500 gm of solid waste per day/per capita. The waste generated is of mixed in nature. It contains both dry and wet waste. The classification of the solid waste is as follows:

Total Solid Waste generated in Pune City (Metric Tons/day)



The PMC is responsible for providing necessary infrastructure for collection, storage, segregation, transportation, processing and disposal of municipal solid waste. The cost of solid waste handling is Rs. 1500 per ton. The solid waste generated in the city is collected by following methods:

Table No. 7.1: Types of containers/bins

Type	Nos.
Compactor bucket 3.8 m ³	1347
Compactor bucket 2.2 m ³	160
Compactor bucket 1.1 m ³	320
Garbage bins including cement concrete	570
Barrel	160
Heaps of garbage	300
Total	2857



The highest solid waste generated in a ward area is 75 to 80 metric tons in Yerawada while the lowest quantum of 40 to 45 metric tons has been reported in Aundh and Dhole Patil Road ward areas in 2001-02. Bibviewadi, Sahakarnagar, Tilak road and Hadapsar ward areas generate 60 to 65 metric tons solid waste where as Bhavani Peth, Ghole Road and Karve Road are a bit higher at 70 to 75 metric tons respectively. Vishrambaugh Wada area generated 55 to 60 metric tones and Kasba 50 to 55 metric tons of solid waste.

Collection and lifting arrangement of solid waste is commensurate with the frequency of filling. Hence the schedule of lifting the solid waste from collection points has been accordingly fixed. Solid waste collected at 246 points is lifted every day while at 377 points it is lifted on alternate days. Also 426 collection points are cleared after every three days while 363 have a weekly duration.

In an effort to make the transportation of solid waste optimal and hygienic, the PMC has setup five mini ramps at strategic locations in the city at Ghole Road, Karve Road, Aundh, Yerawada and Dhole Patil Road, while the construction of mini ramp at Katraj is in progress. The solid waste from each collection point is brought to the mini ramps through dumper placers and other modes of transportation and it is then carried to the Hadapsar transfer station through bulk refuse carriers. Apart from this, the solid waste from the nine ward offices is directly carried by dumper placers which are emptied at the Hadapsar transfer station in the bulk refuse carriers. The heaps of garbage are lifted manually through tippers and are carried to the landfill site. The solid waste is then transferred to the landfill site at Uruli Devachi through bulk refuse carriers. Efforts must, however, be made to maintain hygiene in the transfer of waste to mini transfer stations.

The transportation of the solid waste is carried out in three shifts. The fleet of vehicles used for the transportation of solid waste to the landfill site is as follows:

Table No. 7.2: Vehicles used for transportation of solid waste

Type of Vehicle	Nos.
Dumper Placers	80
Tippers	47
Bulk refuse carries	40
Mobile compactors	08
Static compactors	02

Three JCB machines, two bulldozers and one poclain are also used in this operation. Two water tankers and two fighter engines are pressed into service as and when necessary. Around 250 to 275 metric tons of solid waste is segregated by about 5000 organized rag-pickers spread all over the city out of which 3900 are given identity cards by PMC. About 125 rag pickers again segregate dry recyclable waste at the landfill site amounting to about 60 to 80 metric tons per day. Segregation of the solid waste is being made mandatory by PMC at the household level and also at the institutional level such as hotels, inns, clubs, resorts, big housing complexes etc.



PMC is also embarking on setting up mini biogas plants at mini transfer stations wherein the generated biodegradable waste can be recycled and disposed of at the generation point itself. Methane gas generated thereby can be utilized in nearby communities, institutions and commercial establishments. This will be preferably taken on BOO basis. As per the Ministry of Environment and Forest notification, part II-section-3 dated September 2, 1999, the PMC is proposing to ban plastic of thickness less than 20-25 μ on a big scale. This will be undertaken jointly by PCMC, KCB and PCB since the main manufacturing units of such plastic material are situated in PCMC, KCB and PCB.

Twelve new compactors along with 1200 compactor buckets will be purchased for disposing of the garbage more speedily and mechanically. This in turn will reduce manual handling of garbage. As a result PMC can achieve a higher mechanization target of about 90% than the existing 70% level.



Transfer of waste from Compactor to Bulk Refuse Carrier at Hadapsar Ramp



Waste at Uruli Devachi agitated with EM Technology

The present Uruli Devachi landfill site is located to the east of Pune city near Phursungi Railway Station. The total area of the landfill site is about 1,85,000sq.m. of which only 18325 sq. m. is used for the disposal of solid waste. The PMC has planted 1200 trees around the site and more plantations and landscaping is being carried out on bigger scale. The construction of the boundary wall is in progress. So far, 1000 running meters of boundary wall facing the village has been completed whilst the remaining construction work is in progress. The road leading to landfill site has been constructed and the inner inter-connecting roadwork is in progress. Six HDPE water tanks of 6,000 liters capacity are set up to make 36,000 liters of water available for fire fighting. The water tanks have been fitted with water pumps with the capacity of 7.5 H.P. The civil construction work of carcass utilization plant has been completed. Mechanical and electrical works are nearing completion and the fully equipped plant is due for commissioning by July 2002.

Composting of mixed garbage (biodegradable) at the landfill is being carried out using E. M. (Effective Micro-organism) Technology. The E.M. solution when mixed with molasses and fermented acts as a catalyst for biological disintegration of solid waste into compost. About 450 to 500 metric tons of garbage is treated per day with this process. Foul odour and flies menace is totally eradicated with immediate effect. There is no leachate problem any more. The compost generated is of high bio-fertilizer value and is very productive for agriculture and farming.



Problems of auto-combustion are prevented. It is expected that the present landfill site at Uruli Devachi shall last for 25 years. Efforts are also on to identify another waste disposal site somewhere in southern part of the city to reduce the burden on the existing landfill site and also to facilitate optimal collection and disposal costs.

h **Slaughter House and Carcass Utilisation Plant:**



Carcass Utilisation Plant ready for commissioning

The Pune Municipal Corporation has initiated the construction of the modern slaughter plant at Kondhwa with 50% finance from the Central Government. Over 60% of its work has been completed. The slaughterhouse will cater to 100 large animals and 350 small animals with a supporting effluent

treatment plant at the site.

The construction of slaughterhouses at three other places in the city viz. Nana Peth, Kasba Peth, Ganesh Peth is nearing completion whereas the one at Guruwar Peth has been started. Also, a modular slaughterhouse at Bopodi Mutton Market is proposed.

A carcass utilisation plant with nearly 100% grant in aid from Government of India for the disposal of dead animals and the remains of the animals from the slaughterhouses in the city is being constructed at the Uruli Devachi Landfill site. The plant will be operational by the end July 2002, at the cost of approximately Rs. 1.9 crore with a daily capacity of 10 large animals. Also, the dead stray dogs will be disposed of during the other shifts.

h **Vermiculture:**

The biodegradable garbage, such as kitchen waste, leaves of trees etc is used for vermiculture. Reduction of waste at source by separation must be encouraged to minimise hazards from waste collection, conveyance and disposal. Around 705 housing societies, institutions and hospitals in the city are presently involved in this project and are producing compost from wet garbage. The Pune Municipal Corporation has appointed technical advisors, Mr. A. L. Saraswate and Mr. N. P. Pulavale for this project, who guide the citizens in undertaking and implementing this project.



h **Bio-Medical Waste:**



Incineration Plant for bio-waste

The Pune Municipal Corporation has commissioned an incinerator for disposal of hospital waste generated from the PMC hospitals in 1997. Two more incinerators are set up by PMC to dispose of the hospital waste from the private hospitals on pay and use basis in the premises of Kailas crematorium. The bio-medical waste thus

generated is presently collected by Image India appointed by the Pune Municipal Corporation and is subsequently incinerated. The central incineration facility set up by Pune Municipal Corporation with the collection and disposal of bio-medical waste by Image India has been started in December 2000 and is working well with 80 collection points across the city in two collecting vans. Currently, 535 nursing homes with a bed capacity of 6834 (422 are hospitals with a bed capacity of 5852), along with 12 pathological laboratories and 6 blood banks are registered with PMC under the pay and use scheme for incineration of bio-medical hazardous waste. In addition, 5 private hospitals have the exclusive facility for disposing the bio-medical waste by incineration. The total bio-medical waste generated in the city is around 510 kg/day. The private hospitals are charged Rs. 20/kg against collection and disposal of the bio-medical waste. The pathology laboratories are charged Rs. 300/- per month and blood banks Rs. 1000 per month.

h **Health Facilities:**

Currently a general hospital namely Kamla Nehru hospital and an infectious disease hospital are maintained by the Pune Municipal Corporation. The Pune Municipal Corporation also runs 28 dispensaries and 15 maternity homes and eight other setups that include- a family welfare center, a vaccination center, skin-VD clinic, a laboratory, a polyclinic, an X-ray center and a medical store. A large private health setup, however, also exists in the city and includes 503 hospitals registered under Bombay Nursing Homes Reg. Act 1949. The health facilities in the newly added areas are inadequate and need improvement in quality and quantity. The numbers of patients suffering from various diseases in the city are as follows.



Table No. 7.3: Patients suffering from various diseases.

Diseases	1999	2000	2001
Gastroenteritis	1585	2247	1017
Cholera	18	78	15
Jaundice	77	75	64
Typhoid	31	42	17
Polio	0	0	0
Diphtheria	10	6	4
Whooping Cough	0	2	0
Tetanus	17	23	5

From the table it is quite clear that the number of all types of diseases in the city has drastically reduced in 2001-02. There is considerable reduction in the number of patients suffering from gastroenteritis as compared to the previous years. Due to the construction of toilet blocks, open defecation in the slums has been reduced. Also, 100% vaccination against vaccine preventable diseases is achieved. The channelisation and beautification of nallas has resulted into streamlining wastewater flow. Similarly effective management in conservancy and sanitation undertaken by the PMC partly led to reduction in the number of patients suffering from communicable diseases by 54.63% in the 2000-01.

Table 7.4 - Total number of Births and Deaths during the last five years.

Year	Birth			Death			Still Birth		
	M	F	T	M	F	T	M	F	T
1997	25310	20864	46174	10000	6825	16825	587	501	1088
1998	24561	12501	37062	12153	8332	20485	562	460	1022
1999	23652	29138	52790	12143	8032	20175	494	408	902
2000	24785	22034	46819	12673	8314	20987	695	556	1251
2001	23837	20419	44256	12444	8065	20509	715	587	1302

Table 7.5 - Total Infant Deaths during the last five years.

Year	Infant deaths (0 to 1 yr.)			Deaths (1 to 3 yr.)		
	M	F	T	M	F	T
1997	949	680	1629	104	89	193
1998	998	696	1694	229	230	459
1999	795	579	1374	222	219	441
2000	856	611	1467	157	229	386
2001	820	605	1425	100	101	201



Table No. 7.6 - Number of deaths and their causes during the referral year.

CAUSES OF DEATH	MALE	FEMALE	TOTAL
1. Typhoid	1	2	3
2. Enteritis and other diarrhea diseases	64	41	105
3. Tuberculosis of respiratory system	593	197	790
4. Tuberculosis of meninges & central nervous system	48	25	73
5. Leprosy	8	2	10
6. Diphtheria	0	1	1
7. Tetanus	3	2	5
8. Other bacterial diseases	723	503	1226
9. Infectious hepatitis	8	2	10
10. Other viral diseases	16	9	25
11. Malignant neoplasm of oesophagus	27	20	47
12. Malignant neoplasm of stomach	16	17	33
13. Malignant neoplasm of breast	1	79	80
14. Other Malignant neoplasm of uterus	0	1	1
15. Malignant neoplasm of other & unspecified sites	201	232	433
16. Leukemia	31	17	48
17. Diabetes mellitus	173	124	297
18. Avitaminoses and other nutritional deficiency	31	19	50
19. Anaemias	86	103	189
20. Meningitis	57	23	80
21. Epilepsy	18	10	28
22. Other diseases of nervous system & sense organs	148	85	233
23. Chronic rheumatic heart disease	46	43	89
24. Hypertensive disease	364	264	628
25. Ischaemic heart disease	1203	670	1873
26. Other forms of heart disease	163	168	331
27. Other pneumonia	416	251	667
28. Bronchitis emphysema and asthma	83	56	139
29. Other diseases of respiratory system	68	44	112
30. Cirrhosis of liver	337	59	396
31. Other disease of digestive system	10	3	13
32. Other disease of genitourinary system	287	188	475
33. Delivery without mention of complication	0	13	13
34. Other causes of perinatal morbidity and mortality	302	221	523
35. Senility without mention of psychosis	374	455	829
36. Symptoms and other ill-defined conditions 'E' code alternative Classification of Accidents, poisonings and Violence (External Cause)	5073	3270	8343
37. Accidents caused by fires	240	512	752
38. Accidental drowning and submersion	61	28	89
39. Accident cause by firearm missiles	1	0	1
40. All other accidents	758	131	889
41. Suicide and self-inflicted injury	28	7	35
42. Injury undetermined whether accidentally or purposely inflicted	113	27	140
43. AIDS – H. I. V.	15	5	20
44. Burn	239	512	751
45. All other & unspecified effects of external causes	963	193	1156
	13397	8634	22031



The PMC has undertaken various activities under National AIDS Control Programme. Presently, a STD clinic is run by the PMC at Gadikhana for the last 25 years rendering services to the patients of STDs and other diseases. A free clinic for commercial sex workers has also been started. Taking into consideration the prevalence of STDs and HIV transmission, a special intervention activity through Pune City Aids Control Society is also undertaken by the Pune Municipal Corporation with the financial assistance from Maharashtra State Aids Control Society for 100% condom use amongst the commercial sex workers covering entire area. The 46 condom vending machines have been installed for promoting users for social marketing. On an average 40,000 condoms are sold through the machines every month. These machines are installed at different public places like Pune Municipal Transport bus stops, pan shops, STD booths, Sulabh Shauchalaya and the Red Light areas. The Pune Municipal Corporation is planning to install more machines at different places with the help of NGOs and private industrial houses. A project to study the prevalence of Mother to Child transmission of HIV infection with the help of NARI and Indo-French collaboration is also underway.

Under the National Health Program the Pune Municipal Corporation has initiated the following programs:

h National Family Welfare Program,	h National Vaccination Program,
h National TB Eradication Program,	h National AIDS Control Program,
h National Blindness Control Program,	h National Malaria Eradication Program,
h National Leprosy Eradication Program.	

The PMC awaits eagerly the directive of the State government for banning use of gutkha as decided in the meeting of the state cabinet recently. The drive against gutkha is expected to be launched from 01.08.2002, and the PMC will ensure that it proves to be a great success in our city. The PMC has already initiated necessary mobilization in that direction.

h Nuisance Detection -

Pune Municipal Corporation is undertaking a special cleanliness drive since 1999 with its enforcement through the nuisance detection (ND) squad. A total of 52 retired personnel from police, army, navy, airforce, home guards have been recruited in the ND squad on contract basis. The teams, each consisting of 3 personnel, have been assigned to each ward office to implement the drive. The ND squad members have been penalising the erring citizens causing nuisance like throwing garbage on the road, spitting or passing urine on the road etc. The Government of Maharashtra has banned use of plastic carry bags below the thickness of 20µ and the sale of guthka and tobacco within the 100 meters periphery of the Government and semi Government offices and educational institutions. The members of ND squad of the Pune Municipal Corporation have effectively regulated the ban as existed earlier and would do so in respect of the total ban as per the latest decision of the State government. These members have been authorised to recover the administrative charges from the erring citizens on the spot under sections 3(a) 4 & section 376 of BPMC Act, 1949. Accordingly ND squad has so far



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collected the administrative charges of Rs.1,95,53,009 by penalising about two lakh citizens since its inception.

Table No. 7.7: Action Against Defaulter Creating Nuisance:

Sr. No.	Details of Cases	Total No. of cases	Amount collected as administrative charges
1.	Keeping the building material on the road	5,035	20,33,745
2.	Spitting on the road	40,590	7,20,057
3.	Passing Urine on the road	22,364	3,74,470
4.	Throwing Waste material on the road	53,064	32,38,781
5.	Advertisement, Posters and Banners	6,146	35,81,160
6.	Businesses / Shops	11,673	14,17,175
7.	Plastic carry bags below 20 microns	1,070	2,97,461
8.	Guthka and tobacco sales	614	1,28,,370
9.	Lottery ticket sale	265	40,250
10.	Unauthorised parking on roads	699	4,34,170
11.	Waste , Building material dump	77	2,22,190
12.	At Saras baug special drive	58,403	70,65,180
	Total	2,00,000	1,95,53,009

Z Fire Brigade -

At present there are seven fire brigade stations in Pune City, besides the one being proposed at Katraj.

No.	Name of Fire Brigade Station	Location	Telephone No.
Existing Fire Brigade Station			
1	Central Fire Brigade station	Mahatma Phule Peth, Pune42	6351707, 6350601
2	Hadapsar fire brigade station	Hadapsar Industrial estate, Pune	6870207
3	Suburban Fire brigade Station	Near Pune railway station, Pune 1	6122545
4	Yerawada Fire brigade Station	Near PMC Hot Mix Plant, Yerawada, Pune-6	6696400
5	Budhwar Fire brigade Station	Near Budhwar Peth, Faraskhana Police station, Pune	4458950
6	Erandwane Fire brigade Station	9/A, Erandwane , Pune 4	5868373
7	Aundh Fire brigade Station	Bodygate, Aundh, Pune 7	5883098
Proposed Fire Brigade Station			
1	Katraj Fire brigade Station	S. No. 132 , Katraj, Pune 43	



Table No. 7.8: The quantum of fire and rescue calls received in last 5 years is as follows

No.	Year	Fire Calls	Rescue Calls
1.	1996-97	1184	1072
2.	1997-98	1170	894
3.	1998-98	1156	926
4.	1999-2000	1365	821
5.	2000-01	1434	1010

The Pune Municipal Corporation has also decided to purchase additional equipment, The details of which are as follows.

List of Existing Modern Equipment with Fire Brigade Service:

- 1) Breathing apparatus set,
- 2) Chemical and aluminum asbestos suits,
- 3) Various types of Rescue belts,
- 4) Rescue rocket devices,
- 5) Movable light mask,
- 6) Inflammable Lighting tower,
- 7) Hydraulic Platform-To meet any eventuality in the high rise building the fire brigade is equipped with hydraulic platform ladder, which can reach 42 meter height.

Proposed equipment and machinery to be procured during the next year are as follows.

- 1) Thermal imaging camera,
- 2) Try pod.

Z Communication System :

Existing communication system with Fire brigade consists of four incoming lines (101) and a EPBX Exchange. In addition to this all the fire stations and substations and vehicles are connected with Wireless sets. Considering the expansion of PMC limits, a new fire station will be constructed each at Paud garbage depot and Sinhgad road. Efforts are being made to plan the roads in the newly merged villages in such away so as to allow free passage for fire and rescue vans.

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Chapter-8

Pollution

Increasing urban population and growing levels of industrialization have inevitably led to series of environment-related problems, not the least of which is worsening air quality.

K Air Pollution:

Exposure to air pollution is now an almost inescapable part of urban life. Air pollution problems of the megacities differ greatly and are influenced by a number of factors, including topography, demography, meteorology, level and rate of industrialisation, mobility requirements, effective governance and socio-economic development. Petrol-fuelled motor vehicles



Polluting Vehicles need stricter checks

are the principle sources of NO_x, CO and Pb, whereas diesel-fuelled engines emit significant quantities of particulate and SO₂ in addition to NO_x. Air pollution through these pollutants can adversely affect human health, not only by direct inhalation but also indirectly by other exposure routes, such as drinking water contamination, food contamination and skin transfer. Most of the air pollutants directly affect the respiratory and cardiovascular systems. Constant monitoring of air quality parameters is therefore, imperative to prevent the health hazards from air pollution. The PMC's well-equipped Environmental Laboratory keeps constant check on city's environment.

Ambient air quality monitoring is being carried out by the environmental laboratory at two sites in the city namely at Majur Adda (site No.1) and Yashwantrao Chavan Natya Gruha (site No. 2) to monitor following parameters.

• Respirable Particulate Matter (PM ₁₀)	• Oxides of Nitrogen (NO _x)
• Suspended Particulate Matter (SPM)	• Sulphur Dioxide (SO ₂)

The details of the test results are as following:

Table No. 8.1: Ambient air quality monitoring results in Pune city for Oct. 2001 to May 2002

	Site No.1				Site No. 2			
	PM ₁₀	SPM	NO _x	SO ₂	PM ₁₀	SPM	NO _x	SO ₂
Max.	169.42	222.36	96.34	58.72	110.34	--	74.29	49.51
Min	103.47	137.79	50.27	20.19	55.16	--	29.33	19.67
Avg.	132.32	173.05	78.94	40.48	83.57	--	49.68	30.21

** All the values are in µg/m³



The analysis reveals that the concentration of PM₁₀ at site No.1 reached a maximum (169.42 µg/m³) in February with a minimum (103.47 µg/m³) in the



month of April, while at site no.2 it varied between 55.16 µg/m³ to 110.34 µg/m³ in the months of January and February respectively. The maximum concentration of SPM at site no.1 is 222.36 µg/m³ (December) which reduced to 137.79 µg/m³ in the month of April. The magnitude of NO_x is found to be varying between 50.27 µg/m³ (May) to 96.34 µg/m³ (February) at site

Ambient Air Quality Monitoring: More are required

No. 1 while site No. 2 recorded a maximum of 74.29 µg/m³ in December with a minimum of 29.33 µg/m³ in May. While the SO₂ concentration is found to be varying between 20.19 µg/m³ (May) to 58.72 µg/m³ (February) at site No.1 while site No. 2 recorded a maximum of 49.51 µg/m³ (February) and a minimum of 19.67 µg/m³ (May).

Table No. 8.2: National Ambient Air Quality Standards:¹

Pollutants	Time Weighted Average	Concentration in Ambient Air		
		Industrial Area	Residential Area	Commercial Area
Sulfur Dioxide (SO ₂)	Annual Average 24 hours	80 µg/m ³ 120 µg/m ³	60 µg/m ³ 80 µg/m ³	15 µg/m ³ 30 µg/m ³
Oxides of Nitrogen (NO ₂)	Annual Average 24 hours	80 µg/m ³ 120 µg/m ³	60 µg/m ³ 80 µg/m ³	15 µg/m ³ 30 µg/m ³
Suspended Particulate Matter (SPM)	Annual Average 24 hours	360 µg/m ³ 500 µg/m ³	140 µg/m ³ 200 µg/m ³	70 µg/m ³ 100 µg/m ³
Respirable Particulate Matter (RPM), (size<10µm)	Annual Average 24 hours	120 µg/m ³ 150 µg/m ³	60 µg/m ³ 100 µg/m ³	50 µg/m ³ 75 µg/m ³
Lead (Pb)	Annual Average 24 hours	1.0 µg/m ³ 1.5 µg/m ³	0.75 µg/m ³ 1.00 µg/m ³	0.50 µg/m ³ 0.75 µg/m ³
Carbon Monoxide (CO)	8 hours 1 hours	5.0 mg/m ³ 10.0 mg/m ³	2.0 mg/m ³ 4.0 mg/m ³	1.0 mg/m ³ 2.0 mg/m ³

¹ Standards for Liquid Effluents, Gaseous Emissions, Automobile Exhaust, Noise and Ambient Air Quality, Central Pollution Control Board, June 1997



The analysis further reveals that the concentration of PM₁₀ is above the permissible limit (100µg/m³) at site No.1 while it remained well below the limit at site No. 2 with an exception in the month of February 2002. The concentration of SPM is found to be above the permissible limit (200µg/m³) only in the winter months. Besides, rise in the concentration in SPM does not necessarily occur due to vehicular pollution alone. The untidy conditions on roads with debris and lack of vegetation along their alignments also contribute to the pollution. The problem becomes severe in the congested area where the reconstruction schemes attract building materials and the debris right on the carriageways due to shortage of adequate space. Increased construction activity in the city has had an overall impact on SPM levels in the city. Road digging carried out for laying cables of emerging technologies such as optical fibre cable networking has further compounded the problem. On this backdrop, measures such as revoking the building permissions were taken in case the developers are caught dumping their debris on open plots in the city. The concentration of NO_x at site No.1 is found to be above the permissible limit (80µg/m³) in winter months while it remained well below the limit at site No. 2. The concentration of SO₂ at both the sites is found to be well below the permissible limit (80µg/m³).

The higher levels of PM₁₀, SPM and NO_x at site No.1 may be attributed to the high density of vehicles (Particularly 2-Wheelers) near the site leading to frequent traffic congestion. Apart from the emission factor of vehicles, the particulate matter (PM₁₀ and SPM) concentration on the street level may be mainly affected by mechanical turbulence created by the moving vehicles and wind, and the thermal turbulence produced by the hot vehicle exhaust.

In addition to the PMC, the MPCB have also carried out ambient air quality checks at a place near Wakadewadi in the city as following.

Table No. 8.3: Ambient Air Monitoring at Jog Centre, Wakadewadi

Date	SO ₂ (µg/m ³)	NO _x (µg/m ³)	SPM (µg/m ³)
05.01.2002	15.62	32.55	218.80
18.01.2002	29.15	49.95	450.20
31.01.2002	25.00	25.80	173.10
14.02.2002	20.75	23.35	923.10
26.02.2002	22.25	38.35	222.90
05.03.2002	17.90	41.65	978.30
12.04.2002	30.15	44.75	149.70
03.05.2002	38.95	41.25	366.60
Avg.	24.97	37.21	435.34

Source: Maharashtra Pollution Control Board, Pune.

The table indicates that the average levels of SO₂ and NO_x are well below the permissible limits while the levels of SPM are much more than the prescribed limits. The higher levels of SPM at this site may be partly attributed to the heavy vehicular traffic on the National Highway No. 4(Pune-Mumbai).

Ambient Air Quality Index (AQI):

0-25	:	Good	26-50	:	Fair
51-75	:	Moderate	76-100	:	Unsatisfactory
Above 100	:	Harmful			



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The AQI provides information on pollutant concentration for Oxides of Nitrogen (NO_x), Sulphur Dioxide (SO_2), Respirable Particulate Matter (PM_{10}) and Suspended Particulate Matter (SPM). AQI values for each of the pollutants are derived from concentrations of the respective pollutant. The higher the Index value, the greater is the level of air pollution and health risk. The AQI at Majur Adda, Yashwantrao Chavan Natya Gruha are presented below. Higher index levels of PM_{10} trigger health warnings.

Table No. 8.4: Monthly Ambient Air Quality Index at Majur Adda

Month	PM_{10}	SPM	NO_x	SO_2
November	128	100	106	57
December	153	102	103	56
January	136	86	92	42
February	156	93	114	67
March	119	78	107	53
April	111	71	91	44
May	115	75	76	34
Average	131	87	98	50

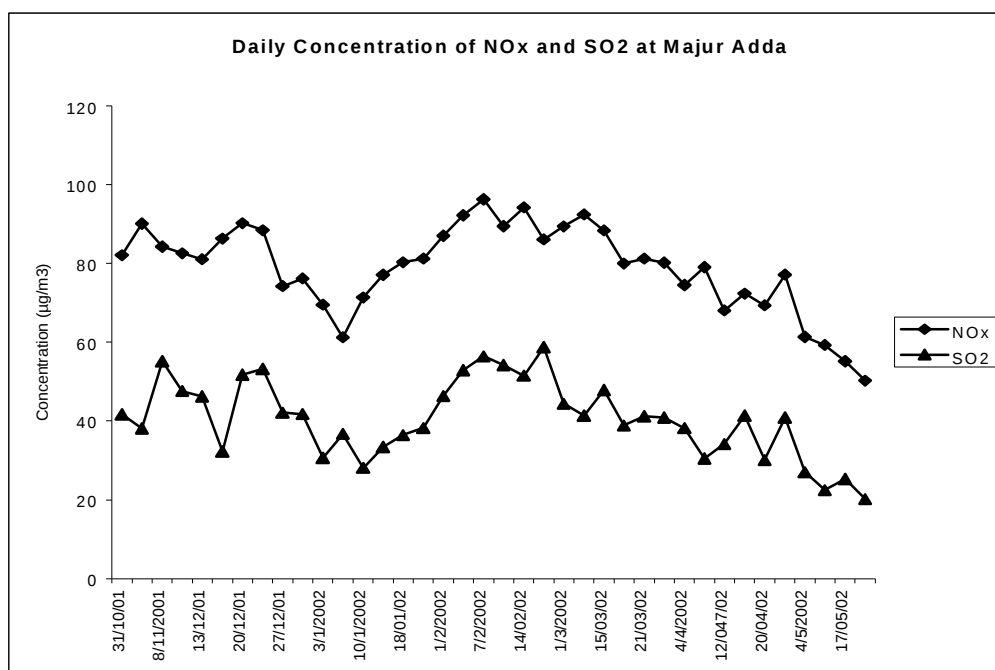


Table No. 8.5: Monthly Ambient Air Quality Index at Yashwantrao Chavan Natya Gruha

Month	PM_{10}	NO_x	SO_2
December	86	89	34
January	71	64	34
February	100	69	52
March	90	59	37
April	78	50	36
May	75	44	31
Average	83	62	37



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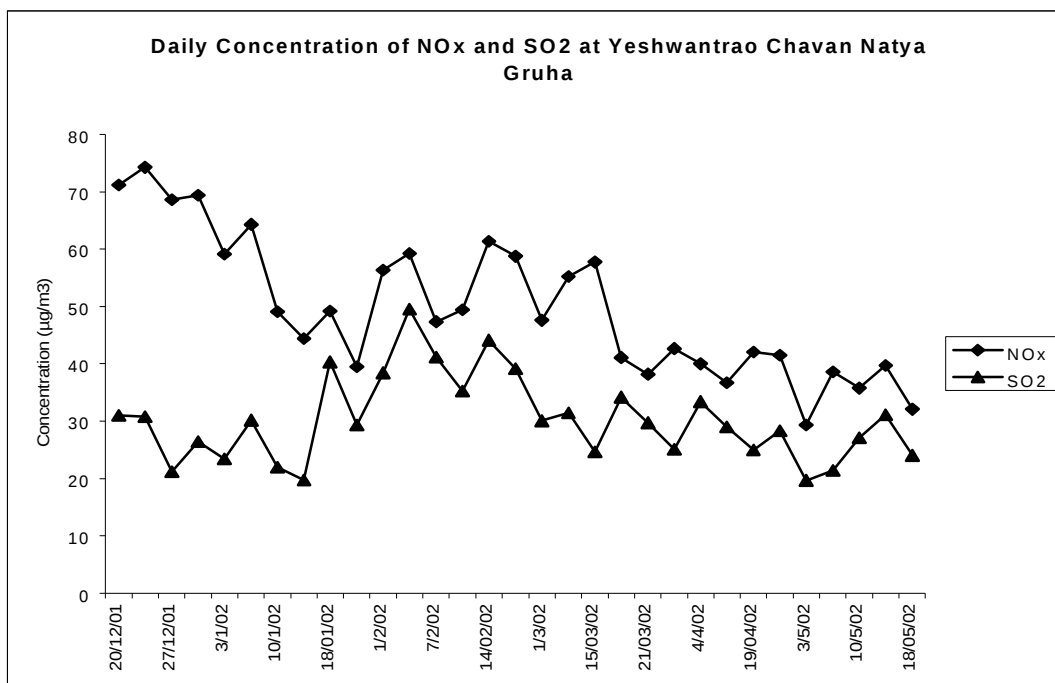


Table No. 8.6: Estimated daily emissions in Pune city (tonnes/day)

Vehicle Type	No. of Vehicles	CO	NO _x	SO ₂	HC	TSP	PM ₁₀	Total
Cars	71771	20.2	2.32	0.034	3.8	0.3	0.2	26.854
2 Wheelers	560359	36.1	0.3	0.058	19.2	0.9	0.7	57.258
Rickshaws	30785	28	0.75	0.036	18.4	0.9	0.7	48.786
Taxis	1633	2.7	0.25	0.002	0.5	0.03	0.02	3.502
Buses	6602	9.2	9.72	0.903	1.8	1.42	1.11	24.153
Trucks	10367	7.5	9.51	0.724	1.2	1.38	1.09	21.404
Total	681517	103.7	22.85	1.757	44.9	4.93	3.82	181.957

Source: C.Ravikumar and S.Ramkrishna, Transport and Environment Simulation for Bangalore, Pune and Hyderabad. Paper presented in workshop conducted by Harvard University, CIRT, Pune, Dec. 2001

Table No. 8.7: Vehicle emissions prescribed under Central Motor Vehicle Rule No. 115(2)

Type of Vehicle	Carbon Monoxide (CO)
Petrol driven 2 and 3 wheelers	< 4.5 % by volume
Petrol driven 4 wheelers	< 3.0 % by volume
Diesel vehicles	Maximum smoke density 65 Hartridge unit

Table No. 8.8: Number of PUC centers

	Pune City	Pune Rural	Pimpri-Chinchwad City	Pimpri-Chinchwad Rural
Petrol	89	06	27	02
Diesel	13	--	09	--
Petrol and Diesel	52	03	13	01
Total	154	09	49	03



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% contribution to automobile pollution by vehicle categories in Pune City

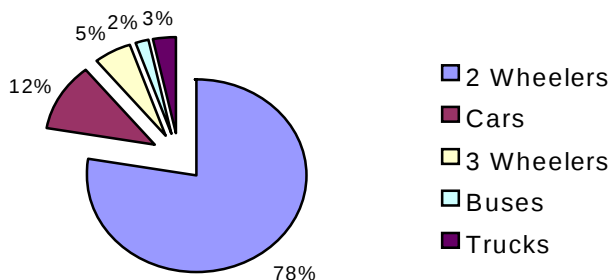


Table No. 8.9: Duration of PUC certificate depending on the vehicle emission.

Period	Petrol driven 2&3 wheelers (CO, % by volume)	Petrol driven 4 wheelers (CO, % by volume)	Diesel vehicles
6 months	< 3.0	< 1.5	50
4 months	3.0 to 4.0	1.5 to 2.5	50 to 60
2 months	4.0 to 4.5	2.5 to 3.0	60 to 65

Table No. 8.10: Number of instruments with the RTO for checking vehicle emissions.

Office	Petrol	Diesel
Pune RTO	3	3
Pimpri-Chinchwad	2	2

As stated in the local newspapers on 11.07.2002, the Regional Transport Authority (RTA) has banned registration of all new diesel public vehicles including six-seaters, all models of diesel three-seater rickshaws and passenger jeeps in Pune and Solapur districts. It is noteworthy that the Pune Municipal Corporation administration had been persistently advocating such a move to be introduced in Pune city through all forums. The RTO will also disallow transfer of existing transport permits of diesel vehicles to gradually extinguish their presence from the city roads. The report further adds that the LPG would soon be introduced in the city particularly for PMT and PCMT to curb the pollution levels. The PMC shall endeavour to modify the fleet of PMT to make it compatible with environmentally friendly fuels. Similar exercise will have to be undertaken to phase out automobiles with two stroke engines with their replacement by four stroke engines.

Water Pollution:

The quality of water is of vital concern for a buoyant community since it is directly linked with its welfare. Water is used for many development purposes and any loss of beneficial use due to pollution amounts to economic as well as



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ecological and human health damage. The main sources of wastewater polluting the city's water sources are:



Merely Chanelisation will not help



River water pollution: Much above permissible limit

- Discharge of waste water into the natural drainage system of the city
- Runoff from deforested areas: soils, Hill Tops and Hill Slopes are continued to be encroached e.g. Parvati Janata Wasahat, or Warje Ramnagar areas
- Pollution in Khadakwasla lake due to gasoline and oils by washing vehicles, litter, organic debris due to indiscriminate use of surrounding area for picnics
- Discharge of sewage in Pashan and Katraj lakes
- Sewage effluent mixing with water due to their proximity with each other
- Industrial waste water from PCMC MIDC area through Pavana river and also from few industries along the right bank of Mutha
- Subsurface waste disposals through leaking septic tanks in the outer area where off site sanitation mechanism does not exist
- Un-authorized use of Mutha Right Bank Canal for washing and disposal purposes
- Existence of slums in the vicinity of the major reservoirs of the city
- Unmanned and neglected open wells in the outer areas

The environmental laboratory is engaged in collecting and testing river water samples periodically. The test report at four places in the city-Vitthalwadi, Garware Bridge, Sangam Bridge and Bund Garden is as following.

Table No. 8.11: Water pollution monitoring at various sites in the city.

Date	Site	pH	Turbidity (NTU)	Conductivity (µS)	D.O. (mg/l)	Hardness (mg/l)	Calcium (mg/l)	Magnesium (mg/l)	Chlorides (mg/l)
9/10/01	VI	7.35	10	574	1.9	216	57.71	158.29	45.44
	GA	7.30	29	534	0.9	232	54.50	177.5	42.6
	SA	7.41	79	536	0.0	216	56.11	159.89	45.44
	BU	7.44	11	543	2.1	228	60.92	167.08	34.08
24/10/1	VI	7.39	12	590	1.7	220	61.03	158.97	52.71
	GA	7.21	34	560	1.2	251	50.09	200.91	38.4
	SA	7.42	74	530	0.0	228	61.06	166.94	56.52
	BU	7.51	14	550	2.4	216	47.36	168.69	41.24
7/11/01	VI	7.32	13	584	1.5	210	49.55	160.45	50.47
	GA	7.22	33	574	1.1	243	59.22	183.78	44.28
	SA	7.39	77	540	0.0	222	64.29	157.71	61.03
	BU	7.59	16	551	2.6	230	57.01	172.99	47.32
28/11/1	VI	7.2	12.3	715	1.9	196	36.3	159.7	62.8
	GA	7.4	13.3	517	1.6	204	46	158	62



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	SA	7.5	34	483	0.0	158	46	112	62.8
	BU	7.6	35	434	2.8	186	52	134	57.01
6/12/01	VI	7.1	11.9	695	1.6	222	30.9	191.1	59.4
	GA	7.3	12.2	502	1.3	217	39	178	61.0
	SA	7.5	52	398	0.0	197	41	156	60.3
	BU	7.4	38	442	2.7	172	50	122	51.7
19/12/1	VI	7.33	10.7	413	--	158	44.88	113.2	32.66
	GA	7.38	13.1	434	--	148	33.66	114.33	32.66
	SA	7.23	63	521	--	128	35.27	92.72	48.28
	BU	7.14	42	500	--	140	41.68	98.31	52.54
26/12/1	VI	7.21	12.6	510	--	162	46.33	115.77	30.21
	GA	7.31	14.2	404	--	149	41.22	107.78	29.22
	SA	7.21	70	474	--	192	31.33	160.67	46.33
	BU	7.22	40	491	--	136	35.21	100.79	61.22
9/01/02	VI	7.23	13.6	570	--	198	37.39	160.61	50.33
	GA	7.01	23	498	--	229	49.64	179.36	54.21
	SA	7.51	63	521	--	205	59.34	145.66	55.39
	BU	7.34	54	501	--	138	39.41	98.59	50.03
23/1/02	VI	8.3	16.3	561	--	210	40.09	169.91	43.97
	GA	8.1	40	531	--	218	42.36	175.64	39.77
	SA	8.2	65	498	--	211	61.78	149.22	61.02
	BU	7.5	48	578	--	194	44.31	149.69	63.47
06/2/02	VI	7.62	14	492	--	200	52.01	147.99	36.92
	GA	7.28	31	563	--	180	44.88	135.12	45.44
	SA	7.20	29	609	--	168	42.48	115.52	61.06
	BU	7.24	22	338	--	158	38.47	119.53	42.6
20/2/02	VI	7.51	13.3	503	--	174	49.37	124.63	44.52
	GA	7.08	41	551	--	178	39.27	138.73	51.63
	SA	7.29	52	581	--	177	38.92	138.08	69.21
	BU	7.14	35	429	--	149	36.23	112.77	51.33
6/03/02	VI	7.08	23.0	491	--	184	51.61	132.99	46.93
	GA	7.10	51	601	--	184	41.33	142.67	49.71
	SA	7.25	58	610	--	178	44.82	133.18	77.38
20/3/02	VI	7.39	19.7	457	--	162	42.18	119.82	51.48
	GA	7.18	58	498	--	165	31.09	133.91	61.42
	SA	7.21	61	493	--	196	51.69	144.31	69.42
	BU	7.29	51	375	--	159	59.37	99.63	44.63
11/4/02	VI	7.31	10	553	0.0	159	48.37	110.63	21.3
	GA	7.22	13.4	489	0.3	171	50.11	120.89	17.75
	SA	7.11	10.6	406	0.0	183	61.35	121.65	16.33
	BU	7.16	6.3	337	1.2	144	40.63	103.37	12.07
23/5/02	VI	7.28	31	570	0.0	148	51.28	96.72	33.41
	GA	7.24	19.3	504	0.2	183	48.24	134.76	20.38
	SA	7.19	14.3	447	0.0	173	55.08	117.92	14.29
	BU	7.18	7.9	408	1.0	156	42.11	113.89	37.82
Permissible Limit		5.5 to 9.0	--	--	5.0	--	--	--	--

VI: Vitthalwadi, **GA:** Garware Bridge, **SA:** Sangam Bridge, **BU:** Bund Garden

From the table it is quite clear that the values of all the pollutants increase as the river traverse down the city. Absence of dissolved oxygen and higher levels of hardness in the river water samples make it prohibitive for any use. Even in the rainy season DO was either very low or absent in the river Mutha near Garware bridge and Sangam bridge indicating high load of organic matter. Increase in the chlorides (Cl) content downstream of Pune indicates pollution due to domestic effluent. At Sangam Bridge one can see the black sludge surfacing from the



bottom due to anaerobic decomposition of the settled solids. The Maharashtra Pollution Control Board has taken serious cognisance of the river contamination



and has sued the Pune Municipal Corporation as per the provisions of Water Pollution Control Act (1974). The problem is further compounded as the river Mutha continues to remain dry year after year despite successive normal monsoons preventing annual draining of the river. Nevertheless, the Pune Municipal Corporation has promptly appreciated exigency in restoring the

Riverside road waiting for clearance from Hon. High Court ecological balance of the river and therefore has already started implementation of 6 sewage treatment plants along the sides of the river totalling PMC's treatment capacity to 333MLD as described in detail earlier. In addition, the PMC has prepared a master plan for "Mutha River Improvement Project" (MRIP) and has sent it to the State Government for financial assistance. Efforts are made to beautify the river by constructing channels, planting trees along the river and by removing water hyacinth. The Pune Municipal Corporation also has a firm resolve to go for the development of riverside road and hopes that the ongoing legal battle in this regard would be over sooner than later.

The environmental laboratory supported by the laboratory of Parvati water works is also engaged in carrying out quality tests of potable water as discussed in water supply section. The monthly details of these samples are given below.



Newly instituted Environmental Laboratory of PMC

Table No. 8.12: Status of Drinking Water in the City:

Month	Total Water Samples Analysed	Potable Water Samples	Unpotable Water Samples	% of Potable Samples
April 01	587	586	1	99.83
May 01	640	636	4	99.38
June 01	773	763	10	98.71



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July 01	722	697	25	96.54
August 01	804	785	19	97.64
September 01	849	838	11	98.70
October 01	1017	1004	13	98.72
November 01	844	842	2	99.76
December 01	972	962	10	98.97
January 02	1144	1141	3	99.74
February 02	821	818	3	99.63
March 02	978	962	16	98.36
April 02	1201	1175	26	97.84
May 02	916	898	18	98.03
Total	12268	12107	161	98.69

U Noise Pollution:

There are numerous effects on the urban environment due to the increase in noise levels. Gradually but subtly, we seem to accept noise and the physiological and psychological deterioration that accompanies it, as an inevitable part of our lives. The increasing ambient noise levels in public places from various sources, inter-alia, construction and other commercial activities, generator sets, loud speakers, public address systems, music systems, vehicular horns and other mechanical devices have deleterious effects on civic health and the psychological well-being of the people.

The following table 8.13 indicates that the noise levels during the Ganesh festival are above the prescribed standards for the last five years at all the sites. The maximum level of 104-dB (A) is recorded at Karve Road while the lowest is recorded at Tulshi Baug, 72-dB (A) during the last year. Though the levels of noise pollution have reduced in 2001, thanks to repeated appeals to the citizens and subsequent coercive measures taken by the Pune Municipal Corporation, they are still above the ambient noise limits. The Nuisance Detection squad of the Pune Municipal Corporation was given necessary decibel meters during the festival season and also was empowered to penalise the defaulters under section 3(a) and 4 of the Bombay Provincial Municipal Corporations Act, 1949. The success can however, be achieved through :

- Mass education
- Loudspeakers to face towards the congregation and not the neighbourhood as is generally the case.
- Programme timing should not inconvenience the neighbourhood.
- The equipment owner should also be punished for infringement of rules.

The Ganesh mandals, whose numbers are increasing year after year and now stand around 4000, can alone help in preventing the noise pollution levels not only during Ganesh festival but during other festivals also. Rampant honking on the streets also contributes substantially to the noise pollution. The proposed Area Traffic Control System shall help overcome this syndrome. The citizens need to take some more lessons for observing the traffic rules. Informal industrial and construction activities in the residential areas also lead to noise. Such activities



must be limited to certain duration in case of inevitability. Advent of cable TV has been quite detrimental to peace in the housing areas. The TV sets are switched on round the clock recklessly. Crackers bursting in Diwali is no exception. When organisers of Sawai Gandharva Mahotsav can forego their specialised night festival into a daylight affair, sacrificing the wonderful tunes of night melodies, there is every hope that the Pune-kars shall rise to the occasion to help serve the civic cause.

Table No. 8.13: Sound levels during the immersion procession from Belbaugh Chowk to Alka Chowk for the last five years in dB (A)

Site	1997	1998	1999	2000	2001
Appa Balwant Chowk	98	87	97	103	93
Tulshi Baug	88	100	92	102	72
Babugenu Chowk	91	98	100	100	86
Dagduseeth Ganpati	91	105	92	89	82
Saras Baug	95	95	--	--	--
Deccan Gymkhana	100	96	112	103	99
Alaka Chowk	98	101	105	102	97
City Post	83	124	105	99	92
Heera Baug	95	105	99	96	92
Shanipar	91	118	93	91	--
Karve Road	107	127	99	104	104
Chimnya Ganpati	92	116	133	108	96

Source: School of Health Sciences, University of Pune.

” **WHAT THE CITIZENS SHOULD DO ?:**

The implementation of various measures and initiatives will give desired results only with an active community participation. In fact, the Constitution of India defines the fundamental duties of the citizens wherein every individual is required to bear responsibility in development process of the cities, states and the nation also. Thus the onus of maintaining acceptable living standards in our city lies equally on the shoulders of Puneites. Following are a few ‘Dos and Don’ts’ to promote community participation in the process of development.

- Do not cause any harm to the public property since they are the public properties meant to serve each one of us
- Maintain cleanliness of Garden and heritage premises
- Use water judiciously and prevent wastage of water
- Segregate the dry and wet waste and use vermiculture and recycling techniques
- Always drop solid waste in dustbins
- Stop use of recycled plastic bags



- Do not use automatic vehicles for short distances
- Maintain upkeep of the vehicles by periodic servicing and make them pollution free
- Follow traffic rules thoroughly
- Park vehicles only at the authorised parking spaces
- Switch off engines during other phases at signals
- Avoid blowing horns and give due regard to neighbour's right of peace and tranquillity
- Limit use of loud speakers and do not burst noise-creating crackers.
- Do not engage in unauthorised constructions and other activities; if found any, immediately give complaints to the concerned Ward Office
- Do not erect pendals causing obstruction to the flow of traffic
- Restrict timings of Ganpati procession. If possible immersion procession should be stopped.
- Pay all the taxes promptly and in time
- Pay attention to the public notices issued by authorities
- Access Pune Municipal Corporation's website 'www.punemahapalika.org' for an update on municipal services
- Maintain general cleanliness of the area you are living in
- Plant more and more trees, use Pune Municipal Corporation's subsidised saplings for plantation
- Clean the water storage tanks and get the samples tested at laboratory.

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Chapter –9

EVALUTION OF PAST RECOMMENDATIONS

The process of preparation of Environmental Status Report will become merely an annual ritual unless it indicates the actions taken on the recommendations suggested in the preceding year's report. The following chart gives details of compliance made by the PMC inter alia, the recommendations made in the Environmental Status Report of 2000-01. It may be noted that the Pune Municipal Corporation has been able to initiate actions in 40 out of the 44 recommendations made in the last year's report.

μ POLLUTION ABATEMENT	
§ 'Polluter must bear the cost of pollution control schemes'; This rule must be given consent and accordingly should think of levying of Environmental tax on them.	A suitable Policy is being formulated; The PMC has very limited statutory support.
§ Establishment of study team for collection of data and formulation of plan to restrict the number of vehicles in the city.	Ban on new registrations of 3 and 6 seater diesel vehicles is proposed by RTA on 11.07.2002 after persistent follow up by the PMC. Further action on restricting two wheelers is necessary.
§ Dissemination of information to the general public regarding the harmful effects of air and noise pollution at the ward level.	During the Diwali festival banners/posters had been put up for creating awareness regarding effects of air and noise pollution; PMC has initiated school teachers education program also
§ Declaration of 'Non Vehicular Zone' of certain lanes in the congested part of the city and also lanes in the other part of the city (e.g. Mandai and the adjacent areas)	Heavy vehicles are banned in the congested parts of the city, study is also on for converting few streets only for the pedestrians use
§ Take concrete steps regarding 'Mass Transport System' and promotions of such steps.	Feasibility study for sky bus is being initiated, the proposed traffic and transportation plan is also scheduled to focus on the issue in detail
μ WATER SUPPLY AND SEWAGE TREATMENT	
§ Equitable distribution of pure water to all the areas and to the different social groups of the society.	New water supply project is being implemented; wherever possible existing system is stretched to scarcity areas



§ Plan and implement the water supply scheme considering the population growth.	Under implementation stage
§ Establishment of a committee of the experts to find other ways of water supply than the 'Centralised Water Supply Scheme'	Ongoing water supply project is meant for decentralised water supply with independent system subsequent to an extensive study
§ Wastewater with the parameters within the permissible limits should be used for irrigation and gardening purpose.	The ongoing STPs with 215mld capacity will enable reuse of water
§ Encourage the inclusion of required quantity of water treatment plant and wastewater treatment plant in the large development schemes.	Policy under consideration
§ Encourage public to use the biological treatment and root zone treatment process.	Feasibility will have to be rechecked since it requires considerable land
§ Encourage the roof top water harvesting and schemes to recharge the sub surface water.	Proposal is forwarded for effecting suitable Development Control Regulations
μ SOLID WASTE MANAGEMENT	
§ Promote segregation of biodegradable and non-biodegradable waste at source and use of biodegradable waste within the same locality or the nearby surroundings through a process of composting.	Under consideration. Around 700 odd housing colonies are already engaged
§ Encourage people for Vermicomposting and rooftop gardening.	same as above
§ Realise the scheme of generation of energy from waste.	Biogas plants to be set up at the STPs and mini-ramps in the city.
μ ROAD AND TRANSPORT	
§ Pune Municipal Corporation should take concrete decisions and steps about the mass transport system.	Under consideration
§ PMC must make the improvement in the public transport system to encourage public to use them and also promote cycling in certain	PMT has already launched some of the economic schemes to attract more number of commuters. Overdraft of around Rs.10 crore is planned from



areas.	PMC budget. Cycle rallies are being undertaken, spearheaded by Hon'ble Mayor herself, in co-operation with NGO's to promote use of cycles. Cycle tracks are being developed.
§ Declaration of 'Non Vehicular Zone' in congested area and areas surrounding Mandai.	Heavy vehicles are banned in the congested parts of the city. Study is on for converting few streets only for the pedestrians
§ PMC should strictly implement the air pollution laws.	Under consideration; MPCB is already engaged with supporting legal mandate
§ PMC should install Timers at all the signal points and should encourage the private organisations to adopt the signal points for the same.	Timers are installed at the major chowks with the help of M/s Persistant Systems private limited
§ PMC must synchronise the entire traffic signal system.	Some of the signals have been synchronised; synchronisation technique, however has limited application due to mixed traffic characteristics affecting average traffic speeds
§ Pune Municipal Corporation must take rational decisions about the traffic islands and the statues posing problems in the smooth flow of the traffic and must implement the same.	Various locations with 23 statues are identified for shifting on priority by the mobility committee of the PMC
§ Banning the heavily polluting vehicles.	Policy being formulated. The RTO is actively regulating the vehicles
§ Clearing encroachments on the footpaths for pedestrians.	Action has been taken (details of which are included in chapter No.4)
μ RIVERS, LAKES AND NALAS	
§ To reserve green belts along the banks of rivers, nallas and the watershed areas of the lakes and maintaining the same.	Plantation along the riverbank has been undertaken alongwith the beautification of nalla gardens and lakes.
§ PMC must formulate and implement the River Development Project to maintain the flow of water in river Mutha and reduce the pollution.	Mutha River Improvement Plan has been prepared and is submitted to the State government for financial assistance.
§ PMC should check pollution of the lake and rivers from time to time and those results must be	Pollution monitoring is being carried out, the results would be displayed on PMC's website www.punemahapalika.org



disseminated to the general public.	soon
μ SLUM IMPROVEMENT	
§ PMC should promote the slum sanitation project, which is being implemented by the non-governmental organisations and should encourage the general public to carry forward such projects.	Schemes are being implemented
§ PMC must back the slum rehabilitation under the 2.5 FSI development scheme and involve the slum dwellers for the same.	Presently revised appendix-T is in force. Construction of transit camps by the PMC is being planned
§ PMC must complete the slum survey, prepare the development plan for the slum infrastructure and implement the same with people's participation.	Initial mobilisation towards Slum survey has commenced. PMC is already providing infrastructure facility.
μ CITY DEVELOPMENT	
§ PMC should evaluate the 1987 development plan and should make improvement or changes if necessary.	Necessary modifications in the DP are made from time to time. Nevertheless, this year, major recommendation is being made to study feasibility of midterm revision of the DP.
§ PMC should publish the development plan made for the newly added 36 villages and invite suggestion and objections and should support the finalisation of the development plan.	Preparation of new DP is in final stages and is due for submission by July 2002 end
§ PMC should make reservations and provide land in economical price for the economically weaker section.	Lands are already designated in the DP
§ PMC should green the hills and prevent constructions on the hills	Joint afforestation program is planned on public lands with the State government
§ PMC should prevent any kind of construction along the banks of river or nallas and in the watershed area of lakes and should take strict action against the people violating the rules.	The Pune Municipal Corporation is more vigilant than ever



§ PMC should use solar energy and encourage the construction of structures for recycling of wastewater.	Non-conventional energy sources are actively promoted. A wind energy unit has already been installed at Rajiv Gandhi zoo at Katraj
§ PMC should take strict decisions about the unplanned growth in the newly added 36 villages and prevent any such unauthorised constructions.	Actions are being taken accordingly; Gunthewari Act shall pave the way for regularisation of constructions prior to 01.01.2001
μ HEALTH	
§ PMC should maintain and work the incinerator in a proper manner to dispose the biomedical waste.	Incineration of bio-medical waste is done on pay and use basis with the help of M/s Image India
§ PMC should work towards the AIDS awareness for the general public.	PMC is working jointly with NGO's
§ PMC should increase and encourage the association with different organisations for health awareness programs for the general public.	Health awareness programs are being implemented under the guidelines of the state government
μ OTHER DEVELOPMENT	
§ Including the environmental subject in the course curriculum of the school children to increase their perception and sensitivity about environment.	Environmental Education Program is being carried out with the help of Bharati Vidyapeeth, imparting training for 200 teachers from over 100 schools.
§ PMC should encourage the participation of non-governmental organisations and community based organisations in the development schemes of the city.	Projects through BOT initiative are being promoted
§ PMC should disseminate the information about the environment of Pune city among the general public and make the information available on the Internet for a wider access.	PMC's website with pertinent information is voted as the best amongst the local bodies of the State.

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Chapter – 10

Appraisal of Environmental Status

The statistical information given earlier on various environmental parameters needs analysis to identify key environmental issues bothering the city. Prioritisation of the activities to be initiated by the PMC to tackle these issues can then be undertaken. The sources of air, noise and water pollution are well understood in a typically growing city such as Pune. Nevertheless, the remedial measures vary depending on the intensity of problems and readiness of the authorities to tackle them. The city now has a dubious distinction of being the most polluted city in air quality in the State as per the study conducted by the Union Environment Ministry. The PMC has already initiated major steps to counter the imbalances in the various environmental services and these are discussed in detail in the preceding chapters. While the continuation of these initiatives is assured, following key issues emerge subsequent to the analyses of data.

1. Rise in the population continues unabated at the rate of 62.13% during the last decade. The census figures are truly revealing as the city is housing 25,40,069 lakh people presently. Physical expansion of the city by net addition of adjoining 23 villages meant merely a mathematical reduction in the average population density, which now stands at 104.20 persons per Hectare. However, the challenges are immense. The areas are devoid of basic infrastructure. Development of infrastructure will be costlier since the settlements are dispersed with an average distance of about 8 to 10 Kms. from the city centre.
2. Administrative decentralisation was immediately effected by instituting two more ward offices at Karvenagar and Sangamwadi. Further facilitation with regard to the orderly development of the outer area is made by proposing allocations of an amount of Rs. 82 Crores in the budget of 2002-03 and by giving them the status of C budget so that the re-appropriations of the sanctioned amounts to elsewhere are prevented.
3. "Land Pollution" or the unauthorised use of land is a striking feature in the city. The lands owned by the public authorities are easily encumbered. The hilltops and hill-slopes are gradually losing green cover and are housing informal settlements. The same holds good for the green belts along the rivers. The open spaces of private layouts are not developed and become dumping grounds for the surrounding area. Ironically, the newly added area is deprived of civic facilities due to the want of space despite the so-called "Gairans" still remain un-developed or being encroached upon by the slums. There is a growing tendency to carry out building developments by cutting the existing contours, which affects the topographic profile of the area. The lands occupied by the non-conforming users in the core city also need to be tackled systematically. Efforts are made to prevent pollution in the Pashan and Katraj lake. However, an integrated programme for development of the lakes in the city is required to be undertaken.



4. The traffic condition is deteriorating much faster by registration of 300 (approx.) vehicles per days on the city roads, notwithstanding commendable success through the mobility initiative adopted by the PMC. Due to the restricted road capacities, the advantages through the construction of ROB's, Fly-overs, widening of roads, clearing bottlenecks, improvements of intersections will continue to fetch limited results until a reliable alternative in the form of a mass transportation system is introduced. It has also been established that the public transport will be economically viable only upon strict enforcement of certain code of conduct for traffic movement. Imposition of ban on six-seaters on certain roads and subsequent strike of the six-seaters rickshaws in the city helped PMT to mop up additional revenue of Rs. 16 lakhs per day, an increase by about 75%. The mix of vehicles with different automobile specifications of bodies, size and speeds has further compounded the problem of traffic. There are 20 different type of vehicles plying on city roads possessing wide range of engine powers. Besides, the level of traffic education and awareness amongst the Puneites has proven to be far from satisfactory.
5. Air pollution levels in the city are closely associated with the traffic and transportation conditions. The increased levels of particulate matter (PM₁₀ and SPM), oxides of nitrogen (NO_x) and sulphur dioxide in the various parts of the city indicate dominance of diesel operated vehicles such as recently introduced three wheelers rickshaws, six seaters, PMT buses and trucks. The Pune Municipal Corporation attempts to mitigate the effect by resorting to a package of promotional and regulatory measures. It is expected that heavy vehicular traffic, to the extent of 40%, plying through the city can be diverted to the bye-passes that are presently being constructed by Maharashtra State Road Development Corporation. The Pune Municipal Corporation co-ordinates these works and also facilitates the process of land acquisition and also shifting of the service lines. The promotional measures such as the construction of bye-passes, fly-overs, river bridges etc. in addition to easing of bottlenecks, proposed shifting of statues and signal improvements in the form of countdown timers and area traffic control systems will reduce the vehicular waiting and running time on roads substantially. In the regulatory exercise, the Pune Municipal Corporation has already commenced imposition of ban on six seaters in a phased manner with a stern resolve, and also deals firmly with the heavy vehicles. Besides, actions against the hawkers and the encroachments on roads are on a sharp rise, clearing of Chinese stalls near University Circle, removal of hawkers at Jedhe chowk and Mandai are a few testimonies of this fact. Nirdhar, in association with the University of Pune and the Pune Municipal Corporation have creditably launched an awareness program by displaying the levels of PM₁₀ in the ambient air at major junctions in the city. The school environment program initiated by the Pune Municipal Corporation for 100 various schools including the private ones, will go a long way in environmentally sensitising the community. In a commendable exercise, the traffic police have started public announcement systems at 25 intersections in the city, much to the relief of law-abiding commuters.



6. Higher decibel levels at important intersections in the city indicate dominance of diesel-operated vehicles such as recently introduced three wheeler rickshaws, six seaters, PMT buses and trucks. Reckless honking of vehicles also adds to the noise levels causing serious health implications. Very rarely any school or medical establishment in the city is spared from such affliction. Besides, the pollution caused by the informal industries operating in the non-conforming zones is also rising sharply with city assuming the status of a megalopolis. It is estimated that around 10% of complaints received by the PMC administration on Lokshahi Din pertain to the industrial/commercial activities in the non-conforming zones causing air and noise pollution to the adjoining residents. Excessive ardour shown by certain quarters during the Ganesh festival and other festivals aggravate the pollutant parameters significantly. The problems faced by the city during the course of the Ganesh festival have assumed such serious proportions that a rich heritage set by the city forefathers is in a danger of getting relegated to an environmental disaster. The same holds good for Diwali season. It is time that a thoughtful introspection is done by Punites on their behaviour during festival seasons.
7. PMC's sanitation facilities require extensive overhauling. Although almost entire erstwhile PMC area is covered with sewage collection system emanating from each household, sewage water is seen flowing eventually through nallas and rivers due to insufficient conveyance systems. The problem is more acute in the recently merged area as even the sewage collection systems are grossly inadequate there. Besides, the natural drainage system of the city is badly affected due to the encroachments and un-authorised constructions. First rains in the monsoon of 2002 led to severe flooding resulting in two casualties when the slums along the bank of a nalla at Bibvewadi gave way. Additional 258 toilet blocks in the slums are further required to be constructed in the II and III phase of the program to cover almost all slums with slum sanitation. In the outer areas, existence of many septic tanks speaks of a huge backlog in an effective sewage collection system.
8. No natural drainage system in the city is free from filth and dirt. Nallas have become the carriers of wastewater to convey it to the river. Wastewater flowing through Mula river has a sizeable content of industrial waste from the PCMC, MIDC, area. The contaminants in the river show 75.86% deviation in DO level from the standard limits. Construction of various dams on Mula and Mutha river upstream of Pune has further compounded the problems since the flow of fresh water through the rivers is prevented due to the storage. The disposition led the PMC to embark on the construction of various wastewater treatment plants at various locations along the river totally 333 MLD capacity augmentation in the wastewater treatment facility. Nalla cleaning and training facilities are also being undertaken to maintain the flow carrying capacities. Nonetheless, an extensive review of the natural drainage system is required so that an action plan can be chalked out to retain the system.



9. Solid Waste Management system of the city is found to be working satisfactorily given a significant increase by about 15% in the lifting capacity than the preceding year. System augmentation in the form of replacement of dumpers, dumper placers, compactors and bulk carriers is a must, though. Optimal route alignment for the movement of fleet needs to be worked out so that the minimum obstructions are caused to the flow of other traffic. Although, a major initiative of organising 5000 rag pickers was undertaken by the PMC, the level of citizen's participation in segregating the SW at source is far from satisfactory. Restrictions on use of plastic bags should be strictly enforced. The Sanitation Apex Committee comprising representations from NGOs, Mohalla Committee's etc. besides the PMC officials is proved to be giving productive deliverables. With the help of EM technology and by developing the landfill site at Uruli Devachi with carefully drawn plans for each activity, there is a total transformation felt at the depot. Nevertheless, a few long-term measures are required to be undertaken such as acquisition of 120 acres of area, construction of compound wall along the entire periphery, further scientific development of the landfill and commissioning of the carcass utilisation plant etc. to redress the problem once and for all.
10. Water supply to the city is characterised by equitable distribution in the planned settlements of the old area on one hand and by inequitable distribution in the outer area on the other. Decentralised waterworks and the distribution systems thereof need to be created to ensure equitable distribution at the optimal running costs. The distribution system in the old areas requires up-gradation to control the component of Unaccounted for Water. Speedier implementation of the ongoing water supply project is a must in order to ensure potable water supply to southern, southwestern and southeastern areas of the city. There are sporadic complaints about contamination in water supply lines affecting quality of water. The incidences of contamination during the course of 2001-02 have been on the rise at 28 % than the last year. The grievance redressal mechanism of the water supply department has been quite effective in the quick responses. Sizeable quantity of water is tapped from open wells and borewells in the various parts of the city. There are frequent complaints about the quality and quantity of water tapped through this source. Surprisingly, The PMC has so far not formulated any policy of ground water tapping. It is a high time that the groundwater potential of the city is considered as a reliable source of water supply.
11. Unauthorised subdivisions of lands and the constructions thereupon are the major concerns of the outer area. Efforts will be required to arrest the process of Gunthewari in addition to their regularisation. As such, the process should be restricted to the old constructions only and under no circumstance be applied to the new constructions as well as to the open plots. The city has town-planning schemes for an area of 24.1 sq. kms. against the total area 146 sq. kms. indicating a genuine need to prepare more town planning schemes for the remaining area. Also the existing town planning schemes must be fully implemented so that road networks and the public amenities are fully put to use. Although, the TDR facility has helped PMC to acquire more lands



reserved in the DP, a judicious approach in this regard is a must to prevent its excessive generation and utilisation. Nevertheless, the city's urbanisation potential needs to be determined and therefore a re-look into the Regional Plan is a must with a subsequent revision of the sanctioned Development Plan of the city.

12. Health profile of the citizens indicates a relative fall in water borne diseases. The diseases caused by air pollution have shown a higher trend based on few paediatrician's opinion. Unauthorised food stalls on the roads and particularly the Chinese food stalls that are seen across the entire city need to be sternly dealt with. Similarly, an effective action against swine and stray dogs is a must. Mosquito problem is also very serious along nallas and rivers and needs to be dealt with more systematically.

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Chapter –11

INITIATIVES

Exercise of appraisal of the environmental status of the city must lead to formulation of an action plan to minimise the level of pollutants. The Pune Municipal Corporation, being responsible for providing majority of environmental services, plays a vital role in ensuring environmental balance and sustainable development of the city. An effective environmental management strategy must cover the issues pertaining to promotional activities, regulatory measures and a smooth citizen interface. It is important that the environment management strategy addresses basic environmental concerns that the city is facing currently. Following key objectives, therefore are targeted with a specific time frame for their implementation. Supplementary mechanism to realise the basic objectives is also tabulated with the current status of each activity.

Key objectives:

- Reduce air pollution in the city by 50% within three years.
- Increase green cover in the city by 50% within three years.
- Sanitize the river flow by increasing the quantum of treated effluent from existing 20% to 75% through the proposed sewage treatment plants by December 2003
- Rehabilitate 10% of existing slums in formal housing in the next three years
- Arrest the process of uncontrolled urbanisation through the DP exercise
- Undertake school environment awareness program to cover all the primary schools in the city by 2004 AD

No.	INITIATIVES	STATUS
1.	<u>TRAFFIC AND TRANSPORTATION :</u> • Preparation of traffic and transportation plan by April 2003 • Measures to implement the proposal of bye passes around city • Further impetus on removal of encroachments on roads and footpaths • Strict imposition of ban on six-seaters and heavy vehicles on remaining major roads • Creation of pedestrian walk-ways and compulsion of bicycles in certain areas of congested city • Strengthening of PMT and also move forward with regard to Sky Bus project • Completion of the various projects of fly-overs, ROBs, FOBs, other road widening works, Concretization programs initiated by PMC and Maharashtra State Road Development Corporation. • Introduction of Countdown Timers and Area Traffic Control System at all the major intersections	Proposed Proposed Initiated Initiated Proposed Proposed Initiated Proposed



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	• Synchronisation of traffic signals on all arterial roads • Shifting of 23 statues from certain chowks causing obstruction to the traffic • Construction of an exclusive cycle track along the alignment of Mutha left bank canal passing through Shivaji nagar TPS, construction of other roads along the embankment of other canals as decided in the meeting with Hon. Minister of Irrigation in Mantralaya on 8th July, 2002. • Expedite implementation of project for shifting of Juna Bazar to ease frequent traffic congestion near Maldhakka. • Further co-ordination between various utilities operating in the city to avoid duplication of works and constant digging of roads • Discourage use of road spaces for dumping of construction material through necessary regulations particularly in the congested area • Balance the use of road space for traffic vis-à-vis parking • Move the State Government and Central Government authorities to introduce the CNG and LPG dispensing centres with adequate infrastructure in the city • Move MPCB for remittance of grant in aid for purchase of new buses for PMT as decided in the meeting held at Mumbai. • Imposition of bans on registration of new diesel three and six seaters rickshaws in the city. • Modernisation of vehicle fleet in service of Pune Municipal Corporation. • Stricter Implementation of PUC certificates. • Reduce dust nuisance on roads • Shifting of goods yard from Pune Railway Station	Proposed Initiated Proposed Initiated Initiated Proposed Proposed Proposed Initiated Proposed Initiated Proposed Proposed Proposed
2.	J <u>GARDEN / RIVER / LAKE / NALLAS :</u> • Implementation of the concept of 'Nalla Garden' on the basis of BOT • Survey the green spaces and prepare a green map of Pune and also carry out the tree census for city • Afforestation program at Pachgaon Parvati hill with 300 hectares of afforestation • Transplantation of trees coming in the way of road widening • Development of Energy Park at Peshwe Garden. • Prepare an action plan for the preservation of various lakes in the city • Expedite implementation of remaining works under the Mutha River Improvement Project. • Empower Nuisance Detection Squad to detect throwing of waste into river • Maintain cleanliness at Khadakwasla Dam & along MRBC • Construction of an athletic track at Sanas ground with Olympic standards • Development of theme parks in the city	Initiated Proposed Proposed Initiated Proposed Initiated Initiated Initiated Initiated Proposed Proposed



3.	U WATER SUPPLY : • Development of water supply system for newly added areas • Replacement of old and extinguished pipelines • Shifting of water lines under road widening • Performing water and energy audit for water supply • Formulation of a policy for groundwater tapping and water harvesting • Procurement of new water pumps and 100% standby for the existing water supply system • Automation of pumping system and procuring and fixing of Automatic Power factor control units • Use of modern techniques of communication for synchronisation and for increasing the efficiency of water supply system • Keeping complaint redressal cell alert and active • Use of modern techniques and equipment for efficient operation and maintenance of the system • Preparation of water quality and water pressure profile • Use of DI pipes for laying distribution system in new areas to prevent the unauthorized tapping of water	Initiated Initiated Initiated Proposed Proposed Initiated Initiated Proposed Initiated Proposed Proposed Proposed
4.	C DEVELOPMENT PLAN : • Preparation of Development Plan for newly merged area considering the environmental aspects i. e. integrate environmental planning with the DP to make them compatible with each other • While preparing the Development Plan, ensure that the agricultural lands in these villages are not indiscriminately converted to residential areas. Instead, nodal development centres focussing around the “gaothans” of the newly merged villages, be developed as small, self contained town ships which will obviate the need for the residents of such areas to come to the inner city for their basic, daily needs. • Use of satellite imageries, Geographical Information System and other modern equipment for perfection of data • Prevention of un-authorised constructions • Assess need for midterm revision of the existing Development Plan to integrate it with the proposed development plan of the new area • Prepare new town planning schemes for the thorough implementation of existing development plan and also fully implement the sanctioned TP schemes • Integrate internal roads of the layouts with the public roads wherever necessary to facilitate mobility • Prepare a comprehensive plan for alignment of roads U/S 205 of the BPMC Act, in the peripheral areas of the old DP where DP roads are insufficient • Initiate modifications in the DC rules to promote use of non conventional energy sources, conservation and reuse of water and waste segregation & onsite Vermiculture composting methods • Formulation of strategy for the development of open spaces of	Initiated Initiated Initiated Initiated Proposed Proposed Proposed Proposed Proposed Proposed



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	private layouts for recreational purposes • Review the existing strategy of preservation of hill top and hill slope and also the green belts against the backdrop that they become easy target for informal housing • Prioritise punitive actions against misuse of parking spaces in the congested area of the city • Move government for speeding up acquisition of reserved sites declared as surplus lands under the provision of ULC Act, 1976. • Also move the government for exploitation of surplus lands for civic purposes rather than granting exemptions under section 20 or 22 of the ULC Act, 1976. • Review the policy of Accommodation Reservation principle for parking facility and accordingly suggest modifications if required • Identification of 'Hawkers Zone' and 'No Hawkers Zone' • Review policy towards user in non-conforming zones in the city to facilitate their phased shifting outside residential area. • Preparation of Assets Management Policy and plans for optimal exploitation of the assets • Strengthen the mechanism for preservation and monitoring of heritage sites • Identification of dumping sites for debris • Move the Registrar of Stamp Duty and Settlement Commissionerate to prevent un-authorised sub-divisions of lands • Enter PMC / Appropriate authority's name as the easement right holder in the 7/12 extracts or the PRCs as the case may be for the properties designated for public purpose in the sanctioned DP • Disseminate information on DP reservations and zones, building permissions, etc. to the Ward Offices • Revocation of building permission in case the builder is found dumping debris unauthorizedly.	Proposed Initiated Initiated Proposed Proposed Proposed Proposed Initiated Initiated Proposed Proposed Proposed Proposed
5.	• <u>DRAINAGE-</u> • Revision and fresh delineation of natural drainage system of the city as the DP provisions are insufficient. • Completion of SPSS and STPs at Bahiroba, Tanaji wadi, Bopodi and Erandwane with capacity of 215 MLD and to set up an integrated system of biogas plants to utilise liquid and solid waste • Commencement of STP works at Vitthalwadi and Tofkhana, capacity 33 MLD • Construction of Pumping Stations at Botanical Garden and Mental Hospital • Completion of Nalla channelisation work • Development of 163 km of sewer lines in newly added areas • Creation of up to date database	Proposed Initiated Initiated Proposed Initiated Initiated Proposed



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6.	h <u>SOLID WASTE MANAGEMENT & HEALTH</u> • Further streamline zero garbage concept • Improvements at Uruli Devachi site: Construction of compound wall, introduction of Geo-textiles for land fill • Disposal of the Bio-medical waste in proper manner • Optimal routing of SWM vehicles to lessen running costs • Modernisation of fleet of vehicles • Ban on use of plastic bags and punishment for violators • Implementation of Integrated Population and Development Project under UNFPA for population control • Prevention of un-authorised Chinese and other food stalls • Health awareness programme in collaboration with social organisers • Construction of a trauma hospital at Bopodi • Provision of academic facilities at Kamla Nehru Hospital • Extension of health facilities and various national programmes to the newly added areas in particular • Impose ban on gutkha of all types from 01.08.2002 • Take strict action against the swine and stray dogs	Initiated Initiated Initiated Proposed Proposed Initiated Proposed Proposed Proposed Proposed Proposed Proposed Proposed Initiated
7.	B <u>SLUMS:</u> • Implementation of revised Appendix'T' for slum rehabilitation project • Creation of Transit Camps to facilitate SRPs • Construction of third phase of Sulabh Toilets Scheme • Implementation of Identity Card for Slum Dwellers • Rehabilitation of Slum Dwellers through the Valmiki Ambedkar Aawas, Lok Aawas Schemes	Initiated Proposed Proposed Proposed Initiated
8.	” <u>ENVIRONMENT CELL-</u> • Preparation of Environment Management Plan by Dec. 2003 • Preparation of Air pollution maps, greenery maps etc. • Strengthening of Environment Laboratory • Institute an award for environment friendly layouts/societies on following criteria; Vermiculture, segregation of household waste, development of open spaces, conservation and reuse of water, parking facility, landscape, use of non-conventional source etc. • Preparation of Disaster Management Plan • Enhance environment awareness through citizen participation • Expansion of school education program to other schools • Creation of silence zones • Disseminate information on pollutants through Pune Municipal Corporation's website at www.punemahapalika.org • Pan for database and pro-active MIS for monitoring and evaluation of environment management	Proposed Proposed Initiated Proposed Initiated Proposed Proposed Proposed Proposed Proposed
9.	<u>NUISANCE DETECTION:</u> • Increase the scope and expand its activities • Strengthening the Nuisance Detection squad to reduce noise pollution (citizen education campaign)	Proposed Proposed
	<u>FIRE BRIGADE:</u> • Purchase of more and better equipment to improve efficiency • Establish fire stations in newly added areas, improve access to habitations for fire control	Initiated Proposed



Chapter-12

SCHOOL EDUCATION PROGRAM

μ **School Training Program :**

Long-term well being of the people of Pune city will depend on their perception on the pattern of development. A realisation of how Pune's environmental assets have today become environmental problems is essential if people need to be motivated to act for environmental preservation. The initiatives to be taken by the people to better their own environment can only take place through an environment education program and most appropriate institutional mechanism that can reach out effectively to a large number of inhabitants, who can shape a better tomorrow for themselves, is through school teachers and students.

The Pune Municipal Corporation is perhaps one of the first to provide funds for a comprehensive locale specific environment education program along with setting up mechanisms for its implementation. The objective i.e. a more aware public participation in environment management, is a key to a successful environment management strategy.

This project is specifically designed for the needs of Pune City and consists of developing a specific environment education program in schools that is supported by school teachers trained in environment education. This envisions training teachers in delivering environment programs and planning and implementing action projects along with the development of clearly defined environment education (EE) modules for classes between standard V and IX.

To be able to introduce such a comprehensive program, there is a need to train local schoolteachers in the techniques that can be used for EE. This requires a series of Teacher Training Workshops (TTW) so that they can incorporate these sessions into the regular school schedule. The program thus enables the sensitised schoolteachers to further environment education

programs and implement a comprehensive environment education program in 100 schools in Pune City. The Bharati Vidyapeeth Institute of Environment Education and Research (BVIEER) has eight years of experience in conducting such programs in a wide variety of schools in the urban and rural sector. While most environments education programs are looked upon as a non-institutionalised non-formal programs, the BVIEER has specialised in using non-formal environment educational technologies in the formal curricular arena. This has brought considerable success through the unique method used by BVIEER in training teachers and implementing the program, through trained schoolteachers supported by highly trained environment educators. The outcome has been a considerable rise in environmental awareness at the



school level, which has a strong outward trickle effect to the community at large.

μ **Program Objectives:**

The program is designed to bridge the multiple gaps between the syllabus, the classroom teaching and real life issues related to environmental concerns. It complements existing textbooks, by providing teaching aids and focuses on enhancing environmental awareness as well sensitising students to various environmental issues and developing a pro-environment attitude.

μ **The target concerns are:**

- ◆ To develop among the student community new values pertaining to the conservation of natural resources.
- ◆ To highlight local, regional, national and global environmental issues and relate them appropriately to the needs of the community.
- ◆ To develop an understanding of the linkages between development and environment conservation leading to an ethic for sustainable living.

μ **Components of the program:**

- ◆ Creating a self-supporting program through teachers who are provided with training and material on environment education.
- ◆ Organising locale specific environment education modules for schools.
- ◆ Developing locale specific environment education material, which would highlight the assets and problems of Pune City.
- ◆ Implementation
- ◆ Selection of schools
- ◆ In the first phase 100 schools have been selected to participate in this program. This includes a mix of both English and Marathi medium schools from the Corporation schools as well as private schools in Pune.
- ◆ Training Workshops

The program has been initiated through training workshops for selected teachers. Five such three days workshops have been conducted by the BVIEER in June-July 2002. Environment education programs conducted for schools must necessarily incorporate a training program for teachers, as most teachers do not have access to information on environment, nor the necessary skills required for effectively imparting environment education. A survey done by BVIEER showed that most teachers thought of environment as being only 'afforestation and pollution'. Their perceptions did not include the natural assets of their area, the diversity in nature, the ecological relationships that sustain life, the need to explain that population and poverty are also environmental concerns and that a wide range of issues related with natural resource and landuse management,



conservation of biological diversity, pollution control and careful energy utilisation are all a part of environmental awareness. A workshop, which bridges the above gaps, thus forms the basis of a successful environment education program.

The aim of these workshops was to orient the teachers to incorporate environment education into their existing classroom curriculum, develop and implement environment related action programs that focus on the assets and problems of Pune City.

The first workshop for a majority of teachers, a three-day workshop focused on the objectives of environment education as well as introduced them to the new innovative technologies possible in environment education. Various environmental issues were approached through a variety of innovative methodologies that are frequently associated with non-formal environment education. These were also mainstreamed into formal curricula. Apart from enhancing their knowledge base, the workshop focused on developing skills for using visual modes of communication in environment education, equipped them to use the activity based method of communicating environmental issues and developed locale specific action programs that have a special emphasis on Pune's assets and problem issues.

This first workshop had a major focus on the environmental assets of the city. It exposed teachers to the various natural and cultural environmental assets in the city and the facilities that teachers can use for teaching-learning about the environment. The Workshop also demonstrated techniques of converting school picnics into Nature Interpretation Excursions. Course material on Environment Education was provided to the participants. Modules that teachers are expected to implement in the academic term were discussed in detail.

One-day follow-up workshops will be held at the end of each semester for getting feedback from the teachers about the program, problems in implementation and discussing the future development of the program.

The second series of three day workshops will build upon the teachers knowledge base and aim to update them with more complex concepts through exposure to ground realities. This workshop will focus on the problems associated with unplanned development, air and water pollution and garbage disposal and specifically on the effects of 'development' on the environmental assets of the city.

μ **The School Program:**

The trained teachers are expected to infuse environmental concerns into their regular classroom teaching and utilise the present slot in the timetable that has been provided for conducting specific action programs. The teachers will implement the modules decided and discussed in the workshop along with implementation of the pre-decided action program.



The themes will focus on Pune's environmental assets in the first half of the academic year and on Pune's environmental problems in the second half of the academic year.

An Environment Fair for all the schools will be held at the end of the academic year. Here the students are given the opportunity to develop their skills not only in the cognitive aspects of environment but in a variety of related pro-environmental attitude generating activities. The students are encouraged to stage dramas on environment, produce exhibits and posters and participate in a quiz. This leads to a deep involvement in the activity itself and generates a concern for environmental conservation. Initiatives such as these are most likely to lead to pro-environment action in their daily lives, which can spread to the community. While it is evident that these activities done at the individual school level are of great value, bringing students from multiple schools together for a common cause generates a feeling of the creation of a new wide based environmental ethic at the community level.

μ **Program Outcome:**

This project would make each school self-sufficient in carrying out environment related activities independently in the long term and produce a highly motivated and environmentally 'active' student community, sensitive to the needs of a better way of life for all, in terms of the 'natural' and 'cultural' surroundings that we live in. The teachers of these schools would be trained as environment educators and could be used as resource persons for other schools and help in initiating a chain reaction. The project aims to institute an environment policy for the school with the help of these trained teachers and an environmentally sensitive management. The program will instil a feeling of pride in being a citizen of a 'green' Pune. The Pune Municipal Corporation intends to cover additional schools under the program, with a priority given to PMC Schools during the next year subsequent to the appraisal of the ongoing program.

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Executive Summary

Consistency is key to a successful implementation of any program. The Pune Municipal Corporation, takes pride in submitting the seventh successive Environmental Status Report for the year 2001-02, pursuant to the legal provisions. Significantly, the report is exclusively prepared in-house and covers extensive details of various promotional projects undertaken by the PMC. Recommendations on regulatory framework are also made to prevent environmental degradation. Besides, the role and expectations from the citizens in nurturing the urban environment are also defined.

The city, with 18° 31' N latitude and 73° 51' E longitude, is situated on the western margin of the Deccan Plateau at the confluence of Mutha and Mula rivers. Pune lies on the leeward side of the Western Ghats, at a height of about 560 Mts. above mean sea level. The mean daily maximum and the minimum temperatures for the hottest month i. e. May are 37°C and 23°C respectively. The same for the coldest month of December are 30°C and 12°C respectively. The relative humidity ranges from 36% in March to 81% in August. The annual rainfall is about 70 cm.

The census of 2001 reveals that the city population has reached a figure of 25,40,069 souls indicating a record rise by 62.13% from 1991 census. The Pune Municipal Corporation proposes to launch a massive program for controlling the population under Integrated Population and Development Project under the assistance of UNFPA from January 2003, to arrest the upward trend. The total population in the slums (declared + undeclared) is 10,50,000 souls. The Pune Municipal Corporation has undertaken number of welfare and development schemes for the citizens residing in the slums such as the construction of the public toilets, slum rehabilitation scheme, Lok Aawas Yojana, Valmiki Ambedkar Aawas Yojana. The PMC is also implementing various programs such as providing self-employment for the youths below poverty line, women and child welfare scheme, backward class welfare scheme and Suvarna Jayanti Shahari Rojgar Yojna in co-operation with the neighbourhood groups.

Economic Activity:

Presently, service industry is the primary and foremost activity that supports the city life. Employment in public/government bodies also constitutes a major force, with more than 25 state headquarters existing in the city. Construction is another sector, which has witnessed a growth during the last two decades. Recent addition is the Information Technology and Biotechnology. Work Participation Ratio (WPR) is estimated at 30.80% with employment pattern of 2% primary, 27.50% secondary and 70.50% in tertiary or service sectors.

Transportation:

With a population of over 25 lakhs and the area of 243.90 square kilometres, the city requires a massive transportation system. The Pune Municipal Corporation has constructed a road length of around 750 kilometres (asphalted) and 100 kilometres (non-asphalted) occupying 5% of the land area in the city. Of these,



twelve roads in the city are identified as the arterial roads, which are presently undergoing transformation in the form of cement concretization. The PMC and MSRDC have also undertaken construction of 24 fly-overs, Railway over-bridges, bridges over rivers in the city to ease the traffic congestion. With introduction of approximately 6800 vehicles per month, the traffic congestion in the city is increasing alarmingly. As a consequence, average speeds on the city roads are greatly impaired and range between 15 km/hr to 35 km/hr. Various development schemes such as square beautification, road divider and railings, setting up timers at the signals, creating parking lots, construction of sub ways to enhance the traffic mobility are completed with a few of them through BOT initiative. Unruly and heavy traffic has direct implication on air pollution in the city area. Disproportionate rise in the no. of vehicles, Growth of informal forms of mass transport, a severely impaired Pune Municipal Transport, heterogeneous traffic conditions with limited road capacities making segregation of traffic impossible, absence of a ring road despite radial expansion of the city, various encumbrances on roads, have all contributed in aggravating the traffic problems faced by the city. Absence of suitable parking facilities at important locations adds to the congestion of the traffic. The current record on accidents demonstrates that the numbers of fatal, major and non-injurious accidents are decreasing over the last few years, there is, however, a constant rise in the number of minor accidents. The city on an average registers about seven accidents every day.

Pune Municipal Transport:

The Pune Municipal Transport is no exception to the other public transport undertakings wherein the services are heavily subsidised. A thinner fleet, rising operational and maintenance costs, inventories and the establishment costs and decrease in the number of commuters, seriously impoverished the soundness of the Pune Municipal Transport. The informal public transportation in the form of diesel driven six seater auto rickshaws came on scene about five years ago adversely affecting its economic viability and also worsening the ambient air quality. Against this backdrop, the PMC was compelled to take coercive measures against these vehicles by banning their movement on certain roads under Section 208 of the Bombay Provincial Municipal Corporation Act, 1949. The PMT also has drawn a comprehensive action plan for its improvement, wherein a major thrust is given on augmentation of its fleet. Accordingly, the PMC has decided to propose a credit of Rs. 10 Crores to the PMT in the month of July 2002, for purchase of 100 new buses and improve public transport facilities.

Development planning:

Pune region has undergone a lot of changes in land use, due to the unprecedented growth in the urban areas of the region. The area under settlement has increased 2.4 times during last 30 years. The area under Agriculture and Grassland-Scrub has decreased by 31% and 39% respectively. The area under 'Hills and Forests' and watersheds remains apparently same, though there are some encroachments over some hill slopes, however very marginal in the regional context. The PMC has already embarked on the preparation of a draft development plan for the newly added area to ensure planned development there and the same is expected to be submitted to the PMC



for publication by end of July, 2002. The concept of Transferable Development Rights and Accommodation Reservation has only partly helped PMC to implement the DP of the old area. The PMC has been able to acquire land measuring 0.69 Sq. kms. so far through TDR and also develop 80 reserved sites through the concept of Accommodation Reservation. It is estimated that the PMC has so far cumulatively been able to implement the sanctioned DP to the extent of 42.91%. The shortcomings with regard to development planning include underestimated population, lack of proper evaluation of development tools like TDR, Accommodation Reservations, lack of road network in the outer area of the old city, limited area covered under sanctioned TP Schemes, lack of basic amenities of minimum standards etc.

Heritage properties:

Pune City boasts a rich cultural and historical background. The city has a number of beautiful structures, that need to be preserved or conserved. The Pune Municipal Corporation has taken initiative in conserving the buildings, artifact structures, areas and precincts of historic, aesthetic, architectural, cultural significance and natural features of environmental significance. In order to monitor conservation of the heritage structures, the urban heritage conservation committee has finalised Development Control Rules & Regulations for heritage structures.

Recreational Developments and Gardens:

The PMC has undertaken various garden development and urban afforestation projects in the city at 30 different locations. There is about 15% increase in the number of gardens in the year 2001-02. The PMC's success of transplantation of over 1000 trees coming under road widening has a revealing effect on the road development projects. The construction works of two large projects of gardens at Parvati, survey No. 120 and 121 (P. L. Deshpande garden, Sinhgad road) and Kothrud (on the 27-acre piece of land where earlier garbage depot existed) have also been undertaken by the PMC. Also, the civic body has undertaken urban afforestation project at Lohegaon on a plot of 80 acres area. The citizens are also encouraged to plant more trees in their own premises. The PMC offers plant saplings at subsidised rates for such purposes at four different places in the city with necessary technical support, if required. The Tree Authority of the PMC formulates norms for the conservation of plantations in the city.

Water Supply:

Pune City has a perennial source of surface water in the form of storage across Mutha river. Annual requirement of raw water is around 9.5 TMC (9500MCFT) against a cumulative storage capacity of 28 TMC in Khadakwasala, Panshet, Varasgaon and Temghar dams on Mutha river. On an average PMC is supplying 200 litre per capita per day of water to the citizen of Pune. About 1500 work force is deployed by the PMC to manage the distribution system with sizes ranging from 80 mm to 3000 mm covering distance of around 1200 kms. The PMC has undertaken a number of measures to overcome deficiency in water supply, such as, reducing leakage component by replacing existing PVC or AC lines and also by shifting pipelines under the road widening, installation of booster pumping



stations and supplementation of water supply through tankers. In order to provide equitable water supply to the entire city, the PMC has started implementation of the first phase of the Water supply Project costing Rs 201 crores. The PMC has shifted to charging water in the form of water tax instead of water meters since 01.04.2000 for residential and the mixed purpose properties. The meter system, however, continues for special domestic connections on medical ground and for rental properties besides commercial, industrial connections.

Drainage:

The city generates around 451 MLD of wastewater. The sewage collection system covers about 132 Km² area in the old Municipal limit whereas, about 49 Km² area would be covered by the sewer lines in the merged villages during 2002. A total of 88.96Km length has been added to the existing drainage lines. Nevertheless, about 265 MLD sewage is still carried through open gutters and nallas for the want of adequate conveyance system. It has led to an adverse impact on the environment in the surrounding areas through which they flow. In an effort to mitigate pollution in nallas, their channelisation program has been undertaken. Also, a large number of housing schemes in the outer area still depend on the on site sanitation in the form of septic tanks. The effluents in the nallas and rivers are affecting the ecological balance of the city. Massive program to augment the sewage treatment capacity is already launched by the PMC. As on date over 50% of the construction work of Bhairoba nalla STP (largest in India) and Bopodi STP is completed and both will be commissioned by January 2003. About 40% civil work of Erandawane STP and 60% that of Tanajiwadi STP is completed and the plants will be commissioned by March 2003 and October 2002 respectively. In the newly merged villages 545 km length of sewage collection systems is planned; of which 80 km has been already laid while another 163 kms will be laid in the coming year.

Solid Waste Management:

The city generates about 1000 metric tons of solid waste daily which amounts to about 400 to 500 gm of solid waste per day/per capita. The waste generated is rarely segregated at source and thus contains both dry and wet components. The PMC is responsible for providing necessary infrastructure for collection, storage, segregation, transportation, processing and disposal of municipal solid waste. Average cost of solid waste handling is Rs. 1500 per ton. In order to maintain hygienic conditions in the SWS management, PMC strives hard in proper collection, transportation and disposal of solid waste. The transportation of solid waste in three shifts, setting up of mini bio-gas plants, ban on plastic of sizes less than 20 - 25 micron thickness etc. are some initiatives being taken in this regard. At the garbage depot at Uruli Devachi efforts are underway for effective disposal of garbage through use of effective micro-organism (EM) technology, installation of carcass utilisation plant, etc. Special cleanliness drive is being under taken through nuisance detection squad.

Air Pollution:

Exposure to air pollution is now an almost inescapable part of our urban life. Air pollution can adversely affect human health, not only by direct inhalation but also



indirectly by other exposure routes, such as drinking water contamination, food contamination and skin transfer. Most of the air pollutants directly affect the respiratory and cardiovascular systems. Air pollution due to vehicular emissions is estimated at 181.96 tons per day and is increasing unabated. Constant monitoring of air quality parameters is therefore, imperative to prevent the health hazards from air pollution. The PMC accordingly has instituted a well-equipped Environmental Laboratory to keep constant check on city's environment.

As stated in the local newspapers on 11.07.2002, the Regional Transport Authority (RTA) has banned registration of all new diesel public vehicles including six-seaters, all models of diesel three-seater rickshaws and passenger jeeps in Pune and Solapur districts. It may be recalled that the Pune Municipal Corporation had been relentlessly advocating such a move to be introduced in Pune city through all forums. The report further adds that the LPG would soon be introduced in the city particularly for PMT and PCMT to curb the pollution levels. The PMC shall endeavour to modify the fleet of PMT to make it compatible with environmentally friendly fuels. Similar exercise will have to be undertaken to phase out automobiles with two stroke engines with their replacement by four stroke engines.

Water Pollution:

The quality of water is of vital concern for a buoyant community since it is directly linked with community's welfare. Water is used for many development purposes and any loss of beneficial use due to pollution amounts to economic as well as ecological and human health damage.

The Pune Municipal Corporation's environmental laboratory is engaged in collecting and testing river water samples periodically. The test report at four places in the city-Vitthalwadi, Garware Bridge, Sangam Bridge and Bund Garden indicate that the values of all the pollutants increase as the river traverse down the city. Absence of dissolved oxygen and higher levels of hardness in the river water samples make it prohibitive for any use. Increase in the chlorides (Cl) content downstream of Pune indicates pollution due to domestic effluent. The Maharashtra Pollution Control Board has taken serious cognisance of the river contamination and has sued the Pune Municipal Corporation as per the provisions of Water Pollution Control Act (1974). The problem is further compounded as the river Mutha continues to remain dry year after year despite successive normal monsoons preventing annual draining of the river. Nevertheless, the Pune Municipal Corporation has appreciated exigency in restoring the ecological balance of the river and promptly therefore has started implementation of six sewage treatment plants along the sides of the river totalling a capacity of 333MLD. In addition, the PMC has prepared a master plan for "Mutha River Improvement Project" (MRIP) and has sent it to the State Government for financial assistance. The PMC is also actively interacting with the Irrigation Department to curb pollution of water in Khadakwasla lake and the Mutha Right Bank Canal.



Noise Pollution:

There are numerous effects on the urban environment due to the increase in noise pollution. The increasing ambient noise levels in public places from various sources, inter-alia, construction and other commercial activities, generator sets, loud speakers, public address systems, music systems, vehicular horns and other mechanical devices have deleterious effects on civic health and the psychological well-being of the people.

It is observed that the noise levels during the Ganesh festival are above the prescribed standards for the last five years at all the tested sites. Though the levels of noise pollution have reduced in 2001, thanks to repeated appeals to the citizens and subsequent coercive measures taken by the Pune Municipal Corporation, they are still above the ambient noise limits. The Ganesh mandals, whose numbers are increasing year after year and now stand around 4000, can also help in preventing the noise pollution levels not only during Ganesh festival but during other festivals also. Rampant honking on the streets also contributes substantially to the noise pollution. The proposed Area Traffic Control System shall help overcome this syndrome. The citizens need to take some more lessons for observing the traffic rules. Informal industrial and construction activities in the residential areas also lead to noise. Advent of cable TV has been quite detrimental to peace in the housing areas. Crackers bursting in Diwali is no exception. When organisers of Sawai Gandharva Mahotsav can forego their specialised night festival into a daylight affair, sacrificing the wonderful tunes of night melodies, there is every hope that the Pune-kars shall rise to the occasion to help serve the civic cause.

What the Citizens should do ?:

The implementation of various measures and initiatives to counter environmental degradation will give desired results only with an active community participation. In fact, the constitution of India defines the fundamental duties of the citizens wherein every individual is required to bear responsibility in development process of the cities, states and the nation also. Thus the onus of maintaining acceptable living standards in our city lies equally on the shoulders of Puneites. The report gives a few 'Dos and Don'ts' for promoting community involvement in the process of development.

Evaluation of Past performance:

The process of preparation of Environmental Status Report will become merely an annual ritual unless it indicates the actions taken on the recommendations suggested in the preceding year's report. The report gives details of compliance made by the PMC inter alia, the recommendations made in the Environmental Status Report of 2000-01. It should be noted that the Pune Municipal Corporation has been able to initiate action in 40 cases out of the 44 recommendations made in the last year's report. Some of the key achievements during last year have been as following:

- Substantial implementation of various components of the integrated water supply and sewerage project



- Increased traffic mobility with an effective traffic planning and the road development works including widening works, and construction of fly overs, ROBs bridges over river etc.
- A net increase of 15% in the availability of gardens and recreational open spaces
- Ban on entry of diesel driven six seaters and other heavy vehicles on five roads of the city in an effort to increase traffic mobility and decrease air pollution
- Nalla channelisation and construction of 6 STPs to minimise water pollution in the rivers Mula and Mutha
- Preparation of draft development plan for the newly added area
- Reduction of FSI in the city area by preventing 'lumping' of TDR
- Establishment of Environmental Laboratory and execution of a School Education Program with the help of Bharti Vydyapeeth Institute of Environmental Sciences and Research to promote environmental awareness in the city.

Appraisal of Environmental Status:

- Rise in the population continues unabated at the rate of 62.13% during the last decade. The census figures are truly revealing as the city is housing 25,40,069 lakh people presently. Physical expansion of the city by net addition of adjoining 23 villages meant merely a mathematical reduction in the average population density, which now stands at 104.20 persons per Hectare.
- The unauthorised use of land is a striking feature in the city. The lands owned by the public authorities are easily encumbered. The hilltops and hill- slopes and green belts are gradually losing green cover and are housing informal settlements. The lands occupied by the non-conforming users in the core city also need to be tackled systematically.
- The traffic condition is deteriorating much faster by registration of 300 (approx.) vehicles per days on the city roads. It has also been established that the public transport will be economically viable only upon strict enforcement of certain code of conduct for traffic movement. Imposition of ban on six-seaters on certain roads and subsequent strike of the six-seaters rickshaws in the city helped PMT to increase its revenue by 75%. The level of traffic education and awareness amongst the Puneites has proven to be far from satisfactory.
- Air pollution levels in the city are closely associated with the traffic and transportation conditions. The Pune Municipal Corporation attempts to mitigate the effect by resorting to a package of promotional and regulatory measures. It is expected that heavy vehicular traffic, to the extent of 40%, plying through the city can be diverted to the bye-passes that are presently being constructed by Maharashtra State Road Development Corporation.
- Higher decibel levels at important intersections in the city indicate dominance of diesel-operated vehicles such as recently introduced three wheeler



rickshaws, six seaters, PMT buses and trucks. Reckless honking of vehicles also adds to the noise levels causing serious health implications. The problems faced by the city during the course of the Ganesh festival have assumed such serious proportions that a rich heritage set by the city forefathers is in a danger of getting relegated to an environmental disaster.

- The natural drainage system of the city is badly affected due to the encroachments and un-authorised constructions. Additional 258 toilet blocks in the slums are further required to be constructed in the II and III phase of the program to cover almost all slums with slum sanitation. In the outer areas, existence of many septic tanks speaks of a huge backlog in an effective sewage collection system.
- No natural drainage system in the city is free from filth and dirt. The contaminants in the river show 75.86% deviation in DO level from the standard limits. Nalla cleaning and training facilities are also being undertaken to maintain the flow carrying capacities. Nonetheless, an extensive review of the natural drainage system is required so that an action plan can be chalked out to retain the system.
- Solid Waste Management system of the city is found to be working satisfactorily given a significant increase by about 15% in the lifting capacity than the preceding year. Optimal route alignment for the movement of fleet needs to be worked out so that the minimum obstructions are caused to the flow of other traffic. Restrictions on use of plastic bags should be strictly enforced. With the help of EM technology and by developing the landfill site at Uruli Devachi with carefully drawn plans for each activity, there is a total transformation felt at the depot.
- Water supply to the city is characterised by equitable distribution in the planned settlements of the old area on one hand and by inequitable distribution in the outer area on the other. Decentralised waterworks and the distribution systems thereof need to be created to ensure equitable distribution at the optimal running costs. Surprisingly, The PMC has so far not formulated any policy of ground water tapping. It is a high time that the groundwater potential of the city is considered as a reliable source of water supply.
- Unauthorised subdivisions of lands and the constructions thereupon are the major concerns of the outer area. Efforts will be required to arrest the process of Gunthewari in addition to their regularisation. The city has town-planning schemes for an area of 24.1 sq. kms. against the total area 146 sq. kms. indicating a genuine need to prepare more town planning schemes for the remaining area.
- Health profile of the citizens indicates a relative fall in water borne diseases. The diseases caused by air pollution have also shown a higher trend. Movement against the swine and the stray dogs needs momentum.

**Initiatives:**

An effective environmental management strategy must cover the issues pertaining to promotional activities, regulatory measures and a smooth citizen interface. It is important that the environment management strategy addresses basic environmental concerns that the city is facing currently. Following key objectives, therefore are targeted with a specific time frame for their implementation. Supplementary mechanism to realise the basic objectives is also given.

Key objectives:

- Ø Reduce air pollution in the city by 50% within three years.
- Ø Increase green cover in the city by 50% within three years.
- Ø Sanitize the river flow by increasing the quantum of treated effluent from existing 20% to 75% through the proposed sewage treatment plants by December 2003
- Ø Rehabilitate 10% of existing slums in formal housing in the next three years
- Ø Arrest the process of uncontrolled urbanisation through the DP exercise
- Ø Undertake school environment awareness program to cover all the primary schools in the city by 2004 AD

The above objectives can be realised by initiating following major actions.

- Preparation of traffic and transportation plan by April 2003
- Strict imposition of ban on six-seaters and heavy vehicles on remaining major roads
- Strengthening of PMT and also move forward with regard to Sky Bus project
- Introduction of Countdown Timers and Area Traffic Control System at all the major intersections
- Imposition of bans on registration of new diesel three and six seaters rickshaws in the city.
- Survey the green spaces and prepare a green map of Pune
- Prepare an action plan for the preservation of various lakes in the city
- Carry out tree census with identification of trees
- Development of water supply system for newly added areas
- Performing water and energy audit for water supply
- Formulation of a policy for groundwater tapping and water harvesting
- Preparation of Development Plan for newly merged area considering the environmental aspects i. e. integrate environmental planning with DP to make them compatible with each other
- While preparing the Development Plan, ensure that the agricultural lands in these villages are not indiscriminately converted to residential areas. Instead, nodal development centres focussing around the “gaothans” of the newly merged villages, be developed as small, self contained town ships which will



obviate the need for the residents of such areas to come to the inner city for their basic, daily needs.

- Assess need for midterm revision of the existing Development Plan to integrate it with the proposed development plan of the new area
- Prepare new town planning schemes for thorough implementation of existing development plan and also fully implement the sanctioned TP schemes
- Prepare a comprehensive plan for alignment of roads U/S 205 of the BPMC Act, in the peripheral areas of the old DP where DP roads are insufficient
- Formulate a strategy for the development of open spaces of private layouts for recreational purposes
- Move the government for exploitation of surplus lands for civic purposes rather than granting exemptions under section 20 or 22 of the ULC Act, 1976.
- Identification of 'Hawkers Zone' and 'No Hawkers Zone'
- Strengthen the mechanism for preservation and monitoring of heritage sites
- Revision and fresh delineation of natural drainage system of the city as the DP provisions are insufficient.
- Completion of SPSs and STPs at Bahiroba, Tanaji wadi, Bopodi and Erandwane with capacity of 215 MLD and to set up an integrated system of biogas plants to utilise liquid and solid waste
- Improvements at Uruli Devachi site: Construction of compound wall, introduction of Geo-textiles for land fill
- Implementation of Integrated Population and Development Project under UNFPA for population control
- Implementation of revised Appendix 'T' for slum rehabilitation project
- Creation of Transit Camps to facilitate SRPs
- Rehabilitation of Slum Dwellers through the Valmiki Ambedkar Aawas, Lok Aawas Schemes
- Preparation of Environment Management Plan by Dec. 2003
- Further expansion of the ongoing school education program
- Institution of an award for environment friendly layouts/societies on following criteria; Vermiculture, segregation of household waste, development of open spaces, conservation and reuse of water, parking facility, landscape, etc.

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Foreword

We are pleased to submit the 7th Environmental Status Report for the year 2001-2002, pursuant to provision under section 67-A of the Maharashtra State Municipal Corporations and Municipal Council Act, 1994. Unlike last year, the report is prepared in-house with a thorough appraisal of various environmental services provided by the Pune Municipal Corporation. The statutory process must pave the way for capacity building of the Pune Municipal Corporation in monitoring urban environmental concerns.

The PMC, being the local body engaged in providing basic civic amenities to the citizens, plays a crucial role in maintaining urban environmental balance. The implications from land, water and air pollution can be decisively tackled by the PMC by initiating appropriate mitigating measures. The report gives not only the details of various promotional projects undertaken by PMC but recommends regulatory measures also to prevent environmental degradation. Besides, the role and expectations from the citizens in nurturing the urban environment are also addressed. Efforts taken by Nirdhar, Persistent Systems, Kalyaninagar and Aundh Residents Associations and several housing societies engaged in Vermiculture composting merit sincere appreciation in this regard. The Pune Municipal Corporation has an uphill task of not only overcoming huge backlog of civic facilities but also leading city to a planned development.

I personally believe that the long term well being of the people of Pune city will depend on their perception on the pattern of development being planned. A more meaningful and enlightened public participation in environment management is key to a successful environment management strategy. Creation of awareness about the environment is the bedrock of PMC's efforts. Thus, it has embarked upon carrying out an environment education program for schoolteachers in association with Bharati Vidyapeeth Institute of Environment Education and Research. The first phase of the program was concluded on 07.07.2002, wherein teachers from around 100 PMC and private schools were imparted necessary training. The details of this initiative are given in the report.



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The hazards caused by traffic congestion, degraded riverine system, growth in informal housing and industry and lack of basic amenities in the outer area are poised to offset the advantages that Pune has cherished so far. The city must seize the initiatives in IT and BT by creating a complementary ambience. The report provides for a sincere introspection on various shortcomings and also comments on plans to tackle them.

The Pune Municipal Corporation, in collaboration with the Maharashtra Pollution Control Board has embarked upon creating an Action Plan to control Air Pollution, which is largely attributed to vehicular emissions. Strategies proposed will range from regulatory (like banning certain types of polluting vehicles in certain area of the city) to promotional (like improving the public transport system of the city and creating facilities to prevent through traffic from entering the city).

The city has witnessed multifarious development during the course of 2001-02. The erection of new water and sewage treatment plants is in full swing, and is scheduled to be completed by the end of the financial year. The road development works with fly-overs, ROBs, concretization etc. are also forging ahead. It must be appreciated that a massive resource mobilisation is required to ensure smooth implementation of these projects simultaneously. Other Government agencies have also complemented Pune Municipal Corporation's efforts by upgrading the level of their services.

It is indeed gratifying that the processes of report making involving activities of surveys, data collection, its collation and analyses, preparation of actual report have been carried out exclusively by the PMC without any external help whatsoever. I would like to sincerely acknowledge the efforts of all the concerned staff of the Pune Municipal Corporation. Thanks are also due to the members of the Environmental Committee of the PMC who have given their timely suggestions in making of the report.

(T. C. Benjamin),
Municipal Commissioner,
Pune Municipal Corporation.