Jawaharlal Nehru National Urban Renewal Mission

CITY DEVELOPMENT PLAN
AHMEDABAD
2006-2012

Prepared By

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And
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with
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Chapter 1 Introduction

1.1 Background

Cities play a critical role in the economic development process of the nation. They are the engines of economic growth and places of high productivity. They contribute more than the proportionate share towards the State income. For instance, Ahmedabad, which accounted for 8 percent of the total and 23 percent of the urban population of the State, was estimated to have generated 17 percent of the State income in 1995. Ahmedabad city, in 1976-77, with 7 percent of the total population, had generated 14 percent of the total State income. The per capita income in the City was found to be almost double than that of the State average (NIUA, 2001). From this it is clear that to sustain high rates of economic growth, cities have to be more competitive.

While cities generate more than proportionate share of States' income, they also pose certain challenges. The challenges include providing access to serviced land for housing the urban poor, provision of basic amenities and facilities and a system to plan and manage these. Hence urban investments in economic, physical and social infrastructure at adequate levels are a prerequisite. In recognition of these the state has initiated series of reforms in urban governance. A greater emphasis has been laid when the state declared the year 2005 as ***Urban Development Year*-2005**. At the State level, in line with URIF framework., preparation of the State Urban Slum Policy, State Hawkers Policy and State Urban Transport Policy has been undertaken and are under various stages of finalization. As a part Urban Year efforts, cities have prepared, through consultative process, City Development Strategies/Plan which outline vision, strategies to achieve the vision and an time bound action plans.

In Ahmedabad, the process of preparation of City Development Strategy began in the year 1999 with a series of consultations which brought out the City Development Strategy report in February 2003. For effective implementation, a medium-term plan City Development Plan focusing on priority projects has been dveloped. Further in May 2005, in line with the Vibrant Gujarat Vision of the Government of Gujarat, AMC and AUDA conceived a three-year-plan to ensure delivery of basic infrastructure services to the entire area under their jurisdiction and set the stage for the next level of development.

The National Urban Renewal Mission gives the city an opportunity to carry forward this initiative and place the reform process on a higher plane. This would also be an opportunity for the city to undertake a mid-course assessment and re-position its priorities with changing needs within the NURM framework. The section below describes the Plan Preparation process.

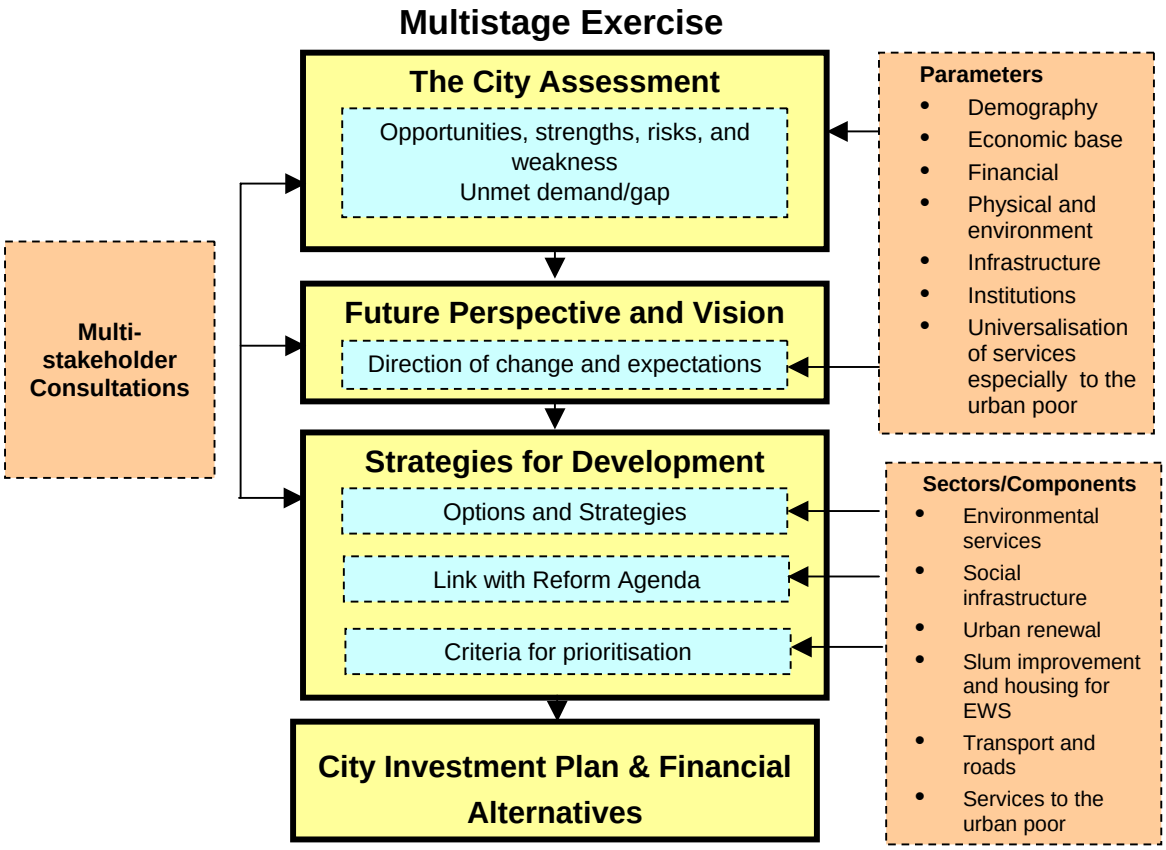
1.2 City Development Planning Process

The City Development Plan[1] presents a perspective of and a vision for future development of the city. Essentially it addresses the following questions:

1. Where are we now
2. Where do we want to go?
3. What issues do we need to address on a priority basis?
4. What interventions do we make in order to fulfill the vision?

The framework for preparing CDP as outlined in JNNURM toolkit is presented below. The key aspect of preparation of CDP is that of involving community in decision process. The city of Ahmedabad has adopted an elaborate consultative process.

Figure 1-1: City Development Planning Process



[1] GOI, JNNURM Toolkit

1.2.1 City Consultations

The consultation process of Ahmedabad may be summarized as three phase activities as presented below.

Phase-I Consultations: City Visioning and Strategy Formulation

July 27-28, 1999
Ahmedabad Management Association

Organised by
Ahmedabad Municipal Corparation
Ahmedabad urban Development Authority
The World Bank

The Ahmedabad Municipal Corporation, Ahmedabad Urban Development Authority and Urban Development Department, Government of Gujarat organized the workshop on the Ahmedabad City Development Strategy with support from the World Bank and the Australian Agency for International Development. This workshop was the first in a series of broad-based consultations, which would culminate in a City Corporate Plan and a 5 year Capital Investment Plan for Ahmedabad. The underlying principle of the City Development Strategy is to enable cities move in the direction of becoming more competitive, better managed, livable and bankable. The main objective of the workshop was to develop a long-term vision of Ahmedabad's development through a participatory process involving a wide cross section of citizen including elected representatives, professionals and other stakeholder groups, identifying the most pressing issues facing the city and evaluate strategies to achieve the objective. Environmental Planning Collaborative (EPC) facilitated the process and the group discussions.

The follow up workshops were held during January 20 - 25, 2000. The report in the form of CDS was prepared by CEPT in 2001.

Phase-II Consultations: Social & Environmental Management Framework and Slum Policy

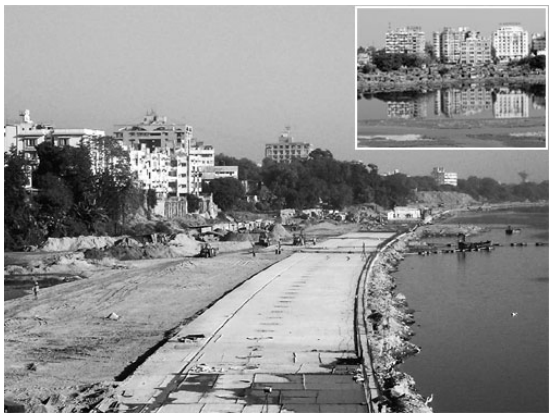
The second series of consultations took place between May ' 02 to February ' 03. The primary objective was to identify projects, assess possible environmental and social consequences of projects and evolve a management framework. These were facilitated by CEPT.

Efforts to evolve state urban slum policy were undertaken in the year 2002 and 2003 through city consultations. The concluding session was held on June 19, 2003. The Draft Sate Urban Slum Policy accordingly emerged and is now being considered by the state for adoption.

As a preparatory exercise to Urban 05, further follow-up consultations were done by AMC and AUDA with support of the State government which revised sectoral priorities and projects to be undertaken on a mission mode.

Phase-III Consultations: Detailed Project Formulation

The overall sectoral objective being of designing clear actions had been fulfilled. Revisions from time to time in the projects priority have also been made. Consultations for taking developmental decisions have been initiated. An overview of three major project related activities is presented.



The Sabarmati Riverfront Development Project: The project envisages development on both sides of the riverbank including the development of housing for slum dwellers located along the riverbed. As a strategy towards this end, a series of consultations were undertaken during 2003-05. SRFDCL and EPC, the design consultants organised the consultations

Bus Rapid Transit Project:

A bus rapid transit project has been initiated by the city. A series of consultations in the form of technical workshops and stakeholder consultations have been carried out. GIDB, Urban Development Department, AMC, AUDA and CEPT organised the stakeholder worshop on August 25, 2005. The outcome was in the form of decision on phase-I corridors and approval for concept design. 164 members participated in the workshop.

Second consultative activity was to decide on technology of the bus. A workshop was accordingly organised at CEPT on October 28, 2005, which was attended by 35 professionals

The Plan

The present plan is an amalgam of outcomes of these evolved over time and focuses on the key services as identified in the Visioning exercise. The plan is anchored on the **NURM goal of creating economically productive, efficient, equitable and responsive cities.** In line with this goal the plan focused on the following 'Development Themes' encompass the socio-economic development sectors and core services.

1.3 Structure of the Report

The report has been presented in 12 chapters. After presenting a brief background of the study, the following chapter presents a profile of the city in terms of population growth, spatial patterns of growth and urban economy. Chapter 3 reviews the current situation of environmental services. In chapter 4 urban transport scenario has been analysed. The chapter 5 deals with urban poor and their housing situation. A brief about social amenities has been made in chapter 6. This is followed by a description of cultural heritage in chapter 7 and an analysis of urban environment in chapter 8. An assessment of municipal finances and the goveranance system have been presented in chapters 9 and 10 respectively.

In Chapter 11, the vision, strategies and action plans have been summarised and the conclusing chapter analyses the investment sustainability through a Finance and Operating Plan.

Chapter 2 Profile of the City Ahmedabad

General
Demographic Characteristics
Urban Economy
Population Forecast
Future Landuse

2.1 General

The city of Ahmedabad was founded in 1411 AD as a walled city on the eastern bank of the river Sabarmati, now the seventh largest metropolis in India and the largest in the state. The urban agglomeration (UA) population has increased from 3.31 Million in 1991 to 4.5 million in 2001.

Historically Ahmedabad has been one of the most important centers of trade and commerce in western India. The city was once famous as the 'Manchester of India' on account of its textile industry. It had as many as 66 mills employing a workforce of over one hundred thousand persons. It lies in the cotton belt of Gujarat, 552 km north of Mumbai and 96 km from the Gulf of Cambay. It has three major industrial estates within its municipal limits. It is also a major industrial and financial city contributing about 14% of the total investments in all stock exchanges in India and 60% of the total productivity of the state[2]. A private company operates a thermal power plant in the city.

Ahmedabad is the home of several scientific and educational institutions of national, regional and global importance. The city has a great architectural tradition reflected in many exquisite monuments, temples and modern buildings.

2.2 Location and Climate

Ahmedabad City lies between 22° 55' and 23° 08' North Latitude and 72° 30' and 72° 42' East Longitude. The city is devoid of any major physical features except for the river

2 Reena Lazar, *Increasing Resources to Local Government in Ahmedabad, India. Local Strategies for Accelerating Sustainability: Case Studies of Local Government Success. ICLEI Study, Canada, May 2002*

Sabarmati, which is cutting the city into two parts: eastern walled city and western Ahmedabad on either side of its banks.

The Ahmedabad-Mumbai Golden Corridor has long been recognized as an important development axis in western India. The city acts as a terminal, rather than as an intermediate node in this linear influence. It has seven major roadways, one expressway and five rail networks. A new corridor between Ahmedabad and Pune has recently emerged, connecting the city to other metropolitan cities including Vadodara, Surat and Mumbai. All these factors have resulted in the axial growth of the region.

Ahmedabad has a tropical monsoon climate, which is hot and dry, except in the rainy season. Summer days are very hot with mean maximum temperature of 41.3^{0}C while, nights are pleasant with mean minimum temperature of 26.30C. The mean maximum and minimum temperatures in winter are 30^{0}C and 15.4^{0}C respectively. The average annual rainfall of the area is 782mm, although there is a considerable variation from year to year. It occurs generally during the months of June to September. The average relative humidity is 60% with a maximum of 80% to 90% during the rainy season.

2.3 Demographic Trends

The Greater Ahmedabad Urban agglomeration is an amalgam covering an area of about 4200 sq. Km is an amalgam of (Refer Map-2-1). The map reveals:

1. An area of 190 square kilometres isunder the jurisdiction of Ahmedabad Municipal Corporation (AMC)[3], and
2. 150 villages in the periphery of the city are under the jurisdiction of Ahmedabad Urban Development Authority (AUDA)[4],
3. 9 Municipalities in the periphery of the city are under the jurisdiction of Ahmedabad Urban Development Authority (AUDA),
4. Gandhinagar and the surrounding villages,
5. Chatral, Bopal and other surrounding villages adjoining AUDA limits

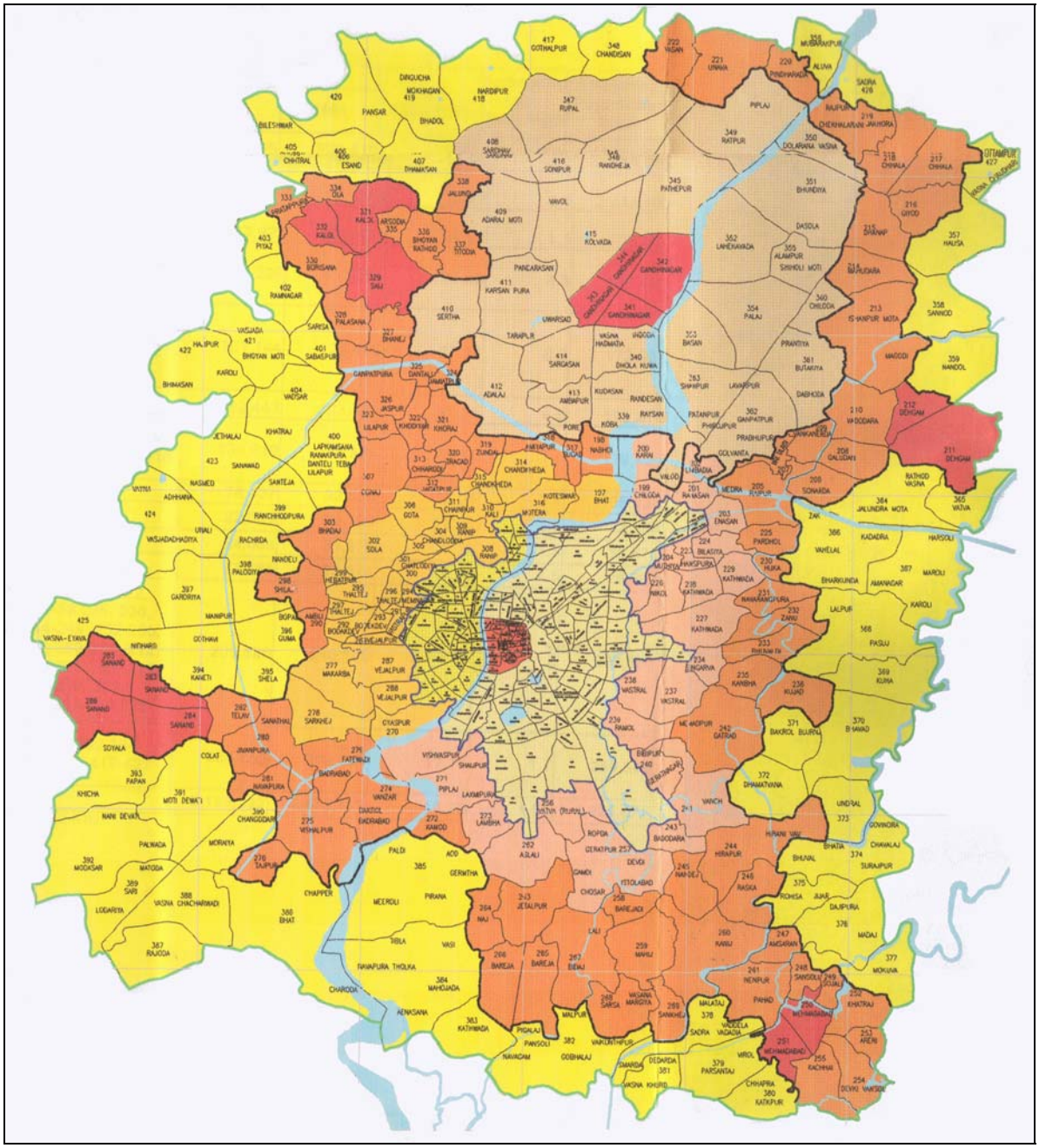
The area within the Ahmedabad Municipal Corporation limits consists of:

[3] *The city government Ahmedabad Municipal Corporation (AMC) was, established in July 1950..*

[4] *The Ahmedabad Urban Development Authority (AUDA) was constituted under the Gujarat Town Planning and Urban Development Act, 1976 in 1978 to regulate and monitor the development in the periphery of the corporation limits and the adjoining 300 villages and 9 municipalities. The major function of the authority is to undertake the preparation of the development plan, town planning schemes, regulate the development and collect the development charges in the area of its jurisdiction.*

1. the traditional city center within the fort walls with relatively high-density development, large concentration of commercial activities and narrow streets,
2. the eastern sector accommodating large and small industries and low income residential areas, and
3. a well planned western sector with wide roads accommodating major institutions and high-income residential areas

Map 2-1: Greater Ahmedabad



The population in the AMC limits increased to 35.15 lakh in 2001 from 28.77 lakh in 1991. The population in AUDA area in 1991 was 38.75 lakh. The Ahmedabad Urban Agglomeration (AUA)

housed 23.25 % of the State's urban population in 1991, which has gone up to about 25% in 2001. Compared to other metropolises in India Ahmedabad has a lesser degree of primacy and urban population is spread evenly across other metropolitan and class I cities in the State.

The AMC area is spread over 190.84 sq km, the AUA area is about 350 sq km and AUDA area is 1330.08 sq km. Spatial distribution of this population within the city over the decades shows that up to 1981 most of the new population added to the city was concentrated within the old AMC limits itself, especially in the eastern part. Expansion of the peripheral areas began in the 1980s and has continued. Earlier only the eastern parts and particularly the eastern periphery registered faster growth rate, but since the 1980s even the western periphery has grown rapidly.

2.3.1 Spatial Patterns of Population Growth

Table 2-1: Population Growth – Greater Ahmedabad

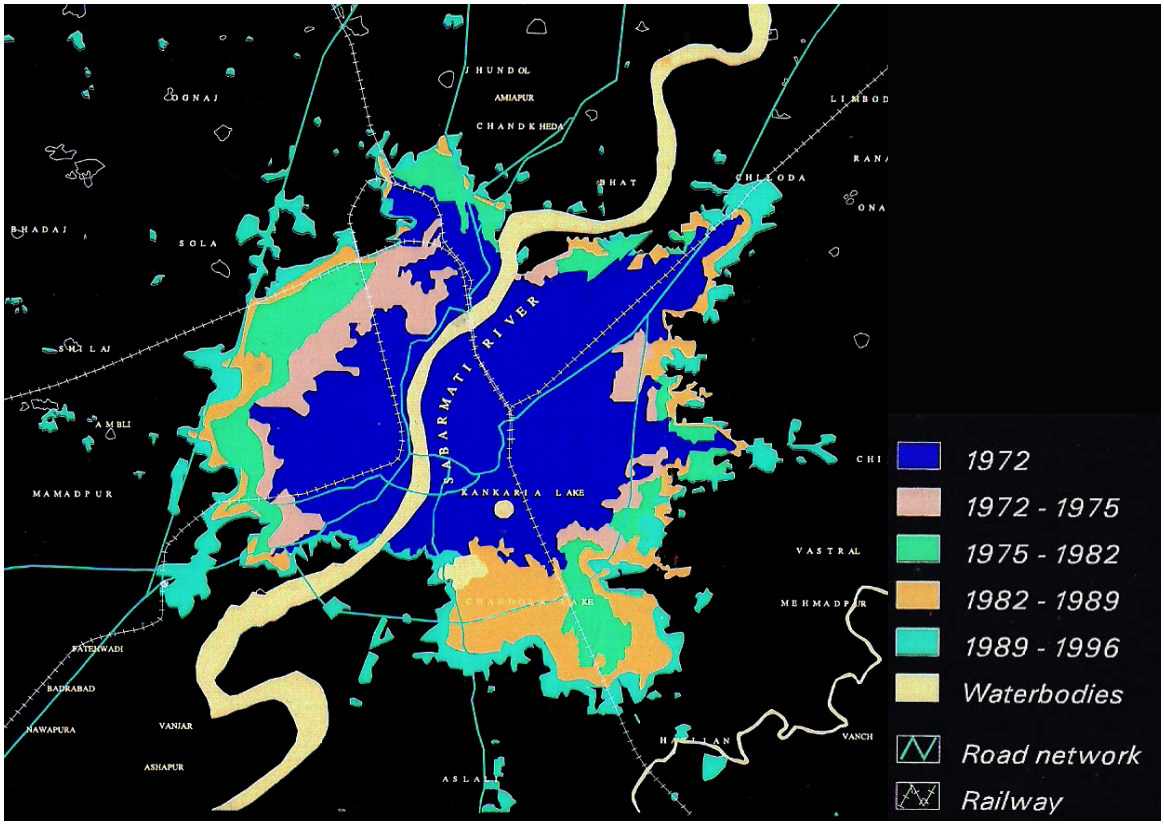
Spatial Unit	Population		
	1981	1991	2001
1. Ahmedabad Municipal Corporation (AMC)	**2159127**	**2876710** (2.9)	**3520085** (2.0)
1.a Walled City	476138	398410 -1.8	372633 -0.7
1.b. East AMC	1122073	1902868 5.4	2521013 2.9
1.c West AMC	463922	575433 2.2	675362 1.6
2. A.U.D.A.	**2721925**	**3756246** 3.3	**4709180** 2.3
2.1.a East AUDA	101144	128999 2.5	202494 4.6
2.1.b West AUDA	204923	457271 8.4	701424 4.4
2.c AUDA (Rural)	209826	246560 1.6	274391 1.1
3. Kalol	78407	92550 1.7	112013 1.9
4. Mehemdabad	22309	26103 1.6	30768 1.7
5. Dehgam	24868	31378 2.4	38082 2.0
6. Sanand	22465	25674 1.3	32417 2.4
7. Other areas outside AUDA	**264555**	**309871** 1.6	**334531** 0.8
8. Gandhinagar	**199353**	**280234** 3.5	**373663** 2.9
8.a. Gandhinagar (GNA)	62443	123359 7.0	195926 4.7
8.b. Rest of Gandhinagar	136910	156875 1.4	177737 1.3
GREATER AHMEDABAD	**3185833**	**4346351 3.2**	**5417374 2.2**

Source: CEPT/GIDB 2005 Ahmedabad BRTS Report no.1

The greater Ahmedabad area has grown at a moderate rate. Growth rates have declined from 3.2 and 2.2 percent (compounded per annum) during the past two decades (Refer Table 2-1). However, the rates vary across different spatial units. The population within the AMC limits appears to approach a stabilization level. The areas adjoining AMC, falling within AUDA limits have shown rapid growth. Gandhinagar is also experiencing relatively high rate of growth.

As stated above the population growth in the peripheral areas is more rapid than the areas within the city limits. This is partly due to the saturation of population within the city area and the consequent large-scale housing development in the peripheral areas. The contrasting spatial patterns observed in the eastern and western areas of AMC have extended into the peripheral areas in the same manner. The western part is experiencing more rapid growth than the eastern part. Rapid growth in the form of ribbon development along the Sarkhej - Gandhinagar highway is being witnessed during the 1990's (Refer Map 2-2). These trends are likely to intensify further in the coming decades. It is also a note worthy feature that the spatial expansion of Ahmedabad is largely contiguous and relatively compact.

Map 2-2: Ahmedabad Growth Pattern

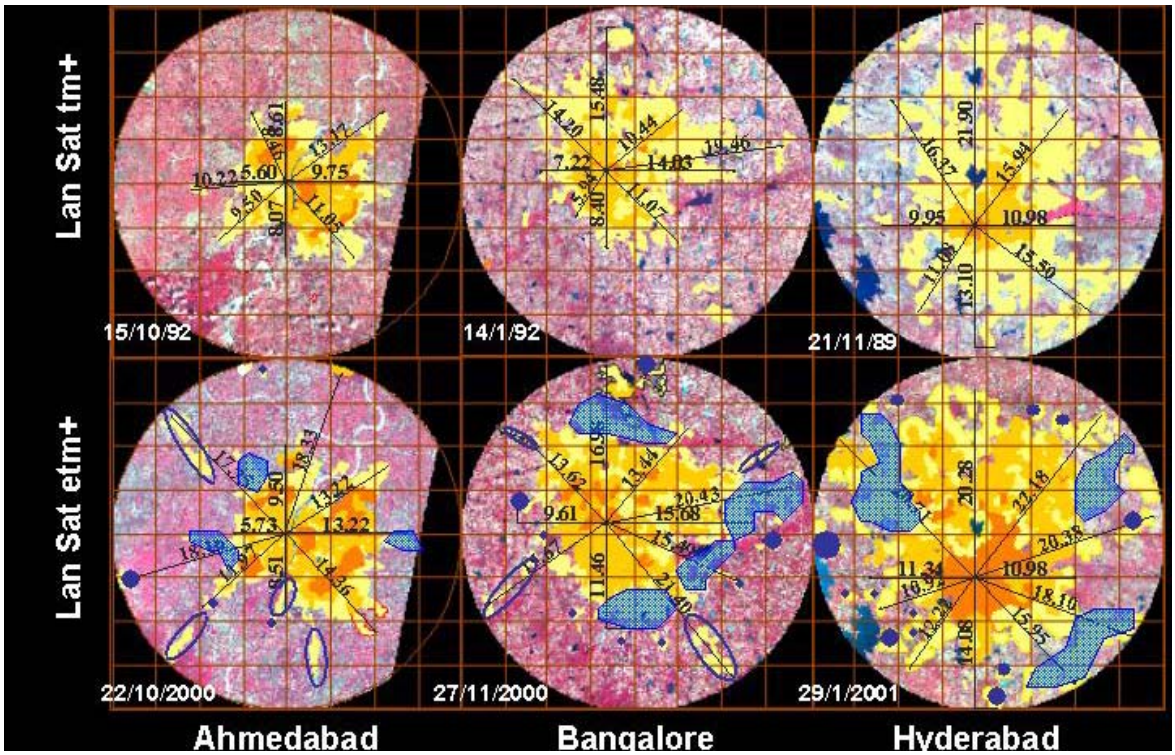


2.3.2 Population Density

The density pattern presented below indicates the spatial expansion is limited to contiguous areas around AMC. The walled city is one of the most densely populated areas in the study area, and it has reached levels of saturation. The new outgrowths have been in the western parts of the city in the AUDA jurisdiction with people preferring to stay in the peripheral areas where they could avail of better infrastructure facilities. The zones along the 132' Ring Road and Naroda - Narol Highway have seen a higher level of physical development in the last few years. It also appears that most of the eastern part and a few parts in the southwest and northwest have higher densities.

Box-1: Ahmedabad- A Compact City

In terms of spatial expansion, as may be seen from below, unlike Bangalore and Hyderabad, the city during the past ten-year period has expanded in a contiguous manner and remained compact

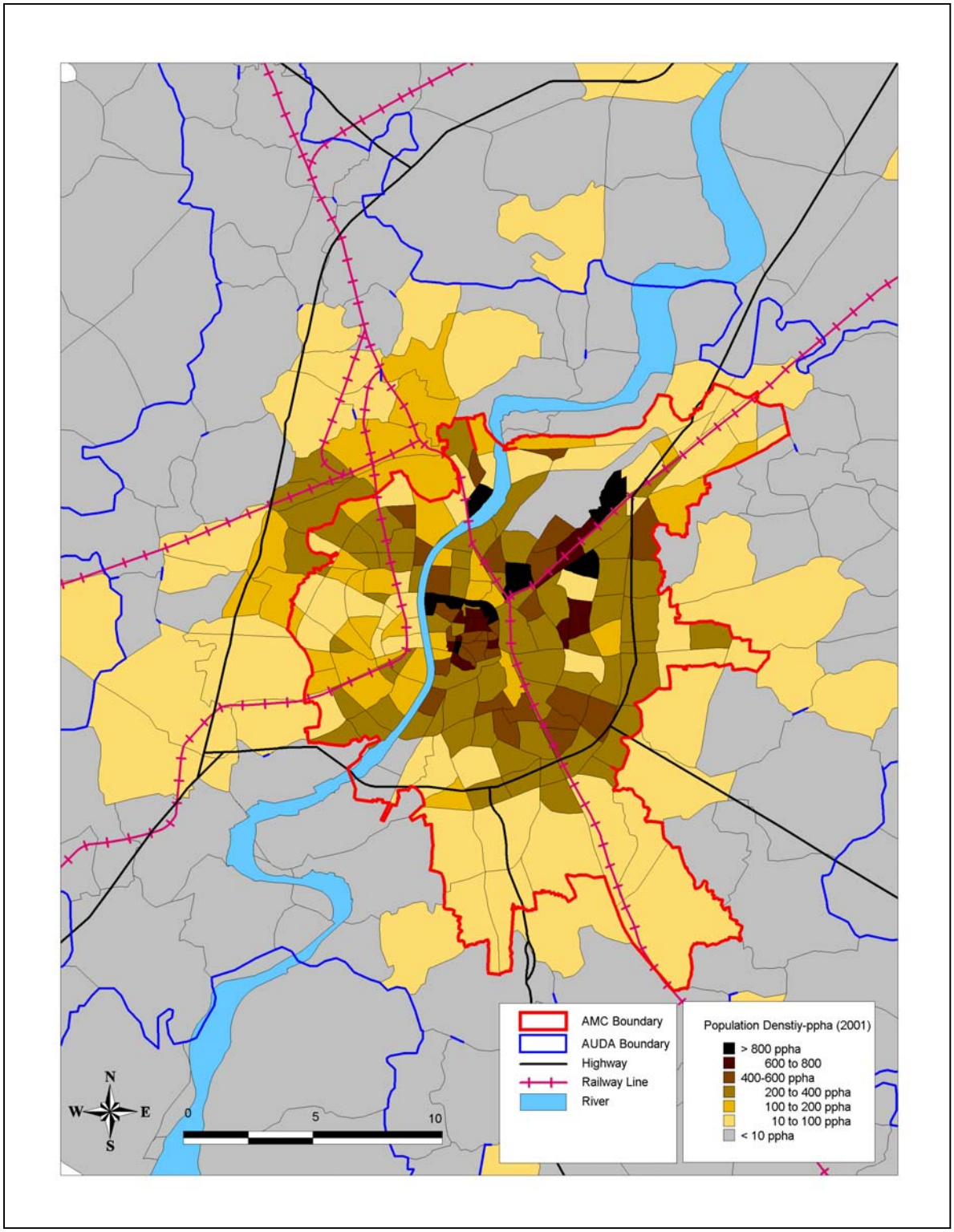


A comparative analysis of three cities in terms of spatial expansion over a decade has been carried out based on Lan Sat Image. From the above it is evident that Hyderbad is the most spread out city followed by Bangalore. The blue patches indicate low-density sprawl type of development.

The study referred below analysed planning mechanisms and concluded that the Master Plan/Development Planning and Town Planning Scheme mechanisms have been effective in Ahmedabad in keeping the city compact. Further, it concludes that the effect of urban sprawl is also evident in terms acute traffic and transport problems in Bangalore and to some extent in Hyderbad.

Source: Desai Sowmya (2005), Urban Spatial Structures & Land management Mechanisms, Unpublished M. Tech. Planning Dissertation, CEPT University, Ahmedabad.

Map 2-3: Population Density



Source: CEPT/GIDB 2005 Ahmedabad BRTS Report no.1

Table 2-2: Population Density

Spatial Unit	Persons/Hectare		
	1981	1991	2001
1. Ahmedabad Municipal Corporation (AMC) (Refer Annexure 2-1 & 2-2)	113	151	184
1.a Walled City	716	599	560
1.b. East AMC	79	134	178
1.c West AMC	109	135	159
2. A.U.D.A.	11	61	77
2.a East AUDA	6	7	11
2.b West AUDA	13	28	43
2.c AUDA (Rural)	12	14	16
3. Kalol	27	31	38
4. Mehemdabad	19	22	26
5. Dehgam	11	13	16
6. Sanand	6	7	9
7. Other areas outside AUDA	8	9	10
8. Gandhinagar	5	7	9
8.a. Gandhinagar (GNA)	24	47	75
8.b. Rest of Gandhinagar	4	4	5
GREATER AHMEDABAD	12	16	20

Source: CEPT/GIDB 2005 Ahmedabad BRTS Report no.1

2.4 Urban Economy

The city of Ahmedabad has had great importance in the economy of Gujarat owing to the large concentration of economic activities their high growth rates and productivity. Ahmedabad accounts for 7% of the state's total population and around 20% of its urban population. In 1995, with 7 percent of the total population, Ahmedabad contributed to 17 percent of the state income [(4)]. Ahmedabad city accounts for 21.5% of factories in the state employing 18% of workers (2000). In 1981, before the textile crisis, Ahmedabad city used to account for 19.3% of factories and 27.7% of workers in the state. Ahmedabad accounts for almost 19 percent of main urban workers in the state and 60 percent in Ahmedabad District.

A sectoral shift has been observed in Gujarat, after liberalization. There has been a rapid growth of chemical and petrochemical industries in South Gujarat districts. The investment figures show a significant decline in the share of industries in and around Ahmedabad. On

the other hand, tertiary sector which includes business and commerce, transportation and communication, construction activities and other services appears to be growing.

The workers participation rate (WPR) or the share of working population in Ahmedabad is 32 percent (2001) as against 33 percent of the State Urban WPR. The following table shows the nine-point classification of the workers in AMC. Though it is not very apt to compare the figures of 1971 and 1991 because of the change in the Corporation area, an analysis of the shares could give an insight into the changing occupational pattern. (Refer Table 2-3)

Table 2-3 : Occupational Pattern of Ahmedabad

Sectors	Categories		1971		1991		2001	
			No.s	%	No.s	%	No.s	%
Primary Sector	I	Cultivation	839	0.19	2659	0.32	1168	0.10
	II	Agr icultural Labourers	613	0.14	1889	0.23	1133	0.10
	III	Live stock, Forestry, Fishing etc and allied activities	2749	0.61	5444	0.65	A	
	IV	Mining and quarrying	2557	0.57	1932	0.23		
	Total		**6758**	**1.50**	**11924**	**1.43**		
Secondary Sector	V-A	Manufacturing and processing in Household Industries	6857	1.52	6479	0.78	34624	3.09
	V-B	Manufacturing and processing in other than Household Industries	204255	45.39	308183	37.07	B	A+B =1085070 (96.71%)
	VI	Construction	14203	3.16	38197	4.59		
	Total		**225315**	**50.08**	**352859**	**42.44**		
Tertiary Sector	VII	Trade and Commerce	88239	19.61	212051	25.50		
	VIII	Transport, Storage and Communication	32779	7.28	75446	9.07		
	IX	Other Services (Other than those mentioned above e.g. Politics, Social Work, Govt.Service, Teaching, Entertainment etc.	96864	21.53	179179	21.55		
	Total		**217882**	**48.42**	**466676**	**56.13**		
Grand Total			**449955**	**100.00**	**831459**	**100.00**	**831459**	**100.00**

Source: Respective Census Documents

The share of secondary sector has fallen from 50 percent to 42 percent. This is inspite of the fact that the industrial areas of Odhav, Vatwa and Naroda were included in the AMC area in 1987. The economy of the city is gradually shifting from secondary to tertiary sector absorbing 56 percent of the total main workers of the city (1991 census).

2.4.1 Industrial Development

Table 2-4 gives the details of the number of working factories and workers employed daily in Ahmedabad city from 1965 to 2003.

Table 2-4: Working Factories and Workers Employed Daily in Ahmedabad City

Year	No of working Factories	Average No of workers employed daily in working factories (including estimated avg. no. of workers)	Workers per Factory
1965	939	162104	173
1971	1129	152986	136
1975	1434	170522	119
1979	1981	184247	93
1983	2320	184246	79
1986	2169	139715	64
1988	3640	205498	56
1990	4114	220083	53
1993	3553	200652	56
1996	4481	193740	43
1999	4271	157568	37
2000	4243	152933	37
2001	4415	157486	36
2002	4689	168700	-36
2003	4859	175728	-36

Source: AMC Statistical Outline 2004

The number of workers employed in registered factories has remained more or less stagnant in the city for over four decades. The numbers of jobs vary between 1.4 lakh to 2.0 lakh jobs and the most recent level is about 1.75 lakh. Workers per factory have also declined from 84 workers in 1981 to 61 in 1987 and to 36 in 2003. These two are in conjunction with the trends at the state level.

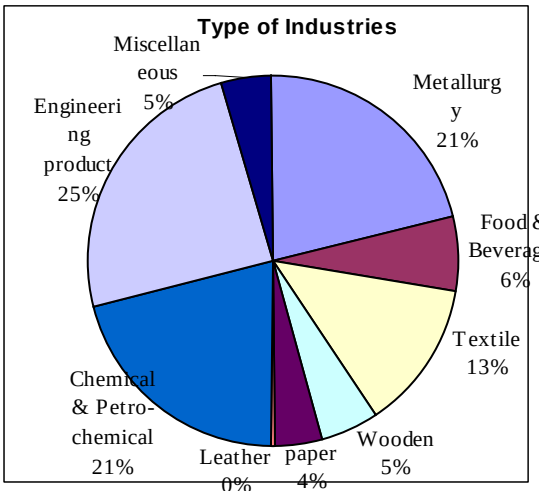
There are around 4859 factories in Ahmedabad City, of which Chemical and Petrochemical industries have the largest share (29%), followed by metallurgical and engineering industries. Significant decline is observed in textile industry, which has a current share of 12 percent (Refer Table 2-5). The employment however is the highest in textile industries followed by chemical and petrochemical. Though the number of chemical industries is more than twice the textile industries, the employment is much lower.

Table 2-5: Working Factories in Ahmedabad City (2003)

Industry Type	No. of working factories	Employment
Metallurgy	1043	29863
Food & Beverages	308	17262
Textile	613	44623
Wooden	243	2611
paper	214	4751
Leather	12	218
Chemical & Petro-chemical	1011	25104
Engineering product	1194	38549
Miscellaneous	221	12747
Total	**4859**	**214277**

Source: AMC Statistical Outline

Figure 2-1: Composition of Industries 2003



There are four GIDC estates within the Municipal Limits: Vatva, Odhav, Naroda and Behrampura (Refer Table 2-6). The following table shows an approximate distribution of industries in these four estates:

Table 2-6: Details of GIDC Estates within AMC area

GIDC Estates	Area (Hect)	Developed Area (Hect)	Functioning Units	Investment (in lakhs)	Employment
Naroda	346.25	344.92	654	118738.05	11780
Odhav	127.00	112.58	708	4932.53	10944
Vatwa	527.00	521.40	1092	18254.60	18571
Behrampura	6.91	6.34	41	181.68	451
Total	1007.16	985.24	2495	142106.9	41746

Source: GIDC, Ahmedabad, 2002

In all the four estates, almost the entire area has been developed. The number of functioning units is highest in Vatwa and so is the employment. However, the investment in Naroda industrial estate is the highest.

2.5 Land Use

Spatial arrangements of land uses determine the population distribution and infrastructure demand patterns in the city. This section briefly describes the land use patterns in the city. The Ahmedabad Urban Development Authority is responsible for land use planning within its jurisdictional limits. As stated above, the area under AUDA may be seen as various subunits depending on the administrative jurisdictional limits and extent of development. Of this, the area delineated as Ahmedabad Urban Complex consisting of AMC, outgrowth adjoining

AMC and area likely to develop in the ten years has been designated as Ahmedabad Urban Complex. It is this area, which is the focus in this study.

BOX 2: Land Use Planning Mechanisms

An integrated landuse planning and regulation of building activities, taking into account the mutual interaction of landuse and urban services, is essential for fostering functional efficiency and orderly growth of urban areas. In order to have a planned and guided growth, planning mechanisms under the Gujarat Town Planning and Urban Development Act (1976) have been established. The mechanism in operation in Gujarat include:

Development Plan: Prepared for the entire area of the Urban Development Area which consists of two parts

a) A land use plan earmarking various areas as permissible use zones, and

b) A Development Control Rules for implementation of development plans

Town Planning Scheme: Prepared for an area of about 100 hectares with an objective to convert original agricultural plots into urban plots with proper shape, size and access. In the process of preparation of these areas, aspects of public amenities, housing for weaker section and for marketing by the ULB to recover facilities infrastructure building costs are integrated. The total of this area ranges between 35 to 50%.

2.5.1 Land-use in AUDA area

Of the total AUDA area of 1294.65 sq. km, nearly 50 percent is built up. Water bodies and wastelands cover 12 percent and 17 percent of area respectively. Industries cover 9 percent of the area (Refer Figure 2-3 and Map 2-4). As per the State Government Policy, no major industrial development within 24 kms of AMC limit is permitted in AUDA area. Considering existing development conditions a certain area for industrial use is designated for light industry as well as for general industry, along with existing industries at Vatwa, Naroda and Odhav (all lying within AMC), which forms nearly 10.38 percent.

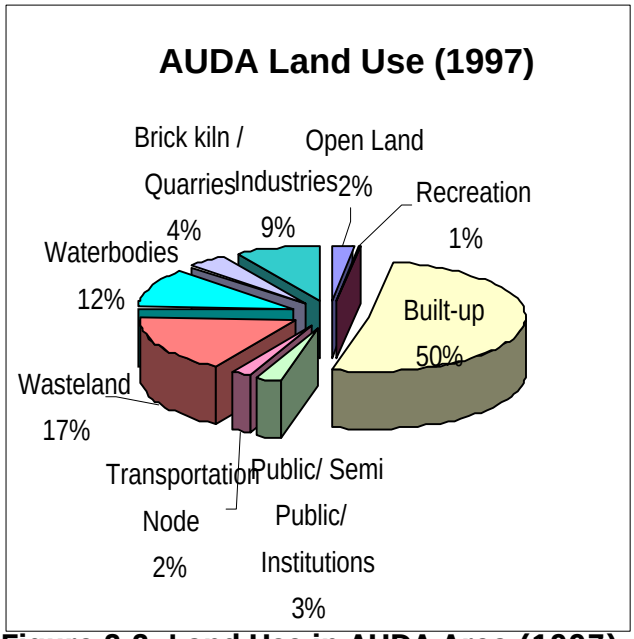
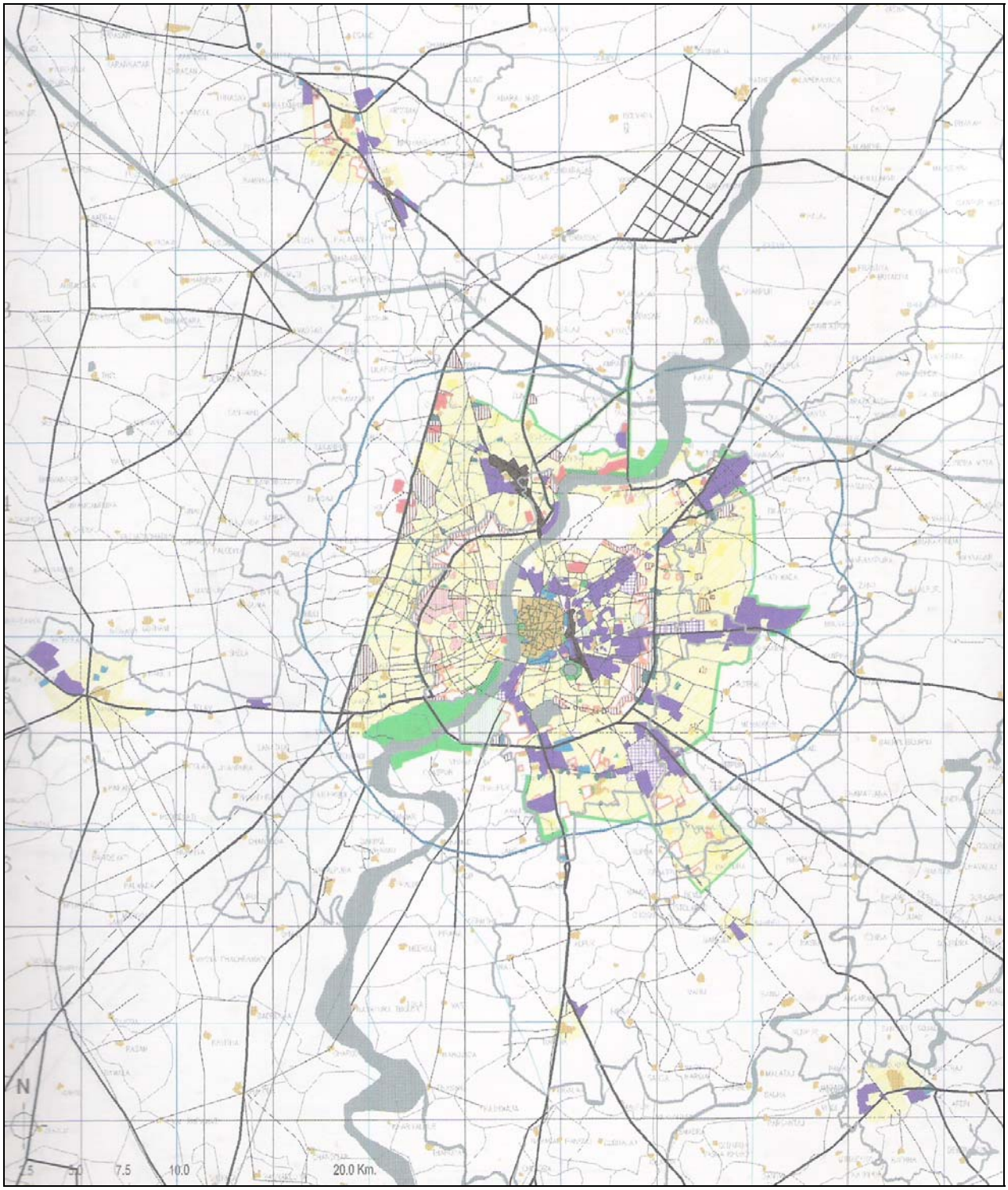


Figure 2.2: Land Use in AUDA Area (1997)

Map 2-4: AUDA Landuse Map



Land Use in City area

As per existing land use (1997), more than one third (36%) of the total area is under residential use, followed by 15 percent of the area under the industries (Refer Figure 2-5). Large tracts of land (23.44%) are lying vacant, mostly in the newly acquired area of the AMC. Only 9.5 percent of the total area is under transportation network as against the norm of 15-18 per cent. as specified by UDPFI norms.

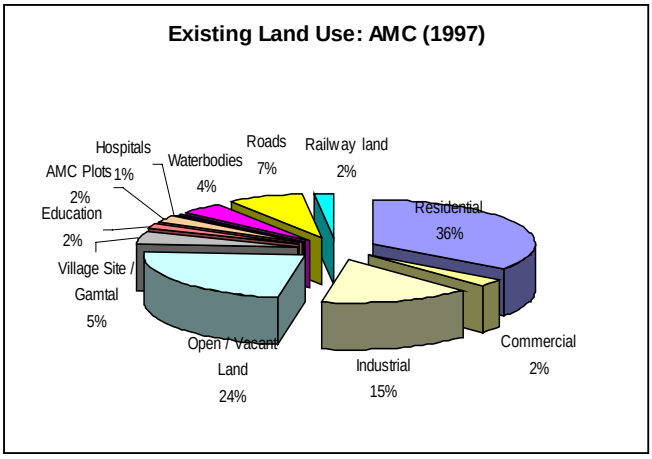


Figure 2.3: Existing Land use of AMC Area (1997)

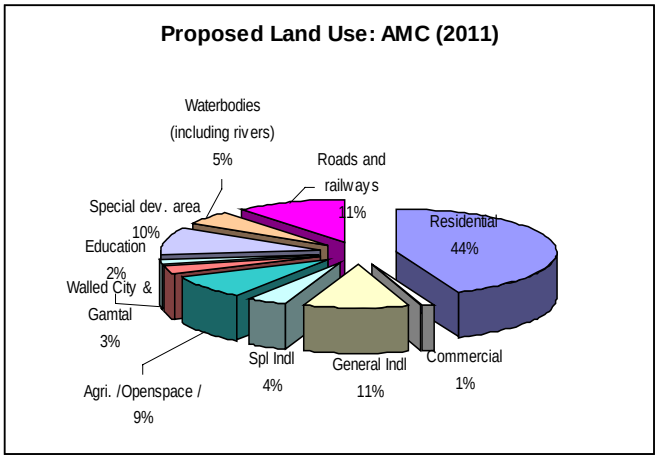


Figure 2.4 Proposed Land Use of AMC Area (2011)

Table 2-7: Existing and Proposed Land use of AMC area

Existing land use for AMC area (1997)				Proposed land use for AMC (2011)		
Sr No	**Use/ Designation**	**Total Area (Ha.)**	**% Of Total Area**	**Use/ Designation**	**Total Area (Ha.)**	**% Of Total Area**
1	Residential	6664.44	34.92	Residential	8340.22	43.70
2	Commercial	472.64	2.47	Walled City and Village Sites(Gamtal)	645.56	3.38
3	Industrial	2932.78	15.37	General Industrial	2006.51	10.51
4	Open / Vacant Land	4473.36	23.44	Special Industrial	786.72	4.12
5	Village Site / Gamtal	895.59	4.69	Commercial	263.06	1.38
6	Education	344.19	1.80	Agricultural / Recreational / Open Space / Gardens	1643.60	8.61
7	AMC Plots	467.18	2.45	Education	387.30	2.03
8	Hospitals	98.36	0.52	Area Under Reservations now designated as special development area	1955.37	10.25
9	Burial Ground / Grave Yard	86.54	0.45	Roads and railways	2117.67	11.10
10	Water bodies	850.55	4.46	Water bodies (including rivers)	937.97	4.92
11	Roads	1426.65	7.47			
12	Railway land	372.00	1.96			
	Total	19084.00	100.00	**Total Area**	19084.00	100.00

Source: Revised Draft Development Plan of AUDA – 2011AD Part I ,Vol 2

Table 2-8: Existing and Proposed Land use of AUC area (Excluding AMC)

Existing Landuse of AUC Area (Excluding AMC Area) (1997)				Proposed Landuse of AUC Area (Excluding AMC Limit): (2011 A.D)			
Sr. No.	**Land Use**	**Total**	**% Of Developed Area**	**Sr. No.**	**Particulars**	**Area in Hect.**	**%age of Developed Land**
1	Residential include Gamtal	3559	38.99	1	Residential, Roads, Public and Semi-Public		
2	Public &semi public	572	6.27		Type 1 (old residential area)	9938	34.523
3	Commercial	276	3.02		Type 2 (new residential area)	4624.92	16.066
4	Industrial	647	7.09	2	Commercial	1071.92	3.724
5	Railway/ Roads/. Airport	406	4.45	3	Industrial	987.58	3.431
6	Water way and tank	3625	39.72	4	Public Activity Area	552	1.918
7	Garden open space and P.G	41	0.46	5	Public and Semi-Public	243	0.844
TOTAL		**9126**	**100**	6	Recreational	6300	21.885
				7	Treatment Plants (AUDA, AMC)	745.16	2.589
				8	High flood hazards	524	1.820
				9	Agriculture	3800.42	13.202
					Total area	**28787**	**100**

Source: Revised Draft Development Plan of AUDA – 2011AD Part I ,Vol 2

2.6 Population Forecast and Spatial Expansion

With declining birth and death rate trends continuing, the city is expected grow at a moderate rate and stabilize by the year 2035 with a population of about 10 to 11 million (Refer Table 2-8). The physical expanse of the city is expected to also incorporate large areas around Ahmedabad, which were presented as part of greater Ahmedabad area.

Table 2-9: Population Forecast

Sl. No.	Year	Population (Million)	Approx. Area (Ha)
1	1981	2.5	19000
2	1991	3.4	23000
3	2001	4.6	30000
4	2011	6.9	50000
5	2035	10.9	8-90000

Source: GIDB/LB (2000) 'Socio-Economic & Land use Studies

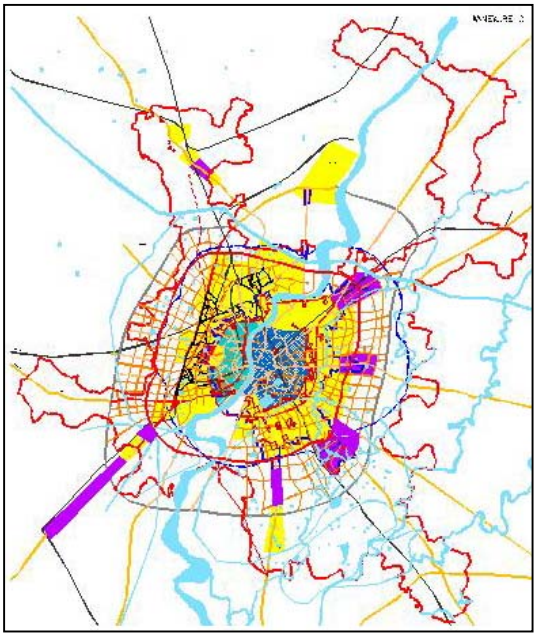
Based on the development plan proposals, taking into consideration the present trends and absorption capacity, following pattern of population distribution over space has been deciphered at.

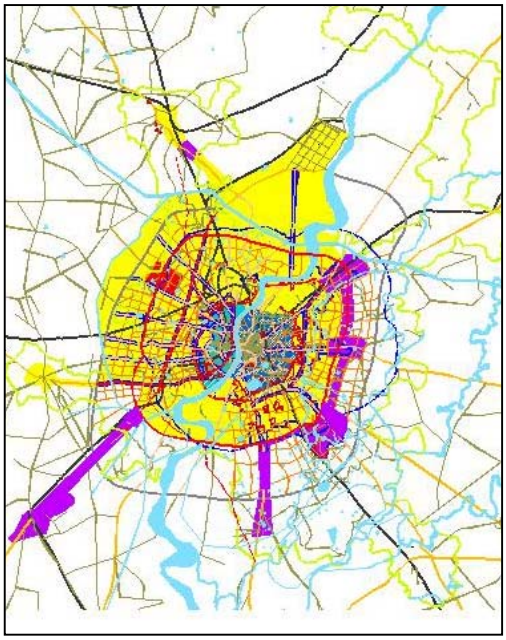
Table 2-10: Population Distribution – 2011 & 2012

Spatial Unit	Population			
	2001	2011	2012	G.R
1. Ahmedabad Municipal Corporation	**3520085**	**4475035**	**4583748**	**2.42**
1.a Walled City	372633	332294	328509	-1.13
1.b. East AMC	2521013	2892832	2932905	1.38
1.c West AMC	675362	1243980	1322334	6.29
2. A.U.D.A. (Excluding AMC)	**1189095**	**2247507**	**2397899**	**6.57**
2.1 Periphery- (U)	895537	1799378	1929418	7.22
2.1a East AUDA-U	150161	304628	326957	7.33
2.1 b West AUDA-U	745376	1494749	1602461	7.20
2.2. Kalol Town	112013	154392	159427	3.26
2.3. Mehemdabad	30768	43387	44904	3.49
2.4. Dehgam	38082	50422	51857	2.84
2.5. Sanand	32417	38208	38841	1.65
2.6. Periphery - Rural	80278	161720	173452	7.25
3. Gandhinagar	**373663**	**512516**	**528969**	**3.21**
3.a. Gandhinagar (GNA)	195926	278258	288193	3.57
3.b. Rest of Gandhinagar	177737	234221	240775	2.79
4. Other areas outside AUDA	334531	433924	445360	2.63
GREATER AHMEDABAD	**5417374**	**6905477**	**7075126**	**2.45**

Source: Based on AUDA, GIDB/LB report

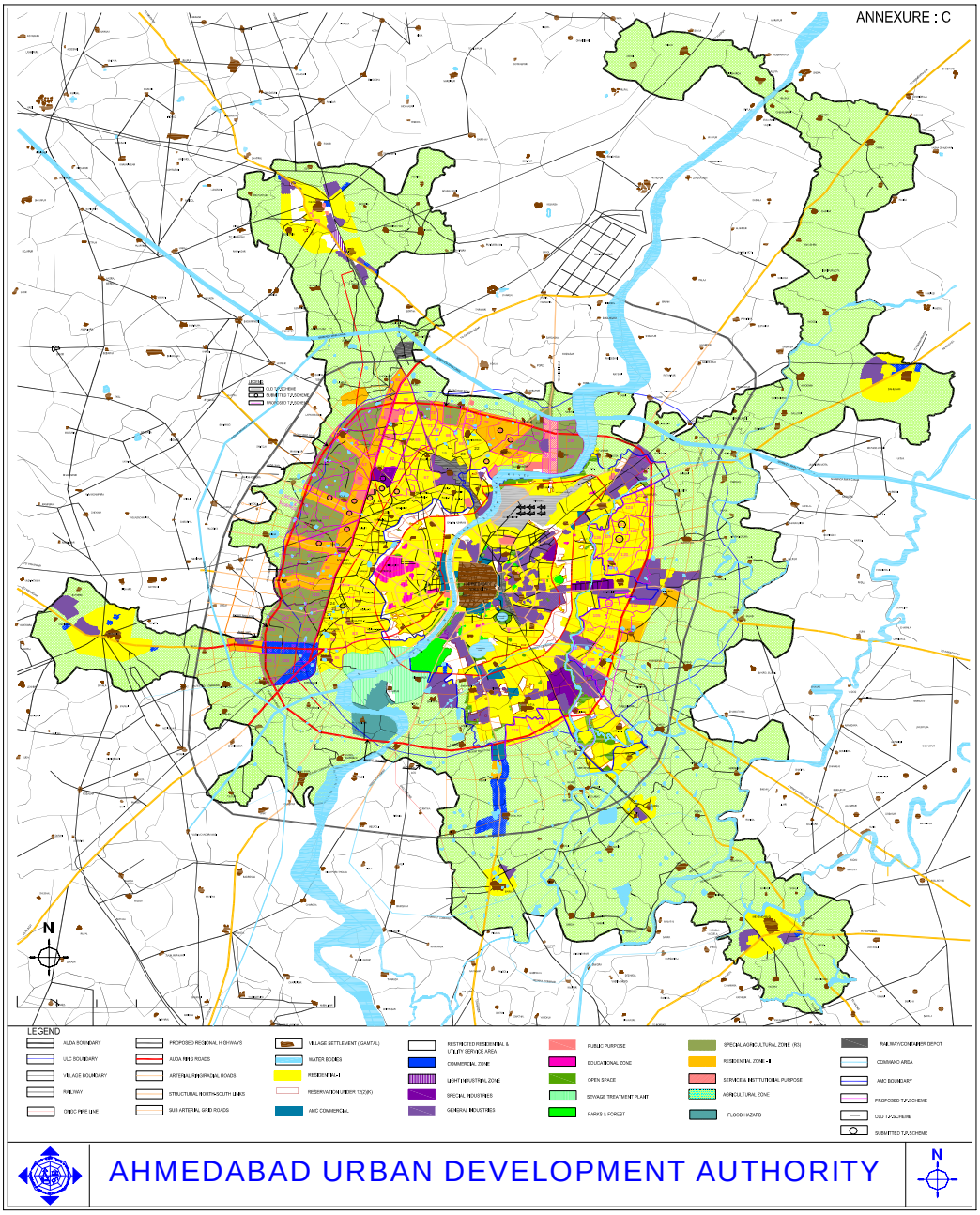
Map 2-5: Greater Ahmedabad Development Area: 2011 and 2035





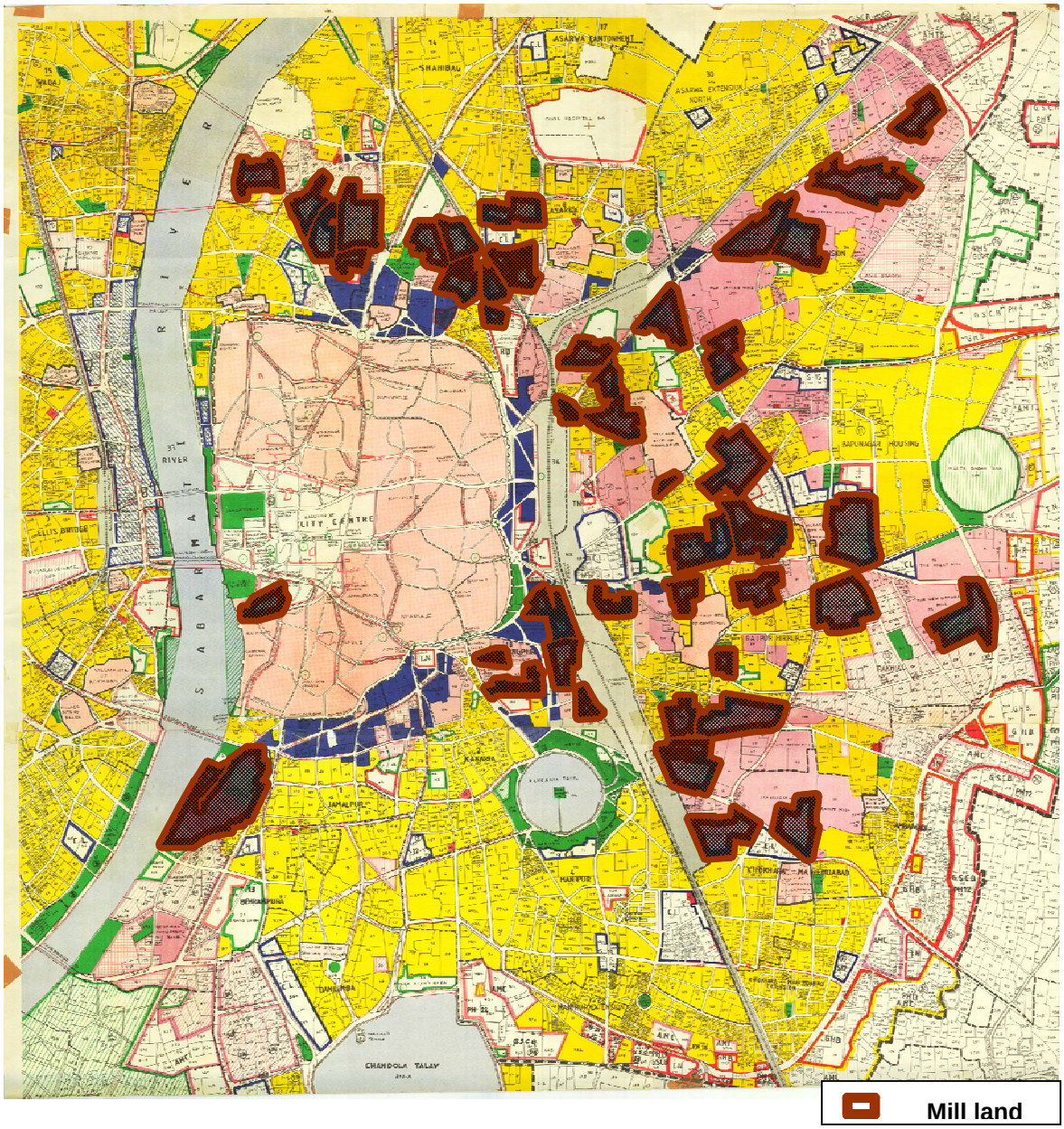
The Proposed Land use Plan of AUDA envisages the development by 2011 as shown in the Map 2-6. The Development Plan 2011 proposes an increase in residential areas from 35 percent to 44 percent. No significant change has been proposed in Industrial area due to the State Government's restrictive policy. Though 23 percent of the area exists as open, the city lacks adequate number of gardens and parks. It is proposed to develop 8.6 percent area as gardens. A huge area of land belonging to closed textile mills in Eastern Ahmedabad, which is lying unused, is being proposed for development. Increase in area under transportation from 9.5 percent to 11.1 percent is envisaged.

Map 2-6: AUDA Proposed Landuse 2011 Plan



Source: Revised Draft Development Plan of AUDA – 2011AD Part I ,Vol 2

BOX-3 AHMEDABAD CLOSED TEXTILE MILL LAND



The total land area occupied by the closed mills is **3.34 sq. kms.** Due to complex use change procedures and because of claims of Banks and workers the land is lying vacant since 1985/86.

Ownership	No. of closed mills
GSTC	18
NTC:	5
Private	50
Total	53

2.7 Issues

The Ahmedabad Urban Agglomeration has a population of 45 lakhs (2001) of which 78 percent is residing within the municipal area. Ahmedabad has been the primate city of Gujarat, the largest in terms of the population size and contribution to state income.

Over the years, rapid urbanization has led to spillover of population outside the city limits. This has resulted in intensification of development high rise structures which have been putting tremendous pressure on the infrastructure facilities. In the following 10 years, when the population within AMC is expected to rise from 35 lakhs to 46 lakhs and in Ahmedabad Urban Complex from 46 to 60 lakhs, it is vital to address such issues and plan accordingly to accommodate future growth

The city continues to be relatively compact. Some industrial activity has spilled over to the periphery. Containing the tendency of sprawl growth observed in the recent past is a necessity. Transit oriented development as a mechanism needs to be explored. Central and eastern zones have lost employment opportunities. Focus on these areas would be an additional contribution.

As may be noted, landuse planning efforts have been fairly successful in Ahmedabad in containing sprawl and haphazard growth. In the light of the fact that city is prone to earthquake, floods and technological hazards measures to integrate disaster mitigation into planning process are essential.

The economy of Ahmedabad is gradually being dominated by the tertiary sector. The downtrend in the textile industry has led to the weakening of the industrial base. The industries like chemical, petrochemical, engineering existing in the GIDC estates are less labour intensive and hence have much lower employment rates. This has led to the redundancy of major section of the labour force.

The surplus labour, which was unable to enter the formal market/sector, was mainly absorbed in the informal sector. Informal sector in the city today provides direct employment to 1 lakh people and indirect employment to 3 lakh people and creates business volume of approximately Rs 4 Crore everyday. Thus, informal sector's contribution in the tertiary sector is high and cannot be ignored.

In the event when the existing chemical/petrochemical industries are threatened by competition from countries like China after the opening up of the economy, the importance of informal sector becomes critical. It is thus imperative to address the spatial and policy issues related to increasing normalization in the tertiary sector. Also, the infrastructure requirements for the tertiary sector economy are much higher than the secondary sector based economy, and would thus have to be attended to. Focused efforts to strengthen city economic base are needed.

Chapter 3 Environmental Services

Water Supply

Sewerage

Storm Water Drainage

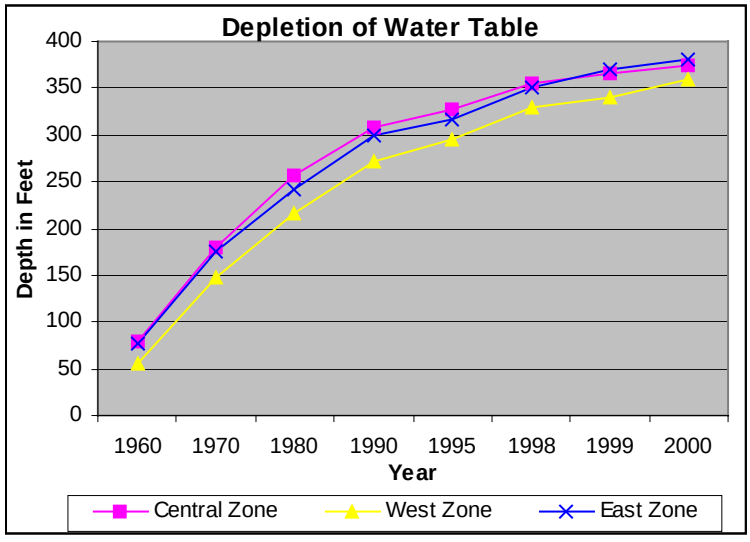
Solid Waste Management

3.1 Water Supply

The history of organized water supply in Ahmedabad dates back to the year 1891, during which Dudheshwar water works was constructed on eastern riverbank and piped water supply was given to the residential localities. Due to non-availability of perennial water after late 50's in the River Sabarmati, the city started depending on the ground water sources.

A new reservoir 'Dharoi' located 150km upstream of Ahmedabad on River Sabarmati, was also commissioned in 1978. The water from the reservoir was to be treated at Kotarpur works, wherein a 650 MLD treatment plant was installed. The water from Dharoi first reached Ahmedabad in 1978. Thereafter in 21 years the reservoir was filled to its capacity only in 8 years. Soon after, water level in Dharoi dam started falling to severe storage in summer months. Though the adequate water is normally released from Dharoi, not more than 33 percent water would actually reach the city; on an average due to in-transit infiltration, evaporation losses and illegal tapping in areas upstream of Ahmedabad (Refer Fig 3-1). Thus, the assured quantity of 680 MLD from Dharoi could not be made available at Kotarpur.

Figure 3-1 Depletion of Water Table



To meet the demand, seven french wells were also constructed in Sabarmati riverbed to draw sub-soil water of 182 MLD. Also, a large number of tubewells were installed all over the city.

All these arrangements however could only mitigate the problem for a short while. Thereafter, problems like non-availability of water in the Sabarmati and depletion of water level at an annual rate of 2 to 3m only worsened the situation.

At this time, a new scheme – Raska Wier Project was commissioned in order to tap water from River Mahi through an underground pipeline. This project started in 2000 and made available a total of 250 MLD water to the city.

3.1.1 Sources of Water Supply

The water supply needs of Ahmedabad city are presently met from three sources

- Surface water from Raska
- French well in Sabarmati River
- By Intakewell constructed in River Sabarmati (Narmada canal water is released in river which is pumped through intake well).

Table 3-1: Water Sources

Source	Year of commissioning	Installed capacity (mLd)	Average Drawal (mLd)	Drawal / Installed Capacity (%)
(A) Surface Water				
(1) Raska Pipeline	April 2000	295	250	85
(2) Kotarpur Intake works	Feb. 2004	165	110	67
(B) Underground Water				
(1) French Wells (7 Nos.)	1975-1999	182	128	70
(2) Dudheshwar Water Works	1900	80	60	75
(3) Bore wells	Different years	658	48	7.2

Due to failure of monsoons, the available quantity of water from both as well as ground sources is at risk. In order to avert a severe water crisis, the Raska Project was taken up on an emergency basis in the year 1999-00. The two phase project was planned with two phases (Refer Table 3-1).

- Transmission pipeline of 2010mm diameter running a length of 32 Km from source at Shedhi canal to Kotarpur Water Works (Raska –1) designed to carry 300MLD of water.

- Pumping main of 1600 mm diameter from Kotarpur Water works to Dudeshwar Water Works (Raska-2) running a length of 11.5Km and having a capacity of 150MLD.

Narmada Water for Ahmedabad City: Sardar Sarovar Narmada Canal has a provision of water for Ahmedabad city from Narmada main canal.

Ground Water

Till recently borewells were significantly meeting water demand of the city. AMC draws water from some 363 tubewells (altogether there are 406 tube wells installed, but 43 tube wells are non-functional currently) installed in various parts of the city. Besides, there are reports of ground water tapping by private borewells/tubewells. The withdrawal from the groundwater table has steadily increased over the years, resulting in an increase of failure rate of the tubewells. After the commissioning of the Raska project however, the stress on the ground water has been reduced by some extent.

3.1.2 Water Treatment System

A water treatment plant of capacity 650 MLD is installed at Kotarpur located in the north of the city. At present, Kotarpur treatment plant is getting water from Raska and Narmada canal through intakewell in Sabarmati River.

Table 3-2: Water Treatment Plant at Kotarpur

Water works (Treatment Plants)	Capacity in MLD (2000-01)	% capacity utilised
Ko tarpur	650	55 %
Dudheshwar	80	70%

Source : AMC, 2005

The water coming from Mahi River is being treated at Kotarpur (Refer Table 3-2). The water treatment process includes pre-chlorination, passing the water through clarifier, intermediate chlorination, filtration, disinfection processes - Alum dosing and post-chlorination stages. The water from the tubewells / borewells is chlorinated at the distribution stations.

3.1.3 Water Supply, Storage and Transmission

There are three water supply zones within AMC: Central, Eastern and Western (Refer Map 3-1) and two water works: Dudheshwar and Kotarpur. A treatment plant is located in Kotarpur. Water is supplied from Dudheshwar Water Works to the Central Transmission Mains while the Kotarpur Water Works supplies to the distribution stations in the three zones.

The central system is the oldest system and consists of CI pipeline of size 1500 mm from DWW and bifurcates to 800mm to feed Asarva area and the other branch is of 1200mm/1000mm/800mm to feed Laldarwaja.

The eastern transmission system consists of MS pipeline of size 1626mm/1520mm/1321mm from the Kotarpur Water Works (KWW) to Kankaria. Water from the French well near KWW

is injected into this pipeline. There is a branch at Sahijpur to supply water to the extended eastern side.

The western transmission system consists of MS pipeline of size 1626mm/1321mm/914mm from Sabarmati Octroi Naka to bifurcation point near Gujarat University and the 1321mm main bifurcates into 1067mm and further reduces to 914mm. There is no inter-connection between the eastern and western transmission systems.

Table 3-3: Water Supply Zones

Supply Zones	Water Supplied (MLD)	Water Supplied from
Central	125	Dudheshwar Water Works
Eastern	342	Kotarpur Water Works
Western	123	Kotarpur Water Works
TOTAL	590	

Source: AMC, 2005

The water from Kotarpur is transmitted to the underground storage reservoirs in the three zones. The available storage capacity is 690 MLD (Refer Table 3-4). Water is supplied for two hours (from 6 to 8 in the morning) from these distribution stations.

Table 3-4: Storage Reservoirs

Storage Reservoirs	Storage capacity (MLD)	Total Water Supplied (MLD)
Underground Storage Reservoirs at water works and water distribution stations	690	590

Source: AMC, 2005

Water from Raska is supplied to south zone. This means that water has to traverse at least 8-10 kms up north and then pumped back for ditribution by the same distance. A proposal to rationalize the distribution is underway.

3.1.4 Distribution System

There are five distribution zones, overlapping with the five administrative zones. The following table shows the zone wise coverage of water supply. The distribution network of 2584 km caters to the entire city (Refer Table 3-5). There are 90 distribution stations in the entire city.

Map 3-1: Existing Water Supply Network of AMC

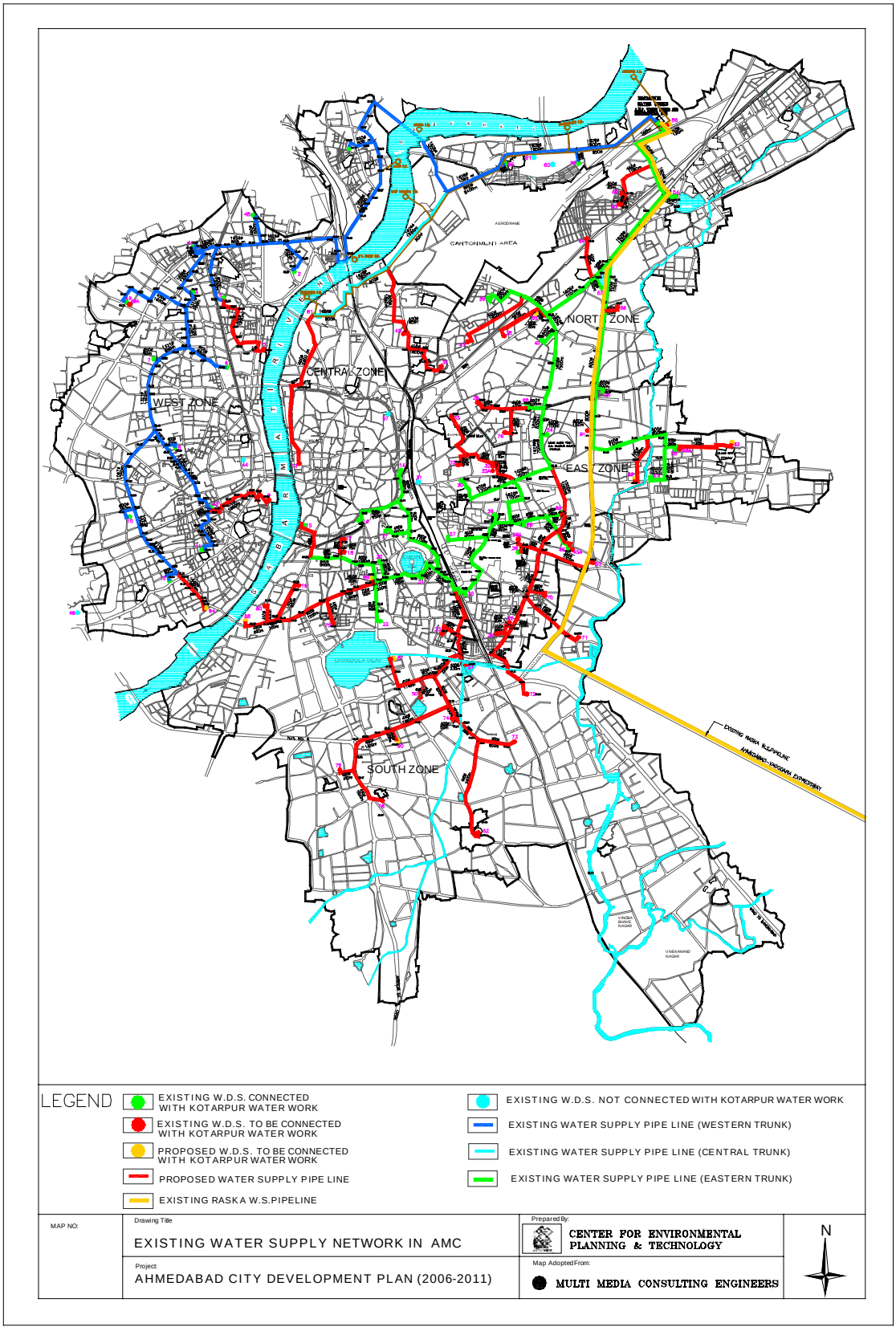


Table 3-5: Zone wise Coverage

Parameters	East Zone	West Zone	North Zone	South Zone	Central Zone	Total
No of wards Catered	9	9	9	7	9	43
Total area of the zone (sqkm)	27.51	42.32	32.19	72.32	16.5	190.84
Total population of the zone	783107	673420	779028	702418	577388	3515361
Total area covered by piped water supply(%)	80	95	80	80	98	
Population covered(%)	90	95	90	90	99	
Total water supply capacity (MLD)	108	152	168	116	146	690
Gross Per capita per day supply (lpcd)	Average 142 LPCD					
Water Supply Pipelines length (km)	605	540	658	561	460	2824
Transmission mains (km)	35	20	25	50	25	240
Feeder mains (km)	-	-	85	-	-	
Distribution Network (km)	570	520	548	511	435	2584

Source: AMC, 2005

The water supply network covers approximately 95 percent of the population and 86 percent of the AMC area. The Table 3-6 shows the zone wise supply to different sectors. 83 percent of the water is supplied to the residential areas, 11 percent for institutional, commercial and industrial needs and 6 percent to public stand posts. There are altogether 2158 public stand posts in the city (Refer Table 3-6).

Table 3-6: Water Supplied in MLD

Sectors	East Zone	West Zone	North zone	South zone	Central Zone	Total
Domestic	81	112	107	80	112	492
Commercial	15	9	18	14	10	66
Industrial						
Institutional						
Public stand posts	12	2	10	5	3	30
Total	108	123	135	99	125	590
No of stand posts	750	441	145	282	540	2158

Source: AMC, 2005

Average supply of water is about 143 lpcd. The distribution system consists of CI pipelines and the total length is about 2824 km (Refer Table 3-5).

3.1.5 Wastage

It has been observed that wastage of water at consumer's end in the city of Ahmedabad is substantial. Almost 15-20% of water supplied is lost in transmission and distribution.

3.1.6 Service Connections

Service connections are of galvanized iron. The number of regular domestic connections for last nine years is as follows:

Table 3-7: Water Connections

Year	No. of Connections
1994-95	231292
1995-96	236902
1997-98	241767
1998-99	246239
1999-00	250191
2000-01	254961
2001-02	261381
2002-03	264458
2003-04	267296

Source: AMC Statistical Outline 2005

Prior to 2002, about three percent connections were metered. Since last year, the system of metered connections has been changed and a new system of pro-rata charges has been introduced, which is based on the connection size. The service connections have a life of 7-8 years after which it should be replaced. However, such replacements, which have to be done at the consumer's end is often not done, leading to problems of leakage, contamination and low pressure.

Table 3-8: Indicators

Water supply litres per capita per day	143 lpcd
Transmission and Distribution Losses	15%-20%
% Population Covered	95%
% Area Covered	86%
Total Supply / Storage Capacity	85%
No. of hours of Supply	2

3.1.7 Efforts for Ground Water Recharge

The Ahmedabad city has high soil permeability and in order to make the ground water sustainable, it is imperative to replenish this source. With this idea, a Rain Water Harvesting Cell has been set up within AMC. Currently they are undertaking three kinds of tasks - utilising defunct bores as recharge wells, recharge pits where aquifer depth is available and digging new percolation wells upto the first unconfined aquifer.

Development of waterbodies like deepening of Kankaria, Odhav Naroda lake and Saijpur lake were also carried out last year. Work is being carried out in three phases: increasing

capacity, setting up of recharge wells and finally the beautification of lakes so as to generate some income through the advertisements in these areas.

3.1.8 Water Supply System in the periphery

In Ahmedabad city, the peripheral areas outside the jurisidiction of AMC, organsied water supply is limited largely to gamtal areas covering less than 10% of the population. Due to steep increase in the population and the increase in multi-storied buildings in the city outskirts, the local bodies are not able to provide the requisite water to the households in these areas. Due to these facts, the societies maintain their own bore wells and face problems of excessive draw down in water levels, functional problems and deteriorating water quality with intrusion of fluorides. In such circumstances, the private societies have to look for other sources of water supplies. Many private water companies have emerged to supply bottled water as well as through tankers.

In view of this situation the city had to look for an allocation from Narmada Main Canal, which is passing about 3 KMs from the northern city limits and through western periphery. AUDA took initiative to tap 400 MLD water for western areas spread in 34 settlements from Narmada Main Canal (NMC). The water shall be drawn to the extent possible by gravity to the WTP at the same location, and in case the canal water level goes down, pumping to the WTP shall be done. The distrubtion network in 16 western peripheral settlement areas has been completed and will be commissioned by March 2006.

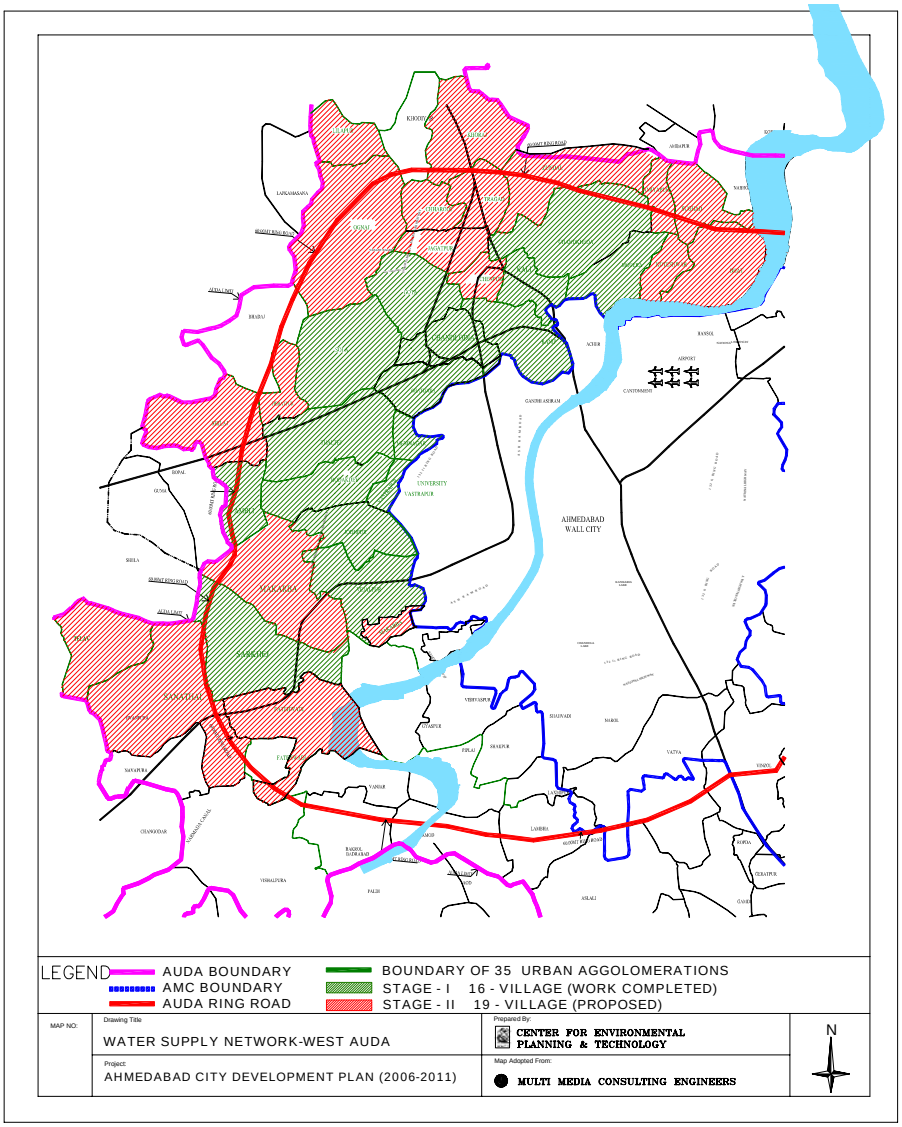
In the eastern periphery also water is drawn from deep tube wells (the depth of these tube wells varying from 160 m to 270 m) by individual societies and in a few cases by local bodies with in Gamtal area. However these tube wells are now unable to satisfy present drinking water needs due to dwindling ground water table. Deterioration in the quality of ground water is also a major issue. Hence a plan to draw water from Narmada Canal is underway.

3.1.9 Issues

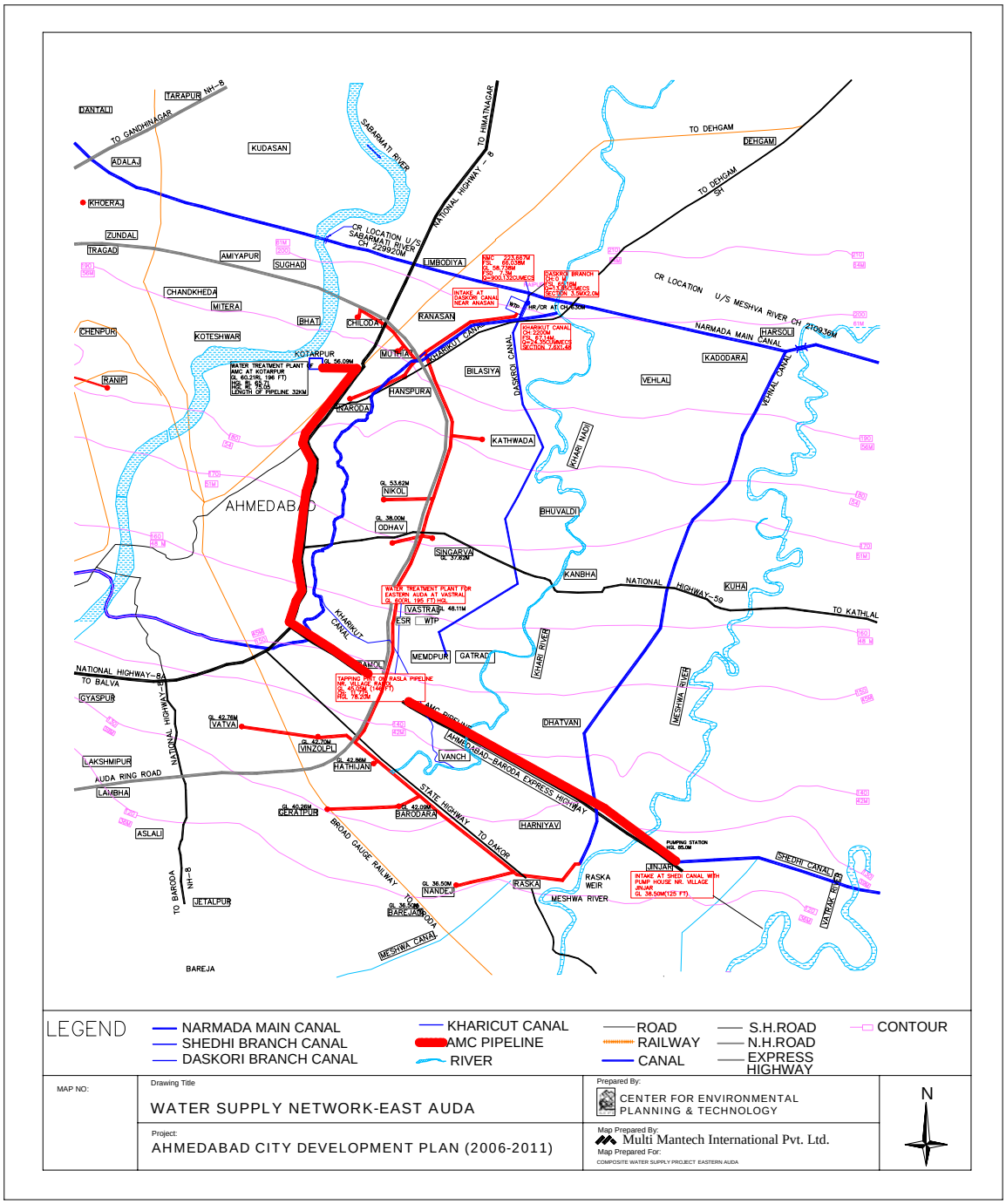
- *Exploitation of Ground Water Source*: In the absence of a perennial water source, dependence on ground water continues to be high in the periphery. Apart from the municipal bores, a large number of private bores have been installed in various parts of the city. This has seriously affecting the ground water level, which is depleting at the rate of 2 to 3m annually. Thus, the reliability and sustainability of the ground water source is questionable.
- *Insufficient storage capacity* Currently, 80% of the storage capacity is utilised. However, the storage capacity would need to be increased looking at the growing water demand.
- *Distrubtional Inefficiency:* At present all the zones are getting water from Kotarpur. The South zone is nearer to the Raska source and hence it is decided to supply water to South zone from Raska Pipeline. A new treatment plant near Raska will be installed to supply treated water.

- *Contamination of water due to old service connections*: The consumer connections are of Galvanised iron, which has a life of 7-8 years. These connections are often not replaced on time and leads to the problems of leakage, low pressure and contamination.
- *Inadequate Coverage:* Presently only 85% of the AMC population is covered by municipal water supply. The eastern area incorporated within the municipal limits in 1986, still has to be linked with the municipal supply. The newly built system in the western periphery is proposed to cover part of the area. The effort as part of this plan would have to address the coverage issue in about 150 Sq.Kms.
- *System Losses:* Around 20%-25% of the water supplied gets lost during transmission and distribution.
- *Limited Duration of Supply:* At present, the water is supplied only for two hours a day. It is proposed to supply water for 24 hours and hence necessary modification including construction of ESR at each distribution station will be carried out.

Map 3-2: Water Supply Network-West Auda



Map 3-3: Water Supply Network-East Auda



3.2 Sewerage System

In Ahmedabad, efforts at developing an organized sewerage system were evident even as early as 1890 when an underground sewer line and temporary pumping station were constructed in Khadia ward outside Astodia Gate. Since then, extension of sewerage network to the old city was undertaken in a phased manner and by 1931 the entire old city

area was sewered. The pumping station was shifted outside Jamalpur Gate. Installation of sewer lines in the areas to the north and the east of the old city, including new sub-urban pumping station was done from 1933 to 1941. From Jamalpur and new sub-urban pumping stations, sewage was taken to the Pirana Sewage Farm established in 1894.

3.2.1 Sewerage Network

Presently, around 75 percent of the municipal area is covered by 1384 km long sewerage network. There are 43 Sewage Pumping Stations, of which 8 are main Sewage pumping stations.

Table 3-9: Sewerage Network Details

Description	East Zone	West Zone	North Zone	Central Zone	South Zone
Area of the zone (Sq Km)	27.51	42.32	45	17.63	72.32
population of the zone	783107	673420	779028	577388	702418
Actual population served (Lakhs)	6.47	7.85	7.45	5.64	6.29
No. of households served	132000	128627	110000	99800	124000
Drainage network area (Sq.Km.)	24.63	38.86	28.9	34.00	16.5
Total length of drainage network (Km.)	262	250	272	256	344
Scraper manholes and vent shafts a) Scrapper Manholes b) Shafts	a)1400 b)60	a)1500 b)50	a)265 b)20	a)1700 b)75	a)380 b)300

Source: AMC, 2005

Table 3-10: Zone wise Drainage Pumping Stations

Main pumping Stations	Nos	Auxillary stations	Nos
Central	1	Central	6
South	4	South	6
West	3	West	3
		North	10
		East	10
Total	8		35

Source: AMC, 2005

At present, Ahmedabad generates about 500 MLD of sewage of which about 168 MLD is discharged into River Sabarmati without treatment through storm water outlets. In the newly merged areas of 92 sq.km. of extended east Ahmedabad, sewerage facilities are provided in 44 sq.km. area. Remaining 48 sq.km. area is yet to be provided with sewerage facilities. This project also includes augmentation of old sewerage pipeline, pumping station and treatment plant.

The city is divided into five sewerage zones. There are about 43 sewage pumping stations in the city, which pump sewage into the terminal pumping stations at Vasna and Pirana before the inlet chambers of the sewage treatment plants.

Table 3-11: Drainage Schemes in AMC Area

Sr. No	Name of drainage scheme	Year of commissioning	Area covered (Sq.Km.)	Popl. Served (Lakhs)	Total length (Km.)	No. of main SPS	Dia. Of Sewers (mm)
1	Sewerage project (World bank credit no 1280 IN)	1989	96	20	21.0	2	1700X1700 to 2500X2500 box drain
2	Priority infrastructure Sewerage project (World Bank Credit 1643IN)	1995	20	5	09.33	2	450 to 1800
3	East Ahmedabad , Phase – I	1998-2002	25	5	91.8	9	300 to 900
4	East Ahmedabad , Phase – II	1998-2003	19	3	99.59	_	300 to 900
5	GIDC Mega Project	2001	–	GIDC Estates (polluting industries)	27	1	1000 to 1600

Source : AMC, 2005

3.2.2 Treatment facilities

There are two sewage treatment plants (aerated lagoons) at Pirana and Vasana having capacity of 180 mLd and 75 mLd respectively in eastern and western part of the city.

In addition to above, recently two sewage treatment plants (UASB) of capacity 106 MLD and 126 mLd (36 mld for city & 90 for periphery) at Pirana (old) and Vasana (old) respectively were commissioned as a part of Sabarmati river action plan.

Common effluent treatment plants (CETP) have been installed by the highly polluting industries in Odhav, Naroda and Vatwa GIDC estates. The treated effluent from CETP is mixed with the treated sewage from STP at Pirana so as to lower the concentration of S.S. and then discharged into river Sabarmati.

The less and non- polluting industries in GIDC are presently not treating the waste and the effluent is discharged either in the open (on the roads, open spaces in the GIDC estates) or in the Kharicut Canal. The other industries in AMC and Behrampura (highly toxic waste) are connected to the main sewer line and the effluents from these are being discharged into River Sabarmati without any treatment.

Map 3-4: Sewerage Network of AMC

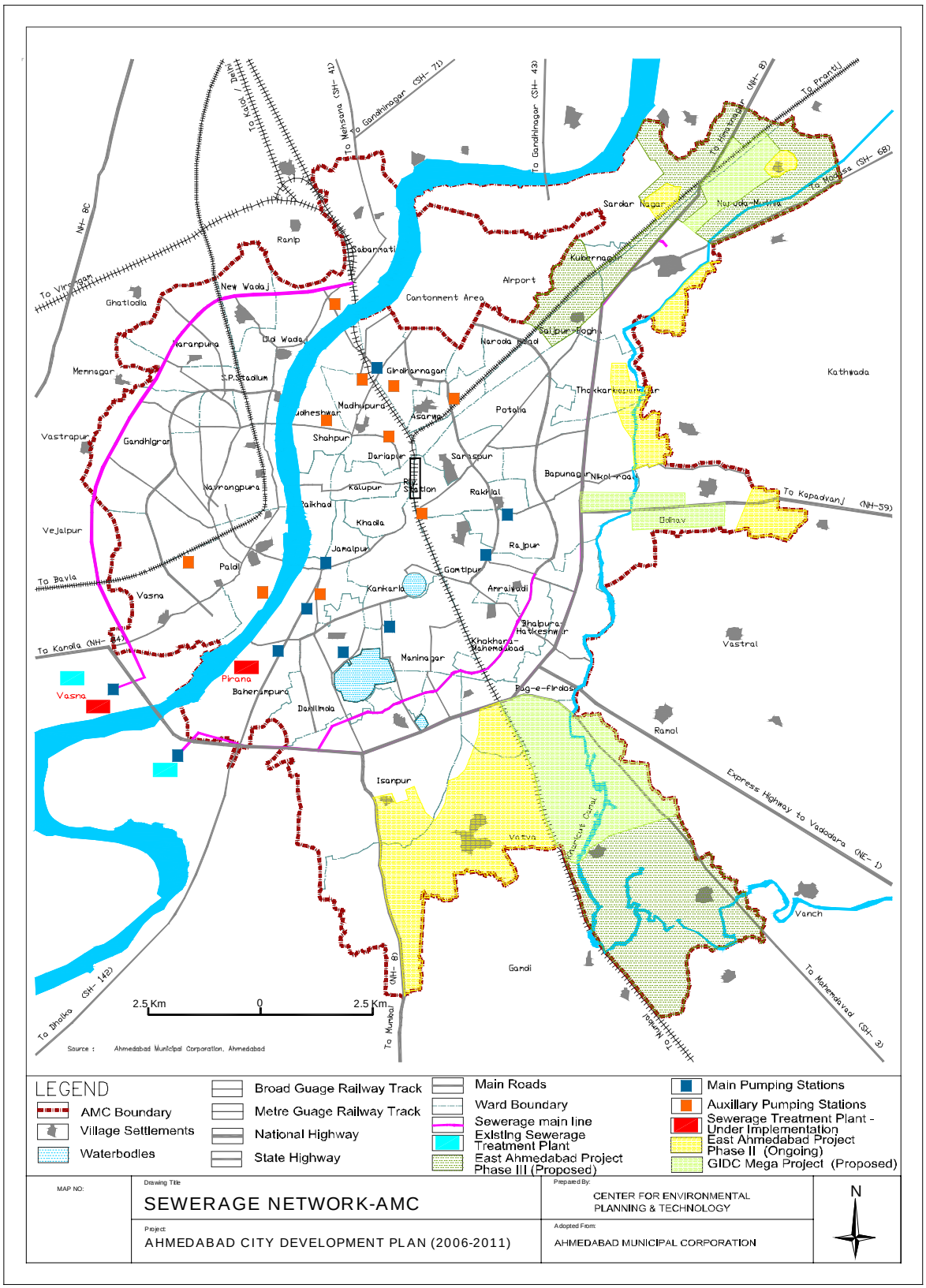


Table 3-12: Sewerage Treatment Plant Details

S.No	Location	Year of commissioning	Capacity (MLD)		Process	Remarks
			Design	Utilizing		
1	Pirana	1995	180	180	Aerated lagoon	Functioning
2	Vasna	1995	75	75	Aerated lagoon	Functioning
3	Pirana	2002	106	106	UASB based	Functioning
4	Vasna	2002	36	36	UASB based	Functioning

Source: AMC, 2005

3.2.3 Drainage / Sewerage System in the periphery

Sewerage network coverage in the peripheral areas is limited. In the eastern periphery, urban growth has extended to eight settlements under AUDA. The total area is about 32.34 sq.km. All the settlements are moderately populated pockets. The urban area is presently not having any sewerage system and the sewage is left out in open through local drains. This sewage flows to open fields, to Khari River and other local drains and finds its way to Kharicut Canal and to Khari River. The Khari River flows down and meets Sabarmati River before Vautha. At some places, illegal connections are made and sewage is discharged into GIDC pipeline, which mixes with partially treated effluent. It is estimated that about 16 Mld sewage is generated from this area and is left untreated.

In the west periphery, the area of 73 sq.km located between Municipal boundary on west side to Sarkhej – Gandhinagar highway was served under Phase I. A systematic drainage network was planned for around 78-sq.km area on the western side. These areas are located between Municipal boundary and on West Side Sarkhej – Gandhinagar Highway. Out of this 78-sq.km area, 44-sq.km area is known as early-developed area and remaining 34-sq.km area is known as fringe area. In the first phase, drainage network of early-developed areas was planned and accordingly executed. This drainage network project was undertaken as part of Sabarmati River Cleaning Project under National River Cleaning Project. This carries wastewater to Vasna Terminal Sewage Pumping Station and 126 MLD Sewage Treatment Plant at Vasna for further treatment. After treatment, it is discharged into Fatehwadi Canal. Out of this 126 MLD capacity treatment plant, 90 MLD capacity was provided for the flow from perphery areas while 36 MLD flow for AMC areas.

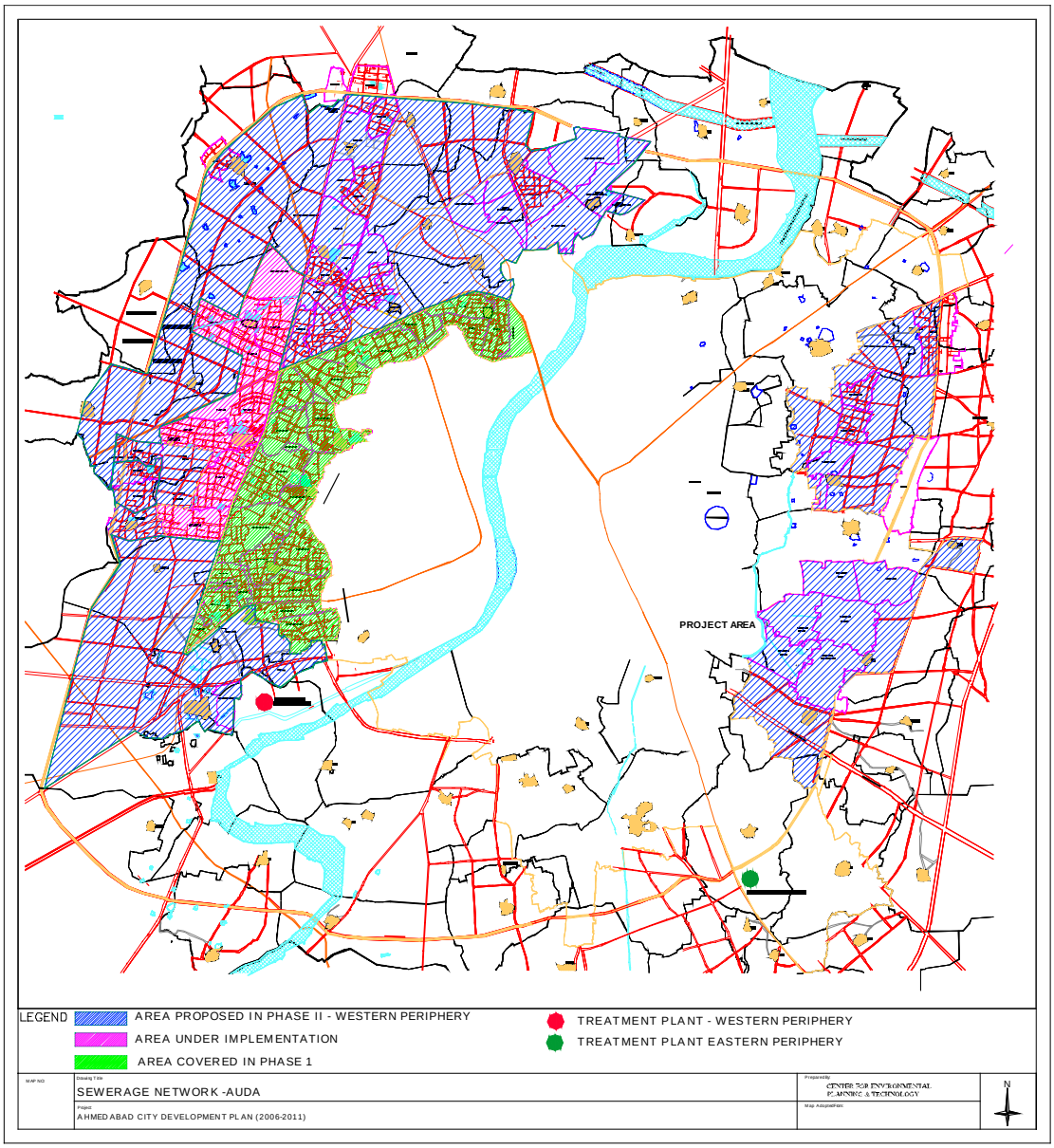
3.2.4 Issues

- *Inadequate System Coverage*: The sewerage network in Ahmedabad presently caters only to 75% of the area. Certain areas of eastern zones do not have sewerage facilities. Systems in periphery have to be built for most part of the area.

Table 3-13: Indicators - City

% Population Covered	90%
% Area Covered	75%
% Sewage treated	72%

Map 3-5: Sewerage Network-AUDA



- *Untreated Waste disposed in River Sabarmati:* Only half the sewerage is being treated while the rest of it is disposed off in Sabarmati river. Less polluting industries are also disposing off their wastes either in Kharicut canal or within the estate, while the rest of the industries of Ahmedabad are pumping their effluent into the GIDC main sewer line. Cases of industries putting their effluents into the manholes have also been reported.

- *Inadequate treatment facility*: The treatment capacity of the plant is much less than the waste generated. The capacity would be increased by 232 MLD with the

implementation of two ongoing STP projects. However, it would still be insufficient to treat the entire sewerage generated.

- *Breakdown of drainage pipeline due to mixing of industrial effluents:* Problems of silting in the sewer lines have been reported in eastern and western zones. Due to mixing of industrial effluents, there have been problems of pipeline breakdown and/or corrosion due to hazardous gases.

- *Mixing of storm water with sewerage during monsoons:* Infiltration of rainwater into the sewage lines in some areas further aggravates the problem during the monsoon months.

- *System expansion in the periphery:* In the periphery system coverage is limted. With rapid expansion in the population wastedisposal in an unplanned manner is becoming a major health threat.

3.3 Storm Water Drainage

The monsoon in the region is seasonal and is active between the months of June to September. The land drainage in Ahmedabad city is relatively poor and, during the monsoon months, many areas of the city suffer temporary flooding/blockage of storm water. The city also experienced one of the worst floods in 2000.

Table 3-14: Details of Storm Water Drains

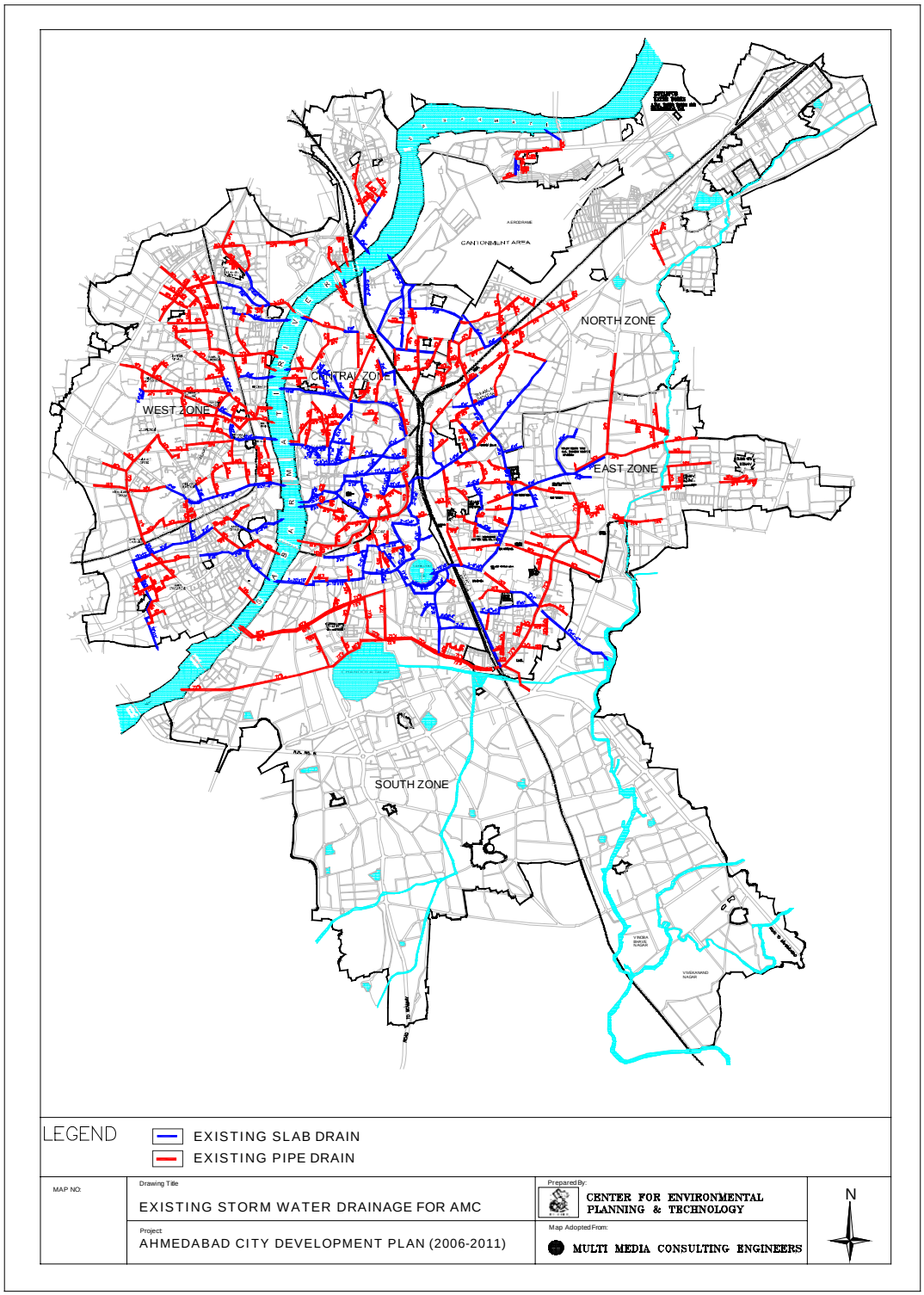
Year	Length of Storm Water Drains (kms)	Total length of roads (km)	S.W.D as percentage of total road length
1989-90	260.0	1214.0	21.42
1994-95	272.4	1214.8	22.42
1999-00	290.4	1271.7	22.84
2003-04	345.9	1325.1	26.10

Source: AMC Statistical Outline

Storm water drains in the city cover only 23% of the roads in the city (Refer Table 3-14). There are three types of drains laid in the city- RCC pipes, Box type drains and arch drains. These storm water drains discharge storm water into River Sabarmati at 42 locations, of which currently only 27 locations are functional. Storm water drains in the city are poorly developed and many parts of the western and eastern zone experience water-logging problems during the rainy season. (Refer Map 3-3) However, the Walled City area does not have any problems of flooding/water logging.

In the periphery the system is yet to be developed in most parts.

Map 3-6: Existing Storm Water Drainage Network of AMC



3.3.1 Issues

- *Water Logging and flooding problems*: Negligence of natural drainage in the growth and development of Ahmedabad city has led to problems of water logging and flooding during the monsoons. The city experienced worst floods in 2000 when large areas of western and eastern Ahmedabad were affected.

Table 3-15: Indicators

% roads having storm water drains	22.8%
% Area Covered	40-50%

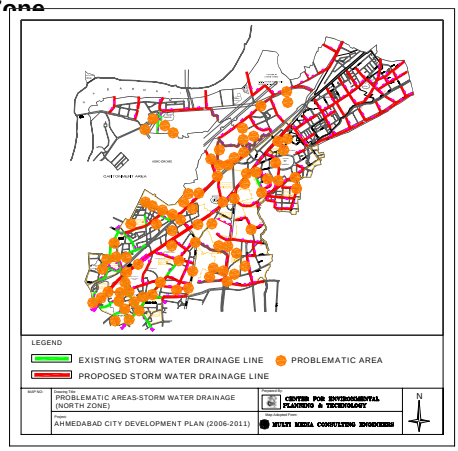
- *Poor Coverage:* The storm water drains cover only 23% of the roads. The newly acquired areas of AMC do not have storm water drainage system because of which areas of Odhav, Naroda and Vatwa experience water logging.

Infiltration of storm water into the sewerage network: Sewer system unauthorized used for discharging storm water in absence of adequate storm water facilities in many areas.

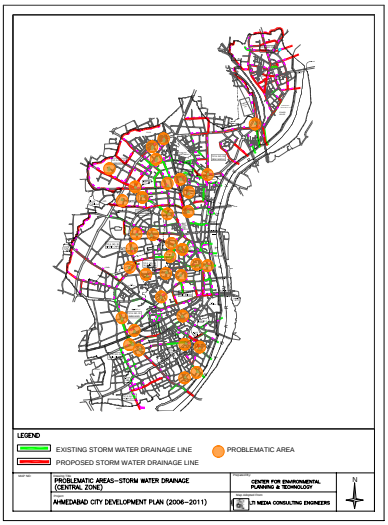
Blockage of outlets and silting of storm water drains: Of the 36 outlets into the river Sabarmati, 9 outlets are blocked. Similar blockage and silting has also been reported in the storm water drains.

Map 3-7: Problematic Areas-Storm Water Drainage

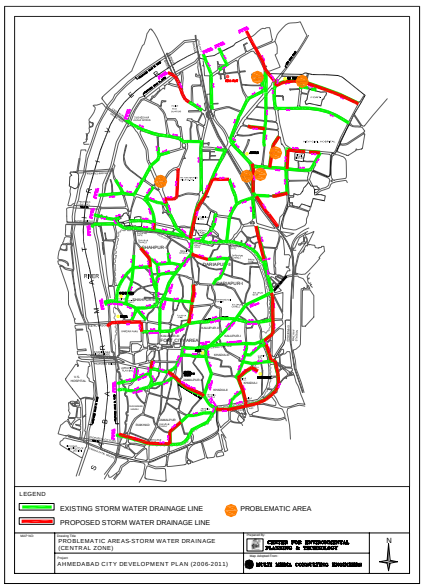
West Zone



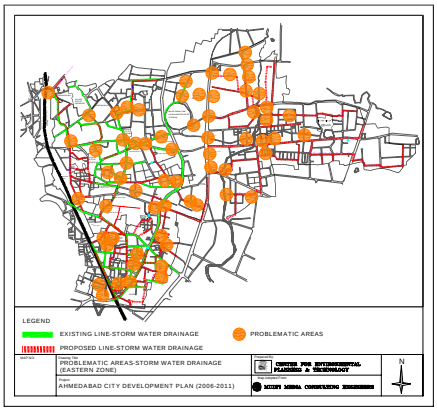
North Zone



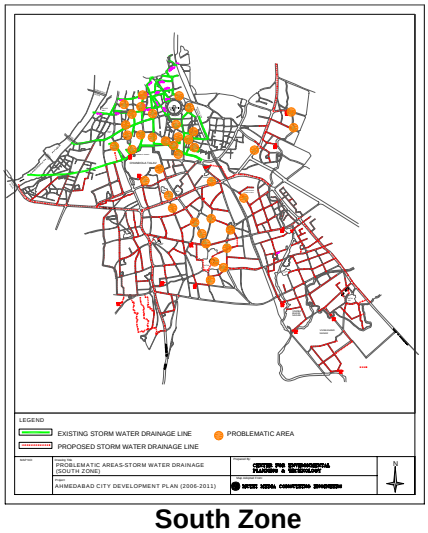
West Zone



Central Zone



East Zone



South Zone

3.4 Solid Waste Management

Solid Waste collection and disposal in Ahmedabad is being carried out by Ahmedabad Municipal Corporation as an obligatory function. The total waste generated in the city is of the order of 2100 tonnes per day.

Table 3-16: Solid Waste Generation & Collection (2005)

Generation : Total (Tons/day)	2095
Generation : Per capita (Kg/day)	0.419
Moisture Content of waste	45%
Density of waste (Kg)	0.5 kg/cu.mt
Distance of disposal point	3-22 kms
By Corporation (T/Day)*	1676
Collection/Capita	0.419
Nos. of dustbins (7 cu.mts. capacity)	789
Total capacity of dustbins (Cu. mt)	3659

Source: AMC, 2005 Excluding construction waste*

For efficient waste collection management, the city is divided into five collection zones, which are the same as five administrative zones. The work relating to the primary collection of waste (conservancy) has been decentralized at the zonal level where the work is supervised by Zonal Additional / Deputy Health Officers with the assistance of ward level supervisors where as the transportation and disposal of waste (Refuse Removal) is being looked after centrally by the Director, SWM. For the refuse removal, the five zones are further divided into 11 Distribution Centres – 4 in Central, 2 each in East, West and South and 1 in North zone.

Map 3-8: Solid Waste Collection Network of AMC

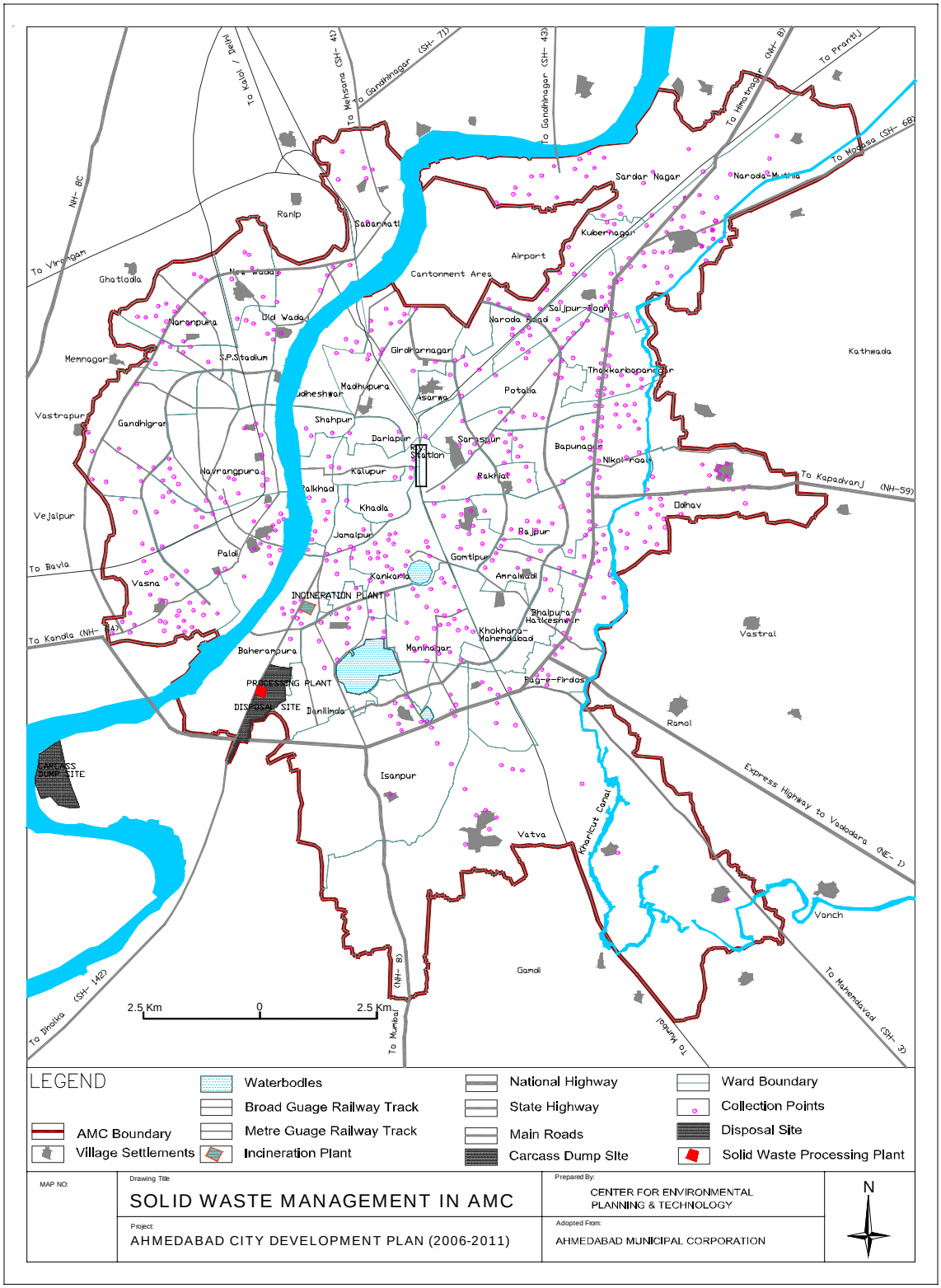


Table 3-17: Details of Collection Points in Different Zones-2005

Zones	Total sites	Paved	Containerised sites	No. of containers placed
Central	72	26	72	92
North	139	14	139	148
East	203	25	203	237
South	156	20	156	157
West	138	32	138	155
Total	**708**	**117**	**708**	**789**

Majority of waste is getting generated from households, followed by 22 percent from construction and demolition material. Wastes from shops and specialised market generate 4.5 percent of the waste and a minimal 1 percent is bio-medical wastes and waste from hotels and restaurants.

AMC has initiated primary waste collection from households through door-to-door collection system. AMC covers about 7.9 lakh houses by allotting work to 706 RWAs / Mandalis which have deployed 3890 contanerised tricycles for collection of waste.

Of the 2100 Tonnes/day waste generated per day, 80 percent waste is collected. However, by scheduling extra vehicles and manpower the remaining wastes are also collected periodically, thereby achieving 98 percent collection efficiency.

Table 3-18 Details of fleet for waste collection (2005)

Type of Vehicles	Scheduled Vehicles	Available Vehicles	No. of Shifts	Total trips	Waste collected in MT
JCB Machine	12	12	2		
JCB Truck	48	48	2	180	1020
7.0 Co. Dumper Placer	61	61	2	500	1125
Mobile Truck	3	3	1	3	15
Refuse Collector/Compactor Machine	3	3	1	3	21
TOTAL	127	127		686	2181

Source: AMC, 2005

Waste collected from the city is disposed at 84 ha, Pirana land fill site approximately 22 km away from the farthest end on Western side and 18 km away from the farthest point on eastern side, near Narol-Sarkhej Octroi Checkpost.

The disposal site at Pirana also has a waste processing plant which has been commissioned and run by private M/s Excel Industries Ltd. It produces soil enricher. Around 500 MT of biodegradable waste like vegetable and fruit market waste is composted at composting site. Required quantity of water and yeasts culture for fermentation is added to the waste and then it is composted for 28 days cycle. Water is added at regular intervals to maintain the moisture content. The average moisture content is 15-45 %. The compost is turned once in

seven days for proper aeration. The turning is done for 4 times within 28 days cycle. The final product C: N ratio is maintained at 10:15. The manure formed is sold at 2kg, 5kg and 50 kg bags also for different rates. About 500 MT waste is composted. The total capital cost incurred was 6 crore for aerobic treatment plant. The production cost is 2.50 Rs/kg.

3.4.1 Bio-medical waste

The bio-medical waste generated from the Municipal hospitals are segregated at source and collected in yellow polyethene bags at separate collection centers in hospitals as per the rules. These are collected and transported in closed vehicles of AMC. The incinator plants are operated by authorized private contractors. The private hosptitals and health care centers also have similar arrangement with the contractors.

3.4.2 Recycling and Reuse

The waste recycling process and its network in Ahmedabad is well established. There are a substantial number of formal/ informal actors involved in this activity. The waste materials from various sources reach the processing units via these actors. Among the major recyclable waste material in terms of its volume are scrap iron, paper waste, card board and glass.

The overall pattern of the flow of the recyclable and reusable waste is circular in nature from origin to the destination. There are two major sources of waste materials namely, accountable source which includes household, factory, offices, institutions and shops and establishments and the unaccountable source which includes dustbins, community bins and municipal bins. The waste originating from these various formal and informal sources comes to the retailers via waste pickers (Rag pickers) and Kabadiwalas. Thereafter, the waste goes to the bulk buyer (dealer) in the central zone i.e. Mehndikuva, Madhupura, Daryapur etc. and from where it reaches the recycling and processing units in Naroda, Odhav and Vatwa.

3.4.3 Solidwaste Management in the Periphery

In the periphery the urban local bodies have initiated measures to collect solidwaste through a door-to-door collection system. In the rural local body areas inititive is limited. The disposal of waste is also a major area of concern.

A total of 35 settlements in the west and 15 settlements in the periphery, under the jurisidiction of AUDA are experiencing the problem severly. Total estimated waste is about 343 TPD. AUDA as a nodal agency for all the LB's in implementing various proposals. The

Work has begun on the following:

1) Construction of First Landfill Cell of the Secured Engineered Municipal Solid Waste Landfill site at Fatehwadi Village of the Size 120 m x 120 m x 10 M depth which shall be capable of handling 1,45,000 MT of MSW at a Cost of Rs. 200 Lakhs.
2) Construction of First Compost Plant of 150 MT/day solid waste handling capacity and able to produce approx. 40 MT/day of Organic compost at a Cost of Rs. 300 Lakhs.
3) Construction of Various Infrastructure Facilities at the Landfill site as per the guidelines of MSW Rules 2000 and Three Solid Waste Transfer Stations at TS – 1 (Thaltej/Ghatlodia), TS - 2 (Ranip) and TS – 3 (Bodakdev) costing Rs. 107 Lakhs.

3.4.4 Issues

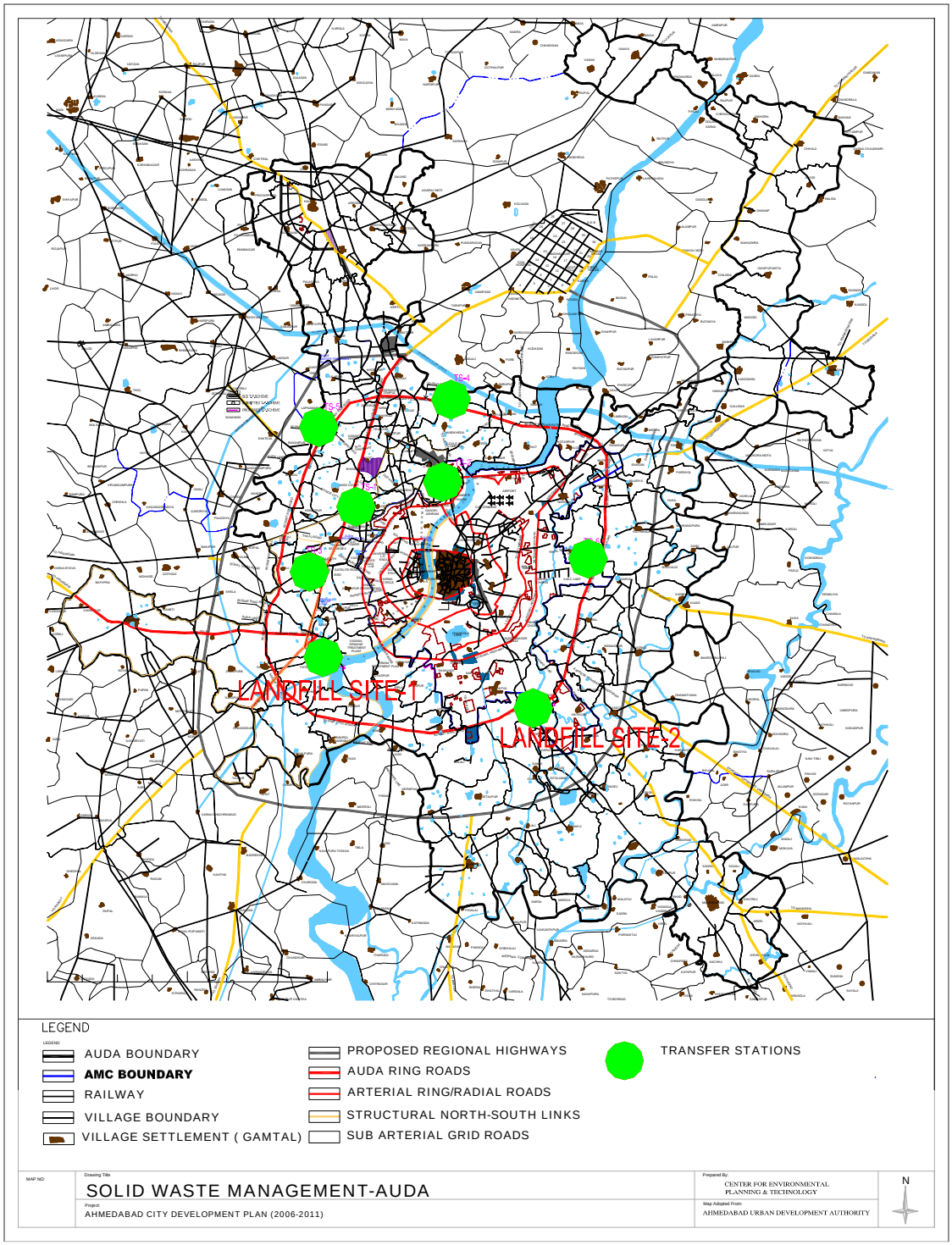
- *Primary collection of waste:* The system of door to door collection of waste is to be made more effective.
- *Disposal of bio-medical wastes with other wastes*: Contractual arrangements are made for collection of bio-medical wastes from hospitals and nursing homes and incinerating them. Scope for making the collection and disposal more effective exist.

Table 3-19 : Indicators

% Waste Collected to Generated	98%
% Waste processed	50%
Total veh capacity/total waste generated	0.81
Trips/vehicle	3 to 5

- *Unpaved and open collection sites:* Only 13% of all the waste storage sites are paved and 55% of the sites are containerised. On the rest of the site the waste is dumped on the open ground which leads to the problem of ground water contamination and creates odour nuisance.
- *Indiscriminate dumping of construction debris on streets:* About 20% of the waste generated is the construction debris. Such waste in most of the cases are indiscriminately disposed off on the streets causing hindrance in traffic and obstruction in city cleaning process. AMC has offered removal of such waste on subsidised payment throiugh skip and skip lifters. However, this facility is not availed in most of the cases and the wastes end up on the streets.
- *No waste segregation done:* Currently, no waste segregation is done by AMC and only 36% of the waste are processed.
- *Unscientific disposal technique*: The method of disposal is not scientific. It requires larger area and may result in problem of ground water contamination. Sanitory landfill sites are proposed.

Map 3-9: Solid Waste Collection Network-AUDA



Chapter 4 Roads and Transportation

System Components
Vehicles
Facilities
Public Transport

4.1 System Components

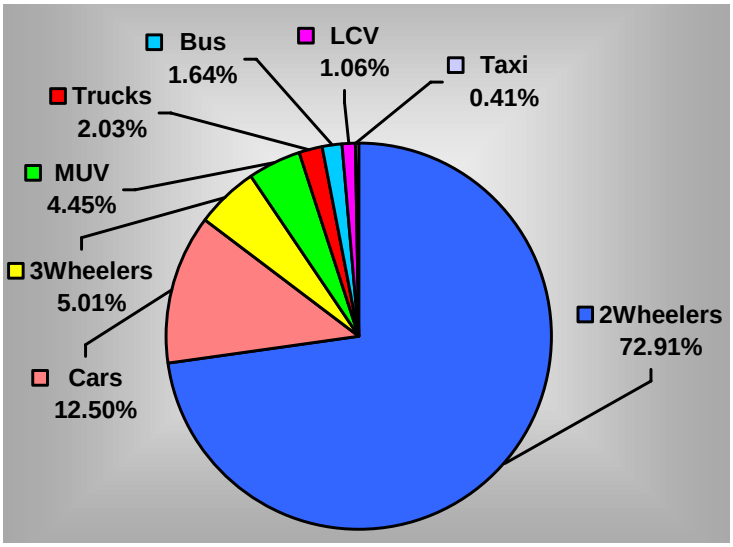
Ahmedabad city is well connected by an expressway, several national and state highways, the broad-gauge and meter-gauge railways and an international airport. The city transportation system is predominantly dependent on roadway systems. Vehicular growth has been rapid. The network is experiencing heavy congestion. Consequently air pollution has become severe.

The information below provides an overview of the existing transportation system in terms of road network, vehicular growth and composition, performance of the system and its impact.

4.2 Vehicles

At the time of formation of the state of Gujarat, in 1961, there were only 43000 vehicles registered. This figure has risen to over 70 Lakh vehicles by the year 2004, recording a rise by 160 folds in four decades. In the recent past, annual additions have been high and increasing. During the years 2001 to 2002, the increase in the number of vehicles registered was by 4.3 lakh. This has risen to 5.1 and 5.7 during 2002 to 03, and 2003 to 04 respectively (Refer Table 4-1).Ahmedabad district has a total number of 14.9 Lakh motor vehicles registered in the year 2004. Of this

Figure 4-1: Figure showing composition of vehicles in Ahmedabad



73% were two wheelers. The district, which accommodates 11% of the state population accounts for about 21% of the vehicles registered in the State[5]. This high density and rapid growth of vehicles have worsened the transport situation to a significant extent.

Figure 4-1 shows the composition of vehicles in Ahmedabad. Table 4-2 indicates the decadal growth of motor vehicles at the level of Ahmedabad with a comparative presentation of national and state level growth. Currently vehicles are growing at the annual rate of 13%, which is quite high and indicates towards a greater vehicular population in the future.

Table 4.1: Total number of vehicle registered and decadal vehicular growth pattern in India, Gujarat and Ahmedabad

Year	India		Gujarat		Ahmedabad	
	Total	Decadal Growth	Total	Decadal Growth	Total	Decadal Growth
1961	665000		43230		N.A.	
1971	1865000	180%	147967	242%	62922	
1981	5391000	189%	522451	253%	165620	163%
1991	21474000	298%	2052391	292%	538182	225%
2001	54991000	156%	5576040	172%	1210278	125%

Source: MoRTH, Gujarat

The annual growth rate of the vehicular population of Gujarat is even higher than the national growth rate because the state economy has been continously doing better than many other states for the past many decades.

Table 4-2 shows the growth pattern of various segments of vehicle in Ahmedabad in the last three decades. Two stroke engine vehicles (two wheelers & three wheelers) and public transport vehicles have a significant influence on urban air quality. Ahmedabad has one of the highest growth rates of two wheeleres and three wheelers.

Table 4-2: Total motor vehicle growth and growth of two/three wheelers and AMTS buses in Ahmedabad (1961-2001)

Year	All Vehicles		Two Wheelers		Three Wheelers		AMTS Buses	
	Total	Growth	Total	Growth	Total	Growth	Total	Growth
1971	62922	-	21702	-	4865	-	525	-
1981	165620	163%	86550	299%	16741	244%	610	16%
1991	538182	225%	361372	318%	38359	249%	756	24%
2001	1210278	125%	863003	139%	65868	72%*	886	17%
Total Growth (71-2001) 1823%			3877%		1253%		69%	

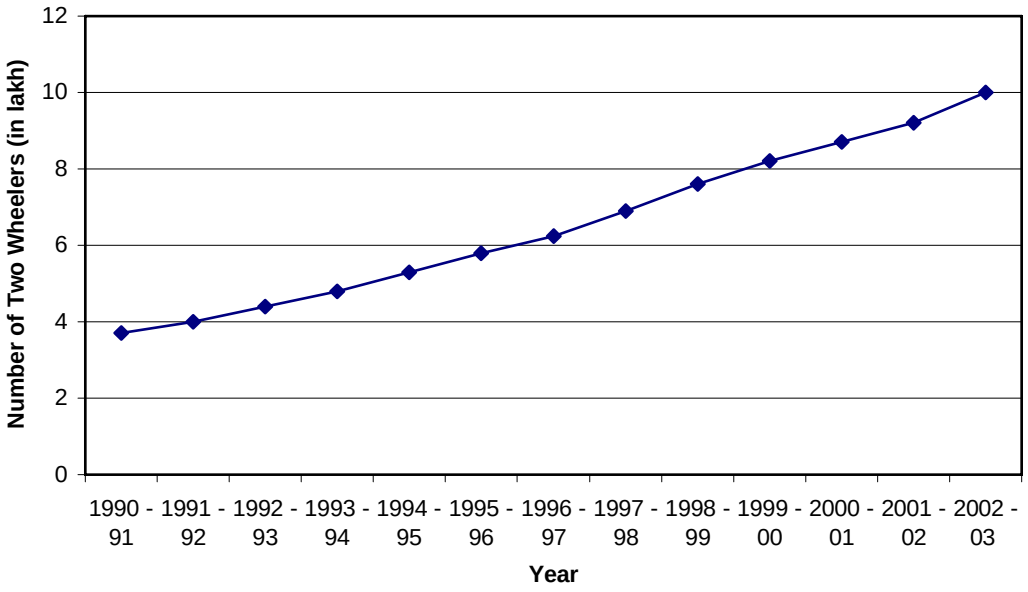
Source: Transport Department, Gujarat, Ahmedabad, 2004

[5] *Ahmedabad Agglomeration accounts for78% of the total district population*

Note: Sudden reduction in growth rate is due to the restriction levied by the transport department

Fig 3.2 presents the graph of two wheelers' growth in Ahmedabad. Ahmedabad experienced 18 times growth of vehicular population in last four decades (1971-2001) with almost 39 times of growth in two wheelers population.

Figure 4-2: Growth of Two Wheelers in Ahmedabad 1990- 2003



Source: Transport Department of Gujarat, Ahmedabad, 2004

The growth rate of two wheelers was the highest in the 1970's and in 1980's because of three possible reasons.

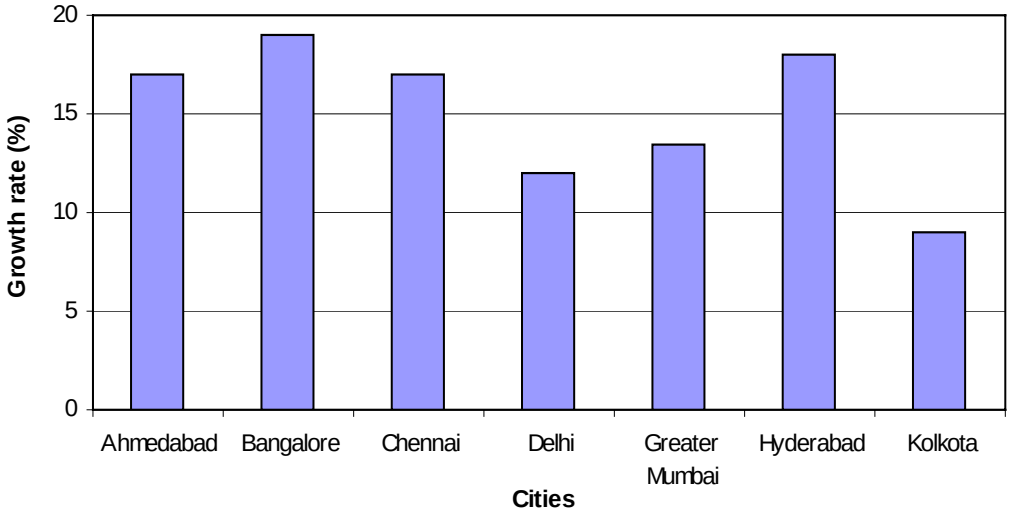
- A large number of lower middle class and middle class population supported by favourable income levels.
- Economic liberalisation and automobile revolution in the country.
- The stagnation of Ahmedabad Municipal Transport Service. A large number of autorickshaws were registered in neighbouring districts and being operated in Ahmedabad city. [6]

Figure 4.4 shows the comparative data of vehicular growth rates in all major metro cities in India. Ahmedabad, Bangalore Hyderabad and Chennai have recorded a higher growth rate than Delhi, Mumbai and Calcutta. If vehicular growth continues, very soon these cities will

[6] As per the estimate currently 10000-15000 such autorickshaws are operational in Ahmedabad.

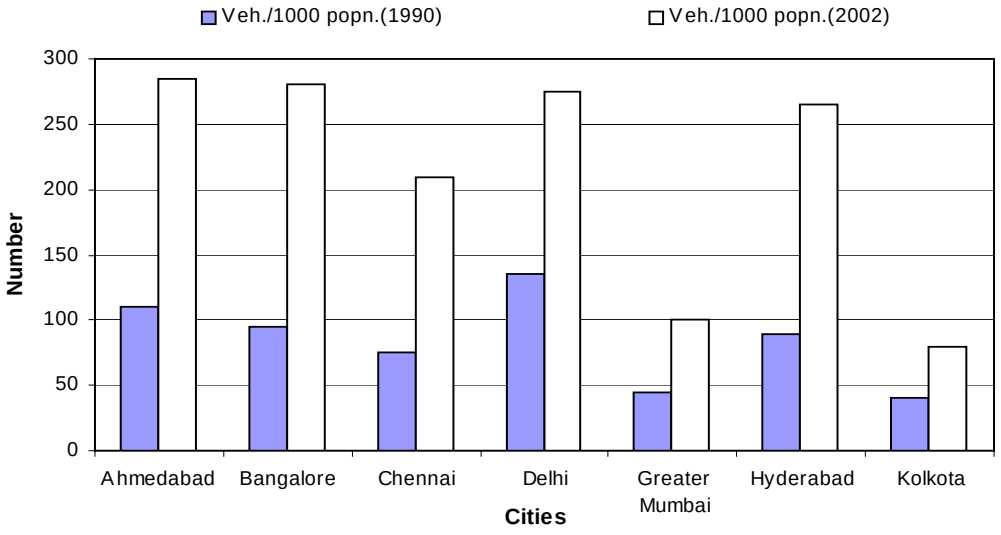
also have the vehicular population similar to major metros. In the year 2002 Ahmedabad has recorded the highest per capita motor vehicles in India (Figure 4-3).

Figure 4-3 : Growth rate of vehicles in major Indian cities (1990-2002)



Source: MoRTH 2003

Figure 4-4 : Vehicle per 1000 Population in Major Cities, 1990 and 2002



Source: MoRTH 2003

4.3 Facilities

4.3.1 Road Network

The greater Ahmedabad area roadway system is approximately 3478 Kms. Other than the National Highway Authority, which maintains National Highways and the State Roads and

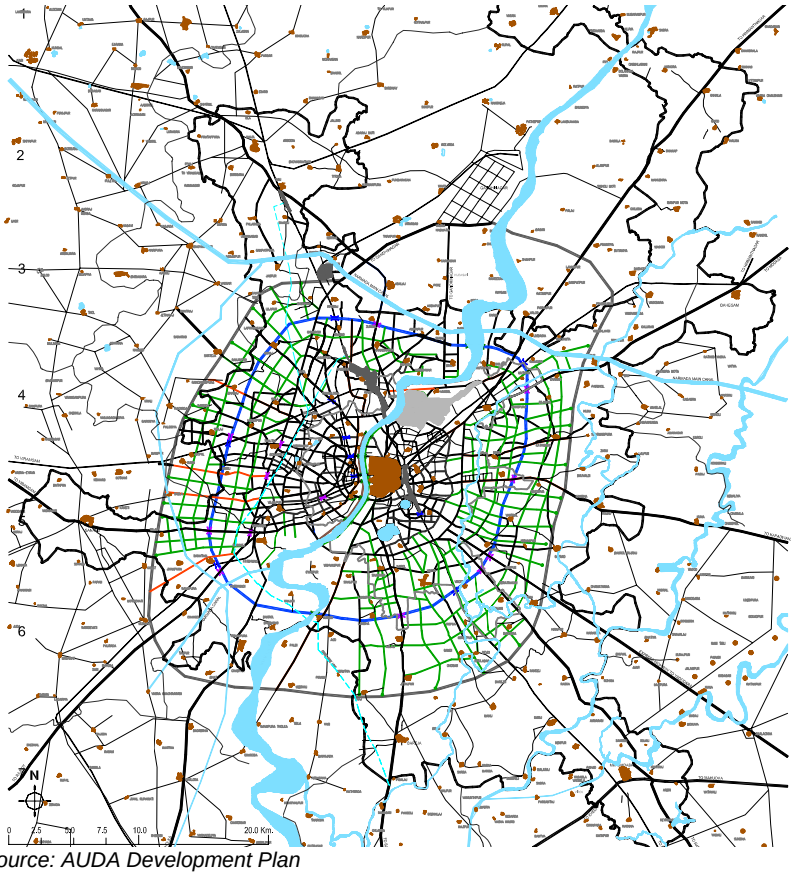
Buildings Department, the two urban local bodies; AMC and AUDA, are responsible for developing, operating and maintaining road infrastructure.

Table 4-3: Distribution of Roads by Width (No. of lanes)

Road widths in Study Area		
No. of Lanes	**Length**	**% of Total Length**
1 Lane	2106	61%
1.5 Lane	522	15%
2 Lane	411	12%
2.5 Lane	12	0%
3 Lane	48	1%
4 Lane	299	9%
6 Lane	46	1%
8 Lane	34	1%
Grand Total	3478	100%

Source: Based on LB Study

Map 4-1: AUDA DP Proposed Road Network



Source: AUDA Development Plan

Table 4-4: Types of Roads in AMC

Parameters	1997-98	1998-99	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004
Surfaced roads (km)	1118.9	1149.6	1189.01	1187.1	1208.3	1220.0	1256.5
% black topped	90.66	92.25	93.50	93.34	-	-	-
Un-surfaced roads (km)	115.3	96.6	84.6	84.64	90.6	78.9	68.6
Total length of roads (km)	1234.2	1246.2	1271.7	1271.74	1310.6	1318.2	1325.1
Length of roads per sq.km	6.47	6.53	6.66	6.66	6.9	6.9	6.9

Source: AMC Statistical Outline, 2000-2001

Table 4-5: Type of roads in periphery

Sr. No.:	Parameters	1997-98	1998-99	1999-2000	2001-2002	2002-2003	2003-2004	2004-2005
1	Surfaced Roads (km)	131.04	171.6	233.7	321.2	409.5	469.8	504
2	% of black topped	72 %	78 %	82 %	88 %	91%	87 %	84 %
3	Un-Surfaced roads (km)	50.96	48.4	51.3	43.8	40.5	70.2	96
4	Total length of roads (km)	182	220	285	365.00	450	540	600

Source: AUDA

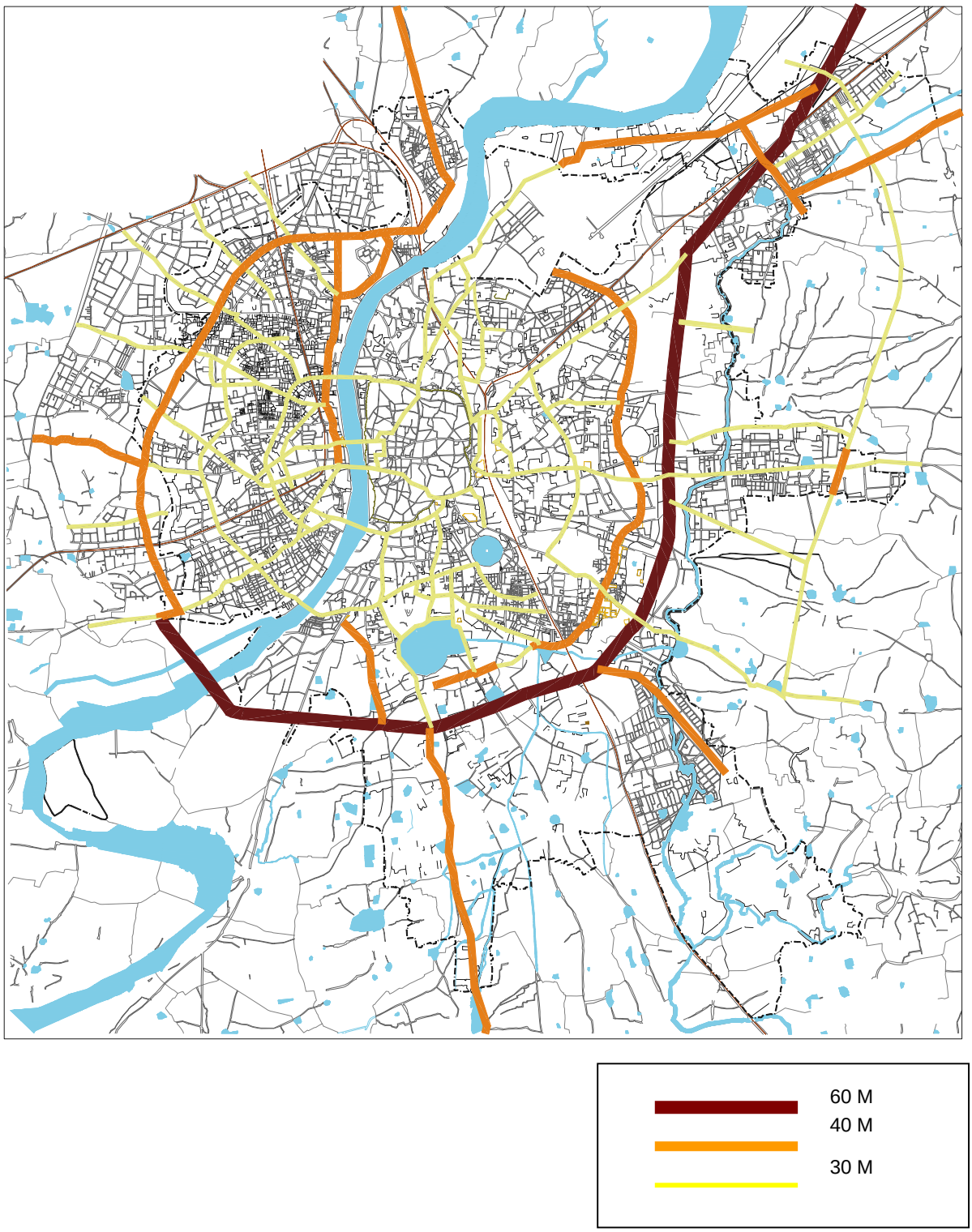
Given the overall network based on width, continuity and functional role performed, the following roads may constitute as major roads.

Table 4-6: Road widths of Major Roads

Sr.No.	Road Name	Average Road Width
1	Ashram Road	30.48
2	Gandhi Road	12.19
3	Tilak Road	18.29
4	Astodia Road	19.81
5	Mirzapur Road	15.24
6	Gheekantha Road	12.19
7	Circular road along fort wall a) Gandhi bridge to Tilak road Junction b) Tilak road Junction to Sardar Bridge	24.38
8	Chandola road	24.38
9	Shyama Prasad Vasavada Road	24.38
10	Rakhial road	18.29
11	Stadium road (To sola village)	18.29
12	Satellite road	60.96
13	Sarkhej road	30.48
14	Circular Road (Sardar bridge to Gandhi bridge via Law Garden)	24.38
15	Circular Road (Usmanpura to Paldi)	36.58
16	Circular Road (New Vadaj to Sarkhej Road NH8)	40.28

Source: Report on Ahmedabad Transportation Study, CRRI.

Map 4-2 : Showing Roads Widths



4.3.2 Bridges and Flyovers

There are eight bridges, which make it possible to traverse east-west across the river Sabarmati. There are two additional bridges proposed of which one in the south is under construction. In addition, there is one more bridge proposed between Subhash Bridge and Gandhi Bridge.

Map 4-3: Showing all the bridges across River Sabarmati

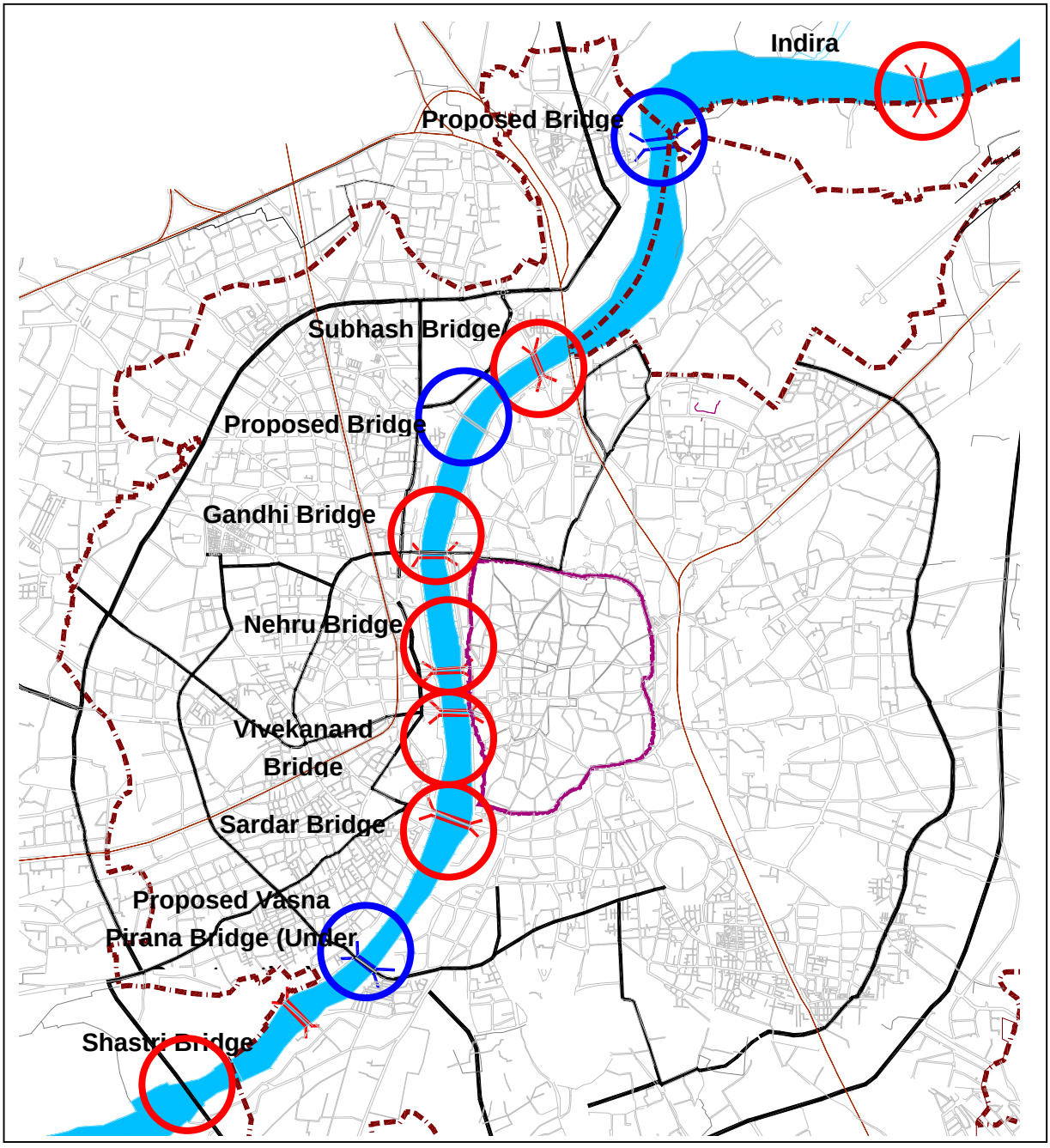
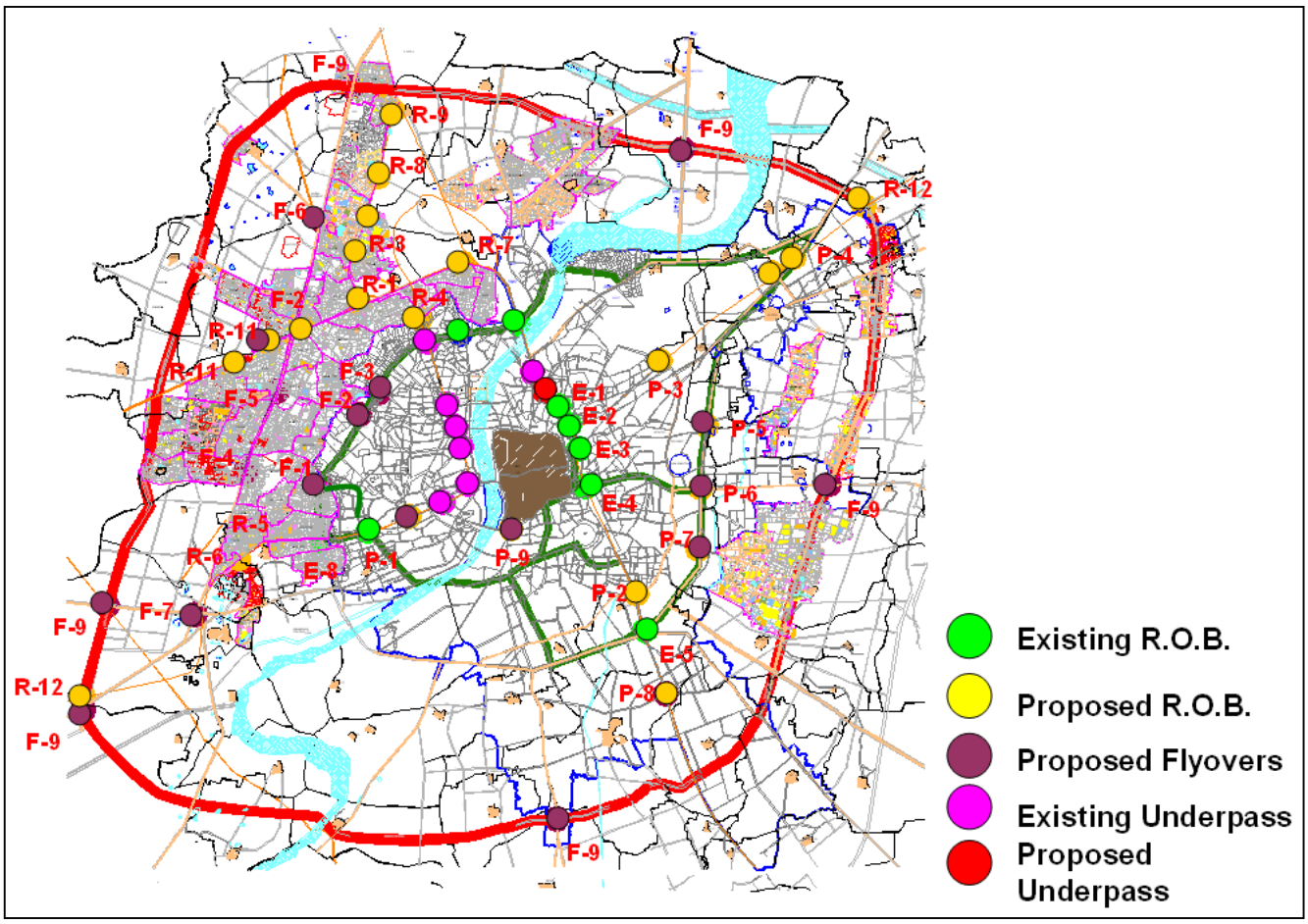


Table 4-7: Characteristics of Bridges across River Sabarmati

Sr. No.	Name of Bridge	Carriageway	Year of Construction
1	Indira Bridge	4-lane	1980
2	Subhash Bridge	4-lane	1973
3	Gandhi Bridge	4-lane	1943
4	Nehru Bridge	4-lane	1963
5	Vivekanand Bridge	4-lane	1892
6	Sardar Bridge	4-lane	1942
8	Shastri Bridge	4-lane	1985
7	Proposed (Vasna-Pirana Bridge) - Under Construction Narsinh bhai Makwana Bridge	4-lane	-
8	Proposed Bridge (Dudheshwar- Wadaj)	6-lane	
9	Proposed Bridge (Hansol – Achar)	6-lane	-

Map 4-4: Existing/Proposed Flyovers in AMC



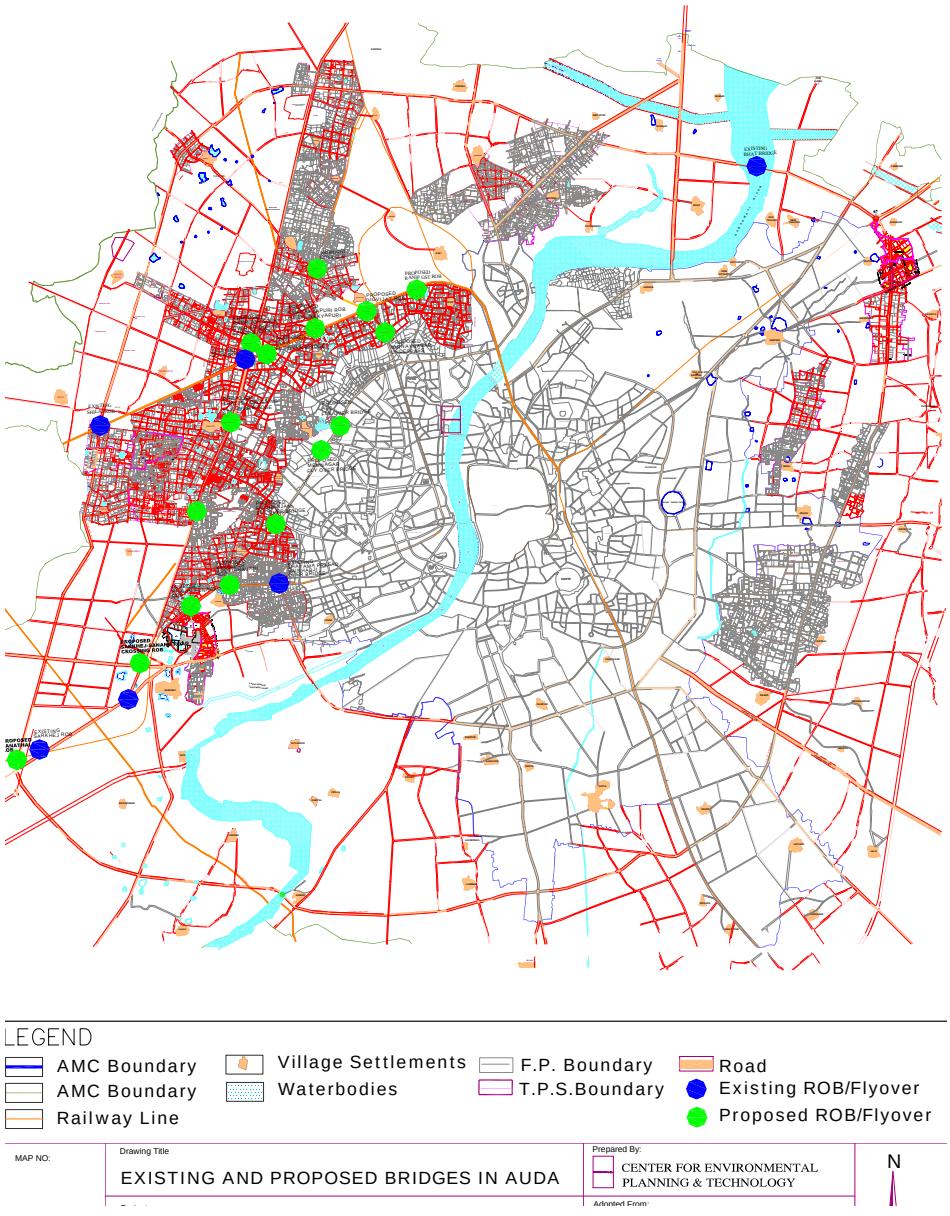
Within the study area, 106 Km long B.G. line and 126 Km long M.G line pass through the network. There are 8 flyovers / rail over-bridges existing in Ahmedabad and 5 under-passes built across railway line. Another 11 flyovers are proposed by AMC and AUDA.

Table 4-8: Characteristics of Flyover/ROB/Underpasses

Code No.	Location	Carriageway	Road
1	**Existing Flyover/Rail Over-Bridges**		
E 1	Tavdipura (ROB)	4-lane	Rajasthan Hospital Road
E 2	Asarwa (ROB)	4-lane	
E 3	Kalupur (ROB)	2-lane	Kalupur - Naroda Road
E 4	Kalupur (ROB)	2-lane	Odhav Road
E 5	Cadilla (ROB)	6-lane	Old NH-8 Narol Naroda
E 6	Prabodh Raval	4-lane	132' Ring Road
E 7	Chimanbhai Patel (ROB)	4-lane	132' Ring Road
E 8	Shyama Prasad	4-lane	132' Ring Road
2	**Proposed Flyovers/Rail Over-Bridges**		
P1	Shreyas Crossing (ROB)	4 lane	Shreyas Railway Crossing to Anjali Cinema Crossroads
P2	Dakshini Society (ROB)	4 lane	40 m Ring Road
P3	Omkar Crossing (ROB)	4 lane	40 m Ring Road
P4	Naroda Railway Crossing	-	Old NH-8,Naroda Approach Road
P5	Thakkarbapa Nagar	-	Old NH-8 Nikol Road
P6	Soni Ni Chali	-	Old NH-8 Odhav Road Intersection
P7	CTM Cross Roads	-	Old NH-8 Narol – Naroda
P8	Vatwa (ROB)	4 – lane	Road to Vatwa GIDC
P9	Jamalpur Flyover	4 – lane	Jamalpur Cross Roads – towards ST Stand
P10	Naroda ITI	4 – lane	
P11	Ranip to Shahibaug Underpass		
P12	Doctor House		Road from Parimal Garden to Paldi
3	**Existing Underpasses**		
U1	Shahibaug	4-lane	Road to Airport
U2	Akbarnagar	4-lane	132 ft Ring Road
U3	Income Tax	4-lane	C.G Road to Income Tax
U4	Town hall	2-lane	Near Gujarat College
U5	Usmanpura	4-lane	Road from Sardar Patel circle to Usmanpura crossing
4	**Proposed Flyovers**		
F1	Junction of 132 feet road and satellite road	Shivranjini Junction	
F2	Junction of 132 feet road and Drive in Road	Memnagar junction	
F3	Junction of 132 feet road and Sola Road	Sola Junction	
F4	S.G Highway and Satellite Road	Satellite Junction	
F5	S.G Highway and Drive in Road	Thalthej Junction	
F6	S.G Highway and Gota Road	Gota Junction	
F7	S.G Highway and Sarkhej - Sanand Road	Sarkhej Junction	
F8	Ramps from Sola ROB on S.G Highway	Sola Junction	
F9	6 Flyovers on Ring Road		

Railway Over-Bridge		
R1	Chanakyapuri Crossing	Ahmedabad – Delhi Line
R2	Sola Crossing	Rajkot – Ahmedabad Line
R3	Gota Crossing	Rajkot – Ahmedabad Line
R4	Nirnaynagar RUB	Bhavnagar –Ahmedabad Line
R5	Vejalpur ROB	Bhavnagar –Ahmedabad Line
R6	Prahladnagar ROB	Bhavnagar –Ahmedabad Line
R7	Digvijay ROB	Ahmedabad – Delhi Line
R8	GST Crossing ROB	Ahmedabad – Delhi Line
R9	Jagatpur BSNL ROB	Ahmedabad – Delhi Line
R10	Jagatpur Gota Road	Ahmedabad – Delhi Line
R11	TP –37 nos – 2 ROB	Rajkot – Ahmedabad Line
R12	Ring Road ROB –2 Nos	Ahmedabad - Bhavnagar and Ahmedabad – Himmatnagar line

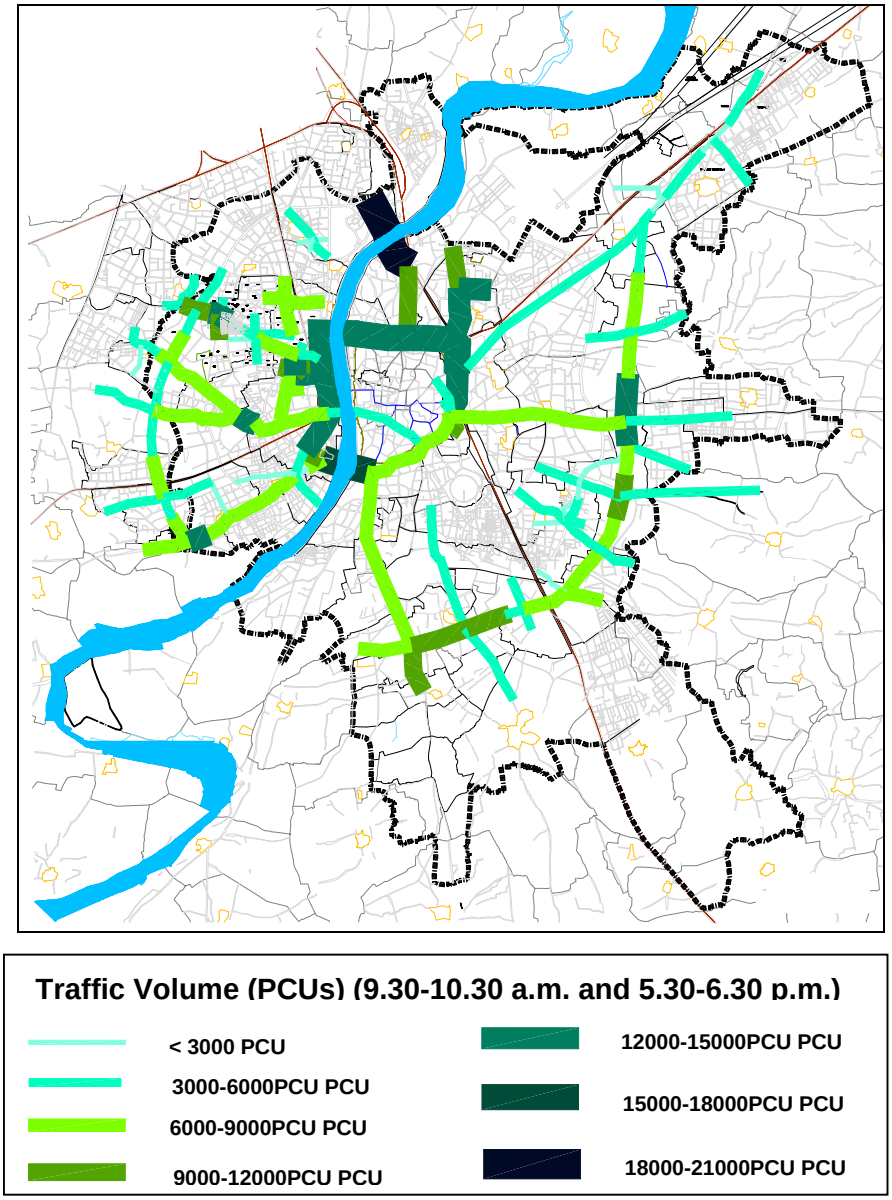
Map 4-5: Existing and Proposed Bridges in AUDA



4.3.3 Traffic Volume

The Western part of the city has developed as a mainly residential area and the eastern part has the industrial estates. Because of this, the traffic flow is very heavy from west to east in the mornings and vice-versa in the evening, which causes serious traffic congestion and frequent traffic jams on the city roads during morning and evening peak periods. Lately, road widening of the major radial roads has been undertaken which has helped ease the traffic flow to some extent. Traffic volumes on major roads has been presented in the map below. As may be observed, volumes far exceed capacities at many places.

Map 4-6: Traffic Volume at different locations in the city



Derived From: Interim Report on 'Traffic Management Plan for Ahmedabad', School of Planning, CEPT University: 2001,

The results of Traffic Volume count survey conducted at eleven locations is presented in Table 4-9.

Table 4-9: Traffic Volume at different locations

Location	Traffic Volume (16 hrs)	Traffic Volume (in PCU), 16 hrs	Peak Hour Traffic (No.)	Peak Hour Traffic (in PCU)
MB-01: Airport 'T'/Hotel Taj Residency-Umed	38905	31470	3700	3071
MB-02:Kotarpur W/Works. Nr N H 8	9644	9306	1123	1046
MB-03: Naroda ST Workshop on Kalupur-Naroda Rd	58837	48787	4581	3530
MB-04: Krishnanagar	53676	48389	5531	4447
MB-05: Chamundanagar	67278	52747	6785	5200
MB-06:Jivan Park	57040	53781	5381	5244
MB-07:Prabodh Raval Bridge	71705	49160	8276	5441
MB-08: Akhbarnagar U/Bridge	66826	47260	8097	5418
MB-09: Sahajanand Complex	67057	44272	6806	4191
MB-10: Andhjan Mandal to Nava Vadaj	59732	41028	5877	3795
MB-11: Nr Someshwar Bunglows	66380	43769	6771	4170

Source: CEPT Survey, 2005

The survey was conducted for 16 continuous hours (06:00 to 22:00 hrs) on pre-designed proforma manually. The mode wise traffic volume have been converted to equivalent passenger car unit using PCU factors. The analysis of traffic composition reveals more than 70% two-wheeler and around 10% cycles which is a reflection of the almost non-existence for public transport on corridor.

4.3.4 Network Speeds

No systematic data is available on network speeds. The study by SAC (ISRO) lists the speeds on major roads as mentioned in Table 4-10.

Table 4-10: Speeds on Major Roads

Sr.No.	Name of Road	Speed (Peak Hour) - (km/hr)
1	Airport road	24
2	Naroda road	20
3	Thaltej road	18
4	Sarkhej road	18
5	Gujarat University road	16
6	Manav Mandir road	16
7	Drive-in road	16
8	IIM road	16
9	Vastrapur road	16
10	Odhav road	16
11	Amraiwadi road	16
12	Gurukul Road	16
13	C.G.Road	16
14	Satellite road	15

Sr.No.	Name of Road	Speed (Peak Hour) - (km/hr)
15	Danilimda road	14
16	Ankur road	14
17	Sola road	14
18	Ghatlodia road	14
19	Sola road	14
20	Rakhial road	13
21	Ashram Road	12.5
22	Gomtipur road	12
23	Civil road	12
24	Shah Alam Road	11.5
25	Kalupur	10
26	Gandhi Road	10
27	Relief Road	9.5

Source: SAC, ISRO

4.3.5 Accidents

In Ahmedabad over 2600 cases of road accidents are being reported in the year 2001 alone. About 160 to 200 persons get killed in these accidents. Some reduction in number of accidents has been observed in the recent past (Refer Table 4-10).

Table 4-11: Population, Vehicles and Accidents in Ahmedabad City

Year	Population (lakhs)	Vehicles	Accidents	Fatal Accidents	Accident Rate (Per 10,000 Vehicles)	Fatality Rate
1961	12.6	N.A.	643	38	N.A.	5.91
1971	17.6	45,268	866	73	191.31	8.43
1981	23.8	120,514	1676	144	139.07	8.59
1991	29.5	431,783	2,931	192	67.88	6.55
2001	37	1,005,870	2718	162	27.02	5.96

Derived From: Safe Traffic Advocacy Cell, School of Planning, CEPT University,

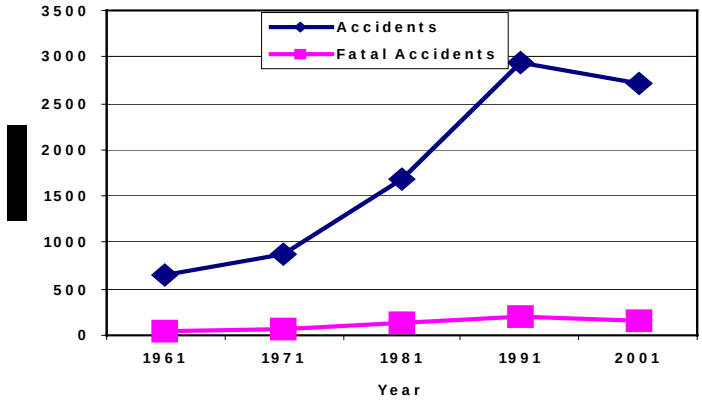
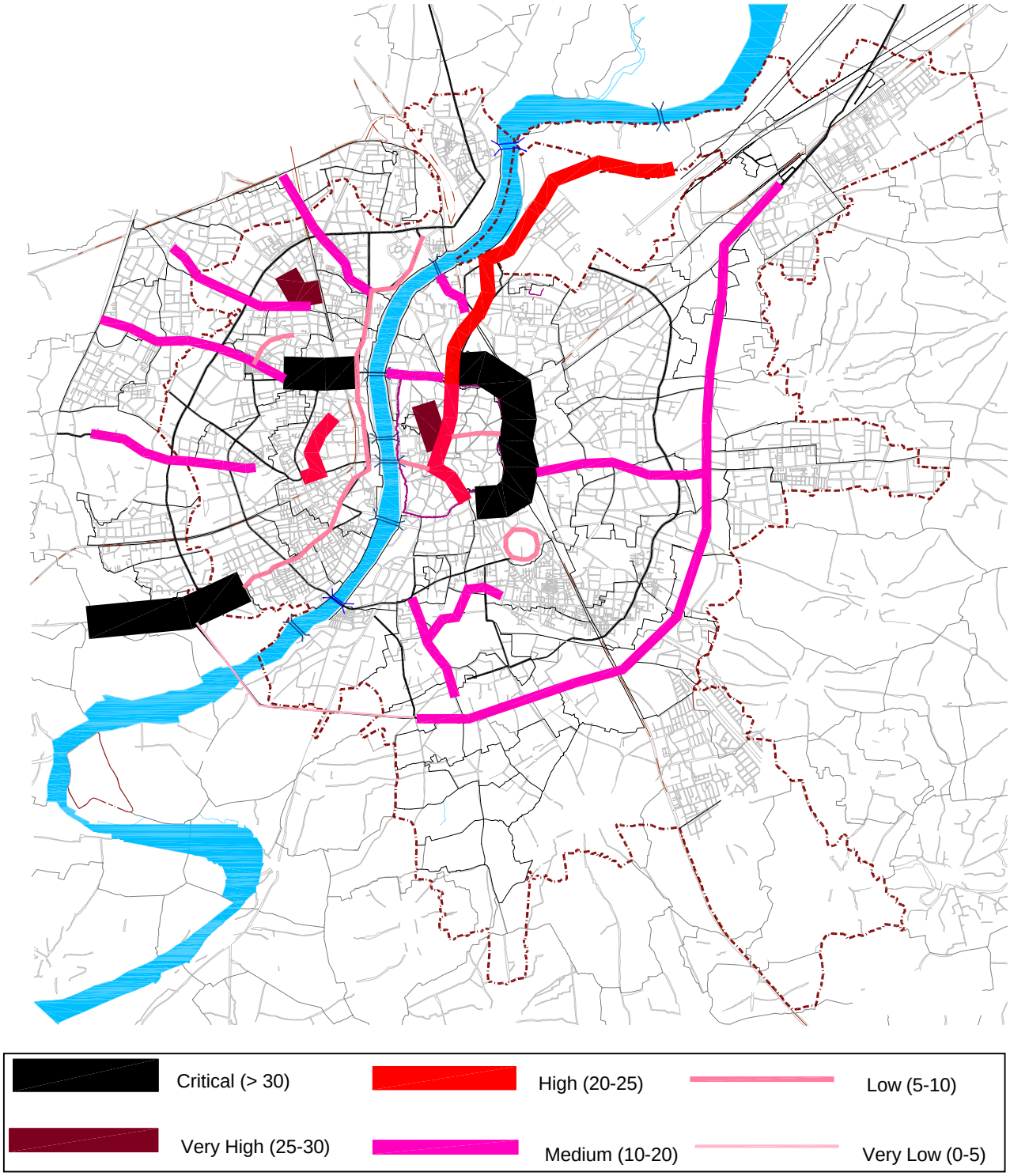


Figure 4-5: showing Number of Accidents Year wise

Map 4-7: Accident Rate in Ahmedabad



Derived From: Safe Traffic Advocacy Cell, School of Planning, CEPT University,

Map 4-8: Fatality Rate in road accidents in Ahmedabad (Accidents/km)

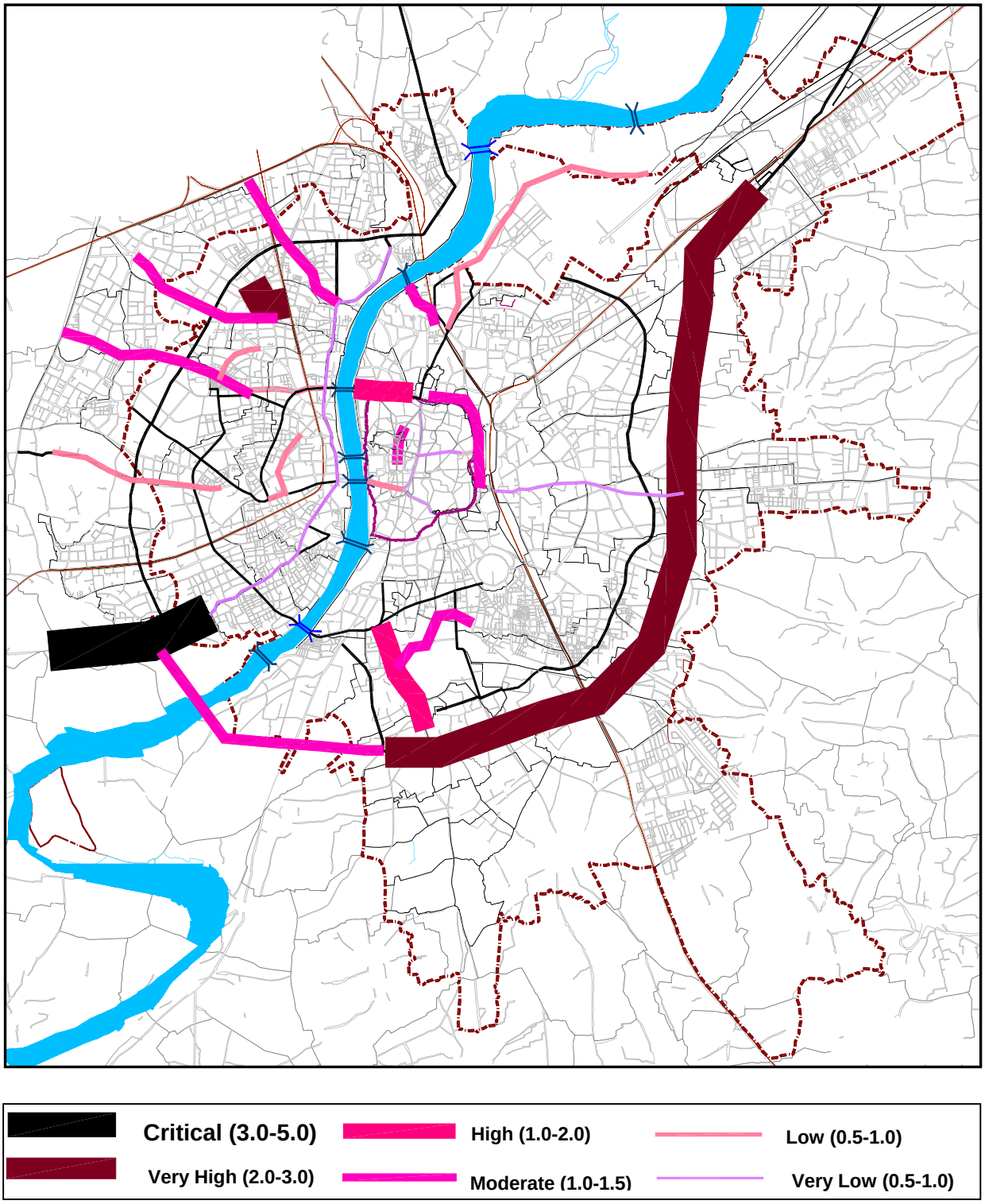


Table 4-12: Accident Rate along major roads of Ahmedabad

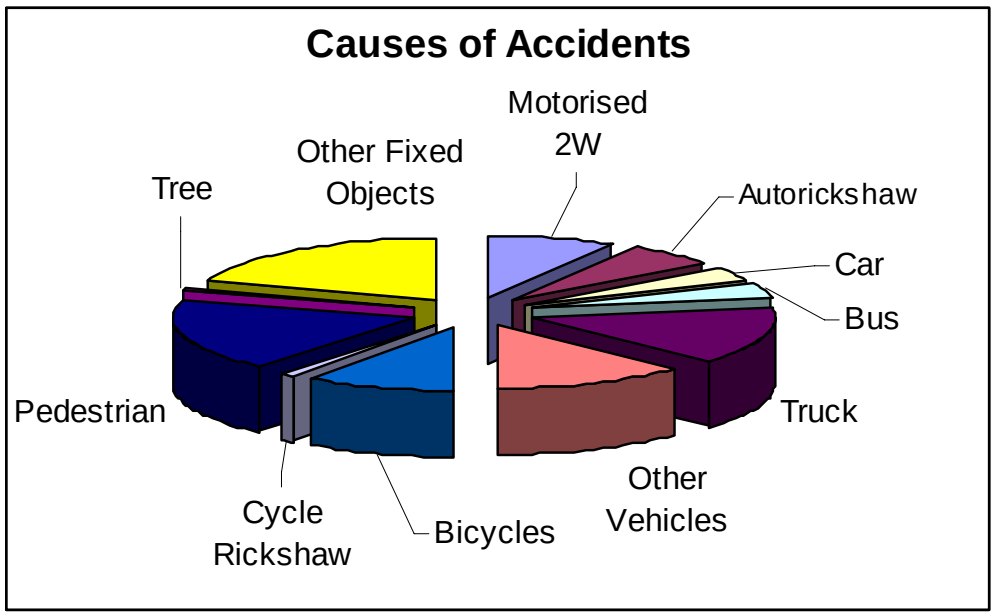
Sr.No.	Road Stretch	Total Accidents (1995-2002)	Length (km)	Total Accidents/Km (1995-2002)	% of Total Accidents	Fatal accidents (2002)	Fatal accidents/ Km (2002)
1	Vasna to Sarkhej	**783**	**3**	**261**	**5.3**	**14**	**4.7**
2	Narol to Naroda (NH 8)	**2365**	**15.5**	**153**	**16.1**	**40**	**2.6**
3	Ankur to Naranpura Railway Crossing	330	1.5	220	2.2	3	2.0
4	S.T. Geeta Mandir to Shah Alam Tolnaka Chandola	423	2.5	169	2.9	4	1.6
5	Prem Darwaja to Gandhi Bridge	359	2	180	2.4	3	1.5
6	Mirjapur to Vijali Ghar	261	0.75	348	1.8	1	1.3
7	Bhairavnath to Shah Alam Tolnaka Dakshini Society	459	2.5	184	3.1	3	1.2
8	Narol to Vasana	205	7	29	1.4	8	1.1
9	Kalupur to Police Comm. Ward Boundary	435	3.5	124	3.0	4	1.1
10	Commerce College to Thaltej	635	4.5	141	4.3	5	1.1
11	Subhash Bridge to Visat Petrol Pump	458	3	153	3.1	3	1.0
12	Sola to Naranpura Bus Stand	516	4	129	3.5	4	1.0
13	Police Commissione Office to Shahibag Subhashbridge	132	1	132	0.9	1	1.0
14	Juna Vadaj to Chandlodia	273	3.25	84	1.9	3	0.9
15	Shahibag Railway Crossing to Gymkhana Indira Bridge	892	4.5	198	6.1	4	0.9
16	Vasna to Juhapura Bus Stand	144	2.5	58	1.0	2	0.8
17	Parimal Garden to Mithakhali	331	1.5	221	2.3	1	0.7
18	Ambavadi to Jodhpur	529	4	132	3.6	2	0.5
19	Incometax to Commerce College	592	2	296	4.0	1	0.5
20	Jodhpur to Nehru Nagar	249	2.25	111	1.7	1	0.4
21	Paldi to Vasana	393	2.5	157	2.7	1	0.4
22	Sarangpur to Police Comm. Ward Boundary	382	2.5	153	2.6	1	0.4
23	Soni-ni-Chawl to Police Comm. Ward Boundary	294	2.5	118	2.0	1	0.4
24	Laldarwaja to Pachkuva	196	2.5	78	1.3	1	0.4
25	Jamalpur to Police Comm. Ward Boundary	301	6.5	46	2.0	2	0.3
26	Dargah to Paldi	203	3.5	58	1.4	1	0.3
27	Paldi to Subhash Bridge	899	7.5	120	6.1	2	0.3
28	Vejalpur to Police Comm. Ward Boundary	116	11	11	0.8	0	0.0
29	Vijali Ghar to Manilal Mansion	164	2	82	1.1	0	0.0

Sr.No.	Road Stretch	Total Accidents (1995-2002)	Length (km)	Total Accidents/Km (1995-2002)	% of Total Accidents	Fatal accidents (2002)	Fatal accidents/ Km (2002)
30	Astodia Darwaja to Kalupur	371	2	186	2.5	0	0.0
31	Astodia Darwaja to Ellisbridge	172	1.75	98	1.2	0	0.0
32	Delhi Darwaja to Dafanara	279	2.5	112	1.9	0	0.0
33	Kankaria Round Road	338	2.5	135	2.3	0	0.0
34	Usmanpura Circle to Sardar Patel Colony's Vijay Char Rasta	218	2.25	97	1.5	0	0.0
	Total	**14697**	**122.25**	**4772**	**100.0**	**116**	

Derived From: Safe Traffic Advocacy Cell, School of Planning, CEPT University.

The stretches along Vasna-Sarkhej and Narol-Naroda highway accounted for almost 50% of the total fatal road accidents that occurred in Ahmedabad (Refer Table 4-11). These roads have higher travel speeds and a higher composition of regional traffic, which consists of trucks and Light Commercial Vehicles. An analysis of causes of fatal accidents **(Refer Fig 3-6)** indicates that trucks accounted for causing about 15 per cent of total fatal deaths in the city. The pedestrian traffic accounts for causing about 18% of total fatal deaths in the city, and there is a high level of pedestrian traffic along the Narol-Naroda Highway at certain locations, but lack proper pedestrian facilities such as footpaths and zebra crossings.

Figure 4-6: Causes of Fatal Accidents



Source: Safe Traffic Advocacy Cell, School of Planning, CEPT University

4.4 Public Transport

In the city of Ahmedabad, AMTS has been providing public transport facilities. AMTS, a municipal body, operates the services with about 550 buses of which only about 350 are on road every day. They used to service about 250,000 passengers per day in the month of march 2004. The service had deteriorated significantly over the years. Now the system has improved with passenger patronage increasing to 6,50,000 per day.

4.4.1 Level of Operations and Coverage

AMTS caters to 2.5 lakh trips every day. About 150 routes are in operation with a fleet size of 540 buses. Fleet utilization has been consistently low. The average load factor has decreased and the number of cancelled service kms has increased.

AMTS bus route lengths average about 17 kms and range from about a minimum to 5km to a maximum of 57 kms. About 55 percent of buses operate on routes with lengths of 10 to 20 kms, with a running time of 30 to 90 minutes. The AMTS average bus stop spacing is 410 meters which is convenient for passengers, but results in longer travel time and delays. In the absence of faster bus services, average operating speed of AMTS is between 15-20 kmph.

Though the primary duty of AMTS was to provide bus-services only within the municipal area, the AMTS gradually expanded its services to the areas on the outer periphery of municipal limits with the increased dependency of the city and peripheral areas with each other. As a result the operational area of AMTS grew to as high as 375 sq. kms. compared to the earlier 198 sq. kms. area of the city.

Table 4-13: Level of Operations of AMTS (1948-2005)

Year-ending 31st March	Fleet-size (Buses)	No. of Routes	Service kms per day	Buses per lakh of population	No. of passengers per day
1948	205	38	15000	26	109024
1951	188	57	19755	21	153004
1961	337	100	44038	27	333865
1971	525	164	75757	33	541096
1981	610	205	96685	30	786301
1991	756	248	111452	24	619726
1995	705	180	115123	19	625479
1996	724	170	119563	19	683607
1997	820	164	134192	21	800822
1998	882	166	141726	22	791370
1999	882	132	150134	22	799321
2000	942	144	155675	22	757852
2001	886	140	151245	21	678861
2002	801	136	124375	18	574257
2003	687	115	81802	15	385682
2004	601	110	76028	13	325378
2005	540	117	77411	11	349653

Source: AMTS

4.5 Issues

- *Poor connectivity in peripheral areas*: The areas which were incorporated within city limits in 1986, are not very well connected and the road network is not fully developed in these areas.
- *Discontinuity in Ring Roads*: The Ring Roads are not fully developed and lack continuity. This causes hindrance in the smooth flow of traffic.
- *Partially developed Right-of Ways*: The roads in Ahmedabad have carriageway of around 14 m. The roads do not have developed pedestrian facilities and also face problems of encroachment by informal shops and on-street parking, reducing the effective carriageway.
- *Poor Junction Design* : The city has quite a number of five arm and six arm junctions, most of which are rotary intersections. Due to the limitation of its capacities, these rotaries are gradually becoming incapable of handling the increasing traffic. The roads have partially developed right-of-ways and lack pedestrian facilities
- *Inadequate parking facilities*: The commercial development in Ahmedabad is mostly along the major roads and junctions. Such developments have most of the time not accounted for parking facilities. Lack of adequate parking facilities has resulted in provision of on-street parking which reduces the effective carriage way of roads affecting the travel speed. Conflict between the slow and the fast traffic is another problem. Owing to the narrow road widths, segregation of traffic is not possible. Parking places are highly inadequate for the high vehicular population in the city. On street parking is observed along the major corridors, in the old city area and the public parking places near the ST Bus stand, commercial centres.
- *Lack of pedestrian facilities*: The city lacks pedestrian facilities in form of footpaths, zebra crossings, subways etc. On the major roads like Ashram Road, Relief Road which have a very high traffic volume, such facilities are imperative for pedestrians. Also footpaths along major commercial roads are either of very less width or are encroached upon.
- *Delays and low travel speed* : In most of the cases, the average travel speed on the major roads is less than 10km/hour because of congestion and increasing delays at intersections. Lack of traffic segregation on all the major arterial roads has been the main reason for the slow movement of vehicles and chaos at intersections.
- *Manifold increase in the private vehicles*: The number of two wheelers has increased over ten times over the last two decades, now constituting about 80 percent of the total vehicles. Such high growth has resulted in increased congestion and air pollution.
- *Inefficient Public Transport System* :The Public Transport System being offered by AMTS, is facing problems of increasing costs and decreasing occupancy rates. In Ahmedabad, currently public transport caters only to 20% trips. Poor service quality and quantity has resulted in non-reliance on the public transport system and thus whopping increases in personalized vehicle modes.

Chapter 5 Urban Poor and Housing

Urban Poor
Housing

5.1 Urban Poor

Poverty alleviation has been an important objective of development planning in Gujarat. Right from the inception of planning, following GOI policy efforts have been made towards improving the conditions of the poor. Poverty alleviation efforts through special plans, programs and policy measures by the central government have been initiated after 1970s and 'Poverty Alleviation' has been promoted as one of the most important goals of government throughout the last three decades.

In terms of urban poverty reduction, the performance of the State has been quite encouraging. During the year 1983, 41 percent and 30 percent of urban and rural populations was below poverty line. This was as against the national average of 42 and 46 percent in urban and rural areas respectively. The recent round of NSS (1999-2000) puts the level of urban and rural population below poverty line at 16 and 13 percent respectively. The comparative figures for the nation as a whole are 24 and 27 percent. The performance, as evident, is better in urban areas. To maintain the initial lead that the State has achieved continued efforts directed towards economic development of cities as well as more specific programmes for poverty reduction are required.

Table 5-1: Percentage of Population Below Poverty Line

Year	Gujarat			All India		
	Urban	Rural	Total	Urban	Rural	Total
1983	40.6	29.8	33.3	42.2	45.6	44.8
1987-1988	39.6	28.7	32.3	40.1	39.1	39.3
1993-1994	29.3	19.7	29.3	33.8	33.4	33.5
1999-2000	15.6	13.2	14.1	23.6	27.1	26.1

Source: NSS various Rounds, Planning Commission, Government of India, March 2002.

The SJSRY survey conducted in Ahmedabad in 1998 was based on the understanding that out of the 32.4% of city's population living in slums, around 60% h/h fall below the poverty line. The average income of the slum households was Rs. 25,752 per year, which was higher than the revised official poverty line estimates,

Rs. 24180, of the Government of Gujarat adopted in 1998 to estimate urban poverty under Swarna Jyanti Sahari Rojgar Yojna.The slum dwellers in the city occupy 8% of the total residential land.

The physical environment, in terms of housing conditions, availability of basic services determines the productivity and consequently the quality of life in urban areas. Although quite a significant proportion of the poor is above the traditional poverty line, they do suffer from other deprivations, especially in basic services and amenities. However the slums in the western zone are comparatively better off than the slums in the east.

A study done by Uma Rani & Unni, Jeemol (2002) in 1997-98, on the income and employment in the city of Ahmedabad indicates faster growth of employment in informal sector than the formal sector. The share of employment in informal sector was 77% and it generated 47% of the total city income. In short, the poor contribute to the globalizing economy of Ahmedabad as much as the non-poor. But the poor do so without receiving the due economic or other civic facilities or services at par with the non-poor. A brief about the conditions of the poor with regard to housing is presented below.

5.2 Urban Housing

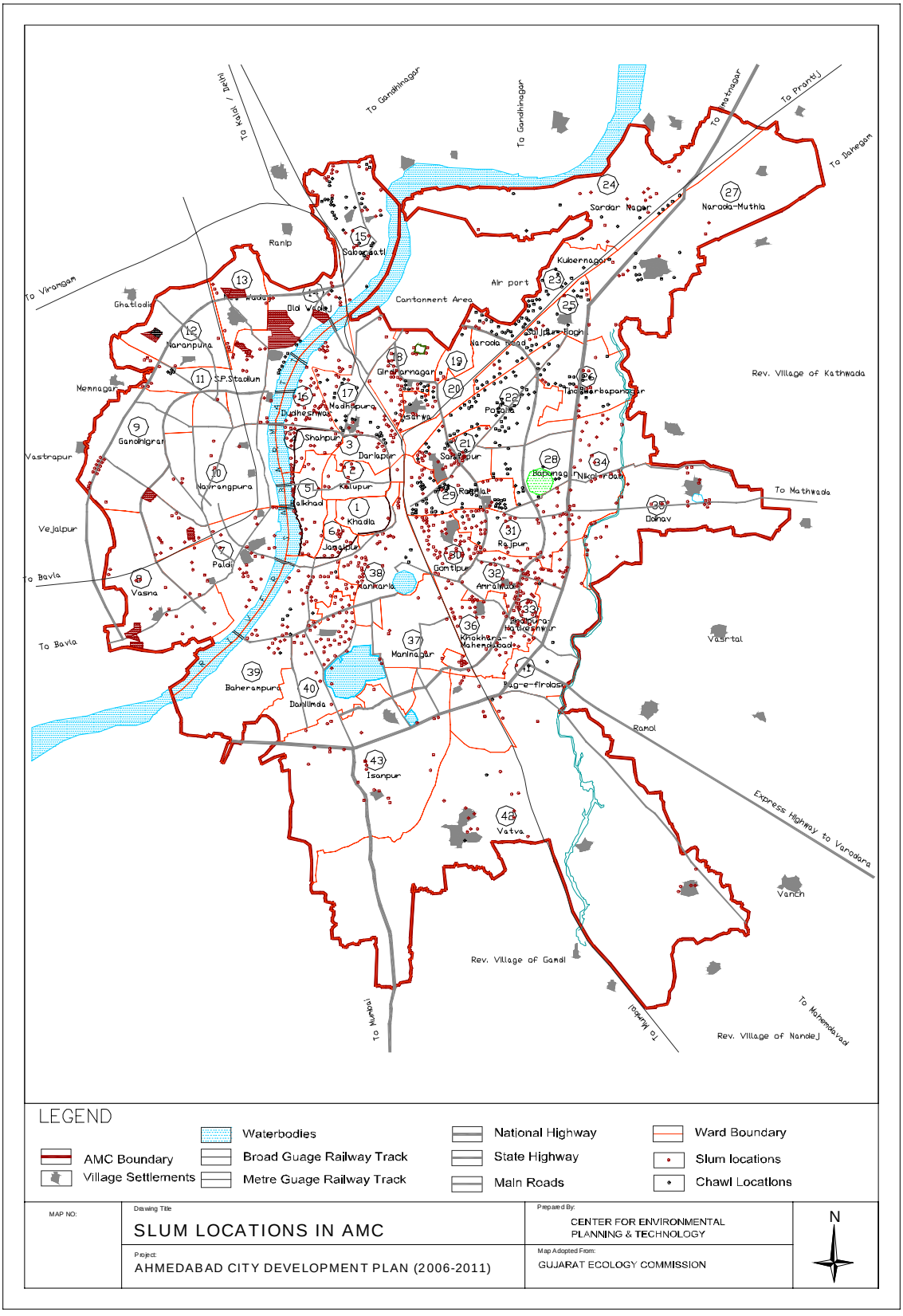
As per Census 2001, the total housing stock in the Ahmedabad City was 10.50 lakh. Of these 67 percent was used for residential purposes (Refer Table 5-1). The city has a large vacancy rate. About 12.5 percent houses are lying vacant in the city, this could be mainly due to the constraints posed by the Rent Control Act which inhibits owners from renting out properties.

Table 5-2: House Listing (2001)

Zone Name	Population	Total No. of Houses	No. of households	Residential			Vacant Houses	Other usage houses
				Fully	Partly	Total		
Central	577388	198389	110323	108278	2180	110458	22517	65414
East	783107	212224	157284	153682	2772	156454	21005	34765
West	673420	222260	150408	147378	2774	150152	34438	37670
North	779028	209108	152237	149591	1966	151557	22321	35230
South	702418	208114	143521	141456	2045	143501	31023	33590
Total	3515361	1050095	713773	700385	11737	712122	131304	206669

Source: AMC

Map 5-1: Existing Slum Locations in AMC



Presently there are around 710 slums in the city housing around 9 lac population[7]

Table 5-3: Slum Population

Parameters	Population in lakhs	
	1991	2001
Total Slum Population (lakhs)	4.56	9.06
Slum Population as % of total population	16	25.77

Source: AMC

Table 5-4: Status of Land of Slum Households

Ownership	1991		2001	
	Nos.	%	Nos.	%
Private	685	67	564	50
Government	61	6	67	6
Municipal Corp	141	14	156	14
Others	142	14	336	30

Source: AMC, 2005

The slum population has almost doubled over the last decade, though the slum number has not increased significantly. Presently slum population accounts for 25.77percent of the city's population.

About 66 percent of the slums are located on private lands and 13 percent are encroached upon government, 17 percent on municipal lands where as 4 percent are on lands held by others.

On the whole, the total number of slums has decreased from 1029 to 710, but the population residing in slums has almost doubled.

Table 5-5: Zone wise Slum Settlements (2001)

Zone	Population	No. of Slums	No. of slum Households	Slum Population	% slum popn to ward popn	%slum popn to total popn
Central	577388	164	47013	235065	40.47	6.67
West	673420	156	43142	215710	32.03	6.13
South	702418	209	39142	195710	27.86	5.56
North	779028	129	25106	125530	16.11	3.57
East	783107	52	22351	111755	14.25	3.29
Total	3515361	710	176754	883770	25.14	25.77

Source: AMC

The above information is only in regard to slums and do not include the chawls which are spread out at 1383 locations in the city and housing about 1 million people in them. Most these chawls lack basic amenities and are generally clubbed along with slums for the provision of essential services in the city.

[7] *The number of households residing in a slum was found out through a survey conducted by SEWA and SAATH. The total slum population has been calculated considering a family size of 5. As per Census figures of 2001, a population of 439843 resides in slums. This figure has not been considered as it includes only those slums which has clusters of more than 60 houses.*

Majority of slums are deficient in terms of basic facilities. Only 3.5 percent of the slum households have private water connections. There are 254 households per public stand post and 506 households per public toilet. One-fifth of the slum population have private toilets. 61percent of the households have electricity connection. One fifth of the population have access to primary medical facilities.

Table 5-6: Basic amenities in slums

Amenities	2001	Amenities	2001
Water Supply		Sewerage	
Private water connection in slums (No.)	6469	Private latrines (No.)	38726
Private water taps (% household)	3.56	Private Latrines (% household)	21.37
Public Stand Posts (No.)	712	Public Toilets (No.)	8189*
Households per public stand post (No.)	254app	Households per public toilet (No.)	171app**
Persons per stand post (No.)	1272app	Persons per public toilet (No.)	855app
Separate Electricity connection (% household)	61.46	Drainage facility (% slums)	45.41
Private ownership of land (% household)	64	Availability of municipal dispensaries (% slum)	23.51
Availability of Balwadi (% slum)	10.24		

** Total public toilet seats for both slum and chawl population.*

*** Slum and chawl households per toilet seat*

5.3 Slum Networking Project (SNP)

This project was initiated in 1996-97 to improve the physical and social infrastructure facilities in the slums with a view to integrate them into the main stream of the society as it was felt that the fragmented efforts made to provide infrastructure facility during the last few decades have not yielded desired results and have not been able to change the character of the slum nor have they helped in improving the health and sanitary conditions in the slums.

This project is based on a partnership concept where the community, industry/social institutions, NGO and the municipal corporation are the partners and they share the cost for the provision of physical and social infrastructure in the slums. It aims at giving dignity to the community and desires to treat the slum dwellers as partners rather than beneficiaries in the project.

The project has two principle components as under

A. Improvements in Physical Environment

Doorstep services are being given to each household towards improvement of physical infrastructural environmental services, which include

- Water supply to individual households
- Sewerage to individual households
- Individual toilets
- Road and paving
- Storm water drainage

- Solid waste management
- Street lighting
- Landscaping

An important feature of the project is to provide individual services, as opposed to shared or common ones.

B. Community Development and Social infrastructure

Under this component with the active involvement of NGOs, neighborhood groups/women's groups / youth groups are formed to make the project sustainable. Efforts are being made to involve the slum population in sharing the cost and in the decision making process as well as in maintenance of the services. NGOs also take up the work of extending education and health facilities like non-formal education programmes, maternal and child health. They also engage themselves in providing vocational training. Besides undertaking income generating activities to improve their financial health.

The cost for Community Development Component has been estimated around Rs. 1000/- per dwelling unit out of which NGOs share 30% cost..

5.3.1 Stakeholder contribution

The project aims at having a partnership concept between the communities, industry, NGO, and AMC. A fixed contribution of Rs. 2000 is to be paid per dwelling unit by the community. The industrial partner, if desires to support this project, has to be contribute similar amount of Rs. 2000 per dwelling unit. The NGO is expected to share 30% cost of community development @ Rs. 300 per dwelling unit and rest of the amount is expected to be spent by the Ahmedabad Municipal Corporation. The cost estimates and its sharing is worked out as per table Table 5-6.

Table 5-7: Cost Estimate and its sharing for Slum Networking Project

COMPONENTS	STAKEHOLDERS				
	Per household in slum	NGO	Industry/Social Instns	AMC	Total
Physical Development	Rs. 2000/-		Rs. 2000/-	Rs. 2000/-	Rs. 6000/-
Community Development		Rs. 300/-		Rs. 700/-	Rs. 1000/-
External Linkage with city Infrastructure				Rs. 3000/-	Rs. 3000/-
Individual toilet cost				Rs. 5800/-	Rs. 5800/-
TOTAL	Rs 2100/-	Rs 300/-	Rs 2000/-	Rs 11500/-	Rs 15800/-

5.3.2 Slum upgradation Process.

Under this project, AMC has listed the locations where slums and chawls are situated. Out of this list slums situated on the street land, in the riverbed or lakes, or on the bank of river or lake, are separated out. This list is further reviewed to ascertain whether any of the plots where slums are situated is critically required by AMC for the provision of infrastructure facilities in the city. All such plots are kept out from upgradation of slums. Rest of the plots are considered eligible for upgradation and referred to the town planning department and

other concerned department for giving necessary clearance for upgradation. By now more than 500 locations have been cleared for in-situ upgradation of slums and NGOs have been given the list of such locations which can be upgraded.

The NGOs on receiving such lists motivate the slum dwellers to participate in this project by becoming partner in the project. They assist the community in forming an association in turn submits an application to AMC for participating in the project. They open their account in a bank and deposit their contribution to AMC in full or part. On receiving the application and contribution, the corporation takes up the work of upgradation. As on December 2005 SNP has been undertaken for 41 slums covering 8703 households benefiting 43515 people, of which infrastructure work has been completed in 28 slums and work is in progress in 13 slums.

Box: 4 Slum Networking Project

•Rs 10200/- Provision of physical and social infrastructure

•Participation:

–AMC – Rs.2000, Industry – Rs.2000,
Community-Rs. 2000 If no contribution from industry, the cost is borne by the corporation

•28 slums covered

•Near completion 13 slums

•47 slums undertaken in 2002-03

Before SNP

After SNP

5.3.3 Facility of Microfinance

The slum dwellers are given a facility of microfinance by an NGO SEWA Bank at the doorstep. Those who can not pay their contribution of Rs. 2000 up-front can avail of the credit facility from SEWA Bank upto Rs.1500. This is an initiative taken by SEWA bank at its own to support the project.

5.3.4 Up scaling of the project.

Looking to the procedural constraints in the implementation of the project, the corporation now proposes to create a special purpose vehicle within the AMC to up-scale the project to ensure that large number of slums are taken up for upgradation each year. Full autonomy is proposed to be given to the SPV to scale-up this project. The SPV will have a special board of management to take all decisions in regard to the upgradation of slums. The board will have, besides the corporation's office bearers, the representatives of NGOs, community and stakeholders on the board of management. It is envisaged to cover all the eligible slums within a period of 5 to 7 years.

5.3.5 Tenural status.

Under this project slums selected for upgradation are given an assurance that they will not be removed by the AMC for at least 10 years if they join this project of upgradation. The AMC has passed a policy resolution to this effect. This gives added incentive to the slum dwellers to participate in the project.

5.3.6 Projects For The Urban Poor

1) Housing
2) Youth Training

1) Housing (Shelter):-

Housing is one of the most basic needs of human just next to food & clothing. In the city, there are numbers of families living in the sub-standard human settlement. The city is required to construct 60,000 houses for urban poor, which cost Rs. 750 Crores. The details are given as under:

Sr. No.	No. of families in the Chawls	Total houses to be constructed	Expenditure without infrastructure	Infrastructure Expenditure	Total
1	1,34,000	12,000 (per year) x 5 years = 60,000	Rs. 1,00,000 per unit Rs. 600 Crores	Rs, 25,000 per unit Rs. 150 Crores	Rs. 750 Crores

2) Youth Training: -

Due to financial and other problems youth of the urban poor families drop out from studies. It is planned to provide vocational & other training to them, to get better & respectable jobs. The details are as under:

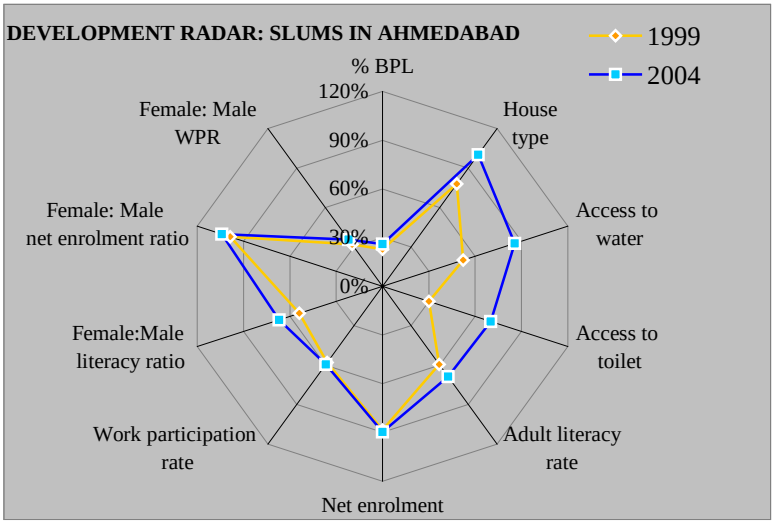
Sr. No.	No. Youth to be trained	Expenditure per youth	Total
1	4,000 (per year) x 5 years = 20,000	5,000 (per youth) x 20,000 = Rs. 10 crores	Rs. 10 crores

Box: 5: Slum Improvement

For benefits of the poor, there have been various approaches and programs in different sector implemented in the state. They include provision of electricity in slums, slum relocation, SJSRY, PDS, ICDS etc.

Most of the times, programs and schemes keep on shifting and changing as per the interests of the bureaucrats. This results in low success rate of most of the programs at the grassroots levels.

- The Slum Networking Program (SNP), Ahmedabad is an innovative approach for the improvement of slum, introduced in 1997.
- Instead of treating slums as marginal areas, Slum Networking Project aims at incorporating them into the fabric of city life.
- SNP also differs from other infrastructure improvement programs introduced before in the way that it has adopted 'participatory' approach where government's role is of facilitator and other stakeholders are slum dwellers. NGO and the private sector.
- The two main component of the project are:
  - **Improvements in Physical Environment:** It includes provision of basic water supply, sewerage network with individual toilets, street lighting, paved roads and solid waste management.
  - **Community Development and Social infrastructure:** It includes mobilization of community savings group, pre-primary, primary and adult education programs and to avail benefits under other government schemes.
- Till now, SNP has been successfully implemented in 22 slums in the city.
- Study suggests that due to SNP, direct improvement in basic infrastructure services like water, individual toilet etc. can be seen.
- This led people to improve their housing condition from sacks to semi-pucca houses, which is an indirect achievement of SNP.



- Due to ICDS and other education related schemes, net enrolment in the schools has increased. Female work participation and female net enrolment has increased.

Source: Neha P. (2005), unpublished Masters of Technology – Plan Dissertation, School of Planning, CEPT University

5.4 Issues

The city has 12.5% housing stock lying vacant due to various reasons. This is inspite of the fact that Rent Act has been amended. About 9 lakh population are living in slums due to non-availability of affordable housing facility for them. Though the number of slums has decreased by 37% over the last decade the slum population has almost doubled. Therefore, the slum population is becoming more and more dense in the existing slums with the increase in population. To tackle the problem of slums and to integrate the slum dwellers into the main stream of the society, an innovative slum networking project has been initiated by the AMC for provision of basic infrastructure and community development in the slums adopting partnership concept where the community, NGO, industry and the AMC share the cost of the provision of physical and social infrastructure. Sixteen projects have been completed so far and many more are under way. The notable feature of this project is that it seeks to involve the community, NGO and industry in the implementation of the project and the community is getting involved in the maintenance of the services rendered. This project targets to cover all eligible slums and chawls in the city before 2011. The total project cost is estimated at Rs 10000 lakhs.

Major issues are:

- *Expansion/densification of existing slums posing a greater challenge:* The SNP is addressing the current infrastructure demand in slums keeping in view the number of dwelling units existing in each slum. Simultaneously, expansion /densification of the slums is taking place at a rapid pace. In such a scenario the infrastructure provided in the slums will become wholly inadequate, over stressed and may nullify improvements made if the densification of serviced slums is not checked.

- *Slow pace of slum upgradation***:** The number of slums to be upgraded are very large and the present pace of slum upgradation is very slow. It will, therefore, be difficult to meet the challenge in the given time frame unless the project is scaled up substantially.

- *Lack of efforts to arrest proliferation of slums:* In absence of a policy and action to create affordable housing stock for the urban poor in the city, the growth of new slums will remain unabated.

- *SNP -a highly subsidised programme with major chunk of resources coming from the AMC:* Despite a cost sharing component built into SNP, very little contribution has been forthcoming from private sector, or the corporate sector. As a result, the AMC has to bear the major share of the costs involved in the programme.

- *Low participation of the NGOs resulting in slow progress of the SNP:* Over the past 6 years only 16 slums have been upgraded and now another 47 slums have been lined up for upgradation in second phase as against the clearance given to 500 slum pockets for upgradation. Only 2 NGOs are presently involved in this activity with the AMC, which is not enough to motivate large number of slum dwellers to join the project. This essentially means that more and more NGOs are required to be roped in to participate in this project and take up the work of motivating the slum communities to join this project as partners.

Chapter 6

Social Amenities

Educational Facilities

Health Facilities

Open Spaces

6.1 Educational Facilities

The city is well developed in terms of educational facilities with a range of primary, secondary, higher secondary schools, colleges being run by Municipal Corporation, private institutions and State and Central Government. In Ahmedabad Municipal Corporation area, the School Board is responsible for the provision of educational facilities. There are altogether 1287 primary schools in Ahmedabad and 583 Higher Secondary Schools. The School Board activities are administered through Zonal Administrative Officer.

Table 6-1: Facilities offered by the AMC, Private and Central Government

Type	Agencies				Total
	Central Govt.	A.M.C	Aided	Private	
Primary Schools	11	531		741	1283
Secondary/ Higher Secondary Schools	11	5	399	168	583

Source: AMC, 2005

Table 6-2: No. of students and teachers

S.No.	Type of Schools	Nos.	No. of Students	No. of Teachers
1.	Mun. primary	531	187115	4925
2.	Private Primary	741	370184	NA
3.	Mun. Secondary	5	1706	52
4.	Pvt. Secondary	226	54218	1565
5.	Colleges	91	NA	NA

Source: AMC, 2005

The Ahmedabad Municipal Corporation is responsible for providing primary education through pre-primary schools and primary schools. AMC is presently running 112 pre-primary and 563 primary schools (Refer Table 6-2). It provides free textbooks to all students, and scholarships to students belonging to SC/ST/OBC. An expenditure of 19 lakhs per school and around Rs 6567/- per student per annum is incurred. Of the total expenditure, almost 80 percent is contributed by the State Government as grant while the rest is borne by the Corporation.

Apart from the above, there are additional 715 primary schools run by the private, having approx. 500 students. There are 91 colleges in the city. Apart from these, several premier autonomous institutions of the country like Indian Institute of Management, National Institute of Design, Center for Environmental Planning and Technology are located here.

When analysed with respect to the UDPFI standards, Ahmedabad was found to be well endowed and far advanced in terms of educational facilities.

Table 6-3: Higher Educational Institutions in Ahmedabad (2001)

Colleges	Nos.	University Post Graduates Schools & Deptt.	Nos.
Arts	10	Social Science	1
Arts & Science	2	Languages	1
Arts & Commerce	15	Phy. Edu. & Philosophy	1
Science	5	Science	1
Education	8	Sheth Damodar Vanijya Vidya Bhavan	1
Commerce	22	Dr. B. K. School of Business Management	1
Law	6	School of Law	1
Engineering	2	Integrated MBA Prog.	1
Medical	3	Centre for Developmental Communication	1
Pharmacy	1	Library & Information Science	1
Dental	1	Dept. of Communication, Journalism and Public Relation	1
BBA	7	Dept. of computer sciences	1
Nursing	1	Department of Physical Education	1
Physiotherapy	1		
B.C.A.	7		
Total (a)	**91**	**Total (b)**	**13**

Source: AMC Statistical Outline

6.2 Medical Facilities

Ahmedabad provides a good network of medical services in the form of hospitals, dispensaries and maternity homes. The Corporation manages three general hospitals, one ophthalmic hospital, one TB Hospital, One infectious decease hospital, 5 Referral hospitals and 22 dispensaries. It also provides 10 maternity homes, three dental clinics and 43 dispensaries (Refer Table 6-4).

Table 6-4: Medical facilities in Ahmedabad

Medical Facilities by AMC		Medical Facilities by others	
Type of Hospital	**Nos.**	**Type of Hospital**	**Nos.**
General Hospital	3	Civil Hospital	1
Ophthalmic Hospital	1	Bapunagar Gen. (ESSI)	1
T.B.Hospital	1	Naroda TB Hospital (ESSI)	1
Infectious Disease Hospital	1	Urban Health Centre	43
Referral Hospital	5	Pathological laboratory	48

Medical Facilities by AMC		Medical Facilities by others	
Type of Hospital	**Nos.**	**Type of Hospital**	**Nos.**
Maternity Homes	10	Aanganwadis	1156
Dental Clinics	3	Super Specialirty Centres	2
Dispensaries	20	Private registered Nursing homes	1317
Mobile dispensary	2		

Source: AMC, 2005

Apart from these there are two more General Hospitals, and 2 Super Specialty Centres. The Municipal General Hospitals together have the capacity of 1700 beds for indoor treatment; whereas other hospitals and maternity homes have above 500 beds (total 2500 beds). Annually over 3 million patients take advantage of indoor treatment in the above medical institutions and about 50,000 operations are performed.

There are around 1300 private nursing homes also. The urban poor has to depened on medical services rendered by the public, charitable hospitals, dispensaries and maternity homes. AMC has a network of 60 medical institutions offering services either free of charge or by levying normal charge. The lower order facilities are lacking in slums. Only one-fourth slum population has access to dispensaries.

Spatially, majority of the medical facilities is located in the Western Zone, followed by Central Zone. The other three zones are deficient in terms of health amenities (Refer Table 6-5).

Table 6-5: Zone-wise distribution of hospitals run by various organisations

Zones	Govt.	Private	Charitable trust	AMC	Total
Central	3	2	3	2	10
West	3	21	4	2	30
South	_	2	_	2	4
North	1	_	_	1	2
East	_	_	_	1	1

Source: AMC, 2005

Table 6-6: IMR and MMR trend

Year	IMR	MMR
1975	81.07	0.92
1980	71.25	0.73
1985	55.66	0.61
1990	44.22	0.23
1995	33.14	0.23
2000	27.15	0.12

Source: AMC, 2005

Both the birth rates and death rates have decreased over last few years, bringing down the natural growth rate to P15.71. Similar downward trend is seen in case of Infant Mortality Rate and MMR (Refer Table 6-6).

Water borne diseases like gastroenteritis, typhoid, viral hepatitis and cholera show a constant trend, depicting the recurrence of these diseases (Refer Table 6-7). The emphasis has been on the curative measures rater than preventive measures.

Table 6-7: Cases of diseases in Ahmedabad

Diseases	2001		2002		2003		2004		2005	
	Case	Death	Case	Death	Case	Death	Case	Death	Case	Death
Gastroenteritis	4893	0	3097	0	3298	0	3266	2	3342	0
Typhoid	494	0	350	0	484	0	493	0	342	0
Viral hepatitis	1190	1	589	0	792	0	1767	5	6421	11
Cholera	29	0	2	0	17	0	6	0	0	0

Source: AMC, 2002

6.2.1 Present Scenario of the Health Services:

- **Urban Health Centres:** For primary health care, maternal and child health care, and family planning services, the norms of Government of India are to have one centre per 50,000 population. Accordingly, the city of Ahmedabad should have 90 family welfare centres, as against which the city has only 47 centres.
- **Malaria, Dengue and Vectorborne Diseases Control:** Getting a very small grant of Rs. 6,92,000 per year from the State Government, the corporation spends nearly Rs. 4,00,00,000 per year for the control of malaria in the city.

6.3 Open Spaces and Recreational Area

The Open Spaces in Ahmedabad are of five types: Open, Garden, Playground, Green belts and Recreational Area. A total of 129 ha are under open spaces in the entire city. This translates to 0.37sq.m area per person as against a specified standard of 8-10sq.m per person (UDPFI Guidelines) (Refer Table 6-8).

Table 6-8: Zone wise details of Open Spaces: Numbers and Area (hectare)

Zones	Open Spaces		Garden		Play ground		Green belts		Recreation		Total	
	Nos.	Area	Nos.	Area	Nos.	Area	Nos.	Area	Nos.	Area	Nos.	Area
Central	5	2.20	17	18.39	3	1.48	0	0.00	0	0.00	25	22.07
East	7	2.56	11	9.62	6	2.60	3	2.43	0	0.00	27	17.22
West	5	0.57	25	32.80	25	11.43	8	4.05	2	1.14	65	49.98
North	12	2.01	10	13.62	1	0.28	1	0.40	1	1.67	25	17.98
South	4	0.30	16	20.42	4	1.11	0	0.00	0	0.00	24	21.83
Total		7.64		94.85		16.91		6.88		2.81		129.09

Source: AMC

Over 40 percent of the open spaces lie in the Western Zone. There are no recreational areas and green belts in southern and Central Zones. Most of the open spaces are in the form of gardens. In all the five zones the per capita open space works out to be less than 0.7 sq.m. There seems to be major shortfall in terms of open green areas.

Open Spaces and Recreational Areas

There are about 100 parks in the city of Ahmedabad. Private agencies like Mother Dairy, Amul and Dairy Den work on leasehold basis with the Corporation for the development and maintenance of these parks. In turn, they grim through their profit margins from advertisements and sale of their products.

In the periphery as part of new planning, AUDA has developed 50 parks over 27 hactares.

6.4 Issues

The primary and secondary school facilities seem to be adequate for 2011 population when compared with UDPFI Guidelines. Ahmedabad can also boast of premier higher education facilities. The city also provides a wide range of medical facilities from super speciality hospitals to primary health care services. These facilities are however not well distributed in the city. With regards to the open areas, the city seems to be deficient.

- **Lack of Educational Facilities for poor:** Educational facilities in the slum localities of the city are lacking.

- **Problems related to health facilities:** poor distribution, inadequate facilities for the urban poor, lack of precautionary and preventive measures against the diseases, financial constraint

- **Lack of Recreational Facilities:** There has been a continuous decrease in the amount of open spaces present in the city over the past decade. With all the available playgrounds being in school premises' there is a clear lack of community play/ park areas. The green belts in the past are put to different urban uses and the gardens and parks in the city at present are very less to cater to the recreational needs of the population of the city.

Chapter 7 Cultural Heritage

7.1 Introduction

The city of Ahmedabad is endowed with a rich architectural heritage that is vital to the local identity and continuity of the place. The foremost heritage assets are the Indo-Islamic monuments of the 15th to 17th centuries: the Jama Masjid, the Teen Darwaza, the Bhadra Gate and Tower and the Tombs of Queen and King located in the historic core, the remaining sections of the original fort wall, 12 original gates and a number of other monuments protected by the Archaeological Survey of India (ASI). Besides these monuments, there are potential heritage precincts in the form of the *Pols,* the traditional residential clusters of the medieval period, which makes Ahmedabad exceptional. A large enclave of the Maratha period and many fine examples of colonial era architecture also survive in the Walled city.

This urban heritage of housing and architecture constitutes a living context, a technology and a morphology, which can be restored and adapted to meet the needs of the day. But, in absence of any protective measures and pressures of urbanization, demolition has continued destructuring the walled city in particular. The protection of any city as a whole is under the auspices of urban management and cannot be limited to mere aesthetic concerns. Hence instead of a piecemeal or a fragmented approach, an overall conservation strategy, which is technically and economically coherent, is required.

7.2 Heritage Resources

The heritage resources in Ahmedabad can be looked at following three distinct levels:

a. **The entirety of the walled city:** ASI has a total of 52 Indo-Islamic monuments under protection. In addition, there are many Hindu and Jain temples, the Gaekwad's Haveli enclave of Maratha period and several other institutional buildings and bungalows of the Colonial period. At the moment, these structures are in a state of disrepair except for the few Jain temples taken care of by the Jain community. The City Wall and its Gates are equally in dilapidated condition.

b. The pols which comprise it: The grouping of houses into pols is typical of Gujarat and especially of Ahmedabad. When compared to the costs engendered by the

modern cities, the pols seem most economical making use of simple facilities, techniques and easily accessible social amenities, something lost in the suburban lifestyle much dependent upon commuting. Destruction and de-structuring caused by new buildings, the invasion of business and traffic point to a worrisome future for the pols.

c. **The individual houses:** The houses of Ahmedabad were traditionally built of carved wood and brickwork characterized by low, single family units, of which only some 10,000 survive now. The gradual progression of the model gave way to the transplantation of forms, which were totally foreign to local traditions. The apartment buildings are of a mediocre quality heralding a decline in the know-how and technique.

Realizing the acute need for a holistic approach to the conservation and preservation of this valuable heritage resource, Ahmedabad Municipal Corporation (AMC) with assistance from CRUTA Foundation set up a heritage cell in 1996. Its main objectives are to create basic awareness amongst the citizens, promote traditional built forms, support participatory action programmes and to co-ordinate efforts of different disciplines, stakeholders and authorities. It is an advisory board to AMC essentially assisting the Corporation in its capacity building.

The Heritage Cell has been actively involved in varied aspects of urban conservation, while, effectively implementing numerous projects. The following interventions are part of its efforts for the overall process of inner city revival:

1. *Generating awareness amongst people through documentation, preparation of models, organizing street exhibitions and community meetings*:

These activities involve strategic partnerships, public-private partnerships as well as international collaborations. Some such activities undertaken by the Heritage Cell are heritage walk, the freedom walk, association of the old house owners, celebration of the pol-day, the auto-rickshaw tour, signposting of the pols, illumination of monuments, traditional street theatre, information through the media, best practice transfer programme, training of administrators, City heritage award, revival of the ‘Panch’ and so on. (for further details refer Annexure 8.1)

2. *Initiating restoration efforts.*

Restoration of the buildings and pols have been initiated by commissioning detailed surveys, mobilizing resources, identifying and commissioning expertise, providing technical assistance, initiating community-based restoration process, training of volunteers, initiating citizens/ NGO actions.

3. Enabling government facilitation:

The Cell is also assisting the Local Body in resolving legal issues, clarification of the property tax, financial assistance, co-ordinating the efforts of the different departments, initiating requisite institutional development, preparing guidelines for revitalization.

The efforts of the AMC have made a cultural impact on community at large. Mention of heritage walk in 'Lonely Planet' is a credit to Ahmedabad Municipality. Some of the successful projects initiated by the Heritage Cell are:

- Revitalization of the Walled city of Ahmedabad (an AMC-France Colloborative project), The City Museum
- Restoration of the facades
- Restoration of Chabotras (bird feeders)
- Restoration of Dwarkadhish temple
- Revival of the 'tankas'
- Design of a special fire fighter
- Development of the Manek Burj
- Restoration and Development of the Dutch Tomb Complex at Kankaria
- Earthquake damage repair of the Municipal School Buildings and
- Awareness creating programs for children.

(For further details refer Annexure 8.1)

AMC has been quite active in the overall process of revival/ conservation of artifacts, structures and precincts of historical, aesthetical, architectural and cultural value. However, problems still persist for which detailed strategies need to be worked out.

7.3 Issues

- *Insensitive Building Controls and Planning:* There is a glaring lack of policy and no action blueprint exists for the conservation of heritage resources either at the state or city government level. The Development Control Regulations (DCR) of 1983 is found inadequate for the task of conservation. Also, the availability of high FAR within the Walled City encourages demolition of old buildings and the construction of large buildings in its place by amalgamation of plots. Planning proposals for road widening in the Walled City area have resulted in the destruction of valuable streets.
- *Heritage Definition:* There are definite problems with the existing definition of heritage as interpreted by ASI as well as the government agencies. The rules say that they can protect monuments that are more than 100 years old. This excludes medieval

residential *pols* worthy of protection and colonial properties, though some of them are more than 100 years old.

- *Deteriorating Building Stock: In the recent years, o*ut-migration of wealthy communities to the peripheral areas of the city has been observed. The Rent Control Act discourages owners from letting properties as vacant properties attract lower taxes. Also, inadequate infrastructure keeps property prices depressed. Also in absence of availability of loans for house repair is deteriorating the building stock. All these reasons are contributing to the high vacancy rates, lack of maintenance and degeneration of usable building stock.
- *Traffic Congestion:* Vehicular traffic has predominantly increased through the years creating problems of parking, thus, blocking the visibility and accessibility of heritage buildings. Air pollution from vehicular exhaust is on an increase, causing an irreparable damage to the heritage resources. Further widening of roads with insensitive design layout has caused increase in traffic problems eventually disrupting the total fabric.
- *Encroachments:* The visual character and aesthetic ambience of the heritage buildings/ precincts is totally engulfed by intense commercial activity, signboards etc. This is coupled with actual physical encroachments around these historic precincts.
- *Inadequate Municipal Services:* Inadequate and inappropriately located facilities for garbage collection, inadequate fire services due to congested lanes, shortage of water supply, storm water and sewerage connections has lead to overall deterioration of the urban fabric.
- *Lack of New Investments:* Areas within the Walled City that can accommodate new development are inappropriately zoned, discouraging new investments. Building in areas surrounding protected archaeological monuments requires permission from the ASI in New Delhi. This discourages the flow of new investments in the Walled City. The lack of public expenditure on improving infrastructure discourages new private investments.

Chapter 8 Urban Environment

Water Quality
Air Quality
Noise Pollution

Environmental problems in a city are inevitable and arise out of resource consumption and disposal patterns by the population. Major impacts witnessed are in the form of water pollution, air pollution and noise pollution.

8.1 Water Quality

There is a steady decline in water quality as one moves downstream of the river - from Indira Bridge to Shastri Bridge. The Water at Indira Bridge has high DO content with minimal COD. The water quality is very poor after Dudeshwar intake (DI). These variations in values may be due to waste water, mainly domestic sewage and some amount of industrial waste water which are discharged after the DI point.

High dependence on ground water in absence of perennial water sources is resulting in depletion of water table at an annual rate of 2 to 3 mts. This is posing serious problems, both from the point of view of availability as well as quality.

A study by CEPT, which sampled 118 households spread over the city, shows that 87 % of the drinking water samples contain fluorides above the maximum permissible limit (1.5 as F mg/1). Another 14% samples were found to contain hardness exceeding the permissible limits (600 as CaCo3) mg/1). Over 70 % are above desirable but within permissible limits. The situation with reference to TDS and alkalinity show that 97 % samples are within permissible limits, but above desirable limits. Another 2.5 % samples had levels beyond the permissible limits.

8.1.1 National River Conservation Project (NRCP)

The National River Conservation Plan (NRCP) is the project initiated by Ministry of Environment & Forests for cleaning up most polluted rivers of India. River Sabarmati has also been picked up under this project, which is highly polluted at a stretch of 80 kms between Gandhinagar and Vautha. This stretch passes through Ahmedabad. The emphasis of this project is on arresting the river pollution due to discharge of wastewater through 27-storm water drains outlets.

Two phases were envisaged for this project:

1. NRCP Phase I Project:

The project components include interception and diversion works to divert the waste water to the treatment plants, construction of two new UASB based sewerage plants in place of the outdated trickling filter plants, provision of independent trunk sewers, terminal sewage pumping stations, provision of low cost sanitation facilities in slums situated on the river bank, afforestation etc. (Refer Table 8-2)

Table 8-1: Details of NRCP Phase I Project

Phase I	Cost in Rs lakhs
Interception & Diversion works	3896.00
Construction of new sewage treatment plants	4397.50
Low cost Sanitation	100.00
Crematoria	60.00
Afforestation & Public Participation	24.00
Land cost	200.00
Cost Escalations at 8%	678.20
Total	9355.73

The scheduled time for completion of NRCP project was by December 2002 but the work in Phase I was hindered due to technology approval delay for the sewage treatment plants and DPR approvals. Finally project got completed in 2004-05.

2. NRCP Phase II Project:

This project is envisaged for the year 2011. The major project components include:

Renovation of Sewerage Pumping Stations: About 10 pumping stations were covered in Phase –I and 6 pumping stations are proposed for renovation and augmentation. The work include replacement of pumping machinery, provision of bypass arrangement, flow measuring device, screen chamber, grit chamber.

i. *Interception and Diversion Works :* In second phase it is proposed to construct drainage lines of 14.19km and 11.66km parallel to river bank on western and eastern side respectively which would collect the waste water and take it to proposed treatment plants at Vasna and Pirana

ii. *Waste Treatment Plant:* To meet the requirement of 2006 for AMC area, another treatment plant of 100 MLD capacity is proposed. Renovation and augmentation of existing aerated lagoon type sewage treatment plants would also be done in order to comply with the NRCP norms of BOD, suspended solids and faecal coliform.

Table 8-2 Details of NRCP Phase II Project

Sl No:	Phase II	Cost in Rs Crore	Salient Features
1	Renovation and Augmentation of Sewage pumping stations	7	Sharda Mandir pumping station – West Zone
			Chamanpura(old)pumping station- North Zone
			Gomitpur(old)pumping station -East Zone
			Gomitpur(new) pumping station-East Zone
			Amraiwadi pumping station - East Zone
2	Interception and Diversion Works	13	i) Western side
		17	ii) Eastern Side
		2	iii) Identification of cross connection between sewers and SWD
	Total	32	
3	Sewage Treatment Plant of additional Treatment capacity of 100 MLD including decentralization	32	
4	Renovation and augmentation of existing aerated lagoon type sewage treatment plants	52	
5	Desilting of sewers	3	i) Desilting Equipment
		5	ii) Cleaning of existing sewers storm water drains and sewage pumping stations
6	Low cost Sanitation: I & D works in slums near Sabarmati River	2	
7	Total	143.64	

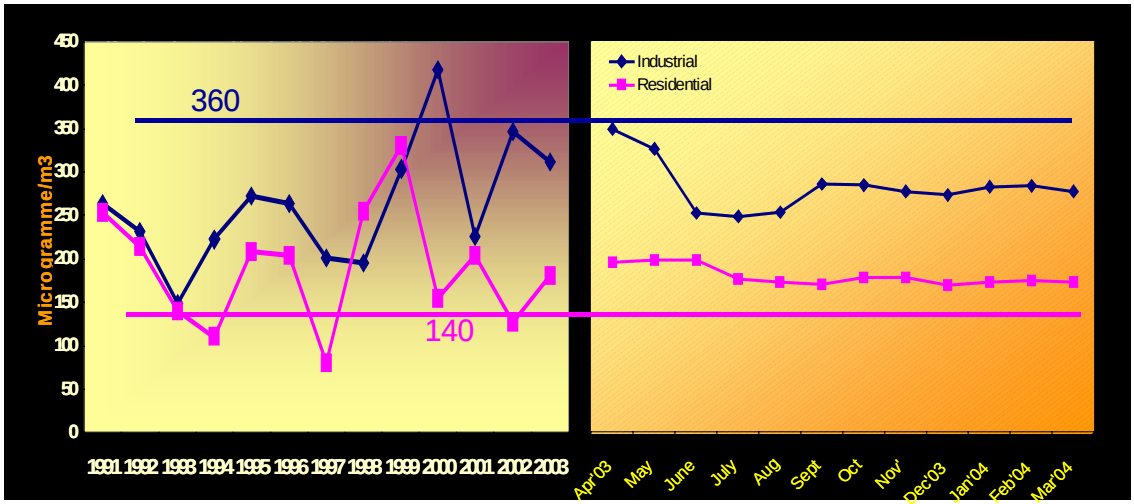
Source: AMC

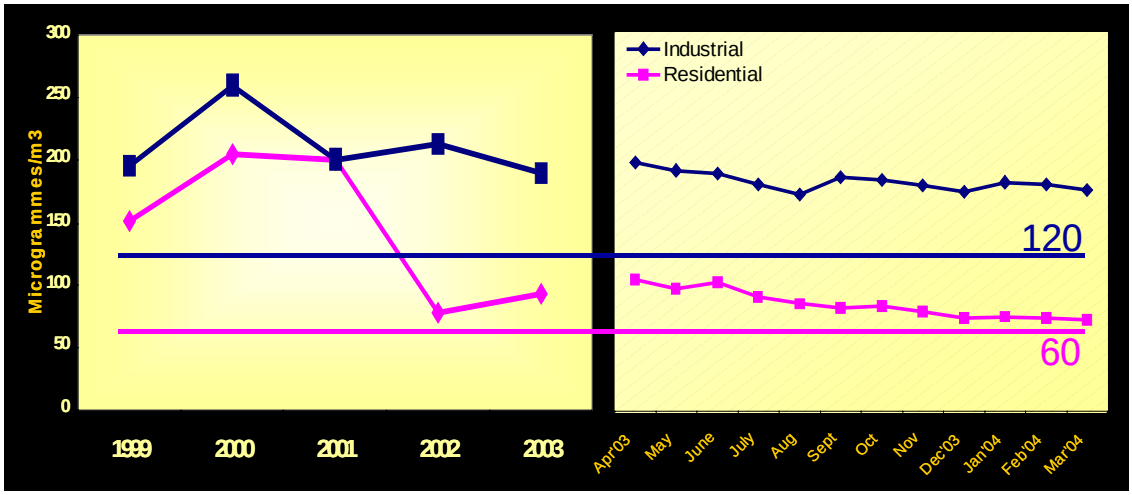
8.2 Air quality

8.2.1 Effects on Air Quality

The city of Ahmedabad has seen a rapid growth in two wheeler population in the last two decades, which has also resulted in rising pollution levels in the city. Vehicular pollution generally accounts for 60-70 per cent of total pollution loads of a city. The root cause of air pollution in Ahmedabad is the two-stroke two wheelers and auto rickshaws, which contribute to the pollution load. The city has been identified as one of worst with regard to Air pollution by Honorable Supreme Court Committee

Figure 8-1: SPM Levels





Source: Gujarat Pollution Control Board

The permissible SPM and RSPM levels as per National Ambient Air Quality Standards (NAAQS), have been consistently high for the past decade in industrial and residential areas.

The graph is plotted for SPM concentration in Ahmedabad. The comparison is made between the three locations viz., GIDC-Naroda- industrial, Cadila - mixed land use, and LDCE - residential. They mixed land use shows a high concentration as compared to other two points.

Table 8-3: Ambient air quality in Ahmedabad

Sr. No.	Name of the Stations	1997			1998			1999			2005		
		SPM, ug/m^3	SO_2, ug/m^3	NOx, ug/m^3	SPM, ug/m^3	SO_2, ug/m^3	NOx, ug/m^3	SPM, ug/m^3	SO_2, ug/m^3	NOx, ug/m^3	SPM, ug/m^3	SO_2, ug/m^3	NOx, ug/m^3
1	Shardaben Gen. Hosp.	297.2	36.12	1.006	321	27.18	9.754	576	2.94	30.45	-	-	-
2	Cadila health care	199	47	9.55	255.8	17.39	6.781	1150	1.88	11.37	602	52	18
3	L. D. Engg. College	81.06	65	4.5	180.5	18.43	8.627	331	11.76	4.51	222	28	15
4	GIDC, Vatva	613.6	65	23.89	536.6	38.6	2.42	119	14.7	1.13	359	73	18
5	GIDC, Naroda	202.8	90.9	16.67	195.3	5.76	10.05	1003	3.14	22.86	329	12	6
6	GIDC, Odhav	211.2	43.39	7.29	294.2	5.79	3.45	157	17.7	0.85	366	41	46
7	AEC ltd. Sabarmati	519.5	54.2	7.04	204.9	4.62	2.41	529	143.6	29.55	494	14	22
8	Ashram Road	484.3	55.88	8.05	910	2.169	60.35	317	7.06	10.6	411	9	33
9	Karanj Police Station				326.6	20.37	6.884	589	5.88	40.6	264	39	11

Source: CPCB

Problems of air pollution are beginning to reach unmanageable proportions in Ahmedabad. The Comparative Environmental Risk Assessment study by AMC and CEPT in 1995 had also indicated air quality deterioration, due to transport as the first most important environmental problem faced by the city of Ahmedabad. In Ahmedabad a total pollution load of 25 tons/day on to the atmosphere during the year 1970-71 has gone up to 209 tons/day by 1987-88. By the year 1996-97 the load has gone up to 640-tons/day (CEPT, 1999). The loss due to high levels of air pollution in Ahmedabad is estimated to be Rs 250 – 300 Crores per year, which is about 40% of the annual budget of the local body.

NIOH study highlighted that problem of air pollution at street junctions in the city of Ahmedabad is quite high. PPM, CO and occasionally NOx have exceeded the ambient levels.

8.3 Noise Pollution

Most of the areas along the major roads in Ahmedabad are subjected to much higher noise levels than the permissible limits. The Central Pollution Control Board has set standards for ambient noise levels in residential, commercial, industrial and silence zones[8].Though

8

legislative options are available for noise abatement under Environment Protection Act of 1986, no concern is shown to the increasing noise levels.

Table 8-4: Main Roads taken for study

1.	Tilak Road/Relief Road
2.	Gandhi Road
3.	Ashram Road
4.	C.G.Road
5.	Drive in Road
6.	University Road
7.	Panjra Pol

As per a study carried out on seven major road sections in Ahmedabad[9] (refer Table 8-5) the areas on Relief Road and Gandhi Road are the noisiest, with equivalent noise levels reaching 87.5 and 86.5 dBA during per hours (5-7PM) the maximum values on these roads reach 110 dBA . On all the roads the noise level was found to be higher than the prescribed limits. On the University Road, the equivalent noise level is 72 dBA, which is 22 dBA higher than prescribed limits for a silence zone. On the other roads, noise levels are around 12 to 22dBA higher than the set limit. On all the roads, noise levels exceed the permissible limits (65 dBA) for more then 50 percent of the time.

Table 8-5: Equivalent noise energy levels on different roads

Ashram road	Drive-in road	CG road	Relief road	Gandhi road	Panjra pol	Uni. Road
83.49	81.64	81.90	85.39	85.8	77.65	72.23
83.47	81.12	80.90	87.44	86.11	75.71	72.50

On Relief road and Gandhi road, the noise levels are 33 percent more than the set standard. It is estimated that 21 percent of the Ahmedabad's population live in close proximity of the major transport routes and hence are exposed to noise levels of most severe consequences. Noise levels recorded in and around VS hospital are also very high.

8.4 Issues

- Lack of comprehensive sewerage system has led to discharge of untreated industrial effluents and sewerage into River Sabarmati. This has led to contamination of ground water through seepage.

Noise standards (in dBA) set by CPCB

	Industrial	Commercial	Residential	Silence zones
Day	75	65	55	50
Night	70	55	45	40

[9] *Misra, Anurag. (2000), Urban Vehicular Noise Pollution, A case of Ahmedabad City, Unpublished Dissertation, School of Planning, CEPT, Ahmedabad.*

- Many of the canals and tanks in the city are encroached upon obstructing the natural flow of water. This results in flooding and stagnation of water thereby rendering the surrounding areas susceptible to infectious and communicable diseases.

- There are no monitoring stations to estimate and assess the quantity and quality of wastewaters being generated in the city. This incapacitates officials to guage the extent of damage caused and inability to penalize offenders.

- The Air quality monitoring stations have recorded high pollution levels especially for SPM. The high volume of dust suspension is due to the unsurfaced margins on majority of the roads in the city and the voluminous increase of the vehicular traffic over the years. Most of the vehicles are not compliant with the norms and release dangerous exhausts.

- The study on major roads of Ahmedabad depicted high noise levels, much above the permissible limits on these roads.

Chapter 9 Municipal Finances

Structure of Municipal Finances
Overview of Municipal Finances
Revenue Account
Capital Account
Outstanding Liabilities
Key Financial Indicators
Status of Municipal Fund

9.1 Introduction

The Municipal Corporation of Ahmedabad is the principal agency at the city level. The project financing would be carried out as per the governing rules of the BPMC Act by AMC. The projects I the periphery have been planned by AUDA, the apex planning agency. Under the existing governance structure, project financing is concievd within the TP & UD Act provisions. This chapter focuss mainly on AMC finances. Summary of AUDA finances is given as part of Chapter on FOP (Chapter 12).

9.2 Structure of Municipal Finances

The review of finances involves a time-series analysis of the income and expenditure of the AMC to ascertain the trends and the major sources and uses of funds. In addition to this, certain key financial indicators relating to property tax, water tax, per capita income, per capita expenditure and debt servicing; have been considered to assess the financial performance of the Ahmedabad Municipal Corporation.

The booking of transactions in Ahmedabad Municipal Corporation (AMC) is carried out under major and minor heads. The corporation perform a series of obligatory and discretionary functions according to the powers vested through the Bombay Provincial Municipal Corporations Act (BPMC), 1949. Under this Act, the corporation is empowered to levy taxes and rates.

The Section 127 of BPMC Act, allows the corporation to levy octroi, property tax and tax on vehicles, boats and animals etc. The Act has special provisions relating to water and conservancy taxes. By virtue of Sec 134 of the Act, the Commissioner has powers to levy a volumetric charge for water supplied in lieu of water tax, subject to its consistency with the bylaws. These bylaws are framed by virtue of powers granted under Sections 458 of BPMC

Act. Similarly, based on approval of the Standing Committee the Commissioner may fix a charge for provision of conservancy service.

As per taxation rules, the base for property taxes will have to be assessed once in four years. The Municipal Corporation is also empowered to levy property tax for residential and non-residential properties for which the minimum and maximum limits are fixed. It needs mention that except for the ceiling on general tax, all other taxes have no minimum or maximum limits specified.

The provisions in the Act enable the corporations to levy other taxes with the approval from the State. In the Act it is indicated that supplementary taxation is allowed with the approval of the State Government if the closing balance is less than Rs. 1.00 Lakh.

The booking of transactions in Municipalities is carried out under major and minor heads. The Corporation is required to maintain the financial information in the format prescribed by the Bombay Municipal Accounts Code, 1961. The code prescribes maintenance of the accounts under the following heads:

- Part I: General (Revenue) Accounts
- Part II Capital Account and
- Part III: Extraordinary and Debt and Suspense Account

AMC introduced double entry computerized accounting system in April 1996 in the place of single entry manual accounting system, which was highly inefficient in terms transparency of information like current liabilities and assets and lack of financial management information. Also, manual accounting system proved time-consuming. Instead, the double entry computerized accounting system was quick, efficient and systematic. Various items in the balance sheet could now be bifurcated into various components and information for different period was made available. This facilitated fast and efficient strategic decisions.

The system of accounting is generally on a cash basis. Essentially all transactions are either receipts or payments, with certain transfers and adjustment provisions, mainly in the form of error in classification, adjustment of expenditure on receipt of a bill against advance, and adjustment of refunds of revenue or recoveries of expenditure by deduction.

9.3 Overview of Municipal Finances

Actual accounts of the AMC for the last five years (2000-01 to 2004-05) have been analysed to assess the finances of the corporation. Detailed accounts compiled from the budget books of AMC are presented in **Annexure 9.1**. An abstract of the annual accounts and tables of the

sectoral contribution, growth trends and per-capita values of the different items of income and expenditure are presented in **Annexures.**

The city of Ahmedabad holds a special status in its onw revenue sources for efficient way of functioning, it has shown operating surplus, in spite of its developmental activities. The corporation has shown a mix of surplus and deficit in its revenue and capital accounts over the last five years (F.Y. 2000/01 to 2004/05). The revenue account portrays a surplus, whereas thecapital account has shown deficit in three of the past five years. It shows the city's ability to generate surpluses amid the favourable environment and flexible environment and flexibility in the tax structure. The Corporation has a healthy opening balance of more than Rs. 240 Crores and the positive fiscal result demonstrates officials' will to maintain fiscal control.

Table 9-1: Summary of Municipal Finances

Sl.	Items	2000- 01	2001- 02	2002- 03	2003- 04	2004- 05
		Amounts in Rs. Lakhs				
Opening Balance		**13922.64**	**16054.20**	**23458.05**	**16950.32**	**246625.70**
I	**Revenue Account**					
1	Revenue Income	**56257.96**	**56184.43**	**61564.13**	**69067.54**	**80619.63**
2	Revenue Expenditure	**56119.93**	**55954.16**	**58190.07**	**56264.50**	**59647.62**
3	**Surplus/Deficit**	**138.03**	**230.27**	**3374.06**	**12803.04**	**20972.01**
II	**Capital Account**					
1	Capital Income	**15608.31**	**24169.80**	**3879.76**	**19211.53**	**13596.57**
2	Capital Expenditure	**13614.78**	**16996.22**	**13761.57**	**24339.19**	**18908.28**
3	**Surplus/Deficit**	**1993.53**	**7173.58**	**(-9881.81)**	**(-5127.66)**	**(-5311.71)**

Note: *The figures have been computed based on the annual accounts' figures provided by the AMC.*

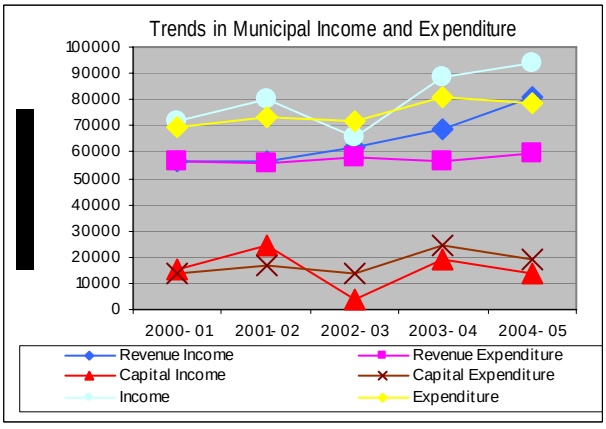


Figure 9-1: Trend in Municipal Income and Expenditure

The revenue account has shown significant surpluses over the years. It represented an upward trend from Rs. 138 lakhs in 2000/01 to Rs. 20972 lakhs in 2004/05, while the capital account has recorded deficit during the past three years (Refer Table 9-1) indicating transfer of revenue surplus for assets' creation on a regular basis, which is a positive feature. Inspite of deficit in capital account, the overall municipal account has been continuously in surplus during the assessment period indicating the sound financial health of the Corporation.

The revenue income of the corporation has grown at a rate of 9.59 per cent, while the growth in revenue expenditure during the same period was only 1.60 per cent. This explains high operating surpluses during the last five years.

The trends in capital income and expenditure have been fluctuating. The growth rate in capital income is 84% largely owing to the income through the Tax free bonds issued in the year 2002, 2004 and 2005, while the capital expenditure has grown at 15 per cent.

Table 9-2: Summary of Municipal Finances

Sl.	Item	2000- 01	2001- 02	2002- 03	2003- 04	2004- 05
		Amount in Rs. Lakhs				
Opening Balance		**13922.64**	**16054.20**	**23458.05**	**16950.32**	**246625.70**
INCOME						
A	**Revenue Account**					
1	Own Sources					
	a Octroi	32451.10	30708.82	36130.57	40093.84	46229.76
	b Taxes	9783.91	12158.15	12123.25	13680.12	17377.09
	c Non-Tax	3819.69	4381.54	4392.26	7059.50	7889.48
2	Grants & Subsidies	10203.74	8935.92	8918.07	8234.08	9123.30
	Total Revenue Income- A	**56257.96**	**56184.43**	**61564.15**	**69067.54**	**80619.63**
B	**Capital Account**					
1	Grants	2879.96	4122.75	3725.46	6302.25	3321.00
2	Loans	12716.02	20039.30	0.00	12800.00	10000.00
3	Others	12.33	7.75	154.30	109.28	275.57
	Total Capital Income- B	**15608.31**	**24169.80**	**3879.76**	**19211.53**	**13596.57**
Grand Total Income (A+B)		**71866.75**	**80354.23**	**65443.91**	**88279.07**	**94216.20**
EXPENDITURE						
A	**Revenue Account**					
1	Establishment Expenditure	322.50	324.33	323.30	301.20	333.97
2	Administration & General Expenses	5.95	5.93	6.31	4.74	9.77
3	Repairs & Maintenance	1,381.42	1,504.47	1,717.94	1,429.23	1,982.99
4	Power Charges	13,804.66	13,588.15	12,958.95	12,640.73	13,666.74
5	Fuels	6,904.73	7,485.02	9,098.00	7,974.36	8,730.12
6	Consumable Stores	**56,119.93**	**55,954.16**	**58,190.07**	**56,264.50**	**59,647.62**
7	Service & Programme Expenses	322.50	324.33	323.30	301.20	333.97
8	Other Expenses	5.95	5.93	6.31	4.74	9.77

Sl.	Item	2000- 01	2001- 02	2002- 03	2003- 04	2004- 05
		Amount in Rs. Lakhs				
9	Debt Servicing	1,381.42	1,504.47	1,717.94	1,429.23	1,982.99
Total Revenue Expenditure- A		**13,804.66**	**13,588.15**	**12,958.95**	**12,640.73**	**13,666.74**
Capital Account						
1	**Total Capital Expenditure- B**	**13614.78**	**16996.22**	**13761.57**	**24339.19**	**18908.28**
Grand Total Expenditure (A+B)		**69734.71**	**72950.38**	**71951.64**	**80603.69**	**7555.90**
STATUS OF MUNICIPAL FINANCES						
A	Revenue Account (I A - II A)	138.03	230.27	3374.08	12803.04	20972.01
B	Capital Account (I B - II B)	1993.53	7173.58	(9881.81)	(5127.66)	(5311.71)
Overall Municipal Account Status		**2131.56**	**7403.85**	**(6507.73)**	**7675.38**	**15660.30**

In addition the Municipal Corporation undertakes infrastructure projects, such as improvement in water supply, conservancy related works, development of commercial complexes, etc. The sources-wise uses of the general fund of the corporation (revenue and capital account) are discussed in detail in the following sections.

9.4 Revenue Account

The revenue account comprises of the operating income and expenditure items of the corporation. These are generally recurring items viz. income from taxes (octroi, property, other direct taxes), non-tax income (rents on municipal properties, charges, fees), grants, etc. and expenditure on establishment, repairs and maintenance, debt-servicing, etc.

9.4.1 Sources of Fund – Revenue Income

The income sources of the municipal fund may be categorized as own sources (octroi, tax and non-tax sources) of the corporation, general grant and contributions. Table 9-3 presents the summary of income under the different categories of source.

Table 9-3: **Summary of Revenue Income by Source Categories**

Sl.	Item	2000- 01	2001- 02	2002- 03	2003- 04	2004- 05
		Amount in Rs. Lakhs				
1	Own sources	**46054.22**	**47248.51**	**52646.08**	**60833.46**	**71496.33**
a	Octroi	32451.10	30708.82	36130.57	40093.84	46229.76
b	Taxes	9783.91	12158.15	12123.25	13680.12	17377.09
c	Non-tax sources	3819.21	4381.54	4392.26	7059.50	7889.48
2	Grants & Subsidies	10203.74	8935.92	8918.07	8234.08	9123.30
Total revenue income		**56258.44**	**56184.43**	**61564.15**	**69067.54**	**80619.63**

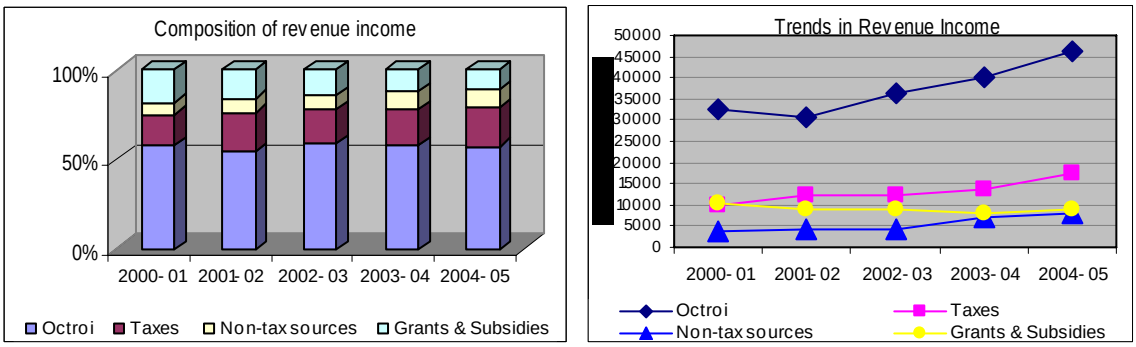


Figure 9-2 Composition and Trend in Revenue Income

The contribution (Table 9-3) shows marginal fluctuation on a higher side during the last five years. AMC derived 77.5 per cent of its revenues from octroi and taxes and a mere 8.5 per cent from non-tax sources, with State Government grants providing a further 14 per cent of the revenues. Octroi and property tax (general tax, water charges and water metre inspection fee) dominated the tax structure, with octroi accounting to 74 per cent of tax revenues (57.3 per cent of total revenues) and property tax accounting to 88.6 per cent of tax revenues (20 per cent of total revenues). The low non-tax receipts can be attributed to low rates of user charges for services against considerably good service coverage. In effect the corporation's income largely depends on a single source i.e. octroi, whose contribution has been constant between 50 to 56 per cent for the past five years. The total revenue income for the year 2004-05 was Rs. 80620 lakhs.

In the absence of any assigned revenues, deposits and advances, AMC has been able to generate 85.97 per cent of the total revenue income through its own sources during the last five years. It has shown a collection of Rs. 71496.33 lakhs during 2004-05[s1]. It needs mention that number of property tax assessments increased by 24 % from 2003/04 to 2004/05[s2].

9.4.2 Own Sources

The AMC levies property tax and service-based taxes of different type against the services provided by it to the citizens. The corporation also owns assets in the form of land and buildings, which are leased/ rented out to generate revenue. The income from such sources contributes to the own source income of AMC.

Own sources as mentioned earlier, contribute about 86 per cent of the total revenue income of the corporation. The total income from tax and non-tax sources has grown at 7.83 per cent.

Octroi

Octroi is levied on the goods entering within the municipal limits for use, consumption or sale. Financial results for the last five years show that, octroi has been the single largest revenue source for the corporation, contributing about 56.62 per cent in the total revenue income. The amount realised under octroi has shown an upward trend during 2000-01 to

2004-05(Refer Table 9-4). Octroi income has increased from Rs. 32451.10 lakhs in 2000-01 to Rs. 46229.76 lakhs in 2004-05 – a growth rate of 9.64 per cent per annum.

Table 9-4: Income from Octroi (2000-01 to 2004-05)

Sl.	Item	2000- 01	2001- 02	2002- 03	2003- 04	2004- 05
		Amount in Rs. Lakhs				
1	Octroi tax	32451.10	30708.82	36130.57	40093.84	46229.76

Taxes

The power of taxation by the corporation and relevant procedure listed in section 127 of BPMC Act, 1949. The tax sources accounts for about 20.12 per cent of the total revenue income. The tax sources have increased from Rs. 9783.91 lakhs in 2000-01 to 17377.09 lakhs in 2004-05, thereby showing a growth rate of about 15.96 per cent. The taxes levied by the corporation include:

- Property tax
  - Property Tax, and
  - Water and sewerage charges
- Other direct taxes;
  - Vehicle tax, and
  - Theatre tax.
- Other taxes/ refund.

Table 9-5 presents the summary of income from tax source of AMC.

Table 9-5: Summary of Income from Tax Source of AMC

Sl.	Item	2000- 01	2001- 02	2002- 03	2003- 04	2004- 05
		Amount in Rs. Lakhs				
1	Property tax	**9382.25**	**12025.13**	**11923.32**	**13088.39**	**16722.87**
a	General tax	9181.77	11944.07	10921.76	11173.74	13992.50
b	Water Sewerage charges	200.37	81.56	1001.51	1912.69	2730.35
c	Water inspection fee	0.29	0.00	0.05	1.96	0.02
2	Other taxes	401.66	133.02	199.93	591.73	654.22
	Total taxes	**9783.91**	**12158.15**	**12123.25**	**13680.12**	**17377.09**

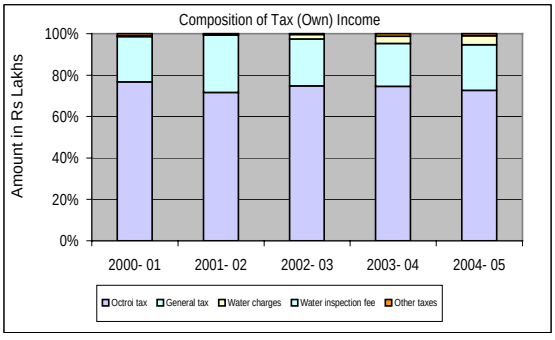


Figure 9-3 Composition and Trend in Income from own sources

Property Tax

The property related taxes are commonly referred as house tax and include a tax on buildings or lands situated within the municipal limits. In some local bodies, it is observed that a consolidated tax is being levied in place of property tax. The AMC levies property tax on residential, commercial and industrial buildings and lands that lie within its jurisdiction. The rules and procedures pertaining to levy of property tax are governed by the BPMC Act 1949.

The share of general tax in tax income has been 20 per cent. The income from general tax has increased from Rs. 9181 Lakhs in 2000/01 to Rs. 13993 Lakhs in 2004/05. The high values are attributable to the revamping of the tariff rates apart from the increase in the number of property tax assessments during 1998 and a further revision is due.

Table 9-6: Number of Property Tax Assessments in AMC

Year	Assessments				
	2000- 01	2001- 02	2002- 03	2003- 04	2004- 05
No. of tenements	**950103**	**962553**	**975002**	**987452**	**999902**

Basis of Property Taxation

Prior the present system of assessment and taxation, AMC had Annual Rateable Value (ARV) based system (Refer Annexure 9.5) according to which for about 73% of residential properties and for 29% of the commercial properties, ARV was below Rs. 600 per annum and were therefore exempted from general tax payment. In order to overcome these AMC had adopted an area based tax system, which is fair, transparent, equitable and having buoyancy.

Table 9-7: Rates of Property Tax as per the previous property tax formula

Sl.	Rateable Value	Tariff Rates per Annum on Rateable Value (%)
1	<600	Exempt
2	601-1000	15
3	1001-2000	20
4	2001-3000	23
5	>3001	**30**

The new property tax structure introduced since 2001-02 gives weightages to following

- Location of the property
- Type of property
- Age of property
- User of the property

In case of non-residential property instead of type of property, use of property was considered. Relief is given to non-residential properties used for religious purpose or charitable purpose vis-a-vis income generating properties.

Factors are assigned to each category; higher weightage is assigned to holding situated in posh area. Independent bungalows have been given higher factor than flats. The formula also accounted for depreciation of properties depending on the age of the property. The formula worked by AMC is as follows

Property Tax = rate x area x (f1x.f2x f3x f4…..fn), Where f1, f2, f3.. ..fn are weightages to various factors mentioned above, whereas f4 is weightage assigned to residential buildings. In case of non-residential properties assigned weightage-ranging form 1 to 8. (Refer Annexure 9-6).

Water and Sewerage Charges

The AMC levied water tax to all assessments having house service connection within the AMC limits. The water tax levied was done as a part of the property tax. However with the change in the property tax formula, water tax component has been removed. Prior to introduction of this system (2001-02) the contribution of water tax to the total revenue income was marginal 0.43 per cent at the aggregate level. Realisations by way of water tax have been about Rs. 200.37 lakhs during 2000/01. The income from water tax has grown at a rate of 7.14 per cent during the last five years. It needs mention that the amount realised under water taxes has been around Rs. 200 to Rs. 230 lakhs during last five years (Refer Annexure 9.1).

Other Taxes

The other major tax items levied by the AMC are Vehicle tax and Theatre tax. The share of these two taxes together in the total tax is negligible. During the last five years, these two contributed 0.62 per cent to the tax sources showing a declining trend. The income from this source during the year 2004-05 was about Rs. 592 lakhs (Refer Annexure 9.1).

Non-Tax Sources

The non-tax own revenue sources of the AMC accounts for 8.51 per cent of the total revenue income. These revenue sources include fees and charges levied as per the legislation. Accordingly, the income sources have been classified under the following broad categories, viz.:

- Municipal properties,
- Collection from public places,
- Realization under special status,
- Public services charges/fee,
- Sale proceeds, and
- Miscellaneous income.

These revenue sources include the income from leased/ rented out municipal property and from the fees and charges levied for the different services rendered by the corporation. At an aggregate level, the contribution of non-tax income to the total revenue income generated is about 8 per cent. The increase in non-tax collection could be attributed to good collection be reflected in the non-availability of new sources. The details of items under these heads are presented in Table 9-8.

Table 9-8: Details of Income from Non-Tax sources

Sl.	Item	2000- 01	2001- 02	2002- 03	2003- 04	2004- 05
		Amount in Rs. Lakhs				
1	Rental Income	424.87	452.64	630.38	634.20	538.51
2	Collection from Public Places	134.35	121.77	95.24	171.30	214.55
3	Realisation under special statutes	13.39	17.71	17.39	16.22	15.29
4	Public Service Charges/ Fees	1894.68	2554.90	2226.70	4274.86	3950.08
5	Interest earned	445.24	149.01	426.83	365.01	596.75
6	Sale proceed	83.30	106.62	115.10	186.01	967.51
7	Miscellanies Income	823.38	978.89	880.62	1411.90	1606.79
	Total	**3819.21**	**4381.54**	**4392.26**	**7059.50**	**7889.48**

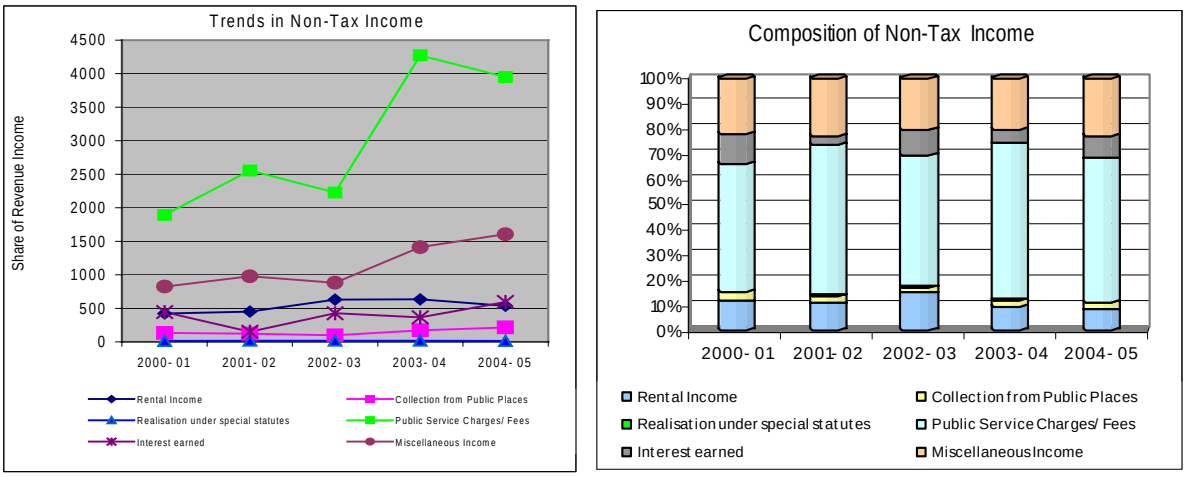


Figure 9-4 Composition and Trend in Non-tax Income

9.4.3 General Grants, Contribution and Subsidies

The AMC receives grants and contribution from the State and Central Government under various heads, for general as well as specific purposes. About 14.03 per cent of the total income is contributed from this source with a sum of Rs. 9123.30 lakhs in 2004-05 Noted heads as per the statement provided by the AMC are:

- Slum Upgradation,
- MLA and MP grant,
- GMFB grant for urban poor,
- Central government grant for purification,
- 10th Finance Commission grant, etc.

9.4.4 Revenue Account Expenditure

The major items of revenue expenditure of the municipal fund may be classified as:

- General Administration and Collection charges
  - Establishment expenditure,
  - Administration and General expenditure,

- Repair and maintenance,
- Power & Fuel Charges,
- Consumerable Stores, and
- Service and programme related expenses.

- Debt Servicing

Table 9-9 presents a summary of revenue expenditure of the AMC. The total revenue expenditure has increased from Rs. 56119.93 lakhs in 2000-01 to Rs. 59647.62 lakhs in 2004-05 – a growth of 1.60 per cent.

Table 9-9: Summary of Revenue Expenditure of AMC

Sl.	Financial Year ->>>	2000- 01	2001- 02	2002- 03	2003- 04	2004- 05	Average G.R.
		Actual in Rs. Lakhs					
1	Establishment Expenditure	25,353.52	23,523.25	23,771.31	24,527.39	24,618.58	***-0.65***
2	Administration & General Expenses	1,029.63	917.15	1,535.37	1,109.68	1,046.47	***5.77***
3	R & M	1,604.39	2,070.77	2,331.26	1,888.42	3,340.58	***24.89***
4	Power Charges	5,713.13	6,535.09	6,447.63	6,388.75	5,918.40	***1.19***
5	Fuels	322.50	324.33	323.30	301.20	333.97	***1.07***
6	Consumarable Stores	5.95	5.93	6.31	4.74	9.77	***21.83***
7	Service & Programme Expenses	1,381.42	1,504.47	1,717.94	1,429.23	1,982.99	***11.26***
9	Contribution to allied Institutions & Others	13,804.66	13,588.15	12,958.95	12,640.73	13,666.74	***-0.13***
10	Debt charges	6,904.73	7,485.02	9,098.00	7,974.36	8,730.12	***6.77***
Grand Total		**56,119.93**	**55,954.16**	**58,190.07**	**56,264.50**	**59,647.62**	

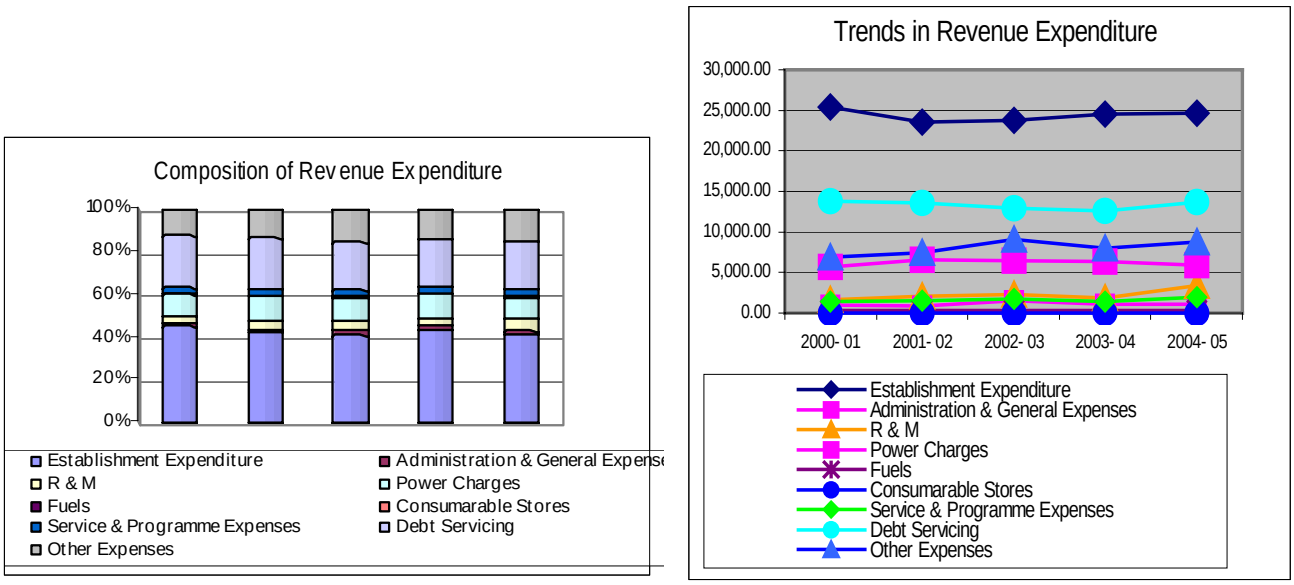


Figure 9-5 Composition of Revenue Expenditure

9.4.5 General Administration and Collection Charges

- Establishment expenditure;
  - Salary & Wages;
  - Allowances (DA, house rent, conveyance, traveling, conservancy, etc.);
  - Reimbursements (medical expenses, LTC, etc);
  - Employee welfare;
  - Pension, gratuity, PF;
    - Other employees costs (ESI, Leave encashment, bonus).
- Administration & General Expenses;
    - Rents-Rates Tariff;
    - Communication expenses,
    - Printing and Stationary,
    - Traveling and Conveyance expenses
    - Insurance Charges,
    - Professional and other fees/charges, and
    - Other expenses.
- Repairs and Maintenances;
- Fuel and Power Charges;
- Service & Programme related Direct Expenses; and
- Other expenses;

Establishment Expenditure

Establishment expenditure is among the most flexible item on the city's expenditure budget. The results indicate that expenditure of in-service employees accounts for about 42 per cent of the total revenue expenditure during the last five years. Furthermore, it has decreased from Rs.25353.52 lakhs in 2000-01 to Rs.24618.58 lakhs in 2004-05, registering an average annual growth of about (-0.65) per cent. On the whole there has not been a major change in this aspect.

Table 9-10: Details of Establishment Expenditure

Sl.	Financial Year ->>>	2000- 01	2001- 02	2002- 03	2003- 04	2004- 05	Average G.R.
		Actual in Rs. Lakhs					
1	Salary & Wages	21036.99	18634.85	18365.68	19055.14	19118.21	***-2.19***
2	Allowances	109.30	127.60	136.18	134.12	144.35	***7.40***
3	Incentives	378.61	615.15	628.75	20.37	8.56	***-22.51***
4	Employee Welfare	7.87	30.18	17.60	71.06	56.12	***131.13***
5	Pension	3820.75	4115.47	4623.10	5246.70	5291.34	***8.60***
Grand Total		**25353.52**	**23523.25**	**23771.31**	**24527.39**	**24618.58**	***-0.65***

The payroll burden on the city's expenditure budget is explained by a legacy of rigid contracts, which significantly reduces the administration's effectiveness in containing expenditure. Redundancies and cost control have plagued most of the departments in the corporation, because of which, half of the expenditure is incurred on establishment expenses, which leaves very less scope for developmental activities.

Administration & General Expenses

The items of administration and general expenses share about 4 per cent of the total establishment expenditure. In actual terms, the administration and general expenses has grown from Rs. 1029.63 lakhs in 2000-01 to Rs. 1046.47 lakhs in 2004-05 - an average growth of 5.77 per cent over the last five years. The major elements in this source of income are income from rent-rates-taxes (9 per cent), communication charges (24 per cent), and printing and stationary expenses (23 per cent).

Repairs and Maintenance

Expenditure on repair and maintenance of municipal assets- land buildings, public spaces, infrastructure systems, equipment and machinery- accounts for 3.93 per cent of the total revenue expenditure. Table 9-11 presents the items-wise annual repair and maintenance of the corporation for the period 2000-01 to 2004-05.

Table9-11: Details of Repair and Maintenance

Sl.	Financial Year ->>>	2000- 01	2001- 02	2002- 03	2003- 04	2004- 05	Average G.R.
		Actual in Rs. Lakhs					
1	Land/ Building Maintenance	199.55	252.37	128.06	178.36	149.72	***-6.93***
2	Public Spaces	200.49	215.27	170.37	107.65	243.04	***4.93***
3	Roads/ Bridges/ Street lights	322.11	839.92	513.40	522.73	747.58	***23.43***
4	Sewerage & Drainage Lines	213.93	203.65	260.92	155.36	207.86	***-0.72***
5	Water Supply	240.80	169.91	645.87	322.59	1270.53	***51.56***
6	Plants, Machinery & Equipment	231.37	190.76	308.84	285.04	378.10	***13.06***
7	Others	196.14	198.89	303.80	316.69	343.75	***15.06***
Grand Total		**1604.39**	**2070.77**	**2331.26**	**1888.42**	**3340.58**	**20.12**

Road/bridges/street lighting (22.37 per cent), Public Place maintenance (7.27 per cent) and plant, machinery and equipment (11.31 per cent), Water (38.03 per cent) are the major items of repair and maintenance expenditure, together accounting for about 69 per cent of the total repair and maintenance expenditure.

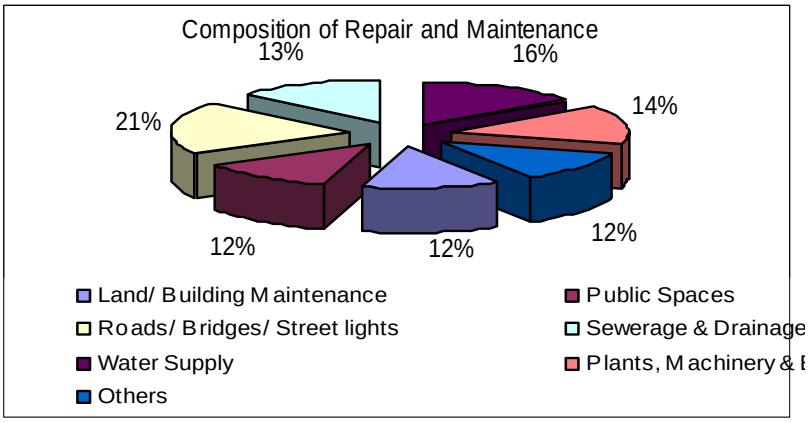


Figure 9-6 Composition of Repair and Maintenance

The repair and maintenance expenditure of the corporation has increased from Rs. 1604.39 lakhs in 2000-01 to Rs.3340.58 lakhs in 2004-05 – growth of 24.89 per cent over the last five years. All the items in this category have shown fluctuation over the last five years, but at an aggregate level they show an increasing trend.

Other Expenditure

The other major items under expenditure are mainly fuel and power charges contributing to about 12 per cent of the total expenditure. The total expenditure under power charges has increased from Rs. 5713.13 lakhs in 2000-01 to Rs. 5918.40in 2004-05, thereby showing an increase of 1.19 per cent per annum.

The other item under revenue expenditure includes expenses incurred on services and programme related items, such as, overheads, contracts, materials, etc. The expenditure has increased from Rs. 1381.42lakhs in 2000-01 to Rs. 1982.99 in 2004-05- a growth of 11.26 per cent.

In addition to these expenses, the other expenditures incurred by the corporation which mainly comprises of contributions given by the corporation to the municipal school board, V.S. Hospital and M.J. Library, which are allied institutions of AMC. All these items consolidate to about 26.67 per cent of the total expenditure over the last five years.

9.4.6 Debt Servicing

The annual accounts of the AMC indicate that it has been servicing its debt on a regular basis. Capital expenditure in AMC is funded by various grants from State Government under various schemes and by loan for capital investments. The average expenditure on debt servicing, during the last five years has been Rs. 6904.73 lacs from the year 2000-01 to 8730.12 lacs in 2004/05. It needs mention that during 2002-03 the total expenditure towards debt servicing has been about Rs. 9098.00 lakhs, which has been the highest payment made during last five years. The debt indicators are discussed in detail as part of financial indicators in this section. The outstanding loan with the AMC has been Rs.420.57 crores during 2004/05.

Table 9-12: Outstanding loans as on 31-03-2005

Sl.	Head	Outstanding Loan Amount (Rs. Lakhs)
1	Government of Gujarat	7954.47
2	LIC/ HUDCO	3.05
3	Banks	4230.70
4	Other Institutions	4069.00
5	Tax free Bonds	25800.00
Total		**42057.22**

9.4.7 Status of Revenue Account

AMC's revenue account has shown surpluses all through out the last five years which was mainly contributed to the capital account for taking up new works. The available surpluses have increased from Rs. 138.03 lakhs in 2000-01 to Rs.20972.01 lakhs during 2004-05. Appropriation also must have been carried out from revenue surplus to the capital accounts, which could have mainly led to reduction in the capital deficit.

9.5 Capital Account

The corporation spends considerable amounts on capital works- such as creation of infrastructure assets - water supply and drainage works, roads, conservancy schemes, purchase of vehicles, plant and machinery, etc. The corporation's funds for capital expenditure are a mix of loans, grants, assistance from financial institutions and from own sources.

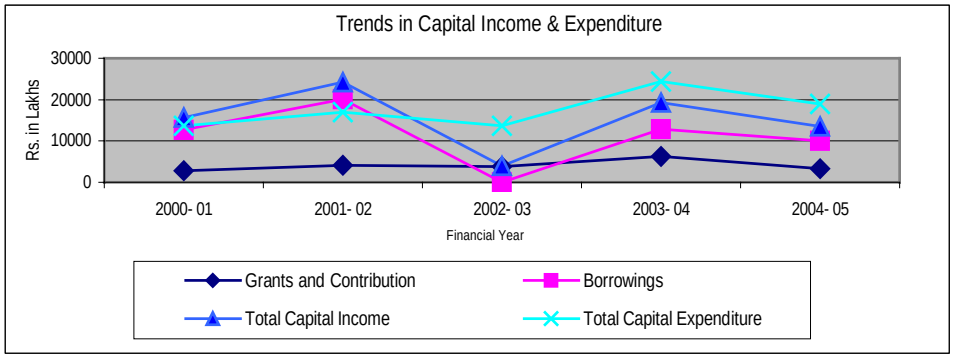


Figure9-7: Trend of Capital Income and Expenditure

9.5.1 Capital Income

Also referred to as capital non-tax sources, AMC has the following sources of income for own sources, grants and borrowings. The major heads are:

- Grant and Contribution,
- Capita Profit from Sale of Asset,
- Contribution and Subsidies,

- Loans and Borrowing and
- Other Capital Income.

The total capital income of AMC was Rs.13596.57 lakhs in the year 2004-05. The share of capital grants and contribution to total capital income is 27.35 per cent and loans and borrowings contribute around 72.65 per cent.

BPMC Act has the provision that the corporation may borrow, for financing capital expenditures of a long term basis. The sources of loans taken by AMC are:

- Open market debenture loans,
- State government loans,
- World Bank loans, and
- Loans from institutions (LIC, HDFC, HUDCO, NHB etc.).

Table 9-13 : Summary of Capital Income of AMC

Sl.	Financial Year ->>>	2000- 01	2001- 02	2002- 03	2003- 04	2004- 05
		Actual in Rs. Lakhs				
1	Grant and Contribution	2879.96	4122.75	3725.46	6302.25	3321.00
2	Borrowings	12716.02	20039.30	0.00	12800.00	10000.00
3	Other Capital Income	12.33	7.75	154.30	109.28	275.57
Grand Total		**15608.31**	**24169.80**	**3879.76**	**19211.53**	**13596.57**

9.5.2 Capital Expenditure

Capital expenditures are the most flexible item of the city's budget, and are normally contingent upon receipt of associated revenue. The capital expenditure of AMC includes all expenditure incurred on creation/ acquisition of capital including construction of buildings and infrastructure systems and purchase of furniture, plant/ equipment, machinery and vehicles. The summary of expenses under various heads of capital account are presented in Table 9-14.

Table 9-14: Summary of Capital Expenditure of AMC

Sl.	Financial Year ->>>	2000- 01	2001- 02	2002- 03	2003- 04	2004- 05
		Actual in Rs. Lakhs				
1	Land	61.19	74.91	5.78	87.85	365.89
2	Buildings	340.42	806.85	433.67	164.80	118.37
3	Public Places	340.71	98.91	88.93	172.64	151.71
4	Roads/ Bridges	1992.98	754.33	310.41	1668.87	3460.17
5	Sewerage & Drainage Lines	857.10	433.89	209.32	1305.32	1674.51
6	Water Supply	5358.46	1078.66	1329.65	4117.40	2838.81
7	Plants, Machinery & Equipment	107.00	88.27	19.43	62.93	192.85
8	Motor Vehicle and Transportation	36.12	3.77	42.21	131.48	100.46

		2000- 01	2001- 02	2002- 03	2003- 04	2004- 05
9	Office Equipments	69.66	6.24	263.09	163.81	365.89
10	Street Lighting	54.13	152.88	0.00	161.79	19.13
11	Works for Weaker Section	162.18	78.03	62.90	47.57	41.21
12	Miscellaneous Fixed Assets	4234.83	13419.48	10996.18	16254.73	9579.28
Grand Total		**13614.78**	**16996.22**	**13761.57**	**24339.19**	**18908.28**

It has been observed that the maximum expenditure has been incurred on water supply - about 40 per cent during 2000-01. At an overall level expenditure on water accounts for maximum – about 16.80 per cent of the total expenditure.

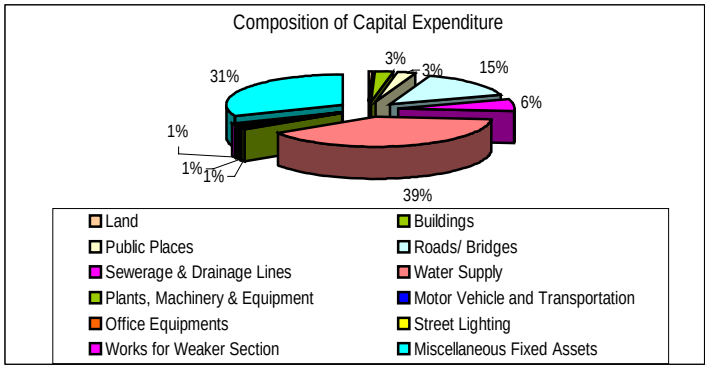


Figure 9-8 Composition of Capital Expenditure

AMC is also empowered by the BPMC Act to levy betterment charge for increase in the value of land and building, if they are a result under a scheme of improvement, clearance or are under developments carried out by the corporation. AMC can also levy an incremental contribution termed as betterment charge, which is generally realised from the land owners, at a rate equal to one half of such increase in value of the land

9.6 Outstanding Liabilities

The agency-wise outstanding liabilities of Ahmedabad Municipality are presented in Table 9.15. The total outstanding loan including the overdue principal and interest as on March 2001 is Rs. 329.24 crores. It may be noted that loans from LIC and HUDCO alone account for about 46 per cent of the total outstanding loans of the AMC.

Table 9-15: Agency wise Outstanding Debt of AMC - 2005

Sl.	Head	Outstanding Loan Amount (Rs. Lakhs)
1	Government of Gujarat	7954.47
2	LIC/ HUDCO	3.05
3	Banks	4230.70
4	Other Institutions	4069.00
5	Tax free Bonds	25800.00
Total		**42057.22**

Source: Ahmedabad Municipal Corporation

The ratio of outstanding liabilities to total property tax demand is 40.48.

9.7 Key Financial Indicators

This section gives the financial indicators which helps analysing the efficiency and operational performance, and debt servicing. These have been calculated as an average over a period of five years, which provides a more realistic picture.

- **Operating Ratio**

Operating ratio (OR) is the ratio of revenue expenditure to revenue income and it indicates financial status or "profitability" of the local body operations. Sound financial management requires that this ratio should be less than unity. The average OR of AMC works out to 0.9. The OR below 1.0 in AMC indicates that it has had a surplus revenue account over the last five years except in 2000/01, where the OR was 1.0.

- **Debt Servicing Ratio**

Debt Servicing Ratio (DSR) is ratio (expressed in percentage) of debt payment to total revenue income. This indicator helps in assessing the implication of debt on the local body finances. But it has been observed that the local body service their debt on a regular basis. The analysis indicates that the average DSR with respect to revenue income is 12.55 per cent.

- **Capital Utilisation Ratio**

Capital Utilisation is the ratio of capital expenditure to the capital income. This ratio indicates the performance of the local body in terms of utilisation of capital income- it could also be an indicator of the Local Bodies' capacity to utilise capital resources. A capital utilisation ratio of greater than unity indicates that revenue account surplus have been utilised for capital works, which is a positive feature. A CU ratio below unity indicates that either capital income is being diverted for revenue expenditure (when O.R is also above 1), or that part of capital income is unspent during the F.Y under consideration.

The years in which the CUR of AMC is high indicates too much of non-plan expenditure and hence capital utilization and improvement plan/ program is necessary. The average CU ratio is 1.56. The high capital utilisation ratio over the years could be attributed to the fact that the capital income received by the AMC have been utilised to its fullest extent before the close of the financial year.

- **Share of Establishment Expenditure to Total Revenue Income**

The contribution of establishment expenditure (including salaries and wages, pension, reimbursement, etc) has accounted for 38.32 per cent of the total revenue income during the last five years. The rest of the income is used for administration and general expenses, repair and maintenance, service related expenses and for other miscellaneous expenses.

- **Collection Performance**

Property Tax

The average collection performance of property tax collection is 17.44 per cent for the period from 2000-01 to 2004-05. It needs mention that the collection performance of the AMC as far as arrears collection is concerned is below 15 per cent. The AMC has been able to maintain the current collection around 40 per cent. However, with the new area based property tax system the current collection levels have been reported to be as high as 80 percent. The details for different years are presented in Table 9-16.

Table 9-16: Demand Collection Balance Statement-Property Tax

Year	2000- 01	2001- 02	2002- 03	2003- 04	2004- 05
No. of Assessments	**950103**	**962553**	**975002**	**987452**	**999902**
Total Demand	**78,538.69**	**84,853.35**	**98,363.20**	**104,068.24**	**106,968.47**
Current	7,602.35	9,157.72	11,914.20	15,871.80	21,030.51
Arrear	4,106.41	5,443.54	6,780.66	8,117.79	9,454.92
Total Collection	**9782.05**	**13403.57**	**17025.09**	**20646.61**	**24268.13**
Current	NA	NA	NA	NA	NA
Arrear	NA	NA	NA	NA	NA
% collection	12.46	14.92	17.31	19.84	22.69

9.8 Status of Municipal Fund

Ahmedabad Municipal Corporation has performed well as far as revenue account is concerned. Annexure 11.7 presents a summary of the operating performance of the corporation. It may be noted that operating ratio has been below unity during the last five years period.

The average debt servicing ratio has been around 12.55 per cent during last five years. The debt servicing ratio has increased from 12.27 percent in 2000-01 to 12.55 percent in 2004-05. Outstanding loan with AMC is Rs. 429.24 crores in 2005 which involves overdue against the lending organisation with respect to principal as well as interest. The debt servicing of long overdue is towards payment to long term borrowing from state government, LIC/HUDCO and other financial institutions. Due to its high dues, there is a possibility of State Government deducting the annuity due from the Corporation's share in state's devolution. Revenue Expenditure has been primarily directed to establishment expenses (42.64 per cent) followed by power and fuel charges (11.4 per cent).

Revenue through the levy of octroi contributes for over 57.34 per cent of the total revenue income of corporation, whereas property tax contributes for almost 20 per cent of the total revenue income. The average collection performance of the same has been very poor around 17.44 per cent from 2000-01 to 2004-05.

Capital Expenditure has been mainly directed towards the water supply and public works (Roads/bridges) at 16.80 and 9.34 per cent respectively which is followed by sewerage and drainage.

The revenue account has been accruing a substantial amount of surplus. On the other hand, the capital account has faced deficit in all years except 2000-01and 2001-02.

AMC's performance with respect to resource mobilisation and expenditures has been reasonably good during the recent past. The per capita incomes, both (both revenue as well as own sources) of AMC, are around Rs 1675 and Rs.1439 respectively. Income from own sources is fairly high which is dominated by income from octroi tax. At present the resource position of AMC is sound inspite of the collection performance being low.

The overall status in the revenue account shows a net surplus. Substantial amounts from revenue surplus have also been diverted to capital account, which is used for capital works. At an overall level the corporation has been able to maintain a positive closing balance each year (2000-01 to 2004-05)

Table 9-17: Key Financial Indicators

	Head/ Financial Indicators	Average Value of 5 years (2000-01 to 2004-05)
Resource Mobilisation (General)		
1	Per Capita income	Rs. 1675
2	Share of Own resources in Revenue Income	85.97 %
3	Growth In Revenue Income	9.59 %
4	Growth in Own Resources of Revenue Income	14.86 %
5	Per Capita own income	Rs. 1439
6	Share of Non-tax to own resources	9.90 %
Resource Mobilisation (Property Tax)		
1	Share of Property Tax in Revenue Income	22 %
Expenditure Management		
1	Per Capita Expenditure	Rs1486.50
2	Share of Establishment expenditure in total revenue expenditure	42.64%
3	Share of Establishment expenditure in total revenue income	38.32 %
Liability Management		
1	O/S Loan to Octroi	21.49%
2	O/S Loan to Property Tax Demand	40.48%
3	O/S Loan to Total Own Sources	14.23%
4	O/S Loan to Total Revenue Grants	84.15%
Performance Assessment		
1	Operating Ratio	0.90
2	Collection Performance (Property Tax)	17.44 %
3	Capital Utilisation Ratio	1.56
4	Debt Servicing ratio	12.55%

Chapter 10

Urban Governance

Structure of Urban Governance
74th Constitutional Amendment
Governing Structure of AMC
Recent Management Reforms

10.1 Stucture of Urban Governance

The city, as has been presented in the preious chapters, may be broadly be devided into the City area (AMC) and periphery within the ring road area. The AMC functioning is governed by the the Bombay Provincial Municipal Corporations Act, 1949 respectively and performs the obligatory and discretionary functions as incorporated in the said Act. The periphery area comprising jurisidiction of about 50 settlements are governed by the Gujarat Municipalities Act and Gujarat Panchayat Act depnding on the status of the settlement. These areas form part of the proposed urban development area of the Developmnet Plan – 2011. In these areas are being developd for urban uses. At present the infrastructure development in these areas is being planned and executed under the overall supervision, guidance and conrol of AUDA. The proposal is to evolve integrated system development and management. Hence the current line of thinking is to extend AMC area to include these areas or form a separate municipal corporation.

This chapter outlines the present structure of the elected and administrative wings of the municipal corporation and brings out the issues related to management functions, operations and reforms.

10.2 74th Constitutional Amendment

The governance of Urban Local Bodies assumes importance in the wake of the 74th Constitution Amendment Act which delegates mandatory elections and greater devolution of powers and functions to the city corporations.

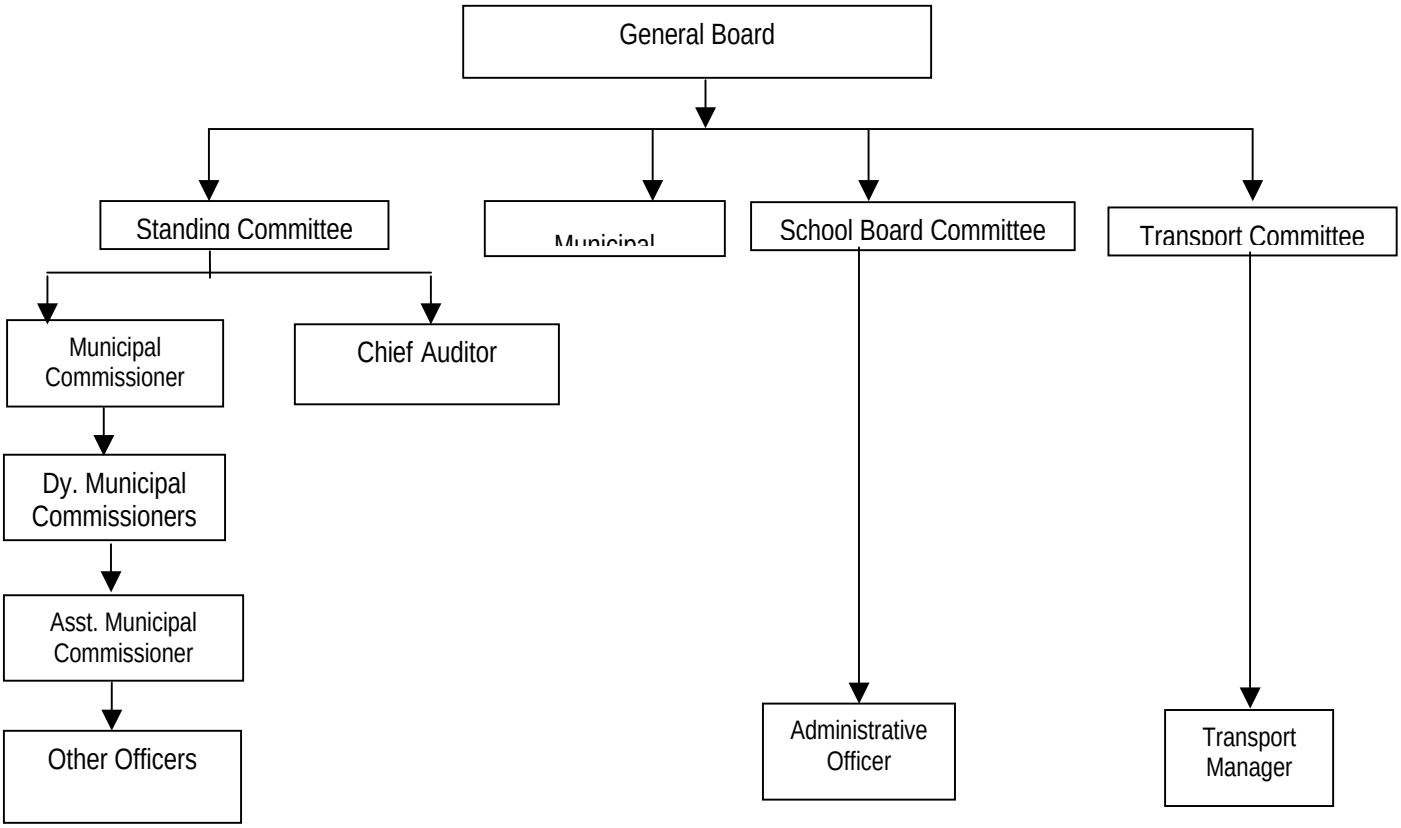
The 74th Constitution Amendment Act has its essence in reforms and building new systems in structural, functional and planning areas of municipal management and capacity building. In conformity with the Constitution (74th) Amendment Act, 1992, and its notification, amendments were carried out by the Gujarat Government to the Gujarat Municipalities Act, 1963 and to the Bombay Provincial Municipal Corporations Act, 1949. The provisions under the Amendments are:

Structural

- Provision for regular and fair conduct of elections to municipalities by statutorily constituted state election commissions.
- A framework assigning appropriate civic functions to urban local bodies as envisaged in the Twelfth Schedule of the Constitution. Besides the core functions, the municipalities are now expected to play a crucial role in preparation and implementation of local development plans and programs for social justice.
- Constitution of a Finance Commission, once in every five years to recommend to their legislature, measures to improve the financial health of municipal bodies. This includes
  - *Assignment of taxes, duties, tolls and fees*
  - *Sharing of state revenues*
  - *Grants-in-aid*

Functional

The Gujarat Municipalities Act, 1963 and the Bombay Provincial Municipal Corporations Act, 1949, have been amended in 1993 but no actual devolution took place as functions like regulation of land-use, town planning with development authorities, safeguarding the in terests of the weaker



sectionSns, promotion of cultural, educational and aesthetic aspects have still not been devolved fully.

Planning

The absence of Metropolitan Planning Committees in Gujarat, as highlighted by the 74th CAA has limited the functional role of the ULBs in planning and management to a series of sectoral and departmental plans and programs which under no circumstances can lead to integrated planning and development of ULBs.

10.3 Governing Structure of AMC

The governing structure of AMC consists of both political and administrative wings. The political wing is an elected body of councillors headed by a Mayor. The Commissioner, from the IAS cadre heads the administrative wing and is responsible for the strategic and operational planning and management of the Corporation.

10.3.1 Elected Wing

The city is divided into 5 zones with a total of 43 wards. Elected wing consists of corporators elected by the citizens of AMC and the actual number of councillors is related to the total population. At present the corporation consists of 129 corporators elected from 43 wards. A deputy mayor assists the mayor and is elected from amongst the corporators. The term of both the mayor and his deputy, is for a period of two and a half years as per the newly amended provision in the act.

Under the BPMC Act, the powers are vested with four distinct statutory authorities of the elected wing, which are the General Body, Standing Committee, Transport Committee and School Board Committee. *(Refer Figure)*

The General Board is the supreme body of the corporation and the mayor is the chairman of the General Board for conducting its proceedings. Though he is not vested with executive powers, as the first citizen of the city, he commands a position of great prestige and honour.

The General Body appoints the mayor and the deputy mayor. It also elects the members for the three statutory committees and 14 other committees. All the policy decisions are taken by the Board. It approves the budget, sanctions appointments and expenditure estimates sent by various departments. The Board meet once every month.

The Corporation has several statutory and non-statutory functional committees to set out the obligatory and discretionary functions bestowed upon the corporation by the 74th CAA. The

Standing Committee is one of the 15 Statutory Committees under AMC and is the most important and powerful committee. Powers to sanction and award major works of cost over Rs 5 lakhs are vested with this committee. The committee has 12 members from the elected councillors and is headed by a chairman elected from among its members. The Standing committee meets once a week.

The other committees look after specialised functions of AMC and are 14 in number. Each of these committees has 12 members. These committees are subordinate to the Standing Committee and any matter pertaining to them goes to the board via the Standing Committee. These committees meet once every fortnight.

1. *Water Supply and Sewerage Committee*
2. *Roads and Building Committee*
3. *Health Committee*
4. *Town Planning Committee*
5. *Housing and Improvement Committee*
6. *Solid Waste Management Committee*
7. *Recreation and Cultural Committee*
8. *Hospital Committee*
9. *Legal Committee*
10. *Estate Management Committee*
11. *Octroi Committee*
12. *Tax Committee*
13. *Secondary Schools Working Committee*
14. *Staff Selection and Appointment Committee*

10.3.2 Administrative Wing

The municipal administration in Gujarat comes under the purview of Urban Development and Urban Housing Department. It is the policy making body for urban sector in the state and undertake the functions as specified in the Local Acts.

After 1994, significant changes were made in the administrative setup of AMC from a vertical-rigid-hierarchical system to a horizontally-more-interactive system. There has been a shift to 'field level operations'. Decentralization of administration is a major aspect of this change. The city has been divided into five zones viz. East, West, North, South and Central. Each zone is vested with complete authority to address local problems and mitigate them at the source. Further, transparency & collective decision-making have become key elements of the administrative process.

The Municipal Commissioner is the administrative head of the executive wing. The various Departments under him have been divided amongst 8 Deputy Municipal Commissioners. This deputation of power has been done under Sec 45 of the BPMC Act. Fig shows the organisational structure of the executive wing. As mentioned above, the administration has been decentralised into five zones, each of which is headed by a Deputy municipal commissioner. Apart from the zonal functions of health and engineering they are also endowed with the additional responsibility of coordination, guidance and policy decisions of

city functions as are listed below the various zones in Fig 10.2 There are three Deputy Municipal Commissioners who are in charge of the central city functions of Finance, Engineering and Solid Waste Management. No zonal responsibilities have been given to them.

10.3.3 Decentralised Administration: Zones & Wards

During the last three decades, the city has expanded in all directions. For administrative purposes, AMC area is divided into five zones. The zonal system envisages decentralisation of activities and having a more responsive administration at the zone level. Each zone is headed by a Deputy Municipal Commissioner who has the responsibility of health and engineering for the respective zone. The Health Department at the zonal level is responsible for food inspection, Branch License Permit, Vaccination, Birth/Death registration, Family Planning. etc while the Engineering Department is responsible for building new roads upto 60 ft, widening roads, repairs and recarpetting works, constructing new buildings, maintaining municipal properties, sanctioning water connections, carrying out repairs of water pipelines, removing encroachments etc.

The zonal administration is further decentralised into wards. There are altogether 43 ward offices headed by Ward Officers. There are three major responsibilities at the ward level – engineering, health and sanitation. Under the decentralised administrative setup, the powers and functions at each level are clearly delegated to the heads to discharge their functions adequately.

The ward offices are responsible for inspection of hotels, hawkers and small shopkeepers from hygienic point of view, cleaning of public urinals, collection, transportation and final disposal of solid waste, availing basic details of the epidemic immediately to inform higher authority regarding disease controlling measures etc.

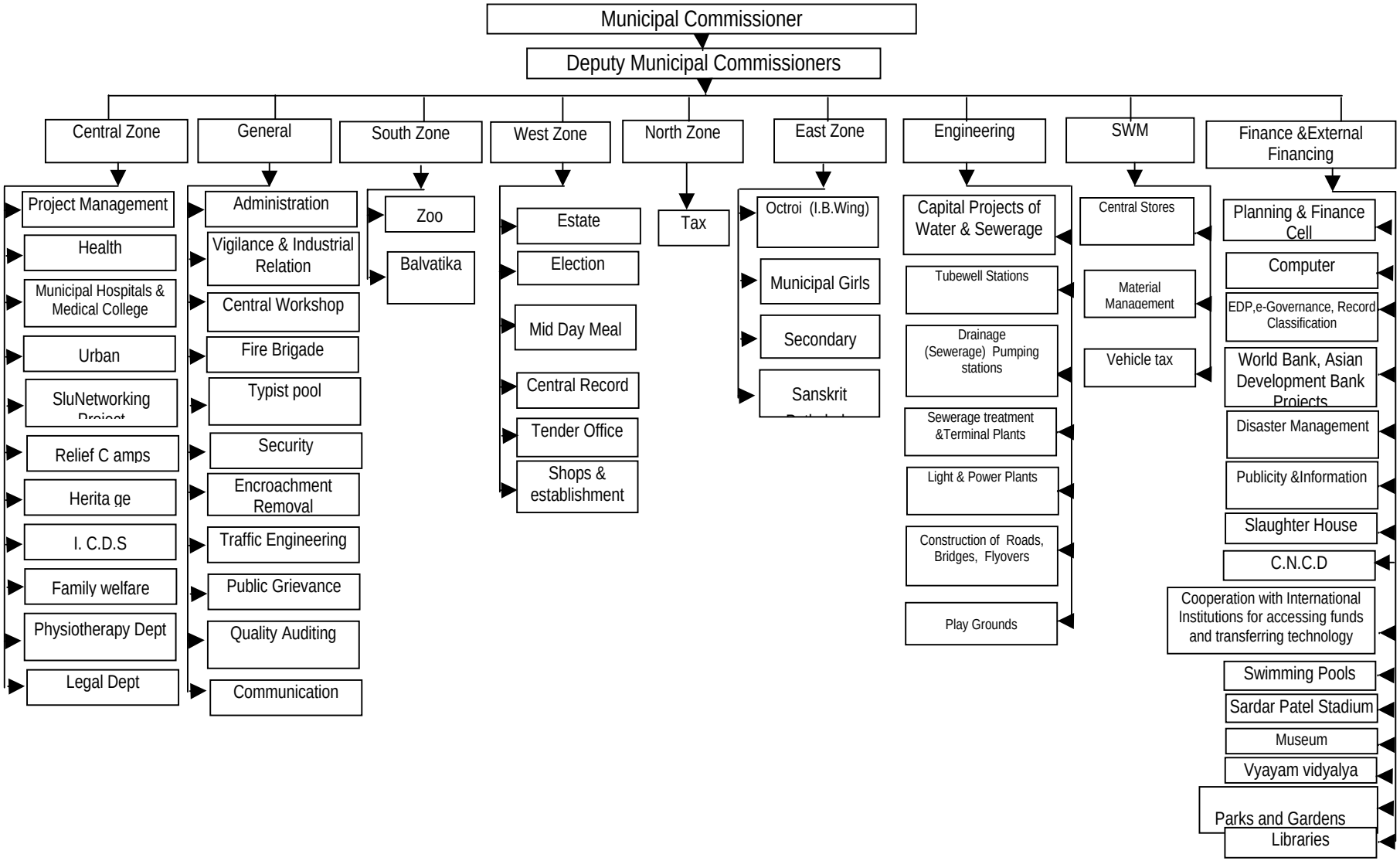


Figure 10.2: Organisational Structure of Administrative Wing of AMC

10.4 Recent Management Reforms

10.4.1 Continuous Monitoring System

Monitoring within AMC is done at four levels, namely, Corporation level, Zone level, Ward level and on the field.

10.4.2 Clearing Disputes regarding Property Tax

Since 2001, 'Lok Darbar'- a redressal system for property tax has been set up. As discussed, the arrear collection performance is found to be very low in Ahmedabad. With this new initiative, the citizens who had high arrears in property tax were summoned and the dispute was sorted out. This initiative has helped clear the arrears by sorting out the issues related to the assessments.

The Lok Darbar is functional at the zonal level and is presided over by Zonal Head -Deputy Municipal Commissioner and the other tax officers. Due to this initiative, an increase in 20% in overall collection was observed in 2001-02.

10.4.3 E-Governance

For efficient management of the increasing administrative responsibilities and the welfare activities, AMC has initiated a project on E-Governance. A provision of Rs 500 lakhs has been made for this project for 2002-03 with the help of State Government. Under this project, following tasks are being undertaken:

- To computerize Octroi posts not covered earlier.
- Increasing computerization in Financial and Property tax Departments.
- To link all zonal offices with each other by electronic media.
- Centralizing collection of property tax i.e. tax payment can be done at any zonal office provided it falls under Municipal Corporation limits.

Salient features of E-Governance project initiated by AMC in 2002:

- Under this project, 6 civic centres having 10 nodes each in zonal offices (5 administrative zones and 1 in old down town – Law Garden opposite G.L.S. school) have been set up. All of these are server zones, whereby, total information is web based and linked. One can calculate one's own tax on line. Also, there is a complaint redressal department, which is an open system meaning one find out the status of his/ her complaint.
- Grant is provided by Gujarat Informatics for Software part, of which 1 crore is already sanctioned.

- Main sections incorporated under these are property tax, vehicle tax and any other licenses like certificate of birth and death, plan approval from T.D.O.

Other sub-functions of the system:

- Float tenders on-line.
- Budgets for the ongoing financial year
- To incorporate the current status of all infra structure projects.
- Setting up kiosks at all civic centres.

Other special features of the project are:

- Operation and maintenance is to be done by AMC, 650 officials have been trained by Microtec
- Total cost of the project is estimated to be 1.5 - 2 crores. This includes all hardware, software and total capital cost.

Facilities Online:

Downloading of forms related to

- Shops and Establishments,
- Property Tax assessment,
- Water Supply Connections,
- Land & Estate,
- Birth & Death Registration,
- Town Development,
- Online complaint lodging and status check of the central workshop complaints.
- Property tax structure
- Status check of one's tenement's outstanding property tax.

10.5 Issues

- *Ward Committees non-existent:* The 74th Amendment proposes setting up of Wards Committees, comprising of elected councillors from the respective wards. These committees have an advisory role. Their responsibilities include setting priorities, general supervison, speedy redressal of common grievances with respect to the essential services. Such committees, though specified by law are non-existent.

- *Lack of will and support in Implementation of the provisions of 74th Amendment Act:* Though the Gujarat Municipalities Act and the BPMC Act have been amended in line with the provisions of 74th Constitutional Amendment Act actual devolution of functions like regulation of land-use, town planning with development authorities, safeguarding the interests of the weaker sections, promotion of cultural, educational and aesthetic aspects

have not been done completely and the state government exercises control over such functions. The absence of Metropolitan Planning Committees as envisaged by the 74th CAA has limited the functional role of the ULBs in planning & management to a series of sectoral and departmental plans and programs which under no circumstances can lead to integrated planning and development of ULBs.

- *Sanctioning powers for major capital works:* Sanctioning powers and approvals of sanctions by divisional heads for major capital works vests with Municipal Commissioner and political interference at this level delays sanction.

- *Multiplicity of Line agencies.:* In addition to Corporation there are various other State and Central Organisations that play a role in the city's management. Multiplicity problems are observed under several functions like Town Planning, State Highways and National Highways' Planning and Design, Capital works of River front development, Monitoring Pollution etc.

10.6 Strategies

Strategies for effective Governance and Management of the city by the Corporation have been formulated based on the additional functions and powers that can be realised through Implementation of the provisions of 74th CAA.

- *Drafting Bylaws to control Pollution:* The Corporation now is also responsible for controlling pollution in the city apart from the Pollution Control Board. Hence the new powers vested on the corporation shall be used to draft bylaws to regulate within the AMC limits the discharge of industrial waste or sewerage into any water body; the disposal of solid wastes into the water bodies etc. GPCB shall be taken into confidence while drafting the bylaw.

- *Institutional Strengthening and Capacity building:* These measures shall focus on identification of training needs for the staff of the Corporation and preparation of a comprehensive programme to suit to the operational requirements. This shall be done in consultation with the staff and other "interested" actors. The programme shall include innovative practices of service delivery and best practices of governance followed across the world.

- *Review of sanctioning limits at various levels to overcome undue delays:* The sanctioning limits and powers of approval shall be further looked into based on the review of the various projects taken up at various levels of the Corporation since the year when devolution of powers is being practiced.

- *Integrated planning with other line agencies involved:* Other Line agencies involved in the city's management shall be taken into confidence during the formulation/ preparation of various programmes and projects. More importantly efforts are to be made to bring the peripheral areas under unified urban governance system is necessary.

- *Creation of Geographical Information System for the city:* The Corporation shall also develop a comprehensive Geographical Information System plotting all the features of the city and its environs with necessary data to act as a tool in development planning.

- *Involvement of private sector in service delivery:* The encouraging experience of part involvement of Private sector in service delivery shall be kept in view and it shall be extended further to take up certain capital projects identified under the City Development Planning process. This shall be on BOT/ BOOT basis as per the requirements framed.

Chapter 11 Vision Ahmedabad

City Foundations

The Vision

Programmes and Projects

11.1 Foundations for Vibrant Ahmedabad

'Vibrant Ahmedabad - Vibrant Gujarat', the sentiment which was expressed when citizen of Ahmedabad were drawing up the vision for the city. These sentiments of the citizen are not without basis. The history of Ahmedabad supports this contention.

The emergence of Ahmedabad as a trading and commercial hub was triggered off by a strategic decision taken by its ruler Sultan Ahmed Shah in the year 1411. Sultan Ahmed, from whom the city derived its present name (its former name being Karnavati), built a citadel and created the walled city. The protection thus provided, encouraged trade and commerce, and the city soon emerged as one of the main trade centres of medieval western India.

The city's second phase of expansion was triggered by the formation of its municipality in 1858, and the provision of railway link with Mumbai in 1864. This phase saw Ahmedabad rising into prominence as an important centre of textile manufacturing. Ahmedabad continued to be a commercial and manufacturing hub till the 1970s.

Almost 40% of the dyestuff factories in India are located in Ahmedabad. Pharma giants like Cadila Pharma, Zydus Cadila and Torrent Pharma and many small pharma companies have flourished in Ahmedabad and the growth trend is expected to continue given the positive outlook of pharma industry in India.

The city contributes more than the proportionate share towards the State income. The city, which accounted for 8 percent of the total and 23 percent of the urban population of the State, was estimated to have generated 17 percent of the State income in 1995. This has also been increasing over time.

The slowdown in the textile sector since the 80s had its negative impact on Ahmedabads' growth. However, the situation is changing again, and Ahmedabad is poised for multi-pronged growth today and certain directions of the same are clearly visible.

Large investments in ports, particularly private ports, in Gujarat are coming up. As a consequence of the state is geared to become the trade gateway for the entire north and central India, which have traditionally been served by ports of Maharashtra. Ahmedabad is

centrally connected to all ports in Gujarat and is expected to be the main conduit for this trade. The extensive port network is also expected to facilitate the growth of new, high-end manufacturing industries, such as automobile accessories.

Several key high-growth industries such as textiles, pharmaceuticals and natural gas are already firmly anchored in Ahmedabad. Also the industrial centres around Ahmedabad, its traditional strength, are witnessing a turnaround, to Ahmedabad's advantage.

The traditional image of Ahmedabad with companies hesitant to launching new products had been changing over the years. Ahmedabad is now one of the most preferred destinations for opening retail outlets. A prime example being the Tata Group's retail arm, Trent, which launched its StarBazaar concept with a store in Ahmedabad on a pilot basis. A wide range of multiplexes and eating joints have also mushroomed all over the city. However, Ahmedabad is yet to fully complete the transition to a truly cosmopolitan city with a variety of entertainment options.

Ahmedabad is not reputed to be a tourist destination. However, in reality it offers visitors an adventurous destination packed with pleasant surprises. The city has the distinction of having probably the largest range of architectural monuments, from ancient examples of Hindu, Jain and Islamic architecture to some of the finest examples of the Modern Movement, designed by architects like Le Corbusier and Louis Kahn. With Mahatma Gandhi setting up the Sabarmati Ashram in the city, Ahmedabad was also an important witness to the Indian freedom struggle, and till date there are many sites of historical significance. Given these factors and the wide variety of festivals, traditional celebrations and handicrafts, Ahmedabad has a huge realized potential of emerging as a cultural hub and tourist destination.

Again, though the information technology wave bypassed Ahmedabad, the city has the potential to become a hub for business process outsourcing (BPO) services, given its strong academic and research base. With institutions such as the Indian Institute of Management, National Institute of Design, Centre for Environment Planning and Technology (CEPT University), Physical Research Laboratory and Institute for Plasma Research, Ahmedabad is well positioned to leverage the nationwide growth in service and knowledge industries.

Finally, the completion of the Narmada canal project is expected to boost agricultural production in the areas surrounding Ahmedabad and improve rural incomes, leading to increased consumption. Ahmedabad is poised to emerge as the key consumption centre and may develop into the most favoured trading zone for farm products, given its capacity to build the right kind of storage and transportation facilities.

AMC's plan aims at empowering the city with suitable infrastructure to realize this multi-dimensional growth potential.

11.1.1 AMC 's Track Record And Philosophy

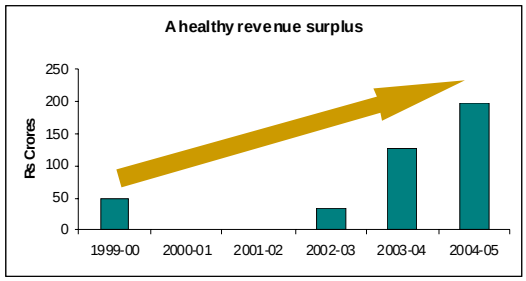
The confidence of the citizen stems from the fact, that the city governments have proven their efficiency in delivering services.

Over the years, AMC has faced growth challenges effectively and provided urban services at a level significantly higher than the national averages, making it one of the top tier service providers in the country. Coverage levels in water supply, solid waste collection and sewerage are well above national averages.

The recent focus on city transportation, encroachment removal and cleanliness has been maintained with impressive improvements over the past. More roads have been resurfaced, more encroachments removed and more solid waste collected in the first three months of calendar year 2005 than in any comparable period in the past.

AMC's service delivery is matched by its high quality of governance, which has set benchmarks for other municipal corporations in the country. AMC has undertaken several novel initiatives including:

- Issuing municipal bonds: AMC was the first municipality in Asia to have accessed the capital markets, and enjoys a high credit rating (AA(so) by CRISIL and AA+ by CARE). This has been made possible by AMC's sound financial management, which has resulted in a healthy revenue surplus in recent years.



- Implementing property tax reforms: Ahmedabad was the first large city in India to have implemented property tax reforms, and set a "zero litigation" record. CRISIL recognised this as the best urban practice in financial management and extended the CRISIL Award for Excellence in Municipal Initiatives to AMC in 2004.

- Setting benchmarks in the areas of e-governance, slum improvement and urban environmental improvement: The civic centres of Ahmedabad are a model in e-governance, which has greatly benefitted citizens. Not surprisingly, these models are being adopted by several other cities.

- Implementing the public private partnership model in municipal transport: This novel step, involving 220 environment-friendly CNG buses, led to 33 per cent reduction in AMC's operating costs. AMC intends to procure 180 more such CNG buses.

AMC over the years has carried out reforms in different areas viz. property tax, E-governance and computerisation, etc. The next section highlights the strength of AMC in undertaking these reforms.These steps are:

- Reform in Property tax by introducing area based property tax, thereby preventing leakage property tax systems
- Introducing E-governamne
- Preparation of comprehensive City Development Strategy (CDS) with an investment plan
- Private sector participation in solid waste management, street cleaning, road maintenance, etc.
- Modernising Octroi collection system thereby preventing leakage in octroi
- Improvement of systems – financial management, valuation of goods, etc.
- Involvement of NGOs and CBOs
- Organisational restructuring and professionalisation of management – lateral recruitment
- Utilisation of professional agencies for project execution

11.1.2 AUDA's' Achievements

- In its 26 years of its existence AUDA's achievements, especially during the past decade have been notable. Among several initiatives the following are important: achievements
- Development Plans: AUDA has prepared two Development Plans as per statutory requirement. Through its recent DP it released 65 sq.kms of area in a planned way for development thus preventing haphazard growth and Rising land prices. Special features were that Ad-hoc zoning policies have been done away with, and DP did not resort to land reservations or acquisitions.
- Town Planning Schemes: An innovative local area planning tool, effectively used by AUDA in its endeavour for growth management planning. It proposed•113 TP Schemes covering entire development area proposed for year the first 10 years. 24 TPS covering 2410 ha have been prepared. 24 TPS have been sanctioned: during 2001- 02. Further, 24 more TP Schemes (2680 ha) are underway. Creating land bank for building infrastructure has been a major feature of this tool. AUDA created

Land-Bank worth Rs. 500 crores from 24 TP Schemes, which may be used as collateral for raising funds for infrastructure development.

- AUDA Ring Road: A ring road which is 60m wide and 76 km long (four lane road) along with amenities has been planned as part of DP proposal. Major part of the road has been completed. Voluntary surrender of land by owners has been a major landmark in urban development project implementation. This is in anticipation of value appreciation anticipated by the land owner and their confidence in the authority.
- Rejuvenating lakes, developing parks, completion of water supply scheme, sewerage scheme provision for water recharge are some of the important developmental works undertaken by AUDA in the recent past.
- Given these demonstrated capabilities the city embarked upon this challenging task of transforming city into vibrant, productive and livable city.

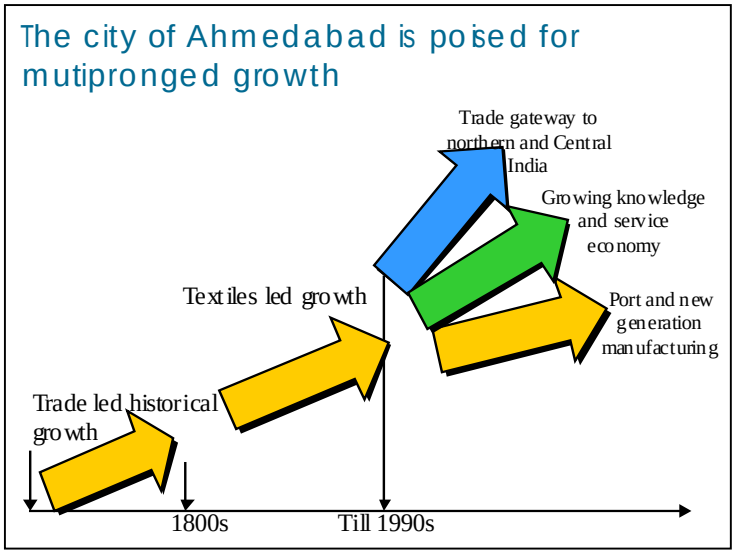
11.2 City Assesment - Summary

An assessment of the city in terms of Strengths, Weaknesses, Threats and Opportunities was carried out through consultations. The city has the following to build on:

- The people of Ahmedabad are known for their Entrepreneurship, Reputation of trust, and hospitality. The labour issues are absent.
- The governments, both the State and Local are known to be proactive, relatively transparent and effective implementers.
- The city has location advantages as it is one hour flying time to Delhi and Mumbai and has a large base of agricultural areas growing cotton, tobacco. It is also strategically located with regard to ports.
- It has the privilege to host world-class educational institutions (IIM, NID, CEPT, MICA, ..).
- Rich History and Cultural Heritage makes the place unique
- Despite fluctuating fortunes of its industrial base, the city has emerged as a vibrant city.
- Successfully transformed itself from an image of being just a Textile City, Capital Market City, and Chemical City to that of an Emerging multi-sector economy.
- It is the largest supplier of denim and one of the largest exporters of gems and jewellery in the country.
- With its low unemployment rate, reasonably balanced income distribution, and low cost of living, the city has the reputation of LIVABLE CITY.
- Large number of NRG,s

In this process of city building, poor english proficiency is some thing which the state has aggressively act upon. It is a Dry State and is faced with harsh climate. Opportunities are aplenty: following are the outcomes of recent discussions at IIM. The city has an opportunity to be:

- A Textile & Apparel exports Hub
- A Design Hub
- A potential agriculture export hub
- A Drug & Pharma export hub
- A hub for Biotech & Packaged Food
- An IT & ITES Hub
- A Logistic Hub
- A Technical Education Hub (Management, Design, Architecture & Planning, Pharmacy)



For a city which till recently was written off as an outgrown village, a city of dying economy to transform itself to be an able competitor to be a multi-sector specialty economy is a great achievement.

11.3 The Vision

Given these demonstrated capabilities of the city, its governments, the conviction of the city and state government that infrastructure development, proposed as part of this plan, will open up vast opportunities for the city development and spur its growth, the city has embarked upon a major plan.

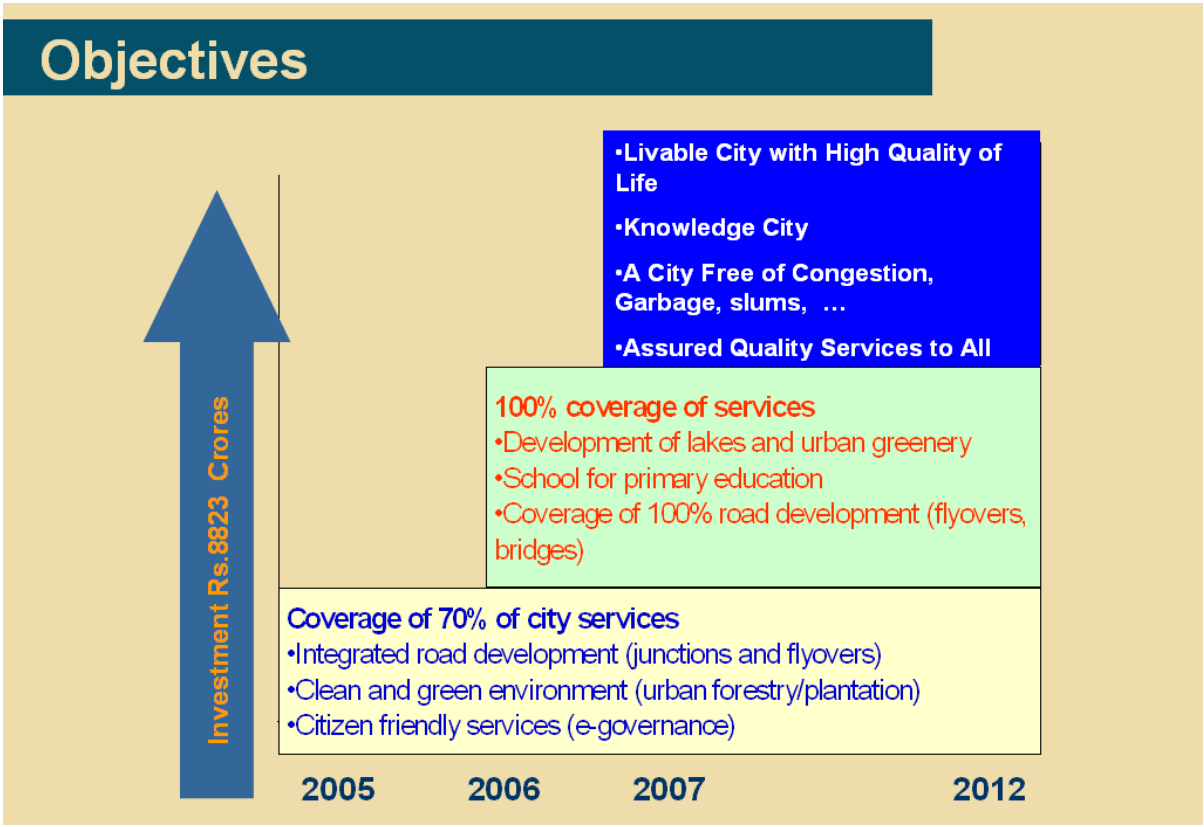
'Vibrant, productive, harmonious, sustainable and environmental friendly, clean and livable city having a responsive local government offering its citizens a good quality of life' is the vision the citizen conceived for Ahmedabad.

In essence the citizen said:

'Ahmedabad – A Vibrant City, a City of Quality Life for all'.

In continuation with Gujarat Urban 05 agenda, in line with the JNNURM programme and the Vibrant Gujarat vision of the Government of Gujarat, the City has conceived a seven-year-plan to ensure hundred percent delivery of basic infrastructure services to the entire city spread over an area of 500 sq. kms. and set the stage for a rapid growth in economy and the next generation of services.

The city government defines its deliverables in terms of a tangible impact on the lives of citizens. Its commitment extends beyond putting up and running infrastructure facilities such as roads, water supply, schools and hospitals. It believes, its job is to ensure that its citizens are educated and healthy, and enjoy a good quality of life. This philosophy drives the efforts outlined in this document.



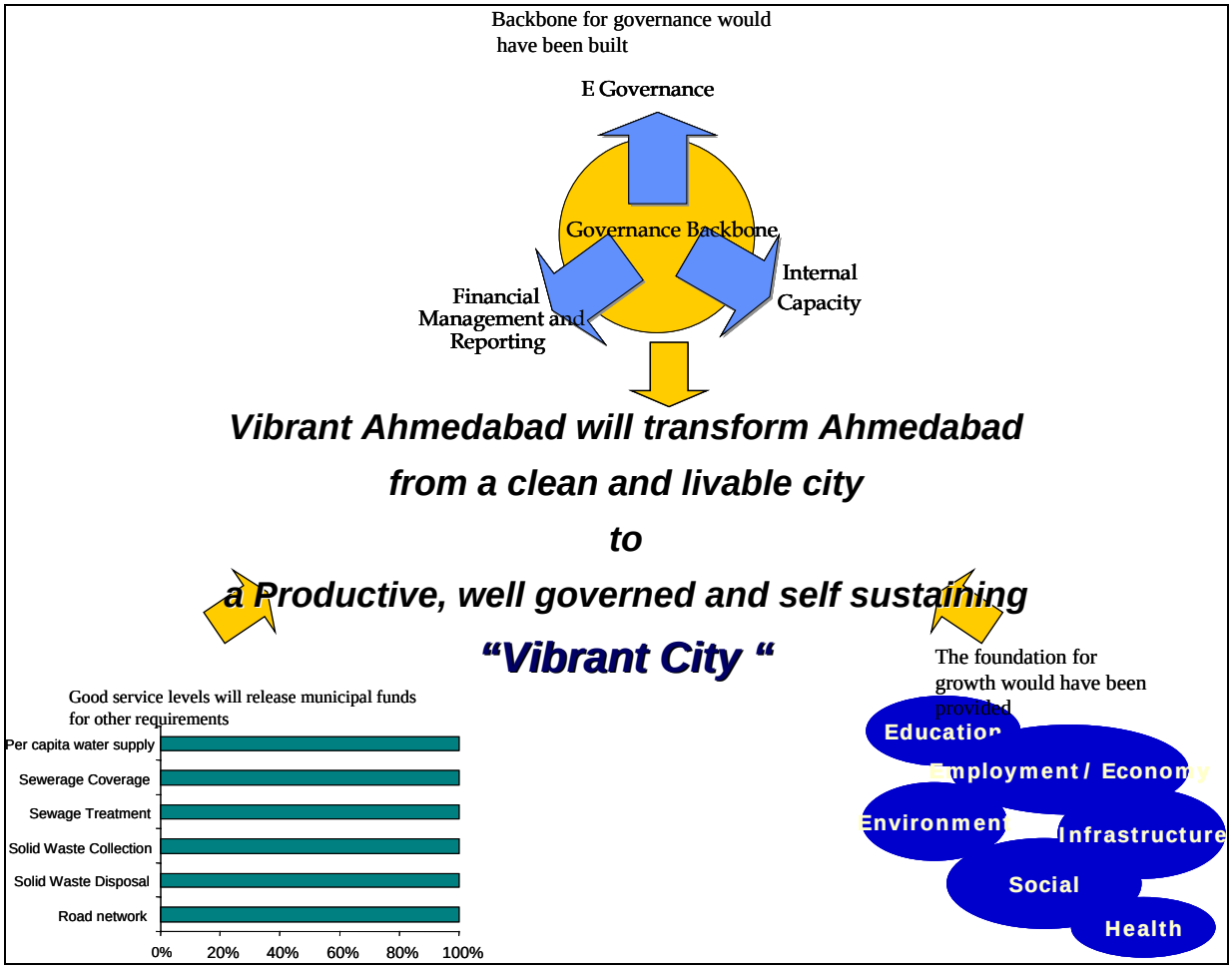
Implementation of the plan entailing investments in key sectors like water supply, sewerage, roads and bridges, will alter the face of Ahmedabad in several significant ways. Ahmedabad will enjoy 100 per cent coverage and assured quality and quantity of all core urban services by the terminal year 2012. The coverage is extended to the city as well as areas developing and likely to be developed in the periphery. The boundary of identified development area extends to Sardar Patel Ring Road covering an area of about 500 Sq. Kms.

In the years to come, the city can look forward to better social and environmental infrastructure: with the improved level of coverage of core services, the city plans to direct its spending and endeavors on the social and environmental sectors, with special accent on

education and health. The city's economic development would receive a fillip with these improvements planned by AMC and AUDA to be implimnted with the support by the Government of India and the Government of Gujarat.

11.4 Sector Goals and Strategies

To give shape to the vision for the city, the city governments have drawn up concrete project plans for different sectors like water supply, education, environment, health, employment generation, and social amenities. The realisation of this through the medium of these projects promises to transform Ahmedabad into a 'vibrant city –a city of quality life'.



Sector wise Investment needs are Summarized below:

Sr. No.	Sector	Investment (Rs. In crores)	
		City	Periphery
1	Environmental Services		
1.1	Water Supply	254.00	252.00
1.2	Solid Waste Management	97.00	54.00
1.3	Sewerage	400.00	212.00
1.4	Storm Water Drainage	385.00	190.00
2.0	Programmes for the Poor		
2.1	Urban Poor: Housing/Slums	495.00	500.00
2.2	Urban Poor: Livelihood & Social Security	150.00	50.00
3	Urban Transport including Roads & Parking & Terminal (Rail/ Road) + BRTS	1350.00	2335.00
4	Inner City Redevelopment	40.00	0.00
5	Social Amenities	430.00	0.00
6	Urban Governance	142.50	30.00
7	Urban Environment Including Riverfront Development and Disaster Management	1367.50	89.00
	TOTAL	**5111.00**	**3712.00**

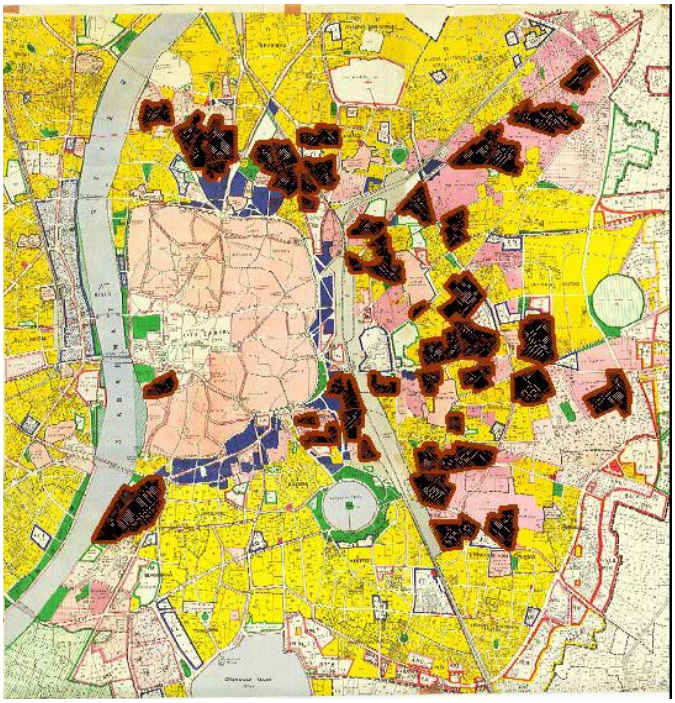
Sector wise goals and strategies have been presented below.

11.4.1 Development and Growth Management

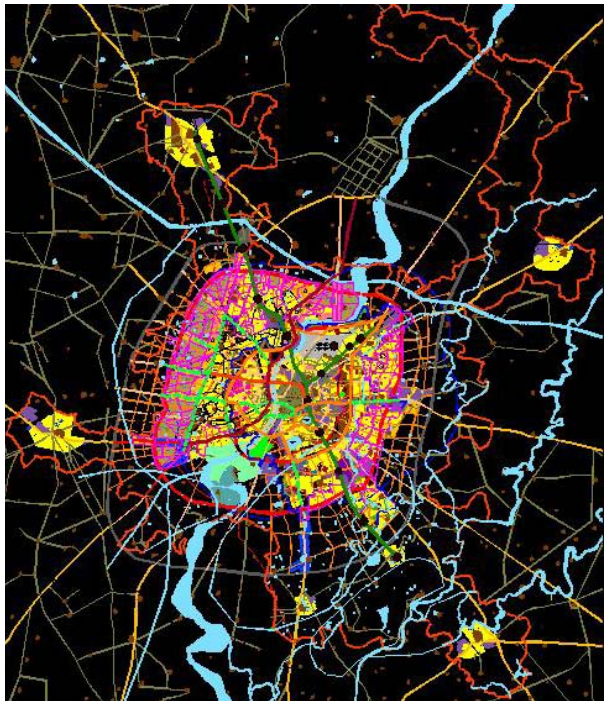
Sector 1: Development and Growth Management
The goal is to achieve ▪ A compact city, coherent urban form with well designed public and green open space ▪ Conservation of nature and heritage areas ▪ Integrated development: ▪ Natural Resources Conservation, Disaster Mitigation, Economic Development, Infarstructre Plan, Landuse-Transport, Urban poor, Informal sector ▪ The strategies include: o The City has the history of adhering to formal planning process. Plans have been prepared regularly and sanctioning done in time. ▪ Further for smaller areas TPS have been prepared. Over 100 TPS at various stages of planning/developmnet are marked below. ▪ Integrated landuse-transport planning is envisaged as part of METRO project, BRTS Project, Riverfront Project. ▪ A new township between Amdabad and Gandhinagar is proposed. ▪ A Street Vendor Policy has been drafted. ▪ A Slum Policy has been drafted. ▪ Plans for redevelopment of unused /vacant textile mill land is underway.

Development and Growth Management

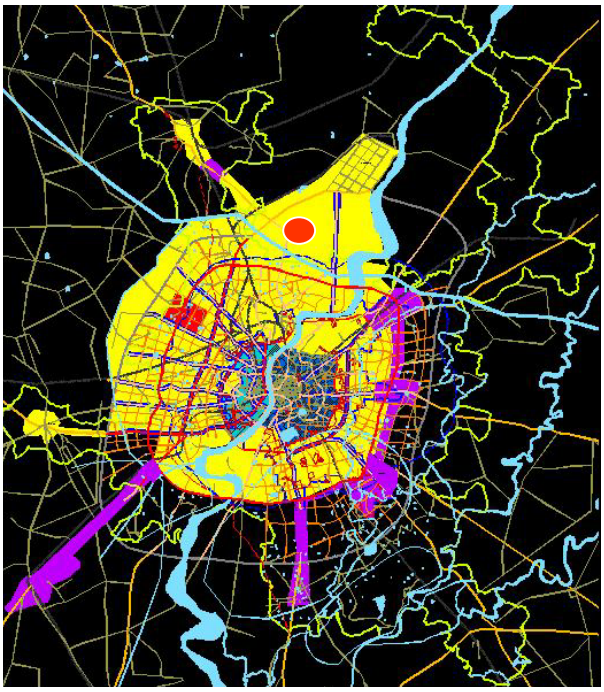
Textile Mill Land Redevelopment Plan



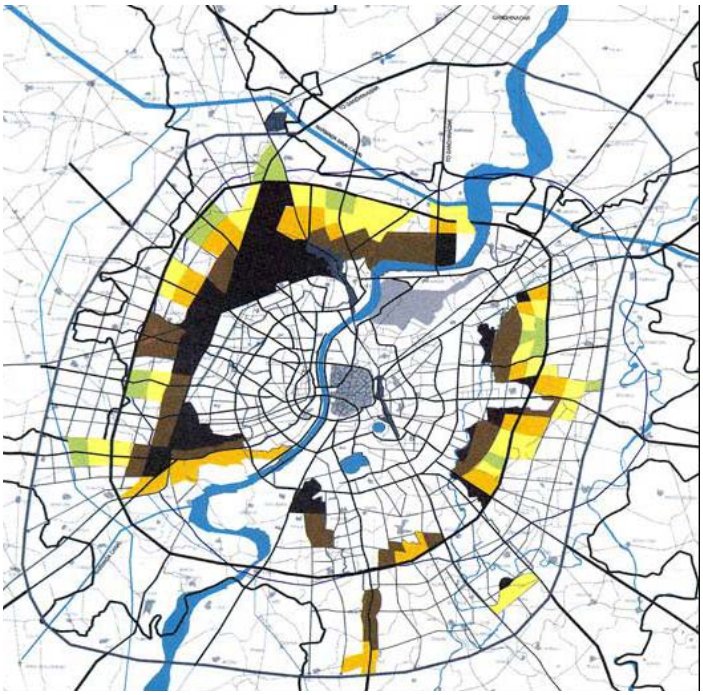
Urban Development Plan



Multi-activity New Town



Town Planning Schemes



11.4.2 Basic Environmental Services – Water Supply

Sector: 2 Basic Environmental Services

2.1 Water Supply **PROJECT COST: Rs. 506 Crores**

The sector **ISSUES** in water sector for Ahmedabad include the following:

- Excessive dependency on ground water source
- Depletion of ground water table @2-3m annually
- Excessive TDS and Fluoride content in the ground water
- Contamination of water due to old service connections/ old network
- Coverage needs to be increased from 85% of the area to full extent
- Reduction in the transmission and distribution from 20-25% to an efficient level of 10-15%
- The areas in the periphery does not have systematic water Supply network.

The sector **GOALS** / **OBJECTIVES** are:

- To enhance health security by assured water supply
- To Protect and Secure water sources
- To Cover 100% households with Individual tap
- Move towards 24x7 water supply in a phased manner
- Move towards metered water supply in a phased manner, and
- To improve cost recovery through efficient collection and initiate reforms through introduction of direct user charge

The **STRATEGIES** include:

- Ensure Source Security
- To Reduce / Eliminate use of ground water dependency and limit use of ground water (Drought / Emergencies) and Develop Multiple Sources / Contingencies need to be built up
- Rationalization of System Operation by redesign (Source to Distribution area (Minimize distances))
- Strengthen Water Quality Monitoring System by developing additional laboratories monitoring water Quality regularly
- Use efficiency through introduction of water audit
- Take Initiatives for ground water recharge and water recycling
- Introduce water pricing to discourage its wastage
- Geo-hydrological study to be conducted for sustainable withdrawal of water and regulate ground water extraction through licenses etc.

Water Supply Projects

The Projects proposed are at a cost of Rs. 506 Crores.

In line with these the projects have been identified. The objectives are to cater to the water needs of 65 lakh people at 200 LPCD. The required water is in the order of 1300 MLD (900 MLD for City and 275 MLD for west periphery and 125 MLD for East Periphery areas). This would imply an additional 500 MLD City and 125 MLD East periphery. 275 MLD for west periphery has already been created.). Complete renewal of network and additional network of 950 Kms has been planned. The specific PROJECTS include:

CITY Projects – Rs. 254 Crores

- Project-1: Providing gravity pipeline from Narmada Canal to Kotarpur Water Treatment Plant along with related Civil works, at an estimated cost of **Rs. 25.0 Crores.**
- Project-2: Construction of Intake well in Sabarmati River near Kotarpur at an estimated Cost of **Rs. 12.0 Crores.**
- Project-3: New Water Treatment Plant near Raska head works, to supply water to South Zone of AMC area at an estimated cost of **Rs. 25.0 Crores.**
- Project-4: Providing additional water distribution stations with distribution network in uncovered area of AMC at an estimated cost of **Rs. 82 Crores.**
- Project-5: Modification of existing water distribution station and distribution network which are very old & having less capacity along with additional storage capacity at an estimated cost of **Rs. 110 Crores**

FOR PERIPHERY AREAS- Rs. 252 Crores

- Project-1: Providing Water Supply in 19 Urban Agglomerations in the Western Periphery at an estimated cost of **Rs 117 crores**
- Project 2: Providing Water Supply in 15 Urban Agglomerations in the Eastern Periphery at an estimated cost of **Rs 135 crores**

11.4.3 Basic Environmental Services - Solid waste

Sector: 2 Basic Environmental Services

2.2 Sanitation* & Solidwaste PROJECT COST: Rs. 151 Crores

*** Sanitation related Costs are Included as part of slum Improvement**

The **GOAL/OBJECTIVE** in the sanitation sector is to achieve **ZERO OPEN DEFECATION** by the end of the plan period. The **STRATEGIES** are:

- Universalisation of city sanitation approach
- Identification of sites in slums and public places for community toilet
- Involve interested NGOs, CBOs for design, construction and maintenance and affordable pricing including monthly passes

The proposals for this sector are part of other schemes related to slums, water supply and sewerage projects.

With regard to **SOLID WASTE MANAGEMENT** the **ISSUES are:**

1. Limitations in the primary collection of waste
2. Open collection sites
3. No segregation of waste
4. Waste Minimization

Disposal of bio-medical waste from private hospitals with other wastes

The GOAL is to achieve **ENVIRONMENTALLY SUSTAINABLE WASTE MANAGEMENT practise.** Place the system as per MOEF guidelines.

The **STRATEGIES** are:

- to make 100% collection of waste in a segregated manner through door-to-door collection system, & Integrate Ragpickers role in collection, Sweeping of street in day and night shifts
- dispose the waste in a scientific manner with large scope for reuse and recycle including conversion of waste to resource.,
- achieve efficiency in operations through participatory collection/ disposal system
- Special attention to 'slums', markets and sweeping of roads is given in the process of designing systems.
- Communication Strategy and User Group Formation
- Out sourcing of secondary collection & transportation; Management contract for land fill & Waste to Energy; Develop PPP for mechanized street sweeping

The objective of the proposal is to increase the capacity to around 2150 MT and 2600 MT of waste which would be generated in 2006 and 2011 respectively.

Municipal Solid Waste Collection including daily sweeping of all roads and streets and primary collection from door to door and segregation of waste at source mainly into dry recyclable waste and wet decomposable waste**;** Local Storage of MSW in Containers at ULB's**;** Transportation of the MSW to Transfer Stations ; Treatment of MSW by converting the MSW to Organic Compost using Composting Technology in a Compost Plant; Land filling of the Inert materials into Secured Engineered MSW Landfill with all the necessary Infrastructure Facilities developed as per the specifications and guidelines of the MSW Rules 2000; Collection, Treatment and Disposal of the Leachate Generated from the landfill in the Leachate Treatment Plant are the project components proposed in this plan.

Cost recovery is in the form of a charge at the primary collection stage and in the form of administrative charges from people who fail to comply with the rules is proposed. Creating Public Awareness for SWM project by various means like conducting meetings, pamphlets, posters, banners, hoardings, rallies, street plays etc. is also envisaged.

The projects in the **CITY are: (Costing Rs. 97 Crores)**

City Projects- Rs 97 Crores

- Project-1: Primary Collection System including door to door collection from Residential & commercial units comprising of containerized handcarts, PE containers for Handcarts, Semi Mechanized Pedal rickshaw, Auto Rickshaws with hydraulic Tipping Hopper System costing **Rs. 1571 Lakhs**.
- Project-2: Secondary Collection System including Front end Loader (JCB) Machines, Tipper Trucks for JCB Machines, Refuse Compactor Machine costing **Rs. 2560 Lakhs**.
- Project-3:For Road Sweeping 5.0/6.0 cu.mt. capacity high speed Truck mounted road vaccum sweeper machines costing **Rs. 1600 Lakhs**
- Project-4:Dead Animal Waste Collection system at **Rs. 40 Lakh**
- Project-5:Transfer station and Heavy Duty Truck Mounted Hauler system **Rs. 400 lakhs**
- Project-6:Machinery requirement with sanitary land fill costing **Rs. 2290 Lakhs**
- Project-7:Bio-medical Waste Management (Incinerator and Vehicles) costing **Rs. 1139 Lakhs**
- Project-8:Workshop Equipments costing **Rs.100 lakhs**
- The projects in the **PERIPHERY is to develop: (Costing Rs. 54 Crores)**

Periphery: Rs. 54 Crores

- Developing Common facilities for collection of construction debris: **Rs. 800. Lakhs**
- Equipment for the purchase of tools and equipment for primary collection, secondary storage and transportation of waste: **Rs.700 Lakhs**
- Treatment and Disposal System with additional equipments needed: **3900 Lakhs**

11.4.4 Basic Environmental Services - Sewerage

Sector: 2 Basic Environmental Services

2.3 Sewerage **PROJECT COST: Rs. 612 Crores**

The sector ISSUES include:1

- Inadequate system coverage (75% of the area)
- Disposal of untreated waste in River Sabarmati
- Inadequate Treatment facility
- Pipeline Breakdown due to mixing of industrial effluent
- Water Supply & Drainage Mixing due to pipeline breaking , and
- in the Periphery limited coverage

The **GOAL** in the sanitation sector is to adopt SUSTAINABLE WASTEWATER MANAGEMENT practices by the end of the plan period.

The **STRATEGIES** are:

- To expand sewerage system coverage to 100% (Collection)
- To Treat all the wastewater to prescribed standards (Inland disposal standards)

The **PLANS** include:

- System Augmentation
- Interception & diversion works.
- Modification of existing sewerage network.
- Additional Sewerage Networks for remaining area with intermediate pumping stations.
- Renovation of existing sewage pumping stations & sewage treatment plants.
- New Sewage Treatment Plants
- Disposal Quality Monitoring

PROJECTS

The projects for the CITY are (Costing Rs . 400 Crores)

CITY Projects- Rs. 400 Crores

- Project-1: Providing Interceptors on Eastern & Western banks of Sabarmati river, to divert entry of waste water into river, at an estimated cost of **Rs. 80 Crores.**
- Project-2: Modification of existing sewerage networks; which are laid long back and

having inadequate capacities at an estimated cost of **Rs. 100 Crores.**

- Project-3: Providing new sewerage networks in the uncovered area of AMC along with intermediate pumping stations at an estimated cost of **Rs. 60 Crores.**
- Project-4: Renovation of existing Sewage Treatment Plants at Vasna & Pirana at an estimated cost of **Rs. 26 Crores.**
- Project-5: Providing new Sewage Treatment Plants for the additional quantity of sewage flow, at an estimated cost of **Rs. 134 Crores**.

The projects for the PERIPHERY: Rs. 212 Crores

West Periphery:

- 76 Sq. Km of West AUDA is experiencing rapid development. Of this 44 sq. kms of sewerage network is completed covering a population of 6.5 Lakhs including a Treatment plant at Vasna (90 Mld UASB)
- Phase-II of 34 Sq. Kms, Sewerage network is being planned along with Treatment Plant of about 90 MLD. (Network + Treatment) at a **cost of Rs.104 Crores**

East Periphery:

- No network exist today. Sewerage required for 32 Sq.Kms. (250 persons / Ha) for 8 lakh people including Treatment Plant near Khari River and Disposal into Khari River At present 16 MLD untreated sewage is disposed locally into drainage system reaching Kharicut Canal/River. Proposed cost of project is **Rs.108 Crores.**

11.4.5 Basic Environmental Services – Storm water Drainage/ Urban Watershed

Sector: 2 Basic Environmental Services PROJECT COST: Rs. 575 Crores

2.4 Storm water Drainage/ Urban Watershed Management

The **ISSUES** are

- Poor coverage
- Problems of water logging and flooding during monsoons
- Infiltration of storm water into sewerage network

The goal is to **EFFECTIVELY MANAGE URBAN WATERSHED TO PREVENT FLOODING AND PROMOTE WATER RESOURCES CONSERVATION AND PRESERVATION.**

The Strategies are:

No systematic up keeping of Lakes, blockage of drains, insufficient storage, dryness in summer, encroachment, garbage dumping, ugly appearance are becoming the sighs in the urban areas when we look at urban drains and lakes. The city has implemented several schemes. Now the city looks at drainage as a watershed management problem and attempts to preserve nature and at the same time prevent flooding. The efforts are in the form of

- Deepings of Lakes
- Provide Recharge facilities inside Lake.
- Protection of bank of Lake
- Slum relocation by providing housing facilities elsewhere.
- Storm water drains to be drained in the Lakes.
- Excess water is to be drained off.
- Recharging from Narmada Canal System

The projects are envisaged to address priority to areas prone to water logging/flooding. The coverage is limited to 350 kms of Roads and another 300 kms network is proposed. In the periphery, a 25 km network exists and 70 km is proposed. Further, the emphasis is in **WATERSHED MANAGEMENT APPROACH.**

Projects – Storm Water Drainage / Urban Watershed Management

Total Projects: Rs. 575 Crores

CITY Projects: Rs. 385 Crores

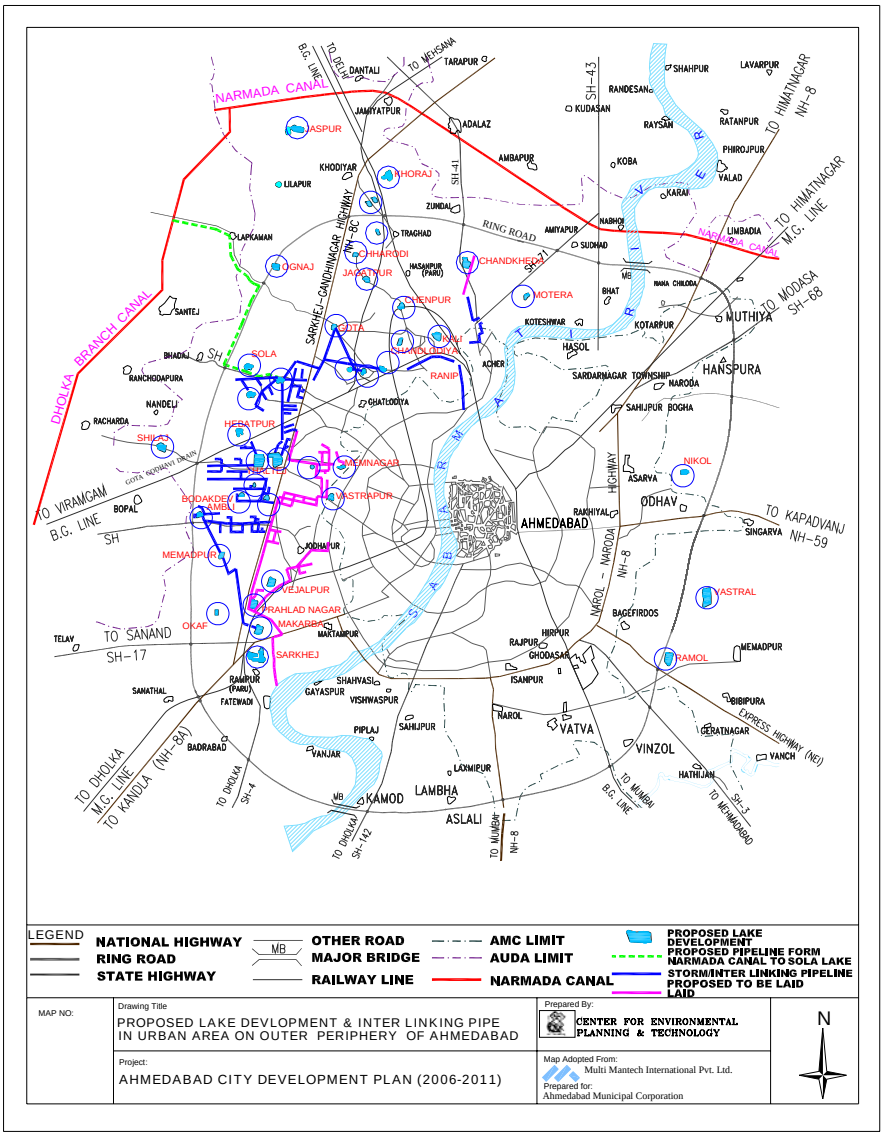
Project-1: For overcoming of water logging & flooding problems, it is proposed to provide storm water drainage system of adequate capacity in the remaining AMC area; so as to dispose off flood water, safely to the river at an estimated cost of **Rs. 300 Crores.**

Project-2: 70 Lakes Rejuvenation Plan – **Rs. 85 Crores**

Periphery: Rs. 190 Crores

41 Lakes connected with storm water drains, Slum relocation, greening, linking with Narmada Canal at a cost of **Rs. 190 Crores**

Map 11-1: Proposed Lake Development in Outer Periphery



11.4.6 Programmse for Urban Poverty Alleviation

Sector: 3 Urban Poor & Housing; Livelihood restoration and Social Security

PROJECT COST: Rs. 995 Crores

The goal is to ensure

- **Access to all at acceptable standard house, owned or rented within the plan period. The target is to move towards a City without slums.**
- **Provide Opportunity to Learn, Earn and Live respectably**

With this as objective the city aims at the following in terms of housing for **Urban Poor**

1. **Slum Networking:** Of the total 190 slums for which NOC has been received for development from the title owner. Of these 41 slums have been covered. The remaining 149 slums are proposed to be covered under the SLUM networking project at a cost of **Rs. 120 Crores.**

2. Chawl Reconstruction Programme: In Ahmedabad, these are about 1,34,000 chawl houses which are in adialapiaated condition. A scheme to renovate this housing stock has been proposed at a cost of Rs. 750 Crores. About 50% (i.e 50,000 per house) is expected to be benefitiary contribution. Balance 50%, i.e **Rs. 375 Crores** has been proposed.

3. Weaker section Housing: In the periphery proposals to build and rlocate households from lakes and road land, and also create affordable housing, a programme has been launched. Total amount proposed is **Rs. 500 Crores.**

The programe for Livelihood restoration and Social Security has been proposed with an outlay of Rs. 200 Crores.

The Strategies are:

- Enhancement of **Livelihood Opportunities through:**
  - Enabling Skill Development
  - Activity Centers
  - Micro Finance
- **Provide Social Security Through convergence of programmes on:**
  - Health Insurance
  - Asset Protection
  - Community Policing

11.4.7 Urban Transport

Sector: 4 Urban Transport including Roads, Highways etc.,

PROJECT COST: Rs. 3685 Crores

The goal is

- **To IMPROVE ACCESSIBILITY** in the City through improvements in network, system technology and management options.
- **To make AHMEDABAD DUST FREE AND CONGESTION FREE CITY** having an efficient road network and public transport system

The Strategies are:

The city and the state identify transport as an important element of the strategy proposing to make city vibrant, productive and efficient. Through the efforts by the state government and GIDB, Ahmedabad Municipal Corporation and AUDA, an integrated system has been conceived.. The System consists of:

- A Regional sub-urban rail system connecting suburban areas to the city,
- A Metro System connecting Gandhinagar and Ahmedabad,
- A Bus Rapid Transit System, and
- A regular Bus System

Studies have been carried out to design systems for the first three and a public transport plan is under preparation with an objective to develop the system as an efficient and people friendly system. This plan proposes improvement of Regular Bus System and BRTS system.

Action areas include:

- Improvements in Road network
- Introduction of Mass Transit System – Metro System
- Introduction of Mass Transit System – Suburban Rail Project
- Introduction of Mass Transit System – BRTS System
- Improvement in Mass Transport System – Regular Bus System

Improvements in Road network : Action agenda for Road sector include:

- All major roads to be developed to their full Right of Way.
- Increase degree of connectivity to 100%.
- Improve connectivity to the peripheral areas of North, East and South zones.

- Completion of Ring road
- Implementation of junction improvements as proposed by the Traffic Management Plan to streamline traffic flow.
- Implementation of parking facilities at Manek Chowk and Prem Darwaja
- Alternate site location for the ST station.
- Appropriate pedestrian facilities to be developed on the major roads having significant pedestrian cross traffic
- Implementation of the flyovers to ensure smooth flow of traffic along major roads wherever they are absolutely necessary.

CITY Projects: 1325 Crores

- Integrated Street Development Project (120 Kms of Arterial Road) @ **Rs. 160 Crores**
- Strengthening of 1100 Kms of other road network @ **Rs. 165 Crores**
- Rail, River Bridges, Flyover & ROB @ **Rs. 332 Crores**
- Decentralized Rail Transport Terminal (Sabarmati) @ **158 Crores**
- 5 Transport Nodes @ **Rs. 50 Crores**
- BUS RAPID TRANSIT System (BRTS) @**Rs. 460 Crores**

MRTS Projects (Separate Submission):

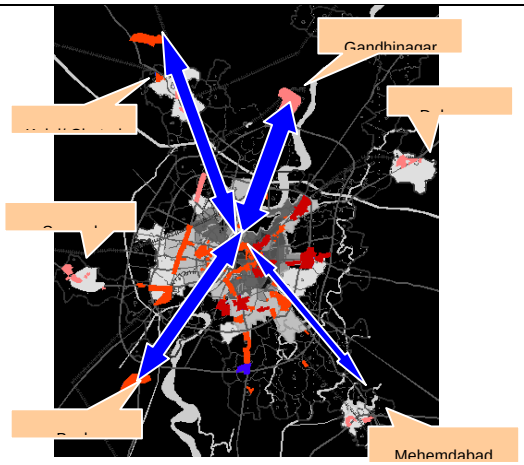
- Regional Rail Project @ Rs 1200 Crores
- Metro Rail Project @ Rs. 3900 Crores

Road improvements in the Periphery (Rs. 2335 Crores)

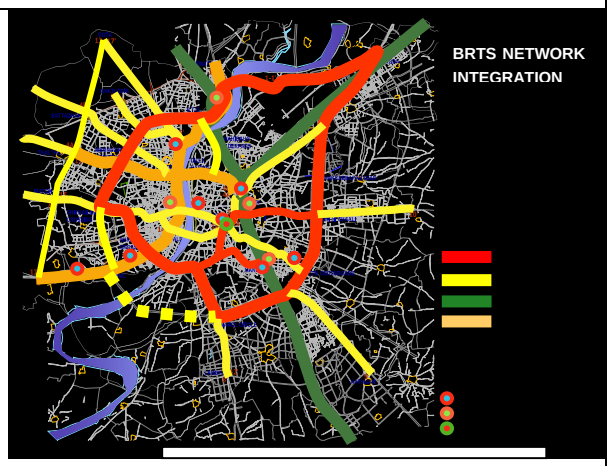
1. 76 Km. long 200' wide partial access controlled corridor/ S.P Ring road development/upgradation at a **cost of Rs. 520 Crores** developed as toll road.
2. Roadnetwork Upgradation (450 Kms in TP areas costing **Rs. 600 Crores**
3. Major Radial & Minor Roads (300 Kms) costing **Rs. 500) Crores**
4. Flyover (14) and ROBs (14) in Periphery costing **Rs. 675 Crores**
5. Parking Lot & Bus Terminals Costing **Rs. 10 Crores**
6. Street Light Improvements at a cost of Rs. **30 Crores**

Introduction of Bus Rapid Transit System: A bus rapid transit system plan has been prepared for Ahmedabad. DPR is under advanced stage of preparation. The plan proposes to upgrade about 60 kms of existing ROW completely such that middle two lanes are made exclusively for buses, lanes for bicycles and pedestrians are also provided along with lanes for private vehicles (Refer Figure 11-1). This facility along with other complimentary measures is expected to improve the bus patronage in Ahmedabad from the present 7% to 40%.

Figure 11-1: Rapid Transit System – Ahmedabad



1. **Regional Rail System**
2. **Metro System**
3. **Bus System**
   a. **Bus Rapid Transit System**
   b. **BRTS mixed services**



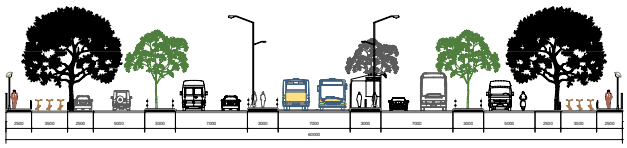
Exclusive BRTS Corridor

Feeder Routes

Regional Rail

Metro Rail Corridor

Integration of BRTS Network with MRTS



Cross Section for 60m ROW

Cross Section for 40m ROW

The cost estimate for the BRT corridor phase-I has been prepared, covering Dismantling, road work, paving, road marking/traffic signs, street furniture, landscaping, electrification, traffic signals etc. and miscellaneous items comes to Rs.460 crores.

11.4.8 Inner City Development

Sector 5: Inner City Development - Rs. 40 Crores

The objective is to Develop Bhadra Area & other City Heritage Conservation, Make Vehicle Free Zone Development and Create City Tourist/Heritage Centre.

11.4.9 Social Amenities

Sector 6: Social Amenities

In the light of liberalization and globalization, the **ISSUE** of urban poor access to social amenities and facilities becomes critical. Hence the sector has been accorded with a special focus. The **GOAL** is to ensure accessibility of the people, especially the poor, to various social amenities and facilities.

1. Invest in Health Sector Projects to the tune of **Rs. 125.8 Crores**

Sr. No.	Item, New	Rs. Crores
1	Building + Furniture	4.80
2	Equipments + Drugs for 1 year	4.80
3	Hospital	116.00
	Total	125.00

2. Proposed Education Sector Projects total an amount of **Rs. 52 Crores**

Sr. No.	Item	Rs. Crores
1	Infrastructure in 100 schools (sanitation & water + Electrical lights)	3.60
2	School Building Renewal etc.	4.00
3	Play Ground, Assembly Hall etc.,	5.00
4	Rainwater Harvesting in 252 School	5.30
5	Laboratory Equipment (computers, science Lba0	21.30
6	Skill Upgradation / Training	0.37
7	Uniforms for poor (2 Lakh Children)	4.00
8	Fire Safety Measures	1.00
9	New Class Rooms	7.50
	Total	**52.00**

3. Public Amenities and facilities proposed with a cost of **Rs. 248 Crores**

Sr. No.	Item	Rs. Crores
1	Community Halls & Swimming Pools for Eastern Ahmedabad	
2	Kankaria Lake Development	
3	Two Indoor Sports Stadium	
4	Kankaria Vyayam Vidhyalaya	
5	Sardar Patel Stadium, Navrangpura	248.00

11.4.10 Urban Governance

Sector: 7 Urban Governance and Management

PROJECT COST: Rs. 172.6 Crores

E-Governance: For efficient management of the increasing administrative responsibilities and the welfare activities, AMC has initiated a project on E-Governance. A provision of Rs 500 lakhs was made for this project for 2002-03 with the help of State Government. In order to expand the scope of activities, AMC is planning to undertake an investment of **Rs. 32.6 Crs.**

Town Planning and Information Systems:

City proposes to earmark **Rs. 60.00 Crores** for information development.

Gujarat Urban Management Institute: The State, given the pace of urbanisation, has identified and awarded the status of university to CEPT. The institute has partnered with the State and City government in various developmnetal activities. The need is to equip the university to meet with the challenges which emerging challenges thrown open by the trends in urbanisation. Urban Economic Developmnet, Urban environment, Information Technology, E-governance, Disaster Mitigation and Management, Public Policy, Technology and Design are the areas requiring strengthening. A proposal to build capacity of the university in terms of state of art equipments, building, human resources is envisaged and an amount of **Rs. 50 Crores** is proposed for the purpose.

Urban Governance Capacity Enhancement in the periphery is proposed to be undertaken with about **Rs. 30 Crores Cost.**

11.4.11 Social Amenities

Sector: 8 Urban Environment

PROJECT COST: Rs. 1367.5 Crores

The goal is:

- **TO IMPROVE ENVIRONMENTAL CONDITION**
- **TO REDUCE VULNERABILITY**
- **TO FACILITATE RCHARGE OF GROUND WATER**

Environmental problems in a city are inevitable and arise out of resource consumption and disposal patterns by the population. Major impacts witnessed are in the form of water pollution, air pollution and noise pollution. Most infrastructure projects proposed in this Plan does involve contribution towards environmental improvement. Some specific aspects which have not been included above/special projects are included.

1. Development of wooded areas in the city & street Plantation etc., = **Rs. 51.5 Crores**
2. Development of wooded areas, Street Plantation etc., in the periphery = **Rs. 10 Crores**
3. Air Quality Monitoring **= Rs. 6.5 Crores**
4. Disaster Mitigation **= Rs. 100 Crores**

3.2 Sabarmati River Front Development

The Sabarmati River Front Development project is essentially a public amenities and land development project undertaken with a prime objective of environmental improvement and provision of housing for the poor who living in life threatening conditions along river bed. The project includes embankment and reclamation works, construction of major level-one roads, installation of infrastructure (water, sewer, storm drainage) networks, resettlement and rehabilitation works, the construction of relatively sophisticated promenades and gardens, maintenance of public spaces during the life of the project, development of urban design guidelines, strategic planning, reconciliation of property rights, management of unclear legal issues and promotion and marketing a portion of the reclaimed land. The project has been planned as a self-financing project. The revenues would be generated from the sale of proclaimed land.

Table 11-20: Sabarmati River Front Development

Project Details	Estimated Cost (Rs. Crs)
▪ Walkway Development ▪ Road development along River ▪ Promenades ▪ Garden ▪ Construction of 4000 houses for slum dwellers on river bed ▪ Creation of Amusement Park, Electronic Golf Course, Water Sports Park ▪ Construction of Kotarpur Weir	1200

11.5 Summary

The proposal for city is for an investment of 5111 crores for the next seven year period. Similarly for the periphery, proposal is for an amount of Rs. 3712 crores worth investment under its jurisdiction. Detailed Project Reports are underway for many of these proposed projects.

Chapter 12 Financial Operating Plan

FOP Assumptions
Phasing of Capital Investment
Sizing of Capital Investment
Results of the FOP
Fund Requirement

12.1 Introduction

The main agency implementing CDP is the AMC. A detailed account of its finances has been presented in chapter 9. This chapter deals with the feasibility of investments proposed in the previous chapter. The financial sustainability of investments in the periphery has also been analysed keeping in view existing system. AUDA has been considered as prime agency with regard to investments in these areas.

The Financial and Operating Plan (FOP) is essentially a multi-year forecast of finances of the local body for a medium term of 5 to 10 years (plan period). It needs mention that the identified investment is phased from 2005-06 to 2011/12 and the FOP has also been generated from the same plan period. A salient feature of the FOP is that all outstanding dues including debt and non-debt liabilities have been taken into account and the repayment has been scheduled accordingly.

The FOP is basically generated to assess the investment sustaining capacity of the corporation adopting a project funding structure comprising, 50 per cent in the form of grants under JNNURM framework and the rest by way of loans, revenue surpluses and through bonds generated by AMC. The major criterion for ascertaining the investment sustaining capacity of AMC is that, they should have year-to-year positive Opening Balance during the plan period and that the debt servicing expenses not to exceed 25% of revenues.

12.2 Financial Operating Plan of AMC

The finance data for the F.Ys 2000-01 to 2004-05 of AMC have been used as the base to prepare the FOP. A spreadsheet FOP model has been customised so as to work out the ultimate investment sustaining capacity of AMC, based on the FOP assumptions.

As mentioned in finance section, the AMC maintains its account on a cash basis accounting system. The main items of income and expenditure have been classified into two accounts for assessing the financial position of the corporation namely revenue account and capital account. The same has been adopted for the FOP and further revenue account receipts and expenditure were projected under following categories.

1. Revenue Account Receipts;
    - Taxes
    - Non Tax Sources, and
    - Grants, Contribution and Subsidies
2. Revenue Account Expenditure;
    - Establishment
    - Operation and Maintenance
    - Debt Servicing- Existing and New Loans
    - Phasing of non debt liabilities, and
    - Additional O&M
3. Capital Income; and
4. Capital Expenditure

12.2.1 FOP Assumptions

A. Forecast of Revenue Income

Octroi has been the single largest source of revenue for the AMC contributing to more than 57 per cent. The assumption adopted in forecasting octroi tax, property tax, water tax, water charges, water inspection fee and other revenue items are presented in Table 12-1.

Other Taxes

Other tax items including fees, etc. have been assumed to grow at the past growth trends, subject to a minimum of 7% and maximum of 15% per annum.

Non-Tax Income

Own Income Sources

Non tax income from the corporation's operations and assets, like income from municipal properties, collection form public places, realisation under special acts, and public service charges and fees, etc. are assumed to grow at the past trends, subject to a minimum of 7% and maximum of 15% per annum, over the average income during the last five years.

Other Income Sources

Other sources mainly include interest earned from deposits and dues, sale proceeds (scrap sale, farm product, publication, tender form, etc), and miscellaneous income. These sources of income are assumed to increase at the past trends, subject to a minimum of 7% and a maximum of 15% per annum.

Revenue Grants

The revenue grants announced from time-to time are assumed to grow at past trends, subject to a nominal growth of 8 per cent. These grants mainly include grants for various purposes viz. UBSP, grants for educational and medical services and other grants announced time to time.

Table 12-1: Assumption adopted for forecasting realization under various heads

Item		Assumption Adopted for Forecast	Basis
I	**Octroi**	Forecast adopting current average growth rate, subject to minimum of 7% and maximum of 15%.	
II	**General tax**	Forecast adopting an average growth rate of 10%	
III	**Other taxes**		
1	Water charges, Water inspection fee, vehicle tax, theatre tax, and other taxes	Forecast adopting current average growth rate, subject to minimum of 7% and maximum of 15%.	
IV	**Non-tax income**		
1	Income from municipal properties, realization under sp. Acts, Inst., Rent & Others	Forecast adopting current average growth rate, subject to minimum of 7% and maximum of 15%.	
V	**Revenue grants**		
1	State Government and Other Grants	Subject to a standard growth rate of 8 %	

B. Forecast of Revenue Expenditure

The assumptions made in forecasting the items of revenue expenditure are presented in Table 12-2.

Table 12-2: Assumption adopted for forecasting items of Revenue expenditure

Item		Assumptions Adopted for Forecast	
I	*Establishment expenditure*	Forecast adopting; 1. Nominal annual growth rate	
1	Annual growth rate	Past trend, subject to a minimum of 5 % and maximum of 8% p.a	
II	**Repair & Maintenance on existing services**	Forecast adopting current average growth rate, subject to minimum of 5% and maximum of 8%.	
III	**Additional R&M expenditure due to new investments identified as part of CIP**	Adopted as % of capital cost, to increase at 6% p.a	
		Water Supply	4.00
		Sewerage & Sanitation	6.00
		Solid Waste Management	10.00
		Environmental Infrastructure	4.00

Item		Assumptions Adopted for Forecast	
		Roads & Bridges	4.00
		Street Lighting	16.00
		Social Infrastructure	3.00
IV	**Debt servicing-**	**Existing Loans:** To be repaid in as per the repayment schedule provided by AMC. **Municipal Bonds:** *Bonds issued in March 2002* Maturity in March 2012 Interest rate 9% per annum payable half yearly Bonds issued March 2004 Maturity in March 2014 Interest rate 6.4% per annum payable half yearly Bonds issued March 2005 Maturity in March 2015 Interest rate 6% per annum payable half yearly **New Loans** (to fund CIP)- To be repaid in 15 years including 5 years moratorium period with IDC applicable @ 7.5% interest rate p.a.	
V	***Outstanding non-debt liabilities*** (Salaries, P.F, GWSSB, GEB, GoG Edu. Cess, etc.)	If any, to be cleared in 1 to 5 Years starting 2006-07	

C. Forecast of Capital Income and Expenditure

Capital Income

Own Sources

The amount realised under own sources contribute mainly from capital grants, municipal bonds, (floated for water and sewerage projects), non-refundable registration/ permit fee, sale of capital assets, etc. A standard nominal growth rate of 8 per cent per annum over the average realisation during the last five years has been assumed.

Regular- Scheme-based Capital Grants

The Ahmedabad Municipal Corporation receives capital grants from the State Government under various state and Central Government sponsored schemes for specific capital works.The income under such grants does not show specific trends during the last five years. Thus a standard nominal growth rate of 8 per cent per annum over the average realisation during the last five years has been assumed. Table 12-3 presents the assumptions adopted for forecasting the items of capital income and expenditure.

Other Capital Income

The other income realised under capital accounts head is from borrowings from government and other institutions. It is assumed that other capital would have a growth rate of 8 per cent per annum on the average realisation of last five years.

Capital Expenditure

Regular Scheme-based Capital Works

The AMC is required to utilise the scheme-based capital income for specific works alone. It is assumed that the entire amount of capital income received for such works from state/ central Government will be expended on specific schemes for which they are meant for.

Table 12-3: Assumption adopted for forecasting items of Capital Income and Expenditure

Item		Assumptions Adopted for Forecast
A	**Capital Income** (Regular capital grants and contributions)	To grow based on current average growth rate, subject to standard growth rate of 8%, except for MLA/MP grant, for which a standard growth rate of 2% is adopted

II	**New Capital Works – Funding Structure**	New Capital works to be funded from
		• 50% of identified investment (excluding social infrastructure)
		  • JNNURM Grants – as percentage of identified investment (excluding social infrastructure) 35% from GoI, 15% from GoG
		  25% JNNURM grants for urban Infra./ Gov. projects shall be contributed by the ULB to SUIF by 2011-12
		  Net of 10% JNNURM grants for Urban poor related projects and related O&M expenses shall be contributed by the ULB to SUIF by 2011-12
		• 50% of remaining investment including social infrastructure
		  • Own Resources- 10% of investment required to be funded from revenue surplus,
		  • Bonds floated for water and sewer project,
		  • Borrowings from other institutions.

B	**Capital expenditure**	
1	Sector-wise capital expenditure	▪ Based on the investment sustainable by the AMC, phased over the plan period. (See phasing of capital investment and sizing of capital investment). The investment needs identified by AMC has been adopted for the plan period

D. Project Identification

The project identification has been based on the strategies listed under each of the service sector as identified by AMC. The forecast population for the planning horizon- 2011/2012 is 45.83 Lacs. The projects derived based on the AMC estimates are aimed at ensuring optimal and efficient utilisation of existing infrastructure systems. Other developmental projects include projects other than those for core service sector viz. slum upgradation, environmental management, etc. Such projects are also based on lists and/ or reports prepared by AMC.

The total estimated capital investment requirement for providing efficient infrastructure and services for the population of AMC by 2011/ 2021 is Rs. 5111 Crores (Refer Annexure 12.1).

Table 12-4 presents the summary of sector-wise investment requirement for the core service sectors. Apart from 23% of the total investment identified specifically for Sabarmati River Front Development and another 4 percent for improvement of environment in the city, Raods and Urban Transport sector accounts for the maximum investment at 26%, followed by Sewerage and Drainage at 15% of the identified investment. Housing and Slums' improvement accounts for 10% and water supply sector accounts for 5% of the investment. Social infrastructure is also given importance at 8% of the identified investment. The phasing of the outlays is done such that the projects are completed within a 5 year period for the city and 7 year period for the periphery (AUDA).

Table 12- 4 Summary of the Sector-wise Investment Requirement in AMC
(Constant Prices : 2005-06 – Rupees Lakhs)

Sector		Total	Investment in Rs. Lakhs					
			2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
1	Public Places/ Urban Development	4000	-	2000	2000	-	-	-
2	Roads/ Bridges & Urban transport	135000	6100	42300	56200	30400	-	-
3	Sewerage & Drainage Lines	78500	3500	24300	26300	22400	2000	-
4	Water Supply	25400	2950	7800	6450	5700	2500	-
5	Environment & River Front Development	136750	7950	35500	55000	28000	10300	-
6	Urban Poor & Slums (Housing & Infra)	49500	600	8200	10700	12500	12500	5000
7	Solid Waste Management	9700	-	2180	7520	-	-	-
8	Urban Governance	14260	1800	3500	4960	4000	-	-
9	Works for Weaker Section/ Urban Poor	15000	-	3000	3000	3000	3000	3000
10	Social Infrastructure	43000	280	10100	13100	10500	6520	2500
	Total	**511110**						

12.2.2 Sizing of Capital Investment

The phased investment is loaded onto the FOP model, and based on the assumptions adopted the annual finances of AMC are forecasted till F.Y 2014-15. The criterion for ascertaining investment sustainability is

- A year-to-year positive Opening Balance during the plan period.
- Debt servicing expenses not to exceed 25% of revenues and

In cases where AMC does not show a positive closing balance during all years of the plan period, the investment needs to be scaled down uniformly across all sectors of identified investment, till the above criterion are met. The investment level at which all the years of the plan period show a positive closing balance is the sustainable investment by AMC.

12.2.3 Results of the FOP

The FOP is generated for the sustainable investment while also incorporating availability and adequacy of internal revenues to cater to the additional Repair and Maintenance works that would arise out of the proposed capital investment.

The 10-year FOP of AMC is presented in Annexure 12.2. It may be noted that, under the assumptions made and availability of grants under JNNURM Framework, AMC records sustainability of the entire identified investment of Rs. 5111 Crores at constant prices (Rs. 5778 Crores in current prices) and infact presents **sustainability of 114 percent of the identified investment amounting to Rs. 5827 Crores (constant prices)**. AMC maintains a positive closing balance during all the years of the planning horizon. AMC would have operating surplus year after year (except during 2009-10 which however AMC will tide over in the immediate year) after prompt repayment of all outstanding loans and non-debt liabilities. This improvement in the performance of AMC would be due to the enhanced revenues from own sources in line with the mandatory reforms proposed under JNNURM.

The results of the FOP in terms of the total investment, investment sustainable and source-wise funding of the sustainable investment is presented in Annexure 12.1 and 12.2.

12.2.4 Fund Requirement

It needs mention that of the total identified investment of Rs. 5111 Crores, only Rs. 4531 Crores is being proposed by AMC for funding under JNNURM Framework. The funding for the entire identified investment of Rs. 5111 Crores at constant prices and Rs. 5778 Crores in current prices as worked out in the FOP model would be by way of:

- JNNURM (GOI & GOG) Grants Rs. 2551 Crores (44%)
- Regular Capital Income Rs. 280 Crores (5%)
- AMC & Users' Contribution Rs. 295 Crores (5%)
- External Loans Rs. 2653 Crores (46%)

** The figures above presented are in current prices*

Of the identified investment for infrastructure development projects in the core sectors of water supply, sewerage & drainage, roads, bridges, street lighting, environment, governance etc and also infrastructure development in slums, which is Rs. 4531 Crores (constant prices) and Rs. 5101 Crores (current prices), 50% is proposed for funding through capital grants under the JNNURM.

The remaining 50 percent investment requirement for these core sector projects and also the identified investment for development of social infrastructure is proposed to be met through the own sources of AMC, user contributions and External Borrowings.

It also needs mention that while AMC is in a sound financial condition to take up large investments, the JNNURM framework assists further in keeping this soundness of financial condition of AMC intact and further provide the leverage to AMC to take up additional investments towards creation of better infrastructure for its ever growing populace and city. In the absence of JNNRUM funding, the sustainability of AMC against the identified investment of Rs. 5111 Crores falls to 65%, that is about Rs. 3322 Crores.

12.3 Financial Operating Plan of AUDA

After formation of Gujarat State in 1960, the area around city of Ahmedabad witnessed a rapid growth with the development of new co-operative housing societies. Due to increase in land cost in the limits of municipal area, few housing developments had been started on the periphery of the municipal boundary.

Looking at the rapid growth in population and development of city of Ahmedabad, the Government of Gujarat incorporated Ahmedabad Urban Development Authority (AUDA) on 1st February, 1978 under the Gujarat Town Planning and Urban Development Act, 1976 for planned development of areas lying outside the limits of Ahmedabad Municipal Corporations.

AUDA covers areas within Ahmedabad City as also some 152 villages, Nagarpalikas and 4 growth centres of various districts adjoining the city. The total land area in AUDA's jurisdiction is 1295 sq. km. including Ahmedabad Municipal corporation area of 190 sq. km.

The principal functions of AUDA include:

- Preparing growth plans for expanding urban areas
- Preparing Draft Schemes for Urban Development
- Implementing the finalised plan
- Regulating growth according to plans
- Developing infrastructure such as roads, drainage and water supply

Some of the major achievements of AUDA are

- Increased the supply of affordable land through zoning and Town Planning Schemes
- Ensured planned development at the micro-level through rapid implementation of Town Planning Scheme, so far completed 18 TPS
- Rapid implementation of vital city level infrastructure such as roads, sewerage and water supply
- Environment improvement by creating green open spaces and gardens, protecting

Talavdis and recharging ground water

- Provision of EWS (economically weaker section) housing to people
- Provision of subsidised land to facilitate creation of social infrastructure such as schools and hospitals
- Assisting Nagarpalika in building their capacities
- Improving governance through increased participation and transparency

The population under AUDA area is estimated to be 19.29 Lakhs by 2011/12 and owing to this growth in the population in the AUDA area and also to develop the area under the TPS prepared/under preparation, AUDA has evolved Development Plan-2011, the plan for providing civic amenities that a modern city needs. For the past two and half decades, AUDA has been vigorously pursuing the implementation of various TPS so that the planned infrastructure takes shape at the micro level well before urbanization. AUDA is rapidly striding towards realizing the objective of making Ahmedabad a city with comprehensive urban amenities.

As in western countries, AUDA has planned to provide all infrastructure facilities before people start living in the developing area. To begin with and set an example for other development agencies in the country, AUDA has developed Prahalad Nagar TPS on previously reserved land on the city's south-western periphery, having area of 162 hectares as a model scheme. With the co-operation of the land owners, all infrastructure facilities are completed within 3 years, before finalisation of the scheme by the Government and before people start residing. As such, the AUDA has completed planning for an incremental population of another million within AUDA limits.

Resource mobilisation

AUDA had no tax based income. There were limited avenues of revenue generation. Lack of resources has impeded AUDA's capacity to provide adequate urban infrastructure. There was also poor recovery of service charges and other dues. Accordingly to tackle this problem, AUDA has designed several innovative methods to mobilise resources, as listed hereunder:

- Land would be used as a means of income generation through allocation of land or sale in TPS.
- Development rights have been identified as a means of revenue generation. Buildings adhering to minimum margin norms and norms relating to maximum height can derive 25% more FSI with payment of requisite fees.
- A special service and amenity fee provision has been made in relation to areas not covered under TPS.

Apart from the above AUDA proposes to mobilise resources for its planned programmes through various grants available from the State Government as well as the Central Government. AUDA proposes to access the "As and When" programme grants from Government of Gujarat for some of its water supply programmes. Also AUDA proposes to access and utilise the grants available under the JNURM framework to a large extent and partly fund its capital requirement for infrastructure creation.

Accordingly a FOP comprising the planned projects and funding and cost recovery pattern for AUDA is included as part of the City Development Plan being prepared for the City of Ahmedabad. The following sections present the details of the same.

12.3.1 AUDA – FOP & Assumptions

The FOP for AUDA is essentially a multi-year forecast of finances and cash-flow analysis for a medium term of 5 to 10 years (plan period). The identified investment is phased from 2005-06 to 2011/12 and the FOP has also been generated from the same plan period. All outstanding dues including debt and non-debt liabilities have been taken into account and the repayment has been scheduled accordingly.

The FOP is basically generated to assess the investment sustaining capacity of AUDA adopting a project funding structure comprising, JNNURM grants, other state grants, internal resources, PPP frameworks and by way of loans. The major criterion for ascertaining the investment sustaining capacity of AUDA is that, they should have a year-to-year positive Opening Balance during the plan period and that the debt servicing expenses not to exceed 25% of revenues.

A. Forecast of Revenue Income

Land

In the absence of tax related income for AUDA, the single largest source of revenue income is lands. Premium on lease of lands and development charges have fetched more than 40 Crores for AUDA during 2004-05 and accordingly the same has been projected to increase further in the future.

User Charges

The collection of user charges has been poor with respect to water supply and sewerage services being provided to the citizens. AUDA proposes to improve upon the collection efficiency and also affect regular revision of the charges for better service delivery as well as cost recovery.

Other Income Sources

Other sources mainly include interest earned from deposits and dues, sale proceeds (scrap sale, farm product, publication, tender form, etc), and miscellaneous income and comprise a minimal quantum of the total revenues.

The growth rate for these sources is assumed at the current average growth rate, subject to a minimum of 7% and a maximum of 15%.

B. Forecast of Revenue Expenditure

The assumptions made in forecasting the items of revenue expenditure are presented in Table 12-5.

Table 12-5**:** Assumption adopted for forecasting items of Revenue expenditure

Item		**Assumptions Adopted for Forecast**	
I	**Establishment expenditure**	Forecast adopting; 1. Nominal annual growth rate	
1	Annual growth rate	Past trend, subject to a minimum of 5 % and maximum of 8% p.a	
II	**Repair & Maintenance on existing services**	Forecast adopting current average growth rate, subject to minimum of 5% and maximum of 8%.	
III	**Additional R&M expenditure due to new investments identified (to be met through the Revolving Fund to be created for the purpose)**	Adopted as % of capital cost, to increase at 6% p.a	
		Water Supply	4.00
		Sewerage & Sanitation	6.00
		Solid Waste Management	10.00
		Environmental Infrastructure	4.00
		Roads & Bridges	4.00
		Street Lighting	16.00
		Social Infrastructure	3.00
IV	**Debt servicing**	**Existing Loans:** To be repaid in as per the repayment schedule provided by AMC. **New Loans** (to fund CIP)- To be repaid in 15 years including 5 years moratorium period with IDC applicable @ 7.5% interest rate p.a.	
V	**Outstanding non-debt liabilities**	If any, to be cleared in 1 to 5 Years starting 2006-07	

C. Forecast of Capital Income and Expenditure

Capital Income

Own Sources

The amount realised under own sources contribute mainly from capital grants, sale of capital assets/ lands, etc. Estimates as available with AUDA for the next five years have been assumed. Also the one-time connection deposits arising out of water supply and sewerage services to be provided out of the planned investments is expected to contribute a significantly.

Regular- Scheme-based Capital Grants

AUDA proposes to the capital grants as may be available from the State Government under various state and Central Government sponsored schemes for specific capital works. The income under such grants does not show specific trends during the last five years. Estimates of such grants as considered to be available for the next five years have been assumed.

Other Capital Income

The other income realised under capital accounts head is from borrowings from government and other institutions. The quantum of external borrowings required is estimated depending on the estimated gap of resources after considering various other capital sources (grants, own sources etc).

Capital Expenditure

The assumptions made in forecasting the items of capital account are presented in Table 12-7.

Table 12-6: Assumption adopted for forecasting items of Capital Income and Expenditure

Item		Assumptions Adopted for Forecast
A	**Capital Income**	To grow based on current average growth rate, subject to standard growth rate of 8%

II	**New Capital Works – Funding Structure**	New Capital works to be funded from
		• 50% of identified investment (excluding social infrastructure)
		  • JNNURM Grants – as percentage of identified investment (excluding social infrastructure) 35% from GoI, 15% from GoG
		  25% JNNURM grants for urban Infra./ Gov. projects shall be contributed by the ULB to SUIF by 2011-12
		  Net of 10% JNNURM grants for Urban poor related projects and related O&M expenses shall be contributed by the ULB to SUIF by 2011-12
		• 50% of remaining investment including social infrastructure
		  • Own Resources- 10% of investment required to be funded from revenue surplus,
		  • Borrowings from other institutions.

B	**Capital expenditure**	

Item		Assumptions Adopted for Forecast
1	Sector-wise capital expenditure	▪ Based on the investment sustainable by AUDA, phased over the plan period. (See phasing of capital investment and sizing of capital investment). The investment needs identified by AUDA has been adopted for the plan period

D. Project Identification

Project identification is based on AUDA's proposed projects and cost estimates together with planned implementation period. The forecast population for the planning horizon- 2011/ 2012 is 19.29 Lakhs. The projects derived based on AUDA estimates are aimed at ensuring optimal and efficient utilisation of existing infrastructure systems. Other developmental projects include projects other than those for core service sector viz. slum upgradation, environmental management, etc.

The total estimated capital investment requirement for providing services for the population of AUDA by the year 2011/21 is Rs. 3712 Crores (Refer Table 12-7).

Table 12-8 presents the summary of sector-wise investment requirement for the core service sectors. Roads and Bridges sector accounts for the maximum investment at 62%, followed by sewerage and drainage sector at 11% of the identified investment. Water supply accounts for 7% and Housing and Slums' improvement accounts for 13% of the investment. Social infrastructure is also given importance at 4% of the identified investment.

Table 12-7 Summary of the Sector-wise Investment Requirement in AUDA
(Current Prices – Rupees Lakhs)

Sector		Total	Investment in Rs. Lakhs						
			2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
1	Housing/ Slums - Infrastructure	50000	3000	8000	8000	8000	8000	8000	7000
2	Roads/ Bridges	229500	16000	39000	44500	36500	30500	35000	28000
3	Sewerage & Drainage Lines	40200	2700	9000	9000	9000	6000	3500	1000
4	Water Supply	25200	-	7000	5500	6500	3000	3200	-
5	Environment	8900	100	1600	2200	1700	1300	1000	1000
6	Solid Waste Managemnt	5360	-	1400	1600	1400	960	-	-
7	Urban Governance	3000	100	500	500	500	500	500	400
8	Dev. of Bus & Truck Terminals	1000	100	200	200	200	300	-	-
9	Street Lighting	3000	300	450	450	600	600	600	-
10	Social Infrastructure	5000	-	1000	1000	1000	1000	1000	-
	Toral	**371160**							

12.3.2 Sizing of Capital Investment

The phased investment is loaded onto the FOP model, and based on the assumptions adopted the cash flows of AUDA are forecasted till F.Y 2014-15. The criterion for ascertaining investment sustainability is

- A year-to-year positive Opening Balance during the plan period.
- Debt servicing expenses not to exceed 25% of revenues and

In cases where AUDA does not show a positive closing balance during all years of the plan period, the investment needs to be scaled down uniformly across all sectors of identified investment, till the above criterion are met. The investment level at which all the years of the plan period show a positive closing balance is the sustainable investment by AUDA.

12.3.3 Results of the FOP

The FOP is generated for the sustainable investment while also incorporating availability and adequacy of internal revenues to cater to the additional Repair and Maintenance works that would arise out of the proposed capital investment.

The 10-year FOP for AUDA is presented in Annexure 12.4. It may be noted that, under the assumptions made and availability of grants under JNNURM Framework, AUDA records 89% sustainability. That is **AUDA can sustain 89% of the identified investment**, that is Rs. 3303 Crores (current prices). At 89 percent sustainability AUDA maintains a positive closing balance during all the years of the planning horizon. AUDA would however have operating deficit during 2009-10 to 2011-12 while maintaining overall surpluses. AUDA however will be able to tide over the situation in the immediate year while maintaining prompt repayment of all outstanding and new loans and non-debt liabilities.

The JNNURM framework will assist AUDA in keeping its soundness of financial condition intact and provides the leverage to take up additional investments towards creation of better infrastructure for its ever growing populace. The results of the FOP in terms of the total identified investment and source-wise funding of the sustainable investment for the AUDA is presented in Annexure 12.4.

12.3.4 Fund Requirement

The funding for the sustainable investment of Rs. 3303 Crores at current prices as worked out in the FOP model would be by way of:

- JNNURM Grants — Rs. 1629 Crores (49%)
- Scheme Specific & Other Capital Grants — Rs. 458 Crores (14%)
- Regular Capital Income — Rs. 550 Crores (17%)
- AUDA & Users' Contribution — Rs. 2 Crores (0.1%)
- Cost Recovery & PPP Frameworks — Rs. 645 Crores (20%)
- External Loans — Rs. 19 Crores (1%)

It is important to mention here that with operationalisation of the recent decision of the state for inclusion of the peripheral areas, hitherto under the jurisdiction of AUDA into AMC jurisidiction, would provide an additional revenue source in the form of property tax and octroi. This would substantially increase the investment sustainability. It also needs mention that AMC has indicated excess sustainability to the tune of Rs. 716 Crores. These would make the entire identified investment for AMC and AUDA sustainable.

12.4 Monitoring and Evaluation

In adition to the process of monitoring set by GOI and the Gujarat Urban Development Mission, it is proposed to mainstream outcome monitoring as part of an Annual Report to the standing committee. The focus will be in terms of progress on development plan implimnetation and the outcomes. The inputs to the annual report will be by way of studies in the years 2006, 2009, 2012 and 2014. This will be by way of analytical studies and household perception surveys.