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Chapter 4 Public Transportation System in the city

4. PUBLIC TRANSPORTATION SYSTEM IN THE CITY

4.1 Introduction to the Public Transport System

The Ahmedabad Municipal Transport Service (AMTS) functioning under the Ahmedabad Municipal Corporation (AMC), is responsible for providing the public transportation system in the city. The responsibility of providing inter-city state operations lies with Gujarat State Road Transport Corporation (GSRTC). Over the years, the AMTS has seen a rapid decline in its ridership levels, on account of stiff competition from rising two-wheeler ownership levels, lack of route rationalization and inability to upgrade its infrastructure to cater to the existing public transport demand in the city. The inability of AMTS to cater to the city's demand has resulted in people shifting to auto-rickshaw, the shared auto-rickshaw (*chakdas*) and two wheelers.

4.2 AMTS - Organization, Structure and Performance

AMTS came into being on 1st April 1947 with a fleet of 112 buses when the municipal administration declared nationalization of the private companies that were plying buses in the city. The AMTS was established under the provision of Bombay Provisional Municipal Act, 1949, which functions as one of the main wings of the corporation.

4.2.1 Management and Administration

The organization is under the administrative control of a statutory committee viz., Transport Committee formed by General Board of AMC. However, the financial control lies with the General Board of the AMC. The AMTS has no capital base and AMC is providing financial assistance to AMTS, on requirement basis, in the form of an interest-bearing loans. The Transport Committee comprise of nine members, including Chairman; drawn from various fields, one of them being AMC's Standing Committee Chairman. These members need not necessarily be elected Municipal Corporators. Transport Manager who exercises all administrative and operational powers under the control and supervision of Transport Committee heads the administration of AMTS. The Transport Manager, however, is not a member of Transport Committee.

4.2.2 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 4-1: Level of Operations of AMTS (1948-2005)

Year-ending 31 st 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

A foremost reason for the decline in number of passengers is the decline in number of short-distance passengers due to the rise in fares and decline in the service. A significant decline in the AMTS fleet and services coupled with a significant growth in IPT modes like Auto-Rickshaw or Chhakda has been the main reasons for the decline in the market-share of AMTS.

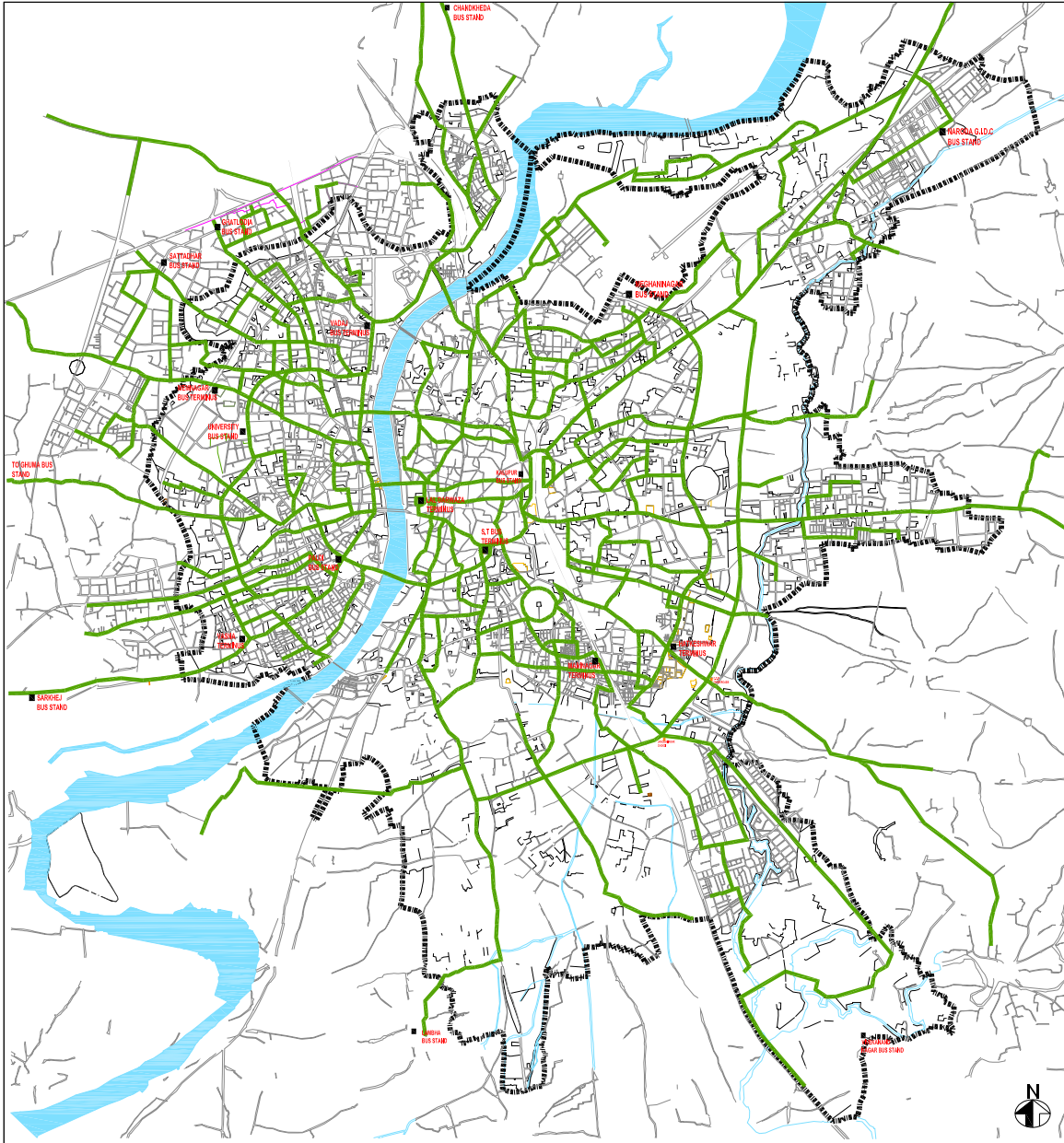
At present AMTS have bus terminals at eleven locations in the city: Lal Darwaja, Kalupur, Sarangpur Maninagar, Hatkeshwar, Vasna, Memnagar and Vadaj being the prominent ones. A repair and maintenance workshop is located at Jamalpur, which caters to the needs of the entire AMTS fleet. The AMTS has not been able to keep up with the growing bus demand and has been operating age-old buses, which has led to an increase in their operational and maintenance expenditure and reduced efficiency. Frequent breakdowns are common phenomena.

Table 4-2: Existing AMTS Fleet

Year	% Fleet by Age in Years				Fleet Size	Buses on Road
	1-4	5-8	9-10	11 & Above		
1981	19.67	26.23	14.75	39.39	610	513
1991	27.38	13.89	8.86	49.87	750	594
2001	7	37	6	51	886	729
2005-March	0.55	31.30	37.04	31.11	540	371
2005-June	0.39	12.06	52.17	35.37	506	-

Source: AMTS

Map 4-1: AMTS Route Network



 AMTS BUS ROUTES

Derived From: AMTS

4.2.3 Acquisition, Replacement and Composition of Fleet

Since 2000 onwards, there has been a steady decline in the fleet. Apart from the total fleet, the over-aged fleet within the total fleet (i. e. the fleet having completed its life) has increased considerably in the recent years, resulting into unreliability in services as well as increased cost of repairs & maintenance. The share of over-aged buses in the fleet is high with an average age of 11.5 years. This has been reflected in decline in the fleet-utilization (Refer Table 4-3).

Table 4-3: Average Fleet Utilization of AMTS

Year	Average fleet held	Average fleet on road	% age fleet utilization	Avg. Age of fleet (Years)	Average Age of Fleet (Kms)
1991-2	744	612	82.26	12.06	736216
1992-3	741	593	80.03	12.01	746922
1993-4	753	604	80.21	13.26	815047
1994-5	715	589	82.38	14.44	891214
1995-6	708	598	84.46	14.10	879939
1996-7	779	659	84.60	11.56	729090
1997-8	852	693	81.34	10.48	673227
1998-9	882	738	83.67	11.48	728739
1999-0	903	752	83.28	11.75	742000
2000-1	905	729	80.55	11.82	716746
2001-2	869	630	72.50	11.54	673672
2002-3	743	410	55.18	10.94	N.A.
2003-4	620	382	61.61	10.47	-
2004-5	551	371	67.33	11.54	-

Source: AMTS

The table indicates that the fleet-utilization ranging between 80 % to 84% during 90's, remarkably declined during the recent four years to as low as at 67%.

Table 4-4: Year-wise Service-km to Scheduled km, Average Breakdowns, Bus Accidents and Average age of bus

Year	Service-km to Scheduled km (%)	Average Daily Breakdowns	Average Breakdowns per 10000 km. Run	Bus Accidents/ lakh km.	Average Age of Bus
1961-62	N.A.	16	3.07	6.54	N.A.
1970-71	N.A.	72	9.13	4.47	N.A.
1980-81	88.35	71	7.38	1.85	9.8
1990-91	90.48	53	4.61	1.52	11.21
1991-92	94.2	51	4.26	1.41	12.06
2000-01	89.21	69	4.34	0.82	11.82
2005	80.96	52	6.39	0.72	11.54

Source: AMTS

4.2.4 Route Structure and Network

The structure and network of routes play an important role. The bus routes are more of an evolution over a period rather than based on any systematic study of travel demand. In Ahmedabad too the routes of AMTS are historically inherited and are adjusted/ patched up

with the passage of time. Consequently, though the city has grown rapidly, both on eastern as well as western periphery, a large no. of routes still continue to terminate or pass through the walled city viz., at Laldarwaja or Kalupur.

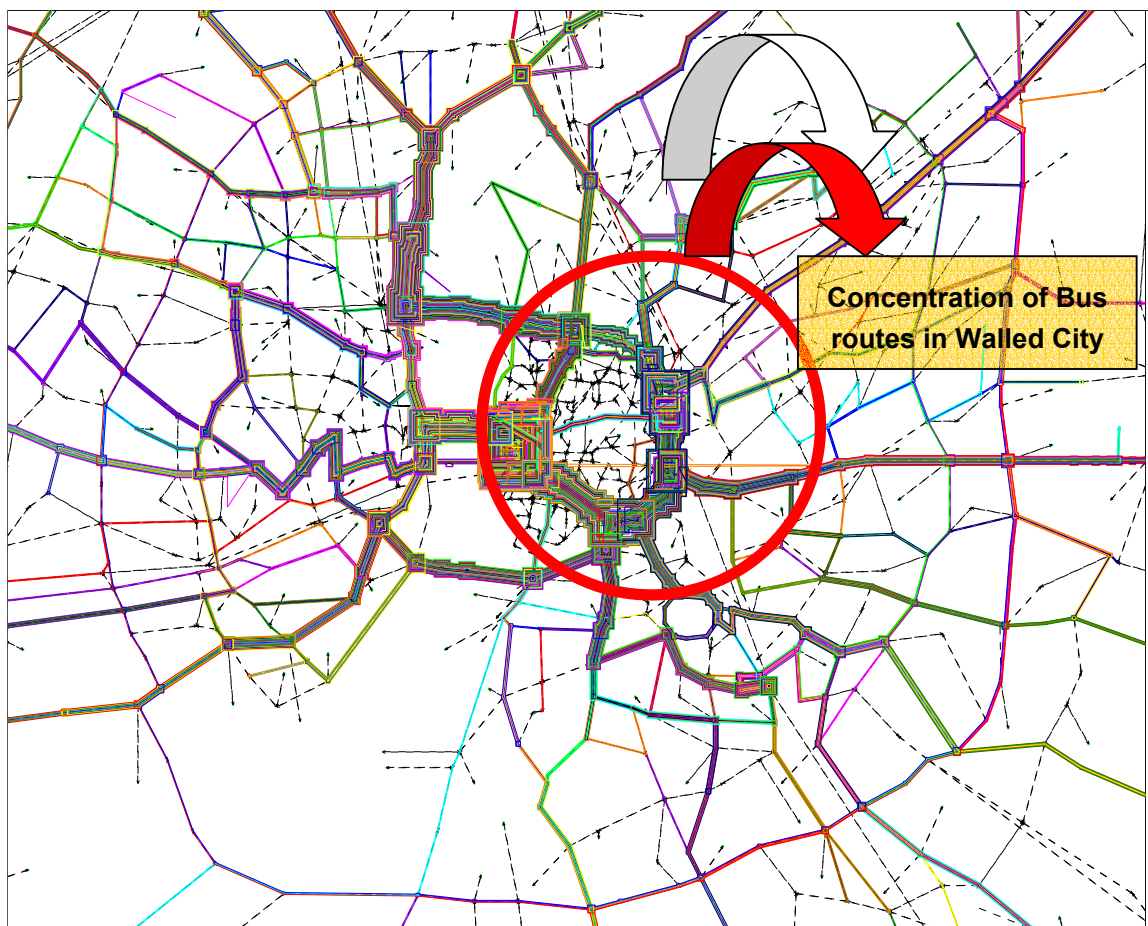
AMTS extends its operations over an area of 250 sq.kms with a fleet of 540 buses per day. A majority of the bus routes are structured around the work centers that used to exist in and around the wall city. But the scenario now has changed with development of major sub-centers on the western parts of city, in addition to the new commercial development along roads such as C.G.Road, 132' ring road and S.G.Highway. These places have also become the new entertainment destinations with upcoming malls and multiplexes. The existing AMTS route structure falls short of catering to these new developments. Moreover, in catering to a large area, the services are spread thinly and buses have to cover large distances irrespective of a sustainable demand along the route throughout. This has also led to longer journey times and waiting times at the bus stops. AMTS route lengths average about 17 kms and range from 5 kms to 57 kms. About 55 per cent of buses operate on route having lengths of 10 to 20 kms, having a running time of 30 to 90 minutes.

The average speed of an AMTS bus is 15km/hr and the average waiting time at bus stops is around 15 minutes (Louis Berger, 2000). Moreover the inefficient road network and buses plying on parallel routes have worsened the situation.

The bus trip demand analysis for the year 2000¹ indicates a favorable bus traffic volume along the 132' ring road, ISKCON Temple-Kalupur and Thaltej - Kalupur. The high passenger volume seen along Ashram road is primarily because of the fact that it serves as a thoroughfare stretch for the all the bus routes plying from the bus terminals on the eastern side to the western part. The Old NH-8 stretch between Naroda and Narol also has a high travel demand. This route caters to the low-income groups residing along the Naroda-Narol highway and employed in various industrial estates beyond the highway, such as Naroda, Odhav and Vatva.

¹ The year 2000 has been considered as the base year for demand projections as AMTS had the maximum buses plying on road in its entire history in this year.

Fig 4-1: AMTS-All Routes



Derived From: AMTS

Most of the bus routes invariably pass through the walled city area and hence the city center is well connected to most parts of the city (Refer Fig.4-3). In 2000, of the 11,800 trips that the buses performed per day, 10,600 trips enter the Walled City. Of the 164 routes that AMTS operated, 113 routes (70%) originate or terminate in the Walled City, as three of the eleven bus terminals are located in the walled city itself. These three terminals cater to the city center, S.T. Depot and the Kalupur railway station. But areas, which are located in AUDA jurisdiction on the western periphery, do not have good bus connectivity with the eastern city considering the fact that there are a large number of west to east trips that occur in the city, due to location of industrial areas and work centers in the eastern parts of the city.

4.2.5 Fares and Occupancy Levels:

The AMTS has been realizing the average effective fare in an increasing mode on account of periodical fare-rises. However, these rises have not been adequate enough to break-even

the operations of AMTS. The details of fares realized, average lead of commuters and occupancy levels of AMTS over a period are given in table below:

Table 4-5: Year-wise Fare Levels and Occupancy Ratio

Year	Average fare realized per seat km. in paise	Average passenger lead (kms) (Pass.kms / no.ofpassenger)	Occupancy Ratio (%)
1990-1	9.75	6.69	58.91
1991-2	12.04	7.16	70.83
1992-3	13.40	7.16	65.25
1993-4	14.97	7.51	63.01
1994-5	16.36	7.63	62.30
1995-6	16.98	7.77	66.85
1996-7	17.41	7.71	68.52
1997-8	19.54	7.68	62.49
1998-9	19.61	7.69	59.30
1999-0	19.80	7.80	55.72
2000-01	22.17	7.95	53.08
2001-02	24.92	7.90	54.21
2002-03	24.28	7.92	57.19
2003-04	24.42	7.82	49.99
2004-05	-	8.09	54.74

Source: AMTS

The table clearly reveals that there has been a steady decline in the occupancy ratio from around 71% during 1991-92 to around 54 % during 2004-05. This is indicative of the fact that AMTS has remarkably lost patronage to its services.

4.2.6 Financial Performance

The AMTS, as is common with other City Transport services in the nation, records losses in its operations. Some of the reasons contributory the losses could be a lack of political will to raise fares corresponding to the increase in the input prices, providing concessional travel facilities to large number of students, non-payment of travel charges by police personnel in the city, subsidized bus-travel facilities to senior citizens and physically challenged personnel, etc. besides typical unidirectional movement of commuters in the morning peak and evening peak, late night and early morning services, lower speed of buses resulting into lower productivity of personnel as well as buses, etc.

Table 4-6: Financial Performance of AMTS

Year-ending	Traffic Revenue	Other Revenue	Total Revenue	Gross Costs	Deficit
1982	1156.97	37.94	1194.91	1474.70	279.79
1991	2506.98	340.27	2847.25	3761.03	913.78
1992	3202.83	428.80	3632.63	4436.32	803.68
1993	3510.21	208.35	3718.56	4951.54	1272.98
1994	4264.94	313.19	4536.22	5501.60	965.38
1995	4572.08	187.19	4759.27	5766.99	1007.72
1996	4937.76	367.36	5305.12	6169.03	863.91

Year-ending	Traffic Revenue	Other Revenue	Total Revenue	Gross Costs	Deficit
1997	5723.76	283.96	6007.72	7528.44	1520.72
1998	6921.90	234.75	7156.65	8723.21	1566.56
1999	7420.92	295.41	7716.33	10286.04	2569.71
2000	7685.09	356.01	8041.10	12214.01	4172.98
2001	8223.14	318.64	8541.78	13752.29	5210.51
2002	7607.96	448.99	8056.95	11996.53	3939.58
2003	4734.33	250.37	4984.70	10134.53	5149.84
2004	4548.37	1181.85*	5730.22	11161.79	5431.58
2005	5266.78	328.35	5595.13	9618.61	4023.48

Source: AMTS

* 114 old buses sold as steel scrap

On account of these losses from year to year, as at the end of year 2002-03 the accumulated losses to AMTS were as high as Rs.34960 lakhs.

Table 4-7: Financial Performance of AMTS

Year	Personnel	Fuel & oil	Spare parts	Depreciation	Loan charges	Lease rent /fees	Rates & taxes	Others	Total
80-81	147.3	69.7	43.0	20.0	40.0	0.00	9.7	16.7	346.4
90-91	462.0	148.5	77.4	21.9	109.5	27.8	18.2	59.2	924.5
91-92	487.6	173.9	91.7	15.5	137.9	50.3	19.5	77.9	1054.3
92-93	580.6	193.4	105.0	16.4	157.8	90.4	23.6	58.0	1225.2
93-94	591.0	219.7	111.3	13.8	168.4	103.8	23.7	37.9	1269.6
94-95	668.4	242.7	127.7	13.5	186.1	59.8	26.3	47.9	1372.4
95-96	756.8	239.5	124.8	14.8	159.1	52.6	26.1	36.0	1409.7
96-97	782.1	274.9	130.9	9.6	165.9	101.8	33.0	38.8	1537.0
97-98	803.8	321.9	127.0	10.3	177.6	154.7	29.8	61.2	1686.3
98-99	1008.1	326.7	105.4	10.8	200.0	158.7	19.1	48.3	1877.1
99-00	1135.6	394.7	113.2	8.4	252.0	165.1	31.5	43.2	2143.7
00-01	1305.2	501.3	108.7	8.4	324.3	168.2	24.0	20.9	2419.2
01-02	1307.1	572.1	103.7	8.5	435.2	112.0	28.3	75.7	2642.6
02-03	1715.3	614.4	110.5	11.4	798.0	91.0	27.5	26.2	3394.3
% rise over 90-91	271.3	313.7	42.8	(-)47.9	628.8	227.3	51.1	(-)55.7	267.1
% rise over 97-98	113.4	90.9	(-)13.0	10.7	349.3	41.2	(-)7.7	(-)57.2	101.3

Source: AMTS

4.2.7 Decline in Patronage:

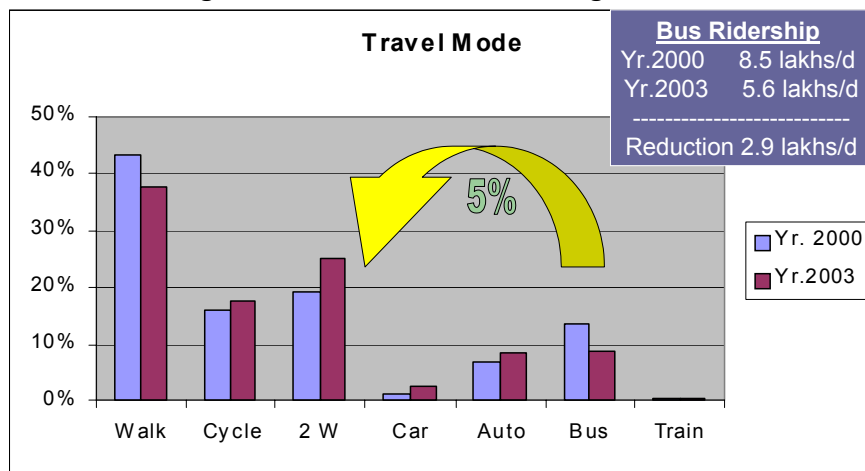
It was after the year 2000, that the bus patronage levels in AMTS started to decline drastically, due to insufficient bus fleet to cater to the ever-increasing needs of the population in the city, and stiff competition from intermediate modes of transport such as shared auto-rickshaws plying on the same routes as the buses. The fleet size of AMTS has come down from 886 buses in 2001 to 540 in 2005.

Table 4-8: Decline in AMTS Patronage levels

Year	Approximate Population covered by AMTS (In Lakhs)	Fleet Size	Average Number of Buses on road	Population to Bus ratio	Estimated Person Trips/day (lakhs)	Person Trips/day (lakhs) by AMTS	% Trips/day using AMTS
1961-62	12	-	294	4102	-	-	-
1970-71	17	-	432	4030	-	-	-
1980-81	27	610	513	5267	31.7	7.86	25
1990-91	35	750	594	5973	42.7	6.20	15
2000-01	43	886	729	5898	60.0	6.78	11
2005	47	540	371	12668	-	3.50	-

Source: AMTS

Fig 4-2 : Decline in Bus Patronage Levels



Derived From: AMTS, IPTS Study by Louis Berger, 2000.

The bus patronage declined very sharply from 2001 to 2003 by almost 5% with a comparable increase in the two-wheeler ownership.

4.2.8 Up gradation Plans-CNG Routes:

The State Government has approved 126 routes that could have CNG/LPG as fuel to meet the Bharat -II norms. Of these AMTS has so far introduced about 97 CNG buses on some of the routes in the city since 9th April 2005. The operators have been asked to ply their buses on per km basis on these routes. The contract is of five years duration with option of additional 2 years. According the contract the minimum distance to be covered by the operators in a day is 233 kms. AMC has reserved the rights of advertising with them, (as a means of revenue generation).

Table 4-9: Routes on which CNG Buses have been introduced

Sr.No.	Route Nos	Private Operators		AMTS Bus
		Mini Bus	Conventional Bus	
1	1	2	-	-
2	4	2	-	-
3	5	2	-	-
4	18	4	-	-
5	31	10	-	-

Sr.No.	Route Nos	Private Operators		AMTS Bus
		Mini Bus	Conventional Bus	
6	34/5	5	-	-
7	52/2	15	5	-
8	71/1	10	-	-
9	89/3	10	-	-
10	137 S	10	-	-
11	146/1	10	-	-
12	200	0	0	3
13	300	0	9	0
Total		80	14	3
Total CNG Fleet		97 Buses		

Source: AMTS

4.2.9 Observations:

The total absence of capital base to finance various capital expenditure, both for replacement of worn out buses as also for expansion in fleet to meet with the growing needs of the city, has severely eroded financial health of AMTS by requiring it to resort to a very costly alternative of lease-finance and interest-bearing loans from AMC.

The AMTS is also required to cater to the social responsibilities in terms of providing subsidized travel facilities to large number of students, movement of police personnel in the city, physical challenged personnel, senior citizens, etc. without any reimbursement of amount of subsidy. This social responsibility, which is not obligatory on AMTS, causes unnecessary burden on its financial health.

Considerable time lag in AMTS decision on revision in fares commensurate with increase in input-prices and the actual approval by State Government, for its implementation, results in heavy losses in intervening period.

The clear absence of any effective monitoring system has resulted in the ongoing deterioration in operational efficiency including remarkable erosion in fleet utilization and occupancy - ratio of buses operated.

The poor enforcement in controlling the IPT modes of three wheelers and allowing them to operate as virtually stage carriage vehicle in contravention of legal provisions as also on roads prohibited for such operations has greatly eroded into legitimate revenue of AMTS. In number of cases these 3-wheelers operate as parallel services, carry stage-to-stage passengers on per head fare, besides overloading to very unsafe levels.

The inadequate infrastructure facilities such as full fledged depots as profit centers, also act as constraint to the efficient management of services.

4.3 Regional Transportation System-GSRTC:

GSRTC bus services are a very important component of regional travel focused on Ahmedabad. Overall 20 percent of study area trips and 80 percent of trips beyond the study

area are carried by GSRTC buses. GSRTC run buses form a vital component of the transportation system of the city. They bring in sizable number of commuters from surrounding towns and villages, and most of these commuters avail of the city's public transportation system once they terminate their journey at one of the many GSRTC drop-off points. These buses connect Sanand, Kalol, Dehgam and Bareja and other major locations with the strategic areas in Ahmedabad in a radial pattern. Everyday, approximately 200,000 (two-way) passengers arrive at the central business district in GSRTC buses and 180,000 of these leave the terminal to reach their final destination by a mode other than GSRTC bus.²

Table 4-10: GSRTC Operation from the City

Sr. No.	Location	No. of Buses
1	Gandhinagar	330
2	Mehemdabad	179
3	Bareja	40
4	Kalol	330
5	Sanand	153
6	Dehgam	217

Source: IPTS Study, Louis Berger, 2000.

The public transportation system for the city needs to be integrated with the regional transport service to have an efficient transfer of commuters from the regional transportation service onto the city transportation service. The GSRTC has identified some locations in the city where they have planned to develop terminals, to decongest the existing GSRTC terminal located at Geeta Mandir. These interception terminals could be effectively interlinked with the public transportation system. The five main corridors by which GSRTC buses come to the city center are **(Refer Map 4-2)**:

- Naroda-Dehgam, Naroda Himmatnagar
- Sarkhej-Bavla-Bapunagar-Rajkot-Jamnagar, Sarkhej-Viramgam
- Kalol-Mehsana
- Bareja-Baroda
- Odhav-Kapadvanj

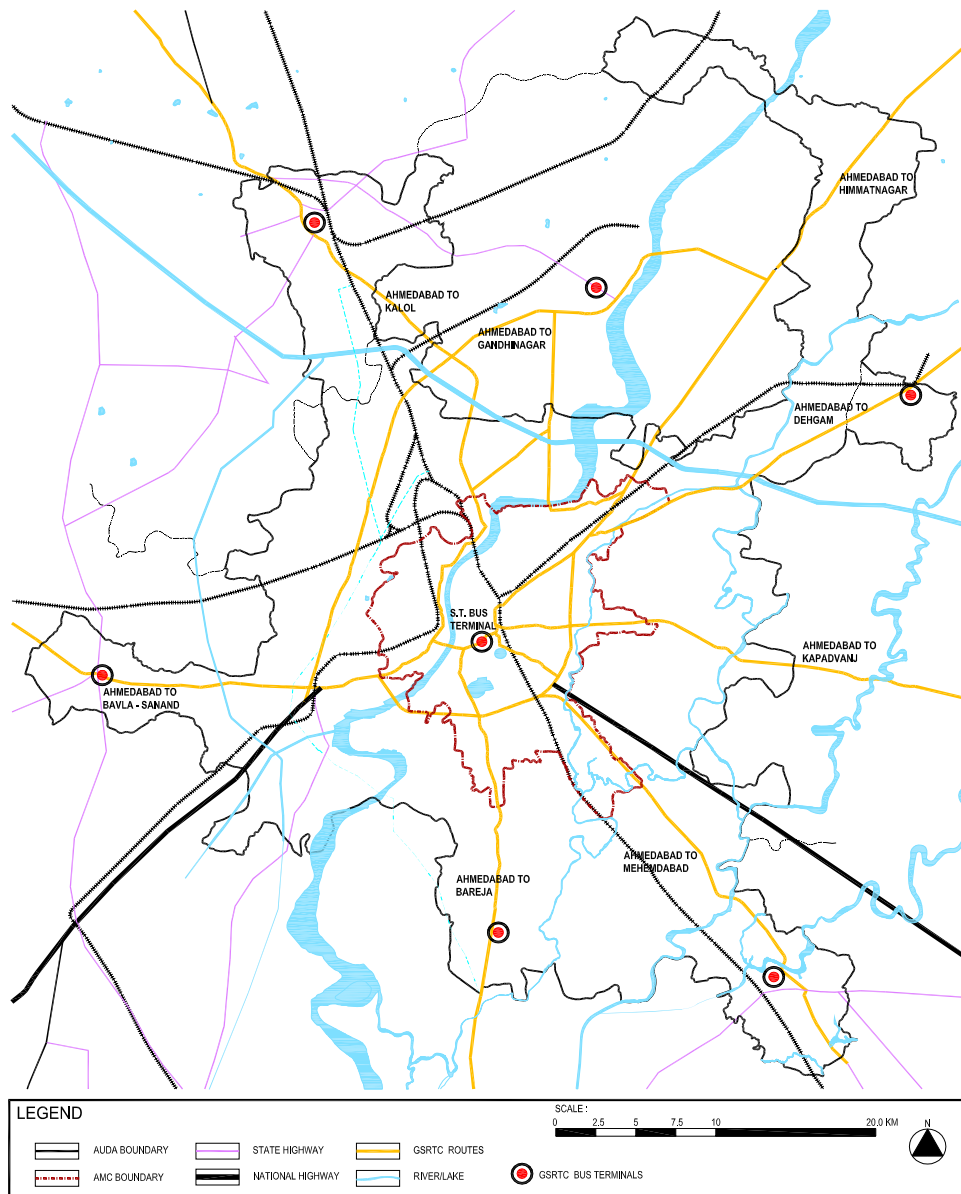
4.4 Railways:

The railway network is broadly divided into the broad gauge and meter gauge railway lines **(Refer Map 4-3)**. The Kalupur and Maninagar Railway stations cater to about 100 inter-state trains, out of which around 10 are commuter services. The total passenger traffic flow at Kalupur station is around 25,000 daily commuters and 22,000 long distance travelers.

² Louis Berger, Feasibility Study on Ahmedabad Integrated Public Transit System, 2000.

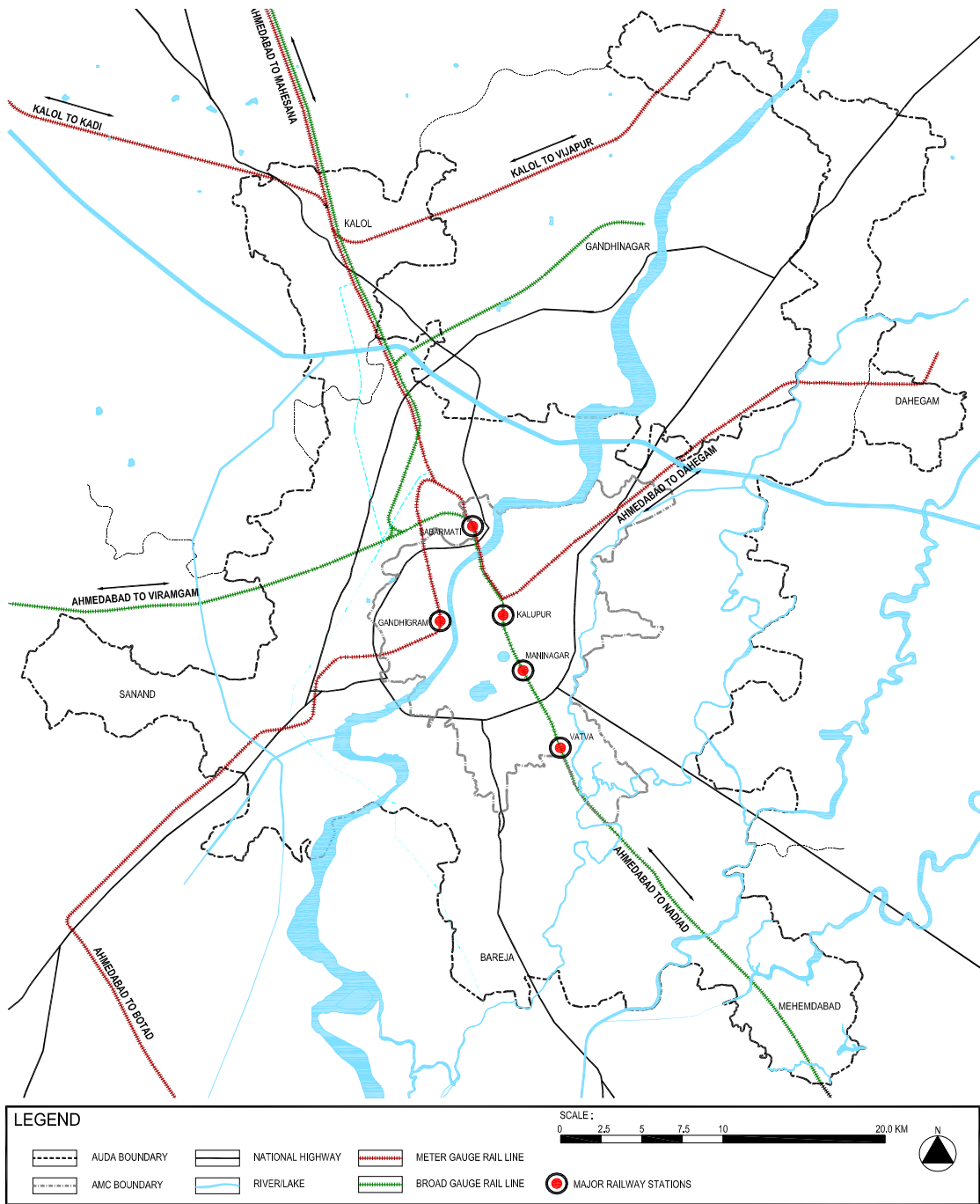
Kalupur and Maninagar railway stations are reasonably well connected to different parts of the city through the bus service. The only rail link between the western and eastern parts of the city across the river is a rail bridge between Sabarmati and Shahibaug. The trains arriving from Bhavnagar and Surendranagar take the meter gauge route from Vejalpur-Gandhigram-Sabarmati-Kalupur. Most of the passengers tend to get off at Gandhigram station itself as the time taken by rail to reach Kalupur from Gandhigram is around one hour, whereas it is much lesser by road. Approximately 50,000 trips are generated from Kalupur station.

Map 4-2: GSRTC routes in the city



Derived from: IPTS Study by Louis Berger, 2000.

Map 4-3: Showing Railway Network



Derived from: IPTS Study by Louis Berger, 2000

4.5 Intermediate Public Transport Modes:

The intermediate modes for public transport such as the shared auto rickshaws known as “Chakdas” have proved to be stiff competition for the AMTS buses. They ply on the same

routes as AMTS at comparative fares. Some of the major routes where these shared auto rickshaws (6-8 seater and 3 seater) ply are as follows:

- Hatkeshwar
- Civil-Wadaj
- Vadaj-Naranpura
- Narol-Naroda
- Narol-Sarkhej
- Vasna-Naranpura.

4.6 Private Bus Operation

Even though private buses are only supposed to operate from point to point they often pick up and drop off passengers along the way. About 35,000 to 40,000 passengers leave and an equal number arrive by private bus in the study area each day. About 1,000 long distance buses are operated daily from Ahmedabad. Private bus operators normally provide bus service from Gitamandir (near the CBS), Paldi, Shahibagh, Shahpur/Dehligate, Kankaria/Maninagar, and Bapunagar.

- 5.1. Introduction
- 5.2. Socio- Economic Characteristics
- 5.3. Travel Characteristics
- 5.4. Spatial Pattern of Passenger Movement
- 5.5. Summary

Chapter 5 Travel Characteristics

5. TRAVEL CHARACTERISTICS

5.1 Introduction

Travel patterns, defined in terms of trip rate, mode choice, geographical distribution etc., are the guiding principles in determining the system needs. These are determined by household / person characteristics such as income, age, sex, occupation, vehicle ownership etc., This chapter, after a brief description of critical household characteristics, attempts to describe the travel characteristics in Ahmedabad based on the IPTS Survey in 2000 and Metro Study survey in 2003.

The system needs include roadway, transit, bicycle, and pedestrian facilities, as well as services and programs that promote the use of alternate modes and other measures intended to improve the efficient use of transportation facilities.

5.2 Socio-Economic Characteristics

5.2.1 Age wise distribution of Population

As per the survey, 80% of the total population is in the active age groups. About 58% of the population are in the working age group years and another 29% in the age-group of students. About 8% of the population belongs to retired and old age category.

5.2.2 Activity Status

As presented in table below about one third of the persons are workers, about one fifth are learners who mainly contribute to two major purposes of travel; work and education. Of the 30 % workers dependency on private service or own business is in almost equal proportion (together 25-28%) with only about 4 percent engaged in government service.

Table 5-1: Distribution of Persons by Activity Status

Area	Occupation														total	% age
	govt. service	% age	private service	% age	business	% age	un-employed	% age	student	% age	house-wife	% age	Others	% age		
Walled city	8208	2	47199	13	55575	16	13307	4	70309	20	113327	32	46817	13	354743	100
AMC west	37594	5	79850	11	99842	13	22519	3	168114	22	233662	31	114200	15	755780	100
AMC east	84978	3	366688	15	267391	11	122712	5	512170	20	771237	31	374947	15	2500123	100
Remainder	121411	5	203333	9	350853	15	103109	4	474312	20	704589	30	363545	16	2321151	100
Total	252191	4	697070	12	773660	13	261648	4	1224905	21	182281	31	899509	15	5931798	100

Source: GIDB IPTS Study (2000) by LBA

5.2.3 Income Distribution

Vehicle ownership, mode choice and expenditure on transport are dependent on the income levels of the household. The income data available from 2000 study reveals that nearly two third of the population of Ahmedabad falls under the category classified as economically weaker section and low-income group.

Table 5-2: Distribution of Income levels in the study area

Area	Economically Weaker Sections	%age	Low Income Group	%age	Middle Income Group	%age	High Income Group	%age	total
Walled city	19777	28	32871	47	14960	21	2520	4	70128
AMC west	29438	19	56870	36	47500	30	24993	16	158802
AMC East	170870	35	210974	43	89611	18	20494	4	491948
Rest of the study area	157883	32	200043	40	99176	20	41275	8	498376
Study area average	377967	31	500758	41	251247	21	89282	7	1219254

Source: GIDB IPTS Study (2000) by LBA

There are a large number of households with low-income and hence the dependence on walk and bicycle continue to be significant. Bus as mode of transport also has a potential. Similar trends have been observed in the recent survey of GIDB Metro Study (2003) by DMRC. The distribution is more balanced when compared to Surat and Bangalore.

Fig 5-1: House Hold Distribution in Selected Cities

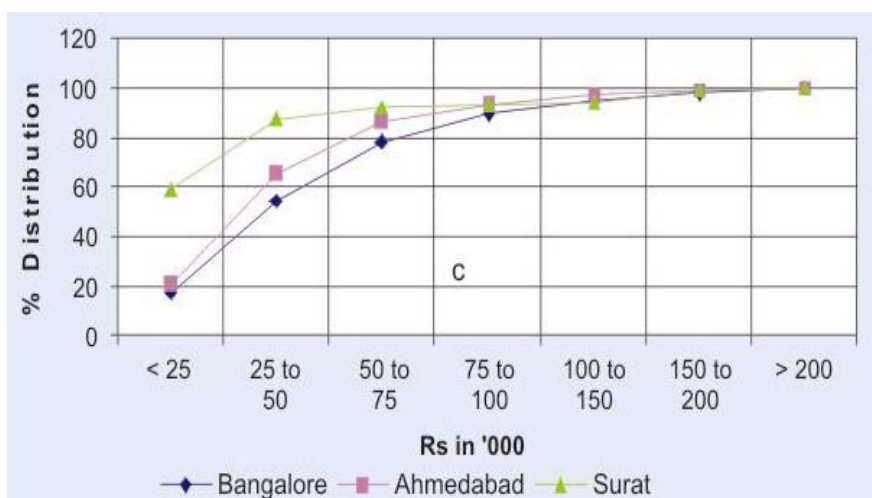


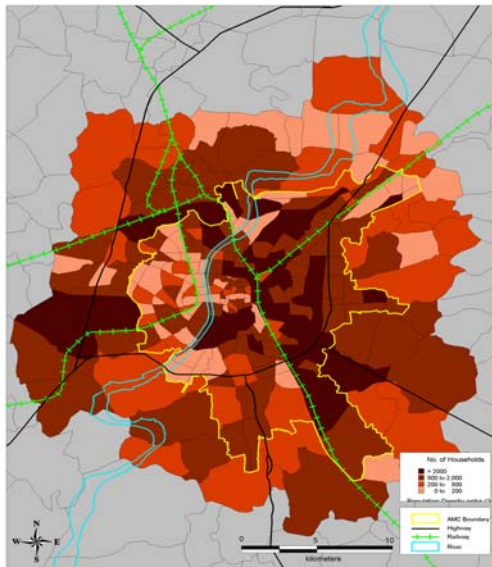
Table 5-3: Distribution of Household According To Monthly Income

SL. NO.	Income groups	Number of individuals in sampled households	Percentage
1	<= Rs5000	2232	42.54
2	Rs 5001-Rs 10000	1790	34.11
3	Rs 10001-Rs15000	625	11.91
4	Rs 15001-Rs 20000	303	5.77
5	> Rs 20000	276	5.26
6	No response	21	1.4
	Total	5247	100

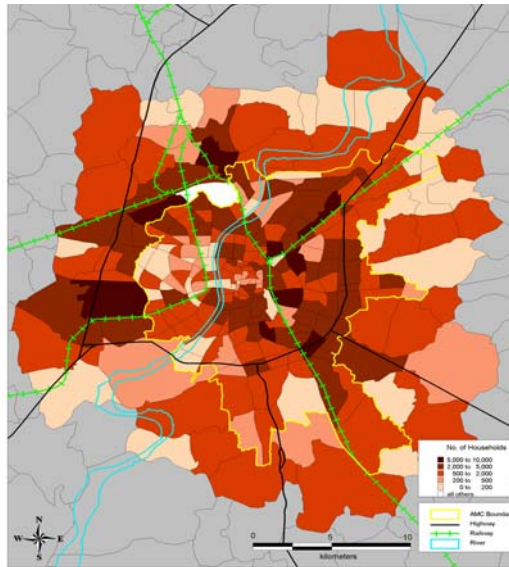
Source: DMRC (2003)

Map 5-1: Income group wise Distribution of Population

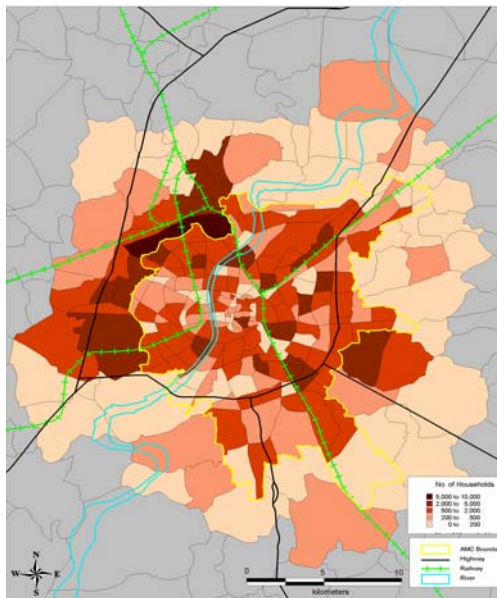
EWS Households



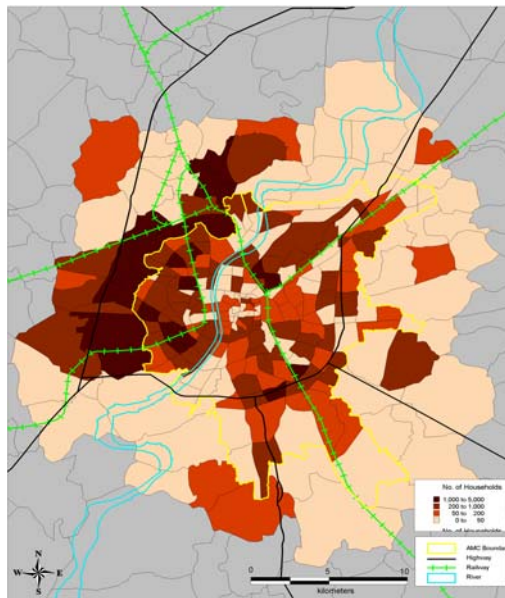
LIG Households



MIG Households



HIG Households



Derived from GIDB IPTS Study (2000) by LBA

5.2.4 Vehicle Ownership

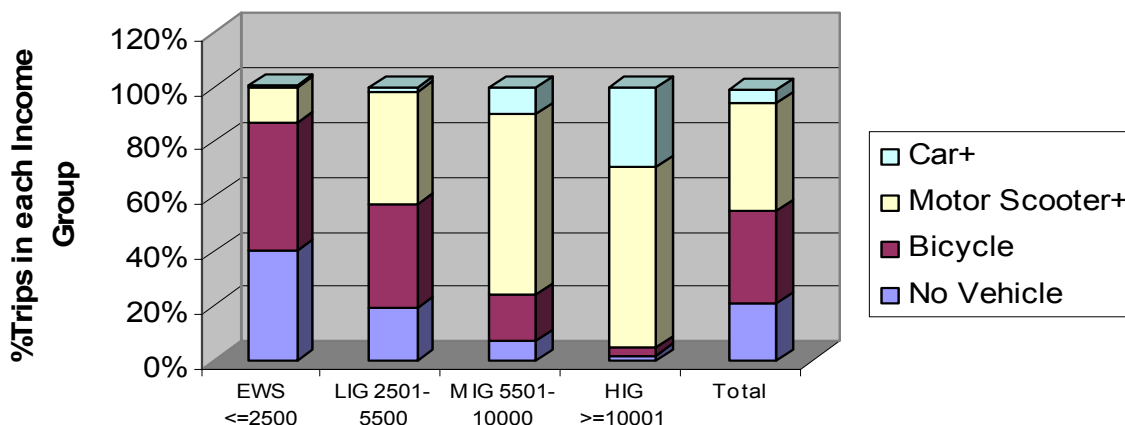
Vehicle ownership indicates the socio economic status of the household. Surveys reveal that nearly 95 five percent of the households falling in the category of high income group own a motorized vehicle in comparison to the 76 percent under middle income and 43 percent in low income group. Under the economically weaker sections and low income groups the most common mode of vehicle owned is the bicycle. The table below enumerates the vehicle ownership percentage of the households falling under the different income group categories.

Table 5-4: Household Vehicle availability within Income groups

Household Income (Rs./month)	Household Vehicle Availability				
	No Vehicle	Bicycle	Motor Scooter+	Car+	Total
EWS <=2500	40%	47%	13%	1%	100%
LIG 2501-5500	19%	38%	41%	2%	100%
MIG 5501-10000	7%	17%	66%	10%	100%
HIG >=10001	2%	3%	66%	29%	100%
Total	21%	34%	39%	5%	100%

Source: GIDB IPTS Study (2000) by LBA

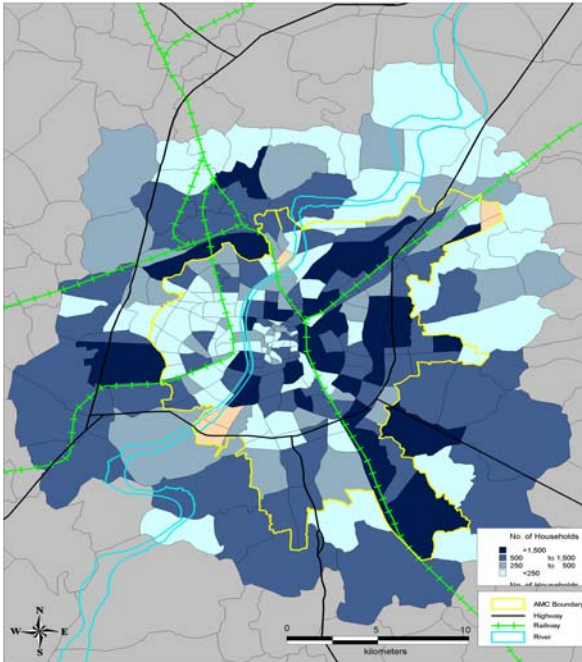
Fig 5-2: Income and Vehicle Ownership



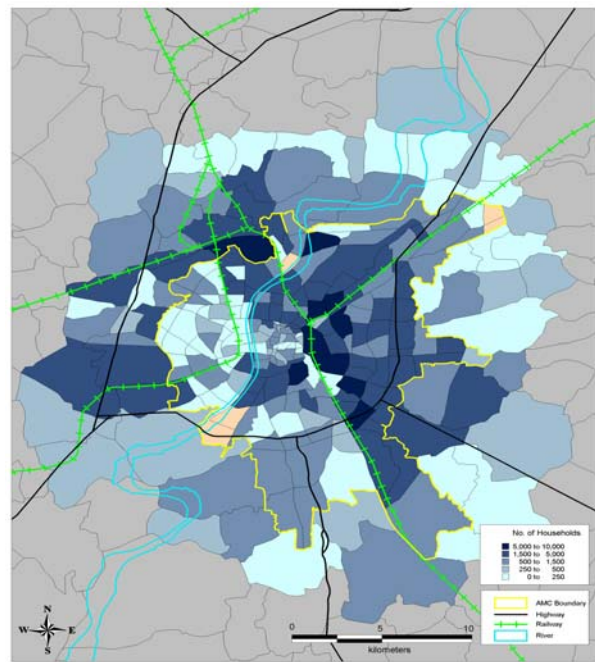
Derived from GIDB IPTS Study (2000) by LBA

Map 5-2: Spatial Distribution of Households by type of vehicle ownership

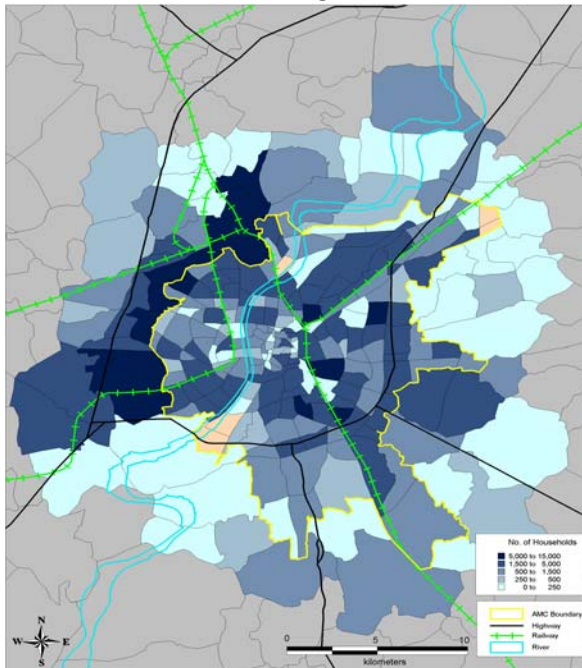
No-Vehicle Owning Households



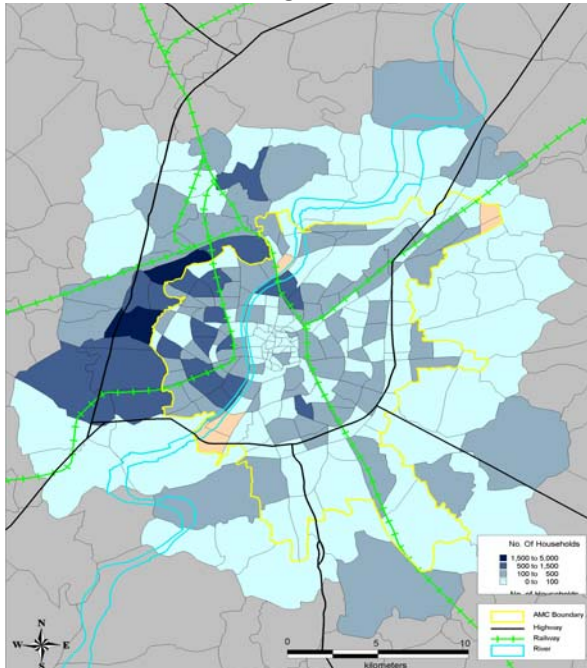
Bicycle Owning Households



2-Wheeler Owning Households



Car Owning Households



Derived from GIDB IPTS Study (2000) by LBA

5.3 Travel Characteristics

5.3.1 Trip Rate

The per capita trip rate including walk, as per AMTS/CEPT (1992) was 1.2, GIDB IPTS 2000) was 1.1 trips per day, GIDB Metro study by DMRC (2003) was 1.16. The same excluding walk was 0.72. Per capita motorized trip rate was 0.52.

Table 5-5: Trips Rates and % Distribution of Trips

Trip Purpose	Total Trips	% of Total Trips	Per Capita Trip Rate
Return Home	3211352	49.00%	0.541
Work	1722572	26.30%	0.290
Education	1137061	17.40%	0.192
Shopping	175033.7	2.70%	0.030
Recreation	26870.95	0.40%	0.005
Social	186810.2	2.90%	0.031
Religious	56694.41	0.90%	0.010
Medical	18664.23	0.30%	0.003
Other	13463.41	0.20%	0.002
Total	6548522	100.00%	1.104

Derived from GIDB IPTS Study (2000) by LBA

5.3.2 Trip Purpose

If we leave aside the return home trips, which forms half of the trips performed, work trips constitute over half of the trips performed in the city. Another 34 percent of the trips are school trips. Of the balance 14 percent trips, Social and shopping trips account for 11 percent (5.5% each). Remaining are social, recreational and other trips. Given this the focus of BRTS system plan would have to address connectivity to major work and education areas.

Table 5-6: Trip Purpose in the study area

Trip Purpose	Total Trips	%age of total trips	Per Capita Trip rate
Return home	3211352	49	0.541
Work	1722572	26.3	0.29
Education	1137061	17.4	0.192
Shopping	175033.7	2.7	0.03
Recreation	26870.95	0.4	0.005
Social	186810.2	2.9	0.031
Religious	56694.41	0.9	0.01
medical	18664.23	0.3	0.003
Other	13463.41	0.2	0.002
Total	6548522	100	1.104

Source: LB - IPTS Study (2000)

5.3.3 Mode choice

The dominant trend in modes of transportation used for trips to work has been the decline in share of all alternatives compared to the personalized motor vehicles; there has been a significant decline in share of public transport when compared to the two wheeler and IPTS alternative.

Still a large proportion (37%) walk and another 17% use bicycles. Despite this we do not allocate any special resources to create facilities for pedestrians or bicyclists! The proportion of car users are as still as low as 2.5%.

Table 5-7: Modal Split

Sr No.	Mode	No. of Trips	Percentage
1	2-wheeler	1681867	25.29
2	Car	165207	2.48
3	Shared auto-rickshaw	381356	5.73
4	Auto rickshaw	169019	2.54
5	Bus	561254	8.44
6	Train	20043	0.3
7	Cycle	1169732	17.59
8	Walk	2501356	37.62
Total		6649834	100

Source: LB - IPTS Study (2000)

25 percent of the population drove their scooters, while 2.5 percent used cars. Use of car is still limited. Auto Rickshaw and shared auto accounts for about 8.5% of trips which are likely candidates for attracting towards bus. As per DMRC report about 55% of trips are made either through walk (18%) or use bicycles (38%). Transit rider ship as a percentage of total trips was a lowly 8.4%.

No distinct trend in choice of mode was observed across the trip purposes.

Table 5-8: Trip Purpose v/s Mode in The Study Area

Purpose	Walk	Bicycle	Motor-cycle	Car	Auto Rickshaw	Bus	Shared Auto	Others	Train	All Trips
Return Home	49.30%	49.00%	48.60%	49.30%	47.60%	48.80%	48.20%	47.30%	54.60%	49.00%
Work	26.20%	26.30%	26.00%	25.50%	28.30%	26.70%	27.40%	26.90%	23.80%	26.30%
Education	17.30%	16.90%	18.00%	16.90%	18.40%	17.20%	17.10%	19.10%	17.40%	17.40%
Others	7.20%	7.80%	7.40%	8.30%	5.80%	7.30%	7.30%	6.80%	4.20%	7.30%
Total	100.00%									

Source: LB - IPTS Study (2000)

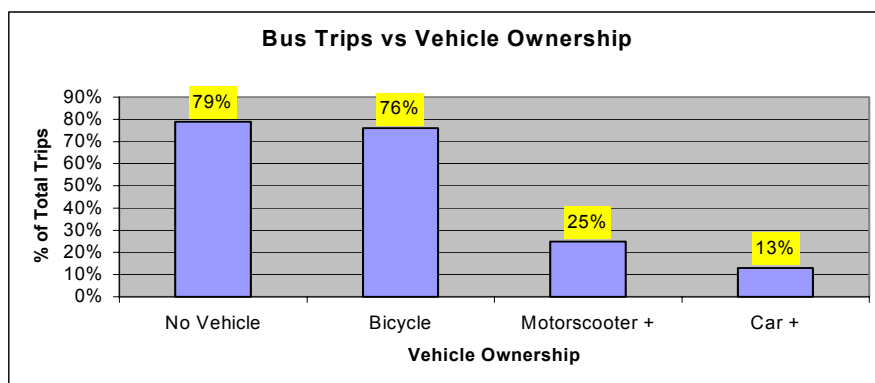
Vehicular Ownership and Mode Choice: So as to understand the choice of mode a cross tabulation was made for those trips performed using motorized mode. No vehicle and only bicycle owner category of population depend more on buses. A quarter of two wheeler owners also use public transport. Car users are limited and only about 13 percent of those prefer bus.

Table 5-9: Mode of Travel and Vehicle Ownership

Travel Mode	Household Vehicle Availability Category				Total
	No Vehicle	Bicycle	Motor scooter +	Car +	
Motor scooter	3%	5%	62%	47%	44%
Car	1%	2%	1%	24%	3%
Auto Rickshaw	8%	9%	9%	14%	10%
Public Transport	79%	76%	25%	13%	38%
Other Modes	8%	9%	3%	3%	5%
Total	100%	100%	100%	100%	100%

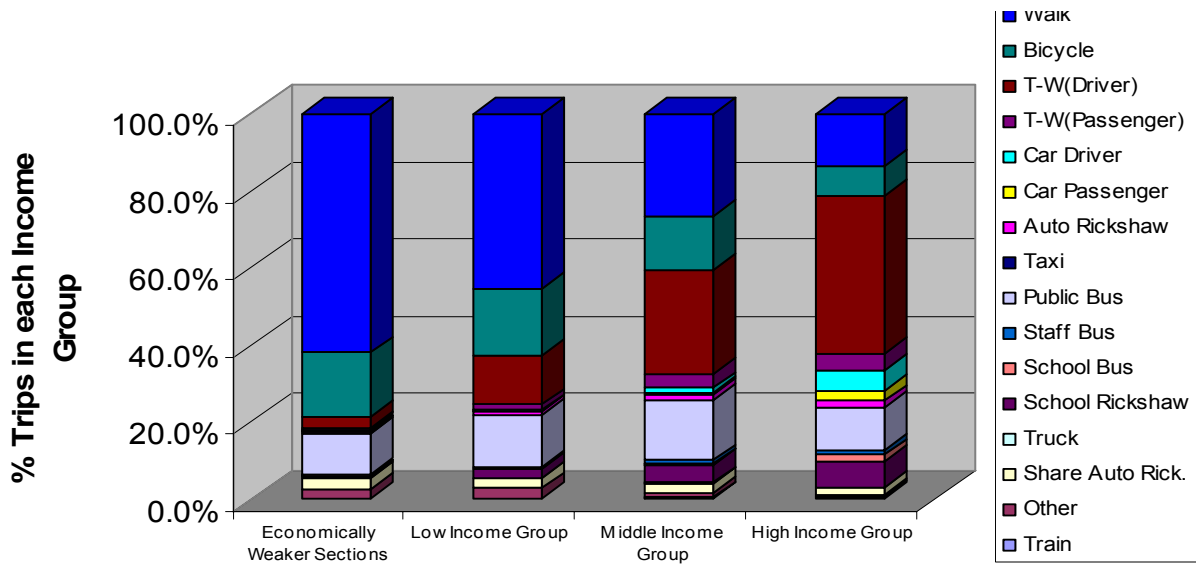
Source: LB - IPTS Study (2000)

Fig 5-3: Bus Trips and vehicle ownership



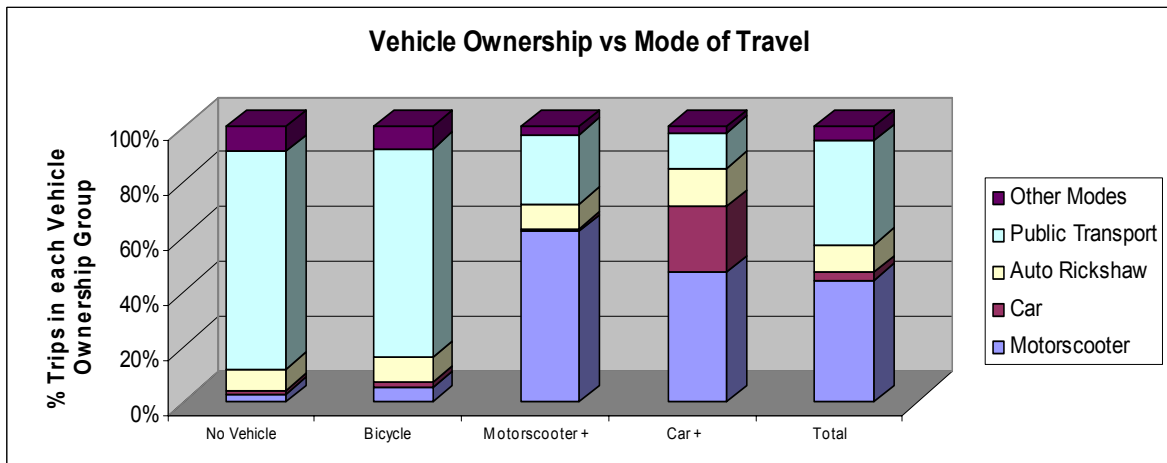
Income and Mode Choice: The choice of mode shifts from walk, bicycle and bus to more personalized vehicles as we move upwards on the income group ladder.

Fig 5-4: Mode Choice and Household Income



Derived from GIDB IPTS Study (2000) by LBA

Fig 5-5: Vehicle ownership and mode of travel

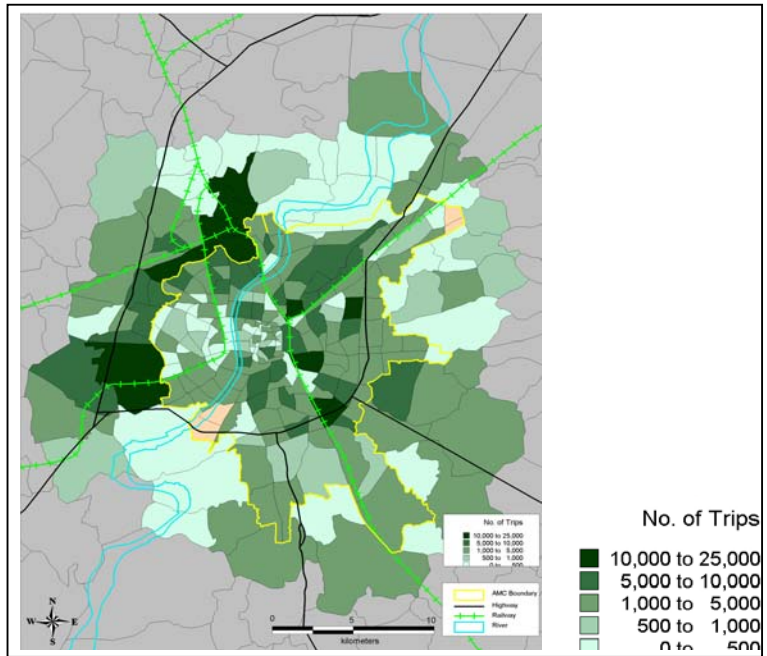


Derived from GIDB IPTS Study (2000) by LBA

Zone wise generated trips using different modes have been presented below. It is evident that east, north-west and south west areas are more potential areas for buses.

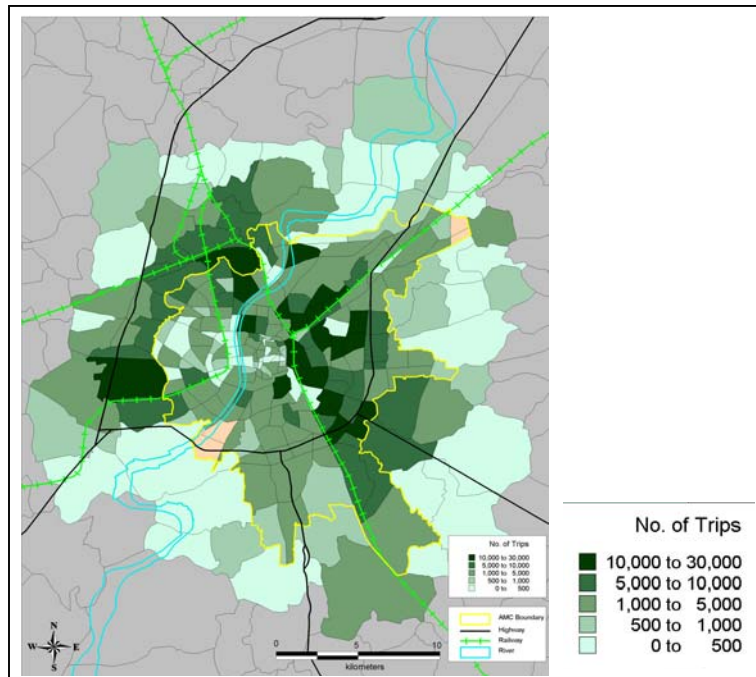
a) Zone-wise Demand for Bus

Total bus trips generated in study area are 910264.



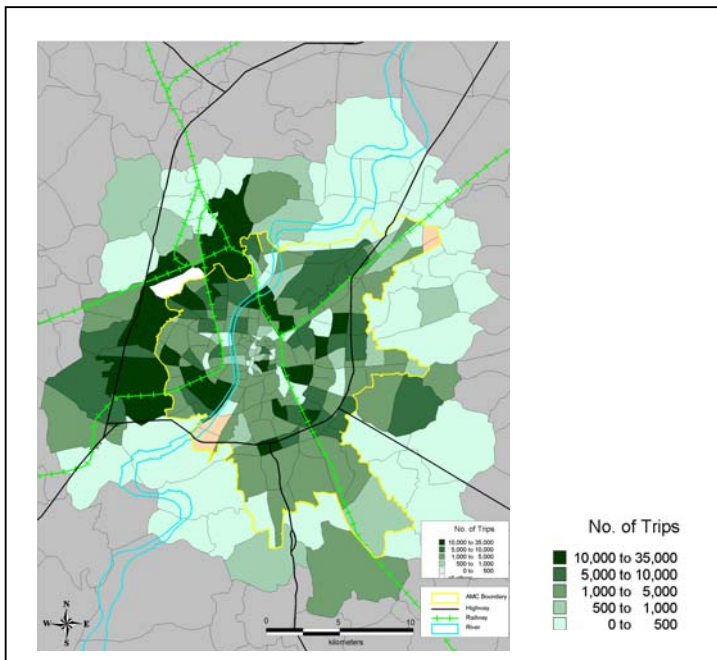
b) Zone-wise Demand for Bicycles

Total bicycle trips generated in the study area are 1005100.



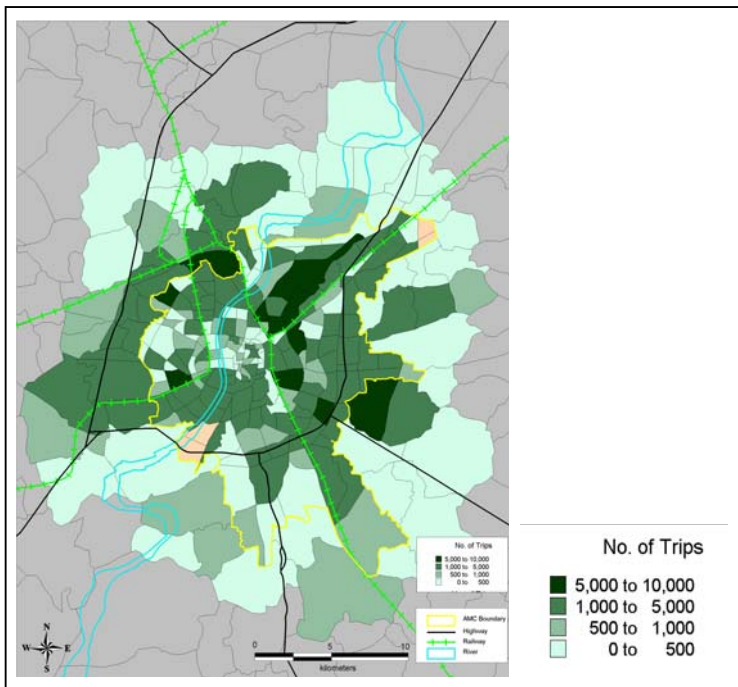
c) Zone-wise Demand for 2-wheelers

Total Trips generated by two wheelers in the study area are 1216708.



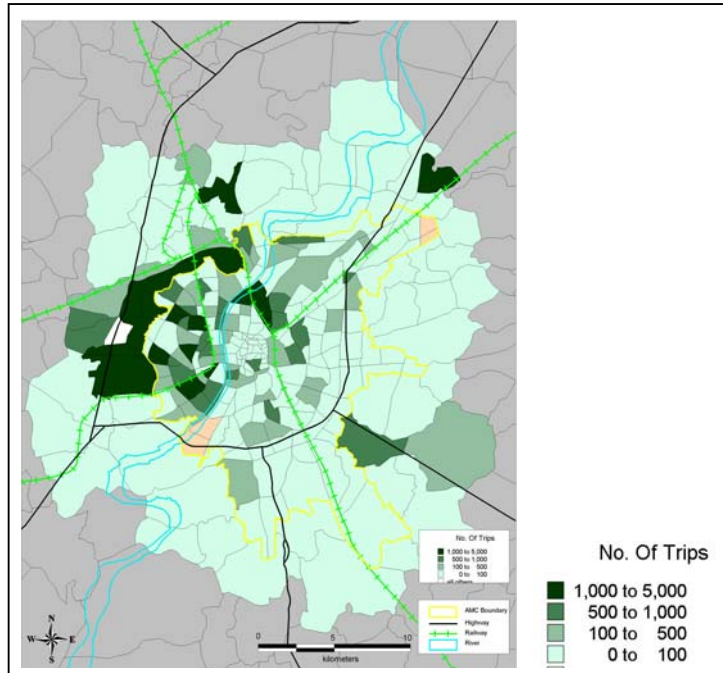
d) Zone-wise Demand for shared auto

Total Trips generated by auto rickshaws/shared auto rickshaws in the study area are 420462.

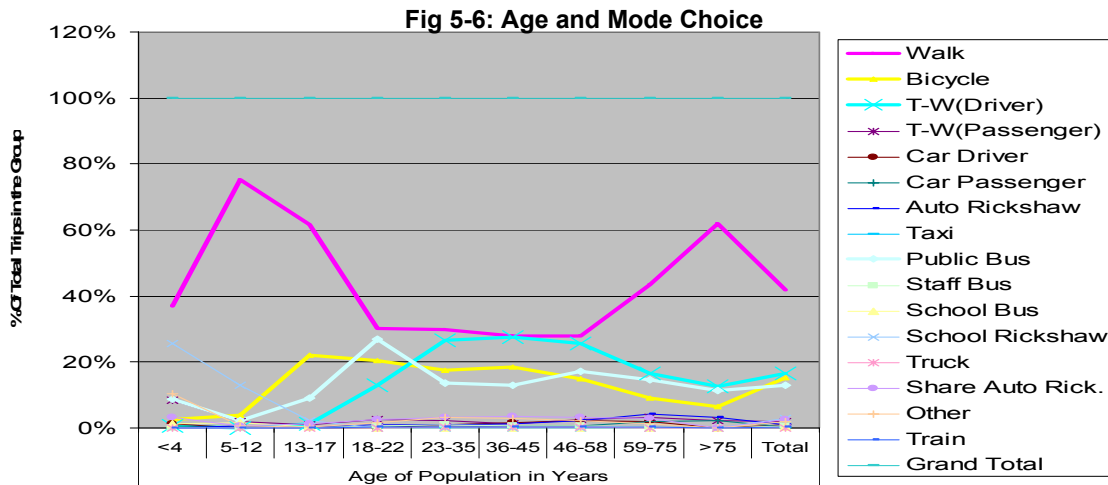


e) Zone-wise Demand for Cars

Total Trips generated by two wheelers in the study area are 87490.



Age and Mode Choice: Close correlation in the age and mode choice is observed. The survey indicates more percentage of walk trips being performed in the age groups below 15 years and above 50 years. In Contrast the age groups in between 15 to 50 years prefer two wheelers and other motorized form of transport.



5.3.4 Trip length

Average trip length including walk trips is 4.6 kms. Bus trips are longer with 12 kms as average trip length. 2-wheelers travel about 6.8 kms, cars 11 kms staff bus 22 kms. Few

who travel by train commute for about 37 kms. Average walk trips are 0.9 km longer and average bicycle trips are 3.6 kms longer. Trip lengths by purpose vary significantly. Work trips on an average are 5.6 kms longer. Longest trips are by train commuters (34.6Km) followed by staff bus 22.8 km.

Of the education trips, walk trip lengths are 0.8 km, bicycle 2.6 km, Auto-rickshaw 3.8 km, bus 10.2 km, school bus 7.4 kms with an average of 2.7 kms.

Fig 5-7: Trip Length Distribution and Age Group

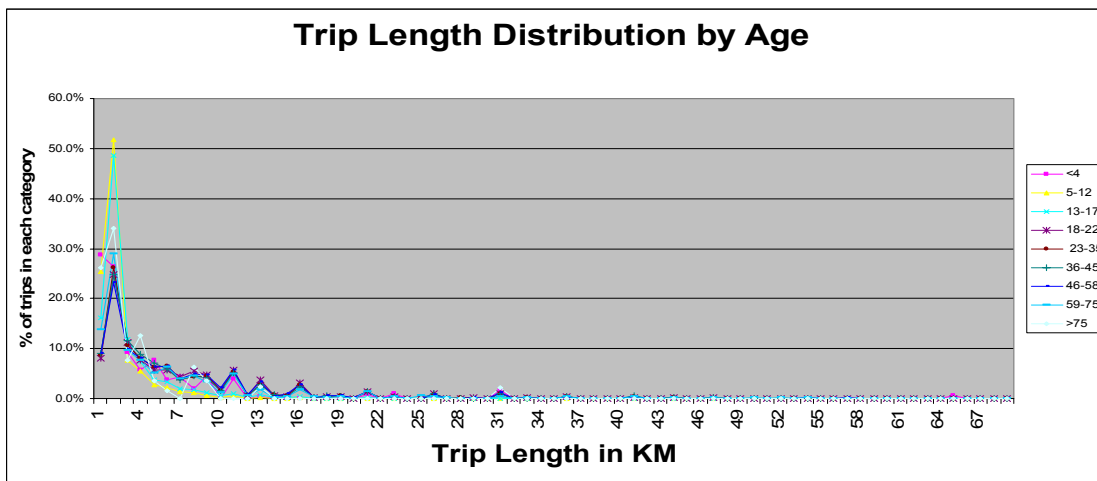
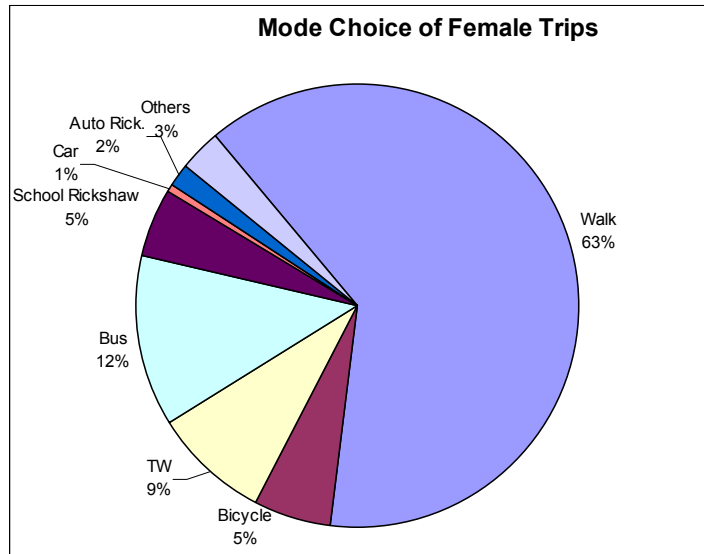


Table 5-10 : Trip Length and Age Group

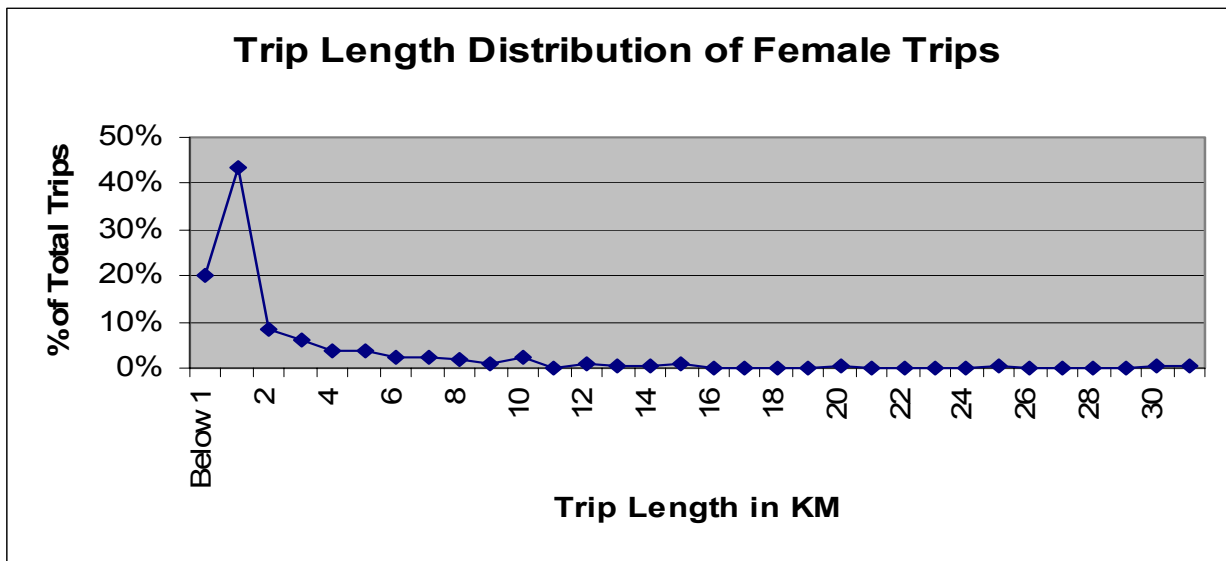
Distance in KM	Age Group (%)									Total
	<4	5-12(Yr)	13-17	18-22	23-35	36-45	46-58	59-75	>75	
<1	28.6	25.4	16.2	8.1	8.7	9.1	9	13.9	26.3	13
1-3	35.5	59.3	60.3	36	36.8	36.5	33.1	38.7	41.7	43.1
3-5	13.4	8.3	11.2	13.5	14.3	16	14.4	12.8	16.1	12.9
5-7	8	3.5	5.2	10.1	10.5	9.6	10.4	10.1	1.6	8.3
7-9	6.5	1.7	2.9	10.2	8.9	8.6	9.6	7.9	9.8	7
9-12	3.8	0.9	1.7	7.9	7.5	7.3	8.7	6.7	0	5.7
12-15	0.5	0.3	1.1	4.8	4.2	4	4.8	2.5	2.4	3.2
15-25	1.7	0.4	0.8	6	5.5	5.3	6.3	5	0	4.1
>25	2.1	0.2	0.6	3.4	3.7	3.7	3.7	2.5	2.1	2.6
	100									

5.3.5 Women and Travel Trips

Average daily number of trips made by women are 1555000 trips (2000) constituting about of the total trips. Most of them walk (63%). About 12% depend on buses. Trip lengths made by women are also shorter.



Derived from GIDB IPTS Study (2000) by LBA



Derived from GIDB IPTS Study (2000) by LBA

Table 5-11: Percentage Trips Purpose and Mode of Travel

Trip Purpose/ Mode	MajorMode																Grand Total
	Walk	Bicycle	T-W(Driver)	W(Passenger)	Car Driver	Car Passenger	Auto Rickshaw	Taxi	Public Bus	Staff Bus	School Bus	School Rickshaw	Truck	Share Auto Rick.	Other	Train	
Home	20.7%	7.7%	8.0%	1.0%	0.4%	0.2%	0.5%	0.0%	6.3%	0.2%	0.2%	1.5%	0.1%	1.2%	0.9%	0.1%	49.02%
Work	7.2%	5.5%	6.9%	0.5%	0.4%	0.1%	0.2%	0.0%	3.3%	0.3%	0.0%	0.0%	0.1%	0.9%	0.9%	0.1%	26.29%
Education	10.6%	1.9%	0.6%	0.3%	0.0%	0.0%	0.1%	0.0%	2.1%	0.0%	0.2%	1.5%	0.0%	0.1%	0.1%	0.0%	17.44%
Shopping	1.6%	0.2%	0.3%	0.0%	0.0%	0.0%	0.1%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	2.70%
Recreation	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.41%
Social	0.8%	0.2%	0.7%	0.2%	0.1%	0.0%	0.1%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	2.76%
Religion	0.5%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.90%
Medical	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.27%
Serve Passenger	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.03%
Transfer Mode	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.14%
Other	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.04%
Grand Total	41.7%	15.5%	16.8%	2.1%	0.8%	0.4%	1.1%	0.0%	12.9%	0.5%	0.3%	2.9%	0.2%	2.4%	2.0%	0.3%	100.00%

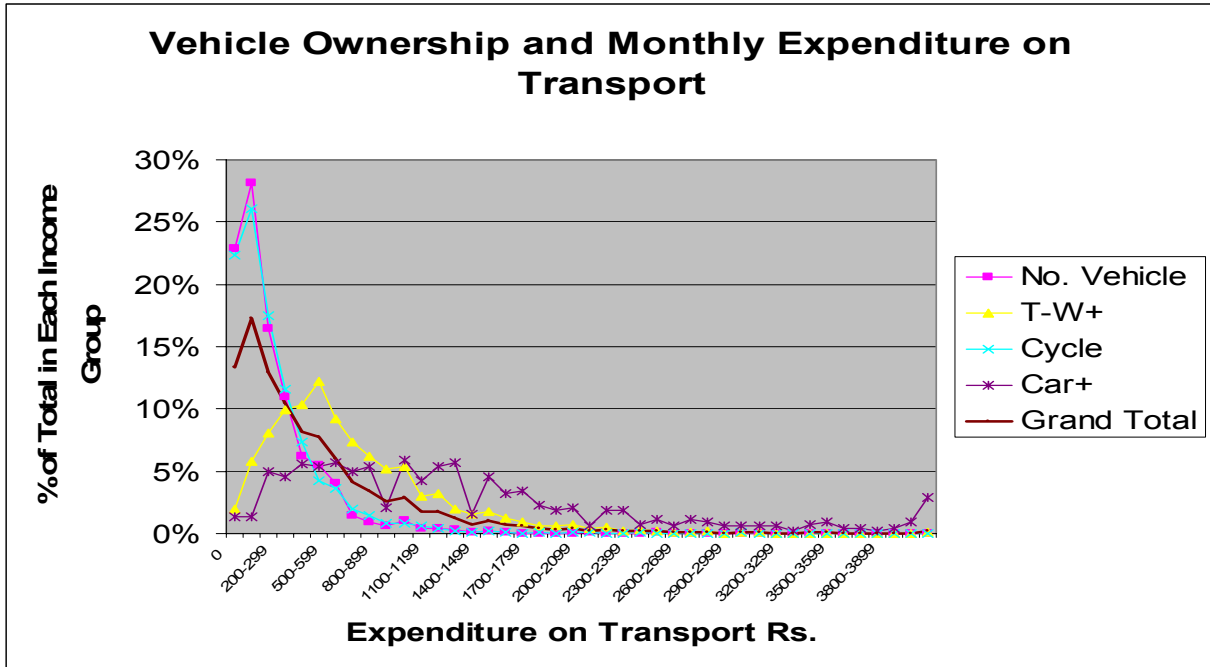
Table 5-12: Trip Length and Mode of Travel

PurposeToCode	Walk	Bicycle	T-W (Driver)	T-W (Passenger)	Car Driver	Car Passenger	Auto Rickshaw	Taxi	Public Bus	Staff Bus	School Bus	School Rickshaw	Truck	Share Auto Rick.	Other	Train	Grand Total
Home	0.9	3.6	6.8	5.8	10.4	10.1	4.8	17.3	12.0	22.4	7.1	3.6	21.8	5.4	5.2	37.1	4.5
Work	1.1	4.0	7.0	6.4	12.9	13.8	6.3	30.0	12.1	22.8		5.4	18.9	5.0	5.1	34.6	5.6
Education	0.8	2.6	6.1	2.9	4.5	5.2	3.8	25.0	10.2	14.0	7.4	3.5		4.0	3.5	45.0	2.7
Shopping	0.7	3.8	6.2	4.3	7.7	5.4	3.4	11.0	11.9					5.2	10.2	21.5	3.5
Recreation	1.3	3.7	4.9	6.5	5.0	6.6	3.9		19.5				10.0	11.1	10.0	18.0	5.9
Social	1.0	3.7	6.1	7.3	9.2	13.2	5.3	16.3	14.7	30.0			37.9	6.4	17.2		6.8
Religion	1.1	2.7	5.3	4.3	4.0	5.9	8.5		22.6					6.6	23.7	30.0	4.5
Medical	0.8	4.6	4.9	4.9		1.0	4.5		11.2					6.0	5.5		5.9
Serve Passenger	1.0		5.0						10.7					3.6	7.5		5.2
Transfer Mode	1.1	4.5	5.4	2.0			6.0		15.8	16.5				17.4	87.3	59.0	14.9
Other	0.4	7.0	4.8	3.0	9.0				9.4								4.9
Grand Total	0.9	3.6	6.8	5.6	11.2	10.6	5.1	19.8	12.0	22.4	7.2	3.6	21.8	5.3	5.6	36.8	4.6

5.3.6 Monthly Expenditure on Travel

In Ahmedabad on an average a person spends about Rs.103 on travel every month which is quite low.

Fig 5-8: Monthly expenditure on travel



Derived from GIDB IPTS Study (2000) by LBA

5.4 Spatial Pattern of Passenger Movement

The outcome of interaction between socio-economic characteristics, land use and transport system results in a movement pattern. The movement patterns generated, based on origin-destination table for the years 2000 and 2003, have been depicted in the form of desire-lines.

From the maps below it is evident that still the movements across the river are very large. As expected, the walled city (Kalupur, Gita Mandir), Naroda, Odhav, Vatva industrial estates, Ashram Road, CG Road, 132 feet ring road and Highway are major trip attraction places. More detailed description is provided in subsequent chapter.

Fig 5-9: Desire line Diagram - 2000 (Total Zone-Zone Movement in excess of 300 Trips)

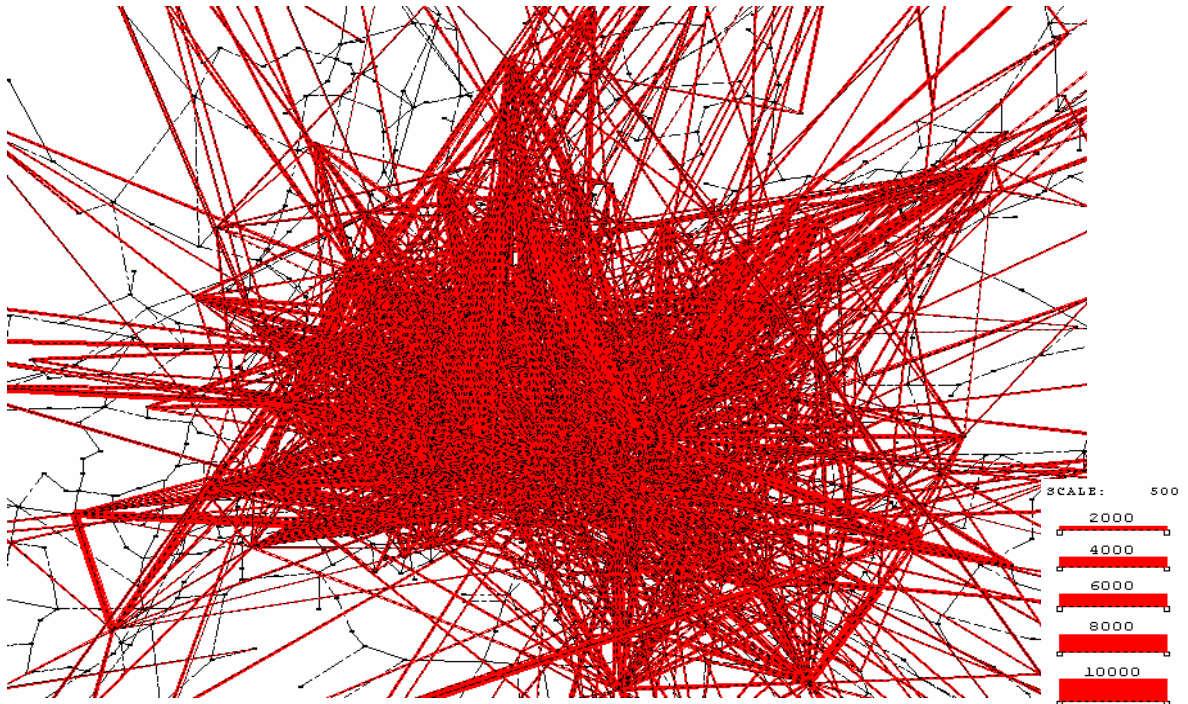
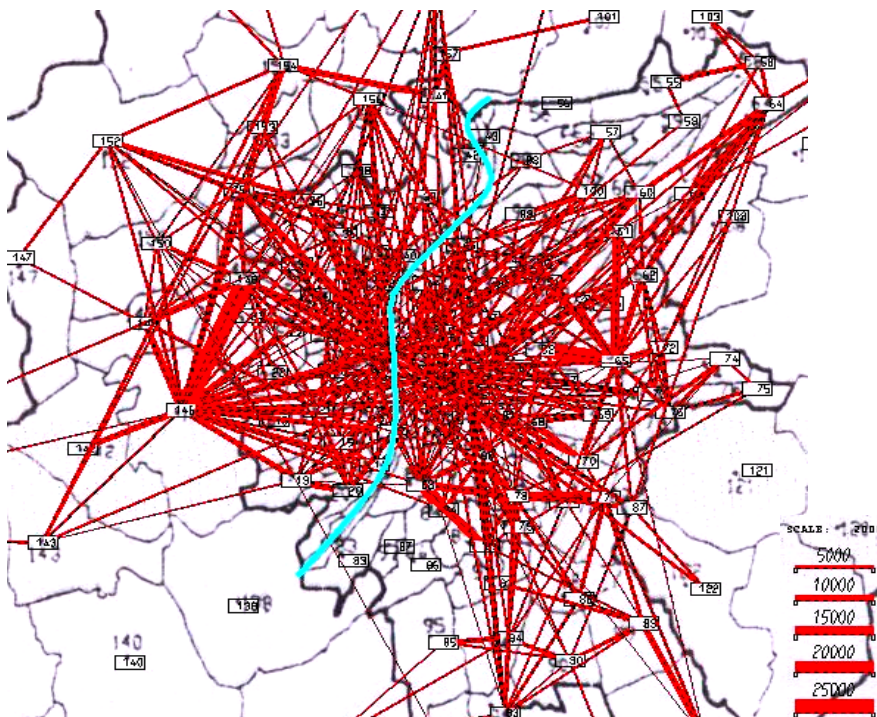


Fig 5-10: Desire line Diagram - 2003



5.5 Summary

Analysis indicates the following trends that are observed, to be taken into consideration while designing a Bus Rapid Transit Plan for the city of Ahmedabad.

- A large proportion of the city population falls under low and middle income category. Over 55 percent do not own any motorized vehicles and hence captive to public transport.
- A large proportion of the population either walks or use bicycle. Hence needs for improvements in related facilities are a necessity.
- Trip lengths are still shorter mainly due to land use and density distribution. Opportunities for enhancing further compactness of the urban structure need high priority while designing the system.
- Deterioration in public transport has resulted in increased patronage of two wheeler and shared auto mode. A good and quality bus service should still be able to recover some of the traffic lost to the other motorized modes of transport.
- At present, though the use of car as a mode does not form a significant number, the rise would be significant in a short period (as in the case of Bangalore). This would lead to severe clogging on the roads.

- 6.1. Background
- 6.2. Challenges and Opportunities
- 6.3. Major Initiatives
- 6.4. Role of Bus Transport in Ahmedabad

Chapter 6 SYSTEM NEEDS & INITIATIVES

6. SYSTEM NEEDS & INITIATIVES

6.1 Background

Ahmedabad public transit system is at a crossroads. After over 5 decades of operation, AMTS has lost its glory. Services have deteriorated and the image has taken a major beating. Financially the organization is in a severe crisis situation. The effects of this are system wide and have become visible in the fact that the city has received the dubious distinction of becoming a highly polluted city in the country. However in terms of congestion, traffic accidents and other parameters the city has still not reached a position of from where recovery is not possible. There could not be a more appropriate time to take a critical look at the significant challenges and opportunities facing public transit in the city.

6.2 Challenges and Opportunities

Today, Key challenges facing the city region that specifically impact public transit include:

Rapid Growth: The city continues to experience growth at a moderate rate. Indications towards urban sprawl are being observed. Employment decentralization beyond urban limits, large open lands within the city are areas of concern that will affect future transport needs. Location of malls and other such activities inside is likely to alter the travel pattern significantly. Old city revitalization (walled city and eastern part) is a critical complimentary objective. Transit oriented land use development strategies need consideration.

Socio-economic Changes: More women participate in the work force. Their travel needs to be focused specifically. With wealth also come the changes in life-style trends, which are personalized transport intensive. Parking strategy and other demand management strategies require focus. Social trips are on the rise. These result in much more complex and varied travel need requiring broad based, wider area coverage oriented transit service system plan.

Transit Patronage: Over the years transit patronage has declined and has reached its minimum in 5 decades of existence of AMTS. The plan hence is not a gap filling exercise, as the market has been lost to other modes of transport. In fact the effort has to be strategic in nature with a focus on stopping further erosion in transit passenger patronage, retrieve whatever has been lost and then bid for a larger share of travel demand on to public transit. This can only be possible with adequate, affordable, convenient, quality public transport service. Of course demand is growing significantly.

Cycling and Walking: Cycling and walking together constitute 54% of trips, to which very little attention is given. Cyclists are the major victims of road accidents. Promotion of these modes needs to be a complimentary activity to public transport development.

System Improvement Focus: Given the strategic nature of the project envisaged, the objective is to enhance accessibility and mobility options of the people of the city as a whole in an integrated framework rather than a limited part intervention focused only on bus or rail.

Resource Mobilization: It is needless to overemphasize that public resources have shrunk over the years and there are too many other tough priorities. While on the one hand supply needs to be enhanced beyond critical minimum threshold, plans and programmes have to evolve mechanisms, which can enable recovery of most or all of the infrastructure development costs. Efficiency gains, wherever possible, through private participation need to be attempted.

6.3 Major Initiatives

In the light of these and with the objective to promote and enhance regional mobility and serve the public by providing quality transit services and solutions that improve the overall quality of life of the residents of Ahmedabad, the Government of Gujarat (GIDB, AMC and AUDA) is considering building of a metro transport facility, up gradation of regional rail facility and the present initiative of BRTS. This is over and above the ongoing effort on road improvement, traffic management, procuring CNG buses by AMC and AUDA at various levels.

The highlights of the rapid transit system under consideration in Ahmedabad are presented below:

- A Metro Rail System
- A Regional Rail System
- A Bus Rapid Transit System
- A Regular Bus System

Metro Rail System:

Through the initiative of the state, DMRC in collaboration with RITES have developed proposals for a Metro system and a Regional Rail Development Proposal in Ahmedabad.

Metro has been proposed within the city, by connecting areas in core Ahmedabad with other areas such as Gandhinagar, Sarkhej, Iskcon and Thalthej under two phase planning. The details of the phasing of the corridors are given below –

Phase 1 has been planned from a) Vishala Vasna to Akshardham through Ashram Road covering a route length of 32 kms with 30 stations and from b) Kalupur to Thalthej covering a route length of 9.6 kms with 11 stations.

Phase 2 has been planned from a) Sarkhej to Indroda Circle via NH8C covering a route length of 32 kms with 16 stations and from b) Vishala to RTO through 132 feet ring road covering a route length of 13 kms with 11 stations.

The estimated cost for developing the first phase of metro is 3180 crores while the full system would be developed with an investment of 7473.75 crores.

Map 6.1: MAP showing Metro Corridor Proposals for Phase 1 and Phase 2

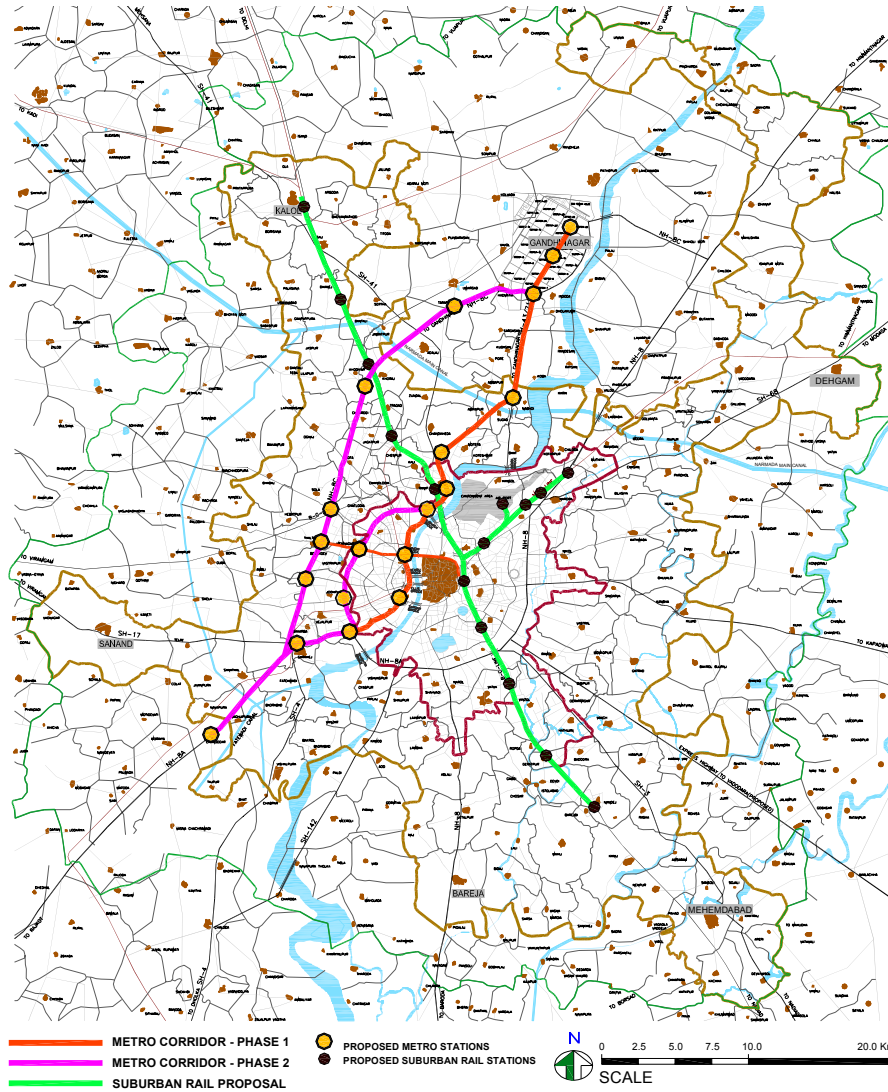


Table 6-1: Metro Proposal

Section	Length (km)	Number of Passengers (lakhs)	Passenger km (lakhs)	Passenger km/km (lakh)	Cost
Line1: Changodar-Vishala-ITO-Sabarmati-Akshardham	45.1	13.27	126.85	2.81	3382.5
Line2: Kalupur- ITO- thaltej	9.65	6.28	52.81	5.47	723.75
Line3: Vishala-RTO	12.5	2.25	20.56	1.65	937.5
Line4: Sarkhej- Indroda Circle	32.4	8.18	87.61	2.7	2430
Total	99.65	29.98	287.83	12.63	7473.75

Source: DMRC & Rites

Regional Rail System:

Currently under consideration the proposed regional rail system spread over a length of 153 kms connecting Core Ahmedabad with Naroda, Kalol, and Barejadi. The proposed corridor has 25 rail stations.

Table 6-2: Regional Rail Proposal

Section	Length (km)	Number of Passengers (lakhs)	Passenger km (lakhs)	Passenger km/km (lakh)	Cost
Line1: Barejadi-Kalupur-Kalol	43.5	2.47	34.3	0.79	957
Line2:Kalupur-Naroda	9.4	1.65	13.73	1.46	206.8
Total	52.9	4.12	48.03	2.25	1163.8

Source: DMRC & Rites

6.4 Role of Bus Transport in Ahmedabad

Need for resurrecting the role of public transport system is evident in the fact that air quality is deteriorating and congestion is increasing. A planned progressive improvement has been envisaged as below. The scenario developed aim at increasing the public transport share from the present 7% to 40% over a period of 10 years. Till the year (probably 2015) other rail based public transport system is realized, it is envisaged to have bus based public transport only in the following form:

Existing A.M.T.S System

- AMTS Own Fleet
- Private Fleet under AMTS

Proposed BRTS System

- Exclusive BRTS Service
- BRTS Mixed Service (Other Corridors)

Depending on the target service population and basic bus operations characteristics demand for bus service has been estimated and presented below.

Table 6-3: Public Transport Demand Parameters

Sl. No	Population Forecast (lakhs)	Trip Rate	Total Trips (lakh)	Target Public Transport Share %	No. of Passangers (Public Transport) lakhs	Passenger Lead (kms)	Pass. Kms per Day
2005	49	1.05	51.45	7	3.6	8	28.8
2006	50	1.05	52.5	10	5.3	8	42.0
2007	51	1.08	55.08	20	11.0	8	88.1
2008	52	1.08	56.16	20	11.2	8	89.9
2009	53	1.08	57.24	25	14.3	8	114.5
2010	54	1.08	58.32	30	17.5	8.5	148.7
2011	55	1.1	60.5	30	18.2	8.5	154.3
2012	56	1.1	61.6	35	21.6	8.5	183.3
2013	58	1.15	66.7	35	23.3	8.5	198.4
2014	59	1.15	67.85	40	27.1	8.5	230.7

2015	60	1.15	69	40	27.6	8.5	234.6
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Table 6-4: Bus Operating Characteristics and Fleet Requirements

Year	Occupancy Ratio	Avg. carrying Capacity/Bus	Vehicle Utilization (kms)/ Day	Fleet. Utilization	Total Fleet Required
2005	55	61	211	72	562
2006	60	55	214	81	738
2007	60	54	238	93	1215
2008	65	55	243	93	1110
2009	65	55	248	91	1424
2010	65	55	244	91	1876
2011	70	63	244	91	1565
2012	70	63	241	90	1911
2013	70	63	243	91	2049
2014	70	63	245	91	2337
2015	70	63	248	91	2336

The system plan being developed and presented in the subsequent chapters take this discussion as basis