



LAHORE DEVELOPMENT AUTHORITY

**INTEGRATED MASTER PLAN
FOR
LAHORE-2021**

**FINAL
VOLUME - I
EXTENDING SCENARIOS**



NATIONAL ENGINEERING SERVICES PAKISTAN (Pvt.) Ltd.
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Lahore master plan
urban plan
En. 11/2011*



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PREFACE

This report is the fourth deliverable required to be presented to Lahore Development Authority (LDA) towards the finalization of Integrated Master Plan for Lahore (IMPL), in accordance with the contract for Consultancy Services and Terms of Reference. The first draft of this report was submitted to LDA in July 1998. Various observations/ comments on the draft report were received and incorporated and the revised version in the form of second draft report was submitted to LDA in November 2002.

A series of presentations made to various government agencies, the technocrats and professionals including town planners, architects, engineers, builders, administrators etc. at various forums to invite their suggestions/ comments which were accordingly incorporated in this document. This report got clearance from the Project Steering Committee on June 23, 2004 and was approved by the Lahore District Council on October 06, 2004.

The published report on 1998 Population Census for Lahore District was available as from February 2001. Since population is the basic parameter for undertaking planning studies, the whole data base of this report was revised/ updated according to the latest census figures. The purpose of this exercise/ assignment is essentially to establish an integrated framework for the development of Lahore by the year 2021 and to create a sustainable working and living environment for its citizens while improving the quality of life.

The preparation of IMPL has been undertaken through a comprehensive process of data accumulation, processing, surveys, field visits, and analytical studies. Extensive discussions with public and private sectors including eminent professionals, civic personalities and special interest groups were also an important element of their participation in the plan formulation. IMPL in essence, therefore, is also intended to serve as a practical working document with sound basis, for the concerned authorities to adopt the proposals and recommendations, and proceed to plan implementation.

This report is divided and submitted into three separate volumes as follows:

Volume-I	Existing Scenario
Volume-II	Analysis and Proposals
Volume-III	Short Term Plan

Volume-I presents a review of existing scenario in Lahore and covers all aspects of the metropolitan area, namely historical background, physical characteristics, socio-economic profile, land development, land use, housing, transportation, community facilities, utility services, environmental issues and urban governance.

Volume-II of the report focuses on the analysis of the above situation and preambles the structure for plan making. It discusses key issues that are to be addressed, the growth components, potentials and constraints of Lahore Metropolitan Area (LMA). This is followed by the proposals for the Integrated Master Plan up to the year 2021. It presents recommendations in all sectors of urban development i.e. land use, land development, housing, transportation, community facilities, public utilities, infrastructure, environment and institutional framework.

Volume-III presents a list of projects identified in various sectors with tentative cost estimates for implementation during the first 5 years.

Apart from the three volumes of the report mentioned above, an Executive Summary is also given in a separate volume which presents the salient features of the three volumes of the Master Plan Report in a summarized form.

NESPAK gratefully acknowledges with gratitude the co-operation of LDA and its associated agencies such as WASA and TEPA including the Ex-Additional Director General (Town Planning) LDA, the Managing Director WASA, the Chief Traffic Engineer TEPA, for their help during formal and informal discussions at various stages of this assignment.

Special thanks are due to Mian Aamir Mahmood, District Nazim; Mr. Akhlaq Ahmad Tarar, Director General LDA; Mr. Khalid Sultan, District Coordination Officer; and Mr. Shaukat Jamal Khawaja, Chief Metropolitan Planner, LDA for their valuable contribution, guidance and help throughout during the preparation of this document.

Last but not the least, are the six Town Nazims of the City District Government, the District Officers (Planning and Coordination) of these Towns, Executive District Officer (Works and Services) and various officials of the City District Government who have directly or indirectly contributed during the Plan preparation. Thanks are also due to various other public agencies like Provincial P&D Department, Housing and Physical Planning Department, Transport Department, Environment Protection Department, Ex-Metropolitan Corporation Lahore (ex-MCL), Lahore and Walton Cantonment Boards, Parks and Horticultural Authority (PHA), Meteorological, Education, Health and Irrigation & Power Departments, Punjab Bureau of Statistics, Water and Power Development Authority (WAPDA), Sui Northern Gas Pipelines Limited (SNGPL), Pakistan Telecommunications Corporation Limited (PTCL), the private sector and numerous individuals who rendered their assistance and guidance on various occasions.

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INTEGRATED MASTER PLAN FOR LAHORE

VOLUME-I: EXISTING SCENARIO

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LIST OF ABBREVIATIONS USED IN THE REPORT

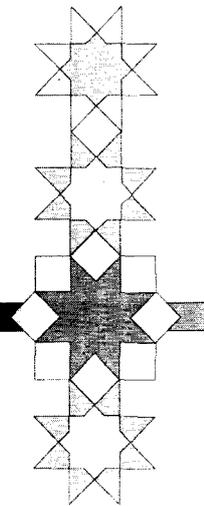
AC	Asbestos Cement
ACSR	Aluminum Conductor Steel Reinforced
ADB	Asian Development Bank
ADP	Annual Development Plan
Amp	Ampere (unit of electric current)
BOD	Bio-Chemical Oxygen Demand
BRB	Bambanwala Ravi Bedian Canal
CADPAD	Computer Aided Distribution, Planning and Design
CBD	Central Business District
CDG	City District Government
CDM	M/s Camp Dressers and Mckee
CDWP	Central Development Working Party
Cfs	Cubic feet per second
CI	Cast Iron
CMP	Chief Metropolitan Planner, LDA
COD	Chemical Oxygen Demand
CTE	Chief Traffic Engineer, TEPA
DG	Director General
DI	Ductile Iron
DMD	Deputy Managing Director
DO	Dissolved Oxygen
DTA	District Transport Authority
DTP	Director Town Planning, LDA
EIS	Environmental Impact Statements
EPA	Environmental Protection Agency
EPD	Environment Protection Department
E&T	Excise and Taxation Department
ft	Feet
GI	Galvanised Iron
gpcd	Gallons per capita per day
Ha	Hectare
HFL	High Flood Level
HIES	Household Integrated Economic Survey
HRT	Heavy Rail Transit
HT	High Tension
HUD&PHED	Housing, Urban Development and Public Health Engineering Department
Hz	Hertz (cycle per second)
IDA	International Development Agency
IMA	Inner Metropolitan Area
JICA	Japan International Cooperation Agency
Km	Kilometre
KV	Kilo Volt
KVA	Kilo Volt Ampere
KW	Kilo Watt
LCB	Lahore Cantonment Board
LCCHS	Lahore Cantonment Cooperative Housing Society
LDA	Lahore Development Authority
LGO	Local Government Ordinance
LHV	Lady Health Visitor
LIT	Lahore Improvement Trust
LMA	Lahore Metropolitan Area
LMC	Lahore Municipal Corporation
LPB	Lahore Protection Bund
Lpcd	Litres per capita per day
Lps	Litres per second
LRT	Light Rail Transit
LSP	Lahore Sanitation Programme
LT	Low Tension

LIST OF ABBREVIATIONS USED IN THE REPORT

LTR	Lahore Telecommunications Region
LUDTS	Lahore Urban Development and Traffic Study
LUTP	Lahore Urban Transport Project
m	metre
m ³ /s	cubic metres per second
mcf/d	million cubic feet per day
MCH	Maternity and Child Health Centre
MCL	Metropolitan Corporation Lahore
mcmd	Million Cubic Metres per day
MD	Managing Director
MEUAFW	Ministry of Environment, Urban Affairs, Forestry and Wildlife
mgd	million gallons per day
mpn	Most probable number
MTS	Model Town Society
MVA	Mega Volt Ampere
NCS	National Conservation Strategy Project
NEQS	National Environmental Quality Standards
NESPAK	National Engineering Services Pakistan (Pvt.) Limited
NGO	Non-Governmental Organisation
NTRC	National Transport Research Centre
O&M	Operation and Maintenance
ODA	Overseas Development Agency
P&E	Planning and Evaluation
RCC	Reinforced Cement Concrete
PCU	Passenger Car Unit
PDWP	Provincial Development Working Party
PHC	Primary Health Centre
PIHS	Pakistan Integrated Household Survey
PLGO	Punjab Local Government Ordinance
PMDF	Punjab Municipal Development Fund
PRTC	Punjab Road Transport Corporation
PTA	Provincial Transport Authority, Punjab
PTCL	Pakistan Telecommunications Corporation Limited
PUDP	Provincial Urban Development Project
PVC	Polyvinyl Chloride
ROW	Right of Way
Rs	Pakistan Rupees
RTA	Regional Transport Authority
SAP	Social Action Programme
SEC	Shalimar Escape Channel
SNGPL	Sui Northern Gas Pipelines Limited
SWM	Solid Waste Management
TDCP	Tourist Development Corporation Punjab
TDS	Total Dissolved Solids
TEPA	Traffic Engineering and Transport Planning Agency
TSS	Total Suspended Solids
UBD	Upper Bari Doab Canal
UD	Urban Development Wing, LDA
UET	University of Engineering and Technology, Lahore
UNEP	United Nations Environmental Programme
WADPA	Water and Power Development Authority
WASA	Water and Sanitation Agency
WHO	World Health Organisation

VOLUME I

EXISTING SCENARIO



1.0 INTRODUCTION

1.1 GENERAL

Lahore commands a strategic political and administrative role as the Capital of Punjab Province and the second largest city of Pakistan. It is situated in the north-eastern part of Pakistan with its centre lying within 25 km of the international border with India (Figure 1.1). It occupies a focal position in the Upper Indus Plain and is located along the left bank of River Ravi. It has grown along the historic route linking Central Asia with the Sub-continent.



LOCATION OF LAHORE

Fig:1.1

Evolution of Lahore Metropolis dates back to the first millennium. During the regimes of this era, Hindu, Afghan, Turk and Mughal Rulers, made periodic changes in the physical form of Lahore, which were mostly confined within and around the Walled City. Development of Civil Lines and Cantonment by the British Empire in 1857, provided strong impetus towards urbanization.

Partition of the Sub-continent in 1947 brought a major upheaval and everlasting changes in the socio-economic and physical set up of Lahore.

The Study Area, for the purpose of Integrated Master Plan for Lahore (IMPL) follows Lahore Metropolitan Area (LMA¹) boundaries under the jurisdiction of LDA (Figure 1.2). LMA consists of most parts of Lahore District, part of Kasur District and Ferozewala Tehsil of Sheikhpura District. LMA covers an area of 2,306 sq.km inclusive of 250.61 sq.km (10.86%) under

¹ LMA was notified under the orders of The Governor of Punjab vide Housing and Physical Planning Department's notification dated May 19, 1975. It was further extended towards the south in its current size and shape vide notification dated January 19, 1988 by the Director General, LDA.

Ex-Metropolitan Corporation Lahore (Ex-MCL) and 92.67 sq.km (4.02%) under Lahore Cantonment Board (LCB).

LMA slopes from 213 m (700 feet) above mean sea level in the north-east to 208 m (683 ft.) in the south-west. Gradients within the area range from 0.2 to 0.4 m per km (1 to 2 feet per mile).

Between 1951 and 1965 the population and built up area of the city increased two folds. The city continued to grow and by 1998, Lahore was transformed into a metropolis with a population of about 5.18 million and a developed area of about 300 sq.km. LMA by now (2001) is estimated to have a population of 7.71 million including the part of Lahore District not currently included in LMA.

In terms of cultural, recreational, commercial, educational and health services, Lahore's area of influence is well beyond its metropolitan boundaries and extends deep into the province and the international sphere.

1.2 HISTORY AND EVOLUTION OF LAHORE

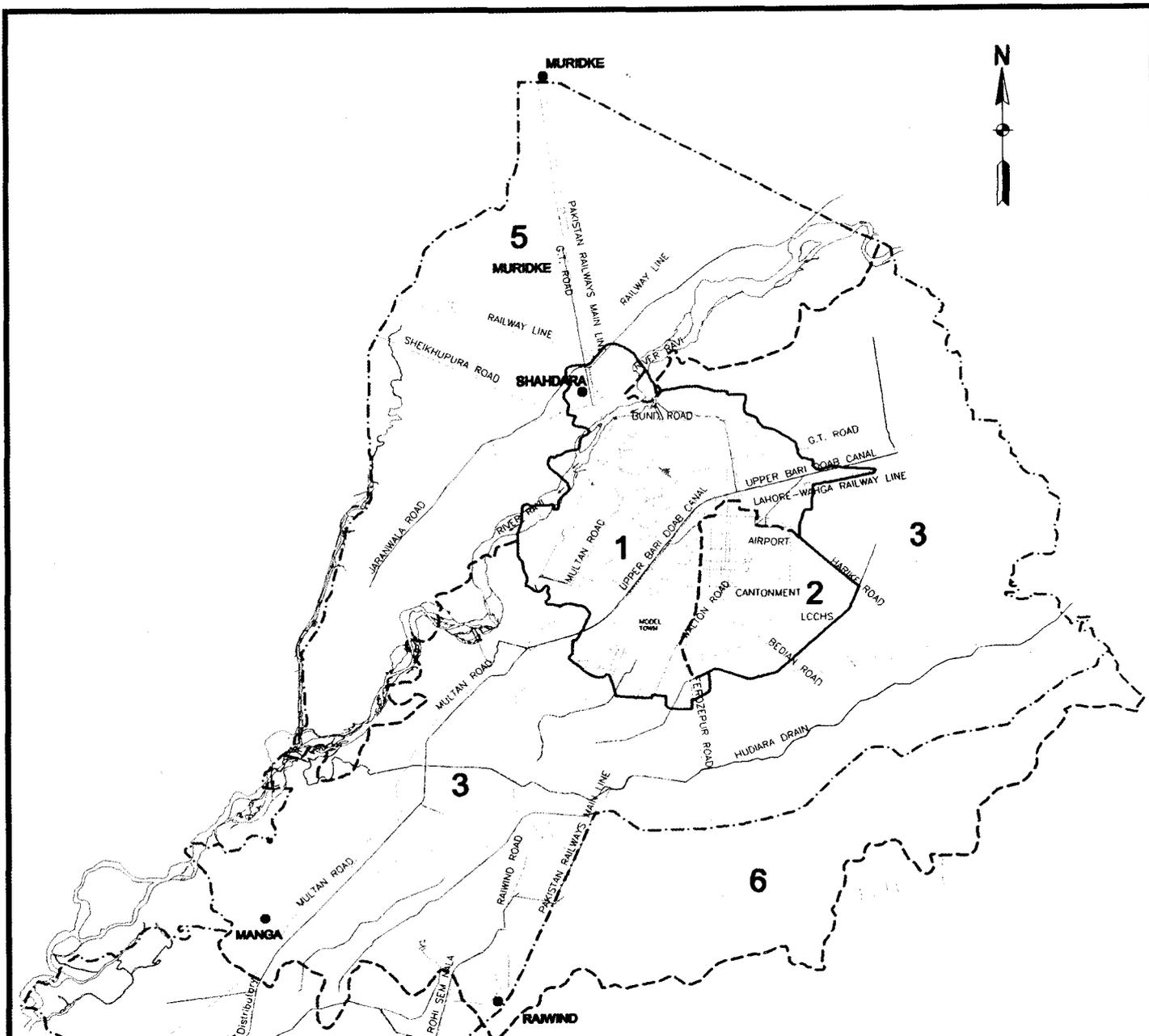
According to Hindu tradition, Lahore was founded by Loh-son of Rama, and the present day name of Lahore is a variation of the original word Lohawar-meaning "Fort of the Loh" which gradually changed to Lahore.

The historians have not been able to discover the exact date or period of the foundation of Lahore. It is generally believed that Lahore, if it existed did not have any importance up to the first century A.D. because there is no mention or indication of Lahore, nor of any city the with which it could be justifiably identified in the writings of the Greek historians who covered Alexander's expeditions. It is evidently clear that Alexander crossed the Ravi in the vicinity of Lahore and must have passed by the site of modern city.

For the first time in recorded history, Lahore appeared in the memoirs of famous Chinese globe trotter. Hiuan Tsiang, who mentioned it as a large Brahaminical city visited by him in A.D. 630 while on his way to Jullandar.

In 988 A.D. Subaktagin, the ruler of the Kingdom of Ghazna, invaded Punjab and defeated the Rajput ruler Jaipal. Later on Sultan Mahmood, the son and successor of Subaktagin, followed the footsteps of his father and subjected Punjab to many successive and successful invasions. Most prominent attack on this area was made by him in 1008 A.D. when the Rajput ruler Anandpal was decisively defeated and Lahore annexed to the Kingdom of Ghazna.

After eliminating Hindu power, Sultan Mahmood appointed Malik Ayaz as the Governor of Punjab who is known as founder of Lahore by virtue of one Muslim Tradition. During the reign of Sultan Masud (III) (1099-1114 A.D.) Lahore became the seat of the government of Kingdom of Ghazna.



No.	Area Under LMA	Sq.km	%
1	EX-MCL	= 250.61	10.9
2	LCB	= 92.67	4.0
3	EX-Lahore Distt Council	= 1068.43	46.3
4	Kasur District	= 263.50	11.4
5	Sheikhupura District	= 631.49	27.4
	Total LMA	= 2306.70	100.0
6	Area of Lahore District Outside LMA.	= 306.6	

SCALE 1:400,000

THE STUDY AREA
(Lahore Metropolitan Area)

Fig: 1.2

In 1186 A.D., Sultan Muhammad Ghauri defeated the last Ghaznavid ruler Khusro Malik and established his hold over Lahore.

Qutab-ud-Din Aibak was appointed as Governor of Lahore by the Sultan of Ghaur in 1206. He died in 1210 playing Chaugan (a kind of Polo) and was buried in Lahore. After his death, Nasir-ud-Din Kibacha, assumed control of Lahore. In 1217 A.D. Sultan Shams-ud-Din Altamash became the master of the city who died in 1230. After him Razia Sultana ruled for three years and replaced by Muiz-ud-din Behram who ruled over here till 1239 A.D. Lahore was taken by Mangols in 1241 and put to ransom in 1246.

Mohammad a son of King of Throne of Dehli (from 1266-1286) was appointed as the Governor of Punjab by his father. He established his seat at Lahore supervised the rehabilitation and reconstruction of Lahore which had been devastated by Mangol invasion in 1241 A.D. In the year 1289 A.D. the Khilji's seized the reign of power and ruled over the Sultanate of Dehli till 1321 A.D. During this period Lahore did not figure prominently in affairs of the Sultanate.

Ghias-ud-Din Tughlaq founded the Tughlaq Dynasty which ruled over India from 1321 to 1414 A.D. In 1342 Khokhars invaded and captured Lahore. However, it was some how recovered by Sarang Khan. In 1398 A.D. Taimurlung during invasion of Tamerlain (Taimur) in Punjab, beside other areas of the Province, Lahore was also captured by a detachment of his Army.

After return of Mangols, Khizar Khan became the Governor of the principality which included Lahore, Multan and Depalpur. Lahore laid desolate till it was rebuilt by Mubarik Shah in 1422 A.D. He was a representative of Tamerlain in India. In 1445 A.D, Bahlol Khan Lodhi became a Governor of Lahore and Depalpur who finally founded the Lodhi Dynasty in 1451 which continued till 1524 during this period. Lahore remained a part of this Sultanate.

Babar invaded Punjab in 1524 A.D. and captured Lahore in the same year and Dehli in 1526 A.D. thus laying the foundation of Mughal Dynasty which ruled over India till 1759 A.D. The period of Mughal's rule over India can be safely termed as the golden period of Lahore. After the death of Babar in 1530 A.D, his son Hamayyun became the king followed by Akbar the Great who became the third Mughal Monarch in India in 1556.

Lahore gained importance after the accession of Akbar. Abul Fazal describing Lahore in the Second Year of Akbar's reign said "It is a very populous city, the grand resort of people of all nations and a centre of extensive commerce. In the shortest (possible) time large armies can be mobilized from here and ammunition in any quantity procured for the use of troops"

From 1584 A.D. Akbar stayed in Lahore, held his court and made it his headquarters to conduct and supervise the military operations for the subjugation of north-eastern Afghans and conquests of Kashmir, Sindh and Kandhar. Akbar appointed Toder Mal as Deewan of Lahore. Todar Mal

belonged to Chunian, now a tehsil of District Kasur, and had considerable skill in revenue administration. For the first time in the history of Lahore he introduced logical system of land measurement and revenue account. He also gave Lahore a new rent roll.

During the period of Akbar Lahore became a centre of vital importance. He raised many gardens and got the wall constructed around the city. Lahore also became a great seat of learning, knowledge, arts and crafts. Many institutions which attracted scores of foreign students from far and wide, cropped up here in a short span of time. Like Akbar, his son Jehangir had also developed fondness for Lahore and as a matter of routine he used to hold his courts at Lahore while on his way to Kabul or Kashmir and back. He died in 1627 and was laid to rest at Lahore. Jehangir's Mausoleum is one of the famous buildings amongst the rich Moghul architectural treasure of the city.

Shah Jehan, the third son of Jehangir is known in the history of India as a great builder. In 1634 A.D. he ordered the laying of the Shalimar Garden. He also ordered the repairs and reconstruction of Lahore Fort. Under his orders and as per his desire the local chiefs constructed many beautiful buildings in Lahore and decorated the existing ones. After Shah Jahan the coronation of Aurangzeb took place in 1659 A.D. He ordered the construction of Badshahi Mosque and about four miles long embankment, known as Band-e-Alamigiri, in order to protect the city of Lahore from floods. He died in 1707 A.D. For more than thirty years thereafter Lahore did not witness much of political or military activity except a bit of striving by the sikhs.

In 1738 A.D. Nadir Shah Durrani crossed Indus and invaded India. A detachment of twenty thousand horsemen headed towards Lahore. The then Governor of Lahore, Zakriay Khan, surrendered after two days siege. Nadir Shah accepted ransom in lieu of plundering the city.

In 1748 A.D. Ahmad Shah Abdali conquered Lahore and kept coming to Punjab and going back to Kabul a number of times during the next 20 years. In 1767 A.D. he adopted a conciliatory policy towards the sikhs and confirmed Lehna Singh as the ruler of Lahore and returned to Kabul. For three decades, Lehna Singh and his associates ruled over Lahore without any interruption.

Ranjit Singh formally took over Lahore in 1799 A.D. He fell on Muslims with a very heavy hand. He virtually destroyed their places of worship, demolished several monuments and buildings which projected the glamour and glory of the Muslim rule, confiscated their properties and distributed the same among sikhs. He converted many important mosques and places of worship in Lahore into powder magazines or workshops for the manufacture of fire-arms and ammunition and stables for the horses. On the whole, Lahore and its Muslim inhabitants bore the major brunt of the prejudices of Ranjit Singh.

After the death of Ranjit Singh the Sikh Rule gradually weakened and finally the British Army entered Lahore on 20th February 1846 A.D. In December

1846 the Council of Regency was established and the British Resident became the real central authority at Lahore.

The history of Lahore onwards up to the end of 19th century A.D. is more social and economic than political. It is a history of Hindu ascendance and Muslim down fall. Like other Muslim majority areas, Lahore shared the vagaries of misfortune and temperament of English over lords.

The first important step the Englishmen took, was the restoration of all places of worship and religious importance to the communities, to which they belonged. The Lieutenant Governor Sir Robert Montgomery opened the Bari Doab Canal on 11th April 1859. In 1861 the building of Lahore Railway Station was completed and the First train from Lahore to Amritsar started running for the public.

On 1st May 1862 Municipal Committee for Lahore assumed office. The same year Lawrence Garden was laid out. The Government College was established in 1861.

Lieutenant Governor of Punjab, Sir Robert Montgomery ordered the laying of garden all around the Walled City of Lahore in 1864. Montgomery Hall (now Quide-Azam Library) was constructed in Lawrence Garden in 1866. In 1868 A.D. Lahore University College was established which was later on became the University of the Punjab. Same year the Law School was established in Lahore. In 1870 Mayo Hospital was established and the Zam Zama gun placed on a platform on the Lower Mall and declared open as a monument of peace.

In 1872 a Zoo was established in Lawrence Garden and Oriental College began its classes. In 1874 the Railway Workshop started functioning. In 1876, the Senate Hall of the University College was completed. The Kinnaird High School for Girls was established in 1879. In 1881, "The Tribune" started publication as a bilingual weekly after being founded by Sardar Dyal Singh. The Punjab University Act was passed in 1881 and the Punjab University formally came into existence on 14th October 1882 and the Veterinary School was also established in the same year.

The Lahore Water Works was inaugurated in 1882 and for the first time the citizens of Lahore started getting piped water supply. In 1883 Lahore Medical College was inaugurated. Sir Syed Ahmed Khan visited Lahore in 1884. Anjuman Himayat-e-Islam was established in the same year. In the year 1885 Sir Charles Aitchison opened the Punjab Public Library on 31st December. In 1886 Punjab Chiefs College was established at Lahore. Forman Christian College started functioning in this year. In 1888 Lady Aitchison Hospital was established at Lahore. In 1889 the building of the Chief Court was completed on the Mall.

In 1911 a new Municipal Act was passed. The Lahore Electric Supply Company came into existence in April 1912. In 1913 Kinnaird High School for Girls was raised to the status of a College. It was the first college for

woman in the Punjab. In December 1917, Lord Harding, the Viceroy of India, performed the opening ceremony of the King Edward Medical College, Lahore. In 1919 the Chief Court was raised to the status of a High Court. The Lahore College for Women started its classes in 1922 in a building located on the Hall Road. This year also saw the first publication of the first Muslim daily Known as "The Muslim Outlook".

In 1923 the Lady Maclagon Training College for Women, the Government Institute of Dyeing and Galico Printing at Shahdara and the Maclagon Engineering College on the G.T. Road, started functioning. In 1925 the Irrigation Research Institute was established at Lahore. In 1926 Senate Hall, Maynard Hall and Oriental College were constructed. The year 1927 saw the opening of the Hailey College of Commerce the vacation of the Lahore Fort by the British Army, occupied since 1849, and its handing over to the Archaeological Department. On 7th March 1930, the Governor of Punjab formally opened the Punjab Dental Hospital outside Taxali Gate.

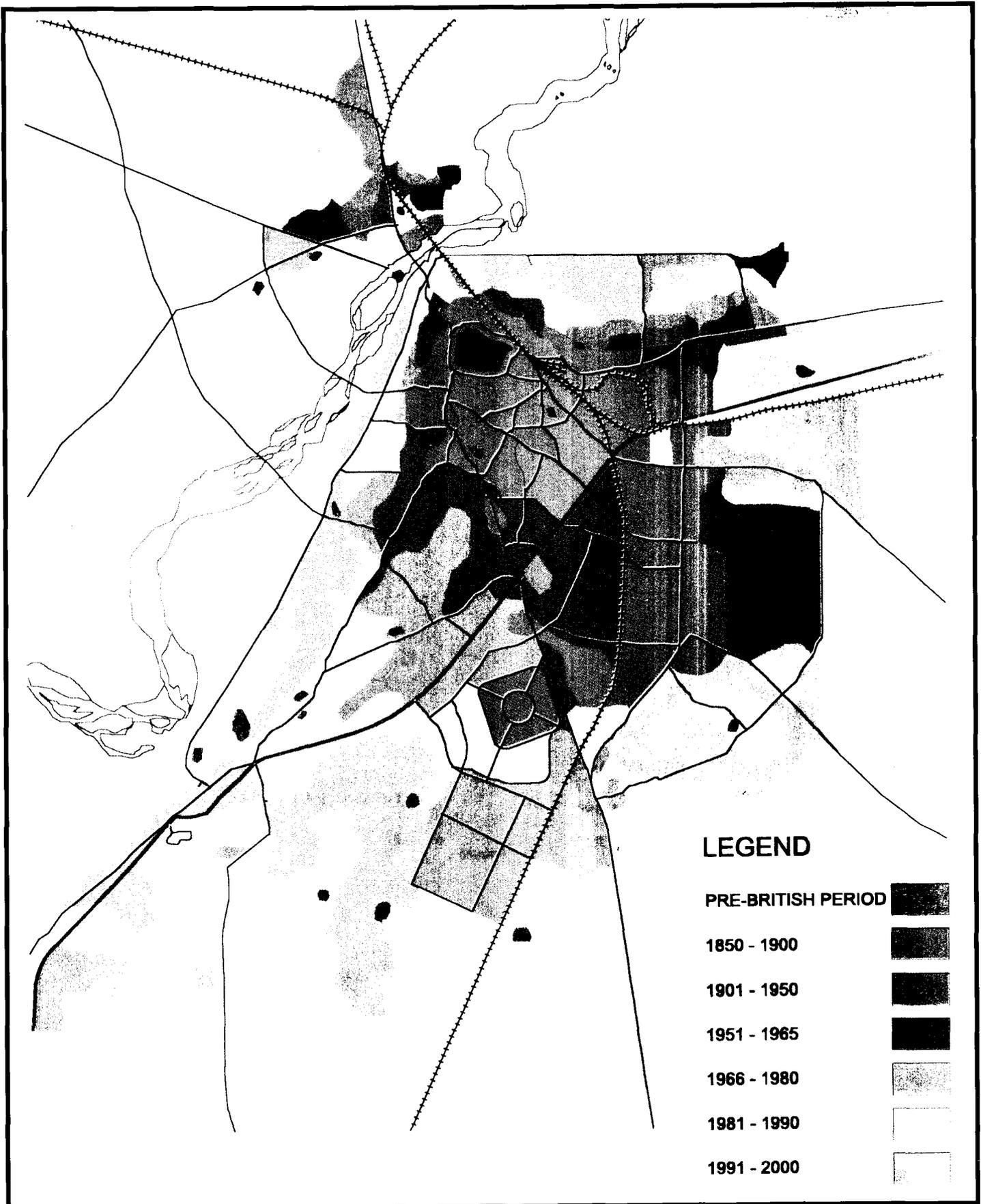
In 1934 De Montmorency College of Dentistry started functioning. In 1936, Lahore Improvement Trust (LIT) came into being. In 1934 the Broadcasting House started operating at Lahore. In 1938 the New Assembly Hall building was formally opened. On 23rd March 1940, the All India Muslim League held its session at Lahore and passed the Lahore (Pakistan) Resolution. In 1941 the Municipal Committee of Lahore was raised to the status of a Municipal Corporation and its limits extended.

Lahore underwent another convulsion with the partition of British India into independent states of India and Pakistan. About 40% of city's population migrated to India and a proportionate number of refugees came to Lahore.

Out of the total 82,000 houses located within Lahore Corporation area as many as 6000 were damaged and burnt. The job of reconstruction mostly of Walled City was entrusted to LIT under the Punjab Development of Damaged Areas Act, 1952. During fifties and sixties the LIT initiated both new and redevelopment projects such as Shahalmi, Gulberg, Samanabad, Upper Mall Scheme etc. LDA, being the successor to LIT embarked on numerous housing schemes and planning exercises, adding industrial areas, new university campus and airport to the Lahore's cityscape.

During the period of 54 years since independence, Lahore's growth has resulted in major expansion in south and southwest directions. The city's expansion on the east is hampered by close proximity of international border with India, and on the north and west by River Ravi. Figure 1.3 shows the historical growth of the city.

Besides the housing development, industrial development has also taken place with the establishment of industrial estates while small scale enterprises have come up in the old city and its immediate environs. The overall cityscape can be described as sprawling low density settlements. As described earlier,



LEGEND

- PRE-BRITISH PERIOD [darkest shading]
- 1850 - 1900 [dark shading]
- 1901 - 1950 [medium-dark shading]
- 1951 - 1965 [medium shading]
- 1966 - 1980 [light-medium shading]
- 1981 - 1990 [light shading]
- 1991 - 2000 [white]

HISTORICAL GROWTH OF LAHORE

Fig: 1.3

Lahore has also enjoyed an enviable place of learning and higher education. It has best of universities, professional colleges and vocational institutes.

1.3 SPECIAL PREMISES AND BUILDINGS OF HISTORICAL IMPORTANCE

Lahore is very rich in buildings of architectural and historical interest related to the pre-Mughal, Mughal, Sikh and British Periods. These represent the art and culture of their age. The preservation of such buildings/monuments is important to ensure their safe custody for the benefit of future generations. While undertaking the repair and preservation exercise, proper tree plantation and laying out of parks where possible around such buildings be ensured. Annex-A to Chapter-1 gives the list of buildings having architectural and historical importance which were constructed before the British Period.

Since 1849 when the British took over, the developments mostly consisted of colleges, hospitals, banks, courts, offices etc. These include Lahore Museum (1864), High Court (1889), Central Telegraph Office (1880), Lahore Railway Station, Governor House (1849), National College of Arts, Town Hall, Aitchison College, Government College, Punjab University (1876), General Post Office (1912), Lahore Gymkhana Club etc.

Post partition additions to such monuments are Minar-e-Pakistan, Summit Minar and the monuments built in the memory of soldiers who were martyred during the 1965 War with India.

In 1985 the Provincial Government promulgated Punjab Special Premises (Preservation) Ordinance for the maintenance, preservation, restoration and if necessary acquisition of buildings having cultural, historical and architectural importance. Most of the junctions envisaged in the law are to be performed by a committee constituted u/s 3(1) of the ordinance. Since the promulgation of the ordinance, 105 buildings have been notified as special premises in Lahore District and are listed in Annex-B to Chapter-1. However, due to the absence of proper Secretariat of the Committee, non-framing of rules and delegation of powers, no results are visible in terms of the objectives of the ordinance.

1.4 LAHORE IN THE REGIONAL CONTEXT

An urban area/city cannot be planned in isolation. This is particularly true in case of Lahore, which being the provincial capital and a metropolis has a vast area of influence, spreading well beyond the district/provincial boundaries.

With the creation of LDA, LMA boundary was delineated in May 1975 and was later extended towards south in January 1988 based on the growth trends in the southern corridor. Delineation of LMA boundary was effected for better development control and channelising urban growth.

LMA covered most part of District Lahore, Ferozewala Tehsil of District Sheikhupura and the adjacent rural areas of Kasur District. Lahore's

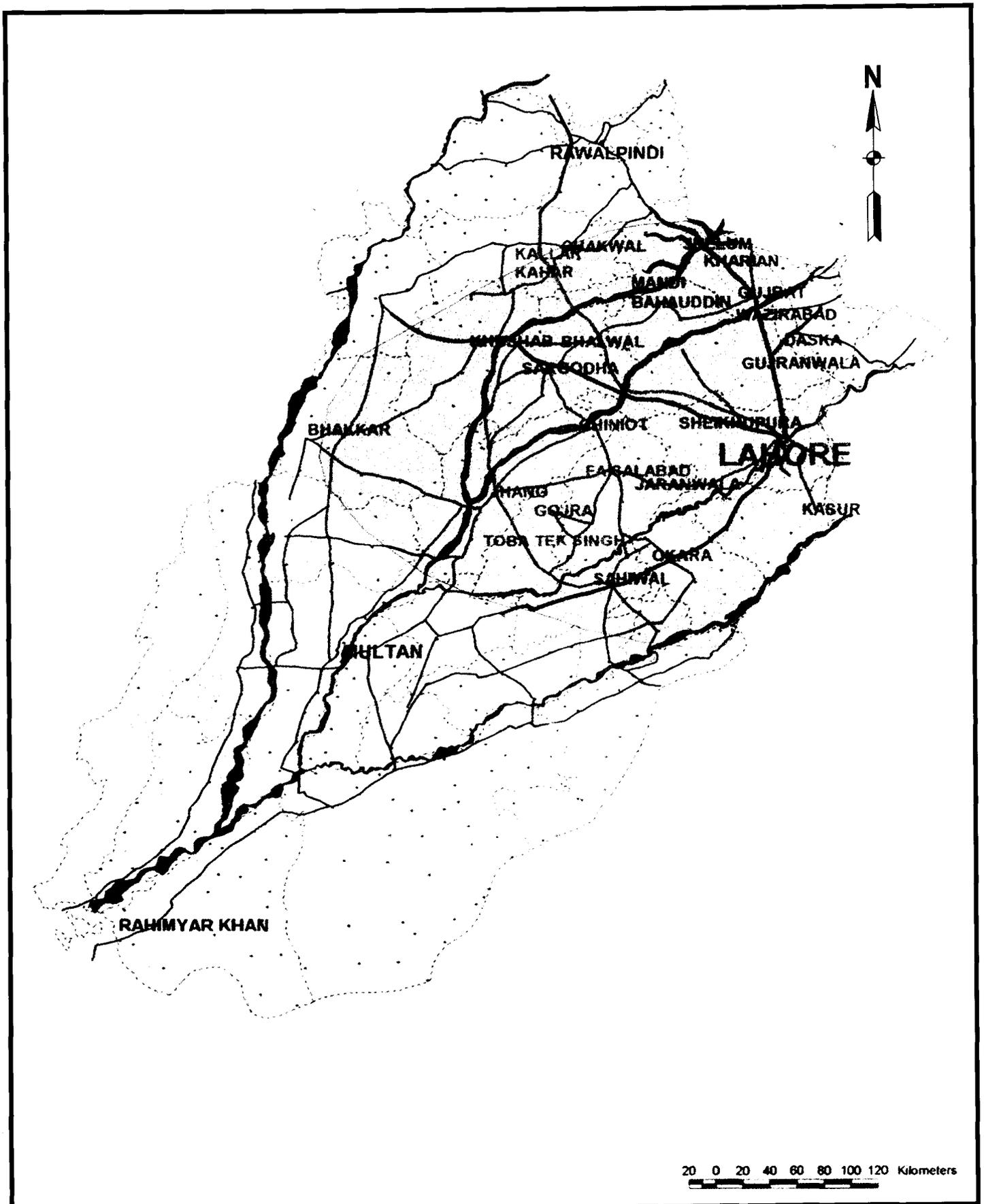
Regional Catchment Area is however much wider than the limits of LMA. As a matter of fact, 'Regional Catchment Area' is a relative term and depending upon the criteria adopted, it may vary significantly. However it must be borne in mind that for Integrated Master Plan for Lahore, the region to be considered can only extend to an area where for most purposes, the population is generally dependent upon the services available in Lahore and for facilities provided by Lahore for the surrounding settlements.

With the above objective in mind, there are different techniques to delineate the regional catchment area of a major urban centre like Lahore. These include the daily commuting pattern from surrounding rural and urban areas to Lahore, the circulation of newspapers from Lahore to other areas, supply of fresh vegetables, fruits, poultry and dairy products to Lahore, telephone calls from and to Lahore and dependence on Lahore for specialised educational, health and recreational facilities etc.

Supply of fresh vegetables to Lahore is one of the methods to determine such region. For this purpose, primary surveys were conducted in three wholesale vegetable markets including Badami Bagh, Kot Lakhpat and Allama Iqbal Town. Questions were asked from members of the Market Committees about origins of the vegetables sold in these wholesale markets. Vegetables in Kot Lakhpat Market mostly originate from District Kasur while those in Badami Bagh Market come from District Sheikhupura and environs. The origins of vegetables sold at Allama Iqbal Town Market are Manga Mandi, Bhai Pheru and areas along Multan Road.

However, Reilly's Rule of Retail Gravitation is the most robust measure to estimate the regional catchment area of an urban settlement. The technique takes into account the distances of surrounding settlements and their population. The law states that two cities attract retail trade from any intermediate town in the vicinity of the breaking point, approximately in direct proportion to the population of the two cities and in inverse proportion to the square of the distance from these cities to the intermediate town. Breaking point is a point up to which one city exercises the dominating retail trade influence and beyond which the other city dominates. Based on this technique, Lahore's region of influence has been delineated and is shown in Figure 1.4. The region so delineated includes in the immediate vicinity urban centres which have day to day dependence on Lahore such as Pattoki, Muridke, Sheikhupura, Kasur etc., apart from a large number of rural settlements. Whereas based on the above gravity model, the Lahore's area of influence includes Jhelum, Chakwal, Gujrat, Gujranwala, Sargodha, Faisalabad, Jhang, Sahiwal etc.

The above model is used to estimate catchment area in the wider context. For the purposes of this project, the catchment area of Lahore can be considered to be an area where for most purposes, the population living in that region is generally dependent upon the services available in Lahore.



REGIONAL CATCHMENT AREA OF LAHORE

Fig: 1.4

2.0 PHYSICAL CHARACTERISTICS

2.1 LOCATION

Lahore is located on a flat alluvial plain on the left bank of River Ravi. Lahore District lies between $31^{\circ}-15'$ and $31^{\circ}-42'$ north latitude, $74^{\circ}-01'$ and $74^{\circ}-39'$ east longitude. It is bounded on the north and west by Sheikhpura District, on the east by India (international border) and on the south by Kasur District. The general altitude of the area is about 208 to 213 metres above mean sea level.

Major roads connecting Lahore to other cities are G.T. Road, Multan Road, Raiwind Road, Ferozpur Road, Sheikhpura Road and Jaranwala Road. The main railway line connects Lahore to most of the settlements along northern and southern routes and also to the neighbouring country-India, through Wagha in the east.

2.2 TOPOGRAPHY

The project area (i.e. LMA) is generally flat and slopes towards south and south-west at an average gradient of 1:3000. The project area may be divided into two parts. The low lying area along River Ravi and the comparatively upland area in the east away from Ravi. The low lands are generally inundated by the river water during monsoon floods. River Ravi flows in the west of Lahore District forming the boundary with Sheikhpura District. The original physiographic features like channels ramnants, levees etc. have been destroyed or changed by the construction of urban infrastructure. Flood plains have been confined by construction of embankments (bunds), spurs etc. Meandering channels have been replaced by sewerage drains. Sub-recent flood plain is 4 to 8 metres higher than the recent flood plain and can be identified at number of places i.e. Shalimar Garden, Moghulpura and Multan Road.

2.3 HYDROGEOLOGICAL SET UP

Lahore area is underlain by unconsolidated alluvial deposits of Quarternary age. The alluvial sands constitute the aquifer material. The aquifer is composed of unconsolidated alluvial complex formed by the contemporaneous filling of a subsiding trough resulting in a huge sedimentary complex of more than 400 metres (1300 ft) thickness. The sediments have been deposited by the present and ancestral tributaries of River Indus during Pleistocene - Recent periods. In accordance with its mode of deposition by large streams in constantly shifting channels, the alluvial complex is heterogeneous and individual strata have little lateral or vertical continuity. However, inspite of their heterogenity, the alluvial sediments constitute a large aquifer which on regional basis behaves as a homogeneous and highly transmissive acquifer. The ground water occurs under water table conditions and the individual lenses of silt and clay do not impede the flow of groundwater.

Beds of gravels and very coarse sand are not common. Pebbles of siltstone or mudstone are embedded in silty or clayey sand at places. Concretions of secondary origin locally known as "Kankar" may be found in association with fine sediments.

2.4 CLIMATE

2.4.1 Temperature

Lahore experiences extremes of climate. The summer season starts in April and continues till September. The hottest months are May, June and July. The mean maximum and minimum temperatures during these months vary between 40.4 deg C and 27.4 deg C. The winter season lasts from November to March. The coldest months are December, January and February with minimum temperature reaching up to freezing point. The mean maximum and minimum temperatures for this period are 22 deg C and 5.9 deg C respectively.

Table 2.1 gives the averages of daily maximum and minimum temperatures during each month of the year along with wet bulb temperatures recorded at Lahore:

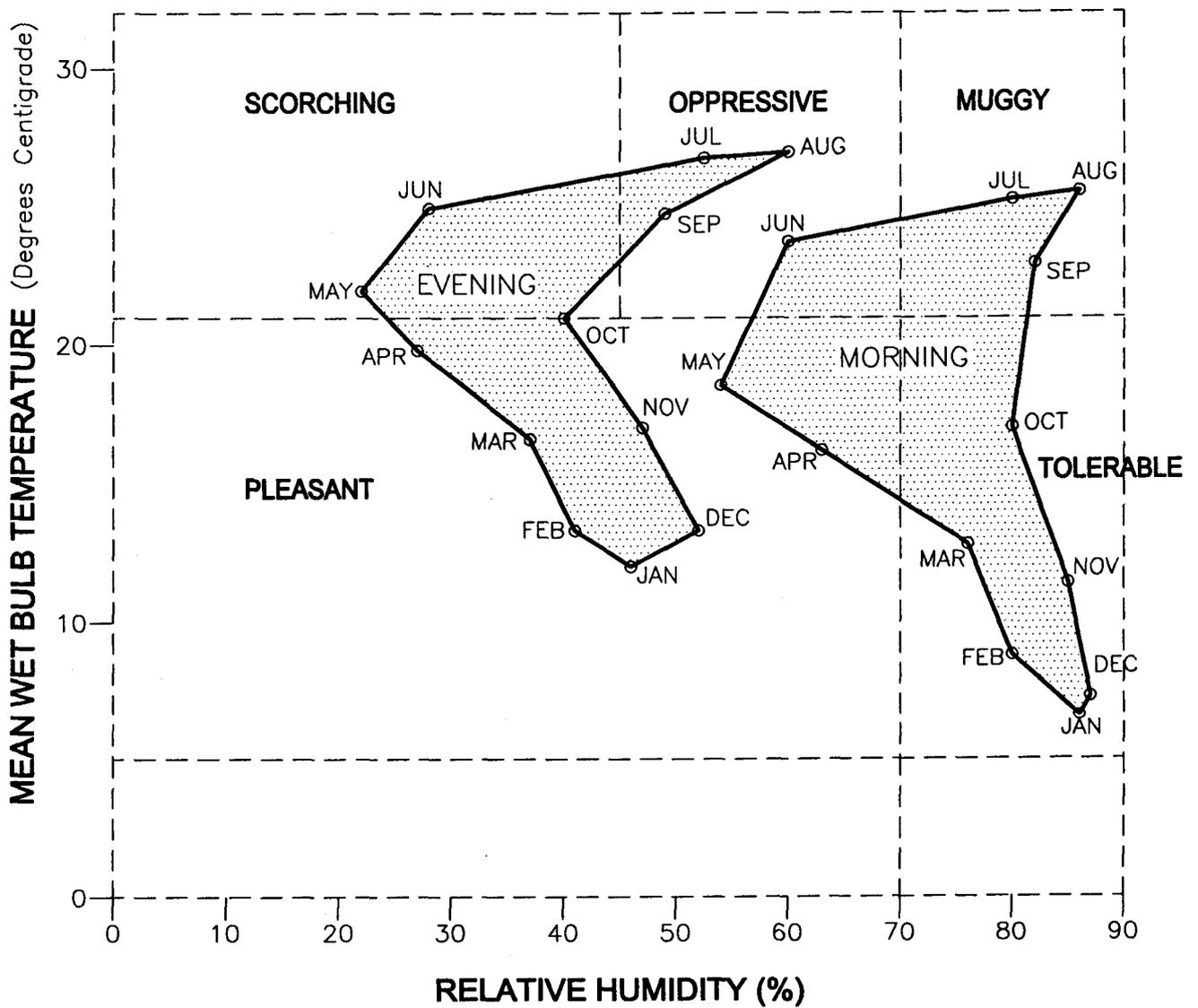
2.4.2 Humidity

Relative humidity throughout the day is higher in winter months than in summer months. May and June are very hot and dry during which dust storms occur occasionally. Towards the end of June or beginning of July, the monsoon season starts which is characterised by heavy downpour and humid sultry weather. It practically becomes oppressive in July, August and September. Monthly variation of relative humidity in Lahore is shown in Table 2.2.

Figure 2.1 shows the Climograph indicating various zones and variations in wet bulb temperature and relative humidity during morning and evening hours for various months of the year. The climograph prepared on the basis of 30 years data (1961-90) shows that climate of Lahore has undergone a change on micro level due to substantial increase in relative humidity during most part of the year and as a result the morning hours are no more as pleasant as these used to be in the past.

2.4.3 Rainfall

Rainfall varies from year to year and also from month to month. Maximum rainfall however, occurs in July and August when the monsoon depression travels westward. Table 2.2 gives the average monthly precipitation with number of rainy days based on the 30 years (1961-1990) meteorological data. Maximum rainfall is observed during the month of July which records 32.1% of the average annual rainfall



CLIMOGRAPH BASED ON 30 YEARS DATA
 RELATING TO WET BULB TEMPERATURE AND
 RELATIVE HUMIDITY IN LAHORE.

Fig: 2.1

and shares 22.1% of yearly number of rainy days. The average annual rainfall in Lahore is about 629 mm with 34 rainy days (i.e. 9.3% of total days) in a year.

The heaviest rainfall recorded during 24 hours over the last 50 years was in September, 1954 with 228 mm. Recent heaviest downpour in 24 hours was recorded on 22nd August, 1996 with 189 mm followed by 185 mm on the following day and 65 mm on the third day when most of the city areas were inundated with rain flood.

2.4.4 Wind Speed and Direction

Table 2.3 gives the monthly variation in average wind speed and the predominant direction from where it comes. The data collected shows that on the average 60% of the days during a year are calm when wind movement is negligible.

Winter months are mostly calm with minimum wind storms. Wind storms are more common during the months of April to July with maximum occurrence recorded in June when low air pressures are developed due to high temperature.

In winter, the wind mainly blows from north-west while in summer it is from the opposite direction i.e. from south-east which brings the monsoon rains.

Figure 2.2 shows the wind direction in Lahore as it changes month by month. The predominant wind direction in Lahore is north-west and during the monsoon season it is south-east.

TABLE 2.1
MEAN TEMPERATURES (C°) IN LAHORE (Period 1961-90)

Month	Maximum Daily	Minimum Daily	Wet Bulb		
			5.00 a.m	8.00 a.m	5.00 p.m
January	19.8	5.9	6.5	6.4	11.9
February	22.0	8.9	8.8	9.0	13.4
March	27.1	14.0	12.8	13.6	16.8
April	33.9	19.6	16.3	17.7	19.9
May	38.6	23.7	18.6	20.4	22.0
June	40.4	27.4	22.6	23.9	25.1
July	36.1	26.9	25.3	25.7	26.9
August	35.0	26.4	25.6	26.0	27.0
September	35.0	24.4	23.0	23.6	24.9
October	32.9	18.2	17.0	18.2	21.1
November	27.4	11.6	11.4	12.4	17.0
December	21.6	6.8	7.3	7.5	13.3
Yearly Average	30.8	17.8	16.3	17.0	19.9

Source: Regional Meteorological Centre, Lahore; January, 1999.

TABLE 2.2
MEAN RELATIVE HUMIDITY AND PRECIPITATION IN LAHORE
(Period 1961-1990)

MONTH	RELATIVE HUMIDITY (%)			PRECIPITATION	
	5.00 a.m.	8.00 a.m	5.00 p.m.	Mean Monthly (mm)	Mean No. of Rainy Days
January	86	83	46	23.0	2.0
February	80	75	41	28.6	2.6
March	76	65	37	41.2	3.0
April	63	49	27	19.7	1.9
May	54	42	22	22.4	1.8
June	60	50	29	36.3	2.4
July	80	72	54	202.1	7.5
August	86	77	60	163.9	6.9
September	82	70	49	61.1	3.2
October	80	66	40	12.4	0.9
November	85	76	47	4.2	0.5
December	87	84	52	13.9	1.2
Yearly Average	77	68	42	-	-
- Total	-	-	-	628.8	33.9

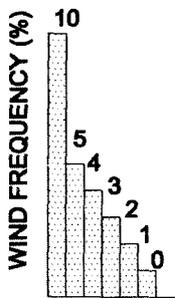
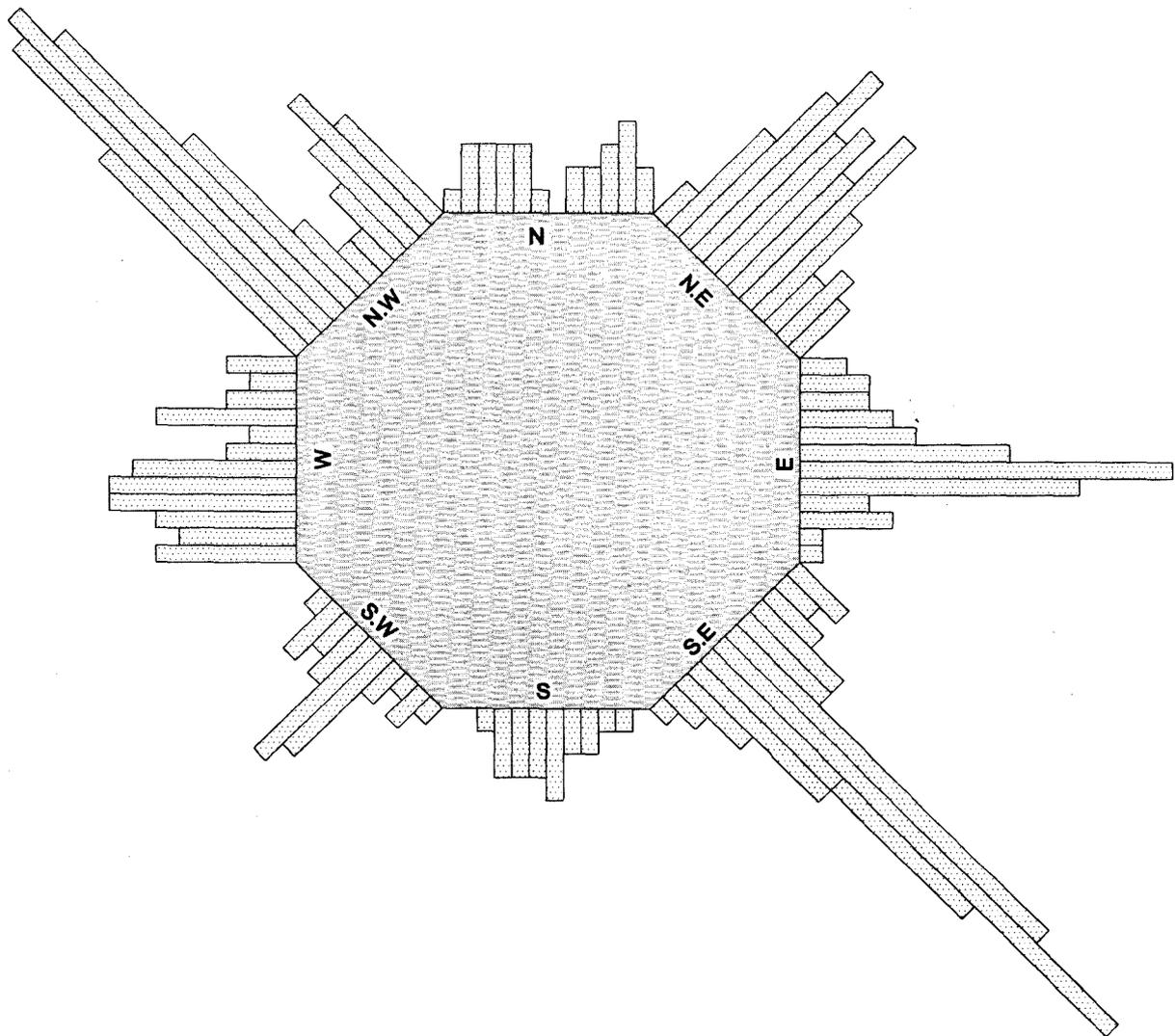
Source: Regional Meteorological Centre, Lahore January, 1999.

TABLE 2.3
MEAN WIND SPEED AND DIRECTION IN LAHORE

MONTH	WIND FREQUENCY (%) SPEED IN KNOT RANGES						PREDOMINANT DIRECTION FROM
	Calm	1 to 3	4 to 6	7 to 10	11 to 16	17 to 21	
January	72	25	3	0.4	-	-	NW
February	60	33	7	1	-	-	NW
March	55	35	7	2	1	0.1	NW
April	48	40	9	3	1	0.1	NW
May	51	39	7	3	1	-	NW
June	40	45	12	4	0.4	-	SE
July	43	46	9	2	0.4	-	SE
August	52	42	5	1	0.4	-	SE
September	65	30	5	0.3	0.1	0.1	SE
October	75	22	1	1	-	1	NW
November	79	19	1	1	0.1	-	NW
December	83	16	1	-	-	-	NW
Yearly Average	60	33	6	1	0.3	0.1	NW

Source: Regional Meteorological Centre, Lahore January, 1999.

Note: NW = North West
SE = South East
1 Knot = 1.854 km/hour



NOTE:

THE MONTHS OF THE YEAR FROM JANUARY TO DECEMBER ARE SHOWN CLOCKWISE IN EACH DIRECTION OF THE OCTAGON

WIND FREQUENCY (%) FROM SPECIFIED DIRECTIONS FOR EACH MONTH IN LAHORE

Fig: 2.2

3.0 SOCIO – ECONOMIC DYNAMICS

Socio-economic parameters determine the composition of a community. These include demographic details, and economic aspects which form the basis for future projections. For socio-economic investigations, primary as well as secondary sources of information were used. The main secondary sources were Population and Housing Census 1998, different rounds of Household Income and Expenditure Surveys and Economic Survey of Pakistan.

For primary investigations, consultative meetings, workshops and discussions were held with different stratas of society, including elected public representatives, professionals in the private sector and governments officials in different departments. Besides, a limited socio-economic survey was also conducted (refer Section 3.2.2). It needs to be stressed here that during the process of information/data collection, the reliance was also made on consultative meetings and secondary sources of information. For demographic and housing data, Census 1998 was extensively used. Demographic features such as household size and other characteristics are stable figures and do not change rapidly. Besides, being a Census, the 1998 data is obviously superior to any sample. For income levels, the latest available Household Income and Expenditure Survey coupled with Economic Survey of Pakistan, 2000-2001 were used. The socio-economic profile is briefly discussed below:

3.1 DEMOGRAPHIC DETAILS

3.1.1 Population Distribution in LMA

Under the Devolution Plan, the dichotomy between urban and rural areas has ended. A District now comprises of Tehsils (without any distinction between urban and rural areas in it), while a City District comprises of Towns. Lahore is so far the only City District in Punjab and one of the two in the Country (the other being Karachi). The demographic details about Lahore have been provided in accordance with the new set-up. However, the administrative units formed under the Devolution Plan are new; and for better cognizance by all, the demographic details have also been provided to accord with pre-devolution set-up.

Lahore Metropolitan Area (LMA) comprises of most of District Lahore, Tehsil Ferozewala (District Sheikhpura) in the north and part of Tehsil Kasur in the south. According to the Population Census 1998, the population of LMA was 6.94 million; which is estimated to have grown to 7.71 million in 2001¹ (Table 3.1). More than 91% of this population (7.04 million) lives in Lahore City District, 7.0% (0.54 million) in Tehsil Ferozewala of District Sheikhpura and 1.7% in parts of Tehsil Kasur of District Kasur.

¹ Including the part of Lahore City District not currently included in LMA.

Out of 7.04 million population living in Lahore District, 82% (5.77 million) lives in the urban areas comprising of Ex-MCL Area, Cantonment Areas of Lahore and Walton, and two small urban settlements (Ex-Town Committees) of Kahna Nau and Raiwind. The urban settlements of Tehsil Ferozwala (District Sheikhpura) falling within the jurisdiction of LMA are Kot Abdul Malik, Ferozewala and Sharaqpur which account for only 2.1% of the total population. There are no urban settlements in Tehsil Kasur falling within LMA. The rural components are 16.4% in case of District Lahore, 4.9% in case of District Sheikhpura and 1.7% for District Kasur. Within the LMA, 77% (5.94 million) people live in urban areas while the remaining 23% (1.77 million) belong to rural areas.

The population distribution in the six towns of Lahore City District is given in Table 3.2.

3.1.2 Population Growth in Lahore District

The population of various administrative areas of Lahore District increased with varying Annual Compound Growth Rates (ACGRs) during different intercensal periods (Table 3.3). A comparison of these ACGRs is diagrammatically presented in Figure 3.1.

Since 1972, the population growth rate of District Lahore (urban) has been constantly declining. It was 4.48% during 1961-72, came down to 3.75% during 1972-81 and further reduced to 3.32% during 1981-98. The overall District growth rate has also been declining, but at a slower pace. The gap in the growth rates of District (Urban) and the entire Lahore District was maximum in 1951-61 but reduced during 1961-72. The growth rate for the two areas was almost the same during 1972-81. In fact the urban growth rate in this period slightly dropped as compared to the overall growth rate (3.75% as against 3.79%). During 1981-98, this difference became further pronounced. The urban growth rate reduced to 3.32% as against 3.46% for the entire district.

In the period 1972 to 1998, the urban population grew from 2.19 million to 5.21 million though the proportionate urban population reduced from 84.62% to 82.44% during this period. The decline in urban population is indicative of decline in urbanization rate and also the fact that population growth rate in urban areas is less as compared to rural areas (Table 3.4).

The comparison of area-wise distribution of urban population over the time, as given in Table 3.5, shows that the proportion of urban population in ex-MCL area reduced from 75.52% (in 1961) to 72.44% (in 1998), whereas the proportion of urban population in Lahore Cantonment rose from 4.21% in 1961 to 8.95% in 1998. The proportionate share in other urban areas of the district remained almost constant throughout the period.

TABLE 3.1
AREA-WISE POPULATION DISTRIBUTION IN LMA (1998-2001)

DISTRICT	AREA	POPULATION			
		1998	2001	%AGE GROWTH	% OF TOTAL POPULATION
LAHORE	URBAN ²	5,209,088	5,774,886	3.22	74.86
	RURAL ³	1,109,657	1,266,953	4.16	16.42
	BOTH	6,318,745	7,041,839	3.39	91.28
SHEIKHUPURA	URBAN ⁴	147,144	165,586	3.70	02.15
	RURAL	351,868	376,096	2.07	04.87
	BOTH	499,012	541,682	2.56	07.02
KASUR	URBAN	-	-	-	-
	RURAL	120,834	131,097	2.54	01.70
	BOTH	120,834	131,097	2.54	01.70
LMA	URBAN	5,356,232	5,940,472	3.24	77.00
	RURAL	1,582,359	1,774,146	3.58	23.00
	BOTH	6,938,591	7,714,618	3.32	100.00

Source: District Census Reports, 1998.

TABLE 3.2
POPULATION DISTRIBUTION IN THE SIX TOWNS
OF THE CITY DISTRICT

S. No.	TOWN	POPULATION		%AGE OF TOTAL POPULATION
		1998	2001	
1.	Data Gunj Bakhsh	1,258,884	1,386,661	22.0
2.	Ravi	1,164,298	1,282,474	20.2
3.	Allama Iqbal	1,006,847	1,123,065	17.5
4.	Nishtar	956,211	1,069,215	16.6
5.	Shalimar	871,031	967,521	15.2
6.	Aziz Bhatti	490,289	549,138	8.5
	TOTAL	5,747,560	6,378,074	100.0

TABLE 3.3
POPULATION INCREASE IN LAHORE DISTRICT (1951-1998)

CENSUS YEAR	INTERCENSAL PERIOD (YEARS)	LAHORE DISTRICT		LAHORE DISTRICT URBAN	
		POPULATION	ACGR ⁵	POPULATION	ACGR
1951	-	1,134,757	-	861,279	-
1961	10.00	1,625,810	3.66	1,312,495	4.30
1972	11.67	2,587,621	4.06	2,189,530	4.48
1981	8.46	3,544,942	3.79	2,988,486	3.75
1998	17.00	6,318,745	3.46	5,209,088	3.32

Source: District Census Reports, Lahore.

² Consists of the population of Ex-MCL, LCB and Town Committees of Kahna Nau and Raiwind.

³ Also includes the population of rural areas of Lahore District lying outside the current LMA boundary.

⁴ Consists of the population of Town Committees of Kot Abdul Malik, Ferozewala and Sharaqpur.

⁵ Annual Compound Growth Rate

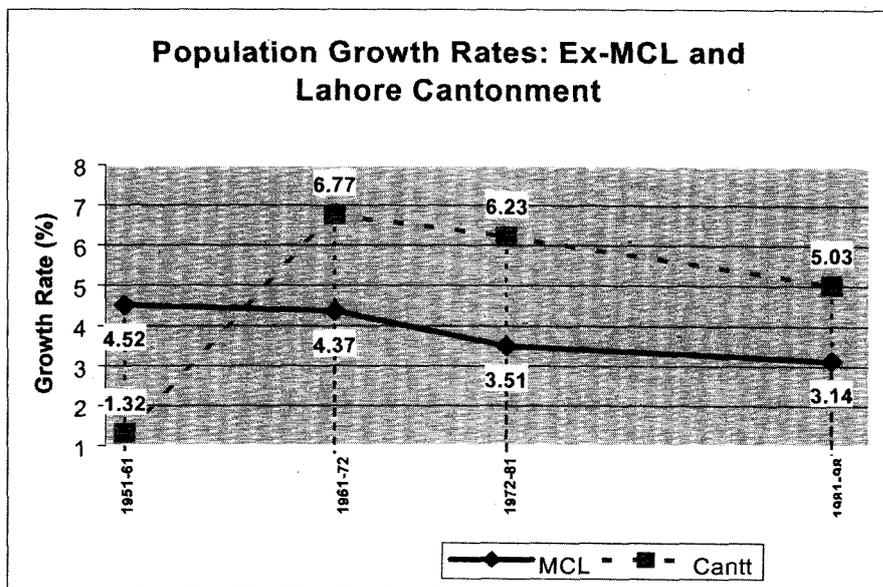
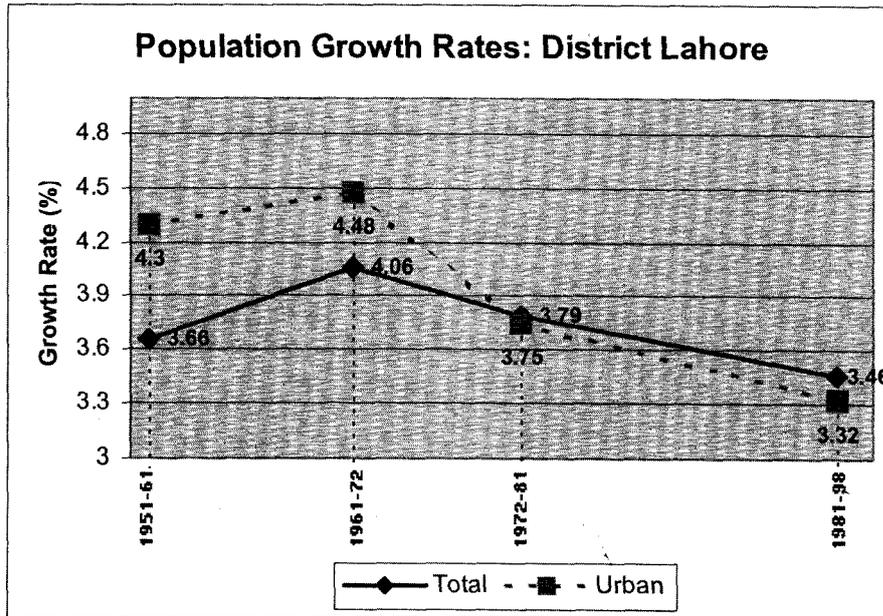


Fig: 3.1 POPULATION GROWTH RATES IN LAHORE

The urban area of District Lahore practically comprises of the Ex-MCL Area and the Cantonment. The average annual population growth rate of Cantonment Area during 1951-61 was only 1.32%, which shot up to about 6.8% in the next decade (1961-72). Since then, it has been steadily declining and presently is around 5%, which is still higher (1.6 times the growth rate of the Ex-MCL Area). The annual growth rate of Ex-MCL Area, which was 4.62% during 1951-61, has also been gradually declining throughout till the last inter-censal period (1981-1998) when it was recorded as 3.14%.

3.1.3 Growth Trends in Ex-MCL and Cantonment Areas

From 1961 to 1998, the population of ex-MCL Area increased with continuously declining ACGRs. The maximum decline of 0.86% occurred during 1972-81 while the cumulative effect over 37 years period comes out to be 1.38% (Table 3.6). Control on births due to family planning and health literacy measures, awareness about the hazards of early marriages, reduction in the inter-district and intra-district in-migration and such other factors are among the main reasons which might have contributed towards the decline of ACGRs.

On the other hand the population of the Cantonment grew from 0.07 million in 1961 to 0.15 million in 1972 with a much higher ACGR of 6.77%. By 1981 the Cantonment also experienced a declining ACGR but it remained substantially above the ex-MCL figures. In the last intercensal period (i.e. from 1981 to 1998), the population of the Cantonment rose to about 0.57 million, an increase by 130% as against 69% for ex-MCL area. The analysis of the recorded figures of population reflects around 9.5 times increase in population in a period of about 47 years.

This large scale increase in population may be attributed to one or more of the following reasons:

- i) major development pressure in the Cantonment Area and accordingly the extension of Cantonment boundaries;
- ii) the shift of well off sections of society from the country side and also from the inner parts of Lahore City, and
- iii) the habitation of a large number of expatriates in LCCHS and other newly developed residential areas.

Inspite of the fact that the population of the Cantonment rose many fold since 1951, the declining trend in ACGRs has been noted in the last two intercensal periods. The overall decline in ACGR in about 25.5 years (i.e. from 1972 to 1998) comes out to be 1.74% in the Cantonment Area.

TABLE 3.4
URBANIZATION (1951-1998) IN LAHORE DISTRICT

CENSUS YEAR	POPULATION		PROPORTION OF URBAN POPULATION (%)
	LAHORE DISTRICT URBAN	LAHORE DISTRICT	
1951	861,279	1,134,757	75.90
1961	1,312,495	1,625,810	80.73
1972	2,189,530	2,587,621	84.62
1981	2,988,486	3,544,942	84.30
1998	5,209,088	6,318,745	82.44

Source: District Census Reports, Lahore.

TABLE 3.5
AREA-WISE DISTRIBUTION OF URBAN POPULATION SINCE 1951

CENSUS YEAR	POPULATION					
	Ex-MCL		CANTONMENT		OTHER URBAN AREAS ⁶	
	Number	%	Number	%	Number	%
1951	789,267	69.55	60,066	5.29	11,964	1.05
1961	1,227,966	75.52	68,481	4.21	16,018	0.99
1972	2,022,577	78.16	147,165	5.69	19,788	0.76
1981	2,707,215	76.37	245,474	6.92	35,797	1.01
1998	4,577,744	72.44	565,751	8.95	65,593	1.04

Source: District Census Reports, Lahore.

TABLE 3.6
POPULATION INCREASE IN Ex-MCL AREA AND LAHORE CANTONMENT SINCE 1951

CENSUS YEAR	INTERCENSAL PERIOD (YEARS)	Ex-MCL		LAHORE CANTONMENT	
		POPULATION.	ACGR	POPULATION	ACGR
1951	-	789,267	-	60,066	-
1961	10.00	1,227,996	4.52	68,481	1.32
1972	11.67	2,022,577	4.37	147,165	6.77
1981	8.46	2,707,215	3.51	245,474	6.23
1998	17.00	4,577,744	3.14	565,751	5.03

SOURCE: District Census Reports, Lahore.

3.1.4 Population Migration

Estimates of the magnitude of migration during 1981-98 to various constituting units of District Lahore and the District as a whole have been made by employing the following methodology⁷. National rate of growth during 1981-98 was used to estimate expected population of District Lahore in 1998. The national urban growth rate was used to estimate the 1998 populations of MCL and the Cantonment, while national rural growth rate was used to assess the 1998 population of District Lahore (Rural). The national growth rates were used deeming that there had been no inward or outward movement from both urban and rural areas of the District assuming uniform natural increase. When these figures are compared with actual populations as recorded in 1998 Census, the difference is the contribution of net migration. Migration is never unidirectional but the net migration figure elaborated above is considered to be a robust technique.

The findings are presented in Table 3.7 and Figure 3.2. For District Lahore as a whole, in the period 1981-1998, the net in-migration is assessed to be about 30%. The natural increase was about 70%. During the 17 years of inter-census period between 1981-1998, about 13% of the population of ex-MCL area have out-migrated. In District

⁶ Include Kahna Nau and Raiwind Town Committees

⁷ Preliminary Report, Description and Diagnosis of The National Human Settlements System, Government of Pakistan, Environment and Urban Affairs Division, December, 1982.

Lahore (Urban), predominantly comprising of ex-MCL and the Cantonment, the out-migration was about 5% (because of the MCL factor).

Based on these estimates, the population growth rates along with their migrational/natural increase split are given in Table 3.8.

TABLE: 3.7
ESTIMATES OF CONTRIBUTION BY MIGRATION DURING 1981-98

Area	Total Population		Increase over 1981-98	Estimated Migration	Estimated Natural Increase	% Migration
	1981	1998				
Ex-MCL	2,707,215	4,577,744	1,870,529	(241,081)	2,111,610	-12.89
Cantonment	245,474	565,751	320,277	128,809	191,468	40.22
District Lahore (Urban)	2,988,486	5,209,088	2,220,602	(110,398)	2,331,000	-4.97
District Lahore (Rural)	556,456	1,109,657	553,201	298,724	254,477	54.00
District Lahore (Total)	3,544,942	6,318,745	2,773,803	825,439	1,948,364	29.76

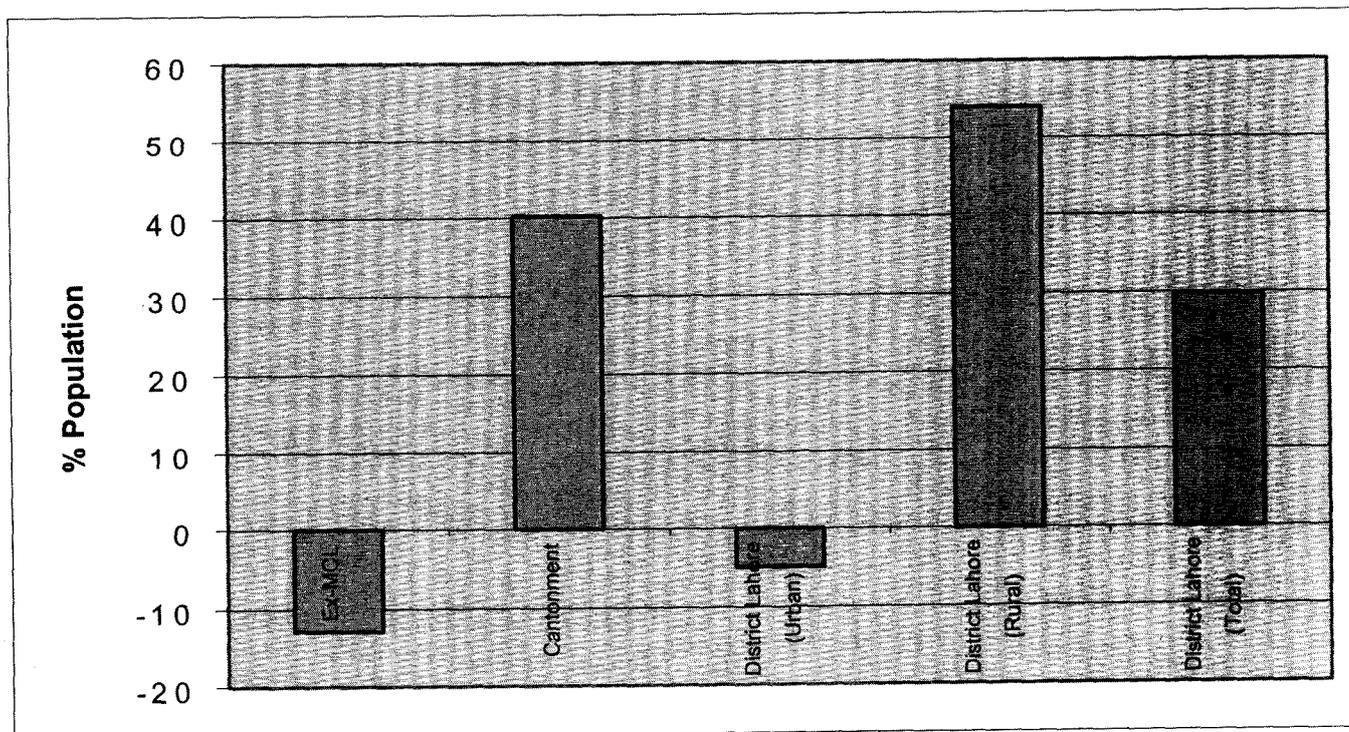


FIG: 3.2 MIGRATORY TRENDS IN LAHORE DISTRICT

TABLE 3.8
MIGRATION AND NATURAL INCREASE COMPONENTS OF
POPULATION GROWTH RATES (%), (1981-1998)

Area	Population Growth Rate	Net Migration	Natural Increase
District Lahore (Urban)	3.32	-0.17	3.49
District Lahore (Rural)	4.14	2.24	1.90
District Lahore (Total)	3.46	1.03	2.43
Ex-MCL Area	3.14	-0.40	3.54
Cantonment	5.03	2.02	3.01

Contrary to the general belief, the in-migration in rural areas of District Lahore has been higher i.e. 54% of its total incremental population (around 300,000) as compared to Cantonment (40% of its total incremental population i.e. around 129,000). The reasons for District Lahore (Rural) to be the largest recipient of the migrants could be manifold: increasing congestion in MCL area, availability of cheaper land in the District's rural areas, (contiguous to urban areas), availability of public transport and infrastructure in the adjacent urban areas; and above all, the rural-urban definitional problems: The ex-MCL boundary in the south passes through Johar Town. The areas south of this boundary line are considered to be rural, which practically is not true. The same is true about many settlements all around the ex-MCL boundary and nearby areas, which officially are designated as rural, but have urban characteristics; people migrating to Lahore from other areas prefer to settle here because of cheaper land and availability of social facilities in the proximate (ex)-MCL area. The Devolution Plan has however, ended this dichotomy. The City District, a Town or a Tehsil is considered an entity as a whole, without any distinction between urban and rural areas.

3.1.5 Base Year Population

Based on the past ACGRs, long term trends of population growth for various administrative areas of Lahore District have been determined and are presented in Table 3.9. Based on the past trends and population planning programmes of the Government, it is safe to assume that the population, in future, would continue to grow with the declining ACGRs. Taking into consideration the per annum variation, the ACGRs for the base year 2001 have been derived with the help of following formula:

Assumed ACGR for mid 2001 = ACGR for the Period 1981-98 minus (per annum variation x 3.5 Years)

The assumed ACGRs with base year population estimates are exhibited in Table 3.10. Population has been estimated by using the compound interest rate formula, i.e. $P_n = P_o (1 + r)^n$

Where P_n = Final (year) population

P_o = Initial (year) population

r = Growth rate (percent)

n = Number of years for which estimate is being made

3.1.6 Age and Sex Composition

In the composition of population, age and sex are important characteristics to evaluate the existing provisions and to forecast the future socio-economic needs in terms of facilities and related services. In-depth study of its composition enables to draw inferences about the demographic characteristics. For example, excess or deficit of male population in economically active age group would result in increase or decrease in household income or dependency ratio. The details are analysed below:

3.1.6.1 Age Composition

Analysis of the age compositions in the population of Lahore District and Lahore Urban shows that the proportion of population in ages less than 15 years dropped during 1981-98 while the proportion rose in ages ranging between 15 and 45 years. The former is the result of decrease in the birth rates while the later can be attributed to immigration of economically active age groups. Almost similar trend might be noted for the ex-MCL Area in the same period.

Changes in the composition of population (during 1981-98) by broad age groups are exhibited in Table 3.11. It is observed that proportion of population in the younger ages (less than 15 years) has decreased from 42.3% to 38.1% in case of Lahore Urban, with a corresponding increase in the proportion of working ages. The composition of population of Lahore Rural depicts a very little decline (i.e. 0.81%) in the proportion of younger ages thereby demonstrating comparative ineffectiveness of the family planning measures in the rural areas.

3.1.6.2 Sex Ratio

Sex ratio is defined as the number of males per 100 females. For Lahore District this ratio has slightly been decreased from 115.3 in 1981 to 111.3 in 1998. The fall could partly be attributed to the decrease in single male migrants.

Comparing the last two census figures, computed in Table 3.12, the proportion of female population increased in all areas of Lahore District with maximum increase recorded in Lahore Cantonment where the female proportion increased by 2.6%.

Figure 3.3 shows the age and sex pyramid for Lahore Urban population comparing the figures of 1981 and 1998 Population Census Reports.

TABLE 3.9
ANNUAL COMPOUND GROWTH RATES: - PAST TRENDS

AREA	PERIOD		VARIATION OVER THE PERIOD IN ACGR	PER ANNUM VARIATION IN ACGR
	FROM-TO	NO. OF YEARS		
Ex-MCL	1961-1998	37.13	-1.38	-0.037
CANTONMENT	1972-1998	25.46	-1.74	-0.068
LAHORE DISTRICT	1972-1998	25.46	-0.60	-0.023

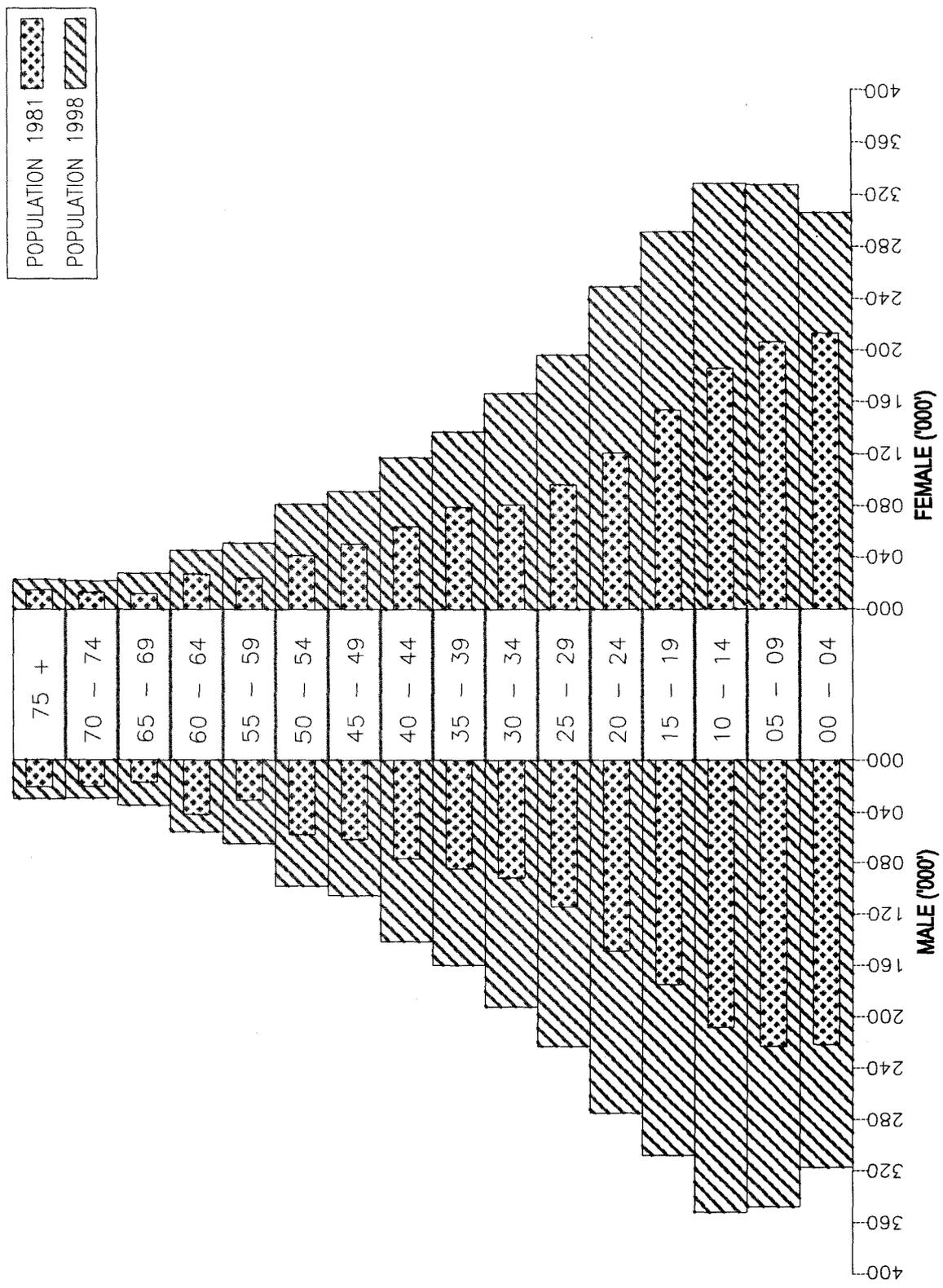
TABLE 3.10
BASE YEAR POPULATION ESTIMATES

LOCALITY	POPULATION 1998	ACGR (%)	POPULATION 2001
Ex-MCL Area	4,577,744	3.02	5,042,507
Lahore Cantonment	565,751	4.81	659,074
Kahna Nau T.C.	38,279	3.93	43,388
Other Urban Area	27,314	2.84	29,917
Lahore District	6,318,745	3.39	7,041,839

TABLE 3.11
INTERCENSAL CHANGE IN COMPOSITION OF POPULATION BY BROAD AGE GROUPS

AGE GROUP (YEARS)	POPULATION (PERCENT)								
	LAHORE DISTRICT			LAHORE URBAN			LAHORE RURAL		
	1981	1998	Variation	1981	1998	Variation	1981	1998	Variation
Below 5	14.8	12.6	-2.2	14.6	12.0	-2.6	15.7	15.3	-0.4
5-10	14.6	13.5	-1.1	14.4	13.0	-1.4	15.7	15.8	+0.1
10-15	13.4	13.2	-0.2	13.3	13.1	-0.2	14.0	13.5	-0.5
Sub-Total below 15	42.8	39.3	-3.5	42.3	38.1	-4.2	45.4	44.6	-0.8
15-65	53.7	57.5	+3.8	54.4	58.7	+4.3	49.5	51.8	+2.3
65 above	3.5	3.2	-0.3	3.3	3.2	-0.1	5.1	3.6	-1.5
Total All Ages	100.0	100.0	0.0	100.0	100.0	0.0	100.0	100.0	0.0

Source: Population Census Reports, Lahore District, 1981 and 1998



POPULATION BY AGE AND SEX (1981 AND 1998): LAHORE URBAN

Fig: 3.3

TABLE 3.12
AREA-WISE SEX DISTRIBUTION 1981 AND 1998

AREA		SEX DISTRIBUTION							
		1981				1998			
		BOTH SEXES	MALE	FEMALE	SEX RATIO	BOTH SEXES	MALE	FEMALE	SEX RATIO
Ex-MCL	No.	2,707,215	1,443,468	1,263,747	114.2	4,577,744	2,403,001	2,174,743	110.5
	%	100.0	53.3	46.7		100.0	52.5	47.5	
Lahore Cantonment	No.	245,474	138,343	107,131	129.1	565,751	304,219	261,532	116.3
	%	100.0	56.4	43.6		100.0	53.8	46.2	
Lahore Urban	No.	2,988,486	1,600,757	1,387,729	115.4	5,209,088	2,741,403	2,467,685	111.1
	%	100.00	53.6	46.4		100.0	52.6	47.4	
Lahore Rural	No.	556,456	297,725	258,731	115.1	1,109,657	587,099	522,558	112.4
	%	100.0	53.5	46.5		100.0	52.9	47.1	
Lahore District	No.	3,544,942	1,898,482	1,646,460	115.3	6,318,745	3,328,502	2,990,243	111.3
	%	100.0	53.6	46.4		100.0	52.7	47.3	

Source: District Census Reports Lahore, 1981 and 1998.

3.1.7 Household Size

Household size of Lahore has been progressively growing over the past 40 years. In Lahore District it rose from 5.8 in 1961 to 7.2 in 1998. The change in respect of various areas of the district in the last inter-censal period is shown in Table 3.13.

TABLE 3.13
HOUSEHOLD SIZE 1981 & 1998

AREA	HOUSEHOLD SIZE	
	1981	1998
Ex-MCL	7.0	7.1
Cantonment	6.8	6.9
Lahore Urban	7.0	7.1
Lahore Rural	7.3	7.4
Lahore District	6.9	7.2

Source: District Census Reports of Lahore, 1981 and 1998.

The growth of household size can be attributed to the following:

- i) In the process of urbanization, male member of the family first moves to an urban area and other members join him in due course of time;
- ii) The house ownership in low income group is very restrictive, joint family system prevails, consequently the household size increases over a period of time;
- iii) For economic reasons and rising cost of living, the people whether having blood relation or not, prefer to live and expend together.

3.2 ECONOMIC INDICATORS

3.2.1 Household Income

The household income distribution of Punjab (Urban) was obtained for the year 1996-97, from the latest available 'Household Integrated Economic Survey', published in 1999. The latest 'Economic Survey' Report is available for the year 2000-2001. To update the 1996-97 income levels to 2000-2001 prices, Consumer Price Indices (CPIs) were obtained for the years 1996-97 and 2000-01 from the 'Economic Survey of Pakistan'. Employing the self-explanatory methodology elaborated in Table 3.14, the household income distribution for Punjab (Urban) was estimated for the year 2000-2001. Income of each category was then enhanced by 10% to make the income distribution more realistic for Lahore (being a metropolis and largest urban centre of Punjab and the hub of economic and commercial activities). The household income distribution is presented in Table-3.14.

3.2.2 Inferences of Socio-Economic Survey

The socio-economic survey was conducted in selected localities, and cannot be generalised for Lahore as a whole. It was conducted to augment the available information. The surveyed localities are evenly spread throughout and represent low-income, middle-income and high-income localities. The low-income localities selected on basis of their geographical location include Sherakot (Bund Road), Saint Mary's Colony, Sultanpura, Ferozewala (a trapped village in Johar Town) and two Katchi Abadis in Gulberg. The middle-income localities included NESPAK Colony, Gulshan-e-Ravi, Wahdat Colony (Ghazali Park, Clifton Colony), Wifaqi Colony, Mughalpura and areas in the vicinity of University of Engineering and Technology. A part of Gulberg was surveyed to include high-income localities. The following are the major inferences of the socio-economic survey:

1. **Age-Sex Composition:** Overall, males are about 51% while females are 49% (Table 3.15). The sex-ratio (i.e. the number of males per 100 females) is 102. The ratio changes with age-groups. It is higher in younger groups (below 1 year and 1 to 5 years) indicating higher female mortality because of better care of male children through better food and medical care than female children of the same age-group. The male-female split is almost even in the age-group 14 to 45 years, but after 45 years of age, the female percentage again declines. In 45-60 years age group, females are around 46%, while in 60+ category, females are 45%.
2. The average household size is 6.96.

3. The average monthly household incomes in low-income and middle-income localities are Rs. 6,300 and 14,000 respectively. The average incomes per earning member, in the same order are Rs. 3,940 and 8,200 (Table 3.16).
4. Average number of earning members per household is 1.67. It is 2 for high-income localities, 1.7 for middle-income localities and 1.6 for low-income localities.
5. The average number of dependent household members per earning member (i.e. Dependency Ratio) is 4.16.
6. The major occupational categories are business (26%), professional/technical (20%), government/private service (15.5%), daily wagers (13%) and manual service providers^a (12%). The details are provided in Table 3.17.
7. The overall literacy ratio (number of literate persons per 100 population) is above 55. It is about 60 for males and 51 for females (Table 3.18).
8. More than 78% of the housing stock in the surveyed areas is pucca, about 18% is semi-pucca and 4% is Katcha (Table 3.19).
9. Average number of persons living per house is 6.96 (Table 3.20).
10. Occupancy Rate (i.e. average number of persons per room) is 2.49 while the average number of rooms per house is 2.8 (Table 3.20).
11. In more than 94% of the surveyed households, the source of drinking water is inside the house. The major sources are piped water supply (88%), hand pump (7%), well (0.4%) and others (4.2%). Refer Tables 3.21 and 3.22.
12. Less than 6% of the surveyed houses have drinking water sources outside the house, mostly in the form of public stand post, neighbour's tap or hand pump (Table 3.23).

^a Include domestic servants, peons, sweepers, barbers, tailors etc.

TABLE: 3.14 HOUSEHOLD INCOME DISTRIBUTION IN LAHORE

% HHs ¹	Cumulative %age of HHs	Monthly HH Incomes (Rs) 1996-97 ²		Consumer Price Index		1996-97 CPI as base for 2000-2001 ⁵	Monthly HH Incomes (Rs) 2000-2001 ⁶		Average Monthly HH Income (Rs.) (2000-01)	Average Annual HH Income (Rs.) (2000-01)	Average Annual HH Income in Lahore Rs. (2000-01) ⁸
		From	To	1996-97 ³	2000-2001 ⁴		From	To			
0.47	0.47	Up to 1000	1001	189.18	233.03	123.18	Up to 1232	924 ⁷	11,088	12,197	
1.26	1.73	1501	2000	189.18	233.03	123.18	1,233 1,848	1,540	18,484	20,333	
3.19	4.92	2001	2500	189.18	233.03	123.18	1,849 2,464	2,156	25,875	28,462	
5.74	10.66	2501	3000	189.18	233.03	123.18	2,465 3,079	2,772	33,266	36,592	
6.18	16.84	3001	3500	189.18	233.03	123.18	3,081 3,695	3,388	40,656	44,722	
7.68	24.52	3501	4000	189.18	233.03	123.18	3,697 4,311	4,004	48,047	52,852	
7.8	32.32	4001	4500	189.18	233.03	123.18	4,312 4,927	4,620	55,438	60,982	
15.24	47.56	4501	5000	189.18	233.03	123.18	4,928 6,159	5,544	66,524	73,176	
12.17	59.73	5001	6000	189.18	233.03	123.18	6,160 7,391	6,775	81,306	89,436	
8.48	68.21	6001	7000	189.18	233.03	123.18	7,392 8,623	8,007	96,087	105,696	
31.79	100	Above 7000		189.18	233.03	123.18	Above 8623	12,935	155,196	170,716	

1: Household Integrated Economic Survey, 1996-97, Table-20 (Punjab Urban), P-304

2: As Above.

3: Economic Survey, 2001-2002, Govt. of Pakistan, Islamabad, Statistical Appendix (Table 7.3 A), Page 81

4: As Above

5: $(CPI \text{ in } 2000-2001 / CPI \text{ in } 1996-97) * 100$

6: $(HH \text{ Income in } 1996-97) * (CPI \text{ base from } 1996-97 \text{ to } 2000-2001) / 100$

7: Has been calculated by adding 1232 and 50% of 1232, divided by 2. Similarly for highest income category, the average is calculated by multiplying 8623

TABLE 3.15: AGE-SEX COMPOSITION

Age-Groups	% Males	% Females	Total	Sex Ratio
Below 1	58.49	41.51	100	141
1 to 5	52.25	47.75	100	109
5 to 14	47.53	52.47	100	91
14 to 45	49.82	50.18	100	99
45 to 60	53.91	46.09	100	117
Above 60	54.55	45.45	100	120
Total	50.52	49.48	100	102

TABLE 3.16: INCOME LEVELS

LOCALITY	AVERAGE INCOME (RS.) PER:	
	HOUSEHOLD	EARNING MEMBER
Low-Income	6,297	3,941
Middle Income	14,038	8,217

TABLE 3.17: OCCUPATIONAL CATEGORIES

OCCUPATIONS	PERSONS (%)
Business	26.01
Professional/Technical	20.05
Govt./Private job	15.51
Labour (Daily wagers)	12.90
Menial Service Providers	11.93
Peddlers/hawkers	2.86
Teachers	2.86
Transport Workers	1.67
Others	6.21
Total	100.00

TABLE 3.18: LITERACY RATIO

GENDER	LITERACY RATIO
Females	50.75
Males	59.73
Overall (Average)	55.29

TABLE 3.19: TYPE OF HOUSING STRUCTURES

TYPE	% OF STRUCTURE
Pucca	78.4
Semi-Pucca	17.6
Katcha	4.0
Total	100.00

TABLE 3.20: HOUSING OCCUPANCY

INDICATORS	NO.
Persons per House	6.96
Persons per Room	2.49
Rooms per House	2.8

**TABLE 3.21: SOURCES OF DRINKING WATER:
INSIDE Vs OUTSIDE THE HOUSE**

SOURCES	% OF HOUSES
Inside the House	94.40
Outside the House	5.60
Total	100.00

TABLE 3.22: SOURCES INSIDE THE HOUSE

SOURCES	% OF HOUSES
Piped Water	88.14
Hand Pump	7.20
Well	0.42
Others	4.24
Total	100.00

TABLE 3.23: SOURCES OUTSIDE THE HOUSE

SOURCES	% OF HOUSES
Piped Water	78.57
Hand Pump	0
Well	0
Others	21.43
Total	100.00

4.0 EMPLOYMENT, INDUSTRY AND COMMERCE

4.1 EMPLOYMENT

4.1.1 Labour Force

Considerable variation has been noted in the employment structure of the labour force in the industrial sectors in Lahore District. Sector-wise variation, during the period 1981-98, is presented in Table 4.1 which indicates that the labour force in the service sector, in Lahore urban, has reduced by 11.0%. The main economic activities, from which the labour force has shifted, are community, social and personal services followed by wholesale and retail trade, and transport, storage and communication. So far as commodity producing sector is concerned, the labour force has increased by 11%. "Construction" is the main economic activity which has attracted the labour force. In 1981, the labour force engaged in construction was 6.3%, which in 1998 has become 27.8% with a net gain of 21.5% in 17 years. This may also be noted from Table 4.1, that the labour force in manufacturing activity has declined from 17.6% in 1981 to 10.1% in 1998. Almost similar variation trend in labour force has been found for Lahore District.

4.1.2 Employment Status

Of all the 1.09 million persons employed in Lahore District in 1998, 83.5% were located in urban areas and the remaining 16.5% in rural areas.

The analysis of the employment status of workers in urban areas (Table 4.2) of Lahore District shows that in 1981 about 56% of the workers were paid employees, while about 36% were self-employed. In 1998, paid workers declined to about 46% and the proportion of self-employed workers rose to 51%. This considerable change in the employment status, during 17 years period, is apparently the result of the government policies like continuous ban on recruitment, down-sizing, golden shake hand, etc which increased the tendency towards self-employment.

A review of Table 4.3 reveals that about 50% of the total urban working population in 1998 was engaged in elementary occupations (mostly doing labour), and 28% were services and sales workers. No change in the occupation pattern under these two categories occurred during 1981-98. Major changes in the occupation pattern of other categories during this period are described below:

- i. Professionals, technicians and associated professionals increased by about 7% and clerical employment decreased by about 5% in urban areas.

- ii. In rural areas the labourers/workers in the elementary occupations increased by about 15%, services and sales workers increased by about 5% and professionals and technicians, increased by about 2%, while skilled agricultural and fishery workers decreased by 21%.

Details of employed population by average income, economic categories, employment status and percentage of employed population by occupation for rural/urban areas for 1981 and 1998 are presented in Annex to Chapter-4 (Tables 1 to 6) at the end of this report.

4.2 INDUSTRY

About 9000 cottage and small to large scale manufacturing industries are operating in Lahore. The spectrum of industries extends from organized, large and medium sized industries to small scale industries, and unorganized traditional industries. The latter known as the micro / cottage and small scale industries constitute an important segment of the economy. These provide maximum employment and ensure maximum utilization of local resources both manpower and materials.

Large scale manufacturing industries are registered under 77 categories. Directorate of Industries and Mineral Development, and Punjab Small Industries Corporation are responsible for the promotion of industries. Provision of physical infrastructure, development of industrial estates and establishment of training and production centres for handicrafts are their main functions. In 1999, out of 8,468 industrial establishments only 1,239 (about 15%) are registered with Directorate of Labour Welfare, Punjab under the Factories (Amendment) Act, 1973. The details of registered factories are presented in Table 4.4.

It is clear that 18.2% of the total factories belong to metal products, followed by machinery other than electrical (13.8%), textile products (12.6%), food manufacturing group (7.2%), service industry group (6.9%), transport equipment (6.5%), and plastic industry group and printing / stationery industry group (6.1% each).

The data relating to period of establishment and the employment level of the registered factories given in Table 4.5 shows that 24.3% of the total industries were established up to year 1972, 23.8% during 1972-82, 36.2% during 1982-92 and the remaining 15.7% during 1992-99. The industries established up to the year 1972 (i.e. 24.3%) were labour intensive as their share in employment of the total labour force of the registered factories, was 45.5% as against 54.5% by the remaining 75.7% factories.

Out of 1239 registered factories in Lahore, 84.2% have employed up to 50 persons each, 12% have employed 51 to 250 persons each and the rest 3.8% have employed more than 250 persons per factory (Table 4.6).

Small manufacturing establishments are mainly housed in the Walled City and its immediate surroundings. With the passage of time, small workshops and backyard

manufacturing units sprung up throughout the city which resulted in a mixed development of industry, shops and houses. While these provided employment for the poor sections of the society, many of these also become a source of nuisance for the residents.

TABLE 4.1
PERCENTAGE VARIATION IN EMPLOYED LABOUR FORCE
BY SECTORS, LAHORE DISTRICT (1981 AND 1998)

Sr. No.	SECTOR	LAHORE URBAN		LAHORE RURAL		LAHORE DISTRICT	
		1981	1998	1981	1998	1981	1998
A	Commodity Producing Sector						
1.	Agriculture, Forestry, Livestock, Fishing	3.5	2.3	45.9	22.9	11.4	5.7
2.	Mining and Quarrying	0.1	-	0.3	-	0.2	-
3.	Manufacturing	17.6	10.1	18.6	7.2	17.7	9.6
4.	Construction	6.3	27.8	17.4	40.8	8.3	30.0
5.	Electricity, Gas, water	2.2	0.5	0.3	0.2	1.8	0.5
	Total of A	29.7	40.7	82.5	71.1	39.4	45.8
B.	Services Sector						
6.	Transport, Storage, and Communications	11.0	7.4	3.3	3.5	9.6	6.7
7.	Wholesale and Retail Trades	22.9	17.0	5.2	8.9	19.6	15.6
8.	Finance, Insurance, Real Estate and Business Services	2.5	6.4	0.4	0.2	2.1	5.4
9.	Community, Social and Personal Services	30.4	18.6	8.1	9.5	26.3	17.1
10.	Activities not adequately defined	3.5	9.9	0.5	6.8	3.0	9.4
	Total of B	70.3	59.3	17.5	28.9	60.6	54.2
	All Sectors	100	100	100	100	100	100

Source: District Census Reports, Lahore, 1981 and 1998.

TABLE 4.2
EMPLOYED POPULATION (10 YEARS AND ABOVE)
BY EMPLOYMENT STATUS, (1981 AND 1998)

EMPLOYMENT STATUS	LAHORE (DISTRICT) URBAN					
	BOTH SEXES		MALE		FEMALE	
	1981	1998	1981	1998	1981	1998
Self Employed	36.5	50.7	37.4	51.9	18.8	25.0
Employee (Government and Autonomous Bodies)	25.5	18.0	24.7	17.1	43.3	37.8
Employee (Private)	30.6	27.9	30.5	27.8	33.1	30.2
Employer	3.2	2.4	3.2	2.4	1.2	1.8
Unpaid Family Helper	4.2	1.0	4.2	0.8	3.6	5.2

Source: District Census Reports, Lahore, 1981 and 1998.

TABLE 4.3
PERCENTAGE OF EMPLOYED POPULATION BY OCCUPATION
IN RURAL / URBAN AREAS (1981 AND 1998)

S. No.	OCCUPATION	EMPLOYED POPULATION (%)					
		ALL AREAS		URBAN		RURAL	
		1981	1998	1981	1998	1981	1998
1.	Legislators, Senior Officials and Managers	2.1	0.7	2.5	0.8	0.2	0.1
2.	Professionals, Technicians and Associate Professionals	6.3	12.6	7.1	14.2	2.3	4.6
3.	Clerks	8.2	4.1	9.4	4.6	2.4	1.2
4.	Services Workers, Shop and Market Sales Workers, Craft and Related Trades Workers	24.5	26.0	27.9	28.4	8.9	13.7
5.	Skilled Agricultural and Fishery Workers	10.6	5.7	3.3	2.1	44.7	23.7
6.	Plant and Machine Operators and Assemblers, Elementary Occupations and others	48.3	50.9	49.8	49.9	41.5	56.7

Source: District Census Reports, Lahore, 1981 and 1998.

TABLE 4.4
REGISTERED FACTORIES, LAHORE DISTRICT

S. No.	GROUP	No.	%
1	Food Items	89	7.2
2	Beverages	24	1.9
3	Textile	156	12.6
4	Leather, Rubber and Plastic Industry	76	6.1
5	Electric Machinery	70	5.7
6	Metal Industry	226	18.2
7	Machinery	171	13.8
8	Printing/Stationery	76	6.1
9	Chemicals	50	4.0
10	Building Materials	28	2.3
11	Pharmaceuticals	52	4.2
12	Transport Equipment	81	6.5
13	Furniture	13	1.1
14	Service Industry	85	6.9
15	Miscellaneous	42	3.4
Total		1239	100

TABLE 4.5
PERIOD OF ESTABLISHMENT AND EMPLOYMENT
LEVEL IN REGISTERED FACTORIES, LAHORE DISTRICT

PERIOD	INDUSTRIES		EMPLOYMENT		AVERAGE EMPLOYEES PER INDUSTRY
	NO.	%	NO.	%	
Up to 1972	301	24.3	43,080	45.5	143
1972 to 1982	295	23.8	18,598	19.6	63
1982 to 1992	448	36.2	21,448	22.6	48
1992 to 1999	195	15.7	11,642	12.3	60
Total	1239	100	94,768	100	76

Source: Bureau of Statistics, Government of The Punjab.

TABLE 4.6
PERCENTAGE OF INDUSTRIES BY EMPLOYMENT
LEVEL LAHORE DISTRICT

NO. OF INDUSTRIAL EMPLOYEES	% OF INDUSTRIES
< 10	24.6
11 to 50	59.6
51 to 100	7.3
101 to 250	4.7
251 to 500	2.0
501 to 1000	0.8
> 1000	1.0
Total	100.0

Source: Bureau of Statistics, Government of The Punjab.

Punjab Small Industries Corporation has established a Small Industrial Estate at Kot Lakhpat, Lahore, Consisting of 34 plots of sizes ranging between 1 Kanal and 4 Kanals. Housing and Physical Planning Department, Government of Punjab has also set up an Industrial Estate at Kot Lakhpat where 245 developed plots were designated for large and medium sized industries. Out of these, 84 (34%) plots were of half acre size, 110 (45%) plots were of one acre and remaining 51 (21%) plots were of two acres and more.

Other industrial concentrations have emerged in Badami Bagh area, Multan Road, Sheikhpura Road, Mominpura, Baghbanpura, Mughalpura, Bund Road, Walton Road Defence Road along Hudiana Drain, Raiwind Road etc. Lahore Improvement Trust had developed an Industrial Estate in Gulberg-II and III, Railway Engineering Works at Mughalpura (1918) with an area of over 120 hectares also became a major employer in the city.

Industries have continuously been growing along major highways radiating out of Lahore. These include textiles, rayon, fertilizers, chemicals, pharmaceuticals, electric products etc. The locational and areal aspects of industry are discussed in detail in the chapter on land use.

4.3 COMMERCE

4.3.1 Commercial Areas/Markets

Lahore, being the provincial Metropolis, the second biggest urban centre of Pakistan and the only City District of Punjab, encompasses all types of commercial activities. It has major district, local and specialized shopping centres; wholesale, retail and mixed markets. These centres and markets were established gradually by following the physical growth and the economic phenomena. Most of these commercial centres/ markets have sprung up as a result of organic growth, and hence are generally unplanned and lack systematic hierarchical order. This has resulted in a number of socio-physical and transportation problems in the downtown area and other unplanned commercial concentrations.

The commercial structure in Lahore dates back to pre-British period. As the city expanded over time, it encouraged creation of centralized self-contained commercial areas, with the result that local and district level commercial centres came up to cater for the growing needs of the public.

Landuse Surveys conducted by NESPAK show that commercial areas cover more than 5% of the Ex-MCL Area and 0.75% of the total LMA (refer Chapter-5). The landuse pattern reveals that commercial activities in Lahore City District have developed along most of the main roads/streets. The trend is more pronounced and hectic in northern parts of the District. Among others, these include dangerous and highly offensive commercial uses such as trading in explosives, inflammable material such as timber and storing and dealing in bones etc. The older parts of Walled City and their immediate surroundings have been enclaved by intensive and specialized commercial activities, offering wholesale as well as retail shopping facilities. The commercial activities in newly developed areas are heterogeneous and mostly of mixed retail nature.

The 'Major' shopping centre represents areas of Anarkali, the Mall (from Anarkali to Charring Cross), McLeod Road, Beadon Road, Gwalmandi, McLeod Link Road and Southern Circular Road. The markets of Hall Road, Patiala Ground and Montgomery Road also come under this category. Mixed type of commercial activity and retail and wholesale trading is observed to be carried out in these areas. Hall Road, an electronics market, remains under great traffic pressure particularly in peak hours because of limited road width and permitted long term angle parking.

People come to Anarkali and Mall for occasional shopping. A variety of goods such as readymade garments, embroidered and silky cloth, shoes, watches and clocks, household food machinery and utensils, jewellery and handicrafts are the main attractions. Bano Bazar is the most popular shopping arcade which attracts females of almost all income groups for the variety it offers in shoes, clothes, baby garments and toys, artificial jewellery and bangles etc. 'District' shopping centres are fairly scattered all over the city. These include some of the planned markets as well. These centres not only meet the shopping needs of local people but also those living in the immediate surroundings and peripheral transitional zones. People visit these centres usually for daily, monthly and occasional shopping. The District Centres include Shahdara, Walled City (Lohari, Shahalmi, Kashmiri, Akbari and Delhi), Baghbanpura, Cantonment, Gulberg, Shadman, Ichhra, Chauburji, Chowk Yateem Khana, Allama Iqbal Town, and Akbar Chowk. Kahna Nau on Ferozepur Road and Hanjarwal on Multan Road are the two other centres which overcome the shopping needs of the people living at the peripheries.

Shadman Market and Liberty Market in Gulberg are the centres which offer quality and variety of the level at par to that of Anarkali and the Mall. The people belonging to high income groups come to shop in these markets.

'Local' shopping centres are concentrated along all the busy roads of the city as well as in localities (planned and unplanned, new and old) which have sufficient threshold population. Neighbourhood and 'Mohalla' level shopping centres may also be included in this category. The activity in these centres is generally heterogeneous and of mixed retail nature. Day to day and weekly shopping activity is generally performed in these centres. The main local shopping centres are inside Bhaati and Lohari Gates of Walled City, Bilal Gunj, Mohni Road, Islampura, Krishan Nagar, Sham Nagar, Sanda, Rewaz Gardens, Temple Road, Misri Shah, Shad Bagh, Chah Miran, Mughalpura, Dharampura, Garhi Shahu, Nawan Mozang, Islamia Park, Samanabad, Pakki Thathi, Rahmanpura, Wahdat Road, Muslim Town, Garden Town, Model Town, Faisal Town, Akbar Chowk, Quaide-Azam Town, Green Town, Allama Iqbal Town, Sabzazar, Gulshane-Ravi etc.

Specialized shopping centres, with homogeneous, wholesale and retail activities, are largely located in the congested parts of Walled City and its immediate surroundings. The main reasons for these large scale concentrations are assumed to be:

- i. Close proximity to transportation terminals i.e. railway station, bus stand and truck stand,
- ii. Heavily populated surroundings, and
- iii. Cheaper transportation modes for goods movement.

The specialized centres include Kasaira Bazar (trading in utensils,), Sooha Bazar (trading in gold and Gota Kinari), Azam Cloth Market, Shoe Market, Garments related Material Market, Electric Material Market, Paper Market Akbari Mandi, Fish Market, Bamboo Market (Bansanwala Bazar), Vegetable and Fruit Market, Chamra and Plastic Market, Timber Market, Hardware Market (at Circular and Brandreth Roads), Electronics Market. With the expanding demand of commercial activity several new centres and markets have come up. Among these Hafeez Centre (specialized in computer hardware and software) in Gulberg, shopping plazas (specialized in cloth) at Chauburji, ceramic tiles, curtain cloth /carpets, and chipboard/hard board centres along Ferozpur Road, and Furniture and Building Material centres along Multan Road, Two new fruit and vegetable markets, one near the railway overhead Bridge on Ferozpur Road and the other in Kamran Block, Allama Iqbal Town/ Multan Road, have also been developed in order to reduce pressure on the central market located in Badami Bagh, as well as to decentralize the

activity to unserved areas. A list of important specialized markets by type of trade in Lahore is shown in Table 4.7 and their location in Figure 4.1.

4.3.2 Sunday (Itwaar) Bazars

Itwaar Bazars are arranged to be held by the City District Administration on Sundays with the objective to supply the commodities of daily use on controlled and comparatively cheaper rates. As these bazars operate on or along motorable roads / streets, the regular/ routine traffic has to divert and follow other routes.

These bazars not only attract the local population of the localities in which these are arranged but also the inhabitants of nearby residential areas. People visit these bazars and purchase various commodities of daily use at least for a week. These bazars have changed the shopping pattern of low and middle income groups, as they prefer to purchase the commodities once in a week on competitive and controlled prices. Itwaar Bazars are becoming popular as these provide an opportunity to the customer to save both money and time.

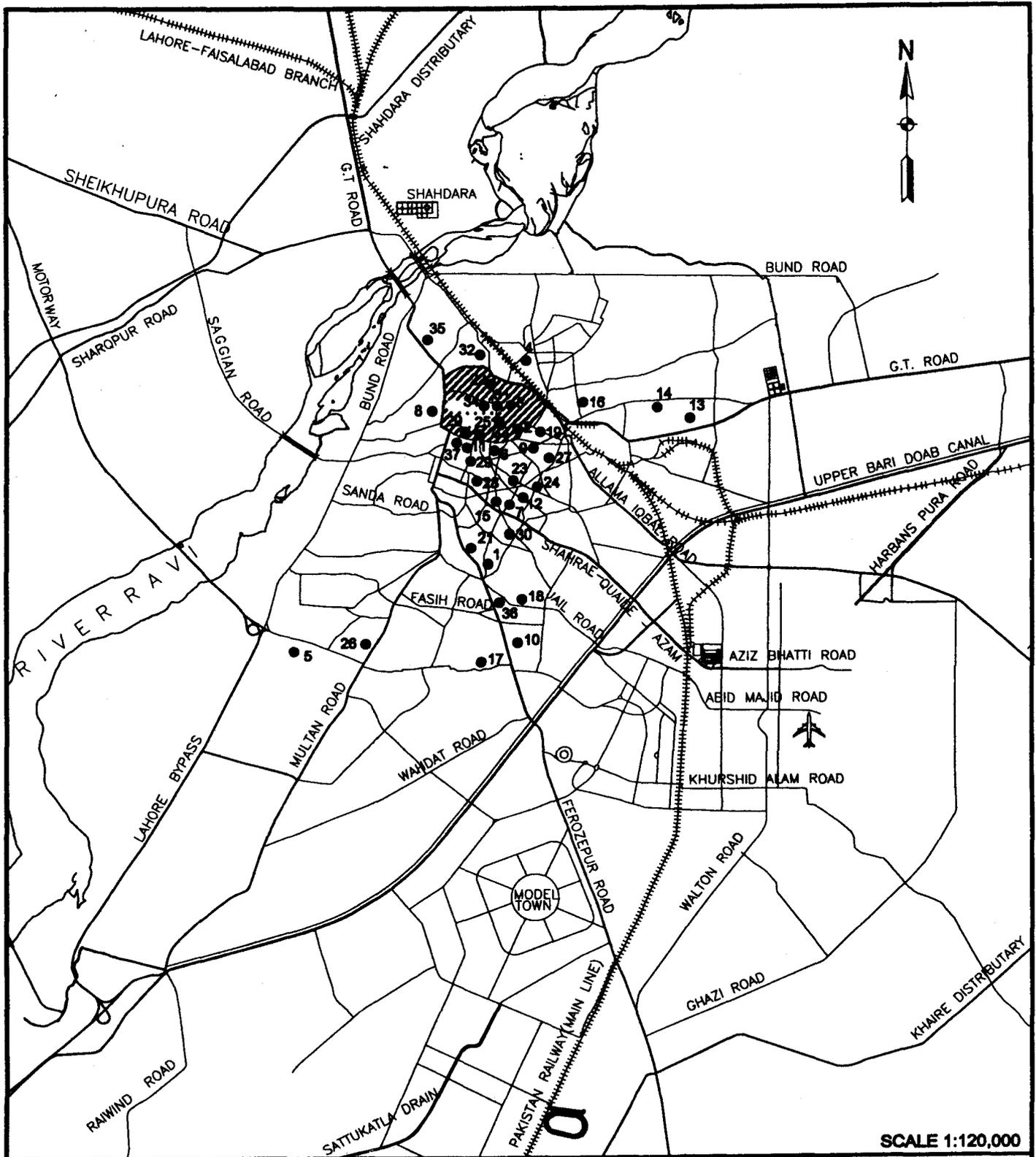
4.3.3 Mobile Commercial Activity (The Vendors)

A lot of commercial activity, particularly relating to fruits and vegetables, is being undertaken by means of hand-drawn and animal driven carts. The vendors operating these carts either move around in residential areas of different localities or stand along road sides or in service lanes of some of the busiest roads.

The roads/areas where the mobile commercial activities commonly concentrate are; Circular Road (Bhaati-Lohari), Railway Station, A.G. Office to Jane Mandir, Lake Road, Multan Road (Chauburji to Samanabad Morh), Chowk Yateem Khana, Scheme Morh, Rehrianwala Chowk, Ichhra etc.

4.3.4 Critical Issues

1. As much of the commercial activity (specialized district and local) is being performed in the congested parts of the Walled City and its immediate environs:
 - a. Juvenile, pick pocketing and other social crimes are expected to be quite high;
 - b. Loading and unloading activities create hindrances both for pedestrians and motorable traffic,
 - c. Long term kerb and angle parkings cause reduction in road capacities and obstruction to through traffic, and



WHOLESALE MARKETS:

- | | | |
|---------------------|---------------------|----------------------|
| 1. Abid Market | 14. Grass Market | 27. Nicholson Road |
| 2. Akbari Market | 15. Hall Road | 28. Nila Gumbad |
| 3. Azam Market | 16. Chamrha Mandi | 29. Palesa Bezaar |
| 4. Badami Bagh | 17. Ichhra Bazaar | 30. Queens Road |
| 5. Bakkar Mandi | 18. Jail Road | 31. Rang Mahal |
| 6. Bansarwala Bazar | 19. Landa Bezaar | 32. Sabzi Mandi |
| 7. Beadon Road | 20. Lohari Market | 33. Shah Alam Market |
| 8. Bilal Ganj | 21. Lytton Road | 34. Sooha Bazaar |
| 9. Brandreth Road | 22. Masti Gate | 35. Timber Market |
| 10. Ferozpur Road | 23. McLeod Road | 36. Tollinton Market |
| 11. Ganpat Road | 24. Montgomery Road | 37. Urdu Bazaar |
| 12. Cooper Road | 25. Mori Gate | |
| 13. Grain Market | 26. Multan Road | |

LEGEND:

- WHOLESALE MARKETS

LOCATION OF WHOLESALE MARKETS IN LAHORE

Fig: 4.1

- d. Backward linkages in terms of establishment of household industry are being strengthened, thus accelerating the process of invasion and succession and resulting in environmental degradation and shortage of housing areas.
2. Local shopping centres are sporadically located along the busy/ congested roads/ streets making the road conditions unsafe for the pedestrians.
 3. Most of the centres /markets have developed without following the design and allocational standards because of which the shopkeepers have to encroach upon the pedestrian paths and streets, creating bottlenecks in the free circulation of pedestrians and through traffic.
 4. 'Itwaar' Bazars are being arranged within the rights of way of some of the busy roads of the city, which disturb the regular traffic on the one hand and create nuisance in terms of waste pollution or the other.
 5. The venders, selling fruit on hand and animal carts occupy usually the side lanes of the busy roads, causing hindrances in the smooth flow of traffic and sometimes resulting in fatal to serious road accidents.

TABLE 4.7
LIST OF IMPORTANT MARKETS IN LAHORE

SR. NO.	MARKET	TRADE
1.	Abid Market	Electric & Gas Home Appliances
2.	Akbari Mandi	General Merchandise/Wool Market
3.	Azam Market	Cloth
4.	Badami Bagh	Auto Parts, Tyres and Iron Market
5.	Bakkar Mandi	Sheep and Cattle
6.	Bansanwala Bazaar	Bamboo
7.	Beadon Road	Building Materials and Electrical Goods
8.	Bilal Ganj	Auto Spare Parts (Second hand)
9.	Brandreth Road	Machinery and Hardware
10.	Ferozpur Road	Ceramics, Curtain Cloth, Carpets
11.	Ganpat Road	Paper & Card
12.	Cooper Road	Glass Market
13.	Grain Market	Grains
14.	Grass Market	Fodder/Grass
15.	Hall Road	Electronics
16.	Chamrha Mandi	Hides and Skins
17.	Ichhra Bazaar	Furniture, General Merchandise & Cloth
18.	Jail Road	Cars (Sales and Purchase)
19.	Landa Bazaar	Garments (Old) and Steel Scrap
20.	Lohari Gate	Medicine & Opticals
21.	Lytton Road	Rickshaw Parts and Repairs
22.	Masti Gate	Shoe Market
23.	McLeod Road	Steel Furniture, Motor Cycles, Auto Parts & Sewing Machines
24.	Montgomery Road	Auto Spare Parts
25.	Mori Gate	Fish
26.	Multan Road	Furniture, Building Materials
27.	Nicholson Road	Carpets
28.	Nila Gumbad	Pedal Cycles and Tyres
29.	Paisa Bazaar	Scientific Instruments
30.	Queens Road	Cars (Sales and Purchase)
31.	Rang Mahal	General & Electrical Goods
32.	Sabzi Mandi	Fruits and Vegetables
33.	Shah Alam Market	Wholesale Clothes, General Consumer Items
34.	Sooha Bazaar	Gold and Silver
35.	Timber Market (Ravi Road)	Timber
36.	Tollinton Market	Fish and Chicken
37.	Urdu Bazaar	Books and Stationery

5.0 LAND USE AND LAND DEVELOPMENT

Physically, Lahore City is characterised by three concentric zones which represent the generalized built-up form. The inner or central zone including the historic Walled City is a combination of residential, commercial and small scale industrial activities. Non-residential uses like retail and wholesale commerce, cottage industry and warehousing are intermingled with previously purely residential neighbourhoods. The intermediate zone is largely planned as a mixture of housing, related activities and services. The outer zone presents typical urban sprawl characteristics comprising new housing schemes sponsored by public as well as private sector. The specialized functions and services are however, concentrated in the inner zone thereby generating a large amount of travel between these zones and thus the need for an efficient public transport system is amply visible.

5.1 EXISTING LANDUSE

A detailed landuse survey of the LMA has been carried out by NESPAK between November 2001 and April 2002. The Study Area, called the LMA, is spread over 2,306 sq.km. (230,670 hectares) although most of it (76.2%) can be classified as vacant or being under agricultural use. The total built-up area including Cantonment and villages is about 19.6%. However the boundary of ex-MCL covers an area spread over 250 sq.km., of which 51% is under residential use and 16% is vacant or under agricultural use (see Table 5.1 and detailed maps in the back folder of this report).

**TABLE 5.1
EXISTING LANDUSE DISTRIBUTION**

LANDUSE	LMA		Ex-MCL AREA	
	Hectares	% age	Hectares	% age
Residential ¹	22,715	9.85	12,822	51.16
Commercial	1,737	0.75	1,289	5.14
Educational	1,419	0.62	1,151	4.59
Institutional	998	0.43	580	2.31
Industrial	2,455	1.06	904	3.61
Graveyards	637	0.28	264	1.05
Parks/Recreational	1,608	0.70	1,027	4.10
Vacant/Agricultural	175,854	76.23	3,971	15.85
Transportational ²	4,449	1.93	2,059	8.22
Villages	3,820	1.66	80	0.32
Water Bodies	5,711	2.47	914	3.65
Cantonment	9,267	4.02	-	-
Total	230,670	100.00	25,061	100.00

Source: Land Use Survey 2001-02 by NESPAK

¹ includes internal roads

² includes primary network and terminals

The above table shows that LMA area under urban use is about 15.6% (excluding the Cantonment) out of which 9.85% is under residential use. The dominant figure of 76.23% of the total area is either vacant or under agricultural use. The Cantonment covers about 4% area followed by water bodies, (2.47%). Villages cover an area of 1.66%. Area under transportation use is 1.93% and under industrial use is 1.06%. The commercial land use covers 0.75% of the total area followed by educational (0.62%), institutional (0.43%) and graveyards (0.28%).

Table 5.1 also depicts that 76.19% of the ex-MCL area is under urban use with 51.16% under residential use followed by commercial (5.14%), educational (4.59%), transportation (8.22%) and recreational as 4.1%. Water bodies occupy 3.65% followed by industrial use (3.61%), institutional (2.31%), graveyards (1.05%) and villages (0.32%). A total of 15.85% of the area is either vacant or under agricultural use.

5.1.1 Residential

Urban growth of Lahore has been following a combination of planned and unplanned activity pattern. About half of the growth is in the form of planned housing schemes coming up in the south and south-west which provide basic amenities and necessary infrastructure. This planned growth is in a piecemeal fashion which requires consolidation and in-filling during the plan period for optimum utilization of available infrastructure.

The unplanned and unauthorized growth is spread in various parts of the metropolis especially in the northern, north-eastern, eastern and western peripheries.

As per land use survey, considerable parts of the haphazardly grown residential areas are invaded by non-conforming uses such as obnoxious industries, cattle breeding sheds, workshops etc. These areas are in the vicinity of Badami Bagh, Gujjarpura, Walid Park, Kot Khwaja Saeed and all along Bund Road, G.T.Road, Ferozpur Road etc. Timber cutting workshops and cattle breeding sheds are concentrated near Daroghawala and Muslimabad areas along the Northern Bund Road where people live in most unhygienic conditions.

5.1.2 Commercial

Except the planned housing schemes where in commercial areas are separately zoned, the commercial activity in the metropolis has developed along almost all urban roads/streets in the form of ribbon development. This development on the one hand is resulting in conversion of land use and on the other hand creating congestion and illegal encroachments.

Higher order commercial activity is of centralized nature which has caused specific problems like congestion, traffic jams, encroachments, vehicular parking, loading/unloading, air pollution etc. Similarly, the Fruit and Vegetable Market at Badami Bagh is not properly planned/organized and is a source of nuisance for the surrounding environments, especially with the choked sewerage system. The situation is aggravated during rainy season.

5.1.3 Industrial

The industrial activity, as depicted in the land use plan is not confined to the designated industrial estates of Gulberg, Kot Lakhpat and Chunian but has developed along some of the major roads and even in densely populated areas.

Heavy industries have been developed in Badami Bagh Area which are hazardous to the living environment. Traffic jams and congestion due to on-road loading / unloading activities is a common feature. About 400 industries have come up in Mominpura area which are continuously growing without any check from the concerned quarters.

Different types of industries have also come up along the major traffic corridors like Multan Road, Ferozepur Road, Raiwind Road, G.T.Road, Sheikhpura Road and Defence Road along Hudiana Drain.

Container terminal is an ancillary use of the large industrial and commercial enterprises, preferably located in their close proximity. There are about 12 container terminals in the city, 10 of which are located along Multan Road outside municipal limits mainly concentrated within a short distance of 1.5 km between Chung and Mohlanwal Villages. Two terminals are located within the ex-municipal area near the industrial establishments along Bund Road.

5.1.4 Vacant/ Agricultural

Vacant (undeveloped) pockets of land within the ex-MCL area are few and smaller in size. Such pockets are found in sparsely populated areas particularly at the north-eastern fringe. These pockets are in transitional stage and in the process of sub-division and in-filling by the residential and related uses. The agricultural activity within the ex-MCL area is confined either along the river or in the east of the Cantonment.

5.1.5 Transportation

Major areas under transportation activities are the Lahore Airport, Lahore Railway Station, General Bus Stand at Badami Bagh, Dry Port

near Mughalpura Railway Station and the inter-city and intra-city bus/wagon and truck stands located all around the city.

The shifting of inter-city bus/wagon terminal from Lahore Railway Station to the General Bus Stand has changed the inter-city and intra-city travel pattern and has also overburdened the transport activity at Badami Bagh. In order to decentralize this activity, designing and construction of a new bus terminal along Multan Road near Shahpur Interchange has been initiated by the City District Government.

5.2 LAND ACQUISITION AND DEVELOPMENT

Between 1947 and 1985, the land development schemes in Lahore were mostly undertaken by LDA and its predecessor, the LIT. The total number of plots of varying sizes developed collectively by LIT and LDA is around 97,000 (Table 5.2) out of which share of LDA alone is more than 73%. Housing and Physical Planning Department also provided about 5,000 plots which were mainly (83%) of 3 Marlas. Presently the major land development schemes are being sponsored by private sector cooperative housing societies. These societies have developed a total of around 61,000 plots of different sizes varying between 1 to 2 Kanals including 15 Marlas (62%), 7 to 10 Marlas (28%), and 3 to 5 Marlas (10%). The analysis of the plots developed in public sector shows the shift in policy with respect to plot sizes. There is more awareness to shift the benefits in favour of lower income groups. Consequently, the provision of smaller sizes of plots in LDA schemes has been increased as compared to LIT schemes.

Since the ownership is predominantly held in private sector, land acquisition has been an integral part of the land development process whether in public or private sector. For over a decade the Punjab Acquisition of Land (Housing) Act, 1973 enabled the LDA to develop a large number of housing schemes in Lahore as it could acquire land for housing at a very low rate of Rs. 100,000 per ha (Rs. 40,000 per acre). This act was however repealed in 1985, to restore the application of the Land Acquisition Act, 1894 which required payment of compensation at one year's average market rate. The requirement of compensation at market rate needed heavy financial outlays for acquisition purposes. Money starved LDA was as such unable to undertake any new housing project for over twelve years. During this period the land development activities were performed by the formal and informal private sector and the LDA's role was restricted to its on-going projects only.

Coming out of hibernation the LDA launched its Jubilee Town Scheme in 1997-98 by adopting a bit novel way of raising funds to cover the initial cost of acquiring the land. This became possible by mortgaging of available assets of LDA with a bank against a certificate issued by it thus guaranteeing the availability of money, a legal requirement for the land acquisition process to start. The LDA was then able to collect substantial funds through advance sale of residential plots at a fixed price. During the course of acquisition, the saleable

assets i.e. public utility sites, residential, and commercial plots etc. however, remained frozen which may have adversely affected revenue collection, budgeting and resource allocation for other developmental activities. Also for obvious reasons, i.e. depletion of assets etc., the methodology of acquiring the land for Jubilee Town cannot be relied upon for all future land acquisition undertakings.

Similarly in private housing schemes maximum provision is made for larger plots which indicates that the private sector development is targeted towards upper income groups. It therefore appears that to fulfill the needs of lower income groups the responsibility lies upon the public sector. This can be achieved by evolving newer strategies as discussed in later parts of this report.

5.3 LAND DISPOSAL POLICY

The developed land in LIT/LDA Schemes has been disposed off through a combination of allotments, auctions and exemption of plots. Different policies governing the disposal of plots have been operative at different times. In the eighties the disposal of developed plots was regulated by Martial Law Instruction No.23 in which quotas for large and small plots were laid down for allotment to different groups of people. Strangely enough it contained an element of discretion for the Martial Law Administrator to allot 7% of larger plots and 5% of smaller plots in compassionate and hardship cases, a provision which was increased to 10% and willingly retained as discretionary quota in subsequent land disposal policies introduced by the political regimes. This discretion oriented policies were widely used to dish out developed plots on very cheap rates against political gains causing colossal financial loss to the LDA and other public sector land development agencies.

The current land disposal policy is embodied in the Disposal of Land by Development Authorities (Regulation) Ordinance of 1998. The salient features of the policy are:

- a. Disposal of plots in the zone of above 10 Marlas and all constructed units by way of open auction.
- b. Plots falling in the zone of 10 Marlas and below to be disposed off in the manner given in Table 5.3:

It appears that the last policy was coined to eliminate group oriented quotas and discretionary provisions. It may be very desirable thing to do but the disposal of as much as 95% of all plots through auction pushes out the lower income groups from the formal housing sector.

TALBE 5.2
DETAILS OF PLOTS/HOUSING SCHEMES DEVELOPED IN LMA

HOUSING SCHEMES BY	NO.OF HOUSING SCHEMES	AREA IN HECTARES (ARCES)	TOTAL NO. OF PLOTS	NUMBER OF PLOTS MEASURING								TOTAL AREA OF PLOTS IN HECTARES (Kanal)
				840 Sq.m (2 K) & above	420 Sq.m (1 K)	315 Sq.m (15 M)	210 Sq.m (10 M)	160 Sq.m (7 M)	105 Sq.m (5 M)	63 Sq.m (3 M & Less)		
LIT	24	1403 (3,468)	8,656 100%	3,444 39.6%	1,765 20.3%	-	2,618 30%	298 3.4%	505 5.8%	26 0.3%	747 (17,874)	
LIT/LDA	13	995 (2,460)	17,064 100%	1,355 8%	1,275 7.5%	-	7,176 42.1%	1,468 8.6%	4,329 25.4%	1,461 8.6%	456 (10,896)	
LDA	21	2515 (6,214)	71,258 100%	438 0.6%	8,944 12.5%	-	16,521 23.2%	4,936 7%	18,361 25.8%	22,058 31%	1,158 (27,707)	
PRIVATE SCHEMES (Finally Approved)	73	1708 (4,221)	26,641 100%	1,823 6.8%	12,725 47.7%	1433 5.4%	6,841 25.7%	899 3.4%	2,350 8.8%	570 2.1%	-	
PRIVATE SCHEMES (Technically Approved)	59	2118 (5,235)	34,747 100%	4,662 13.4%	16,333 47%	1212 3.5%	8,449 24.3%	799 2.3%	3,047 8.8%	245 0.7%	-	
PRIVATE SCHEMES (Total)	132	3826 (9,456)	61,388 100%	6,485 10.5%	29,058 47.3%	2645 4.3%	15,290 24.9%	1,698 2.7%	5,397 8.8%	815 1.3%	2,330 (55,744)	
HOUSING & PHYSICAL PLANNING DEPARTMENT	3	101 (249)	4,971 100%	15 0.3%	17 0.3%	-	347 7%	124 2.5%	335 6.7%	4,133 83%	40 (967)	
Total			163,337								4,731 (113,188)	

Source: L.D.A. and H&PP Department.

* Technically approved schemes are those private housing schemes where land ownership documents, the layout plan and the land use distribution is approved by LDA. While Finally approved schemes are those private housing schemes where the designing of infrastructure services (roads, water supply sewerage, electricity) have also been approved by the LDA and the sponsoring party has executed the required mortgage and transfer deeds with the LDA.

5.4 LAND VALUES

The land values in Lahore vary from one locality to another and from road fronts to back lanes. These also vary from one type of development (use) to the other. The land values are also manipulated by speculators. The tremendous increase in land values over the past several decades has not been matched by the corresponding increase in household incomes. This has put a decent shelter, for a large segment of urban population, beyond their affordability level.

Comparison of change in the land values can be made on the basis of assessments notified off and on by the District Collector for computation of advalorem stamp duty under Stamp Act, 1899. These assessments are being relied upon because no other proper survey of land values has been undertaken by any planning and development agency. Tables 5.4 and 5.5 have been extracted from the Punjab Gazettes for understanding in particular the changing pattern of land values from 1991 to 1999 in twenty selected residential localities and ten important commercial areas scattered in the four administrative sub-divisions of the city.

**TABLE 5.3
DISPOSAL OF PLOTS UP TO 10 MARLAS**

S.NO	MANNER OF DISPOSAL	ABOVE 5 MARLAS TO 10 MARLAS	UP TO 5 MARLAS
1.	Through open auction	95%	90%
2.	By allotment to the defence personnel who become permanently disabled or the legal heirs of the defence personnel who lay down their lives in the discharge of official duties	3.5%	3.5%
3.	By allotment to such persons who become permanently disabled in the performance of functions or volunteering services in relation to the affairs of the government or the legal heirs of the persons who die while performing such functions or services	1.5%	1.5%
4.	By allotment to destitutes	-	5%

**TABLE 5.4
LAND VALUES IN SELECTED RESIDENTIAL LOCALITIES OF THE CITY**

Sr. No.	NAME OF LOCALITY	PER MARLA LAND VALUE (RS.)		% INCREASE IN 8 YEARS
		1991	1999	
CITY SUB-DIVISION				
1.	Inside Lohari Gate (C)	135,000	255,000	89
	Inside Lohari Gate (R)	-	78,000	-
2.	Qila Lakshman Singh (C)	45,000	85,000	89
	Qila Lakshman Singh (R)	30,000	55,000	83
3.	Shah Bagh	40,000	52,000	30
4.	Jia Musa (C)	25,000	85,000	240
	Jia Musa (R)	10,000	20,000	100
5.	Gawal Mandi (C)	100,000	255,000	155
	Gawal Mandi (R)	60,000	72,000	20
SADAR SUB-DIVISION				
6.	Gulshan-e-Ravi (C)	95,000	212,000	123

	Gulshan-e-Ravi (R)	35,000	52,000	49
7.	Main Mozang (C)	125,000	212,000	70
	Main Mozang (R)	55,000	98,000	78
8.	Riwaz Gardens (C)	95,000	255,000	168
	Riwaz Gardens (R)	70,000	117,000	67
9.	Sanda (C)	40,000	94,000	135
	Sanda (R)	25,000	45,000	80
10.	Sabzazar (C)	65,000	136,000	109
	Sabzazar (R)	20,000	39,000	95
MODEL TOWN SUB-DIVISION				
11.	Gulberg II (C)	200,000	425,000	113
	Gulberg II (R)	50,000	78,000	56
12.	Garden Town (C)	60,000	153,000	155
	Garden Town (R)	45,000	65,000	44
13.	Allama Iqbal Town (C)	175,000	298,000	70
	Allama Iqbal Town (R)	45,000	58,000	29
14.	Ichhra (C)	200,000	425,000	113
	Ichhra (R)	35,000	45,000	29
15.	Quaid-e-Azam Town (C)	70,000	153,000	119
	Quaid-e-Azam Town (R)	-	45,000	-
CANTONMENT SUB-DIVISION				
16.	Kot Khawaja Saeed (C)	30,000	76,000	153
	Kot Khawaja Saeed (R)	15,000	20,000	33
17.	Baghbanpura (C)	45,000	95,000	111
	Baghbanpura (R)	25,000	45,000	80
18.	Sadar Bazar Cantt (C)	60,000	100,000	67
	Sadar Bazar Cantt (R)	30,000	52,000	73
19.	Cavalry Ground (C)	300,000	600,000	100
	Cavalry Ground (R)	40,000	80,000	100
20.	LCCHS Phases I & II (C)	120,000	255,000	113
	LCCHS Phases I & II (R)	40,000	78,000	95

Note : C = Commercial
R = Residential

Source: Gazette Notification, Government of the Punjab.

TABLE 5.5
**LAND VALUES IN CERTAIN IMPORTANT MARKETS/
COMMERCIAL ROADS OF LAHORE CITY**

Sr. No.	COMMERCIAL AREA	PER MARLA LAND VALUE (Rs.)		% AGE INCREASE
		1991	1999	
1.	Shah Alami	600,000	1,360,000	127
2.	Akbari Mandi	500,000	850,000	70
3.	Anarkali	400,000	1,020,000	155
4.	Shahrahe-Quaide-Azam	400,000	1,530,000	283
5.	Hall Road	400,000	1,020,000	155
6.	Jail Road	300,000	850,000	183
7.	Ferozepur Road (Shama to Kalma Chowk)	250,000	510,000	104
8.	Gulberg Main Boulevard	150,000	510,000	240
9.	Cavalry Ground Commercial Centre	300,000	600,000	100
10.	Main Defence Market (LCCHS)	100,000	600,000	500

Source: Gazette Notification, Government of the Punjab.

In some residential areas, land values have increased by 75% or even more during the last 10 years. The value of commercial land has recorded an unusual rising trend and on the whole the values have more than doubled in the same period. Exceptional higher rises are noticeable in areas like Anarkali, Shahrae-Quaide-Azam, Jail Road, Gulberg Main Boulevard and Commercial Zone of LCCHS.

5.5 LAND OWNERSHIP

The estimation of land in terms of ownership pattern as reflected in the 1966 Master Plan for Greater Lahore has not undergone any major change and most of the land in the LMA continues to be in the private ownership. Due to land reforms and inheritance under Islamic Sharia, the size of holding has, however, fragmented into smaller units.

The data collected from the office of the then Deputy Commissioner by NESPAK show that 69% of the total family land holdings is below 4.8 ha while another 20% and 9% are within the limit of 10 ha and 20 ha respectively. It also indicates a widely fragmented picture of land ownership requiring painstaking land acquisition and consolidation efforts if compulsory acquisition option is exercised by the public sector agencies. However, land acquisition by private sector and various cooperative housing societies is free from any conflict as it is usually undertaken through negotiations between sellers and the buyers.

5.6 BUILDING HEIGHTS

Height restrictions, along with other regulations, are useful in controlling the overall density, access to air and light, etc. in the city. Height limitations restrict and dampen city growth and make it unnecessarily costly specially when suitable and reasonably priced land is not abundantly available.

The height of buildings is generally linked with the land values which in turn depend upon their location in the city space. Building heights do affect residential densities, congestion on roads and streets, floor area ratios etc.

Field observations reveal that the buildings in the older parts of Lahore, namely Walled City, Brandreth Road, Misri Shah, Elahi Park, Wassanpura, Tajpura, Islampura, Qila Gujjar Singh, Ram Nagar, Ittehadpura Mozng and Ichhra are 3 to 4 storeyed high. The buildings in areas surrounding the said localities are 2 to 3 storeyed high except those lying in GOR, Mayo Gardens and planned schemes of LIT and LDA, which mostly are double storeyed. The residential flats located in Rewaz Garden, Allama Iqbal Town, Faisal Town and Model Town are 4 to 5 storeyed high. The residential buildings in the urban periphery are predominantly single storeyed.

Along all the busy urban roads (permitted for commercialization) the heights of buildings vary from 3 to 4 storeys excluding basement. Multi-storeyed commercial plazas are commonly found along Empress Road, Egerton Road, Davis Road, Shabrae-Quaide-Azam, Jail Road, Gulberg Main Boulevard, Barkat Market (Garden Town), Model Town Link Road and Ferozepur Road.

6.0 HOUSING

Provision of shelter to every family is a daunting task facing the nation today. Lahore is facing acute shortage of housing which will aggravate further due to future population growth and relatively diminishing housing stock. Increased influx of population from rural areas is also being experienced. This group of population adds its own dimension to the shelter problem inflating the ever-growing segment of the urban poor, who cannot afford the housing opportunities viz, developed plots or houses available in the formal sector.

6.1 HOUSING CHARACTERISTICS

6.1.1 Stock

The housing stock in LMA, as per 1998 Census, is 967,202 of which 77.62 is in urban areas of LMA and 22.38% in rural areas. More than 91% of the total stock is in District Lahore, around 7% in District Sheikhupura and less than 2% in District Kasur (Table 6.1).

TABLE 6.1
HOUSING STOCK IN LMA (1998)

DISTRICT ¹	AREA	POPULATION 1998	HOUSEHOLD SIZE (1998)	HOUSING STOCK (1998)	
				No.	%
Lahore ²	Urban	5,209,088	7.1	731,348	75.62 %
	Rural	1,109,657	7.3	150,360	15.54 %
	Both	6,318,745	7.2	881,708	91.16 %
Sheikhupura ³	Urban	147,144	7.6	19,361	2.00 %
	Rural	351,868	7.2	48,871	5.05 %
	Both	499,012	7.3	68,232	7.05 %
Kasur	Urban	-	-	-	-
	Rural	120,834	7.0	17,262	1.78 %
	Both	120,834	7.0	17,262	1.78 %
Total LMA	Urban	5,356,232	7.1	750,709	77.62 %
	Rural	1,582,359	7.3	216,493	22.38 %
	Both	6,938,591	7.2	967,202	100 %

Within District Lahore, as per 1998 Census, there are 881,708 housing units. Of these, 82.9 % are in urban areas and the remaining stock is in rural areas (Table 6.2). Whereas the 1980 Housing Census gave the total figure of housing units as 536,724 in the whole District which included 83.4% of housing units in urban areas.

¹ In case of Sheikhupura and Kasur Districts, the statistics pertain to parts falling within LMA.

² For parts of Districts of Sheikhupura and Kasur falling in LMA, housing stock in urban and rural areas have been estimated by dividing the population with the reported household size, in these areas.

³ For parts of Districts of Sheikhupura and Kasur falling in LMA, housing stock in urban and rural areas have been estimated by dividing the population with the reported household size in these areas.

It will be interesting to note that between 1981 and 1998 population increased @ 3.46% per annum (Chapter-3) whereas the housing stock during this period increased @ 2.79% only. This shows that the increase in the housing stock has not kept pace with the growth in population. This depicts the non-affordability of housing by the lower income group resulting in the increase in household size.

6.1.2 Tenure

During the past two decades there has been a growing trend towards owner occupation in urban areas of Lahore District, a tendency which stems out of sense of security a household gets being owner of a dwelling unit (Table 6.3). Another reason is the unauthorised land subdivisions going on in peripheral areas which are mostly based on owner occupancy. The decrease in the owner occupied houses and corresponding increase of rented and rent free structures in rural area between 1980 and 1998 reflects the transfer of population from rural to urban area.

6.1.3 Period of Construction

37% of the dwelling units in the urban areas of Lahore District were constructed in the last 10 years while another 29% were built during 1970 and 1990. Of the total housing stock one-fifth has already attained a life of more than 30 years and an additional 14% was built more than 50 years ago (Table 6.4).

6.1.4 Type of Housing Structures

According to 1998 Census, 95.6% of the housing units in Lahore District Urban are built in baked bricks, blocks and dressed stone with RCC/RBC roof in as many as 64.9% of the total housing stock. Whereas in 1980, the housing units built in baked bricks, blocks and dressed stone were 93.4% with RCC/RBC roof only in 36.8% of the total housing stock. Table 6.5 depicts the type of housing structures in Lahore Urban for the two census years.

6.1.5 Housing Facilities

Availability of potable water, a separate latrine and electricity are the three facilities which, to a large extent, determine the quality of life in a household. The 1998 Census revealed that as many as 85.24% of the total housing units in Lahore District Urban have potable water supply, 52.86% have the facility of a separate latrine and 97.08% have electricity. In 1980, the potable water supply was confined to 64.54% of the total housing units, separate latrines to 65.36% (25.53% with flush and 39.83% without flush arrangements) and electricity to 85.73% housing units (Table 6.6).

Comparing the figures of the two census years, it becomes clear that that the conditions in case of potable water supply and electricity have remarkably improved but deteriorated in case of household's separate latrines.

6.1.6 Indices of Congestion

Overcrowding in houses continues to persist as ever before. It has improved slightly during the inter-censal period 1981 and 1998. At the national level, the room occupancy has reduced from 3.5 to 3.3. whereas at the urban level it has gone down from 3.1 to 3.0 persons per room. The indices of congestion for Lahore District urban and rural areas however, reflect a further pleasant change in terms of reduced room occupancy and increasing number of housing units with more habitable rooms. Housing units with one and two rooms in urban areas have fallen by 12.6% with correspondent increase of larger housing units with 3 to 5 rooms or even more (Table 6.7).

TABLE 6.2
HOUSING STOCK IN RURAL & URBAN AREAS (1980 AND 1998)

LAHORE	1980		1998		INCREASE/ ANNUM (%)
	No.	%	No.	%	
District	536,724	100.0	881,708	100.0	2.79
Urban	447,509	83.4	731,348	82.9	2.76
Rural	89,215	16.6	150,360	17.1	2.94

TABLE 6.3
HOUSEHOLD TENURE BY RURAL AND URBAN AREAS
LAHORE DISTRICT (1980 AND 1998)

TENURE TYPE	RURAL				URBAN			
	1980		1998		1980		1998	
	No.	%	No.	%	No.	%	No.	%
Owner Occupied	77,997	87.4	123,973	82.4	286,158	64.0	498,776	68.2
Rented	3,181	3.6	12,436	8.3	112,862	25.2	162,168	22.2
Rent Free	18,037	9.0	13,951	9.3	48,489	10.8	70,404	9.6
Total	89,215	100.0	150,360	100.0	447,509	100.0	731,348	100.0

TABLE 6.4
PERIOD OF CONSTRUCTION OF HOUSES
IN URBAN AREAS OF LAHORE DISTRICT

PERIOD OF CONSTRUCTION	NUMBER OF HOUSES	PERCENTAGE
Less than 10 years	273,048	37.30
10 to 30 years	211,959	28.98
31 to 50 years	145,743	19.92
More than 50 years	100,598	13.75

TABLE 6.5
TYPE OF HOUSING STRUCTURES IN LAHORE URBAN

CENSUS YEAR	PUCCA (%)	KATCHA (%)
1980	93.4	6.6
1998	95.6	4.4

TABLE 6.6
HOUSING FACILITIES IN LAHORE URBAN

YEAR	POTABLE WATER	SEPARATE LATRINE	ELECTRICITY
1980	64.64%	65.36%	85.73%
1998	85.24%	52.86%	97.08%

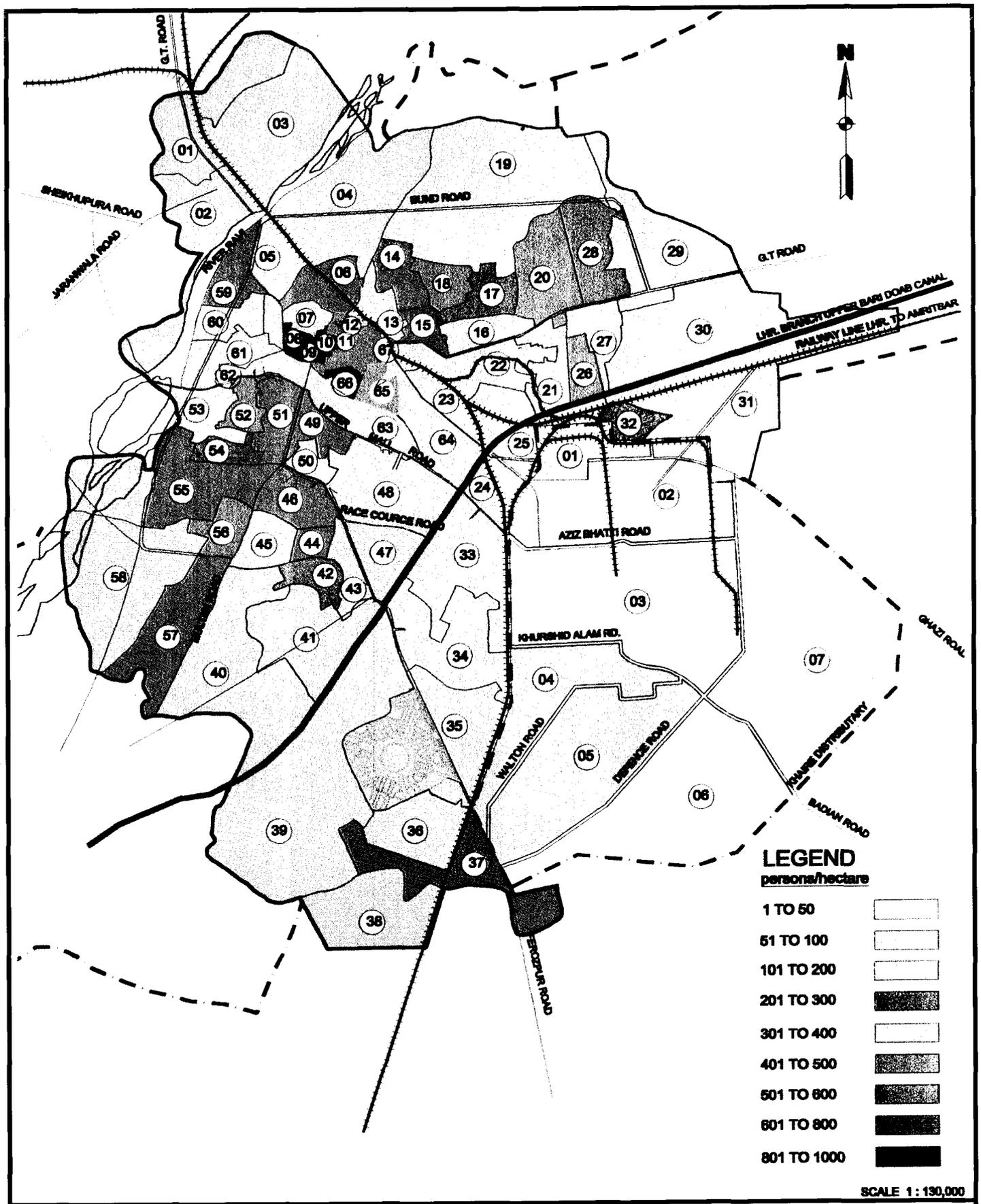
TABLE 6.7
INDICES OF CONGESTION IN LAHORE DISTRICT (1980 AND 1998)

INDEX	1980			1998		
	District	Rural	Urban	District	Rural	Urban
Household size (persons per housing unit)	6.9	7.4	6.7	7.2	7.3	7.1
Occupancy (Persons per room)	3.3	3.9	3.2	3.0	3.6	2.9
Rooms Per housing unit	2.1	1.6	2.2	2.4	2.0	2.4
Housing units with 1 to 2 rooms (%age)	76.93	88.22	74.68	64.20	74.68	62.04
Housing units with 3 to 4 rooms (%age)	17.71	10.36	19.18	26.99	20.44	28.34
Housing units with 5 or more rooms (%age)	5.36	1.42	6.14	8.81	4.88	9.62

Source: Housing and Population Census Reports of Lahore District, 1981 and 1998.

6.2 HOUSING DENSITIES

For the purpose of this study, the Inner Metropolitan Area of Lahore has been divided into 74 analysis zones corresponding to the Charges or divisions used for conducting the Population Census, 1998 as shown in Fig. 6.1. The figure also shows range of zonal densities in terms of persons per hectare (pph). The range of densities in the built up areas varies from below 50 pph (20 persons per acre-ppa) in some zones to more than 740 pph (300 ppa) in others (Table 6.8). Zones with lower densities can be examined for further densification in order to economise on infrastructure costs which would have to be incurred for new developments.



EXISTING DENSITIES IN INNER LMA

Fig: 6.1

TABLE 6.8
POPULATION DENSITY IN VARIOUS ZONES
WITHIN INNER LMA

A. Ex-MCL AREA

Zone No:	Major Locality	Area (hectares)	Population 1998	Density (persons/ha)
1	Rachna Town	605	107,688	178
2	Jia Musa	770	117,015	152
3	Shahdara	1104	91,496	83
4	Data Nagar	943	104,249	111
5	Qila Lachhman Singh	174	55,176	317
6	Badami Bagh	197	48,549	246
7	Shahi Mohallah	89	29,471	331
8	Koocha Hakiman	38	35,947	946
9	Mori Gate	37	30,221	817
10	Shah Alami	28	26,561	949
11	Akbari Mandi	57	24,119	423
12	Yakki Gate	25	14,415	577
13	Misri Shah	121	43,074	357
14	Shadbagh	166	45,918	277
15	Chah Miran	97	69,214	713
16	Begum Pura	155	52,761	340
17	Ghorey Shah	154	86,935	565
18	Wassan Pura	130	54,921	421
19	Bund Road	1561	149,490	96
20	Baghbanpura	195	81,369	416
21	Mughalpura	360	47,717	132
22	Railway Colony	344	62,457	182
23	Gharhi Shahu	303	60,295	199
24	Mian mir	206	25,292	123
25	Dharampura	179	58,767	329
26	Ganj Mughalpura	115	48,321	419
27	Anguri Bagh	170	65,256	383
28	Mahmud Booti	304	75,670	249
29	Daroghawala	688	101,782	148
30	Harbanspura	966	124,755	129
31	Ghaziabad	1331	145,423	109
32	Kumharpura	122	68,884	564
33	Gulberg	587	54,795	93
34	Liberty	552	52,930	96
35	Model Town	973	77,315	79
36	Kot Lakhpat	355	115,366	325
37	General Hospital	533	139,976	263
38	Township	597	186,694	313
39	Jauhar Town	1872	132,222	71
40	Iqbal Town	1093	136,418	125
41	Muslim Town	524	82,013	156
42	Rahmanpura	133	69,026	518
43	Ichhra	136	48,618	358

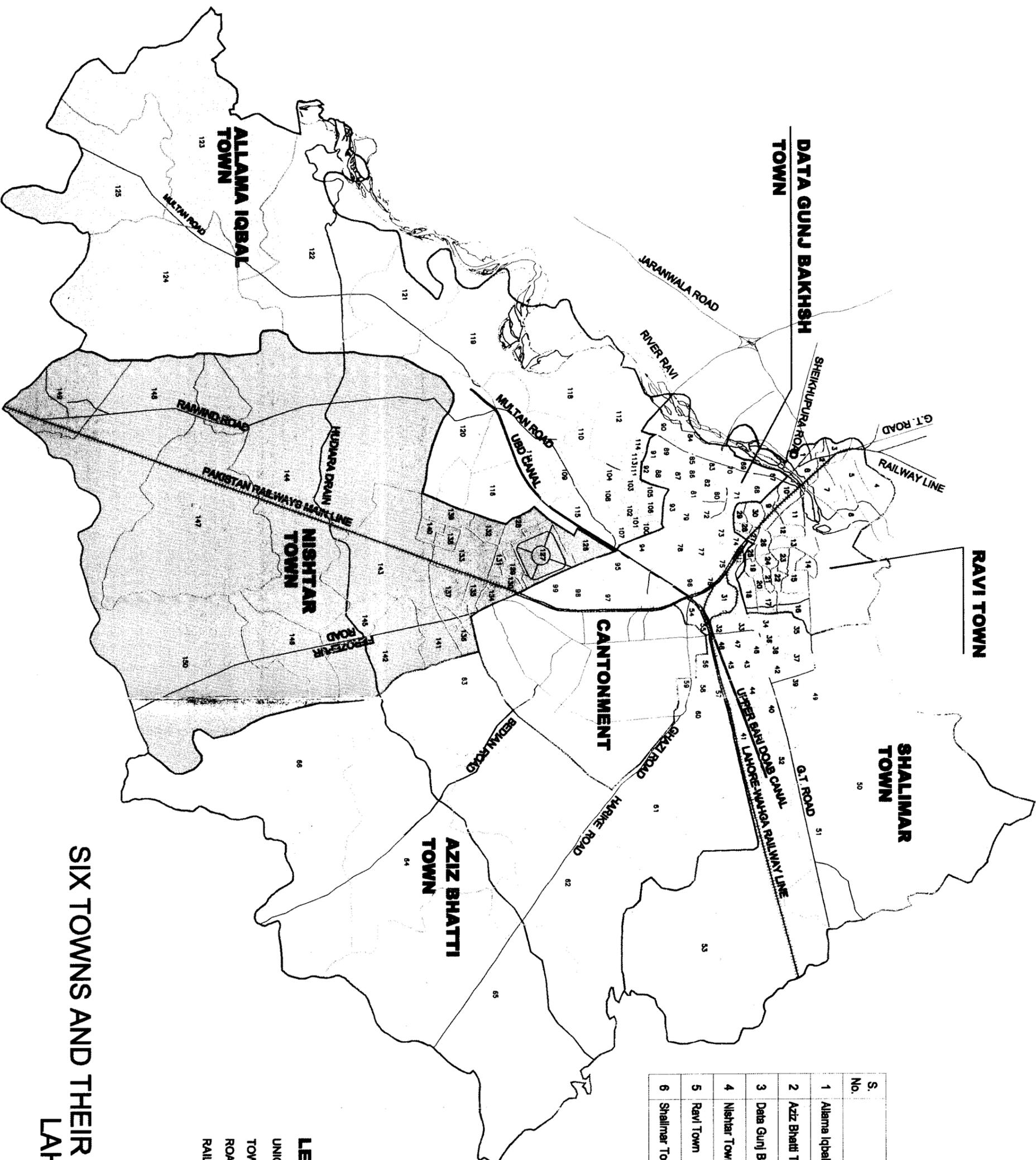
44	Rasul Nagar	72	21,292	296
45	Samanabad	172	59,101	344
46	Chauburji Gardens	218	58,148	267
47	Shadman	237	36,626	154
48	GOR	539	49,649	92
49	Mozang	136	29,473	217
50	New Mozang	82	30,412	372
51	Riwaz Gardens	199	41,832	211
52	Islampura	102	45,389	445
53	Sanda Kalan	193	61,507	319
54	Sanda Khurd	94	68,813	733
55	Gulshane Ravi	447	129,162	289
56	Sodiwal	147	62,424	425
57	Sabzazar	508	110,278	217
58	Babu Sabu	1355	138,078	102
59	Begum Kot	174	35,807	206
60	Mominpura	202	77,629	384
61	Kasarpura	196	71,278	363
62	District Courts	113	35,064	309
63	Anarkali	249	28,569	115
64	Mayo Gardens	310	43,445	140
65	Qila Gujjar Singh	84	36,805	437
66	Gwalmandi	40	35,361	884
67	Landa Bazar	97	23,021	238
TOTAL		25,058	4,577,744	183

B. CANTONMENT AREA

1	Saddar	302	38,424	127
2	CMH	1189	50,483	42
3	Main Cantonment	1817	68,102	37
4	Cavalry Ground	763	119,988	157
5	LCCHS	1317	165,950	126
6	LUMS	1565	74,875	48
7	Sehjpal	2311	47,929	21
TOTAL		9,263	565,751	61

While comparing the residential densities with those of 1963-64 it has been observed that majority of Census Zones have experienced substantial increase in density over the past 35 years. The densities in peripheral areas have on the average gone up by five times. On the other hand some areas of Walled City located inside Mori Gate, Delhi Gate, Shahalmi, Rang Mahal etc. where the previous gross density was 1200 to 1800 pph have now an average density of 1000 pph. This could probably be attributed to intra-city shift of population to comparatively well-serviced and newly developed suburban localities. The process by no means underscores the importance of the Central Business District.

Part of Walled City and areas lying in its immediate vicinity have become more congested being the core of central commercial activities. These include Gwalmandi, Landa Bazar, Chah Miran, Badami Bagh, Mominpura, Mohni Road, Anarkali etc. with densities ranging above 500 pph. Other higher density



DETAIL OF SIX TOWNS

S. No.	Town	No. of Union Councils			Area Sq. Km
		Urban	Rural	Total	
1	Allama Iqbal Town	17	9	26	102,258
2	Aziz Bhatti Town	7	6	13	117,819
3	Data Gunj Bakshish Town	33	-	33	14,820
4	Nishtar Town	15	10	25	109,668
5	Ravi Town	30	-	30	9,633
6	Shalimar Town	18	5	23	71,877

LEGEND

UNION COUNCIL BOUNDARY ————

TOWN BOUNDARY ————

ROAD ————

RAILWAY LINE ————

SIX TOWNS AND THEIR UNION COUNCILS IN LAHORE CITY DISTRICT

SCALE 1:200,000

Fig: 6.2

developments are around Qila Gujjar Singh, Sodiwal, Islampura, Ganj Moghalpura, Baghbanpura, Sanda Khurd, Ghorey Shah, Wassanpura etc. with densities ranging between 400 and 500 pph.

Other additions with medium density are Samanabad, Misri Shah, Anguri Bagh, Ichhra, Mominpura, Qasurpura etc. The residential areas with low to medium density include Faisal Town, Garden Town, Model Town, Gulberg, Quaide-Azam Town, Jauhar Town and many other housing schemes coming up in the southern corridor.

In early sixties Shahdara had an average density of just above 25 pph which has now been estimated at more than 80 pph. Similarly Gulberg and Allama Iqbal Town have witnessed an increase in density from 20 pph in 1963 to 95 and 125 pph respectively.

Of all the localities, the Lahore Cantonment has seen tremendous changes both in terms of population growth and enhancement of densities in the last 35 years. All over the Cantonment area the density in 1963 was below 25 pph. By 1998 in areas like Sadar, Cavalry Ground and LCCHS it has grown to 127, 157 and 126 pph respectively.

The densification could take the form of infilling of vacant plots, vertical or horizontal subdivisions and extensions to existing structures. A zone-wise strategy could be worked out to achieve an optimum residential density level for Lahore to accommodate a proportion of the future population growth.

Under the Devolution Plan 2000, Lahore District has been declared as "City District" consisting of 6 Towns as detailed alphabetically in Table 6.9 and Figure 6.2. The Table and the Figure also show that the Six Towns of the City District are divided into 150 Union Councils, which include 120 Urban Union Councils and 30 Rural Union Councils. The average gross densities in terms of persons per hectare (pph) are highest in Ravi Town and lowest in Nishtar Town. The gross densities worked out for Urban and Rural Union Councils are given in Annex-A to Chapter-6. The serial number of a Union Council given in Figure 6.2 also corresponds to the list given in the Annex referred above.

TABLE 6.9
URBAN DENSITIES OF SIX TOWNS OF LAHORE CITY DISTRICT

S. No.	TOWN	POPULATION 1998 (UNION COUNCILS)			URBAN DENSITY 1998 (pph)
		URBAN	RURAL	TOTAL	
1.	Allama Iqbal Town	658,282 (17)	348,565 (9)	1,006,847 (26)	160
2.	Aziz Bhatti Town	264,585 (7)	225,704 (6)	490,289 (13)	255
3.	Data Ganj Bakhsh Town	1,258,884 (33)	-	1,258,884 (33)	209
4.	Nishtar Town	559,982 (15)	396,229 (10)	956,211 (25)	155
5.	Ravi Town	1,164,298 (30)	-	1,164,298 (30)	296
6.	Shalimar Town	670,260 (18)	200,771 (5)	871,031 (23)	203
TOTAL		4,576,291 (120)	1,171,269 (30)	5,747,560 (150)	208

Like other urban centres, densities are highest in the central zone and gradually taper off towards the fringe areas. Some intermediate zones (like Ichhra, Babu Sabu, Sanda) also show higher densities due to decentralization of activities.

6.2.1 Density Zones

Based on Table 6.8, three main residential zones and seven sub-residential zones have been identified as detailed in Table 6.10:

Figure 6.1 provides a clear picture of the density zones in urban areas of Lahore. However if these density zones are generalised into three broad categories i.e. high density, medium density and low density, these can be elaborated as below:

a) High Density Inner Zone

This is a contiguous cluster of high density census zones with a gross residential density of 250 persons per hectare or above. It is located north of the Lahore UBD Canal, mostly in the area lying between Ferozpur Road/Lower Mall and Bund Road in the west, the area across GT Road in the north and the area comprising of Census Zones 26 and 27 between GT Road and the Canal. This forms the high density inner zone of the Lahore Urban Area, which is more or less in U-shape.

b) Medium Density Intermediate Zone

This zone is not well defined and comprises of sporadic pockets with average density of 151 to 250 persons per hectare. Mostly these pockets are located along major radials such as areas along Bund Road, GT Road, Multan Road, the area south of Model Town, and on both sides of the railway line.

c) Low Density Outer Zone

This zone comprises of most of the Cantonment area, and the area between the Canal and the railway line in the south. In fact most of the area south of the Canal and the area along both sides of the northern Bund Road falls in this category. The average population density is less than 150 persons per hectare.

**TABLE 6.10
MAIN RESIDENTIAL AND SUB-RESIDENTIAL ZONES**

Residential Zone	Sub-Residential Zone	Density (Persons /ha)	Census Zone No.	Localities
Low Density Zone (LDZ)	RL1	Up to 100	3,19,33,34, 35, 39, 48	Shadhara, Bund Road, Gulberg, Liberty, Model Town, Johar Town, GOR.
	RL2	101 to 150	4,21,24,30, 31,40,58,63, 64	Data Nagar, Mughalpura, Mian Mir, Harbanspura, Ghaziabad, Iqbal Town, Babu Sabu, Anarkali, Mayo Gardens
Medium Density Zone (MDZ)	RM1	151 to 200	1,2,22,23, 29,41,47	Rachna Town, Jia Musa, Railway Colony, Garhi Shahu, Daroghawala, Muslim Town, Shadman.
	RM2	201 to 250	6,28,49,51, 57,59,67	Badami Bagh, Mahmood Booti, Mozang, Riwarz Garden, Sabzazar, Begum Kot, Landa Bazar.
	RM3	251 to 350	5,14,16,25, 36,37,38,44, 45,46,53,55, 62	Qila Lachman Singh, Shad Bagh, Begum Pura, Dharampura, Kot Lakhpat, General Hospital, Township, Rasul Nagar, Samanabad, Chauburji Gardens, Sanda Kalan, Gulshan-e-Ravi, District Courts.
High Density Zone (HDZ)	RH1	351 to 450	7,11,13,18, 20,26,27,43, 50,52,56,60, 61,65	Shahi Mohalla, Akbari Mandi, Misri Shah, Wassanpura, Baghbanpura, Ganj Mughalpura, Anguri Bagh, Ichhra, New Mozang, Islampura, Sodiwal, Mominpura, Kasurpura, Qila Gujjar Singh.
	RH2	451 to 600	8,9,10,12,15, 17,32,42,54, 66	Koocha Hakiman, Mori Gate, Shah Almi, Yakki Gate, Chah Miran, Ghorey Shah, Kumharpura, Rahmanpura, Sanda Khurd, Gawalmandi.

6.3 HOUSING DEMAND

Based on last inter-census population growth rates, the demand for housing in the LMA has been worked out. The annual requirement would be around 30,000 housing units just to take care of the increase in population (Table 6.11).

The supply in the formal housing market does not exceed 2500 plots per annum. Out of this meagre figure a large number is held by the speculators resulting in further distortions in the housing market.

The gap between demand and supply results in illegal sub-division of agricultural lands situated in the peripheral areas especially between Ferozepur Road and Harike Road in the south-east. This is how the shelter needs of the middle and lower income groups who are in immediate need of land to construct houses is largely being met. Those who do not afford to buy a piece of land they tend to squat and live in Jhuggies thus making addition to the ever increasing housing backlog.

Various estimates have been made to indicate housing backlog in Lahore. The Master Plan for Greater Lahore (1966) estimated housing shortage to be between 39,086 and 80,399 dwelling units, whereas the LUDTS (1980) estimated this backlog to be as high as 300,000 dwelling units. The recent (2001) estimates worked out by NESPAK indicate the present backlog in Lahore District (Urban) to be around 154,000 dwelling units as detailed below:

	1998	2001
Urban Population in Lahore District	5,209,088	5,774,886
Houses Required (assuming optimum HH size of 6)	868,181	962,481
Existing Housing Stock	731,348	808,484 ⁴
Housing Backlog	136,833	153,997

6.4 HOUSING SUPPLY

For the first time the recommendations contained in the 5th Five Year Development Plan called upon the provincial governments to mainly address the housing problem being faced by the lower and middle income groups. It, in turn, required the public sector organizations to plan and implement housing schemes largely containing small and medium size plots. Simultaneously, the Federal Government directed to restrict the maximum size of plots for individual housing units as 500 sq.yds. (420 sq.m.) in the government sponsored schemes and 1000 sq.yds (840 sq.m) outside the government sponsored schemes in the municipal/ notified areas. The result of these policy instructions is visible in the housing projects of the Lahore Development Authority implemented during 1980-99 predominantly catering for low and middle income groups. A majority of plots were of the size of 250 sq.yds. and less as reflected in Table 6.12.

The scarcity of developed urban land and the need for ever increasing housing accommodation also led to the revision of government policy, thus allowing sub-division of 2 kanal (840 sq.m) and larger plots into 1 kanal (420 sq.m) plots. With the introduction of this policy large plots provided in the old schemes implemented before 1980 are being divided leading to gradual change of zoning. For more affluent class the LDA accepted the idea of providing larger plots (not below 2000 sq.yds i.e 1680 sq.m) by the private sector in the shape of Farm Housing Schemes away from the City's existing limits.

It is of major concern that housing be available at affordable prices. The housing expenditures should not consume substantial portion of the household income. According to HIES 1996-97, the monthly expenditure per household in urban areas of Pakistan on house rent and housing is Rs. 1327 i.e. 19.10% of average monthly income (Rs.6950) of an urban household in Punjab. It has registered an increase of 23.54% in 1996-97 over 1993-94. Table 6.13 depicts the percentage monthly expenditure on house rent and housing by low, middle and high income groups in Lahore District Urban Areas.

⁴ 84% of required stock as in case of 1998 figure.

The information collected from LDA indicates that the proportion of house construction to the total plots in some of the LDA schemes is between 16% to 20%. The comparable figure for private cooperative housing schemes is 10.2%. Thus a very large number of developed plots is lying vacant either due to speculative reasons or high construction cost or lack of facilities and efficient transport service between these schemes and the place of work. The supply side is also distorted due to the fact that the demand is for lower income groups whereas the supply of land in formal housing market is for higher-middle and upper income groups.

The provision of shelter has almost exclusively been taken over by the private sector. This is in the form of developed land in a large number of cooperative housing schemes and illegal sub-divisions of undeveloped land along the peripheral areas of the city. Flats and built housing units in small numbers have also been made available in the market by the private sector.

Although all the building materials are produced locally, the average construction cost has increased by more than three times during 1987-96. The building industry lacks the financial and management potential to meet the annual demand of 30,000 housing units per year.

6.5 HOUSING FOR THE URBAN POOR

Due to shortfall in supply of organised housing, the most severely affected segment of the population is the low income group. In urban areas, over 70% of the annual incremental demand for housing is of low income groups who find it extremely difficult to secure developed plots and construct houses in the schemes undertaken by the public sector and cooperative societies.

6.6 KATCHI ABADIS

The term "Katchi Abadi" refers to housing which according to land revenue records is situated on land which has not been allocated for permanent settlement. Strictly speaking the settlements, therefore, were "illegal" developments. The current policy recognizes only those settlements where at least forty dwelling units existed before 7th April 1986 as "Katchi Abadis" and were fit for regularization subject to availability of land and some other prerequisites. Regularization of Katchi Abadis throughout Punjab is handled by the Directorate of Katchi Abadis, Local Government and Rural Development Department, Government of the Punjab. Whereas in urban areas, Urban Local Councils or Development Authorities are responsible for their development. In Lahore, LDA deals with such settlements. The recognised Katchi Abadis are transferred to LDA for preparation of development/upgrading schemes and grant of proprietary rights alongwith allocation of development funds.

According to the available records there are 308 Katchi Abadis in Lahore (Annex-B to Chapter-6), out of which LDA has developed 73 Katchi Abadis spread over 198 hectares (3,910 kanals) having a population of about 163,000.

Figure 6.3 shows the location of these 73 Katchi Abadis where LDA has granted proprietary rights. According to ADB Pakistan Urban Sector Profile 1993, the urban population of Lahore living in Katchi Abadis and slum areas was about 1.7 million or about 38% of city population.

TABLE 6.11
AVERAGE ANNUAL DEMAND FOR HOUSING UNITS IN URBAN AND RURAL AREAS OF LAHORE DISTRICT (MARCH 1998-JUNE 2001)

Sr No.	LOCALITY	POPULATION*			Average Household size	Housing Units	Average Annual Demand
		1998	2001	Increase			
1	Ex-MCL	4,577,744	5,042,507	464,760	7.1	65,459	20,141
2	Cantonment	565,751	659,074	93,327	6.9	13,526	4,162
3	Other Urban Areas	65,593	73,305	7,712	7.3	1,056	325
4	All Urban Areas	5,209,088	5,774,886	565,799	7.1	80,004	24,628
5	Rural Areas	1,109,657	1,266,953	157,296	7.4	21,256	6,540

* Based on Population Census of Lahore District.

TABLE 6.12
SIZE AND NUMBER OF PLOTS IN VARIOUS PUBLIC SECTOR SCHEMES -- SIZE IN SQUARE YARDS (Sq.m)

NAME OF THE PROJECT	YEAR	1000& above (840)	500 (420)	250/300 (210/250)	175 (160)	125 (105)	75 (63)	50 (42)	TOTAL PLOTS
Tajpura	1982	-	-	99	-	819	1,331	-	2,249
Gujjar Pura	1982-84	-	361	1,671	329	782	3,603	2,609	9,355
Mohlanwal	1986	-	159	291	192	260	422	-	1,344
M.A.Johar Town (Phase-I)	1985-87	15	1,939	2,322	745	3,398	669	-	9,088
M.A.Johar Town (Phase-II)	1989-90	29	2,029	970	929	8,719	717	-	13,393
Sabzazar	1989-90	-	1,368	4,021	985	4,338	1,981	-	12,696
Jubilee Town	1998-2000	-	828	1,471	414	1,049	521	-	4,283
Total Plots		44	6,684	10,845	3,594	19,355	9,247	2,609	52,408

Source: Lahore Development Authority

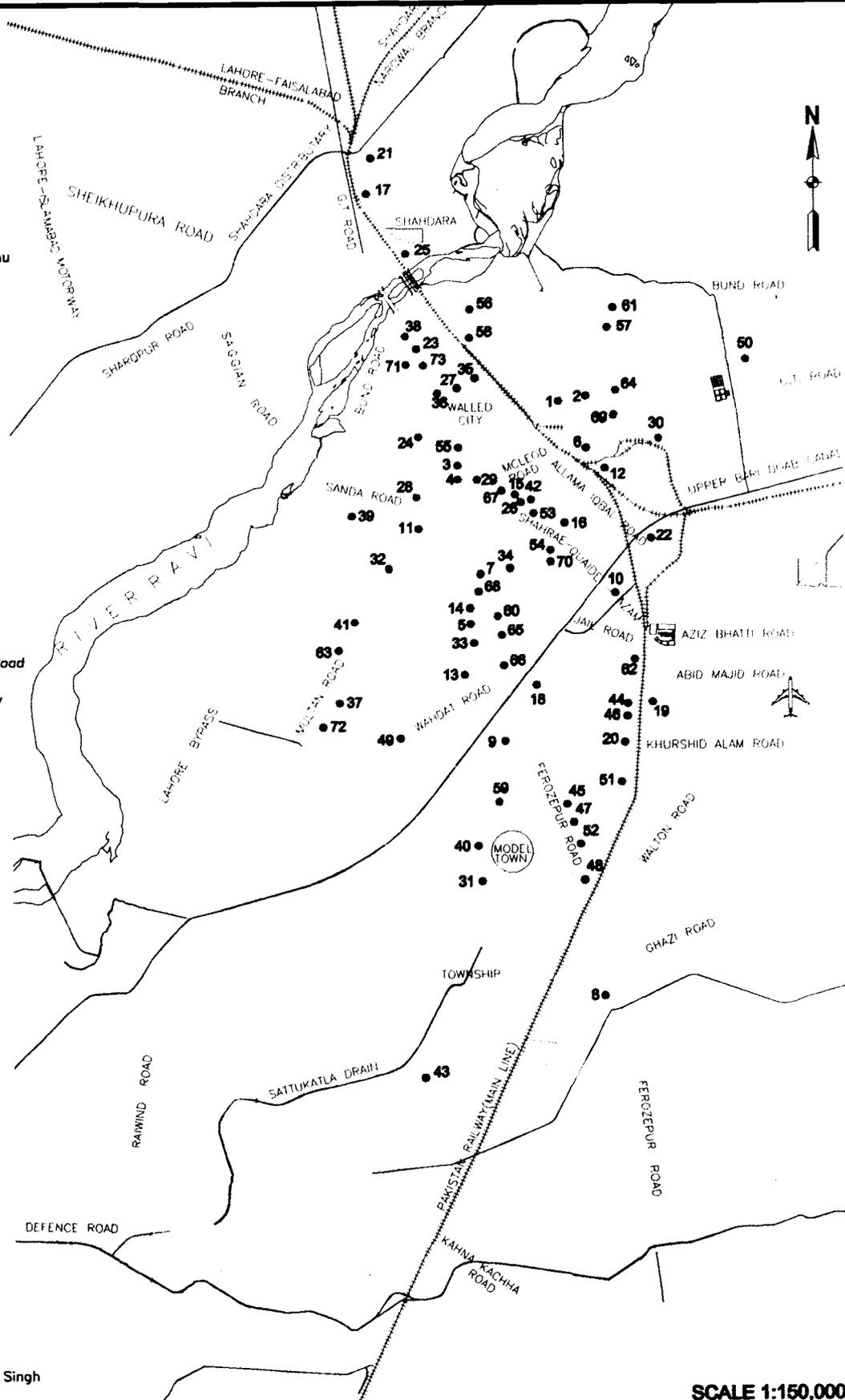
TABLE 6.13
MONTHLY EXPENDITURE ON HOUSING BY INCOME GROUPS IN LAHORE DISTRICT URBAN

Income Group	No. of Households	Average Monthly Household Income (Rs.) 1996-97	Monthly Expenditure on House Rent and Housing(Rs.)	% age of Total Income
Low (up to Rs. 4000)	236,187	2,262	349	15.42
Middle (Rs.4000 to Rs.7000)	359,207	5,504	1,007	18.29
High (More than Rs. 7000)	138,280	12,939	2,945	22.76

Source: HIES, 1996-97.

NAME OF KATCHI ABADI

1. Ahata Dittu Shah
2. Ahata Anan Lal
3. Ahata Hukam Chand
4. Ahata Kishan Kishore
5. Ahata Mool Chand
6. Achant Garh
7. Awa Pahari
8. Awami Colony
9. Abu Bakar Block Ghughtai Park
10. Basti Saidan Shah
11. Behind M.A.O. College
12. Behind Police Station Gari Shahu
13. Chowk Rehman Pura
14. Chaudhry Colony
15. Choor Shah Bandagi
16. Davis Road
17. Dheer Crole
18. F.C. College
19. Gosla Conly
20. Guru Mangat
21. Gharib Nagar
22. Ghulistan Colony 1,2,3
23. Ganj Darya
24. Guru Dutt Bahawn
25. Jaffri Park
26. Janki Devi
27. Khai Bahar Wali
28. Liaqat Abad
29. Mohallah Gawalian
30. Mandar Bhagat Ram
31. Marriam K. Block
32. Mandar Chunni Lal
33. Mata Rani
34. Mohammadia Colony Lawrence Road
35. Mandar Dhyon Singh
36. Marriam Massan, Ittehad Colony
37. Muft Pura
38. Marzi Pura
39. Musaffar Gall
40. Mandar D Block Model Town
41. Muhajar Abad
42. Mela Ram Park
43. Marriam Colony
44. Nabi Pura No.3
45. New Bhabra No. 1,2
46. Nabi Pura No.2
47. Naseer Abad
48. Nawaz Sharif Colony
49. Najaf Colony
50. New Crole
51. Nabi Pura No.1
52. Old Bhabra
53. P.C.Mahindra
54. Patiala House
55. Pathi Ground
56. Qadar Abad
57. Raj Pur Park
58. Siddique Pura, 1,2
59. Sher Shah Atta Turk Block
60. Shah Jamal
61. Sheikh Abad
62. Shora Kothi
63. Sidandria Colony
64. Sultan Pura, Masjid Boor Wall
65. Shah Jamal 32-36
66. Shah Mamal 6-7
67. Takkia Pir Hakam Shah
68. Takkia Yaqoob Shah
69. Tibba Azim Shah
70. Shah Shamas Qari
71. Samadhi Ganga Ram
72. Shah Noor Colony
73. Yateem Khana. Qilla Lachman Singh



LEGEND:

● KATCHI ABADI

KATCHI ABADIS
WHERE PROPRIETARY RIGHTS HAVE BEEN
TRANSFERRED TO DWELLERS BY LDA

Fig: 6.3

7.0 PLANNING, ZONING AND BUILDING REGULATIONS/BYLAWS

Besides other factors, planning, zoning and building bylaws influence the achievement of objectives and successful implementation of a master plan. Salient features of the existing regulating framework are discussed below:

7.1 JURISDICTION

The LMA presently falls within the jurisdiction of the City District Government /LDA and the Cantonment Boards. It extends beyond the areas controlled by the City District Government and the Cantonment Boards. Dual control over certain areas and lack of institutional framework and technical know how in some of the organisations created legal problems apart from causing haphazard development of the suburban areas of the main city. Though urban in character and very much a part of the metropolis, many of the out-lying localities are also controlled by the Town Municipal Administrations (TMAs). Land use, building plans, housing schemes, etc. in these localities are often approved by these agencies in a manner that is not compatible with the concept, basis and objectives of the master plan(s).

7.2 TOWN PLANNING, ZONING AND SUB-DIVISION REGULATIONS

It was in 1972 that the Master Plan for Greater Lahore was approved. Apart from other important recommendations it also suggested framing of zoning and sub-division regulations to regulate future extension of the city and gradual elimination of in-compatible land uses. Unfortunately, due to lack of institutional set up and the necessary legal framework, the implementation of the Plan was not accomplished. Consequently, the City of Lahore with extreme dynamic character acquired its physical and functional growth in a piecemeal fashion by the accretion of many individual sub-divisions conceived with little or no co-ordination. With the exception of housing projects implemented by the government agencies and cooperative societies, the land sub-division undertaken on a very large scale by private sector i.e. brokers and land owners is generally without approval of the competent authority. The area being administered by the ex-MCL was in particular devoid of any zoning concept. The extension of urban area has therefore been going on informally and in an unorganised manner.

The LDA, for the first time, in 1996 notified its regulations (see Annex to Chapter-7) regarding procedure, processing and approval of private housing schemes. Under these regulations, a private scheme must have an area of 100 kanals and it is examined with respect to future development proposals of Lahore, its accessibility and safety from floods etc. before approval is granted. The regulations lay down the land use criteria for open space, commercial area, graveyard, public buildings, in addition size of residential plots (not more than 1000 square yards) and minimum width of streets. In order to ensure that the sponsors will develop the scheme as per the prescribed standards, some legal

safeguards are also included like the requirement for the sponsors to mortgage 30% of the saleable area with LDA. This mortgaged area is released by the LDA after the provision of utility services and infrastructure as per approved plan. LDA can undertake the necessary development works with the money recovered through the sale of the mortgaged plots if the developer fails to fulfil his commitment to provide the services as per approved design.

In short, the regulations briefly lay down standards for major¹ projects undertaken by public sector organizations and land sub-divisions and housing layout plans prepared by the private sector. Minor land sub-divisions are not at all covered by the existing regulatory measures. While the application of LDA Regulations is restricted to projects and schemes located in its Controlled Areas. The ex-MCL had no regulations on the subject and as such adhocism prevailed. Urban expansion and development is generally devoid of zoning and also does not meet minimum standards required for plot sizes, rights of way, pavement widths, pedestrian lanes, open spaces, location of services etc.

7.3 BUILDING REGULATIONS

In order to regulate construction activities the LDA enforced a set of building regulations immediately after its inception in 1976. Again the scope of these regulations was restricted to controlled areas which mainly consisted of localities / schemes developed by the LDA/ LIT. The need to have uniform building regulations for the entire city led to the approval of a comprehensive set of bylaws in 1984. The LDA revised and updated its Building Regulations in 1997 while the ex-MCL till its merger with the City Government continued to rely on 1984 version. The Cantonment Boards operate their own bylaws which have not been updated to meet with the rapidly changing urban scenario.

7.4 PARKING

With the increasing population and private vehicle ownership coupled with densification of commercial land use, the shortage of parking space is becoming visible here and there in the city. It is getting severe in the central areas, along the main arteries and important retail and wholesale market places. Massive encroachment of public rights of way has further added to the problem. Inadequate enforcement of law and failure of civic bodies to provide for additional parking space led to a situation where in 1976, it was made mandatory for the individual builders in the Central Area to provide one car parking space for every 1400 sq.ft. of floor area within the premises. With the passage of time the scope of the mandatory provision of parking space was extended to other areas of the city with simultaneous introduction of revised parking standards under the 1984 and 1997 Building Regulations. Consequently some covered parking facility has been added at the newly constructed sites but achievement of satisfactory position has remained a dream.

¹ Division of land measuring 100 kanal and above is major sub-division. Below 100 kanal is minor sub-division.

7.5 APPROVAL PROCEDURES, VIOLATIONS, COMPOSITION AND PENALTIES

Current procedures for obtaining planning and building permissions / approvals are quite lengthy and cumbersome. For instance, in order to seek building permission along 20 main roads in the city (Table 7.1), in addition to the normal procedure laid down in Building Regulations, clearance has to be obtained from a committee called High Level Design Committee (HLDC) headed by the then Divisional Commissioner and in certain cases also from Special Committee headed by the Provincial Chief Secretary. Approval of plans for sites located within a distance of 1200 ft (366 metres) measured from the outer wall of Government House require permission from the Governor, Punjab in addition to the Committee. The whole process may cause undesirable and abnormal delays which could in some cases extend over years before the plan / project is finally cleared.

These procedures, together with low literacy rates, give rise to many apprehensions and misinterpretations. The difficulties associated with the approval procedures also contribute towards violations of building regulations.

The incidence of violations of planning and building regulations is equally frequent and wide spread. A general shortage of relevant staff in the development authority / municipality / local council, high prices of land and construction, severe population pressure on urban land and the ambient corruption in the society lead to these violations. These violations range from incompatible land use encroachments, excessive construction, etc. to minor and major environmental issues.

Most of the violations (such as excess covered area, etc.) can be regularized through the payment of prescribed fines. This practice should be discouraged and replaced by demolition, etc. of the violation.

7.6 COMMERCIALIZATION

Illegal commercialization is a common phenomenon all over the city. No regulatory measures existed till the approval of a Commercialization Policy in 1993. The policy is applicable to all urban local councils and development authorities in Punjab. It calls for prior identification of areas by the Commercialization Committee duly constituted under the policy to process and decide commercialization of residential properties. Other salient features of the policy inter-alia include:

- i. Submission of NOC from the owners of adjoining properties.
- ii. Lump sum payment of conversion fee @ 25% of the prevailing market rate of commercial plots.

- iii. Temporary conversion extendable annually for a maximum period of 10 years for clinics, schools, banks and offices on payment of annual fee of not less than 3% of conversion fee.
- iv. Exemption from submission of NOC for residential buildings/ properties being used for government / autonomous /semi autonomous offices.
- v. Restriction on partial commercialization.
- vi. Regularization of an existing illegal commercialization and imposition of 10% surcharge in addition to payment of prescribed fee.
- vii. A set back of not less than 15 ft for plots measuring 10 marla and above and 10 ft for plots of less than 10 marla area.

Both LDA and ex-MCL have been responsible for enforcement of the policy in their respective areas of jurisdiction. So far the LDA has approved 29 roads for allowing commercialization as against 62 by the ex-MCL (Tables 7.2 and 7.3). The receipt through recovery of commercialization fee during the past years (Table 7.4) shows that organised commercialization process could also substantially contribute towards the enhancement of municipal revenue.

The 1993 Commercialization Policy provided a useful direction and basis to deal with the problems of illegal conversion of residential properties. Considering the policy as rigid and somewhat harsh the government has recently approved amendments to make it what they call "people friendly". The new Policy called "Change in Land Use (Commercialization) Policy, 2001 contains the following important ingredients:

- i. The commercialization fee in urban area reduced to 20% of commercial value of the land based on valuation tables.
- ii. Fee for rural areas fixed at 20% of average sale price of the preceding 12 months.
- iii. Payment of fee in three equal installments spread over a period of one year allowed subject to deposit of 50% of the fee as down payment. Failure to deposit installment(s) even after a grace period of 3 months renders forfeiture of the deposited amount.
- iv) A 5% rebate allowed if the payment of fee is made in lumpsum and within a period of 4 months.
- v) Submission of NOCs from the neighbours no more required on roads selected and declared for commercialization after inviting objection through press.
- vi) In addition to some uses laid in 1993 Policy, the facility of annual/temporary commercialization extended to uses like guest houses, youth hostels, gymnasiums, museums, health centres, restaurants and auditoriums.

- vii) Partial commercialization disallowed but regularization of existing partially commercialized premises the specific areas has been made permissible.
- viii) Commercialization fee for educational, health and information technology institutions reduced by 50%.
- ix) On individual merits the conversion of land use for projects run by NGOs, trusts, charitable organisations operating on no profit and non-commercial basis and exempted from income tax shall also be exempted by the Government from payment of commercialization fee.
- x) Action in illegal cases to be taken under the law and shall also include sealing of premises.

Reference: The Daily Nation, 18th July 2001.

TABLE 7.1
LIST OF ROADS/AREAS UNDER THE PERVIEW OF HLDC

<u>S.NO.</u>	<u>NAME OF AREAS</u>	<u>S.NO.</u>	<u>NAME OF AREAS</u>
1.	Shahrahe-Quaide-Azam	10.	Ferozepur Road
2.	Egerton Road	11.	McLeod Road
3.	Empress Road	12.	Shalimar Link Road
4.	Davis Road	13.	Canal Bank Road
5.	Lawrence Road	14.	Kashmir Egerton Road
6.	Race Course Road		Development Scheme
7.	Lower Mall	15.	Lytton Road
8.	Multan Road	16.	Queens Road
9.	Jail Road		

TABLE 7.2
LIST OF ROADS APPROVED BY LDA
FOR ALLOWING CHANGE OF USE

	Roads	Min. Building Line (in ft)
1.	Shahrah-e-Quaid-e-Azam (from Chairing Cross to Mian Mir Bridge)	50
2.	Main Boulevard, Gulberg.	30
3.	Stadium Road, Gulberg-III.	30
4.	M.M.Alam Road (from Main Boulevard to Firdaus Market, Gulberg-III)	30
5.	Syed Hussain Shaheed Suharvardi Road (Main Boulevard) New Garden Town.	30
6.	Ferozepur Road (from Canal Bridge to Hudiara Drain)	30
7.	Jail Road (from Ferozepur Road to Sherpao Bridge)	30
8.	Multan Road (from Chowk Yateem Khana to Thokar Niaz Baig)	30

9.	Zahoor Ilahi Road from Canal to Main Boulevard, Gulberg.	30
10.	Raiwind Road from Thokar Niaz Baig to Defence Road Junction (Munoo Chowk)	30
11.	College Road, Gulberg from Sherpao Bridge to Main Boulevard, Gulberg.	30
12.	Main Market Road upto Plot No.40-F, Gulberg-III	30
13.	Park Road Gulberg (from end of park/ graveyard to Firdous Market upto Jinnah Bridge)	30
14.	Gurumangat Road, Gulberg	30
15.	Part of road starting from Main Boulevard (near Pace) and terminating at Hali Road, i.e. Chen One Junction.	30
16.	Shabbir Usmani Road starting from "Y" Junction Garden Town to Maulana Shaukat Ali Road.	30
17.	Model Town Link Road	30
18.	Wahdat Road, (Muslim Town side up to "T" junction and from T-Junction to Multan Road) both sides except Punjab University.	30
19.	Main Boulevard, Allama Iqbal Town, Phase-1.	20
20.	Abul Hassan Isfahani Road (from roundabout Faisal Town to Akbar Chowk)	20
21.	Maulana Shaukat Ali Road (from Canal to Railway Line)	20
22.	Main Boulevard, Gulshane-Ravi Scheme (from Multan Road to Bund Road)	20
23.	Chouburji Development Scheme.	20
24.	Main Road Shadman Colony (from Shadman Chowk to Shah Jamal Roundabout)	20
25.	Poonch Road (from Islamia Park Roundabout to Chowk Pakki Thatti)	20
26.	Main Road Samanabad (from Morh Samanabad to roundabout Ghazali Road).	20
27.	Approach Road Tajpura (from Canal to Main Scheme Tajpura)	20
28.	College Road (Quaide-Azam Town)	20
29.	Hamdard/ Jail Road (Quaide-Azam Town)	20
30.	Bagarian Road, (Quaide-Azam Town)	20
31.	Road starting from Civic Centre to Bagarian Chowk, Quaid-e-Azam Town	20
32.	Canal Road from University Campus to Thokar Niaz Beg	20
33.	Canal Road from Thokar Niaz Beg to Defence Road	20
34.	Sher Shah Road (Disposal Station to Drain Gujjarpura)	20
35.	Main Boulevard Shadbagh.	20

TABLE 7.3
LIST OF ROADS APPROVED BY EX-MCL FOR ALLOWING
COMMERCIALIZATION / CHANGE OF USE

1.	Poonch Road	2.	Sundar Daas Road
3.	Dak Khana Road	4.	Vindala Road
5.	Umar Din Road	6.	Sultan Mehmood Road.
7.	G.T. Road,	8.	Shah Kamal Road
9.	Ghaziabad Road	10.	Tajpura Road
11.	Sahar Road	12.	Main Bazar, Jinnah Park
13.	Main Bazar, Makkah Colony	14.	Zaildar Road
15.	Ganga Ice Factory Road	16.	Saadi Road
17.	Alamgir Road	18.	Qari Road
19.	Bazar Hakeema	20.	Joay Shah Road
21.	Ibrahim Road	22.	Ravi Road
23.	Peco Road	24.	Ganda Nallah Road
25.	Sham Nagar Road	26.	Main Bazar, Rajgarh
27.	Pir Bahawalsher Road	28.	Outfall Road
29.	Faiz Road	30.	Bund Road
31.	Katcha Ferozepur Road	32.	Lawrence Road
33.	Haq Nawaz Road	34.	Fateh Sher Road
35.	Shalimar Link Road	36.	Chah Miran Road
37.	Usmania Bazar, Bilal Ganj	38.	Main Bazar, Siddiqia Colony
39.	Canal Bank, Moghalpura	40.	Allama Iqbal Road
41.	Gulshan-e-Ravi	42.	Temple Road
43.	Main Road, Mozang	44.	Link Wahdat Road
45.	Wahdat Road	46.	Multan Road
47.	Rashid Park, Ichhra	48.	Nadeem Shaheed Road
49.	Shalimar Road, Garhi Shahu	50.	Ferozepur Road
51.	Moulana Ahmad Ali Road	52.	Sanda Road
53.	Pakistan Bazar, Baghbanpura	54.	Main Bazar, Faiz Bagh
55.	Shaowari Road	56.	Soekarno Bazar, Moghalpura
57.	Maqbool Road	58.	Haider Road
59.	Main Bazar, Dhoopsari	60.	Yakki Gate
61.	Qila Lakshman Singh	62.	Naqshbandi Bazar

TABLE 7.4
RECOVERIES OF COMMERCIALIZATION FEE BY LDA & EX-MCL

SR.NO	SCHEMES	YEAR	AMOUNT RECOVERED (RS.)
1	LDA	1996-97	72,962,100
		1997-98	49,081,290
		1998-99	36,250,533
		1999-2000	42,040,331
		2000 – 2001 (Up to January, 01)	40,010,680
2	Ex-MCL	1999-2000	21,931,356
		2000-2001 (Up to March)	21,240,555

Source: LDA and Ex-MCL

8.0 TRANSPORTATION

8.1 GENERAL

This sector has been reviewed through an appraisal of previous studies, updating of necessary information and data on selected areas and through comprehensive programme of traffic surveys aimed at analyzing the travel characteristics, traffic patterns, modal choice and growth trends. Key issues have been discussed with the key players, concerned organizations and specialist groups having interest to contribute in this sector.

A comprehensive appraisal of various development programmes related to infrastructure, operation and management, sponsored by various agencies during the last two decades has been made. Impact evaluation of most recent/current road projects with respect to traffic circulation has been carried out. Organizational and financial issues at Metropolitan level have been reviewed and gaps identified.

An assessment of existing problems in the traffic and transportation sector and related sub sectors is made. Areas of potential improvements are identified and a strategy is framed at metropolitan level, covering all areas including road infrastructure development, maintenance management, public transport operation and associated infrastructure development, mass transit, traffic management and traffic control, parking, traffic supervision and enforcement, environmental and social concerns, private sector participation, regulatory and financial aspects.

A short- term development programme, as part of the long-term transport strategy is suggested in latter parts of this report with a framework for its financing and programme management.

8.2 PREVIOUS STUDIES

First ever professional study carried out for Lahore in the transportation sector was World Bank financed, Lahore Urban Development and Traffic Study (LUDTS) 1980 carried out by Messrs Halcrow Fox and Associates for LDA. The study identified traffic characteristics, addressed the issues related to urban road infrastructure, organizational issues, issues related to public transport operation and its management. Proposals were framed for implementing a number of traffic engineering schemes, improvements in public transport operation and establishment of a Directorate in LDA, specifically to deal with Traffic Engineering in the city.

Traffic Engineering is a new science as far as this part of the world is concerned. LUDTS, however, provided a base for Lahore. Traffic Engineering and Transport Planning Unit (TEPU), established as a result of this study, prepared and executed a number of traffic engineering proposals in the city giving a new trend in urban road engineering and traffic management.

Second serious effort was a Bus Study also carried out in 1980 through a grant from the Swedish Government. This Study provided a Trip Generation Model as part of the exercise for estimating travel demand. The Study, apart from identifying

public transport requirements and providing an efficient bus system, also suggested an integrated traffic engineering programme to improve the operational efficiency of bus system. As a result of this study 350 Volvo Buses were gifted by the Swedish Government which were added to the fleet of Punjab Urban Transport Corporation (PUTC). However, after remaining operational for a couple of years, the bus system in Lahore collapsed because of organizational inefficiency of the government sponsored PUTC. Subsequently, government had to disband the PUTC.

A comprehensive transport planning study was carried out by Traffic Engineering and Transport Planning Agency (TEPA) with the assistance of Japan International Cooperation Agency (JICA) in 1990-91. The study was based on 1.5% sample household survey, various screen line and cordon counts conducted throughout the metropolitan area. Trip generation model developed from household survey information was calibrated through screen line and cordon count information. Trip Distribution and Traffic Assignments were finalized with computer software. Modeling details were not provided by JICA, however the study generated plenty of information for future planning.

The JICA Study known as Comprehensive Study on Transportation System in Lahore (CSTS), first of its kind in this part of the world, apart from providing Transportation Master Plan, also suggested a detailed development programme for this sector. Key projects suggested in this study included road infrastructure development programme, which was aimed at to provide grade separated facilities at various crossings, a comprehensive traffic engineering and management plan for central business district, a programme to introduce wide body buses, introduction of urban rail service through utilization of existing intercity tracks and Light Rail Transit Project on the busiest traffic corridors, development of integrated terminals for local and intercity bus services and facilities for freight handling in the metropolitan area.

The current Master Plan Study for Lahore in the context of transportation sector is in fact a follow up of the JICA Study. Therefore, an effort is made to review the developments which took place so far in various sub-sectors based on which an updated programme for the present day and the foreseeable future will be suggested in latter parts of the report.

8.3 THE ROAD NETWORK

Primary road network comprising of arterials and collectors is well developed in Lahore as compared to any other historical city. Historically the shape and pattern of arterial network has largely taken place because of geographical location of the city with respect to River Ravi and other major towns in the region including Peshawar, Rawalpindi and Sialkot in the north, Chiniot, Mianwali and Sheikhupura in the west, Multan in the south west, Ferozepur, Bombay and Banglor in the south east and Delhi and Amritsar in the east. Collectors have established with the development of Cantonment and the railway station in the east, Secretariat and GOR in the south during British Regime and a number of planned schemes during the post-independence period in the south. Road hierarchy as per current situation in the city is shown in Figure 8.1.

Present shape of the road network developed through historical growth of the city is primarily radial and suits for efficient operation and coverage of public transport but density of primary radials being too low and in the absence of adequate number of distributors/rings/inter-radials, there is unnecessary traffic pressure on the primary network.

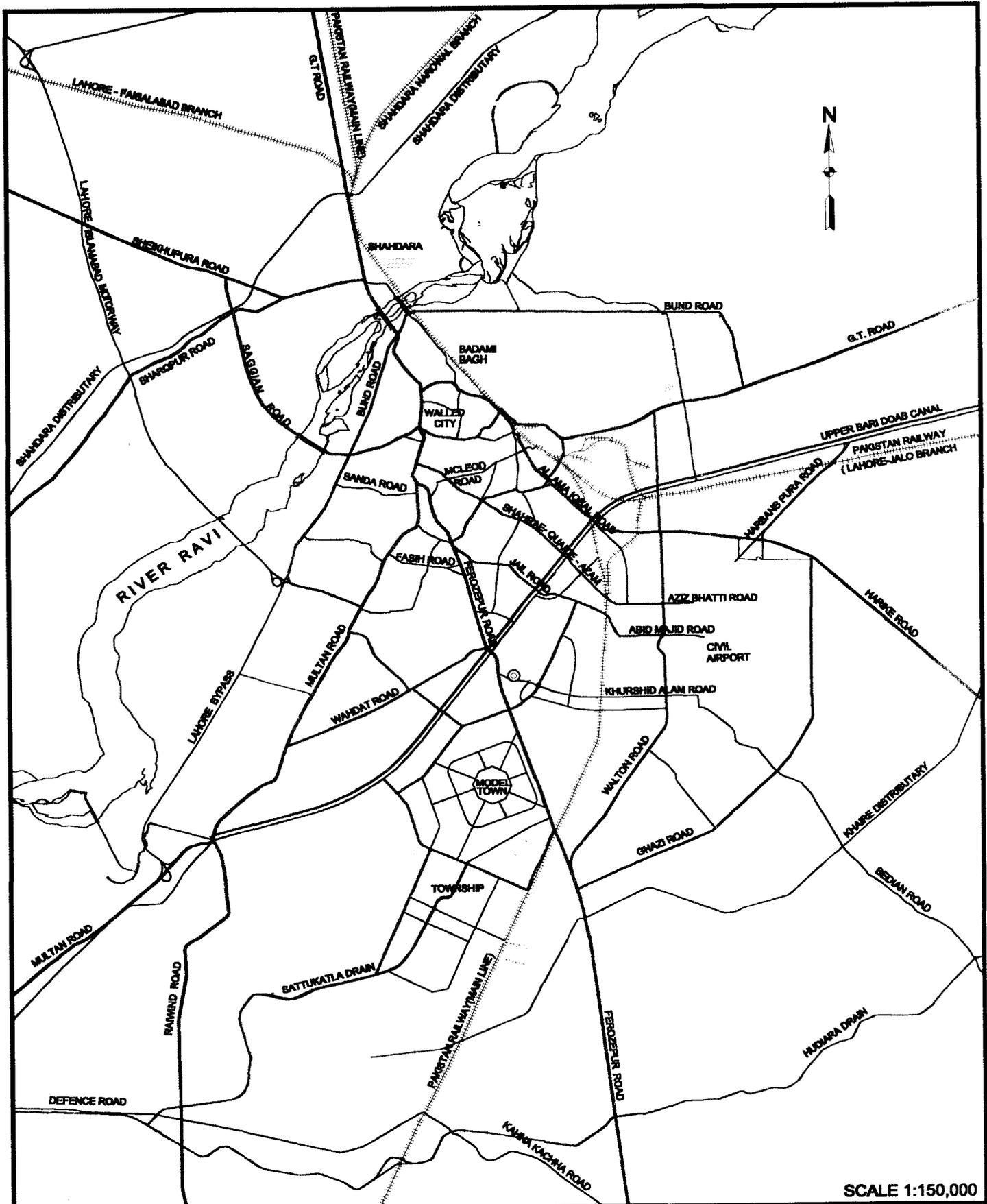
Secondary and tertiary road network is generally below any acceptable standard either because of lack of maintenance or at places it is missing due to uncontrolled growth of the city. There has been tremendous effort to improve the road system through politically driven and through well-programmed interventions during last one decade. These efforts are reviewed briefly before the present status of the network is discussed.

8.3.1 Punjab Urban Development Project

A World Bank financed programme called Punjab Urban Development Project (PUDP) was executed in various cities in Punjab between 1988 and 1998. The programme ran through almost the entire decade. Major share of the proceeds of the programme was directed towards traffic engineering and road improvement projects sponsored through TEPA, LDA. The programme was well planned, well engineered and successfully executed through collaborative efforts of professionals from World Bank, international/local consultants and a team of competent Traffic and Civil Engineering Specialists from the sponsoring agency. The project provided a new base for Traffic Engineering not only for Lahore but also for entire province. Having witnessed the success and fruition of low cost traffic engineering schemes, other local authorities started executing similar programmes in other cities of the province.

The programme covered sizeable chunk of city road network as detailed in Figure 8.2. Main features of this programme included channelising the traffic streams at road links and engineering the junction layouts in a way that segregated the local street functions from mobility requirements and minimizing traffic conflicts at crossings. This exercise contributed enormously towards road capacity improvements, reduction in delays and enhancing towards road safety. Traffic control system introduced for 50 signalized crossings was based on Area Traffic Control System (ATC) with organized support for its operation and management. Phased programme was introduced for this component in central parts of the city extendable to suburban areas having concentration of signalized crossings.

The programme also introduced and contributed towards road pavement evaluation system, design of new pavements and a system of quality assurance and supervision for asphalt pavements based on sound scientific and engineering principles.

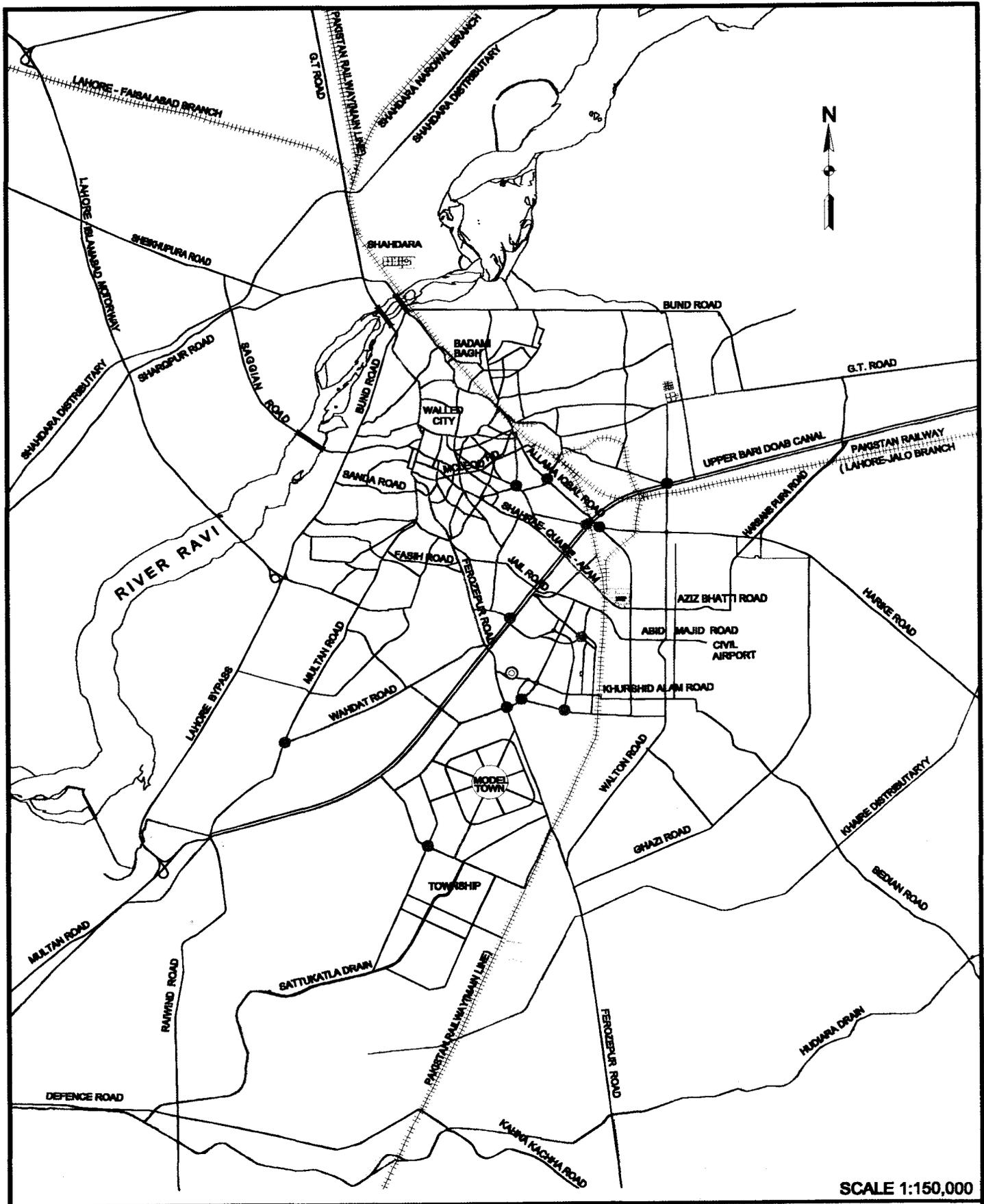


LEGEND:-

- ARTERIAL ROAD
- COLLECTOR

ROAD HIERARCHY

Fig: 8.1



LEGEND:-

- ROAD IMPROVEMENTS
- JUNCTION IMPROVEMENTS

PROJECTS UNDER PUDP

Fig: 8.2

8.3.2 Government Funded Programmes

Apart from donors funded programmes, government did contribute a lot with significant contribution towards traffic corridor improvement and rehabilitation of road pavement condition in different city areas including Lahore Township and Northern parts of Lahore falling between main railway line, GT Road and Northern parts of Bund Road. TEPA, Road Directorate of LDA and Punjab Communication and Works Department (CWD) executed these programmes.

Rehabilitation of Canal Bank Road from Jallo to Niaz Baig, Development of a new corridor including approaches and Bridge over River Ravi at Sagian linking Sheikhupura Road with Lower Mall, improvement of Ferozpur Road from Lahore Bridge to General Hospital and dualization of Raiwind Road are major programmes undertaken by CWD during the last decade. Improvement of Defence Road and approaching ramps to the new terminal of Lahore Airport are recent additions. Remodeling of Garhi Shahu Bridge over railways and development of underpass along Canal Bank Road at Punjab University New Campus was carried out by LDA apart from numerous pavement rehabilitation projects in Lahore Township, Northern parts of the city and other areas as per directives of the Government. This is over and above their regular function of providing roads and streets in housing schemes and Site and Services Projects. During the last decade, LDA has only developed Phase-II of MA Johar Town and Jubilee Town whereas private sector has been quite active in developing roads in housing schemes initiated with private sector financing.

Apart from a number of traffic engineering efforts directed towards various junction improvements, TEPA has developed a number of grade-separated facilities including underpasses along Canal Bank Road at its junctions with Jail Road, Ferozpur Road and University Campus, bridge over railways at Cavalry Ground commonly known as Jinnah Bridge and development of Harike Road as dual carriageway. Extension of Shahr-Quaide-Azam in Cantonment Area as an access road to new terminal of Lahore Airport and development of Kalma Chowk are recent additions.

Federal Government, through National Highway Authority (NHA), played a significant role in changing the traffic scenario by developing a Bypass around Lahore and connecting Lahore-Islamabad Motorway with the city road network through interchanges at Babu Sabu on Western Section of Bund Road and Shahpur on Multan Road. Segregation of local activities from through traffic movements on section of National Highway (N-5) in the suburbs of Shahdara was also achieved during this period.

8.3.3 Lahore Roads Rehabilitation Project (LRRP)

Around 835 roads and streets throughout the city were selected for surface improvements through laying of asphalt including improvement in road drainage under the patronage of the Provincial Government. Ex-MCL was

the sponsoring agency. The programme was initiated in 1997 with a cost estimate of Rs.800 million originally scheduled for completion in a period of nine months. Cost overruns are in excess of 425% with revised project cost of Rs.3.41 billion. Although official revised date of completion expired on 30th June 2001, the project still continues. Mostly secondary and tertiary road network was taken up under this programme; however, some major roads were also included. Till last report, 743 roads/streets were completed, works continued on 21 roads, whereas 71 roads are not being taken up because of funding constraints.

With the exception of 28 roads completed through a private sector contracting firm, all the roads are being improved through public sector organizations namely M/s FWO and NLC. Major remodeling works have been carried out for Jail Road, Main Boulevard Gulberg, Ferozpur Road, Shalimar Link Road, Park Road, Nisbet Road and improvement of Jail Road in Cantonment Area, while on other roads, only surface improvements were made. Apart from above roads, important road links improved under this programme include GT Road, Shalimar Road, Ravi Link Road, Church Road, Amir Road, Yasin Road, Aziz Road, Mohni Road, Nayyer Wasti Road, Faiz Bagh Road, Lakhodehr Road, Kot Khawaja Saeed Road, Fort Road, Shahalam Road, Qila Lachhman Singh Road, Sham Nagar Road, Dil Mohammad Road, Waris Road, Mason Road, Beadon Road, Railway Road, Shadman Road, Gurumangat Road, Zahoor Elahi Road, MM Alam Road, Bank Road, Durand Road, Kashmir Road, Ghazi Road, Lower Mall and Infantry Road. All others are access/local streets.

8.3.4 Lahore-Islamabad Motorway (M2)/Lahore Bypass

Linking the city road network with Lahore-Islamabad Motorway through Lahore Bypass and introduction of Sagian Bypass through construction of Bridge over River Ravi at Sagian during the last decade has brought a phenomenal change in the pattern of intercity and bypassing traffic movements in the western and south-western segments of the city. Approaching network to these two major links including western section of Bund Road have recently been improved, and in addition M2 has helped relieve congested portions of city centre from the onslaught of the intercity and external traffic movements. Traffic flows on the bypasses are still far below their capacity. To make it a value driven investment for the city, there is urgent requirement to improve upon all links leading to this important route enhancing its utility.

8.3.5 Status of Structure Plan Road Network

A series of primary roads running in parallel in the north south direction and acting as feeders to the radial network of the city and a similar widely spaced network running in the east-west direction was proposed in the LUDTS, 1980. Most of these roads were recommended to be taken up for development in CSTS Study of 1990-91. In pursuit of development control as part of its functions, the LDA and its subordinate organization TEPA

have been actively involved in safeguarding the Rights of Way (ROW) and alignments of these roads while dealing the development applications both in private and public sectors. As of today significant kilometrage of ROW of these roads in southern sector of the city proposed in LUDTS and CSTS Study stand safeguarded and added to the road assets of the city. Roads proposed in LUDTS and CSTS are shown in Figure 8.3. It is a plausible practice and need to be further strengthened by bridging the gaps through public sector support.

8.3.6 Lahore Ring Road

Ring Road around the city proposed as a major element of the Transportation Master Plan is to cater for distribution of the traffic on the radial road network and to serve cross suburban bypassable traffic movements. Its alignment in the southern segments of the city was originally identified in the LUDTS. TEPA arranged its feasibility study through World Bank funding. Messrs Mott MacDonald carried out transport planning model and feasibility for this road. Detailed design of Phase-I between western section of Bund Road and Ferozepur Road was also accomplished. TEPA arranged to acquire land and to secure around 9 kilometres of its length. Efforts were made to get it executed through private sector participation, but without carrying any base study as a BOT project. Response from the private sector was quite encouraging, but agreement was never reached because of lack of application from the Government side. Every time false parameters were assumed or alignment was changed resulting in postponement of the project. Last bid from Messrs Daewoo in 1999-2000 was quite serious. Daewoo had engaged Messrs Mott MacDonald, who had worked different models and various alignments for this project. In spite of being a high profile project, it remained dormant until recently when the authorities concerned are planning to construct the same. The opening of new bypasses, new terminal for the Lahore Airport and possible development of a new inter-city bus terminal near Shahpur Interchange have necessitated the incorporation of the Ring Road all the more vital.

Some of these projects mentioned above are demand led and are part of the earlier CSTS Study whereas others are either politically driven or executed on adhoc considerations. What level of improvements have been achieved through these programmes, what gaps are left and what best course of action should have been followed is covered briefly hereafter.

8.3.7 Present Status of the Road Network

8.3.7.1 Physical Condition

The physical condition of the road network as it stands today is described below:

i) **Multan Road:** Multan Road in various sections presents different road conditions. From Chauburji to Sabzazar approach road, it carries 6 lanes

with pedestrian ways on either side. With presence of drain between carriageway and the pedestrian way coupled with other local activities, it has become virtually 4 lanes divided road. Road is seriously capacity-restrained not only on crossings but on links as well. From Sabzazar entrance to Wahdat Road Junction, service road exists on one side, but it is not fully utilized throughout its length since last thirty years. From Wahdat Road crossing to Niazbeg Junction, it suffers from local activities and problem of encroachments. From Niazbeg to Hudiara Drain, the road assumes the character of inter-city highway, but roadside activities do affect its capacity. There is urgent requirement to remodel this road from Choururji to Niazbeg and provide service roads from Niazbeg to Metropolitan boundaries.

ii) Lower Mall: Lower Mall from Choururji to Data Darbar with 6 lanes divided road, is in good condition with well-managed crossings, maintenance of signal control being an exception.

iii) Ravi Road: With 6 to 8 lanes divided road and service road provides well-organized road geometry with better standard of junction layouts. Road pavement of the section close to Niazi Junction needs improvement. Service road between Yadgar Crossing and Niazi Chowk needs upgrading and adjustment of approaches from the main carriageways.

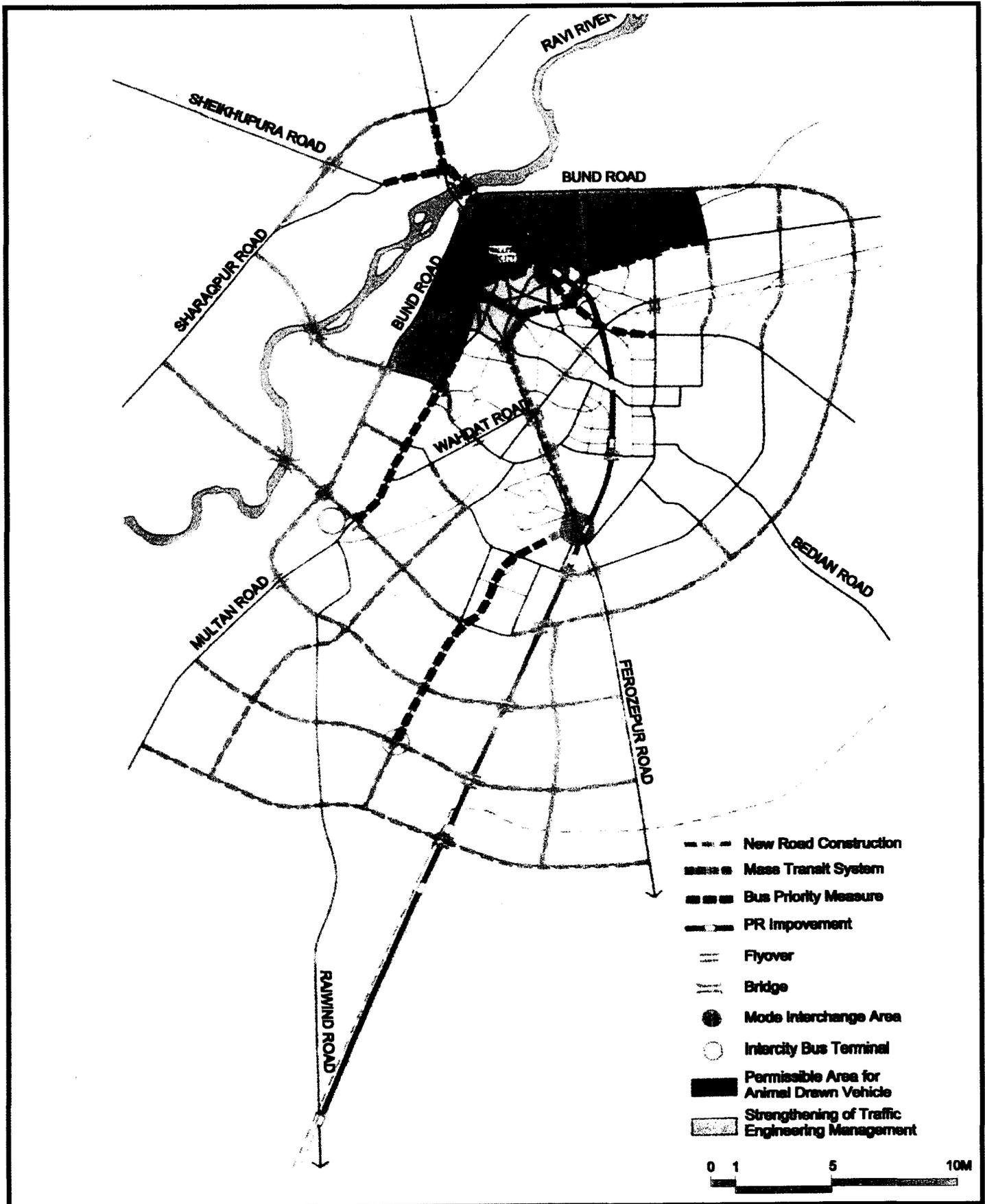
iv) GT Road: GT Road from Niazi Chowk to Shahdara Crossing is highly capacity-restrained because of 4-lane bridge on Ravi. In Shahdara area service roads have been provided, which need to be extended up to the built up area limits with provision of additional lane to main carriageways.

v) Sheikhpura Road: Sheikhpura Road from Shahdara to its junction at Jaranwala Road though carries 6 lanes and is a divided highway, it needs upgrading and segregation of local activities from main highway together with junctions upgrading at both ends. From Jaranwala Road Junction to Faisalabad, this road is being upgraded through BOT financing.

vi) Jaranwala Road within city limits is a 4-lane divided highway and is well maintained.

vii) Sagian Link Road: A 4-lane divided highway linking Lower Mall with Jaranwala and Sheikhpura Roads through Sagian Bridge on River Ravi was developed during last decade. It is a good link, but remains grossly under-utilized partly because of establishment of large waste disposal grounds along both sides of the road close to Sagian Bridge and partly because its section and entry from city side remained substandard and not properly dovetailed in the road network. Another reason for its under-utilization is that it is not linked with GT Road.

viii) Ferozepur Road: Ferozepur Road section between Qurtaba Crossing and Wahdat Road Junction carries 6 to 8 lanes. It has recently been



STRUCTURE PLAN ROADS

Fig: 8.3

remodeled by introducing service roads without removal of encroachments and reorganizing much needed Shama Cinema Crossing. Section between Shama Cinema and Qurtaba remains as before. Its recent remodeling includes four lanes divided road with little space for much needed public transport stoppages. Unplanned drainage has further reduced the road space. Section between UBD Canal and Lahore Bridge after the remodeling has become 8 lanes divided highway which otherwise was not required. Consolidation of service roads and road resurfacing has helped improve road capacity and riding quality but bad planning of new crossings with faulty staging plans of the signals has offset this improvement, as there is marginal change in the cruising speed of the traffic. Six lanes divided highway between Lahore Bridge and General Hospital is certainly vivid improvement. Introduction of service roads and its extension is needed up to Kahna Nau.

ix) Jail Road: Jail Road has recently been remodeled up to its extension to the Airport. From Qurtaba Crossing to Sherpao Bridge though at places it carries 12 lanes but virtually it is 4 lanes divided highway. With good road surface, speeds on links are high but poorly laid crossings result long delays. Second carriageway at Sherpao Bridge is a positive addition but poorly engineered. Merging of service roads with the main carriageway is not properly organized and has added to the traffic conflicts and road safety issues.

x) Main Boulevard Gulberg: Main Boulevard in Gulberg area is another major road remodeled during last few years. Extension of service roads throughout its length is a positive sign but their widths and merging arrangement with main carriageways are defective. Junction layouts are substandard leading to poor traffic control. Most of the crossings have been left incomplete. Provision of additional road space through unnecessary widening of Liberty Roundabout and road section between Center Point and Kalma Chowk has given rise to additional traffic conflicts and road safety problems. Current efforts to improve the situation at Kalma Chowk and Center Point through further addition of road space has lead to safety problems and loss of capacity on newly constructed limited access Park Road.

xi) Park Road: Park Road and Cavalry Ground Bridge, commonly known as Jinnah Bridge, is a well-planned link developed in high car ownership areas of the city. Its extension in the Cantonment as an approach road to new airport terminal would further add to its utility. All junctions in between and at both ends need remodeling. City side crossing presents various opportunities, which must be utilized for smooth merger with the road network without sacrificing the capacity of any junction or road link.

xii) Allama Iqbal Road: Allama Iqbal Road; a dual carriageway carries six lanes with pedestrian ways on both sides. In a small stretch in Garhi Shahu area road width is restricted to four lanes. Recent extension of dual

carriageway in Cantonment area up to Harike Road has added to its capacity. Junctions need further detailing and improvement.

xiii) GT Road (East Side): G T Road from Cooperative Stores to its junction with Bund Road is recently resurfaced. Its service roads need improvement in order to benefit from investment made in the main road. Dual carriageway needs extension towards Jallo up to built up areas of the city and up to Eik Moria Pul within the city area through extensive remodeling. In both the sections, road is single carriageway with width not exceeding 14 metres. GT Road section between Eik Moria and Yadgar Chowk commonly known as Outer Circular Road although in an acceptable geometric shape is usually under constant threat of the overflows from the adjoining Circular Drain and high frequency of heavy axle loads and thus liable to frequent pavement deterioration. Circular Road section between Do-Moria and Railway Station also known as **Choudhary Rehmat Ali Road** is another important bottleneck with ROW not exceeding 14 metres. It needs widening or bypassing through grade separation.

xiv) Bund Road: Bund Road in the north was single carriageway with metalled width of 12 metres except section of one kilometre adjacent to its junction with GT Road in the east, where it was 10 metres wide dual carriageway. Constant threat of encroachments and frontage access problems pose major influence on the capacity of this road. Being in the alignment of the proposed Lahore Ring Road it needs to be upgraded to limited access standard. Western section between Yateem Khana and Old Ravi Bridge has been remodeled by NHA. Two lanes dual carriageway with two lanes service roads have been provided in this section. Remodeling was initiated much later than the preparation of the feasibility for Lahore Ring Road, but the concerned organizations did not ensure the adoption of the proposed Ring Road section once investment is being made through public exchequer.

xv) Canal Bank Road: A 4 lanes road with Canal acting as a large median is a major traffic distributor bisecting the city. From Jallo to Niazbeg it runs on both banks. Service roads have been constructed at stretches, where planned development has taken place. From Niazbeg to Hadiara Drain a two lanes road runs on left bank of the canal. Its section between Punjab University and Shahrae-Quaide-Azam is heavily loaded. TEPA has constructed low height underpasses for Canal Bank Road traffic providing a relief but intermediate crossings and the restricted width of the road itself need to be attended to meet the traffic demand. Sections between University Campus-Niazbeg and Shahrae-Quaide-Azam and Mughalpura are also fairly heavily loaded. Direct access to the main carriageways is a major source of traffic conflicts, which need to be attended on priority for the development of this important corridor.

xvi) Shahrae-Quaide-Azam: Though Shahrae-Quaide-Azam is not the strategic road purely from classification point of view, as it serves more as collector rather than through traffic carrier, but it does carry bulk of the

CBD traffic volumes. Practically two lanes dual carriageway with facility of service roads in long stretches suffers from frequent road crossings with highest traffic volumes, resulting abnormal delays. Traffic control system installed through World Bank funding was never made fully operational. Road geometry does work for the present day traffic demand, however for effective traffic control, readjustment of the junctions would be required in central area as against the project of underpasses which was being pursued by Punjab Government. Due to the current traffic delays, junctions at Canal and with Davis Road being widely spaced do require grade separation. Its extension in Cantonment commonly known as **Aziz Bhatti Shaheed Road** is restricted in width; being single carriageway, in a stretch between Mian Mir Bridge and Afshan Cinema crossing with Tufail Road. From this point to Ghazi Road additional carriageway has been added being major access to the new Air Terminal.

xvii) **Defence/Ghazi Road:** A link road between Ferozepur Road to Harike Road is being upgraded to four lanes single carriageway to serve as main approach to the new Airport Terminal. In front of the airport it is proposed to be dual carriageway. Its restricted width close to Ferozepur Road and Badian Road junctions is major source of capacity restraint. Defence Road in the southern sectors of the city is another important link. Currently it is only two lanes road with ROW of 18 metres. Proposed extension in its ROW as suggested in the LUDTS and CSTS is being grossly violated because of lack of effective development control.

xviii) **Walton/Tufail Road:** Though this road falls in the Cantonment area and is not part of this study, nevertheless its importance cannot be ignored because of its key location. It is a major traffic corridor in the north-south direction linking Shalimar Link Road with Ferozepur Road. In spite of extensive ROW, its metalled width is restricted to 4 lanes. There are some restrictions with ROW in the central section as against the original Master Plan of the Cantonment. This is a rare phenomenon in the Cantonment area, requiring immediate attention as to develop this highly demanding traffic corridor. Northern section between the Canal and Saddar Roundabout is dual carriageway. Southern section, already congested because of LCCHS traffic, is likely to become more busy as this road would serve as major feeding distributor for airport bound traffic.

xix) Apart from above, **Mian Mir Road**, Eastern Section of **Allama Iqbal Road** in Saddar, **Aziz Bhatti Shaheed Road**, **Shami Road**, **Ghazi Road** and extension of **Park Road** in Cantonment as an access to the airport are few important roads which need upgrading to share the load of city traffic.

xx) **Central Area Roads:** Most of the roads in the central area stand improved / widened to maximum width during the efforts of last few years. Nevertheless, **Chaudhary Rehmat Ali Road**, and the semi ring road starting from Katchery Road at Government College Junction to KE Medical College gate, circumferencial entry to Mayo Hospital, crossing

McLeod Road and then Shahrae-Quaide-Azam at High Court Junction, following Fane Road and Begum Road to Lytton Road need remodeling. Network around old Anarkali, Mozang Road including its links at Safanwala Chowk and number of other points in its western section also require remodeling. At-grade crossing improvement, left unattended, needs completion for Qurtaba Crossing before launching any grade separation proposal. Central area, like any other downtown of a city in the developing world, presents problems of mobility, congestion, conflicting parking demand and accessibility. These need to be addressed through adapting an integrated approach of traffic engineering and management rather than conventional high cost solutions.

xxi) Other Major Roads Outside Central Area requiring improvement include Wahdat Road (part), Maulana Shaukat Ali Road, Main Boulevards of Allama Iqbal Town, extension of Maulana Shaukat Ali Road up to Wahdat Road (2 km long) and Multan Road in the west and Ferozpur Road in the east, extension of new Defence Road to Ferozpur Road and other missing links identified in the CSTS Study.

8.3.7.2 Operation and Maintenance

Before the promulgation of Local Government Ordinance, 2000, responsibility of operation and maintenance of the road network generally lied with ex-MCL. Under special arrangement, LDA remained responsible for a couple of important roads and traffic signal control in the city for more than 16 years which now stands transferred to the City District Government. Within ex-MCL, there did not exist any mechanism for regular inspection, inventorying the network, pavement and allied infrastructure, evaluation and recording the status and maintenance requirements of the network. Road pavement was allowed to deteriorate till its reconstruction or a political intervention. Patching is restricted to areas of influence instead of basing it on traffic demand. There have been exceptions too, when road patching has been carried out in most of the areas of the city. Road pavement restoration is substandard in case of road diggings for laying and maintenance of utilities. It is constant source of pavement deterioration.

Poor road drainage is detrimental to the road pavement life. In Central Areas most of unmanaged solid waste and city garbage ultimately finds its way to the city storm water drainage system resulting its outflows and flooding of streets and damage to the asphalt pavements. In outer districts, there being little building and development control, entry ramps to abutting properties and road berms are either encroached upon or kept higher than road levels resulting in flooding of the road pavement from daily household washings and storm water drainage. Recent uncalled for amendment in the Building Regulations has given rise to legal cover to the onslaught of the road encroachments of approach ramps.

Absence of roadside control and lack of maintenance of proper road cross section has led to mass scale road deterioration, environmental pollution

and heavy recurring investments to upkeep the road system in the city. Thanks to recent programme of citywide mass scale Road Rehabilitation Programme, which though not sustainable but has generally given relief. Organizational inefficiencies, and lack of training has not allowed the staff to deliver the function of operation and management of the road system on scientific lines. Organizations are unaware of the modern tools of system data base collection and management, developing interface with respect to GIS, timely assessment of maintenance requirements, development of operational and maintenance plans and execution through performance based contracting systems for sake of sustainability.

8.4 ROAD TRAFFIC

In order to assess future level of demand for any utility concern, it is essential to study the current level and pattern of the demand, growth trends and likely changes in the demand patterns. For the purposes of this study reliance was made on work done in CSTS Study; a bench mark, 1992 Pre-feasibility Study for Lahore Ring Road by M/s Mott MacDonald, 1999 Feasibility Study for Lahore Ring Road as BOT project conducted by M/s Mott MacDonald and field Traffic Counts carried out for this study by NESPAK team. Current traffic volumes on the network were measured through a traffic survey. Twenty-four hours traffic counts on main city roads were conducted in 1997, but same are not utilised as these were conducted at a stage when road rehabilitation works had just started, hence it was assumed that these counts will not present true picture of the traffic pattern in the city.

In order to make it a more meaningful exercise, 24 hours traffic counts were carried out for a Screen Line developed in CSTS Study. Traffic counts were conducted in the month of May 2001 and comparisons made with CSTS traffic counts. Cordon Count developed for the Inner Metropolitan Area during CSTS Study and later on repeated by M/s Mott MacDonald in 1992 and 1999 for Lahore Ring Road were also studied. Both the exercises provide a sound input for assessing the growth trends in traffic volumes and changes in the composition of city traffic.

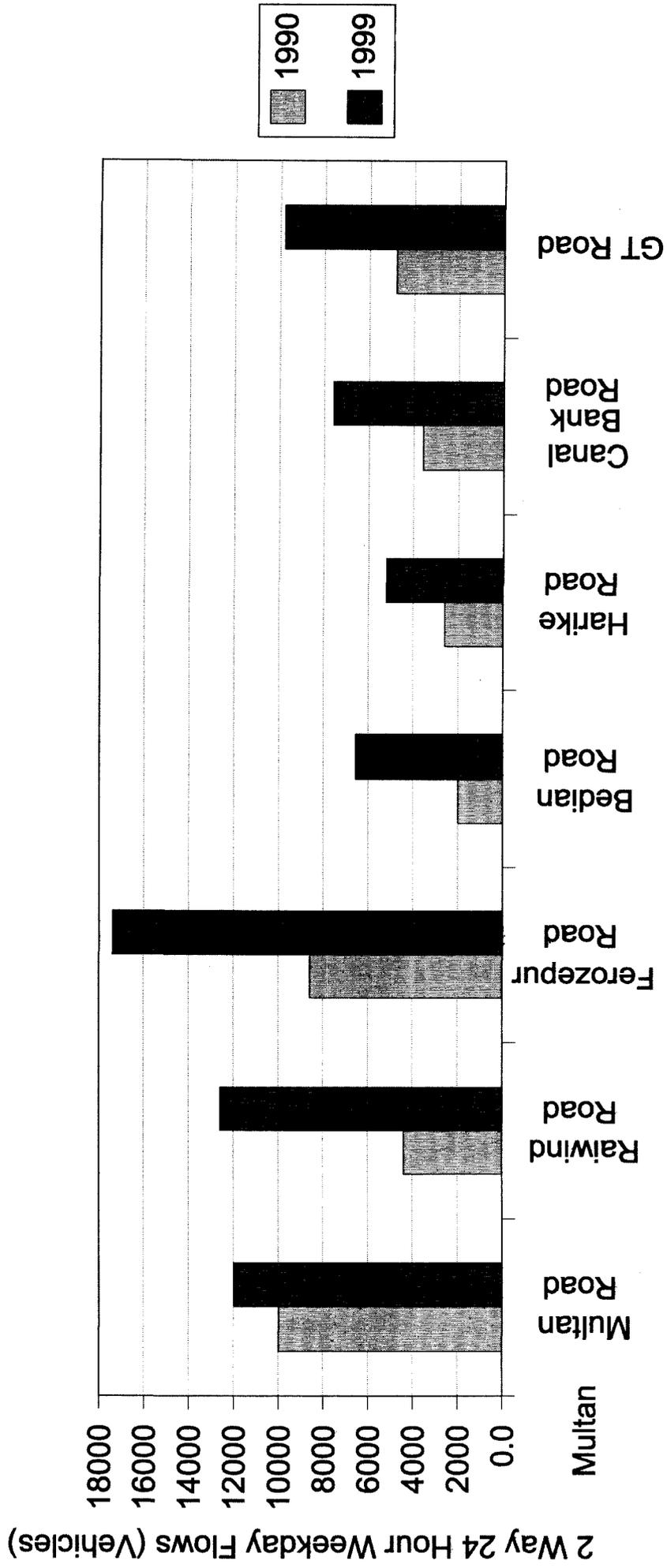
8.4.1 Inner Area Cordon Count

The feasibility study for Lahore Ring Road covered 10 stations on Cordon Line count. Traffic surveys in 1999 were conducted on weekdays at all stations for 12, 16 and 24 hours. Weekend counts were conducted at four major locations. Stations on the Cordon Line include Multan Road, Ferozepur Road, Riawind Road, Badian Road, Harike Road, Canal Bank Road, GT Road (East), Ravi Crossing at GT Road, Ravi Crossing at Sagian Bridge and Ravi Crossing at Lahore Bypass. Through, this data along with data from series of other counts was entered for validation of 1990 Traffic Model for the city having series of traffic assignments for individual modes; growth trends are presented in Table 8.1 & Figure 8.4.

TABLE 8.1
TRAFFIC GROWTH 1990 - 1999

Link	Direction	1999 Traffic Counts (vehicles)				1990 Traffic Counts (vehicles)				1999/1990				1999/1990 % per annum			
		M/cyc	Cars, Pickups	Trucks	Total	M/cyc	Cars, Pickups	Trucks	Total	M/cyc	Cars, Pickups	Trucks	Total	M/cyc	Cars, Pickups	Trucks	Total
Multan Road	In	981	2864	2960	6805	933	2183	1804	4920	1.05	1.31	1.64	1.38	0.6%	3.1%	5.7%	3.7%
	Out	774	2222	2317	5313	972	2374	1700	5046	0.80	0.94	1.36	1.05	-2.5%	-0.7%	3.5%	0.6%
	2 way	1755	5086	5277	12118	1905	4557	3504	9966	0.92	1.12	1.51	1.22	-0.9%	1.2%	4.7%	2.2%
Raiwind Road	In	1665	3389	1071	6125	831	1050	236	2117	2.00	3.23	4.54	2.89	8.0%	13.9%	18.3%	12.5%
	Out	1854	3429	1225	6508	820	1158	256	2234	2.26	2.96	4.78	2.91	9.5%	12.8%	19.0%	12.6%
	2 way	3519	6818	2295	12632	1651	2208	492	4351	2.13	3.09	4.67	2.90	8.8%	13.3%	18.7%	12.6%
Ferozepur Road	In	3513	4024	1122	8659	2144	1753	521	4418	1.64	2.30	2.15	1.96	5.6%	9.7%	8.9%	7.8%
	Out	3384	4065	1278	8727	1970	1655	550	4175	1.72	2.46	2.32	2.09	6.2%	10.5%	9.8%	8.5%
	2 way	6897	8089	2400	17386	4114	3408	1071	8593	1.68	2.37	2.24	2.02	5.9%	10.1%	9.4%	8.1%
Bedian Road	In	1812	809	603	3224	629	197	146	972	2.88	4.11	4.13	3.32	12.5%	17.0%	17.1%	14.3%
	Out	1947	781	522	3250	863	236	116	1215	2.26	3.31	4.50	2.67	9.5%	14.2%	18.2%	11.6%
	2 way	3759	1590	1125	6474	1492	433	262	2187	2.52	3.67	4.29	2.96	10.8%	15.5%	17.6%	12.8%
Harike Road	In	1224	598	638	2460	773	408	324	1505	1.58	1.47	1.97	1.63	5.2%	4.3%	7.8%	5.6%
	Out	1305	646	681	2632	616	242	199	1057	2.12	2.67	3.42	2.49	8.7%	11.5%	14.6%	10.7%
	2 way	2529	1244	1319	5092	1389	650	523	2562	1.82	1.91	2.52	1.99	6.9%	7.5%	10.8%	7.9%
Canal Bank Road	In	1998	1155	415	3568	1082	654	115	1851	1.85	1.77	3.61	1.93	7.1%	6.5%	15.3%	7.6%
	Out	2190	1489	455	4134	1039	554	81	1674	2.11	2.69	5.62	2.47	8.6%	11.6%	21.1%	10.6%
	2 way	4188	2644	870	7702	2121	1208	196	3525	1.97	2.19	4.44	2.18	7.9%	9.1%	18.0%	9.1%
GT Rd	In	1914	1559	1350	4823	1156	631	566	2353	1.66	2.47	2.39	2.05	5.8%	10.6%	10.1%	8.3%
	Out	1914	1480	1574	4968	1222	675	581	2478	1.57	2.19	2.71	2.00	5.1%	9.1%	11.7%	8.0%
	2 way	3828	3039	2924	9791	2378	1306	1147	4831	1.61	2.33	2.55	2.03	5.4%	9.8%	11.0%	8.2%
Total	In	13107	14398	8159	35664	7548	6876	3712	18136	1.74	2.09	2.20	1.97	6.3%	8.6%	9.1%	7.8%
	Out	13368	14112	8051	35531	7502	6894	3483	17879	1.78	2.05	2.31	1.99	6.6%	8.3%	9.8%	7.9%
	2 way	26475	28510	16211	71196	15050	13770	7195	36015	1.76	2.07	2.25	1.98	6.5%	8.4%	9.4%	7.9%

Source: CSTS Study by JICA, 1990 and Feasibility Study of Lahore Ring Road, 1999 by Mott MacDonald.



Traffic Growth 1990-1999

Fig: 8.4

8.4.2 Screen line Count

NESPAK carried out 24 hours traffic counts in May 2001 along Lahore branch of UBD Canal of all the traffic crossing the Canal. On a few roads having significantly little volumes of traffic during night, traffic counts were restricted to 12 hours, however adjustments were made in estimating the total traffic based on representative list samples. List of traffic count stations and their placement is shown in Table 8.2.

Significance of Canal Screen line firstly lies in being a major screen line passing midway through the city representing movements of all types of traffic. Secondly Canal was the major screen line representing the 1990 counts in CSTS Study. Therefore, fresh counts in 2001, has provided an opportunity to look at present patterns of movement, composition of the traffic, growth of overall traffic, pattern of change in modal choice in the city as a whole, and in affluent areas in particular.

Distribution of over all traffic during the day is presented in Table 8.3. Major peaks are observed between 6 pm to 7 pm, which account for 7% of 24 hours of traffic. During winter season as shown in other studies, peak volumes in the city are usually observed in the morning over longer hours. In terms of vehicle composition, 35% of the total traffic is passenger car and jeep, whereas 30% constitute motorcycles. Compared to previous studies, bicycles now constitute only 14% of total traffic. Animal driven is less than 1%. Non-motorized are 15% of total and two wheelers are 44%, whereas public transport carriers are 8% of total traffic.

Comparative analysis between different areas of the city is presented in Table 8.4. Analysis indicates that Northern Section of the screen line; areas north of Railway line carry comparatively higher proportion of non-motorized traffic than Southern Section. Distribution of the traffic during the day in graphic form is presented in Figure 8.5.

Comparative analysis of 1990 and 2001 studies indicates that over all traffic has increased by 1.5 times with average annual growth rate of 3.75%, whereas this increase in motorized transport excluding motorcycle is 5.1%. Major growth of 9.63% per year is registered in minibus/coaster. Trucks and tractor-trailers have been increasing with annual growth rate of 5.68%, whereas least growth of 1.22% is observed for bicycle. Growth of animal driven vehicles is 2.59% per annum. Table 8.5 gives vehicle composition and growth trends since 1990 CSTS Study. Change in terms of composition of traffic over the period is given in the Table 8.6

Comparison between northern and southern sections of the screen line indicates that growth trends in bicycle and animal driven vehicles in case of northern areas remained relatively steady whereas there is negative growth of these modes of transport in southern areas. This trend is understandable because of increasing travel distances and more reliance on motorized transport on one hand and concentration of non-motorized transport in less developed and areas of unplanned growth on the other.

There is another indication that lower growth rate in bicycles; apart from longer travel distances, is because of continual denial of facilities for this important mode of transport. In absolute terms, vehicular traffic has increased from 512,484 vehicles to 768,205 over 11 years. Motorized transport excluding motorcycles has increased from 245,497 to 425,102.

8.4.3 Ravi Screen Line

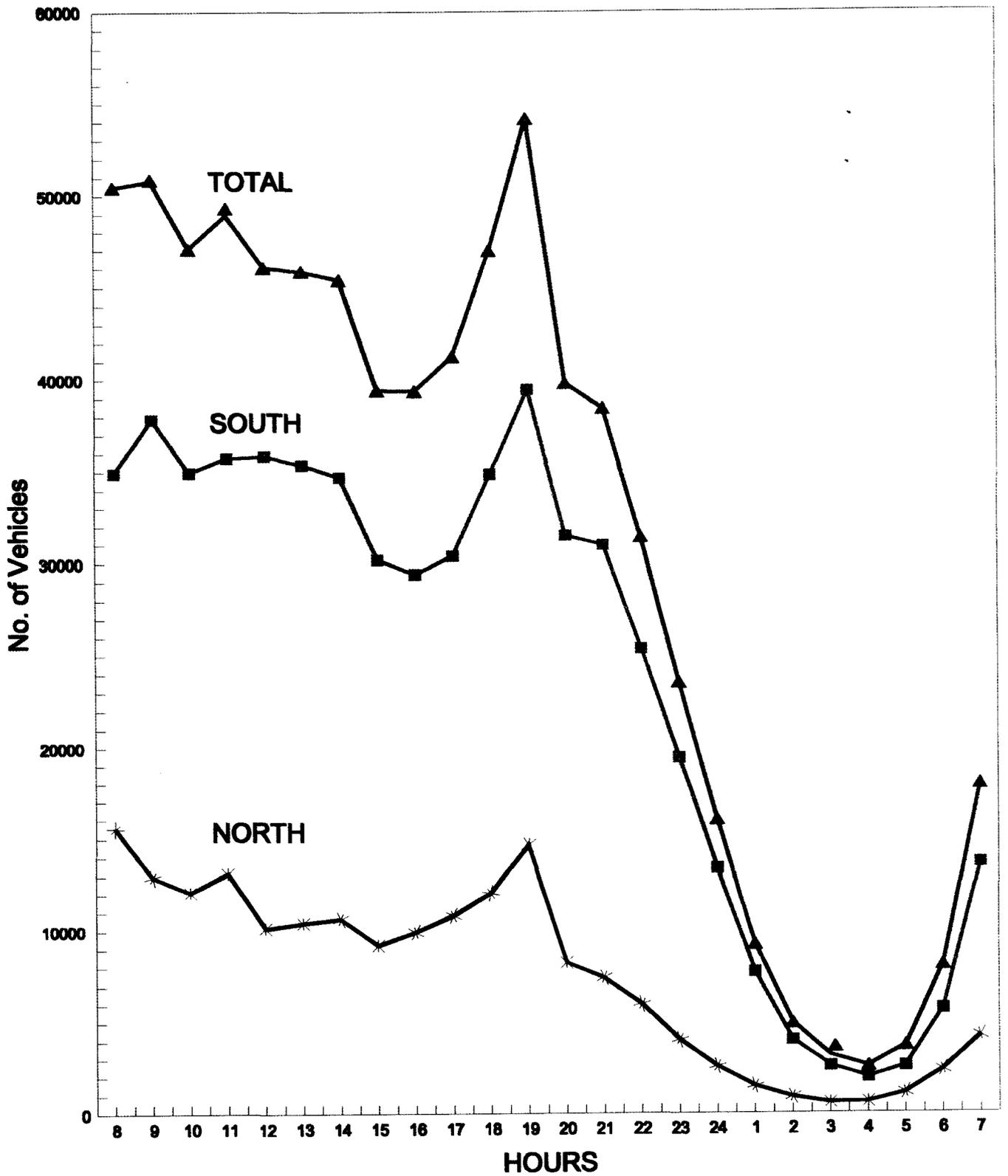
Comparing the screen line count conducted in 1999 for Lahore Ring Road Study and corresponding count carried out for CSTS Study in 1990 brings out picture of the growth of the traffic as given in Table 8.7.

TABLE 8.2
SCHEDULE OF SCREEN LINE COUNT ON BRIDGES OF
LAHORE CANAL BRANCH (Thokar Niaz Baig to Jallo Park)

S. No	Section	Chainage	Location of Count On Bridge
1.	South	0+00	Thokar Niaz Biag
2.	South	0+500	Canal View
3.	South	2+100	Suparco
4.	South	2+900	Johar Town
5.	South	3+500	Dr. Hospital
6.	South	5+100	Shah di Khui (Jinnah Hospital)
7.	South	5+400	Islamic Centre (University Campus)
8.	South	6+700	Psychology Deptt. (University Campus) Steel Bridge
9.	South	7+100	Commerce Deptt. (University Campus) Steel Bridge
10.	South	7+900	New Campus
11.	South	9+200	Muslim Town (Lal Pul)
12.	South	10+200	Ferozepur Road
13.	South	11+200	F. C College
14.	South	11+300	Shah Jamal -1
15.	South	11+400	Shah Jamal-2 (Old Bridge)
16.	South	12+500	Jail Road
17.	South	13+200	GOR
18.	South	13+800	Mall Canal
19.	South	14+300	Aitchison College
20.	South	14+900	Mayo Garden(Mian Mir Colony Pul)
21.	North	15+200	Dharampura
22.	North	15+700	Railway Officers Colony (Chaubucha Pul)
23.	North	17+600	Mughalpura
24.	North	18+500	Lal Pul
25.	North	19+500	Taj Pura (Naya Pul)
26.	North	19+700	Fateh Garh
27.	North	21+100	Taj Bagh (Sohna Pul)
28.	North	22+100	Canadian School(Sultan Pul)
29.	North	23+200	Harbans Pura
30.	North	24+800	Diyal
31.	North	26+200	Lahore Medical and Dental College
32.	North	26+700	Rizwan Garden Pul (Ghurki Pul)
33.	North	27+200	Jallo Park (Sky Land)

8.5 TRAFFIC CONTROL

History of traffic control in Lahore is a mix of success and failure over a period of last two decades. In early eighties there used to be around 50 signalized crossings



HOURLY DISTRIBUTION OF ZONEWISE AND TOTAL TRAFFIC (2001)

Fig: 8.5

mostly installed by LDA on city roads. Though junction geometry of most of the road network was not well designed, signals did work at many places. In mid eighties most of the roads had been improved and signals installed, thus these were transferred to ex-MCL for maintenance. No maintenance whatsoever was carried out and by 1986 there were only 12 locations where only red and green stages of the signals were operative. Others had simply gone out of operation due to lack of maintenance. Signals were transferred back to TEPU of LDA and 50 crossings were thus installed with revamped signal equipment. During this period some of the traffic engineering schemes were also introduced in many areas of the city, where signal equipment was installed as per international practice thus affecting proper traffic control. In eighties there were quite a few roundabouts in the city, which started showing signs of saturation and thus converted to signalized crossings.

TABLE 8.3
SUMMARY OF 24 HOUR TRAFFIC COUNT SURVEY (2001) HOURLY
DISTRIBUTION OF TOTAL TRAFFIC (SOUTH+NORTH ZONES)

S.NO.	TIME (HOURS)		TOTAL TRAFFIC (SOUTH)	TOTAL TRAFFIC (NORTH)	G.TOTAL
	FROM	TO			
1	7	8	34,928	15,539	50,467
2	8	9	37,852	12,961	50,813
3	9	10	34,966	12,120	47,086
4	10	11	35,784	13,158	48,942
5	11	12	35,889	10,157	46,046
6	12	13	35,395	10,455	45,850
7	13	14	34,725	10,668	45,393
8	14	15	30,206	9,236	39,442
9	15	16	29,432	9,956	39,388
10	16	17	30,406	10,855	41,261
11	17	18	34,898	12,071	46,969
12	18	19	39,473	14,691	54,164
13	19	20	31,520	8,283	39,803
14	20	21	30,988	7,464	38,452
15	21	22	25,404	6,032	31,436
16	22	23	19,474	4,075	23,549
17	23	24	13,418	2,606	16,024
18	24	1	7,762	1,512	9,274
19	1	2	4,052	914	4,966
20	2	3	2,604	590	3,194
21	3	4	1,975	626	2,601
22	4	5	2,596	1,140	3,736
23	5	6	5,748	2,393	8,141
24	6	7	13,686	4,279	17,965
TOTAL			573,181	181,781	754,962

Source: Traffic Count by NESPAK, May 2001.

TABLE 8.4
24-HOUR TRAFFIC COUNT FOR BOTH DIRECTIONS
(NORTH AND SOUTH ZONES)

	BICYCLE	M.CYCLE /JEEP	CAR/ JEEP	LIGHT TRUCK/ PICKUP	LARGE TRUCK, TRAILER, TANKER	TAXI	RICKSHAW	SUZUKI PASSENGER	MINI BUS/ COASTER	BUS	TONGA/ ANIMAL DRAWN	ANIMAL/ CART TRAFFIC	TOTAL
<u>NORTH ZONE</u>													
BASE TRAFFIC	44,734	63,260	20,398	4,073	3,871	1,613	19,365	5,372	12,988	1,925	1,091	3,091	181,781
PERCENT DISTRIBUTION	24.61	34.80	11.22	2.24	2.13	0.89	10.65	2.96	7.14	1.06	0.60	1.70	100
TOTAL 24 HOUR TRAFFIC	47,180	66,000	23,086	4,513	5,856	1,768	20,306	5,627	14,307	1,988	1,150	3,244	195,024
PERCENT DISTRIBUTION	24.19	33.84	11.84	2.31	3.00	0.91	10.41	2.89	7.34	1.02	0.59	1.66	100.00
<u>SOUTH ZONE</u>													
BASE TRAFFIC	58,728	163,852	226,420	14,616	5,981	3,735	41,274	14,356	36,020	5,249	901	2,049	573,181
PERCENT DISTRIBUTION	10.25	28.59	39.50	2.55	1.04	0.65	7.20	2.50	6.28	0.92	0.16	0.36	100
TOTAL 24 HOUR TRAFFIC	61,174	166,592	229,108	15,056	7,966	3,890	42,215	14,611	37,339	5,312	960	2,202	586,424
PERCENT DISTRIBUTION	10.43	28.41	39.07	2.57	1.36	0.66	7.20	2.49	6.37	0.91	0.16	0.38	100.00

**TABLE 8.5
VEHICLE COMPOSITION AND GROWTH TRENDS
BETWEEN 1990 AND 2001**

S. No	Type of Traffic	Traffic 1990	Traffic 2001	Growth Rate/Year
1.	Bicycle	92,700	105,908	1.22%
2.	Motorcycle and Scooter	168,744	229,852	2.85%
3.	Car/Jeep/Rickshaw	216,651	355,701	4.61%
4.	Minibus/Coaster	18,305	50,327	9.63%
5.	Bus	4,099	7,237	5.30%
6.	Light/Large Truck, Trailer, Tanker	6,442	11,837	5.68%
7.	Tonga/Animal Driven	5,543	7,344	2.59%
	Total Traffic	512,484	768,205	3.75%

**TABLE 8.6
PERCENTAGE DISTRIBUTION OF ROAD TRAFFIC**

S. No	Type of Traffic	1990	2001
1.	Bicycle	18.1	13.8
2.	Motorcycle and Scooter	32.9	29.9
3.	Car/Jeep/Taxi/Rickshaw/Suzuki/Light Truck/Pick Up	42.3	46.3
4.	Minibus/Coaster	3.6	6.6
5.	Bus	0.8	0.9
6.	Large Truck, Trailer, Tanker	1.2	1.5
7.	Animal Drawn	1.1	1.0
	Total Traffic	100	100

**TABLE 8.7
GROWTH OF TRAFFIC ALONG THE SCREEN LINE**

Year/Type	Car/Jeep	Truck
1990	21,347	6,006
1999	31,332	9,154
Growth Rate	4.36	4.79

PUDP brought a significant change in the traffic control. Most of the road network was remodeled as per traffic requirements, introducing modern concepts of Traffic Engineering and Management. Signal settings were standardized as per universal practice and regulations. City centre, where most of the signalized crossings are placed close to each other and carry heavy volumes of city traffic, was reviewed for Area Traffic Control (ATC). Being a most economical solution compared to grade separation, equipment compatible for ATC software SCATS was installed at 50 crossings in the central area. Ducting for the central area network was also accomplished as the works proceeded for footpaths for central area roads, deferring the linking of the signals and central control equipment to be financed in the next phase. Wireless linking of corridors within limited lengths was affected through installed equipment on heavily loaded links, maximizing their traffic handling capacity.

In mid nineties, signals were again transferred to ex-MCL for maintenance. In the pretext of road remodeling, under the LRRP, ATC compatible equipment was reported to be replaced with ordinary control on certain crossings. On others not

likely to justify linking were installed with ATC compatible equipment. Present status of the signal as such is poor. It remains in the hands of unconcerned having little knowledge to operate and maintain on professional lines for the benefit of the end users. Controlling authority is unaware of operating procedures; staging plans preparation and programme management on the basis of traffic requirements. Their priority lies only in keeping the signals exhibiting red and green stages. At many locations staging is not only funny but also source of abnormal traffic delays and unnecessary congestion.

Junction geometry and layouts of approaches on major roads recently remodeled through LRRP remain non-standardized with poor detailing resulting inappropriate traffic control. Provision of additional road space over and above the traffic requirements is a major source of traffic indiscipline and non-judicious way of utilizing network capacity having far reaching effects on traffic control and road discipline.

Positive improvement, however, is evident in lane discipline close to the junctions through recent strict traffic supervision. But such a control is restricted to areas where police likes to be seen and justifies its presence. It is a good practice, which needs replication elsewhere on the network throughout the city.

Traffic control is poor on priority crossings and roundabouts both in terms of posting of traffic control devices and traffic supervision. Most of the traffic control devices are being installed not because these are required but because somebody has seen them installed elsewhere.

Signage posting and pavement markings are usually left at the mercy of the contractor as in case of LRRP giving rise to malpractices and incorporation of nonstandard stuff. Some times control devices required for a particular category of road are installed for a different category. Signage and markings once installed, may be wrong or right, are repeated without any recourse for setting them right. In spite of the fact that TEPA is quiet rich both in knowledge and experience, standard signage and pavement markings introduced in eighties and early nineties are slowly disappearing giving way to nonstandard control and practice.

8.6 PUBLIC TRANSPORT

Public transport operations in Lahore are currently being delivered completely through private sector. The only public transport company in the public sector operating urban and inter-city services was disbanded in mid nineties because of inefficiency and gross mismanagement. In order to fill in the large gap in delivery of urban services through large body buses, Government of Punjab has initiated private bus operations through franchising some of the routes. On a few routes operators enjoy monopoly and quality services are offered by replacing number of mini bus operations thereby having positive impact on environment and urban mobility. Currently seven routes are being operated through this system with 230 large body buses. Daewoo in particular provides premier service on 3 routes. Pace of shift towards franchised route system is slow partly because of pressures from para transit operators and partly because of lack of programme planning and execution.

Other private operators are operating their services on some of the old routes with mostly old buses at relatively low and controlled fares. Such operations are restricted to 11 routes with 452 buses, which are designed to cater for traffic requirements of outlying rural settlements in LMA and suburbs. Mazda mini buses with 26 seats are operating on 9 routes with 348 vehicles whereas the 12 seater Toyota Hiace wagons have the monopoly of operations with 4,223 vehicles on 47 routes in the city. Wagon has in fact taken over the route alignments of defunct Punjab Road Transport Corporation (PRTC). Comparative share and historical growth of various operators is shown in Table 8.8.

TABLE 8.8
URBAN BUS AND PARA TRANSIT OPERATORS

Vehicle	1984		1985		1990		1990		2001	
	Private	PRTC	Private	PRTC	Private	PRTC	Private Routes	PRTC Routes	Vehicles	Routes
Mini Bus	996		1238		2189		47		4223	47
Mazda	34		80		combined		combined		348	9
Private Bus	143	145	179	167	260	85	13	30	507	18
Suzuki Wagon	191		362		213		4		102	1
Total	1364	145	1859	167	2662	85	64	30	5180	75

Apart from above stage carriages, public transport operations are also shared among 105 taxis and 18,021 three-wheeler Rickshaws. This speaks of the state of affairs in a highly important utility sector of the urban metropolis. Since 1990 CSTS Study, there is more and better route coverage in terms of wagon operations in the city. There is tremendous surge in number of rickshaws. This has resulted towards more flexibility in the public transport service delivery but poor quality of service and resultant contribution towards environmental degradation and traffic congestion are the key issues which has resulted because of present scenario. Fare policy is another factor which needs to be examined as to raise the level of service in privately operated public transport. Operation of quality service on limited routes has derived the dividends, which needs replication.

8.6.1 Inter-City Terminals

Public transport terminals for intercity bus operations in Lahore are historically located at Badami Bagh and a site close to the Railway Station. Later was mostly utilized by defunct PRTC for its city and intercity bus operations. Since the closure of the PRTC this site is reportedly given on lease to two transport operators who are utilizing this space as a terminal and for parking of their buses. It is a vast piece of land measuring about 47 kanals right into the heart of the city, which is being under-utilized.

Badami Bagh Bus Terminal which was put into operation in 1965 has been operating relatively in an organized manner. Over the years, because of increase in demand, it had become congested and therefore some of the operators had started moving to more convenient places in the city.

TEPA, LDA framed a programme of upgrading both the terminals at Badami Bagh and at Railway Station area but no such programme of improvement was executed for these terminals, letting ever-increasing terminal demand worsen the situation.

Railway station area being well accessed and conveniently located close to wholesale markets of the downtown has always remained attractive to public transport operators for their terminal operations. Therefore a number of operators have been utilizing this area, having their individual terminals for their inter-city bus operations for more than two decades. Punjab Government moved these operators to Badami Bagh Bus Terminal closer to Minare-Pakistan National Park through make shift arrangement in 1997. Since then most of the inter-city bus operations are being operated in highly disorganized manner and under extremely poor conditions both for operators and the passengers. Since parking of buses is not segregated from terminal functions there is extreme degree of congestion as a result of mass scale parking and roadside terminating services on Circular Road. Adjacent national and historical monuments are under constant threat of severe level of environmental pollution emanating from diesel operated buses.

A major chunk of land forming part of Badami Bagh Bus Terminal was sold out to finance the LRRP thus squeezing a highly valuable resource. Current operations from Badami Bagh account for 3,500 departures on daily basis. Daewoo has recently commenced their operations from a site on Ferozepur Road. Similarly few others have been granted permission to operate from Bund Road. Growth of such terminals may be convenient for the operators but because of absence of necessary linkages, are certainly inconvenient for the passengers.

Since the shifting of operations to Badami Bagh, Government of the Punjab intended to construct another terminal close to Shahpur Interchange on Multan Road on the basis of Feasibility Study framed by Messrs PEPAC recommending shifting of entire operations to new site. While preparing this study, stock of situation in reality, intending destinations of incoming passengers, capacity of the approaches to the terminal, traffic and project impact assessment has not been taken into account. It is more of an architectural exercise than a feasibility study for a terminal. There is definitely requirement for decentralizing some of the operations to this site but not through shifting entire operations. Requirement lies in segregating parking from terminal activities, upgrading existing terminals to a requisite standard, making arrangements for off site parking and maintenance facility and shifting the south and south-west bound bus routes to the new site relieving pressure from Badami Bagh. Authorities should realise this issue for the benefit of millions of consumers and operators alike.

8.6.2 Terminals for City Traffic

Two major public transport terminals for city traffic partly operating from precincts and partly from road sides are well planned and established by TEPA, LDA at Lahore Railway Station and Bhaati Gate as part of PUDP. Because of high degree of usage and congestion, environmental conditions prevailing at these terminals are poor. Lack of maintenance on part of controlling agencies is eroding the efforts put in developing these terminals. The portion of Badami Bagh Stand reserved for local traffic is sold, disarranging this important function altogether. Plans were prepared at one stage to provide such facilities in the housing schemes of LDA for suburban traffic, but nothing moved beyond planning. Thus a metropolis having more than 23,000 licensed operators have to rely on a facility having not more than 100 vehicle spaces to operate upon. For more than 18,000 taxi/rickshaw registered with the controlling authority, there is not a single taxi/rickshaw ramp in the entire city. Provision of bus bay facility is only restricted on a few newly built roads and does not form part of the priorities of the civic agencies.

8.7 FREIGHT TERMINALS

Officially developed road freight terminals are located at Badami Bagh on Ravi Link Road and Babu Sabu on Bund Road but in practice operation continues from any place convenient to the operators. Circular Road, GT Road, Multan Road, Ravi Road, Walton Road and number of other sites are utilized for on road transfer of the freight. Regional Transport Authority (now District Transport Authority-DTA) has issued permits to 20,364 carriers to operate in the region who are eligible to utilize terminal facilities. Babu Sabu site was an interim arrangement but this site still remains unutilized. Past efforts of TEPA, LDA to acquire some piece of land well accessed from the city and inter-city highways for developing a modern freight terminal did not come to fruition. Officially, movement of freight during the day is restricted in the city but with exceptions. In spite of available capacity on most of the roads, no such routes are established for the movement of the freight for its early delivery.

There is ample room for freight transfer facilities with railways at all the railway stations in the city, but over the years large scale shift to road transport and non response of local authorities towards this change has compounded the situation. Present location of the Dry Port viz the approaches to the Dry Port are neither convenient for city traffic nor for movement of the goods. Plan of Pakistan Railways to establish integrated freight terminal at Kala Shah Kaku or Kahna Railway Station has not materialized because of funding problem but programme as such is on board.

Freight transfer facilities at the airport are adequate except for cold storage facilities for perishable items of freight. With the shifting of passenger terminals to the new site present terminal is planned to be utilized for freight handling with upgraded facilities.

8.8 RAILWAYS

Railways possess strategic location within the city. Karachi-Peshawar Main Railway Line passes through the centre. Apart from the main line, other lines for Narowal-Sialkot, Sheikhpura-Faisalabad, and Wahga-Amritsar (India) also branch out from Lahore. Around 19,700 passenger trains carrying 4.2 million passengers and 3,180 goods trains handling 0.57 million tons of freight per year are managed through Lahore Railway Station. There is insignificant amount of local traffic handled by railways, as local service is not operated. Though there is a lot more capacity to handle local service as suggested by JICA, Railways is wary of the capacity problem. Having improved the track, signaling system and berth conditions at the stations, there is strong feasibility of operating city trains as suggested by JICA in CSTS.

8.9 AIR TRAFFIC

Lahore airport is serving both international and domestic flights and is currently handling around 650 flights a week. There has been considerable increase in the demand in passenger traffic and flight handling requirement because most of the international flights between Europe and Far East have shifted to a shorter route passing over Islamabad, Lahore, Delhi and Calcutta. In view of this Civil Aviation Authority (CAA) started building new passenger terminal on eastern side of the existing runway to increase the capacity of the airport. The terminal is now operational. With the new terminal in operation, CAA plans to handle more than 58,000 flights and more than 5 million passengers per year by the year 2010.

In view of the above, TEPA has rightly planned a number of access roads for the new terminal, located at an odd position as far as the local road network is concerned. It has completed approaches from the northern end giving access to and from Allama Iqbal Road and Shabrae-Quide-Azam. It has successfully completed Jinnah Flyover and its approaches, but this corridor needs to be engineered through the Cantonment as a major access to the terminal. This, being major carrier of airport traffic, demands serious effort on city side as well. Present arrangements being put in place at Center Point and Kalma Chowk are not satisfactory and need immediate review in order to improve accessibility to a high cost and high capacity road project completed by TEPA itself. Though CWD has completed Ghazi Road but it is not going to serve effectively in the presence of bottlenecks close to Ferozepur Road and at Badian Road Crossing.

Improvement and remodeling of Walton/Tufail Road as major distributor to the access routes leading to the airport is yet to be initiated as planned. All these roads would provide a temporary relief for the airport bound traffic. Being situated at one corner of the city, airport needs immediate free flow access for suburban and inter-city traffic without burdening local road network thus requiring construction of the Lahore Ring Road on priority basis.

8.10 PARKING

With the growth of commercial activities and traffic alike, demand for parking in the commercial districts has grown over the period. There is considerable control

on parking activities within the premises of new commercial buildings along important roads but control throughout the city as a whole is not being properly exercised. Growth of bazaar functions along the roads and concentration of commercial activities in the city centre has given rise to roadside parking threatening the capacity of the roads. The consultants surveyed all roads having concentration of roadside parking. Such parking concentrations have been marked on each road and are shown in Figure 8.6.

Issue of roadside parking is purely a management problem on the part of the City Government. Firstly because it is being treated as revenue generating activity (as being practiced by ex-MCL) and therefore most of the roads have been contracted out to collect parking fee from the on-street parkers. Private contractors in pursuit of collecting maximum revenue manage for maximum parking irrespective of availability of parking spaces and capacity of road for normal movement of traffic. Understanding of the civic authorities, in case of on-street parking, as a matter of fact is that it has to be charged. They are usually unaware that parking is charged to discourage it, make parking spaces available to maximum users over a certain time period and not for revenue collection. Many roads having capacity problem for traffic movement and where parking should have been avoided are contracted out for charged parking.

For every street, depending on the availability of road space, on-street parking arrangement and pattern is usually decided and documented to enforce in the interest of proper traffic management but in case of Lahore City concerned authorities act otherwise. TEPA at one stage had prepared a proper Parking Management Plan in line with the traffic circulation plan for the whole of the city. Efforts were made to execute this plan but over the years it could not materialize.

Off-street parking available in certain areas is being fully utilized where pressure for on-street parking is considerable as in case of Egerton Road, Davis Road and Main Boulevard Gulberg. On other roads having enough availability of parking spaces and incentives for on-street parking, off-street facilities remain under utilized. Off street parking regulations with regard to new development are too stringent discouraging the development of commercial buildings activity in the city on one side and encouraging flouting by those who venture to construct the commercial buildings. There is urgent requirement to relax parking regulations for commercial buildings to make them viable to provide the same and at the same time these are easy to enforce and regulate. Equally important is the encouragement of public transport to overcome parking problems. Development of off-street parking facilities through public sector has never been feasible and developing parking as part of commercial ventures have to be encouraged in most parts of the central area lacking this facility.

8.11 ORGANIZATIONAL ISSUES

In spite of the fact that TEPA was established in 1987 under the LDA Act 1975 to take charge of and deliver all functions related to Transportation Planning and Traffic Engineering throughout the LMA, today responsibilities and functions to deliver the services under this important sector stand fragmented amongst many organizations. There is overlapping and sharing of key responsibilities and

functions on one hand and non-performance of delegated responsibilities on the other. Present state of affairs is also reflective of absence of responsibilities and important functions.

The task of Urban Transport Policy preparation, its operation and monitoring generally lies with Provincial Governments in close association with local agencies. None of the agencies, whatsoever has taken up this responsibility. Provincial Transport Department or for that matter DTA and organizations responsible for transport infrastructure are usually engaged in day-to-day functions on ad-hoc basis.

8.11.1 Transportation Planning

Transportation Planning, a key task in city management, as presently delegated to the Provincial Transport Department, the City Government, DTA and TEPA, LDA is not being effectively carried out by any of these organizations. TEPA prepared CSTS in the shape of a Transportation Master Plan but did not proceed further, rather over the years has confined itself to road building activity. Persistent ignorance towards high priority projects and misdirection of financial resources towards low priority schemes from traffic demand point of view is the result of lack of professional and technical manpower resources and commitment of the organizations in Transportation Planning.

8.11.2 Traffic Engineering

Being a pioneer in Urban Road Sector in Pakistan, Traffic Engineering is the key responsibility of TEPA, LDA. Its contribution towards bringing a positive change in urban traffic environment is well recognized. Nevertheless over the years road building and infrastructure improvement has largely been shifted to ex-MCL for number of reasons. Ex-MCL, not strong enough in traffic engineering, roads project planning, construction management and operational aspects, has not produced the desired results in spite of strong Government and consultancy support. Sharing of responsibilities between TEPA and ex-MCL has resulted to a situation where both were interested in just road building, but none has delivered the services in project planning, traffic engineering, traffic impact evaluation and operational and maintenance aspects. Lack of explicit rules, regulations and standards pertaining to traffic engineering and urban roads for project preparation, feasibility, engineering design process, solution evaluation, project management and operational and management aspects has led to non-standardized and ill-conceived design solutions in recently carried out improvements resulting wasteful expenditures and increasing capacity problems.

LDA made a preliminary effort to produce a Manual on Traffic Engineering, but that too is not being utilized because of lack of expertise and knowledge on the part of road building agencies and local consultancy houses. Major problem lies in project preparation and planning. Project feasibilities are seldom based on traffic studies. For

major projects, traffic counts are usually carried out to save from the scrutiny of the approving agencies, their utility for design solutions is witnessed in rare projects. This results towards wasteful expenditure on projects with least priority of traffic demand. It is happening because of lack of expertise on the part of sponsoring and approving agencies on one hand and political compulsions on the other. Recently completed LRRP of ex-MCL is a classical example where more than Rs. 3.4 billion are spent on a project of urban roads without carrying out any traffic study, traffic demand analysis justifying its engineering feasibility, traffic impact assessment ensuring its operational efficiency and economic and financial viability for any of its components.

8.11.3 Operation and Maintenance

Task of operation and management (O&M) including maintenance of infrastructure primarily lies with the City Government, LDA and TEPA. Major responsibility lied with ex-MCL, which it delivered within its capacity of financial and professional manpower resources. Demand for O&M for infrastructure far exceeded the level and quality of ex-MCL service delivery. LDA remains responsible for infrastructure laid down in its housing schemes till their transfer to ex-MCL (currently City Government, which is normally spanned over number of years).

TEPA shifted its key responsibility of operation and management of traffic signaling and control to ex-MCL. There is hardly any procedure and practice of inspection of the infrastructure, or road pavement assessment or evaluation on regular basis, which may help in programme development for road maintenance. Potholes and road cuts due to laying of services are left for further deterioration of road surface and for justifying road reconstruction. Since there is no standard procedure or technique enforced for road patching and road surface restoration, road maintenance does not last long. Serious road-side raisings and encroachments are allowed to create road drainage problems resulting in surface deterioration. Road operation and maintenance being specialized task is not being handled on professional basis resulting wastage of resources and non-delivery of required level of service to the users.

Operational aspects of traffic management entrusted to the office of the then Deputy Commissioner (DC) and TEPA are rarely being exercised by these organizations. DC office, except for dealing with registered traffic violations, had rarely exercised its responsibility for issuing and enforcing traffic regulations. TEPA being responsible to prepare, implement and operate traffic management schemes has practically relieved itself of this key responsibility and confined to road building function.

8.11.4 Regulatory Aspects

Regulatory aspects of public transport operation lie with the DTA and Provincial Transport Authority (PTA) working within the framework of 1965 Motor Vehicle Ordinance. PTA mostly deals with granting inter-

provincial transport routes to freight and public transport operators and has little concern with Lahore Transport. DTA grants routes/ permits to freight and public transport operators both for city and inter-city operations. It also issues licenses for operation of D-Class Stands for inter-city operators. D-Class stand is a small-scale terminal facility to handle operation of three to four services at a time. In view of poor conditions prevailing at the Badami Bagh Bus Terminal, this facility is being granted to the operators but without ensuring any reliable local services.

Though DTA possesses authority for regulating all operational activities but it restricts itself to granting route permits and setting of fare levels only. Recently introduced franchised bus operations regulated with the cooperation of Provincial Transport Department are widely admired and need to be further encouraged through institutional capacity building and raising the level of understanding towards improved service levels through participatory approach of the corporate sector.

8.11.5 Vehicle Examination

Motor vehicle examination of commercial vehicles is the duty of the Motor Vehicle Examiner (MVE) placed under the control of the Secretary RTA. MVEs are also authorized to hold driving tests in coordination with the Traffic Police. General condition of the vehicles on the road portrays the efficiency of this institution.

8.12 TRAFFIC SUPERVISION AND ROAD SAFETY

8.12.1 Traffic Supervision

Enforcement of traffic laws and regulations is the responsibility of the traffic police, however police is required to discharge the duties of traffic control and escorting VIP movements. Around 40 to 50% time of the staff is spent on escort duties. The Traffic Police is hierarchically organized on typical British Police model with eleven ranks from top to bottom. Current staff strength exceeds 1,000 policemen.

“Traffic police staffing strength in Lahore, like any other city of the developing world, is often used to compensate for lack of training equipment and mobility. Traffic control is all that is expected from the majority of the traffic police and they are often stationed at traffic signals to provide backup support. Overwhelmed and under resourced, traffic police earn little respect from the public”. These are the remarks in one of the Asian Development Bank study report. Traffic police is still part of the general police where crime control and law and order is more important than traffic control and road safety.

In the multiple organization of traffic police, rapid changes of traffic officers make it difficult to train anybody in sustainable way. Traffic enforcement that aims at limiting traffic violations is generally missing.

Only documents are actively checked. Neither any enforcement devices are in use nor accident information is availed in planning the activities. Nevertheless, Lahore has witnessed a change on signalized crossings where police has started enforcing lane discipline. This is a positive step on part of the traffic police, which needs furtherance as to prove to be a specialized body in enforcing traffic regulations, and dealing with violation of parking laws, and route regulations.

8.12.2 Road Safety

Road safety situation in Lahore, that had comparatively improved to some extent in early nineties, has again started showing alarming signals. Around 50% of the traffic fatalities in Lahore are vulnerable road users. Pedestrians constitute the largest proportion of traffic fatalities, followed by bicyclists and motorcyclists. Information about the exact location and the manoeuvres involved is missing. In over 70% of traffic accidents in Lahore a commercial vehicle is involved. Over the times, the frequency of involvement of buses, minibuses and coaches has considerably increased.

In absolute number, the road safety situation in Lahore has not improved but is worsening. There has been a rise in traffic fatalities over the past ten years. In the period 1989-93, 866 road users died in Lahore traffic. In subsequent 5 years period 1994-98 this number has risen to 1349, an increase of over 50%. For the next 5-year period, 1999-2003, traffic fatalities in Lahore may have risen to over 2000 if no counter-measures are taken.

Main factors contributing towards bad safety situation are ill-conceived road geometric designs, bad condition of the roads, erratic attitude of drivers, inadequate information and analysis on road safety and lack of supervision and interest on the part of road building agencies. Initiatives on the part of TEPA for channelization of traffic movements contribute a lot in arresting the safety situation, however recent geometric design solutions with respect to junctions and in particular arrangement of the service roads viz their merging with the main carriageways create serious situations on the roads completed under the LRRP. Provision of additional road space more than the requirements of the traffic does not contribute to the capacity rather it acts otherwise and is source of erroneous driver behaviour and bad safety situation in Lahore. Traffic Police is the only organization currently registering the road accident information, which too needs lot of improvement. There is lot under reporting of accidents other than fatalities. Organization like TEPA needs to be associated for gathering and analysing of accident information and for using it as a tool for future planning of roads and operation and management of the traffic.

8.13 FINANCIAL ISSUES

Financial requirements for infrastructure building are mostly being met through government funding. In certain cases donors have assisted to meet the requirements of local agencies. Provincial Highways Department that is administering inter-city

roads is using provincial resources for improvement and reconstruction of such roads. LDA and TEPA also seek government assistance. TEPA though can, with the permission of the government levy fees with respect to transport related activities, but same were exercised for a short duration and now Parks and Horticulture Authority (PHA) and ex-MCL were exercising their right to collect fees from roadside hoardings and parking of vehicles. Within the limits of housing schemes, LDA utilizes its own resources to finance the road construction.

In the past, when financial position of LDA was sound enough, it has been funding not only roads outside its scheme areas, but has also developed bus and freight terminals from its resources. LDA has recently been allowed to enter into contract with private sector for Build Operate and Transfer (BOT) Projects and other private sector financing arrangements. Since the City Government can raise funds through levy of fees and taxes, it is required to meet initial construction, operational and maintenance expenses of the infrastructure from its own resources. LRRP was funded through sale of ex-MCL and government properties, regular receipts of ex-MCL and raising loan facility from Bank of Punjab.

Transport and road related funds from the city are collected by various organizations. Provincial Excise and Taxation Department collects vehicle registration fee and road tax. Police Department issues driving license and fee is deposited in provincial funds. Traffic violators booked by the Police are also required to deposit the fines in the provincial government exchequer. City Government is allowed to collect terminal fee from the operators. Though official rates of terminal fee are nominal, higher rates are charged which are never deposited in the official accounts.

National Highway Authority collects toll fee from the traffic originating from and entering into the city. Federal Government collects duties and fees from sale of fuel and lubricants, vehicles and vehicle parts. Punjab Government levies fee on the air travelers. The amount of taxes and fees collected from the traveling, travel related activities and the infrastructure far exceeds the amount ever spent on the improvement, operation and management of this sector. There is lot more potential to generate additional resources from this sector. Thus an important sector having high revenue-generating capacity and growing demand for investment is being ignored.

9.0 COMMUNITY FACILITIES

This chapter deals with the existing conditions, problems faced and the critical issues being encountered in various social and community facilities including education, health, recreation, fire fighting facilities, religious places and graveyards.

9.1 EDUCATION

9.1.1 Introduction

Educational facilities in Lahore are mainly being provided by the Government of Punjab, the City Government (previously ex-MCL) and the private sector and voluntary organizations. To a limited extent the high school education is also being managed by the Federal Government through the operation of few institutions located in the Cantonment area.

The Directorate of Education, Punjab is the overall controlling body for schools and colleges in Lahore while universities, medical colleges and other postgraduate institutions operate as autonomous bodies under the Provincial and in some cases the Federal Government.

9.1.2 Literacy Ratios

During the intercensal period (1981-1998) the literacy ratio on the average increased by 16% in Lahore District as well as Lahore Urban with last figures reaching up to 64.7% and 69.1% respectively. It is evident from Table 9.1 that the proportion of literate population in Lahore Cantonment is higher than other areas. Similarly, the ratio of literate male population is higher than the literate female population in all areas of Lahore District.

9.1.3 Participation Rates/Enrolment Level

Eighth Five Year Plan (1993-98) and National Educational Policies have emphasized universalization of primary education over a minimum period of time. The Eighth Plan states that by the end of the plan period, almost all boys and girls of 5-9 age group will be enrolled in primary or mosque schools. However, the enrolment target set by the Eighth Plan for the age group 5-9 was 87.7% (1997-98) against a benchmark estimate of 68.9% (1992-93). The enrolment level which could be achieved up to 1998 for the specified age group in Lahore District and Lahore Urban was 64.06% and 67.40% respectively (Table 9.2). This was even lower than the benchmark estimate of the Plan. One of the major reasons for low enrolment level is the high drop-out rate.

The participation rate of children having ages ranging between 10-14, in 1981 in Lahore Urban was 48.36% which had increased to 72.57%

in 1998. Similarly the proportion of population of age groups 15-19 and 20-24, attending various education levels, has also noted to be increased in both Lahore Urban and Lahore District during the period 1981-1998 (Table 9.2). Participation rates worked out separately for male and female are given in Tables 1 and 2 in Annex A to Chapter-9.

9.1.4 Primary and Secondary Education

9.1.4.1 Primary Level Schooling

In the year 1999-2000, 135,598 children (51,200 boys and 84,398 girls) i.e. 14.4% of the total estimated population of students¹ of primary level were enrolled in 512 Punjab Government and ex-MCL primary schools (including mosque schools) in Lahore Urban (Table 9.3).

TABLE 9.1
LITERACY RATIOS, LAHORE DISTRICT, 1998

AREA	LITERACY RATIO ²		
	MALE	FEMALE	TOTAL
Lahore City Tehsil Urban	70.64	64.08	67.55
Lahore Cantonment Tehsil Urban	74.11	65.78	70.21
Lahore District Urban	72.73	65.10	69.15
Lahore District	69.05	59.68	64.66

Source: Lahore District Population Census, 1998.

TABLE 9.2
PARTICIPATION RATES³ (1981 & 1998)
LAHORE DISTRICT AND LAHORE URBAN

AGE GROUP (YEARS)	PARTICIPATION RATE (%)					
	LAHORE DISTRICT			LAHORE URBAN		
	1981 *	1998 **	2000 ***	1981 *	1998 **	2000 ***
05 - 09	7.94	64.06	70.66	8.78	67.40	74.30
10 - 14	42.99	69.12	72.19	48.36	72.57	75.41
15 - 19	29.86	44.07	45.74	32.99	47.74	49.48
20 - 24	10.05	15.50	16.14	11.09	17.33	18.07

* The rates are derived by using the population figures given in Table 9 (pages 22,23) of 1981 District Census Report of Lahore. The substantially low participation rates, of children of 5-9 age group are probably due to the reluctance of parents getting their children admitted to schools at an early age of 5 and also not sending the female children at all to schools.

** The rates are derived by using the population figures given in Table 14 (pages 129, 131) of 1998 District Census Report of Lahore.

*** Estimated on the basis of average annual increase in participation rate during 1981-98.

¹ It is estimated that there were about 936,000 students of primary level in the year 2000. Among these 14.4% were enrolled in 512 Nos. Punjab Government/ex-MCL Schools, 0.2% (about 2000) in 4 Nos. Federal Agencies Schools, 2.4% (about 22,000) in 129 Nos. private registered schools and the remaining 83.0% in un-registered private institutions and/or elsewhere.

² The literacy is measured as the ratio, in percentage of literate population to corresponding population aged 10 and over. A person was treated as literate in 1998 Census if he could read a newspaper or a journal of same standard and could write a simple letter in any language.

³ Participation Rate is the percentage of population (age specific) attending educational institutions to corresponding total population of that age group.

TABLE 9.3
CHARACTERISTICS OF PRIMARY SCHOOLS, LAHORE URBAN

DESCRIPTION/ INDICATOR	GOVERNMENT SCHOOLS *			MCL SCHOOLS **		
	BOYS	GIRLS	TOTAL	BOYS	GIRLS	TOTAL
No. of Schools	223	186	409	44	59	103
No. of Students	46,625	74,792	121,417	4,575	9,606	14,181
No. of Teachers	1,256	2,670	3,926	156	271	427
Students/ School	209	402	297	104	163	138
Teachers/ School	5.6	14.4	9.6	3.5	4.6	4.1
Students/ Teacher	37	28	31	29	35	33
No. of Rooms	532	722	1,245	195	346	541
Rooms/ School	2.29	3.88	3.06	4.4	5.9	5.3
Total Area (Marla)	5,322	5,028	10,350	1,591	3,192	4,783
No. of Schools Responded for the Area	160	158	318	42	53	95
Area/ School (Marla)	33	32	33	38	60	50

* Based on latest data (1999-2000) available with EMIS, Lahore.

** Based on data (of April 2001) collected from Education Directorate, ex-MCL.

The analysis shows that the students-school ratio in case of government schools comes out to be 297 whereas in ex-MCL schools it is 138. Similarly, the students-teacher ratios in Government and ex-MCL schools are comparable but the teachers-school ratios widely differ as the number of teachers per school in ex-MCL primary schools is less than half as that in the government schools.

The study reveals that each primary school in ex-MCL area is serving a population of about 10,926. The condition of government primary schools is such that about 27% of the boys schools have no building, 24% have no water, 44% have no electricity and 31% have no latrine. Out of a total number of 223 boys schools only 18 have play ground and nearly all of them are devoid of canteen facility. Similar condition has been noticed for girls primary schools (Table 9.4).

TABLE 9.4
PHYSICAL AND BASIC FACILITIES IN
GOVERNMENT PRIMARY SCHOOLS (LAHORE URBAN)

FACILITY	BOYS SCHOOLS				GIRLS SCHOOLS			
	Yes	% age	No.	% age	Yes	% age	No.	% age
Building	163	73	60	27	158	85	28	15
Boundary wall	152	68	71	32	157	84	29	16
Water	169	76	54	24	135	73	51	27
Electricity	124	56	99	44	87	47	99	53
Latrine	153	69	70	31	134	72	52	28
Canteen	3	1	220	99	9	5	177	95
Mosque	63	28	160	72	4	2	182	98
Play ground	18	8	205	92	37	20	149	80

Source: EMIS, Lahore.

Among these, 27% of schools have no water, 53% have no electricity and 28% have no latrine. So far as the physical condition of the buildings is concerned, only 24% of the total structures have been

recorded as satisfactory, 38% as dangerous and the remaining 38% require minor or complete repair (Table 9.5).

TABLE 9.5
CONDITION OF BUILDINGS IN
GOVERNMENT PRIMARY SCHOOLS (LAHORE URBAN)

CONDITION	BOYS SCHOOLS		GIRLS SCHOOLS		ALL SCHOOLS	
	No.	% age	No.	% age	No.	% age
Satisfactory	64	29	33	18	97	24
Dangerous	91	41	65	35	156	38
Minor Repair	40	18	53	28	93	23
Complete Repair	28	12	35	19	63	15
Total:	223	100	186	100	409	100

Source: EMIS, Lahore.

9.1.4.2 Secondary Level Schooling

Records show that in the year 1999-2000, 190,445 children (92,558 boys and 97,887 girls) i.e. 49.7% were enrolled in 399 Nos. Punjab Government/ex-MCL Middle and High Schools in Lahore Urban (Tables 3 and 4, in Annex A to Chapter-9), 5.7% (about 22,000 children) in 17 Nos. Federal Agencies Schools and the remaining 44.6% (about 171,000) in 517 Nos. private registered schools.

The students-school ratio in government schools works out to be 468, whereas in ex-MCL schools it is 498. There were 4,635 teachers in 275 government middle and high schools teaching 128,638 students, representing teachers-school ratio as 17 and students-teacher ratio as 28. Similarly, there are 1,546 teachers in 124 ex-MCL middle and high schools teaching 61,807 students, indicating teachers-school ratio as 12 and students-teacher ratio as 40. Sex-wise ratios for government and ex-MCL schools have also been determined and exhibited in Table 9.6.

TABLE 9.6
CHARACTERISTICS OF SECONDARY SCHOOLS, LAHORE URBAN

DESCRIPTION/ INDICATOR	GOVERNMENT SCHOOLS			EX-MCL SCHOOLS **		
	BOYS	GIRLS	TOTAL	BOYS	GIRLS	TOTAL
No. of Schools	118	157	275	59	65	124
No. of Students	64,003	64,635	128,638	28,555	33,252	61,807
No. of Teachers	2,245	2,390	4,635	755	791	1,546
Students/ School	542	412	468	484	512	498
Teachers/ School	19.0	15.2	16.9	12.8	12.2	12.5
Students/ Teacher	29	27	28	38	42	40
No. of Rooms	1,557	1,715	3,272	573	783	1,356
Rooms/ School	13.19	1,092	11.89	9.7	12.0	10.9
Total Area (Marla)	25,223	24,533	49,756	5,307	4,399	9,706
No. of Schools Responded for the Area	99	136	235	57	61	118
Area/ School (Marla)	255	180	212	93	72	82

* Based on latest data (1999-2000) available with EMIS, Lahore.

** Based on data (of April 2001) collected from Education Directorate, ex-MCL.

The study demonstrates that each school (both Government and ex-MCL) in ex-MCL area is serving a population of about 14,381.

The condition of the government middle and high schools, in terms of basic facilities, is relatively better than the primary schools. About 18% of the boys schools have no building, 15% have no water, 20% have no electricity and 15% have no latrine. Out of a total number of 118 boys schools 31% have play ground and 70% have library. A review of Table 9.7 indicates that only 10% of the girls schools have no building, 7% have no water, 16% have no electricity, 8% have no latrine, 74% have no play ground and 56% have no library. So far as the physical condition of the school buildings is concerned, only 22% of the total structures have been found satisfactory, 24% as dangerous and remaining 54% require minor or complete repair (Table 9.8).

TABLE 9.7
PHYSICAL AND BASIC FACILITIES IN
GOVERNMENT SECONDARY SCHOOLS (LAHORE URBAN)

FACILITY	BOYS SCHOOLS				GIRLS SCHOOLS			
	Yes	% age	No.	% age	Yes	% age	No.	% age
Building	97	82	21	18	142	90	15	10
Boundary Wall	90	76	28	24	138	88	19	12
Main Gate	94	80	24	20	138	88	19	12
Water	103	87	15	13	146	93	11	7
Electricity	94	80	24	20	132	84	25	16
Latrine	100	85	18	15	144	92	13	8
Canteen	22	19	96	81	25	16	132	84
Mosque	15	13	103	87	4	3	153	97
Play Ground	36	31	82	69	41	26	116	74
Library	83	70	35	30	69	44	88	56
Laboratory *	46*	53	41*	47	55*	55	45*	45

* Middle schools excluded.

Source: EMIS, Lahore.

TABLE 9.8
CONDITIONS OF BUILDINGS IN
GOVERNMENT SECONDARY SCHOOLS (LAHORE URBAN)

CONDITION	BOYS SCHOOLS		GIRLS SCHOOLS		ALL SCHOOLS	
	No.	% age	No.	% age	No.	% age
Satisfactory	20	17	40	25	60	22
Dangerous	31	26	34	22	65	24
Minor Repair	50	42	49	31	99	36
Complete Repair	17	15	34	22	51	18
Total	118	100	157	100	275	100

Source: EMIS & ex-MCL

9.1.5 Higher Secondary/ College Education

According to Population Census 1998, there were 716,356 persons (368,745 male and 347,611 female) in the age group 15-19 in Lahore District. Sex-wise education level, in terms of literacy ratio and

participation rate for Lahore Urban and Lahore District is shown in Table 9.9.

TABLE 9.9
EDUCATION LEVEL (15-19 YEAR GROUP) LAHORE

SEX	AREA	LITERACY RATIO (%)		PARTICIPATION RATE (%)	
		1981	1998	1981	1998
Male	Urban	65.08	77.69	35.27	47.47
	District	61.22	75.02	32.55	44.66
Female	Urban	64.00	79.36	30.39	48.02
	District	56.95	73.87	26.75	43.45
Both Sexes	Urban	64.57	78.50	32.99	47.74
	District	59.24	74.46	29.86	44.06

Source: District Census Reports of Lahore, 1981 and 1998.

It may be noted from the above table that the education level has considerably improved over the last 17 years. The literacy ratio which was about 59% in 1981, in Lahore District, has gone up to about 74%. Similarly the literacy ratio among college going age group, in Lahore Urban, has increased from about 65% in 1981 to about 79% in 1998. So far as the participation of 15-19 year age group in the education attainment is concerned, the level has also upgraded. In 1981, the participation rate in Lahore District was about 30% which in 1998 has become 44%. It is a matter of interest to observe that the education participation rate of female population of 15-19 year age group, is distinctly faster than the male population of that group and it is true both for Lahore Urban and Lahore District.

There were 36 higher secondary schools and inter colleges (14 for boys and 22 for girls) in Lahore District in 1998-99 with total enrolment of 7,154 (2,453 boys and 4,701 girls); and teaching staff was 642 (287 in male schools and 355 in female schools).

Similarly, there were 38 (Arts and Science) Degree Colleges in the District in which 77,393 students were enrolled. Based on the figures given in Table 9.10 the students inter college ratio comes out to 199, whereas the students-degree college ratio amounts to 2,037. The higher secondary school and colleges relationship with the population served is shown in Table 9.11. Educational Institutions are shown in Figure 9.1.

TABLE 9.10
HIGHER SECONDARY/ INTERMEDIATE AND DEGREE COLLEGES
LAHORE DISTRICT 1998-99

LEVEL	NUMBER OF COLLEGES			ENROLMENT IN COLLEGES			TEACHING STAFF IN COLLEGES		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Higher Secondary Schools and Intermediate Colleges	14	22	36	2,553	4,701	7,154	287	355	642
Degree Colleges	15	23	38	31,213	46,180	77,393	1,387	1,788	3,175
Both	29	45	74	33,776	50,881	84,547	1,674	2,143	3,817

Source: Punjab Development Statistics, 2000

**TABLE 9.11
POPULATION-INSTITUTION RELATIONSHIP**

TYPE OF INSTITUTIONS	NUMBER OF INSTITUTIONS	POPULATION SERVED PER INSTITUTION
- Higher Secondary Schools and Intermediate Colleges	36	182,990
- Degree Colleges	38	173,359
- All Institutions	74	89,022

Note: The estimated population in 1998-99 of Lahore District was 6,587,627.

9.1.6 Education Facilities in Sheikhpura District (LMA Urban)

The urban settlements other than those lying in Lahore District (which include the Town Committees of Ferozewala, Kot Abdul Malik and Sharaqpur of Tehsil Ferozewala, District Sheikhpura) have 6 primary and mosque schools with 697 students (295 boys and 402 girls) 3 middle schools with an enrolment of 2,016 (1,285 boys and 731 girls) and 2 high schools with 2,568 students (1,299 boys and 1,269 girls) as shown in Table 9.12. There are 14 teachers in primary and mosque schools, 34 in middle schools and 65 in high schools. There is no higher secondary school or college existing in these urban centres. The catchment population of each primary school is 27,598, middle school is 55,195 and high school is 82,793. The other important indicators of the education institutions are given in Table 9.13.

9.1.7 Education Facilities in Rural LMA

In Rural LMA, there are 40 mosque schools, 687 primary schools, 87 middle schools, 56 secondary schools and only 2 higher secondary schools. Majority of these schools lie in the rural areas of Lahore District (which include the rural areas of entire Lahore District even these falling beyond the LMA) which are detailed in Table 9.14. The total enrolment in primary and mosque schools is 99,630 (61 % male and 39% female); in middle schools 22,477 (63% male and 37% female); and in secondary schools 11,180 (65% male and 35% female). From these figures, it is clear that the proportion of female students is decreasing with the rise in the education level. The ratio of schools with the population served shows that for every 2,447 persons there is one primary (or mosque) school; for every 20,392 persons there is one middle school, and for every 31,681 persons there is one secondary school. The other important indicators are calculated and presented in Table 9.15.

**TABLE 9.13
INDICATORS OF EDUCATIONAL INSTITUTIONS
IN SHEIKHUPURA DISTRICT (LMA URBAN)**

INDICATOR	PRIMARY SCHOOLS	MIDDLE SCHOOLS	SECONDARY SCHOOLS
Students per school	116	672	1,284
Students per teacher	54	59	40
Teachers per school	2.3	11.3	32.5

TABLE 9.12
EDUCATIONAL INSTITUTIONS: TEHSIL FEROWZEWALA (LMA URBAN)

Town Committee	Gender	Primary Schools			Middle Schools			Secondary Schools		
		No.	Students	Teachers	No.	Students	Teachers	No.	Students	Teachers
Ferozewala	Male	2 ⁴	222	2	-	-	-	-	-	-
	Female	2	123	4	1	731	12	-	-	-
	Both	4	345	6	1	731	12	-	-	-
Kot Abdul Malik	Male	1	73	1	1	544	14	-	-	-
	Female	-	-	-	-	-	-	-	1269	22
	Both	1	73	1	1	544	14	1	1269	22
Sharaqpur	Male	-	-	-	1	741	18	1	1299	43
	Female	1	279	7	-	-	-	-	-	-
	Both	1	279	7	1	741	18	1	1299	43
All	Male	3	295	3	2	1285	32	1	1299	43
	Female	3	402	11	1	731	12	1	1269	22
	Both	6	697	14	3	2016	34	2	2568	65

TABLE 9.14
EDUCATIONAL INSTITUTIONS IN RURAL LMA

District	Gender	Mosque Schools			Primary Schools			Middle Schools			Secondary Schools			Higher Secondary School		
		No.	Students	Teachers	No.	Students	Teachers	No.	Students	Teachers	No.	Students	Teachers	No.	Students	Teachers
Lahore	Male	32	1,203	24	266	49,050	1,247	29	10,321	422	32	3,812	80	-	-	-
	Female	-	-	-	259	34,602	883	29	5,406	228	12	1,687	49	1	143	16
	Both	32	1,203	24	525	83,652	2,130	58	15,727	650	44	5,499	129	1	143	16
Sheikhupura	Male	8	555	9	81	7,788	208	8	1,996	67	5	2,087	83	-	-	-
	Female	-	-	-	51	3,299	120	11	1,913	103	3	1,802	55	1	2,097	52
	Both	8	555	9	132	11,087	328	19	3,909	170	8	3,889	138	1	2,097	52
Kasur	Male	-	-	-	12	1,756	40	5	1,811	41	3	1,423	36	-	-	-
	Female	-	-	-	16	1,377	31	5	1,030	22	1	369	11	-	-	-
	Both	-	-	-	28	3,133	71	10	2,841	63	4	1,792	47	-	-	-
LMA Rural	Male	40	1,758	33	359	58,594	1,495	42	14,128	530	40	7,322	199	-	-	-
	Female	-	-	-	326	39,278	1,034	45	8,349	353	16	3,858	115	2	2,240	68
	Both	40	1,758	33	685	97,872	2,529	87	22,477	883	56	11,180	314	2	2,240	68

Source: EMIS, Lahore October 2001

⁴ Includes one mosque school.

Source: EMIS, Lahore

TABLE 9.15
CHARACTERISTICS OF EDUCATIONAL INSTITUTIONS IN RURAL LMA

DISTRICT	INDICATOR	LEVEL / GENDER					
		PRIMARY		MIDDLE		SECONDARY	
		Male	Female	Male	Female	Male	Female
Lahore	Students/School	169	134	356	186	119	141
	Students/Teacher	40	39	24	24	48	34
	Teachers/School	4.3	3.4	14.6	7.9	2.5	4.1
Sheikhupura	Students/School	94	65	250	174	417	601
	Students/Teacher	38	27	30	19	25	33
	Teachers/School	2.4	2.4	8.4	9.4	16.6	18.3
Kasur	Students/School	146	86	362	206	474	369
	Students/Teacher	44	44	44	47	40	34
	Teachers/School	3.3	1.9	8.2	4.4	12.0	11.0
LMA Rural	Students/School	151	120	336	186	183	241
	Students/Teacher	40	38	27	24	37	34
	Teachers/School	3.8	3.2	12.6	7.8	5.0	7.2

Source: EMIS, Lahore - October 2001

This may be noted from Table 9.14 that the average number of students in secondary schools, in case of Sheikhupura and Kasur Districts, is considerably higher than Lahore District, but in primary schools the average number of students in Lahore District is relatively more.

9.1.8 Professional Education

Lahore has always been characterised as a centre of academic excellence in recognition of its special facilities for higher academic and professional education, which serve a very large region.

Lahore has Pakistan's oldest and largest university, the Punjab University. It formally came into existence in 1882. In addition, there is an Engineering University, 3 Medical Colleges, College of Dentistry, College of Veterinary Sciences, National College of Arts, 13 Commerce Colleges, 9 Law Colleges, 3 Colleges of Education and 2 Colleges of Physical Education, and a Home Economics College for Women. There are two Post Graduate Medical Institutes, an Institute of Public Health and a School of Physiotherapy, Mayo Hospital. A number of other institutions, (government and private) offering degree/diploma courses in Information Technology, business, accounting etc. in affiliation with local and foreign universities have also been established. The number, enrolment and teaching staff (by sex and type of institution) is exhibited in Table 9.16.

9.1.8.1 University Education

About 8,206 students are enrolled in Punjab University in various fields of Arts and Sciences. About 5,439 students are enrolled in University of Engineering and Technology (UET) and a total of about 3,878 students are studying in the three medical colleges in the city. The pass out rate of these institutions is around 90%. There is higher male participation rate in

the Punjab University, UET, Law and Commerce Colleges, whereas female participation rate is higher in case of Medical Colleges and Colleges of Education.

TABLE 9.16
UNIVERSITIES/ PROFESSIONAL EDUCATION INSTITUTIONS LAHORE 2000

NAME/ TYPE OF INSTITUTION	NUMBER			ENROLMENT			TEACHING STAFF		
	Boys	Girls	Total	Boys	Girls	Total	Male	Female	Total
- Punjab University	1	-	1	4,415	3,791	8,206	326	85	411
- Engineering University	1	-	1	4,875	564	5,439	265	5	270
- Medical Colleges	2	1	3	1,400	2,478	3,878	382	242	624
- College of Dentistry	1	-	1	141	245	386	18	12	30
- Institute of Public Health	1	-	1	49	13	62	24	17	41
- Post Graduate Medical Institutions	2	-	2	191	50	241	146	48	194
- School of Physio-therapy	1	-	1	62	48	110	23	9	32
- College of Veterinary Sciences	1	-	1	560	49	609	57	1	58
- Commerce Colleges	12	1	13	10,923	1,954	12,877	251	33	284
- Colleges of Education	2	1	3	599	946	1,545	67	80	147
- Colleges of Physical Education	1	1	2	224	309	533	17	13	30
- Home Economics College	-	1	1	-	1,416	1,416	-	89	89
- Law Colleges	9	-	9	4,887	826	5,713	253	20	273
- Information Technology/ Computer Colleges	12	-	12	4,358	382	4,740	213	29	341
- Lahore University of Management Sciences (LUMS)	1	-	1	538	187	725	34	7	41

Source: Punjab Bureau of Statistics.

The university education is characterized by low quality, indiscipline, campus closures, budget deficits, faulty examination system, absence of effective accountability system and insignificant output of quality research. There is little emphasis on application aspects. At present, the general educational system of Pakistan is producing graduates without functional and marketable skills which is resulting in accumulation of a large number of unemployable youths.

The universities have serious administrative, financial and disciplinary problems which arise due to the duality of control, i.e., administrative control by the provincial governments and financial control by the federal government, highly subsidized user charges (university fees constitute only 1% of the recurring expenditure), and politicised campuses.

9.1.8.2 Medical/ Health Related Education

As mentioned earlier, there are three Medical Colleges in Lahore one is meant purely for girls (i.e. Fatima Jinnah Medical College). The total enrolment in Medical Colleges is 3,878, about 64% of which are girls. The enrolment in other health education institutions is 1,408, out of which 1,003 (71%) are boys and 405 (29%) are girls. Like Medical

Colleges, the College of Dentistry is also dominantly enrolled by girls (63%).

The Nursing Schools attached with various hospitals in Lahore along with their sanctioned seats are given in Table 9.17.

TABLE 9.17
HOSPITALS WITH NURSING SCHOOLS
AND NUMBER OF SEATS

SR. NO.	NAME OF INSTITUTION	GENERAL NURSING	NURSE MIDWIFE
1.	Mayo Hospital Lahore	250	-
2.	Services Hospital Lahore	110	28
3.	Sir Ganga Ram Hospital Lahore	158	20
4.	General Hospital Lahore	121	92
5.	Children Hospital Lahore	300	-
6.	Lady Willingdon Hospital Lahore	-	92
7.	Lady Aitchison Hospital Lahore	-	73
Total		669	305

Source: Directorate General of Nursing, Punjab

Annually two batches of nurses pass out from these institutions. The average pass percentage is around 75. Examinations are held under the Nursing Examination Board, Punjab. Out of 1948 admissions almost 1461 nurses pass out every year from various Nursing Schools of Lahore but the deficiency still prevails.

9.1.8.3 Information Technology/ Computer Sciences

The Punjab Bureau of Statistics compiled data only for 12 computer colleges which are affiliated with Lahore Board of Intermediate and Secondary Education and Punjab University. The enrolment in these computer colleges is 4,740, the majority (92%) of which is of boys.

As a matter of fact, thousands of students, after secondary school examination, take admission in the basic (short) computer courses, such as DOS, MS Word, MS Excel, Power Point etc. They also prefer doing Intermediate in Computer Science (ICS) from various colleges, after matriculation.

Almost all government colleges offer short courses and diploma programmes in Information Technology. Even the two universities (Punjab and Engineering) have started short term and long term programmes in Information Technology. The Punjab University has recently opened "University College of Information Technology" at Quaide-Azam Campus (New Campus); which at present is offering BCS (Bachelor in Computer Science) Degree programme in addition to other short courses.

Several private (small and large) computer colleges/ institutions have been established in Lahore. Some of these, offer even the MCS (Master in Computer Science) and MIT (Master in Information Technology)

degree programmes in affiliation with the foreign universities. The colleges/ institutions which have affiliation with local and foreign universities are concentrated in Gulberg, New Garden Town, Model Town and Allama Iqbal Town, particularly along the main transportation corridors. They offer certification in software and hardware engineering in addition to BCS and MCS Degree programmes.

9.1.9 Technical, Commercial and Vocational Training

The technical, vocational and commercial training institutes/ colleges are functioning under the administrative control of Provincial Education Department, National Training Bureau, Provincial Labour Department, and semi-autonomous and private organizations. These institutes/ colleges provide pre-service and in-service training in a variety of trades. However, institutionalized, vocational training facilities are limited and the lower and middle income groups usually acquire technical skills through on-the-job training. At present there are 3 Polytechnic Institutes, 13 Commercial Training Institutes, 20 Vocational Training Institutes/ Apprenticeship Training Colleges in Lahore. The number, enrolment and teaching staff (by sex) for each type of institute/college is given in Table 9.18.

TABLE 9.18
TECHNICAL INSTITUTES/ ELEMENTARY TEACHERS
TRAINING COLLEGES, DISTRICT LAHORE: 1999-2000

TYPE OF INSTITUTE/ COLLEGE	INSTITUTES/ COLLEGES			ENROLMENT			TEACHING STAFF		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Colleges of Technology/ Polytechnic Institutes	2	1	3	2,023	569	2,592	302	42	344
Commercial Training Institutes/	13	-	13	2,457	-	2,457	218	-	218
Vocational Institutes	-	20	20	-	1,186	1,186	-	198	198
Technical Training Institutes/	8	2	10	3,197	417	3,614	695	89	784
Apprenticeship Centres Elementary Teachers Training Colleges	2	2	4	245	520	765	38	38	76

Source: Punjab Development Statistics, 2000.

Table 9.18 shows that all the 20 Vocational Training Institutes are meant for women. The total enrolment in these vocational institutes is 1,186 representing one institute for every 59 women. Vocational Training Institutes offer a variety of courses, ranging in duration between 3 months and one year, for persons holding middle and secondary school certificate. In addition to vocational institutes there are 64 ex-MCL Industrial Homes for Women in Lahore.

About 2,457 trainees are enrolled in 13 commercial institutes, indicating 189 trainees per institute. These institutes are meant for male segment only. The total enrolment in 3 polytechnic institutes, 10 technical training

institutes and 4 elementary teachers training colleges is 6,971. The proportion of female trainees in these institutes/ colleges is about 22%.

9.1.9.1 Enrolment in Professional, Vocational Institutions and Universities

According to 1998 Population Census, 97,018 persons (i.e. 15.50% of the total population in the age group 20-24) were attending various educational institutions in Lahore District; out of which 13,800 persons (i.e. 14.22%) were in the professional, commercial vocational and related fields, while the remaining (85.78%) were acquiring general education. Apart from the age group 20-24 active participation in acquiring the technical and commercial education and training, is discernible from persons lying in the age group 15-19. In 1998, as many as 8,359 persons of age group 15-19 were recorded to be enrolled in such institutions. Keeping in view the total enrolment (57,094) in professional and vocational institutions and universities) this may be inferred that about 40% of the total enrolment belongs to Lahore District.

9.1.10 Participation of Private Sector in Education

Although a number of policies have been framed in the country to overcome the current deficiencies, the education sector still ranks very low in order of priorities. These policies could not be implemented due to a number of reasons such as limited resources, untrained personnel, unrealistic goals, poor planning, resistance to change, discontinuity of implementation, lack of proper monitoring and evaluation, high drop-out and wastage rates, lack of motivation in students and teachers, rural-urban, female-male and regional disparities and a number of other inhibiting factors.

The present Education Policy aims at raising the quality of education and has been prepared keeping in view the National Education Policy (1997-2002), Eighth Five Year Plan (1993-98) and Social Action Programme-II (1997-2002). The Education Policy envisages increase in the rate of literacy, enrolment, decrease in drop-out rate, enhancement in community participation, improvement in quality of education, elimination of mal-practices from the system and invigorating co-curricular activities/sports, by providing basic physical and social infrastructure to the educational institutions and the Department. The Education Policy also recommends that an enactment shall be made regarding the private educational institutions giving them congenial environment for their development but arresting the mushroom growth of sub-standard private educational institutions.

In order to broaden the resource base for financing and for sharing the development processes in the education sector, private sector's participation is required to be strengthened. It was against this backdrop that the Government of Punjab decided to establish Punjab Education Foundation (PEF) in 1991 as an autonomous statutory body. The main consideration was to encourage and promote educational institutions in

the private sector operating on non-commercial basis. The three basic objectives of PEF are:

- i) Promotion
- ii) Development and
- iii) Financing of Education

To pursue these objectives, the PEF extends help in the establishment of educational institutions by giving loans and grants to non profit making NGO's to construct buildings and to purchase equipment and function on the cost sharing basis. By end of financial year 2001, the PEF had sanctioned 331 cases in Punjab including 44 (37 urban 7 rural) for Lahore District. Out of total funds (Rs. 41.40 million) provided for institutions of Lahore District, about 57% were in the shape of grants and the remaining 43% as loan released against collaterals. The proportional number of beneficiary students comes to around 15,000.

9.1.11 Critical Issues

- The provision of new primary and secondary schools by the Government does not keep pace with the continuously increasing demand of elementary education.
- The condition of the existing Government Educational infrastructure has deteriorated and dilapidated in the absence of proper maintenance. A large number of schools lack essential facilities.
- The standard of education is not satisfactory. The curricula lack relevance, and methodologies of instruction and testing are outdated.
- There are gender imbalances both in the availability and quality of educational facilities.
- The dropout and failure rates, particularly at the primary and terminal levels, are recorded to be high.
- Participation of the private sector is unregulated and much below the required level/standard.
- University campuses are politicised and devoid of an environment conducive to research. The universities are faced with serious administrative problems, large budget deficits, out-moded curricula, and lack of focus on research (specially applied research).
- The user charges at higher education level are insignificant thus resulting in large budget deficits.

9.2 HEALTH

9.2.1 Introduction

In spite of steady improvements in the health sector over the years, the position is not yet satisfactory. The health status of the nation is characterised by a high rate of population growth coupled with higher infant and under-5 mortality rates of 91 and 120 per thousand live births respectively (1998). Similarly crude death rate of 8 per thousand is also on the higher side though the life expectancy over the past 7 years has increased from 57.7 to 62.⁵

Drug abuse has emerged as a public health problem. Communicable, infectious and parasitic diseases remain a severe burden although a measure of success in controlling these diseases has been achieved especially under the Expanded Programme of Immunization. As reported in 1998 census in Lahore District, nearly 1.29 million children (i.e. 78.1 percent of the total children under 10 years) were immunized against six killer diseases i.e. polio, measles, whooping cough, tetanus, diphtheria and tuberculosis. Health problems are most severe for young children and their mothers. The most pressing need is therefore the improvement of the maternal and child health care system.

9.2.2 Major Diseases Common in Lahore and Number of Patients

The primary sources of data collected on prevalent diseases are the O.P.Ds of hospitals, dispensaries, Maternity and Child Health (MCH) Centres and T.B. Clinics. The Priority Diseases Report collected from the Health Management Information System (HMIS), Monitoring and Evaluation Cell (MEC) Directorate General Health Services, Punjab (DGHS) for First Level Care Facilities gives an indication of the health status of the people and the prevalence of priority diseases in District Lahore. However, details regarding specific diseases like cancer, diabetes, hypertension, sexually transmitted diseases (STD) etc. are not available as the information has not been separately compiled by the HMIS. Directorate General of Health Services is now working on a more detailed package wherein all types of diseases will be listed/recorded. Table 9.19 shows the Priority Diseases Report prepared by HMIS for the period January to April 2001.

A review of Table 9.19 indicates that the total new cases of priority diseases reported in the first quarter of year 2001, are 80,042, among which 21,599 cases (27%) relate to children under 5 years of age. Seven of the 18 priority diseases i.e. diarrhoea, dysentery, respiratory infections, malaria, cough, dog bite and scabies account for 39% of the total new cases (204,044), during the first three months of the year 2001.

⁵ Government of Pakistan, "Economic Survey 1999-2000".

TABLE 9.19
PRIORITY DISEASES IN LAHORE DISTRICT
(JANUARY 01 - APRIL 01, 2001)

HEALTH PROBLEMS (Priority Diseases)	CASES UNDER 5				CASES 5 & OVER	TOTAL	
	UNDER 1	1 to 4	TOTAL	% of Total NC<5		CASES	% OF TOTAL NC
		NC:	39,395			NC:	204,044
1. Diarrhoea	2,177	3,749	5,926	15.0%	6,111	12,037	5.9%
2. Dysentery	254	651	905	2.3%	1,782	2,687	1.3%
3. Acute Respiratory Infections	3,399	9,217	12,616	32.0%	41,639	54,255	26.6%
4. Fever (Clinical Malaria)	179	556	735	1.9%	3,766	4,501	2.2%
5. Cough more than 2 Weeks	0	4	4	0.0%	522	526	0.3%
6. Dog bite	100	22	122	0.3%	218	340	0.2%
7. Scabies	384	907	1,291	3.3%	4,405	5,696	2.8%
Total New Cases Priority Diseases	6,493	15,106	21,599	54.8%	58,443	80,042	39.2%
Total New Cases (All Diseases)	12,782	26,613	39,395		164,649	204,044	

NC = New Cases

Source: Health Management Information System

The information collected from HMIS shows that the total new cases reported in the year 2000 in Lahore District were 671,294; among which 407,302 (61%) cases were related to females and 264,816 (39%) cases with males. The proportion of new cases under 5 years formed 20% of the total reported cases in the year 2000.

9.2.3 Existing Health Facilities in Lahore

9.2.3.1 Hospitals

Out of 40 major hospitals listed with the DGHS, 23 are under the administrative control of the Provincial Government. The rest are run by the Rangers, ex-MCL, WAPDA, Railways, Auqaf, Trusts and NGOs. Table 9.20 presents the details of these hospitals with respect to status, number of doctors and beds available in each one of these. Complete list of the hospitals is given in Annex-B to Chapter-9.

TABLE 9.20
NO. OF HOSPITALS, BEDS, DOCTORS IN LAHORE
(LISTED WITH DIRECTOR GENERAL OF HEALTH SERVICES)

STATUS	HOSPITALS	BEDS	DOCTORS/SPECIALISTS
Punjab Government Hospitals	23	9,235	2,449
Federal Government, Autonomous, Semi Autonomous, Local Bodies, Army Hospitals	7	1,903	571
Trusts, NGOs, Waqf and Other Hospitals listed with DGHS	10	1,133	299
Total	40	12,271	3,319

Source: Directorate General Health Services (DGHS), Lahore.

The number of hospital beds per thousand persons (for ex-MCL and Cantonment ⁶) works out to about 2.2 against 2.3 in 1981 (LUDTS) and 3 in 1966 (MPL). That means the provision of hospital beds is not keeping pace with the increase in urban population. The situation looks more depressing, if the catchment area is considered to be extended over to Lahore District. In that case the number of hospital beds per thousand persons comes down to 1.7; whereas the long-term national goal ⁷ is 5 hospital beds per thousand persons. As per analysis, the population-doctor ratio comes out to 1,718 persons per doctor for ex-MCL and Cantonment area and 2,122 persons per doctor for Lahore District. For Punjab, this ratio is 6,001 persons per doctor.⁸

In Lahore there are only 67 dental surgeons working in 18 government hospitals; 45 of them working in the Teaching Hospital alone attached with Demont Morency Dental College near Baadshahi Mosque. A large proportion of Lahore's population is thus dependent on the private dental clinics. Based on facilities available in Government Hospitals there is one dentist for every 75,260 persons living in ex-MCL area.

After the construction of Punjab Institute of Cardiology on Jail Road in mid-eighties two more specialist hospitals - Shaukat Khanum Memorial Hospital and Cancer Research Institute and Children's Hospital and Institute of Child Health have recently been commissioned in Lahore. Another very old specialist hospital in Lahore is the Mental Hospital, covering in terms of catchment area of a population of more than 58.47 million.⁷

There are eight teaching hospitals in Lahore - Lady Willingdon Hospital, General Hospital, Mayo Hospital, Services Hospital, Sir Ganga Ram Hospital, Lady Aitchison Hospital, Dental Hospital and Jinnah Hospital. Combined Military Hospital located in the Cantonment area is mainly meant for defence personnel. Recently a new medical college has been established in Lahore - The Punjab Medical College affiliated with Surgimed Hospital which is a private sector hospital.

According to the information provided by Director General Nursing Punjab (DGNP), at present there are 2,522 staff nurses in Lahore District, representing one nurse for 2,792 persons. Pakistan Nursing Council Rules for Lahore District has suggested:

- i) 3 Charge Nurses or 10 general beds for 24 hours
- ii) 3 Charge Nurses for one special bed for 24 hours.

⁶ The mid-year population, 2001 of ex-MCL and Cantonment is estimated as 5,701,581, and that of Lahore District as 7,041,839.

⁷ Ministry of Housing and Works, Government of Pakistan, "National Reference Manual on Planning and Infrastructure Standards, 1984.

⁸ HMIS, Office of the Director General Health Services, June 2001.

Based on these recommendations, the total number of nurses required for the existing bed strength is 6,648; indicating a shortage of 4,126 Charge Nurses.

Since late 1970's and 1980's there is a trend of growth in the number of health institutions in private sector. There are about 85 private hospitals in Lahore which have 714 doctors. These hospitals are mostly located in the posh localities of Lahore and serve the higher income groups. These hospitals are basically business enterprises run on commercial basis. The costs of private health services are beyond the means of the poor, who must use public hospitals irrespective of the distance involved. Figure 9.2 shows the location of major public and private sector hospitals in Lahore.

The total number of doctors both in public and private sectors is 4,033 indicating a current ratio of 1414 persons per doctor for ex-MCL and Cantonment area. In 1999, about 4.882 million patients had been treated in 42 hospitals of Lahore District; among which 3.568 million (i.e. 73%) patients were treated in 27 Government and allied departments hospitals, 0.09 million (2%) in 2 local bodies hospitals and 1.225 million (25%) in 13 private hospitals (aided by the Government).⁹

The total number of hospital beds both in public and private hospitals is 14,307 representing a current ratio of 2.5 beds per thousand persons for ex-MCL and Cantonment area, and 2 beds per thousand persons for Lahore District. The hospital beds-doctor ratio comes out to 3.5 beds per doctor, whereas for Punjab it is 9 beds per doctor.¹⁰

9.2.3.2 Dispensaries, Maternity and Child Health (MCH) Centres

As per Punjab Development Statistics 2000, there are 153 dispensaries with 68 beds, and 117 MCH Centres in Lahore District. That means one dispensary, on the average, serves 41,299 persons¹¹; whereas one MCH Centre serves about 12,685 women of reproductive age group (15-49)¹⁰. Included in MCH Centres are, 55 ex-MCL Centres for Reproductive Health, each headed by a Lady Health Visitor (LHV). Among 153 dispensaries; 50 were under ex-MCL control. Except 11 (Homoeo related), all ex-MCL dispensaries are headed by a doctor having a dispenser as an assistant. The dispensaries and MCH Centres (Centres of Reproductive Health) in ex-MCL area seem to be overburdened as each dispensary has to serve about 20,017 women of reproductive age group.⁷

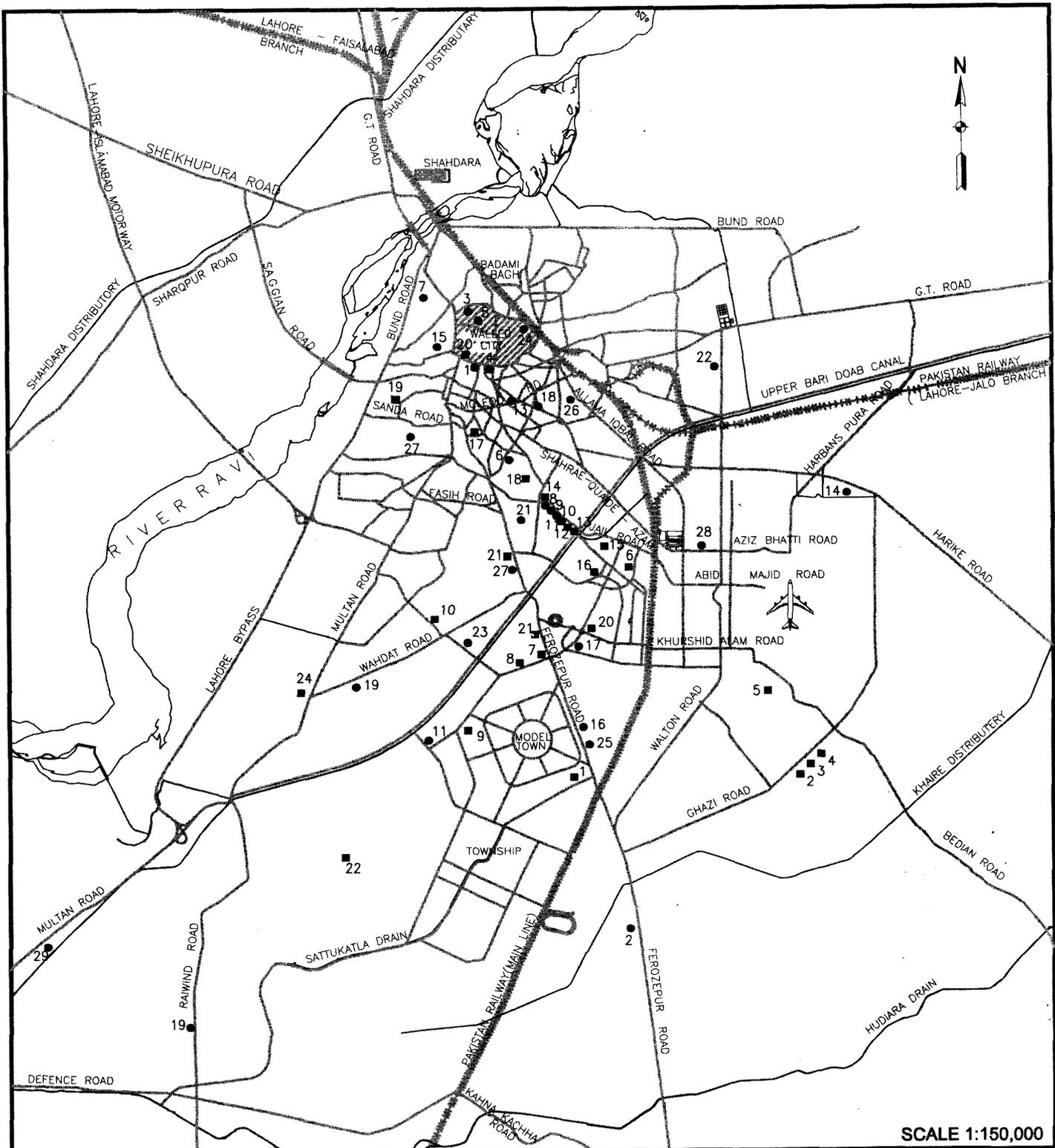
9.2.4 Health Facilities in Sheikhpura District (LMA Urban)

In Sharaqpur Town, there is one Rural Health Centre with 20 beds, a civil dispensary and a MCH Centre.

⁹ Punjab Development Statistics, 2000

¹⁰ HMIS, DGHS, Lahore, 2001.

¹¹ As the record of health institutions, given in Punjab Development Statistics, are for the year 1998, hence the calculation for the ratios is based on 1998 population.



MAJOR GOVT. HOSPITAL

1. Mayo Hospital
2. General Hospital
3. Lady Willingdon Hospital
4. Lady Aitchison Hospital
5. Dental Hospital
6. Sir Ganga Ram Hospital
7. Mian M. Munshi Hospital
8. Services Hospital
9. Punjab Institute of Cardiology
10. Mental Hospital
11. Jinnah Hospital
12. Kot Khawaja Saeed Hospital
13. Police Hospital, Qila Gujjar Sing
14. Satluj Ranger Hospital
15. I.D. Hospital
16. Gulab Devi Hospital
17. United Christian Hospital
18. Janki Devi Hospital
19. Mumtaz Bakhtawar Hospital
20. Malik JalalUddin Waqaf Hospital
21. Fatima Memorial Hospital
22. Shalimar Hospital
23. Sheikh Zayed Hospital
24. Nawaz Sharif Hospital
25. Children's Hospital
26. Railways Hospital
27. Wapda Hospital
28. Combined Military Hospital
29. Health Centre NPF Multan Road

MAJOR PRIVATE HOSPITALS

1. Ittefaq Hospital Model Town
2. Rasheed Hospital Defence
3. Aadi Hospital Defence
4. National Hospital Defence
5. Ayesha Hospital Nishat Colony
6. Hijaz Hospital Gulberg
7. Masood Hospital Kalma Chowk
8. Zaniab Memorial Hospital, Kalma Chowk
9. Kalim Medical Complex Faisal Town
10. Farooq Hospital Allama Iqbal Town
11. Umar Hospital Jail Road
12. Cardex Clinic, Jail Road,
13. Rehman Clinic, Jail Road,
14. Race View Clinic, Jail Road,
15. Surgimed Hospital Zafar Ali Road
16. Akram Medical Complex Jail Road
17. Family Hospital Mozang
18. Ramzan Ali Syed Hospital Temple Road
19. Faran Hospital Islampura
20. Fazal Cardiac Centre Liberty Market
21. Hameed Lateef Hospital Ferozpur Road
22. Shaukat Khanum Memorial Hospital Johar Town

LEGEND:

- GOVT. HOSPITAL
- PRIVATE HOSPITAL

MAJOR GOVERNMENT & PRIVATE HOSPITALS IN LAHORE

Fig: 9.2

9.2.5 Health Facilities in Rural LMA

Records on health services reveal that at present there are 71 health institutions in the rural part of LMA. Among these, 46 are lying in the vicinity of Lahore District, 18 in Sheikhpura District and the remaining in Kasur District. Category-wise distribution of these institutions along with their beds strength is presented in Table 9.21.

**TABLE 9.21
HEALTH INSTITUTIONS IN RURAL LMA**

DISTRICT	TYPE OF HEALTH INSTITUTION											
	BHU		SHC		RHC		GRD		MCHC		TOTAL	
	No.	Beds	No.	Beds	No.	Beds	No.	Beds	No.	Beds	No.	Beds
Lahore	37	54	3	-	6	120	-	-	-	-	46	174
Sheikhpura	10	17	3	-	1	1	2	4	2	-	18	22
Kasur	7	14	-	-	-	-	-	-	-	-	7	14
LMA Rural	54	85	6	-	7	121	2	4	2	-	71	210

BHU = Basic Health Unit SHC = Sub-Health Centre RHC = Rural Health Centre
GRD = Government Rural Dispensary MCHC = Maternity and child Health Centre

The catchment population per institution and beds-persons relationship for each district is shown in Table 9.22

**TABLE 9.22
CATCHMENT POPULATION AND NUMBER OF BEDS IN RURAL LMA**

District	Catchment Population/Institution	Beds/ 100 Persons
Lahore	27,542	0.14
Sheikhpura	20,894	0.06
Kasur	18,728	0.11
LMA (Rural)	24,988	0.12

It is evident from Table 9.22 that the rural population of Kasur District is better served than Lahore and Sheikhpura Districts. In terms of number of beds, the conditions are relatively better in Lahore District whereas these are worse in Sheikhpura District.

9.2.6 Private Health Establishments & Role of Punjab Health Foundation

According to the Federal Bureau of Statistics, in 1992 there were about 1370 Allopathic Medical Practitioners, besides 442 Homoeopathic Doctors and 580 Hakeems running their own clinics in Lahore City. It is expected that the number must have substantially increased in the last nine years.

- Establishment of Punjab Health Foundation (PHF) in November 1992 was a significant initiative of Government to actively assist and promote the private sector in providing broader and grass root health cover. The idea of providing financial assistance in urban and rural areas to individual doctors and NGOs was vital step towards greater and satisfying employment opportunities for professional and much desired

guided withdrawal of public sector through effective participation and integration and consideration of health cover in the private sector. During the past four years (1997-2001) the PHF provided Rs. 7 million in loans to 14 health establishments in Lahore for purchase of equipment and Rs. 1.0 million to 10 young doctors to open private clinics. This is a very modest contribution from any standard. On the other hand the PHF was initially provided a sum of Rs. 376.78 million as seed capital and the funds available with them duly invested in saving schemes have grown to Rs. 571.78 million by June 2001.

9.2.7 Health Sector Problems

The problems being faced by the health sector include: inadequate primary health care, high rate of population growth, prevalence of communicable diseases, managerial deficiencies, inadequate funding, and manpower imbalances.

Environmental pollution in Lahore is the key factor responsible for the ill-health of the citizens. Provision of medical facilities in terms of hospitals and dispensaries is of secondary importance under the circumstances. Besides, there are other contributing factors like malnutrition, inadequate and poor quality water supply, and lack of inter-sectoral coordination.

The chemists and general stores sell medicines on demand and people generally prescribe medicines for themselves through personal experience or get a second opinion from a druggist. Doctors are consulted as a last resort, perhaps due to ignorance or poverty. Substandard medicines are freely available in the market. There is almost no quality control on the medicines being manufactured locally. Practice of medicine by quacks is rampant.

About 60% of the health sector budget is consumed on recurring expenditure like salaries with the result that health infrastructure / facilities could not be expanded. Doctors and paramedics do not get any training in management.

9.2.8 Critical Issues

- i. The public sector hospitals, which serve the majority of low and middle income segments of society, are not able to cope with the continuously increasing health needs of the growing population.
- ii. There is an acute shortage of hospital beds, nurses and para-medical staff in the hospitals.
- iii. Primary health care facilities (dispensaries, MCHS etc.) are quite inadequate.
- iv. There is only one dental hospital in Lahore and the people, (who cannot afford the fee of private dental surgeons), have to travel long distances to avail the dental related facility.

9.2.9 Improvement Programmes

The improvement programmes envisaged by the government in the health sector are:

- Physical infrastructure for primary health care would be consolidated by providing equipment and enhancement of staff skills.
- The health care system would be made effective by involving local councils and NGOs in the provision of primary health care (PHC) facilities. The long term objective would be 100% coverage i.e. at least one PHC facility for each ward/Mohalla.
- Health and Population Welfare Departments would make concerted efforts in the training of health personnel in family planning and delivery of family planning services.
- NGOs will be encouraged in assisting the public sector for specific activities. The NGOs would be funded through Health Foundation.
- The manufacture, import, sale and quality of drugs and medicines would be reviewed.
- Besides curative health programmes, improvement in preventive health is needed through primary health centres.
- The private sector will be facilitated to expand its services and develop mechanism for quality control.

9.3 RECREATIONAL FACILITIES

Lahore provides numerous recreational and amusement facilities not only to the local population, but also caters for the needs of the adjoining areas. The facilities include cinemas, theatres, parks and open spaces, sports facilities, museums, clubs and libraries, etc.

9.3.1 Sports

Organised sports activities at the schools or even university level are limited. However, professional sports like hockey and cricket are organised by the respective sports boards on international level. The main stadiums and various complexes meant for local and national sports events along with attached facilities are listed in Table 9.23.

In addition there exists Punjab Squash Complex for the promotion of Squash. There are several exclusive private clubs in Lahore such as Lahore Gymkhana Club/Golf Club, Cosmopolitan Club, Punjab Club, Services Club, Defence Club, Mayo Gardens Club, etc., which offer sports facilities of a wide range. However, these serve a very small/elite section of the society.

TABLE 9.23
MAIN STADIUMS AND SPORTS COMPLEXES

SR. NO.	SITE	MANAGED BY	APPROXIMATE AREA (KANAL)	SEATING CAPACITY	REMARKS
1.	Gaddafi Stadium	Pakistan Cricket Board	139	25,000	Exclusively reserved for cricket. In addition to players pavilion, physio-room, gymnasium, media room, press gallery, T.V. room, inter communication room, there are 8 to 12 hospitality boxes all comprising of 14 seats meant for special groups / sponsors.
2.	National Hockey Stadium	Directorate General of Sports, Punjab	119	50,000	Exclusively reserved for hockey. This is the biggest hockey stadium in the world.
3.	Punjab Foot Ball Stadium (under construction)	-do-	218	8,000	Apart from football grounds it will have 8 lane tartan athletic track. The seating capacity of 8,000 represents 1st phase only. However, this may be extended to 30,000 at later stages.
4.	Iqbal Park Sports Complex	-do-	600	See Remarks	No formal seating arrangement has been made for grounds. About 30,000 to 40,000 persons could usually come to witness the tournament. However Gymnasium (meant for badminton, volley ball, basket ball, Judo Karate, wrestling etc.) has seating capacity of approximately 5,000 persons 28 rooms hostel available for players stay.
5.	Squash Complex (adjacent to National Hockey Stadium)	-do-	10	1,200 for Championship Court 150 for International Court	Construction is incomplete. Work has been stopped. The complex will comprise of one championship court, one international court and 6 practice courts. The other facilities will include VIP room, players changing room Gymnasium, players lounge, cafeteria, shops, offices, hall of fame etc.
6.	Cycling Velodrom (adjacent Gaddafi Stadium)	National Sports Training and Coaching Centre	70	1,000	This was built in 1952.
7.	Gymnasium Hall	-do-	15	3,500	Incomplete. Construction work stopped due to change in design. This will be multipurpose hall having facilities of indoor games.

TABLE 9.23 (Continued)

8	Attique Stadium	Parks and Horticulture Authority	60	2,000	This stadium has been transferred to Parks & Horticulture Authority from MCL. It is meant for volley ball, cricket Kabaddi, wrestling, etc.
9.	Pakistan Railways Stadium	Pakistan Railways Sports Board	155	2,000	In addition to formal seating arrangement, about 3,000 persons could sit around to witness the tournaments/ matches. International and/or national level tournaments (of football, cricket, athletics, hockey, Kabaddi, basket ball etc.) are arranged.
10.	Railway Burt Institute	-do-	155	See Remarks	Meant for all games. A cricket pitch is constructed. Water accumulates in the ground in rainy season due to its low level. This is not a standard ground.
11.	Railway Griffin Institute (Mughalpura Institute)	-do-	194	See Remarks	No formal seating arrangement has been made. This is meant for all games including football, hockey, basketball, volley ball, athletics etc.
12.	Carson Ground (Allama Iqbal Institute)	-do-	75	750	Basically it is used for cricket. League matches are usually held in this ground.

9.3.2 Entertainment

9.3.2.1 Cinemas

Lahore at present has 42 cinema houses with a seating capacity of 28,411 i.e. about 5 seats per 1000 persons for Lahore urban and about 4 seats per 1000 persons for Lahore District. In 1981, the number of cinema houses was 55 with a seating capacity of 37,000 indicating about 12 seats per 1000 persons for Lahore Urban and 10 seats per 1000 persons for Lahore District. The seating capacity has decreased to less than half over the last 20 years due to the increase of population on one hand and replacement of as many as 13 good cinema houses by shopping plazas on the other. New cinema houses have not been constructed in view of recession in local film industry. The public trend to go to cinemas has reduced considerably due to invasion of VCR and the Satellite 'Dish'. The general upkeep and maintenance of the cinema houses is very poor. Cinemas are mostly located in the central parts of the city i.e. along Abbot Road and McLeod Road in close proximity to Lakshami Chowk. At the time of conclusion of film shows, traffic congestion gets severe particularly on Abbot Road.

9.3.2.2 Theatres

In the recent years theatre has emerged as a popular means of entertainment among the lower and middle income groups. This form of entertainment is not cheap: the entry tickets being quite expensive. Some of the theatres in Lahore are Al-Hamra Halls I and II, Al-Hamra Cultural Complex, Lahore Theatre, Tamaseel Theatre, Rabbia Theatre and Open Air Theatre at Bagh-e-Jinnah. There is a need to increase the number of public auditoriums, theatres and community halls and to encourage the production of good quality stage plays/shows.

9.3.2.3 Fairs and Festivals

- i). A number of seasonal fairs or 'Melas' are celebrated in Lahore in association with the annual 'Urs' of the Sufi poets/saints and spiritual guides. These Melas, apart from providing cultural entertainment, are a source of tourist attraction and additional revenue for the city. Mela Chiraghan and Urs Hazrat Data Gunj Bakhsh (R.A) and Urs Mian Mir Sahib are the three main events which attract people even from other parts of the Punjab Province. The Canal Mela, Food and Music Festivals are recent additions to the Lahore's cultural life.
- ii) National Horse and Cattle Show, one of the most famous annual festivals, is held in spring season in the Fortress Stadium. The activities include a display of the country's finest livestock, horse and camel dances, tent pegging, colourful folk dances, mass-band and tattoo shows.

- iii) Basant-Kite flying festival is celebrated with great pomp and show in mid-February every year in Lahore. Though Basant festival has no relation with the Muslim culture, yet it is becoming very popular among the young and old people, rich and poor, men and women. Lahore is becoming the focal point for the celebration of this festival in Pakistan.

These short time fairs and festivals fetch considerable number of people from other parts of Punjab in particular and from other provinces in general, thus posing a lot of pressure on existing physical infrastructure and services.

9.3.2.4 Hotels and Restaurants

In Lahore there are three hotels of international standard; i.e. Pearl Continental and Avari (on Shalrae-Quide-Azam) and Holiday Inn (on Egerton Road). Lahore Hotel, Ambassador and Best Western are some of the middle class hotels. Faletti's Hotel also used to be among the top class hotels a couple of decades ago but now it has lost its status due to the absence of first class facilities and services. There are other hotels too, mostly located close to the transportation terminals, but these are meant to cater for the needs of local passengers and ordinary tourists from home and abroad.

Numerous Pakistani, Chinese and franchised restaurants with quality food exist in the City. Most of these are located in the downtown area, Gulberg and LCCHS. Recently a street in Gwalmandi has been upgraded and named "Food Street". No traffic is allowed to enter the street in the designated hours, and the people enjoy the food in relatively calm and quite and smokeless environment.

9.3.3 Historical Places

Lahore, being a city rich in the imprints of time, has a total of 59 monuments and sites of historical interest. Many of these are extremely popular, not only among local and foreign tourists but also among resident families, as recreational spots. These include Shalimar Gardens, Jahangir's Tomb, Nour Jahan's Tomb, Badshahi Mosque, Lahore Fort, Minare-Pakistan, Kamran Baradari, Wazir Khan Mosque, etc. Many people visit these places on Pakistan Day (23rd of March), Independence Day (14th of August) and Defence Day (6th of September) every year.

Average daily number of visitors to Lahore Fort is 3,100, to Shalimar Gardens is 980 and to Jahangir's Tomb is about 340.

9.3.4 Libraries

Lahore has a few large public libraries which include Quaide-Azam Library, Punjab Public Library, Diyal Singh Library and the Children Library Complex. These libraries are not evenly distributed but concentrated in the

inner parts of the city. Several other libraries are either associated with the educational institutions (universities and colleges) or with foreign cultural centres like the British Council (Library) and the American Centre (Library).

9.3.5 Museums / Art Galleries

Lahore has a number of good museums and art galleries. Notable among these are the Lahore Museum, Shakir Ali Museum, Chughtai Museum, Fakir Khana Museum, Lahore Fort Museum, Allama Iqbal Museum. The Art Galleries include the Alhamra Art Gallery, Lahore Art Gallery and the Permanent Art Gallery at National College of Arts, Lahore. Private art galleries include Crow Eaters Gallery and Ejaz Gallery.

Lahore Museum is under the administrative control of Ministry of Information, Youth, Sports and Culture. The average number of visitors to the Lahore Museum is 650 which is increasing at an average annual rate of 2.18%. Maximum number of visitors is recorded during the months of March, April and June when the educational institutions are closed. During these months as many as over 850 visitors were recorded. Average number of daily visitors to Allama Iqbal Museum is 24.

9.3.6 Lahore Zoo

Lahore Zoo was established in 1872 in the heart of the city. It is the only one of its kind in Pakistan and covers an area of 9.7 ha (24 acres). It has two approaches-one from Shahrae-Quaide-Azam and the other from Lawrence Road. Lahore Zoo is an autonomous body under the Forestry, Wildlife, Fisheries and Tourism Department, Government of the Punjab.

The Zoo provides good entertainment to the public especially the children throughout the year. On the average, daily number of visitors to Lahore Zoo is over 7,000 with an average annual increase of 3.26% . The average annual increase in case of children is 7.86% whereas for adults it is only 1.48%. Government is planning to upgrade the existing facilities and provide new attractions and proper landscaping to enhance its beauty.

9.3.7 Open Spaces

Open spaces denote all land (public and private) designated for active or passive recreation. These spaces include play grounds/ fields, parks /gardens, fun lands/play lands etc.

Uptill the recent past, the development of open spaces and their maintenance have been the responsibility of the Horticulture Wings of LDA and ex-MCL. But since September 1998, this responsibility has been conferred to the newly established "Parks and Horticulture Authority" (PHA). The total area of parks

transferred to PHA is 2,576 acres. (This includes 357 acres of area covered under roadside and central green verges).

Other agencies involved in maintaining the open spaces are Cantonment Board, Archaeology and Forest Departments. Private Sector has also shown interest in developing entertainment facilities. These include Sozo Water Park and the newly constructed Solo World which is the biggest indoor musical fountains and light show in the country.

A number of beautiful parks/gardens have been developed in Lahore; adorning the cityscape. These include Baghe-Jinnah, Race Course Park, Gulshane-Iqbal Park, Ravi National Park, Circular Gardens, Nasir Bagh, Zoological Gardens, Iqbal (Minto) Park, Linear Park, Model Town Central Park, Woodland Wild Life Park, Jallo Park, Liberty Park, Shalimar Gardens, Hazuri Bagh, Jahangir's Tomb, etc. Area of various parks/open spaces is given in Tables 1 to 5, Annex C to Chapter-9.

Number of visitors in Race Course Park on an average day is about 4,000 while in Gulshane-Iqbal Park it is about 1600. On Sundays these figures are almost doubled and on special occasions like Eid and other festivals, these figures are multiplied by 20 to 30 times.

Planned open spaces cover an area of 5,548 acres in Lahore, indicating a ratio of 1.21 acres per 1000 persons for ex-MCL (1.04 acres if the area under exclusive use of army is excluded and 0.79 acres per 1000 population considering the whole of Lahore District) against 1.80 acres per 1000 persons in 1966 (Master Plan for Greater Lahore). This decline in per capita open space can be attributed to (i) the rapid increase in population, (ii) limited allocation/ development of land for open spaces at city level over the last 35 years.

About 35% (1,952 acres) of the total area under open spaces is under active recreational use, 30.5% (1,686 acres) under passive recreational use and 34.5% (1,910 acres) under both active and passive uses. The city level open spaces / parks are mostly situated around central and south western parts of Lahore. The areas located on the north of G.T. Road and west of Multan Road are found to be deficient of such facilities. Figure 9.3 shows the location of open spaces in Lahore.

The Old City and other high-density residential zones are almost devoid of open spaces. The housing schemes developed by LIT and LDA, (Table 3 in Annex C of Chapter-9) though have reasonably adequate allocation of open spaces, yet these do not cope with the local demand with respect to active recreation (play grounds etc.) Realizing the importance of active recreational facility, the PHA has taken some initiatives towards developing few play fields at local level. This is being done in areas where open spaces are already available and the same are not properly maintained. Till now, 11 play fields

covering an area of 79.13 acres (Table 5, in Annex C of Chapter-9), have been developed by PHA. Such play fields have been handed over by PHA to the local area residents who can form a governing body (comprising 5 members each) for the maintenance of such play fields.

9.3.8 Critical Issues

- There is a need to realise the demand for leisure activities at all levels and a wide range of facilities with maximum access opportunities for the less privileged may be provided.
- There is a need to provide for active recreation for the youth in order to channellize their potential towards positive outlets.
- There is a need to assess and reduce the existing deficiencies in recreational facilities and open spaces and to ensure an equitable spatial distribution of recreational and related facilities particularly parks and play grounds, for all target groups (especially the lower income group).

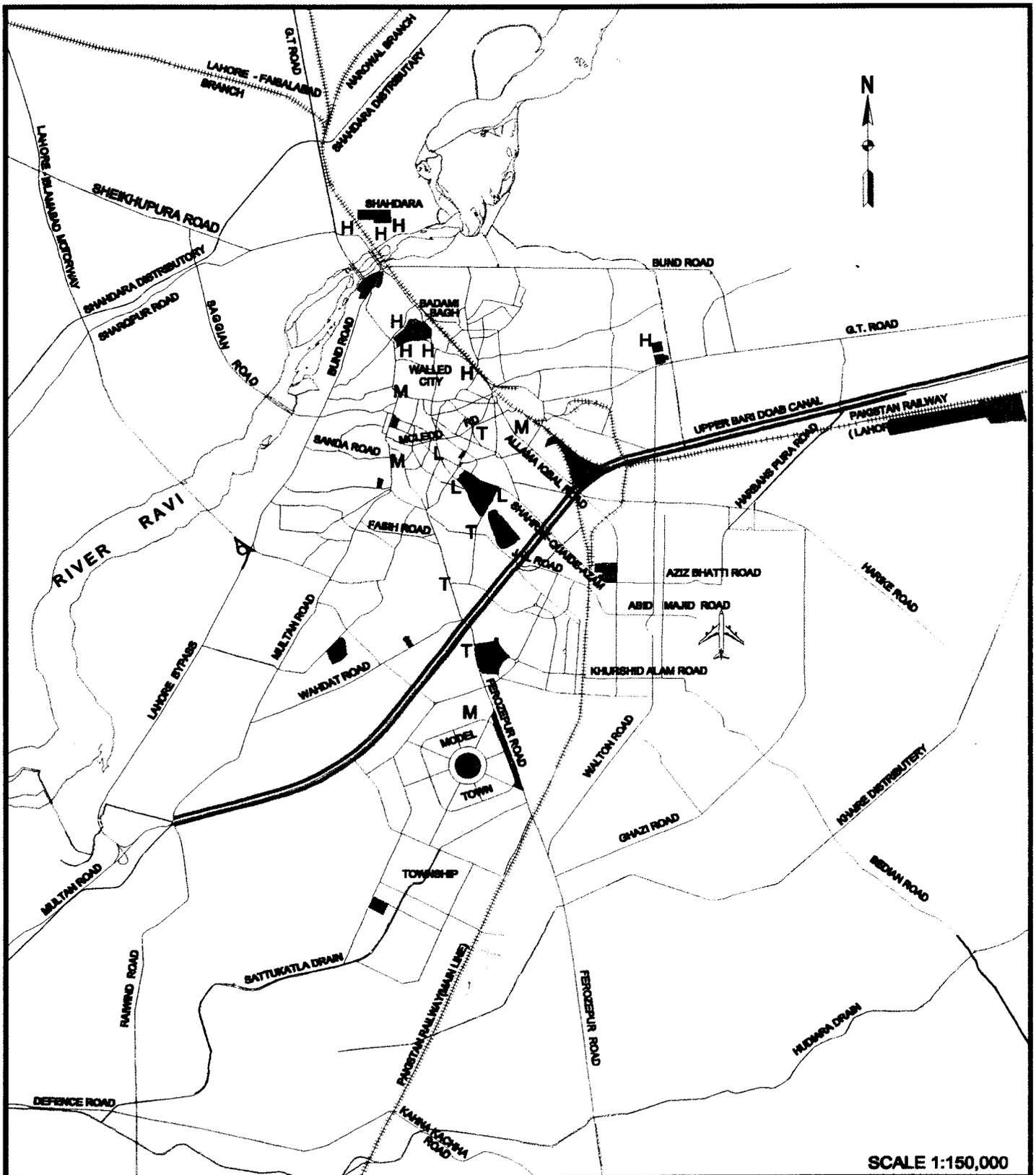
9.4 FIRE FIGHTING

The provision of fire fighting services in the city is the obligation of District Government. The Chief Fire Officer, being the head of Lahore Fire Brigade (LFB), is under the direct administrative control of the District Nazim, and is responsible to manage the service in the best interest of the general public. The total sanctioned strength of the Fire Brigade staff (as in July 2001) is 436 but appointed staff is 411. This indicates a ratio of one worker to a population of 12,270. In 1981, the ratio was one worker to a population of 7,600, which means the workers' representation to serve the average population has considerably gone down.

There are 13 Fire Stations in the city, out of which 9 stations are located within a radius of 4 km from the Central Fire Station at Jinnah Hall. These 9 fire stations are spread over an area of about 50 sq.km and are meant to provide coverage against fire hazards to densely populated and highly centralized activity zones (Figure 9.4). In order to support the fire fighting services, there are 14 fire hydrants mainly located within or near the fire stations. The fire hydrants are not being maintained properly as 5 of these are out of order at present. The maintenance of these fire hydrants is the responsibility of WASA, LDA.

On an average, about 500 fire incidents are reported in a year in the city. Some times, fire incidents are proved to be highly destructive. For instance, in the year 1996 assets of about Rs. 800 million were lost and 20 casualties were recorded.

More than 1/3rd of the fire incidents take place in the Walled City; where access is a great limitation due to narrow and zigzag streets. More than 50% of major fire incidents occur during night and it is generally due to the limited means of communication.

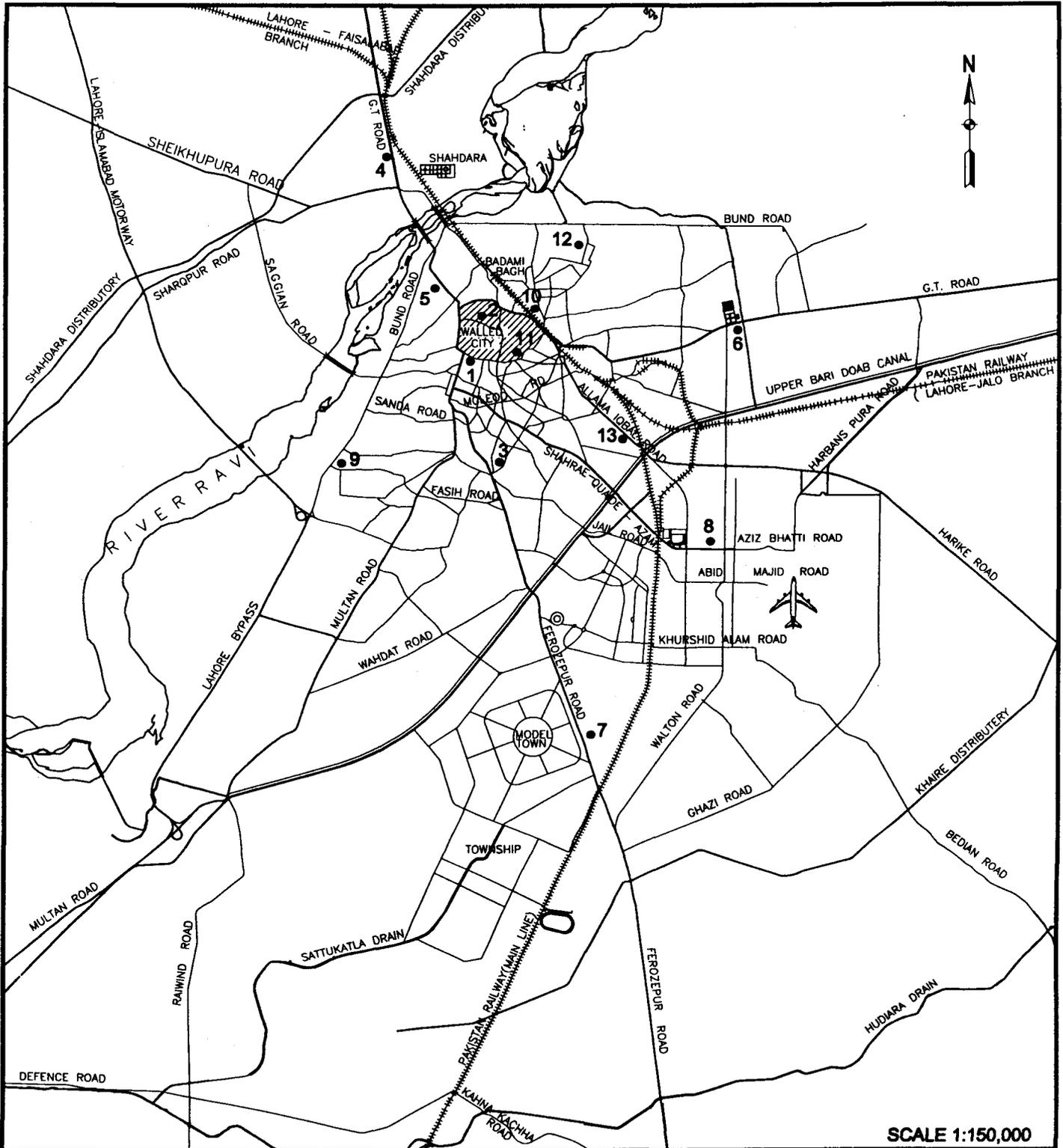


LEGEND:

- PARK
- M MUSEUM
- L LIBRARY
- H HISTORICAL PLACE
- T THEATRE

**RECREATIONAL
FACILITIES
IN LAHORE**

Fig: 9.3



SCALE 1:150,000

FIRE STATIONS :

1. CENTRAL FIRE STATION, JINNAH HALL
2. CITY FIRE STATION, PANI WALA TALAB
3. QUEENS ROAD FIRE STATION
4. SHAHDARA FIRE STATION, G.T. ROAD.
5. TIMBER MARKET FIRE STATION, RAVI ROAD
6. BAGHBANPURA FIRE STATION, G.T. ROAD
7. FERROZPUR ROAD FIRE STATION ,NEAR GHULAB DEVI, HOSPITAL
8. CANTT. FIRE STATION, SARWAR ROAD
9. BUND ROAD FIRE STATION NEAR NAWAN KOT POLICE STATION
10. BADAMIBAGH FIRE STATION NEAR MCL WORKSHOP
11. SHAH MUHAMMAD GHAQS FIRE STATION NEAR AKBARI GATE POLICE STATION
12. SCHEME NO. 2 SHADBAGH FIRE STATION
13. MUSTAFABAD DHARAMPURA FIRE STATION NEAR CANAL BRIDGE

LEGEND:

- FIRE STATIONS

FIRE STATIONS IN LAHORE

Fig: 9.4

The equipment with LFB comprises of 4 water lorries, 2 fire Land Rovers, 7 fire fighting vehicles, 6 foam cum water tenderers, 6 fire fighting suits, 13 breathing apparatuses and on each station 4 to 6 helmets and rubber boots.

Besides Lahore Fire Brigade (LFB), other agencies like Pakistan Air Force, Pakistan Railways, Civil Aviation Authority and Civil Defence also have fire fighting units of their own.

9.4.1 Critical Issues

The deficiencies in the fire fighting facilities available with LFB were also pointed out by LUDTS 1980. Observations of this study which hold good even today, are reproduced below:

“A review of the existing equipment indicates that with development, especially in the Central Business District, fire fighting equipment is not commensurate with the needs of city:

- The fire signaling system lags behind the needs of today. There are no radio signals at the Fire Stations for activation and control. There is only one telephone at each Fire Station which, when out of order, breaks the communication link.
- There is hardly any system of checking the working of the hydrants. Maintenance of the hydrants is the responsibility of WASA which is a separate agency.
- There are only two lorry filling hydrants in working order, one at Queens Road, another at Shahdara as against the requirement of 21.
- The standard of 300 ft. and one furlong for 2 fire hydrant in congested and planned locations respectively is not being maintained.
- There is hardly any training programme for the general public and people working in offices and industrial units to combat fire”.

9.5 RELIGIOUS BUILDINGS

Lahore has a rich heritage of beautiful mosques and shrines of saints. The famous mosques in Lahore include the Badshahi Mosque, Masjid Wazir Khan, Sunehri Masjid, Masjid-e-Shohada etc. An impressive addition to the mosques is the new Mosque of Data Darbar Complex. The maintenance and upkeep of large mosques and shrines is being carried out by the Provincial Auqaf Department. The shrines are the nucleus of religious gatherings and an integral part of Lahore's cultural and historical legacy. The famous shrines of saints are those of Pir Makki, Syed Ali Hajveri (Data

Ganj Bukhsh), Maadho Lal Hussain, Bibi Pak Daaman, Mian Mir Saheb and Mauj Darya. Almost all shrines include a grand mosque within their premises. There is no dearth of local and Jamia (Friday) mosques which are scattered all over the city including peripheral new urban developments.

A number of Cathedrals, Convents and Churches mostly located along the major city roads are the visible and beautiful land marks, of the British Colonial Rule. These include Cathedral on the Mall, St. Anthony's Church on Lawrence Road, Don Bosco and Naulakha Churches on Empress Road, and Convent of Jesus and Mary on Durand Road. Quite a few buildings / structures such as Temples, Gurdawaras, Mandirs etc. depicting Hindu and Sikh religious faiths can be seen scattered all over the older parts of the city.

9.6 GRAVEYARDS

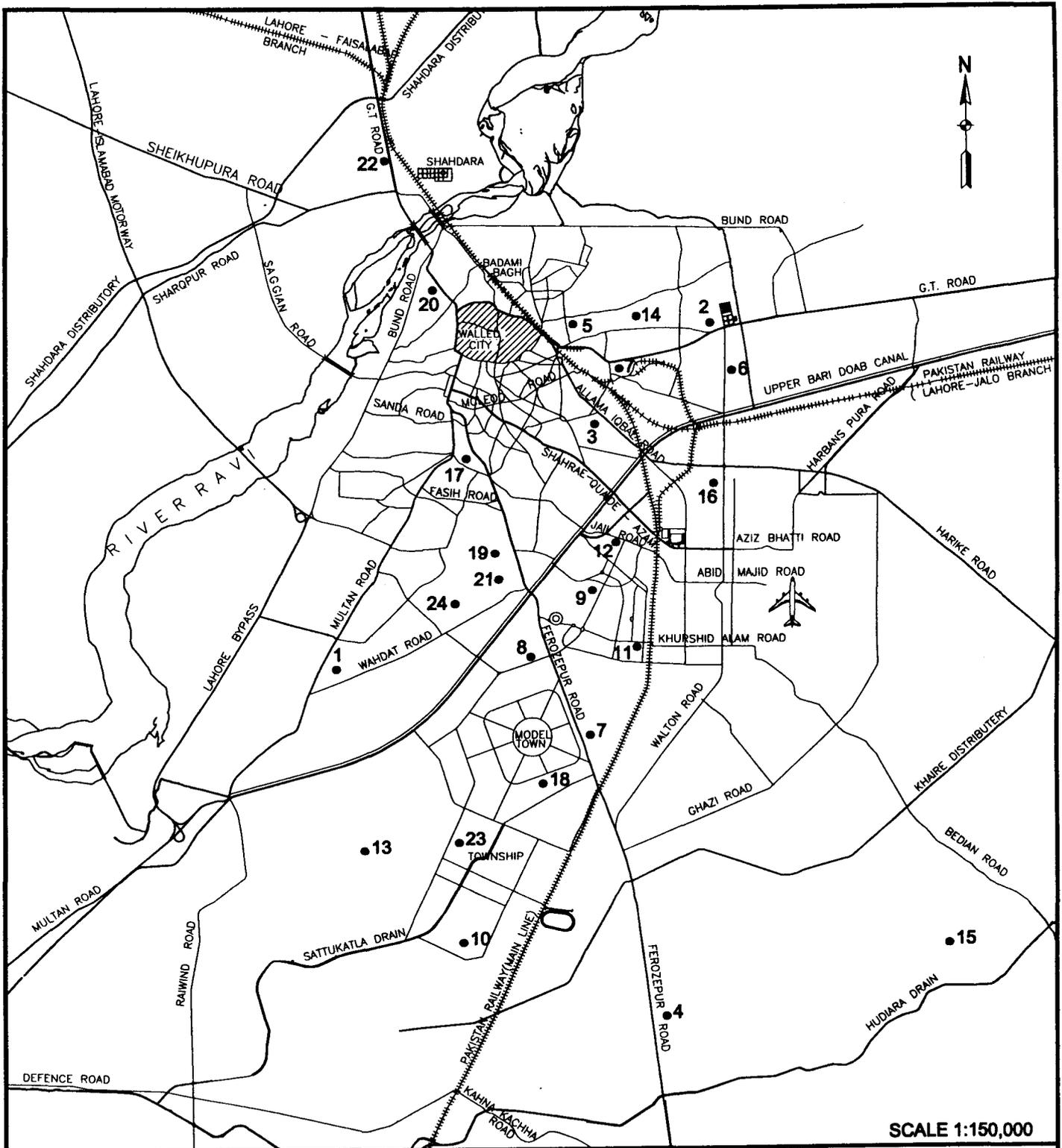
Lahore has about 476 hectares (1180 acres) of land under graveyards while Inner parts of Lahore shares about 171 hectares (425 acres) i.e. 36% of total area under graveyards. Figure 9.5 shows the location of major graveyards in Lahore. The largest is Miani Saheb Graveyard which has now been enclaved by the urban development. The peripheral lands around this graveyard have been encroached upon by residential and commercial uses, hence its original extent/size has been reduced. There are other graveyards and burial grounds that date back to early Muslim Rule.

In the newly developed residential areas, LDA has provided graveyard sites which are used in haphazard and unplanned manner. The general standard for allocation of graveyard sites in residential schemes both in the public and private sectors is 2% of the total area of a particular scheme which obviously has led to an undesirable situation and burial grounds are now seen scattered all over the city. The graveyards are mostly neglected and present a dreadful appearance and often end up as breeding places for anti-social elements. The graveyards, if purposely planned, landscaped and maintained can serve as open spaces for passive recreation. Contrary to that the existing graveyards present ghostly sight and major steps are required to be taken by the District Government for their improvement.

9.7 SLAUGHTER HOUSES

There are 4 Nos. of slaughter houses in the city, 3 of which are operating under the City District Government (one at Kot Kamboh with separate arrangements for mutton and beef; one at Shahdara and one at Baghbanpura) and one under LCB as shown in Table 9.24.

About 75% of the total meat consumption in ex-MCL area is being provided through the City Government Slaughter Houses. Due to lesser capacity in these abattoirs, rest of the meat is supplied from outside the city and by about 100 illegal slaughter houses spread all over the area which pose a very serious bird menace for the air traffic. Whereas according to the Slaughter House Management Bylaws 1965, "No person



GRAVEYARDS :

- | | |
|---------------------------------------|--------------------------|
| 1. ALLAMA IQBAL TOWN (KARIM BLOCK) | 13. JOHAR TOWN |
| 2. BAGHBANPURA | 14. KOT KHAWAJA SAEED |
| 3. BIBI PAKDAMAN | 15. L.C.C.H.S |
| 4. CHUNGI AMIR SIDHU | 16. MIAN MIR |
| 5. CHAHMIRAN | 17. MIANI SAHIB |
| 6. DARS ROAD (OPP. SHALIMAR HOSPITAL) | 18. MODEL TOWN (Q-BLOCK) |
| 7. G.T. ROAD (BUDHA DA AWA) | 19. PIR GHAZI ROAD |
| 8. GARDEN TOWN | 20. RAVI ROAD |
| 9. GULBERG | 21. SHAH KAMAL |
| 10. GREEN TOWN | 22. SHAHDARA |
| 11. GURUMANGAT | 23. TOWNSHIP |
| 12. JAIL ROAD (CHRISTIAN) | 24. WAHDAT ROAD |

LEGEND:

- GRAVEYARDS

MAJOR GRAVEYARDS IN LAHORE

Fig: 9.5

shall sell any meat within the Corporation limits, which is not slaughtered and dressed at the Corporation Abattoir”.

**TABLE 9.24
EXISTING SLAUGHTER HOUSES IN LAHORE**

LOCATION	ANIMALS SLAUGHTERED/DAY (AVERAGE)		AREA (KANAL)
	BEEF	MUTTON	
Kot Kamboh, Babu Sabu (near Bakkar Mandi)	550	6,300	32 + 35
Shahdara Town	60	150	8
Baghbanpura	100	350	0.75
Cantonment	75	300	-
Total	785	7,100	-

Source: City District Government, October 2001

The prevailing conditions at these abattoirs can be summarized below:

- Insufficient to cater for the meat requirement
- Inadequate area for cattle market
- Absence of cattle holding yards
- Located in residential areas
- Old and unhygienic structures
- Primitive system of slaughtering process
- In-efficient utilization of bye-products
- Lack of allied facilities for meat processing e.g. cold storage, blood rendering, hide /skin, water and effluent treatment etc.
- Inadequate drainage system

In order to overcome the above deficiencies, government is planning to establish modern, hygienic meat processing plants at Harbanspura and near Shahpur along Multan Road. The new facilities are proposed to have arrangements for inspection of animals at the entrance, animal holding yards, separate slaughtering halls for beef and mutton, change rooms and toilets, retiring area, administrative block, separate areas for distribution of meat and by-products, parking areas, tubewell and other allied facilities.

For Multan Road Slaughter House, an area of 717 kanals near Shahpur Village has been purchased by the Government. The project is proposed to be developed on BOT basis and will cost about Rs. one billion. The new facility will have proper facilities including cold storage and disposal of by-products.

10.0 PHYSICAL INFRASTRUCTURE

Since 1947, the following executing agencies have been trying to provide the infrastructure facilities (water supply, sewerage, drainage and roads) both in urban and rural areas of Lahore District:

- (i) Ex-Lahore Municipal Corporation (Ex-MCL)
- (ii) Lahore Improvement Trust (Now LDA)
- (iii) LIT Water Wing (Now WASA, LDA)
- (iv) Lahore Cantonment Board (LCB)
- (v) Pakistan Railways
- (vi) Public Health Engineering Department
- (vii) Housing and Physical Planning Department
- (viii) Highway Department
- (ix) Ex-District Council
- (x) Many other organizations tried to implement different programmes such as Peoples Works Programme, Prime Minister's Programme, and different Aided projects etc.

Because of multi-directional approaches and involvement of unconcerned people, the present infrastructure facilities failed to create the desired effect of properly coordinated, pre-planned development to satisfy the public. In 1975, LDA was created which tried to set things right but majority of the area which was under the control of Ex-MCL, Local Councils and LCB continued to be expanded haphazardly.

It is a known fact that the local development of infrastructure facilities is carried out at the public expenses through private or public sectors before actual inhabitation. People constructed houses without contributing towards infrastructure development. The Government had to accept the responsibility and ultimately created LDA along with its subsidiary agencies such as Water and Sanitation Agency (WASA) and TEPA that were asked to provide the facilities against Foreign Aided Loans. The recovery of expenditures thus incurred is obviously not a viable proposition. This ultimately made the executing agencies financially unsustainable. The landowners benefited the most. Land prices shot-up to an extent that now even the unserviced sites have gone beyond the reach of a common man. There are Development Authorities in Punjab who have not been able to develop even a single plot since their creation. It is estimated that Rs. 12,000 million have been spent by the government on the local infrastructure development and on the other hand same amount has been paid by the public but to the landowners. This needs to be addressed on priority basis by the Government.

10.1 WATER SUPPLY SYSTEM

WASA of LDA is responsible for water supply facility to 84.82% population of Lahore City whereas 10.93 % population is served by the LCB and remaining 4.25% population is looked after by the others such as Railways, Government of Punjab and Housing Societies. It is further estimated that 4.831 million population resides within the jurisdiction of WASA who have provided 431,336 Nos. of water

supply connections, thus serving 3.28 million people which is 70% of the total population. There are 630,971 houses in WASA area and out of which 199,676 houses (30% of total) are either without WASA supply connection or have their own arrangements or illegal connections. The sub-division wise details of above facts are given in Table 10.1. As it is clear from the table, areas deficient in water supply when compared to other localities of Lahore are Baghbanpura, Mughalpura, Shahdara and Mozang.

WASA and Housing Societies base their water supply on ground water abstraction within LMA. Tube wells in various locations have been installed for abstraction of ground water, which is generally pumped directly into the distribution system of WASA while the Housing Societies have over-head reservoirs. Water supply system within LMA is designed to provide water by WASA at an average rate of 363 litres per capita per day (lpcd) which is equivalent to 80 gallons per capita per day (gpcd). The tube wells are operated for an average duration of 14 to 16 hours a day. This is the highest figure among the eight Mega Cities of Asia¹ including Karachi, Dhaka, Calcutta, Manila, Bangkok, Jakarta, Seoul and Singapore. The water supply provided to these eight cities ranges between 120-239 lpcd (26-52 gpcd) and that too for short duration only. The direct pumping into the system requires ideally designed water supply distribution system (properly backed with Main Grid) for maintaining the required terminal pressure. In practice, it is experienced that the areas closer to a tube well have higher pressure resulting in higher percentage of wastage of un-accounted-for water, and causing low pressure in distant areas. In brief, the terminal pressure varies from one area to another.

WASA at present supplies approximately 290 mgd of water to 431,336 connections with average household size of 7.1 persons per house i.e. a population of 3.28 million. Average supply rate to consumer works out to be 94.69 gpcd, and is indicative of high percentage of unaccounted-for water which could be attributed to the following factors:

- (i) Direct pumping system.
- (ii) Incomplete water distribution system.
- (iii) Leakages in the system.
- (iv) Un-metered connections.
- (v) Illegal connections.
- (vi) Excessive pumping hours.
- (vii) High capacity of tubewells.
- (viii) Billing system.
- (ix) Procedure of sanction of a new connection.

¹ ADB, Mega-City Management in the Asian - Pacific Region, Vol. I&II, 1996.

TABLE 10.1
SUB-DIVISION WISE DETAILS OF EXISTING WATER SERVICES

Sr. No.	Description Of Area	Population 2001	No. of WASA Conne.	Average Household	Population Served	% of Popula. Served	Total No. of Houses	No. Of Houses Without WASA W/S Conn.
NORTH DIVISION								
1	Data Nagar	187,306	16,831	8.26	139,075	74%	22,485	5,654
2	Misri Shah	369,996	40,922	7.96	325,886	88%	46,086	5,164
3	BaghanPura	440,935	27,186	8.23	223,667	51%	54,883	27,697
	Total for XEN (N)	998,237	84,939	8.15	688,628	71%	123,454	38,515
CENTRAL DIVISION								
4	Shahdara S/D	348,331	27,406	8.12	222,480	64%	44,193	16,788
5	Ravi Road	264,267	23,889	8.11	193,705	73%	33,279	9,390
6	CITY Sub Division	177,068	16,391	6.93	113,565	64%	23,199	6,808
	Total for XEN (C)	789,666	67,686	7.84	529,750	67%	100,671	32,986
EAST DIVISION								
7	Muchalpura S/D	560,912	43,317	7.85	339,823	61%	74,066	30,749
8	Mustafa Abad S/D	116,216	13,776	7.35	101,264	87%	14,568	792
9	Simla Hill S/D	183,548	16,952	7.14	120,979	66%	23,699	6,747
	Total for XEN (E)	860,676	74,045	7.63	562,066	71%	112,333	38,288
	Total For D.O (N)	2,648,579	226,670	7.88	1,780,444	70%	336,458	109,789
WEST DIVISION								
10	Krishan Nagar	283,324	29,748	7.53	224,084	79%	38,406	8,658
11	Allama Iqbal Town	291,417	42,132	7.47	314,582	108%	51,387	9,255
12	Saman Abad	385,682	24,391	7.08	172,720	45%	40,821	16,430
	Total For XEN (W)	960,423	96,271	7.37	711,386	77%	130,614	34,343
SOUTH DIVISION								
13	Mozang	115,705	8,010	7.10	56,849	49%	15,022	7,012
14	Ichra	279,378	28,215	6.87	193,765	69%	37,151	8,936
15	Gulberg	223,023	18,995	7.37	139,632	63%	30,031	11,076
16	Garden Town	161,064	14,496	7.14	103,534	64%	23,160	8,664
	Total For XEN (S)	779,170	69,716	7.10	493,780	61%	105,364	35,688
QAT DIVISION								
17	Industrial Area	227,533	17,335	7.60	131,825	58%	30,552	13,217
18	Township	102,834	8,775	7.47	65,570	64%	13,257	4,482
19	Green Town	113,116	12,569	7.73	97,172	86%	14,726	2,157
	Total For XEN (QAT)	443,483	38,679	7.61	294,567	69%	58,535	19,856
	Total For D.O. (S)	2,183,076	204,666	7.32	1,499,733	69%	294,513	89,887
	GRAND TOTAL	4,831,655	431,336	7.62*	3,280,177	70%	630,971	199,676
				7.10**				

*WASA has carried out surveys and figured out 7.62 as average household size in its Jurisdiction area .

**1998 Census has given 7.10 as average household size for Lahore Urban area. For calculation of future requirements figure of 7.10 has been used.

Source: WASA, June 2001.

10.1.1 Ground Water Abstraction

Ground water abstraction from the Lahore aquifer has been going on since times immemorial. Various studies by independent consultants, based on limited data, have painted a very bleak picture of the ground water reservoir underlying Lahore. A study carried out by M/s. Camp Dressers and McKee (CDM) in 1975 indicated that the ground water level may register a decline of 40m to 82m (130 ft to 270 ft) from 1975 to 1986 in major part of the city. A detailed study conducted by Messrs NESPAK and Binnie and Partners in 1991 indicated the probability of an average ground water lowering of 28 m (92 ft) as a result of the ground water withdrawal rates postulated for the year 2010. Water abstraction rate by various sources during the year 1987 was estimated to be about 1.45 million cubic metres per day (319 mgd) in LMA while only the WASA Tubewells were found to be pumping about 1 million cmpd (222 mgd). Hydrology Section of WASA carries out monitoring of relative static ground water table of aquifer under the LMA on regular basis. A comparison of water table decline during the last 23 years has been given in Table 10.2.

Mean average decline in ground water level comes to be 2.03 feet per year. Water table contour maps of the years 1987 and 2000 are exhibited in Fig. 10.1 & 10.2. In 1987 the lowest contour was 192 m (630 ft) above mean sea level around Mozang Area which has gone down to 183 m (600 ft) above mean sea level in 2000 around Regal Crossing.

10.1.2 Tubewells

WASA is operating 316 tubewells which include 197 Nos. of 112 lps (4 cusecs) capacity, 3 Nos. 84 lps (3 cusecs) capacity, 83 Nos. of 56 lps (2 cusecs) capacity, 6 Nos. of 42 lps (1.5 cusecs) capacity and 27 Nos. of 28 lps (1 cusec) capacity. The depth of these tubewells varies from 150m to 180 m (500 to 600 feet). These tube wells inject water directly into the main water supply system. The total installed capacity of machinery of these tubewells is 27,860 lps (995 cusecs) which should produce 402.97 mgd but WASA is getting 290 mgd indicating that the machinery is operating at 72% efficiency on average. Present tube wells capacity is generally adequate to meet the average day demand. Due to direct pumping, when the tube wells are stopped at night, negative pressure is developed in pipe lines which suck in the sewage and other deleterious materials thereby causing serious water quality problems. Tubewells are shown in Fig.10.3.

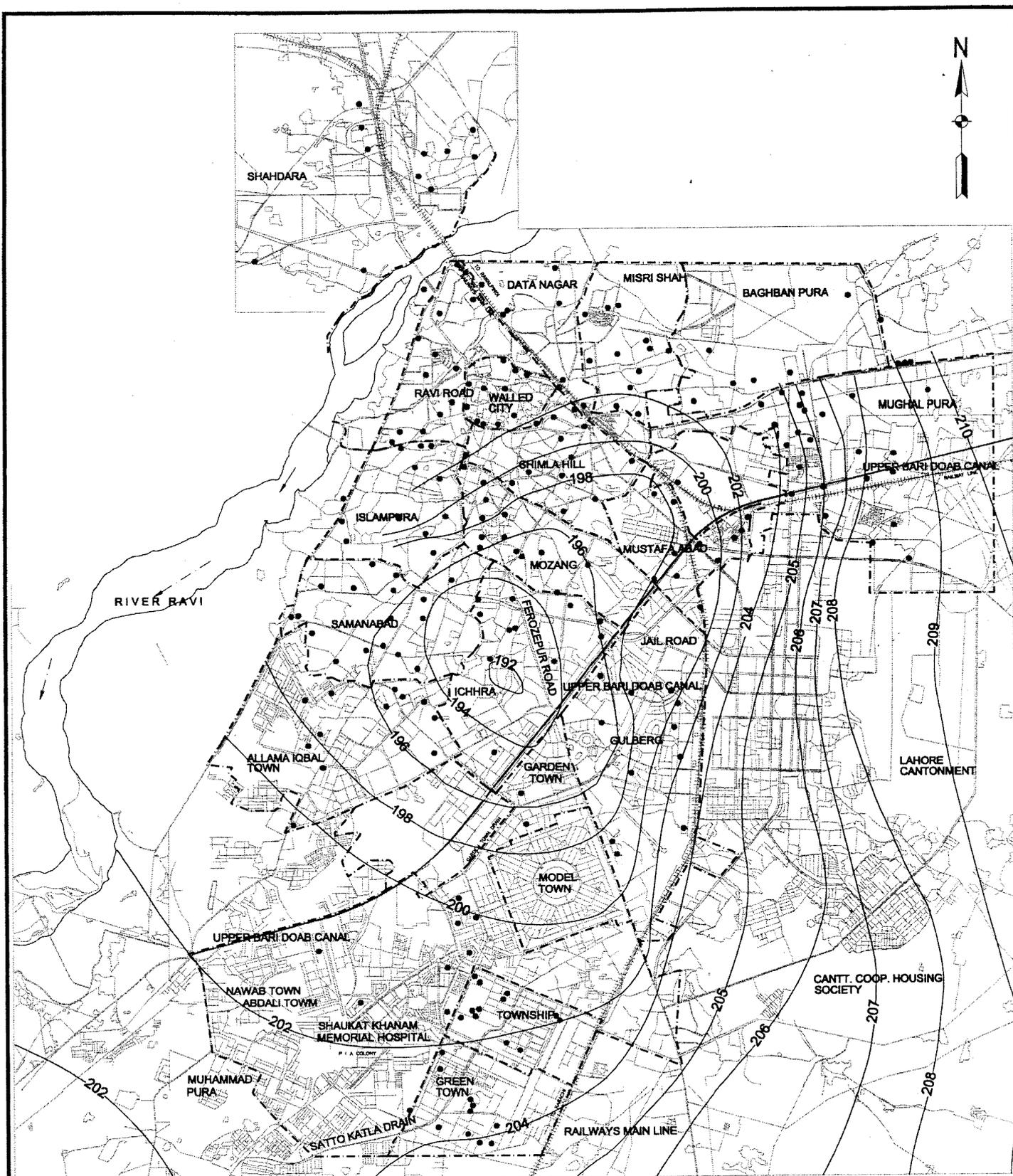
**TABLE 10.2
YEARLY WATER TABLE DECLINE**

S. No.	Location of Observation Point	Water Level		Below N.S.L		Average Decline Ft./Year
		Feet	Year	Feet	Year	
1.	Rajgarh Disposal	26.84	1977	65.63	2000	1.68
2.	A. Block, Gulberg	40.75	1977	87.74	2000	2.04
3.	Takkia Lehri Shah	33.75	1978	86.92	2000	2.41
4.	F.C.C Block	42.75	1978	78.00	2000	1.60
5.	Nawan Kot Police Station	30.83	1981	66.22	2000	1.86
6.	L.M.P. Blocks, Gulberg	34.97	1979	77.86	2000	2.04
7.	Bhogiwal Disposal	33.12	1978	70.94	2000	1.72
8.	Singh Pura	45.40	1981	86.59	2000	2.16
9.	Ravi Park – I	21.02	1981	33.12	2000	0.63
10.	Ravi Park – II	20.66	1981	33.83	2000	0.69
11.	Mozang Adda	34.67	1978	81.34	2000	2.12
12.	Huma Block, A.I. Town	30.83	1980	64.87	2000	1.70
13.	Data Nagar	24.99	1979	54.41	2000	1.40
14.	Tezab Ahatta	62.33	1979	98.40	2000	1.71
15.	Nehru Park	49.20	1987	70.35	2000	1.62
16.	Gulshane- Ravi, G- Block	32.80	1987	46.87	2000	1.08
17.	Fasih Road	54.15	1987	80.36	2000	2.01
18.	Rahmanpura	58.71	1987	94.46	2000	2.75
19.	Windsor Park	68.88	1987	105.94	2000	2.85
20.	Makka Colony	59.04	1987	88.88	2000	2.29
21.	Jinnah Park	57.04	1987	94.13	2000	2.85
22.	Salamat Pura – I	55.76	1987	79.57	2000	1.83
23.	Shadi Pura	49.20	1987	74.45	2000	1.94
24.	Masti Gate	46.08	1987	85.11	2000	3.00
25.	Masoom Gunj	26.57	1987	70.81	2000	3.40
26.	Yaseen Road	39.36	1987	64.61	2000	1.94
27.	Avari Hotel	70.68	1987	107.45	2000	2.83
28.	Muhammad Nagar	65.93	1987	96.07	2000	2.32
29.	Shahuwari	70.52	1987	97.94	2000	2.11
30.	Al-Faisal Town Ghaziabad	47.98	1987	79.37	2000	2.41
31.	Infentry Road	65.93	1987	97.22	2000	2.40
32.	Habib Ullah Road	73.80	1987	95.45	2000	1.66
33.	Nishtar Colony	27.88	1987	41.65	2000	1.06
34.	Sher Shah Block, Garden Town	52.48	1987	85.34	2000	2.52
35.	Raheem Road	34.44	1987	75.24	2000	3.14
36.	Dhobi Mandi	53.07	1987	81.44	2000	2.18
37.	Jia Musa	25.65	1987	37.72	2000	0.93

Source: WASA, June 2001.

Model Town Society (MTS) has its own water supply network with twelve tubewells of 56 lps (2 cusec capacity each). These tube wells generally operate from 15 to 18 hours a day. Similarly LCB has its own network of water supply system with 52 tubewells of 56 lps (2 cusec) capacity each which on the average operate for 12 hours a day. Some of the Government residences and offices also operate their own water supply system.

Recent survey indicated that in summer ground water abstraction is about 1.30 million cmpd (290 mgd) while in winter it is around 1.08 million



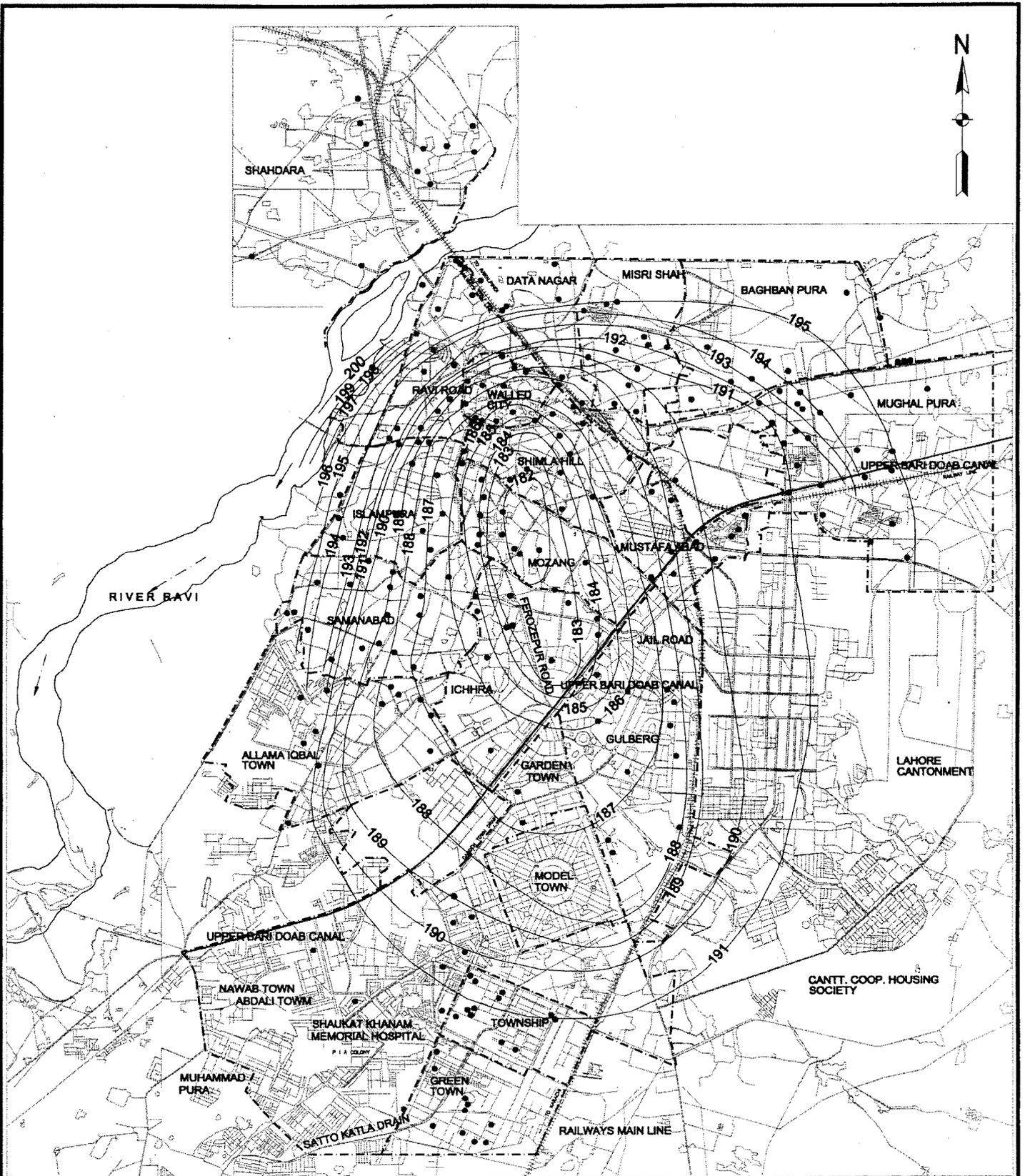
SCALE 1:120,000

LENGEND:-

- SUB-DIVISION BOUNDARY - - - - -
- EXISTING TUBEWELL •

WATERTABLE CONTOUR MAP OCTOBER-NOVEMBER 1987

Fig: 10.1



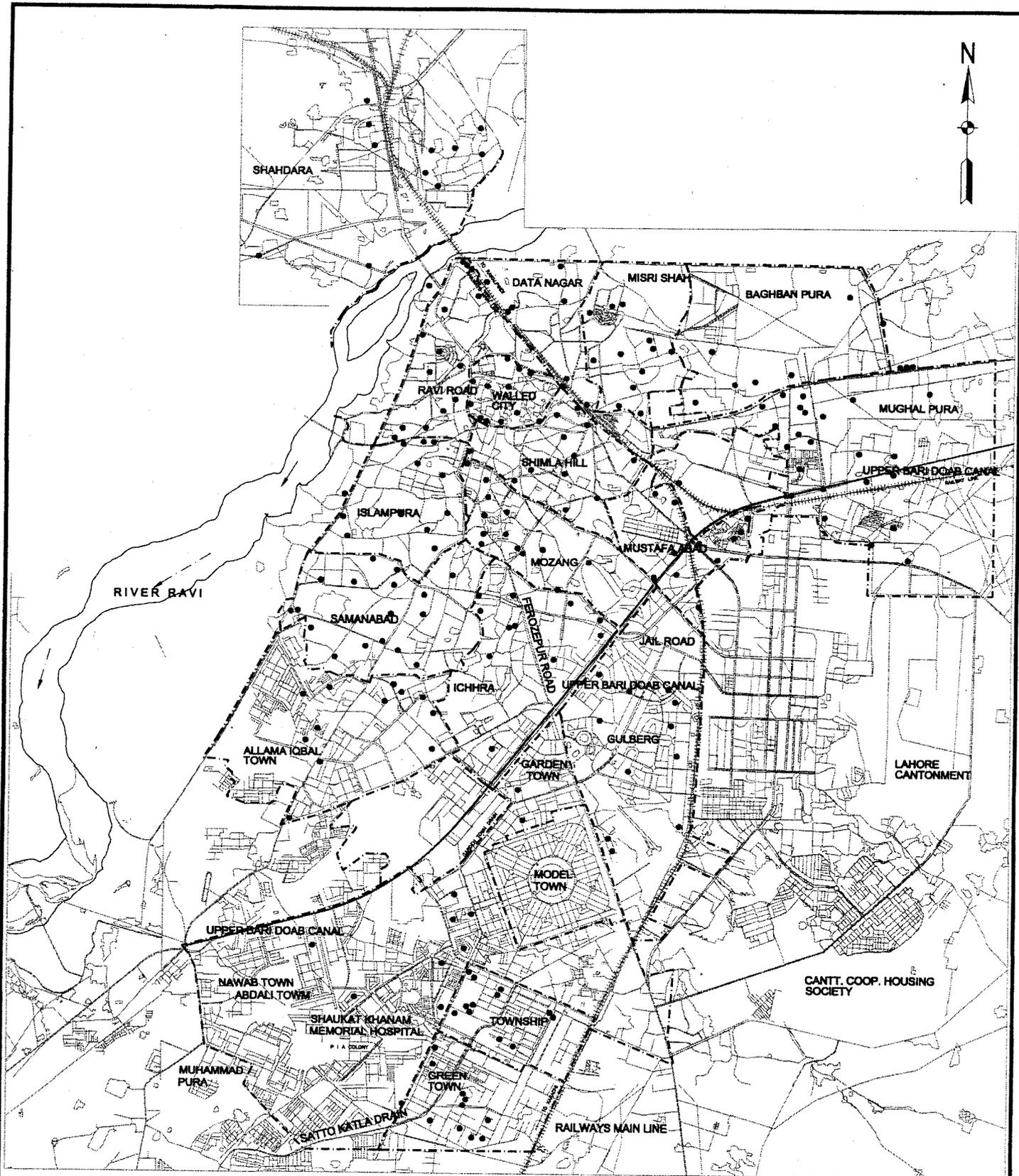
SCALE 1:120,000

LENGEND:-

- SUB-DIVISION BOUNDARY - - - - -
- EXISTING TUBEWELL •

WATERTABLE CONTOUR MAP 2000

Fig: 10.2



SCALE 1:120,000

LENGEND:-

- SUB-DIVISION BOUNDARY - - - - -
- EXISTING TUBEWELL •

LOCATION OF TUBEWELLS

Fig: 10.3

cmpd (240 mgd). Average working hours for tubewell operation also vary from 18 hours in summer to 15 hours in winter. Considering the rate of water supply as 363 lpcd (80 gpcd) the total water demand works out to be 5.0 million cmpd (1100 mgd). In order to check the decline in water table, the abstraction of water has to be controlled by adopting the following preventive measures:

- a) Proper control on wastage of Water.
- b) Use of surface water.
- c) Control on expansion of Lahore City.
- d) Recharge of aquifer.
- e) Intermittent supply hours.

10.1.3 Water Quality

Water quality is normally satisfactory in the WASA service area as chlorination is generally done to eliminate chances of contamination. Quality of water is regularly monitored by WASA as it has its own laboratory for bacteriological as well as chemical testing of water and accordingly corrective measures are taken as per requirements. In spite of all these measures there are complaints from various areas of the city where the consumers are receiving contaminated water.

The Laboratory Assistant Director informed that 300-350 samples are tested as per surveillance programme every month. Any contamination if noticed is rectified by flushing, chlorination and maintaining positive pressure in the distribution system. Some of the results are shown in Table 10.3. Water Quality is normally satisfactory in the WASA service area.

10.1.4 Distribution Network

The existing distribution network within WASA service area consists of 3,200 Km of water supply lines including 79.5 Km Main Grid (30" dia 10.7 Km, 24" dia 15.8 Km, 20" dia 10.1 Km, 18" dia 32.5 Km, 16" dia 10.4 Km). Asbestos Cement (AC) pipes have been used for distribution system. In some of the LDA Housing Schemes Polyvinyl Chloride (PVC) pipes have also been used and comparatively older system in central part of the city has Cast Iron (CI) pipes. The Main Grid which was designed by CDM Consultants in 1975 ranging from 12" to 30" diameter has Ductile Iron (DI) and AC pipes. Existing Grid is shown in Fig.10.4. This was designed for provision of use of treated surface water in future as well as carrying underground pumped water from North and South to the Central part of the city in order to stabilize the excessive decline in sub-surface water level.

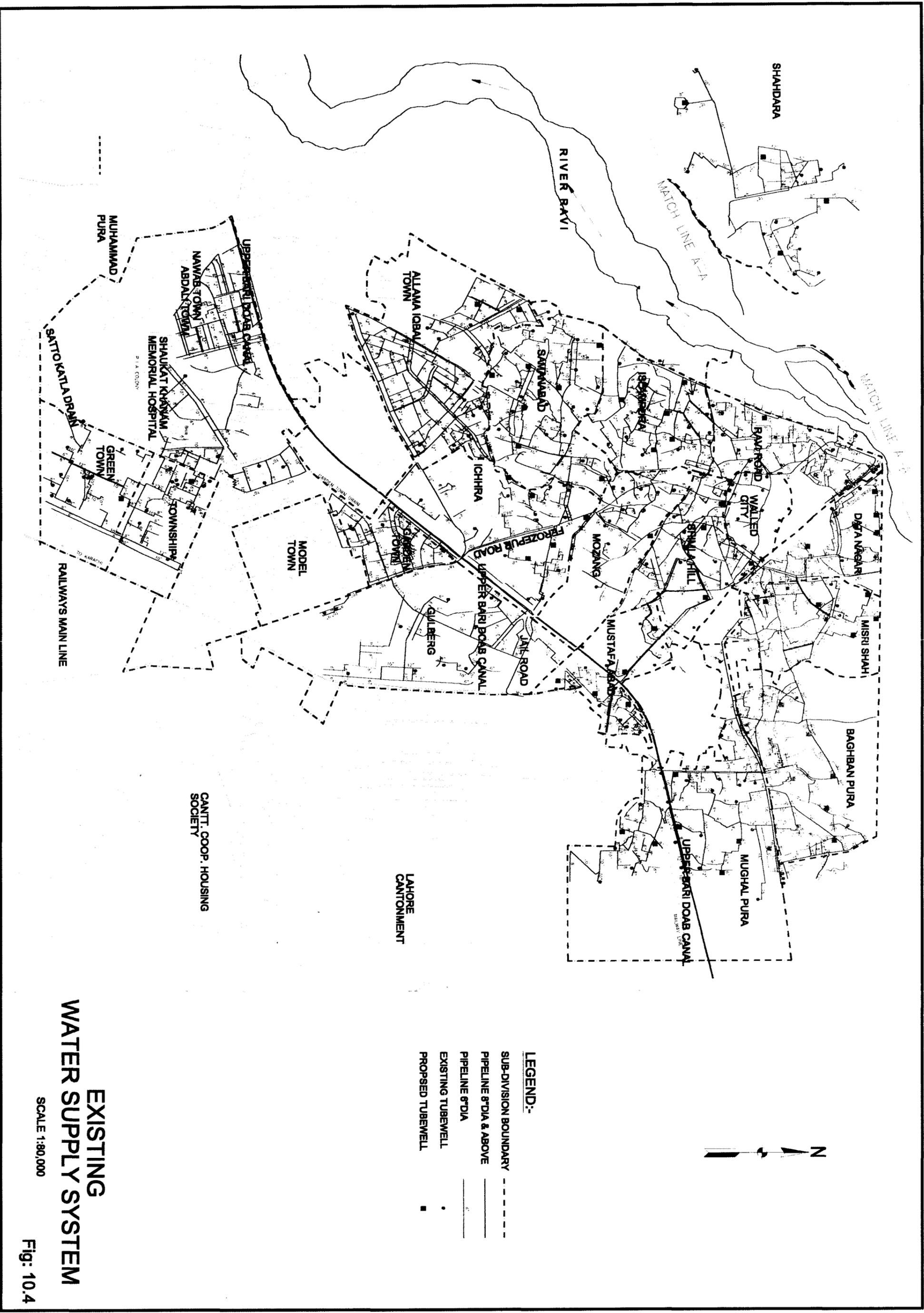
**TABLE 10.3
WATER QUALITY RESULTS**

CHEMICAL & PHYSICAL TESTS	WHO GUIDELINE VALUES MIN & MAX IN (PPM)	RESULTS			
		State Bank of Pakistan 19-04-2001	Dev Smail Road, Sant Nagar 24-04-2001	4-D II, Green Town Lahore 31-05-2001	New Angoori Bagh Scheme 23-06-2001
Temperature		A.T	A.T	A.T	A.T
PH	7 ----- 9.2	7.8	7.4	7.4	7.9
Odour	Unobjectionable	Odourless	Odourless	Odourless	Odourless
Colour	5 ----- 50 Units	Colourless	Colourless	Colourless	Colourless
Taste	Unobjectionable	Tasteless	Tasteless	Tasteless	Tasteless
Turbidity	5 ----- 25 Units	Nil	Nil	Nil	Nil
Clay/Sand/Rust etc.	Absent	Nil	Nil	Nil	Nil
Conductivity		228	570	660	640
Total Dissolved Solids	500 -----1500	160	400	465	450
Total Hardness	150 -----500	48	276	212	270
Calcium as Ca.	75 ----- 200	9	69	35	48
Magnesium as Mg	30----- 150	4	25	30	35
Alkalinity		152	278	370	400
Chlorides	250 ----- 500	22	53	35	42
Nitrites	Traces Objectionable	Nil	Nil	Nil	Nil
Nitrates		Nil	----	----	----
Ammonia Nitrogen	0.5	Nil	Nil	Nil	Nil
Flouride			Nil	Nil	Nil

10.1.5 Elevated Reservoirs

There are 52 overhead reservoirs listed at Table 10.4 having a total capacity of about 3.16 million gallons and height ranging between 12 to 25m (40 to 80 ft). None of the reservoirs, except the 4,500 cu.m (one million gallon) reservoir at Langey Mandi, is in operation.

Present capacity of the tubewells installed in various zones of Lahore is generally adequate for average demand but falls short during maximum day and peak hour demand period. During the peak demand 112 lps (4 cusec) tubewells are operating in the range of 112 to 170 lps (4 to 6 cusec) and at low demand, these operate between 56 to 112 lps (2 to 4 cusec). In both cases, on the one hand the tubewells start sand blowing due to excessive velocity in the filter and on the other hand they start consuming more power at low production. The problem was analyzed in 1986 during the preparation of Computer Study of Lahore Water Supply Distribution System. It was concluded that the tubewells should be designed on peak period demand and peak hour's demand could be met through installation of elevated tanks.



- LEGEND:-**
- SUB-DIVISION BOUNDARY - - - - -
 - PIPELINE 8" DIA & ABOVE ———
 - PIPELINE 6" DIA ———
 - EXISTING TUBEWELL .
 - PROPOSED TUBEWELL ■

**EXISTING
WATER SUPPLY SYSTEM**

SCALE 1:80,000

Fig: 10.4

**TABLE 10.4
OVERHEAD RESERVOIRS IN WASA / LDA**

Sr. No.	DESCRIPTION	SUB DIVISION	CAPACITY (GALLONS)
Director Operations (North)			
1	Langey Mandi (Pani Wala Talab)	City	1,000,000.00
2	Chowk Na-Khuda, Misri Shah	Misri Shah	50,000.00
3	Shad Bagh	-do-	50,000.00
4	Wassan Pura	-do-	50,000.00
5	Gujjar Pura	-do-	50,000.00
6	Baghbanpura SDO Office	Baghbanpura	50,000.00
7	Mustafabad SDO Office	Mustafabad	50,000.00
8	Upper Mall Scheme, XEN East Office	-do-	50,000.00
9	Ghari Shahu	-do-	50,000.00
10	Qila Muhammadi (Qila Lachman Singh)	Ravi Road	50,000.00
11	Timber Market	-do-	50,000.00
12	Fruit market	-do-	50,000.00
Total Reservoir Capacity for DO (North)			1,550,000.00
Director Operations (South)			
1	Rewaz Garden	Islampura	50,000.00
2	Krishan Nagar SDO Office	-do-	50,000.00
3	Sham Nagar	-do-	50,000.00
4	Main market, Samamabad	Samanabad	50,000.00
5	Doongi Ground near Masjid Khizra	-do-	50,000.00
6	Sodiwal	-do-	50,000.00
7	Chenab Block	Allama Iqbal Town	100,000.00
8	Ravi Block	-do-	100,000.00
9	F & V Market	-do-	100,000.00
10	H- Block, Sabzazar	-do-	100,000.00
11	F - Block, Sabzazar	-do-	100,000.00
12	Mohianwal	-do-	30,000.00
13	Shah Jamal	Ichra	50,000.00
14	Rehmanpura	-do-	50,000.00
15	Main Bazar, Ichra	-do-	50,000.00
16	Shadman-I	-do-	100,000.00
17	Shadman-II	-do-	100,000.00
18	A-Block Muslim Town	-do-	100,000.00
19	Zafar Ali Road	Gulberg	50,000.00
20	Main Gulberg	-do-	50,000.00
21	B- Block Gulberg II	-do-	30,000.00
22	T- Block Gulberg	-do-	50,000.00
23	A- Block Gulberg III	-do-	50,000.00
24	C- Block Gulberg III	-do-	50,000.00
25	D- Block Gulberg III	-do-	50,000.00
26	E- Block Gulberg III	-do-	50,000.00
27	B- Block Gulberg II	-do-	50,000.00
28	FCC Block Gulberg	-do-	50,000.00
29	LMP Block Gulberg III	-do-	50,000.00
30	Nishar Colony	-do-	50,000.00
31	A- Block M.A. Johar Town	Garden Town	100,000.00
32	Block G-4 M.A. Johar Town	-do-	100,000.00
33	F- Block M.A. Johar Town	-do-	100,000.00
34	Block R-3 M.A. Johar Town	-do-	100,000.00
35	Trade Center M.A. Johar Town	-do-	100,000.00
36	Tanki No.1 Pindi Stop Industrial Area	-do-	50,000.00
37	Gawala Colony	-do-	30,000.00
38	Tanki No.2 Block No. P B-1 Township	Township	50,000.00
39	Tanki No.3 Block No. P B-1 Township	-do-	150,000.00
40	Tanki No.4 Sector D-1	Green Town	250,000.00
Total Reservoir capacity for DO (South)			1,610,000.00
Total Reservoir Capacity			3,160,000.00

10.1.6 Operation and Maintenance

The distribution system is being operated and maintained through 19 Operation and Maintenance (O & M) Sub Divisions of WASA which also serve as complaint centres. Some of the old CI pipe distribution system has outlived its useful life and its maintenance is a difficult job. Water losses are colossal due to leakages in the old distribution system and installation of non-standard sanitary fixtures and GI service lines at the consumer's premises.

10.1.7 Water Connections

In 1967 water supply system was taken over by WASA (Water Wing of LIT) from ex-Lahore Municipal Corporation when the total numbers of water supply connections were 50,000. It has reached a figure of 431,336 in 2001. The year wise detail is given in, Table 10.5.

10.1.8 Water Tariff

At present 30% of total water supply connections are metered and the remaining 70% are unmetered and are charged on the basis of Annual Rental Value (ARV) of the property. In addition 70% of water rate is charged as sewerage rate. The present tariff along with its comparison with that of 1977 is shown in Table 10.6.

10.1.9 Past Development Expenditure

WASA has executed three phases of development projects, which were implemented with financial assistance of the World Bank. The year-wise input of capital expenditure on Water Supply, Sewerage and Drainage is given in Table 10.7.

10.1.10 WASA Income

The year-wise operating income of WASA is given in Table 10.8.

10.1.11 Critical Issues

- 30% to 40% water is being wasted due to leakages in the system, unmetered and illegal connections, incomplete distribution system etc.
- Only 70% houses in WASA Service Area are provided with water connections. The remaining houses are either without water connection or have their own arrangements or illegal connections.
- During summer water pressure is low.
- There is excessive abstraction of ground water resulting in depletion of water table.

- Water salinity increases south of Hudiara Drain.
- WASA is under a debt of Rs. 5,316 million.
- Pumping cost (electricity) is very high. WAPDA claims arrears of Rs. 1,006 million.

TABLE 10.5
YEAR WISE DETAIL OF WATER CONNECTIONS

Financial Year	Water Connection			Water Connections provided in the year		
	Metered	Unmetered	TOTAL	Metered	Unmetered	TOTAL
	(Nos.)	(Nos.)		(Nos.)	(Nos.)	
1970	5,733	59,650	65,383	-	-	-
1971	6,155	64,650	70,805	422	5,000	5,422
1972	6,732	70,937	77,669	577	6,287	6,864
1973	7,385	83,144	90,529	653	12,207	12,860
1974	7,934	95,489	103,423	549	12,345	12,894
1975	8,598	106,460	115,058	664	10,971	11,635
1976	9,964	114,395	124,359	1,366	7,935	9,301
1977	10,956	120,337	131,293	992	5,942	6,934
1978	12,047	135,505	147,552	1,091	15,168	16,259
1979	13,517	146,627	160,144	1,470	11,122	12,592
1980	15,916	157,501	173,417	2,399	10,874	13,273
1981	20,152	170,472	190,624	4,236	12,971	17,207
1982	24,500	186,097	210,597	4,348	15,625	19,973
1983	28,472	199,284	227,756	3,972	13,187	17,159
1984	35,370	213,348	248,718	6,898	14,064	20,962
1985	40,076	222,490	262,566	4,706	9,142	13,848
1986	43,574	227,952	271,526	3,498	5,462	8,960
1987	46,815	233,669	280,484	3,241	5,717	8,958
1988	52,655	245,453	298,108	5,840	11,784	17,624
1989	58,777	255,125	313,902	6,122	9,672	15,794
1990	58,494	244,167	302,661	-(283)	-(10,958)	-(11,241)
1991	62,883	251,618	314,501	4,389	7,451	11,840
1992	68,670	261,291	329,961	5,787	9,673	15,460
1993	72,991	268,150	341,141	4,321	6,859	11,180
1994	77,783	293,587	371,370	4,792	25,437	30,229
1995	82,388	300,138	382,526	4,605	6,551	11,156
1996	88,029	303,173	391,202	5,641	3,035	8,676
1997	94,233	305,635	399,868	6,204	2,462	8,666
1998	101,896	305,476	407,372	7,663	-(159)	7,504
1999	107,358	305,798	413,156	5,462	163	5,625
2000	119,443	303,210	422,653	12,085	-(2,588)	9,497
2001	128,045	303,291	431,336	8,683	81	8,764

Source: WASA, June 2001.

**TABLE 10.6
COMPARISON OF WATER RATES OF 1977 AND 1998**

1. WATER RATES	1977	1998
Unmetered Connections: Domestic	Rs/month	Rs/month
01 - 400 ARV	12.00	41.50
401 - 500	14.00	64.00
501 - 720	16.00	109.00
721 - 1000	20.00	190.00
1001 - 1500	25.00	268.00
1501 - 2388	-	282.00
2389 - 4370	-	300.00
4371 - 4499	-	314.00
4500 & Above	20 % Of ARV	84 % of ARV
Metered Connections: Domestic		
01 - 5000 Rs. / 1000 Gallons	-	9.20
5001 - 20000	-	14.90
20001 & Above	-	19.50
Flat Rate	3.00	-
Commercial & Industrial		
01 - 5000 Rs. / 1000 Gallons	-	19.53
5001 - 20000	-	34.89
20001 & Above	-	50.48
Flat Rate	4.00	-
2. SEWER RATES: Domestic		
Unmetered Connections:		
01 - 400 ARV	-	29.05
401 - 500	-	44.80
501 - 720	-	76.30
721 - 1000	-	133.00
1001 - 1500	-	187.00
1501 - 2388	-	197.40
2389 - 4370	-	210.00
4371 - 4499	-	219.00
4500 & Above	-	70 % of Water Rate
Metered Connection: Domestic		
01 - 5000 Rs. / 1000 Gallons	-	6.44
5001 - 20000	-	10.43
20001 & Above	-	13.65

TABLE 10.7
YEAR WISE CAPITAL EXPENDITURE

Financial Year	Capital Expenditure For The Year (Rs. In Million)	Accumulated Capital Expenditure (Rs. In Million)
1969-70	26.010	26.010
1970-71	8.442	34.452
1971-72	14.952	49.404
1972-73	24.793	74.197
1973-74	16.672	90.869
1974-75	34.676	125.545
1975-76	76.709	202.254
1976-77	75.373	277.627
1977-78	80.661	358.288
1978-79	228.311	586.599
1979-80	142.912	729.511
1980-81	119.879	849.390
1981-82	166.832	1016.222
1982-83	119.054	1135.276
1983-84	61.582	1196.858
1984-85	81.209	1278.067
1985-86	150.07	1428.137
1986-87	150.984	1579.121
1987-88	124.039	1703.160
1988-89	108.065	1811.225
1989-90	74.928	1886.153
1990-91	378.718	2264.871
1991-92	273.953	2538.824
1992-93	256.335	2795.159
1993-94	264.534	3059.693
1994-95	279.12	3338.813
1995-96	371.278	3710.091
1996-97	576.728	4286.819
1997-98	547.818	4834.637
1998-99	467.453	5302.090
1999-2000	424.178	5726.268

Source: WASA, June, 2001.

TABLE 10.8
YEAR WISE OPERATIVE INCOME

Financial Year	OPERATING INCOME				
	Water Supply (Rs. In Million)	Sewer (Rs. In Million)	Property Tax (Rs. In Million)	Others (Rs. In Million)	TOTAL (Rs. In Million)
1969-70	5.667	0.968	-	0.291	6.926
1970-71	6.914	1.818	-	0.161	8.893
1971-72	8.584	1.836	-	0.448	10.868
1972-73	10.385	1.854	-	0.960	13.199
1973-74	13.929	1.843	-	2.255	18.027
1974-75	20.567	0.068	6.338	1.246	28.219
1975-76	31.791	1.625	12.062	1.327	46.805
1976-77	33.295	1.287	12.032	3.063	49.677
1977-78	43.436	2.399	19.207	6.257	71.299
1978-79	45.846	1.161	15.666	5.372	68.045
1979-80	54.054	1.648	18.375	5.738	79.815
1980-81	75.273	2.919	20.621	7.393	106.206
1981-82	87.859	1.967	31.033	6.435	127.294
1982-83	88.634	1.465	37.662	3.144	130.905
1983-84	109.044	2.583	36.310	3.803	151.740
1984-85	115.364	2.461	35.206	9.769	162.800
1985-86	116.304	2.942	37.986	11.775	169.007
1986-87	118.568	3.409	56.620	19.734	198.331
1987-88	143.672	8.756	66.475	20.952	239.855
1988-89	175.220	15.553	66.735	24.882	282.390
1989-90	207.734	17.624	59.578	28.488	313.424
1990-91	267.625	25.263	67.107	40.703	400.698
1991-92	390.594	83.203	94.634	52.458	620.889
1992-93	354.948	96.856	110.407	53.633	615.844
1993-94	438.098	125.847	114.312	94.518	772.775
1994-95	465.894	177.884	125.257	66.286	835.321
1995-96	467.210	246.242	129.637	48.989	892.078
1996-97	462.040	272.744	169.550	41.026	945.360
1997-98	547.864	332.246	179.131	56.075	1,115.316
1998-99	615.995	405.848	248.810	38.751	1,309.404
1999-2000	653.143	436.517	211.394	22.770	1,323.824

Source: WASA, June 2001.

10.2 SEWERAGE SYSTEM

The sewerage system of Lahore was originally built in the early nineteenth century with the construction of egg-shaped sewers and a sewage pumping station at Main Outfall Road. Lahore Municipal Corporation (LMC) was responsible for the water and sewerage system in the city till 1967. Due to a rapid increase in population and consequent need for the expansion of the water supply and sewerage facilities the system was handed over to the Water Wing of Lahore Improvement Trust (LIT) in 1967. With the establishment of LDA in 1975 LIT Water Wing was converted to WASA.

The sewerage system kept on expanding until a Master Plan was prepared by Messrs CDM in 1975, for water supply, sewerage and drainage. This master plan

was implemented with the financial assistance of World Bank. Phases I, II and III of the sewerage project have already been completed.

Lahore City is comparatively a flat area and therefore a large quantity of rainwater finds its way into the sewerage system. In fact it is a semi-combined sewerage system. The haphazard expansion of the city and abnormal rise in land prices have resulted in the inhabitation of low lying areas which used to act as a source of relief for the sewerage system during the rainy season. Improper solid waste disposal and lack of sense of sanitation amongst the general public has further taxed the sewerage system. At the same time WASA has not been able to keep the pace of development with the rapid expansion of the city. The improperly planned development of the land through private or public sector also contributed towards unsatisfactory and incomplete sewerage facilities in some parts of the city. Flood Protection Bunds, Railway Track and the UBD Canal are the three natural constraints.

The raw sewage is corrosive to concrete as it contains sulfides, therefore, RC pipes are likely to be eaten up with the passage of time. Useful life of RC pipes ranges between 40 to 50 years. Survey indicates that the RC sewers which were laid during sixties in Gulberg Area have started creating problems and at number of places pipes had to be replaced. It is high time for the authorities to give a serious thought to this aspect.

10.2.1 Sewerage Network

Existing sewerage system in WASA service area caters for about 2.426 million people which are 54.17% of the present population. The sewerage system consists of 405 Km of Trunk Sewers and 3,205 Km of Lateral Sewers, making a total length of 3,610 Km. The diameters of sewers vary from 300 mm to 1,650 mm (12" to 66"). The sewage is pumped to the storm water cum sullage drains in various sewerage districts of WASA. These drains ultimately dispose of in River Ravi. During flood in River Ravi, the gates of storm water drains have to be closed and sewage and storm water is pumped across the bund.

Low lying areas present the worst scenario particularly in rainy season, when the intermediate pumping stations are out of order or closed due to power failure and the sewers and manholes start over flowing causing ponding of the area for quite a long period making the life of the residents miserable. Over flow through manholes in low-lying areas is also due to surcharge of some sewers. The manholes are sometime filled with silt, solid waste and in some areas with wastes from cottage industries.

10.2.1.1 Trunk Sewers

There is 405 Km of trunk sewers in Lahore as marked on the plan shown in Figure 10.5. Out of a total population of 4.831 million in WASA jurisdiction, 45.83% population is yet to be served with adequate trunk sewers.

10.2.1.2 Lateral Sewers

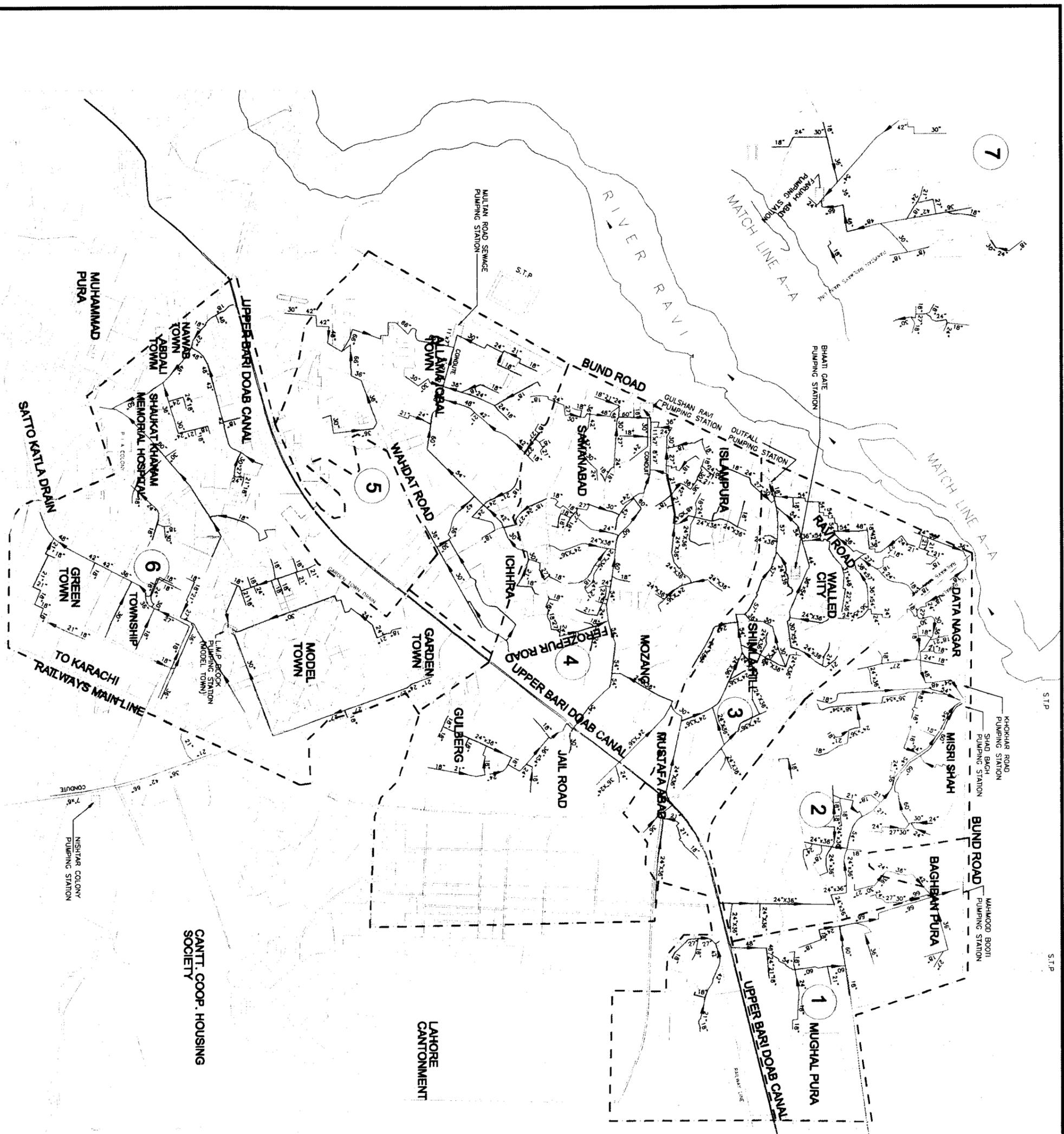
Existing length of Lateral Sewers is 3,205 Km. Out of 630,931 number of houses (both Katcha and Pucca) that exist in WASA jurisdiction, 289,157 houses are without sewerage facilities. It shows that 45.83% of the present population is still to be provided with Lateral Sewers. The sub-division wise details are provided in Table 10.9, which shows that areas lying in the north of Lahore are deficient in sewerage facilities. Samanabad in the south-west and Township in the south also need more sewerage connections.

TABLE 10.9
SUB-DIVISION WISE DETAILS OF EXISTING SEWERAGE SERVICES

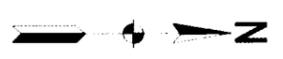
Description Of Area	Population 2001	Total Houses	Total No. Of Houses		% age of Houses Served
			Connected With WASA System	Not Connected With WASA Syatem	
Data Nagar	187,306	22,485	10,163	12,322	45.20
Misri Shah	369,996	46,086	16,495	29,591	35.79
BaghanPura	440,935	54,883	30,477	24,406	55.53
Shahdara S/D	348,331	44,193	36,432	7,761	82.44
Ravi Road	264,267	33,279	20,308	12,971	61.02
CITY Sub Division	177,068	23,199	8,876	14,323	38.26
Mughalpura S/D	560,912	74,066	36,071	37,995	48.70
Mustafa Abad S/D	116,216	14,568	8,735	5,833	59.96
Simla Hill S/D	183,548	23,699	11,357	12,342	47.92
Krishan Nagar	283,324	38,406	22,937	15,469	59.72
Allama Iqbal Town	291,417	51,387	24,985	26,402	48.62
Samnan Abad	385,682	40,821	24,507	16,314	60.04
Mozang	115,705	15,022	10,372	4,650	69.05
Ichra	279,378	37,151	24,488	12,663	65.91
Gulberg	223,024	30,031	11,837	18,194	39.42
Garden Town	161,064	23,160	13,038	10,122	56.30
Industrial Area	227,533				
Township	102,833	58,535	30,736	27,799	52.51
Green Town	113,116				
			*		
GRAND TOTAL	4,831,655	630,971	341,814	289,157	54.17

* Figures taken from Population Census 1998.

Mostly the expansion of Lahore City has taken place towards South West during the last one and a half decade. About 250 new housing schemes (181 approved and the remaining unapproved) have come up. The private developers have tried to provide internal infrastructure. With the exception of a few housing schemes that exist on or around Sattu Katla Drain, the remaining do not have ultimate disposal point for its sewage. There is immediate need to lay Main Trunk Sewer in this area. Survey



7



- 1 NORTH EAST SEWERAGE DISTRICT
- 2 NORTHERN SEWERAGE DISTRICT
- 3 CENTRAL SEWERAGE DISTRICT
- 4 SOUTH CIVIL LINES SEWERAGE DISTRICT
- 5 SOUTH WEST SEWERAGE DISTRICT
- 6 SOUTH EAST SEWERAGE DISTRICT
- 7 SHADARA SEWERAGE DISTRICT

LEGEND:-

- DISTRICT BOUNDARY
- EXISTING SEWER
- PUMPING STATION
- SEWAGE TREATMENT PLANT (PROPOSED)
- S.T.P.

EXISTING SEWERAGE SYSTEM

SCALE 1:80,000

Fig: 10.5

indicates that individual plot owners are willing to contribute towards its cost.

10.2.2 Sewerage Pumping Stations

The entire sewage is pumped into different sullage/storm water drains, which ultimately discharge untreated sewage into River Ravi. WASA is operating eleven Main Pumping Stations. In addition 61 intermediate/local lift stations are working to provide timely relief. Operating expenditures on lift stations are extra burden on WASA resources and need to be eliminated as far as possible. The details of main pumping stations and lift stations along with present pumping capacities are given in Tables 10.10 and 10.11 and shown in Fig.10.6.

10.2.3 Operation & Maintenance

In order to facilitate the operation and maintenance of the sewerage system the city has been divided into seven sewerage districts as shown in Fig.10.7. Sewage from these districts is carried through a network of lateral, secondary and primary sewers. MTS maintains its own sewerage network. The sewage is disposed off at LMP Blocks Disposal Station, which is being maintained by WASA. In LCB, each house has a septic tank as per their bylaws. Effluent from these septic tanks and other areas discharge the raw sewage in the open drains, which is then pumped to Mian Mir Drain. Other private housing societies are also maintaining sewerage systems in their schemes but are pumping the sewage in open areas, nearby nullahs/drains or in the UBD Canal.

Survey indicates that inadequate pumping has caused silting up of the sewers. At some places the existing size of sewer has become inadequate with the passage of time due to increase in population. It has also been noted that due to haphazard expansion of the city the sewage load of additional areas has been connected to the already under-capacity sewerage. For example trunk sewer for Gulberg I & II was designed and executed in sixties. Later on Gulberg III was planned and its sewage load was added to the existing trunk sewer. The misery did not end here, huge Abadies like Modern Colony and Muftpura were also added to the same under-sized trunk sewers. The conversion of Main Boulevard into commercial area has further deteriorated the condition. This needs to be tackled immediately.

10.2.4 Wastewater Treatment

Presently no wastewater treatment services exist and the raw wastewater is directly discharged into River Ravi thus causing unhygienic condition in the river as well as for the down stream users. The situation is very critical under low flow condition in the river when sufficient dilution is not available and the river almost serves as a sullage carrier.

TABLE 10.10

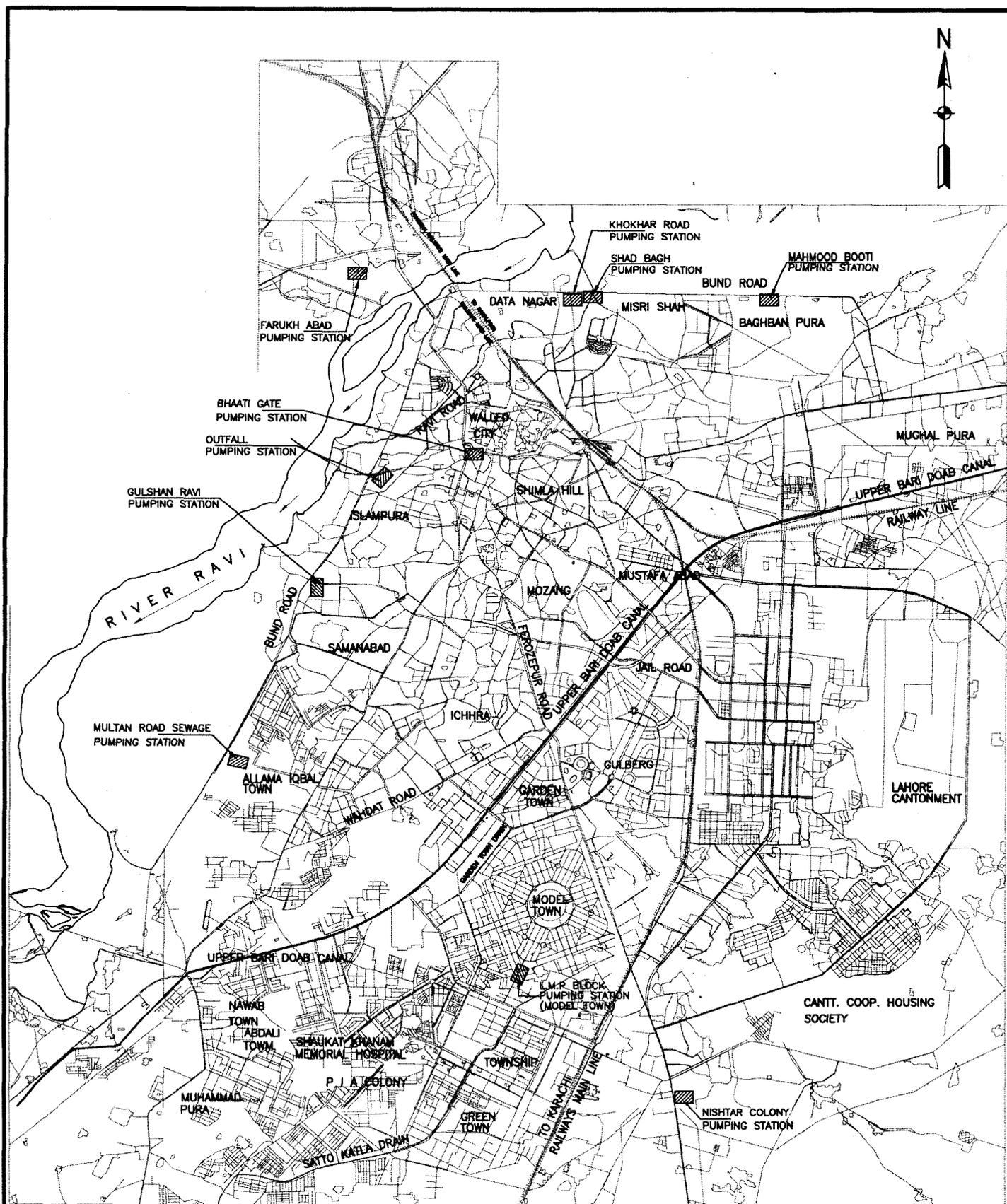
DETAIL OF PUMPING MACHINERY AT MAJOR DISPOSAL STATIONS.				
S. No.	Location of Disposal	Installed Capacity (Cfs)	Detail of Pumping Units Installed	
			Capacity (Cfs)	Nos.
1	Gulshan Ravi	320	40	8
2	Multan Road	160	40	4
3	Shad Bagh	160	40	4
4	Main Outfall - I	175	25	3
			20	3
			15	2
			10	1
5	Main Outfall - II	102	26	2
			25	2
6	Main Outfall - III	87	25	3
			6	2
7	Farrukhabad	111	25	1
			13	2
			20	3
8	Mehmood Booti	168	56	3
9	Khokhar Road	168	56	3
10	LMP Block	130	25	2
			20	3
			10	2
11	Nishtar Colony	39	13	3
12	Bhatti Gate	100	25	4

Source: WASA, June 2001.

WASA planned four wastewater treatment plants for the city with three plants serving the main city and the fourth one for Shahdara Area. About 364 ha (900 acres) of land has already been acquired by WASA on the west of Lahore Bypass and south of Spur No. 6 to accommodate the proposed plan. It is reported that the design and tender documents are ready for implementation of the project, however no progress has been made so far due to lack of funds.

10.2.5 Critical Issues

- Existing sewerage system in WASA Service Area caters for 54% of the present population.
- The system is inadequate and is partially combined with the drainage network.
- Additional trunk sewers and pumping stations are required to meet the demand. Without these provisions, sewage is discharged in open drains/ open spaces.



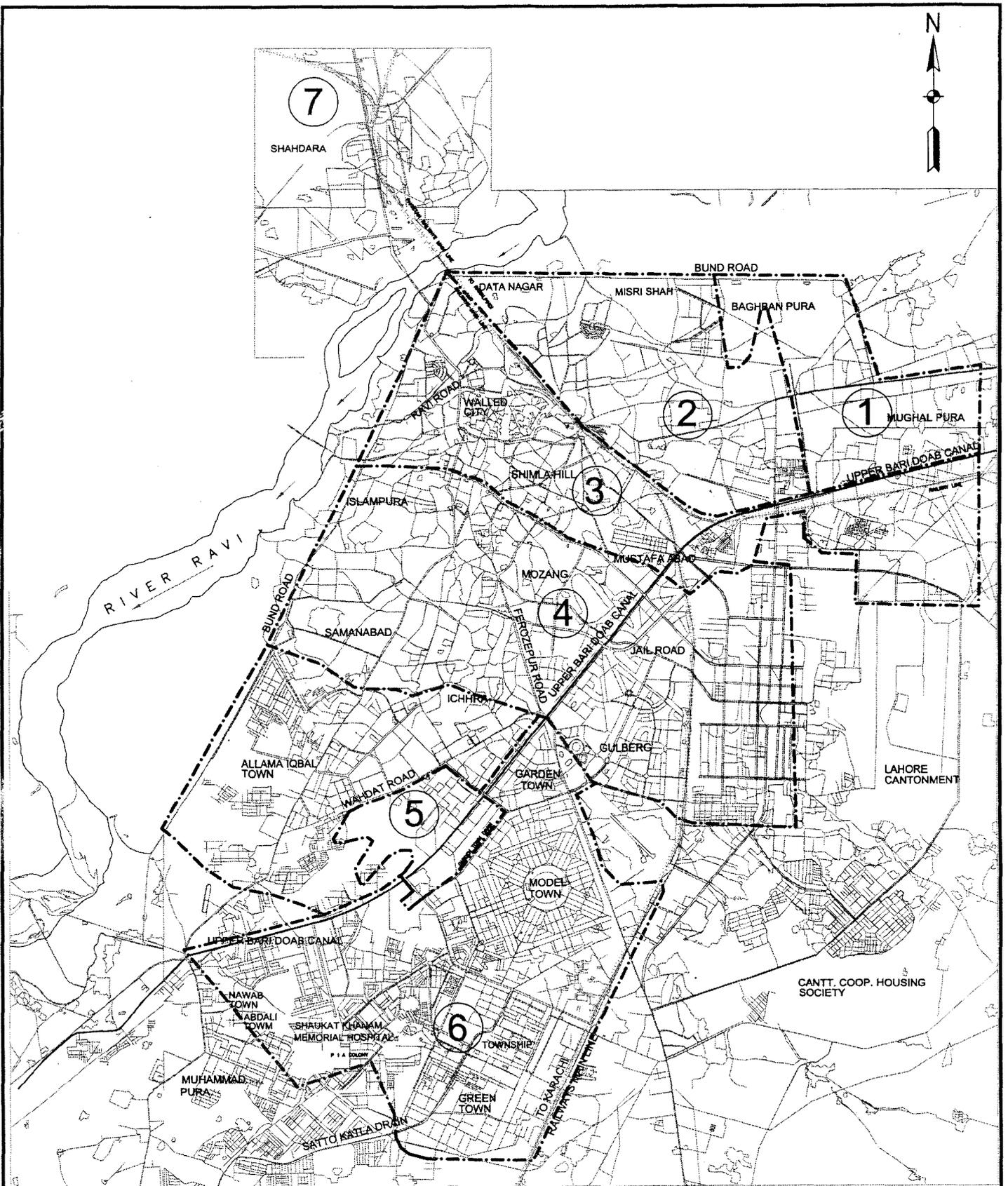
SCALE 1:120,000

LEGEND:-

PUMPING STATION

EXISTING SEWERAGE PUMP STATIONS

Fig: 10.6



SCALE 1:120,000

- ① NORTH EAST SEWERAGE DISTRICT
- ② NORTHERN SEWERAGE DISTRICT
- ③ CENTRAL SEWERAGE DISTRICT
- ④ SOUTH CIVIL LINES SEWERAGE DISTRICT
- ⑤ SOUTH WEST SEWERAGE DISTRICT
- ⑥ SOUTH EAST SEWERAGE DISTRICT
- ⑦ SHAHDARA SEWERAGE DISTRICT

LEGEND:-
 DISTRICT BOUNDARY - - - - -

EXISTING SEWERAGE ZONES

Fig: 10.7

Untreated wastewater being discharged into River Ravi and Lahore Canal.

TABLE 10.11
DETAILS OF LIFT STATIONS

S.No.	Location of Lift Station	Pumping Capacity (Cusec)	S.No.	Location of Lift Station	Pumping Capacity (Cusec)
1	Faiz Bagh	10	32	Fruit Market	10
2	Elahi Park	18	33	General Bus Stand	7
3	Kachu Pura	8	34	Peco Culvert (Old)	10
4	Bhogiwal	20	35	Maqbara Morh	2
5	Muhammad Nagar	14	36	Bagh Munshi Ladha	41
6	Ghazi Mohalla	11	37	Walton	10
7	Shalimar Link Road	16	38	Bostan Colony	6
8	Acchat Ghar # 1	4	39	Nishtar Colony (Old)	12
9	Acchat Ghar # 2	8	40	Johar Town (F- Block)	12
10	Infantry Road	18	41	Satto Katla (Township)	50
11	Bahar Shah Road	12	42	Liberty Park D/S	2
12	Shah Kamal	4	43	Johar Town (D - Block)	12
13	Toheed Park	4	44	Guru Mangat	10
14	Daras Baray Mian	4	45	Shama Cinema	4
15	Larechs Colony	7	46	C-I Quaid-e-Azam Town	53
16	Janki Devi	4	47	C-II Quaid-e-Azam Town	47
17	Lal Pul	8	48	A-II Quaid-e-Azam Town	20
18	TajPura	74	49	Industrial Area Quaid-e-Azam Town	5
19	Peco (New)	12	50	Kalma Chowk	16
20	Faiz Park Lalpul	6	51	Marzi Pura	8
21	Rehman Gali	6	52	Lytton Road	16
22	Mustafabad (Bridge)	3.5	53	Ahata Moolchand	12
23	Do Moria Pul	8	54	Macca Colony	20
24	Shamas Pura I	2	55	Usman Block	9.5
25	Shahdara Town	24	56	Rasool Park	24
26	Ali Pura	4	57	Centre Point	5.5
27	Faisal Park	5	58	G - Block, Gulberg	18
28	Forest Colony	28	59	Sharif Colony	3
29	Barkat Town	8	60	Johar Town, C-Block (Bher Pind)	13
30	Saeed Park	10	61	Khamba Distributory (Johar Town)	10
31	Food & Vegetable Market	7			

Source: WASA, June 2001.

10.3 SOLID WASTE MANAGEMENT

Average per capita solid waste generation in the city ranges between 0.50 kg to 0.55 kg per day. On this basis it is estimated that presently 3,000 tons/day of solid waste is generated in Lahore (approximately 1.0 million tons per year) of which about 87 % is contributed from the ex-MCL area and the remaining from Lahore Cantonment including LCCHS and MTS. This quantity is expected to increase to about two million tons per year by the year 2021.

Presently solid waste generated in Lahore is collected from the communal bins placed at various locations in the city and transported for open dumping. Both public and private sectors are involved in managing solid waste within the city. In public sector the City Government and LCB are responsible for collection and disposal of solid waste within the ex-municipal and cantonment limits of Lahore City respectively. In the private sector MTS and LCCHS is responsible for the collection and disposal of solid waste from their respective areas. In addition some NGOs are also involved in the solid waste management but their activity is generally limited only to the collection of solid waste in some parts of the city. Presently on-going Lahore Sanitation Program (LSP) in various areas of the city is being managed by NGOs.

The existing solid waste collection is not very effective and some of the solid waste generated in the city finds its way into open drains, sewers, streets or in open areas. It is estimated that only about 70% of the total solid waste generated is collected by the City Government or other responsible agencies. Proposed Solid Waste Dumping sites are shown in Fig.10.8.

10.3.1 Collection and Disposal

Generally the collection of solid waste in the city is carried out both by the public and private sectors by employing manual as well as mechanical means but the final disposal is the sole responsibility of the City Government and LCB and as such private sector is only limited to the collection of solid waste.

10.3.1.1 Ex-Metropolitan Corporation Lahore

For the purpose of effective solid waste management and better control, the city has been divided into eight (8) zones. These zones are shown in Fig. 10.9. Presently Lahore District has been divided in six towns as discussed earlier in Chapter 6.

Collection of solid waste from the entire city is done manually. Sweepers in each zone, in addition to sweeping of roads, also collect solid waste from the streets and roads in baskets or hand carts and dump it into the nearest bin. Transportation of solid waste from these bins to the dumping sites is done through vehicles.

The collection system consists of open trucks as well as specially manufactured compact collection trucks assigned for solid waste. These also include pickups, dumpers and front end loaders. In addition ex-MCL had 2 bulldozers in its fleet for handling the solid waste at disposal sites. Table 10.12 shows the town-wise distribution of SWM vehicles.

The solid waste collected from the bins/ skips is taken either directly to the landfill sites (presently open area dumping is employed) or to the transfer station. Three landfill sites, one at Mahmood Booti (636 Kanals

of land acquired by ex-MCL and the other at Sunder (Multan Road) and Khokhar Road across the Protection Bund are being used.

A comprehensive PC-I with a total project cost of Rs.808 million has been proposed by ex-MCL to deal with the solid waste management. The PC-I includes the construction of landfill site (at an estimated cost of Rs. 43 million), gas recovery system (estimated cost of Rs. 40 million), power plant (Rs. 190 million) and technical assistance amounting to Rs. 60 million. The project is held up for want of funds.

TABLE 10.12
TOWN WISE DISTRIBUTION OF SWM VEHICLES

Sr. No.	Vehicle Type	Ravi Town (UC-30)	Data Gunj Bakhsh Town (UC-33)	Shalimar Town (UC-23)	Nishtar Town (UC-25)	Allama Iqbal Town (UC-26)	Aziz Bhatti Town (UC-13)	Total
1.	Mazda Truck	22	24	16	11	19	10	102
2.	Mazda Arm Roll	5	8	5	4	4	4	30
3.	Arm Roll	6	13	4	4	4	1	32
4.	Compactor	5	9	5	6	5	2	32
5.	Tractor	1	1	1	1	1	1	6
6.	Tractor Trolley	11	4	1	1	1	1	19
7.	Tractor Loader	2	3	1	1	2	1	10
8.	Tripping Trolley	2	2	4	4	4	4	20
9.	Mechanical Sweeper	4	8	2	2	3	1	20
10.	Loader	1	1	1	1	1	1	6
11.	Dumper (Nissan)	2	2	2	2	2	2	12
12.	Dumper (Bed Ford)	3	2	1	1	1	1	9
13.	Tractor Arm Roll (Kissan)	2	-	2	2	2	2	10
14.	5 Cum Containers	12	-	12	12	12	12	60
Total		78	77	57	52	61	43	368

Note: Conversion of open trucks into Arm Rollers is under process in which 9Nos. open trucks have been converted in Arm Rollers, which are working in the field and remaining 21 Nos. open trucks are under process. As soon as converted Arm Rollers are received these will be handed over to respective towns accordingly.

Source: District Officer Solid Waste Management City District Govt. Lahore, December, 2001

10.3.1.2 Lahore Cantonment Board

LCB is responsible for the collection and disposal of solid waste within the cantonment boundary. In addition, various unplanned areas located within the cantonment boundary do not have proper collection and disposal systems. Brick masonry bins are employed for the collection of solid waste generated from surrounding areas. The collection of solid waste is being carried out through open trucks and tractor trolleys. Solid waste collection from the bins is disposed of through open dumping at a designated location along Ghazi Road about 22 km from Sadar Bazaar. A total of 19 open trucks and 6 tractor trolleys are employed for this purpose by the LCB. Hospital within LCB boundary does not have any incinerator and the solid waste generated is burnt manually.

10.3.2 Hospital Waste

There are about 40 Government hospitals located within the City, out of which only four have incineration as a means of treatment for the waste generated in the hospital. The remaining hospitals including those in the private sector do not have any proper system and the waste so generated is mixed with the municipal waste which is a potential health hazard and also not environment friendly. Ex-MCL had already prepared a plan which involves construction of an incineration facility adjacent to the proposed landfill site near Mahmood Booti for the treatment of solid waste generated from various hospitals. The land fill as well as incinerator is proposed to be operated and maintained by the private sector.

10.3.3 Private Sector Involvement

10.3.3.1 Model Town Society (MTS)

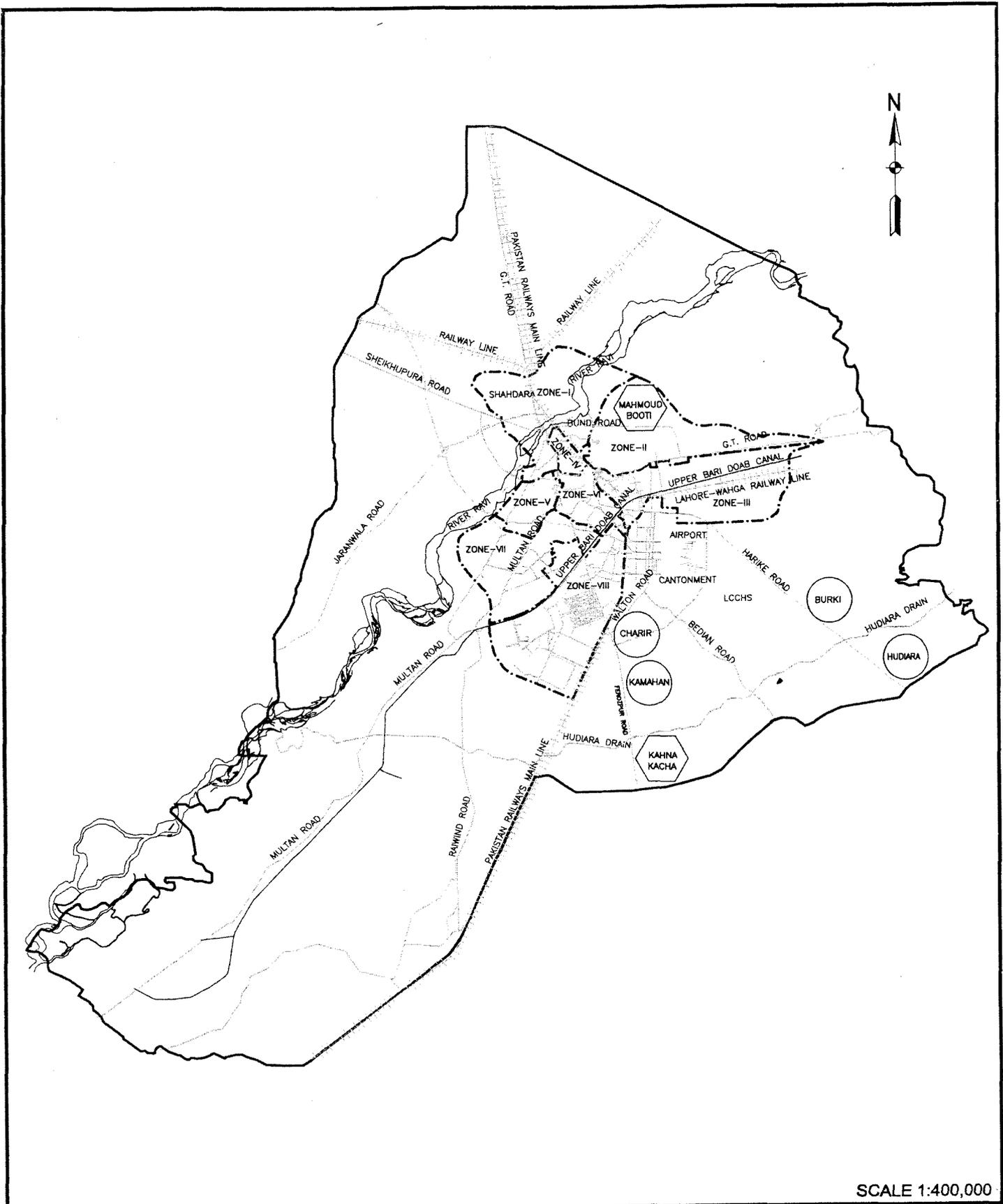
MTS is dealing with solid waste problem in its area. The Society is managing about 40 tons of solid waste per day. The Society has arranged hand carts to collect solid waste, which is transferred to the collection points, tractor trolleys transfer the solid waste to Charar Pind (Village) along Kamahan Road in the form of open dumping. At present MTS is charging Rs. 25 per house per month as sewer charges and Rs. 20 per house per month as sanitation charges.

10.3.3.2 Lahore Cantonment Cooperative Housing Society

LCCHS has engaged a private contractor on behalf of LCB for the collection and disposal of solid waste from the Society area. The contractor has his own fleet of waste collection trucks along with skilled and semi-skilled labour to carry out this operation. The solid waste collected is disposed off in the form of open dumping along Harike Road, Burki Hudiara Road and in Charar Village along Kamahan Road due to non-availability of proper landfill site. The payment to the contractor is made by the Cantonment Board out of its income against property tax. No new tax is imposed in this respect.

10.3.3.3 Lahore Sanitation Programme

Lahore Sanitation Programme (LSP) has been recently initiated by a group of about 42 Non-Governmental Organisations (NGOs) for which they have established their office at 7-Shami Road Lahore. They intended to cover entire Lahore City. At present they are working in the areas including Cavalry Ground, Lahore Cantonment Ward No. 4, Super Town and localities along Main Walton Road. At present 15 bags per house per month are being provided for which charging rate is Rs. 100 per house



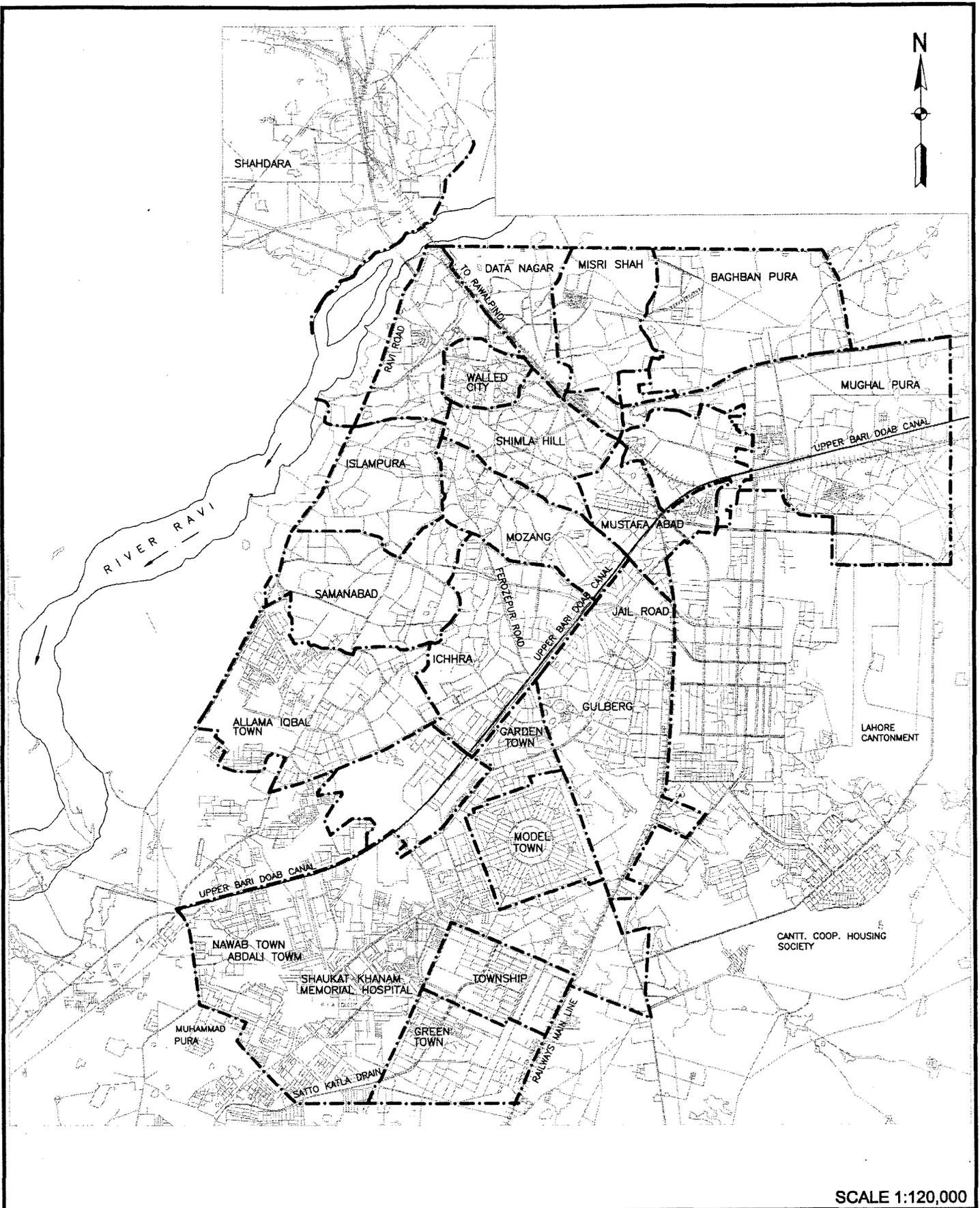
SCALE 1:400,000

LEGEND:-

-  PROPOSED LANDFILL SITES
-  EXISTING OPEN DUMPING SITES
-  LMA BOUNDARY
-  MUNICIPAL ZONE

SOLID WASTE MANAGEMENT IN LAHORE METROPOLITAN AREA

Fig: 10.8



SCALE 1:120,000

LENGEND:-

SUB-DIVISION BOUNDARY - - - - -

ZONES OF EX-METROPOLITAN CORPORATION LAHORE

Fig: 10.9

from high income areas, and Rs. 25 per house from low income areas and their service is limited to collection only. After collection, the solid waste is dumped into nearby skips/containers provided by the City Government and LCB. As mentioned earlier, the City Government and LCB are responsible for ultimate disposal of the solid waste.

10.3.4 Critical Issues

- Only 70% of the solid waste generated is collected by the concerned agencies. The rest finds its way into open drains.
- Solid waste is collected both by manual and mechanical means and is disposed of at un-designated depression areas.
- Only Mahmood Booti site has been acquired for solid waste dumping which is still to be developed as a proper land fill site.
- Hospital and municipal wastes are being collected and dumped in depressions without separation.
- Transportation and disposal of solid waste is carried out in open trucks /vehicles.

10.4 STORM WATER DRAINAGE SYSTEM

Storm water drainage has become a major environmental hazard / civic challenge. The situation becomes worst in the monsoon season which normally extends from July to September. It is not only an issue for the low lying areas but also for the posh areas like Gulberg, Allama Iqbal Town, Garden Town, Model Town etc. Total length of major as well as secondary drains is 180 km.

The storm water drains also function as sullage carriers. A few drains are flowing to their full capacity even in the dry weather and after only a light rainfall these start over flowing. Encroachments along and over the drains have further deteriorated the situation. The dumping of solid waste in the drainage system is very common. Another bottleneck in the operation of the system is the low head clearance of bridges across these drains, which reduces the waterway of the drains thus affecting their capacities.

LCB and LCCHS are maintaining the secondary and tertiary drains in the Cantonment Area. These drains at the moment are functioning as sullage carriers which ultimately join the Mian Mir Storm Water Drain in the Western Cantonment and Rohi Nullah in the Southern Cantonment along with the sewage from sewage pumping stations. MTS does not have separate drainage network. The storm water generally accumulates in the open areas and is ultimately drained through the sewerage system. Private Housing Schemes do not have storm water drainage system. Major drains are shown in Fig.10.10.

10.4.1 Drainage Network

Lahore is comparatively a flat area with a mild slope towards south-western side. There are natural barriers like River Protection Bund along River Ravi, Railway Track which divides the city into Northern and Southern parts and the Canal which runs east-west and is situated on the ridge. The following five main natural drainage channels run on the lowest contours and finally discharge into River Ravi:

1. Upper Chotta Ravi (Northern Area)
2. Lower Chotta Ravi (North Western Area)
3. Sukh Nehr (North Eastern Area)
4. Mian Mir (Central Area)
5. Sutto Katla-Hudiara Drain (Southern Area)

Besides, WASA constructed drainage channels in Shahdara and Allama Iqbal Town. The rest of the channels are secondary drains and are discharged into the above five natural drains and two man made drains. The details are given in Table 10.13.

10.4.1.1 Upper Chotta Ravi Channel

Its catchment area is about 5,250 acres. WASA has recently constructed a drainage pump station at Shadbagh for northern area along with 8,950 Rft. conduit to drain out western side and 12,400 Rft. open drain to eastern side. A number of secondary drains have been added. During the last rainy season, the drainage system has worked quite efficiently. The cost was Rs. 500 million.

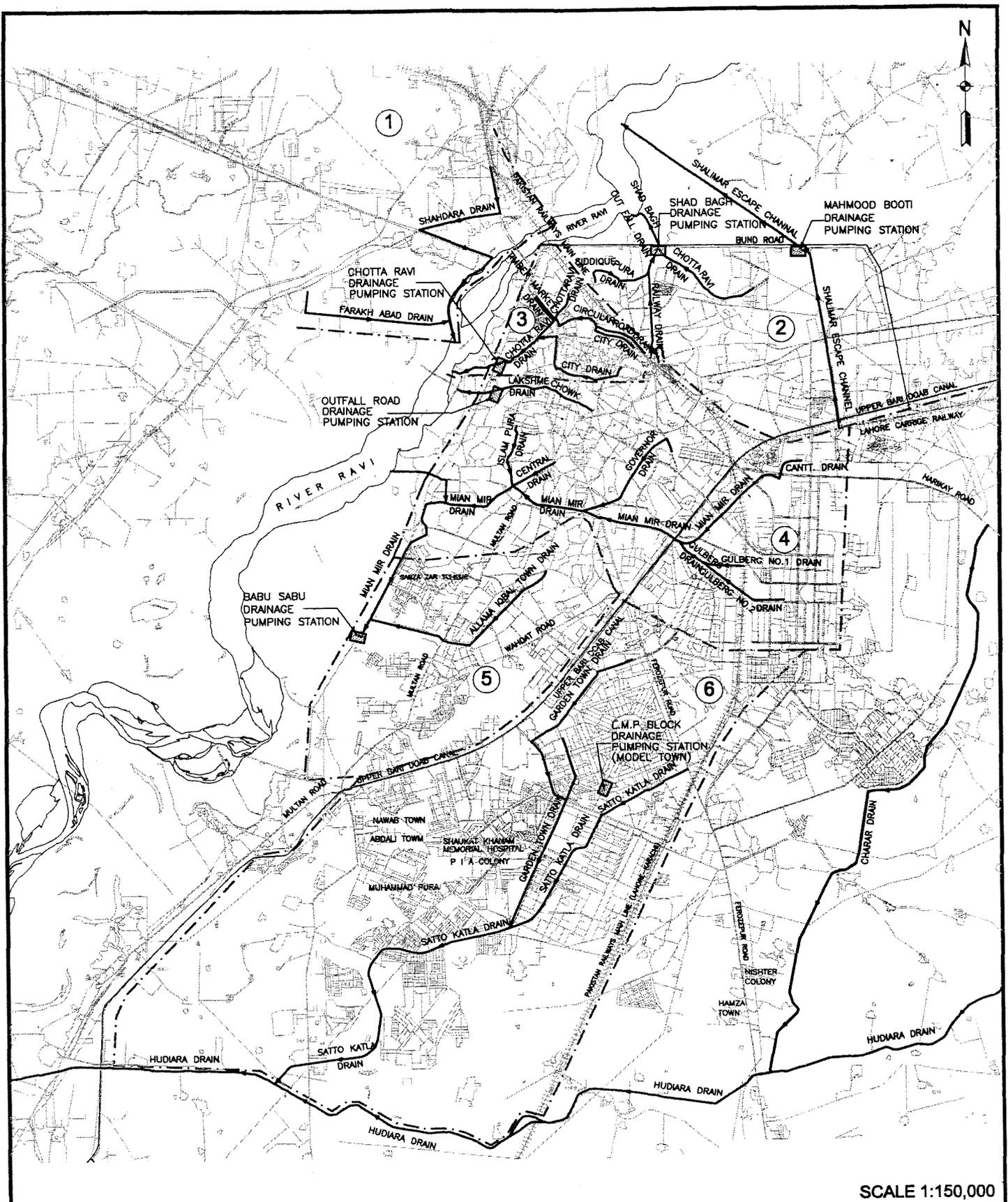
TABLE 10.13
EXISTING DRAINAGE SYSTEM CAPACITY

Main Drains	Size	Length (Rft.)
Upper Chotta Ravi Drain East	17'x 9'	8,950
Upper Chotta Ravi Drain West	26'x10'	12,400
Lower Chotta Ravi Drain	16'x6'	11,500
Sukh Nehr Drain	10'x8'	16,500
Mian Mir Drain	40x5	63,500
Satto Katla Drain	40x10	56,000
Shahdara Drain	8'x4'	13,500
Allama Iqbal Town Drain	12'x6'	14,000
Total		185,750
Secondary Drains		515,222

Source: WASA, June 2001. (WASA has calculated their total capacity as 6,474 cusecs).

10.4.1.2 Lower Chotta Ravi Channel

The catchment area of this channel is about 1,800 acres. Presently it is being used as sullage drain and practically is running full even during dry weather. Encroachments/ construction all along the drain on its both sides have made cleaning operations impossible. It is also practically a solid waste dumping place. Mainly the sewerage of Walled City is disposed of through this drain. WASA has implemented Lahore Walled City Circular



SCALE 1:150,000

- ① SHAHDARA DRAINAGE DISTRICT
- ② UPPER CHOTTA RAVI DRAINAGE DISTRICT
- ③ LOWER CHOTTA RAVI DRAINAGE DISTRICT
- ④ MIAN MIR DRAINAGE DISTRICT-I
- ⑤ MIAN MIR DRAINAGE DISTRICT-II
- ⑥ SATTO KATLA DRAINAGE DISTRICT

LEGEND:-

CATCHMENT BOUNDARY - - - - -

DRAIN —————

DRAINAGE PUMPING STATION □

EXISTING DRAINAGE SYSTEM

Fig: 10.10

Road Sewerage and Drainage Improvement Project costing Rs. 528.555 million, which would provide substantial relief to the drainage problems of northwest area.

10.4.1.3 Sukh Nehr

The Shalimar Escape Channel (Sukh Nehr) is the natural drainage channel flowing from south to north in the North East Drainage District. Originally it was 150 ft. wide channel which, with the passage of time, was badly encroached by registered (not recognized) Sukh Nehr Katchi Abadi having 2,410 dwelling units over 842 kanals of land, which obviously reduced the width from 150 feet to 10-20 feet only along the 80% of the entire length. WASA had planned to remodel this channel. Provisions were made in the ECNEC approved Punjab Urban Development World Bank Project Cr.1895 Pak. At the time of its revision in 1994, this particular provision was dropped, due to unknown reasons. For effective rain water drainage of North East Area, there is an immediate need for taking up a project for remodeling of entire reach of Sukh Nehr Channel along with its secondary and tertiary drains. The possibility of shifting of Sukh Nehr Katchi Abadi also needs to be examined.

10.4.1.4 Mian Mir Channel

This is a natural drainage channel passing through the Central Area. The catchment area is 32,500 acres. This is the area where acute drainage problem exists particularly during the rainy season. At present the stagnation time in this area is more than 12 hours for average rainfall intensity.

Central drain is a secondary drain of Mian Mir Channel and caters for central area of Lahore such as Lakshmi Chowk, Dil Muhammad Road Gwalmandi, Nila Gumbad, Maclagon Road, Shahahe-Quaide-Azam, Purani Anarkali, Nabha Road, Link Road etc. (these areas are normally submerged with rain water). This drain passes through congested areas and is covered at a number of places. The erratic flow in the Mian Mir Drain due to the disposal of sewage by Gulshane-Ravi and Multan Road Pump Station, the Central Drain does not flow properly. At present most of the secondary drains do not function properly due to silting up of the main drain. The rehabilitation of Mian Mir drain along with Central Drain is a work of the highest priority. There is available slope of 40.477 ft from Juray Pull to new Babu Sabu Drainage Station in a total length of 63,500 Rft of Mian Mir Channel (average available slope is 1:1568). At RD 41,500 and RD 63,500, WASA is pumping design discharge of 320 cusecs and 160 cusecs of sewage through Gulshane-Ravi and Multan Road Pump Stations into the Mian Mir Channel respectively which, badly affects the flow (at the time of rain) in the channel. As a matter of fact, both the pump stations must discharge into the channel across the Bund Road.

10.4.1.5 Satto Katla Drain

Its catchment area is 33,500 acres and discharges into Hudiara Drain which ultimately falls in River Ravi. More than 100 feet wide seepage drain is the only means of disposal of rain water for the Southern Area of Lahore. Its rehabilitation was done by WASA in 1982-85. Its periodic maintenance is required. The City of Lahore has expanded towards south-west. About 250 new private (approved and unapproved)/ Government Housing Schemes are in the process of development in the south of Lahore. Looking at the future requirements, efforts should now be initiated for rehabilitation of Main Drain.

10.4.1.6 Shahdara Drain

During eighties, WASA constructed drainage channels for Shahdara area for a catchment area of 4,500 acres. Rehabilitation /extension of these drains is required. Solid waste dumping into the channel has considerably reduced their capacity, which needs to be attended.

10.4.1.7 Allama Iqbal Town Drain

Its catchment area is 3,500 acres and was constructed by WASA during seventies. There is a need to add secondary drain to use this drain effectively.

It has been observed that during the seventies, the drainage aspect could not find its priority and has been ignored. In order to assess the true future requirements of proper drainage facilities, the Sub-Division of WASA has been examined as shown in Table 10.14.

10.4.2 Operation and Maintenance

Operation and Maintenance of the drainage system is managed by WASA. 52% drains are cleaned mechanically and 48% manually. Since solid waste dumping is very common, these drains get silted up quickly and can not accommodate storm water. Due to the encroachments, there are certain reaches of the drains where cleaning is not possible at all. In addition to this, the capacity of the drains at these reaches is inadequate due to the narrow section which causes overflow / heading up in the upper reaches.

10.4.3 Drainage Pumping Stations

The drainage system is not only catering for the storm water but it also acts as a sullage carrier. The interlinking of each drainage system with the

related pumping station and pumping capacities are provided in Tables 10.15 and 10.16.

**TABLE 10.14
STATUS OF DRAINAGE SERVICES IN
WASA OPERATIONAL SUB-DIVISIONS**

S.NO.	SUB-DIVISION	POPULATION 2001	% OF AREA UN-SERVED
1.	Data Nagar	187,306	30 %
2.	Misri Shah	369,996	50 %
3.	Baghban Pura	440,935	80 %
4.	Mughal Pura	560,912	90 %
5.	Ravi Road	264,267	80 %
6.	City	177,068	-
7.	Shimla Hill	183,548	60 %
8.	Mustafa Abad	116,216	50 %
9.	Shahdara	348,331	50 %
10.	Allama Iqbal Town	291,417	80 %
11.	Krishan Nagar	283,324	60 %
12.	Mozang	115,705	50 %
13.	Samanabad	385,682	80 %
14.	Gulberg	223,023	90 %
15.	Ichhra	279,378	70 %
16.	Garden Town	161,064	80 %
17.	Township	102,833	80 %

10.4.4 Critical Issues

- Dumping of solid waste in the drainage system is very common. The storm water drains also function as sullage carriers. After a slight rainfall these start over flowing.
- Encroachments along and over the drains and low head clearance of bridge across these drains have reduced the waterway of the drains affecting their capacities.
- Due to non-existence of right of way, it is difficult to properly clean the drains.
- 52% of the drains are cleaned mechanically and 48% manually.
- Disposal of sewage and industrial wastes and dumping of solid waste into storm water drains is causing reduction in their capacities and source of pollution and environmental hazards.

TABLE 10.15
STORM WATER DRAINAGE PUMPING STATIONS

S. No.	DRAINAGE SYSTEM	DRAINAGE PUMPING STATION
1.	Upper Chotta Ravi Drainage System	Mahmood Booti and Shad Bagh Pumping Stations
2.	Lower Chotta Ravi Drainage System	Chotta Ravi Pumping Station
3.	Lakshmi Chowk Drain	Outfall Road Pumping Station
4.	Mian Mir Drainage District – I	Babu Sabu Pumping Station
5.	Mian Mir Drainage District – II	Babu Sabu Pumping Station

Source: WASA, June 2001.

TABLE 10.16
CAPACITY OF DRAINAGE STATIONS

S.No.	LOCATION	INSTALLED PUMPING CAPACITY (cfs)	DETAIL OF INSTALLED MACHINERY	
			CAPACITY (cfs)	No.
1	Babu Sabu	100	25	4
2	Chotta Ravi	100	25	2
			10	5
3	Shad Bagh (New)	213	71	3
4	Mehmood Booti	150	25	6

Source: WASA, June 2001.

11.0 PUBLIC UTILITIES

11.1 ELECTRICITY

Water & Power Development Authority (WAPDA) is the agency responsible for installation, operation, maintenance, upgradation and augmentation of the electricity network. LMA has a total of 1,189,539 consumers as of December, 2000 which include 75% residential, 22% commercial and 3% industrial consumers. The electricity is supplied through an interconnected 132 kV system comprising of 38 Nos. 132/11 kv, grid stations (as shown in Figure 11.1).

The existing system of power supply reveals that the network is relegating towards inefficient operational level and there is an imperative need for regular reinforcement and rehabilitation programmes for better service. A brief review of the present picture is as under:

11.1.1 Grid Stations

The power is supplied to LMA from a 500/220 kV substation located near Sheikhpura through 3 Nos. 220/132 kV stations (Ravi, Bund Road and Kot Lakhpat) and 38 Nos. 132/11 kV grid stations as shown in Figure 11.1. The above grid stations in turn are supplied from hydel generation in the north and thermal generation in south of the country through interconnected 500 kV and 220 kV networks.

The total installed capacity of 132/11 kV grid stations in the Lahore Metropolis is 2106 MVA with a maximum demand of 1567 MVA (1254 MW) in the year 2000. The power demands on grid stations are well within the installed capacities of respective grid stations.

The grid stations and transmission systems of WAPDA generally suffer from lack of proper tools and plants for maintenance purposes, inadequate protection meeting international standards which contribute towards system break-down with loss of supply. This deficiency and shortfall needs to be catered for.

11.1.2 11 kV Distribution System

The distribution system of LMA primarily constitutes 11 kV lines emanating from 132/11 kV grid stations, supplying low voltage systems through distribution transformers. There are 377 feeders of 11 kV with 4,065 km length. The system is primarily overhead consisting of 11kV lines which are generally overloaded resulting in high technical losses.

11.1.2.1 Distribution Transformers

Standard pole-mounted transformers of different kVA ratings are employed for general supply. Most of the pole-mounted transformers do not have properly sized drop-out fuses as required for adequate protection of the transformers. This combined with transformer overload and unbalance load often causes transformer burn-out or breakdown. Repairs or replacements of such transformers take considerable time.

11.1.2.2 Low Voltage System

The low voltage system consisting of 400/230 volts, like the 11kV system also suffers from overloads, under voltages, excessive losses, tilted or un-earthed structures and close proximity to buildings in congested areas/Walled City exposing consumers to accidents. In addition, the three phase loads are unbalanced. The above problems need to be attended through proper planning, adequate maintenance etc.

11.1.2.3 Service Connections

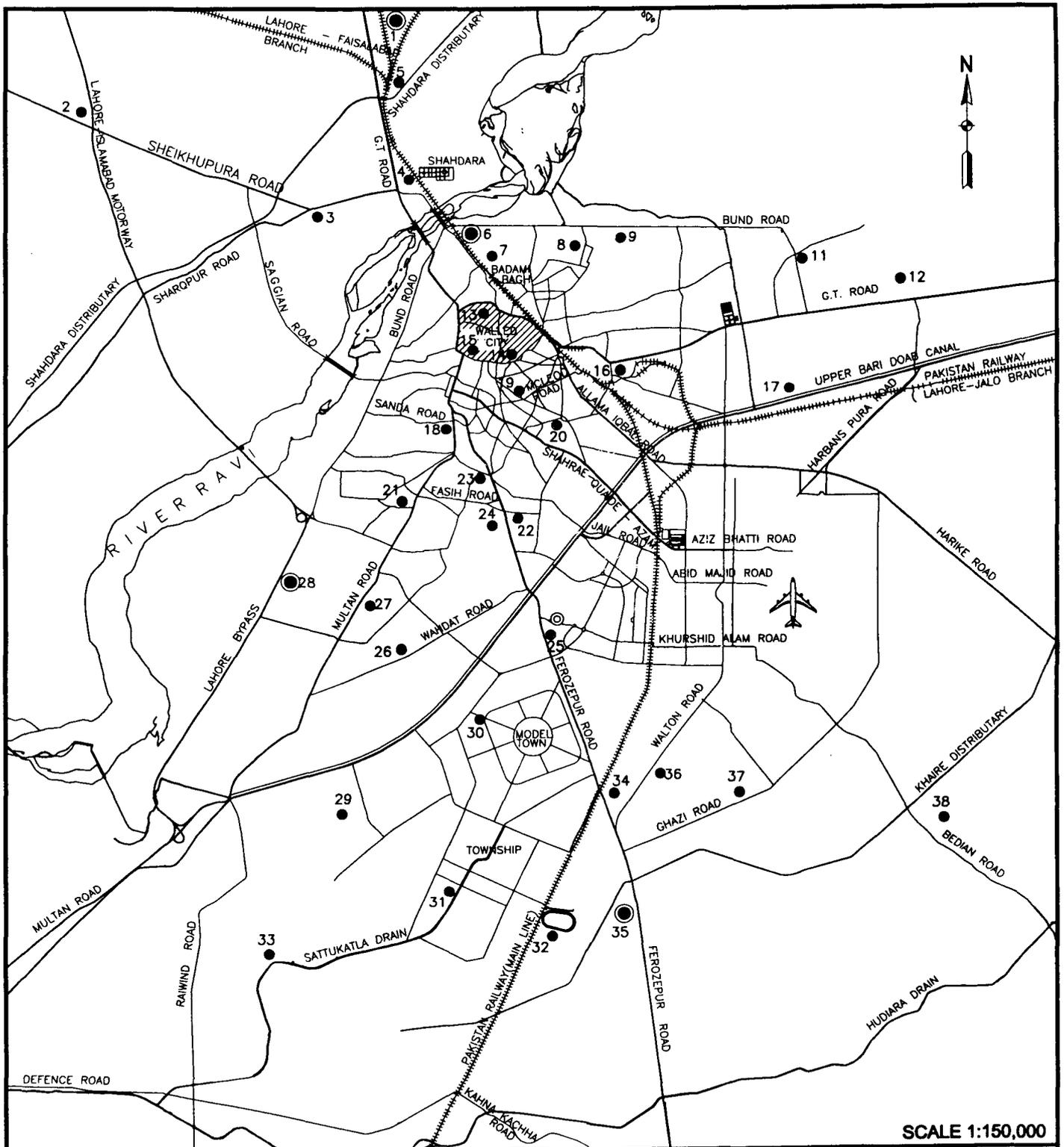
WAPDA charges Rs. 4,300 for single phase and Rs. 11,400 for three phase as connection fees from new customers. Service connections to consumers are made directly from the overhead lines without proper clamps with loose connections resulting in increased losses and voltage fluctuation to the annoyance of consumers. Meters to monitor the energy consumption of consumers are often damaged or defective resulting in increased commercial/non-technical losses with loss of revenue to WAPDA.

11.1.2.4 Tariff

The electricity tariff applicable to different categories of consumers is given in Table 11.1.

11.1.3 Street Lights

Street lights are fed through WAPDA network either through independent transformers specially for street lights or through distribution transformers for general supply. Majority of the street light fixtures are mounted on WAPDA poles and maintained by ex-MCL (now the City Government). There are a total of about 120,000 street light fixtures in the city. On certain roads and bridges, street light mountings are installed and maintained by other agencies such as TEPA and Provincial Highway Department. Most of the light fittings, lamps, chokes and switches are required to be replaced, and conductors and cables also need to be strengthened.



GRID STATIONS:

- | | | |
|-----------------|-----------------------|---------------------|
| 1. United Steel | 15. Bhaati Gate | 29. Jauhar Town |
| 2. Green View | 16. PWR | 30. Model Town |
| 3. Rustam Park | 17. Fateh Garh | 31. Township |
| 4. Shahdara New | 18. Riwas Garden | 32. Lefo |
| 5. Shahdara P/H | 19. McLeod Road | 33. Wapda Town |
| 6. Ravi Road | 20. Sunny View | 34. Old Kot Lakhpat |
| 7. Badami Bagh | 21. Gulshan Ravi | 35. New Kot Lakhpat |
| 8. Chah Miran | 22. Shadman | 36. Wallington Mall |
| 9. Bhogiwal | 23. Qurtaba Chowk | 37. D/Colony |
| 10. Chongg | 24. Rahman Park | 38. Ghazi Road |
| 11. Shalimar | 25. Garden Town | |
| 12. Batapur | 26. Allama Iqbal town | |
| 13. Fort | 27. Said Pur | |
| 14. Mochi Gate | 28. Bund Road | |

LEGEND:

- 220/132/11 KV Grid Station
- 132/11 KV Grid Station

**GRID STATIONS
IN LAHORE**

Fig: 11.1

**TABLE 11.1
ELECTRICITY TARIFF APPLICABLE TO DIFFERENT
CATEGORIES OF CONSUMERS**

a) General Supply (A-1)

Particulars	Consumption during the month (KWH)	Energy Charges Ps/KWH	F.A.S. Ps/KWH	Additional Surcharges Ps/KWH
i) For supply to residences, places of worship, approved religious and charitable institutions; and Government sponsored educational institutions, hospitals and dispensaries, etc.	For First 50 Units	54	7	73
	For next 51-100 units	68	7	131
	For next 200 Units (101-300)	77	15	202
	For next 700 Units (301-1,000)	110	75	320
	For next 3,000 Units (1,001-3,000)	147	75	415
	Above 4,000 Units	147	75	400

b) General Supply (A-2)

Particulars	Consumption during the month (KWH)	Energy Charges Ps/KWH	F.A.S. Ps/KWH	Additional Surcharges Ps/KWH
For supply to all government and semi-government offices and institutions; commercial offices and commercial establishments such as shops, hotels, restaurants; private hospitals, clinics and dispensaries; places of entertainment like cinemas, theatres and club; rest houses and government lodges; private educational institutions; offices of lawyers, solicitors, law associates and consultants etc.	For First 100 Units	217	75	354
	Above 100 units	241	75	384

c) Industrial Supply (B-1) & (B-2)

Particulars	Fixed Charges Rs/Kw/month	Energy Charges Ps/KWH	F.A.S. Ps/KWH	Additional Surcharges Ps/KWH
For sanctioned load Up to and including 40 kilowatts. (B-1)	Up to 40 Kw (at 400 volts)	119	75	207
For sanctioned load 40 kilowatts and up to and including 500 kilowatts. (B-2)	41 to 500 Kw (at 400 volts normal)	68	75	241

11.1.4 Restructuring of WAPDA

It is learnt that Government of Pakistan is implementing a programme for the restructuring of WAPDA and Corporatization/ privatization of power sector. According to a strategic plan, the programme involves establishment of WAPDA Power Holding Company, the corporatization and commercialization of existing facilities into

operating subsidiaries of WAPDA, which may be followed by privatization of corporatized entities.

11.1.5 WAPDA Criteria for Electrification of New Housing Schemes

According to the new criteria enforced by WAPDA for the electrification of new housing schemes, the design of each scheme shall be prepared by a consultant registered with Pakistan Engineering Council. Irrespective of the fact that the electrification works are to be carried out through WAPDA's approved contractor or by WAPDA itself on deposit basis. WAPDA shall charge a fee @ 4.5% of the electrification cost of the housing scheme. This fee is charged at three different stages i.e. 1.5% for the approval/ vetting of design, 1.5% for inspection of material and 1.5% for the inspection of electrical works. In addition WAPDA shall also charge an amount of Rs. 2,732 /Kw against the ultimate load of the housing society, as trunk infrastructure cost, also known as grid sharing cost. For a housing scheme of moderate size i.e. 500 kanals, the grid sharing cost above runs into millions.

The development process is discouraged on account of the exorbitant overheads being charged by WAPDA, though in the process it also acquires all the materials including transformers used by the developers for providing the complete electrification system in a colony. No doubt it also negates the government policies for providing affordable housing facilities to the middle and low income groups.

11.2 GAS SUPPLY

Supply of natural gas for fuel consumption is the principal activity of Sui Northern Gas Pipelines Limited (SNGPL), which is under the control of Ministry of Petroleum and Natural Resources, Government of Pakistan. The company has its head office at Lahore and 8 regional offices, 6 of which are in the Punjab and 2 in NWFP.

11.2.1 Transmission

The gas distributed and supplied by SNGPL comes from Sui and Potohar Gas Fields. The supply in the whole SNGPL network up to March, 2001 was 26.7 million cubic metres (mcm) per day i.e. 941 million cubic feet per day (mcf) which has now been augmented to a total supply of 30 mcm (1050 mcf).

About 143 km long 45 cm (18") dia pipeline between Sahiwal and Lahore transmits over 4 mcm (140 mcf) gas to Lahore. Another 72 km long 75 cm. (30") dia transmission pipeline connects Qadirabad gas field to the existing transmission system at Bhong, which injects 7 mcm (250 mcf) gas into the system.

11.2.2 Distribution

The existing distribution network consisting of distribution mains and service lines varies from 2.5 cm to 45 cm (1" to 18") dia pipelines. Within Lahore Region, there are 6213 kms of distribution mains (Figure 11.2) and 2215 kms of service lines which share about 26% of the overall distribution network of SNGPL. During the fiscal year 2000-2001, SNGPL planned to lay more than 270,000 metres of distribution lines in various housing schemes in Lahore. Meter installation target for the year 2000-2001 was 31,522, out of which 25,497 gas connections have been provided till the end of March, 2001.

11.2.3 Consumption

Major portion of the revenue (52%) generated by the Company through gas sales comes from the industrial consumers. The sale for the year (1999-2000) was 34,252,285 Hm³ (21,575 mmcf) with a total revenue of Rs. 10,791 million.

During 1999-2000, total number of consumers in Lahore Region was 0.54 million which increased to 0.56 million by the end of March, 2001. During the same period, the number of customers (those who have applied for gas connection) was 100,701 which included 27,751 (27% of total) from Lahore Region. By the end of March, 2001 the type of consumers in Lahore were 0.17% industrial, 2.11% commercial and 97.72% residential.

11.2.4 Growth

Gas sales are growing at the annual rate of 7.65% for domestic use, 15.56% for industrial and 5.37% for commercial uses giving an overall growth of 12.3% per annum. Similarly the gas transmission system is expanding @ 2.05% per annum while the distribution mains and service connections are expanding @ 5.07% giving an average growth rate of 4.63% per annum.

Number of consumers is increasing at an annual rate of 7.83% while the number of customers are increasing @ 8.0% per annum. The prospective consumers for domestic use are increasing @ 8.0% per annum while commercial use is registering an increase @ 4.64% whereas industrial use has recorded an increase of 14.3% over the previous year.

SNGPL is expanding its distribution network within LMA as the city expands and the demands are established. Gas distribution network and service connections are growing three times as compared to the average population growth. This gives an indication of the fast changing pattern of urban living. The expansion programme by the

company is facing certain limitations/constraints which are in the form of limited funds, acute shortage of trained staff, lack of material, absence of proper planning etc. There is a need to overcome these problems to enhance the efficiency of the company.

11.2.5 CNG/LPG

Up to March 2001, there were a total of 146 CNG Stations established within SNGPL controlled area, out of which 23 were established in Lahore and 77 in Islamabad. The average daily sales of CNG stations in Lahore is 222 Hm³ whereas in Islamabad it is 2049 Hm³. The total CNG sale is only 1.33% of the total SNGPL sales.

The total average LPG sales are 6.33 million tons per day whereas within SNGPL area approximately 9,000 domestic / commercial cylinders are sold every month. The approximate sale of cylinders in Punjab is around 7,500 per month.

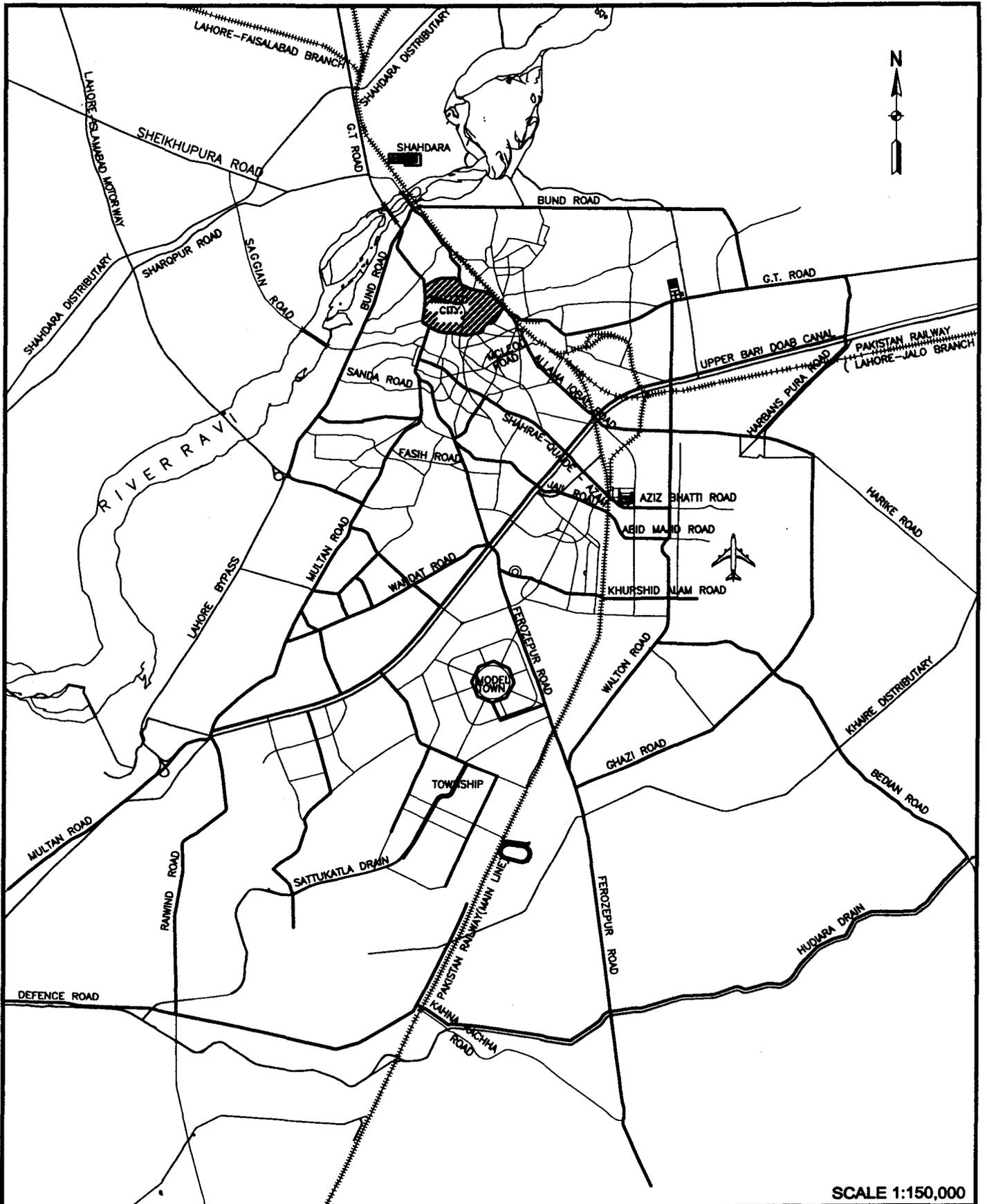
11.3 TELEPHONE

The existing telecommunication system in the country is operated and maintained wholly by the Pakistan Telecommunications Corporation Limited (PTCL). The Lahore Telecommunication Region (LTR) consists of two administrative regions; LTR (North) and LTR (South). Each region has a number of telephone exchanges under its jurisdiction.

There are a total of 82 telephone exchanges at 31 locations scattered around Lahore (refer Table 11.2 and Figure 11.3) with installed capacities ranging between 604 and 67,024 connections. The total capacity of these exchanges is 613,369 while 497,346 connections (81% of total capacity) have been provided. There is a pending demand of 16,700 connections which can easily be met from within the available capacity. More than 85% of the available capacity is installed in digital type exchanges.

Timely provision of new lines in the congested inner city areas is a critical problem due to considerable delays in obtaining construction permission from the concerned local authorities. There is also a lack of coordination between the various agencies dealing with public utilities (i.e. gas, water, sewerage, electricity, telephone etc.) and due to the lack of up-to-date information regarding the physical routing of electricity cables and water supply pipelines etc., this situation is further aggravated. As a result there are protracted delays in the provision of necessary connections required between exchanges as well as from exchanges to the subscribers.

The existing set-up for receiving customer complaints and responding to service calls needs considerable improvement. PTCL is currently procuring consultancy services to advise and recommend improvements in this system.

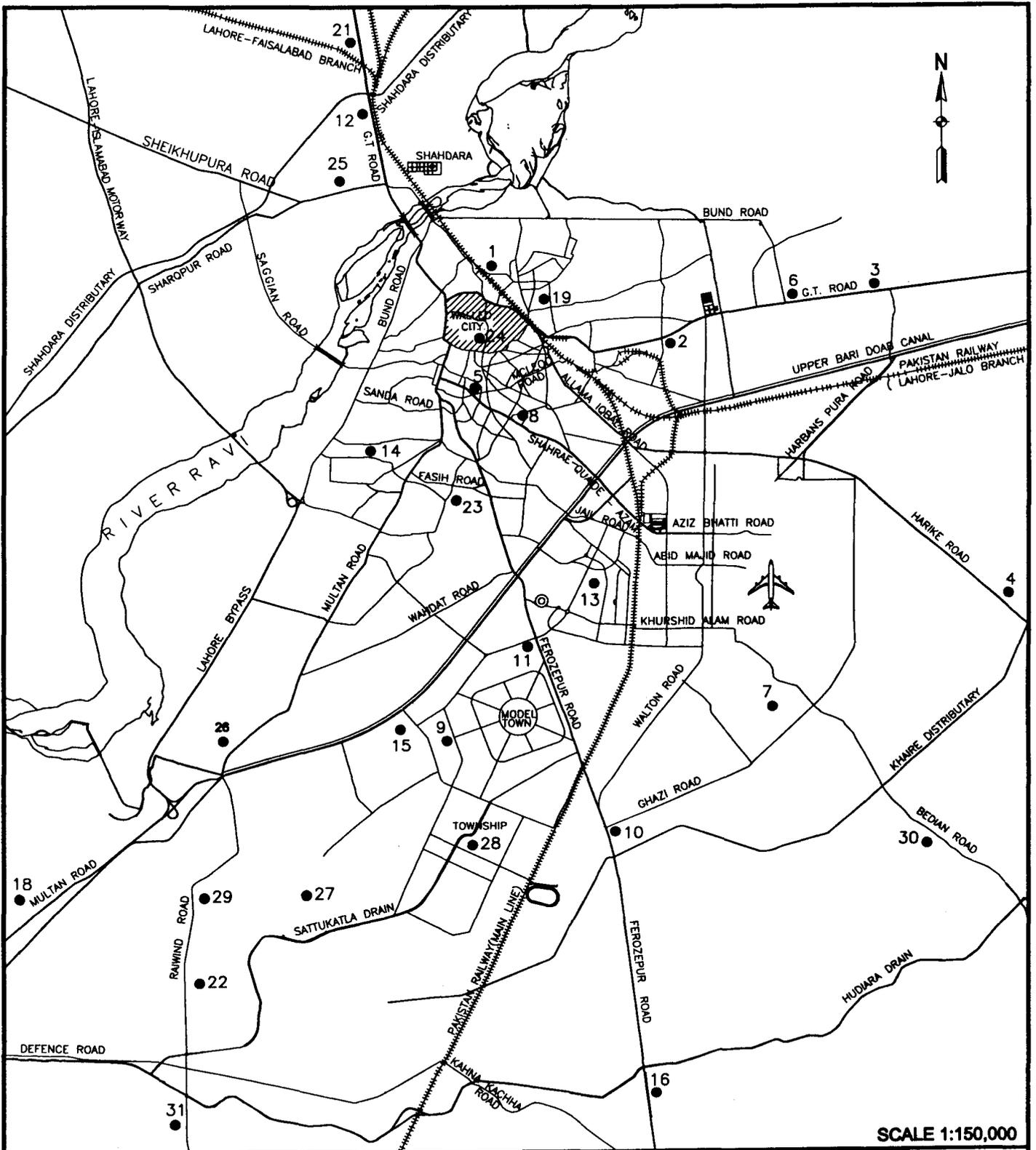


LENGEND:-

SUB-DIVISION BOUNDARY ———

**GAS SUPPLY
MAIN DISTRIBUTION NETWORK**

Fig: 11.2



TELEPHONE EXCHANGES:

- | | | |
|--------------------|--------------------|----------------------|
| 1. Badami Bagh | 13. Gulberg | 25. Shahdara |
| 2. Baghbanpura | 14. Gulshan Ravi | 26. Thokar Niaz Baig |
| 3. Batapur | 15. Johar Town | 27. Wapda Town |
| 4. Burki | 16. Kahna Nau | 28. Township |
| 5. C.T.H | 17. Lahore Cantt. | 29. Ali Razabad |
| 6. Daroghawala | 18. Maraka | 30. Har Bedian |
| 7. Defence | 19. Misri Shah | 31. Mal |
| 8. Egerton Road | 20. Multan Road | |
| 9. Faisal Town | 21. Muridke | |
| 10. Ferozepur Road | 22. Mustafa Town | |
| 11. Garden Town | 23. Samanabad | |
| 12. Green View | 24. Shahalami Gate | |

LEGEND:

- TELEPHONE EXCHANGES

LOCATION OF TELEPHONE EXCHANGES IN LTR

Fig: 11.3

TABLE 11.2
EXISTING TELEPHONE EXCHANGES IN LAHORE

S.No.	Site	Exchanges	Total Capacity	Spare Capacity	
				No.	%
1.	Ali Razabad	1	2000	670	33.5
2.	Badami Bagh	2	21008	5517	26.2
3.	Baghbanpura	3	50004	10393	20.7
4.	Batapur	1	4000	1376	34.4
5.	Burki	1	1402	462	32.9
6.	C.T.H.	4	67024	9994	14.9
7.	Daroghawala	2	18916	3638	19.2
8.	Defence	3	24828	6161	24.8
9.	Egerton Road	5	34202	15029	43.9
10.	Faisal Town	2	15828	4071	25.7
11.	Ferozpur Road	3	14706	2517	17.1
12.	Garden Town	5	39026	7450	19.1
13.	Green View	1	1820	930	51.1
14.	Gulberg	4	33688	8290	24.6
15.	Gulshane Ravi	3	20916	1461	7.0
16.	Har Bedian	1	912	387	42.4
17.	Johar Town	1	4094	510	12.4
18.	Kahna Nau	1	5454	1828	33.5
19.	Lahore Cantt.	4	30854	4379	14.2
20.	Mal	1	604	268	44.3
21.	Maraka	1	1820	523	28.7
22.	Misri Shah	5	32601	5302	16.2
23.	Multan Road	4	23330	3674	15.7
24.	Muridke	2	6000	2125	35.4
25.	Mustafa Town	3	18716	590	3.1
26.	Samanabad	6	56300	8716	15.4
27.	Shahalami Gate	4	31956	231	0.7
28.	Shahdara	3	19128	2495	13.0
29.	Thokar Niaz Baig	1	4550	2216	48.7
30.	Wapda Town	1	5760	1185	20.5
31.	Township	4	21922	3635	16.5
Total		82	613,369	116,023	18.9(average)

Source: PTCL, June 2001.

12.0 FLOODS

According to the Indus Water Treaty, the water rights of Sutlej, Beas and Ravi Rivers were given to India and those of Chenab, Jhelum and Indus Rivers remained with Pakistan. India is, therefore, diverting most of the Ravi flows at the Madhopur Barrage. Recently, India has also constructed a dam, called Thein Dam, upstream of Madhopur Barrage.

The population growth in Lahore with its increasing economic pressure has led to unauthorised encroachments upon the flood plains of River Ravi. In this river low to medium floods of less intensity and frequency have created a 'false sense of security' among the flood plain dwellers and residents in the adjoining neighbourhoods. Some of the existing railway and road bridges, having low water discharge capacity, have added to the complexity of the problem. The degree of constriction imposed by these obstructions can be judged from the fact that the width of flood plain at 4 km (2.5 miles) upstream of Lahore-Rawalpindi Road bridge is about 7.6 km (25,000 ft.), while it is about 610 m (2,000 ft) at the bridge.

12.1 EXISTING FLOOD PROTECTION FACILITIES

The existing river training and flood protection facilities (Figure 12.1) on River Ravi, for protecting the Lahore City and adjoining areas, mainly comprise embankments (bunds) and spurs built on both banks and are briefly described below.

12.1.1 Mahmood Booti Bund

This Bund was constructed in 1952, and was badly damaged during the high flood of 1955. It was then remodelled to have a total length of 8,840 m and top width of 12 m. During the 1981 flood, the river loop eroded its foreshore endangering the safety of the Bund. A hockey spur (983 m long) and a solid stone spur (1050 m long) were constructed to keep the meandering channel away from the bund. This Bund provides protection to the north-eastern area of Lahore City.

12.1.2 Lahore Protection Bund

This Bund (7.6 km long) was constructed during the early 1950s (Figure 12.1) and was breached during the exceptionally high flood of 1955 whereafter it was strengthened and remodelled. Heavy damages to the Bund occurred during the floods of 1973 and 1976 and it was subsequently repaired.

In 1982, the river developed a sharp loop towards the left downstream of Shahdara Bridge and reduced the distance of the main river creek from Lahore Protection Bund (LPB). Consequently, five spurs were added during 1984-85 to protect LPB against this trend of the river.

12.1.3 Tie Bund of Lahore Protection Bund

This Bund was constructed on the left bank of the river during 1979-80 to protect suburbs of Lahore beyond Chowk Yatim Khana and Lahore-Chung part of the National Highway (N-5). The Bund and its spurs were damaged during the 1988 flood and have since been restored.

12.1.4 J-Spur of Tie Bund of Lahore Protection Bund

Tie Bund has been constructed along the left bank of River Ravi and is a continuation of LPB (Figure 12.1). It connects the tail of LPB with the high land near Thokar Niaz Baig Village. J-Spur has been constructed along RD 940+1630 of Tie Bund. The spur is 610 m (2000 ft) long with the top width of 7.5 m (25 ft) and side slopes of 3:1.

The spur protects Tie Bund which ensures safety to the southern part of the city and Lahore-Multan Road. During 1996, the bund was damaged seriously by the flood and rainfall.

12.1.5 Spur Near Furrakhabad

Sloping Spur near Furrakhabad was constructed on the right bank of River Ravi downstream of Shahdara Bridge to Protect Furrakhabad Town (Figure 12.1). This mini spur has played an important role in protecting the town from the river floods. The spur is 82 m (270 ft) long with 3:1 side slopes. During the 1997 flood, this spur was seriously damaged and needs repair.

12.1.6 Shahdara Distributory Flood Bund

This Bund forms the most upstream part of flood bunds on the right bank of Ravi near Lahore. It is provided with a breaching section which is blown off when water level in Ravi rises above the design limit. This Bund was breached at a number of places during the 1988 flood and has been restored to original dimensions.

12.1.7 Babakwal Spur

Babakwal Spur (Figure 12.1) has been constructed under Flood Protection Section Project. It is located at RD 39+000/L of Shahdara Distributory Bund, about 610 m (2000 ft) from Babakwal Village. Total length of the spur is 914 m (3000 ft). The top width of the shank of the spur is 6 m (20 ft) with side slopes of 2:1 for pitched portion.

The spur protects Shahdara Distributory Flood Bund and Babakwal Village with agricultural lands and fruit gardens. Presently, the spur lies in a seriously damaged condition. J-head of the spur is incomplete and the shank is also damaged.

12.1.8 Shahdara Flood Protection Bund

This Bund protects Shahdara Town, Archaeological site of Jahangir's Tomb, the Lahore-Islamabad Highway (G.T. Road), the railway lines and adjoining settlements.

12.1.9 Hockey Spur of Shahdara Flood Protection Bund

Hockey Spur is fourth of the five spurs of Shahdara Flood Protection Bund as shown in Figure 12.1. It was constructed in 1959-60 to save the main bund of River Ravi, upstream of railway bridge. This spur ensures the safety of Shahdara Town alongwith rail road communications and local industries. The spur is 991 m (3,250 ft) long and 8 m (25 ft) wide at the top with side slopes of 3:1 and 2:1 respectively. The floods of 1996 and 1997 damaged the spur and caused launching of apron along the entire width of the nose on upstream side. This needs immediate repair.

12.1.10 J-Spur near Shahpur Kanjran

Shahpur Kanjran Spur is located along the left bank of River Ravi, opposite Niaz Baig Village (Figure 12.1). This bund protects the village and Lahore - Multan Road alongwith a number of installations. The total length of the spur is 2,620 m (8,600 ft) with 8 m (25 ft) top width and 3:1 side slopes.

The spur was damaged in early 1997. It was repaired immediately so as to enable it to withstand Monsoon floods. During the Monsoon floods of 1997, the spur was again damaged. The earthen portion was damaged in a length of 107 m (350 ft) from RD 7+250 to RD 7+600. The apron has also been washed away in the reach from RD 7+600 to 8+600. The repair works are pending till today due to shortage of funds.

12.2 BRIDGES ACROSS THE RIVER

There are four existing bridges that span over the river in its most constricted reach. A fifth bridge is also constructed downstream of the Sagian Bridge for the Lahore Bypass/Motorway. Design discharge of both Railway and old highway bridges, commissioned in 1873 and 1866 respectively is $7080 \text{ m}^3/\text{s}$ (i.e. 250,000 cfs), whereas the design discharge of new highway bridge at Shahdara, commissioned in 1967 is $9,910 \text{ m}^3/\text{s}$ (350,000 cfs). The design discharge of recently constructed highway bridges at Sagian and Lahore Bypass/Motorway, commissioned in 1996 and 1997 respectively, is $11,330 \text{ m}^3/\text{s}$ (i.e. 400,000 cfs.). Thus the first two (old) bridges impose a severe restriction to the discharging capacity of the river beneath these structures.

12.2.1 Old Rail & Road Bridges and their Capacities

The Lahore-Rawalpindi Rail Bridge across Ravi when commissioned had 33 number spans in all. The centre to centre distance between piers of a bay is 29.7m (97.5 ft) and the clear waterway is 27.4m (90 ft). In the year

1915, 18 spans were plugged i.e. 15 on Shahdara side and 3 on the Lahore side. Presently, the end spans of the remaining 15 spans are also partially blocked due to construction of 'Bell' type guide banks. Thus 14 spans with each having 27.4m (90 ft) clear waterway are presently available to the flood flows. The existing waterway width is therefore 384m ($14 \times 27.4 = 384$ m), which is sufficient to allow the passage of about 250,000 cfs of flood flow.

The Old Road Bridge (Lahore-Rawalpindi) was abandoned after commissioning of the new Lahore-Rawalpindi (commonly known as G.T. Road) Bridge in 1969. However, the old road bridge was not demolished and is being used by animal driven carts etc. The clear waterway under this bridge is also the same as that of the railway bridge i.e. 384m (1260 ft) corresponding to a discharge capacity of about 250,000 cfs.

12.3 THE FLOODING MECHANISM

As can be noted from the foregoing, the discharge capacities of railway bridge and Shahdara Highway Bridge (old) are limiting the safe flood discharge through the river to a peak value of 7,080 m³/s (250,000 cfs.) In case the incoming flood peak rises above this value, an afflux starts building up on the upstream side of the railway bridge. The water level rises beyond safe limits of the Mahmood Booti and Shahdara Distributary Bunds. As the flow reaches the red line corresponding to about 8,490 m³/s (300,000 cfs,) the breaching section of Shahdara Distributary Bund has to be blown off to reduce pressure on Mahmood Booti Bund that plays a key role in protecting the Lahore City. Part of the flow then escapes through the breach taking a westerly direction. Large built-up areas are submerged under ponding depths varying between 0.9 m and 2.75 m (3 ft and 9 ft.) The excess water flows almost parallel to the river for some distance. Part of the water crosses the railway track and highway through the culverts or by overtopping and moves towards west ultimately taking southerly direction and falling back into the river at a few miles downstream of the city limits. During this process, severe damage to life and property occurs in the settlements on the right bank. Pounded water remains trapped in depressions for several weeks causing health and environmental hazards.

12.4 HISTORIC FLOOD DAMAGES

The city of Lahore has seen two catastrophic Ravi floods during the years 1955 and 1988. The 1955 flood damage was much less than that of 1988. The main reason being the land use which is much more dense and valuable now than during the year 1955. Figure 12.2 shows the flood inundation of River Ravi near Lahore.

The 1988 flood caused un-precedented damages to the city of Lahore and surroundings. All the flood protection facilities were damaged. Some 1200 ha (3,000 acres) of urban settlements (Shahdara and surroundings) on the right bank got inundated, irrigation system was disrupted, communication links were interrupted and life in the city came to a stand-still for several days.

12.5 IMPROVEMENT EFFORTS

12.5.1 Review of Previous Studies

The Technical Committee of the Punjab Flood Commission proposed remodeling of the Old Rail and Road Bridges for a discharge of 400,000 cfs in the year 1976. The Committee also recommended to conduct hydraulic model studies for deciding the optimum design of remodeling works.

A hydraulic model was set-up at the Nandipur Research Station and various experiments were carried out. Results of the study were presented in Irrigation Research Institute (IRI) Report No. 752/Hyd/Shahdara, June 1979. The studies indicated an optimum waterway of 625m (2050 ft). for the Rail and Old Road Bridges, which corresponds to a discharge of 400,000 cfs.

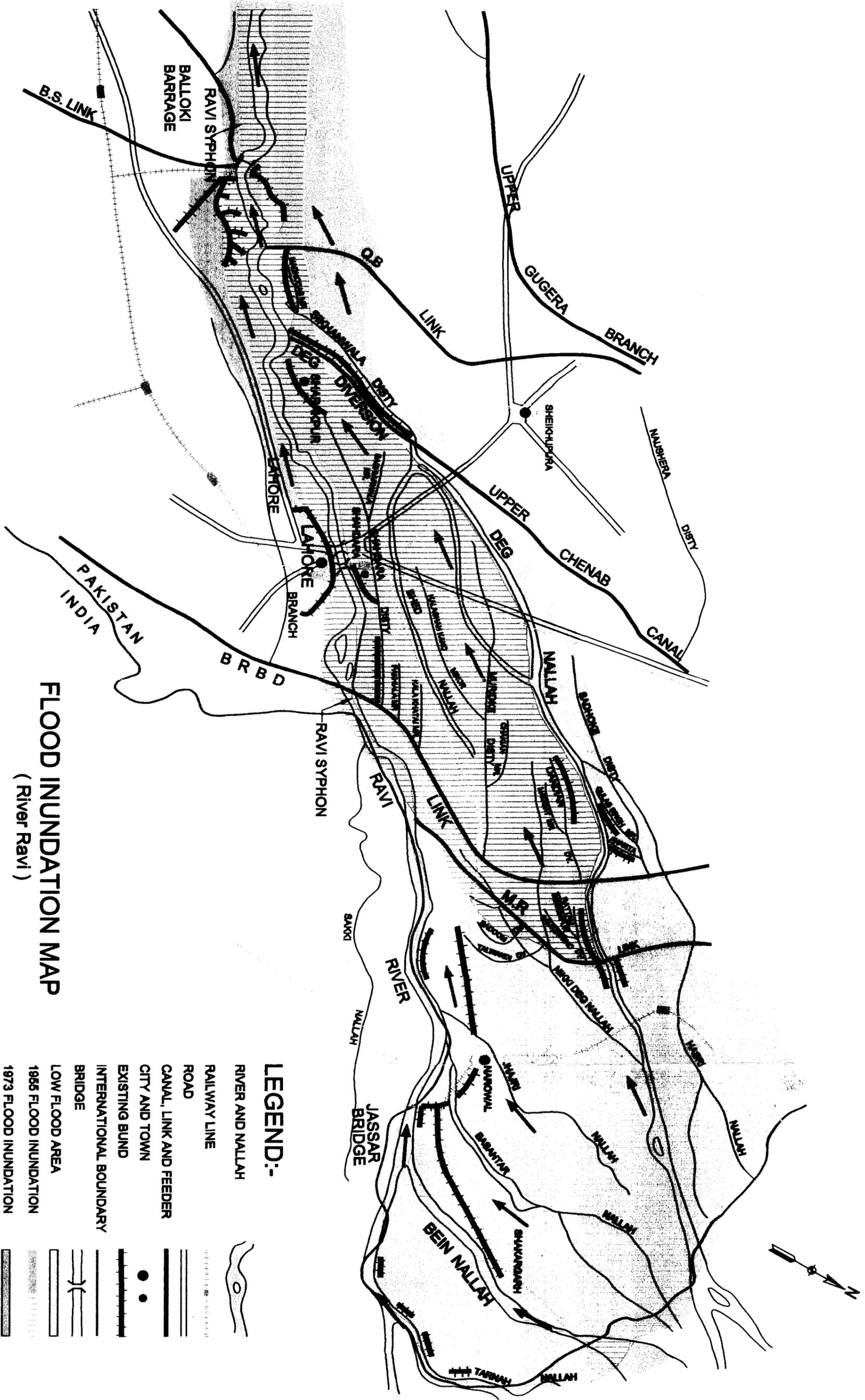
12.5.2 Current Proposals

- The Provincial Irrigation and Power Department has proposed to open/restore 3 spans on the left bank of River Ravi and 5 spans on its right bank to enhance capacity of the old railway bridge to cater for a flood discharge of 350,000 cfs so as to be at par with the discharge capacities of Sagian and Lahore Bypass Bridges.
- The Provincial Irrigation and Power Department is planning to construct a barrage about 15 km downstream of Ravi Syphon at a site where the river has two defined creeks. It is designed to pass a discharge of 450,000 cfs at a cost of about Rs.12.2 billion (inclusive of a land acquisition cost of Rs.7.68 billion). The project is called Lahore Reservoir with an area of about 60 sq. miles and a storage capacity of 0.5 million acre feet. The depth attained near the Syphon will be about 5 feet and a head of 14 feet over the crest at maximum pond level. Width of the marginal bund will be about 150 feet for security and recreational purposes.

This project, if implemented, will have positive effect on recharging the aquifer, providing recreational facilities (with boating, fishing), occasional flushing of the River to clear pollution, etc.

12.6 PROTECTION REQUIREMENTS

The existing flood protection facilities around the city of Lahore have, from time to time, been upgraded during the past 45 years. Crisis provoked adhocism has, however, remained the prime-mover of these endeavours. The immediate flood management needs of Lahore comprise an evaluation of the hydraulic conditions in the related reach of the River in view of the latest developments (Sagian and Lahore Bypass Bridges).



FLOOD INUNDATION MAP
(River Ravi)



- LEGEND:-**
- RIVER AND NALLAH
 - RAILWAY LINE
 - ROAD
 - CANAL, LINK AND FEEDER
 - CITY AND TOWN
 - EXISTING BUND
 - INTERNATIONAL BOUNDARY
 - BRIDGE
 - LOW FLOOD AREA
 - 1966 FLOOD INUNDATION
 - 1973 FLOOD INUNDATION
 - 1988 FLOOD INUNDATION
 - FLOW DIRECTION

Fig: 12.2

13.0 ENVIRONMENTAL CONCERNS

The state of the environment in a city is best described by the water and air quality prevailing in that city. Other possible indicators include the presence (or absence) of proper solid waste management, traffic planning/management, recreational parks and green areas, stormwater drainage etc.

Lahore, which is also called the "City of Gardens" has gone through a rapid deterioration of its environmental conditions due to a number of reasons which are presented in this section, along with a brief review of the existing environmental conditions in the city and a review of the data available with the Environment Protection Department, Punjab (EPD).

13.1 MAIN FUNCTIONS AND RESPONSIBILITIES OF EPD, PUNJAB

The main functions and responsibilities of EPD include, inter alia, the implementation of National Environmental Quality Standards (NEQS), which have been promulgated through the "Pakistan Environmental Protection Act.1997".

The charter of EPD's responsibilities also includes surveillance and monitoring of air and water quality in various parts of the Province of Punjab. EPD has its own testing laboratory to carry out water and wastewater analysis. It also has the services of a Mobile Air Laboratory available to monitor air quality in various cities of Punjab. EPD's main focus of activities in the recent past has mostly been aimed at the urban sector.

13.2 REVIEW OF THE DATA AVAILABLE WITH EPD ON WATER/AIR QUALITY

Various water and air quality surveys in and around the city of Lahore have been carried out by EPD, a preliminary review of which was carried out by NESPAK. The available data on water quality may be subdivided into the following two categories:

- i) Results of surface water/wastewater investigations carried out by the Environmental Protection Agency (EPA)/EPD soon after its inception in 1987 (presented in section 13.2.1)
- ii) The air quality data available with the EPD based on their Air Quality Investigations carried out in various parts of the city (section 13.2.3).

13.2.1 Surface Water/Wastewater Quality Investigations

Various studies have been carried out by EPD to assess the quality of water in River Ravi and its tributaries, which receive almost all the municipal/industrial wastewater from the city of Lahore and the adjacent localities/industrial estates.

River Ravi used to be one of the main sources of fishing and recreation for Lahorites till the 1960's, when the river started getting polluted due to the indiscriminate disposal of municipal as well as industrial effluents. During the dry season, this discharge may exceed the river's own base flow. As Ravi is also one of the sources of recharge to the ground water aquifer of Lahore, the disposal of untreated effluents including toxic metals etc. into the river may have negative impacts on the ground water quality of Lahore.

EPA soon after its establishment in July 01, 1987 started monitoring the water quality of various effluent channels disposing of in River Ravi. A brief review of those investigations/findings is presented as under:

A. Assessment of Pollution Status-Barianwala Drain (March 1988)

Barianwala Drain is a severely toxic wastewater drain running at about 26 km from Ravi Bridge across Lahore-Sheikhupura Road (Figure 13.1). This study was aimed at monitoring the effects of industrial effluents and wastewater from various industries located along Sheikhupura Road. Samples were also collected from Barianwala Drain at various locations starting from its origin upto its outfall into River Ravi.

The report highlights the following salient points about the effects of pollution caused by Barianwala Drain on River Ravi and its surrounding environment:

i) Water Quality of River Ravi

The river has fresh water conditions before receiving effluent from Deg Nala with a Bio-Chemical Oxygen Demand (BOD) value of 17.5 milligrams per litre (mg/l) which increases by about 14 times after the outfall of Barianwala Drain.

ii) Effects of Industrial Effluents on Ground Water Quality

These effects were indicated by an unpleasant taste and odour in drinking water from contamination by nitrates. Inorganic nitrates are potential health hazards for small children, when present in more than the prescribed limits.

iii) Effects of Untreated Effluents on Barianwala Drain.

The bulk of the untreated effluents from the industrial estates when discharged into Barianwala Drain, turn it into a toxic wastewater drain with almost zero dissolved oxygen (DO).

B. Pollutional Position of River Ravi and Its Tributaries

The report on "Pollutional Position of River Ravi and its Tributaries during November and December, 1988" dated August 1989 published by EPD presented the results of monitoring of River Ravi from the point of its entry into Pakistan to its point of confluence with Madunna/Samundri Main Drain, before reaching Sidhnai Barrage. The report lists the discharges and the effluent BOD loadings on the drains receiving discharge from Kala Shah Kaku Industrial Estate and the industries located along Sheikhpura Road.

The net pollution entering the river at various points of entry has also been presented. The discharge of one million cubic metres per day-m³/day (216 mgd) of municipal sewage, quoted in the report is similar to the one projected in a publication¹ by the Institute of Public Health Engineering, University of Engineering and Technology, Lahore, as equal to about one million m³/day (214.2 mgd) for 1990.

The results of the study indicate that from the entry point of the river into Pakistan, to a point upstream of Shad Bagh Disposal Station near Lahore, river water quality was close to fresh water condition, with the DO varying between 9.0 and 8.8 mg/l. However downstream of Shad Bagh Disposal Station, there was a rapid decrease in the DO in the river. This downward trend continued until the confluence of Babu Sabu Outfall, as a consequence of which the DO plunged to a value as low as 1.1 mg/l.

C. NCS Study for Pollution Monitoring of River Ravi

Under the "National Conservation Strategy Project" a field study for monitoring the effects of municipal/industrial effluents in and around the city of Lahore, on the River Ravi water quality, was carried out. The sampling area included a 77 km stretch of River Ravi from Bambanwala Ravi Bedian (BRB) Syphon upto Head Balloki. The actual sampling in the field was carried out between February 18 and March 5, 1996.

This mainstream survey was carried out by a team of NESPAK experts in collaboration with a field team from EPD. A total of fourteen sampling points/stations were established along the river, whereas 13 drain samples were collected representing all the major municipal/industrial effluent drains in and around the city. The

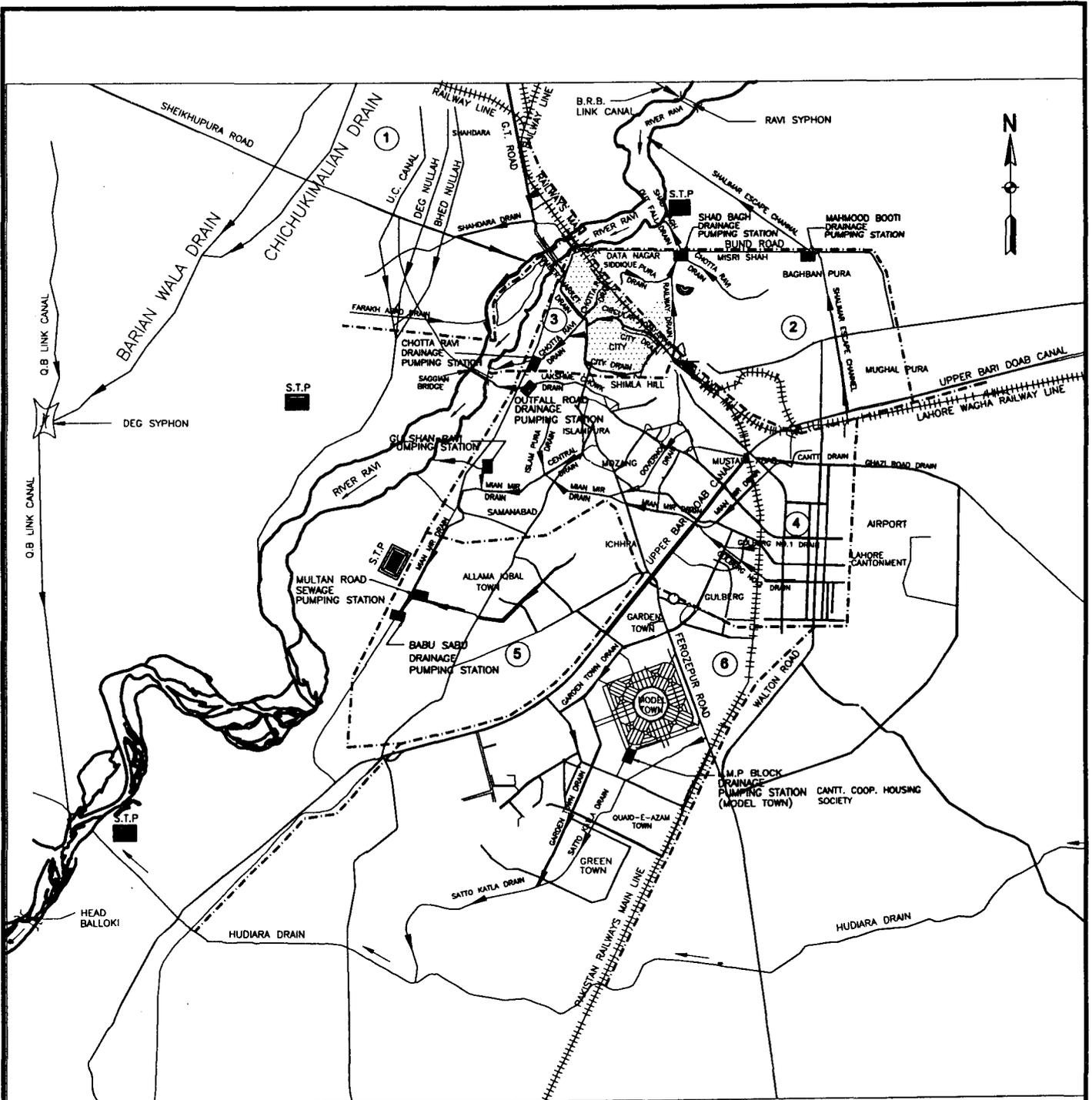
Institute of Public Health Engineering, University of Engineering and Technology, Lahore Reports on Pollution Monitoring of River Ravi (Year 1977-79)

dissolved oxygen curve drawn for various sampling stations along River Ravi is reproduced in Figure 13.2.

The lowest dissolved oxygen was observed after the confluence of Hudiara Drain with the river where the DO was determined to be only 2.6 mg/l (which is less than the minimum desirable value of 4 mg/l to sustain aquatic life in the river). During the field survey, it was estimated that about 18.8 m³/sec of wastewater from the city of Lahore and about 5.8 m³/sec of industrial effluents were entering River Ravi in the selected length of the river. Other major conclusions of the study as provided in the study report include the following:

- i) During a period of low flow in River Ravi (November through March), the quantity of municipal and industrial effluents into the river almost equals the discharge of the river. The construction of Thien Dam across River Ravi by India has further reduced its dry weather flow.
 - ii) Ravi is prone to various sources of pollution i.e. solid waste dumped on its banks, pollution due to cattle dung and illegal settlements along its banks (which are also a threat to the protective bund raised on the northern and western sides of the city after the severe flooding of 1955).
 - iii) Results of the toxic metal analysis indicate that high levels of chromium were present in the Shad Bagh and Main Outfall Drains. The wastewater from Main Outfall had a Chromium content of 1.2 mg/l which exceeded the NEQS of 1.0 mg/l.
 - iv) Among the various wastewater drains running close to the city, Hudiara Drain running on its southern side is one of the most toxic drains which also receives untreated waste from various municipal/ industrial units from India before entry into Pakistan.
 - v) The NCS study also recommended that till the time the proposed wastewater treatment plants are constructed, (which is rather a time consuming and expensive proposition), the flow of River Ravi should be augmented, upstream of Ravi Bridge which can mitigate the extent of pollution to a reasonable extent.
- D. Study of Hudiara Drain by Worldwide Fund for Nature (WWF) in collaboration with EPD and Soil Survey of Pakistan**

Hudiara Drain originates from Batala (District Gurdaspur in East Punjab) and after receiving a number of tributaries from Amritsar area, enters Pakistan near Village Lallo, about 7 km east of



- ① SHAHDARA DRAINAGE DISTRICT
- ② UPPER CHOTTA RAVI DRAINAGE DISTRICT
- ③ LOWER CHOTTA RAVI DRAINAGE DISTRICT
- ④ MIAN MIR DRAINAGE DISTRICT-I
- ⑤ MIAN MIR DRAINAGE DISTRICT-II
- ⑥ SATTO KATLA DRAINAGE DISTRICT

LEGEND:-

- CATCHMENT BOUNDARY
- DRAIN ▶
- DRAINAGE PUMPING STATION
- SEWAGE TREATMENT PLANT (PROPOSED) S.T.P.

SCALE 1:175,000

RIVER RAVI AND ITS TRIBUTARIES

Fig: 13.1

Lahore-Bedian Road. It then runs almost parallel to Defence Road, and after receiving the municipal/industrial effluents from Lahore Cantonment /Defence Housing Society (DHS) and industries located along Ferozepur Road and Defence Road, falls into River Ravi about 8 km from Multan Road near Village Mohlanwal. On its way to River Ravi, Hudiara Drain also picks up the "Satto Katla Drain" 1 km downstream of Raiwind Road which contains the municipal/ industrial wastewater from Township/Kot Lakhpat Area.

The WWF Study carried out during summer of 2000 found that the DO was zero or very close to zero in Hudiara Drain at its entry point into Pakistan. Other salient findings were as follows:

- Generally Hudiara Drain's water had high metal concentration at sampling point one i.e. entry point into Pakistan.
- DO on the average was found to be less than 0.5 mg/l at all sampling points, BOD, chemical oxygen demand (COD) and total suspended solids (TSS) exceeded the permissible levels of National Environmental Quality Standards (NEQS) for industrial effluents.
- In some of the settlements/ villages located around Hudiara Drain, incidences of skin, eye, joint pains and other abdominal diseases were reported.

A team of Pakistan Drainage Consultants (PDC) working for National Drainage Project (NDP) on January 11, 2001 made a brief survey of the Hudiara Drain and came out with the following salient observations:

- The DO of Hudiara Drain, from its entry point to the outfall in River Ravi was found to be zero which means the absence of any aquatic life in the drain. The Electrical Conductivity (EC) of the Drain at the entry point was found to be 1.4 millisemens per centimetre (ms/cm), at Ferozepur Road 2.7 ms/cm and at Multan Road 2.2 ms/cm. In terms of TDS this could be estimated at 896 mg/l, 1728 mg/l and 1408 mg/l respectively at these locations.
- Throughout the length of Hudiara Drain, its polluted water is being exclusively used for irrigation through lift pumps. Local farmers concede that the drain water is harmful to the grain crops (wheat and rice) but is beneficial to fodder. However they are compelled to use this water due to economic necessity and high diesel/ power charges for private tubewells. The crops grown are normally wheat, rice, vegetables and fodder.

- The implications of the use of polluted water of Hudiara Drain for irrigation are questionable. The use of drain water by cattle for drinking purposes is also undesirable, because milk from those cattle is supplied to Lahore.

13.2.2 Status of Vehicular Traffic in Lahore

According to the LUDTS, 1980, there were only 39,205 vehicles "On Road" in Lahore District during 1974. This number rose to 79,382 by 1980 which indicates an increase of over 100% in a period of six years with an average annual increase of 12.5%. This figure rose to 246,383 vehicles in 1990, and 561,949 vehicles in 1998, indicating an average annual increase of more than 11.4% between 1980 and 1998.

From the above comparison, the challenge ahead for our city/traffic planners can be very easily assessed, since the road capacities have not been able to keep pace with the growing volume of traffic. Badly managed traffic not only creates traffic jams/ congestion, loss of valuable time of passengers and idling and wear and tear of the engines, but also produces increased quantities of Carbon Mono-oxide (CO), which is injurious to human health. Some improvement in the City's main roads was carried out in the recent past especially in posh areas and around Gulberg, but the ever-increasing traffic loads demand a multiple approach.

- i. Development of an appropriate public transport system for the entire city to minimize the necessity of using private cars/vehicles. Recently some foreign and local transporters have been allowed to run their buses through the city. This service should also be extended to various other areas of the city.
- ii. Introduction of flyovers/ additional underpasses etc. where ever necessary.
- iii. A comparative study for various alternative means of mass transit systems including circular railway/ underground railway, elevated mono-rail system etc. may be carried out keeping in view the experience of other Asian / western mega cities. Railway trains carry heavy traffic loads while comparatively creating lesser environmental pollution.

13.2.3 Air Quality Monitoring/Noise Level Measurements

As discussed above, with the rapid increase in population of the city coupled with the growing living standards, the number of vehicles plying on the roads of Lahore has increased manifold. The vehicular traffic combined with the uncontrolled emissions from the industrial units located in and around the city has created an adverse impact on the air quality of the city. Noise and other pollution parameters normally

RIVER RAVI DISSOLVED OXYGEN VARIATION FROM BRB SYPHON TO HEAD BALLOKI (MAIN STREAM)

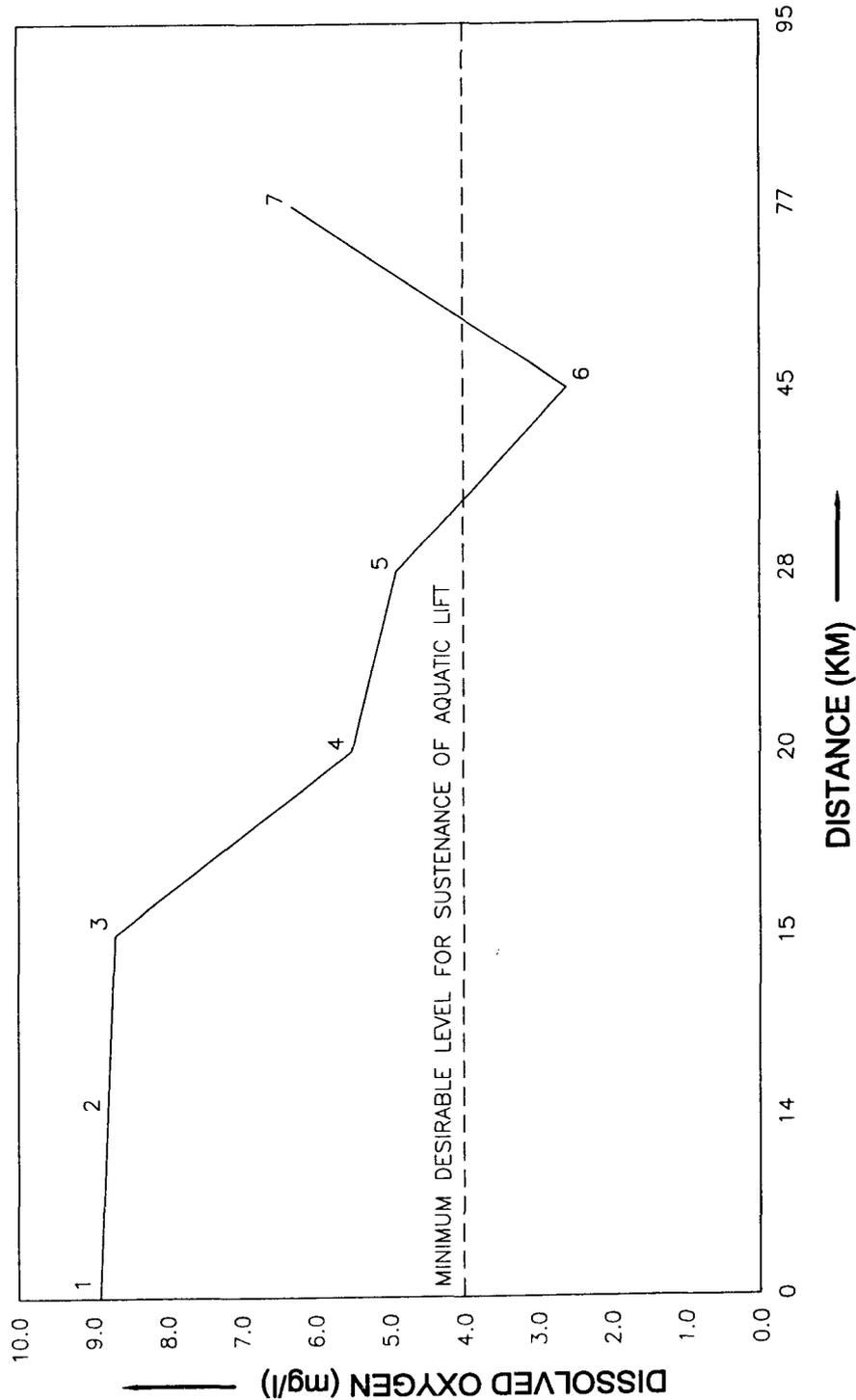


Fig: 13.2

indicated by suspended particulate matter (SPM), CO and Nitrogen Dioxide (NO₂) have been monitored by EPD since 1989.

13.2.3.1 Air Quality Survey and Investigations

EPD carried out follow-up surveys/investigations at various intersections / locations in Lahore during the years 1990 to 2000. Following is a brief summary of those investigations.

A. Year 1990-1991

The survey was conducted from October 08, 1990 till March 27, 1991. The maximum CO concentration was found to be 90 parts per million (ppm) at Qurtaba Chowk on October 17, 1990, which was ten times the WHO Standard of 9 ppm. Very high values of SPM 3223 microgram/cubic metre ($\mu\text{g}/\text{m}^3$) were also reported at Choburji Chowk on October 08, 1989 (the WHO Standard is 230 $\mu\text{g}/\text{m}^3$).

With the exception of another very high value of particulate matter at Azadi Chowk on October 15, 1990, i.e. 2443 $\mu\text{g}/\text{m}^3$, the measurements at other stations normally varied between 400 and 1150 $\mu\text{g}/\text{m}^3$. All the measured values however exceeded the WHO Standard for particulate matter. In Lahore, most of the particulate matter can be attributed to the emissions from vehicles, re-suspension of road dust by passing vehicles, refuse burning, idle burning of fuel and construction activity etc.

B. Year 1994-1996

During the above years, air quality monitoring for CO, NO₂, dust, noise level was carried out utilizing the EPD Air Monitoring Unit. The results are reproduced in Table 13.1. A review of the table would indicate that the CO levels with the exception of Chowk Yateem Khana and Chowk Assembly Hall were usually in the lower desirable range of 3 to 9 ppm. However the dust level at almost all busy intersections exceeded the standard. The maximum values of noise level also exceeded the standard of 85 dBA at various intersections.

TABLE 13.1
AIR POLLUTION MEASUREMENTS RECORDED BY EPD AIR
MONITORING UNIT AT VARIOUS BUSY CENTERS OF LAHORE

SITE	AREA	NO ₂ ppb		CO ppm		DUST ug/m ³		NOISE dB(A)	
		1994	1995	1994	1995	1994	1995	1994	1995
Chowk Yateem Khana	Road Side	30-77	31-80	05-40	06-40	500-1800	700-2000	75-116*	80-121*
Chowk Assembly Hall	Road Side	28-60	28-62	04-31	05-33	300-750	303-790	65-97	66-101
Badami Bagh	Industrial	25-35	25-37	03-09	03-10	450-2500	450-2500	72-99	73-104
Kot Lakhpat	Industrial	20-32	20-33	03-07	03-08	450-980	450-980	68-97	70-103
Model Town	Residential	11-18	11-20	03-05	03-06	225-600	225-600	50-80	52-85
Islampura	Residential	10-15	12-18	03-05	03-08	350-550	350-550	52-88	55-91

US Ambient Air Standard:

Noise (Residential) = 52-57 dBA, PAK-NEQS (noise) = 85 dBA
 NO₂ = 50 ppb, CO = 9 ppm, Dust = 260 ug/m³

* Noise levels above 96 dBA were normally measured when pressure horns were blown

Reported Frequency of Measurement = once/week
 Source:- EPD Punjab, Lahore.

C. Year 2000

The latest study for evaluation of the air quality of Lahore (and the twin cities of Islamabad and Rawalpindi) under the title "Environmental Investigations in Pakistan" was carried out by Mr. Y. Shigeta, Environmental Expert of JICA. The period of study extended from February 15 through June 26, 2000, with the actual sampling in the field carried out from April 4 to May 11, 2000.

Five number of sites were selected for sampling in Lahore which included Chowk Yateem Khana, Multan Road, Azadi Chowk (Near Minar-e-Pakistan), Chowk Lohari Gate, Bank Square Shahrae-Quaide-Azam and Qurtaba Chowk. The major conclusions of the above mentioned study could be summarized as follows:

i. Suspended Particulate Matter

- The suspended particulate matter (SPM) concentrations compared with other air quality parameters were very high and their existing levels were higher than the Japanese Air Quality Standards (JAQS) and the limits set by World Health Organisation (WHO).

Various sources of SPM include natural phenomenon such as unpaved roads and places not covered by green grass or trees. The artificial causes include the emission of gases with particulate matter from the motor vehicles and industrial activity. Other natural sources affecting particulate matter include quantity of rainfall, kind of surface soil in the area and relative moisture content, cleaning conditions on paved roads and under construction roads etc.

- Particulate matter in the air is classified broadly into "falling dust" and "suspended dust". The "suspended dust" is further classified into SPM of which the grain diameter is (10 μgm) or less for the environmental standard.
- Table 13.2 provides data about SPM in some of the foreign cities of Latin America/Asia. This data indicates that Mexico City had a high value of SPM, which reached more than 2500 $\mu\text{g}/\text{m}^3$ in NW and NE (industrial area). In Lahore, SPM level also reached 1535 $\mu\text{g}/\text{m}^3$ at Qurtaba Chowk, 1400 $\mu\text{g}/\text{m}^3$ at Shahrae-Quaide-Azam and 1349 $\mu\text{g}/\text{m}^3$ at Yateem Khana. The later investigations in Lahore were made for only one day (24 hours) at each sampling station. However, it is possible if

each sampling site was continuously investigated over the year then the maximum one hour's data of high SPM levels for Lahore, may reach the maximum data of Mexico City, one of the most air contaminated cities in the world.

TABLE 13.2
COMPARISON OF THE SPM DATA TO OTHER FOREIGN CITIES ($\mu\text{g}/\text{m}^3$)

City	Santiago (City Area)			Mexico (5 City area)			Tokyo (City area)			
Item	Daily Average in the month			Maximum Data in 24 Hours.			Year's Average			
Year	1990	1991	1991	Area	1990	1992	1994	1989	1991	1993
Term of Data Evaluation	Oct	Nov	March	NW	1089	2829	358			
Range of daily average in month	18-250	67-205	11-160	NE	2624	2041	806			
Monthly average	115	143	68	Cent	1441	1316	392			
				SW	295	544	352			
				SE	1745	1220	518			
Year's average	83		74		1434	1590	587	57	59	46

Note: NW-North West Area, NE-North East Area, Cent-Central Area,
SW-South West Area, SE- South East Area

ii. Sulphur Dioxide

- Generally speaking Sulphur Dioxide (SO_2) in Lahore (and also in Rawalpindi and Islamabad) was not so high as compared with International Air Quality Standards and WHO Guidelines. Only one sampling station at Lohari Gate in Lahore indicated 211 ppb (parts per billion) on an hourly basis which was over 2.1 times the Japanese Standard (100 ppb for 1 hr) and 1.8 times the WHO guidelines (120 ppb for 1 hr). This may be due to the presence of number of public transport wagons, Suzuki pick-ups in the vicinity of Lohari Gate, which normally use diesel oil, containing about 1% of Sulphur compounds in Pakistan. (On the other hand SO_2 data in Mexico City shows that all data of daily average exceeded the Japanese Standard of 140 ppb, whereas Tokyo had a much lower quantity of SO_2 on an average yearly basis i.e. 7 ppb measured in 1996 against 41 ppb for Mexico City measured in 1994).

iii. Carbon Mono-oxide

- CO is a very toxic gas which has the capacity to easily react with the hemoglobin (Hb) in the blood replacing oxygen. The combining power of CO with Hb is about 210 times stronger than O_2 . Therefore it prevents the oxygen carrying function in the human body.

- CO, which is produced due to incomplete combustion of fuel, idling of engines during traffic congestions etc. or otherwise, was measured to be as high as 9.4 ppm at Azadi Chowk and Qurtaba Chowk by the EPD mobil laboratory.

The above measured values for Lahore (although higher than those for Rawalpindi and Islamabad) were below the International AQS, Japanese Standards and WHO Guidelines (Japanese Standard is 20 ppm for 8 hrs investigations and WHO, 35 ppm for 1hr)

However, according to another analysis technique i.e. "test tube method", the three Sampling Stations at Lahore i.e. Yateem Khana Chowk, Azadi Chowk and Qurtaba Chowk were found to have more than 30 ppm CO concentration. It may be possible that during sampling, the source of emission i.e. car stream was too close to the sampling equipment or the frequency of cars passing during that particular sampling time increased.

- Overall compared to other foreign cities like Mexico City and Santiago, where the 8 hours maximum data reached as high as 50 ppm and 24 ppm respectively, the 9.4 ppm measured in Lahore, was still lower than the above mentioned foreign cities.

iv. Nitrogen Oxides

- The Nitrogen Oxides (NO_x) occur mainly due to mobile emissions and stationery sources such as boilers and furnaces of industrial activities
- The study found out that the NO_x concentration at Qurtaba Chowk (556 ppb) and Shahahe-Quaide-Azam (423 ppb) in Lahore exceeded the WHO Guidelines (110 ppb for 1 hr) The hourly maximum data in Mexico City is shown between 176 to 390 ppb while on the other hand for the above spots in Lahore, it ranged between 96 to 556 ppb. These data are not so much different compared to the data for Mexico City, which means that at some congested intersections, Lahore's air contamination levels may be reaching as high as Mexico City.
- Lahore's Ozone (O₃) levels were however found to be below the Japanese Standards and WHO Guidelines.

13.3 COMPARISON WITH OTHER MEGA CITIES OF ASIA

Based on the investigations carried out from 1990-1996, a comparison of Lahore's air quality where the suspended particulate matter and noise levels are

reaching quite high levels, with the other mega cities of Asia would be of interest. Like many other Asian cities, Lahore has a problem of suspended particulate matter which is a typical pollution characteristic of all major Asian cities except Tokyo. Lahore has also high noise levels at its major traffic intersections along with high concentration of CO.

13.4 STORM WATER DRAINAGE OF LAHORE

One of the important aspects of the environmental beauty of a city is the proper drainage of storm water in a reasonable period of time without causing excessive loss to property or environmental damage. Unfortunately, with the passage of time, Lahore which was once served through several drainage channels, is being deprived of its natural drainage facilities. The natural drainage capacity of the city has been reduced due to several reasons, some of which include the following:

- i. The sewerage system of Lahore operated by WASA/LDA is not planned to completely carry the stormwater drainage. The cost of a combined sewerage system would be quite prohibitive.
- ii. Most of the roads have been built without a provision for roadside drainage.
- iii. The right of way of various stormwater drainage channels has been usurped by various influential groups as well as squatters especially in and around the city centre by erection of markets and in some instances residential houses. The floodway of River Ravi along Bund Road has also been encroached.
- iv. Several new housing schemes have been developed without any provision for stormwater drainage or provision of green areas/open spaces which were previously acting as absorbing pads for the stormwater drainage.
- v. Dumping of solid waste into the sewerage system and/or storm water drains also badly affects their carrying capacity.

13.5 SOLID WASTE MANAGEMENT IN THE CITY

Like many other cities in the country, Lahore's Solid Waste Management needs a lot of improvement. In the "Solid Waste Management Study" for Lahore carried out in 1997, it was estimated that only 70% of approx. 3000 tonnes of solid waste generated every day (at a rate of 0.55 kg/person/day) was being collected and disposed of by the civic authorities. Of this 3000 tonnes of waste, the Cantonment Board, Model Town Society (MTS) and Defence Housing Society (DHS) contributed about 150, 30 and 50 tonnes/day respectively, while the rest of the solid waste is collected/generated in the areas under the jurisdiction of ex-MCL (now the City Government).

The 71² major hospitals and clinics located in Lahore also generate about 13.8 tonnes (13,856 kg) of solid waste/day. Most of this hospital waste is quite toxic.

The uncollected 30% of the municipal solid waste i.e. about 900 tonnes/day finds its way into the open spaces/vacant plots, sewage manholes and stormwater channels.

13.6 RECREATIONAL PARKS/GREEN AREAS OF LAHORE-AESTHETIC CONSIDERATIONS

Recreational parks/green areas of a city serve many useful objectives. Apart from providing recreational facilities to the residents/tourists in a city, the green areas also facilitate stormwater absorption. As mentioned earlier, Lahore is also called the City of Gardens, and it has maintained that tradition to a great extent.

Shalimar Gardens and Baghe-Jinnah (previously known as Lawrence Garden) are two of the oldest gardens in Lahore, which are still visited by a large number of visitors/tourists each day. While the Shalimar Garden (with its beautiful fountains) located on G.T.Road, remind us of the Moghul Era, the Baghe-Jinnah developed during the British Rule and located near the city centre, provides a serene and cool environment to the visitors.

The Tomb of Jahangir, located on the right bank of River Ravi (near Shahdara) is frequented by visitors, especially on the weekends. LDA has carried out considerable renovation work on the Tomb of "Queen Noor Jahan" located opposite Jahangir's Tomb and Kamraan Baradari located inside the mainstream of River Ravi. The environmental conditions around Kamraan Baradari however badly deteriorate during the dry months of the year, when stagnant sewage pools start accumulating around it, due to very low flow in the river.

LDA also seems to have made commendable efforts to rehabilitate the "Circular Gardens" around the Walled City. Other recreational parks developed during the last two decades include the Ravi National Park, Race Course Park, Gulshane-Iqbal and Model Town Parks. Green areas have also been developed along the Canal Bank Road, which have added to the environmental beauty of that highway passing through the city. The establishment of "Saint Mary Park" on the western side of Main Boulevard Gulberg near Kalma Chowk is a recent positive development. However, most of the newly developed schemes are devoid of any community centres or children play grounds which should have been an essential part of these residential schemes.

Some negative trends in the form of landuse changes are also observed. Some of the green belts were utilized for development purposes e.g. construction of petrol pumps etc. In other instances, the open spaces earmarked for recreational purposes in private housing schemes have been misused for other purposes including dumping of solid waste etc. This trend can be observed in newly developed schemes like Johar Town etc, where no body seems to be incharge of operation and maintenance of existing infrastructure. There has also been a trend to illegally occupy all vacant government lands by various "Qabza

² GPEC International Ltd. "Capital Project Study for the Characterization of Medical Waste in 8 cities in the Province of Punjab. Pakistan"

Groups". The Railway lands located on both sides of Lahore-Rawalpindi and Lahore-Karachi Railway lines have been encroached upon on which substandard houses/ slums have been constructed without any planning or provision of civic facilities. The unplanned settlements across the protective bund of River Ravi are also deprived of basic facilities. The residents of these settlements are under constant threat of submergence during the periods of high flood in the river.

13.7 GROWTH OF COMMERCIAL PLAZAS

Mushroom growth of plazas has been witnessed in the city at various places without paying much regard to its consequent adverse impact on the existing infrastructure. For example, several commercial plazas have been constructed on Davis Road, which is a rather narrow road, resulting in undesirable traffic congestion in the busy hours. Preferably the building-line of any commercial plaza should be kept with a minimum off-set of 50 metres from the road shoulder with adequate space left for vehicle parking on the front.

While sanctioning the construction of high rise buildings / plazas, their impact on the adequacy of existing infrastructure, fire fighting and security should also be considered. Commercial centres should ideally be isolated from residential areas.

13.8 PLIGHT OF NORTHERN LAHORE

The area bounded between Lahore-Rawalpindi Railway Line, River Ravi Protective Bund and Shahdara Railway Bridge is called "Northern Lahore". As has been highlighted several times in the print media, Northern Lahore faces severe problems of storm water drainage, stagnant sewage/rain water ponding, improper solid waste management, lack of any recreational facility etc. Although other neighbourhoods located in other parts of Lahore have their own environmental problems, the condition of Northern Lahore needs special attention.

13.9 SUMMARY OF THE EXISTING ENVIRONMENTAL CONDITIONS

Like many other Cities of Asia, Lahore, the 2nd largest city of Pakistan, faces numerous environmental problems which tend to impair the quality of life and well-being of its residents, such as:

- i. Limited capacity of the urban infrastructure to cope with the ever-increasing growth in population.
- ii. Indiscriminate disposal of untreated municipal and industrial wastes into the waterways/natural streams, passing in and around the city including the Lahore Canal and River Ravi.
- iii. Improper solid waste collection and disposal.
- iv. Inadequate system for stormwater drainage in the city.
- v. Increase in vehicular traffic especially due to the absence of a proper public transport system, which has consequently resulted in

deterioration of the air quality in the city especially at busy traffic intersections.

- vi. Unplanned and mushroom growth of Katchi Abadis/slum areas, which are normally devoid of recreational areas/facilities and basic infrastructure.
- vii. Lack of proper operation and maintenance of facilities/ infrastructure especially in the private housing schemes with the general exception of DHS, WAPDA Town and NESPAK Society.

In spite of the above problems, Lahore, however, could be considered a fortunate city at least on the basis of two major considerations:

- a. The city is blessed with a rich groundwater resource which is unparalleled, compared to any other major city in Pakistan. The groundwater quality could also be rated as satisfactory requiring minimum treatment. This is without prejudice to the need for disinfection of water supply/ treatment especially during rainy season etc. or otherwise and monitoring needs of the water quality on a continuous basis to safeguard against contamination from various above ground pollution sources.
- b. The tree line/plantation in the city tends to mitigate the negative effects on the air quality to some extent. Therefore, there is an urgent need to protect and enhance the green areas/plantation in the city. This can serve as a best check against adverse impacts of climatic changes and deteriorating air quality.

14.0 URBAN GOVERNANCE

14.1 GENERAL

The management of urban development for Lahore was fragmented and was under the control of a number of authorities/agencies. About 20 agencies were involved in the urban management of Lahore and among these there was overlapping of functions in various service areas. Linkages amongst a number of agencies on the one hand and with ex-MCL and LDA on the other, were weak. There was no cohesive policy framework to guide various agencies involved in urban matters. The institutional limitations of urban management in Lahore were:

1. Lack of cohesive policy framework
2. Overlapping of functions
3. Lack of coordination
4. Inadequate finances for development works
5. Mis-appropriation of funds
6. Weak management
7. Lack of technical/professional staff
8. Deficient accountability/transparency.

The above situation resulted in:

1. Poor resource mobilization and poor connections between service provision and taxation.
2. Weak inter-sectoral coordination of urban services
3. Inadequate cost-effectiveness of local and municipal services.
4. Substandard infrastructure/services operation and maintenance.

Because of the above weaknesses, it was expedient to devolve political power and decentralise administrative and financial authority to accountable local governments for good governance, effective delivery of services and transparent decision making through institutionalised participation of the people at grass root level.

Under the Devolution Plan and the subsequent Punjab Local Government Ordinance, 2001 (PLGO), District Lahore has been declared as a "City District". However, the institutional set-up is in a process of transformation from the old centralised system to the new devolved system. It is therefore imperative to describe both the systems.

14.2 THE POST-DEVOLUTION INSTITUTIONAL SET-UP

The local government system under the PLGO has a number of tiers, including the District Government (City District Government in case of Lahore), Town

Municipal Administration (TMA) and the Union Councils (Ucs) which are described below:

14.2.1 The City Government

Zila Nazim being the Chief Executive, is responsible for the over all District Administration, which comprises of district offices¹, including sub-offices of the government departments decentralised to the District Government and other offices set-up by the District Government and grouped under the Executive District Officers (EDOs) and coordinated by the District Coordination Officer (DCO) (Refer Figure 14.1). The DCO is the coordinating head of the District Administration with powers to review and assess the performance of the group of offices individually or collectively, and give directions for taking actions or measures for improving efficiency, service delivery and achievements of goals assigned in the approved plans of the District Government. After creation of the City District, the organisations and authorities providing municipal services and facilities shall ultimately come under the administrative and financial control of the City District Government². The City District comprises of Union Nazims in the District and elected Union Councillors.

The planning related functions of Zila Council in City District are as follows³:

- a) Approve master plans, zoning, land use plans, including classification and reclassification of land, environmental control, urban design, urban renewal and ecological balances;
- b) Review implementation of rules and bye-laws governing land use, housing, markets, zoning, environment, roads, traffic, tax, infrastructure and public utilities.
- c) Approve proposals of the District Government for public transport and mass transit systems, construction of expressways, fly-overs, bridges, roads, underpasses and inter town streets.
- d) Approve development schemes for beautification of areas along rivers, beaches and sea sides and;
- e) Review development of integrated system of water reservoirs, water sources, treatment plants, drainage, liquid and solid waste disposal, sanitation and other municipal services.

In case of the six towns in Lahore City District, the Zila Council shall perform the functions of approval of such macro municipal plans as may be notified by the City District Government⁴.

¹ First Schedule, Part A (Decentralised Offices), Part B (Other Offices), Part C (Groups of Offices), of the PLGO.

² Section 36, Page 29 of the PLGO.

³ Section 40, Page 31 of the PLGO.

⁴ Section 41, Page 32 of the PLGO.

The 'Groups of Offices' under the City District are given in Table 14.1.

TABLE-14.1
GROUPS OF OFFICES UNDER DISTRICT ADMINISTRATION

GROUPS OF OFFICES	OFFICES
1. DISTRICT COORDINATION	Coordination
	Human Resource Management
	Civil Defence
2. AGRICULTURE	Agriculture (Extension)
	Livestock
	Farm Water Management
	Soil Conservation
	Soil Fertility
	Fisheries
	Forests
3. COMMUNITY DEVELOPMENT	Community Organization
	Labour
	Social Welfare
	Sports and Culture
	Cooperatives and Registration
4. EDUCATION	Boys Schools
	Girls Schools
	Technical Education
	Colleges (Other than professional)
	Sports (Education)
	Special Education
5. FINANCE AND PLANNING	Finance and Budget
	Planning and Development
	Accounts
	Enterprise and Investment Promotion
6. HEALTH	Public Health
	Basic and Rural Health
	Child and Woman Health
	Population Welfare
	District and Tehsil (Hqrs) Hospitals
7. INFORMATION TECHNOLOGY	IT Development
	IT Promotion
	Data Base
8. LAW	Legal Advice and Drafting
9. LITERACY	Literacy Campaigns
	Continuing Education
	Vocational Education
10. EXECUTIVE MAGISTRACY	(excluding for trial functions)
11. REVENUE	Land Revenue
	Estate and Excise Taxation
12. WORKS AND SERVICES	Spatial Planning and Development
	District Roads and Buildings
	Energy
	Transport
	Environment

14.2.2 Town Municipal Administrations

Based on the contiguity of Unions, the City District of Lahore has further been divided into six towns, each administered by a TMA,

Organization of City District as per PLGO, 2001

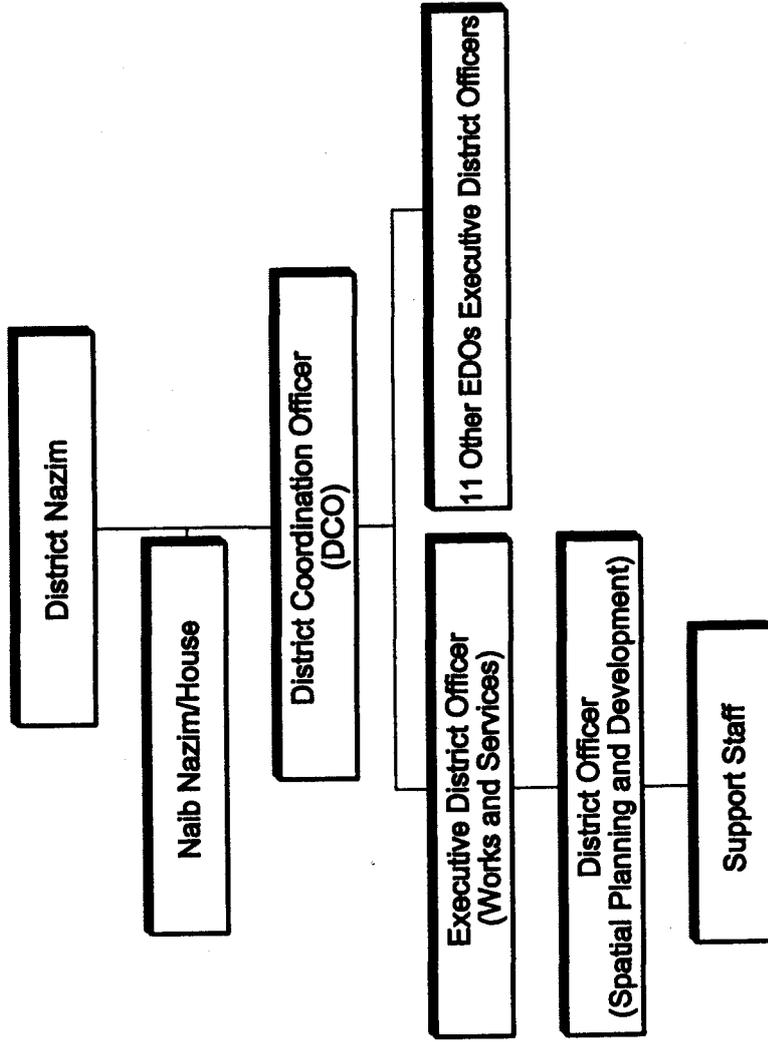


Fig: 14.1

headed by the Town Nazim. The details about the six towns is given Table 14.2.

TABLE 14.2
POPULATION AND NUMBER OF UNION COUNCILS
IN EACH TOWN

TOWNS	NUMBER OF UNION COUNCILS		
	URBAN	RURAL	TOTAL
Ravi Town	30	0	30
Shalimar Town	18	5	23
Aziz Bhatti Town	7	6	13
Data Ganj Bukhsh Town	33	0	33
Allama Iqbal Town	17	9	26
Nishtar Town	15	10	25
Total	120	30	150

For each of the above six towns, there is a TMA which is a body corporate and consists of the Town Nazim, Town Municipal Officer (TMO), Town Officers (TO), Chief Officers and other officials of the Local Council Service and officials of the offices entrusted to the TMA⁵ (refer Figure 14.2).

14.2.3 Union Administration

The six towns of the Lahore City District, have in aggregate, 150 UCs, 120 of which are urban and 30 are rural UCs. Ravi Town and Data Ganj Bukhsh Town have no rural UCs. The planning related functions of Union administration are⁶:

- a) To collect and maintain statistical information for socio-economic surveys;
- b) To consolidate village and neighbourhood development needs and prioritize them into Union-wide development proposals.
- c) To identify deficiencies in the delivery of services and make recommendations for improvement thereof to the TMA (in case of Lahore City District, it is inferred that the Union Administration will make recommendations to the concerned Town Administration).

14.3 THE PRE-DEVOLUTION INSTITUTIONAL SET-UP

Prior to devolution, the management of the city of Lahore has remained in the hands of a number of institutions, each of which was assigned a specific role in the urban affairs of the city. Depending upon their respective legal cover, these

⁵ Section 50, Page 34 of the PLGO.

⁶ Section 76, Page 47 of the PLGO.

institutions have been functionally operating at the federal, provincial or local levels. The main local institutions, namely MCL, LDA and its affiliated agencies like TEPA and WASA, along with the LCB in the cantonment area of Lahore have been holding the prime responsibility of delivering urban services to the citizens of Lahore.

MCL was a local government institution under the control of the Provincial Local Government Department. It derived its strength and sanction from the elected Councilors and within the local area of jurisdiction was considered superior to any other agency or department. It traditionally exercised greater autonomy in its decision making, revenue collection and provision of basic urban services.

LDA, on the other hand, is an autonomous body established under the LDA Act, 1975. The primary objective of LDA is to provide infrastructure and developed land for housing and is directly controlled by the Government of Punjab. Its area of operation is the LMA, which is larger than the city municipal area. Some parts of the LMA also extend into the adjoining Districts of Kasur and Sheikhpura in addition to the former District Council, Lahore.

14.3.1 Metropolitan Corporation Lahore

Till the enforcement of the Punjab Local Government Ordinance, 2001, MCL was the basic urban local government institution in Lahore and performed the following main functions:

- Maintenance, repair and construction of roads/streets
- Sanitation
- Health (Hospitals, maternity homes and dispensaries)
- Social Welfare
- Street Lights
- Primary and High School education
- Recreation (parks and play grounds)
- Fire fighting
- Building control and removal of encroachments

MCL consisted of elected Councilors and an elected Mayor with four-year term of office. It discharged its duties mostly within the municipal limits divided into 250 wards; each represented on its Council by an elected Councilor. The house also included 11 minority, 26 lady and 14 labour Councilors. The power to abolish the elected Council has been frequently used in the past and as such the affairs were run by an Administrator appointed by the Provincial Government. Thus government officials who were not answerable to the people guided the management of MCL. This lack of accountability resulted in inefficiency, mismanagement and financial indiscipline. Lack of scientific management and accountability also resulted in gradual decline in the level and standard of municipal services.

Organization for a Typical Town Municipal Administration as per PLGO, 2001

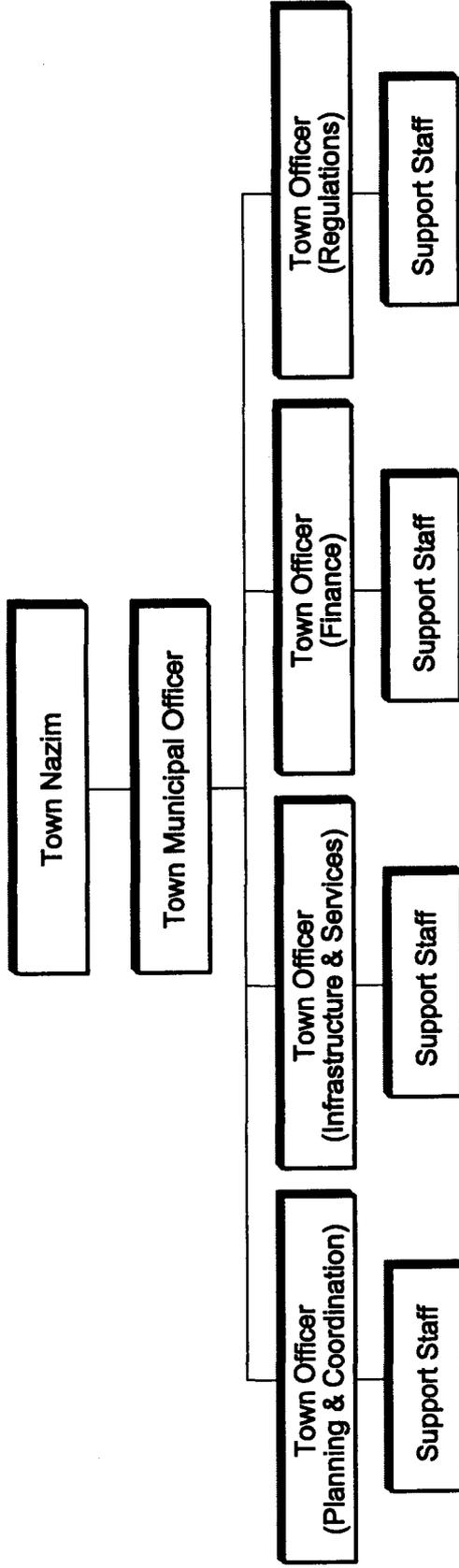


Fig: 14.2

management of MCL. This lack of accountability resulted in inefficiency, mismanagement and financial indiscipline. Lack of scientific management and accountability also resulted in gradual decline in the level and standard of municipal services.

MCL was divided into eight zones and the yearly budgetary allocations are made on the basis of these zones. The zones are looked after by the Zonal Secretaries (under the Mayor) and were staffed with adequate number of employees.

At the level of the Province, the Provincial Government has constituted a Punjab Local Government Board. It is a body corporate, having perpetual succession with the power to hold, acquire and transfer property. The Board performs the following functions for all the local Councils in the Province:

- a) Acts as a planning commission
- b) Undertakes research and evaluation
- c) Operates the Punjab Local Government Board Fund
- d) Makes recruitment and appointments to the Punjab Local Council Service
- e) Such other functions as may be specified by the government.

14.3.1.1 Municipal Finances

Ex-MCL finances were raised through two major sources: octroi and tax on transfer of property. Due to the Provincial Government's deduction of 15% of the gross receipts of property tax and allocation of 75% of the balance to LDA and WASA, MCL's share of the property tax was reduced to a mere 18.9% of the gross receipts.

Octroi has remained the main source of income (about 60% of the total) till 1998-99. A major change was introduced in the 1999-2000 budget by the abolition of Octroi. The Provincial Government undertook to make up for this amount through transfers from Federal receipts, especially under the head of General Sales Tax (GST). Urban Immoveable Property Tax was also proposed to be transferred back to ex-MCL, and initially this decision was implemented on experimental basis, in two zones (Zone 2 and 8) within ex-MCL area with effect from Financial Year 1999-2000.

Peculiar feature of the budgetary allocation in the past five years has been the large proportion of the municipal funds being spent on staff salaries and other non-development activities. In terms of capital expenditure, health and sanitation took precedence over other urban services.

In 1997-98 staff salary and contingency spending accounted for as much as 68% of the total expenditure. During 1998-99 Financial Year, the figures as per revised budget estimates indicated an improvement in the expenditure pattern though the total income of ex-MCL (Rs. 2,346 million) did not register a major change. Of the total expenditure (Rs. 2,298 million), the staff salary accounted for 34% as against 59% for the capital expenditure.

The non-development expenditure substantially increased once again during the 2000-2001 Financial Year. 60.86% the total expenditure (Rs.265.35 million) was utilized mainly for staff salaries/contingencies (49.50%) and 11.11% of capital expenditure for miscellaneous expenses. The capital expenditure recorded a corresponding decrease as it accounted for only 39.14% of the total expenditure during the year.

14.3.2 Lahore Development Authority

LDA was constituted under the LDA Act, 1975 to establish a comprehensive system of metropolitan planning and development in order to improve the quality of life in the LMA, to ensure optimum utilization of resources and to evolve policies and programmes relating to improvement in the sectors of housing, industrial development, traffic, transportation; health, education, water supply, sewerage, drainage, solid waste disposal and matters connected therewith.

LDA is a Provincial statutory body chaired till recently by the Chief Minister or Governor of Punjab. Lately, the District Nazim has been appointed as its Chairman. Apart from the Ministers for Local Government, Housing and Physical Planning and Town Nazims, it also includes Chief Secretary, Chairman P&D and Provincial Secretaries of the four concerned Government Departments and Managing Directors of its Agencies as ex-officio members. The Director General is the Chief Executive of the Authority.

It is deemed to be a Local Authority for the purposes of borrowing money. It is also deemed to be an "Official Development Agency" for the purposes of developing housing schemes. The Provincial Government may notify LDA to exercise and perform functions of a Municipal Corporation during such period and for such locality as the government may specify. It is a body corporate with perpetual succession and with powers to acquire and hold property, both movable and immovable.

14.3.2.1 LDA Finances

The 1997-98 budgetary positions of MCL and LDA indicated a combined per head expenditure of Rs. 394 per person. Comparing this,

for example with Ahmadabad, India (Rs. 1,437 per person) for the same year, indicates a very low figure. The situation has not changed substantially till recently as the combined per capita expenditure inclusive of staff salaries incurred by LDA, MCL and PHA during 2000-2001 could hardly touch the figure of Rs. 615 per person.

LDA has been assigned various municipal functions which do not fall within LDA's responsibilities. Until June 1997, a total expenditure of Rs. 747.71 million was incurred by LDA on such functions, whereas only Rs. 152.47 million (20%) was received from MCL.

Because of administrative and political reasons, non-development expenditure has been on the increase. In 1996-97 nearly fifty % of the staff became surplus. Despite the reduction of 626 staff members, the salary bill for 1997-98 increased by about Rs. 2 million. The development activities have been cut down drastically due to shortage of funds. The main source of revenue, that is, land sales has been adversely affected as no new housing scheme (except launching of Jubilee Town Housing Scheme) has been initiated since 1986.

The Revised Budget for 2000-2001 Financial Year shows that the Revenue receipts (506.73 million) constitute one half of the total income (Rs. 1008.51 million) and the remaining one half (501.78 million) mainly consist of the opening balance development budget of the preceding year.

14.3.3 Traffic Engineering and Transport Planning Agency (TEPA)

TEPA was created in 1987 under Section 6 of the LDA Act, 1975 as an agency to carryout a number of specific functions including coordination and preparation of a Comprehensive Transportation Plan for the LMA; implementation of traffic engineering and management programme, monitoring traffic surveys and analysis of relevant data, determination of design standards, specification and maintenance of a parking policy, undertaking research and arrange for educational programmes, training courses and launch campaigns to promote traffic safety and create public awareness about traffic laws.

The TEPA started functioning in 1990 and has since been involved in ADP funded projects, which used to be previously under taken by the Engineering Department of LDA. The Agency has undertaken a few short term traffic improvement projects but could not acquire and develop expertise and professionalism needed to discharge the fundamental responsibilities assigned to it under the charter. Similarly the Transport Operation Committee constituted side by side with TEPA to provide effective coordination amongst various agencies in transport sector remained inert though it was supposed to meet at

least once in the two months as per notification issued on December 08, 1987.

14.3.3.1 Financial Aspects

Since the inception of TEPA, ADP has been the main source of funding. The budgetary allocations for the last three years indicate that no development work has been carried out from TEPA's own sources and during 2000-2001 financial year the ADP allocation constituted 92.80% of the annual receipts (229.08 million) and 94.34% of the total annual development expenditure (Rs. 145.41 million). The performance of TEPA during 1999-2000 remained quite depressing as the development expenditure (Rs. 15.887 million) was surpassed by non-development expenditure (Rs. 20.365 million) by 12.4%.

14.3.4 Water and Sanitation Agency (WASA)

WASA is an agency established under Section 10 of the LDA Act. It is responsible for provision of water supply, drainage and sewerage facilities in its service areas. The staff strength of WASA in 1996-97 stood at 4,226 against the approved figure of 5,678. The current staff strength, as per 2001-2002 budget, is 4,762 against the approved strength of 5,665.

The 1996-97 budget estimates showed total receipts of Rs. 1,762.76 million and an expenditure of Rs. 1,762.601 million. The revised figures showed a reduction of Rs. 192.16 million in the receipts and a decreased expenditure by Rs. 432.8 million. The deficiency of expected funds from various sources had consequently reduced WASA's development expenditure.

The 2000-2001 budget showed receipts of Rs. 1,532.675 million and an expenditure of Rs. 1,532.50 million. The revised estimates for the same year showed receipts of Rs. 1,736.79 million (an increase of 13.3%) and an expenditure of Rs. 1,598.667 million (an increase of 4.3%).

The significant increase noted in the WASA receipts is due to the improvement in its revenue collection which is at the level of 78%, and is claimed to be the highest in Pakistan for similar agencies. Despite this, the arrears of WASA have been increasing over the last few years.

The 2001-2002 budget shows a receipt of Rs. 1,615.631 million and an expenditure of Rs. 1,929.335 million, showing a deficit of Rs. 313.704 million. The 20% higher expenditure figures (which appeared for the first time in WASA's Budget) are due to increased electricity tariff by

WAPDA and on debt servicing. The expenditure on "power and energy" which used to range between 37% to 45% is consuming 60% of the total expenditure. The quality of water supply, sewerage and drainage facilities have declined due to financial resource problems.

14.3.5 Parks and Horticulture Authority (PHA)

PHA is an Authority created on 21st September 1998 under Sections 3 and 4 of the Punjab Development of Cities Act, 1976. Its functions have not been specified in the notification issued on its creation. However, as the name indicates, the Authority is required to develop and maintain public parks, horticulture works and allied activities. All assets i.e. public open spaces, recreational facilities and related equipment, parks, nurseries etc. previously being maintained and run by the LDA and MCL have consequently been transferred to PHA along with the administrative set up and budgetary allocations. The Authority consists of 20 members, with the Chief Minister of the Punjab as its Chairman. Its area of operation is the District of Lahore, which is deemed to be a city for the purposes of the 1976 Act.

By another notification dated December 26, 1998, the PHA has been conferred the exclusive authority and rights to lease outdoor advertisements, bill boards (hoardings) etc. and to collect revenues therefrom in the notified areas of Lahore District. During the preceding three years the out door advertisements have been liberally allowed. The overcrowded look presented by the display of a large number of hoardings at the important road crossings and along the green verges is a clear manifestation of the policy in force. During 2000-2001 Financial Year the income of PHA including the reimbursements from LDA and MCL were Rs. 356.432 million. Out of the total expenditure (Rs. 267.797 million), 26.6% was spent on staff salaries and the remaining 73.4% constituted the development expenditure.

14.3.6 District Council Lahore

Before the promulgation of the PLGO, the Local Government in the rural areas of Lahore District, as distinct from the urban/city areas, consisted of the District Council responsible to providing municipal services and performing certain statutory civic functions. Like its urban counterpart, the District Council too had an elected Chairman and functioned under the control of the Local Government and Rural Development Department of the Provincial Government. It was governed by the provisions of the Punjab Local Government Ordinance, 1979.

During 1997-98, the District Council Lahore had an income of Rs. 771.02 million and an expenditure of Rs. 397.28 million. This left the Council with a surplus of Rs. 383.74 million, which was carried

forward to 1998-99. The estimated income for 1998-99 was Rs. 536.76 million and the estimated expenditure Rs. 856.76 million. There was thus an estimated excess expenditure of Rs. 320.00 million over the income for the year, which was to be met out of the amount carried forward from the previous year. Included in the excess expenditure was an amount of Rs. 756.38 million for annual development outlay.

14.3.7 Cantonment Board (LCB⁷)

Within the cantonment area of Lahore, the Cantonment Board has been constituted by the Cantonments Act. It is a Federal Institution working directly under the control and supervision of the Federal Government. The objectives and functions of this Board are almost the same as of a Local Council. The Cantonment is divided into 12 wards, each having an elected member, whose term of office is four years.

⁷ The details about the organisation, functions, financial aspects of LCB were not available from the Cantonment Authorities.

15.0 RECOMMENDATIONS OF EARLIER MASTER PLANS AND THEIR IMPLEMENTATION

There have been a series of planning studies to organise the city structure and land development of Lahore, notable being the Master Plan for Greater Lahore, 1966 and Lahore Urban Development and Traffic Study (LUDTS), 1980. Major recommendations of these earlier plans which still have relevance for modern Lahore are discussed here.

15.1 MASTER PLAN FOR GREATER LAHORE, 1966

On behalf of the ex-MCL, this study was undertaken by the Town Planning Directorate of Housing and Physical Planning (H&PP) Department, Government of the Punjab. The Master Plan is shown in Figure 15.1 and its summary of planning proposals is given below:

a) Land Use

- Urban Lahore was conceived as the core of a large metropolitan complex. The in-migration of population was proposed to be diverted to the existing peripheral towns by strengthening their economic base or by the creation of self-sustaining new industrial townships around Lahore. In order to segregate the main urban complex from the surrounding towns, a well controlled 24 km (15 miles) wide area was proposed to be left as green belt.
- Preparation of Regional Development Plan to assess the inter-relationship of various urban centres.
- Preparation of Outline Development Plans for the existing Urban Centres around Lahore.

Comments

Neither any concerted effort was made to strengthen the economic base of peripheral towns nor self-sustaining new industrial townships could be conceived. Thus the influx of people towards Lahore continued unabated. The Outline Development Plans for certain towns (e.g. Sheikhpura, Muridke, Kasur, Raiwind etc.) surrounding the city of Lahore were though prepared by H&PP Department but their implementation remained unaccomplished due to lack of institutional and legal framework at the local level.

b) Communications & Transport

- For the facilitation of through traffic, portions of inter-city roads like Multan Road, G.T. Road and Ferozepur Road were proposed to be downgraded as major town roads. The through traffic was proposed to be diverted to the proposed circumferential road.

- Construction of new road bridge 2.5 miles south of the existing Ravi bridge was recommended.
- A super-highway bypassing Kala Shah Kaku industrial ribbon development was recommended.
- Inner ring road was proposed to overcome traffic congestion in the central area.
- Phased provision of a circular railway to serve as a mass transit system for the movement of commuter traffic.
- All railway crossings were proposed to be grade-separated and traffic signals/junctions improved.
- Acquisition of rights of way for widenings of major roads and removal of encroachments from ROW was also recommended.
- Animal drawn vehicles were proposed to be withdrawn gradually with provision of cycle tracks recommended along all major roads.
- Removal of milch cattle from the city with establishment of Gwala Colonies.
- Provision of new bus and onmi-bus terminals.
- Provision of underground and multi-storeyed parking lots in the central area.
- Setting up of Traffic Department within Lahore Improvement Trust.

Comments

The conversion of portions of above-named inter-city roads into major urban roads, construction of another bridge on River Ravi, grade-separation on major railway level crossings and construction of two Gwala Colonies with a view to remove milch cattle have been implemented as per the recommendations of Master Plan. Similarly the creation of TEPA and the consequential development relating to improvement of a number of road junctions, provision of traffic signals and improvement/ dualization of major roads has been undertaken.

The recommendations concerning provision of new bus terminals, underground and multi-storeyed parking facilities, completion of inner ring road, and circular railway could not be implemented for one reason or the other. The condition of secondary roads, and local streets continued to deteriorate because of encroachment of rights of way and perhaps inadequate financial resources required for acquisition of properties for widening of roads. Gradual elimination of animal drawn vehicles and segregation of cyclists from the main traffic stream is still a dream to come true.

c) **Industry, Commerce and Employment**

- Expansion of industries was proposed at three industrial estates of Baghbanpura, Kot Lakhpat and between Multan Road and Bund Road extension.
- Wholesale markets from central areas were proposed to be shifted.
- Cottage industries which are not dangerous to public health were permitted to continue in commercial and residential areas.
- It was proposed to provide encouragement for the small entrepreneurs to participate in the economic activity for the sale of generating employment opportunities.
- Establishment of industry within the green belt was to be restricted to farm type industries only which could use the farm produce as a major raw material.
- Industrial estates were proposed at Muridke and Pattoki to check the inflow of unskilled labour to Lahore.
- Central city areas be redeveloped in order to exploit the maximum economic potential of the prime land.
- Decentralising commercial activity by establishing 4 divisional, 23 district, 60 neighbourhood and a number of Mohalla Shopping Centres.

Comments

Except for the Kot Lakhpat area, the development of industrial estates has not kept pace as visualized in the Master Plan. However, the new industrial estates being developed in Chunian Tehsil of District Kasur and Kala Shah Kaku partly correspond to the recommendations of the Master Plan. These have improved the economic base of adjoining Districts of Kasur and Sheikhpura and are likely to check, to some extent, the inflow of unskilled labour.

Fruit, vegetable, timber and salt markets have since been shifted. Other wholesale markets continued to function in the central congested areas. The recommendation of the Master Plan with reference to decentralization of commercial activity has immensely been useful and few divisional, district and neighbourhood centres have been established in the newly developed localities. It is unfortunate that no redevelopment project was undertaken in the CBD and as such the recommendation for intensive land utilization in the central area could not materialize resulting into the invasion of residential localities by central area uses.

d) **Housing**

- Low cost housing schemes be encouraged in central area and construction of multi-storeyed dwellings be undertaken.

- Private sector be encouraged to participate in the house building programme.
- Maximum size of residential plots be restricted to 2 Kanals.
- Provision of various categories of residential plots be kept proportionate to various income groups.
- Preparation of comprehensive legislation on housing.

Comments

The proposals of Master Plan for the housing sector basically refer to the policy issues which have been adopted to regulate housing activities. The institutional set up relating to town and physical planning have been established both in ex-MCL and LDA. Since no redevelopment exercise has been undertaken in Central Area, the idea of developing low cost housing scheme has not materialised. In the absence of comprehensive legislation on housing, the enforcement of minimum standards in the existing housing has not been possible as visualised in the Master Plan.

e) Social Services

- One 500-bed hospital be provided in each district and a polyclinic in every alternate neighbourhood.
- The capacity of hospitals be expanded, similarly new colleges, schools, metropolitan parks etc. be established.
- Two metropolitan parks, 4 divisional parks, 23 district parks and 61 neighbourhood parks were suggested along with establishment of play grounds at Mohallah level.
- A committee be constituted to work out detailed development schemes and establish parks and green belts in Lahore.

Comments

Contrary to the recommendations of Master Plan, four major hospitals (i.e. Zaid, Jinnah, Children and Social Security Hospitals) have been constructed by the public sector in Southern Lahore. The areas deficient in social services are still deprived of the recommended social services due to the concentration of health, educational, recreational and cultural facilities in relatively posh localities built over the last 30 years in Southern Lahore. The parks and open spaces developed as part of site development schemes have to a large extent complied with the recommendations of the Master Plan.

f) Public Services

- Regular laboratory tests of municipal tubewells to ensure water quality.

- Water supply coverage be increased along with rehabilitation of existing distribution network.
- Three new sewage treatment plants were proposed.
- Existing drainage channels be cleared and enlarged, banning the construction of structures over them.
- Refuse collection and disposal be improved by constructing 3 high rate composting plants at Nawan Kot, Shad Bagh and Central Disposal Works.
- LMC was required to maintain /control graveyards by taking effective measures.

Comments

The municipal water supply was substantially increased during the plan period. The recommendations regarding three new sewage treatment plants and 3 high rate composting plants for refuse disposal have not been attended and as such satisfactory arrangement of sewerage and refuse disposal is still lacking. The clearing of drainage channels is a regular feature which is usually undertaken before the start of monsoon season.

g) Development by Government

- Faletti's Hotel be acquired for extension of proposed Secretariat Complex.
- Encourage establishment of new offices in the proposed Divisional Centre to reduce journey to work distances.
- Provision of adequate parking lots in all new re-development schemes in the central area.

Comments

No material action has been taken by the government on the above recommendations.

h) Implementation

- A high level planning authority to exercise control over land use and building activities was to be established under the Chairmanship of Commissioner, Lahore Division.

Comments

LDA has been giving due sanctity to the proposals of the Master Plan in so far as their housing and other development projects are concerned. But since the necessary institutional and legal framework was not

provided hence the strict enforcement and implementation of the Master Plan was not possible.

Most of the above given recommendations are still valid and need to be implemented, especially the encouragement of low income housing schemes, constant monitoring and removal of encroachments on public rights-of-way, acquisition of rights-of-way for widening of major roads, shifting/duplication of wholesale markets, redevelopment of central city areas to exploit maximum economic potential etc.

Due to the continuous urbanization and development pressure in Lahore and failure to create self-sufficient industrial communities around it, it has not been possible to maintain/provide a green belt around the city.

15.2 LAHORE URBAN DEVELOPMENT AND TRAFFIC STUDY (LUDTS), 1980

This study was undertaken by a joint team of foreign and local consultants in 1980 and financed by a credit from International Development Agency.

One of the major outputs of this study was the preparation of a Structure Plan for 20 years time horizon (1981-2000) outlining framework for future growth of Lahore (shown in Figure 15.2). The study consisted of following four components:

- i) Urban planning activities leading to formulation of the Structure Plan, to provide a framework for action programme within Lahore;
- ii) Neighbourhood upgrading and urban expansion projects, to provide substantial improvements in living conditions for lower income groups;
- iii) Improvement of traffic conditions in congested parts of the street system of Central Lahore; and
- iv) Improvement of living conditions within the Walled City by improving environmental sanitation and providing social support programme.

The study recommended the following:

- a) **Urban Growth Strategy, Urban Land Policy and Housing**
 - Future physical growth be planned towards south and southwest.
 - Densification of built-up areas by in-filling.
 - Decentralization of existing centres and development of new secondary and tertiary centres.
 - Future densities be kept closer to 300 persons per hectare (pph).
 - Urban areas to expand by up to 800 hectares every year to accommodate projected growth of population.

SCALE: 0 1 2 3 Km

LEGEND

DEVELOPMENT DURING:
 1981 - 85
 1985 - 90
 1990 - 95
 1995 - 2000

REGIONAL CENTRE
 AREA OF OPPORTUNITY
 MOHALLAH CENTRE
 WALLED CITY
 DEVELOPED AREA (EXISTING)



LAHORE STRUCTURE PLAN (1981-2000)

Fig: 15.2

- Minimum compensation payable under Punjab Acquisition of Land (Housing) Act, 1973 be increased.
- Urban expansion could also cross over River Ravi subject to thorough investigation of flood problems and provision of flood protection measures.
- Maximum number of plots be developed for low income groups in LDA sponsored housing schemes by reducing plot sizes and infrastructural standards, encouraging informal sector engaged in providing shelter, development of sites and services schemes and introducing cross-subsidies.
- Subsidised housing be provided by employers in the form of constructed houses or flats for their own employees.

Comments

The recommendations on Urban Growth Strategy and Land Policy as contained in the Study were of generalised nature and were perhaps based on the on-going market trends and the land development policy adopted both by the public and private sectors. The policy of site and services based on smaller zoning and fixation of higher density standards do go side by side but recommended density of 300 persons / hectare may not be achievable within a foreseeable future. Urban expansion across River Ravi was also recommended in the 1966 Master Plan after carrying out of a flood protection study which has not been undertaken even after the lapse of 35 years. The uncontrolled expansion is however, taking place on its own.

The recommendations given in the LUDTS are still valid and are being implemented to a certain extent by the concerned agencies. Most of the development pressure is taken in the form of private cooperative housing schemes which are unable to meet the growing demand of the low income communities. These private housing schemes have so far been able to achieve an average density of 112 pph whereas LDA's contribution in undertaking housing schemes has been negligible since 1985 i.e. after repeal of Punjab Acquisition of Land (Housing) Act, 1973. The average density achieved in LDA housing schemes so far is around 198 pph.

b) Open Land and Recreation

- Vacant land in LMA be put to use by creating a series of linked open spaces or for use of social facilities.
- One stadium for every 250,000 population; one sports ground, family park and public swimming pool for every 25,000 population and two play lots for every 3,000 population were proposed.

- All graveyards need to be landscaped. Restrict further growth of those below 3 to 4 hectares. Two or three large graveyards be suitably located between the built up areas and agriculture land.

Comments

Given the financial resources, the standards for open spaces and recreational facilities e.g. public swimming pool for every 25,000 population and creation of series of inter-linked open spaces appear to be based on wishful thinking. The idea to landscape the existing graveyards with a view to enhance their environmental quality is meaningful.

c) Employment Strategy and Location of Employment

- Small scale manufacturing sector be encouraged.
- Existing employment centres be allowed to function as far as they do not create congestion or pollution. These should be provided better public transport access.
- New employment centres be created near new residential areas with better public transport facilities.

Comments

The recommendations on employment strategy are still valid but nothing concrete appears to have been done through adoption of policy measures relating to small scale manufacturing sector and creation of new employment opportunities near new residential areas.

d) Basic and Social Infrastructure

- Conduct tests to assess the aquifer situation.
- Reduce wastage and leakage of water.
- Identify worst served areas of water supply for remedial action.
- Provide high level water reservoirs to increase pressure.
- Sewerage Master Plan of 1975 be reviewed and updated and northern and eastern districts be taken up for laying the sewerage system.
- Separate systems be created eventually for sewage and storm water run-off.
- Improve the design of dustbins and filth depots as well as mechanization of the collection process of solid waste from dust bins onto vehicles.
- Improve fire protection facilities in the narrow streets of Walled City with improvement in water pressure.

- Provision of Basic Health Centre with 2 health workers is recommended for every 3,000 people, one dispensary for every 25,000 people and one polyclinic for every 100,000 people.
- More emphasis be given to provide facilities for primary education and improve quality of existing schools. In the first stage (1981-86) 50% schools be run on double shifts. In the second stage number of class rooms and teachers be increased to eliminate double shifts.

Comments

Again the recommendations on basic and social infrastructure are generalised and consisted of advisory instructions. The study did not make concrete recommendations.

e) **Urban Management**

- LDA should play the role of the leader to ensure coordination among various agencies.
- LDA should become the urban data centre, collecting and providing information to all agencies for their use.

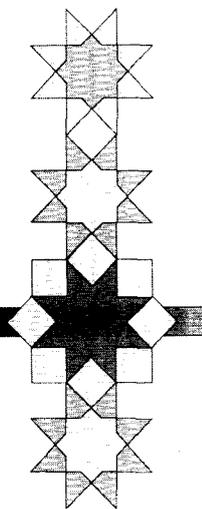
Comments

The importance of coordination amongst various agencies and development of a data centre should not have been under-estimated. The LDA or the City Government must be identified to acquire the responsibility for collecting and providing information to all agencies dealing with planning and development within LMA. The recommendation of the Structure Plan on this issue shall remain valid till the creation of necessary institutional framework for the better urban management system.

The implementation of the salient planning recommendations from the two above-listed planning studies has been carried out as far as growth, direction and strategy is concerned. Effective implementation of these Plans has been hampered by the following factors, which were generally beyond the domain of LDA, the coordinating agency for plan implementation.

- a) Limited funds and resources of Federal and Provincial governments
- b) Changes in political scenarios and priorities
- c) Inadequate enforcement
- d) Weak legal and institutional framework for plan implementation
- e) Lack of coordination between government agencies and shortage of technical manpower.

ANNEXURES TO VOLUME I



ANNEX-A to Chapter-1

**LIST OF PROTECTED IMMOVABLE ANTIQUITIES
(MONUMENTS AND SITES) UNDER THE ANTIQUITIES ACT 1975**

S. NO	LOCALITY OF LAHORE	NAME OF MONUMENT	YEAR OF CONSTRUCTION
1	Shahdara	Akbari Sarai & Mosque	1637
2	Baghbanpura	Anguri Bagh Opposite Shalamar Gardens	-
3	Walled City	Baadshahi Mosque	1673-74
4	Lahore	Baradari & Samadhi Maharaja Sher Singh	1848
5	Walled City	Bhaati Gate	-
6	G.T Road	Buddha's Tomb	1671
7	Lahore	Buddha Ka Awa monument	-
8	Chowk Wazir Khan (inside Delhi Gate)	Chitta Gate	1650
9	Mozang	Chauburji	1646
10	Lahore	Dai Anga's Tomb	1671
11	Naulakha	Dai Anga's Mosque	1635
12	Walled City	Delhi Gate	-
13	Inside Lohari Gate	Gate on North East Corner of Wazir Khan Mosque	1650
14	Begumpura	Gulabi Bagh Gateway	1655
15	Koocha Nau Nihal Singh	Haveli Nau Nihal Singh. (including Garden Quarters)	-
16	Kot Khawaja Saeed	Hujra Mir Mehdi (Janaazgah)	1800
17	Badshahi Mosque	Huzuri Bagh and Baradari	1818
18	Baghbanpura	Inayat Bagh Opp. Shalamar Gardens	1632
19	Shahdara	Jahangir's Tomb and Compound	1637
20	Baghbanpura	Jani Khan's Tomb	-
21	Walled City	Kashmiri Gate	-
22	Walled City	Lahore Fort	1566
23	Walled City	Lohari Gate	-
24	Inside Masti Gate	Mariam Zamani Mosque (Begum Shahi Mosque)	1614
25	Lahore Walled City	Masti Gate	-
26	Begumpura	Mosque with glazed tiles	1750
27	Baghbanpura	Mosque of Nawab Zakriya Khan	1731
28	Mian Mir Lahore Cantonment	Nadira Begum's Tomb and Tank	1632
29	Chowk Wazir Khan	Other gate on north-east of Wazir Khan's Mosque	-
30	Garhi Shahu	One Kos Minar	17 th Cent.
31	Aibak Street	Qutbuddin Aibak's Tomb	1210
32	34-A, McLeod Road	Residence of Late Dr. Muhammad Iqbal	Late 19 th Cent
33	Walled City	Roshnai Gate	-
34	Near Huzuri Bagh	Samadhi of Ranjit Singh, Kharakh Singh & Nau Nihal Singh	1818
35	Baghbanpura	Saruwala Maqbra	1750
36	G.T.Road	Shalamar Gardens	1642

37	Texali Gate near Shahi Qila	Samadhi of Bhai Wasti Ram	-
38	Nawankot	Tiled gateway and two bastions	After 1650
39	35-Ghiraghan Street, McLeod Road	Tomb of Shaikh Musa Ahangar Mosque and House	-
40	Railway Workshop	Tomb of Ali Mardan and Gateway	1650
41	Huzuri Bagh	Tomb of Dr. Allama Muhammad Iqbal	1951
42	Shahdara	Tomb of Asif Khan and compound	1645
43	Kuri Bagh	Tomb of French Officer's daughter (Marie Charlotte)	1827
44	Baghbanpura	Tomb of Mahabat Khan & Boundary Walls	1650
45	Mughalpura	Tomb of Mughal Period	-
46	Mughalpura	Tomb of Nawab Bahadur Khan	1601
47	Railway Workshops	Tomb of Nawab Nusrat Khan	-
48	Shahdara	Tomb of Noor Jahan	1645
49	Kot Khawaja Saeed	Tomb of Prince Parwaiz	1650
50	Nawankot	Tomb of (erroneously called) Zebun-Nisa	1670
51	Punjab Secretariat	Tomb of Anaarkali	1615
52	Minola 6 miles from Jallo	Two Kos Minars	17 th Cent.
53	Chowk Wazir Khan (Inside Delhi Gate)	Wazir Khan's Hammams	1630
54	Old Anarkali Behind Lahore Museum	Wazir Khan's Baradari	-
55	Chowk Wazir Khan	Well of Raja Dina Nath	1851
56	Walled City	Wazir Khan's Mosque	1634

ANNEX B to Chapter-1

LIST OF "SPECIAL PREMISES" NOTIFIED UNDER THE PUNJAB
SPECIAL PREMISES (PRESERVATION) ORDINANCE, 1985,
LAHORE DISTRICT.

- | | | | |
|----|---|----|---|
| 1 | Aitchisan College, Lahore | 2 | Residency (State Guest House) |
| 3 | Lahore High Court, Lahore | 4 | Assembly Chambers, Lahore |
| 5 | Free Masons Hall, Lahore | 6 | Ferozesons Building, Shahrah-e-Quaid-e-Azam, Lahore |
| 7 | Montgomery Hall (Quaid-e-Azam Library), Lahore. | 8 | Chamba House (GOR Estate), Lahore. |
| 9 | Civil Lines Police Station, Lahore | 10 | Patiala Block, King Edward College, Lahore |
| 11 | Ewing Hall, Neela Gumbad, Lahore | 12 | General Post Office, Lahore |
| 13 | State Bank of Pakistan, Nabba Road, Lahore. | 14 | Anarkali Tomb (Civil Secretariat), Lahore |
| 15 | Barkat Ali Hall, Circular Road, Lahore. | 16 | Punjab University (Old), Lahore |
| 17 | Museum and National College of Arts, Lahore | 18 | Town Hall, Shahr-ah-e-Quaide-Azam, Lahore |
| 19 | Lakshami Building, McLeod Road, Lahore. | 20 | Tomb of Malik Ayaz (Rang Mahal), Lahore. |
| 21 | Fateh Garh Gardens near Shalimar Garden, Lahore. | 22 | Faqir Khana Museum (Inside Bhati Gate) Lahore |
| 23 | Haveli Dhayan Singh, Texali Gate, Lahore. | 24 | Kamran Baradari at Ravi, Lahore. |
| 25 | Seetla Mandir (Outside Shahalami Gate), Lahore | 26 | Tomb of Qutabuddin Aibak, Lahore. |
| 27 | Bredlaw Hall, Sheesh Mahal Road, Lahore. | 28 | Railway Station, Lahore. |
| 29 | Government College, Lahore. | 30 | Islamia College, Railway Road, Lahore |
| 31 | Islamia College, Civil Lines, Lahore | 32 | Government College Hostel, Lower Mall, Lahore. |
| 33 | Animal Husbandry College, Lahore | 34 | Central Model High School, Lower Mall, Lahore. |
| 35 | Mubarik Haveli, Bhati Gate, Lahore. | 36 | Haveli Nawab Sahib, Mochi Gate, Lahore. |
| 37 | Cricket Pavillion, Baghe-Jinnah, Lahore. | 38 | Kinnaird College, Jail Road, Lahore. |
| 39 | Queen Mary College, Lahore. | 40 | Government House, Lahore |
| 41 | Haveli Sheikh Rukandin, Lohari Gate, Lahore. | 42 | Gurdawara (D-Block Model Town), Lahore. |
| 43 | Chobara Chajju Bhagat near Mayo Hospital, Lahore. | 44 | Dayal Singh Library, Nisbat Road, Lahore. |
| 45 | Administrative Staff College, Lahore. | 46 | Shahdin Building, Shahrah-e-Quaid-e-Azam Lahore. |
| 47 | Shrine of Hazrat Mian Mir Sahib (R.A). Lahore. | 48 | Badshahi Masjid, Lahore |
| 49 | Masjid Wazir Khan | 50 | Sunehri Masjid |
| 51 | Shrine of Hazrat Abual Ma'ali. | 52 | Shrine of Hazrat Shah Chiragh and attached Mosque. |
| 53 | Shrine of Hazrat Aishan Sahib. | 54 | Shrine of Hazrat Mauj Darya Bukhari |
| 55 | Shrine of Mian Wadda Sahib | 56 | Shrine of Hazrat Sikandar Shah |
| 57 | Masjid Saleh Mohammad Kamboh | 58 | Shrine of Hazrat Data Ganj Bakhsh |
| 59 | Shrine of Hazrat Khwaja Behari. | 60 | Small Mosque near the Shrine of Hazrat Behari. |
| 61 | Shrine of Hazrat Madhu Lal Hussain. | 62 | Shrine of Hazrat Miran Hussain Janjani |
| 63 | Plateform of the grave of Mian Mir's Sister. | 64 | Tomb of Hazrat Sabir Shah on the west of Badshahi Mosque. |
| 65 | Tomb of Hazrat Pir Makki. | 66 | Mazar of Hazrat Bibi Pak Daman. |

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|-----|--|-----|--|
| 67 | Shrine of Hazrat Shah Jamal | 68 | Tomb of Mullah Badakhshi and its surrounding area specially the corner Burja |
| 69 | Small Mosque of Wazir Khan inside Taxali Gate known as the Mosque of Ladies of Wazir Khan | 70 | Tombs of Nawab Abdul Samad Khan and his family |
| 71 | Chowk Masjid Wazir Khan occupied by Khokhawalas | 72 | Masjid Mai Ladi. |
| 73 | Shrine of Hazrat Shah Kamal. | 74 | Barkat Ali Islamia Hall. |
| 75 | Unchi Masjid | 76 | Masjid Patolian |
| 77 | Shrine of Hazrat Syed Mahmood Hazoori. | 78 | Shrine and Mosque of Syed Jan Muhammad Hazoori |
| 79 | Shrine of Hazrat Syed Maulvi Nizam-ud-din. | 80 | Shrine of Hazrat Sadr-ud-Din Sadr Jahan. |
| 81 | Mosque of Khawaja Ayaz | 82 | Tomb of Shah Rustam Ghazi. |
| 83 | Masjid Chinian Wala | 84 | Masjid Maulvi Taj Din |
| 85 | Tomb of Hazrat Shah Ismail | 86 | Tomb of Khawaja Muhammad Saeed within an enclosure opposite Nila Gumbad. |
| 87 | Tomb of Shah Sharf lying on the north of Khwaja Muhammad Saeed's Tomb. | 88 | Tomb of Hazrat Shah Muhammad Ismail Gilani. |
| 89 | Tomb of Hazrat Shah Shams-ud-Din. | 90 | Tomb and Garden of Mian Khan s/o Sa'd Ullah Khan, the Prime Minister of Shah Jahan |
| 91 | The Mughal Garden at Fatehgarh | 92 | Shahzadi ka Maqbara near it on its north surrounded by residential houses |
| 93 | The remaining entrance gate and baradari of the garden of Khawaja Ayaz who was the Governor of Lahore. | 94 | Mosque of Khawaja Ayaz |
| 95 | Tomb of Nawab Khane-Dauran Nusrat Jang Bahadur lying within the area of Railway Workshop. | 96 | Tomb of Muhammd Saleh Kamboh. |
| 97 | Masjid Moran Tawaif | 98 | Shrine of Hazrat Imam Gamun. |
| 99 | Tomb of Abdul Ghani between Shalamar Garden | 100 | Temple and tank of Bhairon ka Than. |
| 101 | Smadhi of Sir Ganga Ram | 102 | Smadhi of Ghhajju Bhagat |
| 103 | The enclosure and Grave of Mian Natha and his Goat in the General Graveyard of Mian Mir. | 104 | The Grave of Mulla Hamid Gujar and his relatives |
| 105 | Shah Chiragh Chambers. | | |

Source: Government of the Punjab, LG&RD Department Notification.

ANNEX to Chapter-4

**TABLE 1
TOTAL INCOME BY OCCUPATION
LAHORE (DISTRICT) URBAN, 1998**

(Rupees)

SERIAL NO.	OCCUPATION	NO. OF EMPLOYEES	AVERAGE INCOME 1996-97	AVERAGE INCOME WITH AN INCREASE @10% PER ANNUM (1998)	TOTAL INCOME
1.	Administrative and Managerial Workers	7,290	17,493	19,242	140,274,180
2.	Professional, Technical and Related Workers	129,397	7,104	7,814	1,011,108,158
3.	Clerical and Related Workers	41,917	6,344	6,978	292,496,826
4.	Sales and Service Workers	175,870	5,887	6,476	1,138,934,120
5.	Agriculture, Animal husbandry and Forestry Workers, Fishermen and Hunters	19,136	5,619	6,181	118,279,616
6.	Production and Related Workers, Transport Equipment Operators and Labourers	525,788	5,149	5,664	2,978,063,232
7.	Workers not classifiable by Occupation	11,846	965	1,062	12,580,452
Total		911,244	6,950	-	5,691,736,584

Source: Table 16 (Page 279) HIES, 1996-97.

$$\text{Average Household Income (1998)} = \frac{\text{Total Income}}{\text{Total Households}} = \frac{5,691,736,584}{733,674} = \text{Rs. } 7,758$$

TABLE 2
POPULATION BY ECONOMIC CATEGORIES, SEX, RURAL/URBAN AREAS, 1998

AREA	ECONOMICALLY ACTIVE POPULATION ¹			NOT ECONOMICALLY ACTIVE POPULATION ²			UNEMPLOYED POPULATION ³		
	BOTH SEXES	MALE	FEMALE	BOTH SEXES	MALE	FEMALE	BOTH SEXES	MALE	FEMALE
Lahore Urban Areas	1,146,780	1,106,225	38,672	2,760,748	968,812	1,793,819	235,536	234,557	979
Lahore Rural	229,629	222,598	8,914	534,530	186,427	346,220	49,264	49,182	82
Lahore District	1,376,409	1,328,823	47,586	3,295,278	1,155,239	2,140,039	284,800	283,739	1,061

1. The Economically Active Population is defined (in 1998 Census) as the persons working most of the time during the year preceding the census date i.e. 5th March 1998, looking for work, laid off and unpaid family helpers assisting their family.
2. Unemployment rate is measured as ratio of looking for work and laid off in total economically active population comprising employed, looking for work, laid off and unpaid family helpers, generally representing in percentage.

¹ Reproduced from Table 22 (Page 180), District Census Report of Lahore, 1998.

² Deduced from Table 22 (Page 180), District Census Report of Lahore, 1998.

³ Reproduced from Table 27 (Page 207), District Census Report of Lahore, 1998.

TABLE 3
EMPLOYED POPULATION (10 YEARS AND ABOVE) BY EMPLOYMENT STATUS, 1981

S. No.	OCCUPATION GROUP	LAHORE DISTRICT				LAHORE DISTRICT (URBAN)							
		BOTH SEXES		MALE		FEMALE		BOTH SEXES		MALE		FEMALE	
		No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
1	Self Employed	338,438	38.39	330,183	39.15	8,225	21.71	262,336	36.53	256,332	37.36	6,004	18.76
2	Employee (Government)	193,096	21.91	178,845	21.20	14,251	37.47	182,995	25.49	169,147	24.66	13,848	43.26
3	Employee (Non Government)	274,697	31.16	262,440	31.11	12,257	32.23	220,105	30.65	209,510	30.54	10,595	33.10
4	Employer	24,117	2.74	23,691	2.81	426	1.12	22,680	3.16	22,282	3.25	398	1.24
5	Under Family Helper	51,155	5.80	48,316	5.73	2,839	7.47	29,946	4.17	28,780	4.19	1,166	3.64
	All Occupation Groups	881,503	100	843,475	100	38,028	100	718,062	100	686,051	100	32,011	100

Source: District Census Report of Lahore, 1981.

TABLE 4
EMPLOYED POPULATION (10 YEARS AND ABOVE) BY EMPLOYMENT STATUS, 1998

S. No.	OCCUPATION GROUP	LAHORE DISTRICT ⁴				LAHORE DISTRICT (URBAN) ⁵							
		BOTH SEXES		MALE		FEMALE		BOTH SEXES		MALE		FEMALE	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1.	Self Employed	573,690	52.55	560,947	53.67	12,743	27.39	462,115	50.71	452,209	51.88	9,906	25.03
2.	Employee (Government)	157,415	14.43	142,895	13.67	14,520	31.21	143,365	15.73	129,807	14.89	13,558	34.26
3.	Employee (Autonomous Body)	24,097	2.21	22,558	2.14	1,539	3.31	20,706	2.27	19,335	2.22	1,371	3.46
4.	Employee (Private)	296,076	27.12	281,931	26.75	14,145	30.40	254,016	27.88	242,066	27.77	11,950	30.20
5.	Employer	27,795	2.54	26,943	2.55	852	1.83	21,595	2.37	20,874	2.39	721	1.82
6.	Under Family Helper	12,536	1.15	9,810	0.93	2,726	5.86	9,447	1.04	7,377	0.85	2,070	5.23
	All Occupation Groups	1,091,609	100.00	1,045,084	100.00	46,525	100.00	911,244	100.00	871,668	100.00	39,576	100.00

⁴ Table 23 (Page 181), District Census Report of Lahore, 1998.

⁵ Table 23 (page 185), District Census Report of Lahore, 1998.

TABLE 5
PERCENTAGE OF EMPLOYED POPULATION BY
OCCUPATION AND RURAL/URBAN AREAS, 1981

S. No.	OCCUPATION	ALL AREAS		URBAN		RURAL	
		% AGE	POPULATION	% AGE	POPULATION	% AGE	POPULATION
1.	Professional, Technical and Related Workers	6.3	60,055	7.1	56,162	2.3	3,893
2.	Administrative and Managerial Workers	2.1	19,712	2.5	19,324	0.2	388
3.	Clerical and Related Workers	8.2	78,448	9.4	74,387	2.4	4,061
4.	Sales Workers	17.1	164,135	19.8	155,946	4.9	8,189
5.	Services Workers	7.4	70,688	8.1	63,992	4.0	6,696
6.	Agricultural, Animal Husbandry and Forest Workers, Fishermen, Hunters	10.6	101,207	3.3	26,043	44.7	75,164
7.	Production and Related Workers, Transport Equipment Operators, Labourers	37.6	359,599	37.2	293,508	39.3	66,091
8.	Workers not classified by occupation	10.7	102,735	12.6	99,124	2.2	3,611
	All Occupations	100.0	956,579	100.0	788,486	100.0	168,093

Source: Table 15, District Census Report of Lahore, 1981.

TABLE 6
PERCENTAGE OF EMPLOYED POPULATION BY OCCUPATION
AND RURAL/URBAN AREAS, 1998

S.No.	OCCUPATION	ALL AREAS		URBAN		RURAL	
		% AGE	POPULATION	% AGE	POPULATION	% AGE	POPULATION
1.	Legislators, Senior Officials and Managers	0.7	7,504	0.8	7,262	0.1	242
2.	Professionals	9.2	100,041	10.5	95,538	2.5	4,503
3.	Technicians and Associate Professionals	3.4	37,755	3.7	33,901	2.1	3,854
4.	Clerks	4.1	44,349	4.6	42,180	1.2	2,169
5.	Services Workers, Shop and Market Sales Workers	17.5	191,505	19.3	176,291	8.4	15,214
6.	Skilled Agricultural and Fishery Workers	5.7	62,397	2.1	19,591	23.7	42,806
7.	Craft and Related Trades Workers	8.5	92,257	9.1	82,784	5.3	9,473
8.	Plant and Machine Operators and Assemblers	5.1	55,759	5.4	48,921	3.8	6,838
9.	Elementary Occupations	44.7	488,027	43.2	393,304	52.6	94,723
10.	Others	1.1	12,015	1.3	11,472	0.3	543
	All Occupations	100.0	1,091,609	100.0	911,244	100.0	180,365

Source: Table 25 (Page 199), District Census Report of Lahore, 1998.

DETAILS OF UNION COUNCILS IN LAHORE DISTRICT

Union Council No.	Name of Locality	Urban/ Rural	Population	Area Hectares	Density (Persons/ha)
A. Ravi Town					
1	Kot Begum	Urban	40,030	296.1	135
2	Kot Mohibo	-do-	42,296	56.7	746
3	Aziz Colony	-do-	41,382	108.5	381
4	Faisal Park	-do-	44,034	318.6	138
5	Qaiser Park	-do-	38,852	365.6	106
6	Dhair	-do-	35,087	200.9	175
7	Shahdara	-do-	35,516	204.8	173
8	Jia Musa	-do-	39,002	169.7	230
9	Qila Lachhman Singh	-do-	32,291	123.4	262
10	Fruit Mandi	-do-	36,101	166.9	216
11	Siddique Pura	-do-	33,059	123.6	267
12	Bangali Bagh	-do-	41,758	127.0	329
13	Siddiqia Colony	-do-	46,689	168.9	276
14	Bhamman	-do-	35,267	80.2	440
15	Bhagat Pura	-do-	31,564	203.2	155
16	Gujjar Pura	-do-	37,880	216.5	175
17	Rehmat Pura	-do-	38,711	118.5	327
18	Begum Pura	-do-	38,020	140.4	271
19	Chah Miran	-do-	45,783	61.7	742
20	Bilal Park	-do-	41,839	39.6	1056
21	Makhan Pura	-do-	43,088	48.3	892
22	Kot Khawaja Saeed	-do-	37,036	62.4	593
23	Shad Bagh	-do-	38,666	79.1	489
24	Wassan Pura	-do-	33,528	59.5	563
25	Faiz Bagh	-do-	39,093	36.7	1065
26	Farooq Ganj	-do-	36,982	91.4	404
27	Androon Delhi Gate	-do-	38,534	52.7	731
28	Rang Mahal	-do-	40,923	40.7	1005
29	Androon Bhati Gate	-do-	42,853	61.1	701
30	Androon Texali Gate	-do-	<u>38,434</u>	<u>104.6</u>	<u>367</u>
	TOTAL	30	1,164,298	3,927.3	296
B. Shalimar Town					
31	Railway Colony	Urban	38,312	390.6	98
32	Dars Barhay Mian	-do-	42,052	129.0	326
33	Crown Park	-do-	31,422	137.6	228
34	Madhu Lal Hussain	-do-	31,987	139.8	229
35	Muhammad Din Colony	-do-	36,968	225.4	164
36	Baghbanpura	-do-	37,041	63.3	585
37	Muslimabad	-do-	41,370	140.1	295
38	Nasirabad	-do-	34,300	136.7	251
39	Shadipura	-do-	39,567	298.3	132
40	Salamatpura	-do-	43,269	270.1	160
41	Harbanspura	-do-	38,475	491.9	78
42	Daroghawala	-do-	42,124	39.9	1055
43	Rashidpura	-do-	41,950	181.9	231
44	Fateh Garh	-do-	31,844	289.1	110
45	Nabi Pura	-do-	40,634	129.6	313
46	Anguri Bagh	-do-	33,416	80.7	414
47	Mujahidabad	-do-	32,395	75.0	432
48	Mughalpura	-do-	<u>33,134</u>	<u>85.7</u>	<u>386</u>
	Total Urban	18	670,260	3,304.7	203

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49	Lakho Dher	Rural	39,853	4,117.0	10
50	Bhaseen	-do-	37,259	10,487.3	4
51	Dograi Kalan	-do-	42,880	2,022.6	21
52	Manawan	-do-	41,895	1,090.7	38
53	Minhala	-do-	<u>38,884</u>	<u>8,102.2</u>	<u>5</u>
	Total Rural	5	200,771	25,819.8	8
	TOTAL	23	871,031	29,124.5	30
C. Aziz Bhatti Town					
54	Mian Mir	Urban	33,546	133.6	251
55	Mustafabad	-do-	42,337	26.8	1580
56	Ghaziabad	-do-	40,802	112.0	364
57	Taj Bagh	-do-	33,283	172.3	193
58	Taj Pura	-do-	38,174	99.9	382
59	Al-Faisal Town	-do-	31,896	72.0	443
60	Guldasht	-do-	<u>44,547</u>	<u>422.1</u>	<u>105</u>
	Total Urban	7	264,585	1,038.7	255
61	Bhangali	Rural	40,788	7,604.8	5
62	Barki	-do-	39,328	6,448.2	6
63	Kamahani	-do-	35,025	3,865.3	9
64	Hair	-do-	35,491	7,137.4	5
65	Hadiara	-do-	40,525	11,560.0	4
66	Dhaloke	-do-	<u>34,547</u>	<u>10,118.4</u>	<u>3</u>
	Total Rural	6	225,704	46,734.1	5
	TOTAL	13	490,289	47,722.8	10
D. Data Ganj Bukhsh Town					
67	Kasur Pura	Urban	43,563	122.1	357
68	Ameen Park	-do-	39,323	108.7	362
69	Kareem Park	-do-	35,651	161.7	221
70	Ganj Kalan	-do-	42,103	67.0	628
71	Bilal Ganj	-do-	46,076	110.7	416
72	Anarkali	-do-	35,931	158.9	226
73	Gwalmandi	-do-	38,210	66.4	575
74	Sarae Sultan	-do-	43,204	105.3	410
75	Bibi Pak Daman	-do-	40,683	198.8	204
76	Garhi Shahu	-do-	33,112	80.2	413
77	Qila Gujjar Singh	-do-	33,355	210.0	159
78	Race Course	-do-	35,043	488.7	72
79	Mozang	-do-	46,003	111.9	411
80	Town Hall	-do-	42,173	190.7	221
81	Riwaz Gardens	-do-	32,453	71.8	452
82	Islam Pura	-do-	39,957	65.6	609
83	Chohan Park	-do-	40,781	71.8	568
84	Abubakar Siddique	-do-	35,695	228.9	156
85	Sanda Kalan	-do-	39,142	40.4	969
86	Sanda Khurd	-do-	40,053	73.2	547
87	Sham Nagar	-do-	41,880	214.2	195
88	Gulgasht Colony	-do-	34,114	63.9	534
89	Gulshane-Ravi	-do-	33,069	170.3	194
90	Babu Sabu	-do-	33,069	687.7	48
91	Rizwan Park	-do-	38,539	42.5	907
92	Shadiwal	-do-	31,822	62.9	506
93	Bahawalpur House	-do-	30,368	136.2	223
94	Shadman	-do-	37,650	239.1	157
95	Al-Hamra	-do-	36,078	536.5	67
96	Zaman Park	-do-	40,078	251.1	159

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97	Gulberg	-do-	42,540	395.6	107
98	Makka Colony	-do-	38,383	126.5	303
99	Nasirabad	-do-	<u>38,783</u>	<u>352.2</u>	<u>110</u>
	TOTAL	33	1,258,884	6,011.5	209
E. Allama Iqbal Town					
100	Ichhra	Urban	34,205	75.7	452
101	New Samanabad	-do-	34,896	63.6	548
102	Shah Kamal	-do-	40,549	66.1	613
103	Pakki Thatti	-do-	43,549	98.4	442
104	Kashmir Block	-do-	45,149	210.1	215
105	Nawan Kot	-do-	44,606	115.8	385
106	Samanabad	-do-	36,068	126.1	286
107	Rahmanpura	-do-	39,366	100.1	393
108	Gulshane-Iqbal	-do-	43,617	191.0	228
109	Sikandar Block	-do-	43,083	465.5	92
110	Awan Town	-do-	37,507	179.6	209
111	Saidpur	-do-	34,838	105.5	330
112	Sabzazar	-do-	31,575	376.6	84
113	Dholanwal	-do-	38,482	68.2	564
114	Bakkar Mandi	-do-	32,563	96.2	338
115	Muslim Town	-do-	34,742	601.8	58
116	Johar Town	-do-	<u>43,487</u>	<u>1181.3</u>	<u>37</u>
	Total Urban	17	658,282	4,121.6	160
117	Hanjarwal	Rural	44,336	2,385.1	19
118	Niaz Beg	-do-	44,448	725.1	61
119	Shahpur	-do-	36,097	3,766.4	10
120	Ali Razabad	-do-	38,190	2,660.8	14
121	Chung	-do-	34,917	2,283.2	15
122	Maraka	-do-	36,543	6,783.8	5
123	Shamke Bhattian	-do-	33,042	7,622.8	4
124	Sultanke	-do-	36,399	7,311.2	5
125	Manga	-do-	<u>44,593</u>	<u>3,445.8</u>	<u>13</u>
	Total Rural	9	348,565	37,284.2	9
	TOTAL	26	1,006,847	41,405.8	24
F. Nishtar Town					
126	Garden Town	Urban	40,672	361.9	112
127	Model Town	-do-	33,385	598.8	56
128	Faisal Town	-do-	32,739	206.8	158
129	Liaquatabad	-do-	41,172	129.0	319
130	Kot Lakhpat	-do-	34,067	100.9	337
131	Pindi Rajputan	-do-	40,127	94.2	426
132	Township	-do-	41,658	181.2	230
133	Township A/1, A/2	-do-	35,047	514.8	68
134	Bostan Colony	-do-	37,330	138.5	269
135	Ismail Nagar	-do-	34,154	134.5	254
136	Sitara Colony	-do-	34,442	172.5	200
137	Farid Colony	-do-	34,050	474.6	71
138	Keer Kalan	-do-	36,600	115.5	317
139	Green Town	-do-	43,985	271.2	162
140	Maryam Colony	-do-	<u>40,554</u>	<u>128.1</u>	<u>316</u>
	Total Urban	15	559,982	3,622.5	155
141	Attari Saroba	Rural	39,859	711.9	56
142	Dullo Khurd Kalan	-do-	39,828	1,892.2	21
143	Chandrai	-do-	41,513	4,194.9	10
144	Haloke	-do-	41,302	7,449.0	6

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145	Guju Matta	-do-	35,906	2,936.5	12
146	Kahna Nau(T.C.)	-do-	44,547	1,600.1	28
147	Jia Bagga	-do-	37,671	7,431.0	5
148	Paji(Raiwind R.P.11,533)	-do-	34,915	5,151.1	7
149	Raiwind(T.C. R.P.13,882)	-do-	41,287	2,037.5	20
150	Pandoke	-do-	<u>39,401</u>	<u>7,461.3</u>	<u>5</u>
	Total Rural	10	396,229	40,865.5	10
	TOTAL	25	956,211	44,488.0	21

LIST OF KATCHI ABADIS IN LAHORE

- 1 Abbas Nagar North
- 2 Abbas Nagar South
- 3* Abu Bakar Block
- 4* Achant Garh
- 5* Ahata Anand Lal
- 6 Ahata Bari Wala
- 7 Ahata Chiragh Din
- 8* Ahata Dittu Shah
- 9* Ahata Hukam Chand
- 10* Ahata Kishin Kishore
- 11* Ahata Mool Chand
- 12 Ahata Nimak Wala
- 13 Ahata No. 52, Mohni Road
- 14 Ahata No.247, Dharampura
- 15 Ahata Workshop near Railway Station, Shahdara
- 16 Al-Badar Colony
- 17 Alipura
- 18 Al-Madad Colony
- 19 Al-Mujahid Colony
- 20 Al-Noor Colony
- 21 Amin Colony No.1
- 22 Amar Sidhu
- 23 Amratsari Mohallah
- 24 Annexi Colony near Imamia Colony
- 25 Ara Chanan Din
- 26* Awa Phari Jalal Din
- 27* Awami Colony
- 28 Azam Colony near Bridge Garhi Shahu
- 29 Baba Barey Wala
- 30 Babu Wala Lahore Cantonment
- 31 Bail Ahata
- 32 Baja Line
- 33 Bangali Building
- 34 Barganza Quarters
- 35 Barket Colony
- 36 Barud Khana
- 37 Basti Allah Hu
- 38* Basti Saidan Shah
- 39 Bazu Ahata
- 40 Begh Bangalin, Qaddafi Colony
- 41 Begumpura
- 42 Behatlatas near Washing Line
- 43 Behind Khyaban Hotel
- 44* Behind M.A.O. College
- 45* Behind Police Station, Garhi Shahu
- 46 Bela Basti Ram (Data Nagar)
- 47 Bhagatpura near Gujjarpura
- 48 Bhali Masih, Dharampura
- 49 Bhatta Harike Road
- 50 Bibi Pak Daman
- 51 Bilal Colony
- 52 Bilal Park near Najaf Colony
- 53 Bogi Road
- 54 Budha Dhara near Qausar Town
- 55 Canal Park
- 56 Chah Qurban Wala
- 57 Chah Awan Wala
- 58 Chah Jamu Wala

59	Chah Motian Wala
60	China Basti
61	Chamba House
62	Chananpura
63	Chandi Ahata
64	Chappar Colony, Nawan Kot, Multan Road
65*	Chaudhary Colony
66	China Hospital
67*	Choor Shah Bandagi
68	Cooper Road
69	Daira Baba Riaz Shah
70	Daras Baray Mian
71	Dargah Hazrat Rasul Sain near Landa Bazar
72*	Davis Road
73	Dawai Khana Shahrah-e-Aziz Bhatti, Lahore Cantonment
74	Dhami Ahata
75	Dhana Singh Wala
76	Dharampura
77*	Dheer
78	Din Pur Kothey
79	Dry Port, Chapparpura
80	Dubbanpura
81	Essaabad
82*	F.C.College
83	Farid Colony
84	Farooq Gunj
85	Fatehabad
86	Fazalia Colony
87	Ferozeabad
88	Ferozepura
89	Furakhabad
90	Gali No. 17, Chah Miran
91	Gali No.13, Regal
92	Gandi Jhalar
93*	Ganj Darya
94	Gawala Colony, G.T.Road
95	Chapparpura
96*	Gharib Nagar
97	Ghaziabad, Lahore Cantonment
98	Ghosia Colony
99*	Ghosia Park
100	Gillani Muhallah
101	Girja Chowk near Airport
102	Gondi Pir
103	Gopal Nagar
104	Gosht Market near D.S. Office, Allama Iqbal Road.
105	Gujjapir
106	Gujjar Pura
107*	Gulistan Colony
108	Gulshan Colony Balla
109	Gunj Bukhsh Colony
110*	Guru Datt Bhwan
111*	Guru Mangat
112	Habibia Colony
113	Haji Kot, Shahdara
114	Hajipura
115	Henry Ke.
116	Herbanspura No.1
117	Herbanspura No.2
118	Hope Road, Mughalpura
119	Hussainabad
120	Hussainpark, Badami Bagh
121	Hussainpura
122	Hussain Road
123	Iqbal Park, Manzoorabad

124	Iqbal Camp, Lahore Cantonment
125	Iqbal Park
126	Iqbal Park No. II
127	Islam Colony
128	Islampura Shahdara
129*	Ittehad Colony
130	Ittifaq Colony
131	Ittifaq Colony O/H Water Tank
132*	Jaffri Park
133	Jamilabad
134	Janak Nagar
135*	Janki Devi, Abbott Road
136	Jhallar Saeen Jevan.7
137	Jhuggain Faiz Bagh
138*	Jhuggian Muftpura, Shah Noor Studio
139	Jhuggian Airport
140	Jhuggian Allah Ditta
141	Jhuggian Bagrian
142	Jhuggian Faiz Bagh
143	Jhuggian Mayo Hospital
144	Jhuggian Nasheman
145	Jhuggian Pura Side
146	Jhuggian Railway Station
147	Junejo Town
148	Kachhupura
149	Kala Khatai Road
150	Karam Nagar
151	Karim Nagar
152	Karim Park
153	Katcha Massan Road
154	Katchi Abadi R.A.Bazar
155	Katri Bawa Herbajan Das
156	Katri Choor Karam
157	Katri Churi Garan
158	Katri Pathana
159	Katri Sheikh Mubarik
160*	Khai Bohar Wali
161	Khan Colony Lahore Cantonment
162	Khawaja Behari
163	Khokhar Town
164	Kot Fateh Singh
165	Kot Haji Danda Wad
166	Kot Muhammad Hussain near Barkat Town
167	Kothi No.89-B, Lahore Cantonment
168	Kund Jhuggian Baddian outside Taxali Gate
169	Lal Kurti, Lahore Cantonment
170	Langa Mandar, Marzipura
171*	Liaqatabad
172	Link Wahdat Road
173	Mahmood Abad No. II
174	Mai Da Mandir
175	Mai Mangla Masti Gate
176	Majeed Park, Mandir Kalu Ram
177	Malipura, Bund Road
178	Malik Pura, Lahore Cantt.
179*	Mandar Bhagat Ram/Baragian
180*	Mandar Block 'K'
181*	Mandar Chunni Lal
182*	Mandar D-Block
183*	Mandar Dhyan Singh
184	Maqbra Morh
185*	Marrium Colony, Outside Taxali Gate
186*	Marzipura
187*	Mata Rani
188	Mayo Colony

189	Mehmoodabad
190*	Mela Ram Park
191	Mental Hospital
192	Mian Mir Colony
193	Mill Area, Shahdara
194	Millat Colony
195	Miran Park
196	Model Colony, Packages
197	Mohallah Eid Gah near Sadar Bazar, Lahore Cantonment
198	Mohammadabad
199	Muhammadpura
200	Mooti Sagar
201*	Morh Rehmanpura
202*	Mufatpura Near Soha Bazar
203*	Muhajarabad
204*	Muhallah Gwalian
205	Muhammadipura
206	Muhammadipura No. II
207*	Muhammadia Colony
208	Mujahid Colony
209*	Musafar Gali
210	Muslim Colony
211	Mustafaabad
212*	Nabipura near Bengali Building
213*	Nabipura No. 2
214*	Nabipura No. 3
215*	Najaf Colony
216	Naqsha Stop
217*	Naseerabad
218*	Nawaz Sharif Colony
219	Neelumpura
220*	New Bhabra
221*	New Crole
222	Nilampura in Bela Basti Ram
223	Niwan Ahata Near Garhi Shahu
224	Noor Colony near Carriage Shop
225	Nusrat Colony
226*	Old Bhabra
227*	P. C. Mahindra
228	P.R.T. Garden Town
229	Pagari Gandhi Jhallar, Lahore Cantonment
230	Parashoot Factory
231	Barganza Quarters
232*	Pathi Ground
233*	Patiala House
234	People Colony
235	Peter Gill Colony
236	Pilan Wali, Shahdara
237	Piplian Wala
238	Plot No. 6-7 Shah Jamal
239*	Qadirabad
240	Qalandarpura
241	Qasimpura, Lahore Cantonment
242	Qaddafi Colony
243	Qaziabad
244	Qazi Mohallah Dharampura
245*	Qila Lachhman Singh
246	Qila Khazna
247	Qurban Line
248	R.A.Bazar, Lahore Cantonment
249	Railway Stadium, Garhi Shahu
250*	Rajput Park, Shad Bagh
251	Rasool Park, G.T.Road
252	Ravipura
253	Ravi Town

254	Rehmat Colony
255	Rohail Park
256	Rose Nagar
257	Saddique Colony
258	Saeed Park
259	Saint Mary Colony
260*	Sikandria Colony
261*	Samadhi Ganga Ram
262	Sansi Quarter No. II
263	Sansi Quarters
264	Santa Park
265	Saraey Kashi Parashad
266	Sarai Gora Pir
267	Shah De Khoi
268*	Shah Jamal
269*	Shah Jamal 32-36
270*	Shah Shamas Qadri
271	Shah Waris Wala
272*	Shahnoor Colony
273	Sham Nagar
274	Shamaspura No. 1
275	Shamaspura No. 2
276	Sharif Park, Begumpura
277*	Sheikhabad
278	Sher Shah Road
279*	Sher Shah Wali Colony
280	Sher Singh Road
281*	Shora Kothi near 7-up Factory, Gulberg
282	Shuja Colony
283*	Siddiquepura
284	Sikandar Colony
285	Station Colony near Railway Station
286	Sukh Nehr
287*	Sultanpura
288	Survey Colony
289	Tahirabad
290*	Takia Pir Yaqoob Shah
291	Takia Qutab Shah
292*	Takia Pir Hakam Shah, Cooper Road
293	Takia Sunyarian, Garhi Shahu
294	Tanki No.56, Baja Line, Mughalpura
295	Tappri Wala Dhana Singh Wala, Ferozepur
296	Tariqabad (Bhattu Colony)
297	Theh Zaildaran
298	Thokar Niaz Baig
299*	Tibba Azeem Shah
300	Umer Farooq Colony
301	Usman Park
302	Wanket Nagar
303	Warispura near Barkat Town
304	Wireless Compound, Lahore Cantonment
305	Younuspura
306	Zia Colony
307	14-A Lawrence Road
308	36-A Lawrence Road

- Proprietary rights given by LDA. (73 Nos.)

Source: 1. LDA
2. Directorate of Katchi Abadis
Local Government and Rural
Development Department,
Government of Punjab.

**RULES/ PROCEDURES FOR THE PROCESSING AND APPROVAL
OF PRIVATE HOUSING SCHEMES IN LAHORE**

1. Due to rapid urbanization and population growth there is lot of pressure on the Housing Sector. It is impossible for the Government alone to cope with the problem. Therefore, Private Sector is being encouraged to forward and help the Government in solving the housing problem. Therefore, Private Sector is being encouraged to come forward and help the Government in solving the housing problem.
2. Since 1978 LDA has approved about 150 Private Housing Schemes. LDA has been revising the procedure for the processing and approval of Private Housing Schemes from time to time in the larger interest of development. The main objective of these rules and procedure is to make sure that the sponsors of the Private Housing Schemes do not go back from their commitment regarding the development of their schemes. Various Directors General of LDA during previous Governments have been amending the policy and procedure for the approval of Private Housing Schemes. It is high time that all these Rules/ Procedures are consolidated and approved by the Chief Minister Punjab/ Chairman, LDA for its effective implementation.
3. The present procedure/ Rules for Private Housing Schemes is summarized as below:
 - i) The applicant/ Sponsor of the Housing Scheme applies to LDA for approval of a Private Housing Scheme along with following documents:
 - a) A site plan showing location of the scheme with reference to the surrounding areas.
 - b) Topographic Survey of the area.
 - c) Proposed Layout Plan of the Scheme duly signed by the Owner and Registered Town Planner.
 - d) A complete set of ownership documents from the Revenue Department.
 - e) A copy of the Khasra Plan duly signed by the Patwari of the area.
 - ii) In case proposal of the applicant conflicts with any of the proposed Scheme then the proposal is rejected and returned to the applicant.

ANNEX to Chapter-7

- iii) In case the proposal is in line with future development of Lahore, then the applicant is asked to submit Scrutiny Fee at prescribed rate.
- iv) The applicant/ sponsor must own at last 50% of the land and for the remaining 50% he must have a General Power of Attorney. After checking and clearance of the ownership documents a public notice is given in the newspaper at the cost of the applicant for inviting public objections. The applicant has to settle the objections received.
- v) In case no objections is received then layout plan proposed by the applicant is examined technically and keeping in view the following land use standards:
 - a) That site is accessible through a road and the area of the proposed scheme is not less than 100 kanal.
 - b) That the proposed site is not liable to flooding.
 - c) Minimum width of the roads in the scheme should not be less than 30 feet.
 - d) Open spaces provided should not be less than 7%.
 - e) Site for graveyard should not be less than 2%.
 - f) Site for public buildings like schools, dispensaries, mosques etc. should not be less than 2%.
 - g) Site for Commercial Centre should not be more than 2%.
 - h) Maximum size of the plots should not be more than 1000 square yards (2 kansl) except the Farm Houses.
- vi) Comments are obtained from TEPA regarding the provision of Structure Plan Roads in the proposed Housing Scheme,
- vii) After all the objections regarding ownership and layout plan, land use planning are settled then the scheme is submitted for the approval of the D.G.
- viii) The Sponsor of the scheme has to indicate 30% saleable area which is to be mortgaged with Authority as security for the provision of the Utility Services. The Sponsor/ applicant has an option to submit a Scheduled Bank Guarantee equal to the cost of development in lieu of mortgaging of plots.

ANNEX to Chapter-7

- ix) In case the Sponsor decides to mortgage the plots a public notice is given at the cost of Owner giving number of plots and warning the public not to purchase these plots as the same have been pledged with LDA. The sponsor has to submit Mortgage Deed, as per specimen for mortgaging these plots.
- x) The applicant/ sponsor of the scheme has to transfer free of cost to LDA all the area under the Roads, Open Spaces, Graveyards, Public Buildings such as Mosque, Schools/ Colleges, Dispensaries/ Hospitals, Post Office Stations etc. The sponsor has to submit a Transfer Deed as per specimen for the transfer of the above land free of cost to LDA.
- xi) The sponsor/ applicant of the scheme has to get the design of water supply and sewerage approved from WASA and designs of roads, drainage approved from LDA and the designs of Electricity from WAPDA.
- xii) After the approval of the design, the sponsor has to provide all the services like Water Supply System, Sewerage System, Drainage System, Street Light and Electrification System, Roads and Landscaping of the Parks and Open spaces.
- xiii) Keeping in view the development of the Scheme, the mortgaged plots are released through Redemption Deed in four equal installments.
- xiv) In case the sponsor does not develop the scheme then the LDA is at liberty, to auction the mortgaged plots and to spend the entire income from these plots on the development of the scheme and to encash the Bank Guarantee.

4. EXCEPTIONS FOR FARM HOUSING SCHEMES

Following exceptions will be applicable in case of processing and approval of Farm Housing Schemes:

- i) The minimum plot size shall not be less than four kanals.
- ii) The minimum road width shall not be less than 40 feet.
- iii) 5% Scheme area shall be reserved for all or any of the following public utility spaces "Schools, Dispensary, Mosques, Sports Ground, Post Office, Police Station, Bus Terminal, Public Toilets, Community Centre". The area of graveyard shall be 1%.
- iv) The sub division of plots into smaller plots will not be allowed.

ANNEX to Chapter-7

- v) Maximum built up area within a residential plot will not exceed 30% of the total plot area of the ground floor.
- vi) 10% plots of saleable area will be mortgaged as Guarantee for development or equivalent Bank Guarantee shall be provided.
- vii) The mortgaged plots will be released after 100% development works are completed to the satisfaction of LDA.
- viii) The residential buildings shall not be more than double storey in height (24 feet).
- ix) The change in land use of plots subsequently shall not be allowed.

TABLE - 1
PARTICIPATION RATES (MALE)
LAHORE (DISTRICT) URBAN, 1998

Age Group		Male Population				Rate (%)
		Total	Attending	Completed	Never Attended	
05-09 (Primary)	No.	348,321	238,716	4,906	104,699	68.5
	%	100.0	68.5	1.4	30.1	
10-14	No.	352,589	253,548	20,188	78,853	71.9
	%	100.0	71.9	5.7	22.4	
15-19	No.	308,656	146,533	84,051	78,072	47.5
	%	100.0	47.5	27.2	25.3	
20-24	No.	275,448	54,141	146,542	74,765	19.7
	%	100.0	19.7	53.2	27.1	

Source: Population Census Lahore District, 1998

TABLE - 2
PARTICIPATION RATES (FEMALE)
LAHORE (DISTRICT) URBAN, 1998

Age Group		Female Population				Rate (%)
		Total	Attending	Completed	Never Attended	
05-09	No.	328,569	217,488	4,710	106,371	66.2
	%	100.0	66.2	1.4	32.4	
10-14	No.	329,410	241,351	18,149	69,910	73.3
	%	100.0	73.3	5.5	21.2	
15-19	No.	291,951	140,199	81,889	69,863	48.0
	%	100.0	48.0	28.1	23.9	
20-24	No.	250,196	36,965	138,453	74,778	14.8
	%	100.0	14.8	55.3	29.9	

Source: Population Census Lahore District, 1998

TABLE 3
GOVERNMENT, MOSQUE, PRIMARY, MIDDLE, SECONDARY AND
HIGHER SECONDARY SCHOOLS, LAHORE DISTRICT 1999-2000

LEVEL	LAHORE CITY TEHSIL			LAHORE CANTT. TEHSIL			LAHORE DISTRICT		
	Boys	Girls	Both	Boys	Girls	Both	Boys	Girls	Both
Mosque Schools	Urban	-	67	17	-	17	84	-	84
	Rural	23	-	23	9	9	32	-	32
	Total	90	-	90	26	26	116	-	116
Primary Schools	Urban	57	112	169	82	74	139	186	325
	Rural	94	97	191	172	162	266	259	525
	Total	151	209	360	254	236	405	445	850
Middle Schools	Urban	21	25	46	10	32	31	57	88
	Rural	9	13	22	20	16	29	29	58
	Total	30	38	68	30	48	60	86	146
Secondary Schools	Urban	61	58	119	26	42	87	100	187
	Rural	16	6	22	16	6	32	12	44
	Total	77	64	141	42	48	119	112	231
Higher Secondary Schools	Urban	-	7	7	1	1	1	8	9
	Rural	-	1	1	-	-	-	1	1
	Total	-	8	8	1	1	1	9	10
All Schools	Urban	206	202	408	136	149	342	351	693
	Rural	142	117	259	217	184	359	301	660
	Total	348	319	667	353	333	701	652	1353

Source: EMIS, Lahore

TABLE 4
ENROLMENT IN GOVERNMENT, MOSQUE, PRIMARY, MIDDLE,
SECONDARY AND HIGHER SECONDARY LEVELS
LAHORE DISTRICT 2000

LEVEL/STAGE	LAHORE CITY TEHSIL			LAHORE CANTT TEHSIL			LAHORE DISTRICT		
	Boys	Girls	Both	Boys	Girls	Both	Boys	Girls	Both
Primary	Urban	23,332	42,066	65,398	23,293	32,726	56,019	74,792	121,417
	Rural	18,815	14,036	32,851	31,438	20,566	52,004	34,602	84,855
	Total	42,147	56,102	98,249	54,731	53,292	108,023	109,394	206,272
Middle	Urban	26,952	23,433	50,385	12,578	18,871	31,449	42,304	81,834
	Rural	4,434	2,191	6,625	5,887	3,215	9,102	5,406	15,727
	Total	31,386	25,624	57,010	18,465	22,086	40,551	47,710	97,561
Secondary	Urban	15,789	13,118	28,907	8,684	9,213	17,897	22,331	46,804
	Rural	1,808	743	2,551	2,004	944	2,948	3,812	5,499
	Total	17,597	13,861	31,458	10,688	10,157	20,845	24,018	52,303
Higher Secondary	Urban	-	1,897	1,897	191	278	469	191	2,366
	Rural	-	143	143	-	-	-	143	143
	Total	-	2,040	2,040	191	278	469	191	2,509
All Levels	Urban	66,073	80,514	146,587	44,746	61,088	105,834	110,819	252,421
	Rural	25,057	17,113	42,170	39,329	24,725	64,054	64,386	106,224
	Total	91,130	97,627	188,757	84,075	85,813	169,888	175,205	358,645

Source: EMIS, Lahore

Annex B to Chapter-9

**HOSPITALS IN LAHORE LISTED WITH
DIRECTORATE GENERAL OF HEALTH SERVICES**

S.NO	NAME	NO. OF BEDS	DOCTORS/ SPECIALISTS
1	Mayo Hospital	1799	712
2	General Hospital	612	302
3	Lady Willingdon Hospital	235	100
4	Lady Aitchison Hospital	100	47
5	Dental Hospital	8	68
6	Government Model Town Hospital	8	5
7	Government Wahdat Colony Hospital	8	4
8	Sir Ganga Ram Hospital	534	301
9	Government Mian Munshi Hospital	125	35
10	Services Hospital	1050	443
11	Punjab Institute of Cardiology	284	96
12	Mental Hospital	1400	59
13	Government Maternity Hospital ,(Pathi Ground)	20	6
14	Govt. Maternity Hospital, Chohan Road Islampura	20	7
15	Jinnah Hospital	1100	53
16	Government Khaira Hospital	-	2
17	Government Kot Khawaja Saeed Hospital	125	21
18	Government Mozang Hospital	25	11
19	Police Hospital, Qila Gujjar Singh	64	2
20	Police Hospital, Qurban Lines	18	1
21	Satluj Ranger Hospital	50	1
22	MCL - Infectious Diseases Hospital	170	9
23	MCL - Eye Hospital	44	9
24	Gulab Devi Hospital	1300	75
25	United Christian Hospital	216	33
26	Janki Devi Hospital	60	6
27	Mumtaz Bakhtawar Hospital	100	15
28	Malik Jalal-uddin Waqf Hospital	70	7
29	Ishaq Haroon Waqf Hospital , Sham Nagar	18	4
30	Fatima Memorial Hospital	330	89
31	Al-Khumaini Hospital	12	14
32	Shalimar Hospital	200	114
33	Sheikh Zayed Hospital	453	392
34	Nawaz Sharif Hospital	150	30
35	Children's Hospital	250	69
36	Railways Hospital	225	31
37	Wapda Hospital	161	49
38	Combined Military Hospital	800	80
39	Data Darbar Hospital	77	12
40	Said Mitha Hospital	50	5
	Total	12,271	3,319

Source: Office of the Director General, Health Services, Lahore Division.

PRIVATE SECTOR HOSPITALS IN LAHORE

S.NO.	NAME/LOCATION	NO. OF BEDS	DOCTORS/SPECIALISTS
1	Bajwa Hospital, Ferozepur Road	12	1
2	Ahbab Hospital , Badami Bagh	13	4
3	Aisha Siddiqa Hospital, Umerdin Road Wassanpura	4	1
4	Dr. Abid Hussain Hospital, Shadbagh	13	2
5	Ali Hospital, Link Road Mughalpura	17	2
6	Mian Hospital, Fateh Garh	5	1
7	Social Security Hospital, Ferozepur Road	12	35
8	Muhammad S.Gaba Hospital Guru Mangat Road	6	1
9	Dr.I.A.Khawaja Hospital, Garden Town	6	2
10	Zahida Bibi Hospital,Garden Town	2	1
11	Raza Manzoor Hospital, Ferozepur Road	10	2
12	Mazhar Hospital, Ichhra	7	3
13	Handicapped Hospital, Ferozepur Road	70	4
14	Packages Hospital, Shadman Road	2	2
15	Abu Baker Hospital, Sanda Kalan	6	1
16	Ishaq Hospital,Sanda	17	6
17	Ejaz Ahmad Hospital, Sanda	5	3
18	United Muslim Hospital, Islampura	70	9
19	Yasir Hospital, Islampura	10	1
20	Abdul Ghani Hospital, Islamapura	4	1
21	Bismillah Hospital, HighCourt	2	1
22	Shiraz Hospital, Garhi Shahu	5	1
23	Dr. Ijaz Hospital, Habib Ullah Road	15	4
24	Family Welfare Hospital, Sant Nagar	20	2
25	Union Free Hospital, Data Darbar	10	1
26	Bashir Hospital , Bilal Ganj	24	4
27	Shahid Shahab Hospital, Texali Gate	5	1
28	Zakria Hospital, Mohni Road,	5	2
29	Abbas Hospital , Qila Lachhman Singh	10	5
30	Ravi Hospital, Ravi Road	20	3
31	Mughal Free Hospital, Karim Park, Ravi Road	5	1
32	Punjab Social Security Hospital, G.T. Road	20	10
33	Red Crescent Hospital, Shah Alam Market	10	2
34	Naseer Hospital, Lahore Cantt.	10	2
35	S.M.Memorial Hospital, Lahore Cantt	11	2
36	P.I.A. Hospital, Abid Majeed Road, Cantt.	2	6
37	Safia Hanif Hospital, Sarfaraz Rafiqui Road	15	10
38	Dr.Agha Mehmood Raza Hospital, Township	2	1
39	Sakina Tufail Hospital, Raiwind Road	20	1
	Total	502	141

Source: Directory of Health Establishments in Pakistan (Private Sector)
Hospitals Nursing / Maternity Homes MCH Centres,
Federal Bureau of Statistics, Statistics Division, Government of Pakistan.

PRIVATE SECTOR HOSPITALS IN LAHORE

S.NO.	NAME/LOCATION	NO. OF BEDS	DOCTORS/SPECIALISTS
40	Ittefaq Hospital, Model Town	175	62
41	Usman Hospital, Ferozepur Road	20	3
42	Rasheed Hospital, Defence	30	19
43	Aadil Hospital, Defence	100	43
44	National Hospital, Defence	50	22
45	Ayesha Hospital, Nishat Colony	25	2
46	Faiz Hospital, Sadar	15	2
47	Rashid Hospital, Mustafaabad	10	1
48	Ali Hospital, Ramgarh	20	5
49	Razzaq Hospital, Baghbanpura	25	1
50	Dr. Sardar Hospital, Sahuwari	15	2
51	Gulberg Hospital, Mini Market	20	6
52	Ibn-e-Sina Hospital, Liberty Market	30	5
53	Hijaz Hospital, Gulberg	30	6
54	Masood Hospital, Kalma Chowk	40	22
55	Zainab Memorial Hospital, Kalma Chowk	30	15
56	Meena Clinic, Garden Town	20	4
57	Kalim Medical Complex, Faisal Town	40	7
58	Faisal Clinic, Faisal Town	20	9
59	Saira Memorial Hospital, Faisal Town	30	7
60	Toori Hospital, Model Town	15	1
61	Farooq Hospital, Allama Iqbal Town	30	11
62	Umar Hospital, Jail Road	60	30
63	Cardex Clinic, Jail Road	-	11
64	Surayya Azim Hospital, Chauburji	10	5
65	E.N.T.Hospital, Jail Road	10	1
66	Bone & Joint Hospital, Jail Road	10	1
67	Race View Clinic, Jail Road,	30	8
68	Ammar Medical Complex, Jail Road	35	14
69	Surgimed Hospital, Zafar Ali Road	60	18
70	Akram Medical Complex, Gulberg-I	20	14
71	Family Hospital, Mozang	50	22
72	Yasser Hospital, Multan Road	15	12
73	Abdul Ghani Hospital, Sanda Road	20	3
74	Ramzan Ali Syed Hospital, Temple Road	40	16
75	Faran Hospital, Islampura	50	5
76	Mumtaz Hospital, Samanabad	20	4
77	Ehsan Hospital, Farid Court Road	30	10
78	Ehsan Mumtaz Hospital, PECO Road	30	17
79	Ghazala Hospital, Samanabad	20	5
80	Shadman Medical Complex, Shadman	35	5
81	Fazal Cardiac Centre, Liberty Market	25	11
82	Hameed Lateef Hospital, Ferozepur Road	40	18
83	Mansab Clinic, High Court	35	8
84	Naz Hospital, Shadman	30	22
85	Shaukat Khanum Memorial Hospital, M.A. Johar Town	49	45
	Total	1514	560

Source: Private Clinics and Hospitals Association

-Chairman Dr. Ibrahim Khan

-President Dr. Akhtar Ali

-Secretary Dr. Azar Ali Shah

TABLE 1
CITY / REGIONAL LEVEL OPEN SPACES IN LAHORE

SR. NO.	OPEN SPACE	STATUS	AREA (ACRES) UNDER		
			Active Use	Passive Use	Both Active & Passive Uses
1	Noor Jahan's Tomb	OT	-	13	-
2	Jahangir's Tomb	OT	-	80	-
3	Ravi National Park	O	-	86	-
4	Iqbal Park (Minto Park)	O	-	-	110
5	Circular Park around Walled City	O	-	-	80
6	Lahore Fort Area Park	OT	-	14	-
7	Hazuri Bagh (in front of Badshahi Mosque)	O	-	7	-
8	Nasir Bagh (Gol Bagh)	O	-	14	-
9	Baghe-Jinnah (including Botanical Garden)	O	-	-	146
10	Lahore Zoo	OT	-	24	-
11	Shalimar Gardens	OT	-	42	-
12	Lahore Branch Canal (Jallo to Niaz Baig)	O	-	536	-
13	Race Course Park	OT	-	-	90
14	Polo Club Grounds	R	62	-	-
15	Gulshane-Iqbal Park	OT	-	-	66
16	Linear Park, Model Town	O	-	73	-
17	Central Park, Model Town	OT	-	-	103
18	Golf Course / Gymkhana Club	OT	-	-	125
19	Qaddafi Stadium	OT	124	-	-
20	Fortress Stadium	OT	85	-	-
21	Jallo Park	OT	-	456	-
22	Sozo Water Park	OT	-	25	-
23	Kamran Bara Dari	O	-	5.5	-
24	Park in front of Lahore Railway Station	O	-	7	-
25	Wooland Wild Life Park	OT	-	242	-
26	New Race Course at Chandrai	R	150	-	-
	Total		421	1624.5	720

O = Open for General Public OT = Open on ticket R = Restricted for General Public
Source: PHA, Lahore, District Census Report Lahore 1998, and CSTS Study by JICA, August, 1991.

TABLE 2
OPEN SPACES UNDER USE OF SPECIFIC GROUPS *

SR. NO.	OPEN SPACE(S)/LOCATION	STATUS	AREA (ACRES) UNDER		
			Active Use	Passive Use	Active & Passive Both
1	Shahdara Encamping Ground	O	40	-	-
2	Military Club **	R	-	-	15
3	Military Parade Ground **	R	690	-	-
4	Cantonment Church and Mess**	R	-	62	-
5	Railway stadium	R	16	-	-
6	Railway Golf Course	R	120	-	-
7	Railway Burt Institute	R	16	-	-
8	Railway Griffin Institute	R	20	-	-
9	Quaide-Azam Campus (Punjab University)	R	100	-	-
10	University Ground	R	22	-	-
11	University of Engineering & Technology	R	14	-	-
12	Aitchison College	R	84	-	-
13	Other Colleges	R	138	-	-
14	Elementary Schools	R	192	-	-
	Total:		1452	62	15

Source: (1) JICA (2) Master Plan for Greater Lahore 1966 (3) EMIS, May 2001.

* Specific groups represent army, students, railway employees etc.

** Exclusively under army use. O = Open for General Public R = Restricted for General Public

**TABLE 3
PARK AND OPEN SPACES DEVELOPED BY LDA AND
TRANSFERRED TO PHA ***

SR.NO.	LOCATION	AREA (ACRES)
1	Shadman Colony	24.00
2	Gulberg I, II, III and IV	98.00
3	New Garden Town	75.00
4	Faisal Town	32.00
5	Packages Quarters	2.60
6	Model Town Extension	69.00
7	Ibn-e-Sina Park	6.00
8	Gulshan-e-Ravi	27.00
9	Assembly Hall	6.00
10	Gate way House Park	4.00
11	Nila Gumbad	0.24
12	Park behind Badshahi Mosque	7.00
13	Tajpura Park	1.50
14	Wassanpura Park	0.50
15	Hamd Colony Park	0.50
16	New Karol Park	2.50
17	Azadi Chowk	3.00
18	Ali Park	2.75
19	Mela Ram Park	2.50
20	Allam Iqbal Town	105.00
21	New Muslim Town	9.00
22	New Muslim Town Extension	20.00
23	Masjid Khizra, Samanabad	10.50
24	Siddiquepura Park	1.50
25	Nabipura Park	1.50
26	Park in WASA Colony	0.50
27	Park in Janak Nagar	1.00
28	Open space around Hafeez Jalandhri Mazaar	0.50
29	LDA Flats	3.00
30	Liberty Market Park	7.00
31	Park in Bazar Tehsilwala & Rang Mahal	2.50
32	Upper Mall Scheme	1.00
33	Tajpura Housing Scheme	15.00
34	Nishtar Colony	13.00
35	Nadra Begum Park	7.00
36	Park in Nawaz Sharif Colony	0.50
37	Park in Industrial Zone, Model Town	5.00
38	Sharif Park, Ichhra	4.00
39	Park in Katchi Abadi, Ichhra	0.50
40	Awa Pahari Park	4.50
41	Sabzazar Scheme Phase-I	48.00
42	Jauhar Town, Phase -I	90.00
43	Mohlanwal Scheme	5.00
44	Park near Masjid Kubra	0.75
45	Pariwala Talab (New)	0.50
46	Park near Telephone Exchange, Samanabad	0.76
47	Park in Mian Mir Colony, Katchi Abadi	2.00
48	Park in Surraya Jabin	2.00
49	Azhar Park	6.50
50	Alipura Katchi Abadi Park	3.00
51	Park in Timber Market	1.50
52	Open space around Shalimar Fountain	0.50
53	Nehru Park	5.00
54	Park behind Chishtia High School	4.00
55	Lalazar Park, Raiwind Road	17.00
56	Gujjarpura Scheme	20.00
57	Mustafa Town	34.00
58	Jauhar Town Phase -II	70.00
59	Sabzazar Phase-II	20.00
60	Park in Nawaz Sharif Hospital	0.50
61	Lawn in Haveli Diyan Singh	1.50
62	Park in WASA Training Centre	2.50
63	Quaid-e-Azam Town	60.00
64	Establishment of Arbotatum	10.00
	Total	981.10

Source: PHA, Lahore.

TABLE 4
OPEN SPACES TRANSFERRED BY MCL TO PHA *

SR.NO.	LOCATION (No. of Open Spaces)	AREA (ACRES)
1	Mohni Road (3)	2.25
2	Masoomia Park, Band Road (1)	1.50
3	Karim Park (5)	4.25
4	Kasurpura (4)	7.25
5	Shahdara Town (Shahdara Match Factory)	10.00
6	Siddique Stadium, Shahdara	3.75
7	Almadad Park, Ravi Road	1.87
8	Ateeq Stadium, Circular Road	6.25
9	Qila Lakshman Singh (4)	4.50
10	Roti Plant Park, Qila Muhammadia	1.12
11	Badami Bagh (4)	1.38
12	Shah Alam Market (2)	0.75
13	Parks / open spaces, Zone 2 & 3 (78)	26.62
14	Rustam Park (2)	1.12
15	Sodiwal (4)	2.25
16	Sanda, Rajgarh, Santnagar, Krishan Nagar (15)	8.25
17	Chauburji (4)	3.88
18	Rewaz Gardens (6)	3.12
19	Mustafa Park, Bank Road (1)	0.75
20	Farid Kot House Park (1)	1.00
21	Ittehad Park, Lytton Road (1)	0.25
22	Ghazi Ilam Din Shaheed Park (1)	0.75
23	Parks, Khorra Stop (2)	0.62
24	Montgomery Park	0.25
25	Punjab Assembly Hall Park	4.00
26	Mela Ram Park	0.25
27	Upper Mall Scheme	1.50
28	Shimla Pahari	3.00
29	Namak Mandi Park	0.37
30	Lakshami Mansion Park	0.50
31	Shadman Park	3.75
32	Mason Road Parks (3)	1.25
33	Samanabad (14)	17.25
34	Rasool Park (5)	3.50
35	Islamia Park (3)	2.25
36	Jinnah Colony, Multan Road (10)	10.25
37	Shah Jamal Area (2)	2.75
38	Rahmanpura Scheme (5)	4.38
39	Shah Din Scheme (1)	0.50
40	New Muslim Town (2)	2.25
41	Gulberg (17)	32.00
42	Township Area (14)	9.88
	Total	193.86

* Open spaces in Tables 3 and 4 are accessible to general public for use as active and passive recreational purposes.

TABLE 5
PLAY FIELDS DEVELOPED BY PHA

SR.NO.	LOCATION	AREA (ACRES)
1.	Huma Block, Allam Iqbal Town	6.3
2	Doongi Ground, Samanabad	3.4
3	Wahdat Road	7.6
4	Sharif Park, Ichhra	3.7
5	Saddar, Cantonment	3.7
6	Shahdara Town	8.0
7	Islampura	4.5
8	M-Block, Model Town Extension	15.5
9	E&F Blocks, Model Town	6.0
10.	G & H Blocks, Model Town	10.6
11	R Block, Model Town	10.0
	Total	79.0

Source: PHA, Lahore.