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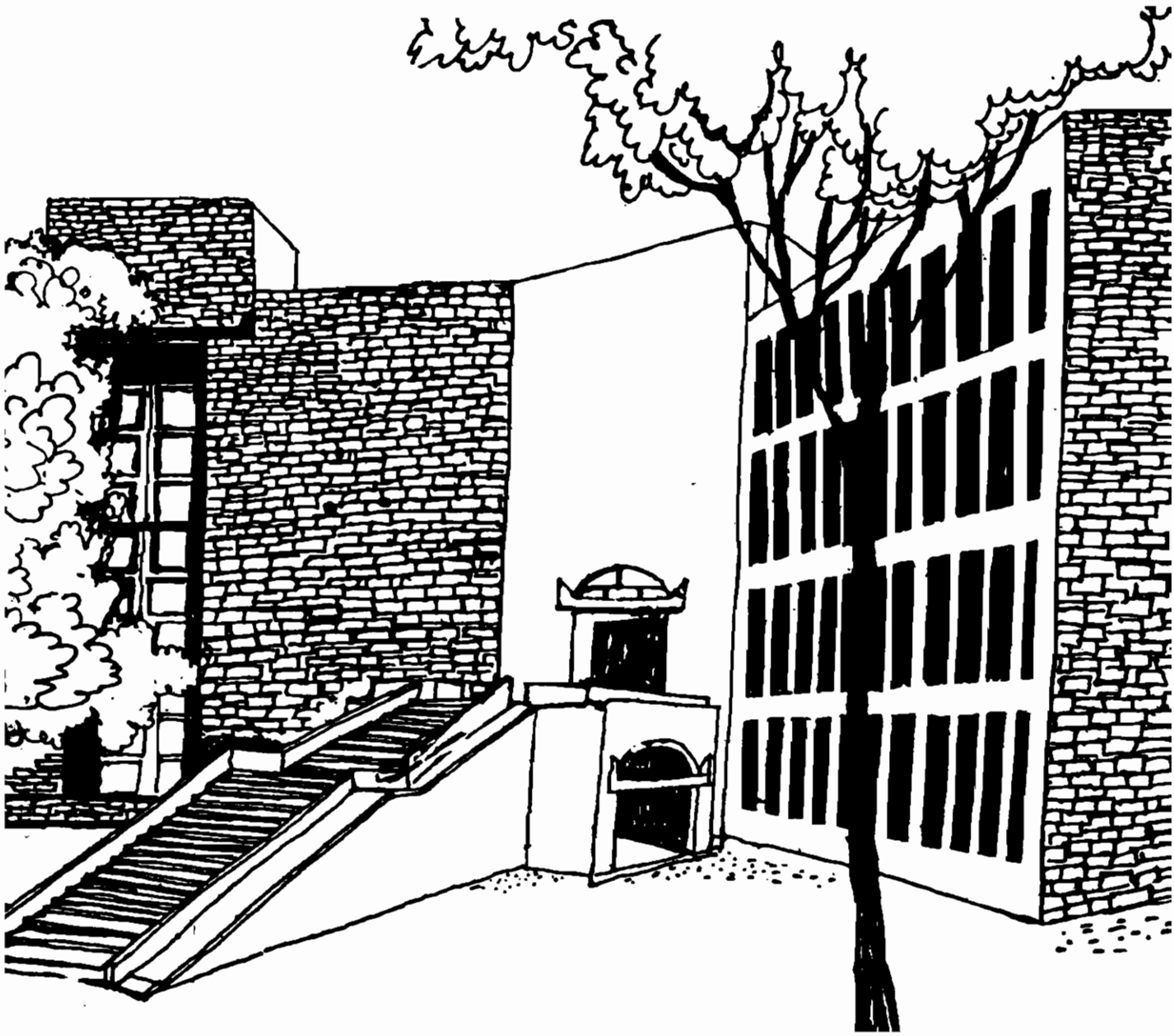

COMPARATIVE RANKING OF QUALITY OF LIFE IN FOUR INDIAN CITIES

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Comparative Ranking of Quality of Life in Four Indian Cities.

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ABSTRACT

Cities are often compared with one another using a variety of indicators which measure the physical, economic and social well being of the residents. Such comparisons are used to assign rankings such as "best places to live" or " best places to do business" etc. Frequently these comparisons are based on subjective opinions of individuals relying on minimal facts. Often the rankings cover cities which differ so widely in terms of population, level of economic development and the social and political institutions, that these comparisons are of rather limited use. This study, covering four Indian cities (Ahmedabad, Pune, Hyderbad, Bangalore) is an attempt to develop the conceptual and methodological framework for comparing the quality of life in urban centres.

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1. INTRODUCTION

1.1 Background

As we approach the end of the twentieth century, it is becoming apparent that urbanization of human settlements and economic growth are intertwined processes. Urban centres throughout the world are in a phase of transition. In 1950, only 750 million people lived in urban centres. In the year 1990, this figure reached 2400 million. In 1995, North American and European countries had more than 70 percent of their population living in urban areas, while Asia and Africa were only 30 to 35 percent urbanised. At the beginning of this century, developed countries urbanised at a faster rate, but now greater growth is taking place in the developing countries. Asia and Africa are urbanising at the rate of around 4 percent. Almost half of their population will be living in urban by the end of this century. The poorest countries like Nepal, Afghanistan are experiencing tremendous growth of more than 7 percent. Every day almost 1,50,000 people are added to the urban areas of the developing world. (*World Resources, 1996-97*)

Cities from the developing world are growing at a rate twice than that of the developed world. In 1950, there were only two megacities[1] : New York and London. By 1990, there were 21 megacities, 16 out of them were from the developing world. UN estimates state that by the year 2015, there would be 33 megacities, out of which 27 would be from the developing world.

India has 16 percent of world population and only 2 percent of the land area. Three Indian megacities, namely Mumbai, Calcutta and, Delhi appeared on the list of 25 largest cities of the world. India has experienced a large growth of urban population since the it's independence in 1947. The urban population has shot up from 18 percent in 1950 to around 26 percent in 1991. In 1991, India had 23 cities with population more than one million each. By the next census, there will be more metropolitan cities in India than in any other country. According to 1991 census, cities with population more than one lakh are growing faster than that of million plus cities. 62 percent of the urban

[1] A city with population more than 8 million.

population live in these intermediate size cities, while million plus cities host 32 percent of urban population of the country. Ensuring a good quality of life for all citizens is an enormous challenge.

Cities are often ranked using a variety of indicators to describe the quality of life. These indicators which measure physiological, social and economic well-being of their citizens. Comparisons of "quality of life" across different cities have several obvious uses. Such information can influence the locational choices of individuals, households and firms. For local governments, these comparisons are critical for objective assessment of their city's infrastructure; civic services; local economy; and socil, physical and cultural environment. Most of these studies view human development as a major aspect of quality of life. In many western countries, authoritative city-ranking indices are available and widely used. Being highly mobile societies, the emphasis is usually on identifying "the best places to live", e.g. the Rand-McNally Index of USA.

Myers (1988) enlisted a number of approaches to measure the quality of life. Some of these approaches are the personal well-being approach; the community trends approach; the liveability comparison approach; and the market/residents approach. The Liveability Comparison Approach (*Boyer and Savangeau, 1985*) compares the urban areas using 55 indicators in nine categories and determines the score by summing up ordinal ranks. The Market Residents Approach has used the quality of life components weighted by individual residents' preferences (*Berger, 1987*). *Dasgupta and Weale (1992)* compared quality of life in 48 poorest countries based on ordinal scores and *Paul (1996)* showed that ordinal ranks, obtained by different statistical techniques, are very similar.

In 1989, the UNCHS (Habitat) had developed an indicator programme at international level, for effective monitoring of the Global Shelter Strategy. This programme was extended to include urban indicators, which enable the residents, government and community groups to monitor and provide benchmarks for evaluation and capacity building (*1994*). This Urban Indicator Programme is a decentralised programme, carried out in more than 100 countries worldwide The results of this

programme will be reported to the 17th Commission on Human Settlements in 1999 and to the General Assembly in 2001.

In an early attempt of inter-city comparisons in India , Thompson Urban Market Index was prepared by Hindustan Thompson Associates Ltd. (1963). The main purpose of this index was to provide a quantitative assessment to compare urban centres. Multiple regression model was used to calculate an index. This index groups the urban centres into 3 categories, A, B and C class markets, reflecting their the market potential, but not on the quality of life in the city.

There are two important issues involved in measuring quality of life across urban areas. The first relates to appropriate choice a set of indicators to determine quality of life and the second relates to ranking of these indicators. Two possible approaches to compare quality of life are the ordinal ranking approach and cardinal ranking approach.

The ordinal ranking approach ranks individual indicators along the characteristics being scaled. But, it shows no implication of the distance between the scale positions of those indicators. This is the simplest measure available for inter-city comparisons.

The cardinal ranking approach has equal units of measurements which makes it possible to interpret the distance between the scale positions. For the purpose, weights are assigned to cardinal magnitude of the parameter. These weights are derived either arbitrarily (e.g. individuals, experts opinions) or using statistical methods (e.g. factor analysis, hedonic regression). The cardinal ranks are too subjective of the method used or opinions of the individuals.

Often, the cities compared are non-comparable in terms of population, level of economic development and their social and political base. In this case, the choice of approach becomes an important factor determining the of the reliability of these inter-cities comparisons. There exists inconsistency in the data sources, also the data constraints hinder valid and consistent measurement. These four cities selected for this study (Ahmedabad,Pune, Bangalore and Hyderabad) are of comparable size and also enjoy similar level of social and economic development.

1.2 Objectives

The purpose of this study was to design a city-ranking system for Indian cities which can form the basis of urban development strategies and improve the management of urban infrastructure and services.

Accordingly, the objectives of this exploratory study were:

1. Develop the concepts for measuring the "quality of life" in a city and devise appropriate parameters and indicators.
2. Operationalise the city monitoring system as a fact sheet, a report card and a scale for comparing a selected sample of cities.
3. Test the validity and implementability of the city-ranking system on a bigger scale.

1.3 Methodology

In designing a city monitoring system, it is useful to think of the entire community as the stakeholder in the economic, social and institutional development of the city. Perceptions of special-interest groups invariably produce a distorted picture even if these groups play a dominant role in the city's affairs. The focus of this exercise is on devising more general indicators that determne the quality of life in a city.

The quality of life of residents of a city depends on many physical, economic and social factors. We began with identifying the key parameters which would adequately capture the quality of life in different cities while providing insights into the critical issues of urban management. The search for appropriate parameters was confined to the following dimensions of urban environment:

1. Local Economy
2. Infrastructure
3. Civic Services
4. General Environment.

A healthy local economy is the key to better employment opportunities and higher incomes for the residents, which in turn improve their standard of living. A city's physical and social infrastructure (e.g. power, communications, roads, education and health facilities) is a critical prerequisite for growth of local economy and effective delivery of municipal services. The quality of civic services, such as water supply, sanitation and primary health care obviously affects the citizens' quality of life. The general environment parameters include direct measures of quality of life in a city, such as pollution levels, public health indicators and crime rates. The key steps in the study methodology were:

1. Selection of appropriate parameters of quality of life and approaches for measurement.
2. Data collection
3. Data analysis with simultaneous refinement of indicators for key comparisons.
4. Ordinal ranking of cities on each of the selected parameters.

It was decided that the investigation would be based on factual information rather than on opinions of individuals. Yet it was recognised that the required data would not be easily available as the municipal corporations do not, usually, maintain good records or the information is scattered and outdated.

Thus, the methodology for data collection for this study involved two major sources: (a) Records of Municipal Corporations and other government and non-government organisations; (b) Research publications and other secondary documents. As it turns out, it was not possible to get the data on many of the study parameters in the form that it was sought. So a number of these had to be estimated through indirect methods of interpolation and extrapolation. In the end it was possible to put together a fairly accurate picture of the state of civic affairs in the four cities.

2. DEMOGRAPHICS

2.1 Population

Among the four cities, which are the subject of this study, the urban agglomeration of Hyderabad was largest, both in terms of population and land area, in 1991. Bangalore, Ahmedabad and Pune followed in descending order. Within municipal limits also, Hyderabad had maximum population followed by Ahmedabad, Bangalore and Pune, in that order. During the 1981-91 decade, the urban agglomeration and municipal areas of Hyderabad experienced the highest rate of population growth. In fact Hyderabad was one of the fastest growing cities of India.

Table 1: DEMOGRAPHIC COMPARISONS

Parameter	Pune (MC)	Ahmedabad (MC)	Bangalore (MC)	Hyderabad (MC)
Population, 1991 (lakh)	15.7	28.8	26.6	30.4
Total Area, 1991 (Sq.km.)	146	190	126	173
Density (Persons/sq.km.)	10,722	15,129	21,129	17,627
Growth, 1981-91 (%)	30.2	20.8	16.1	41.6
No. of Households	316347	552164	515138	515217
Average HH size	5.0	5.2	5.2	5.9
Sex Ratio (F/1000M)	928	889	906	940
Literacy Rate (%)	69	66.9	70.9	59.7

Source: Census of India 1981 and 1991.

Notes: MC - Municipal Corporation.

The municipal corporation of Ahmedabad (AMC) has the highest area under its jurisdiction, while the Bangalore Corporation (BCC) has the least Thus, among the four cities, population density is highest in Bangalore and lowest in Pune Municipal

Corporation areas. Comparisons of other demographic parameters show that Hyderabad leads in terms of average household size as well as female-to-male sex ratio, which is particularly low in Ahmedabad. Bangalore has the highest literacy rate, followed by Pune and Ahmedabad, while Hyderabad lags behind considerably.

2.2 Projections

During the decade of 1981-91, population of the Hyderabad municipal area increased by 42 %, Pune (MC) increased by 30 %, Ahmedabad (MC) 21 %, and Bangalore (MC) by 16 %. Table 2, on the following page shows population estimates for the year 1996 and projections for 2001 for these cities at three levels of jurisdiction -- municipal corporations (MC); municipal corporations and outgrowth (MC+OG) ; and urban agglomeration (UA).

The method used is that of equal absolute increment each year determined by an assumed average annual growth rate. At the MC level the implicit growth rate is the same as that observed in 1981-91 decade. At the (MC+OG) and UA levels also, the assumed growth rates reflects the general trends observed in the previous decade.

Table 2: POPULATION PROJECTIONS				
	Pune	**Ahmedabad**	**Bangalore**	**Hyderabad**
I. Municipal Corporation (MC)				**(lakh)**
Population, 1991	15.67	28.77	26.60	30.44
Population, 1996	18.04	31.76	28.74	36.8
opulation, 2001	20.40	34.75	30.88	43.10
Implicit Growth Rate (same as 1981-91)	3.0 %	2.1 %	1.6 %	4.2 %
II. Municipal Corporation and Outgrowths (MC + OG)				**(lakh)**
Population, 1991	17.27	29.55	33.02	32.25
Population, 1996	20.27	35.46	39.62	38.7
Population, 2001	24.18	41.37	46.23	45.15
Implicit Growth Rate (assumed %)	4 %	4 %	4 %	4 %
III. Urban Agglomeration (UA)				**(lakh)**
Population, 1991	24.94	33.12	41.30	43.44
Population, 1996	29.93	39.74	49.56	54.30
Population, 2001	34.92	46.37	57.82	65.16
Implicit Growth Rate (assumed %)	4 %	4 %	4 %	5 %

Source: Census of India 1991, 'Final Population Tables'.

Notes: 1. MC - Municipal corporation

2. MC+OG - Municipal corporation and outgrowth areas.

3. UA - Urban agglomeration.

3. ECONOMY

3.1 Economic Base

The economic base of the four cities differs significantly in terms of labour participation and sectoral composition of employment. Bangalore has the highest labour force participation rate (33%),while Hyderabad has the lowest (27 %). In Ahmedabad and Bangalore, the manufacturing sector has the maximum share in employment of main workers. In contrast, the economic base of Pune and Hyderabad is dominated by government and social sector. In Hyderabad, the share of employment in trade and commerce is much greater than in manufacturing, making it a service oriented city.

Pune, a British cantonment since the early 19th century, experienced rapid growth after 1951 when some important defence and research institutions were established there. The establishment of manufacturing companies like Kirloskar Oil Engines, Premier Automobiles, Bajaj Auto and TELCO led to the setting up of a large variety of ancillary units. Restrictions on industrial expansion in Bombay, availability of good infrastructure, skilled professionals,and proximity to Bombay were the factors responsible for industrial development of Pune.The strength of Pune's economic base lies in its food-processing, engineering and automotive industries and their ancillaries. Pune is now also emerging as a centre for software development and electronics manufacturing industries.

Like Pune, Ahmedabad has a strong industrial base of traditional manufacturing, especially textiles, plastics, machinery and basic metals and alloys. During the 18th and early 19th centuries, Ahmedabad was one of the most important centres of trade and commerce in western India. Ahmedabad's economic health revolves around the textile mills established in the early part of this century. Until the early 1980s, Ahmedabad boasted of 62 large textile mills and was known as the "Manchester of India". Subsequently this Industry went into a decline resulting in the closure of 24 of these mills, which rendered nearly 50000 workers jobless.

Bangalore, the state capital of Karnataka, was also a major British cantonment in 19th century alongside an older textile manufacturing and trading centre. Industrial

development of Bangalore gained momentum in the 1950s with the establishment of giant public sector undertakings like ITI, HMT and BEL. These companies set up their own townships on the outskirts of Bangalore and generated tremendous demand for ancillary units. The industrial base of Bangalore consists of large industries manufacturing capital goods, supported by small, medium and large ancillaries. Most of the sunrise industries in electronics and computer related services prefer Bangalore to almost any other location in the country. Bangalore is also strong in agribusiness, silk and warehousing.

In contrast to Pune and Bangalore, Hyderabad has a smaller manufacturing sector in its economic base. Historically, Hyderabad developed as a centre of trade and commerce, famous for its pearls. Like Pune, it also has major defence establishments. Being the state capital of Andhra Pradesh, larger proportion of employment is in the government sector. Chemicals, machinery and metal products account for a large number of industrial units. The city is trying to attract investment in modern hi-tech industries and information technology.

Table 3:	**ECONOMIC BASE**			**(Census, 1991)**
Functional Category	**Pune** (MC+OG)	**Ahmedabad** (MC+OG)	**Bangalore** (MC+OG)	**Hyderabad** (MC+OG)
I. Labour Force				
Main Workers (no.)	537014	854701	1087681	848629
Total Workers (no.)	550566	865024	1094690	860687
Participation Rate (% of pop.)	31.9	29.3	33.2	26.7
II. Sectoral Distribution of Main Workers				**(%)**
Agriculture and Mining	2	2	2	1
Manufacturing	27	38	33	19
Construction	11	5	8	8
Trade/ Commerce	22	25	24	29
Transport & Communications	8	9	9	12
Govt. & Community Services	30	21	24	31
Total	100	100	100	100

Source: Census of India 1991, 'Functional Classification of Urban Agglomeration/ Town of India 1991', Occasional Paper No 3 of 1994, New Delhi.

Though the four cities covered in this study have evolved through different historical experience, they have also followed somewhat similar paths of industrial development and each has developed a reasonably stable economic base with a diversified mix of industries. The future growth of their economies would depend critically on their ability to sustain industrial development in a liberalising national economy, a globalising market place and limited environmental carrying capacity.

3.2 Employment Trends

A comparison of the results of the 43rd and 50th rounds of the National Sample Survey shows some interesting trends of the employment situation in the four cities. During 1993-94 Ahmedabad and Bangalore had higher proportion of employed males in the working age population. In 1987-88, Hyderabad had the highest employment rate for males. Pune had the highest proportion of employed females in 1987-88 and 1993-94. The unemployment rate for males was highest in Pune and lowest in Hyderabad in 1993-94. In 1987-88, Ahmedabad had the highest unemployment rate for males. The female unemployment rate in 1993-94 was high in Ahmedabad and Bangalore. It was lowest in Hyderabad. The unemployment situation for females in Ahmedabad in 1993-94 was much worse than in 1987-88.

Table 4: EMPLOYMENT TRENDS (NSS)

	Pune	Ahmedabad	Bangalore	Hyderabad
I. Employment				
No. of persons employed (usual status) per 1000 persons aged 15 yr. and above.				
Male				
1993-94	699	764	763	750
1987-88	750	755	745	773
Female				
1993-94	261	196	162	164
1987-88	214	141	169	169
II. Unemployment				
No. of persons unemployed (usual status) per 1000 persons aged 15 yr. and above.				
Male				
1993-94	48	44	38	20
1987-88	45	71	59	41
Female				
1993-94	61	137	134	6
1987-88	82	14	51	61

Sources: 1.NSS fiftieth round (1993-94) and

2.NSS forty- third round (1987-88).

3.3 Investment Climate

New investments are crucial for maintaining the economic health of a city. With liberalisation of the national economy, the major cities of India find themselves amidst intense competition for attracting major investments, which promise new jobs and higher incomes. No doubt what distinguishes a success story from a failure are comparative advantages and disadvantages, some inherent and others developed over time.

Since the 1980s, Bangalore has been considered India's best city for business, its major advantages being high quality manpower, state government support, cleanliness, and mild climate. Pune is also a preferred business location due to its low-cost skilled manpower, stable law and order, and good climate (Business Today, Dec. 1996) A recently published report of the Centre for Monitoring Indian Economy ("Survey of Investments Projects", January 1998) provides a comprehensive listing of all investment projects, under implementation or proposed, in different states. This information has been compiled for the four cites, after categorising the investment projects into major economic sectors..

Pune's strong economic base in traditional manufacturing continues to dominate. Largest projects under implementation are for manufacturing of steel, colour picture tubes, city cars and auto ancillaries. A Rs. 200 crore project of Bajaj Auto is under implementation. Several floriculture projects are proposed.

Bangalore is clearly the location of choice for hi-tech manufacturing industries (especially electronics) and services (especially software development and hotels). Large number of projects are proposed in floriculture, software development and electronic components. Infrastructure projects in the pipeline include a thermal power plant, Light Rail Transit system and an international airport.

Investment projects under implementation in Hyderabad and Ahmedabad are mainly in the traditional manufacturing sector. These cities are practically drawing a blank in high-tech manufacturing. NTPC has proposed a gas based thermal power project in Hyderabad with investment of Rs. 2021 crore. Considering only the projects under

implementation during 1997, Hyderabad could attract less than one-third of the investment in Pune or Bangalore.

Table 5:	**SURVEY OF INVESTMENT PROJECTS**			**(1996-97)**
	Pune	**Ahmedabad**	**Bangalore**	**Hyderabad**
(Rs. Crore)				
I. Agriculture & processing				
Proposed	-	25	20 +	-
Under implementation	5	-	+	-
II. Manufacturing (traditional)				
Proposed	27	144	141	-
Under implementation	761	186	102	133
III. Manufacturing (hi-tech)				
Proposed	-	-	15.0	-
Under implementation	320	-	110	-
IV. Services				
Proposed	54	+	224	+
Under implementation	90	212	462 +	30
V. Infrastructure				
Proposed	100	920	7196	2049 +
Under implementation	90	14	58	101
VI. Total				
Proposed	181	1089	7596	2049+
Under implementation	1266	412	732	264

Source: Compiled from CMIE, 1998, " Survey of Investment Projects".

Note: + indicates investment amount not available for some projects.

3.4 Income Distribution

The overall income distribution in Pune is significantly better than in other three cities according to the findings of a NCAER survey conducted in 1993. Hyderabad also has smaller proportion of its population in the lower income categories (upto Rs. 40,000) compared to Ahmedabad and Bangalore. Both Bangalore and Ahmedabad have a greater proportion in the middle income categories (Rs. 40,001 to Rs. 86,000).

Table 6:	**INCOME DISTRIBUTION**			**(1993-94)**
Income Group (Annual HH income)	**Pune**	**Ahmedabad**	**Bangalore**	**Hyderabad**
				(%)
up to Rs.20,000	18.37	18.24	30.96	20.30
Rs. 20,001 to 40,000	20.32	43.37	34.05	37.61
Rs. 40,001 to 62,000	30.26	23.28	18.48	22.71
Rs. 62,001 to 86,000	17.74	9.86	10.45	10.97
above Rs. 86,000	13.30	5.25	6.05	8.41
Total	100.0	100.0	100.0	100.0

Source: 'Indian Market Demographics' , NCAER, 1995

4. INFRASTRUCTURE

4.1 Physical Infrastructure

All of the four cities have medium-sized airports and are well-linked to regional metropolitan centres and the national hubs. Ahmedabad, Bangalore and Hyderabad airports have limited international services. Pune's air links are relatively less developed. Major new airport projects are also proposed in Hyderabad and Bangalore. The four cities are also equally well connected by rail and road to their hinterlands, the regional centres and to the national networks for passenger as well as cargo movement. Pune has particularly good link to Bombay, which is India's premier commercial centre.

Bangalore has the maxium availability of roads per unit area and population. The road density is nearly 0.4 times of Hyderabad, 2.2 times of Ahmedabad and 3.5 times of Pune. Municipal corporations of Pune and Ahmedabad operate their own local bus transport services, while these are provided by the state roadways corporations in Hyderabad and Bangalore. Pune has highest telephone connections per capita. Ahmedabad has the highest per capita electricity consumption, while Hyderabad has the lowest.

Table 7:		**INFRASTRUCTURE**			**(1996-97)**
	Units	**Pune** (MC)	**Ahmedabad** (MC)	**Bangalore** (MC+OG)	**Hyderabad** (MC+OG)
Road					
Length	Km	590	1215	3200	2000
Density	Km/ sq.Km	4.0	6.4	14.1	10.3
Intensity	Km/lakh persons	32.7	38.3	80.8	54.4
Public Transport	No. of buses	813[a]	724[a]	1926[b]	1190[b]
Electricity		(UA)	(MC+OG)	(UA)	(MC+OG)
Generation	MW	-	550	-	-
Consumption	MKWh	2124	2559	2750	1138
Telephones		(MC+OG)	(MC+OG)	(MC+OG)	(MC+OG)
No of connections	Per thousand persons	85.3	68.3	78.2	77.7
Primary Schools	Per lakh persons	23.2	39.7	82.5	17.0
Secondary Schools	Per lakh persons	44.6	13.0	15.4	21.7
Hospitals & Nursing homes	Per lakh persons	26.3	22.0	11.3	5.7

Sources: 1. Respective municipal corporations, telecom agencies and state electricity boards.

2. AMC, Statistical Outline, 1994-95

Notes : a. Municipal Transport agencies PMT and AMTS provide only local services.

b. State Roadways Transport Corporations, APSRTC and KSRTC provide intercity services also.

4.2 Education Facilities

Pune and Bangalore are recognized centres of quality higher education in their respective states. This is also seen from the high number of general colleges and other higher education institutions. Bangalore has 73 general colleges followed by 51 in Pune. Hyderabad has 184 general colleges out of which 127 are for higher secondary only. Ahmedabad has the least number of general colleges. Pune has better facilities of higher education, as it hosts maximum number of medical and engineering colleges as compared to the other cities.

Ahmedabad has more number of municipal primary schools , which cater to the children from economically disadvantaged households. Hyderabad has the lowest student to teacher ratio, followed by Ahmedabad. Pune has the highest number of secondary schools, most of which are private.

Table 8:	EDUCATIONAL FACILITIES			(1996-97)
	Pune (MC)	**Ahmedabad** (MC)	**Bangalore** (MC)	**H'bad** (MC)
I. Primary [a]				
Total (per lakh population)	430 (24)	1284 (40)	2406 (84)	826 (22)
Municipal	232	564	11	-
State	-	-	1191	284
Private	194	720	1204	542
Student-Teacher Ratio	48:1	41:1 [b]	48:1	34:1
II. Secondary				
Total (per lakh population)	826 (26)	422 (22)	449 (12)	645 [c] (6)
Municipal	20	5	44	-
State	-	3	12	118
Private	802	414	392	400
Student -Teacher Ratio	33:1	29:1	35:1	32:1
III. Higher Education				
General Colleges	51 [d]	48	73 [d]	57
Medical Colleges	14	5	5	3
Engineering Colleges	15	2	10	9
Universities	1	2	2	7

Source: 1. District Education Officer, Pune, University of Pune.

2. Statistical outline of Ahmedabad : 1996 -97.

3. Education Officer, Hyderabad and Bangalore.

Notes: a. includes upper primary schools.

b. For only Municipal schools.

c. Includes higher secondary schools also.

d. Some in Bangalore and Pune allow enrolment for higher secondary.

4.3 Health Facilities

Bangalore and Ahmedabad have more municipal health facilities compared to the other cities. The AMC operates a mix of dispensaries, nursing homes, family welfare centres as well as full-fledged general hospitals. BCC also has large number of dispensaries. Hyderabad has highest number of child welfare centres. Again Bangalore has more specialised hospitals. Pune and Ahmedabad are more dependent on private nursing homes and hospitals while in Hyderabad, major health facilities are provided by the state government.

Table 9:	**HEALTH FACILITIES**			**(1996-97)**
	Pune	**Ahmedabad**	**Bangalore**	**Hyderabad**
I.Muncipal Health Facilities				**(Number)**
Allopathic Dispensaries	11	22	23 + 3 (mobile)	5
Ayurvadic Dispensaries	1	3	1	2
Unani Dispensaries	-	2	1	1
Maternity Homes	12	18	30	1
Dental Clinics	3	4	3	-
Child Welfare Centres	2	-	3	22
Family Welfare Centres	7	31	38	34
II. Hospitals and Nursing Homes				**(Number)**
General Hospitals	22	17	25	19
- Corporation	1	6	-	-
- Government	5	2	10	19
- Private	16	9	15	-
Specialised Hospitals	1	4	6	3
Private Nursing Homes	452	681	300	190

Sources: PMC, AMC, BCC and MCH

5. CIVIC SERVICES

5.1 Water Supply

In Pune and Ahmedabad, water supply to the city is the responsibility of their respective municipal corporations while in Hyderabad and Bangalore water is supplied by state government agencies, the Hyderabad Metropolitan Water Supply and Sewerage Board (HMSSB) and Bangalore Water Supply and Sewerage Board (BWSSB).

At 263 litres per capita per day (lpcd) in 1996, the municipal water supply in Pune was considerably more than any of the other three cities. The situation was worst in Hyderabad where the actual supply was only 127 lpcd. Neither Bangalore nor Ahmedabad is near the optimum level of 200 lpcd recommended for cities of their size. The duration of supply is double in Pune than other three cities.

Hyderabad's problems are usually related to the drop in the levels of the Himayatsagar and Osmansagar reservoirs. Bangalore has also had precarious water supply situation due to slow progress of Cauvery Water Supply Schemes while its population has grown rapidly. Ahmedabad has suffered due to reduced availability of water in Sabarmati river after construction of Dharoi dam upstream. The water works commissioned in 1996 helped PMC to increase its actual supply to a satisfactory level.

Residential and industrial consumers in Ahmedabad and Hyderabad depend significantly on private borewells to meet their requirements. This is especially alarming for Ahmedabad where the water table is already low and is dropping rapidly. BWSSB is planning to drill over 4000 borewells to meet the city's future requirement. Even Hyderabad is seeing the proliferation of private borewells in newly developed areas.

The area served by municipal water supply is highest in Pune with 100 % coverage within municipal boundaries. But the network of pipelines for supplying water to the consumers is most extensive in Ahmedabad with network density of 11.7 Kms per sq.km. No data on condition of pipeline network were available, but all four cities regularly experience outbreaks of waterborne diseases caused by contaminated drinking

water.Total number of connections are maximum in Bangalore followed by Ahmedabad. Hyderabad has maximum metering (95 %) followed by Pune (54 %), while Ahmedabad has only 3% metered connections.Bangalore also provides maximum public taps per lakh slum population. Ahmedabad and Hyderabad lag behind on this score.

Water tariffs in Ahmedabad are lowest, with 97 % of connections are unmetered, both domestic and non-domestic customers are levied a low annual fixed charge. Water rates in Bangalore are also low, as there is a free allowance upto first 16000 Kilolitres. The tariffs in Pune and Hyderabad are considerably higher.

Table 10:	WATER SUPPLY				(1996-97)
	Units	**Pune** (MC+OG)	**A'bad** (MC)	**B'lore** (MC+OG)	**H'bad** (MC+OG)
I. Water Supply					
System capacity	(MLD)	843	463	711	700
Municipal supply	(MLD)	657	415	551	585
Private Borewells [a]	(MLD)	-	150	150	150
Per capita supply					
Municipal	(LPCD)	263 [b]	130	139	127
Total	(LPCD)	263	178	177	147
Hours of supply	(hr./ day)	2-4	1-1.5	1-2	1.5-2
II. Network Coverage					
		(MC)	(MC)	(MC)	(MC)
Area	(% of MC area)	100	84	85	90
Density	(km / sq.km)	4.4	11. 7	n.a	9.6
III. Connections					
Connections	/lakh persons	7128	7282	8949	7098
Public Taps	/ lakh slum pop.	714	230	1184	131
Metered	(%)	54	3	n.a	95
IV. Tariffs					
Rate (domestic)	(Rs/ Kl)	4	1.50	0.8-9	3-10
Min.charge (domestic)	Rs.	40	108 p. a.	n.a	40
Rate (non-dom.)	(Rs./Kl)	10	4	9-20	5-12
Min. charge (non-dom)	Rs.	1000 p.m.	360 p. a.	90 p.m.	1000 p.m.

Sources: 1. BCC, AMC

2. PMC 'Environmental Status Report'

3. EPTRI, 'Environmental Status Report of Hyderabad'

4. Bangalore Water Supply and Sewerage Board, 'Handbook of Statistics', 1993 & 1995.

Notes: a. Estimated water consumption.

b.Water supply is provided to the areas within five Kms. from PMC limits to an estimated population of 25.0 lakhs.

5.2 Sewerage and Drainage

None of the four cities can be described as having a satisfactory sewerage and drainage system in place. All of them have several localities without underground sewer lines or covered drains. The slum areas invariably lack this amenity and as a result the slumdwellers live in extremely unhygienic conditions. During 1996, newspapers from all four cities reported several incidents of contamination of drinking water with sewage through corroded pipes.

The Bangalore City Corporation areas are fully covered by underground sewerage network but coverage in the outskirts is low. In Hyderabad areas outside the corporation limits do not have underground network. In Ahmedabad the network is being expanded but many portions of the old network are badly corroded and need to be replaced. These cities are still struggling with the problem of treating large quantities of wastewater stream that contains not only domestic sewage but also highly polluted industrial effluents discharged into the urban sewers.

Ahmedabad has installed capacity to provide secondary treatment for 258 MLD of sewage. This accounts for 57 % of the total sewage generated. According to the Annual Reports of the BWSSB, Bangalore has installed capacity to provide primary and secondary treatment for 163 MLD of sewage and only primary treatment for additional 123 MLD of wastewater. This amounts to 51 % of total sewage generated. Hyderabad treats only 19 % upto primary stage. Pune lags behind the others with operating capacity to treat only 15 % of its sewage.

Table 11:		SEWERAGE			(1996-97)
Parameter	**Units**	**Pune** (MC+OG)	**Ahmedabad** (MC)	**Bangalore** (MC+OG)	**Hyderabad** (MC+OG)
Qty. Generated [a]	(MLD)	526	452	521	588
Network Coverage					
Area Sewered	(%)	100 (MC)	n.a	72 (MC)	65 (MC)
Network Length	Km.	552.5	1117.7	n.a	1629
Network Density	(km per sq. Km)	3.2	6.0	n.a	7.6
Treatment Capacity					
Primary	(MLD)	80	-	123	113
Secondary	(MLD)	-	76+182	163	-
Effectiveness	(%)	15.2	57.1	54.1	19.2

Sources : AMC,BCC,MCH,PMC

Notes :a: Includes rough estimates of wastewater due to water consumption from domestic and non-domestic private borewells but not effluents of industrial zones.

The consequence of failure of these cities to treat their wastewater is that their precious rivers and other waterbodies are heavily polluted by untreated sewage disposed in them daily by an ever-increasing population. The Sabarmati river in Ahmedabad is one of the most polluted in the country. Mula and Mutha rivers in Pune are also in a terrible state. Sewage disposal is responsible for polluting the Hussein sagar lake in Hyderabad.

5.3 Solid Wastes

Garbage heaps are the most visible sign of lack of sanitation in the urban environment and, despite enormous efforts, some parts of all these cities remain littered with garbage day after day. The Ahmedabad Municipal Corporation manages to collect 85 % of the solid wastes generated in the city, which is slightly better than the others. Pune's municipal corporation has the lowest collection effectiveness.

Until recently all four cities were dumping their garbage in open landfills on the outskirts. None practiced sanitary landfilling. All of them are now exploring various options. Ahmedabad has contracted with Excel Industries Ltd. to convert 500 tones of garbage per day into enriched soil conditioner manure. The others are also seriously exploring this option. All four cities are also attempting to involve NGOs, volunteers, ragpickers and the community to improve the efficiency of houses-to-house collection.

Among the four cities, the solid waste collection system of Pune is most labour intensive. Ahmedabad's system is most efficiently managed with least manpower deployed per ton of wastes collected and a not too large fleet of specialised vehicles. For street cleaning, Bangalore deployed more than twice the manpower per unit area than any other city. Nearly fifty percent of the solid wastes operations in Bangalore are contracted outtoprivate providers.

Table 12:	SOLID WASTES				(1996-97)
Parameter	**Units**	**Pune** (MC+OG)	**A'bad** (MC)	**B'lore** (MC+OG)	**H'bad** (MC)
Average generation [a]	(Tonnes /day)	810	1430	1780	1650
Average collection	(Tonnes /day)	550	1215	See note b	1260
Collection Effectiveness	(%)	68 %	85 %	-	76 %
Vehicles deployed					
Trucks/ lorries	No.	20	-	265 [c]	-
Tippers	No.	52	73	-	107
Dumper placers/ JCB	No.	30	20	13	-
Compactors	No.	-	1	-	36
Others	No.	-	22	-	31
Manpower deployed for					
SW removal	No.	1247 [d]	531	n.a	824
Street cleaning	No.	3700	7000	n.a	4000
Total	No.	4947	7531	10878	4824
Per Unit Resources					
Vehicles	per tonne	0.19	0.1	n.a	0.14
Manpower(SW removal)	per tonne	2.3	0.4	n.a	0.7
Manpower (st. cleaning)	persons/sq. Km	32.5	39.6	86.3	27.9

Sources: AMC,BCC, MCH and PMC.

Notes : a. Estimated @ 450 gms per capita per day.

b. The BCC reports quantity of solid wastes generated and collected daily is 2500 tonnes. This seems highly exaggerated. In any case BCC is responsible for solid waste removal in roughly half of the city, while the remainder is contracted out to private operators.

c. Out of these vehicles BCC owns 85, while 185 are hired.

d. Assumption : Out of 800 daily wagers 300 are assigned for SW removal and 500 for street cleaning.

5.4 Slums

It is tragic that such large number of people in urban centres must live in slums characterised by dilapidated housing, absence of basic amenities and insanitary living environment. Among the cities covered in this study, Ahmedabad has the highest proportion of its population living in slums (41 %), and has the largest number of slums. Pune's slum population is 39 % of the total. Thirty per cent of Hyderabad's population lives in slums while in Bangalore this proportion is 22 per cent.

In Ahmedabad and Hyderabad more than 2/3rd of the slum population have access to water supply, while in Pune only 60% have the same. Ahmedabad's slum dwellers are better off as 70 % of them are provided with toilet facility. In Pune more than half of the population does not have proper sanitation facilities. Seventy percent of Hyderabad's slum population have electricity followed by 45 % in Pune.

Table 13:	**SLUMS**			**(1996-97)**
	Pune (MC)	**Ahmedabad** (MC)	**Bangalore** (MC+OG)	**Hyderabad** (MC+OG)
No. of Slums	444 [a]	2412 [b]	400	811 [c]
Slum population (lakh)	7.04	13.07	8.8	11.0
Proportion of total pop. (%)	38.8	41.1	22.2	29.9
Basic Amenitiescoverage (as reported by corporations)				**(% of households)**
Water Supply	60	70	n.a	70
Toilets	48	70	n.a	55
Electricity	45	n.a	n.a	70

Sources: AMC, BCC, MCH, and PMC

Notes: a.This figure includes 136 non-declared slums.

b.This figure includes 1383 chawls, which are dilapidated blocks of single room tenements.

c. This figure includes 391 denotified slums.

5.5 Municipal Finances

The following analysis is based on the budget documents and summary statements provided by the municipal corporations of the respective cities. The comparisons pertain to 1995-96, the latest year for which actual accounts were available. Budget estimates were found to be generally not too reliable. The revised estimates of 1996-97, as reported in the budget documents of the respective corporations, have been compiled in a consistent format and are included in appendix 5 of this report.

5.5.1 Revenue Accounts

With total revenue income of Rs. 354 Crore in 1995-96, the Ahmedabad Municipal Corporation (AMC) was the richest local body. The Pune Municipal Corporation's (PMC) revenue receipts of Rs. 237 crore are equally impressive, given that Pune's population is roughly half of the other three cities. The Bangalore City Corporation's (BCC) total revenue was Rs. 169 crore, while the Municipal Corporation of Hyderabad raised only Rs. 91 crore.

PMC's total expenditure in 1995-96 was Rs.154 crore, which left it a surplus of Rs. 83 crores on revenue account. Ahmedabad spent Rs. 295 crores, Bangalore 148 crore, and Hyderabad Rs. 67 crore, which resulted in revenue surpluses of Rs. 59 crore, Rs. 21 crore and Rs. 24 crore respectively. Presumably the surpluses generated by them went towards retirement of debt and minor capital expenditure etc. It is important to note that MCH is not responsible for water supply in Hyderabad and BCC's involvement is limited to providing water for public taps only. This difference should be recognised not only on the expenditure side but also on the income side since property tax is usually levied as a combination of general property tax, water tax and conservancy tax.

On the expenditure side of revenue accounts, AMC spent maximum portion of its budget (20%) on education. BCC and MCH spent most on public works, while Pune spent most on water supply compared to other services. In terms of per capita expenditure, the differences among the four corporations are surprisingly large. The AMC wins hands down with Rs. 928 spent per citizen. PMC comes next at Rs. 856 per

capita, BCC follows with per capita spending of Rs. 516, but MCH is way behind spending only Rs. 183 per citizen.

AMC's per capita expenditure on general administration is much higher than the others. The PMC spends nearly 1.5 times as much as AMC on public health and more than two times as much on water supply. AMC spends more per capita on conservancy than the others do. AMC spent Rs. 182 per capita on education compared to Rs. 159 spent by PMC.Hyderabad lags behind in almost all categories of municipal expenditure on per capita basis. Bangalore does well on public works and conservancy.

On the income side of revenue accounts, the most significant factor is the substantial income from octroi obtained by AMC and PMC, which was 57 % and 50 % of total revenue income respectively. Interestingly, BCC got a grant of Rs. 60 crore from state government in lieu of octroi. This amounts to nearly one-third of its total income. In contrast to this, MCH received a minuscule compensation of Rs. 9 crore in lieu of octroi from the state government.

Not surprisingly, MCH obtained 59 % of its income from property taxes (general, water and conservancy) while the share of these taxes was 29% for BCC , 24 % for PMC and only 22% for AMC. AMC raised more revenue from non-tax receipts, mostly charges for services, than PMC and MCH, but less than BCC.

Table 14:	PER CAPITA REVENUE ACCOUNTS			(1995-96)
Category	**Pune**	**Ahmedabad**	**Bangalore**	**Hyderabad**
I. Per Capita Revenue Income				**(Rs.)**
Octroi	661.2	639.1	-	-
Property Tax	117.4	111.2	174.2	110.5
Water Tax	154.7	56.5	-	-
Conservancy Tax	54.3	78.7	-	36.1
Other taxes	91.3	5.5	55.1	39.2
Non Tax receipts	-	82.1	149.9	38.3
Grants	234.0	142.1	208.0	23.3
Total	**1312.9**	**1115.1**	**587.1**	**247.3**
II. Per Capita Revenue Expenditure				**(Rs.)**
Gen. Administration	61	147	43	23
Public Works	49	73	162	62
Water Supply	166	90	42 [a]	- [b]
Conservancy	25	144	99	62
Public Health	179	114	36	10
Public Safety	11	34	28	6
Education	159	182	24	1
Total	**856**	**928**	**516**	**183**

Source: AMC, BCC, MCH and PMC

Notes. a. Water supply in Bangalore is primarily by BWSSB, but provides supply to public taps, parks, school etc.

b. Water supply in Hyderabad is by HMWSSB. No role of MCH

5.5.2 Capital Accounts

The picture of capital income and expenditure of these cities is rather hazy because of lack of complete information in the budget documents and inconsistencies in accounting procedures. In any case, during 1994-95 MCH had the highest capital income (Rs. 47.3 crore) and expenditure (Rs. 34.6 crore). Again in 1995-96, MCH maintained

the lead, followed by AMC. In 1995-96, PMC and AMC more than doubled their capital expenditure, while Bangalore spent the least.

The sources of this income were mostly grants and loans from the state and central governments, financial Institutions and the World Bank.Since 1994 -95, all four cities have become more resourceful in raising capital income and more ambitious about capital expenditures. Bangalore and Hyderabad having been designated as Mega Cities are receiving central assistance and matching state grants for development of urban infrastructure. Ahmedabad is receiving financial assistance under the National River Action Plan for controlling pollution of the Sabarmati river. All of these cities are seeking much larger assistance from HUDCO, World Bank, Asian Development Bank, etc. The buzzwords of capital expenditure today are no longer footpaths and storm water drains but rather LRT systems, airports, flyovers and of course, municipal bonds.

As a postscript to the budget analysis it may be noted that CRISIL has given AA-(so) credit rating to AMC for its Rs. 100 crore bond issue, which was successfully subscribed. The PMC followed suit by obtaining AA rating for it's proposed bond issue for Rs. 200 crore in 1998. BCC is also planning a bond issue in 1998.

Table 15 : CAPITAL ACCOUNTS

	Pune	**Ahmedabad**	**Bangalore**	**Hyderabad**
I. Capital Receipts				**(Rs. Crore)**
1994-95	n.a	38.30	16.37	47.84
1995-96	n.a	31.96	4.54	39.4
1996-97 (R.E)	61.68	9.82	52.39	70.16
II. Capital Expenditure				**(Rs. Crore)**
1994-95	32.92	27.49	15.05	34.55
1995-96	69.58	66.55	7.45	19.35
1996-97 (R.E)	107.96	72.44	36.03	68.46

Source: AMC, BCC, MCH and PMC

Table 16 :	PROPOSED CAPITAL PROJECTS		
	Type of Projects	**Source of Funding**	**Investment**
I.Upgradation			**(Rs. Crore)**
Pune	Water Supply	HUDCO	13.5
	Public Works	PMC	0.7
	Roads	Govt. of Maharashtra	2.0
	Slaughter Houses	Ministry of Animal Husbandry	8.0
Ahmedabad	GIDC	Industries	28.00
	East Ahmedabad Project	HUDCO	31.00
Bangalore	Sewerage	Private Sector	n.a
Hyderabad	Sewerage	World Bank	44.8
	Gardens	Govt. of Netherlands	10.0
II.New Infrastructure			**(Rs. Crore)**
Pune	Water Supply	HUDCO	500
	River Conservation (NRCP)	State and Central Government	130
	River Development	Self Financing	n.a
	Sewerage	PMC	350
	MRTS	Private sector	4000
Ahmedabad	River Conservation (NRCP)	State and Central Government	98.7
	Water Supply & Sewerage	HUDCO , Municipal Bonds, USAID	195.4
	River Development	Self Financing	n.a
Bangalore	Water Supply	Private sector	1072.0
	LRT	Private sector	4000
Hyderabad	Water Supply	Megacity Grant	112.0

Source: AMC, BCC, MCH and PMC

6. GENERAL ENVIRONMENT

6.1 Pollution

There is an obvious connection between the increasing air and water pollution and high incidence of diseases in all four cities. Newspapers frequently report the contamination of drinking water from leaking sewers and the alarming increase in air pollution from vehicles each of these cities. Their waterbodies (rivers, lakes, ponds etc.) in these areas are highly polluted by discharge of domestic sewage and industrial effluents and pose a very serious threat to public health both in the cities and in the settlements downstream.

Pune

Vehicular ownership in Pune has been growing at a very high rate and this is considered to be the major cause of high levels of pollution. A study conducted by the University of Pune identified the diesel vehicles as well as the six-seater autorickshaws as main contributors to air pollution. Another study carried out by an NGO (Mashal, 1997) showed that the street-level concentrations at busy crossings and congested locations were considerably above the standards prescribed by CPCB. Low traffic speeds due to congestion were identified as one of major the causes.

Though Pune is fortunate in having two rivers (Mula and Mutha) to meet its water requirements, the river system is already highly polluted. A study conducted by the University of Pune in April 1997, tested water samples at various sampling points along the river. It found that, right from the point of confluence of the two rivers, the water is highly polluted and is suitable only for agricultural and industrial purpose. Most of the riverbed is covered with dense growth of water hyacinth, which becomes a breeding place for mosquitoes. Industrial and domestic effluents are discharged in the river in large quantities. Another study of river water quality conducted by Mashal (July 1997) found it to be unfit for human consumption. The ground water along the course of the river was also found to be highly polluted.

Ahmedabad

With the number of vehicles in Ahmedabad increasing at the rate of nearly 10 % a year, air quality of the city is deteriorating. Ambient concentration of SPM in the air has been very high in Ahmedabad since more than a decade, especially in the industrial and mixed-use areas. An environmental risk assessment study conducted by the Centre for Environmental Planning and Technology (CEPT) rates air pollution as posing the highest

health risk to the city's residents. Apart from vehicular pollution, the study identifies indoor air pollution from cooking fuels as a major health risk for the poor, especially women.

Water pollution is the major cause of high incidence of jaundice and gastro-enteritis diseases in the city, although the AMC has taken effective steps such as replacing corroded water pipes to address the problem. The Sabarmati river, which is the city's main source of water supply, is considered one of the most polluted stretches of the country. The city has initiated a major project under the National River Conservation Plan to reduce pollution in the Sabarmati. Another major area of concern for Ahmedabad is the effluents discharged by the three industrial estates in the east, which were annexed into the city in 1986. The Kharicut canal, which carries these effluents has contaminated the ground water in many villages down stream and is causing enormous damage. The industries are in the process of setting up common effluent treatment plants, but these problems many not be easily tackled.

Bangalore

Bangalore's problems of air and water pollution are no less serious than those of Pune and Ahmedabad. A number of studies have noted the increasing pollution levels in the city. A study by the Indian Institute of Science identifies vehicular pollution as a major cause of the increase in respiratory diseases and allergy related disorders among the city's residents.

Like other cities, water- borne diseases are common in Bangalore. Flow of untreated sewage into lakes and tanks, corroded pipes and overflowing drains are the obvious causes of water contamination. A study by the Centre for Science and Technology in 1996 found that ground water in the city's outgrowth areas was unfit for drinking. A number of lakes and tanks in the city have got filled with domestic solid and liquid wastes creating conditions for outbreaks of dengue and malaria epidemics.

Hyderabad

Hyderabad's environment is deteriorating in a similar pattern as in the other three cities. Noxious emissions from industries and vehicular emissions are the major contributors to air pollution. A study by Environmental Protection Training and Research Institute found excessive levels of pollutants at the city's busy traffic intersections. Another study showed that nearly 25 % of school-going children between the age of 6 and 7 years suffer from asthma.

The state of the Musi river in Hyderabad is no better than Mutha in Pune or Sabarmati in Ahmedabad. It has become just a sewage canal carrying untreated domestic and industrial effluents. Studies of water quality along the river show high levels of pollution throughout. The Hussainsagar lake, located in the middle of the twin cities, receives domestic sewage and effluents from various industrial estates. The toxic, heavy metal contaminants from the lake have also been found in the surrounding ground water aquifers.

The Central Pollution Control Board (CPCB), which monitors air quality in various urban centres, has only two monitoring stations in Pune, three each in Ahmedabad and Bangalore, and four in Hyderabad. This is clearly inadequate for assessing the extent of air pollution. According to these estimates, in terms of annual average levels of SPM in the ambient air, Ahmedabad has the worst air quality, followed by Bangalore, Hyderabad, and Pune in that order. The Centre for Science and Environment (CSE), Delhi, estimates that there are nearly 3000 premature deaths annually due to air pollution in Ahmedabad. In terms of vehicular pollutants, CSE estimates the maximum load in Bangalore followed by Ahmedabad, Pune and Hyderabad in that order.

6.2 Public Health

The relative state of public health in different cities may be deduced by their aggregate vital health statistics. Surprisingly, the four cities show very high variation on these parameters. Hyderabad has the highest birth rate and lowest death rate. In contrast, Pune has the lowest birth rate and highest death rate, as well as rate of still births, in Pune is alarmingly high. Overall, the vital health statistics in these cities are better than the national average.

The detailed information on incidence of major diseases, obtained from the respective municipal corporations also shows that the status of public health in Pune is the worst. In 1996, there were 619 deaths fron gastro- enteritis in Pune, 75 in Hyderabad, 14 in Ahmedabad and 9 in Bangalore.The incidences of cholera is also the highest in Pune. The data on various diseases in reported in table 24 were not uniformly available in

the four cities and therefore these comparisons are somewhat incomplete. Yet all four cities are reported to have high incidences of water-borne diseases. The incidences of tuberculosis, malaria , and viral hepatitis is also reported to be extremely high in these cities.

Table 17:	**VITAL HEALTH STATISTICS**				**(1996-97)**
	All India	**Pune**	**A'bad**	**B'lore**	**H'bad**
Birth Rate (per thousand)	26.19	20.52	25.27	25.1	30.00
Death Rate (per thousand)	8.87	8.29	7.65	7.1	5.68
Infant Mortality Rate (per thousand live births)	65.5	53.89	28.97	30.0	8.87
Still Birth (per thousand live births)	n.a	45.05	7.14	18.1	17.20

Sources: 1. PMC, BCC, MCH

2.Statistical Outline of Ahmedabad, 1996-97

Table 18 :	INCIDENCE OF DISEASES			(1996-97)
	Pune	**Ahmedabad**	**Bangalore**	**Hyderabad**
I. Water- borne diseases				
G.E.	2302 (619)	4940(14)	3273 (9)	11000(75)
Cholera	225	100	76	141
Diarrhoea	84 (19)	n.a	n.a	n.a
Typhoid	n.a	266	n.a	n.a
II. Other Diseases				
Infective / Viral Hepatitis	178 (12)	808 (24)	na	600 (1)
Diphtheria	n.a	126	6	n.a
Tuberculosis	850 [a]	1574 (213)	n.a	1700
Pneumonia	n.a	548 (65)	n.a	n.a
AIDS	1903 (42) [a]	Significant [b]	Significant [b]	Significant [b]
Tetanus	n.a	34 (12)	45 (14)	n.a
Rabbis	n.a	n.a	19 (19)	n.a
Measles	n.a	90 (7)	4	n.a
Polio	n.a	1	n.a	n.a
Enteric Fever /Meningitis	10 (6)	65 (22)	n.a	1400

Source: AMC, BCC, PMC & MCH

Notes: 1. Figures in parenthesis indicate number of deaths.

2. a : Mashal, Pune

b : Hindu Survey of Environment, 1997.

6.3 Traffic

Among the four cities, Bangalore has highest vehicle population followed by Hyderabad. The vehicle ownership per lakh population is also highest in Bangalore followed by Pune. Pune has the highest number of three- wheelers. Hyderabad has the least number of vehicles per lakh population in all categories per lakh population. Pune has an alarmingly high rate of road accidents, which is almost double of the other cities. Rate of fatalities in road accidents is highest in Bangalore, which is twice that of Hyderabad and not much better in Pune. Ahmedabad has the lowest fatality rate in road accidents.

Table 19: TRAFFIC

Category	**Pune** (MC+OG)	**Ahmedabad** (MC+OG)	**Bangalore** (MC+OG)	**Hyderabad** (MC+OG)
I. Vehicle Ownership (1995)				**(Per lakh population)**
All Vehicles	17887	14879	20824	14900
Two Wheelers	13355	11465	15519	11753
Three Wheelers	1377	1158	979	694
Cars, jeeps and taxies	1902	1577	3047	1710
II. Road Accidents (1996)				
Total Accidents	2625	1971	7370	2015
(per lakh population)	(123.7)	(55.6)	(52.6)	(54.8)
Persons Killed	283	173	575	310
(per lakh population)	(13.3)	(4.9)	(16.7)	(8.4)

Source: Pocket Book on Transportation Statistics in India, 1995.

6.4 Law and Order

Crimes are an important parameter to indicate the quality of social life of the City. Bangalore is one of the cities having higher crime rates in India. Again Bangalore has recorded highest number of crimes against women in 1995 followed by Pune. Total registered COG crimes under IPC are highest in Bangalore and, in Hyderabad, the crime rate as well as crimes against women are least compared to other cities.

Table 20:	**CRIMES**			**(1995)**
	Pune	**Ahmedabad**	**Bangalore**	**Hyderabad**
I. COG crimes under IPC				**(No. of cases)**
Murder	86	118	212	92
Theft	2013	4874	8387	2897
Robbery	99	138	524	51
Burglary	838	984	2660	1196
Riots	1444	200	419	252
Others	4979	9158	16697	4709
Total COG crimes	9459	15472	28899	9197
II.Crimes against women				**(No. of cases)**
Rapes	66	3	42	41
Molestation	92	35	181	38
Dowry Deaths	9	17	57	36
Kidnapping and abduction	26	112	72	42
III. Crime Rates				
Crimes per lakh population	538.67	487.15	1020.81	262.02
Crimes against women per lakh female population	22.2	11.2	25.8	8.8

Source: National Crime Record Bureau, 'Crimes in India, 1995'

7. SUMMARY OF FINDINGS

The main findings of this study are:

1. The cities of Pune and Bangalore have a stronger economic base than Hyderabad and Ahmedabad. Pune's strength is in traditional manufacturing whereas Bangalore is attractive to newer high-tech industries. Actually Hyderabad's economy has greater service orientation and lower cost of living for industrial workers, but its weak infrastructure is a deterrent. The declining textile industry is still the mainstay of Ahmedabad's local economy.

2. During the last decade, the employment situation in Ahmedabad and Bangalore has improved significantly for the male population but worsened for the female population. Pune's employment situation for females has improved greatly.

3. The income distribution of households is most skewed in Bangalore and least so in Pune. Pune also leads the other cities in the proportion of population in the upper middle and higher income classes.

4. Housing is more affordable in Hyderabad and Ahmedabad, as both Bangalore and Pune are more than twice as expensive. This is true for residential as well as commercial properties. Recent slump in property prices has hit all cities, though to a lesser extent in Hyderabad.

5. Bangalore leads in road infrastructure, while Ahmedabad is best placed with respect to electricity supply. Pune has more number of telephone connections per capita compared to the others.

6. Pune has more, and we believe better, educational facilities, though Bangalore has more primary schools than the other cities. Pune also leads in terms of number of private health care facilities, while others have better municipal facilities. Hyderabad has the largest number of state government run hospitals.

7. Civic services in all the cities leave a lot to be desired. Water shortages persist in Hyderabad, Banglore and Ahmedabad. What is worrisome is that, for all these cities, the future scenario of the water situation looks bleak. Water supply situation in Pune is better. The distribution network of Ahmedabad has better coverage, while Bangalore has more connections including public taps. Hyderabad and Pune have more metering and higher tariffs.

8. The sewerage network in all four cities is inadequate. All of them dispose their sewage in rivers and other waterbodies which are now dangerously polluted. Ahmedabad and Hyderabad have higher network density. Ahmedabad and Bangalore are able to treat over fifty percent of their sewage, while Hyderabad and Pune treat less than twenty percent.

9. While the municipal corporations in all these cities claim to be handling their solid wastes satisfactorily, data show that that there is lot of room for improvement. In any case, the media reports confirm that uncollected garbage is a major nuisance and health hazard in all four cities. Ahmedabad Municipal Corporation has higher collection efficiency as well as higher operational efficiency than the others.

10 Ahmedabad has 41% of its population living in slums and chawls, which is higher than any other city. In Pune, the slum population is 39 % of the total. Hyderabad has been successful in implementing slum improvement projects. Pune's slumdwellers are more satisfied with the access to the basic services than those in other cities.

11. The financial condition of the municipal corporations of Ahmedabad and Pune is significantly better than that of Bangalore and Hyderabad both in terms of revenue raising and per capita expenditure. They are also more enterprising in undertaking capital improvement projects and adopting innovative financing approaches.

12. All four cities have severe problems due to air and water pollution. Ahmedabad's air quality is marginally worse than the others and all of them have highly polluted waterbodies. Growth of vehicles, inadequate sewerage and drainage, slums, and non-conforming industries are the major contributors.

13. Vehicle ownership is highest in Bangalore in all categories except three-wheelers. Pune has an alarmingly high rate of road accidents, more than twice of the other cities. Rate of fatalities in road accidents is highest in Bangalore and lowest in Ahmedabad.

14. The law and order situation in the four cities shows significant variation. The crime rate in Bangalore is the highest. Hyderabad has the lowest crime rate, based on 1995 crime statistics. Crimes against women are highest in Bangalore and lowest in Pune.

15. Pune's vital health statistics are shocking as it has very high infant mortality rate and still births. Our data on incidence of disease also show an alarming situation in Pune.

16. Pune's citizen groups are most actively concerned about civic affairs. Ahmedabad is succeeding in mobilising public-private-NGO partnerships for implementing civic projects.

17. The following ***overall ranking*** of cities is suggested:

- **Local Economy :**
  1. Pune
  2. Bangalore
  3. Ahmedabad and Hyderabad
- **Civic Services:**
  1. Ahmedabad
  2. Pune
  3. Bangalore
  4. Hyderabad
- **Infrastructure:**
  1. Bangalore
  2. Pune
  3. Hyderabad
  4. Ahmedabad
- **General Environment :**
  1. Ahmedabad and Hyderabad
  2. Pune and Bangalore

Note : The above overall ranks are not necessarily based on summing of disaggregated rankings shown on the next page.

FINAL RANKINGS			
Parameters	**Pune**	**Ahmedabad**	**Bangalore**
1. *Economy*			
ECONOMIC BASE	❶	❸	❷
INVESTMENT CLIMATE	❶	❸	❷
INCOME DISTRIBUTION	❶	❸	❹
COST OF LIVING	❸	❶	❸
REAL ESTATE	❹	❶	❸
2. *Infrastructure*			
ROADS AND PUBLIC TRANSPORT	❹	❸	❶
ELECTRICITY	❶	❶	❸
EDUCATION FACILITIES	❶	❸	❷
HEALTH FACILITIES	❸	❶	❶
3. *Civic Services*			
WATER SUPPLY	❶	❷	❸
SEWERAGE AND DRAINAGE	❹	❶	❷
SOLID WASTES	❹	❶	❸
COMMUNITY FACILITIES	❹	❸	❷
SLUMS & COMMUNITY DEVELOPMENT	❷	❸	❸
MUNICIPAL FINANCES	❷	❶	❸
4. *General Environment*			
POLLUTION	❷	❹	❶
PUBLIC HEALTH	❹	❷	❶
TRAFFIC	❸	❷	❹
LAW AND ORDER	❸	❶	❹
COMMUNITY PARTNERSHIPS	❶	❶	❸

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ABBREVIATIONS

APPCB	Andhra Pradesh Pollution Control Board.
APSEB	Andhra Pradesh State Electricity Board.
BCC	Bangalore City Corporation.
BDA	Bangalore Development Authority.
BTS	Bangalore Transport Services.
BWSSB	Bangalore Water Supply & Sewerage Board.
CEPT	Centre for Environmental Planning and Technology
COG	Cognizible Crimes
CSE	Centre for Science and Environment
EPTRI	Environmental Protection and Training Research Institute
HSIP	Hyderabad Slum Improvement Project
HMWSSB	Hyderabad Metropolitan Water Supply and Sewerage Board.
HUDA	Hyderabad Urban Development Authority.
IPC	Indian Penal Code
KEB	Karnataka Electricity Board.
KSCB	Karnataka Slum Clearance Board.
KSPCB	Karnataka State Pollution Control Board.
KSRTC	Karnataka State Road Transport Corporation
MCCI	Mahratta Chamber of Commerce and Industries
MCH	Municipal Corporation of Hyderabad.
NRAP	National River Action Plan
NSS	National Sample Survey
PCB	Pune Cantonment Board.
PMC	Pune Municipal Corporation.
PMTS	Pune Municipal Transport Service
SIP	Slum Improvement Programme
SIS	Slum Improvement Scheme
SNP	Slum Networking Programme
SRFDCL	Sabarmati River Front Development Corporation Limited
TERI	Tata Energy Research Institute
UCD	Urban Community Development