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1. EXECUTIVE SUMMARY

Introduction

1.1. Bathinda with its population of 2.17 lacs is the fifth largest city of Punjab. On account substantial industrial development that has already taken place its growth impulses have led to growth outside the limits of Municipal Corporation of Bathinda. Recognising the need for regulating the development of the entire influence area of Bathinda City, Government of Punjab initially declared the Bathinda Local Planning Area (LPA Bathinda) in July 2007 and subsequently further amended the boundaries in January 2009. The Government also designated the Chief Town Planner, Punjab as the Planning Agency to prepare the Master Plan of LPA Bathinda.

The LPA Bathinda comprises three towns viz. Bathinda, Goniana and Bhuchu Mandi and 46 villages. The total area of LPA Bathinda is 571.54 sq.km. (As per revenue record) of which 73 sq.km. is municipal and the remaining is rural. According to Census 2001 the total population of LPA Bathinda was 367301 out of which 243315 was urban.

Regional Setting

1.2. LPA Bathinda is located in Malwa Region of Southern Punjab. It extends from 30˚-4'-30" N to 30˚-21'-20" N Latitude and 74˚-47'-50" E to 75˚-10'-00" E longitude.Its hinterland is fertile and rich in agriculture. Its regional connectivity is excellent as six railway lines link it to major towns in Punjab and surrounding states. The highway network too provides road linkages to important cities in all directions. However, as of now there is no airport close to the city.

Historical Background

1.3. Bathinda is one of the oldest towns in the state of Punjab and has many historical associations. There is an ancient "Fort" in Bathinda (refer Figure 2), which is believed to have been in existence for the last 1800 year. It is believed that Rao Bhatti, son of Bal Band who became ruler of Punjab in 336 Bikrami Sambat established the modern town of Bathinda in Lakhi Jungle area in the third century. The fort is also associated with the first woman ruler of India "Razia Sultana" who ruled India during 1236-1240. Tenth Guru of Sikhs, Guru Gobind Singh visited the town in 1705 on his way to Talwandi Sabo (Damdama Sahib) after battles of Muktsar. Guru Ji stayed in the fort for some days. With the

formation of Patiala and East Punjab States Union (PEPSU) on May 5, 1948, Bathinda district came into existence on August 20, 1948.

1.4. Institutionally, in 1945 Small Town Committee was established for Bathinda. Finally in 2003 a Municipal Corporation was constituted for Bathinda. In 2007 Bathinda Development Authority was established for the LPA Bathinda that included the area surrounding Bathinda City comprising two additional towns and 46 villages.

Legal Framework

1.5. The Punjab Regional and Town Planning and Development Act, as amended 2006 provides the legal framework for preparation of Master Plan. The four stage process involves declaration of Local Planning Area, designation of Planning Agency, preparation of present land use map and preparation and approval of Master Plan. The contents of the Master Plan as laid down by the Act are;

(a) Broad indication of the manner in which the land in the area should be used.
(b) Allocation of areas or zones of land for use for different purposes.
(c) Indication, definition and provision of the existing and proposed highways, roads, major streets and other lines of communication.
(d) Indication of areas covered under heritage site and the manner in which protection, preservation and conservation of such site including its regulation and control of development, which is either affecting the heritage site or its vicinity, shall be carried out.
(e) Regulations to regulate within each zone the location, height, number of storeys and size of buildings and other structures, open spaces and the use of buildings and structures

The Act also provides for "Control of Development and Use of Land in Area where Master Plan is in Operation"

Population growth

1.6. The population of LPA Bathinda is 367301 persons (2001) growing at a decadal growth rate of about 27% during 1991-2001. The details are summarized in table below.

	POPULATION			GROWTH RATE IN %	
	1981	1991	2001	1981-91	1991-2001
LPA BATHINDA					
TOTAL	235608	289305	367301	22.79	26.96
URBAN	143779	179463	243315	24.82	35.58
Bathinda MC	127363	159042	217256	24.79	36.60
Goniana	8596	10415	12813	21.16	23.02
Bhuchu Mandi	7820	10006	13246	27.95	32.81
RURAL	91829	109842	123986	19.61	12.88

Out of a total increase of 58214 persons in the population of Bathinda city during 1991-2001, increase of 14757 was due to migration from states other than Punjab.

1.7. The average gross population density of Bathinda City is 32.01 persons per hectare. However ward wise densities vary considerably. The highest and the lowest being 317 persons per hectare and 1.82 persons per hectare respectively. The low gross population density is due to large industrial areas located in the ward no. 2.

Employment

1.8. The work force participation rate of LPA Bathinda is 35.52% and that of Bathinda City is 31.95%. The main sectors providing employment in Bathinda City are Manufacturing (12%), Wholesale and Retail Trade (22%), Public administration, Education and Health Care services etc (30%), Finance and business activities (7%)

Housing

1.9. According to Census 2001 about 93% of the census houses are of permanent nature, 4 % are semi-permanent and only 1% non-serviceable temporary houses. In terms of availability of rooms only 22% of the households live in one-room dwelling units. As regards access to service, 59% have tap water, 95% have electricity, 38% have water closets and 29% have pit latrines. According to Census 2001 about 19% of Bathinda City's population were slum dwellers. There are 8 slums all located on private land.

Present Land Use and Transport Network

1.10. Preparation of Existing land use map was undertaken with the help of Punjab Remote Sensing Centre (PRSC), Ludhiana. For the core built up area Quick Bird data of 0.6m resolution was used where as for the outer areas Cartosat. I data of 2.5 m resolution was used. The maps based on satellite imageries were updated by undertaking field surveys. Out of a total LPA area of 57198 ha.(as calculated by PRSC) maximum proportion is occupied by agricultural use 76.49% followed by residential 7.15%, industrial 2.04%, and transport 2.30%. In case of Bathinda City out of a total area of 6788 ha., 32% is occupied by residential use, 14% by industrial use, 6% each by public & semi public uses and transport and 35% by agriculture.

1.11. The regional road network of Bathinda comprises two National Highways viz. NH 15 - from Malout leading to Kotkapura and NH 64 - from Barnala leading to Dabwali and three State Highways viz. from Mansa SH 12-A, from Talwandi Sabo SH 17 from Bhuchu Mandi to Nathana SH 16A. Although the Right of Way (ROW) of these roads outside the municipal area varies between 20 to 45 m the effective carriageway is 7.5m to 10 m. – (2 - lane undivided). Within the city limits some roads have wider and divided carriageways. Some missing links on the planned network persist on mainly on account of resistance to land acquisition.Six rail corridors converge at Bathinda and provide excellent connectivity to the city. But the so many railway lines lead to fragmentation of land mass necessitating number of ROBs to provide accessibility.

Physical Infrastructure

1.12. Water for Bathinda City is sourced from both ground water and surface water. Quality of ground water is not satisfactory. The total supply is 60 mld. For 2001 population it worked out to be 220 lpcd. Allowing for distribution losses the net supply worked out 170 lpcd. With the increase in population it might be sufficient to barely achieve the norm of 135 to 150 lpcd. Nearly 85 % of the city is covered by piped water supply. The situation of other two towns is little bit better than Bathinda as Goniana Mandi supplies water up to 90% of its area whereas Bhuchu Mandi supplies up to 95% of its area. The water supply to all the villages is handled by Public Health department by supplying piped water.

As regards sewerage 65% of the population of Bathinda has access to underground sewerage. However sewage collected is pumped without treatment in the natural drains through 8 pumping stations.Bhuchu Mandi covers only 66% and Goniana Mandi 70% of its area under sewerage network whereas no sewerage network is existing in rural settlements.

The low lying areas of the city are flood prone during monsoon due to absence of planned storm water drainage. Letting flood waters into sewers is environmentally undesirable.

Though collection and transportation of solid waste is managed by the Municipal Corporation, disposal is not in the form of sanitary land fill as required by the Municipal Solid Waste Rules of the Ministry of Environment and Forest.

Similarly the disposal of Bio-Medical waste too is not in compliance with relevant rules similar is the case of other two municipal towns and no such system exists in villages.

Traffic

1.13. Recent surveys of traffic indicate most of the road network is not congested. Few roads like Amrik Singh Road, The Mall Road, Hazi Rattan Road, Bhagu Road, Guru Kashi Marg have Volume/Capacity (V/C) ratio is well in excess of 1. There is acute shortage of parking particularly in the traditional bazaar areas of the city. In the absence of organized Truck Terminal, trucks are parked on the road for loading and servicing. Bus stand exists in the center of the city leading to congestion on city roads.

Number of registered vehicles has tripled during 2005-07. If such high growth rate persists, the rapid improvements in road network, transport terminals and parking will be of very high priority.

Social Infrastructure

1.14. There is sufficient number of educational facilities in LPA Bathinda but health facilities are not up to the mark, however Adesh Institute of Medical Sciences and Research is newly emerging medical centre. The sports and recreational facilities are also not adequate as there is no national or state level sports complex only one stadium and one park of the city level are available, however the individual stadiums are available is some educational intuitions. Five cinemas and five clubs are servicing in city.

Environment

1.15. In terms of air quality, though the ambient concentration of SO and NO is well within the norms, SPM levels far exceed the norms. Ground water is unfit for human consumption on account of high contents of fluorides and chlorides. Surface water too gets contaminated on account of release of untreated waste water in canals at some places. Storage of waste water in dirty water ponds is a source of mosquito breeding and ground water pollution.

Population and Employment forecast

1.16. The population of LPA Bathinda is estimated to grow to 7.68 lacs of which the population of Bathinda City along with that of the fringe villages is estimated to be 5.86 lacs by 2031.The employment in 2031 is estimated to be 2.42 lacs. of

which major share will be that of Trade (46000), Transport, Storage and Warehousing (13000), Manufacturing (23000), Finance and Business Services (14000) and Public administration and other services (60000).

Infrastructure Demand

1.17. The infrastructure requirements of this growth by 2031 would be,

(a) Water supply: 78.04 mld

(b) Wastewater: 62.43 mld

(c) Solid waste management: 211mt per day

(d) Power: 225 MW

Vision 2031

1.18. A specially constituted Think Tank comprising official and non-official representatives from all walks of life articulated the Vision 2031 for Bathinda in following terms:

"To transform Bathinda into an industrial hub focused on Petro Chemical industries and a service centre of Malwa region by providing high quality physical and social infrastructure to all its citizens in an inclusive and environmentally sustainable manner."

The strategies to attain this vision would require spatial and land use planning, infrastructure planning and financing, enabling private investment in economic growth, ensuring environmentally sustainable development etc. The role of Master Plan in this regard would be that of facilitating a spatial and land use planning framework conducive to attaining the vision.

1.19. Visualizing the future structure of the city involves delicate trade-offs. If urban development is freely permitted anywhere it might lead to sprawl that is difficult to service in terms of infrastructure services and may cause loss of fertile agricultural land. On the other hand if the future structure is visualized as compact city that is easier to service, it might increase the land price where development is permissible and might cause unauthorized development where it is not. The extent of urbanization visualized is therefore not narrowly linked to land required for accommodating the projected population and economic activities by 2031. The extent of urbanization is defined based on the land requirement for various activities, transport network that would be desirable and

the areas that would acquire development potential on account of such transport network.

Proposed Land Use and Road Network

1.20. In the light of the above approach proposed land use and road network plans are incorporated in the Master Plan. The land in LPA has been zoned for Residential, Commercial, Industrial and Rural and Agricultural purposes. However specific designation for public purposes like schools, hospitals, playground etc has not been earmarked. The arterial road network has been proposed. The proposed land use plan is shown in DRG No. DTP (B) 1577/2009 Dated 08.06.09.

1.21. It is proposed to follow up the Master Plan preparation by more detailed zonal or sector plans. These planning sectors Zones are shown on DRG No. DTP(B) 1579/2009 Dated 10.06.09.

1.22. The arterial road network proposed comprises four categories roads viz. R1-(200 feet) and above, R2-(150 feet), R3-(100 feet) and R4-(80 feet). This is separately shown on DRG No. DTP (B) 1578/2009 Dated 08.06.09. The road network comprises of inner and outer Ring Roads, radial roads and other roads.

Zoning Regulations

1.23. The Punjab Regional Town Planning & Development (Amendment) Act, 2006 provides for the "Control of Development and Use of Land in Area where Master plan is in Operation." However for control of development through parameters like sub-division of land, ground coverage, FAR, parking requirements, norms for building construction etc. have been covered through different bye laws. The zoning regulations included in the Master Plan are therefore confined to use of land. For this purpose a two-dimensional framework has been used. Land use zones as shown in the Proposed Land Use Plan is one dimension and more detailed use classes patterned after the National Industrial Classification is the second dimension supplemented with the land use provisions as provided in various notifications issued by Punjab Government from time to time. A matrix shows the zones in which each use class is permissible. In addition regulation regarding maximum permissible densities and heritage conservation are also proposed.

2. INTRODUCTION

Initial Steps

2.1. As a first step towards the preparation of Master Plan Bathinda, Local Planning Area (LPA) has been delineated and notified u/s 56(i) of "The Punjab Regional and Town Planning and Development (Amendment) Act 2006" in the official gazette vide notification no 12/49/2006-4HG1/5547 Dated 18/07/2007 (Refer Annexure 1). In continuation of the above said notification dated 18/07/2007 government has altered the boundaries of LPA Bathinda within the meaning of Sub section 7 of section 56 of Punjab Regional and Town Planning and Development (Amendment) Act, 2006 vide notification no.12/49/06-4HG1/186 dated 15/01/09 (Refer Annexure 2). As per the notification dated 15.1.09 the LPA Bathinda includes cities/towns namely Bathinda, Goniana and Bhuchu Mandi and 46 villages all of which fall in administrative boundaries of district Bathinda. The total area of Local Planning Area of Bathinda works to be 57,154 hectares (571.54 sq. Kms) a per Revenue records. The Government also designated the Chief Town Planner, Punjab as the Planning Agency to prepare the Master Plan of LPA Bathinda. (Refer Annexure-3)The detail of areas and population etc of LPA Bathinda are given in Annexure ***4***.

2.2. While delineating LPA of Bathinda following factors mentioned in rule 22 of the Punjab Regional and Town Planning and Development (General Rules 1995) have been considered.

(a) Administrative boundary limits of the villages and the district for better identification and management of the LPA
(b) Geographical features Bathinda branch of Sirhind Canal and other physical features like roads and railway lines.
(c) The means of transportation and communication
(d) The present and future growth trends and distribution of the population.
(e) Economic base and commercial activities of the city/towns and their surroundings areas.
(f) Preservation of historical and cultural heritage of the areas.
(g) Urban expansion trends and management of periphery areas for ecological and environment balance have also been kept in mind.
(h) Dispersal of economic activities to alleviate pressure on Bathinda City and balanced development of the area.

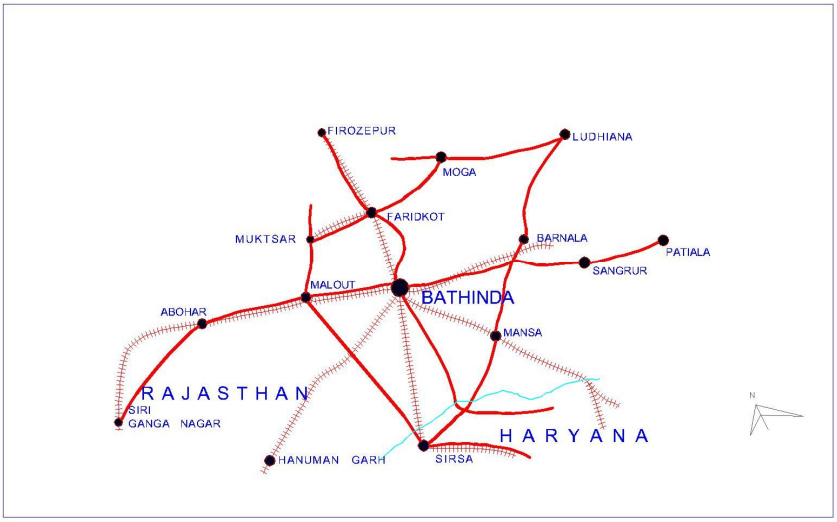
2.3. Out of three urban areas, Bathinda is Municipal Corporation having a population of 2, 17,256 persons as per 2001 census whereas Goniana and Bhuchu Mandi are other two urban areas of small size (class IV town) having a population of 12,813 persons and 13,246 persons respectively. Out of total area of Local

Planning Area about 73 Sq Km. is urban (including area of Goniana Mandi) which is 12.76% and 437.48 Sq Km is rural and agricultural area which is 76.49% of total area of LPA Bathinda. The jurisdiction of LPA Bathinda extends up to village Kotshamir in south and village Goniana Kalan in north. In the east it includes village Lehra Khana whereas towards west up to village Jhumba. The physical extent and boundaries of LPA, Bathinda are shown in Drg. No. DTP (B) 1551/2009 dated 14-01-2009

Regional Setting

2.4. Bathinda city, the District Head Quarter of Bathinda district is an important town of state of Punjab. It is situated in the southern part of Punjab in the heart of Malwa region of the state which is a cotton belt of this State. Bathinda is located at a distance of about 220 kilometers towards southwest of Chandigarh, about 185 Kilometers towards south of Amritsar. Bathinda is the largest railway junction of north India with six railway lines coming from different directions converging at here. It is connected with Delhi, Ambala, Sirsa, Bikaner, Ganganagar and Ferozepur by broad gauge railway lines. Two national Highways i.e. N.H-15 and N.H-64 provide road connectivity to the city. Bathinda is well connected with the cities like Chandigarh, Patiala, Barnala, Ludhiana, Sirsa, Mansa, Hanumangarh, Abohar, Ganganagar, Faridkot, Firozpur etc. by the major roads as indicated in the Figure 1 showing the regional setting of Bathinda. The Local Planning Area of Bathinda, which surrounds the city, is an important part of rich fertile land of Malwa region. It extends from 30˚-4'-30" N to 30˚-21'-20" N Latitude and 74˚-47'-50" E to 75˚-10'-00" E longitude.

Figure 1: Regional Setting



1: LPA Bathinda

Physiography and Climate

2.5. Local Planning Area, Bathinda mostly comprises of sandy soil. In rural areas big sand dunes (sand mounds) can still be seen in many places though the topography of the area experienced a vast change with the various ventures connected with green revolution. A large number of sand dunes previously existing in the villages have been leveled by the farmers to put more and more land under cultivation. No river flows through the Local Planning Area however Bathinda Branch of Sirhind Canal crosses in the middle providing a very good irrigation network. It is believed that earlier river Sutlej flew adjoining Bathinda Fort which later turned its course towards west.

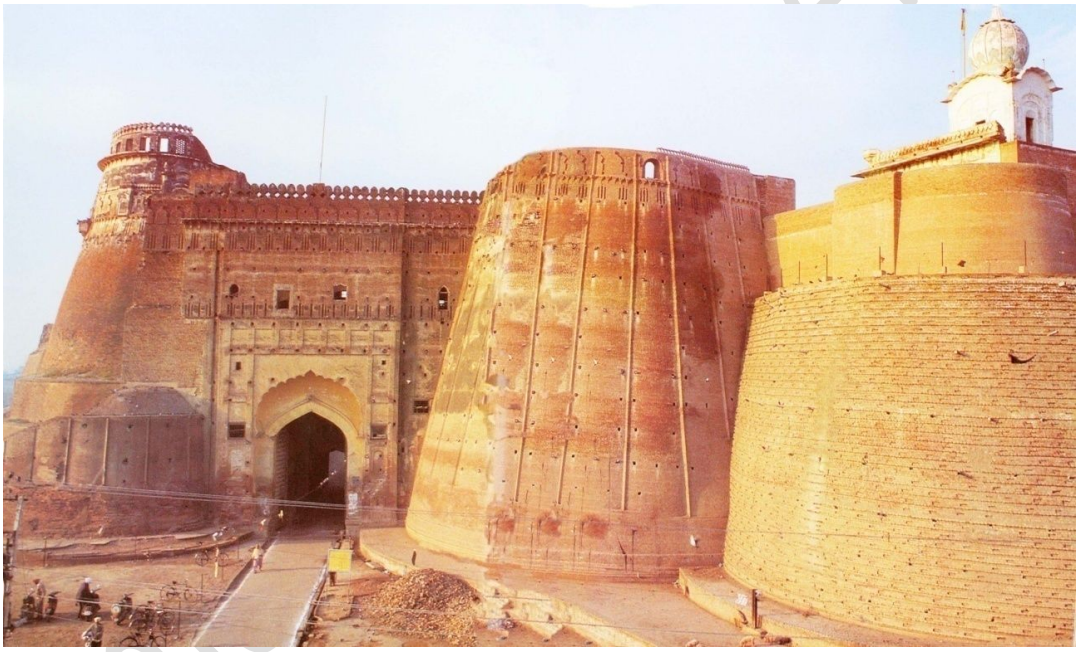
2.6. The district of Bathinda as well as Local Planning Area, Bathinda lies in the south-western region of the state and is far away from the Shivalik Hill ranges in the north-east. It is nearer to the Thar Desert of Rajasthan and quite away from the major rivers that run through the state. Therefore climatically this area has a very hot summer. During the month of June which is peak of summer season the mercury sometimes touches over 47º C and the dust storms are regular feature. There is very short spell of rainy season with scanty rainfall of about 410 mm per annum. The winter season is dry with minimum temperature touching to 0º C. The prevailing wind direction of this region is North-West to South-East.

Historical Background

2.7. Bathinda is one of the oldest towns in the state of Punjab and has many historical associations. There is an ancient "Fort" in Bathinda (refer Figure 2), which is believed to have been in existence for the last 1800 year. It is believed that Rao Bhatti, son of Bal Band who became ruler of Punjab in 336 Bikrami Sambat established the modern town of Bathinda in Lakhi Jungle area in the third century and the city was captured from him by Sur Brars. Bala Rao Bhatti inhabited the city in 965 AD naming it Bhatinda after his surname. The city also remained the capital of Raja Jaipal. It was also called "Whatinda" and "Bitunda" which finally came to be known as Bathinda on authority of Survey of India to conform to the phonetical expression locally pronounced. In the year of 1000 Mahmud Gazni besieged the Bathinda Fort which fell in his way from North West to the rich Ganges Plains. Later Mohammad Gori attacked and captured the Fort of Bathinda in 1189, but Prithavi Raj Chauhan the ruler of this region

managed to recover the possession of the fort thirteen months later in 1191. The fort is also associated with the first woman ruler of India "Razia Sultana" who ruled India during 1236-1240. Razia Sultana was imprisoned in the Fort in 1240. Tenth Guru of Sikhs, Guru Gobind Singh visited the town in 1705 on his way to Talwandi Sabo (Damdama Sahib) after battles of Muktsar. Guru Ji stayed in the fort for some days. With the formation of Patiala and East Punjab States Union (PEPSU) on May 5, 1948, Bathinda district came into existence on August 20, 1948. Its headquarters were originally at Faridkot which were shifted to Bathinda in 1953

Figure 2: Bathinda Fort



Major Development Events

2.8. As per the records available on Punjab Govt. website the first planned development to appear on the city map of Bathinda was Rajinder Ganj Mandi which was established in year 1885 then ruler of Patiala state. This old Mandi part of city is the main commercial centre presently known as Dhobi Bazar, Bank Bazar, Post office Bazar, Hospital Bazar, Kikkar Bazar and Sadar Bazar etc. In the year of 1890 first railway line was laid connecting the city with Hissar which was followed by other railway lines connecting Ambala, Delhi, Bikaner, Firozpur, Ganga Nagar and Fazilka. Ultimately Bathinda railway junction became the largest junction of north India. As a result of better connectivity provided by the railways, the first industry named Bhupindera Floor Mill was

established in the city in 1911. After this Bathinda did not show any sign of major development activity till the independence.

2.9. After independence Civil Station area comprising District courts, District Administrative Block etc. came into existence in 1953, thereafter in 1956, Police line, Central Jail, Rajindera Govt. College and Civil Hospital etc. were established which gave the shape to the town morphology. The foundation stone of Guru Nanak Thermal Plant at Bathinda was laid in 1969 which started production in 1974 (refer Figure 3) and in the same year National Fertilizer Limited and Milk Plant came into existence followed by Bathinda Chemicals Ltd. and Vardhman Polytex Ltd. which came in 1978 and 1984 respectively.

2.10. During this period Industrial Estate Phase-I (1959), Industrial Estate Phase-II (1972) and Industrial Focal Point (1978) were established. The establishment of Military Station at Bathinda in the year 1973-74 was another development milestone for Bathinda city. The events of development milestone in Bathinda are listed in Table 1.

Figure 3: Thermal Plant, Bathinda

Table 1: Development Milestones in Bathinda

Sr. No.	Year	Events
1	1885	Rajinder Ganj Mandi
2	1890	First meter gauge railway line to Hissar.
3	1911	First Industry-Bhupindera Floor Mill
4	1952	First road to Talwandi Sabo
5	1956	Civil Hospital and Central Jail
6	1959	First Industrial Estate
7	1972	Industrial Estate Phase-II
8	1973-74	Thermal Power Plant, (Commissioned), NFL and Milk Plant.
9	1973-74	Military Station Bathinda
10	1978	Industrial Focal Point
11	1978	Rose Garden
12	1984	Vardhman Polytex Limited
13	1998	Industrial Growth Centre

Institutional and Planning Milestones

2.11. With the advent of various development milestones in the city, the institutional sector also started concentrating and contributing towards the growth of the town. The establishment of Rajindera Govt. College in 1956 and St. Joseph's Convent School in 1961 were the educational institutional which played a dominating role in the region. However, Govt. Polytechnic in 1985 and Giani Zail Singh College of Engineering in 1989 started the era of technical education in the city followed by Medical College (Adesh Institution of Medical Science and Research) in 2003. The details of institutional and planning milestones are given in Table 2 below:

Table 2: Institutional and Planning Milestones in Bathinda

Sr. No.	Year	Events
1	1953	Civil Station area including Court Complex and D.C. office Complex
2	1956	Govt. Rajindera College
3	1973	First Town Planning Scheme First Development Scheme First Urban Estate
4	1973-74	Thermal Colony and NFL colony.
5	1976	First time Master Plan prepared for Bathinda
6	1984	Regional Centre of Punjabi University Patiala
7	1989	G.Z.S. Engineering College
8	2003	Adesh Institute of Medical Sciences and Research (Medical College)
9	2004	First PUDA Approved private colony (Homeland Enclave)
10	2005	First Shopping Mall-cum-Multiplex (Under construction)

2.12. Keeping in view the rapid growth of Bathinda city and in order to check unplanned development, first Development Scheme under Punjab Town

Improvement Act, 1922 was prepared by Improvement Trust, Bathinda known as Amrik Singh Road Development Scheme (Veer Colony) in 1973 and ultimately 12 Development Schemes were prepared comprising about 300 acres of land. Similarly first Town Planning Scheme under Punjab Municipal Act, 1911 was framed in 1973 followed by other 16 Town Planning Schemes, which covered an area of 1256 acres approximately. Simultaneously the Department of Housing & Urban Development notified first Urban Estate in 1973 and later on other Urban Estates were framed which cover an area of 720 acres. Besides this, the self contained townships developed by Guru Nanak Thermal Plant and NFL within their respective areas came into existence during this period.

2.13. The private sector started contributing towards planned development of the city only in the year of 2004 when first private colony Homeland Enclave was approved under Punjab Apartment and Property Regulations Act, 1995. Thereafter several other similar colonies came up both within the corporation limits and outside.

Administrative Milestones

2.14. Bathinda remained as rural settlement till the year of 1945 when for the first time Small Town Committee was established. After this, Bathinda did not record any development worth mentioning or administrative change till independence. It was after the independence that Bathinda was upgraded as a 9th district on 20th August, 1948 with headquarters at Faridkot. In 1953 the head quarter of Bathinda district was shifted from Faridkot to Bathinda and after that all the administrative functions started to operate from here. After recording a rapid growth during the decades of 1971-81 and 1991-2001 and attaining the status of the fifth largest town of the State (as per 2001 census) the Municipal Council of Bathinda was upgraded as Municipal Corporation on 10.4.2003. In order to control the development activities within as well as outside the municipal limits of Bathinda, Development Authority, Bathinda was constituted in the year 2007 vide Govt. notification No. 13/31/07/1HG-2/5398 dated 16.7.2007. Thereafter Notification of Local Planning Area, Bathinda under section 56(1) of 'The Punjab Regional and Town Planning and Development (Amendment) Act, 2006' was published in Govt. Gazette for preparation of Master Plan of Bathinda. The

details of administrative milestones relating to Bathinda are given in Table 3 below:

Table 3: Administrative Milestones of Bathinda

Sr.No	Year	Events
1	1945	Constitution of Municipal Committee (Small Town Committees)
2	1948	Status of district headquarters (Functioned from Faridkot)
3	1953	District headquarters shifted from Faridkot to Bathinda
4	1973	Improvement Trust constituted
5	2003	Status of Municipal Corporation (10-4-2003)
6	2007	Establishment of Bathinda Development Authority

Legal Framework for Preparation and Implementation of Master Plan

2.15. The principal legislation governing Regional and Town Planning is the "Punjab Regional and Town Planning and Development Act, 1995 (PRTPDA)" was enacted in the year 1995 (Punjab Act No.11 of 1995) which has been amended in the year 2006 and is now known as "The Punjab Regional and Town Planning and Development (Amendment) Act 2006" (Punjab Act No 11 of 2006). This is an act to make provision for better planning and regulating the development and use of land in planning areas delineated for that purpose, for preparation of Regional Plans and Master Plans and implementation thereof, for the constitution of a Regional and Town Planning and Development Board, for guiding and directing the planning and development processes in the State, for the constitution of a State Urban Planning and Development Authority, Special Urban Planning and Development Authorities and New Town Planning and Development Authorities, for the effective and planned development of planning areas and for undertaking urban development and housing programs and schemes for establishing new towns and for matters connected therewith or incidental there to.

2.16. Prior to the enactment of the Act the town planning activity within urban areas was being governed by different legislations such as The Town Improvement Act 1922, The Punjab Municipal Act 1911, The Punjab Municipal Corporation Act 1976, The Punjab Urban Estates (Development and Regulation) Act 1964 etc and for areas falling outside municipal limits in the periphery of urban centers, there was 'The Punjab Scheduled Roads And Controlled Areas Restriction of Unregulated Development Act 1963(Now repealed)' but no comprehensive legislation was available for the overall control and development at local and regional level.

The Punjab Regional and Town Planning and Development (Amendment) Act 2006 (Main Provisions of the Law)

2.17. This act provides the framework for preparing Master Plans and Regional Plans and provides for the manner in which the use of land in the area of a planning authority is regulated. The act also prescribes specific time period for various steps in the plan preparation process.

The act intends to achieve the following main objectives:

(a) To consolidate, with suitable modifications, in one place laws dealing with the different aspects of urban development.

(b) To set up a high powered Board to advise the State Government and to guide and direct planning and development agencies, with respect to matters pertaining to the planning, development and use of urban and rural land.

(c) To set up a State level Urban Planning and Development Authority and to provide for the setting up of a Special Urban Planning and Development Authorities and New Town Planning and Development Authorities to promote and secure better planning and development of different regions, areas and cities.

(d) To create a legal and administrative set up for the preparation and enforcement of Master Plans for regions, areas and for existing and new cities.

(e) To make the whole programme of urban development mainly a self - sustaining and self - paying process.

(f) To interlink land development and house construction permitting full exploitation of the urban land resource to provide a boost to the programme of house construction, especially the Economically Weaker Sections of the Society.

(g) To provide a legal, administrative and financial framework for the preparation and execution of Town Development Schemes aimed at filling the gaps in the required civil infrastructure and securing the renewal and redevelopment of congested and decayed areas in the existing towns.

2.18. The main provisions of the Act related to preparation of Master Plan are described below:

(a) Section 56(1) enables declaration of Local Planning Areas (LPA) in the official gazette for preparing Master Plan. Once an area has been declared under section-56 (1), no person can institute or change the use of land for any purpose or carry out any development in respect of any land without the previous permission of competent authority until the Master Plan

comes into operation. However, this prohibition does not apply to any area comprised in abadi deh of any village falling inside its lal lakir or phirni.

(b) Section 57 provides for the state Government to designate Planning Agency for area declared as Local Planning Area.

(c) Section 58 defines scope of Planning agency and provides that;

- The designated Planning Agency will work under the overall directions and control of the State Government.
- The State Government may assign any or all of the following functions to the Designated Planning Agency, namely to Chief Town Planner.
- Carry out survey of the regional planning area, local planning area or a site for new town, as the case may be, and prepare reports on the surveys so carried out;
- Prepare an existing land use map and such other maps as may be necessary for the purpose of preparing regional plan and outline master plan, a new town development plan or a comprehensive master plan, as the case may be;
- Prepare a regional plan, an outline master plan, a new town development plan or a comprehensive master plan.
- Subject to and in accordance with the directions of the Govt., a designated planning agency shall exercise all such powers as may be necessary or expedient for the purposes of carrying out its functions under this act and also perform any other functions which are supplemental, incidental or consequential to any of the functions specified in sub section (2) or as may be prescribed.

(d) Section 59 deals with the preparation of present land use map and fixes six months time for this purpose, which may be extended by the State Govt. from time to time.

(e) Section 70(1) states that the planning agency shall not later than one year after declaration of planning area and after the designation of that agency for that area shall prepare and submit to the state government a master plan for its approval. The Master Plan so prepared shall –

- Indicate broadly the manner in which the land in the area should be used.
- Allocate areas or zones of land for use for different purposes.

- Indicate, define and provide the existing and proposed highways, roads, major streets and other lines of communication.
- Indicate areas covered under heritage site and the manner in which protection, preservation and conservation of such site including its regulation and control of development, which is either affecting the heritage site or its vicinity, shall be carried out.
- Include regulations to regulate within each zone the location, height, number of storeys and size of buildings and other structures, open spaces and the use of buildings, structures and land.

(f) Section 70 (3) has the provision for the state government to direct the designated planning agency to publish the existing land use plan and master plan and the information regarding places where copies of the same may be inspected by the public for inviting objections in writing with respect to existing land use plan and master plan within a period of 30 days from the date of publication.

(g) Under Section 70(4), the state government after considering the objections and in consultation with the Board may direct the designated planning agency to modify the master plan or approve it as such.

(h) Under Section 70 (5), the Designated Planning Agency after approval of the state government shall publish the final master plan in the official gazette after carrying out the modification if any under intimation to the state government within a period of 30 days from the date of according the approval by the state government.

(i) According to Section 75, the Master Plan comes into operation from the date of publication, referred in to sub section 5 of Section 70.

The entire process is shown in the form of flowchart Figure 4.

2.19. Chapter XI of the Act also provides for "Control of Development and Use of Land in the area where the Master Plan is in operation."

2.20. Chapter XII, Section 91 of the Act deals with the preparation of Town Development Schemes that can play a significant role in the implementation of Master Plan by way of planned development and through making land available for the open spaces, recreation, education and health services, transport and

communication network, water supply, sewerage, sewage disposal and other public utilities including electricity and gas etc

2.21. Chapter XIV deals with “Control and Development along Scheduled Roads”

2.22. In addition to the "The Punjab Regional and Town Planning and Development (Amendment) Act 2006" there are a few acts that have no direct bearing on preparation of Master Plan but have a definite role to play in the implementation of the proposals of the Master Plan. These are briefly described below;

(A) Punjab Apartment And Property Regulation Act, 1995

The Punjab Apartment and Property Regulation Act, 1995 has been enacted with a view to regulate the promotion of the construction, transfer and management of apartments on ownership basis, to regulate colonies and property transactions and to provide for registration of promoters and estate agents and enforcement of obligations on promoters and estate agents and for matters connected therewith or incidental thereto.

- It provides planned development by checking, controlling and regulating the activities of the private developers.
- It makes funds available for planned development.
- It provides land for social and physical infrastructure through the mechanism of planned development.
- It also has the provision to make social housing available at low prices for Economically Weaker Section of the society.

(B) Punjab Town Improvement Act, 1922

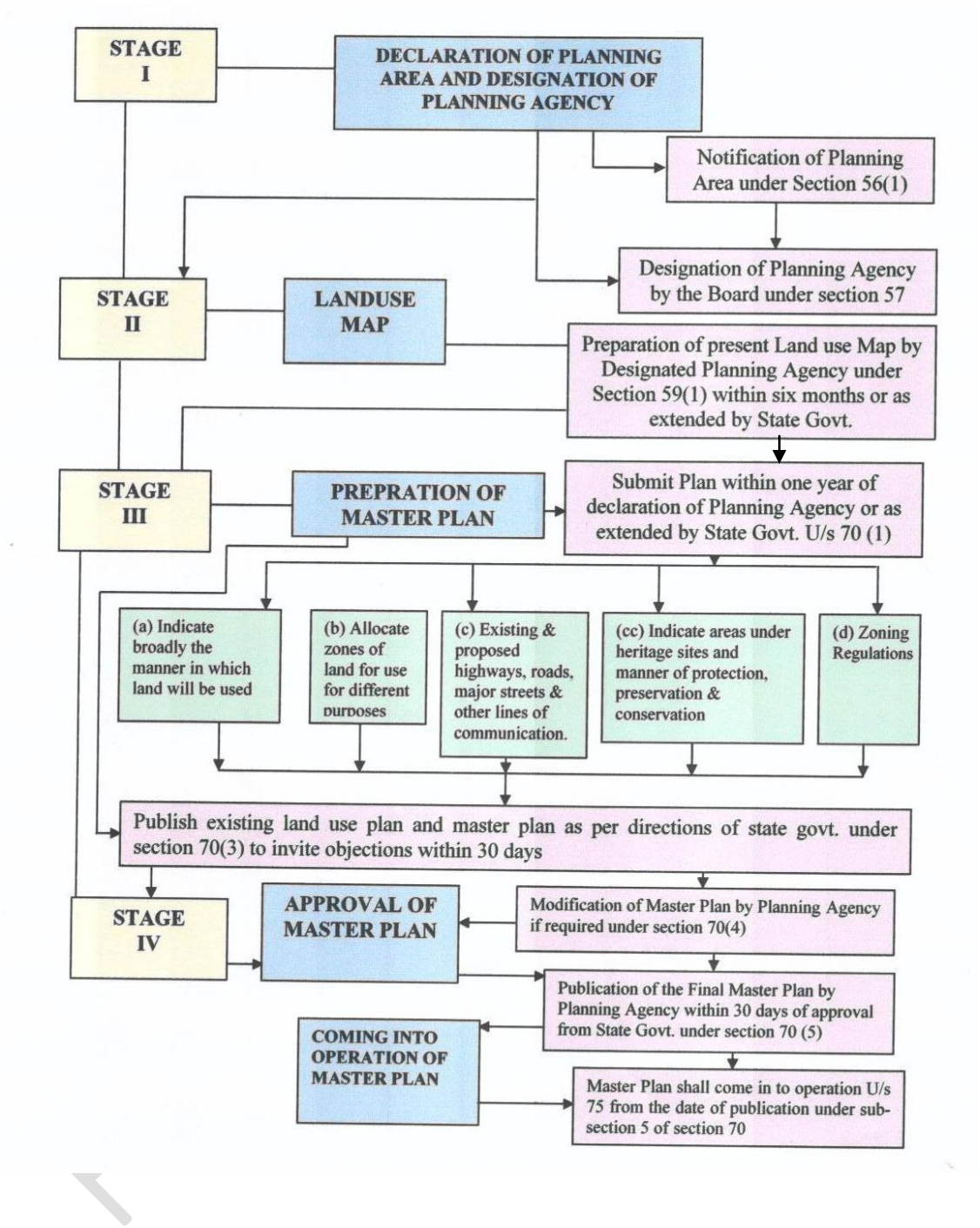
The Punjab Town Improvement Act, 1922 plays a significant role for the implementation of Master Plans in the following manner:

- It helps to provide planned development through the mechanism of Development Schemes.
- It makes land available for the development of social and physical infrastructure like schools, health, parks and playgrounds, and planned road network etc.

It also provides social housing to Economical Weaker Sections and thus helps to check the growth of slums.

2.23. The stages of preparation of Master Plan are shown in flowchart at Figure 4 on next page in a more elaborated way.

Figure 4 : Stages of Master Plan Preparation



3. POPULATION, ECONOMY AND EMPLOYMENT

Population Growth and Characteristics

3.1. Understanding population growth and its characteristics is fundamental to planning of city. Relevant data are compiled and presented below:

3.2. LPA Bathinda experienced growth rate of 22.79% and 26.96% during the year 1981-1991 and 1991-2001 respectively. Bathinda is the 5th largest city of Punjab and one of the major urban settlement of its LPA with population of 2, 17,256 persons in 2001 whereas the Goniana and Bhuchu Mandi have population of 12,813 and 13,246 respectively as per 2001 census. The growth trend of population of LPA, Bathinda and Punjab state is given in Table 4 below:

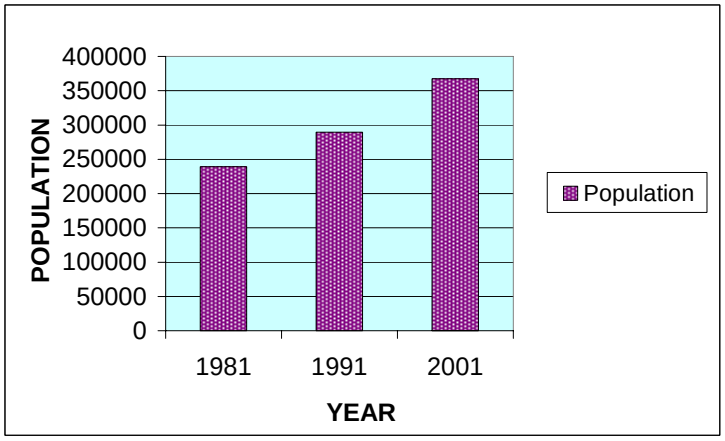
Table 4: Population Growth Rate of Punjab State and LPA, Bathinda: 1981-2001

	POPULATION			GROWTH RATE IN %	
	1981	**1991**	**2001**	**1981-91**	**1991-2001**
PUNJAB STATE *					
Total	16.79	20.28	24.36	20.79	20.12
Urban	4.65	5.99	8.25	28.82	37.73
Rural	12.14	14.29	16.11	17.71	12.74
* Population In Millions					
LPA BATHINDA					
Total	235608	289305	367301	22.79	26.96
Urban	143779	179463	243315	24.82	35.58
Rural	91829	109842	123986	19.61	12.88

Source: District Census 1981, 1991, 2001, Bathinda

3.3. The above Table 4 depicts that growth rate of total population of LPA Bathinda has increased from 22.79% during 1981-91 to 26.96% during 1991-2001 decade, which is higher in comparison to that of state of Punjab whereas the growth rate of urban population of LPA, Bathinda remained lower in comparison to the State – Urban. The growth rate recorded of rural population of LPA. Bathinda is almost equal to that of the State – Rural. Growth trend of LPA Bathinda is shown in figure. 5 below:

Figure 5: Growth trend of population of LPA, Bathinda



3.4. Besides above, growth trends have been analyzed in terms of share of population of LPA, Bathinda to the State population. So far as the share of total population of LPA to total population of state is concerned it has increased from 1.40% in 1981 to 1.51 % in 2001. However, the share of urban population of LPA Bathinda out of total urban population of the state showed the decreasing trend from 3.09% in 1981 to 2.95 % in 2001 and the share of rural population also decreased from 7.56% in 1981 to 7.00% in 2001 as mentioned in Table 5 below:

Table 5: Share of Population of LPA Bathinda in Punjab state

	1981	**1991**	**2001**
TOTAL	1.40%	1.43%	1.51%
URBAN	3.09%	3.00%	2.95%
RURAL	7.56%	7.69%	7.00%

Source: District Census 1981, 1991, 2001, Bathinda

3.5. As already stated Bathinda is 5th largest city and is the major urban settlement of its LPA but its share in the total urban population of Punjab has decreased during the year 1981-2001. The share of population of Bathinda to the total urban population of the state was 2.63 in the year 2001. The growth rate of Bathinda was 95.12% during 1971-81 mainly because of the expansion of limits of Municipal Committee as to include the two major industries i.e. Thermal Power Plant and National Fertilizer Limited which were established during that decade. During the decade of 1971-1981 the population grew from 0.65 lacs to 1.27 lacs, which was highest in the state.

However during the period of 1981-91 the growth rate dropped to 24.79% due to terrorism. Normalized social and economic conditions during 1991-2001 led to a

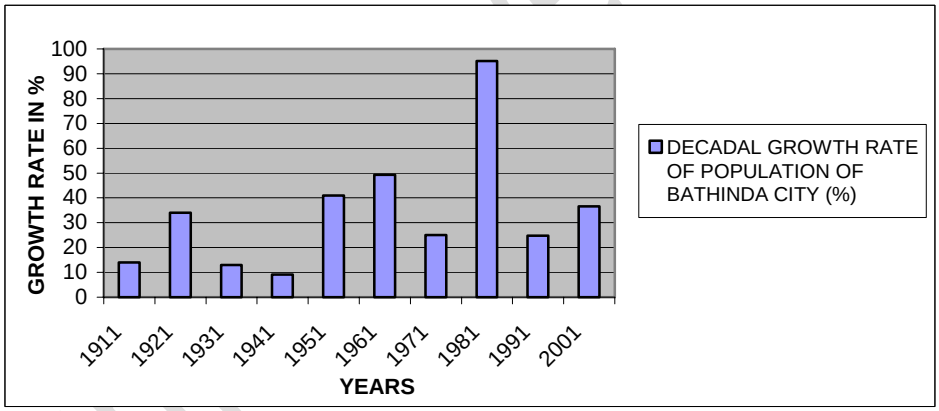
growth rate of 36.60%. The details of population growth of Bathinda city from 1901 to 2001 is given in Table 6 below:

Table 6: Population Growth Rate Bathinda City: 1901-2001

Years	Population	Decadal Growth Rate (%)
1901	13185	--
1911	15035	14.05
1921	20154	34.03
1931	22771	12.99
1941	24833	9.06
1951	36991	40.91
1961	52253	49.33
1971	65318	25.00
1981	127363	95.12
1991	159042	24.79
2001	217256	36.60

Source: Census of India 1901-2001

Figure 6: Population growth rate Bathinda city: 1901-2001



3.6. Table below shows that the share of population of Bathinda city to total urban population of Punjab was 2.03% in 1971, 2.74% in 1981 and 2.63% in 2001. The share of population of Bathinda city to the state- urban and the growth trends of urban population in Punjab and that of Bathinda city are given in Table 7 below:

Table 7: Share of Urban Population of Bathinda City in Punjab Urban

Years	Punjab Urban	Population of Bathinda city	Bathinda city / Punjab Urban- %
1971	3216179	65318	2.03
1981	4647757	127363	2.74
1991	5993220	159042	2.65
2001	8245566	217256	2.63

Source: District Census Bathinda 1971-2001

Population Density

3.7. According to 2001 census the density of LPA Bathinda was 6.42 persons per hectare. The Population Density of Bathinda city increased slightly during the period of 1971- 2001, from 31.52 persons per hectare in 1971 to 32.01 persons per hectare in 2001. The area falling within the Municipal limits was only 20.72 Sq. Km. (2072 hectares) in 1971 which was increased to 67.87 Sq. Km. (6787 hectares) by 2001; this was the reason for less variation in the town density during this period. The town density increased to 38.38 per hectare in the year 2008 due to growth of commercial and trade activity. The detail of population density of Bathinda city is given in Table 8 below:

Table 8: Population density of Bathinda city: 1971-2001

Year	Population (Persons)	City Area In hectares.	Population Density in Persons/hectare
1971	65318	2072	31.52
2001	217256	6787	32.01
2008	261000*	6800	38.38

**Projected population* *Source: Municipal Corporation, Bathinda*

The density of population within the corporation limits is not uniform all over the city. It varies from ward to ward as given in Table 9 below. Inter census comparison of ward wise density is however not possible as ward boundaries have been changing over the years. The density gradient as per 2001 census shows that ward no. 15, 17, 18, 20 and 21 have a gross density of more than 200 persons per hectare with the distinction of highest density of 317 persons per hectare in ward no. 18 and the lowest of 1.82 persons per hectare only in ward no. 2.

The higher density zone of 200 persons per hectare and above falls in the inner part of the city because of thickly built up areas. The wards surrounding the inner area have medium density whereas the wards falling on the periphery of the city have low density because of large vacant areas or large industrial units in these wards. The density gradient as given above is shown in the Figure 7.

Table 9: Ward Wise Population Density of Bathinda city: 2001

Sr.No.	Ward No.	Area in Hect.	Population	Density Persons Per Hectares
1	Ward No - 1	470.74	6242	13.25
2	Ward No - 2	1615.00	2944	1.82
3	Ward No - 3	134.01	6870	51.27
4	Ward No - 4	451.97	8868	19.620
5	Ward No - 5	61.41	6948	113.14
6	Ward No - 6	46.63	5667	121.53
7	Ward No - 7	50.33	6106	121.32
8	Ward No - 8	173.87	9150	52.63
9	Ward No - 9	65.10	6721	103.24
10	Ward No - 10	142.13	7121	50.10
11	Ward No - 11	77.14	5030	65.20
12	Ward No - 12	111.24	8113	72.94
13	Ward No - 13	951.15	3139	3.30
14	Ward No - 14	151.55	5621	37.09
15	Ward No - 15	26.92	6828	253.65
16	Ward No - 16	105.42	4269	40.50
17	Ward No - 17	16.97	3735	220.05
18	Ward No - 18	17.10	5437	317.95
19	Ward No - 19	33.32	5684	170.61
20	Ward No - 20	26.41	5324	201.61
21	Ward No - 21	22.12	5544	250.66
22	Ward No - 22	180.53	6079	33.67
23	Ward No - 23	32.03	4391	137.09
24	Ward No - 24	29.66	4755	160.33
25	Ward No - 25	62.45	5165	82.70
26	Ward No - 26	137.65	7127	51.77
27	Ward No - 27	108.18	7563	69.91
28	Ward No - 28	170.09	6962	40.93
29	Ward No - 29	519.57	8798	16.93
30	Ward No - 30	253.27	6880	27.15
31	Ward No - 31	108.82	7571	69.57
32	Ward No - 32	52.54	6738	128.24
33	Ward No - 33	209.22	7409	35.41
34	Ward No - 34	57.52	5730	99.61
35	Ward No - 35	115.62	6727	58.18
	Total	**6787.68**	**217256**	
Average Density of Persons per Hectare				**32.01**

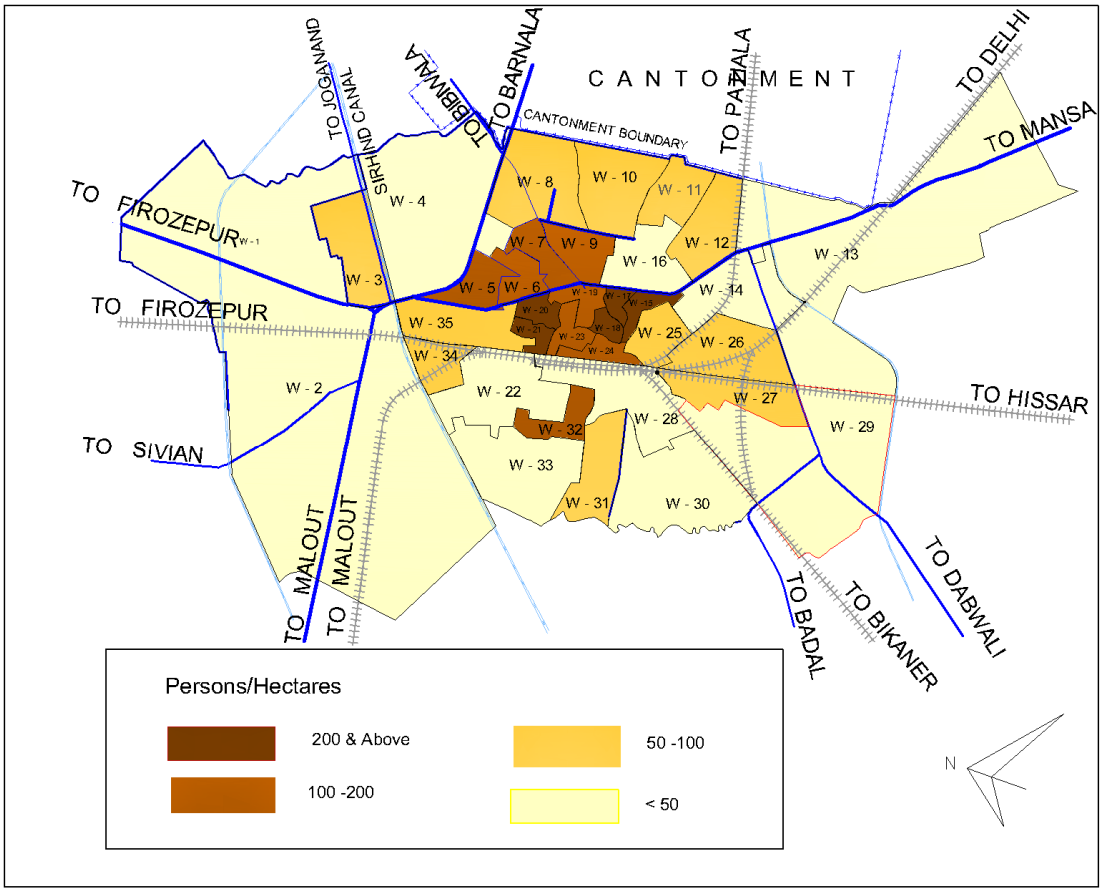
Source: Census of India 2001

The density has been classified into four groups as given in Table 10 below:

Table 10: Density Gradient M.C. Bathinda (ward wise): 2001

Sr. No.	Density slab (Persons/Hectare)	Ward numbers
1.	200 and above	15,17,18,20,21
2.	100-200	5,6,7,9,19,23,24,32
3.	50-100	3,8,10,11,12,25,26,27,31,34,35
4.	50 and below	1,2,4,13,14,16,22,28,29,30,33

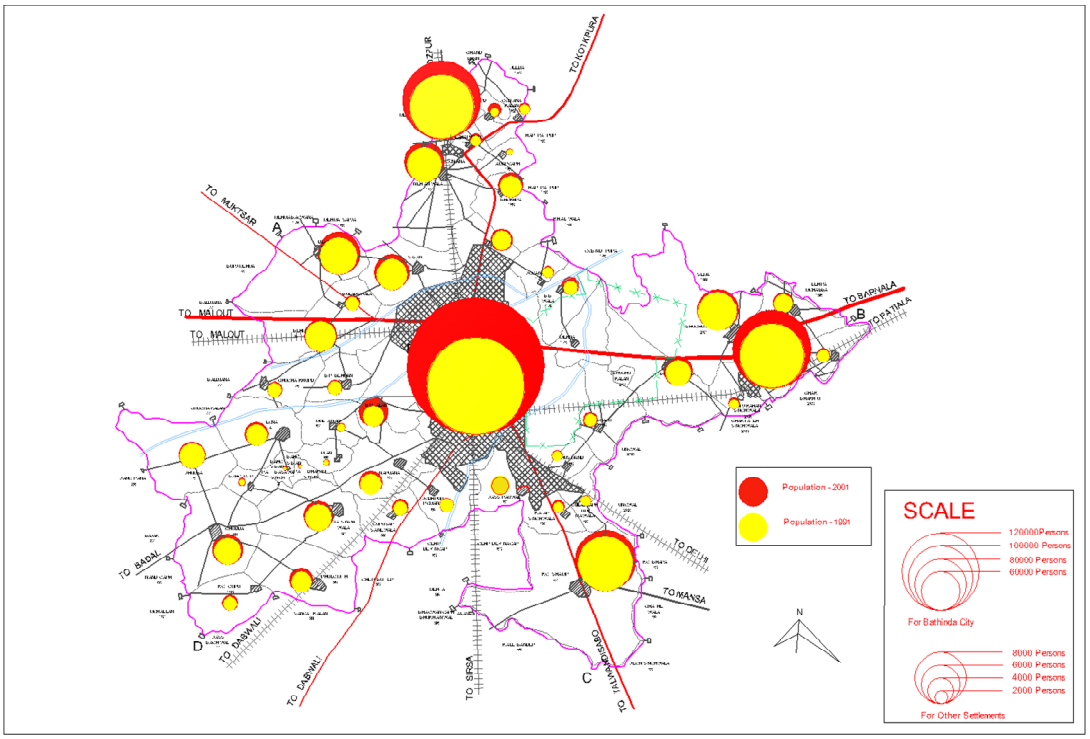
Figure 7: Ward Wise Density Gradient in Bathinda City



Population Distribution in LPA Bathinda

3.8. As per the figures of 2001 census, Bathinda is the largest settlement of L.P.A having a population of 217256 persons followed by other two urban areas i.e. Bhuchu and Goniana having a population of 13246 and 12813 persons respectively. Out of rural settlements Kotshamir is a largest village having a population of 9314 and village Baho Sibian Patti Basawa Singh is the smallest settlement having only 454 persons. The size of rural settlement is not as much related to the hierarchy of road on which it exists except Kotshamir which is situated on two state highways. Some villages like Sibian, Chughe Khurd, Nehianwala, Ghudda, Multania and Deon are comparatively larger in size but none of these exists on national or state highway on the other hand, villages like Jodhpur Romana, Gurusar Sainewala, Gill Patti, Bulahr Vinju and Goniana Kalan etc are smaller in size in spite of their location on national highway as shown in the thematic map of L.P.A Bathinda at Figure 8. The growth rate of all the rural settlements remained almost equal except village Bir Talab as given in Annexure 8.

Figure 8: Population Growth of Urban and Rural Settlements of LPA Bathinda (1991-2001)



Age Structure

3.9. According to Census 2001 the age groups of 5-19 and 20-39 had about 33% share in each category, consequently the broader age group of 5-39 accounted for 65.8% of the total city population. As per table below about 52.3% population falls in working age group of 20-59 years and only 6% in 60 years and above. The break up of different age groups is given in Table 11 below:

Table 11: Age Structure of Bathinda City for the year 2001.

Age Group	Persons	Percentage	Male	Female
0 -4	16237	7.5	9275	6962
5-19	71595	33.0	39536	32059
20-39	71154	32.8	36753	34401
40-59	42368	19.5	23385	18983
60 & above	13158	6.1	6562	6596
Age not stated	2744	1.3	1435	1309
Total	**217256**	**100%**	**116946**	**100310**

Source: Census of India- 2001

Sex Ratio

3.10. Proportion of women is expressed in terms of sex ratio i.e. number of women per one thousand men. According to 1981 census, the sex ratio was 843 in LPA Bathinda and in 1991 the sex ratio improved to 878 but in 2001 the sex ratio again declined to 870. In case of Bathinda city also, the sex ratio increased from

819 in 1981 to 865 in 1991 and then declined to 858 in 2001. The sex ratio of Punjab State was 876, which is on higher side as compared to that of LPA, Bathinda and Bathinda city. The details of sex ratio are given in Table 12 below:

Figure 9 : Sex Ratio of LPA Bathinda and Bathinda City

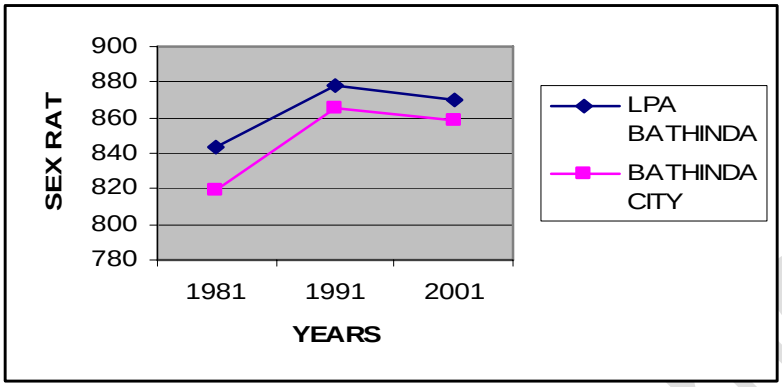


Table 12: Sex Ratio of LPA Bathinda and Bathinda City 1981-2001

Year	LPA BATHINDA				BATHINDA CITY			
	Total Population	Males	Females	Sex Ratio	Total Population	Males	Females	Sex ratio
1981	235608	127872	107736	843	127363	70026	57337	819
1991	289305	154025	135280	878	159042	85286	73756	865
2001	367301	196445	170856	870	217256	116946	100310	858

Source: District Census handbook 1981, 1991, 2001 Bathinda

Religious Composition

3.11. Hindus constitute 60.71% of population of Bathinda city, while 37.82% are Sikhs and 0.67% is Muslims and rest of the population belongs to other religions as per 2001 census.

Literacy

3.12. Table 13 depicts that the literacy rate has increased in LPA, Bathinda. The literacy rate in 1981 was 41.01%, which increased to 49.37% in 1991 and further rose to 61.97% in 2001. Out of total male persons 66.95% are literates and out of total female persons 56.26% are literates. Literacy rate of males increased from 48.10% in 1981 to 66.95% in 2001 whereas female literacy rate increased from 32.58% in 1981 to 56.26% in 2001 in LPA, Bathinda, which shows that more and more boys and girls are coming to schools. Similarly, literacy rate of Bathinda city also substantially increased from 51.78% in 1981 to 69.26% in 2001. The male literacy rate of Bathinda city recorded an increase from 58.74%

in 1981 to 73.52% in 2001 and female literacy rate has also increased from 51.78% to 69.26% during this period as shown in Table 13 & Table 14 below:

Table 13: Literacy Rate of LPA Bathinda 1981-2001

Sr. No.	Year	Total Population	Total literates	Male Literacy		Female Literacy		Total Literac rate (%)
				Number	%age	Number	%age	
1.	1981	235608	96618	61518	48.10	35100	32.58	41.0
2.	1991	289305	142839	85795	55.70	57044	42.17	49.3
3.	2001	367301	227638	131519	66.95	96119	56.26	61.9

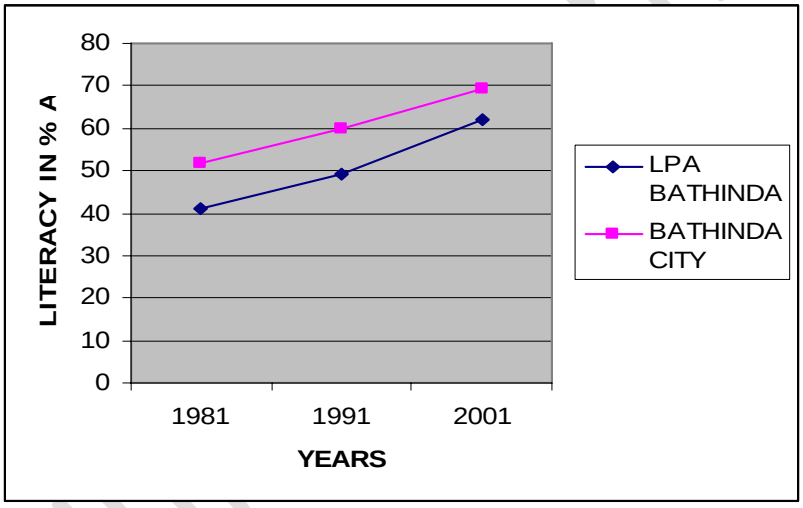
Source: District Census Handbook1981, 1991, 2001, Bathinda

Table 14: Literacy Rate of Bathinda City 1981-2001

Sr. No.	Year	Total Population	Total literates	Males		Females		Liter rate (%)
				Number	%age	Number	%age	
1.	1981	127363	65948	41137	58.74	24811	43.27	51.7
2.	1991	159042	95512	56070	65.74	39442	53.47	60.0
3.	2001	217256	150479	85979	73.52	64500	64.30	69.2

Source: District Census Handbook1981, 1991, 2001, Bathinda

Figure 10: Literacy Rate in LPA Bathinda and Bathinda City



Migration

3.13. Migration forms an important component of process of urbanization. Census of India, defines the migration in two ways; viz.:

Migrants by place of birth: Migrants by place of birth are those who are enumerated at a village/town at the time of census other than their place of birth.

Migrant by place of last residence: A person is considered as migrant by place of last residence, if the place in which he is enumerated during the census is other than his place of immediate last residence.

Migration at Punjab Level: The total number of migrants from outside the state and outside the country is 0.81 million and 0.02 million respectively, but there is

significant out-migration from the state (0.5 million). As a result, the net migration to Punjab is only 0.33 million. States from where sizeable number of in-migrants came to Punjab are: Uttar Pradesh (0.24 million), Haryana (0.11 million) and Bihar (0.14 million). Male in-migrants from Uttar Pradesh and Bihar cited 'Work/Employment' as the main reason for migration (72.1% and 82.2% respectively).

In case of Bathinda city the people from different parts of the country came to this city for availing better employment opportunities and higher level of facilities and services. As per census 2001 there were a total number of 32072 migrants all durations whereas 14757 migrants came to this city during last 10 years. Table 15 shows the details of migration of Bathinda city.

The Table 15 depicts that maximum number of migrants i.e. 3404 came from the adjoining state of Haryana during last 10 years which is 23.07% of total migrants. The second highest number of migrants i.e. 3377 came from Uttar Pradesh, which is 22.88% of the total followed by Bihar and Rajasthan having a share of 17.78% and 14.98% respectively. About 21% migrants belong to all other states. The all duration migration has not been discussed as the trend of migration can only be judged from the figures of latest years therefore the figures of last 10 years have been analyzed. As it can be derived from Table 6 the total added population during 1991-2001 has been recorded as 58214 out of which 14757 are the migrants as per the Table 15 which is 25.35% share of the increased population.

Table 15: Migration from Different States to Bathinda City

Sr. No.	States	All durations		Below 10 years	
		Persons	Percentage of total	Persons	Percentage of total
1	Andaman & Nicobar Islands	0	0	0	0
2	Andhra Pradesh	60	0.19	25	0.17
3	Arunachal Pradesh	3	0.01	3	0.02
4	Assam	98	0.31	40	0.27
5	Bihar	4,688	14.62	2624	17.78
6	Chandigarh	620	1.93	382	2.59
7	Chhattisgarh	237	0.74	81	0.54
8	Dadra & Nagar Haveli	0	0.00	0	0.00
9	Daman & Diu	1	0.00	0	0.00
10	Delhi	1,289	4.02	617	4.18

11	Goa	10	0.03	8	0.05
12	Gujarat	134	0.42	50	0.34
13	Haryana	8,173	25.48	3404	23.07
14	Himachal Pradesh	1,099	3.43	429	2.91
15	Jammu & Kashmir	168	0.52	91	0.62
16	Jharkhand	175	0.55	72	0.49
17	Karnataka	35	0.11	17	0.12
18	Kerala	76	0.24	30	0.20
19	Lakshadweep	0	0.00	0	0.00
20	Madhya Pradesh	325	1.01	210	1.42
21	Maharashtra	255	0.80	124	0.84
22	Manipur	4	0.01	3	0.02
23	Meghalaya	1	0.00	1	0.01
24	Mizoram	0	0.00	0	0.00
25	Nagaland	0	0.00	0	0.00
26	Orissa	175	0.55	94	0.64
27	Pondicherry	2	0.01	0	0.00
28	Punjab	0	0.00	0	0.00
29	Rajasthan	5,079	15.84	2210	14.98
30	Sikkim	1	0.00	1	0.01
31	Tamil Nadu	85	0.27	49	0.33
32	Tripura	0	0.00	0	0.00
33	Uttar Pradesh	7,482	23.33	3377	22.88
34	Uttranchal	1,178	3.67	453	3.07
35	West Bengal	619	1.93	362	2.45
	Total	**32072**	**100.00**	**14757**	**100.00**

Source: Census Data 2001

Besides the above, a considerable number of migrants of all time duration have been recorded as per 2001 census that came to Bathinda city from within the Punjab State. The detail of migrants of this category is given in Table 16 below:

Table 16: Total Migrants in Bathinda City (2001)

Sr. No.	Place of last Residence	No. of Migrants in Persons	Percentage Of total Migrants.
1	Else where in the District of enumeration	38,899	34.65
2	In other districts of the state of enumeration	39,082	34.81
3	States in India beyond the State of enumeration	32,072	28.57
4	Last residence outside India	2,209	1.97
	Total	**1,12,262**	**100.00**

Source: Census Data 2001

The Table 16 depicts that maximum number of 39082 migrants who came to Bathinda had their place of last residence in other districts of Punjab which is 34.81% of total migration followed by the migrants from within the district

numbering to be 38,899 which is 34.65% of total whereas 28.57% are from other states. As per the facts of the above table the maximum share of migrants in Bathinda city i.e. about 70% are from within the state.

Overview of the Economy of Punjab

3.14. Punjab being an agrarian state, agriculture has played a pivotal role in the economic development of the state. Through green revolution in the 60's, Punjab took a major stride in increasing its productivity of food grains, especially of wheat and rice. It contributed significantly towards strengthening India's self-sufficiency by contributing a major share in the central pool over time. During 2006-07, it contributed 75.3% wheat and 31.2% rice to the central pool. However, the growth of secondary sector especially of manufacturing sector is not of satisfactory level. Neighboring states got an edge over Punjab in the growth of manufacturing sector due to location advantages and due to more conducive policy regime. Punjab has grown at a rate of 5.08% during 10th Five Year Plan as compared to 7.77% at all India level. Its secondary sector has grown at 8.40% as compared to 9.46% at all India level.

Table 17: Key Economic Indicators of Punjab State

Item	Unit	2004-05	2005-06	2006-07
Gross State Domestic Product at 1999-2000 prices	Rs.in Crores	81229.39	85729.29	91148.12
Growth Rate of GSDP at 1999-00 Prices	Percent	5.2	5.54	6.32
Per Capita Income at 1999-00 Prices	(Rs)	27851	28872	30158
Percentage Share to Central Pool				
Wheat	%	55	60.9	75.3
Rice	%	36.9	32	31.2
Electricity Generated	(m.k.w.h)	21296	24642	23695
Per Capita Power consumption	(k.w.h)	871	906	968

Source: web site of Economic survey of Punjab 2006-07

The overall economy of Punjab has witnessed a growth rate of 5.54% at constant (1999-2000) prices during 2005-06 and it is expected to grow by 6.32 during 2006-07. The Per Capita Income at Constant (1999-2000) prices in Punjab is Rs. 28872 during 2005-06 as against Rs.27851 during 2004-05 registering an increase of 3.67%. It is expected to increase to Rs. 30158 in 2006-07 showing a growth rate of 4.45%. The per capita income at current prices is Rs. 36759 in 2005-06 as against Rs. 33158 in 2004-05 showing an increase of 10.86%. Per capita income is Rs. 40566 during 2006-07, registering a growth rate of 10.36

percent. The sectoral growth rates are given in Table 18. As may be seen from this table, secondary and tertiary sectors have grown at rates faster than that of the primary sector. Within the secondary and tertiary sectors, Construction, Transport Storage and Communication and Banking & Insurance have grown significantly faster.

Consequently the share of agriculture (proper) in GSDP has declined from 26.2 % in 1999-2000 to 20.65% in 2006-07. The share of primary sector, which includes agriculture and livestock, has come down from 37.53% in 1999-2000 to 31.97% in 2006-07. The share of secondary sectors has increased from 22.75% 1999-2000 to 25.90% in 2006-07, which is mainly due to increase in activity of construction sector. The share of tertiary sector, which comprises of services sector, has increased from 39.72% in 1999-2000 to 42.13% in 2006-07. This growth is mainly due to increase in contribution of transport, storage & communication, trade, hotels & restaurants and banking & insurance sector. It is evident that this structural change in Punjab's economy is the main underlying reason for the sustained urbanization.

Table 18: Sectoral Growth Rates in GSDP at 1999-2000 prices

Percentage change over the previous year							
Item	**2000-01**	**2001-02**	**2002-03**	**2003-04**	**2004-05**	**2005-06**	**2006-07**
1.Agriculture & Allied (Primary)	1.42	0.81	(-) 1.12	5.77	2.16	1.68	4.05
II. Industry (Secondary)	5.66	(-) 2.07	3.02	6.85	9.66	12.17	10.28
Manufacturing	3.87	(-) 5.19	6.09	3.72	6.46	7.66	6.03
Electricity, Gas & Water Supply	0.03	0.06	4.47	6.75	1.61	8.12	4.2
Construction	16.19	5.98	(-) 6.27	16.61	23.71	24.98	21.77
III. Services (Tertiary)	5.39	5.21	6.11	4.63	5.34	4.95	5.74
Trade, Hotels and Restaurants	7.01	3.47	3.26	5.35	6.22	4.03	5.12
Transport, Storage & Communication	14.9	18.67	12.24	13.76	7.15	8.63	10.45
Banking & Insurance	4.95	4.72	11.26	(-) 1.00	9.57	8.43	9
IV. Total GSDP	3.96	1.92	2.81	5.52	5.2	5.54	6.32

Source: web site of Economic survey of Punjab 2006-07

Employment LPA Bathinda

3.15. Economic data as available for the state is not available for district or the city. The trends of economic growth have therefore to be judged on the basis of employment data as discussed ahead. depicts that the number of workers has increased in LPA, Bathinda as the percentage of worker to the total population increased from 32.78 % in 1981 to 35.52% in 2001. However, the workforce participation rate has slightly decreased from 32.13% in 1981 to 31.95 % in 2001 in case of Bathinda city. There are 64.47% non-workers in LPA and 68.05 % non-workers in Bathinda city as per census 2001. The details of workers and non-workers are given Table 19 below:

Table 19: Workers and Non Workers in LPA, Bathinda and Bathinda City 1981-2001

Year	LPA BATHINDA			BATHINDA CITY		
	Total workers	%age	Non workers	Total workers	%age	Non workers
1981	77231	32.78	157659	40927	32.13	86436
1991	87716	30.32	201533	46100	28.99	112942
2001	130483	35.52	236818	69411	31.95	147845

Source: District Census handbook 1981, 1991, 2001, Bathinda

Occupational structure

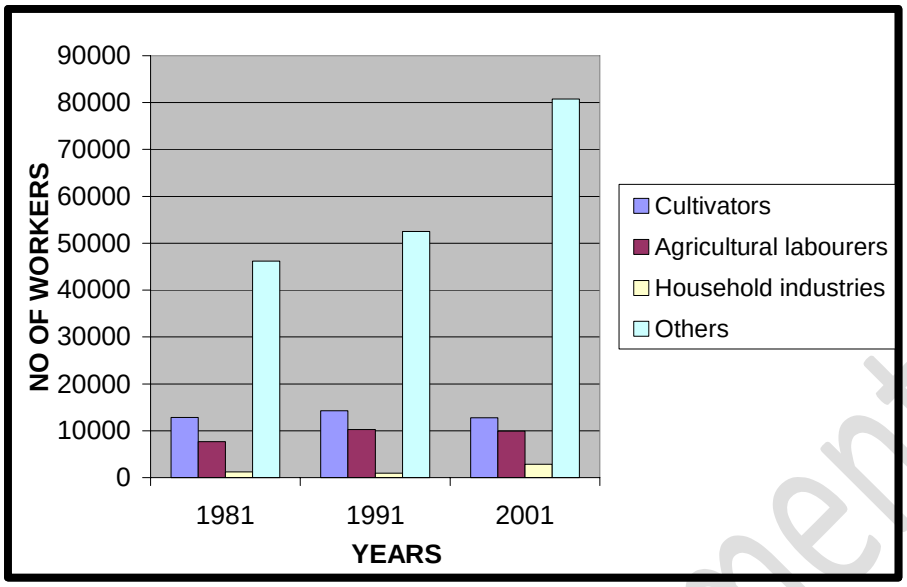
3.16. The change in occupational structure has been noticed to a considerable extent as the persons engaged in primary activities i.e. cultivators and agricultural laborers decreased from 34.92% in 1981 to 26.67% in 2001 for the LPA, Bathinda whereas an increase is recorded in percentage of workers in household industries from 1.82% to 2.53% in 1981 and 2001 respectively. The most notable change during 1991-2001 is seen in the percentage of workers engaged in other activities, which jumped from 62.43% to 70.80% in this period. The detail of occupational structure is given in Table 20 below:

Table 20: Occupational Structure of LPA, Bathinda:

Year	Total workers	Cultivators		Agricultural laborers		Household industries		Others	
		No	%age	No	%age	No	%age	No	%age
1981	74033	16490	22.27	9361	12.64	1346	1.82	47037	63.53
1991	85558	18481	21.60	12649	14.78	1012	1.18	53416	62.43
2001	117173	18491	15.78	12764	10.89	2962	2.53	82956	70.80

Source: District Census Handbook 1981, 1991, 2001, Bathinda

Figure 11: Occupational Structure of LPA, Bathinda 1981-2001



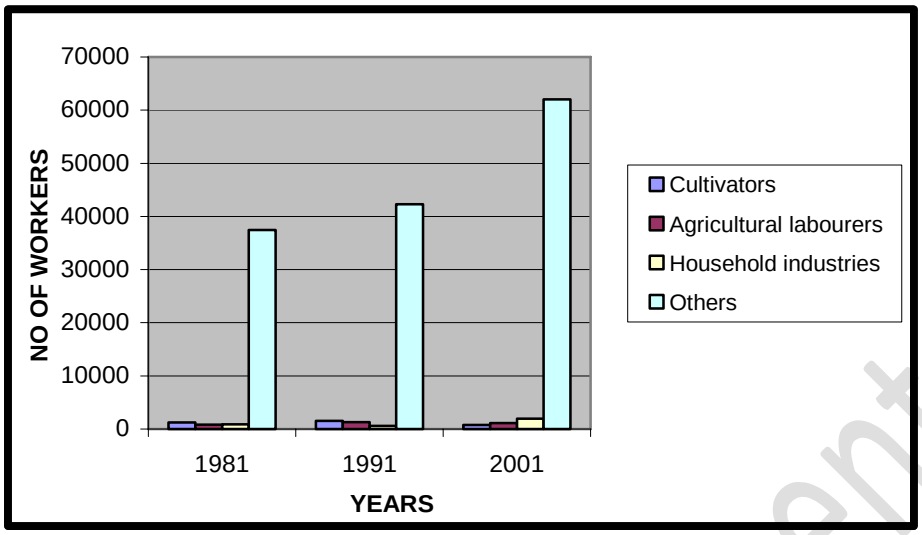
3.17. In case of Bathinda city, the workers engaged in primary activities i.e. cultivators and agricultural decreased from 5.14% in 1981 to 2.89% in 2001 as given in and shown in .The household industry after showing a decreasing trend during 1981-1991 again recorded an increase from 1.32% to 2.41% during 1991-2001. Similarly, the share of workers engaged in other activities recorded a slight decrease from 92.66% to 92.40% during 1981 and 1991 and then increased to 94.17% in 2001. However other workers are too large a category to draw any conclusions.

Table 21: Occupational Structure of Bathinda City, 1981-2001

Year	Total workers	Cultivators		Agricultural laborers		Household industries		Others	
		No	%age	No	%age	No	%age	No	%age
1981	40444	1225	3.03	853	2.11	890	2.2	37476	92.66
1991	45780	1561	3.41	1320	2.88	603	1.32	42296	92.4
2001	65892	771	1.17	1074	1.63	1585	2.41	62462	94.79

Source: Bathinda District Census Handbooks 1981, 1991, 2001

Figure 12: Occupational Structure of Bathinda City, 1981-2001



Besides, above the detailed occupational structure of Bathinda city as elaborated in the figures of 2001 census is given in below:

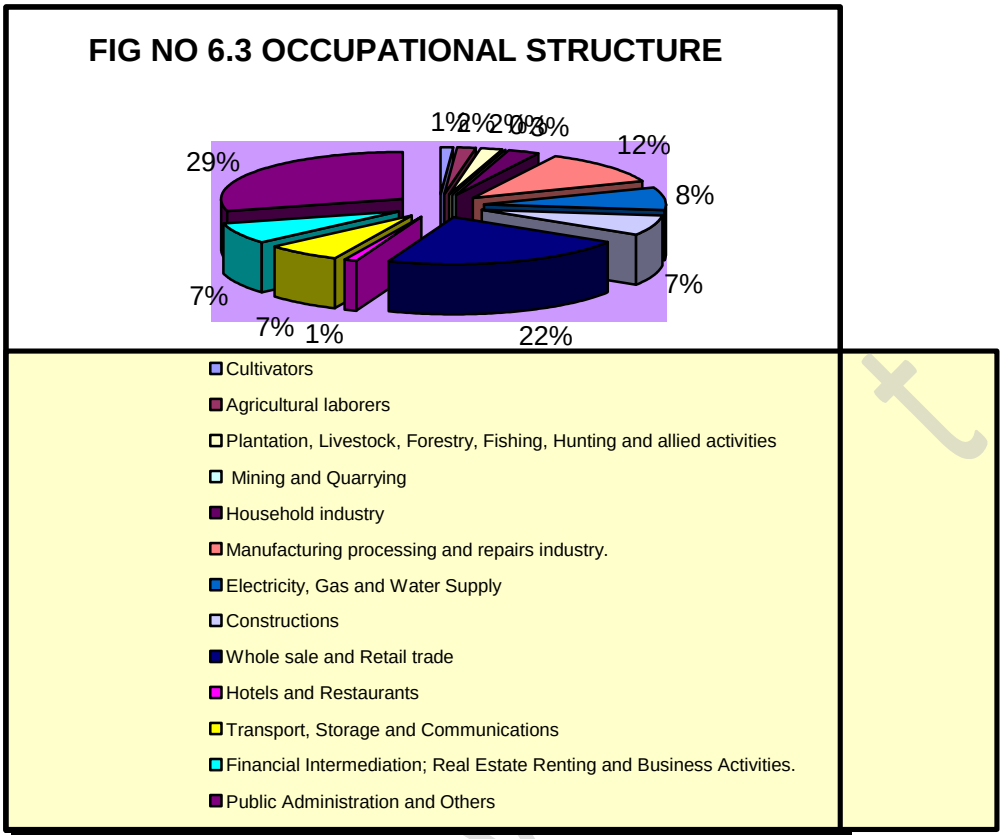
Table 22: Occupational Structure Category Wise of Bathinda City: 2001

Code	Type of worker	Number of workers	Percentage
A & B	Cultivators	771	1.17
	Agricultural laborers	1074	1.63
	Plantation, Livestock, Forestry, Fishing, Hunting and allied activities	1200	1.82
C	Mining and Quarrying	49	0.07
D	Household industry	1585	2.40
	Manufacturing processing and repairs industry.	7789	11.80
E	Electricity, Gas and Water Supply	5100	7.73
F	Constructions	4576	6.94
G	Whole sale and Retail trade	14385	21.80
H	Hotels and Restaurants	844	1.28
I	Transport, Storage and Communications	4327	6.56
J & K	Financial Intermediation; Real Estate Renting and Business Activities.	4748	7.20
L to Q	Public Administration and Others	19535	29.61
	Total	**65983**	**100.00**

Source: Census of India, 2001

From the above it is found that out of total workers of Bathinda City a major share goes to other services given under L to Q which is 29.61% followed by wholesale and retail trade.

Figure 13: Occupational Structure category wise of Bathinda City 2001



Manufacturing Industry

3.18. Although LPA Bathinda and Bathinda City do not have large number of industries in case of Bathinda city quite a handsome share of workers is engaged in industrial activities. As per the figures given in census data of 2001, about 9374 workers were engaged in industrial sector, which is 14.20% of total workers. The household industries have a share of 2.40% only. Workers other than house hold industries have a major share i.e. 11.80% of workers.

Ware housing & Wholesale Trade

3.19. So far as this economic activity is concerned, it has been found that the wholesale trade is concentrated in Bathinda city. Besides the wholesale market of agricultural produce the city serves a regional centre for wholesale cloth market and wholesale medicine market. The influence zone of this trade extends over Ganganagar, Hanumangarh in Rajasthan, Firozpur, Abohar, Mansa, Barnala etc. in Punjab and Sirsa, Dabwali, Ratia in Haryana. The concentration of warehouses has also been noted in and around the city. As per data of 2001 census as many as 14385 workers are engaged in wholesale and retail trade accounting for 21.80% of total workers. This sector is the second highest

employment provider sector in the other services. From the figures, it is clear that the economic base of the city is mainly dependent on this sector. The main wholesale trades are wholesale Grain market, Vegetable Market, Cloth Market, Medicine Market etc.

Tourism and Hospitality

3.20. The Local Planning Area is not so rich in tourism. Bathinda Fort is the only historical monument visited by some tourists. . However there are a number of hotels and restaurants in which many people are engaged. As per figures given in 2001 census there are about 844 persons engaged in hotels and restaurants, which are 1.28% of total work force of Bathinda city. Besides the above, Rose Garden in Bathinda city and Chetak Park in Cantonment are other places of interest in LPA, Bathinda. A well-developed Golf course of 18 holes spreading over an area of 200 acres exists in Bathinda cantonment where competitions of National level are held.

Finance, Insurance and Banking

3.21. The activities related to finance, insurance and banking are concentrated in Bathinda city however a few number of banks are found in rural areas of LPA of Bathinda the analysis of which will not be useful here. As per census 2001 figures, about 4748 persons are engaged in financial sector in Bathinda city, which is 7.20% of total work force of the city. These workers are engaged in banking financial institutions and insurance companies. As per information collected from field there are about 40 banks operating in Bathinda city, which cater the services to LPA Bathinda besides Bathinda city. All the four General Insurance Companies and Life Insurance Company of India have their offices in Bathinda city. In addition to this, there are 15 other Private Life Insurance companies operative in Bathinda city.

Emerging Economic Drivers of the LPA

3.22. Several economic drivers have been identified within LPA. Bathinda, which would influence development of Bathinda city as well as that of LPA Bathinda which comprises rich fertile agricultural land, giving boost to the economic development of this area. The boom in real estate activities during recent years (till October 2008) has also been experienced in LPA Bathinda. This played an important role in physical and economic growth of Bathinda. Homeland Enclave, Ganpati Enclave, Sheesh Mahal colony, and H.B.N. Sunrise city are the main

residential colonies, which emerged during recent years in private sector. In addition to above Sushant City Phase-I of Ansal Mittal Group on Mansa Road, Royal Enclave on Barnala Road and Silver Oaks Apartments on Bibiwala Road are other residential colonies in private sector which are contributing towards the economic development. Besides this, there are five Shopping Malls and Multiplex, which are under construction in different parts of Bathinda city. Also the several institutions, which came into existence in recent past in LPA of Bathinda, played an important role in the economic development of this area as these institutions have provided large employment. Adesh Institution of Medical Sciences & Research on Barnala road, Baba Farid Institute of Higher Education & Foreign Studies on Muktsar Road and Malwa Regional College are worth mentioning here.

There are several more projects under development outside the LPA Bathinda, which may act as supporting economic drivers. Guru Gobind Singh Oil Refinery coming up at a distance of about 45 Km from Bathinda would encourage some allied activities and employment to grow around Bathinda. One Thermal Plant near Talwandi Sabo and another near Gidderbaha also fall within 50 Km radius from Bathinda which are expected to be developed in times to come would also generate employment in this region, these employees will be dependent on Bathinda city for their basic commercial needs, thus definitely would contribute to economy of LPA Bathinda. Besides this, a site of more than 200 hectares in village Ghuda on Badal road has also been cleared by the State Govt. for establishment of Central University to accelerate the educational activities in this area.

Keeping in view the growth potential of this region Govt. has decided to establish a Domestic Air Port to be constructed by Ministry of Civil Aviation Govt. of India. A site measuring about 40 acres adjoining to the Air Force Station, Bhisiana (Bathinda) has already been selected for domestic airport, which will be acquired shortly. This will be an additional economic driver for this LPA.

4. HOUSING

4.1 Housing is one of the basic human needs and ranks after food and clothing in terms of priority. Housing constitutes one of the most important parts of the social environment where an individual is nurtured, grows and matures as a human being, part of the society and as a citizen. Housing, in addition to making contribution to the quality of living also plays a significant role in improving the national economy and generation of employment. Housing has multiplier effect on the economy and industry of the country. Poor quality of housing or absence of appropriate shelter has considerable impact on the economy and productivity of human beings besides health and hygiene. Accordingly, housing has been placed high on the agenda of any national government committed to the cause of promoting human welfare. Considering the role and importance of housing in the national economy, productivity, industrial growth, employment and quality of life a number of policies dedicated to creating affordable housing have been framed at the national level. The agenda of these policies have been focused on the ultimate goal of providing affordable shelter to all by 2021.

Growth of Housing in Bathinda

4.2 Housing is an activity, which is mainly driven by individuals to provide them with an appropriate shelter. With the rapid increase in population, number of houses has also recorded an increase. Besides individuals, different agencies have also contributed to the household stock of the Bathinda city. In order to facilitate the construction of houses Government of Punjab through Bathinda Development Authority (BDA), Improvement Trust, Housefed and Municipal Corporation, Bathinda has framed large number of schemes. These agencies have not only created built up houses but also have provided developed plots by framing different types of schemes in and around Bathinda city. Improvement Trust, Bathinda has so far promoted 12 Development schemes covering an area of approx. 298 acre offering 2500 residential plots and 870 commercial plots besides built up houses in the city. Municipal Corporation has contributed by framing about 17 Town Planning Schemes offering 3600 residential plots covering an area of approx. 1256 acre. In addition, Department of Housing & Urban Development has developed 5 Residential Urban Estates in Bathinda and has offered 3600 residential plots of various sizes for building houses and built

up houses. In addition, private developers have also taken up 7 numbers of colonies with 3450 residential plots in an area of 426 acres licensed under the Punjab Apartment & Property Regulation Act, 1995.

Data regarding housing and slum areas is collected from census and mainly from Municipal Corporation Bathinda. The census data relating to housing has certain limitation as all houses are counted irrespective of tenure /materials etc. and household is defined as group of people sharing a kitchen. This many include multiple nuclear families –indicating latent demand.

4.3 The growth of residential houses and households has been found to be keeping pace with the growth of population in the Bathinda. As per the Census figures, number of occupied houses increased from 23,990 to 41,014 during the year 1981 to 2001. The maximum growth has been recorded during the decade 1991-2001 which has been placed at 42.21%. The high growth rate of housing in Bathinda can be attributed to large migration from the neighboring rural area to urban area during this period. However, the growth was found to be lower during the last 1981-91 decade when it was recorded at 20.22% only. During this period the number of households has also increased at a rapid pace. During the last two decades, the number of household has increased from 25,247 in 1981 to 41,645 in 2001. The growth rate of households during the period 1981-91 was 20.79%, which is almost the same (20.22%) as of residential houses. Similarly the growth during the last decade was found to be 36.53%, which is also lower than the growth of residential houses. This shows the comfortable position of housing stock in the city. During this period it has been found that the household size has also recorded an increase as against a household size of 5.0 persons per family in the year 1981, the household size of 5.2 persons per family has been recorded in 1991 which remained the same in the year 2001. Table 17 indicates the growth pattern of houses and households during the last two decades.

Table 23: Growth of Houses and Households in Bathinda City: 1981-2001

Year	Occupied Residential Houses	%age growth Rate of Residential houses	No. of households	%age growth Rate of Households	Household size
1981	23990	-	25247	-	5.0
1991	28840	20.22	30495	20.79	5.2
2001	41014	42.21	41645	36.53	5.2

Source: Census of India 1981, 1991, and 2001

Housing Characteristics

Pattern of use of housing stock

4.4 Out of a total of 50707 houses listed in Census 2001, nearly 78% were used for residential purposes and additional 10% were used for mixed residential uses. Remaining houses were used for exclusively used for non-residential uses. Details of use of census houses are given in Table 24 below:

Table 24: Pattern of Use of Census houses Category wise in Bathinda City: 2001

S. No.	Category	No. of houses	% age of total houses
1.	Residential	39403	77.71
2.	Residential cum other use	1636	3.23
3.	Residential cum shop cum office	3640	7.18
4.	School/College	180	0.35
5.	Hotel/Lodge/Guest House	63	0.12
6.	Hospital/Dispensary	155	0.31
7.	Factory/Workshop/Work shed	427	0.84
8.	Place of Worship	148	0.29
9.	Other Non Residential uses	1342	2.65
10.	Vacant houses	3713	7.32
	Total census houses	**50707**	**100**

Source: Census of India 2001

Type of housing structure

4.5 As per the census figures of 2001, major portion of city population i.e. 93% of the total households live in permanent and 4% in semi permanent structures only 3% of the total households i.e.1373 are living in temporary structures, out of which only 1% are non serviceable structures. Table 25 shows the distribution of residential houses by their type of structure in Bathinda city.

Table 25: Distribution of Residential Houses by their Type of Structure in Bathinda City: 2001

Type of Structure	Permanent	Semi-permanent	Temporary			Unclassifiable
			Total	Serviceable	Non-serviceable	
No. Of houses	37,988	1,651	1,373	907	466	2
%age of total	93	4	3	2	1	0

Source: Census of India 2001

Households by number of dwelling rooms

4.6 The figures of 2001 census indicated that out of the total households of Bathinda city about 77% are living in the houses having two rooms or more whereas about 21% are living in one room set and a few households are having no exclusive room. Thus maximum number of households is having at least minimum one

dwelling room and this number when compared to all India Urban proportion of 35% households living in one room, shows that city has relatively better housing condition and houseless population is meager. Only 1% of the total households are in category of no exclusive room. Detail of households by number of rooms is given in Table 26 below:

Table 26: Households by Number of Dwelling Rooms in Bathinda City: 2001

Number of rooms	No exclusive Room	One Room	Two Room	Three Room	Four Room	Five Room	Six rooms and above	Total
Households	258	8,911	12,830	9,610	5,913	2,262	1,861	**41645**
%age	1	22	31	23	14	5	4	**100**

Source: Census of India 2001

Services to households

4.7 As per the census 2001 about 59% of the total households in Bathinda City had 'tap' as the source of the drinking water and 38% dependended on hand pump 95% of the households of the Bathinda city have access to electricity for lighting. As indicated in census 2001 about 87% of the total households had bathroom facility within the house 38% and 29% of the total households had water closet and pit latrine respectively while 8% of the total households do not had latrine facility. Also in case of drainage for wastewater 41% of the total households had closed drainage while 49% are having open drainage. Besides this 10% of total households did not have drainage facility.

Slums in Bathinda

4.8 Slums represent multiple human deprivations in urban settlements and majority of urban poor seems to reside in the slums and squatter settlements. With the industrialization, slums and slum population have multiplied, as cities have been unable to support the large number of migrants who cannot buy a house or a plot of land for their own shelter. This has been putting strain on urban resources as poor unskilled migrants with negligible income find it convenient to create a temporary shelter on government or private land without security of tenure. Generally these settlements do not have any basic civic amenities, and people live under unhygienic and unsanitary conditions. The Census of India (2001) defines slums as, "all areas notified as slums by the state/local government under any Act; and all areas recognized as slums by state/local government, which have not been formally notified as slum under any Act and a compact area of

about 300 population or about 60-70 households or poorly-built congested tenements in unhygienic environment, usually with inadequate and lack of any proper sanitary and drinking water facilities."

General Characteristics of slums in Bathinda

4.9 Bathinda has an urban population of 2, 17,256 comprising 41645 households. The slums population was 40602 comprising 7723 households, which is 18.68% of the total urban population. Average size of the households in slum was 5.13 as compared to 5.26 in non-slum areas. Bathinda slums have work participation Rate (WPR) for total (31.86%) and for male workers (48.46%). Table 27 below shows the Socio-economic & Demographic Indicators of Slum & Non-Slum Areas in Bathinda city.

Table 27: Socio-Economic & Demographic Indicators-Bathinda City

Indicator	Bathinda	Slum Area	Non-Slum Area
Households	41645	7723	34407
Population	217256	40602	176654
Average Household Size	5.16	5.13	5.26
Sex Ratio	858	854	859
Population (0 – 6) in %	11.28	14.20	10.60
0-6 Sex Ratio	752	793	583
SC Population (%)	21.30	35.60	18.02
SC Sex Ratio	892	881	898
Percentage of Literacy			
Persons	69.26	55.65	72.39
Male	73.52	61.31	76.33
Female	64.30	49.01	67.80
Total Workers (Percentage to total population)			
Persons	31.94	31.86	31.96
Male	49.88	48.46	49.89
Female	11.04	10.80	11.09

Source: Census of India, 2001

Distribution of slum population

4.10 The city of Bathinda is the major town of Punjab state, both in terms of area and population. The industrialization of Bathinda city has resulted in the emergence of several slum colonies in the city. Emergence of slums is largely due to migration of poor population from rural areas and other smaller towns/villages of Punjab, Haryana, and Rajasthan etc. for employment purpose and to avail higher level of services in city. There is no formal housing for industrial workers, due to which some slums have come up in the town near the industrial areas. As per the data made available by municipal corporation Bathinda, there are 8 notified

slums existing in the city, but other than, notified slums, there are some areas in the city, which can be categorized as slum areas as per the definition given by census of India. List of notified slum areas are given below:

1.Jogi Basti	2. Janta Nagar
3.Subash Basti	4. Harbans Naga
5.Chandser Basti	6. Sanjay Basti
7.Amarpura Basti	8. Alam Basti

4.11 It has been seen that above notified slums existing in the city are spread in all directions of city with major concentration on the west side of the Firozpur-Hissar Railway line. Railway line has been found to be the most favorable location for the slums and accordingly a large number of slums are located along the Railway line. Industrial Area has also been found to be a favorite place for proliferation of slums as most of them are near the Industrial area. Besides this other slum areas are scattered over the city in the existing residential development of the city. The location of all slums is shown in the Figure 22 .

Ownership pattern

4.12 All the eight slums mentioned above of these slums are located on the private land. Looking at the location of the slums, it is seen that almost all of the slums are located in the residential areas. The existence of majority of slums on the private land can help in finding appropriate solution for the removal of the slums with the involvement of the owners of the land based on providing higher incentives and subsidies for creating appropriate shelter for the slum dwellers occupying such lands. Slum dwellers occupying the land can be treated as partners in the entire process by asking them to contribute part of the cost of the shelter. On their part, parastatal agencies can be asked to waive off all the charges and fees levied for construction, sanction of the building plans etc.

5. EXISTING LAND USE AND TRANSPORT NETWORK

Preparation of base map

5.1. The work of preparation of base map for the Local Planning Area, Bathinda was assigned to Punjab Remote Sensing Centre, P.A.U., Ludhiana vide memo no. 4827 CTP (Pb) / SP 480 dated 22-10-2007 of Chief Town Planner, Punjab . The base map of whole Planning Area Bathinda is generated on 1:10,000 scale using Cartosat I data of **2.5m spatial resolutions**. The Cadastral maps of the villages falling in Local Planning Area were procured from the State Revenue department by the office of District Town Planner, Bathinda and these maps have been scanned in the office of PRSC, Ludhiana and registered with Cartosat I data to demarcate village and musteel boundaries. The features like roads, rails, high and low lands, drains and settlements etc. have also been delineated from Cartosat I data, by the concerned agency and shown on the draft base map prepared on basis of satellite imagery. After editing the map details the attributes to different features were assigned. After the preparation of LPA plan on 1:10,000 scale using Cartosat I data, the draft base map for densely populated built up areas of Bathinda city (core areas) was prepared on 1:5000 scale using quickbird satellite data of **0.6 mtr. Spatial resolution**. The quickbird data (satellite imagery) are received by the PRSC, Ludhiana from National Remote Sensing Agency, Hyderabad.

Enhancement through field surveys-Land use and Road network

5.2. The draft base map for the Local Planning Area, Bathinda and the densely built up areas (i.e. core areas) received from Punjab Remote Sensing Centre, P.A.U., Ludhiana were updated through ground truthing field survey by the office of D.T.P Bathinda. The various land uses have been identified at the site and earmarked accordingly. Similarly the road network, drains, distributaries and other communication zones have been verified and checked at site. After conducting field surveys the necessary feedback was supplied to P.R.S.C Ludhiana, which were ultimately incorporated and an updated base map was prepared by P.R.S.C, P.A.U Ludhiana. The Office of D.T.P Bathinda again conducted second round of field verification (ground truthing) and the updated (corrected) plans were then supplied to P.R.S.C, this exercise was repeated

several times and the field staff of D.T.P office personally assisted the concerned staff of PRSC and a final Land Use map thus was prepared.

Existing Land Use: LPA, Bathinda

5.3. The LPA Bathinda comprises 57,154 hectares (571.54 sq.kms) of area as per revenue record whereas as per calculations of P.R.S.C. it works out to 57198 Hectares variation of 0.08% only is very negligible.

Table 28 : Existing Land Use LPA Bathinda-2009

Name of Landuse	Area In Hectare	Percentage
Residential	**4087.68**	**7.15**
Residential Built Up	3292.06	5.76
Residential Plots	787.67	1.38
Mixed Land Use	7.94	0.01
Commercial	**309.29**	**0.54**
Retail Shopping	163.22	0.29
Whole Sale, Godowns, Ware Housing Regulated Market	146.07	0.26
Industry	**1169.41**	**2.04**
Service And Light Industry	219.01	0.38
Medium, Large & Heavy	160.69	0.28
Planned Industrial Areas	789.71	1.38
Utilities	**138.31**	**0.24**
Water Works	117.67	0.21
Electric Grid	10.54	0.02
Sewage Disposal	1.67	0.00
Solid Waste	5.21	0.01
Communication	3.22	0.01
Public & Semi-Public	**609.78**	**1.07**
Govt/ Semi Govt/ Public Offices	46.40	0.08
Govt Land (Use Undetermined)	128.16	0.22
Education And Research	302.59	0.53
Medical & Health	74.06	0.13
Social, Cultural & Religious	53.53	0.09
Cremation & Burial Grounds	5.04	0.01
Transportation	**2126.00**	**3.71**
Main Roads & Parking	1723.34	3.01
Railways	397.93	0.70
Bus Terminus	4.45	.007
Truck Terminus	0.28	0.00
Recreational	**201.55**	**0.35**
Play Grounds, Stadium, Sports Complex	41.70	0.07
Parks &Gardens (Public Open Spaces)	95.93	0.17
Lakes	63.92	0.11
Agricultural	**42936.36**	**75.07**
Agriculture	41489.75	72.54
Forest	107.37	0.19
Extractive Area	1.89	0.00
Water Bodies	383.44	0.67
Plantation & Orchards	281.94	0.49
Dairy And Poultry Farms	15.64	0.03
Vacant Land	656.37	1.15
Special Area	**5.92**	**0.01**
Heritage & Conservation Area	5.92	0.01
Others	**5614.00**	**9.82**
Total	**57198.30**	**100.00**

Source: PRSC, PAU, Ludhiana

5.4. LPA Bathinda covers the revenue estates of 46 villages which also includes the areas of three urban centres i.e. Bathinda, Bhuchu and Goniana, as given in Annexure 4. Local Planning Area Bathinda is mostly agricultural. The detail of breakup of major existing land uses is given in Table 28.

Existing Land Use: Bathinda city

5.5. LPA, Bathinda comprises 57,154 hectares (57198 hectares as per P.R.S.C) covering the Land of 46 villages. The total area of Municipal Corporation of Bathinda in the Year 2009 is 6787.68 hectares (say 6800 hectares). The detail of major existing land uses within the M.C. Limits is given in Table 29.

Residential

5.6. It is very much clear from Table 29 that the residential use has a larger share of city area. Out of total Municipal area of 6800 hectares about 2178.08 hectares (32.09%) of area is under residential use which includes both planned and unplanned development. The gross density of the town is 32.01 persons/hectare. The population density is more in inner areas (>200 persons/hectare) as compared to outer areas (< 50 persons/hectare). As far as planned residential development is concerned there are 12 numbers of Urban Estates, 17 T.P Schemes, 12 Development schemes and 7 colonies licensed under Punjab Apartment and Property Regulation Act 1995'. Majority of these planned and regulatory schemes are located in the eastern part of the town while other side of the town is having unplanned and haphazard residential development. The inner zone of the town is characterized by irregular street pattern, narrow lane, low ventilation of buildings, dilapidated structures etc .So for as the residential use is concerned it has expanded in each nick and corner of the city. In south Bhai Matti Das Nagar, Nachhattar Nagar are there on Mansa Road and in north Adarsh Nagar, Guru Nanak Nagar on Kotkapura road besides the coming up private approved residential colonies, whereas in east Baba Farid Nagar, Patel Nagar on Barnala Road and in west Bhagwali Enclave and Sukhmani Enclave towards Multania Road etc. are prominent residential areas on the outskirts of the city. The areas lying between two large scale industries are not free from residential development like Kheta Singh Nagar, Hardev Nagar, Katcha colony etc. The central part of city is predominantly residential as shown in the Existing Land Use Plan Drg. No.D.T.P (B) 1570 /2009 dated 01/04/2009.

Table 29: Existing Land Use Bathinda City -2009

NAME OF LANDUSE	AREA IN HECTARE	PERCENTAGE
Residential	**2178.08**	**32.09**
Residential Built Up	1462.11	21.54
Residential Plots	708.03	10.43
Mixed Land Use	7.94	0.12
Commercial	**205.56**	**3.03**
Retail Shopping	104.22	1.54
Whole Sale, Godowns, Ware Housing Regulated Market	101.33	1.49
Industry	**974.46**	**14.36**
Service And Light Industry	38.88	0.57
Medium, Large & Heavy	145.86	2.15
Planned Industrial Areas	789.71	11.63
Utilities	**106.66**	**1.57**
Water Works	83.76	1.23
Electric Grid	3.82	0.06
Sewage Disposal	1.29	0.02
Solid Waste	14.57	0.21
Communication	3.22	0.05
Public & Semi-Public	**419.53**	**6.18**
Govt/ Semi Govt/ Public Offices	45.46	0.67
Govt Land (Use Undetermined)	45.76	0.67
Education And Research	277.77	4.09
Medical & Health	17.36	0.26
Social, Cultural & Religious	28.55	0.42
Cremation & Burial Grounds	4.63	0.07
Transportation	**384.16**	**5.66**
Main Roads & Parking	237.34	3.50
Railways	126.71	1.87
Bus Terminus	20.11	0.30
Recreational	**149.89**	**2.21**
Play Grounds, Stadium, Sports Complex	38.58	0.57
Parks &Gardens (Public Open Spaces)	47.39	0.70
Lakes	63.92	0.94
Agricultural	**2363.43**	**34.81**
Agriculture	1659.59	24.45
Forest	34.82	0.51
Extractive Area	1.89	0.03
Water Bodies	49.80	0.73
Plantation & Orchards	37.17	0.55
Dairy And Poultry Farms	12.34	0.18
Vacant Land	567.82	8.36
Special Area	**5.92**	**0.09**
Heritage & Conservation Area	5.92	0.09
Total	**6787.68**	**100.00**

Source: PRSC, PAU, Ludhiana

Commercial

5.7. The commercial use is the most important use of the urban areas. It may have lesser share in area but plays an important role in city character. In case of Bathinda city the total area covered under commercial use is **205.56** hectares which is **3.03** % of the total developed area. The main commercial center in Bathinda which acts as CBD of the town is located on either side of Dhobi Bazar, such as Sadar Bazar, Post Office Bazar, Bank Bazar, Kikkar Bazar and Sirki Bazar, This commercial center also serves as a major shopping center for surrounding small towns like Goniana, Bhuchu Mandi, Maur Mandi, Talwandi Sabo, Rampura phul, Rama Mandi, Giddarbaha, Sangat Mandi, Dabwali and Jaitu etc. The commercial areas of the city lack adequate parking and other public amenities. The commercial area of the town is in the form of semi-organized bazars along streets and roads. Apart from this there are informal bazars in the form of temporary shops like Rehri walas, farhi walas and kiosks located in the existing commercial areas and near the bus stand, railway station, grain market, near Thermal Colony and near other important economic activities. About 12 such sites have been identified in the city. There are more than 500 numbers of rehris / informal shops existing in the various parts of the city. These activities are not of permanent nature and are using the roads or parking places therefore areas covered under this use are not shown separately. The detail of informal commercial sector is given in Table 30 below:

Table 30 : Detail of Informal Commercial Sector in Bathinda City

Sr. No.	Location	Approximate no. rehies etc.
1	Sirki Bazar Multania Bridge to Neem wala chowk	40
2	Towards South of Bridge	30
3	Area Samaj Chowk	28
4	Near Shakti Market	42
5	Gole Diggi Market to Rly Station	55
6	Amrik Singh Road	35
7	Canal Bridge to Rose Garden	60
8	Canal Bridge to Rly Crossing	95
9	Bibi Wala Chowk	62
10	Power House Road near Ambedker Bhawan	28
11	Power House Road U/E Phase-III	38
12	Shaheed Sandeep Singh Chowk Paras Ram Nagar	60
	Total	**573**

Source: Field Survey 2009

Under Commercial land use wholesale markets such as Cloth Market, Medicine Market and Grain Market are the main features of the city. Wholesale cloth

market meets the requirements of adjoining districts of Ferozepur, Faridkot, Mukatsar, Mansa, Barnala, Sangrur in Punjab, Sirsa in Haryana and Ganganagar & Hanumangarh in Rajasthan. The Wholesale grain market is located in the south part of the town over an area of 71 Acres. There is no planned site marked for other wholesale trade like timber, iron market etc. However wholesale cloth market and wholesale medicine markets are developed in a semi planned manner which are situated on mall road.

Mixed Land Use

5.8. Like other towns/cities of the state the mixed land use is also found in Bathinda. The mixed Land use has been noticed comprising residential and commercial. Normally many of the roadside commercial developments are having the ground floor as commercial and the first floor or above are used for residential purpose. This Character is found in Kikkar Bazar, parts of Bank Bazar, Court road, Quila road as shown in the Existing Land Use Plan. The area covered under mixed land use is 7.94 hectares only which is 0.12 % of total municipal area. In Bathinda mixed land use is only shared by residential and commercial other type of mixed land use (such as residential with industrial, Commercial with industrial etc) is not very common is this city.

Industrial

5.9. As Table 29 depicts that the total area under industrial use is 974.46 hectares which is 14.36% of the total municipal area. The city of Bathinda has medium and large scale industrial units like Thermal Power Plant, National Fertilizers Limited ,Bathinda Chemicals, Milk Plant and Vardham Polytex etc along with more than 500 small scale registered industrial units dealing with products like manufacturing of utensils, pharmaceuticals, cotton ginning. The latest trend is towards manufacturing of electrical transformers and production of electric motors, plastic pipes, electric wires etc. Besides this agro based industries are also concentrated in the city. It is evident from Existing Land Use plan that big industrial units i.e. Thermal plant N.F.L. are located in north of the city whereas the other planned industrial areas like Industrial Estate, Industrial Focal Point and Industrial Growth Centre are situated in southern part of the city whereas very few small scale or service industries are seen scattered in other parts of the city.

Planned Industrial Areas:

5.10. With a view to facilitate industrial growth, and to locate the industries in planned areas a policy of developing Industrial Estates and Industrial Focal Points in different cities having potential for industrialization was formed by the State Govt.The Industrial Estate was set up in Bathinda by the Department of industries in the year 1959 on an area of 9.74 acres near I.T.I. Industrial Focal Point (Old) (area 30 acres) and Industrial Focal Point new (Area 50 acres) on Dabwali Road were planned and developed by Small Scale Industries and Export Corporation limited in the year 1978 and 1982 respectively. Industrial Focal Point (Old) is located near ITI and Industrial Focal Point (New) is located on Dabwali road. Then in the year 1998 Industrial Growth Center was developed by PSIEC on an area of 394 acres on Mansa road. The detail of area and plots carved out in industrial areas is given in Table 31 below:

Table 31: Detail of Planned Industrial Areas at Bathinda.

Name of Industrial Focal Point.	Year of Establishment	Location	Area in Acres.	Total plots	Agency involved	Remarks
Industrial Estate	1959	Near ITI	9.74	28	Deptt. of Industries	Fully developed & operative
Industrial Focal Point (Old)	1978	-do-	30	62	Pb. Small Industries & and Export Corporation Ltd.	-do-
Industrial Focal Point (New)	1982	Dabwali Road	50	119	-do-	Development works completed but some plots are still unused.
Industrial Growth Centre	1998	Mansa Road	394	401	-do-	Development works completed but only few industries are there.
Total			**483.74**	**609**		

Recreational

5.11. The total area under recreational use including lakes is 149.89 hectares which is 2.21 % of the total municipal area. Under recreational use city has three lakes which cover an area of 63.92 hectares and are located in the northern part of the town near the Thermal Plant, Bathinda. These lakes give a pleasant view and act as a relief to the city. Although basically these lakes are developed as water reservoirs for Thermal Plant but are adding to the beauty of the city. Apart from this, there is one city level park known as Rose Garden located on Bathinda-Kotkapura road near Thermal Colony. Recreational aspect is also covered in depth in Chapter 5 under sub heading 5.51. The physical location of above uses is clearly shown in the Existing Land Use Plan Drg. No. DTP (B) 1570/2009 Dated 01/04/2009.

Traffic & Transportation

5.12. The total area under traffic and transportation is 384.16 hectares which is 5.66 % of the total developed area. The percentage of use under this head is low as compared to norms and standards. The major problems related to this aspect are missing road hierarchy, lack of parking places, traffic bottlenecks, encroachment of roads, lack of railway over bridges & railway under-passes, lack of traffic signals etc. The further detailed study of traffic & transportation is covered in Chapter 5 ahead however Table 29 depicts that out of this use major share i.e. 3.50% of total municipal area is covered under main roads followed by railways which cover an area of 126.71 hectares (1.87%). The details of existing road network and other uses relating to traffic transportation are shown in Existing Land Use Plan Bathinda.

Public & Semi-Public

5.13. This Use comprises the areas covered under Govt. /Semi Govt. offices, Govt. Lands, Education, Health, Socio-Cultural, cremation grounds etc. As per Table 29 the total area covered by this use is about 419.53 hectares which is 6.18% of total municipal areas. The most of public and semi-public uses are concentrated in the central part of the city as it is clear from the Existing Land use Plan Drg. No. DTP (B) 1570/2009 Dated 01/04/2009 whereas few uses of this category are also seen in the outer parts of the city.

Utilities

5.14. As Table 29 shows that utilities such as Water Works, Electric Grid Station, (E.G.S) Sewerage Disposal Works, Solid Waste Dump site and communication etc. cover an area of about 103.44 hectares which is only 1.52% of total municipal area. Some of the utilities like E.G.S. and Communication are evenly distributed in the city as it is clear from Existing Land use Plan of Bathinda city whereas Disposal works, Solid waste site and disposal works are located in one side of the city.

Agricultural / Rural

5.15. There are some chunks of land falling within municipal limits which are still being used for agricultural purposes. The areas near village Gill Patti, areas on backside of N.F.L. colony, area along Malout Road, Multania Road and Dabwali Roard are largely agricultural. As per the figures of Table 29 about 2372.79 hectares are under agricultural use which is 34.96% of total area. Out of this category about 49.80 hectares of land is under water bodies and 567.83 hectares under vacant land. The Existing Land Use Plan shows the spatial distribution of all these uses within the limits of municipal corporation Bathinda.

Special Areas

5.16. There is only one prominent special area i.e. 'The Fort' in Bathinda city which is declared as Protected Monument by the Archeological Survey of India. This fort lies just in the centre of the city as shown in Existing Land use Plan. The total area covered under this use is about 5.92 hectares, which is only 0.09% of total municipal area.

2: Existing Land Use Plan Bathinda City 2009

3: Existing Land Use Plan, LPA Bathinda 2009

Existing Road-Rail Network

5.17. If urban centers have been recognized as engines of economic growth, traffic and transportation has rightly been termed as wheels of such engines. Urban transport has also been considered an integral part of urban planning. The objective of studying the transport sector is to analyze and understand the role of transport in the present scenario of the city and the surrounding and to understand the existing potentials, strengths, weaknesses and constraints of the transport sector and consequently arrive at strategies and projects which will form an integral part of the city development strategy.

Road and Rail play a significant role in the transport sector in Bathinda and surrounding areas. The road network is studied in terms of classification of roads, length of roads, cross section of roads (divided and undivided carriageway, footpath, shoulders etc.), surface material of roads, area of road network and major road intersections. Similar data regarding rail network is also studied.

Road network at LPA level

5.18. There are two National Highways i.e. N.H. 15 coming from Malout and diverting to Kotkapura, and N.H. 64 coming from Barnala and leading to Dabwali. There are three state highways viz. from Mansa (SH 12-A), from Talwandi Sabo (SH 17) and Bhuchu Mandi to Nathana (SH 16-A) in LPA, Bathinda. Besides this, there are other two major district roads coming from Muktsar and Badal.

All the roads passing through LPA, Bathinda have undivided carriageways outside the M.C. limits. The National Highway No 15 and 64 have 1.5 meters wide paved shoulder on either side of 10 metre wide carriage way. S.H.17 has undivided 10 meter carriage way with 1.5 meter pucca shoulders on either side whereas the other state highways S.H.16A and S.H.12A have 7.5 meter carriage way and other major roads have 7 meter wide carriageway. The details of length and width of major roads falling in LPA Bathinda are given in Table 32. The location and alignment of roads falling in LPA Bathinda is shown in Drg. No. 1573/2009 dated 21.5.2009.

4:Existing Transport Network Plan, LPA, Bathinda

Table 32: Detail of Length & Width of Major Roads falling in LPA, Bathinda

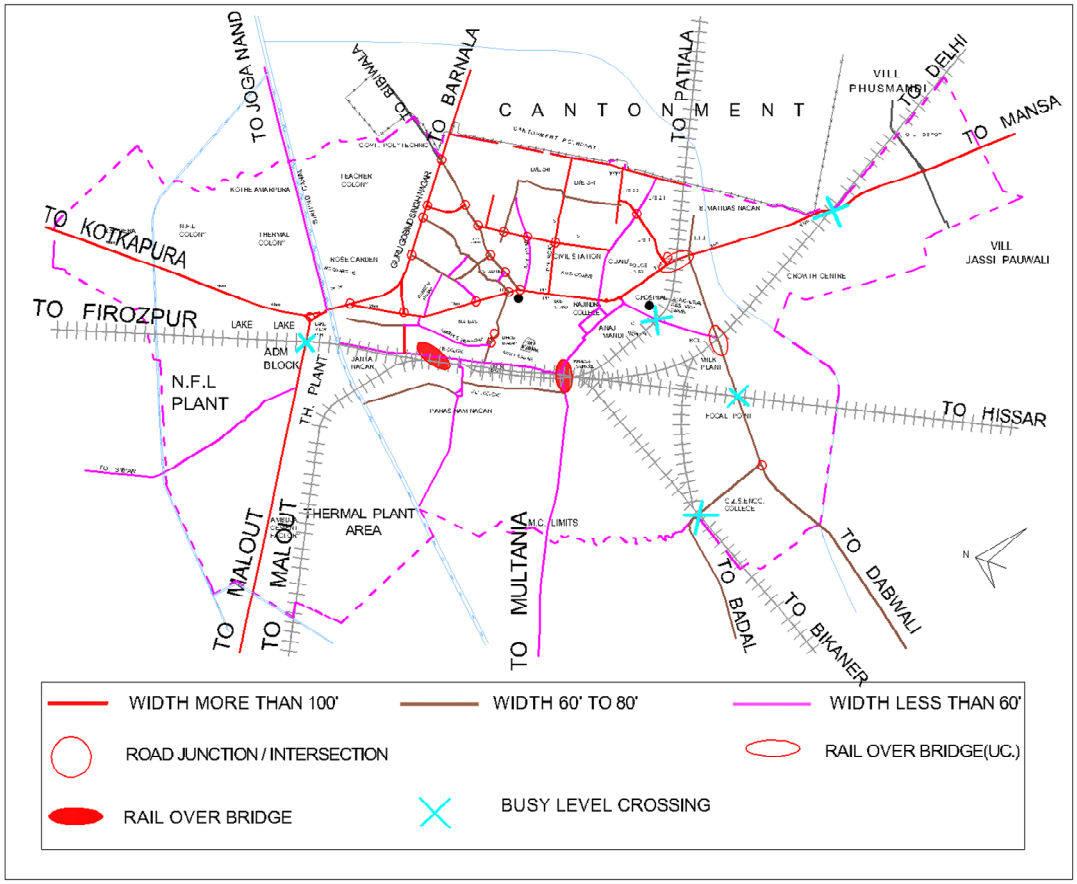
Name of road	Length of roads in LPA (in kms)		Width of road (ROW) in mtr	Width of Carriageway (outside MC limits)	Remarks
	Total	Outside MC limits			
NATIONAL HIGHWAYS					
Bathinda Malout (NH-15)	11.9	7.8	45	10	1.5 M wide paved shoulder
Bathinda Kotkapura (NH-15)	13.6	9.3	30	10	-do-
Bathinda - Barnala purana (NH-64)	21.4	17.9	45	10	-do-
Bathinda Dabwali (NH-64)	9.3	4.6	24.4	10	-do-
STATE HIGHWAYS					
Bhuchu-Nathana (SH-16A)	4.4	4.4	20	7.5	-
Bathinda –Talwandi Sabo (SH-17)	14.19	10.0	30	10	-
Kotshamir-Mansa (SH-12A)	4.8	4.8	30	7.5	-
OTHER MAJOR ROADS					
Bathinda Badal	7.1	6.0	24.4	7	
Bathinda Muktsar	6.7	6.7	24	7	
Total	**93.4**	**71.5**			

Source: 1 PWD central works and Plan roads, Bathinda

2. Field survey 2008

The existence of main roads in Local Planning Area Bathinda shows that this area is well served by the regional roads, which provide a high level of connectivity with other parts of the State. The length of these roads is 93.4 km within LPA boundaries out of which about 22 Kilometers fall within the limits of Municipal Corporation of Bathinda. The total area covered by these roads has been calculated as 895 Hectares, which is about 1.56% of the total area of Local Planning Area. All these roads have black top as the material of construction. There is very good network of rural roads in LPA, Bathinda which is having a total length of about 130 kms.

Figure 14: Road Network- Bathinda city



Road Network at city level

5.19. The existing road network in the city is partially radial in pattern. The roads leading to Bathinda converge at two distant points, in the northern part of city at Kanahaya Chowk where two roads coming from Malout and Kotkapura merge and then lead to city. The Malout road also carries the traffic coming from Muktsar side after merging in it at a distanse of about 4 Kms. from Kanahaya Chowk. The second point of convergence is in southern part of city at I.T.I. chowk where roads from Dabwali and Mansa meet each other and then lead to city. Mansa road also carries the traffic coming from Talwandi Sabo which joins it at village Kotshamir at a distance of about 7 kms. from I.T.I. Chowk. Similarly Badal road joins Dabwali road near G.Z.S. Engineering College. After the merging of important roads at two different points the whole traffic flows over one road i.e. Guru Kashi Marg which runs south to north (From I.T.I. chowk to Kanahaya chowk) just through the centre of the city dividing it into two parts. In fact Guru Kashi Marg functions as an axis or main spine of the city. Two National Highways are entering the city from four sides, one State Highway and several

other roads are existing in the city, besides the local intra city roads. The important roads entering the city are listed below:

1. Bathinda-Kotkapura (N.H.15)
2 Bathinda- Malout (N.H.15)
3 Bathinda-Barnala (N.H.64)
4 Bathinda-Dabwali (N.H.64)
5 Bathinda- Mansa-Talwandi Road (S.H.17/12-A)
6 Bathinda-Badal (M.D.R.)
7 Bathinda-Multania (O.D.R.)
8 Bathinda-Bibiwala (O.D.R.)

The existing positions of these roads is shown in the . As per Figure 14 it is clear that the eastern part of the city has a road network of wider roads with width in exceeding 60 feet (18.40 m.) whereas the area to the western side of railway lines has narrow roads with average width ranging from 10 feet to 33 feet only. The inner city road network has irregular alignments, inadequate width and frequent intersections leading to serious capacity constraints. The details of length and width/carriage way of major roads falling in Bathinda city is given in Table 33.

Table 33: Detail of Length and Width of Major Roads at City level

Name of road	Length in meter	Width of ROW in meter	Width of carriageway in meter	Divided /undivided	Footpath on either side in meter	Paved Shoulder on either side in meter
NATIONAL HIGHWAYS						
Barnala Road (From Kanahya Chowk to Cantt boundary)	4200	45	10+10	Divided	-	1.5
Kotkapura road (From Kanahya Chowk to M.C. limits	4200	30	10	Undivided	-	
Malout road (From Kanahya Chowk to M.C. limits)	4400	45	10	Undivided	-	1.5
Guru Kashi Marg (From Rose Garden to ITI Chowk)	5500	30	10 + 10	Divided	1	3.5 M Parking strip both sides

Dabwali road (From ITI Chowk to M.C. limits	4800	24.4	10	Undivided	-	-
STATE HIGHWAYS						
Mansa Road (from I.T.I Chowk to M.C. limits)	4900	30	**7**	Undivided	1.2	-
OTHER ROADS						
Badal road (From Dabwali road to M.C. limits)	1300	24.4	10	Undivided	--	-
Bibiwala road (From Bibiwala Chowk to Old bus stand	2400	26	9+9	Divided	1.2	2
Power House road (from Guru Kashi Marg road to M.C. limits)	2200	18 to 30	10	Undivided	1 M on one side (partly)	2.15
Mall Road (from Hanuman Chowk to Railway Station)	1200	24	10+10	Divided	2	-
Sector Roads (a) From Bibiwala road to Bhagu road	2000	30	10+10	Divided (1 M to 3 M)	1	2.5 to 3.5
(b) From Bibiwala road to Barnala Byepass road	600	30	10+10	Divided (3 M)	-do-	2.5
(c) Brijwasi Sweet house to Jujhar Nagar	550	30	7+7	Divided	-do-	7.0
(d) Santpura road to Mela Ram Hospital road	550	30	10+10	Divided (2 M)	2	2
(e) T.V. tower to Ring road Phase-1	2000	30	12	Undivided	3 (partly)	6 (partly)
(f) From Barnala bye pass to Guru Kashi Marg	380	30	10	Undivided	-	10.24 (katcha)
Dr. Bhatti road (a) From barnala bye pass to bibi wala road	**222** 1500	24	7.5+7.5	Divided	1	3.5
(b) From Guru Kashi Marg to 80' Bhatti road	400	12	10	Undivided	-	-
Dr. Kishori Ram Hospital road	**22222** 1300	18.5	10	Undivided	1.0	3.25
Dr. Maheshwari Hospital to Model Town	800	18.5	10	Undivided	-do-	-do-
Ajit Road (from Old Bus Stand to Urban Estate Phase-3)	1800	12	10	-do-	1	-
(a) from Sector road of Urban Estate Phase-2 to Urban Estate Phase-3	1600	24.40	10.4	-do-	2 (partly)	5 (partly)

(b) Bhagu Road (from Mansa Road to M.C. limits (Cantt.))	1500	7.5	7.5	Undivided	-	-
Haji Rattan road (from Mansa road to Dabwali road)	1500	9	7	-do-	-	1
Mulatania Road (from Mansa road through Grain market, over bridge upto M.C. limit)	3500	11.5(avg.)	6.5 (avg.)	-do-	-	2.5
Lal Singh Basti road (from Multania road to M.C. limits)	2300	9	6	-do-	-	1.5
Paras Ram Nagar Road	3300	11(avg.)	7	-do-	-	2
Santpura Road (from canal to railway station)	2000	15.25	9.25	-do-	-	3
Mall Godam Road	2100	12.20	10	-do-	-	1.10
Amrik Singh Road (from Goniana Road to Mall Road)	1200	12.20	10	-do-	-	1.10
Namdev Road (from Goniana Road to Dr. Bhatti Road)	900	12.20	10	-do-	-	1.10
(a) Stadium Road (from Hanuman Chowk to 80'Road)	500	18.30	10	-do-	-	4.15
(b) Stadium Road (from Pirkhana to Bibiwala Road)	100	12.20	10	-do-	-	1.10
Thandi Sadak (from Canal to Irrigation Colony)	2400	18	7	-do-	-	5.5

Source: Measurement from ground (Average width)

Note: The length of roads has been measured from the plan, which may vary at site.

The data given above about the length and width (in terms of right of way and carriage way) of the National Highway, State Highway and the major roads existing in the city shows that the total length of the two National Highways i.e. N.H.15 coming from Malout side and diverting towards Kotkapura and N.H.64 coming from Barnala leading to Dabwali is 8.6 kms. and 14.15 kms. respectively while the length of State Highway i.e. Bathinda-Mansa-Talwandi Sabo is 4.9 km in the city. The length of other important roads is 29 km. The right of way and carriageway of National Highway, State Highway and other roads are not uniform in width. The right of way and carriageway range from 9 m. to 45 m. and 6 m. to 10 m. respectively. The present road network (excluding lower order roads) of city spreads over an area of 237.34 hectares, which accounts for 3.50% of the total Municipal area.

Missing Road Links

5.20. There are some missing road links in the city which give the impression of dead end of these roads some of which are very important. In some cases the possibility of making them through is still there, whereas in others because of coming up of thickly built up areas in the way there is no scope of realization of the remaining part of the road. Detail of missing road links is given in Table 34.

Table 34 : Missing Road Links- Bathinda City

Sr. No	Name of road	Width of road	Reason of missing link	Remarks
1	Ring road Phase-I	200’	Litigation	Very strategic link for city
2	Sector road near Barnala bye pass	100’	Encroachment by hutments	Connects Barnala Roads
3	Sector road in Vishal Nagar	100’	Non implementation of part by I.T Bathinda	Provides direct access to R.O.B
4	Sector road Jujhar Nagar	100’	Thickly built up area – T.P scheme was dropped by govt.	Would have provided link to Ring road Phase- I

Source: Field Survey 2009

Road Intersections

5.21. While examining the road network of the city a total number of 27 road intersections have been identified within the limits of Municipal Corporation, which remains busy throughout the day. These road intersections are listed in the Table 35 below:

Table 35: Detail of Road Intersections in Bathinda City

Sr. No.	Name of Junction	Type of Junction
1	Old Bus Stand Chowk	Round About
2	Ghore Wala Chowk	Round About
3	Rose Garden Chowk	Round About
4	Grain Market Chowk	Round About
5	Bibi Wala Chowk	Round About
6	Tinconi	Signalized
7	Hanuman Chowk	Signalized
8	Power House Chowk	Signalized
9	New Bus Stand	Signalized
10	Engineering College	T-Junction
11	T.V Tower	T-Junction
12	Bhagu Road	T-Junction
13	St. Joseph's School	T-Junction
14	Krishna Continental	T-Junction
15	Near Mandir (On Bibiwala Road)	T-Junction
16	Dr. Narang (On Bibiwala Road)	T-Junction
17	Sector 40' Road (On Barnala Bye Pass)	T-Junction
18	Kanhya Chowk	T-Junction
19	Brijwasi Sweet House	T-Junction
20	A.C. Market	T-Junction
21	Gole Diggi Market	T-Junction
22	Opp. Wadi Hospital	T-Junction
23	Model Town (Near Gurdwara)	Cross junction
24	Bhatti Road (On Barnala Bye Pass)	Cross junction
25	Kishori Ram Hospital (Barnala Bye Pass)	Cross junction
26	Dr. Maheshwari	Cross junction
27	Power House Road	Cross junction

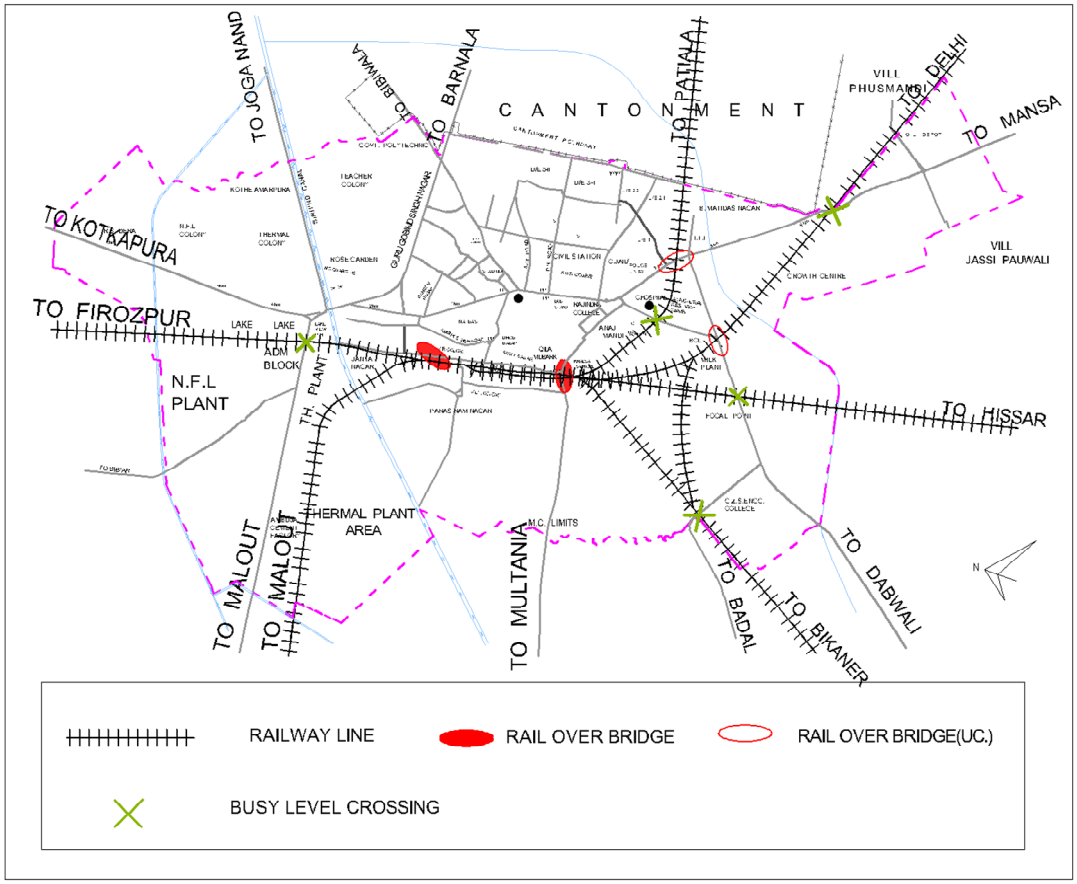
Source: Field survey 2009

The Table 35 shows that out of 27 road intersections, 5 intersections have Round-abouts and 5 intersections are signalized. Remaining 17 intersections do not have Round-abouts or signals. Out of these 18 intersections only, 5 are cross junctions and 13 are 'T' junctions. Besides these identified road intersections there are many other intersections in the inner part of the city, which have not been listed over here. The position of above listed road intersections has been shown in table 14.

Rail Network

5.22. The strong rail network existing in the city provides a high level of connectivity with other parts of the country. The six railway lines merging at Bathinda provide the status of best connected city in northern India by railway links. There are six railway lines entering in to the city out of which two lines enter from northern side whereas four railway lines enter the city from southern side as shown in the Figure 15

Figure 15: Rail Network-Bathinda city



A large number of railway lines existing in the city and quite a longer station and shunting range of Bathinda Junction has an area of about 127.21 hectares under these activities. The area under railway circulation is 1.87% of the total area of the city. Out of the six railway lines one line connects the city directly with Delhi whereas other lines lead to other important towns of northern India. The detail of connectivity by railway lines is given in Table 36 below:

Table 36: Detail of Railway Lines in Bathinda

Sr. No.	Name of route	Important cities connected
1	Bathinda-Delhi	Mansa-Rohtak-Delhi
2	Bathinda-Hissar	Raman Mandi-Sirsa –Hissar
3	Bathinda-Bikaner	Dabwali-Hanumangarh-Bikaner-Jodhpur
4	Bathinda-Ganganagar	Malout-Abohar-Ganganagar
5	Bathinda-Firozpur	Kotkapura-Faridkot-Firozpur
6	Bathinda-Ambala	Patiala-Rajpura-Ambala

Source: Station Master, Railway, Bathinda

Railway Over-Bridges & Under-Passes

5.23. It is evident from above the city is divided into several segments by the railway lines necessitating railway over bridges. Besides dividing the city into many parts, the railway lines cut the major roads at many points, which create traffic bottlenecks. At present there are only two railway over bridges (R.O.B.) in the city, one on Multania road and other near Paras Ram Nagar which connects the western part of city with the eastern part. However, two R.O.Bs and one underpass are under construction whereas two more R.O.Bs and one under pass are likely to be approved. The detail of R.O.Bs and under passes is given in Table 37 below:

Table 37: Detail of R.O.Bs. and Under Passes

Sr. No.	Name of road	Location	Type of Bridge	Present position
1	Multania Road	Near Grain Market	R.O.B.	Functioning
2	Road connecting Santpura road to Thandi sarak	Near Paras Ram Nagar	R.O.B	Functioning
3	Mansa Road	Near I.T.I. chowk	R.O.B.	Under construction
4	Dabwali Road	On Delhi railway line	R.O.B	-do-
5	Gatta Factory Road	Near Railway Station	Underpass	-do-

Source: Field survey 2009

Level Crossing

5.24. Because of six railway lines passing through the city there is a large number of level crossings of major and minor roads. A total number of 20 level crossing have been identified in Bathinda city out of which 16 are manned (Both A & B Category) whereas 4 level crossing are still unmanned. On some of the railway level crossing the Railway Over Bridges (R.O.Bs) are already under construction as explained in para 4.2.3. Some other level crossings are also there, where traffic bottlenecks are seen at the time of closure of the barriers such as:-

- Sirsa Railway line on Dabwali road (manned)
- Patiala Railway line on Hazirattan road (manned)
- Bikaner Railway line on Badal road (manned)
- Ferozepur Railway line on Malout road (manned)
- Delhi Railway line on Mansa Road (manned)

Environmental Status

5.25. The intensity of the pollution in terms of air, water and noise is evaluated in order to clearly understand the level and causes of pollution existing within the city so that appropriate strategies are put in place to tackle the problem of pollution.

Table 38: Ambient Air Quality in Bathinda (2003 -2007)

Month	SPM in µg/m^3					SO_2 in µg/m^3					NO_2 in µg/m^3				
	03	04	05	06	07	03	04	05	06	07	03	04	05	06	07
Jan	182	254	293	200	198	8	8	11	7	11	33	29	35	25	31
Feb	143	225	291	202	201	7	8	9	8	11	23	25	32	27	31
Mar	286	251	283	194	232	8	9	8	9	12	32	28	26	28	32
Apr	312	287	321	330	383	7	10	8	11	18	29	29	23	29	35
May	299	296	321	315	425	7	7	8	11	22	28	27	26	30	39
Jun	324	252	303	275	382	9	7	7	10	21	30	27	30	28	32
July	169	248	189	237	225	7	8	8	11	17	26	29	26	29	29
Aug	134	243	227	221	223	7	7	7	8	12	28	31	22	24	28
Sep	190	254	210	186	218	8	8	6	10	7	26	33	23	307	23
Oct	126	284	225	187	222	10	9	7	11	10	29	34	25	31	26
Nov	190	327	234	198	215	8	11	6	11	11	27	36	21	31	23
Dec	136	327	199	173	200	9	11	6	12	11	31	37	23	32	22
Annual Avg.	157	271	258	226	277	8	9	8	10	14	31	30	26	29	29

Source: Punjab Pollution Control Board, Bathinda

Air Pollution

5.26. Emissions generated by fuel burnt by industries have contributed to the lowering of quality of the air. With a view to clearly assess and monitor the status & quality of ambient air in Bathinda, data with regard to quantity of suspended particles, SO_2 and NO_2 present in the air is being collected and analyzed by the Punjab Pollution Control Board. The data is collected for the entire year. The data collected for the year 2003-2007 has been given in Table 38.

Permissible Levels

Residential and commercial area: SPM = 120 µg/m^3, SO_2 = 80 µg/m^3, NO_2 = 80 µg/m^3

Industrial area: SPM = 200 µg/m^3, SO_2 = 120 µg/m^3, NO_2 = 120 µg/m^3

Looking at the data given in the above table, it is seen that air contains large volume of suspended particles and the higher presence of such particles has been recorded against the permissible limit of 120µg/m^3. The higher level of SPMs has been found to exist throughout the year with value varying from the lowest annual average value of 157 in the year 2003 and highest annual average value of 277 in the year 2007. The presence of higher level of SPMs can be attributed to mixing of dust from open land, pollutants from industrial areas (especially from Bathinda Thermal plant) and smoke from vehicular traffic. With regard to level of SO_2, it has been found to be within limits. Also the level of NO_2 has been found to be within the permissible limits and well below the prescribed standards during the years 2003-2007.

Major contributors to the air pollution are:-

- Vehicular exhaust due to the presence of large number of vehicles and higher use of personalized vehicles.
- Absence of effective & efficient system of mass transportation.
- Narrow road width (with average varying between 4.5 to 7 m.), low capacity of the roads and high intensity of traffic in internal parts of city.
- Smoke emitted by the large-scale use of kerosene/diesel based power generators.
- Smoke emitted by Industries (especially from Guru Nanak Thermal plant and N.F.L. Factory).

Water Pollution : Ground water

5.27. The Ground water in this area contains high quantity of fluorides and Chlorides which make the ground water unfit for human consumption and also plant life. The unsafe ground water therefore forces the residents of city to have the risk of water borne diseases. The use of brackish ground water for agricultural purposes has also led to the degradation of the soil and presence of heavy metals into soil and vegetable crops grown in the area.

Surface Water Pollution

5.28. The surface water is main source of water supply in Bathinda city and Local Planning Area. The Bathinda branch of Sirhind Canal is the only supply line for surface water. This canal passes through vast distance after taking its origin from Ropar head works. Several towns like Ropar, Doraha and Ahmedgarh are located just adjoining to the canal route. Besides this many villages also exist near the

canal. It has been noticed that some of the settlements release their wastewater in the canal. In addition to this and to further aggravate this problem several industrial units located near to the canal dispose off their waste into the canal. Because of the above facts the water flowing in this canal became contaminated, which contain many impurities like some chemical contents and suspended particles.

Existence of Dirty Water Ponds

5.29. The existing ponds in various localities also add to the problem of pollution in the city. The dirty water including sewage is normally put into these ponds in normal days and during rainy season the ponds usually expand in size and are full up to the banks of the ponds. These ponds become the centers for mosquitoes and create many other diseases. In addition to this, the dirty water of these ponds also pollutes the sub soil water of these localities. The most effected areas are Chandsar Basti, Khadar Bhandar Street, Aggarwal colony, Vasant Vihar, Amarpura Basti, Sanguana Basti, Lal Singh Basti, Deep Nagar, Sanjay Nagar, Balraj Nagar, and Awa Basti etc. All these ponds require their cleanliness and proper long term management in an environment friendly manner.

Key Issues

- The suspended particles in the air remained on quite higher side throughout the year.
- The emission from Thermal Plant and NFL is required to be controlled, dirty water ponds needs immediate improvement..
- Handling of solid waste is required to be in a scientific manner.
- The city is lacking proper plantation along its roads and in many of public and semi-public places. Plantation on available and visible open spaces is required.

Heritage & Conservation

5.30. The basic objectives of urban and regional planning are very clearly related to those of conservation of historic towns, area and monuments. Land use plans,

Master Plan, Zoning Regulations and building bye-laws etc. help in achieving these objectives. The existing old areas in cities need care of the architectural fabric in urban areas. Therefore conservation needs to be an integral part of the town planning process, i.e. land use plans, building regulations and development policies. The perspective plan of a city must be reviewed to assess its effect on the conservation needs of the city. It must reflect and respect the form of all areas and buildings and precincts must recognize the social needs of community in old days.

Acts/laws

A few of the Central and State Government Acts which mentions conservation of build heritage monuments and natural and environmental protection are enumerated as under:-

Central Level Acts

Ancient Monuments and Archaeological Sites and Remains Act, 1958 is the principal Act.

State Level Acts

The Punjab Ancient Monuments and Historical Remains Act, 1964

Provisions contained in "The Punjab Regional and Town Planning and Development Act, (Amended) 2006

Heritage & Conservation in Bathinda

5.31. Bathinda does not have many scenic spots but cultural activities including "Virasat Mela" is held in the Fort every year in the month of November. The other places of historical importance and interest falling in Local Planning Area are as follows:

The Fort: The fort of the medieval period (Approximately 1800 year old) as described earlier is located in the center of the old part of the town. The fort is an attractive feature of the town from tourism point of view. Department of culture (Archeological Survey of India) Vide notification no. S.O. 1764 dated 16 June, 1992 declared Fort area to be prohibited area up to 100 meters from the protected limits and further beyond it upto 200 meters as the regulated areas for purpose of both mining operation and construction. Copy of site plan showing prohibited and regulated area is enclosed with Annexure 5.

The Fort is important from conservation point of view and also because there is no other open space in the old part of the city. So there is need to conserve this massive building and develop it as a recreational spot (with adequate parking facility) so that more number of tourists/visitors can come to the fort. The fort is in urgent need of proper maintenance.

Mousoleum of Pir Baba Hazi Rattan: Pir Baba Hazi Rattan is said to have visited Macca, as an ambassador of Raja Bhoj. After returning back he settled down in Bathinda, The manusoleum or mazar is located in the Civil Hospital and the Grain Market. Large number of devotees, irrespective of their faiths and belief visit the mazar.

6. EXISTING INFRASTRUCTURE

Physical Infrastructure

Water Supply

6.1. Public water supply in Bathinda started around 1955, when a number of tube wells were dug in the inner part of city area and the water supplied through reservoirs located at the Fort and Subhash Park. Later the raw water was taken from the Bathinda branch of Sirhind canal. The Civil station and ITI water works based on slow sand filters were constructed for supplying water to Government institutions like Civil Hospital, Police Lines, District jail Bus Stand, Govt. offices like DAC and Court Complex, Rajindra College and Civil Station etc. by gravity through overhead reservoirs located in water works campus on Bhagu road.

Sources of water supply

6.2. The Water supply system of Bathinda city is dependent partially on ground water and substantially on surface water. In Bathinda, ground water is available 12 meter below the ground level, but the quality of ground water is not suitable for drinking purpose due to presence of excessive chlorides and fluorides and high degree TDS. River Sutlej is the nearest river to Bathinda, which is about 100 km north. Bathinda branch, which is a distributary of Sirhind canal system, passes by the north side of the town and it is a perennial canal, one of its distributaries known as Bathinda distributary passes by the south side of the town, thus encircling the town from north and south sides. This raw water is easily available to water works sites. The carrying capacity of Bathinda branch is about 25.2\m3\sec (890 cusecs) which is quite sufficient to spare required quantity of water for the city.

The canal is operated and maintained by irrigation Department. Normally closure period of canal is about 12 to 15 days annually. The quality of water is reasonably good. The turbidity varies from clean in winter and summer to muddy in rainy season. Irrigation Department sells raw water to bulk consumers at the rate of Rs. 8 per 170 cubic meters for domestic purpose and Rs. 12 per 170 cubic meters for commercial purpose. At present, canal water is supplied to consumers supplemented by ground water through public distribution network.

System of water supply and Area coverage

6.3. Supply, operation and maintenance of water are one of the prime and basic services provided by Municipal Corporation of Bathinda. However, the role of Municipal Corporation is limited to funding the entire cost of the project for maintenance and making the system operational, besides collecting the revenue from the end users. The entire process of planning, construction and laying the major network and construction of tube-wells & OHRS is handled by the state level agency i.e. Punjab Water Supply and Sewerage Board (PWSSB). The Board undertakes this work for and on behalf of the Municipal Corporation and after completing the system it is handed over to Municipal Corporation.

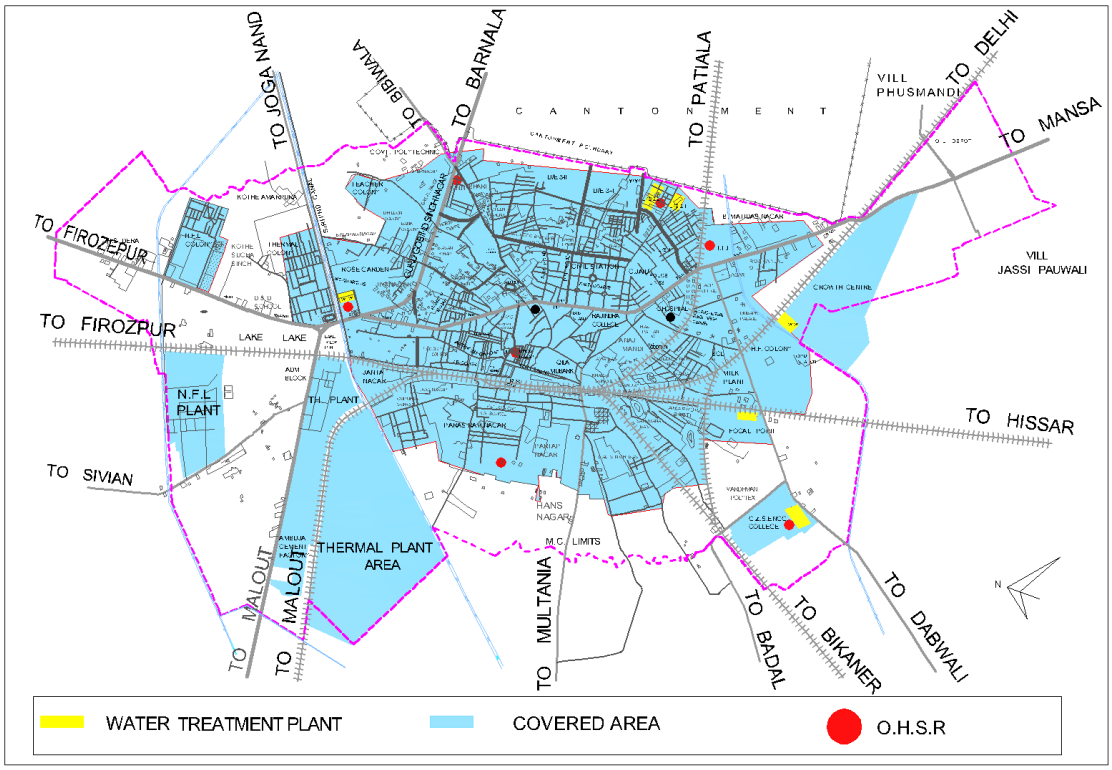
Area of supply

6.4. Municipal Corporation supplies water to the most of Bathinda city, which covers an area of about 68 sq. kms. either directly or indirectly. The total coverage is about 85% of the total area of town. Present Coverage area is shown in the Figure 16. Bulk consumers like Railway Colony, Thermal Power Plant, NFL, Engineering College, PSIDE (Industrial Focal Point /Industrial Growth Centre) have their own water supply arrangements and they are responsible for the distribution of water within their own territories. The water supply infrastructure in these areas is owned by them and consequently, is not the responsibility of the Municipal Corporation.

Operational Agencies

6.5. The P.W.S.S.B. operates and maintains the water supply system in municipal areas on behalf of Municipal Corporation. All the cost associated with supply is borne by M.C. Some residential areas in south-eastern part of city known as Urban Estates Phase- I, Phase- II and Phase- III (Model Town) developed by PUDA (now BDA) have their own water supply system. Besides these, the other areas such as Civil Station (Government residential area) and Bhagu road etc. are also covered by this water works known as Govt. Water Works located at Bhagu Road. All the expenses relating to operation and maintenance of this water works is borne by the BDA.

Figure 16: Water Supply Network-Bathinda City



The location of the various WTP's is shown in the Figure 16 and water works wise treatment capacity is shown in Table below:

Table 39: Capacity of Different Water Supply Treatment Plants

Sr. No	Water Works	Treatment Capacity		Operation & Maintenance
		MGD	MLD	
1	Rose Garden Main WTP*Ph-11&111	7.0	31.82	PWSSB
2	Industrial Growth Center (PSIEC)*	3.5	15.91	PWSSB
3	Government Water Works *1,11,111	3.2	14.55	PWD
4	ITI Water Works	0.20	0.91	PWSSB
5	Industrial Focal point*	0.45	2.05	PSIEC
6	Engineering College	0.50	2.27	Engineering College
	Total	**14.85**	**67.51**	

Source: Detailed project report for water supply system

1)* Phase –I plant is not in use and it has been dismantled recently.

2)*1.5 MGD plant existing and 2.0 MGD plant under construction.

3)*1.2 MGD plant existing and 2.0 MGD plant ready for commissioning.

5)* Used for supplying water to industrial complex.

Water production

6.6. The total production of water at all installations in the city is 49400 m³ /day. The highest capacity of production of water is recorded at Rose Garden main treatment plant, whereas the water works existing at I.T.I. is having capacity only of 910 m³ /day. The detail of production of water at various installations is given in Table 40 below:

Table 40: Detail of Production of Water at Different Sources

Production unit	Rated capacity		Average daily production		Percentage of total production
	MLD	M³/day	MLD	M³/day	
Rose Garden Main WTP	31.82	31820	31.82	31820	51.47
Industrial Growth Center(PSIEC)**	15.91	15910	6.82	6820	11.03
Government Water Works**	14.55	14550	13.62	13620	22.03
ITI Water Works	0.91	910	0.91	910	1.47
Industrial Focal Point	2.05	2050	1.0	1000	1.61
Engineering College	2.27	2270	2.20	2200	3.55
Tube wells*	10.50	10500	5.45	5450	8.81
Total	**78.01**	**78010**	**61.82**	**61820**	**100.0**

Source: Detailed project report for water supply system

**based on22 hours of operation*
***includes capacity of plant under construction*

Distribution

6.7. The areas covered by water supply system within the municipal limits, have not been divided in clear-cut segments. However, it can be assumed that there are five major zones, which are based on the supply area of water works and physical separation of town by railway lines. The major distribution areas are indicated below:

-Core town area around fort
-Area below railway line (railway station)
-Area served by Govt .water works (Urban Estate & Civil station)
-Area between Delhi and Patiala railway lines
-Area between Hissar and Bikaner railway lines

The above distribution areas which are divided by railway line are shown in the Figure 16. Total length of the distribution pipelines is around 400 km. There are some pockets that receive water directly from tube wells as these pockets are segregated from the main distribution network due to lack of crossing the railway lines.

Surface water

6.8. The surface water used for Bathinda water supply is abstracted from two main sources Sirhind canal – Bathinda branch and Bathinda distributory. The source is

dependable and there is more than adequate water available for future requirement. However, the ground water quality is not good and it is desirable to discontinue abstraction of ground water supply.

Water Connections

6.9. The city at present has 26,082 registered water connections to different category of users. Table 41 shows total no. of water connections from year 2002-2008. The Table 41 indicates that during the year 2002-2008, a growth of 30% has been recorded in number of water connections. Thus the number of connections is increasing very fast. Detailed analysis has been made with regard to number of connections registered in the domestic and commercial segments of the city. It has been observed that larger proportions of the connections fall under the category of domestic use which constitute about 98.57% whereas commercial water connections constitute only 1.43% of the total water connections. Number of connections has been growing very fast with the increase in population and increased number of dwelling units and commercial establishment resulted to more water demand in the city. Moreover, the affordability level of people has lead to increase in the number of connection during the past seven years. It is worth mentioning that besides the above number of registered connections there are many unregistered illegal water connection that avail the facility of getting water from the existing network putting burden on the supply network.

Table 41: Detail of Water Supply Connections in Bathinda from 2002-2008

Years	Water supply connections		
	Domestic	Commercial	Total
2002	19852	235	20087
2003	20664	247	20911
2004	21657	251	21908
2005	22371	306	22677
2006	22862	333	23195
2007	23383	353	23736
2008	25708	374	26082

Source: M.C. Bathinda

Table 42: Water demand and Supply

Category	Area (in Sq. kms)	Amount of Water supplied	Registered Connections	Population	Water supply in lpcd
Municipal area	67.87	60mld	26082	217256	>220

Source: M.C. Bathinda

Water demand & Supply

6.10. The Present total production from different source (Rose Garden, Civil Station, tube wells and Growth center water works, Engineering College and Industrial area) is approximately 60 MLD. The estimated population as per PWSSB for the year 2007 is 2.5 lacs out of which 2.12 lacs population is served by a piped water system. This gives a gross per capita supply of 283 lpcd.

The gross per capita consumption includes physical and non-physical losses. If we deduct the losses, which are assumed to be 40% of the supply based on experience of other similar cities, the net per capita consumption becomes 170 lpcd. Thus the per capita water requirement is sufficient if compared with standards given in UDPFI guidelines i.e. 135-150 lpcd.

Key issues

- The foremost deficiency in water supply system in Bathinda city is that there are many areas which do not have piped water supply till now such as areas across canal, Namdev Nagar which comprises about 11.2% of total areas.
- The contamination of water because of existence of water and sewer lines one above the other in narrow lanes is another problem.
- There are some areas like Amarpura Basti, Lal Singh Basti, Udham Singh Nagar, Dhillon Colony etc. which are having supply of ground water which is not recommended for human consumption because of high level of fluorides etc.
- There is large number of illegal water connections which is another serious problem in field of water supply.

Sewerage

6.11. Municipal Corporation of Bathinda with association of Punjab Water Supply & Sewerage Board (PWSSB) provides the facility of sewerage net work to the areas falling within the corporation limits. The sewerage includes the waste generated from domestic, industrial, commercial, institutional units etc.The work of laying underground sewerage in the city was first taken up in the year 1963-64. During the period of last 43 years only 65% of the population could be provided the sewerage facility. The unplanned colonies falling in outer areas like Kothe Amarpura, Kothe Sucha Singh, Kothe Joga Nand, Guru Nanak Nagar, Hardev Nagar, Partap Nagar, Amarpura Basti, Sanguana Basati, Jogi Nagar, Balla Ram Nagar, Katcha colony, Kheta Singh Nagar, Alam Basti, National

colony, Matti Das Nagar, Beant Nagar, Nachhattar Nagar, Dhillon Colony, Wisheshar Nagar, Subash Basti etc. do not still have facility of sewerage. Waste water is being disposed off in open surface drains.

Existing Situation

6.12. As per the contents of the report of Water Supply and Sewerage prepared by Feedback Venture Private Limited (F.V.L.) the wastewater of the town is disposed off through 8 temporary pumping station located in different parts of the city. Unfortunately, Sewerage treatment facility does not exist in Bathinda. The raw sewage is being discharged into a manmade drain. This 14 km. long drain ultimately meets the natural drain known as Lissara Drain. Present disposal practice is highly undesirable from environmental consideration and poses a great threat to the health of the people residing in nearby localities.

Existing Sewerage System

6.13. The existing sewerage system primarily covers the core area which is about 16 Sq. Km. and includes the localities like Pujan wala Mohalla, Seedian wala Mohalla, Mehna Mohalla, Tellian wala Mohalla, Main Bazar Area, Nai Basti, Birla Mill colony, Veer colony, Vishal Nagar, Tagore Nagar, Green Avenue, Ganesha Basti, Harpal Nagar, Aggarwal colony, Minocha colony, North Estate, Kamla Nehru colony, Jujhar Nagar, Patel Nagar, Guru Teg Bahadur Nagar, Ajit road, Tagore Nagar, Power House road, Shant Nagar, Civil Lines, Urban Estate Phase I, II & III, Guru Nanakpura, Haji Rattan colony etc. As it has already been mentioned that the waste water of the town is disposed off through 8 nos. of temporary pumping stations installed in various localities and 4 main Disposal works located at Mansa road (2 Nos. near T.V. Tower) and one each at Harbans Nagar and at Sanjay Tobha. The untreated sewage is finally discharged into the sullage carrier running parallel to the Bathinda distributory. The total length of the existing sewerage network is around 25 kms. The entire length and breadth of existing sewerage system has been analyzed and found to be sufficient for the existing flow of the areas for which it has been laid down. However, due to the non-availability of natural gradient of ground surface the slope provided to the trunk and main lines is found quite steep resulting in greater depth which has been found to increase progressively from north to south from 2 meters at Tinkoni to about 10 meters at disposal near T.V. Tower on Mansa road.

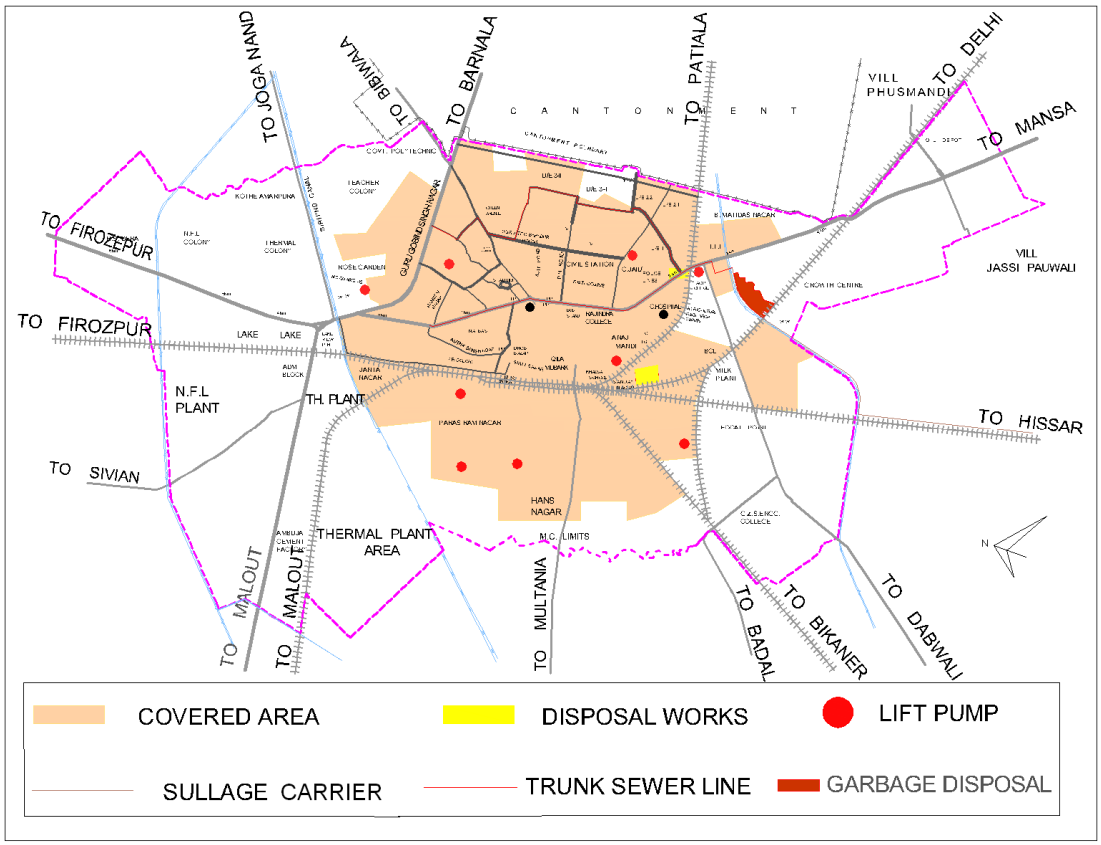
Collection System

6.14. As explained in DPR for sewerage system prepared by the F.V.L., the collection system of a network of trunk and branch lines linked by intermediate temporary pumping stations ultimately joining to main disposal works the locations of these pumping stations is given in Figure 17. As per D.P.R. the entire area has been divided into seven different zones and collection system coverage of each zone has been designed keeping in mind individual sewerage zones. These sewerage zones are primarily drainage basins for a certain catchments areas. Each of these areas are having lifting stations for collection of sewage of the area and there after pumping it further on thereby maintaining a smooth flow in the system

Disposal system

6.15. The disposal system consists of 4 number of disposal points one each at Sanjay Tobha of about 3 MLD capacity and at Harbans Nagar of 1.8 MLD capacity and two disposal points near T.V. Tower on Mansa road of a total capacity of 37.4 MLD. All the disposal points transmit the waste water into sullage carrier through rising mains untreated.

Figure 17: Sewerage Network & Disposal works



Capacity of Existing Network

6.16. The existing net work has been examined by the feedback venture Private Ltd. (FVL) for sufficiency in terms of sewage carrying capacity based on existing flow areas with existing sewerage network, within the municipal boundary. It has been observed that the existing trunk main which is about 3.5 kms long in the northern side of the town up to Bathinda branch of Sirhind Canal covering the areas towards eastern side up to Cantonment boundary and towards west up to Railway lines linking to the main disposal works is sufficient to carry the sewage for the next 30 years.

Key Issues

- The most challenging issue relating to sewerage system of the city is the disposal of untreated wastewater into the sullage carriers and ultimately into the natural drain called Lissara drains.
- In the absence of sewage treatment plant the water bodies which are being used to dump the waste water is a severe environmental threat considering the possibility of ground water pollution, unhygienic surroundings, health hazard etc.
- The other challenging problem is the unserved areas falling within municipal limits, which has been counted to be 30% of the city area as per the figures of the DPR prepared by Feedback Venture Limited.
- The disposal of raw sewage into ponds is creating many problems to the residents of surrounding areas.

Storm Water Drainage

Existing status

6.17. Following the analogy of sewerage network, the city has high degree of deficiency in the storm water drainage. Considering the existing status, it has been found that creating an effective and efficient system of storm water drainage has never been on the agenda of the Municipal Corporation. City has been facing problem of flooding in certain parts during the rainy season due to the absence of an effective system of storm water disposal.

At present city does not have any storm water network and the rain water sometimes cause havoc in the city. The rainwater is mostly discharged into the sewer network. This results in heavy loading of the sewerage network; ultimately

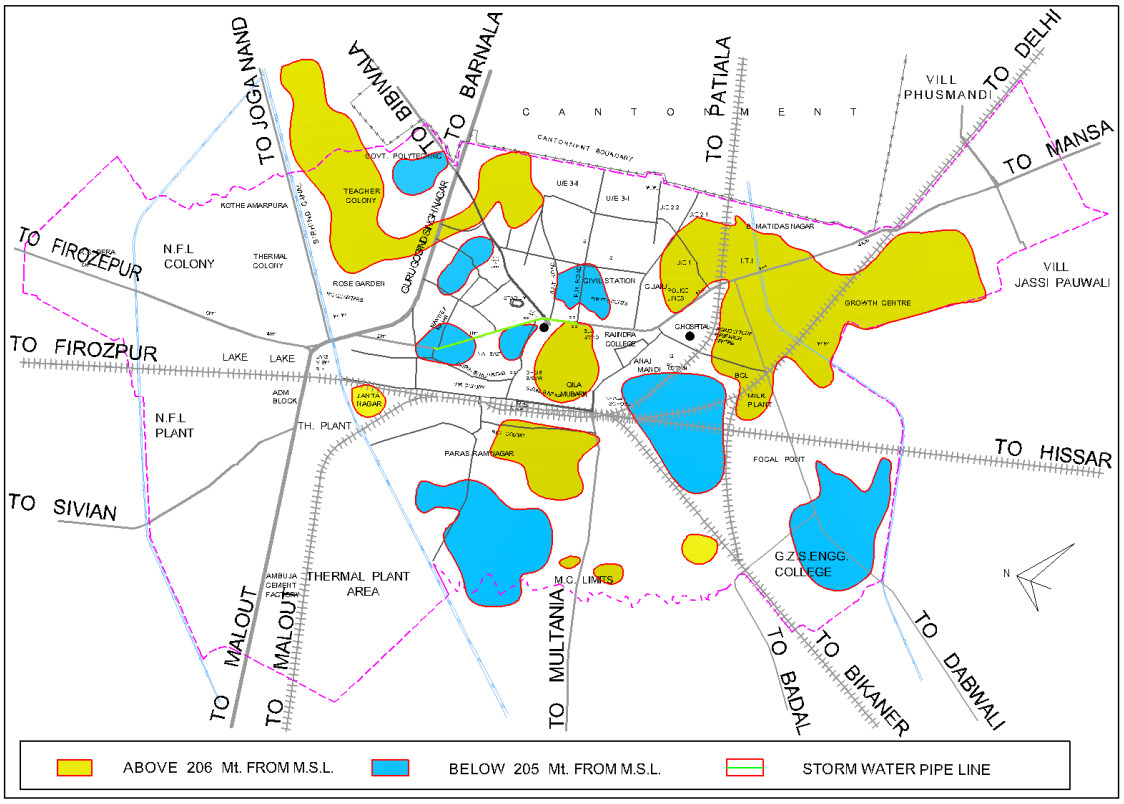
leading to choking of the pipes, overflow of the sullage and backflow of the sewage water.

No storm water drainage system exists in the city, which may independently collect and dispose of storm water out of city areas. However as per the information supplied by the Municipal Corporation a storm water main line has been laid along Guru Kashi Marg from Tinkoni to Power House road which collects the storm water of parts of Nai Basti, Mall road and Power House road but the disposal of this storm main pipe is again through the sewerage network.

As the town has developed on the sand dunes having no proper direction of natural gradient of its surface and no plinth level has been fixed for the construction of building by the authorities concerned. The rainwater usually accumulates in the depressions. During the old times when there was not much development in the town these depressions were vacant open lands and the storm water collected there during rainy season used to get soaked in the subsoil within a short period. But as the town expanded buildings have been constructed on these open vacant lands. More and more open areas came under structures thus leaving no vacant land for storage of storm water other than the roads only. As indicated by Municipal Corporation there are some flood prone areas in these depressions, which are very critical such as Power House road along with parts of Civil station area and some streets towards Ajit road, Mall Road, Birla Mill Colony, parts of Ganesha Basti, Nai Basti, areas around Guru Kashi Marg, Dhobeana road, Bhatti road, Sirki Bazar, Guru Nank Pura, Paras Ram Nagar, Jogi Nagar, Deep Singh Nagar etc.

As explained above since the city has developed on an uneven topography and a large number of railway lines existing in the city, several number of smaller storm water basins can be identified. These bowl type basins are encircled by physical features like railway lines, canal, roads etc. which do not allow the rain water of these basins to flow outside because of non-availability of required natural slope thus these basin areas many a times are flooded during rains. On the basis of studies conducted by this office and the information supplied by the PWSSB, Bathinda the attempt has been made to identify these basins as shown in the Figure 18.

Figure 18: Storm Water Drainage and Low Lying Areas – Bathinda city



Solid Waste Management

6.18. Solid waste is a combination of unwanted and discarded materials from households, commercial and industrial operations besides street sweeping. Increase in urban population coupled with change in life style and economic prosperity has lead to generation of considerable solid waste. Solid waste arising from human activity has emerged as one of the major environmental issue leading to extensive pollution and threat to human health. Limited disposal facilities coupled with dumping of the solid waste in a haphazard manner in various parts of city have lead to not only creating environmental problems but also serious health hazards. The national Conservation Strategy and Policy Statement on Environment and Development has laid stress on adopting stringent measures for prevention and control of pollution due to indiscriminate disposal of solid waste on land and into water resources. Hence, immediate steps are required for proper management of urban solid waste.

Solid Waste Management

6.19. The solid waste management is the prime responsibility of Bathinda Municipal Corporation within its boundaries. Municipal Corporation discharges this duty through the infrastructure created for collection, storage, segregation, transportation, processing and disposal. The Health department of the Corporation is vested with the responsibility of day to day solid waste collection and disposal. The Corporation organizes the collection and transportation through its own conservancy workers and a fleet of vehicles and dumper-placers. Municipal Corporation collects solid waste from all the residential areas within its limits. Collection facility is provided in 100% area occupied by people.

Type & Quantity of Waste Generated

6.20. There has been no formal study estimating the amount of solid waste generated in the Bathinda Municipal Corporation. However, it is estimated that waste generated per capita per day is of the order of 350 gms. In all, city generates garbage to the tune of 102 metric tons on daily basis. The amount of garbage generated on per capita basis is found within the range as per the pattern of garbage generation in other cities of the country, which ranges between 300 to 450 gms per capita per day.

Current Practices of Solid Waste Management

6.21. The process of solid waste management can be broadly classified into following stages:

- Primary and secondary collection
- Waste Storage & segregation
- Waste transportation
- Disposal of Waste

First three activities are carried out by the Municipal Corporation by deploying adequate manpower and vehicles.

Bio Medical Solid Waste

6.22. The waste generated by the hospitals mostly falls into the category of hazardous /infectious waste which poses danger to human life. The bio-medical waste requires specialized mechanism for its collection, transportation and disposal. The bio-medical waste is collected and segregated at the source in three separate bins of different colors namely; yellow, blue and white depending upon the

toxicity of the waste. The waste is then transported to the garbage disposal site near Roshan Lal oil mill on Mansa Road.

Disposal of solid waste

6.23. The method adopted by the Bathinda Municipal Corporation for disposal of the solid waste is through the mechanism of landfills. At present Bathinda corporation uses only one site for dumping of the solid waste. The site is located behind the Roshan Lal Oil Mill on Mansa Road. The area under the site is 36 acres (44.57 Hects.) (Refer Figure 17). The average depth available at the site varies from 6 to 7ft. for dumping of the solid waste. It has been estimated that this site will be sufficient to take care of the solid waste for the next 10 years as per information supplied by Municipal Corporation.

The landfill site is not lined and properly defined. Moreover land filling is being done in an unscientific manner. The waste is directly dumped, without any segregation. There is no compaction of the waste undertaken. In the absence of scientific disposal of the waste lot of valuable waste is lost due to absence of recycling. Municipal Corporation Bathinda does not involve rag pickers in recovering the valuable recyclable waste.

Further, in the absence of defined boundaries, animals like pigs etc. vegetate on the waste. In addition, due to unscientific disposal of the waste, lot of foul smell is generated due to the presence of organic waste polluting the environment in the process. No treatment of the solid waste is undertaken during the dumping process as required in the system of sanitary landfills. The site does not have any kind of fencing or compound wall surrounding to it. This poses a danger for children or cattle in that region.

Key issues

6.24. Removal of garbage is done arbitrarily without following any well laid down system. Cleaning of roads also has not been found to be satisfactory and the dumping of waste by the public has been found to be highly unsatisfactory. In the process, solid waste management has emerged as the major issue in the management of the city. The key issues involved in the solid waste management have been found to be:

- Absence of scientific management of solid waste.
- Absence of public participation and lack of public awareness.
- Poor management of dumping sites.

- Absence of segregation of waste at the primary level.
- Absence of involvement of large institutional network creating large volume of solid waste including Marketing Board, Department of Industries, etc.
- Absence of scientific system of sanitary landfills.
- Absence of appropriate mechanism for converting waste into wealth and for generating energy and fertilizers.

Traffic and Transport

6.25. The transport infrastructure in the form of road and rail network is described earlier. In this section nature and traffic on the network is described

Vehicle composition on main road network

6.26. It has been noticed that there is mixed traffic running on the main city road network such as heavy vehicles (Trucks, Trailers, Buses etc), medium vehicles, light vehicles, three wheelers, two wheelers, cycles, carts etc. As per survey of traffic volume on main city roads conducted by this department there is a great variation in the composition of vehicles. The outer roads of the city have a large number of heavy vehicles whereas the main roads falling in the inner part of the city normally have large number of light vehicles and two wheelers. On Bathinda-Kotakpura road two wheeler vehicles have a share of 54% of total vehicles followed by light vehicles, which constitute to 26% and heavy vehicles have a very small share of 14% only. It is the case of other regional roads too. The detail of composition of vehicles on different roads of the city is given in Table 43 .

Volume capacity ratio of main road networks

6.27. The study of regional traffic is essential to know the town traffic that is coming in direct contact with the regional traffic. In the absence of any bye pass the regional traffic is passing through the town, hence disturbing the whole population of the town, leading to the problems of traffic conflicts, delays and degradation of road environment.

Table 43: Vehicular Composition on Main Roads of Bathinda City

Name of the road	Bus	Truck	Car/ Jeep	Tractor	Cycle/ Scooter	Rickshaw /Auto -Rickshaw	Gadda	Total
(i)Bibiwala Chowk-Rosegarden	35	77	250	22	530	62	2	978
	4	**8**	**26**	**2**	**54**	**6**	**0**	**100**
(ii) Bibiwala Chowk-Barnala	81	214	405	65	510	120	4	1399
	6	**15**	**29**	**5**	**36**	**9**	**0**	**100**
(iii) Bibiwala Chowk-City	75	105	260	18	447	135	15	1055
	7	**10**	**25**	**2**	**42**	**13**	**1**	**100**
(iv) Bibiwala Chowk -Bibiwala village	5	17	134	20	862	45	6	1089
	0	**2**	**12**	**2**	**79**	**4**	**1**	**100**
(v) Bathinda-Malout	42	198	432	90	1168	96	35	2061
	2	**10**	**21**	**4**	**57**	**5**	**2**	**100**
(vi) Bathinda-Kotakpura	52	118	435	35	720	42	1	1403
	4	**8**	**31**	**2**	**51**	**3**	**0**	**100**
(vii) Bathinda-Dabwali	35	155	347	60	412	42	26	1077
	3	**14**	**32**	**6**	**38**	**4**	**2**	**100**
(viii) Bathinda-Badal	15	30	111	22	192	2	3	375
	4	**8**	**30**	**6**	**51**	**1**	**1**	**100**
(ix)Bathinda-Mansa	44	163	313	59	405	27	13	1024
	4	**16**	**31**	**6**	**40**	**3**	**1**	**100**
(x)Amrik Singh road	2	5	232	16	1072	292	64	1683
	0	**0**	**14**	**1**	**64**	**17**	**4**	**100**
(xi)The Mall road	8	20	504	8	1320	616	32	2508
	0	**1**	**20**	**0**	**53**	**25**	**1**	**100**
(xii)Power house road	0	11	274	14	932	256	40	1527
	0	**1**	**18**	**1**	**61**	**17**	**3**	**100**
(xiii)Hazi Rattan road	0	32	184	87	681	162	31	1177
	0	**3**	**16**	**7**	**58**	**14**	**3**	**100**
(xiv)Bhagu road	4	5	204	17	624	282	22	1158
	0	**0**	**18**	**1**	**54**	**24**	**2**	**100**
(xv)Ajit road	0	0	92	0	440	104	14	650
	0	**0**	**14**	**0**	**68**	**16**	**2**	**100**
(xvi)Guru Kashi Marg	49	90	495	39	1143	831	38	2685
	2	**3**	**18**	**1**	**43**	**31**	**1**	**100**

Note: Figures in bold shows the percentages of the vehicles on the respective roads

Source: Field survey-2008

The office of the District Town Planner has conducted the traffic volume survey in the month of November-2008 for several days from 7 a.m to 7 p.m. and the peak hours have been carved out observing the extent of problems like congestion, journey speed, pollution, load etc. It helped in calculating the congestion index degree of congestion that reflects the extent of conflicts, jamming conditions etc. on the roads of the town. In order to assess the capacity

utilization of roads, a detailed analysis of the existing road network has been made in terms of volume & capacity of important roads.

The ratio of volume and capacity (V/C) is one of the most important factors for evaluating the level of services of road network. The peak hour volume of different categories of major road network in Bathinda has been assessed to calculate volume capacity ratio. While the capacity is measured in PCU's per lane of road width, the V/C ratio up to 1 is considered as the optimum condition. If ratio exceeds 1 it indicates condition of congestion whereas figure below 1 indicates under utilization of the road capacity. As per the UDPFI guidelines the table of equivalent PCU factors is given Table 44.

Table 44: Recommended PCU factors for various Types of Vehicles on Urban Roads

Sr. No	Type of vehicle	Equivalent PCU factors
1	Two wheeler motor cycle	0.5
2	Car, Jeep, Van	1
3	Rickshaw, Auto-Rickshaw	1.5
4	Bus, Truck, minibus	2.2
5	Agricultural Tractor Trailor	4
6	Tonga, Hand-Cart etc.	2

Source: UDPFI Guidelines

The various roads that are taken under consideration have been classified under three categories:

Arterial Road- Roads for intra-urban through traffic, with no frontage access, no standing vehicle and very little cross traffic and minimum roadway intersection spacing 500 m.

Sub Arterial Road- Roads for intra-urban through traffic with frontage access but no standing vehicles having high cross traffic, high capacity intersections and minimum roadway intersection spacing 300 m.

Collector Street- Streets for collecting and distributing traffic from arterial roads to local streets and also for providing access to arterial and sub-arterial roads, having free frontage access but no parked vehicle and having heavy cross traffic and minimum road way intersection spacing 150m

6.28. As per above defination of roads, none of the roads in Bathinda fulfill the above conditions.L.R. Kadyali in his book "Traffic Engg. and Transport Planing" modified this defination as per Indian conditions and gave third category of roads with free frontage access, parked vehicles and heavy cross traffic. The standard for traffic capecity recommended by L.R. Kadyali are more suitable for our roads, thus these standards have been addopted. The tentative practical

capacities for both uni-direction and two-direction flows of urban roads between junctions are given in Table 44-A below;

Table 44-A: Tentative Capacities of Urban Roads between Intersections

No. of traffic lanes and width	Traffic flow	Capacity in PCUs per hour for various traffic conditions		
		Roads with no frontage access, no standing vehicles, very little cross traffic	Roads with frontage access but no standing vehicles and high capacity intersections	Roads with free frontage access, parked vehicles and heavy cross traffic
2-lane	One way	2400	1500	1200
(7-7.5m)	Two way	1500	1200	750
3-lane (10.5 m)	One way	3600	2500	2000
4- lane	One way	4800	3000	2400
(14m)	Two way	4000	2500	2000
6- lane	One way*	2600	2500	2200
(21 m)	Two way	6000	4200	3600

*For three lane in predominant direction of flow

As per the standards quoted in Table 44 the volume on the main roads of Bathinda has been calculated and is summarized in Table 45. According to the data given in the table, nine roads namely Guru Kashi Marg, Amrik Singh Road, Mall Road, Hazi Rattan Road, Bhagu Road, Dabwali Road, Kotkapura Road, Malout Road and Power House Road in Bathinda city suffer from the problem of traffic congestion. The V/C ratio ranges from 1 to 2 on these roads, which indicates the severe conditions of traffic congestion.

Table 45: Volume Capacity Ratio on Main Roads of Bathinda City

Sr. No.	Name of the Road.	Type of carriageway	Peak hour Volume (PCU)	Capacity (PCU)*	V/C ratio
1 (a)	Rose Garden to Bibiwala Chowk	2 lane (1way)	407	1200	0.34
(b)	Bibiwala Chowk to Rose garden	-do-	509	1200	0.42
2 (a)	Bibiwala Chowk to Barnala	-do-	901	1200	0.75
(b)	Barnala to Bibiwala Chowk	-do-	773	1200	0.64
3 (a)	City to Bibiwala Chowk	-do-	568	1200	0.47
(b)	Bibiwala chowk to city	-do-	593	1200	0.49
4	Bibiwala Chowk –Bibiwala Village	2 lane (2way)	737	750	0.98
5	Bathinda –Malout	3 lane(2 way)	2003	1250	1.60
6	Bathinda – Kotkapura	-do-	1344	1250	1.08
7	Bathinda – Dabwali	3 lane(2 way)	1245	750	1.66
8	Bathinda – Badal	2 lane (2way)	363	750	.48
9	Bathinda – Mansa	2 lane (2 way)	1191	1250	0.95
10	Amrik Singh Road	2 lane (2 way)	1526	750	2.03
11	The Mall Road – L R	2 lane (1 way) 2 lane (1 way)	1200 1226	750 750	1.60 1.63

12	Power House Road	2 lane (2 way)	1387	1250	1.11
13	Hazi Rattan Road	2 lane (2 way)	1348	750	1.80
14	Bhagu Road	2 lane (2 way)	1157	750	1.54
15	Ajit Road	2 lane (2 way)	536	750	0.71
16	Guru Kashi Marg – L R	2 lane (1 way) 2 lane (1 way)	1400 1433	1200	1.17 1.19

Source: Field survey-2008

* Traffic Engneering and Transport Planing by L.R. Kadyali.

Accordingly it becomes critical that either the existing capacity of the roads is increased or volume of traffic on these roads be reduced to the level of available capacity. In fact no single strategy would be useful. A firm strategy, which not only enhances the available road capacity but also rationalizes the flow of traffic on these roads, should be adopted to minimize congestion.The Table 45 given above reveals that some of the roads about 6 roads of Bathinda are under-utilised having V/C ratio below 1. This means that there is no traffic problem on these roads. However there are several roads which are carrying the traffic volume more than their respective capacity thus facing traffic problems, and some more roads are likely to be overloaded in near future.

Bus Transport

Bus Terminal and Frequency of Bus Service

6.29. There is one Bus Terminal in Bathinda city, which is situated on Guru Kashi Marg near district Administrating Complex and Court complex. The Total Area of Bus stand is 14.7 acres including workshop out of which only 6.5 acres are under operational Bus stand. The area of bus stand is not sufficient to accommodate all the components as per the norms given in UDPFI Guidelines and as per the standards of Delhi Master Plan 2001. The buses for all the routes originate and terminate at this bus stand leading to the congestion in central areas of city. It has been noted that preferred mode of travel of the people of the area for distant stations is also the buses; accordingly, it attracts large volume of the traffic in process. In addition terminal caters to large number of daily commuters who come to work and business places and in process terminal also attracts large number of informal commercial activities. There is no proper link between Bus Stand and Railway Station. Thus its location is improper as far as the change of modes of transportation is concerned. There is a provision of Rickshaw stand for 20 Rickshaws only within Bus Stand area, which is inadequate but there is no parking space for taxies, cars, two wheelers, auto- rickshaws etc. which is an important component of bus stand. The space for idle parking is very less and there is a congestion of buses in the bus stand. However, the location of the existing Bus terminal needs a critical review. Therefore a new ISBT with an area of about 10 Hectares is required to be developed at a suitable site to serve the needs of the future population of 2031.

Bus Routes and Intercity Bus Service

6.30. As per data supplied by General Manager PRTC Bathinda total number of 1094 buses operate from this bus stand daily. In addition to this about 300 mini buses also operate from this bus stand, which have their destinations in villages or small towns. The city is well connected by bus service with the important towns and cities of the state like Ludhiana, Patiala, Chandigarh, Mansa Malout, Dabwali, Kotkapura, Amritsar, Jalandhar, Hoshiarpur, Dabwali, Sirsa, Hissar, Ambala of Haryana and Hanumangarh, Sanghria, Ganganagar of Rajasthan. The maximum numbers of 306 trips are found towards Barnala which includes the buses having their destination to Chandigarh, Ludhiana and Patiala. Table 46 further indicates that there are 121 buses towards Mansa and 153 buses towards Talwandi Sabo totaling to 302 buses up to village KotShamir from the road bifurcates. The route of Bathinda Kotkapura has a number of 133 via Jaitu and 82 buses via Bajakhana. These figures are for upside directions and the same number of buses stands for downside thus the figure doubles to be 2188 buses and 600 mini buses which operate from the bus stand. Table 46 indicates that during last one year, bus traffic has recorded an increase of 12 buses only. There is concentration of buses on Bathinda Barnala Road, Bathinda Talwandi Sabo-Mansa Road and Bathinda-Kotkpura Road.

As informed by General Manager, Pepsu Road Transport Corporation, the average occupancy of buses is considered to be 50 Passenger per bus per trip which shows that 54700 passengers are picked up from Bathinda Bus Stand daily by buses and about 9000 passengers by minibuses and almost same number of passengers are dropped in bus stand daily .The details of routes form Bathinda is given in Table 46 below:

Table 46: Daily Bus traffic Route-Wise in Bathinda 2007-08

Name of Route	2007	2008
Bathinda Barnala Road	329	306
Bathinda Talwandi Sabo- Mansa Road	259	302
Bathinda- Kotkpura Road	221	215
Bathinda- Dabwali Road	87	92
Bathinda Malout Muktsar Road	160	157
Bathinda Lambi Road	28	22
Sub total	1084	3102
Mini Buses	300	300
Grand total	**1382**	**1394**

Source: Punjab Roadways, Bathinda

Intra city bus service

6.31. There is no public transport system in Bathinda city. Due to the inefficient services and unorganized system of public transport, predominant modes used for intra city passenger travel are personalized vehicles, cycle rickshaws, auto-rickshaws etc. which enhance the problems like congestion, accidents, parking as well as pollution. However some mini buses going to rural areas from bus stand pick up the passengers and drop at various stops in the city to facilitate the general public hence functioning partly as city level public transport also. Besides this a large number of buses owned by private and government organizations such as N.F.L, G.Z.S Engineering College, Adesh Institute of Medical Sciences & Research, Baba Farid Institute of Foreign & Higher studies and various schools etc. have their own fleet of buses which carry a large number of passengers daily. In the absence of an effective and efficient public transport system in Bathinda the nature of city road network has lead to the enormous growth of intermediate public transport in the shape of rickshaws and auto rickshaws. Preferred mode of transport in the city has been witnessed as use of auto rickshaws which have been found to be highly convenient by the users because of affordable fare and convenience of getting on and getting down at any place in the city. It has been estimated that about 500 auto rickshaws and about 300 cycle rickshaws are plying on the city roads. Looking at the existing pattern of transportation it has been observed that for the smaller distance and intra city travel, auto rickshaws & cycle rickshaw are the preferred mode of travel whereas for inter city and longer distance bus travel remains the popular mode of travel.

Parking demand and availability

6.32. Parking remains another critical area for the Bathinda city. Increasing number of vehicles, narrow road network, small old houses in the core areas, and absence of parking space within majority of built up spaces, parking blues are on the rise in the city. Absence of public transport, higher use of personalized vehicles and rapid growth of intermediate public transport has led to the more and more vehicles using road for the parking. Policy adopted by the local Government to allow conversion of residential building into commercial use without provision of parking has led to attracting large number of vehicles on the smaller roads. Poor norms of parking provided in the commercial, institutional buildings have

led to shift of vehicles from these buildings to the roads. The existing available parking spaces are listed in Table No. 47 below:

Table 47: Existing Parking Spaces in Main Commercial Areas in Bathinda

Sr. No.	Name of Bazar/Parking lot	Parking available in ECS
On street parking		
1	Dhobi bazar	91
2	Bank bazar	66
3	Kikar bazar	62
4	Sirki bazar	155
5	Mall road	97
Sub Total		**471**
Off street parking		
1	Shahid Bhagat Singh Market	35
2	Near Fire Brigade	97
3	Near Rajesh Cinama Site	29
4	Whole Sale Medicine Market	45
5	Fish Market	34
6	Near Bhagwan Tikki Wala	44
7	Shakti Market	18
Sub Total		**302**

Source: Field Survey – 2008

6.33. In case of Bathinda city the main Bazars and roads of the city i.e. Dhobi Bazar, Bank Bazar, Kikkar Bazar, Sirki Bazar, Sadar Bazar, Mall Road, Court Road are having very inadequate parking spaces.No doubt some parking spaces do exist near some of these bazaars but the requirements as per norms are quite higher than the available parking spaces. At Mall road some parking strips are there along the road but these parking places are too less, that these remain jam packed throughout the day. Same is the position with Dhobi Bazar, Sadar Bazar, Hospital Bazar, Sirki Bazar, Bank Bazar and Kikkar Bazar. The worst effected areas are Court road, Purana Bazar, Part of Amrik Singh road. Similarly the commercial areas along Guru Kashi Marg, Bibi Wala Road, Bhatti Road, Ajit road and Bhagu road are not having any parking areas. The detail of required parking spaces of main commercial bazars is given in the Table 48 below:

Table 48: Parking Requirement of Various Bazars

Sr. No.	Name of commercial area	Estimated total floor area in sq. mtr.	Required parking in ECS (as per norms)
1	Dhobi bazar	43200	1296
2	Bank bazar	38400	1152
3	Kikar bazar	19200	576
4	Sirki bazar	54950	1648
5	Wholesale medicine market	21150	634
6	Fish market	6200	186
7	Area around gole diggi market	25650	769
8	Mall road	52000	1560
Sub total		**260750**	**7821**
1	Court road- Mehna chowk to Arya samaj chowk	3600	108
2	Court road- Mehna chowk to bus stand	3960	118
3	Old bus stand market	4455	133
4	Guru kashi marg-bus stand to hanuman chowk	7740	232
5	Guru kashi marg- hanuman chowk to tinkoni	16500	495
Sub total		**557755**	**16728**

Source: Field Survey – 2008

The above table shows that there is a requirement of parking spaces of 7821 ECS for main bazars of the city whereas the available parking spaces both in terms of on street and off street are only 773 ECS within the bazaars and in the adjoining areas which shows a deficiency of 7048 ECS. It means there is acute shortage of parking spaces in the main commercial areas of the city which in turns creates traffic problems.

Terminals

6.34. Terminals are the nodal points of transportation network. Description about truck terminal and taxi terminal is elaborated below:

Truck Terminal

6.35. In spite of development of heavy industries in the city and great importance of wholesale activity, Bathinda does not have any authorized Truck Terminal. Due to the absence of proper Truck Terminal the trucks are parked along the main roads like Guru Kashi Marg, Bibiwala Road, Stadium road etc. These trucks reduce the effective width of the roads. Moreover these give shabby look to the stadium and the surrounding area. Due to absence of Truck Terminal within the city various service shops have been developed along Bibiwala Road. The service shops attract vehicles and encroach the road creating bottlenecks in free flow of traffic.

At present there is no organized Truck Stand in the town. A truck union office near stadium is functioning as Truck Stand which measures an area of 0.90 hectare only. This area is too inadequate as per the present requirements. Also the four-wheeler unions have no space for their stands but simply operate from the office of small size room whereas the vehicles usually are parked along the roads. A development scheme measuring an area of 24.47 hectare has been framed by Improvement Trust Bathinda on Kotkapura road near N.F.L Colony out of which about 10.5 hectare have been proposed for residential remaining part is reserved for activities related to truks stand. In this scheme provision has been made for the parking of about 600 trucks and mini trucks. Besides this 44 sites of goods booking agencies and repair and service shops have also been proposed. In fact this Transport Nagar is having all the modern facilities but unfortunately none of the goods booking agencies or truck or mini truck unions have been shifted to this site.

Taxi Terminal

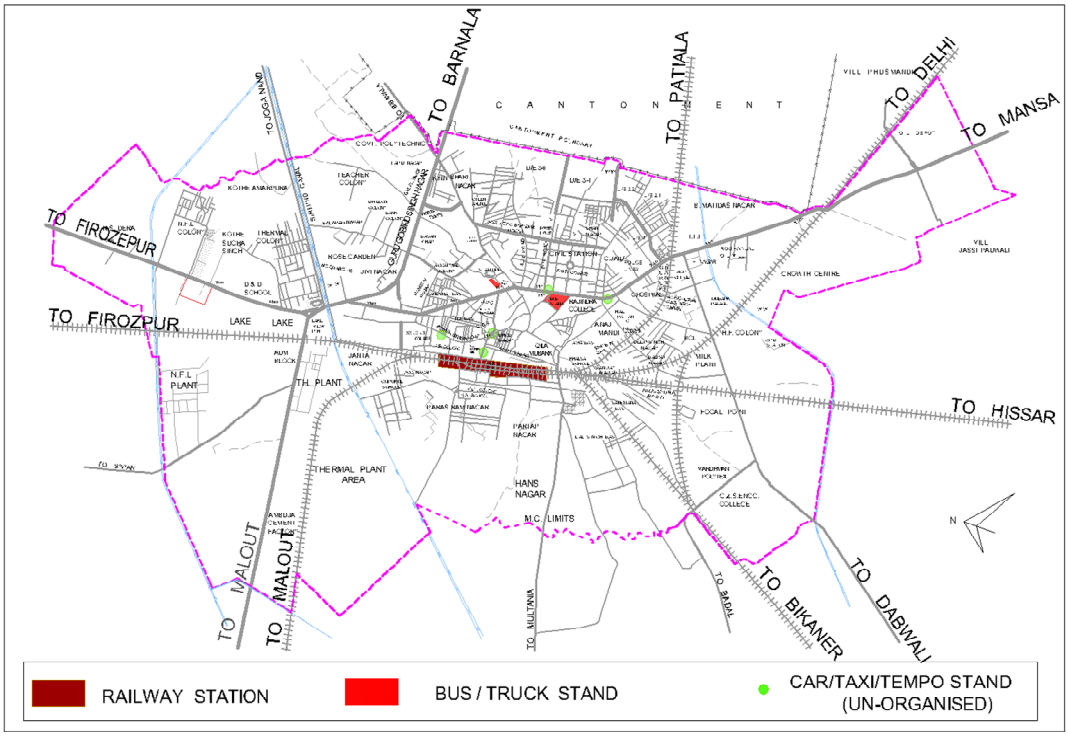
6.36. Intermediate modes of transportation are significant in all the urban settlements for the movement of passengers. At present there is no authorized taxi stand in the town. But nearly five unauthorized taxi stands have been identified in the town located near Rajindra College, Opposite Bus Stand, near Silver Star Hotel, near Fire Brigade and near Fish Market. The areas that have been occupied by these taxi stands are actually the parking areas for the nearby commercial areas or the portion of road. Due to the encroachment of the parking area by the taxi stands the vehicles are parked along the roads resulting in the congestion of roads and traffic.

Goods Vehicle Movement

6.37. Roads are significant mode of transportation within the settlement and also in the regional context. Five main roads entering the town are Barnala Road, Mansa Road, Dabwali Road, Malout Road and Kotakpura Road. In addition to the flow of passengers on various vehicles there is a flow of inward & outward goods on these roads. The chief incoming goods in Bathinda are coal from Bihar, cloth from Ahmedabad, Milk & vegetables from nearby rural areas, timber from Jammu & Rajasthan, sand & pebbles from Chandigarh, cycle goods & other machinery from Rajpura and Ludhiana, electric goods from Delhi etc. Though all these goods used to come to Bathinda even before, their quantity has greatly

increased. It indicates that Bathinda has gained much significance in this activity. Bathinda itself is also the source of many outgoing goods. Some of the major commodities involved in the wholesale trade are agricultural produce, fertilizers (urea & kissan), electric transformers, plastic pipes, electric wire, copper wire, thread, refined oil & vegetable ghee, milk products, aluminium utensils, bathroom slippers, cement, diesel/petrol, redistribution of pesticides, welding rods, agricultural implements, desert coolers, sanitary pipes, cattle feed and many others. Trading of all these commodities is also done through those five main roads entering the town which means that there is need of better road network.

Figure 19: Road & Rail Terminals- Bathinda city



As per the information collected by the field staff of the office of District Town Planner Bathinda, a total number of 15 goods booking agencies have been counted in the city. All these agencies are situated in the different parts of the city located at Grain Market, near stadium, near D.A.V College, Amrik Singh Road and near Improvement Trust Office. The vehicles of these agencies are mostly parked unauthorized on roads and streets hindering the free flow of traffic. In addition to lacking parking facilities other facilities such as rest rooms

etc. are also not provided for the drivers. They need to be relocated at the Transport Nagar.

Vehicular Growth

6.38. The number of registered vehicles has recorded more than 3 fold growth during the 2005-07 period. The growth rate of vehicles during the period 2005-06 and 2006-07 is 106% and 54% respectively. The average registration of vehicles per month has exceeded 15,000. Out of the total number of vehicles majority of vehicles (almost 60%) are the two wheelers followed by the other vehicles (tractors) accounted for 30% of the total registered vehicles in the city in the year 2007. Thus both these categories accounted for 90% of the total vehicles added in the city and region. Four wheeler light vehicles (Car Jeep, etc.) accounts for more than 7% of the total vehicles registered. There is an increase in personalized vehicles ownership that leads to the growth of vehicles in the city. The population growth during 2001-2006 (estimated) showed an increase of 2.8% per annum whereas the average growth rate of registered vehicles during the year of 2005 and 2007 was recorded as 80%. Because of large influx of vehicles in the city, the road network has not kept pace in vehicular growth, leading to numerous traffic problems in the city. Table 49 given below indicates the pattern of growth of registered vehicles category wise in the city on annual basis.

Table 49: Registered Vehicles Category Wise 2005-07

Year	Four wheelers (Medium and Heavy)	Four wheelers (Light vehicles)	Three wheelers	Two wheelers	Others	Total No. Vehicles.	Growth Rate in %
2005	4430	13081	294	103395	55363	1,76, 563	-
2006	7912	27690	594	215507	112728	3,64,431	106
2007	12477	42490	909	335991	168739	5,60,606	54

Source: District Transport Office, Bathinda

Road Accidents

6.39. With a view to assess the safety of the road users in Bathinda it is important to study the road accidents in the city as per the figures made available by the Police department the total no. of accidents increased from 57 in 2005 to 73 in 2006 and then decreased to 65 in 2007. So despite the rapid increase in vehicular

population, the number of accidents have by and large remained at the same level. The number of fatal accidents increased from 28 in 2005 to 39 in 2007. There is a reduction in non-fatal accidents in the city. This may be due to large congestion and slowing the speed over the period of time. Because of increase in fatal accidents, there is a need of strict regulations and enforcement mechanism. This clearly brings out the case for enhanced traffic safety and reduced number of accidents on the roads of Bathinda.

Table 50: Year Wise Fatal and Non Fatal Accidents in Bathinda city 05-07

Year	Total No. of accidents	Fatal	Non Fatal
2005	57	28	29
2006	73	31	42
2007 Up to November	65	39	26

Source: Senior Supdt. Police, Bathinda.

Management of Urban Transport

6.40. Existing scenario of urban transport management is marked by existence of multiplicity of agencies with overlapping areas of operation. In some cases even a single component is managed by different agencies. For example in Bathinda, Licensing of motorized vehicles is being delt by District Transport Agencies and non-motorized vehicles are by Municipal Corporation. Bus transport services are provided by dedicated State Road Transport undertaking. Rail services are under the control of Ministry of Railways whereas traffic rules are enforced by the State Traffic Police and so on. All these agencies plan their activities and operate independently without any coordination. The funds for development/management of transport are sourced independently and are spent by them, not necessarily, in the most optimum manner.

The worst part of the existing scenario is that urban transport is considered as secondary responsibility by these agencies. For example it is the primary responsibility of Municipal Corporation, Bathinda to provide civil services, police to maintain law and order, transport department to issue licenses, Development Authorities to plan for the growth of city, Railways to take care of rail traffic etc. But in the given context urban transport remains secondary on the agenda of these agencies. In certain cases, traffic engineering and management is left to the traffic police, an area in which they have no expertise. Bathinda does not have any Urban Transport Planner and Traffic Engineer on its role to guide and manage the urban transport.

Rail Based Transport

6.41. In addition to road traffic, railway also handles very large volume of goods and passenger traffic into Bathinda city. In all 46 pairs of passenger trains pass through the city on daily basis which caters to the traffic on Bathinda–Ferozpur, Bathinda-Ambala,Bathinda–Ganganagar,Bathinda-Delhi,Bathinda-Sirsa, Bthinda-Bikaner Routes. Maximum trains ply on Bathinda-Ferozpur route and accounts for nearby 1/4th of the total trains. Railway being the economical and efficient mode of transportation, largely catering to the intercity long distance traffic would continue to attract large volume of passenger traffic.

Table 51: Passenger Trains passing through Bathinda City

Name of route	Incoming	Outgoing
Bathinda-Firozpur	12	12
Bathinda-Ambala	7	7
Bathinda-Malout	7	7
Bathinda-Mansa	8	8
Bathinda-Sirsa	6	6
Bathinda-Dabwali	6	6

Source: Station Supdtt. Railway, Bathinda

In addition to 46 pairs of Passenger trains about 100 goods trains pass through the city every year for bringing and taking out raw material and finished goods. Railway plays an important role in the movement of goods.

Power Supply

6.42. The power supply to Bathinda city and Local Planning Area is provided by Punjab State Electricity Board. There is one Thermal Power Plant of 440 Megawatt situated within the limits of Bathinda Municipal Corporation on Malout road and another Thermal Power Plant is situated on Barnala road (NH-64) just outside the planning area boundary for distribution and regular supply of electricity. There are 10 Electric Grid Stations installed in Local Planning Area, Bathinda out of which seven Grid Stations are situated within the municipal limits and three are located out side municipal limits as shown in the plan Drg. No.DTP (B) 1571/09 Dated 15-04-09. The detail of Grid Stations is given in Table 52.

Table 52: Detail of Grid Stations in LPA, Bathinda and Bathinda City.

Sr. No.	Location	Capacity	Remarks
1.	Power House Road	66 K.V.	City Area
2	M.E.S. Grid near Bibiwala Chowk	66 K.V	"
3	Near Gole Diggi Market	33 K.V,	"
4	Industrial Growth Center	66 K.V.	"
5	Back Side Ganpati Enclave	66 K.V.	"
6	Multania Road	66 K.V.	"
7	Malout Road	66 K.V.	"
8	Kot Shamir	132 K.V.	L.P.A.
9	Bhokhra	66 K.V.	L.P.A.
10	Bhuchu Kalan	66 K.V.	L.P.A.

Source: PSEB

The Table 52 shows that out of the seven Grid Stations in city, six Grid Stations are of 66 K.V. capacity each and one is having capacity of 33 K.V. The grid station which is situated near Gole Diggi Market (33 K.V.) remains over loaded because of high consumption of electricity by the business establishments of main commercial areas as stated by S.E (Distribution) PSEB Bathinda whereas other Grid Station located near Gole Diggi Market all are having sufficient capacity for the present demand however there would be need for more Grid Stations in future to fulfill the requirements of future expansion of city. Three Grid Stations are falling outside the limits of Municipal Corporation such as one at village Kot Shamir having capacity of 132 K.V. and one each of 66 K.V. at village Bhuchu Kalan and village Bhokhra.

Social Infrastructure

Educational Facilities

6.43. Educational facilities certainly impact the quality of manpower available in urban area. In addition, these facilities leverage the economic development and employment. There are quite a large number of educational institutions in LPA Bathinda out of which many are located in Bathinda city like “Giani Zial Singh Engineering College” on Dabwali Road, Govt. Polytechnic College on Bibiwala Road, two Industrial Training Institutes on Mansa Road, Regional Center of Punjabi University, Patiala etc. Other than this Bathinda has 7-degree colleges and one Law College operating from different locations of the city. In addition to this there is Adesh Institute of Medical Sciences & Research, Baba Farid Institute of Higher Education and Foreign Languages are major educational institutes functioning in LPA Bathinda. Above quoted higher institutions are

adequate in number as compared to the norms and standards prescribed in UDPFI guidelines. There is no deficiency of these institutes in the existing situation.

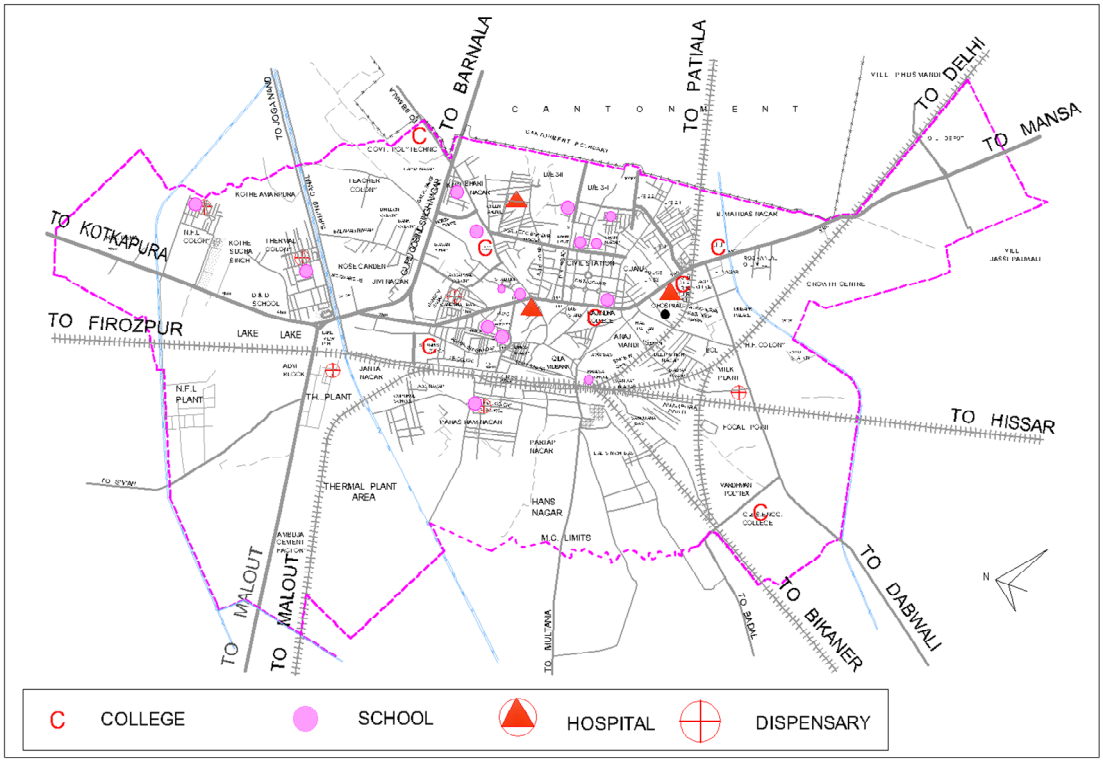
Besides the availability of institutions in the field of higher education, Bathinda and its LPA have large number of institutions imparting education at the school level. At present there are 176 Primary and Elementary schools and 53 high/ higher/ secondary level schools in LPA, Bathinda, whereas 46 primary and 25 High/ Higher secondary schools are working in Bathinda city. Considering the existing population and norms defined for educational institutions, quantitatively the number of institutions is adequate to cater the needs of the education of the city and LPA Bathinda. Space occupied by many of these institutions is found on the lower side when compared with the norms prescribed by various agencies. The situation remains critical particularly in case of educational institutions located in the old city area. Further number of institutions and academies has been found to be operating from residential houses and commercial buildings indicating shortage of space for educational institutions. The availability of educational institutions at various levels both in the field of technical and non-technical education have been detailed in Table 53.

Table 53: Educational Facilities in LPA Bathinda and Bathinda city

Sr. No.	Name of Facility	Existing in Numbers	
		Bathinda city	LPA Bathinda
1	Primary and Elementary Schools	62	176
2	High / Secondary Schools and Senior Secondary Schools	25	53
3	Colleges (Degree)	10	12
4	Technical Institutions	3	3
5	Engineering Colleges	1	1
6	B.Ed. College	2	3
7	Medical College	0	1
8	Regional University Campus of Punjabi University	1	1
9	Other LLB College	1	1
	Total	**105**	**251**

Source: DEO,Bathinda.Census of India 2001

Figure 20: Educational & Medical Facilities - Bathinda City



Health Care

6.44. As per information available from census 2001 there are 100 units of medical facilities of different types providing health services to the residents of LPA as well to the persons from outside the LPA. Out of these units there are six hospitals, 4 in Bathinda city and one in Goninan Mandi with a total bed capacity of 269 available in Bathinda city. There is one T.B Hospital with 25 beds working in Bathinda city. Total number of Sub Health Centers, Primary Health Centers and Dispensaries has been counted to be 46 in LPA out of which 9 are working in Bathinda City with a bed capacity of 22. There are 10 Nursing Homes out of which 6 are located in Bathinda city. In addition to this there are 4 Ayurvedic Hospitals and 8 Ayurvedic dispensaries in the LPA, Bathinda. In order to take care of animals and pets there are 7 Veterinary Hospitals and 15 Veterinary Dispensaries working in LPA, Bathinda.

Besides the above medical facilities there is one Medical College-cum-Hospital known as "Adesh Institute of Medical Sciences & Research" located on Bathinda–Barnala road in LPA, Bathinda which has 750 beds.

The details of different medical facilities available in Local Planning Area, Bathinda is given in Table 54 below:

Table 54: Medical Facilities in LPA Bathinda and Bathinda City

Sr. No.	Name of the Facility	Existing in Numbers		
		City	Bed Capacity	LPA Bathinda
1	Sub Health Centre and Primary Health Centre /Dispensary	9	22	46
2	Hospitals	4	269	6
3	Ayurvedic Dispensary	2	-	8
4	Ayurvedic Hospital	1	-	4
5	Homeopathic Dispensary	1	-	3
6	Homeopathic Hospital	-	-	2
7	Veterinary Dispensary	-	-	15
8	Veterinary Hospital	1	-	7
9	T B Clinic	1	25	3
10	Nursing Homes	6	70	10
11	Adesh Institute of Medical Sciences & Research	-		750
	Total	**25**	**386**	**850**

Source: Census 2001 & CMO, Bathinda.

Fire Prevention and Protection

6.45. Fire prevention and protection is an important issue in present times due to a number of mishaps in every field of activities, industrial accidents, electric short circuiting in commercial establishments and burning of crop structure in rural areas are most vulnerable for fire incidents. It is one of the main obligations of the government toward the general public.

Availability of Fire Stations

6.46. There are only three fire stations in the Local Planning Area Bathinda to take care of fire safety. These fire stations are located within the limits of Municipal Corporation of Bathinda, which take care of whole of the district. Out of these three fire stations one is maintained by Municipal Corporation which is located in the heart of the city while other two are in Thermal colony and N.F.L colony. The latter two fire stations although basically are meant for their respective areas but can be called for outside areas also in case of acute emergencies .The fire

station existing in city which in under the control of M.C serves vast areas of Municipal Corporation and rest of Local Planning Area, Bathinda.

Fire Incidents

6.47. As per information collected from all the three fire stations, a total number of fire incidents reported to different fire stations during last three years have been recorded to 1634. It shows that on the average about 544 fire incidents took place per year during past three years. The maximum number of 993 fire incidents has been recorded at Thermal Plant fire station followed by city fire station where 590 incidents have been recorded and only 51 incidents were reported to N.F.L. fire station.

Key Issues

The shortage of staff in all the three fire stations is the major working problem.

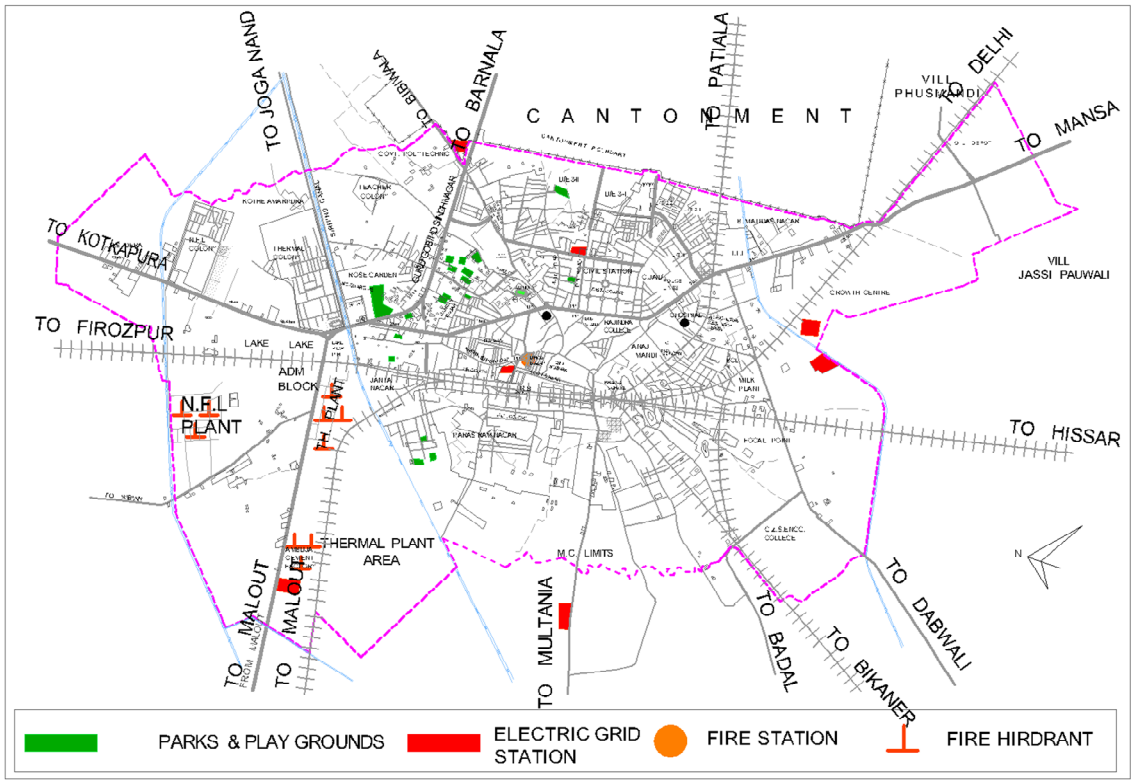
All the three fire stations are located towards northern part thus southern part of the city is lacking of this facility.

The fire sub stations near I.T.I. chowk and one in trans railway lines area are required.

An additional fire station is required for oil depots near village Jassi Pauwali chowk to take care of southern part of the city.

Lack of public awareness regarding the importance of leaving the way to the fire tenders.

Figure 21: Social Infrastructure Facilities-Bathinda city



Recreation and Sports

6.48. Recreational facilities constitute an important element of physical and social development of an individual and for that reason, their provision and balanced spatial distribution at the local; sub-city and city level assumes importance. Accordingly, it would be important that city is divided into compact and sustainable communities and recreational facilities of appropriate order are made available to these communities to serve the population residing therein. Recreational facilities have been found to exist in the shape of parks and open spaces, cinemas, multiplexes, stadiums, museums, sports related activities, clubs, library and amusement parks etc. Recreational facilities have also been divided into active and passive recreational facilities. Provision of both these facilities has to make in order to cater to the essential needs of the individuals and communities.

Parks and Open Spaces

6.49. As per the field studies conducted by the Department of Town & Country Planning, Punjab and the data collected from various departments, there is one amusement park in Bahia Resort (Paid Entry) on Barnala road (N.H.64) and one large size park in Bathinda Cantonment known as Chetak Park again on Barnala road N.H.64 (Open for Public Entry) which cater the needs of Bathinda Local Planning Area. Besides this, there is one mini Zoo within the boundaries of LPA, Bathinda on Multania Road.

In addition to this, there is one city level park known as Rose Garden in Bathinda city. There are only three neighborhood parks in the city one is in Railway Colony (which is also used for sports activities) second in Urban Estate Phase-I and another in Urban Estate Phase-3 part-II. Except these few parks, there is no park of reasonably good size. However the parks having an area of more than one thousand square meters has been taken into account out of the data supplied by the Municipal Corporation. All these parks cover an area of about 23 Hectares. The other parks are smaller in size but still contribute a lot for providing little bit open spaces in the congested morphology of the city. These so called smaller and medium size parks are not evenly distributed in the city. These parks are available in the various residential colonies developed by various agencies like PUDA (BDA), Municipal Corporation Bathinda and Improvement Trust Bathinda within the provision of their respective Acts. In

terms of physical location of these parks it has been found that all these parks and open spaces are located in the eastern part of city. Most of these parks (25) are falling in Urban Estates developed by BDA Bathinda. About 20 parks have been carved out in Town Planning Schemes by Municipal Corporation and only 2 parks have been developed by Improvement Trust, Bathinda. The inner parts of the city specifically Central Business District, Pujan wala Mohalla, Tellian wala Mohalla, Mohalla Jhutti Patti, Mehna Mohalla, Seedian wala Mohalla, Harizan Basti, Birla Mill colony, Nai Basti, Guru Nanak pura Mohalla etc. are not having any park or open space. Similarly Guru Ki Nagri, Harbans Nagar, Matti Das Nagar, Balraj Nagar, Deep Singh Nagar, Sanjay Nagar, Jiwi Nagar, Hajura Kapura Nagar, Balla Ram Nagar, National colony, Farid Nagar, Jujhar Nagar on eastern side of Railway lines and entire Nagars and Mohallas on western side of railway lines do not have any park.

Cinemas & Multiplexes

6.50. There are 5 cinemas in the city catering the entertainment needs of the residents. With number of multiplexes coming up in the city, numbers of cinemas are likely to go up considerably. Considering the options of entertainment offered by multiplexes some of existing cinemas are in process of conversion into multiplexes. At present four cinemas are situated on Guru Kashi Marg whereas one cinema is situated on Amrik Singh Road.

Other Recreational facilities

6.51. In addition to the above there are 5 clubs, 2 libraries / reading rooms, four swimming pools, three stadiums and three auditoriums in Bathinda which provide recreational facilities to the general public. However, any well organized cultural or drama club has not been noticed in the city thus city is lacking the facility of good theater. One open-air theater exists in Rose Garden which is not properly maintained. There is no museum, no Art Gallery etc. in the city for recreational purposes.

Sports

6.52. There is only one public stadium known as ‘Sports Stadium’ in Bathinda city, which lies almost in the middle of the city. Besides this, there are two other stadiums one each in Govt. Rajindera College and DAV College in the city. There is no swimming pool in the city where the games of National level can be held. Small swimming pool maintained by Municipal Corporation Bathinda is in

Civil Station, however; a swimming pool of State level status is available in Thermal Colony. There is no indoor stadium, Gymnasium Hall, or any other sports complex available in the city. However, 18 holes golf course is available in Cantonment area where national level competitions have been held several times.

Key Issues

- The city is facing acute shortage of main neighborhood parks.
- Lack of amusement park and green belts.
- Lack of modern sports stadium/ indoor stadium and Gymnasium hall.
- Lack of standardized swimming pool.
- Absence of Museum or Art Gallery.

Police Station

6.53. In order to maintain law and order in LPA and Bathinda City the elaborated arrangement of police administration has been made. Besides the Police Lines and District jail in Bathinda city there are five police stations, three police chowkies and three police nakas in Local Planning Area, Bathinda. The Detail of police stations and other posts is given in Table 55 given below:

Table 55: Police Stations and Chowkies etc. in LPA Bathinda.

Sr. No	Name of Police Stations/Chowki/Naka	Location	Status
1	Thana Kotwali	Near Railway Station, Bathinda	Police Station
2	Thana Sadar	Mohalla Patti Jhutti, Bathinda	Police Station
3	Thana Thermal	Malout Road, Bathinda	Police Station
4	Thana Cantt.	Barnala Road, Bathinda	Police Station
5	Thana Nehian Wala	At Goniana Mandi	Police Station
6	Canal Chowki	Railway Colony, Bathinda	Police Chowki
7	Civil Line Chowki	Near Court Complex, Bathinda	Police Chowki
8	Bhuchu Chowki	Bhuchu Mandi	Police Chowki
9	Vardhman Spinning Mill	Badal Road, Bathinda	Police Naka
10	Kot Shamir	Talwandi Road, Village Kot Shamir	Police Naka
11	Model Town	Model Town Phase-I, Bathinda	Police Naka

Out of these police stations, the police station kotwali looks after the area of city falling towards south of Sirhind Canal (Bathinda Branch). Besides this, in order to ensure effective enforcement of law and order there are two police chowkies i.e. Civil Station and Canal chowki and two nakas one each at Vardhman mill and Model Town under the Kotwali Police Station. One Police chowki at Bhuchu Mandi is under the jurisdiction of police station Nathana (which falls outside LPA boundary). The Police Station Sadar deals with most of the villages

falling in LPA, Bathinda and one police naka at village Kot Shamir is also there under this police station.

Post and Telegraph

6.54. Despite rapid progress made in different modes of communications, post and telegraph still remains the most popular option of communication for vast majority of population. The provision and management of post and telegraph facility falls under the domain of the department of post and telegraph. There are in all 8 post offices operating in the city out of which 3 are branch level and 1 head post office. Numbers of such offices are reducing due to availability of better option of communication, which are not only faster but also cheaper. But still, these facilities serve considerable proportion of population both at the city level and LPA level. The existing distribution of post offices also needs to be rationalized in order to serve the community in a better manner. Accordingly their provision should be made as per defined norms in order to cater to the needs of vast majority of city population. Details of the post offices available within Bathinda are provided in the Table 56 given below:

Table 56: Post Offices in Bathinda City

Sr. No.	Name of the Facility	Existing in Numbers
1	Branch Post Office	3
2	Sub Post Office	4
3	Head Post Office	1

6.55. With the introduction of the privatization in the telecommunication sector, large numbers of players have emerged in this areas leading to faster growth and cut throat competition. Accordingly demand for providing telephone exchanges has gone up considerably. Since the private players have got major chunk of the segment, so most of the demand for space will be met in the private sector, but considering the existing pattern, parastatal agencies still continue to be major player in the segment of telephones. With the increasing population and availability of enormous network, government sector would be required to expand its operational mechanism to meet the future demands in the urban sector. Accordingly number of telephone exchanges would require to be created within the city besides upgrading the facilities and infrastructure in the existing exchanges to cater the existing needs and the future requirements of population.

7. VISUALIZING THE FUTURE

The first thing to be visualized for 2031 is the likely population and workforce. The requirements of different types of infrastructure would be based on the projected population for that year. For this purpose the past trends of share of population of Bathinda city as well as that of rural and other settlements falling in LPA Bathinda has been taken into account. In addition to this, the government policies and the opportunities affecting the growth of Bathinda city have also been kept in mind.

Population Projections 2031

7.1. In order to achieve more realistic forecast of population a simplied version of ratio method is used. Population of LPA is derived from the forecast made for Punjab state in the Report of the technical group on Population projections constituted by the National Commission on Population entitled "POPULATION PROJECTIONS FOR INDIA AND STATES 2026". For that purpose observed ratios of LPA population to the state population have been used. The population projections for Punjab state as presented in the report are reproduced in Table 57 below:

Table 57: Projected Population of Punjab – Total and Urban 2001-2026

Year	2001	2006	2011	2016	2021	2026
Punjab Total	24359	26059	27678	29112	30323	31345
Punjab Urban	8263	9439	10681	11940	13185	16456
Percentage Urban	33.92	36.22	38.59	41.01	43.48	52.50

(*Population in Thousands)*

Population Projections for Urban Areas

Share of population of urban areas to the total urban population of Punjab state is given in Table 58 below:

Table 58: Share of Population of Urban Areas of LPA Bathinda to the Total Urban Population of Punjab State 1981-2001

Urban areas	Population of LPA Urban / Punjab Urban population		
	1981	1991	2001
Bathinda city	2.74	2.65	2.63
Goniana	0.18	0.17	0.16
Bhuchu Mandi	0.17	0.17	0.16

(Source: Census of India 1981, 1991, 2001)

Method-I

7.2. In Method I population projection of urban areas of LPA Bathinda is calculated assuming that its share in Punjab Urban (2001) will remain constant in future. Thus, Population Projection of urban areas of LPA Bathinda up to the year 2031 is given in Table 59 below:

Table 59 : Projected Population of Urban Areas of LPA Bathinda 2006-2031

Year	2006	2011	2016	2021	2026	2031
Bathinda city						
%age of Punjab Urban	2.63	2.63	2.63	2.63	2.63	-
Projected Population in '000'	248	281	314	347	433	540
Projected Population including 5% of floating and seasonal migratory labour	260	295	330	364	455	567
Goniana						
%age of Punjab Urban	0.16	0.16	0.16	0.16	0.16	-
Projected Population in '000	15	17	19	21	26	32
Bhuchu Mandi						
%age of Punjab Urban	0.16	0.16	0.16	0.16	0.16	-
Projected Population in 000	15	17	19	21	26	32

(Population in Thousands)

The projected population of urban areas in LPA Bathinda is shown in the above table. The year 2031 is taken as horizon year for the master plan Bathinda to tally with the census year keeping in view the infrastructural requirements of Bathinda city for the future, the floating population of about 5% has been added to the projected population as shown in Table 59.

Method-II

7.3. As per the trend of reducing share of LPA urban population to Punjab Urban population from 1981 to 2001 it is assumed that trend would continue till 2026. Projections based on this assumption are presented in Table 60.

Table 60 : Projected Population of Urban Areas in LPA Bathinda 2006-2031

Year	2006	2011	2016	2021	2026	2031
Bathinda						
% age of Punjab Urban	2.61	2.61	2.59	2.59	2.57	2.57
Projected Population	246	279	309	341	423	532
Goniana						
% age of Punjab Urban	0.15	0.15	0.14	0.14	0.13	0.13
Projected Population	14	16	17	18	21	27
Bhuchu Mandi						
% age of Punjab Urban	0.15	0.15	0.14	0.14	0.13	0.13
Projected Population	14	16	17	18	21	27

(Population in Thousands)

Projected Population of urban areas of LPA Bathinda for the horizon year 2031 is calculated by taking the growth rate of 2021-2026 of the respective urban areas.

Table 61 Population Projection for 2031 of Urban Areas by Various Methods

Name of Town	Method I	Method II
Bathinda	567,000	532,000
Goniana	32,000	27,000
Bhuchu Mandi	32,000	27,000
Total	**6,31,000**	**586,000**

Out of the above two methods, Population Projected by Method No.I is adopted for the plan formulation, as there will be development of trade, commerce, and industries in planned manner and also with the policy the establishment of Civil Aviation Airport, Guru Gobind Singh Oil Refinery, Cricket Stadium in and arround LPA Bathinda and in anticipation of Govt. policies. The towns will retain their share in Punjab urban despite general reduction in growth rate of population. The Projected Population of these urban areas therefore has been taken as 6,31,000 persons for the year 2031.

Population Projections for Villages of LPA Bathinda

7.4. Population of rural areas of LPA Bathinda has been similarly projected i.e.by using the ratio of LPA Rural to Punjab Rural up to 2016 thareafter the implied growth rate during 2011-1016 has been used. The growth rate for projections for the years after 2016 has been taken constant i.e. 1.03% because the growth rate of Punjab rural during the year 2016-21 and 2021-26 is expected to be negative in the Report. The projections of LPA, Bathinda rural are shown in Table 62.

Table 62: Projected Population of L.P.A Rural 2011-2031

Population	2001	2006	2011	2016	2021	2026	2031
Punjab Rural in '000	16096	16620	16997	17172	17138	14889	-
Projected LPA Rural	123986	128022	130926	132743	134110	135491	136887
Share of LPA Rural %	0.77	0.77	0.77	0.77	0.78		-
Growth Rate		3.26%	2.27%	1.39%	1.03%	1.03%	1.03%

Population Projection for LPA, Bathinda

7.5. The projected population of LPA Bathinda is calculated by adding the projected population of urban areas in LPA Bathinda and villages falling in LPA Bathinda. It is shown in Table 63 below:

Table 63: Projected Population of LPA Bathinda 2006-2031

Years	2006	2011	2016	2021	2026	2031
Projected Population	418022	459926	500743	540110	642491	767887

Villages of Urban fringe Bathinda

7.6. It is observed that some of the villages of LPA Bathinda situated near the M.C. limits will adopt urban character in near future and will act as an urban fringe around the city. The following villages have been included in this fringe area as shown in Table 64 below:

Table 64: Villages and Population included in Urban Fringe

Name of Village	**Population**
Gill Patti	2957
Sibian	5417
Bir Talab	4507
Jodhpur Ramana	2083
Jassi Pau Wali	2759
Total	**17723**

(*Source: District Census Hand Book 2001)*

Population projection of above villages have been done separately to assess the urban thrust and have been calculated as per the method adopted for calculating the projections for villages falling in LPA Bathinda. The projected population of these villages is given in Table 65.

Table 65: Projected Population of Villages included in Urban Fringe

Years	2006	2011	2016	2021	2026	2031
Projected Population	18299	18713	18906	19101	19298	19497

The consolidated populations of Bathinda city and its fringe area are given in Table 66 below:

Table 66: Projected Population of Bathinda City and its Urban Fringe

Years	2006	2011	2016	2021	2026	2031
Projected Population in lacs	2.78	3.14	3.49	3.83	4.74	5.86

Workforce Projections

7.7. For calculating the workforce projection, LPA, Bathinda is divided into three parts:

- Bathinda city
- Other towns in LPA, Bathinda (Goniana and Bhuchu Mandi)
- Villages in LPA, Bathinda

Category wise Employment data is available for Bathinda city and Bathinda district- as Total, Rural and Urban. To estimate category wise employment, for the year 2031 certain assumptions have been made as:

- Employment Pattern of Bathinda city will be same as observed in 2001
- Employment pattern of other towns will be similar to District Urban – (excluding Bathinda Municipal Corporation.)
- Employment pattern of villages falling in LPA will be similar to Bathinda District total – (excluding Bathinda Municipal Corporation.)
- Category wise employment data for 2001 is given in Table 68 presents the forecast for the year 2031 for the above said constituents is given in Table 67.

Table 67: Main Workers and Employment Category Wise of Constituent Areas of LPA Bathinda

Data and assumptions 2001		Bathinda(M Corp.) 2001	Main Workers as % of Population and categories as % of main workers	Bathinda outer towns in LPA (Bucho mandi & Goniana)	Main Workers as % of Population and categories as % of main workers	Bathinda District Excluding LPA Bathinda urban	Main Workers as % of Population and categories as % of main workers
Population		217256		26059		939,980	
Main workers		65982	30.37%	8134	31.21%	340,239	36.20%
A & B	Cultivators	771	1.17%	741	9.11%	129,624	38.10%
	Agriculture Hunting Forestry	1074	1.63%	597	7.34%	73,554	21.62%
	Fishing, Hunting and allied activities	1200	1.82%	168	2.06%	34,153	10.04%
C	Mining & Quarrying	49	0.07%	4	0.05%	35	0.01%
D	Household Industry	1585	2.40%	8	0.10%	3,808	1.12%
	Non HHI	7789	11.80%	702	8.62%	9,839	2.89%
E	Electricity Gas & Water Supply	5100	7.73%	105	1.29%	3,365	0.99%
F	Construction	4576	6.94%	443	5.44%	8,301	2.44%
G	Whole Sale & Retail Trade	14385	21.80%	2383	29.29%	21,259	6.25%
H	Hotels & Restaurants	844	1.28%	89	1.09%	674	0.20%
I	Transport Storage & Communication	4327	6.56%	379	4.66%	5,653	1.66%
J & K	Finance Real Estate and Business Services	4748	7.20%	385	4.73%	5,986	1.76%
L to Q	Public Admin & Other Services	19535	29.61%	1695	20.84%	36,789	10.81%

Table 68: Employment Forecast for LPA Bathinda 2031

Data and assumptions 2001		Forecast 2031			
		Bathinda (M Corp.)	**Bathinda outer towns (LPA Bathinda - Bathinda M Corp)**	**Rest of LPA**	**Total**
Population		568000	64000	136887	768887
Main workers		172505	19977	49548	242030
A & B	Cultivators	2016	1820	18877	22713
	Agriculture Hunting Forestry	2808	1467	10711	14986
	Fishing, Hunting and allied activities	3137	412	4974	8523
C	Mining & Quarrying	128	9	5	142
D	Household Industry	4144	20	555	4719
	Non HHI	20364	1723	1433	23520
E	Electricity Gas & Water Supply	13334	257	490	14081
F	Construction	11964	1087	1209	14260
G	Whole Sale & Retail Trade	37609	5851	3096	46556
H	Hotels & Restaurants	2207	218	98	2523
I	Transport Storage & Communication	11313	931	823	13067
J & K	Finance Real Estate and Business Services	12413	945	872	14230
L to Q	Public Admin & Other Services	51073	4163	5357	60593

Infrastructure requirements

Water Requirements

7.8. **General:** In true sense the term water demand refer to the estimated quantity of water required for a city to fulfill water needs of the people residing in the city. The estimated water demand includes per capita consumption, system losses, industrial and commercial consumption, fire fighting demand etc. The water demand is broadly classified as domestic and non-domestic water demand.

Rate of water supply

Domestic water demand:

7.9. The Indian codal precisions recommended a minimum water supply of 135 lpcd for cities and Bathinda adopts the same. The residential area in Bathinda is expected to have a much higher demand due to better life style adopted by the

residents. However considering the availability of water and the norms followed by the PWSSB, a rate of supply of 135 lpcd for domestic purpose will be adopted for requirement purpose.

Industrial water demand

7.10. Bulk supplied to industrial establishment will be considered as per specific requirement of each industry. However the figures of 135 lpcd include water requirements for commercial, institutional and minor industries.

Unaccounted for water (UFW):

7.11. As per Central Public Health and Environmental Engineering Organization (CPHEEO) manual a maximum provision of 15% towards losses, unaccounted water shall be made.

Fire Demand:

7.12. As per CPHEEO recommendations a provision of 100 kilo liter per day based on formula of 100 p where P= population in thousands shall be kept in mind.

Estimation of Water Demand:

7.13. The water demand calculated based on water requirements calculated by the Feedback Ventures Private Limited in a detailed project report for water supply system the net water demand comprises consumption of domestic and non domestic purposes. Non domestic user includes consumption by Institutions (Colleges, School and Hospital), Commercial Establishment, Industries, Public Parks, Hotels, Tourist places etc. Gross water demand comprises network demand and physical & non-physical losses. Estimated net water demand and Gross water demand as calculated by the Joint Venture Pvt. Ltd. is given in Table 69.

Table 69: Projected Net and Gross water Demand for Bathinda City 2031

Year	2007	2011	2021	2025	2031
Net water demand in MLD	33.34	37.39	49.92	56.71	66.34
Gross water demand in MLD	39.72	43.99	58.73	66.72	78.04

As per the policy decision taken by the concerned authorities, the above water demand excludes the water demand of Thermal Power Plant, National Fertilizer Limited (NFL) and Railway Colony. In future the above bulk consumers will

continue to manage their own water supply system and they will not depend on Municipal Supply.

The water requirements for the rural settlements (village abadis) have not been projected since this aspect is independently handled by the Department of Water Supply and Sanitation.

Sewerage requirements

Per capita wastewater flow

7.14. The rate of wastewater flow depends upon the rate of water supply to community and the rate of ground water infiltration.

The entire spent water of community should normally contribute to the total flow in a sewer. However, the actual dry weather flow quantities usually are slightly less than the per capita water consumption. Since some water is lost in evaporation, seepage into ground, leakage etc. Generally, 80% of the water supply may be expected to reach the sewers unless there is data available to the contrary.

As per PWSSB's practical wastewater flows has been estimated considering 85% of water supplied to the consumers that will reach the sewers.

Projected waste water flows

7.15. Considering 85% of the water supplied to the consumption reaching the sewer and adopting the recommended norms for infiltration the projected waste water flows has been calculated.

Table 70: Projected and Gross Waste Water Flows

Year	2007	2011	2021	2031	2040
Net waste water flows in MLD	29.10	32.59	43.53	57.90	75.43
Gross Waste Water Flows in MLD	33.63	37.12	48.06	62.43	79.96

As per the policy decision taken by the concerned authorities the above waste water flow excludes the flows from Thermal Power Plant, and National Fertilizer Limited (NFL). However, the waste water flows of Railway colony have been considered.

Combining the projected net waste water flows and infiltration gives the value of gross waste water flows as shown in Table 70.

Drainage requirement

7.16. As it is evident from existing studies in chapter 5 (5.17), there is no natural gradient towards a particular direction available in the areas falling within the limits of Municipal Corporation Bathinda. The rain water usually accumulates in the depressions formed by virtue of natural topography of the city. So far as collection of storm water is concerned the city can be divided into three different parts i.e. area across the railway lines, (western side) area around Guru Kashi Marag (central part) and areas falling on eastern side. The Storm Water Collection system is required to be evolved in such a manner that above mentioned areas should be covered.

Solid waste disposal

7.17. The production of solid waste in an urban area is a function of the socio economic profile of the population and activities in the area. As per UDPFI guidelines the generating of waste varies from about over a quarter of a kilogram in small towns to about half a kilogram per capita in large and metro cities. For Bathinda city which is medium sized city the waste generation will be 3/8 of kilogram per capita i.e. 3/8 x 563000 = 211125 kg = 211.13 metric ton per day.

Power

7.18. As per the standards given in UDPFI guidelines the power consumption works out to be 2 KW per household at city level. Based on above the power consumption for Bathinda city on five yearly basis is calculated in the Table 71 below:

Table 71: Power Requirement of Bathinda City 2006-2031.

Year	2006	2011	2016	2021	2026	2031
Household	62000	70200	78600	86800	108200	112600
Power consumption in MW	124	140	157	174	216	225

For the requirements of electric sub station, for the population of 15000 persons one electric sub station of 11KV is required as per the UDPFI guidelines. Thus for the projected population of 563000, a total number of about 6 electric sub stations of the capacity of 66 KV are required.

Constitution of Think Tank

7.19. As per the D O letter dated 2-12-2008 of Honouraable Chief Secretary addressed to all the Deputy Commissioners of the Punjab state, circulated vide Chief Town Planner's Endst. No. 9526-45 CTP (Pb) /sp 135 dated 10-12-08 of Chief Town Planner Punjab, there is a proposal to set up a think tank under the chairmanship of Deputy Commissioner concerned for each city/town to envisage a vision 2031 for that city/town.

Based on the instructions contained in the above referred letter, the think tank for visualizing the future of the Bathinda city (vision 2031) was constituted by Deputy Commissioner Bathinda on 23/01/2009.

The following are the members of the think tank.

List of members included in Think Tank for finalizing 2031.

<table>
<tr><th>Public Sector</th><th>Private Economic Sector</th><th>Social Sector</th></tr>
<tr><td>Mayor, Municipal Corporation, Bathinda.</td><td>Sh. R.P.Mittal, Chemical Ltd. Bathinda.</td><td>Sh. G.S.Dhaliwal Baba Farid Institute, Bathinda.</td></tr>
<tr><td>Chief Administrator, BDA, Bathinda</td><td>Sh.Vishnu Goyal, Homeland Enclave, Bathinda.</td><td>Sh.Harvinder Singh Khalsa, Bathinda.</td></tr>
<tr><td>Senior Supt. Police, Bathinda.</td><td>President, Chamber of Commerce of Bathinda.</td><td rowspan="3">President, Sahara Club, Bathinda</td></tr>
<tr><td rowspan="2">Commissioner, Municipal Corporation, Bathinda.</td><td>Principal, Giani Zail Singh College, Bathinda.</td></tr>
<tr><td>President, Vapar Mandal, Bathinda.</td></tr>
<tr><td colspan="3">Other Govt. Officers</td></tr>
<tr><td colspan="3">Civil Surgeon, Bathinda</td></tr>
<tr><td colspan="3">District Education Officer, Bathinda.</td></tr>
<tr><td colspan="3">Divisional Forest Officer, Bathinda.</td></tr>
<tr><td colspan="3">General Manager, District Industry Centre, Bathinda.</td></tr>
<tr><td colspan="3">District Transport Officer, Bathinda.</td></tr>
<tr><td colspan="3">Executive Engineer,P.W.D., (B & R), Construction Division, Bathinda.</td></tr>
<tr><td colspan="3">Executive Engineer,PWD (B & R), Central Works, Bathinda.</td></tr>
<tr><td colspan="3">Executive Engineer, Punjab State Electricity Bathinda.</td></tr>
<tr><td colspan="3">Executive Engineer, PWD, (B & R), Public Health, Bathinda</td></tr>
<tr><td colspan="3">Executive Engineer, Punjab Pollution Control Board, Bathinda.</td></tr>
<tr><td colspan="3">Executive Engineer, Punjab Water Supply & Sewerage Board, Bathinda.</td></tr>
</table>

The Strength Weakness Opportunities Threat (SWOT) Analysis

7.20. For the preparation of master plan Bathinda it is necessary to develop a long-term (2031) vision of the city that takes into account the present Strengths and Weaknesses of the city and the Opportunities and Threats likely to be presented by the surrounding region. Based on the above parameters, the issue paper (SWOT Analysis) was prepared by the office of District Town Planner, Bathinda, which was discussed and finalized in the meeting of Think Tank as given below:

Strengths:

- Strategic location in terms of rail and road linkages.
- Important Urban centre of Southern Punjab and of adjoining States.
- Existence of medium and large-scale units like Thermal Power Plant, NFL, Cement Unit.
- Availability of Sufficient infrastructure: in terms of educational facilities, water supply, fire protection etc.
- Diversified economic activities.

Weaknesses:

- Away from developed belt i.e. NH-1 corridor.
- Low growth rate of small scale industries
- Shortage of affordable and qualitative housing stock.
- Unplanned development.
- Existence of dirty water ponds.
- Ground water not fit for drinking purpose.
- Lack of connectivity in terms of infrastructure due to existence of so many railway lines.
- 15% population not covered by piped of water supply.
- 35% unserved area of sewerage facility.
- No sewerage treatment facility available.
- Absence of Storm water drainage.

Opportunities:

- New sports complex including Cricket Stadium by Punjab Govt. will create a sports environment.
- With the establishment of Domestic Airport facility near Bathinda will provide air connectivity with rest of country.
- Oil Refinery near LPA Bathinda will provide opportunities for establishment of allied industrial units.
- Development of ring road Phase-II (Under Process).
- Real estate development.
- Central University Likely to come up near Bathinda.
- Four Laning / widening and strengthening of major roads of LPA.
- Trend of shopping malls and multiplex.
- Establishment of new Management School in Industrial Growth Center.

Threats:

- Present Scenario of commercial development along major roads will create more parking problems.
- Through traffic will put huge burden on city roads.
- Developing a vision for the city is central to the preparation of a Master Plan. A vision is a statement of where the city wishes to go, within a given timeframe, and is often expressed in terms of clear expectations.

Vision- 2031

7.21. Based on the outcome of discussions held in the meetings of Think Tank, the Vision Bathinda 2031 is articulated as follows:

"To transform Bathinda into an industrial hub focussed on Petro Chemical industries and a services centre of Malwa region by providing high quality physical and social infrastructure to all its citizens in an inclusive and environmentally sustainable manner."

Strategies to attain Vision

7.22. In order to achieve the objectives and goals enshrined in the vision statement, mission statements for various focused areas have been detailed below:

Growth management

- Promoting planned development through effective city planning.
- Rationalizing land use pattern for effective traffic management and provision of basic services and amenities.
- Making effective plan implementation and enforcement as integral part of city planning and development process.
- Conserving the cultural fabric.
- Making growth management process participatory.
- Review of master plan on regular basis.
- Improving system of approvals of building plan through use of IT and GIS.
- Making urban development self sustaining.

Urban Environment

- Urban environment to be made integral and essential part of city development process.
- Environment to be made integral part of planning and decision making process.
- Effective treatment of all sewage generated within the city.
- Improving solid waste management.
- Creating / developing new and improving existing parks and open spaces.
- Promoting better water management.
- Making city free from air, water and noise pollution.
- Discouraging the growth of slums and improving existing slums.

Urban Services:

Water supply

- To ensure safe, equitable, reliable, adequate and quality water supply
- To ensure 100% coverage of the city
- To promote rain water harvesting and recycling of water.

Sewerage and Drainage

- Total coverage of the city with sewerage and drainage system including slums.
- To promote eco-friendly decentralized treatment system.
- To minimize sewerage generation through water saving appliances
- To promote recycling of sewage
- To promote protection of natural water bodies
- To promote optimum use of storm water as an alternate source of water supply.

Solid waste management

- To improve the solid waste management in the city using best practices.
- To use PPP model for Solid waste management.
- To promote "Recycling" system of SWM.
- To make solid waste management people centric

Storm water disposal

- To introduce the storm water disposal system in the entire city
- To improve the capacity of the water bodies existing within the city
- To improve the natural water drainage channels by de silting and stopping the sewage water from entering the channels.

Traffic and Transportation

- To improve safety, mobility and efficiency of traffic within and out side the city.
- To segregate and rationalize the inter and intra city traffic
- To improve road geometry and road capacity of existing network
- To minimize pollution caused by traffic and transportation and improve environment.
- To create new road network and to improve the existing network to promote operational efficiency of traffic.
- To provide adequate parking spaces to remove traffic bottlenecks.
- To plan and provide effective public transport services

Social Infrastructure

- To provide adequate sites based on norms, for creating / developing various social infrastructures.
- To involve private and corporate sectors for providing / developing and maintenance of social infrastructure.
- To make optimum use of mechanism of planned development for developing adequate and quality infrastructure.
- To promote community participation in maintenance and upkeep of social infrastructure.

8. THE MASTER PLAN

Components of the Master Plan

8.1. The scope of a master plan is limited to the broad proposals and allocation of land for various uses such as residential, industrial, commercial, recreational, public and semi-public etc. It will propose a network of roads and pattern of streets and traffic circulation systems for the present and the future. It will identify areas required to be preserved and conserved and development of areas of natural scenery and landscape together with preservation of features, structures or places of historical, architectural interest and environmental value. It will include zoning regulations for regulating development within each zone. Therefore, the Master Plan is an important instrument for guiding and regulating development of a city over a period of time and contributing to planned development both conceptually and operationally. Master Plan of LPA Bathinda comprises four main components as follows:

- Proposed land use
- Transport network
- Heritage Conservation
- Zoning Regulations

Master Planning Objectives

8.2. The long term vision and the mission statements would require spatial land use planning, infrastructure planning, financing and implementation, effective management and operation of infrastructure services, and regulating and enforcing plan proposals. The objective of the Master Plan is to create enabling spatial and Land Use Planning framework to achieve the Vision of LPA Bathinda. More specifically following are the objectives.

- To make Bathinda city as the most vibrant economic centre to promote the balanced regional growth.
- To make land allocation in an environmentally benign fashion.
- To minimize haphazard, unplanned and sub-standard growth and development of the city and to achieve planned growth to create healthy environment.

- To effectively manage the traffic and transportation within the city through the mechanism of rationalizing the landuse pattern defined in the Master Plan.
- To make land available for public purposes.
- To minimize travel within the city by creating self contained and self sufficient communities
- Adequate parking spaces to be created in the city as an integral part of commercial, industrial and institutional planning and development process.
- To strengthen the basic infrastructure favorable for Petro Chemical and Petroleum Industries.
- To rationalize the distribution of physical and social infrastructure in order to ensure appropriate quality of life to all the residents of the city.
- To identify man-made and natural heritage and to make heritage conservation as integral part of the city planning and development process.

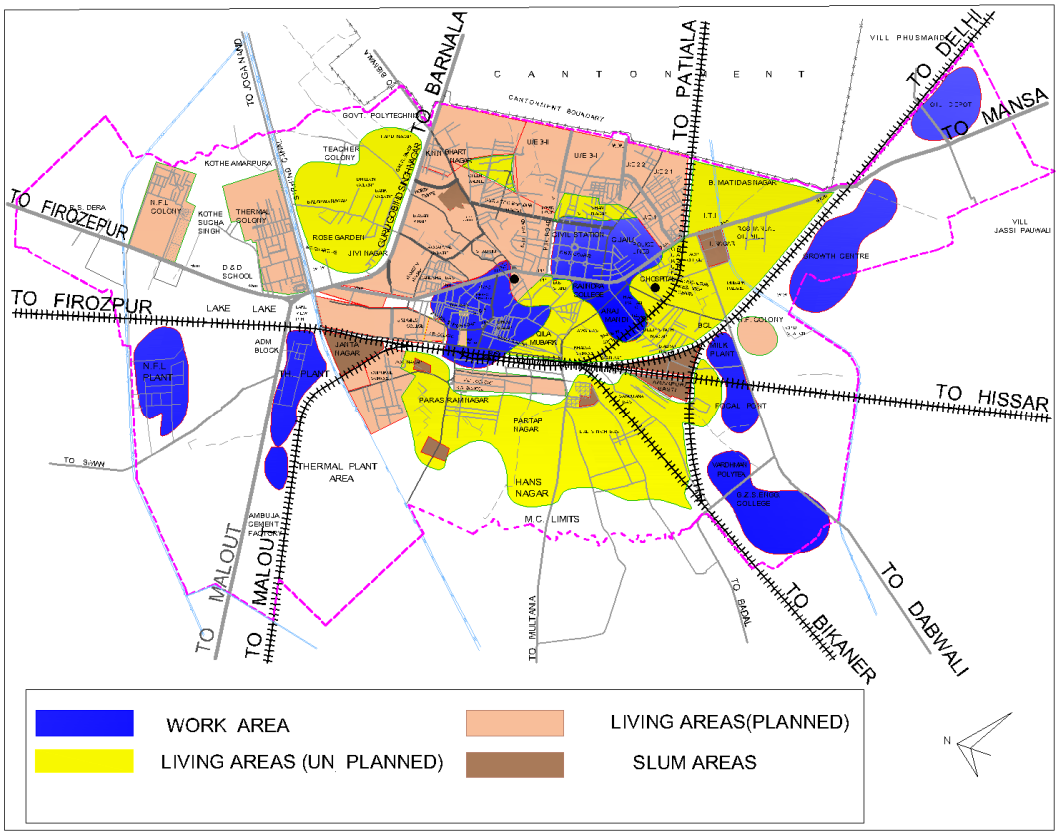
Evaluation of Alternative City Structures

Evaluation of Existing Structure

8.3. Understanding of existing city structure is prerequisite to visualize future and structure for accommodating projected growth. The structure of the city can be appreciated by noting the relationship between living and work areas in terms of their connectivity with each other. A thematic map of LPA Bathinda given at Figure 22 shows such a structure as it exists at present. A careful study of this map brings out the following:

- The Central part of city where main bazar (CBD) known as Dhobi Bazar, Bank Bazar, Kikkar Bazar, Sadar Bazar, Mall road, Amrik Singh road, Court Road and Purana Bazar are located is the main work area of the city where most of the people are engaged in trade and commerce. The second work area is the Civil Station area, Rajindra College, Grain Market and commercial road front of Guru Kashi Marg etc.where the concentration of various activities is found. The other work areas that are mainly industrial are the Thermal Power Plant, N.F.L, in the north of city and some areas on Dabwali Road and Mansa road in the southern part of city.

Figure 22: Work & Living Areas – Bathinda City



- The main living areas which are developed by various agencies like PUDA (BDA), Improvement Trust and Municipal Corporation and are situated towards eastern part of city, these are the planned living areas, whereas the unplanned residential areas are seen in the inner part of city and areas falling towards west of railway lines and at some other scattered places. It is clear from the thematic map that the living areas falling towards western side of the city have very poor connectivity with the work areas. There are only two railways over bridges to connect these areas with work areas. Besides this, the work areas of southern part have accessibility only through one road i.e. Guru Kashi Marag.
- There is no doubt about potentiality of Bathinda because of larger number of railway lines but at the same time city has been fragmented into several segments which have poor connectivity among each other and with work areas and living areas. This fragmentation is an unavoidable feature of the city.

- Besides this the existence of large size military station on both sides of Barnala road (N.H.64) in the east of city is another major barrier to the natural expansion of Bathinda city which lead to the leap frogging and development of city particularly towards Barnala road. The development of Adesh Institute of Medical Science & Research, an amusement park and hotel and resort and concentration of marble trade across the Military area is the result of this barrier. Similarly on Kotkapura road the development of Adarsh Nagar away from N.F.L. complex is also notable.

Alternative city structures -2031.

8.4. Cities grow organically depending upon the availability of land and potential for growth, sometimes leap frogging the natural as well as manmade barriers. On the basis of studies conducted by the office of District Town Planner Bathinda, it is observed that the development activities around Bathinda are concentrated along main roads passing through the city besides the area falling in the vicinity of existing developed areas of the city. Keeping in view the present growth trend three different alternative structures could be envisaged for the future city of Bathinda. The different alternatives are as follows:

1 Compact core with expansion along main Axes
2. Development along main highways
3. Development at potential road intersections

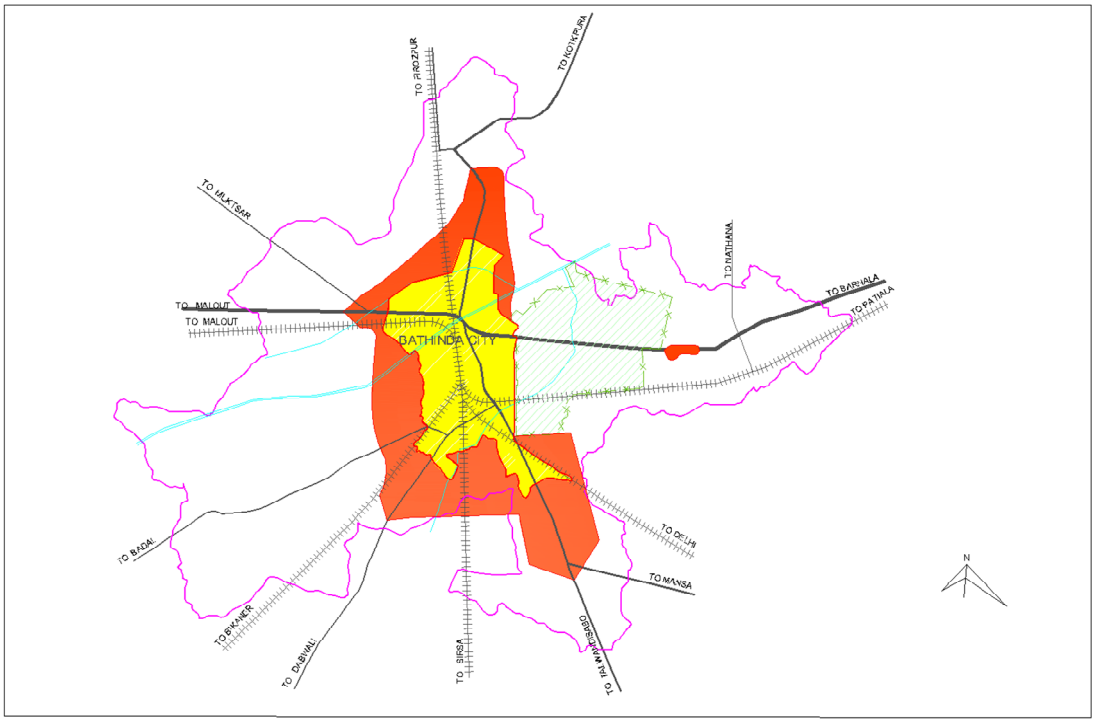
These alternatives have to be seen in the context of the fact that in 2001 the LPA Bathinda had a population of 3,67,301 out of which 2,17,256 was within Bathinda Municipal limits. By 2031 the population is likely to be more than doubled reaching LPA total of about 7, 68,000 persons.

Alternative I: Compact core with expansion along main Axes:

8.5. In order to save the fertile and scarce land resource of the state it has been conceived to shape the future city of Bathinda as a compact urban settlement along the main road and rail axis running from south to north. Besides this the areas falling in western side of the city up to Ring Road Phase-II (Under process) which connects Malout road and Badal road also provide the opportunity for taking this area for future expansion of the city. This alternative is based on the trend of residential colonies along the main axis such as in south of city Sushant City-I near village Kotshamir, Sushant City-II and H.B.N Sunrise City in village Jassi Pauwali along Bathinda Mansa road are the recent PUDA approved residential colonies and in north the C.L.U. of two residential

colonies i.e. OMEX city near village Bhokhra and Pearl Township near village Gill Patti along Bathinda – Kotkapura road. These developments give the base to think upon this alternative to propose the future city along main axis however the development along Bathinda-Barnala road across the cantonment cannot be ignored.

Figure 23: Concept Plan Bathinda Alternative I



Merits:

- Minimum invasion upon fertile and scarce land resource of the state.
- Compact and integrated development of the city, avoiding sprawl
- An effective, economic and efficient infrastructure development
- Close relationship of work-place and residential areas

Demerits:

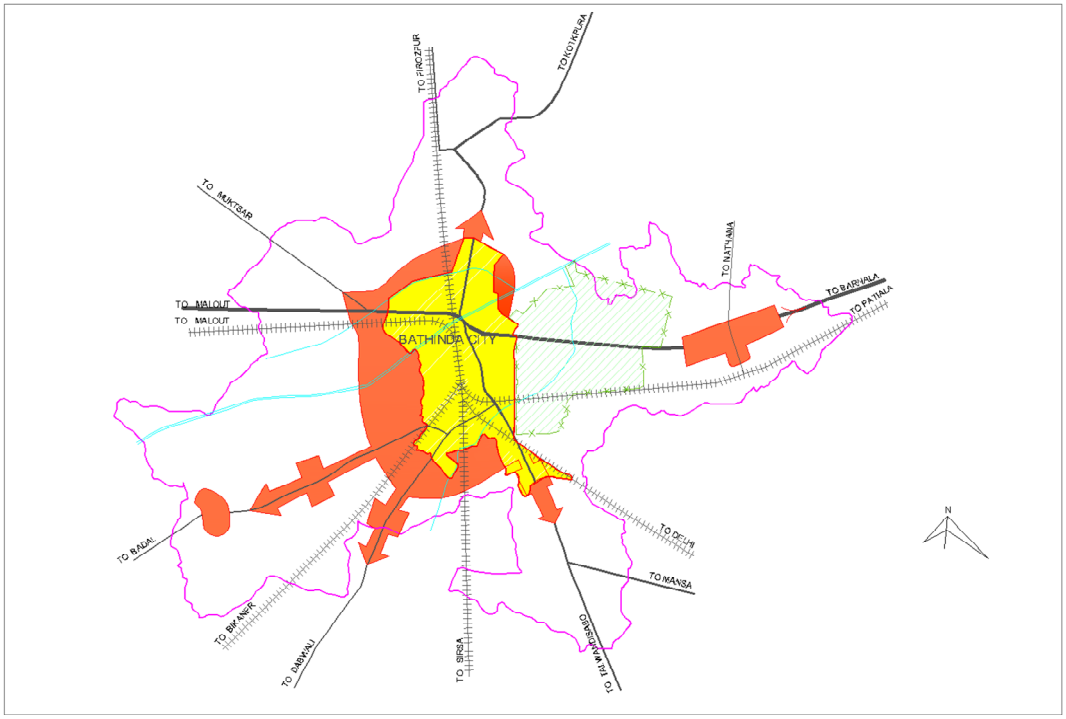
- It may put extra pressure on main road i.e. Guru Kashi Marg
- It may create a feeling of congestion and more load on existing infrastructures
- Improving core city infrastructure to cope with increased population may be difficult.
- Constrained availability of land for authorized development may increase the price of land in developable area and/or lead to unauthorised development.

Alternative II: Development along main Highways:

8.6. This alternative provides the opportunities to develop future city of Bathinda along the main highways passing through the city. The upcoming residential

colonies on Bathinda – Mansa and Bathinda-Kotkapura road, Central University (coming up) on Badal road, development of Adesh Medical College and Research Institute and cluster of other development activities such as concentration of marble trade, other educational institutions, hotel and marriage palaces on Barnala road across the Cantonment Area near Bhuchu Mandi, Baba Farid Institute of Higher and Foreign Studies and other educational institutions along Bathinda-Muktsar and Bathinda-Malout road, concentration of agro based industries near village Jodhpur Romana and village Gurusar Sainewala along Dabwali road etc attract the future development of the city towards the respective potential areas along main arteries besides areas all- around the existing city.

Figure 24: Concept Plan Bathinda Alternative II



Merits:

- Maximum utilization of existing infrastructure specifically the accessibility being provided by the main highway
- Provides new avenues of development on basis of the existing trend of growth of the city
- The impact of future economic drivers of LPA Bathinda such as Oil Refinery, Domestic Airport, Central University and proposed Thermal Plant around Bathinda can easily be absorbed.

Demerits:

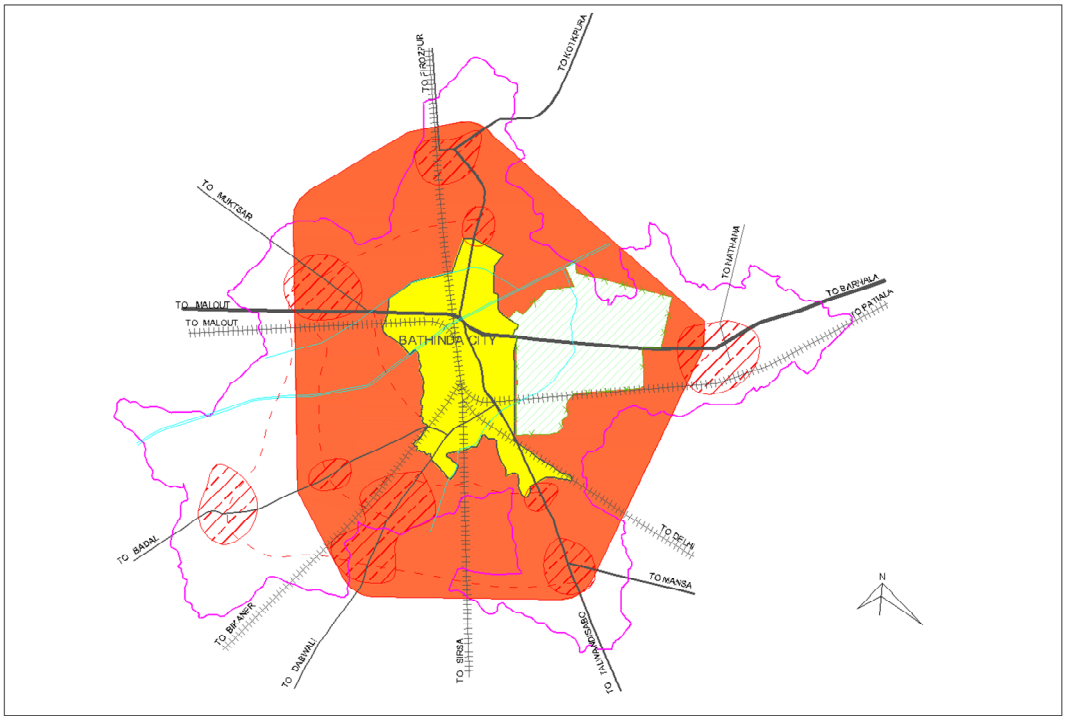
- May invade upon large area of fertile land

- May be difficult to provide infrastructure up to long distances
- Ribbon development around main roads would take place.

Alternative III: Development at Potential road intersections:

8.7. While studying the existing road network of LPA Bathinda and some proposed linkages, it is found that certain very important road junctions are likely to come up on all sides of Bathinda city which may prove to be potential nodal centers of development around the existing Bathinda city. Besides the potentiality due to future road intersections, all these nodal centers are having their own justification and reasons to grow such as Central University on Badal road, petro chemical and agro based industries on Dabwali road, residential colonies on Mansa and Kotkapura roads, Domestic Airport towards Malout and Muktsar road and concentration of marble trade (shops) and medical college on Barnala road are the further governing factors. With the proposal of new links many areas will be available for development, in order to exploit the potentials of new pockets a vast area up to Outer Ring road and even beyond this in some directions becomes potential for development under various uses.

Figure 25: Concept Plan Bathinda Alternative III



Merits:

- Would provide relief to the core city
- Would provide broader base for future expansion
- Conducive to present trends and increasing car ownership.

Demerits:

- May be difficult to integrate the infrastructure in near future.
- May be disastrous for limited fertile land resource of the state
- This type of leapfrogged development may not help maintain a close relationship between residence and place of work.
- All these centers may not fully developed by 2031 and the growth may appear to be a sprawl for quite some time.

It would be useful to consider all the above alternatives and select the optimal before proceeding with the detailed Master Plan. The merits and demerits of the alternatives are brought out from the basic spatial planning objectives like preventing sprawl, promoting compact cities to protect fertile farmlands. However the land and real estate market in Punjab seems to be operating in a different direction usually developers assemble farmland where ever it is available at relatively low price but with accessibility by road, then provide basic local infrastructure like access roads, water supply and local sewerage and create gated communities of people having relatively high car ownership. Law like PAPRA also supports this type of development. The actual building activities and occupation of such colonies may be spread over a longer period of time. The legal practice ensures land for public purposes and finances for external development. Notwithstanding the demerits of this pattern of land development it cannot be reversed. Restrictive zoning to ensure compact city may increase the land prices of developable land whereas permitting development of all lands having potential may lead to sprawl in short run. The question is how to strike a balance.

After discussing all the above explained alternative with senior offices of the Department and with Advisor Town Planner, it has been concluded that Alternative III with limited number of growth centers depending upon the certainty of Ring Road connectivity may be the solution. As the proposed roads would open up new areas for development the scope of potential areas extends upto the outer ring road which may touch the potential nodes of development.

Land Use Requirements

8.8. Before proceeding to prepare proposed land use plan and transport network the areas required for different purposes is to be worked out on the basis of norms and standards of various organizations.

Land required for main land uses:

8.9. The land requirements for different uses for the projected population of Bathinda, Goniana and Bhuchu towns and the villages falling in fringe area of Bathinda city have been worked out on the basis of norms given in UDPFI. The assessment of the urbanisable area is normally based on the proposed residential area, which is considered to be 40% of total proposed urbanisable area of cities like Bathinda as per the norms given in UDPFI guidelines. Though the residential area requirements for urban areas of LPA as per UDPFI guidelines works to 5772 Hectare the proposed road network would open up many new areas for urban uses because of increased accessibility. Therefore keeping in view the proposed road network particularly the Inner Ring Road and Outer Ring Road, accessible land is required to be put under different uses out of which major share is to be covered by residential use.

Residential use:

8.10. It is evident from Table no 20 given at head no. 3.19 that maximum number of house holds (31%) have two rooms accommodation and 22% have one room whereas 23% have three rooms thus for the purpose of working out the requirements dwelling unit having average of 2 bed rooms has been taken as shown in table below:

Table 72: Calculation of Average Plot Area in Bathinda

Sr.No.	Description	Area in sq.m.
1	Carpet area of average dwelling unit. 1 Living Room,2 Bed Rooms, 1 Kitchen and other	120
2	Built up area inclusive of walls, verandahs etc	144
3	Plot area @ footprint to plot ratio of 0.65	222

Table 73: Stage Wise Residential Area Requirements for Urban Areas (2011-2031)

City	Year	No.of Families	Net Land Required in hectare (Assumed 1 family plot)	Gross Land in hectares
Bathinda	2011	62800	1394	2788
	2016	69800	1550	3099
	2021	76600	1701	3401
	2026	94800	2105	4209
	2031	117200	2602	5204
Bhuchu Mandi	2011	3400	75	151
	2016	3800	84	169
	2021	4200	93	186
	2026	5200	115	231
	2031	6400	142	284
Goniana Mandi	2011	3400	75	151
	2016	3800	84	161
	2021	4200	93	186
	2026	5200	115	231
	2031	6400	142	284
Total	2011	69600	1544	3090
	2016	77400	1718	3429
	2021	85000	1887	3773
	2026	105200	2335	4671
	2031	130000	2886	5772

Note:

Assumed family size = 5

Plot size of 222 sq. meters has also been adopted for Goniana and Bhuchu Mandi

50% area is assumed under other uses like convenient shopping, roads, parks & open spaces and public buildings etc.

Assumed 1 family per plot

Commercial Use

8.11. As given on page 152 of UDPFI guidelines the area requirements for commercial activities have been calculated. As per the classification of towns given at page 7 of UDFPI guidelines which indicate that towns having the population more than 5,00,000 persons qualifies in category of large cities. By the year 2031 Bathinda will fall in the category of large cities. The projected population of Bathinda city including fringe area for 2031 has been worked out to be 5,86,000 which is just close to the category of 5 lac size of city in comparison to large size city of 25 lacs, therefore it is quite convincing that the population of Bathinda city would remain close to 5 lacs figure. Similarly the population of Goniana Mandi and Bhuchu Mandi is projected to be 64000.

Therefore, the norms of 5 lacs have been taken for calculating area requirements for commercial use as per Table 74 below:

Table 74 : Area of Commercial Centers

Name of Centre	Area per 1000 persons sq.m.	Number of shops
Cluster Centre	220	1 for 110 persons
Sector Centre	300	1 for 200 persons
Community Centre	500	1 for 200 persons
District Centre	880	1 for 300 persons
Total	**1900**	

As per the figures given in the table above 1900 sq mts area for different categories of commercial areas has been proposed for 1000 persons thus 1.9 sq mts (say 2 Sq. M.) area is required per person.

Table 75: Commercial Area Requirements for Urban Areas of LPA Bathinda

Sr .No	Name of Town	Projected Population	Commercial Area Required@ 2 sq. m. per person
1	Bathinda urban (city & fringe)	586000	117.2
2	Bhuchu Mandi	32000	6.4
3	Goniana Mandi	32000	6.4
	Total	**6,50,000**	**130**

Industrial

8.12. Total projected industrial workers as per Table 27 and Table 68 for Bathinda city is 20,364 for the year-2031 and the number of existing workers as per 2001 census is 7789.

- Existing (2001) = 7789
- Projected (2031) = 20,364
- Additional Workforce = 12575
- Proposed Industrial Density = 100 person/hect.
- Additional Area required = 125 hectares.

For calculating the industrial use requirements the proposed land use structure standards cited in UDPFI guidelines on page no 143 are adopted as given below.

- Total existing industrial area of Bathinda city 974.46 Hect
- Industrial workers (2001) 7789

- Industrial workers density 8 persons/hectare
- Existing industrial use as a percentage of city area 14.36%
- Norms and standards for percentage of industrial use (as per UDPFI standards) 10-12 %

As the existing industrial use is 14.36% of the total city area but the industrial workers density is 8 persons/ hectare due to the existence of large size industries like Thermal Power Plant and National Fertilizer Ltd. in the city. With the coming up of large scale industries around LPA Bathinda such as Oil Refinery and new Thermal Plants the industrial workers in LPA Bathinda and Bathinda city may increase abnormally,therefore,the area projected to be required on the basis of the figures of 2001 census may not be sufficient. In order to accommodate such uncertainty and taking into account the vision of making Bathinda a hub for allied activities of Oil Refinery i.e. petro chemical and petroleum industries, more areas are required for industrial use. As per above narration, 10 - 12% of the total urbanisable area is assumed to be required for industrial use in LPA Bathinda which needs bigger chunks of industrial areas at potential sites. Irrespective of above facts the efforts have been made to work out the actual requirements of industrial area for urban settlements falling in LPA Bathinda as follows:

Table 76: Projected Urbanisable Area Requirements for Bathinda, Bhuchu and Goniana Municipal Areas-2031

Sr .No	City	Year	Gross Residential Land required	Urbanisable area required*	Industrial use requirement **
1	Bathinda	2011	2788	6970	1046
		2016	3099	7748	1162
		2021	3400	8500	1275
		2026	4200	10500	1578
		2031	5200	13000	1884
2	Bhuchu	2011	151	300	30
		2016	169	340	34
		2021	186	370	37
		2026	231	460	46
		2031	284	570	57
3	Goniana Mandi	2011	151	300	30
		2016	169	340	34
		2021	186	370	37
		2026	231	460	46
		2031	284	570	57

Note:

* For calculating the Urbanisable area the residential use is assumed as 40% of the total urbanisable area.

** Assumed % of industrial use is 15% for Bathinda city and 10% for other towns of total urbanisable area as per UDPFI standards.

Recreational facilities

8.13. As per PAPR Act 1995, about 45 % of the area of a colony is to be left for non saleable purposes out of which 10 % is to be left for public buildings. It has been found that normally 25-30% area is under circulation i.e. roads, pavements etc. Assuming the figure at 27% for roads, the remaining 8% has been considered for recreational, sports etc. By this formula if we have one hectare area of a colony then 800 sq.mt. are supposed to be provided for this category. Keeping in view the average size of plots as 200 sq.mts., about 28 plots can be adjusted in one hectare area (assuming 55% saleable area), which would accommodate about 40 families taking average size of one family as five members a total of 200 persons are estimated to live in one hectare. Therefore, by this calculation about 4 sq.mt. recreational area works as share of each person. However at city level approx. 2 sq.mt. per capita area is to be added for city level open spaces. Thus total 6 sq.mt. per capita area is required at city level for recreational facilities.

Road Network and Termini Required:

Network Required at city level

8.14. As it has already been discussed in detail, there are several roads merging at Bathinda city putting a huge traffic load on internal city roads causing traffic congestion and accidents. As per the traffic volume survey conducted by this office some of the city roads are already having the traffic volume more than the carrying capacity of these roads. In absence of detailed traffic studies regarding growth of traffic during past years, the IRC standards for calculating the vehicular traffic have been taken into account according to which if reliable data is not available 7.5% growth per annum should be taken for national highways. In case of urban roads growth ratio of 7.5% is assumed whereas in case of other rural roads (out of urban area) rate of 6% per annum has been assumed since there are many factors which govern the growth of traffic volume thus the long term projections of traffic volume may not be factual

therefore projections have only been made for the year of 2011. The projected vehicular growth on main city roads projected for the year of 2011 is given in **Table 77** below;

Table 77: Projected Traffic Volume on City Roads Bathinda.

Sr. No.	Name of the Road.	Type of carriageway	Capacity (PCU)*	Peak hour Volume (PCU) - 2008	Projected Peak Volume (PCU)- 2011	V/C ratio- 2008	Projected V/C ratio- 2011
1 (a)	Rose Garden to Bibiwala Chowk	2 lane (1way)	1200	407	506	0.34	0.42
(b)	Bibiwala Chowk to Rose garden	-do-	1200	509	632	0.42	0.52
2 (a)	Bibiwala Chowk to Barnala	-do-	1200	901	1119	0.75	0.93
(b)	Barnala to Bibiwala Chowk	-do-	1200	773	960	0.64	0.80
3 (a)	City to Bibiwala Chowk	-do-	1200	568	706	0.47	0.58
(b)	Bibiwala chowk to city	-do-	1200	593	737	0.49	0.61
4	Bibiwala Chowk – Bibiwala Village	2 lane (2way)	750	737	916	0.98	1.22
5	Bathinda –Malout	3 lane(2 way)	1250	2003	2488	1.60	1.99
6	Bathinda – Kotkapura	-do-	1250	1344	1670	1.08	1.34
7	Bathinda – Dabwali	3 lane(2 way)	750	1245	1547	1.66	2.06
8	Bathinda – Badal	2 lane (2way)	750	363	451	.48	0.60
9	Bathinda – Mansa	2 lane (2 way)	1250	1191	1480	0.95	1.18
10	Amrik Singh Road	2 lane (2 way)	750	1526	1896	2.03	2.53
11	The Mall Road – L R	2 lane (1 way) 2 lane (1 way)	750 750	1200 1226	1491 1417	1.60 1.63	1.99 1.13
12	Power House Road	2 lane (2 way)	1250	1387	1723	1.11	1.38
13	Hazi Rattan Road	2 lane (2 way)	750	1348	1675	1.80	2.23
14	Bhagu Road	2 lane (2 way)	750	1157	1437	1.54	1.92
15	Ajit Road	2 lane (2 way)	750	536	666	0.71	0.89
16	Guru Kashi Marg – L R	2 lane (1 way) 2 lane (1 way)	1200 1200	1400 1433	1739 1780	1.17 1.19	1.45 1.48

Source: Field survey-2008

* Traffic Engneering and Transport Planing by L.R. Kadyali.

The table given above shows that there are several roads which would have higher V/C ratio by the year 2011. The Projected traffic volume shows that during a short period of three years only, many roads will become congested if the present condition and status remains the same of these roads. The roads like Power House road, Hazi Rattan road, Bhagu road, Malout road, Guru Kashi Marg, Mansa road, Bibiwala road and Mall Road require immediate attention. The detailed traffic studies are required separately for mass transit system and road improvement plan. However on the basis of broad studies conducted there is an ardent need to propose Ring Road around the city connecting various radial roads for efficient and free flow of traffic. Besides this, the roads of lower

hierarchy are required to be proposed for inter connection of Ring Road and existing main city roads.

Road Network at LPA Level:

8.15. Besides the road network required at city level there would be an ardent necessity to connect the regional roads with each other so that the regional traffic may be diverted out of city. In addition to the city road network an additional Outer Ring Road is required at LPA level which may link the regional roads such as Talwandi Sabo road, Mansa road , Barnala road, Kotkapura road, Mukatsar and Malout road and further up to Badal road and Dabwali road is required.

In addition to the Outer Ring Road and Inner Ring Road, many other lower hierarchy roads are required for better connectivity between proposed ring roads and existing regional roads. Besides interlinking ring and radical roads, these lower hierarchy links provide access to interior areas and increase the scope of potentialities of these left out pockets.

Termini Required:

8.16. For the city like Bathinda in which 5.86 lacs population has been projected for the year 2031, only one Bus Stand of adequate size and one Truck Terminus would be sufficient. Since no space norms have been given in UDPFI guidelines area requirement have not been worked out. However an area of 8-10 hectares for Bus Stand and 15-20 hectare for Truck Terminus would be sufficient.

Land required for social infrastructure:-

8.17. The land requirement of social infrastructure for Health Care Police, Fire, Education and recreational facilities for Bathinda urban is calculated as below:

Table 78: Land Requirement for Educational Facilities

(for 100000 populations)

	Norms	No. of units	Area/unit (in ha.)	Total area (in ha)
College	100000	1	4	4
Secondary School	7500	13	1.6	21
Primary School	5000	20	0.4	8
Pre-primary school	2500	40	0.08	3.2
Total				**37**

- Area per person required in sq.mts. =3.7
- Total area required 3.7 x 5.86 lacs = 217 ha.

Table 79: Land Requirement for Medical Facilities (for 250,000 persons)

	Norms	No. of units	Area/unit (in hects.)	Total area (in hects.)
Hospital	250000	1	4	4
Intermediate (Category-A)	100000	2.50	2.7	6.75
Intermediate (Category-B)	100000	2.50	0.6	1.50
Dispensary	15000	17	0.1	1.7
Total				**13.92**

- Area per person required in sq.mt. 0.56 or Say 0.6
- Total area required under medical facilities 0.6 x 5.86 Lacs = 35 Ha

Table 80: Land Requirement for Police. (For 100,000 persons)

	Norms	No. of units	Area/unit (in ha..)	Total area (in hects.)
Police station	100000	1	1.5	1.5
Police Post	50000	2	0.16	0.32
Total				**1.82 (or 18200 sq. mtrs.)**

- Area per person required in sq.mt 0.18. Say 0.2
- Total area required for police =5.86 .lacs x 0.2 =12 hect.
- Additional area required for Police line and Distt. Jail as per UDPFI Guidelines =6+10=16 hect.
- Existing area of police line and Distt jail =22 hect.
- Total area required for police =22+12=34 hect

Table 81: Land Requirement for Fire Station 2 Lakh

	Norms	No. of units	Area/unit (in ha.)	Total area (in hects.)
Fire/Sub Fire station	200000	1	1	1

- Area per person required = 0.5 sq.mt
- Total area required = 5.86 lacs x 0.5 = 29 hectares.

Table 82 : Land Requirements for Main Public Amenities

Sr. No.	Name of facility/Amenities	Land required (in hectare)
1	Educational	217
2.	Medical & Health care	35
3.	Police & Security(including Police line and Jail)	34
4.	Fire Prevention	29
	Total	**315**

Space Norms and Standards
Social Infrastructure and Public Utilities:

8.18. Basically UDPFI norms and standards have been followed for calculating the area requirements for different social infrastructure and public utilities however the Punjab State Govt. policies issued time to time have also been adopted where it was applicable. There are three different sets of norms and standards taken into consideration the comparative chart of these is given in Table 83 below:

Table 83: Comparative Statement of Norms and Standards for Social Infrastructure

Aspect	**As per zoning regulations and sub-division clauses for Master Plan in Punjab/Govt. Policies**	**UDPFI Guidelines**	**Delhi Master Plan**
Primary school	Population:3,000-4,000 No. of students: 600 Area Old city (over 650 ppha) : 0.2 ha Outer areas (less than 650ppha):0.5 ha	Population: 5,000 Number of students :500 Area per school:0.4 ha Covered area:0.20 ha Minimum play field area: 0.20 ha	Population: 10,000 Area:2000-4000 sq m
Senior Secondary School	Population:12,000-20,000 No.of students: 1000 Area Old city (over 650 ppha) : 1.00 ha Outer areas (less than 650 ppha):2.5 ha	Population: 7,500 Number of students :1000 Area per school:1.60 ha Covered area:0.60 ha Minimum play field area: 1.00 ha	Population: 10,000 Area:6000-8000 sq m
College	Population:30,000 No.of students: 800 Area Old city (over 650 ppha) : 2.50 ha Outer areas (less than 650 ppha):5.00 ha	Population: 1,25,000 Number of students :1000-1500 Area per college:4.00 ha Covered area:1.80 ha Play field area:1.80ha Residential/hostel area: 0.40 ha	Population: 5,00,000 Area: As per UGC Norms
University	N.A.	New University Area:60.00ha	4 sites in urban extension to be provided at city level Area: up to 20.00 ha
Technical Education Centre	N.A.	Population :10,00,00 Area per centre 4.00 ha Area per technical centre:2.10 ha	Population :5,00,000 Area : 4000 sq m

		Area per ITI:1.40 ha Area per coaching centre:0.30 ha	
New Engineering College	Number of students :300 Area Old city:(over 650 ppha): 1.00 ha Outer areas (less than 650ppha):2.50 ha	2 Number to be provided in urban extension Strength of college : 1500 -1700 Students Area per college:60.00ha	Population :5,00,000 Area: As per AICTE norms
Medical/Pharmacy College	Area :5 acres(Rural) Area: 2.5 acres (Distt. Headquarter Corporation Limit)	2 site of 15 ha each in urban extension including space for specialized general hospital.	Population: 10,00,00 Area :As per Medical Council of India /Regulatory body
Dispensary	Population :5,000 Area: 0.1ha	Population:15,000 Area :0.08 to 0.12 ha	Population:10,000 Area :800-2000 sq m
Nursing Home	N.A.	Population :45,000-1,00,000 Capacity:25 to 30 beds Area:0.20 to 0.30 ha	Population :50,000 Area:1000-2000sq m
General Hospital	Population :50,000 Area:2.5 ha	Population:2,50,000 Capacity:500 beds Area for hospital :400 ha Area for resi accommodation :2.00ha Total area :6.00ha	Population:5,00,000 Capacity :501 beds and above Area :25,000-45,000sq m
Veterinary Hospital	N.A.	N.A.	Population :5,00,000 Area:2,000sq m
Community Hall and Library	N.A.	Population :15,000 Area: 2,000 sq m	N.A.
Club	N.A.	Population :1,00,000 Area :10,000sq m	Population:5,00,000 Area:5000sq m
Amusement park	N.A.	N.A.	Up to 10 ha
City level p ark	N.A.	N.A.	Population :5,00,000 Area 10acres
Neighborhood level park	N.A.	N.A.	Population 10,000 Area:10,000 sq m
Golf Course	N.A.	N.A.	Population :10,00,000 Area :10-30 ha
Sports Centre/Stadium	N.A.	N.A.	Population :5,00,000 Area :3-10 ha
Post and Telegraph Office	Population :10,000 Area :0.1 ha	N.A.	Population :10,00,000 Area :2,500 sq m
Religious Building	Population :15,000 Area :0.1 ha	N.A.	Population :10,00,000 Area :40,000 sq m
Old Age Home	N.A.	N.A.	Population :5,00,000 Area :1,000 sq m

Orphanage/ Children Centre	N.A.	N.A.	Population :5,00,000 Area :1,000 sq m
Multipurpose Ground (Exhibition cum fair Ground)	N.A.	N.A.	Population :1,00,000 Area :20,000 sq m
Burial/ Cremation Centre	N.A.	N.A.	Population :10,00,000 Area :10,000 sq m
Electric sub-station	Population :50,000 Area : 0.4 ha	N.A.	Population :5,00,000 Area :29,600 sq m
Police Post	N.A.	Population :40,000-50,000 Area :0.16 ha (area inclusive of essential residential accommodation)	Population :1,00,000 Area :1000 sq m
Police station/police Division	Population:50,000 Area:0.8 ha	Population:90,000 Area:15 ha Area inclusive of essential residential accommodation 0.05 ha additional to be provided for civil Defence and home guards	Population :2,50,000 Area :10,000 sq m
Police Line	N.A.	Population:20,00,000 Area:4.00 to 6.00 ha	1 for each administrative zone to be provided at city level Area:2.0 ha
District jail	N.A.	Population :10,00,000 Area :10.00 ha	Population :25,00,000 Area :5.0 ha
Fire Station	N.A.	1 fire or sub-station within 1 to 3 km to be provided for 2 lakh population Area for fire station with essential residential accommodation :1.00 ha Area for sub-fire station with essential residential accommodation :0.60 ha	Fire Station for 5,00,000 population within radius of 5 to 7 km Area: 10,000 sq m

From the comparative table of norms and space standards as given above, the norms suggested by UDPFI Guidelines have been found more suitable for the preparation of Master Plan Bathinda because of the following reasons:

- The norms and standards suggested by UDPFI Guidelines are more detailed and cover almost each physical and social infrastructure as compared to Master Plan Zoning Regulation /Govt. policies

- Norms and standards suggested by UDPFI Guidelines are more realistic and suit to local conditions such as prevailing development controls, availability of land, land prices etc.
- UDPFI Guidelines suggest different norms and standards for different category of towns like small and medium towns, large cities and hill areas which is not available in other guidelines.
- The Norms and standards of Master Plan Zoning regulation are not detailed and do not cover the whole of activities, hence are not being adopted.
- Norms and standards suggested by Delhi Master Plan have not been found suitable for local planning area Bathinda because these norms are of higher level, formed especially for Mega city like Delhi, where development controls are very tight, population is more than 1.25 crores and the land is scarce and costly.

Note:

The norms space standards as suggested by Punjab Govt policies from time to time shall have the over riding effect on the norms and standards of UDPFI Guidelines adopted for the preparation of Master Plan, Bathinda .

For the aspects which are not covered under UDPFI Guidelines, the norms and standards as suggested by Master Plan zoning Regulation in Punjab shall be adopted and where these Zoning regulation are also silent, only in that case, the norms and standards suggested by Delhi Master Plan shall be followed.

Traffic and Transportation

8.19. After duly considerisation the norms and standards for Traffic and transportation as given in UDPFI Guidelines were discussed with the Advisor Town Planner and following roads hierarchy has been adopted;

Road hierarchy

R1: 200 feet (R.O.W.)

R2:150 Feet

R3: 100 feet

R4: 80 feet

Within the above ROW, width of footpaths and cycle tracks given may be provided if required

Footpath

The width of footpaths is listed as below:

Minimum width	1.5 m
Adjoining shopping frontage	At least 3.5 m
Longer shopping Frontage	Minimum 4.5 m

Width should be increased by 1m in business/ shopping areas

Cycle Track

The minimum width of cycle tracks should be 2m. Each additional lane, where required, should be one meter. The capacity of cycle tracks recommended is as below:

Table 84: Norms and Standards of Cycle Tracks

Width of Cycle Tracks	Width in meters	Capacity (Cycle /hr)	
		One way	Two way
Two lanes	3	250-600	50-250
Three lanes	4	>600	250-600
Four lanes	5		>600

Strategy for obtaining Land for public purposes

8.20. A city typically requires 40 to 50% of its area for variety of public purposes. Where land is owned by the state as in Delhi, Chandigarh or Navi Mumbai it is easier to allocate land of public purposes. However where private land market is active, how to ensure land for public purpose it is a major challenge in preparing Master Plans. Conventional master planning relied on the powers of compulsory acquisition of land designated in the master plan for public purposes. However limitations of this approach have been painfully exposed. At the same time not addressing the question of land for public purposes may limit the utility of the master plan itself.

With this background a wide menu of strategies to obtain land for public purposes is examined in this chapter. The land required for public purpose can be divided into four-fold classification as illustrated in diagram below.

	A Specific Location	**B** Flexible Location
A. Positive impact on land prices	**AA** Arterial Road network	**AB** Parks, play grounds, schools etc.
B. Negative price or environmental impact invoking NIMBY response.	**BA** Sewage Pumping Stations and treatment plants	**BB** Solid waste disposal sites

(In many cases necessity of a particular activity at the city scale is recognised e.g. solid waste disposal site or a slaughterhouse. But they are locally undesirable and invoke “Not in My Backyard” response.)

No single alternative needs to be used throughout the city. It may vary for example, in core areas v/s outlying areas. Similarly different alternatives may be suitable for different types of public purposes. The possible alternatives for obtaining land for public purposes such as roads, educational, health, parks, water supply, sewerage, social and religious institutes, old age homes, community centers etc with their limitations are listed as below.

Through O.U.V.G.L. Scheme:

8.21. Identifying vacant government land (including municipal land) and using it as source for providing land for public purposes. However given the need for using government land for generating financial resources, entire stock of government land need not be assigned to non-remunerative public purposes. In fact government land would offer many opportunities for PPP where part of the land could be used for public purpose. For example a plot of government land could be allocated for an intercity bus terminal with a budget hotel.

Rationalising obsolete uses of public lands could be another way of putting public land to more relevant public purpose. Old jail or an agricultural produce market in the congested part of the city is common examples. But this requires public land at other location.

Make specific designations on the master plan and then proceed with compulsory acquisition of land. Impracticability of this is too well known to be recounted here. But this may be unavoidable in certain cases – particularly 'A' category public purpose.

Through T.D.R.:

8.22. Alternative to monetary compensation could be award of Transfer of Development Rights either to remainder of the land or to a distant location. This could be in three generic cases viz.

Roads and Road widening: Development rights calculated at the FAR permissible in adjoining area may be allowed to be used in the remainder of the plot up to a limit. Development rights that cannot be so consumed can be

transferred elsewhere in receiving areas. If FAR is related to width of the road, resistance to widening may get reduced.

Public purposes on open land or exclusive plots: Lands required for parks and playgrounds or exclusive uses like secondary school, fire station etc. can receive TDRs in lieu of compensation. Weight related to price differentials in originating and receiving zones could be considered as an incentive.

Public purposes that require built-up space but not necessarily exclusive plot: Examples of this could be municipal vegetable market, library etc. In such cases landowner may be allowed to fully use his development rights provided that he offers the built up space required for the public purpose.

Through PAPR Act 1995

8.23. Layout and Sub-division Regulations: These regulations depending upon the total area of layout can provide for some reservation for general public purpose in addition to local requirements. This is currently being used under the colonisation rules operated under the PAPRA Act.

Through Land Pooling or Town Planning (Development) Schemes:

8.24. As per the provisions of section 91 (Chapter XII) of Punjab Regional and Town Planning & Development (Amendment) Act, 2006, the concerned Authority may for the purpose of implementation of the provision of the Master Plan or for providing amenities where the same are not available or are inadequate, frame the Town Development Scheme and land for various amenities can be earmarked as per the provisions of sub section 2(g) of section 91.

The strategic approach would relate to geographically depicting the sites required for public purpose and proposing regulatory framework for obtaining the land for public purpose whether shown on the plan or not. For this, master plan has to consider a wide menu. Described below is a possible menu. Admittedly all items on the menu may not be available for every city.

Table 85: Strategy for Obtaining Land for Public Purpose

Alternative	Land Acquisition through 1894 Act	TDR	Development of land through PAPR Act 1995, TDS under PRTPD Act 2006 and Development Schemes under PTI Act, 1922	Land Pooling	Govt / Panchayat / Waqf Board lands
Plan Proposal	Land designated for public purposes	Land designated for public purposes	Land designated for public purposes	Land designated for public purposes	Land designated for public purposes
Regulation	No separate regulatory provision necessary	Regulation about use of TDR on receiving plots is necessary	Certain proportion (about 40%) of land is dedicated for public purposes.	This requires a separate legal process to be followed of reconstitution of plots along with evaluation of compensation and betterment as provided in Chapter XII of the 1995 Act.	No separate regulatory provision necessary
Means of securing land	Compulsory acquisition by paying monetary compensation	Monetary compensation substituted by Transfer of Development Rights (TDR)	Availability of land through layout plan provisions		Land can be made available through transfer of ownership from one department to another. No monetary compensation is involved.
Limitations	Lack of finances for compensation	Lack of finances for compensation	This is the method currently relied upon where minimum area for colony is set at 10 acres, as in case of PAPRA.	Comprehensive Land Pooling Policy is required to be framed.	Locational disadvantages in certain cases.
	Landowners' resistance	Landowners' resistance	This is to be market driven and present response is said to be not so	Difficulty in pooling of land of large number of owners.	Minimum area requirement may not be fulfilled

			encouraging.		
	Iniquitous distribution of costs and benefits. Cost borne by those who lose land and benefits enjoyed by surrounding landowners	Iniquitous distribution of costs and benefits. Cost borne by those who lose land and benefits enjoyed by surrounding landowners		Time consuming and complicated process	Source of revenue for Panchayat Bodies / Waqf Board gets depleted.
		But where real estate prices are high particularly where land price is several times the construction cost, chances of success are high.		Equitable distribution of costs and benefits to different share holders.	
		Could also be used for heritage conservation.		New concept difficult to be implemented.	
		New concept difficult to be implemented.			

Given the details included in the Master Plan, it is not possible to specify which of the above techniques will be used for obtaining land for public purpose. This would be address in the detail zone plans.

Proposed Land Use Plan

8.25. After going through the detailed studies conducted by the office of DTP Bathinda pertaining to LPA Bathinda and discussions held at different levels i.e. with S.H.U.D, Adviser, Town Planner, Chief Town Planner and Think Tank and further based on analysis, assumptions and projected population of LPA Bathinda, the Proposed Land Use Plan 2031 has been prepared, in which different landuse zones have been earmarked such as residential, commercial, industrial, rural and agricultural etc.

After examining the various possibilities and taking into account the pattern suggested in Urban Development Plans Formulation & Implementation (UDPFI) Guidelines published by Ministry of Urban Affairs & Employment, Government of India, New Delhi, the aforesaid land use categories have been adopted for the proposed landuse plan. The other concerned aspects of these different landuses have been detailed out in the following sub-heads. The issues, guidelines and controls mentioned below may be read with Zoning Regulation Specified later in the chapter

However, the lands which come under the optimum utilization of vacant Govt. Lands (OUVGL) scheme of the state Govt., the use of such lands/sites shall be determined by the Govt. later on at any appropriate time, irrespective of their existing / proposed landuse.

The sites on which various projects have been approved or whose change of landuse has already been permitted by competent authority/govt., such sites shall be deemed to be adjusted as sanctioned/permitted**.**

As discussed earlier in the chapter the alternative –III has been broadly adopted while preparing proposed land use plan of LPA Bathinda, in which pattern of continuous growth of Bathinda city spreading over adjoining area has been kept in mind. Certain other nodal points which have better potentials because of connectivity may come up in future such as near Bhuchu chowk on Barnala road, Goniana on Kotkapura road, village Ghudha on Badal road and village Jodhpur Romana on Dabwali road will emerge as the future nodes of development. Besides this two more low potentiality nodes at Malout- Muktsar road intersection near village Buladewala and Deon, and Mansa – Talwandi Sabo road intersection near village Kotshamir which may be considered at later stage. Therefore the concept of leapfrog development with Bathinda city functioning as leading urban centre and other nodes as smaller clusters has been kept in mind while formulating proposed land use plan and proposed road network of L.P.A Bathinda as shown in proposed land use plan of L.P.A Bathinda Drg. No DTP (B) 1577/2009 Dated 08-06-2009 and the detail of proposed areas are given in Table 86.

Table 86 : Break-up of Major Proposed Landuses LPA Bathinda-2031

Sr. No.	Proposed Landuse	Urbaniseable Area*		Total LPA	
		Area in Hect.	%age	Area in Hect.	%age
1	Residential	33108	74.40	33358	58.32
2	Commercial	309	0.69	309	0.54
3	Industrial	4705	10.57	4705	8.23
4	Warehousing and Godowns	480	1.08	480	0.84
4	Rural and Agricultural	-		6763	11.82
5	Designated Areas				
	i) Traffic & Transportation	4024	9.04	4084	7.14
	ii) Utilities	134	0.30	138	0.24
	iii) Public, Semi-Public	850	1.91	855	1.49
	iv) Other Special Areas	-		5614	9.82
	v) Prohibited areas	785	1.76	785	1.37
	vi) Forest Areas	107	0.24	107	0.19
	Total	**44502**	**100.00**	**57198**	**100.00**

*Urbanisable Area excludes the area proposed to be retained as predominantly 'Rural and Agricultural' and Other Special Areas

It would be observed that the area requirements calculated earlier are considerably less than the areas allocated in the proposed land use plan. It needs to be appreciated that farmland incrementally acquires potential for growth as the road network and other infrastructure developes. Consequently all the fringe areas are neither converted to urban uspe nor are they developed at the same density at any given point in time. The proposed land use plan apart from the area requirement based on the norms, takes cognizance of this fact. As a result some of the fringe areas may not be converted to urban use till 2031.

Residential:

8.26. The projected population of Bathinda city and the villages falling in urban fringe works to be 586000 persons by the year 2031 which is almost double the number of 2001 census figures, therefore the rise in demand for residential areas is inevitable.In order to accommodate the growing population within the limits of proposed urbanisable area of Bathinda and other two towns i.e. Goniana and Bhuchu Mandi and integrating the future nodal patterns the proposals have been made on the pockets which have been identified as most potential and suitable for residential purpose. Besides this the rural settlements falling in LPA. Bathinda are proposed to expand around its existing built up areas (Abadis).

Keeping in view the trend of growth of residential areas and accessibility etc some potential pockets have been identified suitable for residential purposes such as on western side of Bathinda along both sides of Multania road, and areas between proposed Inner Ring Road Phase-II and Outer Ring Road upto village Multania, Bir Behman etc., which is in vicinity of existing city area, in south near village Jassi Pauwali upto village Kotshamir on Mansa road, in north on both sides of Kotkapura road upto Goniana Mandi some smaller pockets on Dabwali road near Engineering College and further upto proposed Outer Ring Road on Malout road around existing Kheta Singh Nagar laying between Thermal Plant and NFL factory and further upto Outer Ring Road and some areas on Mukatsar road. The area on backside of Polytechnic on both sides of proposed Ring Road Phase -I connecting Bibiwala road and Kotkapura road have also been proposed for this purpose.

In order to maintain the continuity of urban development the gaps falling between Bathinda city and other two municipal towns i.e. Goniana and Bhuchu have been proposed under residential and other uses. The total area proposed for different uses is termed as ‘proposed urbanisable area’ which works to be 44502 hectares. The spatial extent of different use zones has been shown in the Proposed Land Use Plan Drg. No. DTP (B) 1577/2009 dated 08-06-2009. The total residential area proposed works to be 33034 hectares that is 74.23% of total urbanisable area. However, at LPA level a total area of 33284 hectares

(including urban and rural) has been proposed for residential use which is 58.19% of total LPA area as given in Table 86.

Proposed Density Gradient LPA Bathinda- 2031

8.27. Before proposing density gradient for different density zones, it is essential to study/analyse the existing density gradient of Bathinda city. For this purpose three wards each from high density zone and medium density zone have been selected and the average net residential density has been calculated as follows:

High Density Zone:

The existing ward wise density gradient of Bathinda city based on population figures of 2001 census as shown in Table 9 earlier shows the Gross densities of various wards. As per this Table 9 wards are having Gross Densities more than 200 persons per hectare with the highest figure of 318 persons per hectare in case of ward no 18. Deducting the areas under roads and other public uses @ of about 30% from the total area of ward, the average net residential density of the wards falling in the internal part of the city (High density zone) exceeds 300 persons per hectare as given in table below:

Table 87: Net Residential Density of the Wards falling in High Density Zone

Ward Number	20	21	18
Total population	5324	5544	5437
Total area (in hectares)	26.41	22.12	17.1
Gross Density (persons per hectare)	201	250	318
Area in non-residential uses (in hectare)	8	6.6	4.3
Net residential area (in hectare)	18.41	15.54	12.8
Net residential density (persons per hectare)	289	357	425
Average Net Residential Density (persons per hectare)	357		

Medium Density Zone:

The wards surrounding the internal part of the city (Medium Density Zone) have a Gross Residential Density between 101- 300 persons per hectare. The net residential density of several wards of this category is detailed as below:

Table 88 : Net Residential Density of the Wards Falling in Medium Density Zone

Ward Number	9	24	19
Total population	6721	4755	5684
Total area (in hectares)	65.10	29.66	33.32
Gross Density (persons per hectare)	103	160	170
Area in non-residential uses (in hectare)	19.53	8.89	9.99
Net residential area (in hectare)	45.57	20.77	23.23
Net residential density (persons per hectare)	147	229	244
Average residential Net Density (persons per hectare)	207		

Low Density Zone:

As it is evident from above calculations the inner areas of the city are having a net residential density of more than 300 persons per hectare and surrounding wards are having an average net residential density ranging from 100- 300 persons per hectare and the remaining wards are having low density of about 100 persons per hectares and below.

Based on the above facts the following Density Gradients are proposed in the proposed land use plan as given in table below:

Proposed Density:

Table 89: Proposed Density Gradient for LPA Bathinda 2031

Density zone	Proposed density	Proposed Areas
High Density (RD1)	300 persons per hectare And above	Densily populated zone comprised inner zone of the city (ward no 8, 10, 11, 12, 5, 6, 7, 9, 19, 23, 24, 35, 25, 16, 26, 27, 31, 33, 22, 28, 30,15,20,21,14,4)
Medium Density (RD2)	101-299 persons per hectare	Moderately populated residential area of the city i.e.Outwards such as part of ward No. 2,3,13,29 and area falling between the MC limit and Inner Ring Road, area between cantonment and Sirhind Canal in Bibiwala Village, area on both sides of Barnala road in east of cantonment and municipal araes of Goniana and Bhuchu has been proposed for medium density zone
Low Density (RD3)	100 persons per hectare And below	Low density residential areas which have come up or likely to come up in peri urban areas i. e. the area between Inner Ring Road and Outer Ring Road and beyond are also proposed for Low Density Zone.

The areas zoned for residential uses are not derived from affordable densities but are based on potential for growth. A large proportion of the areas of these density zones particularly on the periphery may remain undeveloped by 2031.

The above densities could be translated into plot area per dwelling unit and floor space per dwelling unit as shown in the following table as a reality check.

Table 90: Plot Area per Dwelling Unit and Floor Space per Dwelling Unit of LPA Bathinda 2031

Density					
Persons/ha	Dwelling Unit/ha	Plot area/D U	Floor Space /DU		
FAR >			0.55	1.25	1.75
300	60	167	92	115	201
200	40	250	138	172	301
100	20	500	275	344	

Average floor space of 344 derived in the above table appears to be too high. But that would imply that construction might not go up to FAR of 1.25 and above. Since other figures appear to be in keeping with present trends of housing the densities as proposed are realistic.

Commercial:

General Business

8.28. As discussed in chapter 3 the major share of workforce of Bathinda city is engaged in commercial activity which is about 30.32% of total workforce. The studies reveal that the existing Central Business District (C.B.D) or the main commercial centre of city (Dhobi Bazar, Bank Bazar, Sadar Bazar, Post Office Bazar, Hospital Bazar, Purana Bazar) is very congested where the lack of parking facilities and inadequate approach etc are the major problems therefore to serve the additional population of the city more new commercial areas are proposed to be developed in the new expansions. It has also been kept in mind that Bathinda will continue to function as a larger regional centre and will serve the larger areas than its planning areas. The existing Commerical areas have been retained as such. In addition to this more commercial centers will be required in new residential areas such as along Multania road, Dabwali road and Kotkapura road but the sites would be earmarked only at the stage of preparation of zonal plans. The existing commercial areas shall remain the part of proposed commercial use zone which is 309.00 hectares. As per the provisions of PAPR Act 1995 about 5% of residential colony is required to be provided for commercial use, therefore as and when the new residential areas are developed in the future the commercial areas will be ear marked as above.

The latest trend of commercial development i.e. Shopping Malls and Multiplexes are also coming up at Bathinda, three such type complexes are coming up in the internal area (on Mall road near railway station, in Civil

Station and near Rose Garden) where as one each Shopping Mall is under construction on Kotkapura road opposite Thermal Lakes and another on Dabwali road opposite Milk Plant. However present City Centre would continue to maintain its status in spite of the challenges of latest trend. Besides the above, several pockets already planned as commercial in Urban Estates and Development Schemes have also been zoned as commercial which will serve the local needs of city dwellers.

Informal Sector

8.29. A survey of unorganized trading activity in Bathinda was conducted by this office and identified about 12 points in the city where concentration of informal sector in terms of rehries, roadside sellers, tharas etc are found. It is felt that organized sites for informal sector are required to be created near the main city functions such as Railway Station, Bus stand, Hospital, Major institutions, Courts and other transport nodes etc. It is suggested that the organized well planned sites for rehri markets shall be proposed in the new planned colonies and provided for in the detailed zonal plans.

Policy for existing areas

8.30. With a view to make informal sector, an integral part of the planning process and keeping in view the National Policy on Urban Street vendors, the following provisions are proposed to be made for the informal sector:

The location/concentration of present stationary informal units shall be considered on case to case basis and steps for relocation/improvement shall be taken. It should be ensured that such activities do not spill over on the road network in the right of way. The Govt. /concerned local agency would coordinate to achieve the objective.

The areas of informal sector shall have suitable public conveniences and arrangement of solid waste disposal arrangements.

Formulation of guidelines for schemes would include ‘Hawking’ and ‘No Hawking’ zones. Specific areas would be earmarked for stationary and mobile street vendors by the concerned local authority.

The local authorities would take up new design of stalls, push-carts and mobile vans of various sizes and with cleaning facilities, giving due consideration to urban design requirement of specific area, where informal shopping is being permitted.

No informal unit should be permitted along/near the intersection in order to avoid traffic congestion and accidents.

Planning norms for informal trade

8.31. As already stated informal sector is proposed to be made an integral part of planning process. Accordingly the informal sector trade would be incorporated in the planned development in various use zones. The provision of informal sector trade units should be ensured at the time of sanction of building plans/layout plans as per the norms given in the Table 91.

Table 91: Planning Norms for Informal Sectors

Sr. no.	Use zones/use premises	No. of informal shops/units
i	Retail trade:	
	Metropolitan city centre, district centre, community centre, convenience shopping centre	3 to 4 units per 10 formal shops(to be provided in informal bazaar/service market components)
ii	Government and commercial offices	5 to 6 units per 1000 employees
iii	Wholesale trade and freight complexes	3 to 4 units per 10 formal shops
iv	Hospital	3 to 4 units per 100 beds
v	Bus terminal	1 unit for 2 bus bay
vi	Schools	
	Primary Secondary/	3 to 4 units
	Senior secondary/integrated	5 to 6 units
vii	Parks	
	District parks	8 to 10 units at each major entry
	Neighborhood parks	2 to 3 units at each major entry
viii	Residential	1 unit/1000 population
ix	Industrial	5 to 6 units per 1000 employees

Source: UDPFI Guidelines

Industrial:

8.32. Because of existence of two large scale industrial units in the city a low density industrial use spreads over a larger area. However as it has already been explained in preceding chapters and vision 2031, Bathinda city as well as LPA Bathinda is likely to emerge as a hub of Petro Chemical and Petroleum Industries in Punjab, a vast area towards southern side of Bathinda city and having proximity to coming up Oil Refinery has been proposed for industrial use zone. This area extends from Delhi Railway Line to Bikaner Railway Line further up to the limits of LPA Bathinda. Besides this a chunk of land has been proposed near Bhuchu Mandi between Barnala road (N.H. 64) and Patiala

railway line where concentration of existing agro based industries has already taken place. Other two pockets for industrial use are proposed near Goniana Mandi adjoining to Firozpur railway line. In this area some industries already are existing. The existing planned industrial areas such as Industrial Focal Point on Dabwali-Road and Industrial Growth Centre on Mansa Road where a large number of industrial plots are still laying vacant have also have been made part of proposed industrial zone. In this industrial zone light and medium scale industries are proposed whereas the character of large scale existing industrial units is proposed to be retained. The total area proposed for industrial use has been measured to be 4779 hectares which is 10.74% of urbanisable area as shown in Table 86 and the spatial spread of industrial use is shown in proposed land use plan Drg. No. DTP (B) 1577/2009 Dated 08-06-2009.

A 15 meters wide green belt of broad leaf trees has been proposed to be developed within the industrial zone where it coincides with residential zone.

Industies Spot Zoned

8.33. After evaluating the existing status of some industries on Dabowali road and Badal road falling within the limits of Municipal Corporation Bathinda, it is proposed that these industries be spotzoned as marked A,B,C,D in Proposed Landuse Plan of LPA Bathinda.Residential development by the side of these industries shall maintain 15 mtrs green belt.However,if the spot zoned industry decides to shift from this area the land so vacated shall be used for residential purpose.

8.34. The industries which have not been spot zoned and are not in conformity with the proposed landuse shall be treated as per the provisions of section 79 of Punjab Regional and Town Planning and Development Act,1995.

Warehousing and Godowns:

8.35. Keeping in view the vision for LPA Bathinda there is likely hood of development of many types of industries particularly ancillary industries related to Oil Refinery, therefore there would be great demand of land for the wholesale and bulky material marketing like logistic, godowns, freight complexes, junk yards, warehousing etc. Wholesale markets such as Grain Market, Cloth Market and Medicine Market which are existing in the city would continue as such and some new sites required for this purpose may be proposed in mixed land use zones however keeping in view the trend of growth

of godowns etc. the bigger chuncks of lands have been proposed for godowns, warehousing, logistics and freight complexes on Mansa road adjoining to the existing depots of oil companies. This site will have approach from Delhi Railway line and road connectivity with work areas. Besides this another pocket on Malout road (N.H. 15) has been proposed as shown in proposed land use plan Drg No. DTP (B) 1577/2009 dated 08-06-2009. Since there are no norms available for this particular land use a lump sum area of about 480 hectares have been proposed.

Rural and Agricultural Zone:

8.36. With the intention of preserving the basic character of agriculture, the remaining of the rural area, which has not been proposed for other uses, will be retained as Rural and agricultural zone. Out of total area of 57198.00 hectares of LPA Bathinda 6763 hectares have been proposed to be kept under rural and agriculture, which is 11.82 % of total area as shown in proposed land use plan Drg. No. DTP (B) 1577/09 Dated 08-06-2009.

Designated Areas:

Traffic and Transportation

8.37. Transport network and proposed land use need to be considered in an integrated manner. For Master Plan of LPA Bathinda, extensive road network has been proposed taking into account the connectivity requirements. The entire network may develop in phases as the traffic demand builds. However, it is emphasized that landuse proposals of Master Plan may be reviewed as the road network actually develops.

The concurrent planning of urban and rural growth in Bathinda Local Planning Area and the Transportation system is required to provide an integrated, safe and efficient system for transportation of people and goods. The system is intended to meet the projected travel demands in that area. The road and rail sector occupy the significant roles in the transport sector in Bathinda Local Planning Area.

5: Proposed Land Use Plan LPA Bathinda 2009-2031

8.38. Entire Local Planning Area and Bathinda City will be served by well structured and well defined road hierarchy in order to cater the traffic needs of the city population arising from living areas to work areas. This would include redefining of existing road network and the network to be created in the areas proposed to be brought under urbanization. Keeping in view the future shape and size of Bathinda urban area there is need to create/ propose a high-speed network in the shape of ring and radial roads. Some of these links could be part of Bus Rapid Transit System (BRTS) which will provide fast means of public transport system thereby reducing the reliance on private mode of transport.This would be distinctly beneficial in reducing congestion and air pollution. Some routes have been identified for BRTS as follows:

- Malout Road because of Airport
- Kotkapura Road because of new living areas
- Barnala Road because of new work areas
- Dabwali Road because of new work areas
- Badal Road because of institutional centre.
- Ring Road due to providing connectivity among the new nodal points

However their final alignment is to be decided at appropriate time and after conducting detailed feasibility studies.

Proposed Road Network :

8.39. The proposed road network for LPA Bathinda has been developed in concurrently with the proposed land use pattern as shown in the Plan, Drg. No. DTP (B) 1577/09 Dated 08-06-2009**.** In order to provide relief to the city roads and keeping in view the increased volume of traffic in future the concept of ring radial road pattern has been followed. Two ring roads, one immediately encircling the city (inner ring road) and another connecting future node of development in LPA Bathinda (outer ring road). The existing roads have been adopted as radial roads. Efforts have been made to follow existing roads wherever available or along the irrigation channels. The vast areas falling within the ring and radial roads have been proposed to be served by next lower hierarchy of roads as shown in Drawing No. DTP (B) 1578/09, dated 08-06-2009. The following hierarchy of roads has been proposed:

R-1	**200 feet wide**
R-2	**150 feet wide**
R-3	**100 feet wide**
R-4	**80 feet wide**

Inner Ring Road:

Phase-I : This part of the road starts from Kotkapura road near village Gill Patti and connects to Bibiwala road near Govt Polytechnic measuring about 6 kms and then follow Bibiwala road upto Bibiwala chowk, further starting from Barnala road adjoining Cantonment boundary linking Mansa road near Bathinda Public School having a length of 5.5 kms.

Phase-II: This section of road starts from Mansa road just opposite link road to village Katar Singh wala and meets with Dabwali road near village Naruana covering a length of 7.85 kms approximately and further starting from Badal road connecting Malout road having a length of about 7.20 kms and then meets Kotkapura road near village Gill Patti further measuring 7.60 kms and further upto Bibiwala Road near polytechnic (6 kms approximately) completing the circle around the city as shown in the proposed transportation plan Drg.No. DTP (B) 1578/09 Dated 8-6-2009. The total length of all sections of Ring Road is estimated to measure about 34 km. long.

Outer Ring Road:

Looking forward for the year 2031 and keeping in view the proposed city structure of LPA Bathinda it is expected that clustered development will occur at five main centers i.e. near Bhuchu Mandi on Barnala road, near village Kot Shamir on Mansa road, near village Ghuda on Badal road, near village Deon on Muktsar and Goniana on Kotkapura road. In order to provide connectivity among these clusters and assessing the future traffic volume on existing radial roads an Outer Ring Road has been proposed which will provide direct links between these clusters such as Goniana with Bhuchu and direct access to emerging domestic airport and the airport will be directly linked to coming up Central University and further to Oil Refinery.

This proposed Ring road starts from Kotkapura road near Goniana Mandi goes towards Bhuchu Mandi where it meets Barnala road at intersection of link road

to Dera Roomiwala (Bhuchu Kalan) then proceeding towards Mansa road and Talwandi Sabo road encircling village Kotshamir and further connects Dabwali road near village Gehri Butter, Badal road near village Jai Singh wala, Malout road near village Behman Diwana, Muktsar road near village Deon, Jaitu road near Goniana and Kotkapura road near village Balhar Vinju as shown in Drg.No. DTP (B) 1578/09 Dated 8-6-2009. The total length of Proposed Outer Ring Road has been calculated to be 79 kms approximately out of which about 46 kms fall within the jurisdiction of LPA Bathinda and about 33 kms fall outside LPA boundaries as shown in above mentioned drawing.

Other Roads:

The existing roads like Mansa road, Dabwali road, Badal road, Muktsar road and Kotkapura road have been proposed as second hierarchy roads (R-2) with the recommendation of widening upto minimum of 100 feet R.O.W. where required however Barnala road and Malout road have been proposed to work as R-1 category because of the existing width of these roads.

The lower hierarchy roads of R-3 and R-4 category have been proposed to provide accessibility upto interior areas. These roads are mostly proposed following the existing link roads proposing their widening.

These roads would interlink the proposed Inner Ring Road and Outer Ring Road besides the existing radial roads. The proposed road network as explained above has been shown in Drg.No. DTP (B) 1578/09 Dated 8-6-2009.

It is proposed that tree plantation along the main roads such as R1, R2, R3 and R4 may be done in consultation with the landscape Architects, Horticulture department and Forest Department. The selection of trees should be in such a manner that the blooming of flowers may be seen throughout the year. The list of trees is given at Annexure ***9*** the typical cross section of main roads is attached at Annexure ***10.***

6: Proposed Transportation- Network Plan, LPA Bathinda 2009-2031

Proposals for Urban Roads:

8.40. The study of existing city road network reveals that there are several roads which are overcrowded carrying more volume of traffic than their respective capacity. There is no possibility or scope of widening of Right Of Way (R.O.W.) of these roads in thickly built up areas of the city however some measures of road engineering can be adopted for improving the capacity of these roads. As per the guidelines for capacity enhancement of Urban Roads in plain areas published by the Indian Road Congress. In the event of traffic on a road section exceeding the design service volume at the desired level of service, the operating conditions will deteriorate, if so, the available practical capacities can be improved through applications of traffic engineering techniques besides better enforcement, some of the measures that could be considered for enhancement of capacity of roads are as under:

- Prohibiting on–street parking of vehicles, and simultaneously developing off–street parking facility;
- Segregating the bi-directional traffic flow through central verge/median;
- Provision of segregated right–of–way for slow moving vehicles such as animal drawn carts, rickshaws/ tongas etc.;
- Imposing restrictions on the movement of animal drawn /other slow moving vehicles, and/ or heavy commercial vehicles on busy arterial/ sub-arterials during selected periods, specially the peak hours;
- Reduction of roadside friction through control of abutting land–use and roadside commercial activity;
- Provision of adequate facilities for pedestrians and cycles;
- Banning certain conflicting movements at major intersections, particularly during peak hours;
- Controlling the cross traffic and side–street traffic by regulating the gaps in medias; and
- Improving traffic discipline such as proper lane use and correct over taking, through appropriate road markings, education and publicity.
- The following urban roads in LPA Bathinda have been identified and proposed for adopting the traffic engineering measures.

Proposed roads for capacity enhancement in Urban Area-2031

- Barnala road (From Kanahya Chowk to Cantt.boundary)
- Kotkapura road (From Kanahya Chowk to M.C. limits)
- Malout road (From Kanhya Chowk to M.C.limits)
- Guru Kashi Marg (From Rose Garden to I.T.I. Chowk)

- Mansa road (From I.T.I. chowk to M.C. limits)
- Dabwali road (From I.T.I.chowk to M.C. limits)
- Badal road (From Dabwali road to M.C. limits)
- Bibiwala road (From Bibiwala chowk to Old Bus stand)
- Power House road (From Guru Kashi Marg to M.C. limits)
- Mall road (From Hanuman chowk to Railway Station)
- Sector Road (From Bibiwala road to Bhagu road)
- Sector Road (From Bibiwala road to Barnala Bye-pass road)
- Sector Road (From T.V.Tower to Ring Road Phase-I)
- Dr Bhatti road (From Barnala bye-pass to Bibiwala road)
- Kishori Ram Hospital Road (Kabir road)
- Bhagu road (From D'bros. to Gurudwara Model Town)
- Hazi Rattan road (From Mansa road to Dabwli road)
- Multania Road (From Mansa road to M.C. limits through Grain Market)
- Paras Ram Nagar road.
- Santpura road (From Canal to Railway Station)
- Amrik Singh road (From Goniana road to Mall road)
- Mall road at Goniana
- Main Bazar road at Bhuchu Mandi

R.O.B's and R.U.B's

There are two Railway Over bridges and one small size under bridge presently existing in the city and two Railway over Bridges (ROB) and one Railway under Bridge (RUB) are under construction. In order to ensure the smooth flow of regional and local traffic over the proposed road network of LPA Bathinda more R O.B's and R.U.B's are proposed. The list of R.O.B's and R.U.B's in order of priority is given as below:

R.O.B Multania road	(Existing)
R.O.B Paras Ram Nagar road	(Existing)
R.U.B. Near Canal	(Existing)
R.O.B. Mansa road near I.T.I. chowk	(U/C)
R.O.B. Dabwali road near Milk Plant	(U/C)
R.U.B. Paras Ram Nagar road	(U/C)
R.O.B. Badal road near Engineering College	(Proposed)
R.O.B. Dabwali road near Industrial Focal Point.	(Proposed)

R.O.B. Malout road near Thermal Plant.	(Proposed)
R.O.B. Ring Road Phase-II over Malout Railway line	(Proposed)
R.U.B. Ring Road Phase-I below Patiala Railway line	(Proposed)
R.U.B.Mansa road below Delhi Railway line	(Proposed)
R.O.B. Ring Road over Sirsa Railway line.	(Proposed)
R.O.B. Ring Road over Firozpur Railway line.	(Proposed)
R.O.B.Outer Ring Road over Firozpur Railway Line	(Proposed)
R.O.B. Outer Ring Road over Patiala Railway Line	(Proposed)
R.O.B. Outer Ring Road over Delhi Railway Line	(Proposed)
R.O.B. Outer Ring Road over Sirsa Railway Line	(Proposed)
R.O.B. Outer Ring Road over Bikaner Railway Line	(Proposed)
R.O.B. Outer Ring Road over Malout Railway Line	(Proposed)

Termini:

Bus Terminal:

8.41. The Existing bus stand falls in the center of the city and at present is over crowded. In order to provide relief to city roads new bus stand for inter city traffic had been proposed few years ago on Barnala Road near Cantonment boundary and was made the part of development scheme of Patel Nagar framed by Improvement Trust Bathinda. The site measuring about 7.00 hectares is still available which is most suitable for this purpose therefore this site has been proposed for new bus stand. However the site of present bus stand is proposed to be used partly for local bus stand and part of site can be used for commercial purpose.

Truck Terminal:

8.42. The present site of truck stand is almost inadequate for the present fleet of trucks operating from truck union of Bathinda. A development scheme known as Transport Nagar Development Scheme has already been framed by the Improvement Trust Bathinda measuring about 24.47 hectares on Kotkapura Road near Lake No- 3 of Thermal Plant, out of which an area of about 14 hectares has been proposed exclusively for Truck Terminal.

Utilities

8.43. The existing utilities like Water Works, Electric Grid stations, Garbage Disposal site, Sewage Disposal etc. which are available within the boundaries of LPA Bathinda are proposed to be retained as such. So far as the proposals are

concerned the proposals will be made at the time of preparation of Zonal Sector Development plan. Besides this such utility sites will be made part of the colonies to be approved under PAPR Act 1995.

Public & Semi-public & Utilities:

8.44. As it has already been discussed in earlier part of the report, there are several categories of designated areas such as Public & Semi-public uses existing in the Bathinda city and LPA Bathinda. All these designated areas have been proposed to be retained as such. At this stage no areas are earmarked for this purpose however it is recommended that the suitable site will be designated for this purpose at the time of preparation of Zonal Plans. Similarly the areas covered under utilities are also designated for same use and the future requirements shall be taken care at the time of preparation of Zonal plan.

Utilities

8.45. The areas covered under different utilities have been kept as such however the new areas for different types of utilities will be proposed at the time of preparation of Zonal /Sector Plan.

Parks and Play Grounds:

8.46. The only existing park in Bathinda city known as Rose Garden has been spot zone has designated area however the smaller existing park are supposed to be part of the residential zone. For future requirements the green areas would be carved out as per the provisions of PAPR Act, 1995 at the time of preparation/ approval of residential/industrial estates /colonies. The existing Stadium near Hanuman chowk has been retained as such and a new site for cricket stadium has been proposed on Dabwali road.

Conservation Areas:

Protected Monuments:

8.47. There is no heritage building or precinct in LPA Bathinda however 'Bathinda Fort' (known as Gobindgarh Fort) is the only historical monument in LPA Bathinda which has been declared as protected monument by the Central Government, Archaeological Survey of India Vide notification No S.O.1764 dated 16/06/1991 as attached at Annexure 5. This monument covers an area of about 6 hectares and is located in centre of city. This is proposed to be retained as such within the provision of Rule 32 of the Ancient Monument & Archaeological Sites and Remains Rules, 1959.

Forest Area:

8.48. There is a small patch of forest land existing in LPA Bathinda on Multania road falling in the revenue boundaries of village Bir Talab Nahar. As intimated by Xen. Irrigation Bathinda the whole area of village Bir Talab Nahar belongs to the Department of Irrigation Govt. of Punjab. This area was basically meant for irrigation escape but at present most of area of this village is under illegal possession of the people who are doing cultivation there. As per the notification no 1122-FT-58/1195 Dated 03/05/1958 of Forest Department as attached at Annexure 6 all the strips of Govt. land or waste land whether under the tree growth or not on either side of all roads, canals, railways in State of Punjab except those in Patiala Division are declared to be protected forests. At present out of the total area of escape at village Bir Talab Nahar an area of about 32 hectares only is under forest. Besides this forestation is also visible along Bathinda Branch of Sirhind Canal. The area already under forest use are retained as such.

Other Special Area:

8.49. Defence Department owns and occupies 5614.00 hectares of land in LPA Bathinda which shares about 9.82% of LPA area, this area has been retained as such

Prohibited Areas:

8.50. There are two types of restricted (Prohibited) areas where no activity relating mining or construction is allowed –there is a site of ammunition depot within the boundaries of military area Bathinda in the south western corner of Military Station. As per notification no.S.R.O.-10 dated 2/2/2005 of Ministry of Defense notification under section 3 of the Works of Defense Act 1903 (copy attached at Annexure 7) a no building zone is to be maintained up to a distance of 1200 yards (1097.28 meters) from the crest of outer parapet of Ammunition Depot, Bathinda. As per this notification a restricted zone has been earmarked in proposed land use plan Drg. No. DTP (B) 1577/09 Dated 08-06-2009.

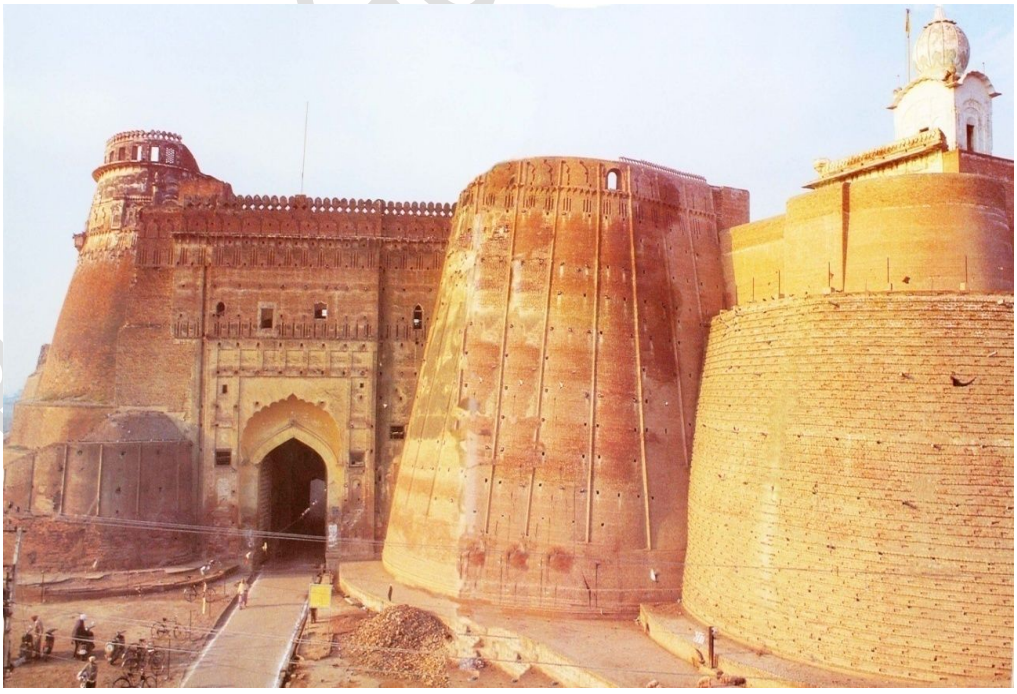
As per notification no. S.O. 1764 Dated 16/06/1992 (copy attached Annexure) of Central Government , Archaeological Survey of India, the area falling within a distance of 100 meter from protected monument i.e Bathinda Fort has been declared as no building zone This restricted area has been shown in

proposed land use plan Drg. No. DTP (B) 1577 /09 dated 08-06-2009 and plan attached with Annexure 5.

Heritage Conservation:

8.51. There is only one historical building known as Bathinda Fort (or Gobindgarh Fort as it is locally known) lying in the center of Bathinda city which has been declared as protected monument by the Government of India Department of Culture, Archaeological Survey of India. As per Gazette notification No. S.O.1764, dated 16 June, 1992 (Refer Annexure 5). The Central Government declared the area upto 100 meters from the protected limits and further beyond it upto 200 meters near or adjoining protected monument to be prohibited and regulated respectively for purposes of both mining and construction under the provisions of rule 32 of the Ancient Monuments and Archaeological sites and Remains Rules, 1959. The Fort is standing on elevated ground, is square on plan having 32 small and four large basions. The large basons are placed at four corners and the most complete among them stands to a height of 36.5 meters. The Fort originally made of mud bricks, may have been built around 6th century AD as a defensive measures against the invading Huns.

Figure 26: Front view of Bathinda Fort



The Fort is prominent land mark of Bathinda city because of its dominating impressive character. The front view and aerial view of the fort itself explains

the story of the role played by this splendid building. There is a narrow road running around the fort. Originally there were no structures near the fort site but with the passage of time many structures (mostly residential and commercial) have come up around the fort. The worst part of this is towards southern and eastern side of the Fort where the buildings are touching the erected part of the Fort as shown in Figure 27 below:

Figure 27: Aerial View of Bathinda Fort

Keeping in view the historical, aesthetical and architectural values of this magnificant building there is immediate need to pay serious attention for its conservation. At present it is being locked after by the department of Archaeological Survey of India. Many of the bastions have collapsed due to rains and lack of proper maintenance, Besides this the roofs of many of the rooms which are part of front portion above entry gate, have also collapsed. There is one Gurudwara's building inside the fort. The inside plan of the fort has different level platforms and parks which give a very good inside view of the fort.

In order to maintain its past glory and fame and its status in the region, it is very necessary that this magnificent building may be conserved and preserved in a proper way. It is therefore proposed that the area upto 100 meters from the protected site may be kept free from any type of construction and further the

areas up to 200 meters may be kept as regulated areas no high rise building should be allowed so that the dominance of this building may be maintained.

Besides the above there is no other building in the city or LPA declared as protected monument under 'The Punjab Ancient & Historical Monuments and Archaeological Sites and Remains Act, 1964'. This act provides for the preservation of ancient and historical monuments and archaeological sites and remains other than those of national importance, for the regulations of archaeological excavation and for the protections of sculptures, carvings and other like objects which are in existence for not less than 100 years. An extensive study regarding identification of such buildings in the city has been conducted by this office but sufficient record regarding this subject could not be found. However one building of irrigation department in irrigation colony has been found to be more than 100 years old and has a distinctive British Architectural look. The building remained as the residence of Xen, Irrigation, Bathinda from the year 1890 onwards till now. The building is having sloping roof of its varanda which runs all around the structure and double height central room (most probably Drawing room) gives a look of British architectural design.

Figure 28: Residence of XEN Irrigation, Bathinda

Planning Zones

8.52. It is proposed that for the follow up of the Master Plan preparation by more detailed zonal or sector plans, the whole area of LPA Bathinda out site Corporation and Municipal Limits is divided into 16 Planning zones. These planning zones are shown on DRG No.DTP (B) 1579/2009 Dated 10.06.09. While delineating the boundaries of respective zones the existing features like roads, canals or village boundries have been given preference, however at some places the proposed roads have also been considered. The alignment of additional secter road would be determined in zonal plan of these planing zones. The zonal plan of zone-14 has been prepared and atteched at annexure-11. This may act as an illusfration/model for preparation of other zonal plan.

Whereever any ambiguity arises in colour/notation and road alignment shown in the proposed landuse plan, the same shall be clarified in the Zonal Development Plans and shall be followed.

7: Proposed Planning Zones , LPA Bathinda 2009-2031

Development Controls and Zoning Regulations

Section I: Development Controls Regulations

8.53. The purpose of the Development Control Regulations (DCR) is to assist developers and end – users within the Local Planning Area, Bathinda to strive for a more quality and environment – friendly development.

These Development Control Regulations are applicable to new and future developments. The developers are requested to abide by the zoning and planning intentions of the Master Plan. However, development proposals / projects which have been granted approval by the Competent Authority previously will continue to be honored and shall not be affected by these controls.

Chapter XI of the Punjab Regional and Town Planning and Development Act, (amended) 2006 provides for 'Control of Development and Use of Land where Master Plan is in Operation.' The chapter lays down the procedural framework for exercising the development control. "Development" as defined by the Act means the carrying out of building, engineering, mining, quarrying or other operation in, on, over or under land or making of any structural or material changes in any building or land including that which affects the appearance of any heritage site and includes demolition of any part or whole of the building or change in use of any building or land and also includes reclamation, redevelopment, a layout or sub-division of land. Some of the key regulations currently in force are reproduced below.

Residential

Category	Minimum area of colony	
	Low Potential Zone (I & II)	Low Potential Zone III
Residential Plotted	10 Acres	10 Acres
Group Housing		
a)For General	5 Acres independent	5 Acres independent
b) For EWS	2.5 Acres	2.5 Acres

1. In category Low III within Municipal Limits any area of land can be developed as a colony as per instructions of Memo No. 17/17/01 -5HG2/1640 dated 18-06-09 shall also apply.
2. Maximum area under residential and commercial - 55% Subject to the condition that commercial shall not exceed 5% of total area
3. Minimum area under institutional / pubic buildings - 10% of total area

4. Minimum area under parks/open spaces, roads & parking lot - 35% of total area
5. Minimum road width in residential areas shall not be less then 40' (12mts) if the existing road is less then 40' (12 mts) the proposed land on both sides shall be safe guarded for widening to comply with the minimum requirements. The building heights on these roads shall not exceed ground+2(G+ 2 storeys).

Note: -F.A.R., height and ground coverage for individual residential plots within municipal areas,Municipal building byelaws shall be applicable and outside municipal limit, the building bye-laws of respective Development Authority shall apply.

Parking requirements for plotted developments

Plot size*	Parking requirements
85 sq m and less (100 sq yd and less)	2 scooter parking spaces
86 – 168 sq m (101 – 200 sq yd)	1.5 car parking spaces within plot area
169 – 425 sq m (201 – 500 sq yd)	2 car parking spaces within plot area
425 sq m and more(500 sq yd and more)	3 car parking spaces within plot area

* Deviation of up to 10% of this control is allowed, if it is arising from site conditions / constraints.

Group Housing

1	Minimum Plot size	
	• Within MC limits	4000 square meters
	• Outside MC limits a) For General Category b) For EWS	 5 acres 2.5 acres
2	Minimum Road width	For group housing stand alone projects, minimum width of approach road is 60’ but the promoter is required to leave space from his own land for widening it to 80’ and the space so left shall be public space. In the planned colony, group housing shall not be permissible on a road less than 60’ wide.
3	Minimum Frontage	20 meters
4	Permissible FAR	1:1.75
5	Ground Coverage	40% (within M.C.limits as per municipal byelaws)
6	Permissible Height	There shall be no restriction on the height of building subject to clearance from Air force Authorities and fulfillment of other rules such as set backs, distance between buildings etc.However structural safety and fire safety requirements as per National Building Code shall be compulsory.
7	Parking provisions	For group housing residential developments, the requisite parking provision is 1.5 ECS per 100 sq m of covered area. The maximum provision allowable for group housing projects is 3 ECS per dwelling unit.

Note:

- Construction of residential houses sold by promoters on floor basis shall also be considered as group/flatted housing development and parking requirements shall be as per the norms applicable to group housing.
- Size of front gate on boundary wall and construction of front boundary wall is optional to meet the parking requirements.
- All projects for which CLU has been approved prior to the approval of this master plan shall stand adjusted in the master plan irrespective of the proposed land use in master plan subject to necessary environmental safe guards, road networks etc.proposed in the master plan.

Farm House

Minimum area	2.5 acres
FAR	0.04
Ground Coverage	2%
Number of storeys	2
Height	Single Storey 18'-0" Double Storey 28'-0"
Hard Surface	10%

Commercial

8.54. Commercial uses in residential zones located within the municipal limits shall be allowable along 80 feet wide roads with minimum frontage of 20 meters however area requirements for such commercial developments shall be as per the Municipal byelaws's rules and regulations.

For stand alone commercial complexes with height greater than three storeys within as well as outside the Municipal limits, the additional criteria listed in following table shall apply.

Additional criteria for stand–alone commercial complexes (more than three storeys)

1	Minimum area required	As per municipal byelaws(within M.C.limits) 1000 sq,mts (outside M.C. limits)
2	Minimum frontage	20 meters
3	Maximum F.A.R.	1:1.75
4	Maximum height	There shall be no restrictions on the height of building subject to clearance from Air Force Authority and fulfillment of other rules such as setbacks, distance between buildings etc. However, structural safety and fire safety requirements as per N.B.C. shall be compulsory.
5	Maximum ground	40% (within M.C.limits as per municipal byelaws)

	coverage	
6	Parking	For projects with no multiplexes, the minimum parking shall be 2 ECS per 100 sq m of covered area (including circulation area)
		For projects with multiplexes/cinemas/theatres, the minimum parking shall be: a) 3 ECS per 100 sq m of covered area, in respect of the covered area of the multiplex component + 30% of the total covered area of that component and b) 2 ECS per 100 sq m of covered area, in respect of balance commercial component and circulation area
		Parking norms within the municipal limits shall be the same as that notified by the Department of Local Government.
7	Basement	Multi level basement will be allowed behind the building in zoned area except in setbacks provided it is proposed for parking purposes only and satisfy the public health and structural requirements.
8	Minimum approach road width	80 feet
9	Landscape	If the site area is one acre or more minimum 15% of the total area is to be reserved for landscaping purposes.
10	For movement of Fire tender	The minimum setback distance is to comply with the existing norms and standards.

Note:
Total parking requirement shall be provided in the compulsory front set back and within the development site boundary or in the basement.

The E.C.S. shall be counted as below:

- 23 square meters for open parking
- 28 square meters for parking under stilts on ground floor
- 32 square meters for parking in the basement

Commercial at local level

There will be provisions for small scale, single storey commercial facilities at the local level within as well as outside the Municipal limits, subject to these abutting roads with a minimum width of 18 m (60 feet) and minimum 6mts setback from road for parking.

These commercial facilities are intended to serve the needs of local residents only and will not be shown separately on the Draft Master Plan. Instead, they are subsumed under the predominant residential land use.

Vehicular access

Vehicular access to all properties within and outside the municipal limits that abut National Highways and other major road shall be via service lanes with a

minimum width of 9 meter (30 feet) and front setback for these properties (outside MC Limits) are given in Table below;

Sr.No.	Name of Roads	ROW	Service Lane after ROW	Setback inclusive of Service Lane
1	Bathinda - Barnala Road	150	9 mtr.	30 mtr
2	Bathinda - Malout Road	150	9 mtr.	30 mtr
3	Bathinda - Kotkpura Road	150	9 mtr.	30 mtr
4	Bathinda - Mansa Road	150	9 mtr.	30 mtr
5	Bathinda - Muktsar Road	100	9 mtr.	30 mtr
6	Bathinda - Badal Road	100	9 mtr.	30 mtr
7	Kotshmir -Talwandi Sabo Road	100	9 mtr.	30 mtr

Note:-

1. Within MC Limits setback limits after service lane as per muncipal bye laws.
2. In case MC Lmits are extendard after the notification of master plan the stipulation of ROW, setbacks, service lane etc shall be as per table above in the extended part of muncipal limit.

Institutional:

8.55. Minimum area and size shall be as per affiliating authority norms with minimum frontage of 20 mts and road width 60 feet,(except in case of nursery and primary schools) F.A.R. 1:1, ground coverage 40%. Zoning plan shall be got approved from competent authority. Other building regulations shall be governed by zoning plan approved by competent authority.

Industrial

Size of Plot	**Site Coverage**
For the first 2420 sq yds	50% of the site
For the next 2420 sq yds	33% of the site
In excess of 4840 sq yds	25% of the site
FAR	1:1.0
Parking	1 ECS per 100 sq. mtr. of covered area

Note:

- Micro, small, medium and large industries shall be located in their respective zone and the classification of industries shall have the meaning assigned to them in clause (a) of sub-section (1) of section 7 of Micro,Small and Medium Enterprises Dovelopment Act 2006 of Govt of India. However the environmental conditions of different department shall apply.
- Industrial / I.T. Park shall have minimum 10 acres area. In I.T. park, I.T. component shall have F.A.R. 1: 2 and in industrial park for industrial component F.A.R shall be 1:1 and other components shall have F.A.R

as mentioned for different land uses in Master Plan. In industrial park,only green and orange industries shall be allowable.

- **Residential component:** Residential component in the industrial plot / premises shall not exceed 5% of the area of the site and shall be within the maximum permissible covered area.
- **Height:** There shall be no restrictions on height of building subject to clearance from Air Force Authority and fulfillment of other rules such as set backs, distance between building etc. However, structural safety and fire safety requirements as per N.B.C. shall be compulsory.
- **Road width:** The minimum road width for industrial unit shall be 40'.
- The construction activity along scheduled roads and bypasses passing through Local Planning Area, Bathida shall be subject to the provisions of Section 143 of the Punjab Regional and Town Planning and Development (Amendment) Act, 2006.

a) **Environmental considerations:**

- All the Petroleum,Perto chemical and other industries shall set up treatment plants individually or collectively if required to achieve zero level of discharge of any kind.
- Minimum buffer of 15 meters green belt of broad leaf trees should be provided around the boundary of village abadies.Also between residential areas and air polluting industries falling in industrial zone of Master Plan and boundaries of which are located within 100 m from the boundary of such areas.
- All residential colonies, commercial establishments like shopping malls, multiplexes etc shall maintain a minimum distance of 250 meters from the hazardous (maximum accident hazardous) industries notified by Director General, Factory Adviser Service Labour Institute. The distance should be measured from source of pollution / hazard in the industrial premises to the building lines as per zoning plan of the colony / complex.However for specified type of industries such as rice shellers/sela plant,brick kilns,stone stone crushers,hot mix plants etc.standardsprescribed by PPCB and concerned dept.shall apply.

Other development controls and guidelines required

- Regulation for village abadi: Special building regulation shall be prepared for the development and regulation of an area falling within the Lal Dora or phirni of the villages falling in the Local Planning Area.
- The existing High Tension lines shall be shifted along the road but outside the Right of way to ensure unhindered ROW for traffic and other services for all times.
- The minor drains shall have minimum 10 meters wide green strips on each side. Other major water bodies shall have minimum 30 meters green strips on each side. Realignment of water bodies shall be permissible wherever feasible, subject to the certification by the Engineering Department to ensure free flow of storm water
- Contiguious expansion of villages abadi in non-residential zones of master plan is permisible up to the extent shown in the Proposed Land Use Plan. However for the village abadi falling in the residential zone of Master Plan no such limit has been ear marked as the area around these villages is already proposed as residential.

Transferable Development Rights

8.56. To facilitate development, it is necessary to accord top priority to the implementation of public utilities and infrastructure (such as roads, parks, green belts etc.) which will in turn encourage urbanization.However, the respective technical agency or authority will not be able to proceed with its implementation programmes until the ownership of private land affected by these public utilities and infrastructure has been transferred to the state or to the relevant authority(s).

Acquisition of private land for this purpose can be carried out through one of the following options:

- Cash compensation can be made to affected land owners whose land is to be acquired.
- A government – approved land pooling scheme can be implemented.

Of these options, TDR is recommended because:

- It is relatively simple and straightforward to implement and execute.

- The requisite public infrastructure projects can be implemented quickly, thus facilitating rapid urban development.
- Most importantly, the interests of affected land owners will be protected.

The TDR scheme shall be restricted to development projects for public infrastructure and facilities which shall be announced from time to time. The additional FAR shall not be transferable from one LPA to another.

Detailed policy guidelines on the operation and implementation of TDR Scheme should be prepared and announced by the competent authority in due course of time.

Section II – Zoning Regulations

8.57. In view of the above the zoning regulations proposed under this master plan are essentially concerned with the control of land use. The proposed land use plan includes following land use zones

- Residential
- Commercial
- Industrial
- Warehousing and Godowns
- Rural and Agricultural

In addition specific designations have been shown in respect of proposed arterial road network, existing rail network, transport termini etc.

8.58. As explained earlier since sub-division of land and design and construction of buildings is being controlled by well established regulations and concerned competent authorities, zoning regulations under the Master Plan are seen as the reference point for these agencies to ensure that the development permitted by them is in compliance with the Master Plan.

The zoning regulations proposed for adoption in LPA Bathinda are presented below

LPA Bathinda Master Plan

Zoning Regulations

Chief Town Planner, Punjab being the planning agency designated under section 57 of the Punjab Regional and Town Planning and Development Act (Amended) 2006 for the Local Planning Area, Bathinda declared under section 56 of the said Act, following the requirement under clause (d) of sub section 1 of section 70 of the Punjab Regional and Town Planning and

Development Act 1995 hereby makes following Zoning Regulations as a part of the Master Plan prepared for the Local Planning Area, Bathinda.

1. SHORT TITLE, SCOPE, EXTENT & COMMENCEMENT

1.1. Title

These Regulations shall be called the Zoning Regulations for Local Planning Area, Bathinda 2009 (hereinafter referred to as "these Regulations").

1.2. Scope of the Regulations

The scope of thse regulations in limited to defining permissible land uses in various land use zones depicted in the proposed land use plan forming part of the Master Plan. Other aspects of "development" such as sub-division and layout of land or intensity of development measured through FAR, ground coverage, parking requirements, building design and construction etc. will be governed by other acts and regulations promulgated by Government from time to time. Competent Authorities under such regulations shall ensure that the developments permitted by them are in conformity with these regulations.

1.3. Jurisdiction

These Regulations shall apply to all "development" in the Local Planning Area, Bathinda declared under section 56 of the Punjab Regional and Town Planning and Development Act 1995 *vide* notification no 12/49/2006 – 4 HGI/186 dated 15-1-2009.

1.4. Date of Coming into Force

These Regulations shall come into force on the day on which the designated Planning Agency publishes the final Master Plan along with these regulations in the *Official Gazette* after obtaining the approval of the State Government under sub section (5) of section 70 of the Punjab Regional and Town Planning and Development Act 1995.

Till such approval, the Authorities in considering the application of for permission for development shall have due regard to the draft proposals including these regulations.

2. DEFINITIONS

For the purpose of these zoning regulations, the following definitions, unless the context otherwise requires, shall apply:

1. **"Act"** means the Punjab Regional and Town Planning and Development (Amendment) Act, 2006 (Punjab Act No. 11 of 1995).
2. **"Government"** Means the Government of the State of Punjab.
3. **"Chief Town Planner"** Means the Chief Town Planner of the Department of Town & Country Planning, Punjab or any other officer to whom his powers are delegated.
4. **"Planning Agency "** means the Chief Town Planner Punjab designated as such under Section 57 of the Punjab Regional and Town Planning and development (Amendment) Act 2006 for Local Planning Area Bathinda.
5. **"Existing Land Use Plan"** Means the Plan showing the different land use existing at the time of preparation of the Existing Land Use Plan of Local Planning Area, Bathinda and as indicated on Drawing No. DTP (B)1571/2009 dated 15-4-09.
6. **"Local Planning Area"** means the Local Planning Area Declared under section 56(1`) of the Punjab regional and town Planning and development (Amendment) Act 2006 vide notification No 12/49 /2006-4HG1/ 186 dated 15-1-2009.
7. **"Non- Conforming Building or use"** means use in respect of any land or building in the Local Planning Area, the existing use of which land or building is contrary to the prescribed land use.
8. **"Proposed Landuse Plan"** means the plan showing the proposed any admissible uses of different areas and Land use zones covered in the Local Planning Area, Bathinda and as indicating on Drawing No. DTP (B) 1577/2009/ Dated 8-6-09.
9. **"Sector Plan"** means the detailed plan of a part of Mater Plan as delineated in the master plan and approved by the Chief Town Planner, Punjab showing all or any of the following:-
   a) Layout of Plots, Streets, Roads Public open spaces, parking areas.
   b) Area temporarily or permanently prohibited for the building operation.

c) Uses Permitted in respect of each or a group of plots into which the land may be shown to be divided.

d) Any other detail provided in the Lay-pout plan.

10. "**Zoning Plan"** means the plan of area or part thereof or supplementary layout plan approval by the Chief Town Planner and maintained in the office of Competent Authority showing the permitted use of land and such other restrictions on the development of land as may be prescribed in the zoning regulations, for any part or whole of the area such as sub-division of plots, open spaces, streets, position of protected trees and other features in respects of each plot, permitted land use, building lands, height, coverage and restrictions with regard to the use and development of each plot in addition to such other condition as laid down in these regulations hereafter.
11. **"Knowledge Park":** Such parks in residential land use zones can have only such activities which are absolutely non –polluting, non hazardous Environment friendly, free from noise& vibrations, having no polluting effects on air and water and causing no nuisance whatsoever. Uses in such parks will be determined by Chief Town Planner, Punjab.
12. **"Farm House**" Farm house means a building allowed on a holding of agricultural land for residential and agricultural activity of the land holder. The total floor area of such farm house shall not exceed 2 per cent of the area of holding or 200sq.m.whichever is less.

13.**"Atta Chakki":** Atta Chakki is categorized as service industry where:

- Grinding of only food grains is carried out through the process of crushing under the load rotational movement of two plates or blocks.
- The maximum electric load does not exceed 20 kW.
- The Atta Chakki shall be used for grinding food grains supplied by the consumers only and no sale/ purchase of food grains/ flour be carried out by the Atta Chakki owner at commercial level.
- The Atta Chakki shall only be permitted on roads having minimum 13.5 m Row.

14. "**House Hold Industry"** House Hold Industry means house hold occupation/ Industry conducted only by family members/persons residing in the dwelling with or without power and not contrary to the provisions of the Water Pollution (Prevention and Control) Act 1974 Air pollution (prevention and Control) Act 1981 and Environment (Protection) Act 1986.
15. **"Cottage Industry":** Industrial units employing less than 10 workers, not creating excessive traffic and not omitting fumes, noise and effluents

injurious to the existing sewers and not contrary to the provisions of the Water Pollution (Prevention and Control) Act 1974, Air Pollution(Prevention and Control) Act 1981 and Environments (Protection) Act 1986.

16. **"Micro, Small and Medium Enterprises engaged in manufacture or production of goods"** have the meaning assigned to them in clause (a) of sub-section (1) of section 7 of Micro, Small and Medium Enterprises Development Act 2006 of Government of India
17. **Large Industries:** Large Industries are the industries in which the investment in fixed assets in plant and machinery is more than Rupees 10 crores.
18. General Industries : General industries shall include all category of industries (mall,medium & large scale)except highly obnoxious,hazardous,inflamable,non compatible and polluting industries as defined by the Punjab Pollution Control Board from time to time.
19. Specified industries : specified industries shall include highly obnoxious,hazardous,inflammable,non compatible and polluting industries as defined by the Punjab Pollution Control Board from time to time.
20. **Public and Semi Public activities:** Public and semi public activities means governmental/ semi governmental offices, educational, medical intuitions, recreational and entertainment facilities, cultural and religious institutions etc.

Terms and phrases used, but not defined in these regulations, shall have the same meaning as assigned to them in the Act.

3. LAND USE ZONES

The proposed land use plan incorporated in the Master Plan of Bathinda LPA depicts the following land use zones

3.1. Residential
3.2. Commercial
3.3. Industrial
3.4. Warehousing and Godowns
3.5. Rural and Agricultural

4 LAND USE CLASSES

For the purposes of these Regulations various land uses are grouped into following land use classes**.**

Sr.No.	Land Use Class	Use Class Code
1	Housing	A
2	Trade and Commerce	B
3	Manufacturing / Industries	C
4	Transport, Storage & Warehousing	D
5	Offices	E
6	Education, Training and Research Institutes	F
7	Healthcare facilities	G
8	Recreation, Entertainment	H
9	Public utilities and services	I
10	Agriculture, forestry and fishing	J

5 USE PROVISIONS IN LAND USE ZONES

Following table describe the land use classes and their further sub-classes permitted in various land use zones. The shaded cells in the table indicate that the use is generally permissible. A number in the cell indicates the conditions listed at the end of the table subject to which the use is permissible.

LAND USE ZONES AND PERMISSIBLE LAND USES							
USE CLASS		LAND USE ZONES					
Sub Code	Description	Residential	Commercial	Industrial	Warehousing	Rural and Agricultural
A	**Housing**					
A1	Residential houses in the form of plotted development, group housing, farm houses for customary residence including household industry,EWS housing			**1**		**2**
A2	Old age homes, Orphanages, Hostels for students, working women etc.					**3**
A3	Service apartments, Hotels including Star Hotels, Motels, Guest Houses, Dharamshalas, Lodging Houses			**4**		
A4	Jails, asylums, reformatories and the like					
A5	Residences for watch and ward staff, residences for industrial workers/ management					
A6	Housing not classified above					
B	**Trade and Commerce**					
B1	Retail trade including markets for fruits and vegetables, meat and fish; super markets,informal shopping					
B2	Department stores, Malls including super market, retail trade, restaurants and multiplexes					
B3	Personal and community services like laundry, hair dressing, beauty parlors, tailoring, coaching classes, cyber cafes, Atta Chakki, Repair of Household Appliances, Bank Branches, ATM					
B4	Wholesale trade with storage of commodities					**5**
B5	Filling Station **					
B6	Kerosene Storage/Gas Godown and storage of fire works	**8**				
B7	Gas Distribution (without storage of cylinders)					
B8	Trade Fares, Exhibition and Conventional centers					
B9	Showroom of Mills/ Factory Retail Outlets,Auto Showrooms and Auto Workshops					

LAND USE ZONES AND PERMISSIBLE LAND USES						
USE CLASS		LAND USE ZONES				
Sub Code	Description	Residential	Commercial	Industrial	Warehousing	Rural and Agricultural
B10	Trade not classified above					
C	**Manufacturing / Industries***					
C1	Manufacture of food products (NIC Division 10)					
C2	Manufacture of beverages (NIC Division 11)					
C3	Manufacture of textiles (NIC Division 13)					
C4	Manufacture of wearing apparel (NIC Division 14)					
C5	Manufacture of leather and related products (NIC Division 15)					
C6	Manufacture of wood and products of wood and cork, except furniture; (NIC Division 16)					
C7	Manufacture of paper and paper products (NIC Division 17)					
C8	Printing and reproduction of recorded media (NIC Division 18)					
C9	Manufacture of coke and refined petroleum products (NIC Division 19)					
C10	Manufacture of chemicals and chemical products (NIC Division 20)					
C11	Manufacture of pharmaceuticals, medicinal chemical and botanical products (NIC Division 21)					
C12	Manufacture of rubber and plastics products (NIC Division 22)					
C13	Manufacture of other non-metallic mineral products (NIC Division 23)					**6**
C14	Manufacture of basic metals (NIC Division 24)					
C15	Manufacture of fabricated metal products, except machinery and equipment (NIC Division 25)					
C16	Manufacture of computer, electronic and optical products (NIC Division 26) and cottage industry					
C17	Manufacture of electrical equipment (NIC Division 27)					
C18	Manufacture of machinery and equipment n.e.c.(NIC Division 28)					
C19	Manufacture of motor vehicles, trailers and semi-trailers (NIC Division 29)					
C20	Manufacture of other transport equipment (NIC Division 30)					
C21	Manufacture of furniture (NIC Division 31)					
C22	Other manufacturing (NIC 32)					
C23	Repair of machinery and equipment (NIC Division 33)					
C24	Milk Chilling(independent plot), Pastuerization plant,					

LAND USE ZONES AND PERMISSIBLE LAND USES						
USE CLASS		LAND USE ZONES				
Sub Code	Description	Residential	Commercial	Industrial	Warehousing	Rural and Agricultural
	Cold Storage					
C25	Rice Shellers, Processing of Farm Products, Brick Kilns, Lime/ Charcoal Kilns					
C27	Repair of Household Articles, Cycles and scooters repair					
C28	I.T. Parks, Knowledge Park & Industrial Park	**10**				
C29	Cement, Sand and Concrete Mixing Plant(Batching plant), Bitumen, Sand, Concrete Mixing Plant(Hot Mix Plant)					
C30	Industries not classified above					
D	**Transport Storage and Warehousing**					
D1	Warehousing and storage activities for transportation (NIC Division 52) and Loading & unloading yard					**7**
D2	Rail and Air Freight Terminals					
D3	Truck Terminals					
D4	Bus Terminals, Auto-Rickshaw/ Taxi Stand					
D5	Warehousing, Logistic Park, Storage & Godowns, Freight complex, Container Yards					
E	**Offices**					
E1	Publishing of books, periodicals and other publishing activities (NIC Group 581) Software publishing (NIC Group 582)					
E2	Motion picture, video and television programme production, sound recording and music publishing activities (NIC Division 59)					
E3	Broadcasting and programming activities (NIC Division 60)					
E4	Telecommunications (NIC Group 61), Govt/ Semi-Govt / Private Business offices					
E5	Computer programming, consultancy and related activities (NIC Division 62)					
E6	Information service activities (NIC Division 63)					
E7	Finance, Banking and insurance (NIC Section K)					
E8	Real estate activities (NIC Section L)					
E9	Professional, scientific and technical activities (NIC Section M)					
E10	Administrative and support services (NIC Section N)					
E11	Public administration and defence; compulsory social security (NIC Section O)					
E12	Professional Services like Lawyers, Accountants, Architects, Charted engineers					

LAND USE ZONES AND PERMISSIBLE LAND USES						
USE CLASS		LAND USE ZONES				
Sub Code	Description	Residential	Commercial	Industrial	Warehousing	Rural and Agricultural
F	**Educational, Training and Research Institutes**					
F1	Pre-Primary Schools, Play schools Kinder Garten					
F2	Primary Schools,					
F3	Secondary Schools, Colleges, Vocational Training Institutes,					
F4	Research and Training Centres, Universities, Centres of Advanced Education and training like IIM or IIT					
F5	Educational, Training and Research Institutes not classified above					
G	**Health care facilities**					
G1	Medical and Dental Clinics and Dispensaries	**9**				
G2	Hospitals (NIC Group 861) and Health Center	**9**				
G3	Nursing care facilities (NIC Group 871)	**9**				
G4	Residential care activities for mental retardation, mental health and substance abuse (NIC Group 872)					
G5	Residential care activities for the elderly and disabled (NIC Group 873)					
G6	Veterinary services					
G7	Health care facilities not classified above.					
H	**Arts, entertainment, recreation, cultural and religious activities**					
H1	Arts, entertainment and recreation (NIC Section R) and Multimedia					
H2	Libraries, archives, museums and other cultural activities (NIC Division 91)					
H3	Gambling and betting activities (NIC Division 92)e.g.Race Course					
H4	Sports activities and amusement and recreation activities (NIC Division 93),activities of membership organisations (clubs etc.) (NIC division 94),tot-lots, playgrounds, stadia, golf courses etc.					
H5	Places of worship					
H6	Marriage Palaces					
H7	Arts, entertainment and recreation activities not classified above					
I	**Public Utilities and Services**					
I-1	Electricity, gas, steam and air conditioning supply (NIC Section D),Telecom tower/antina					
I-2	Water collection, treatment and supply (NIC Division 36)					
I-3	Sewerage (NIC Division 37)					

LAND USE ZONES AND PERMISSIBLE LAND USES						
USE CLASS		LAND USE ZONES				
Sub Code	Description	Residential	Commercial	Industrial	Warehousing	Rural and Agricultural
I-4	Waste collection, treatment and disposal activities; materials recovery (NIC Division 38) and Carcass Disposal Site	**8**				
I-5	Postal and courier activities (NIC Division 53)					
I-6	Police station					
I-7	Fire Station					
I-8	Public utilities and Services not classified above					
I-9	Cemeteries, Graveyards, Cremation grounds					
J	**Agriculture, forestry and fishing (NIC Section A)**					
J1	Crop and animal production, hunting and related service activities (NIC Division 01)					
J2	Land Conservation and Preservation measures such as Storage, Check Dams and other water harvesting measures					
J3	Fishing and aquaculture (NIC Division 03)					
J4	Quarrying of stone, sand and clay (NIC Group 081)					
J5	Plant Nursery and Greenhouses related to Nursery, Floriculture					

Notes:		
NIC	National Industrial Classification (All Economic Activities) 2008, Central Statistical Organisation, Ministry of Statistics and Programme Implementation, Government of India, www.mospi.nic.in	
A	Shaded areas indicate that the use class is permissible in the zone	
B	Shaded area with number /notation indicates the conditions attached	
	Only Ews housing	1
	Only farm houses permissible	**2**
	Old age homes and Orphanages only	**3**
	Hotel, Motel and Guest houses	**4**
	Wholesale trade in agricultural commodities only	**5**
	Only Manufacture of bricks, earthen pots, country tiles etc.	**6**
	Warehousing for agricultural commodities only.	**7**
	Only in Low Density Residential Zone till the contigous residential development takes place	**8**
	Subject to fulfillment of conditions of Pb. Govt. Notification No. 17/17/5-Hg2/311 dated 11.01.08 and instructions issued from time to time	9
	Only Knowledge Parks as defined at Sr. No. 11 Page No. 182	**10**
* All types of industries permitted in the designated land use zone are subject to the fulfillment of requirements of different departments		
** The siting of petrol pumps shall be subject to instruction / guidelines of IRC/ MORTH/TCPO/Punjab govt. issued from time to time.		
C	Micro, small, medium and large industries shall be located in their respective zone.special industries shall be permissible only in area zoned for medium and large Scale industries.	
	The establishment of Industries in rural zone shall be subject to the environmental consideration and norms / standards of distance etc.fixed by various departments / agencies from time to time.	
	Minimum area required for Educational and Health care facilities shall be as prescribed by government or the accrediting authorities from time to time	
	All developments will be subject to Environmental Clearance wherever required.	
	Minimum width of the access road for all public places and involving “Assembly” occupancy shall be 18 m.	
	The activities not mentioned in the tble above but found compatible for particular land use zone shall be promissible with the approval of compitant athority.	

6. DESIGNATED AREAS

Following areas have been specifically designated in the proposed land use plan.

- **Traffic and Transportation**
- **Public & semi public**
- **Protected Monuments/Conservation Sites**
- **Prohibited Areas**
- **Utilities**
- **Parks & Play Grounds**
- **Other Special Areas**
- **Forest Areas**

USE PROVISIONS IN DESIGNATED AREAS

Following uses are permissible in the designated areas mentioned in 5 above.

6.1. Traffic & Transportation: Permissible uses

Rail yards, Railway station & sidings, Transport Nagar (including, Post & Telegraph offices & Telephone exchange, Dhabas, Labour yards, Areas for loading and unloading, Stores, Depots, and Offices of goods booking agencies, Petrol Filling Station & Service garages, Parking spaces, public utilities and buildings) Bus Terminus & depot, Bus stop shelter, Taxi/ Tonga/ Rickshaw/Scooter Stands, parking spaces.

6.2. Utilities: Permissible uses

Water supply, drainage, storm water, wastes processing, and disposal, electricity, communication systems and related installations etc.

6.3. Public and semi-public activities: Permissible uses

Governmental and semi governmental offices, Governmental administrative centres, Secretariat, Educational- Cultural and Religious institutions including Theaters, Auditoriums etc. Medical Health Institutions, Community Centres, Club, Orphanage, Old Age Home, Banks, Police Stations etc.

6.4. Parks and Play Grounds :Permissible Uses :

Regional Park, Local Parks, Green Belts, Play Grounds, Sports Stadium/Complex, Cricket Stadium, Sports Training Centres, Open Air Cinemas/ Auditoria, Shooting Range, Holidays Resorts with ground coverage not exceeding 2%, Public Institutional Libraries, Swimming Pools with built up areas not exceeding 2%.

6.5. Protected/ Conservation Sites: Permissible uses

Only protected monument/ Heritage Building or conservation sites as notified by the concerned authority and the related activities are allowed. All other uses are prohibited

6.6. Others Special Areas: Permissible uses

All the uses related to Defence Services and any other use as decided by the Ministry of Defence. No other uses are permitted.

6.7. Prohibited Areas: Permissible uses

The areas around the Protected Monument of 'Bathinda Fort' up to the distance of 100 meters from the protected limits as described in the notification no. S.O.1764 Dated 16thJune, 1992 issued by the Department of Culture, Archaeological Survey of India are to be prohibited areas and beyond it up to

200 meters regulated areas for the purposes of both mining operation and construction.

6.8. Forest Areas: Permissible uses

This area indicates all Reserved Forests as notified by the Forest Department. No activity other then Forest is permitted in this area unless expressly allowed by the Forest Department

7. SPECIAL CONDITIONS

7.1. The siting of Petrol Pump / Filling Stations shall be subject to instructions/guidelines of IRC/MORTH/TCPO /Punjab Govt. issued from time to time.

7.2. Minimum width of access road for warehousing uses shall be 80 feet.

8. EXCEPTIONS

8.1. Any use not listed above under a specific zone will not be permissible in the respective zone

8.2. Notwithstanding the above, the uses specifically provided for in the Sector Zoning Plans shall be permissible or as may be allowed by the Chief Town Planner, Punjab.

8.3. Uses determined by the Chief Town Planner, Punjab as compatible with uses permissible shall be allowed in respective zones.

8.4. Uses of land covered under Optimum Utilisation of Vacant Government Land (OUVGL) Scheme of the State Government shall be determined by the Government at any appropriate time not withstanding the provisions of these Regulations.

8.5. Development Projects approved prior to coming into force of these Regulations shall be deemed to be in compliance with these Regulations.

8.6. In the event of conflict in interpretation of data within the study area; the information in the GIS format will be deemed as the accurate version and shall prevail.

9. RESIDENTIAL DENSITIES

Residential zone is divided into three sub zones viz. High Density Zone, Medium Density Zone and Low Density Zone and are shown on the Proposed

Land Plan Drg. No. DTP (B) 1577/09 Dated 08.06.2009. The maximum permissible net plot density in these zones shall be as shown in Table below:

Sr.No.	Zone	Net Plot Density
1	High Density Residential Zone RD 1	301 and above persons/ha.
2	Medium Density Residential Zone RD 2	101 to 300 persons/ha.
3	Low Density Residential Zone RD 3.	100 and below persons/ha.

10. IMPLEMENTATION OF THESE REGULATIONS

10.1. All authorities competent to grant permission for layout or sub-division of land or construction of building or development of land in any other form shall ensure that the permitted development is in compliance with these regulations.

10.2. Land owners desirous of developing their land can obtain, by applying to the designated authority in writing and giving details of their land along with necessary maps, a list of permissible uses.

10.3. Similarly land owners proposing development of certain uses on their land can obtain a certificate of "Compliance with Master Plan" from a designated authority.

Annexure 1 : Notification Regarding Declaration of LPA Bathinda

GOVERNMENT OF PUNJAB
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT.
HOUSING BRANCH-I

NOTIFICATION
The 18th July, 2007

No. 12/49/2006-4HG 1/ 5547 Whereas it appears to the Governor of Punjab that to meet the challenge of rapid growth of Bathinda city and to provide for a workable framework for comprehensive planned and regulated development, preparation of Statutory Master Plan of Bathinda city is very essential. Hence in order to develop Bathinda city and its surroundings in orderly manner and to prepare its Master Plan under "The Punjab Regional and Town Planning and Development Act, 1995'', the Governor of Punjab is pleased to declare the Local Planning Area of Bathinda city within the meaning of sub section (1) of section 56 of the Punjab Regional and Town Planning and Development (Amendment) Act, 2006. The total area proposed for Local Planning Area is 46492 hectares (114835.24 Acres) which includes Bathinda city, 2 other urban settlements and adjoining 32 villages. The schedule of boundary of Local Planning Area is as under:-

Schedule of Boundary :-

North: Starting from point 'A; which is intersection point of northern side of Bathinda-Malout road (N.H. 64) and then along western revenue boundary of village Behman Dewana (H.B.No. 74) towards North along revenue boundary of village Deon (H.B.No. 177) village Sibian (H.B.No. 72), north western revenue boundary of village Nahianwala (H.B.No. 167) village Balhar Vinju (H.B.No. 166), village Goniana khurd (H.B. No 165), then along revenue boundary of village Goniana Kalan (H.B.No. 162) towards east, then towards south along revenue boundary of Goniana Kalan (H..B.No. 162) and then towards south along revenue boundary of village Amargarh (H.B.No. 161), Bhokhra (H.B.No. 160), Joganand (H.B.No. 173), Bibiwala (H.B.No. 174) upto point 'B' which is formed by northern side of Sirhind canal.

East: From point 'B' crossing Sirhind canal towards south east along revenue boundary of village Bibiwala (H.B.No. 174), Mehna (H.B.No. 175), Bhuchu khurd (H.B.No. 207) then along revenue boundary of Bhuchu kalan (H.B.No.. 201) towards East, then towards North, North-East and then towards East along revenue boundary of Lehra Bega and then towards South along revenue boundary of Lehra Bega (H.B.No. 200) and Lehra Khana (H.B.No. 202) towards West along revenue boundary of Burj Kahan Singh wala (H.B.No. 206), Bhuchu khurd (H.B. No. 207) Bhagu (H.B.No. 59), village Gulabgarh (H.B.No. 58) upto point 'C' which is formed by northern side of Bathinda-Mansa- Jakhal railway line.

South : From point 'C' crossing Bathinda-Mansa-Jakhal railway line along South-Eastern revenue boundary of village Gulabgarh (H.B. No. 58) and then along revenue boundary of village Kotshamir (H.B. No. 57) towards South then towards West then towards North and along revenue boundary of village Katar Singh wala (H.B. No. 62) and then towards West along Southern revenue boundary of Jassi Pauwali (H.B.No. 61) village Jodhpur Romana (H.B.No. 54)and Gurusar Sainewala

(H.B.No. 92) upto point 'D' which is formed by northern side of Bathinda-Bikaner railway line.

West : From point 'D' towards north along revenue boundary of village Gurusar Sainewala (H.B.No. 92) village Naruana (H.B.No. 65) village Mian (H.B.No. 66) village Multania (H.B.No. 67), village Bir Behman (H.B.No. 75) and then towards west and North along revenue boundary of village Behman Diwana (H.B.No. 74) upto point 'A' which is starting point.

These boundaries have been shown on Drawing No. DTP (B) 15/08/2007 Dated 27-06-07. All the provisions laid down u/s 56(2) of "The Punjab Regional and Town Planning and Development (Amended) Act. 2006" and all the concerned rules framed under this Act have been taken into consideration.

Place: Chandigarh

Date: 17-07-2007

ARUN GOEL I.A.S.
Secretary to Government, Punjab.
Housing and Urban Development Department

Annexure 2 : Notification Regarding Alteration of Boundaries of LPA Bathinda

GOVERNMENT OF PUNJAB

PUNJAB REGIONAL AND TOWN PLANNING AND DEVELOPMENT BOARD

(HOUSING BRANCH-I)

NOTIFICATION

No.12/49/06 – 4HG1/186 **Dated 15/01/09**

In continuation of Notification No. 12/49/2006-4HG1/5547 dated 18th July, 2007, the Governor of Punjab is pleased to alter the boundaries of Local Planning Area, Bathinda within the meaning of Sub section 7 of section 56 read with the sub section 1 of section 56 of Punjab Regional and Town Planning and Development (Amendment)Act, 2006. The total area of proposed Local Planning Area, Bathinda is 57154 (Hects.) (571.54 Sq.Kms.), which includes Bathinda city, two other urban settlements and adjoining 46 villages. The Schedule of boundaries of Local Planning Area, Bathinda is as under:-

North : Starting from point 'A; which is common sarhada of village Deon (H.B.No. 177), village Burj Mehma (H.B.No.178) and village Mehma Bhagwana (H.B.No.176) towards north along the boundary of village Deon (H.B.No. 177) village Sibian (H.B.No. 72) village Nahianwala (H.B.No. 167) village Balhar Vinju (H.B.No. 166), Chak Gonianakhurd (H.B. No165) crossing Firozpur railway line and, Jaitu road jaitu road then along the boundary of village Goniana khurd (H.B.No. 163), village Goniana Kalan (H.B.No. 162) crossing Bathinda-Kotkapura road (N.H.- 15), then towards south along revenue boundary of village Goniana Kalan (H..B.No. 162),village Amargarh (H.B.No. 161), village Bhokhra (H.B.No. 160), Village Joganand (H.B.No. 173), village Bibiwala (H.B.No. 174) crossing Sirhind Canal (Bathinda Branch)and again along the boundary of village Bibiwala (H.B. No 174),then along the boundary of village Mehna (H.B. No 175), village Bhuchu khurd (H.B.No. 207), village Bhuchu kalan (H.B.No.201), village Lehra Bega (H.B.No. 200) crossing Bathinda Patiala road (N.H.64) upto point 'B' which is common sarhada of village Lehra Bega (H.B.No. 200), Lehra Khana (H.B.No. 202) and village Lehra Mohabbat (H.B.No. 196)

East Starting from point 'B' towards south along the revenue boundary of village Lehra Khana (H.B.No.202) crossing Patiala railway line,again along the boundary of village Lehra Khana(H.B. No 202) village Burj Kahan Singh wala (H.B.No. 206),Bhuco khurd (H.B.No.207), village Bhagu (H.B.No 50), village Gulabgarh Urf Nai wala (H.B.No.58) crossing Delhi railway line and along the, boundary of village Kot Shamir(H.B.No.57), crossing Mansa road (S.H. 12A) and Talwandi Sabo road (S.H.-17) up to point 'C' which is common Sarhada of village Kot shamir(H.B.57), Jeon singh wala (H.B.55)and Village Kaile Vander (H.B.56).

South : Starting from point 'C' towards west along the revenue boundary of village Kot shamir (H.B.No. 57) crossing Sirsa railway line then towards north, again crossing Sirsa railway line again along the boundary of village Kot Shamir(H.B.No57), village Katar Singh wala (H.B.No. 62) then towards west along the boundary of village Jassi Pauwali (H.B.No.61) crossing Sirsa railway line along the boundary of village Jodhpur Romana(H.B.No. 64),village Gurusar Saine wala (H.B No. 92) crossing Dabwali road (N.H.64), again along the boundary of village Gurusar Saine wala (H.B.No 92) boundary of village Jai Singh wala (H.B.No.91), village Phullo Mithi (H.B.No. 90) crossing Dabwali railway line, along the boundary of village Kotguru (H.B.No.100) upto point then 'D' which is common sarhada of village Kot Guru (H.B.No.100), village Jassi Baghwali (H.B.No.11) and village Mohalan (H.B.No.101)

West : Starting from point 'D' towards north along revenue boundary of village Kot Guru (H.B.No. 100) village Ghudda (H.B.No. 99) crossing Badal road again along the revenue boundary of village Ghudda (H.B.No.99),Village Jhumba (H.B. N0 5), village Teona (H.B.No. 4), village Chugha khurd (H..No. 76), village Behman Diwana (H.B.No. 74) crossing Malout railway line and Malout road (N.H.-15) then along the revenue boundary of village Deon (H.B.No. 177) crossing Muktsar road upto the starting point 'A'

These boundaries have been shown on Drawing No. DTP (B)1551/2009 Dated 14.1.2009. All the provision laid down u/s 56(2) of "The Punjab Regional and Town Planning and Development (Amendment) Act. 2006" and all the concerned rules framed under this Act have been taken into consideration.

Place: Chandigarh

Date: 15-01-2009

ARUN GOEL I.A.S.

Secretary to Government, Punjab.
Housing and Urban Development Department.

Annexure 3: Notification Regarding Declaration of Planning Agency

Government of Punjab
Department of Housing and Urban Development
(Housing Branch-I)
NOTIFICATION

The 19th July, 2007

No.12/49/2006-4HG1/5684 -Whereas the Governor of Punjab was pleased to declare the Local Planning Area of Bathinda City and its surrounding area u/s 56(1) of "The Punjab Regional and Town Planning and Development Act, 1995" vide notification No.12/49/2006-4HG1/5547 dated 18-07-2007.

Further the Governor of Punjab is pleased to designate the Chief Town Planner, Punjab as Planning agency for the above Local Planning area under Section 57 of "The Punjab Regional and Town Planning and Development Act, 1995".

19th July, 2007

Arun Goel
Secretary to Government of Punjab
Department of Housing and Urban Development

Endst No.12/49/2006-4HG1/5685 Dated: 19-07-2007

A copy along with spare copy is forwarded to the Controller Printing & Stationary Punjab, Chandigarh with the request that this notification may be published in the Official Gazette (ordinary) and 50 copies of the printed notification may be sent to the Government for record.

Special Secretary

Endst No.12/49/2006-4HG1/5686-87 Dated: 19-07-2007

A copy of the above is forwarded to the following for information and necessary action: -

1. Chief Town Planner,Punjab, Chandigarh.
2. Chief Administrator, Bathinda Development Authority (BDA).
3. Additional Chief Administrator, PUDA, Bathinda.

Special Secretary

Annexure 4: List of Towns and Villages included in LPA Bathinda

Sr. No.	Name of Village/Town	H.B. No.	Area in Hectares	Population	Remarks
1	Bathinda (M.C.)			217256	Area of city included in different villages
2	Goniana (M.C.)			12813	-do-
3	Bhuchu Mandi (M.C.)			13246	-do-
4	Bathinda Rural	70	8600		Includes area of M.C. Bathinda
5	Amargarh	161	496	1054	
6	Baho Jattri	3	374	911	
7	Baho Sibian Patti Basawa Singh	2	178	454	
8	Baho Sibian Patti Dharam Singh	1	183	516	
9	Balahar Vinjhu	166	547	1849	Includes area of M.C. Goniana
10	Behman Dewana	74	1749	4981	
11	Bhagu	59	1164	1905	Includes Cantt area also
12	Bhokhra	160	1180	3786	
13	Bhuchu Kalan	201	3290	6349	Includes Cantt area also
14	Bhuchu Khurd	207	1810	4446	Includes Cantt area also
15	Bibiwala	174	886	2657	Includes Cantt area also
16	Bir Behman	75	699	2224	
17	Birtalab Urf Talab Neehar	68	529	4507	
18	Buladewala	73	708	2345	
19	Burj Kahan Singhwala	206	437	1778	Includes area of Bhuchu MC
20	Chak Goniana Kalan	164	100	0	Uninhabited
21	Chak Goniana khurd	165	126		Uninhabited
22	Chugha Khurd	76	844	2245	
23	Deon	177	2162	6487	
24	Ghudda	89	1890	4649	
25	Gill Patti	71	883	2957	Includes part of Bathinda M.C. area
26	Goniana Kalan	162	713	1801	
27	Goniana Khurd	163	530	2029	
28	Gulabgarh Urf Naiwala	58	573	1636	Includes part of Bathinda M.C. area

29	Gurusar Sainewala	92	988	2468	
30	Hazi Rattan	69	648		Includes part of Bathinda M.C. area
31	Jai Singhwala	91	1838	4549	
32	Jassi Pauwali	61	1028	2759	
33	Jhumba	5	1819	4069	
34	Jodhpur Romana	64	1012	2083	Includes part of Bathinda M.C. area
35	Joganand	173	524	1824	
36	Katar Singhwala	62	564	1866	Includes part of Bathinda M.C. area
37	Kot Guru	100	965	2373	
38	Kot Shamir	57	4607	9314	
39	Lehra Bega	200	1168	2922	
40	Lehra Khana	202	1367	2063	
41	Mehna	195	835		Includes Cantt. Area also
42	Mian	66	403	796	
43	Multania	67	796	1320	
44	Naruana	65	1438	3550	
45	Nehianwala	167	1702	6083	
46	Phulo Mithi	90	1694	3692	
47	Phus Mandi	60	404	1667	Includes Cantt. Area also
48	Sivian	72	1374	5417	Includes part of Bathinda M.C. area
49	Teona	4	1329	3605	
	Total		57154	367301	

Annexure 5: Copy of Notification regarding Protected Monument– Bathinda Fort

DEPARTMENT OF CULTURE
(Archeological Survey of India)
New Delhi, the 16th June, 1992
(ARCHAEOLOGY)

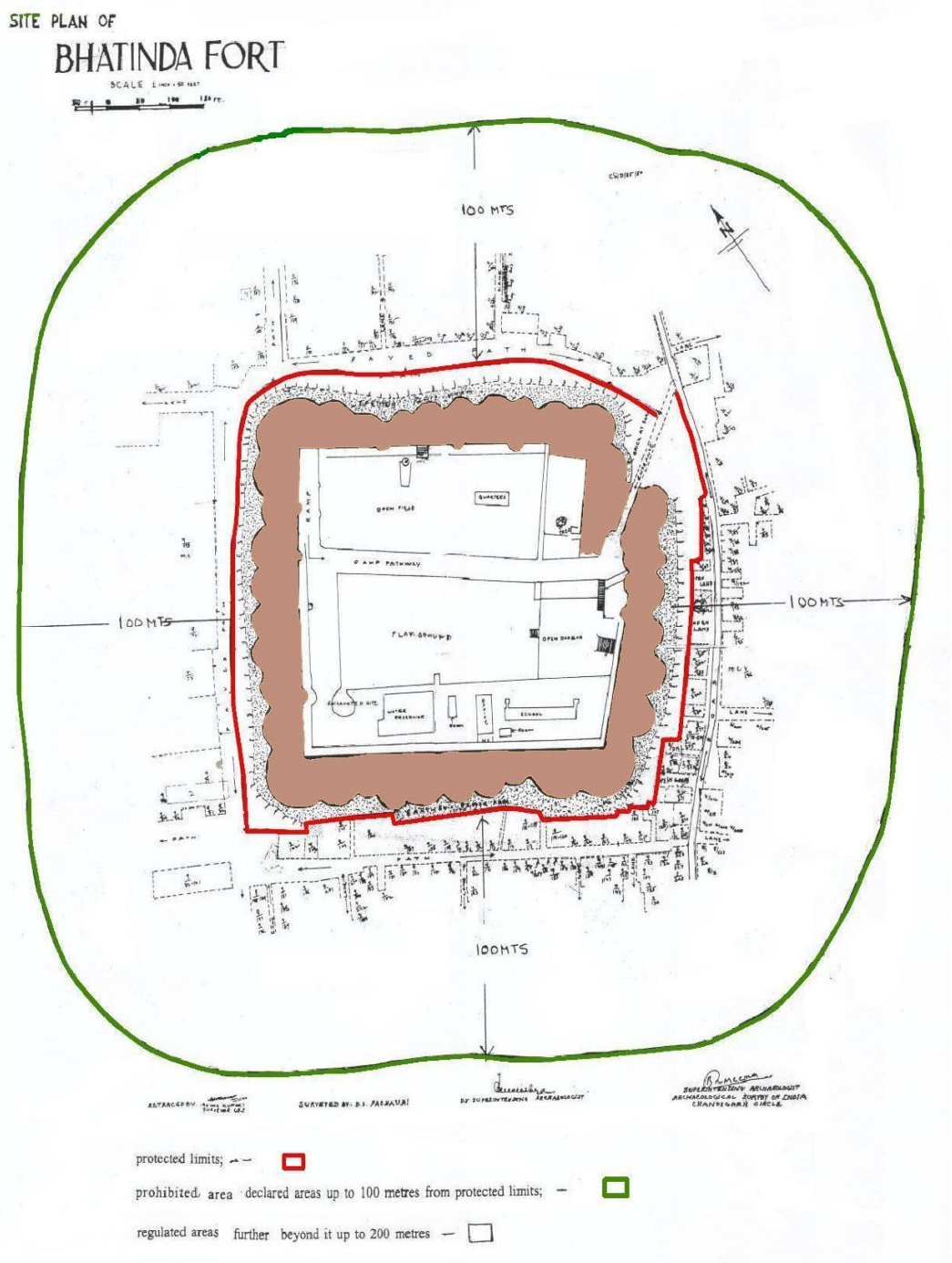
S.O. 1764 - Whereas by the notification of the Government of India in the Department of Culture, Archaeological Survey of India No. S.O. 1447 dated the 15th may 1991, published in the Gazette of India. Part II Sections 3 sub-section (ii) dated the 25th may, 1991, the Central Government gave one month's notice of its intention to declare areas upto 100 meters from the protected limits and further beyond it upto 200 meters near or adjoining protected monuments to be prohibited and regulated areas respectively for purpose of both mining operation and construction;

And whereas the said Gazette was made available to the public on the 5th June, 1991;

And whereas objections to the making of such declaration received from the person interested in the said areas have been considered by the Central Government.

Now, therefore, in exercise of the powers conferred by rule 32 of the Ancient Monuments and Archeological Sites and Remains Rules, 1959, the Central Government hereby declares the said areas to be prohibited and regulated areas. This shall be in addition to and not in any way prejudice the similar declarations already made in respect of monuments at Fatehpur Sikri; Mahaballapuran; Golconda Fort, Hyderabad (Andra Pradesh); Thousand Pillared Temple, Hanamkonda,District Warangal(Andra Pradesh); Sher Shah's Tomb, Sasaram (Bihar); Rock Edict of Ashoka, Kopbal, District Ralchur (Karnataka); Fort Wall, Bijapur(Karnataka) Gomateswarn Statue at Srhvanbelgola, District Hussan(Karnataka), Elephant Caves, Gharapur, District Kolaba (Maharstra).

(No. F. 8/2/90 AI)
M.C. JOSHI, Director General.


SITE PLAN OF
BHATINDA FORT
SCALE
100 MTS
100 MTS
100 MTS
100MTS
N
PAVED
PATH
OPEN FILE
QUARTERS
RAMP PATHWAY
PLAY GROUND
OPEN DHABA
WATER RESERVOIR
SCHOOL
protected limits;
prohibited area declared areas up to 100 metres from protected limits;
regulated areas further beyond it up to 200 metres

Annexure 6 : Notification regarding Forest or Waste Land in Punjab

Notification
The 3rd May, 1958

No. 1122-FT-58/1195. In super session of Punjab Government notifications

1. No. 260-FT-dated the 8th February, 1945
2. No. 5002-D-51/6264 dated the 15th November, 1951
3. No. 563-FT-54/458 dated the 3rd March, 1955 and
4. No. 3384-Ft-55/2134 dated the 19th August, 1955

and in exercise of the powers conferred by section 29 of the Indian Forest Act, 1927, and all other powers enabling him in this behalf, the Governor of Punjab is pleased to declare the strips of Govt. forest or waste land whether under tree growth or not on either side of all roads, canals and railways in the State of Punjab except those in the Patiala Division described in the following schedule, to be protected forests and the provisions of chapter IV and section 68 of the said Act to be applicable to them :-

S C H E D U L E

Name of Strips	Description and situation
Roads	All . P.W.D. (Buildings and Roads) roadside strips and also other P.W.D. lands in Punjab State transferred to the Forest Department for Management.
Canals	All land on either side of P.W.D. (Irrigation Branch Canals and Canal roads including main canals, branches distributaries, Minors escapes and bounds and also other land of that department transferred to the Forest Department for Management.
Railways	The land along the railway track and station yards on Northern railways transferred to the Forest Department for Management.

No. 1122-FT-58/1196. Whereas by Punjab Government Notification No. 1122-FT-58/1195, dated 3rd May 1958, all strips of Government waste lands, demarcated by boundary pillars whether under tree growth or not on either side of all roads, canals and railways in the state of Punjab except, Patiala Division as mentioned in the schedule annexure to the said notification have been declared to the protected Forests under section 29 of the Indian Forest, Act 1927.

NOW HERE FORE the governor of Punjab in exercise of the powers conferred by section 30 of the said Act is pleased :-

(a) to declare all trees standing in or upon these lands to be reserved with effect from the date of publication of this notification.

(b) To prohibit from the same date the quarrying of stones, burning of lime or charcoal, or the collection or subjection to any manufacturing process, or removal of any forest produce in any stage forest and the breaking up or clearing of land for building or for herding cattle or for any other purpose of any land in such forests.

NAKUL SEN
Secretary to Govt. Punjab, Revenue Deptt

Annexure 7 : Notification regarding Prohibited Area around Amunition Depot

रजिस्ट्री सं० डी एल(एन)-04/0007/2003-05

REGD. NO. D.L.(N)-04/0007/2003-05

भारत का राजपत्र
The Gazette of India

प्राधिकार से प्रकाशित
PUBLISHED BY AUTHORITY

साप्ताहिक
WEEKLY

सं. 3] नई दिल्ली, फरवरी 6—फरवरी 12, 2005, शनिवार/माघ 17—माघ 23, 1926
No. 3] NEW DELHI, FEBRUARY 6—FEBRUARY 12, 2005, SATURDAY/MAGHA 17—MAGHA 23, 1926

इस भाग में भिन्न पृष्ठ संख्या दी जाती है जिससे कि यह अलग संकलन के रूप में रखा जा सके
Separate Paging is given to this Part in order that it may be filed as a separate compilation

भाग II—खण्ड 4
PART II—Section 4

रक्षा मंत्रालय द्वारा जारी किए गए सांविधिक नियम और आदेश
Statutory Rules and Orders issued by the Ministry of Defence

रक्षा मंत्रालय
नई दिल्ली, 2 फरवरी, 2005

का०नि०आ० 10.— रक्षा संकर्म अधिनियम, 1903 (1903 की 7) की धारा 3 द्वारा प्रदत्त शक्तियों का इस्तेमाल करते हुए और भारत सरकार के दिनांक 5-11-2001 के रक्षा मंत्रालय सा. नि. आ. 225 की अधिसूचना का अधिक्रमण करते हुए केंद्र सरकार एतद्द्वारा घोषणा करती है कि नीचे दी गई अनुसूची में उल्लिखित भूमि पंजाब राज्य के भटिंडा में गोलाबारूद डिपो के निकट होने के कारण इसे भवनों तथा अन्य बाधाओं से मुक्त रखे जाने के उद्देश्य से इसके उपयोग तथा अधिभोग पर उपर्युक्त अधिनियम की धारा 7 के खंड (क) से (ग) में निर्दिष्ट प्रतिबंध लगाया जाना आवश्यक है।

2. उपर्युक्त भूमि की योजना से संबंधित रेखाचित्र नक्शे का निरीक्षण उपायुक्त, भटिंडा, पंजाब राज्य के कार्यालय में किया जा सकता है।

अनुसूची

पंजाब राज्य के भटिंडा में रक्षा संकर्म अर्थात् गोलाबारूद डिपो के प्राकार की बाहरी परिधि से 1200 गज (1097.28 मी.) की दूरी के भीतर के क्षेत्र में आने वाली समस्त भूमि।

[सं. पीसी टू एम एफ बी/50542/एडी भटिंडा//एलडब्ल्यू(पश्चिम)/179]
सहेली घोष राय, अवर सचिव

MINISTRY OF DEFENCE

New Delhi, the 2nd February, 2005

S.R.O. 10.—In exercise of the powers conferred by Section 3 of the Works of Defence Act, 1903 (7 of 1903), and in supersession of the notification of the Government of India in the Ministry of Defence number SRO 225, dated the 5th November, 2001, the Central Government hereby declares that it is necessary to impose the restrictions specified in clauses (a) to (c) of Section 7 of the said Act upon the use and enjoyment of the land described in the Schedule below, being land lying in the vicinity of Ammunition Depot at Bhatinda, in the State of Punjab, with a view to keep the said land free from buildings and other obstructions.

2. A sketch plan of the said land may be inspected in the office of the Deputy Commissioner, Bhatinda, in the State of Punjab.

SCHEDULE

All the land comprised in the area lying within the distance of 1200 yards (1097.28 metres) from the crest of the outer parapet of the Works of Defence, namely, the Ammunition Depot at Bhatinda, in the State of Punjab.

[No. PC to MF B/50542/AD Bhatinda/ LW(West)/179]

SAHELI GHOSH ROY, Under Secy.

नई दिल्ली, 2 फरवरी, 2005

का०नि०आ० 11.— रक्षा संकर्म अधिनियम, 1903 (1903 की 7) की धारा 3 द्वारा प्रदत्त शक्तियों का इस्तेमाल करते हुए केंद्र सरकार एतद्द्वारा घोषणा करती है कि नीचे दी गई अनुसूची में उल्लिखित भूमि हरियाणा राज्य में जिला अम्बाला के अम्बाला छावनी में गोलाबारूद गोदाम, नारायणगढ़ रोड के निकट होने के कारण इसे भवनों तथा अन्य बाधाओं से मुक्त रखे जाने के उद्देश्य से इसके उपयोग तथा अधिभोग पर उपर्युक्त अधिनियम की धारा 7 के खंड (क) में इस अधिसूचना को सरकारी राजपत्र में प्रकाशित करने की तारीख से निर्दिष्ट प्रतिबंध लगाया जाना आवश्यक है।

2. उपर्युक्त भूमि की योजना से संबंधित रेखाचित्र नक्शे का निरीक्षण उपायुक्त, अम्बाला, हरियाणा राज्य के कार्यालय में किया जा सकता है।

अनुसूची

हरियाणा राज्य के जिला अम्बाला में रक्षा संकर्म अर्थात् गोलाबारूद गोदाम, नारायणगढ़ रोड, अम्बाला छावनी के प्राकार की बाहरी परिधि से 1200 गज (1097.28 मी.) की दूरी के भीतर के क्षेत्र में आने वाली समस्त भूमि।

[सं. पीसी टू एमएफबी/50542/एडी नारायणगढ़/एलडब्ल्यू(पश्चिम)/संस्करण-I]

सहेली घोष राय, अवर सचिव

New Delhi, the 2nd February, 2005

S.R.O. 11.—In exercise of the powers conferred by Section 3 of the Works of Defence Act, 1903 (7 of 1903), the Central Government hereby declare that it is necessary to impose restrictions specified in clause (a) of Section 7 of the said Act upon the use and enjoyment of the land described in the Schedule below, being land lying in the vicinity of Ammunition Dump, Naraingarh Road, Ambala Cantonment, District Ambala in the State of Haryana, in order that the said land may be kept free from buildings and other obstructions from the date of publication of this notification in the Official Gazette.

2. A sketch plan of the said land may be inspected in the office of the Deputy Commissioner, Ambala in the State of Haryana.

SCHEDULE

All the land comprised in the area lying within a distance of 1200 yards (1097.28 metres) from the crest of the outer parapet of the Works of Defence, namely, Ammunition Dump, Naraingarh Road, Ambala Cantonment. District Ambala in the State of Haryana

[No. PC to MF B/50542/AD Naraingarh/ LW(West)/Vol. I]

SAHELI GHOSH ROY, Under Secy.

नई दिल्ली, 2 फरवरी, 2005

का०नि०आ० 12.— रक्षा संकर्म अधिनियम, 1903 (1903 की 7) की धारा 3 द्वारा प्रदत्त शक्तियों का उपयोग करते हुए केंद्र सरकार एतद्द्वारा घोषणा करती है कि नीचे दी गई अनुसूची में उल्लिखित भूमि राजस्थान राज्य के जिला बाड़मेर के जसई में 25 गोलाबारूद कंपनी, द्वारा 56 एपीओ के निकट होने के कारण इसे भवनों तथा अन्य बाधाओं से मुक्त रखे जाने के उद्देश्य से इसके उपयोग तथा अधिभोग पर उपर्युक्त अधिनियम

Annexure 8: Growth Rate of Villages of LPA Bathinda 1981-2001

S. No.	Name of village	Population			Growth Rate		Average Growth Rate
		1981	1991	2001	1981-91	1991-2001	
1	AMAR GARH	909	942	1054	3.63	11.89	7.76
2	BAHO JATTRI	732	864	911	18.03	5.44	11.74
3	BAHO SIBIAN PATTI BASAWA	289	413	454	42.91	9.93	26.42
4	BAHO SIBIAN PATTI DHARAM	349	451	516	29.23	14.41	21.82
5	BALADEWALA	1562	2044	2345	30.86	14.73	22.79
6	BALAHAR VINJHU	1333	1568	1849	17.63	17.92	17.78
7	BEHMAN DEWANA	4008	4631	4981	15.54	7.56	11.55
8	BHAGU	1750	1837	1905	4.97	3.70	4.34
9	BHOKHRA	2642	3328	3786	25.97	13.76	19.86
10	BHUCHU KALAN	4882	5893	6349	20.71	7.74	14.22
11	BHUCHU KHURD	3624	3856	4446	6.40	15.30	10.85
12	BIBIWALA	1815	2071	2657	14.10	28.30	21.20
13	BIR BEHMAN	1652	2026	2224	22.64	9.77	16.21
14	BIRTALAB URF TALABNEI	1721	3130	4507	81.87	43.99	62.93
15	BURJ KAHAN SINGH WALA	1270	1454	1778	14.49	22.28	18.39
16	CHAK GONIANA KALAN	0	0	0			
17	CHAK GONIANA KHURD	0	0	0			
18	CHUGHA KHURD	1535	2048	2245	33.42	9.62	21.52
19	DEON	4806	5618	6487	16.90	15.47	16.18
20	GHUDDA	3448	4031	4649	16.91	15.33	16.12
21	GILL PATTI	2334	2921	2957	25.15	1.23	13.19
22	GONIANA KALAN	1345	1589	1801	18.14	13.34	15.74
23	GONIANA KHURD	1468	1231	2029	-16.14	64.83	24.34
24	GULAB GARH URF NAIWALA	1220	1561	1636	27.95	4.80	16.38
25	GURUSAR SAINE WALA	1791	2086	2468	16.47	18.31	17.39
26	JAI SINGH WALA	3046	4013	4549	31.75	13.36	22.55
27	JASSI PAU WALI	1780	2862	2759	60.79	-3.60	28.59
28	JHUMBA	3051	3801	4069	24.58	7.05	15.82
29	JODHPUR ROMANA 0064	2621	2039	2083	-22.21	2.16	-10.02

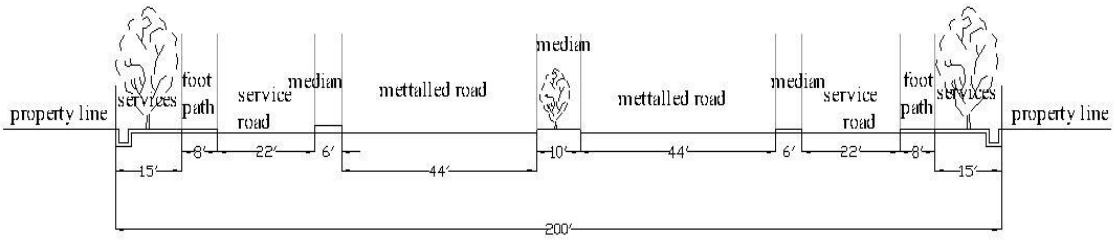
30	JOGANAND	1476	1653	1824	11.99	10.34	11.17
31	KATAR SINGH WALA	1199	1532	1866	27.77	21.80	24.79
32	KOT GURU	1634	2053	2373	25.64	15.59	20.61
33	KOT SHAMIR	7369	8341	9314	13.19	11.67	12.43
34	LEHRA BEGA	2362	2843	2922	20.36	2.78	11.57
35	LEHRA KHANA	1579	1837	2063	16.34	12.30	14.32
36	MIAN	703	769	796	9.39	3.51	6.45
37	MULTANIA	1077	1191	1320	10.58	10.83	10.71
38	NARUANA	2640	3186	3550	20.68	11.42	16.05
39	NEHIAN WALA	4208	5208	6083	23.76	16.80	20.28
40	PHULO MITHI	2747	3090	3692	12.49	19.48	15.98
41	PHUS MANDI	1335	1515	1667	13.48	10.03	11.76
42	SIBIAN	3853	4645	5417	20.56	16.62	18.59
43	TEONA	2664	3225	3605	21.06	11.78	16.42
	TOTAL	91829	109842	123986			

Annexure 9: List of Trees recommended for Plantation on the Main Roads within Urban Limits/ Master Plan Areas

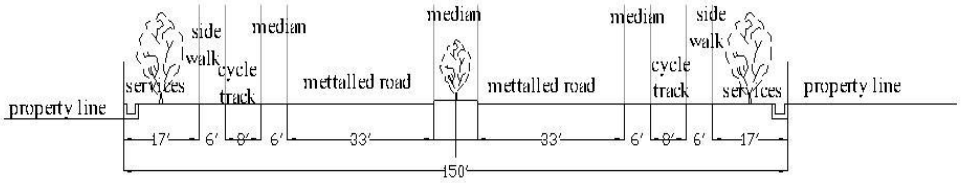
Sr. No.	Name of tree (Botanical/ common)	Description
1.	Alstonia scholaris (Chhatim)	Tall tree with columnar shape, Evergreen, very ornamental, bears greenish-white flowers in October- December.
2.	Barringtonia acuitangula (Smudar Phal)	Medium tree with spreading habits, deciduous from April to May. Ornamental foliage and flowers in pendulous branches. Bears crimson flowers in April and September.
3.	Bauhinia blackiana (Kachnar)	Small tree, evergreenwith columnar form, highly attractive and ornamental. Propagated by layers and cuttings. Flowers deep pink from January to April and from Septermber to Novermber.
4.	Bauhinia purpurea (Kachnar)	Medium tree, with columnar form, evergreen, bears purple coloured flowers in November.
5.	Bauhinia variegata (Kachnar)	Medium tree with columnar form. Sheds leaves in January-February, profusely flowering tree, highly beautiful when in bloom, bears pink, white and purple coloured flowers in February, March, April
6.	Cassia fistula (Amaltas)	Tall columnar shaped tree, leafless in April-May. Very hardy tree, looks very ornamental when in bloom. Bright yellow flowers in April-May.
7.	Cassia grandis (Pink Mohur)	Medium in height, with spreading habit. Highly ornamental tree. Bears deep carmine flowers in November, December.
8.	Cassia javanica(Java-ki-Rani)	Medium in height, leafless in April-May. It is the most beautiful flowering tree. Bears clusters of pink flowers in May-June
9.	Cassia Marginata(Pink Mohur)	Medium in height, spreading and graceful tree, bears deep pink flowers in May and June.
10.	Cedrela tuna (Tun)	Tall columnar shaped tree, lealfless in Dec.-January. fairly fast growing and hardy tree with creamy white flowers in March-April.
11.	Chakarassia Tabularis	Tall spreading tree, evergreen and hardy. Excellent for shade. Flowers are greenish, white in April-May.
12.	Chorisia speciosa(Maxican Silk Cotton Tree)	Medium in height, pyramidal in shape,leafless from October to January, fast growing, bottle shaped green trunk. Flowers are of pink and yellow colour in October-November.
13.	Delonix Regia (Gulmohar)	Tall tree, with spreading crown, leafless from Jan.-March. Fast growing, very ornamental creates mass colour effect with orange red flowers from April to June.
14.	Ficus religiosa (Pipal)	Tall columnar shaped tree, lelafless in February-March, very hardy and fast growing, flowers pale green in April.

15.	Ficus infectoria(Pilkhan)	Tall spreading, fast growing and hardy tree, leafless in March, good for shade, need protection from cattle, green yellow flowers in Nov., Dec.
16.	Hetrophragma roxburghii (Marour Phaly)	Tall columnar tree, ever green, flowers are of pale, yellow brown colour in March.
17.	Jacranda mimosaefolia (Jakaranada or Neely-Gulmohar)	Medium in height, leafless when in bloom, good for parks and houses, fern like bipinnate leaves, bears flowers of violet-blue colour in April-May.
18.	Kigelia pinnata(Jhar Phanoos)	Tall and spreading tree, evergreen hardy and fast growing flowers are of crimson, yellow and brown colour in April-May.
19.	Lagerstroemia fros-reginae (Queen's flower)	Medium sized tree, columnar shape, very pretty, leafless in winter (December-February). Purple and pinkish blooms in April-May and July-August.
20.	Lagerstroemia thorelli (Pride of India)	Medium in height, columnar in shape, beautiful tree, leafless from Dec-Feb, flowers of mauve colour from June to December
21.	Lagerstroemia rosea	Medium in height, columnar tree, very pretty. Leafless in winter (December-Feb.) with deep pink flowers from April to September
22.	Pongamia Glabra(Karanj)	Tall spreading and fast growing tree, leafless in March. Bears mauve coloured flowers in April, May.
23.	Pterospermum acerifolium (Kanak Champa)	Tall columnar tree, ever green, handsome, bears sweet scented flowers of creamy white colour in March-April.
24.	Putranjaniva Roxburghii (Jiva Pota)	Medium in height, pyramidal shaped, ever green, handsome and very graceful tree, good for shade and beautiful form. Flowers are of pale yellowish colour in March-April.
25.	Saraca Indica(Sita Ashok)	Height medium, spreading tree, ever green, very hardy, foliage glossy and ornamental. Highly flow growing takes 30 years to become a good tree. Bears highly attractive scarlet coloured flowers in large compact clusters in Feb. – March.
26.	Schleichera Frijuga(Kusum)	Tall columnar shaped tree, evergreen, good for shade, leaves become red in March, April and again in July,-Sept. Flowers are of green colour in Feb-March.
27.	Sweitnia (Mahogany)	Evergreen, shady, attractive foliage, very hardy, tall tree with columnar shape, blooms in April, tree is slow growing and very good for avenues.
28.	Tabeuia Rosea	Small in height, golumnar in shape, dedciduous from December to February,Scanty foliage, flower colour is purple pink in Februar-March.
29	Terminalia Arjuna(Arjan)	Tall, columnar shaped tree, sheds leves in March. Very Hardy tree, flowers of pale-yellowish white colour appear in September-October.
30	Terminalia Chebula(Bahera)	Tall, Columnar shaped tree, leafless in March, Pale-yellow flowers all the year round.

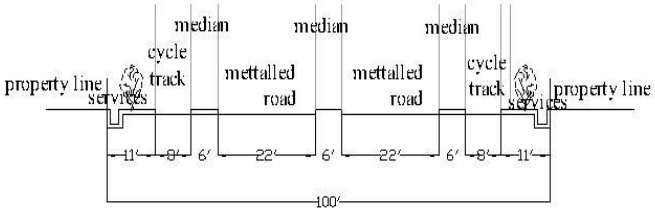
Annexure 10: Typical Road Cross Section of the Various Hierarchy of Roads.



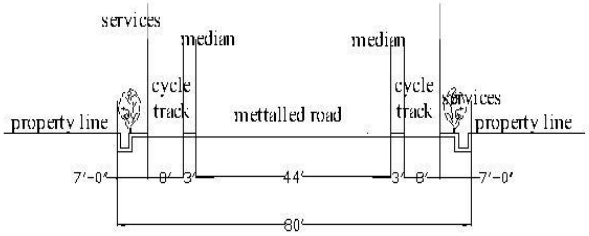
MAJOR ARTERIAL ROAD



MINOR ARTERIAL ROAD



COLLECTOR ROAD (DIVIDED)



COLLECTOR ROAD (UNDIVIDED)

Annexure 11:-Brief Summery of Zone no. 14 of LPA Bathinda

Master Plan Bathinda 2009-2031 is to be notified under section 70(5) of the "Punjab Regional and Town Planning and Development (Amendment) Act, 2006. There is a need to regulate and guide the development of the area. Hence the entire Local Planning Area, Bathinda has been sub-divided into 16 different zones so that for each zone, a zonal plan could be prepared which will act as a link between the proposals of Master Plan and the Layout Plan.

1.1 Parameters defined by the Master Plan for delineation of zone boundaries

As mentioned above, the entire Local Planning Area has been divided into 16 zones (except areas within Municipal Corporation and Municipal Council limits) and numbered as Zone '1' to Zone '16'. These zones have been delineated, keeping in view, the physical features like Roads, Railways and Canals and village boundaries. Besides this, the proposed road network in the Master Plan also forms basis of delineation of zones in some cases. An attempt has been made to keep the zone size compact and regular for better planning and development of each zone. For the purpose of specimen of Zonal Plan of L.P.A. Bathinda the zone No. 14 has been selected and the detailed zonal plan thus prepared is explained below :-.

1.2 Location

Zone No. 14 is situated in the southern part of LPA Bathinda which is about 10 kms. from Bus stand and about 11 kms. from railway station of Bathinda. This zone comprises whole of the revenue boundary of village Kotshamir and forms the boundary of L.P.A. Bathinda also on three sides of village boundary. State highway No. 17 Bathinda-Talwandi Sabo road passes through this zone and State Highway No. 12- A i.e. Bathinda=Mansa road bifurcates from S.H. 17 at village Kotshami. In the western corner of this zone, Bathinda-Sirsa railway line also passes. Besides this there are some rural link roads in the this zone. The total area of this zone works to be 4596 hectares as per PRSC PAU Ludiana (as per revenue record 4607 hect.)

1.3 Existing land use distribution:

The detail of Existing Land Use distribution of Zone No. is given in Table No.1

Table no. 1 Existing land use distribution

Sr. No.	Landuse	Area in Hects.	Percentage
1	Residential	166.00	3.60
2	Commercial	6.00	0.13
3	Industrial	19.36	0.42
4	Public & Semi public	15.64	0.35
5	Agriculture and water bodies	4389.00	95.50
	Total	4596.00*	100.00

*Area as given PRSC, PAU Ludiana

The existing pattern of development in this zone is broadly agricultural. The only residential developed area is abadi area of village Kotshamir where some public and semi public uses are also existing.Out of total area of the zone about 4389 hects. are under agricultural use and water bodies which is 95.52 % of total area and 166 hects. is under residential use which is 3.58 % of total area. There are some industrial units like shellers and brick killns which cover only 19.36 hects. of area. Besides this 15.64 hects. are under public and semi public uses.

1.5 Present Population

The population of Zone No. 14 is 9314 persons as per 2001 census. The population is mostly concentrated in abadi area of village Kotshamir except few farm houses scattered in revenue estate of this village. A planned colony (under development) approved by PUDA known as Sushant City also falls in this zone. The present gross residential density of population of this zone works to about 2 persons per hectare., however net residential density is 56 persons per hectare.

1.6 Existing Infrastructure

This zone falls outside the limits of Municipal Corporation of Bathinda thus lacks the urban level facilities like sewer,street lighting, proper drainage of storm water etc. however the village abadi has piped water supply system. The village ponds are the main disposal sites for domestic sewage.

The existing social and physical infrastructure available in this zone has been found sufficient for the present population according to the prescribed norms and standareds of the Master Plan. The following table shows the infrastructure available in this zone.

.**Table no. 2: Existing Infrastructure**

Name of Infrastructure	Scheduled (Population / Unit	Existing Numbers.
High/Senior Secondary Schools	7500	3
Civil Dispensary	15000	1
Post and Telegraphs	10000	1
Religious buildings	15000	3
Police Post	40000-50000	1
Veternary	10000	1

The main roads available in this zone are listed as below :-

1. Bathinda-Talwandi Sabo road State Highway

2 Bathinda-Mansa road State Highway

Besides these main roads there are some other link roads available in this zone as shown in the plan. The existing katcha rastas having a width ranging from 11 feet to 27.5 feet are also available in this zone but these rastas are mostly leading to the fields from the village abadi. The proper road heirarchy is almost missing in this zone. The buses leading to Mansa and Talwandi Sabo serve this zone, the only settlement of village Kotshamir thus is well served by bus transportation.

1.7 Projected Population

The population for this zone has been projected based upon the proposed density as per master plan. This zone falls in low density zone having a density of 100 persons and below per hectare. Hence with 4607 hectares of area the population which can be accommodated in this zone works to 4.6 lacs persons approximately.

1.8 Proposed Land Use

As per the provisions of Proposed Land Use Plan of L.P.A. Bathinda this zone has been envisaged as residential with low density development. The proposals have been made on the basis of existing tredns of development found in this area and keeping in view the impacts of coming up Oil Refinery near Tawandi Sabo. The detail of Proposed Land Use pattern in this zone is given in table below :-

Table :Proposed Land Use Zone No. 14

Sr.No.	Land Use	Area in Hectares	Percentage
1	Residential	4149.00	90.27
2	Commercial	-	-
3	Recreational	-	-
4	Traffic & Transportation	365.00	7.95
5	Public Utilities	60.65	1.32
6	Water bodies	21.35	0.46
	Total	4596.00	100

1.9 Planning concept

The Zonal Plan of this zone has been prepared keeping in mind the governing principles of town planning viz, maintaining hierarchy of roads, widening of existing road network and provision of other social and physical infrastructure to make the zone self sufficient to meet the day to day requirements of its population so as to reduce trip generation on the already over crowded city roads and to relieve the pressure on traditional bazaars of the city. The roads shall have standard cross section and the kind of trees to be planted shall be as the annexures attached with the Master Plan report of LPA Bathinda,.at annex ure 9 and 10

As per the proposals of road network for LPA Bathinda some part of outer Ring Road passes through this zone. In order to ensure free flow of traffic on this Ring Road a road overbridge (R.O.B.) has been proposed on Bathinda-Sirsa railway line. An attempt has been made to carve out small sectors of about 100 -150 hectares. The road hierarchy of proposed road network has been maintained as proposed outer Ring Road of 200 feet width, existing State High Ways have been proposed to be widened to 150 feet wide and Sector road of 100 feet width have been proposed besides the main internal roads of 80 feet width are also proposed.

A number of sites comprising about 60.65 hectares of land in zone 14 have been earmarked and rationally distributed in whole of the zone for public and semi public utilities where provision of water works, sewerage disposal and electric grid station and physical infrastructure etc can be allowed. Care has been taken to locate these sites on minimum 60’ / 80’ wide roads and above so as to cater conveniently to the future traffic requirements of these pockets. Besides this, panchayat land in

this zone where available is proposed to be used for public utilities or for creating any other physical / social infrastructure. However, the other infrastructure like communication tower, petrol pumps etc shall be provided as per the siting norms. Utilities shall be laid as per the design requirements of the concerned department. The remaining area of this zone shall be developed according to the provisions of PAPRA, 1995. The detail of proposals are as per Zonal Plan Drawing No. DTP(B). 1591/09 dated 25/11/09 attached overleaf.

1.10 Zoning Regulations and Development Controls

The zoning regulations and development controls as mentioned in the Master Plan Bathinda shall be applicable to these zones.

8: Zonal Plan of Zone-14.

GOVERNMENT O PUNJAB

DEPARTMENT OF TOWN AND COUNTRY PLANNING PUNJAB

Notification

The 21 July, 2011

No. 5117 CTP (Pb)/SB-59 Whereas Master Plan Bathinda has been notified vide notification no. 4030CTP(Pb)/SB-59 dated 25/5/10. Whereas certain changes were necessitated in the public interest during implementation u/s 77 of The Punjab Regional and Town Planning & Development (Amendment) Act, 2006.

The Government in consultation with The Punjab Regional and Town Planning and Development Board has approved that within municipal limts, municipal bye-laws will be applicable and also approved that mixed land use will be allowed along the already notified commercial streets within the municipal limts. Before the notification of Master Plan u/s 70(5).

It shall come into operation from the date of its notification.

This issues with the approval of the Government vide memo no. 12/49/2006-4ਹਿਉ1/2707 Date 15-7-11

Sd/-

(K.S. Dhaiiwal)

Chief Town Planner, Punjab,
Old Estate Office Building, Madhya Marg, Sector 18-A, Chandigarh

Endst. No. 5118 CTP(PB)/SB-59 Dated Chandigarh, the, 21-7-2011

A copy is forwarded with a spare copy to Controller, Printing and Stationery Department, Punjab. Chandigarh along with soft copy (CD.) and report containing all documents with the request to publish this notification in the Punjab Government Gazette and 100 copies thereof be supplied to this Department for office use.

Sd/-

Chief Town Planner,

Punjab, Chandigarh.

Endst No.5119-CTP(Pb)/- SB-59 Dated Chandigarh, the, 21-7-2011

A copy is forwarded to Secretary, Housing and Urban Development Deptt. Punjab Chandigarh w.r.t. memo no No. 12/49/2006-4ਹਿਉ1/2707 Date 15-7-2011 for information

Sd/-
Chief Town Planner,
Punjab, Chandigarh