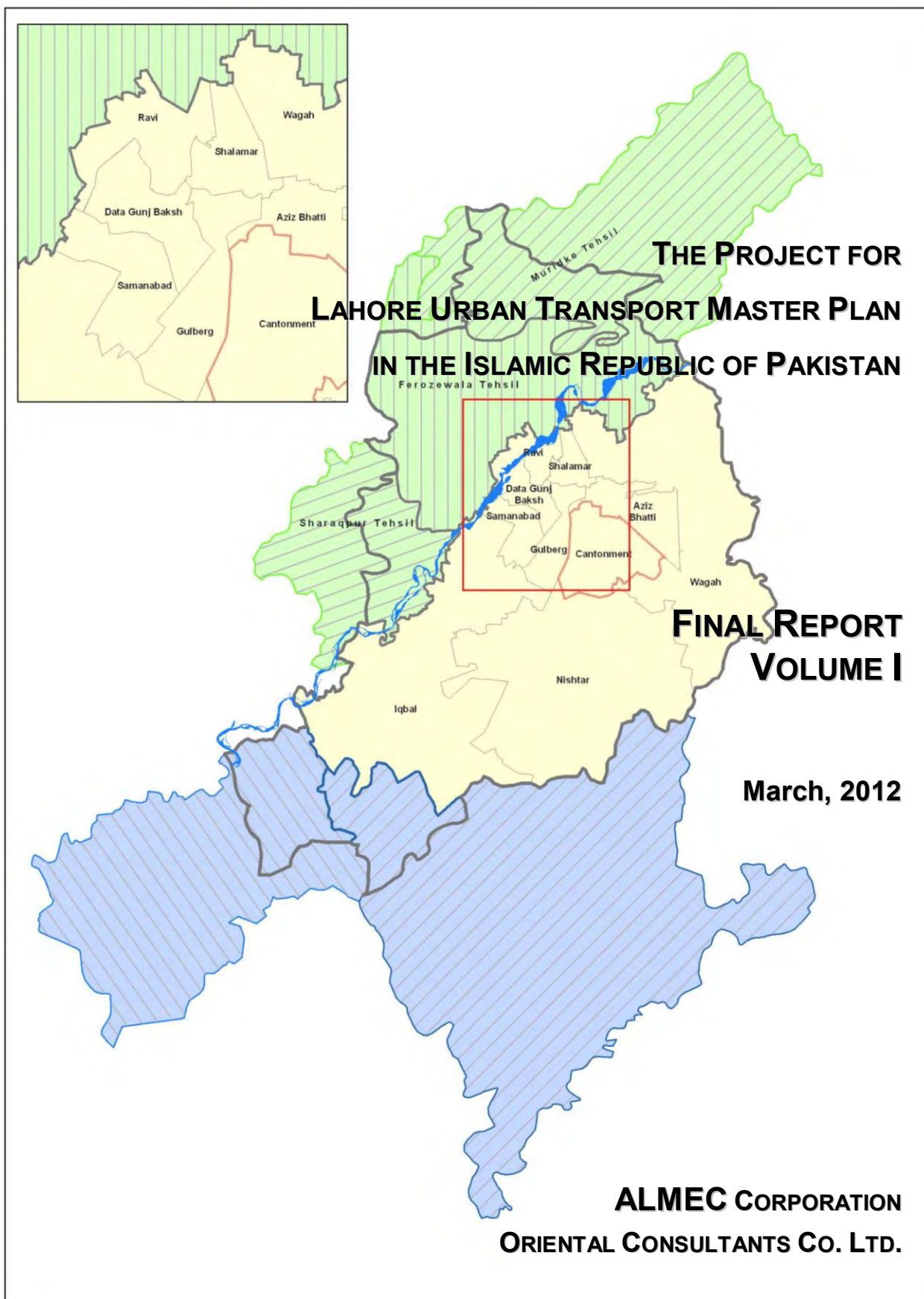




JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

**A GOVERNMENT OF THE PUNJAB PROJECT
TRANSPORT DEPARTMENT**



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PREFACE

In response to a request from the Government of the Punjab in the Islamic Republic of Pakistan, the Government of Japan decided to conduct “The Project for Lahore Urban Transport Master Plan in the Islamic Republic of Pakistan” and entrusted to the study to Japan International Cooperation Agency (JICA).

JICA selected and dispatched a study team headed by Mr. Takashi Shoyama of ALMEC Co., LTD. and consists of ALMEC Co., LTD. and Oriental Consultants Co., LTD. between April, 2010 and March, 2012.

The study team held discussions with the officials concerned of the Government of the Punjab, conducted field surveys in the study area, prepared a Lahore Urban Transport Master Plan (LUTMP) and its Action Plan, conducted a capacity development through On-the-Job-Training (OJT), and prepared this final report.

The project was composed of two phases; i) Phase I to conduct a Home Interview Survey (Person Trip Survey) and other transport/ traffic surveys and develop a transport demand analysis model, and ii) Phase II to prepare a master plan and its action plan. This report is presents the study findings of both Phases.

I hope that this report will contribute to the promotion of this project and to the enhancement of friendly relationship between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of the Punjab for their close cooperation extended to the study team.

March, 2012

KONISHI Atsufumi,
Director, Economic Infrastructure Department
Japan International Cooperation Agency

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ABBREVIATIONS & ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
AD	Assistant Director
ADB	Asian Development Bank
ADP	Annual Development Program
ALOS	Advanced Land Observation Satellite
BOT	Build Operate Transfer
C&W	Communication and Works Department
CantB	Cantonment Board
CBD	Central Business District
CDG	City District Government
CDGK	City District Government, Kasur
CDGL	City District Government, Lahore
CDGS	City District Government, Sheikhpura
CNG	Compressed Natural Gas
DCO	District Coordination Officer
DHA	Defence Housing Authority
DIG	Deputy Inspector General
DPL	Development Policy Loan
DRTA	District Regional Transport Authority
DSMD	District Support and Monitoring Department
E&T	Excise and Taxation Department
EDO	Executive District Officers
EPA	Environment Protection Agency
EPD	Environmental Protection Department
ETC	Electronic Toll Collection
F&P	Finance and Planning
FDI	Foreign Direct Investment
FMR	Farm to Market Roads
GDP	Gross Domestic Product
GIS	Geographic Information System
GoPb	Government of the Punjab
H&PP	Housing and Physical Planning Provincial Department
H&UPDD	Housing and Urban Physical Development Department
HIS	Household Interview Surveys
HOV	High Occupancy Vehicle
HP&EP	Housing Physical & Environmental Planning
HRT	Heavy Rapid Transit
HUD&PHED	Housing, Urban Development and Public Health Engineering Department
ICT	Information and Communication Technology
IFC	International Finance Corporation
IMF	International Monetary Fund
ITS	Intelligent Transport System
LCCHS	Lahore Cantonment Cooperative Housing Society
LDA	Lahore Development Authority
LDRTA	Lahore District Regional Transport Authority
LIT	Lahore Improvement Trust
LRMTS	Lahore Rapid Mass Transit System
LRR	Lahore Ring Road
LRRP	Lahore Ring Road Project
LRT	Light Rail Transit
LSE	Lahore School of Economics
LTC	Lahore Transport Company
LTD	Lahore Transport Database
LUTMP	Lahore Urban Transport Master Plan
MCC	Manual Classified Count
MD	Managing Director
MRT	Mass Rapid Transit
MS	Municipal Services

MTDF	Medium Term Development Framework
MVO	Motor Vehicles Ordinance
MVR	Motor Vehicle Rules
NEC	National Economic Council
NESPAK	National Engineering Services Pakistan
NFC	National Finance Commission
NHA	National Highway Authority
NHMP	National Highway and Motorway Police
NHSO	National Highway Safety Ordinance
NMT	Non-Motorized Transport
NTCIP	National Trade Corridor Improvement Program
NTRC	National Transport Research Centre
NWFP	North West Frontier Province
O&M	Operation and Management
OBU	On Board Unit
OD	Origin-Destination
OJP	On-the-Job Participation
OJT	On-the-Job Training
P&D	Planning and Development Department
PHA	Parks and Horticultural Authority
PHATA	Punjab Housing and Town Planning Agency
PHED	Public Health Engineering Department
PMDGP	Punjab Millennium Development Goal Program
PMU	Project Management Unit
PNR	Pakistan National Railway
PPHPD	Passenger Per Hour Per Direction
PPO	Punjab Police Office
PPP	Public Private Partnership
PPTA	Punjab Provincial Transport Authority
PRTC	Punjab Road Transport Corporation
PSP	Private Sector Participation
PTA	Provincial Transport Authority
PTPS	Pakistan Transport Plan Study
PTUIS	Public Transport User Interview Survey
PUTC	Punjab Urban Transport Corporation
R&B	Rehabilitation and Building
RCC	Roller Compacted Concrete
RIS	Road Interview Survey
RMTS	Rail-based Mass Transit System
RTAs	Regional Transport Authorities
STREAM	Sustainable Transport in East Asian Mega-cities
TD	Transport Department
TDM	Traffic Demand Management
TEPA	Traffic Engineering and Transport Planning Agency (Under LDA)
TEVTA	Technical Education and Vocational Training Authority
TEVTC	Technical Education and Vocational Training Council
TMA	Town Municipal Administrations
TPU	Transport Planning Unit
TSDI	Transport Sector Development Initiative
UA	Union Administration
UCs	Union Councils
UN	United Nations
UNESCO	United Nations Educational Scientific Cultural Organisation
UU	Urban Unit
W&S	Works and Services
WASA	Water and Sanitation Agency (Under LDA)
WB	World Bank

SUMMARY, CONCLUSION AND RECOMMENDATIONS

FINAL REPORT

SUMMARY, CONCLUSION AND RECOMMENDATIONS

1. Study Objectives

The Lahore Urban Transport Master Plan (LUTMP) was formulated with the following main objectives:

- (i) To formulate an urban transport master plan for the Study Area up to the year 2030;
- (ii) To formulate an action plan for the identified priority projects up to the year 2020; and
- (iii) To provide assistance to strengthen the administrative capacity of the Government of the Punjab for implementing the master plan.

2. Worsening Transport Situation – Threat to Sustainability

The LUTMP study area of about 3,044 km², covering the whole of Lahore District, part of Kasur and Sheikhpura Districts, has been suffering from worsening traffic situation and environmental degradation in the city center and on major arterial roads.

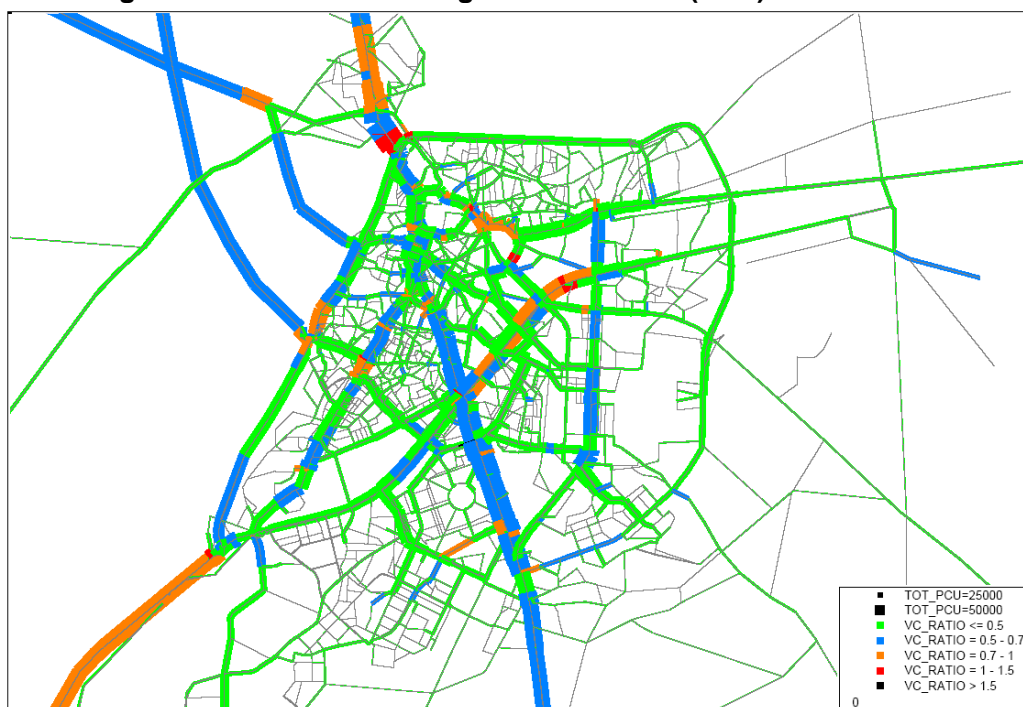
Population of Lahore District has been growing continuously, and increased by 7.5 times since the first census in 1951. The fastest growth pace was recorded between 1972 and 1981, i.e., 4.3% per annum. Since then, the growth rate has been steadily declining. As of 2010 the population of the LUTMP study area was estimated at about 9.9million, including 0.4million of part of Kasur and 0.9million of Sheikhpura District areas. However, most of the population is concentrated in the center of Lahore, while the rest of the areas are mostly rural except for narrow strips along arterial roads, showing a ribbon development.

Table S.1 Growth of Socio-economy and Transport Demand in LUTMP Study Area

Indicator	Present (2010)	2030	Growth 2030/ 2010	
Population (000)	9,928	16,429	1.65	
No. of Workers (000)	2,691	4,978	1.85	
No. of Students (000)	857	1,597	1.86	
GDP per Capita¹ (PKR 000)	135.1	274.8	2.03	
Car Ownership (% of households)	18.3	44.0	2.40	
Trip Production (million/ day)	8.2	17.0	2.07	
Average Volume/ Capacity Ratio (Do-Nothing Scenario)	Canal Screenline	0.28	0.66	1.74
	Railway Screenline	0.50	1.07	2.14
	Ravi River	0.71	1.95	2.75
	Study Area Cordon	0.32	0.76	2.38

Note: 1) at 2010 constant prices
 Source: JICA Study Team

Figure S.1 2010 Traffic Assignment Volumes (PCU) and V/C Ratio



Source: JICA Study Team

Figure S.2 2030 Traffic Assignment (2010 Network) Volumes (PCU) and V/C Ratio



Source: JICA Study Team

While population and economy of the study area are foreseen to grow steadily in the future, the increase of transport demand will be at much faster rate. The gradual shift from poor quality public transport to private transport due to the increase of income and motorcycle/ car ownership would further exacerbate the road traffic congestion, particularly at the Railway and Ravi crossings. The forecast traffic volume will well

surpass the road capacity by 2030, if no countermeasures are taken.

This trend is the most fundamental threat to the quality of Lahoris life to overcome. Under the strong pressure of this rapidly growing transport demand, the critical issues are not only how to develop transport infrastructure but how to seek a sustainable solution between urban development and transport development.

3. Constraints and Opportunities

Constraints: - Influencing transport sector development include insufficient institutional capacity of the government even to understand the problems ahead, poorly coordinated project implementation, limited funding, unclear status of “committed” projects, and so on. Particularly critical is the funding capability. The estimated budget envelope is USD 6.6-19.8 billion for the entire Master Plan period (2011 to 2030) and USD 2.3-6.9 billion for the Action Plan period (2011 to 2020). However, the percentage of the investment to Lahore’s GDP is on the high side at 2.4 % during the Action Plan period. This is about 3 times of the current level of investment in transport infrastructure. For the entire plan period, the investment is equivalent to 1.4 % of the Lahore GDP. Private sector funding such as PPP scheme would be additional to public funds.

Opportunities: - There are many to improve the situation in the LUTMP study area. These are, among others: (1) the modal share of public transport in Lahore is considerably high at 37~40 % as of 2010 (excluding walk trips, residents only) as compared to some other Asian cities (see Table S.2). This is one of the precious assets that Lahore should maintain; (2) the road infrastructure of Lahore is well developed and allows Lahoris to live on “borrowed time” for a while more; and (3) LDA’s land use rules and regulations, though in a limited coverage, offer a good opportunity not only to control urban development but to provide revenue sources from integrated development of trunk public transport system, local access roads and other urban facilities.

Table S.2 Public Transport Modal Shares in Selected Asian Cities

City (Country)	Modal Share of Public Transport (%)	Year
Shanghai (China)	22	2000
Bangkok (Thailand)	39	1989
Manila (Philippines)	70	1996
Jakarta (Indonesia)	55	2000
Hanoi (Vietnam)	7	2005
Phnom Penh (Cambodia)	18	2000
Kuala Lumpur (Malaysia)	10	1997
Delhi (India)	54	2000

Source: JICA urban transport master plans and UITP publications

4. Master Plan 2030

Key Strategies

- 1) For large urban areas, such as Lahore, the only way to effectively meet transport demand is to provide the city with a high-quality public transport system which must be developed in integration with the urban development. The core network will be composed of urban rail (RMTS) and Bus Rapid Transit (BRT). Secondary and feeder services will be by buses with different sizes and types of services. Experiences of successful cities clearly indicate that mass transit networks serve as the backbone of the urban transport infrastructure and are integrated with urban land use and development. Bus, including wagon, is and will remain the most important mode of public transport system in Lahore. Although urban rail is expected to play a major role in the future, the coverage will be limited and many corridors and areas would remain without direct (walk-in) access to mass transit. Bus also provides important feeder services for urban rail.
- 2) The travel demand analysis has presented the gap between the available road capacity and the demand. The outcome is clear that with 2+% growth rate in population, coupled with GRDP growth of about 6% the current network will not be able to sustain the future road traffic demand. The primary strategy of road network development is to fill the gaps by increasing road capacity. This has been seriously considered in the master plan particularly at the congested cross-section of the Ravi River.
- 3) Infrastructure is expensive and requires proper management and operation. Traffic management is hence essential not only for the efficiency of traffic but for safety, comfort and urban environment. Particularly in relation to road safety, the current worsening situation is unacceptable. As car ownership is expected to increase sharply in the future while road development is limited, managing the demand for private transport will become a more serious concern. Traffic condition/ situation in the central area of Lahore is the most serious in the study area. Most intercity and intra-city traffic concentrate there using radial arterial roads. Disorderly traffic management and insufficient road infrastructure aggravate the situation. The traffic management deficiencies need to be tackled urgently.

Investment Summary and Project List

The development of the Lahore Urban Transport Master Plan (LUTMP) has been carried out based on the analyses on current situation and future transport demand, and project prioritization by Multi Criteria Analysis (MCA). The summary of the investment planned in

The Project for Lahore Urban Transport Master Plan in the Islamic Republic of Pakistan
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the Master Plan is presented in Table S.3. The estimated total investment for the entire plan period till 2030 is about USD 11.1 billion. This falls in the estimated range of budget envelope though on the high side particularly for the short- and medium-term.

Table S.3 Planned Investment Summary for the Master Plan Projects (USD million)

Period (Year)	Short Term 2012-2015	Medium Term 2016-2020	Long Term 2021-2030	Total
Public Transport	1,499	3,021	2,742	7,262
Road Sub-sector	450	570	2,139	3,159
Traffic Management	146	363	154	663
Total	2,095	3,954	5,035	11,084

Note: excluding committed projects of which cost is unknown
Source: JICA Study Team

Table S.4 summarizes the projects proposed in the Master Plan with responsible agency specified by project.

Table S.4 Master Plan Projects with Estimated Cost and Responsible Dept./ Agency

Project No.	Project Description	Project Cost (USD Million)	Assumed Year of Operation	Status 1)	Proposed by:	Responsible Agency
Public Transport Projects – Committed						
PT01	Multimodal Inter-City Bus Terminals in Lahore	-	2014	Ongoing	TD	TD
PT02	Effective and Efficient School Bus System	0.01	2014	Planned	TD	TD
PT03	Up-gradation of Bus Stands	-	2015	Planned	TD	TD
PT04	Integrated Bus Operation	80.1	2015	Planned	LTC	LTC
PT05	Establishment of Multimodal Bus Terminal at Shahdara	-	2017	Planned	TD	TD
Public Transport Projects – LUTMP 2030 Proposed						
PT06	RMTS Green Line	2,583.0	2020	Planned	TD	TD
PT07	RMTS Orange Line (Initially BRT)	2,330.0	2030	Planned	TD	TD
PT08	RMTS Blue Line (Initially BRT)	1,908.0	2030	Planned	TD	TD
PT07	BRT Orange Line	74.5	2015		LUTMP	LTC
PT08	BRT Blue Line	58.6	2020		LUTMP	LTC
PT09	BRT Purple Line	40.8	2020		LUTMP	LTC
PT10	BRT Line 1	30.7	2020		LUTMP	LTC
PT11	BRT Line 2	30.5	2020		LUTMP	LTC
PT12	BRT Line 3a	28.7	2020		LUTMP	LTC
PT13	BRT Line 3b	35.3	2020		LUTMP	LTC
Road Sub-sector Projects – Committed						
R01	Construction of LRR (Airport – Ferozepur Road)	113.0	2015	Ongoing	C&W	C&W
R02	Construction of Kalma Chowk Flyover	17.5	2015	Completed	C&W	C&W

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Project No.	Project Description	Project Cost (USD Million)	Assumed Year of Operation	Status ¹⁾	Proposed by:	Responsible Agency
R03	Construction of Canal Bank Road Flyover	17.1	2015	Ongoing	C&W	C&W
R04	Remodeling of Canal Bank Road	43.8	2015	Ongoing	TEPA	TEPA
R05	Remodeling of Barki Road (LRR – Green City)	2.0	2015	Ongoing	C&W	C&W
R06	Remodeling of Kala Khatai Road	10.8	2015	Ongoing	C&W	C&W
R07	Remodeling of Allama Iqbal Road	16.1	2015	Ongoing	C&W	C&W
R08	Remodeling of Multan Road	46.4	2015	Ongoing	C&W	C&W
R09	Remodeling of Thokar Niaz Baig Road	4.8	2015	Ongoing	C&W	C&W
R10	Remodeling of Lahore Ferozepur Road	17.5	2015	Completed	C&W	C&W
LUTMP 2030 Road Sub-sector Projects – Proposed						
R11	Barki Road (Green City – BRB Canal)	17.0	2020		LUTMP	C&W
R12	Bedian Road (DHA – LRR – Ferozepur Road)	142.0	2026		LUTMP	C&W
R13	Shabir Usmani Road (Barkat Market – Maulana Shaukat Ali Road)	6.9	2021	Planned	TEPA	TEPA
R14	Link Peco Road – Ferozepur Road	6.7	2021		LUTMP	TEPA
R15	Link Ferozepur Road - Nalay Wali Road (Completion of link between Ferozepur and Multan Road)	5.3	2021	Planned	TEPA	TEPA
R16	Old Ravi Bridge and Road (Bridge 0.5km)	5.3	2018	Planned	TEPA	TEPA
R17	G.T. Road (Cooper Store - Ek-Moria Pul)	6.3	2019	Planned	TEPA	TEPA
R18	College Road (Ghaus-e-Azam Road to Defence Road)	14.0	2020	Planned	TEPA	TEPA
R19	Structure Plan Road (Shahrah Nazria-e-Pakistan – Defence Road)	35.0	2018	Planned	TEPA	TEPA
R20	EXPO-Kahna Kacha Station Road (Khayban-e-Jinnah – Kahna Kacha Station)	29.9	2024	Planned	TEPA	TEPA
R21	Main Boulevard PIA Society Road (Baig Road – Ittehad Road)	4.0	2024	Planned	TEPA	TEPA
R22	Raiwind Road (Lahore Ring Road Southern Loop – Raiwind City)	52.5	2025		LUTMP	C&W

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Project No.	Project Description	Project Cost (USD Million)	Assumed Year of Operation	Status ¹⁾	Proposed by:	Responsible Agency
R23	Madrat-e-Millat Road - Defence Road	10.9	2024	Planned	TEPA	TEPA
R24	Extension of Maulana Shaukat Ali Road (Canal Bank Road – Noor-ul-Amin Road through Punjab University)	6.0	2024	Planned	TEPA	TEPA
R25	Kamahana Lidher Road (Ferozepur Road – Lahore Bedian Road)	26.4	2027	Committed	C&W	C&W
R26	Sua Asil Road (Ferozepur Road – Raiwind Road)	130.7	2030	Committed	C&W	C&W
R27	Kahna Station – Raiwind City (Kahna Kacha Approach Road – Raiwind City along Railway Line)	91.7	2027	Committed	C&W	C&W
R28	Kahna Kacha Road (Kahna Station – Ferozepur Road)	29.9	2027	Committed	C&W	C&W
R29	Sharaqpur Road (Lahore Ring Road – Saggian Wala Bypass) (Bridge 0.7km)	202.0	2030		LUTMP	C&W
R30	Lahore-Sheikhupura Road (Saggian Wala Bypass – G.T. Road)	20.4	2028		LUTMP	C&W
R31	Sagianwala Bypass Road (Ring Road – Sharaqpur Road) (Bridge 0.6km)	43.4	2028		LUTMP	C&W
R32	Lahore-Sheikhupura Road (West) (Sharaqpur Road – Lahore-Sheikhupura Road)	16.2	2028		LUTMP	C&W
R33	Link Thokar Niaz Baig Canal Bank Road – Ferozepur Road (Khyaban-e-Jinnah Road – Defence Road – Ferozepur Road)	57.6	2022		LUTMP	TEPA
R34	Manga-Raiwind Road (Multan Road – Raiwind Road)	43.5	2028		LUTMP	C&W
R35	Southern Bypass South Road (Ferozepur Road – College Road)	57.0	2022	Planned	TEPA	TEPA
R36	Southern Bypass North Road (Canal Bank Road – M-2)	19.7	2022	Planned	TEPA	TEPA
R37	Raiwind-Pattoki Road (Raiwind City – Boundary of LUTMP Study Area)	73.3	2028		LUTMP	C&W
R38	Raiwind Road (Thokar – Lahore Ring Road Southern Loop)	54.2	2028		LUTMP	C&W

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Project No.	Project Description	Project Cost (USD Million)	Assumed Year of Operation	Status ¹⁾	Proposed by:	Responsible Agency
R39	Defence Road (Multan Road – Ferozpur Road)	60.1	2022		LUTMP	C&W
R40	Thokar Niaz Baig Canal Road Extension (Defence Road – Lahore Ring Road Sothern Loop)	20.8	2028		LUTMP	C&W
R41	Construction of LRR West (Multan Road – M2)	121.9	2024	Planned	C&W	C&W
R42	Construction of LRR South (Ferozpur Road – Multan Road)	201.2	2030	Planned	C&W	C&W
R43	Secondary Roads in Dharampura Area	38.9	2018		LUTMP	TEPA
R44	Secondary Roads in Shadbagh Area	170.5	2018		LUTMP	TEPA
R45	Secondary Roads in Samanabad Area	48.0	2017		LUTMP	TEPA
R46	Lahore Bypass (G.T. Road – Kala Shah Kaku Bypass)	41.0	2022		LUTMP	NHA
R47	M-2 – Lahore-Islamabad Motorway (Lahore-Sheikhupura Road – Boundary of LUTMP Study Area) (Bridge 0.6km)	89.0	2022		LUTMP	NHA
R48	M-2 – Lahore-Islamabad Motorway (Bund Road – Lahore-Sheikhupura Road)	64.6	2022		LUTMP	NHA
R49	N-5- Multan Road (Lahore Ring Road Sothern Loop – Boundary of LUTMP Study Area)	109.7	2029		LUTMP	C&W
R50	Sharif Complex Road (Defence Road – Manga Raiwind Road – Bhai Pheru Kot Rada Kishan Road)	116.1	2029		LUTMP	C&W
R51	North-West Secondary Ring Road (Sharaqpur Road – Lahore-Sheikhupura Road – G.T. Road)	118.3	2031		LUTMP	C&W
R52	Sheikhupura Muridke Road (G.T. Road – M-2)	284.4	2031		LUTMP	C&W
R53	Link G.T. Road (Sharaqpur Road – Lahore-Sheikhupura Road – G.T. Road)	22.9	2027		LUTMP	C&W
R54	Link Kala Shah Kaku – Lahore-Sialkot Motorway	25.1	2022	Planned	C&W	C&W
R55	Lahore-Sialkot Motorway (Bridge 0.8km)	128.0	2024	Planned	C&W	C&W

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Project No.	Project Description	Project Cost (USD Million)	Assumed Year of Operation	Status 1)	Proposed by:	Responsible Agency
R56	Link G.T. Road Lahore-Sialkot Motorway	2.2	2022	Planned	C&W	C&W
R57	Construction and remodeling of Secondary roads - south of LRR in the south-western quadrant between Ferozpur Road and Multan Road	The Road Projects will be executed by LDA/ TEPA in conjunction with the developer's contribution towards capital cost to be completed by 2020.				
Traffic Management Projects – Committed						
TM01	Establishment of Centralized Driver Licensing Authority	-	2016	Planned	TD	TD
TM 02	Parking Management Company	-	2018	Planned	TEPA	TEPA
TM 03	Traffic Education Center	-	2014	Planned	Traffic Police	Traffic Police
TM 04	Traffic Control Plan of City	-	2015	Planned	Traffic Police	Traffic Police
TM 05	Vehicle Inspection and Certification System (VICS)	-	2021	Ongoing	TD	TD
TM 06	Construction of New Parking Plazas	207.1	2020	Ongoing	TEPA	TEPA
TM 07	Construction of Pedestrian Bridges	1.8	2016	Ongoing	TEPA	TEPA
TM 08	Improvement of 52 Junctions	30.5	2021	Planned	TEPA	TEPA
TM 09	Ferozpur Road Pilot Project	28.3	2022	Ongoing	TEPA	TEPA
TM 10	Conversion of Two Stroke Rickshaw into CNG Fitted Four Stroke Rickshaw	12.4	2019	Planned	TD	TD
TM 11	Remodeling of Inner and Outer Circular Road	14.1	2015	Planned	TEPA	TEPA
Traffic Management Projects – Proposed by LUTMP 2030						
TM 12	A.1 Junction Design and Traffic Signal Improvement – CBD	4.0	2015		LUTMP	TEPA
TM 13	A.2 Existing Junctions Design and Network Improvement	30.0	2019		LUTMP	TEPA
TM 14	A.3 Road Function and Capacity Improvement Program	2.0	2015		LUTMP	TEPA and CDGL
TM 15	B.1 Low Occupancy Vehicles Planning for Outskirt/ Rural Areas	5.0	2017		LUTMP	LTC
TM 16	B.2 Traffic Circulation System Design and Implementation	20.0	2018		LUTMP	TEPA
TM 17	B.3 Public and Freight Transport Terminals	100.0	2021		LUTMP	TEPA and CDGL
TM 18	B.4 Linking Communities - Smart Roads	4.0	2019		LUTMP	TEPA

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Project No.	Project Description	Project Cost (USD Million)	Assumed Year of Operation	Status 1)	Proposed by:	Responsible Agency
TM 19	B.5 Feasibility Study for Traffic Demand Management Measures	2.5	2018		LUTMP	TEPA
TM 20	B.6 RMTS and BRT Station Area Traffic Management	1.5	2023		LUTMP	TEPA
TM 21	C.1 Planning and Design Study for Non-Motorized Traffic	1.5	2017		LUTMP	TEPA
TM 22	C.2 Non-Motorized Traffic Facilities Implementation	6.0	2021		LUTMP	TEPA
TM 23	C.3 Pedestrian and Bicycle Path Network	5.0	2017		LUTMP	TEPA
TM 24	D.1 Comprehensive Parking System Development	2.5	2015		LUTMP	TEPA
TM 25	D.2 Parking Facilities Implementation	60.0	2024		LUTMP	TEPA
TM 26	D.3 Park and Ride Facilities Development	75.0	2030		LUTMP	TEPA
TM 27	E.1 Traffic Enforcement Strengthening Programme	3.0	2015		LUTMP	Traffic Police
TM 28	F.1 Traffic Calming	6.0	2015		LUTMP	TEPA
TM 29	F.2 Traffic Safety Education Improvement	1.0	2018		LUTMP	Traffic Police and 1122
TM 30	G.1 Intelligent Transportation System Development	38.0	2029		LUTMP	TEPA
TM 31	H.1 Local Standards and Guidelines Development	1.5	2017		LUTMP	TEPA

Note: 1) Committed: officially approved by GoPb. Planned: waiting for approval.
Source: JICA Study Team

5. LUTMP Action Plan 2020

Core Programs

A number of transport projects have been proposed in the Master Plan. Among the projects, there are many projects that need immediate action of government agencies due to urgent needs of the city. These projects are categorized as follows:

- ❑ Immediate action to commence work on trunk public transport system such as RMTS and BRT; to improve convenience, accessibility and comfort of people's travel, alleviating serious road traffic congestion foreseen in the future (***Core Program-1***).
- ❑ Traffic management in central Lahore; to improve disorderly traffic situation around the Walled City, by a combination of minor road improvement, junction re-design, parking management, pedestrian/ bicycle path development and other cost effective traffic management measures (***Core Program-2***).

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These projects may be considered as the core program of LUTMP. Other cost effective projects to supplement and enhance the viability/ performance of the **core projects** mentioned above may be included in the core program during project planning phase.

Proposed Core Program-1

In the Action Plan period (2012-2020), one RMTS line (Green) and seven BRT lines are proposed. Later, by 2030, two BRT lines would need to be upgraded to RMTS (Orange and Blue Lines). Table S.5 shows implementation programme. Figure S.3 illustrates the broad corridors for these proposed projects for 2020.

Table S.5 RMTS and BRT Lines Proposed for 2020 and 2030

Project Code	Project Description	System	Daily Boarding			Max Line Load (Pax Per Hr Per Direction – PPHPD)		
			2020	2030	% Growth	2020	2030	% Growth
PT06	RMTS Green Line	RMTS	759,000	980,000	29	17,200	21,900	28
PT07	RMTS Orange Line	2020 BRT/ 2030 RMTS	510,000	743,000	46	9,500	20,100	102
PT08	RMTS Blue Line	2020 BRT/ 2030 RMTS	270,000	379,000	40	5,600	11,200	100
PT09	BRT Purple Line	BRT	129,000	276,000	114	1,800	3,700	137
PT10	BRT Line 1 (Red)	BRT	88,000	285,000	224	2,100	6,800	219
PT11	BRT Line 2 (Light Blue)	BRT	109,000	331,000	204	1,500	3,700	164
PT12	BRT Line 3a (Pink)	BRT	161,000	265,000	65	3,200	3,500	12
PT13	BRT Line 3b (Pink)	BRT	167,000	248,000	49	2,700	3,200	19
Totals			2,193,000	3,507,000	60	n/a		

Source: JICA Study Team

Proposed Core Program-2

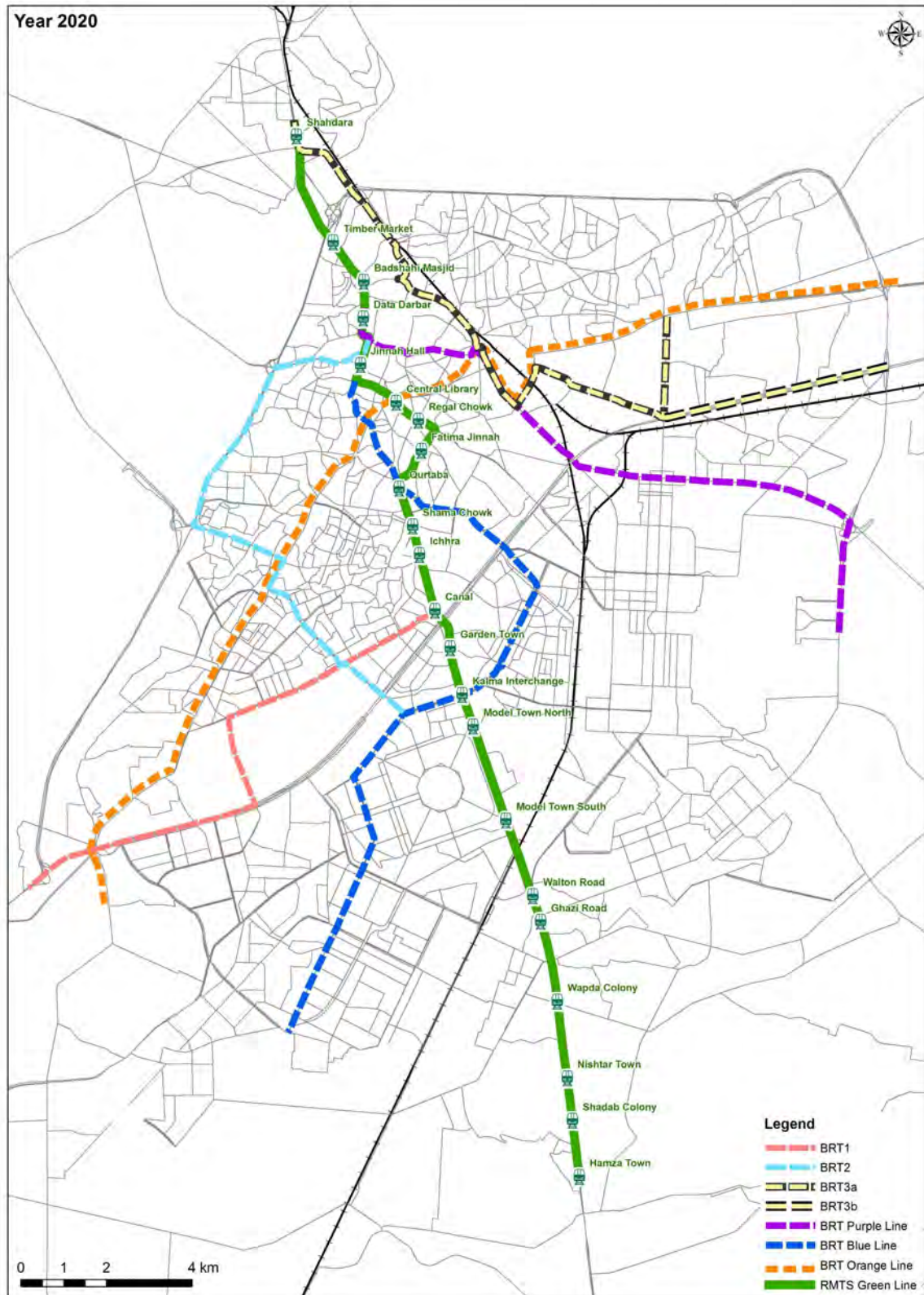
List of the projects selected for the 2020 Action Plan Core Program 2 are given in Table S.6.

Table S.6 Proposed Action Plan Traffic Management Projects (Core Program-2)

Project No.	Project Description	Implementation
TM12	A.1 Junction Design and Traffic Signal Improvement – CBD	Short Term
TM18	B.4 Linking Communities - Smart Roads	Short Term
TM23	C.3 Pedestrian and Bicycle Path Network	Short Term
TM24	D.1 Comprehensive Parking System Development	Short Term
TM31	H.1 Local Standards and Guide Lines Development	Short Term
TM16	B.2 Traffic Circulation System Design and Implementation	Medium-term
TM17	B.3 Public and Freight Transport Terminals	Medium-term
TM19	B.5 Feasibility Study for Traffic Demand Management Measures	Medium-term
R44 & R45	Shadbagh Area (Roads - R44) and Samanabad Area (Roads R45) – Secondary Road Network Development	Urgent Action
R57	Construction and Remodeling of Secondary roads - south of LRR in the south-western quadrant between Ferozepur Road and Multan Road	On-Going Developments

Source: JICA Study Team

Figure S.3 Location of RMTS/ BRT Lines for 2020



Source: JICA Study Team

Investment Summary

Table S.7 shows investment summary of LUTMP for the 2020 Action Plan period. Public transport projects share is about 75 % of the total cost, while road and traffic management share is 17 % and 8 %, respectively. The budget envelope is USD 2.3-6.9 billion for the Action Plan period (2012 to 2020). The planned investment falls in this range. However, the percentage of the investment in relation to Lahore's GDP is on the high side at 2.6 % during the action plan period. This is about 3 times the current level of investment. Private sector finance should be sought for these projects and measures to raise government revenue should also be taken.

Table S.7 Planned Investment Summary for the Action Plan (USD million)

Period (Year)	Short Term 2012-2015	Medium Term 2016-2020	Total
Public Transport	1,499	3,021	4,520
Road	450	570	1,020
Traffic Management	146	363	509
Total	2,095	3,954	6,049

Note: Excluding committed projects of costs of which are unknown
Source: JICA Study Team

Possible reduction of public investment has been estimated assuming PPP scheme on the proposed RMTS/ BRT projects. This was done assuming a percentage of contribution from the private sector as shown in Table S.8. The reduction was estimated at about USD 750 million equivalent to 26 % of the total investment.

Table S.8 Cost Reduction by Applying PPP Scheme to RMTS/ BRT Projects by 2020

Project No.	Project Description	EIRR (%)	FIRR (%)	Project Cost (USD million)	% Private Sector	Cost to Gov't (USD million)
PT06	RMTS Green Line	12.1	7.1	2,583.0	20	2,066.4
PT07	BRT Orange Line	18.8	21.0	74.5	100	0.0
PT08	BRT Blue Line	16.7	17.9	58.6	80	11.7
PT09	BRT Purple Line	15.5	16.1	40.8	50	20.4
PT10	BRT Line – 1	37.6	24.9	30.7	100	0.0
PT11	BRT Line – 2	43.6	26.5	30.5	100	0.0
PT12	BRT Line – 3a	20.4	16.3	28.7	50	14.4
PT13	BRT Line – 3b			35.3	50	17.7
Total				2,882.1	26.1	2130.6

Source: JICA Study Team

6. Recommendations

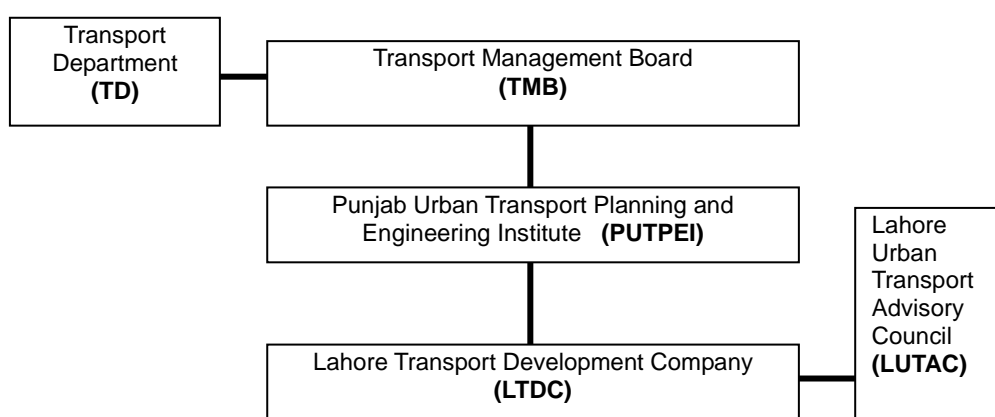
The LUTMP study team recommends for the Government of the Punjab to:

- 1) Authorize and get this master plan approved by Chief Minister and concerned agencies of GoPb, and disseminate its contents to all stakeholders.
- 2) Allocate implementation responsibilities by project clearly to government agencies. Transport Department (TD) oversees and monitors the implementation of these

projects.

- 3) Establish new organizational setup to make decisions on various transport projects. This proposal includes the establishment of Transport Management Board (TMB), Punjab Urban Transportation Planning and Engineering Institute (PUTPEI), Lahore Transport Development Company (LTDC) and Lahore Urban Transport Advisory Council (LUTAC) to control the urban transport sector of Lahore as presented in Figure S.4. This institutional setup is expected also to monitor and manage the progress of the proposed projects in this master plan.

Figure S.4 New Establishment for Transportation Development



Source: JICA Study Team

- 4) Take necessary actions to launch the Core Program 1 of the LUTMP Action Plan as shown in Table S.9.

Table S.9 Necessary Actions to Construct Trunk Public Transport System

Project Code	Route/ Line	System	Actions Needed
PT06	RMTS Green Line	RMTS	EIA, detailed design, land acquisition, utility relocation and procurement of transaction adviser are needed immediately. Tender and financial arrangement by 2015. Completion by 2019/20.
PT07	RMTS Orange Line (Initially BRT)	BRT	Reference Design is needed urgently to firm up costs for budgeting, land acquisition etc. Other actions (EIA etc) by 2015.
PT08	RMTS Blue Line (Initially BRT)	BRT	FS is needed by 2015. Other actions by 2019/20.
PT09	BRT Purple Line	BRT	All actions by 2019.
PT10	BRT Line – 1	BRT	All actions by 2019.
PT11	BRT Line – 2	BRT	All actions by 2019.
PT12	BRT Line – 3a	BRT	All actions by 2019.
PT13	BRT Line – 3b	BRT	All actions by 2019.

Source: JICA Study Team

- 5) Start the projects proposed in the Core Program 2 of the LUTMP Action Plan as soon as possible. GoPb has already requested Japanese Government to conduct a

technical assistance project in this regard. Particularly in relation to the encroachment of roads found everywhere at present in central Lahore, not only strengthening enforcement but rationalization of road space and pedestrian facilities use (along with improved bus system) should be seriously considered and planned coupled with improvement of traffic management such as installation of modern signal system.

- 6) Raise funding capability of GoPb by seeking from various additional revenue sources, and optimising current revenue sources under the institutional arrangements of the government. Some of the initiatives that could be expanded further in Lahore could include: (1) Property Assessment Taxes, (2) Betterment Charges and (3) Development Charges. Although application of these initiatives needs careful examination before it is implemented, the revenue potential is huge, presumably at an order of several tens of billion rupees. It is recommended for GoPb to investigate the possibility in relation to LDA's land use rules and regulations.

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INTRODUCTION

FINAL REPORT

1. INTRODUCTION

1.1 Study Background

Lahore, the provincial capital of Punjab, is the second largest city in Pakistan with a population of about 10 million. The city's population has been growing at a growth rate of about 3 % per annum. The city's rapidly growing population coupled with increasing vehicle ownership has resulted insatiable travel demand. Development of transport infrastructure has not kept pace with this increase, and has caused transport related problems like traffic congestion, poor environment and a slew of emerging issues:

- absence of mass transit system, inefficient and dilapidated condition of public transport system;
- insufficient traffic management; poor junction design and lack of traffic control;
- encroachment of road space and public right of way, and poor public space management;
- roadside commercial activities, absence of sidewalks, bus stops, proper bus services, shelters; roadside garbage and garbage collection containers;
- illegal parking, and totally uncontrolled parking; and
- disorderly traffic: mixed of animal-drawn carts, auto rickshaws, bicycles and pedestrians.

In 1991, Japan International Cooperation Agency (JICA) conducted a comprehensive urban transport study and formulated a master plan for Lahore. The priority road projects identified in the study, included intersection improvements, underpasses and bridge construction across the Ravi River have been implemented by the World Bank and Government funds. This improved traffic situation to limited extent, and alleviated congestion in the last decade. However, guide way transit projects, including the construction of the light rail transit (LRT) could not be implemented due to lack of institutional capacity and financial constraints. Over the last twenty years city's population has more than doubled, as anticipated, but the transport infrastructure did not keep pace. Also the city's growth was not as planned; it expanded uncontrolled in all directions, as unplanned ribbon development. There was no attempt to review and update the transport master plan except limited planning for some ad-hoc transport projects.

The necessity of formulating a new urban transport master plan was highlighted under these circumstances, and this led the Government of the Punjab requesting JICA to conduct this study. Acting on the request of the Government of the Punjab (GoPb), JICA dispatched a preparatory study mission to Lahore in January 2010. The mission discussed and signed the Scope of Work and Minutes of Meeting with the Government of the Punjab. This study has been implemented based on the agreed Scope of Work.

This study was divided into two phases; Phase 1 focused on transport/ traffic surveys and Phase 2 included transport planning and master plan development. This report covers both Phase 1 and Phase 2 of “The Project for Lahore Urban Transport Master Plan in the Islamic Republic of Pakistan (LUTMP),” covering transport and traffic surveys, analyses, formulation of urban development scenarios, setting future socio-economic framework, demand forecast, preparing transport development strategies, formulation of urban transport master plan for 2030 and formulation of urban transport action plan for 2020.

Figure 1.1.1 A Typical Directionless Traffic Mix and Parking in Lahore



Source: JICA Study Team

1.2 Study Objectives

The following are the overall objectives of the study, as defined in the scope of work:

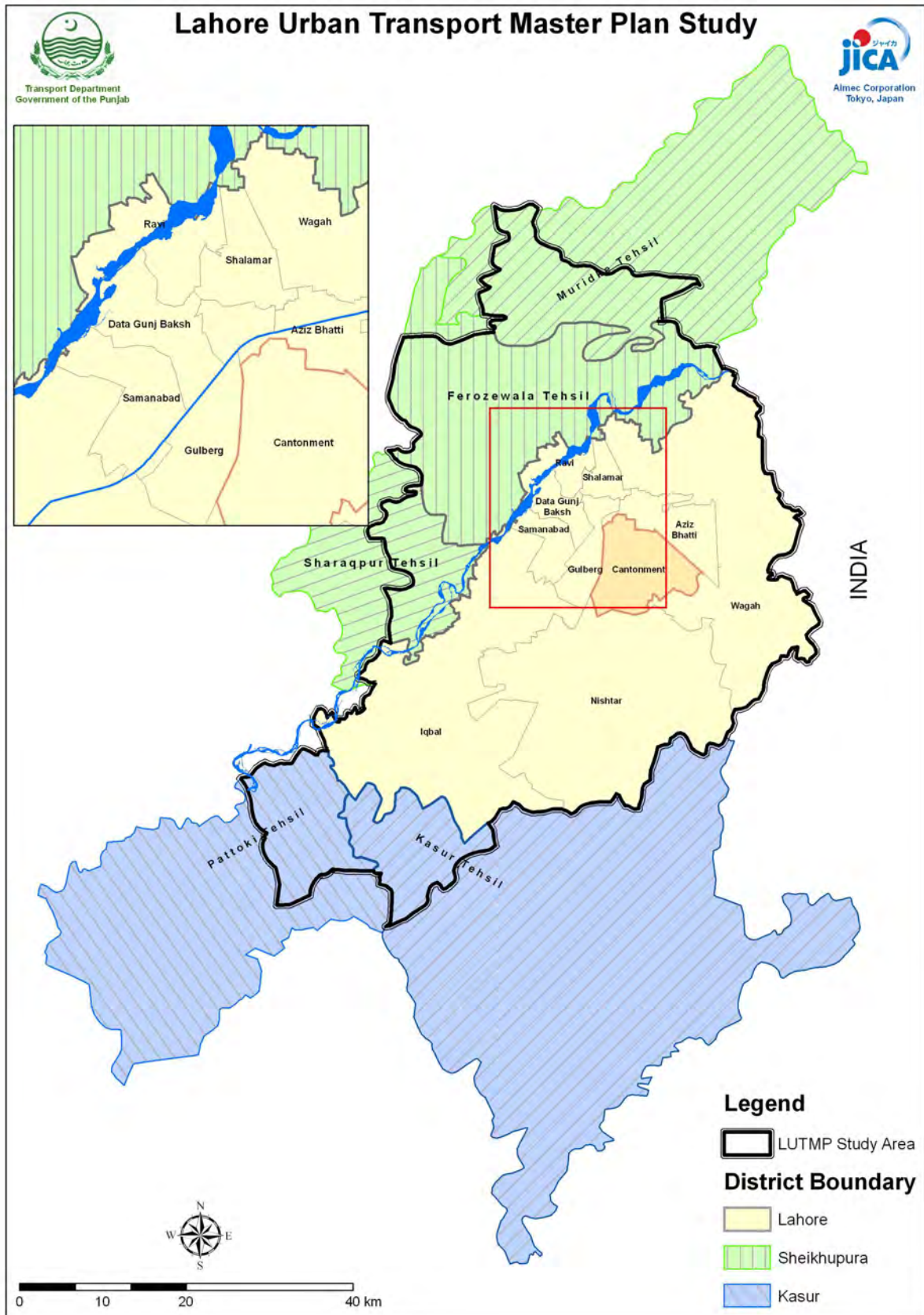
- (i) To formulate an urban transport master plan for the Study Area up to the year 2030;
- (ii) To formulate an action plan for the identified priority projects up to the year 2020; and
- (iii) To provide assistance to strengthen the administrative capacity of the Government of the Punjab for implementing the master plan.

1.3 Study Area

The Study Area as shown in Figure 1.3.1, is about 3,044 km², covers the whole of Lahore District (yellow area), part of Kasur District (blue area), and part of Sheikhpura District (green area). This area is 30% larger than the LMA Area (2,306 km²) studied by JICA in 1991 master plan and also by the LDA in 2004 master plan project.

Urbanization in Lahore has spread beyond its administrative boundaries, although the city continues to be the center of the growing metropolis. As of 2010 the population of the Study Area was estimated at about 9.9 million, including 0.4 million of Kasur; and 0.9 million of Sheikhpura District areas included in the Study Area. However, most of the population is concentrated in the center of Lahore, while the rest of the areas are mostly rural except for narrow ribbon development along arterial roads.

Figure 1.3.1 The Study Area

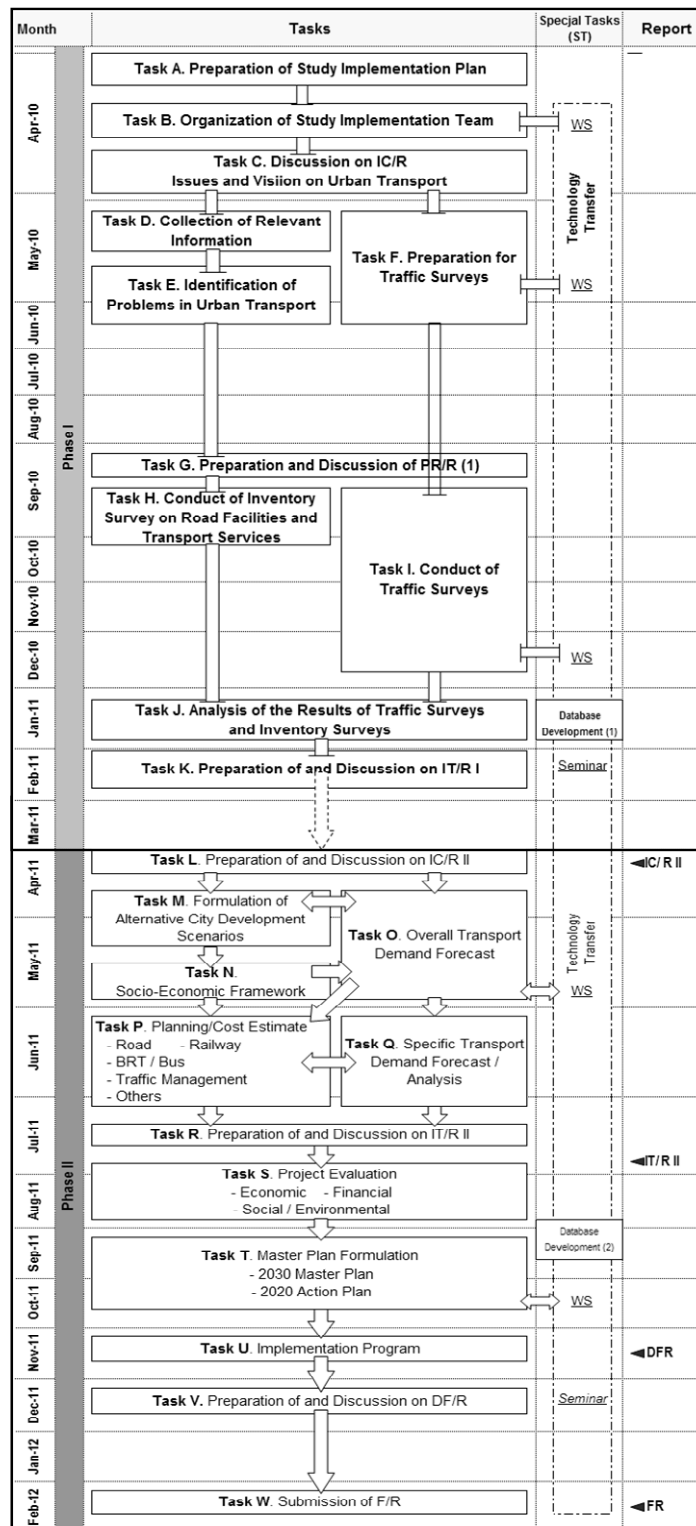


Source: JICA Study Team

1.4 Study Schedule and Framework

The study commenced in April 2010 and ended in February, 2012. The overall framework of the study is shown in Figure 1.4.1.

Figure 1.4.1 Outline Schedule of LUTMP



Source: JICA Study Team

1.5 Composition of LUTMP Reports

The LUTMP Final Report is composed of the following:

- A. Main Text Vol.1: Urban Transport Master Plan for Lahore
- B. Main Text Vol. 2: Surveys, Analyses, Demand Forecast and Capacity Development

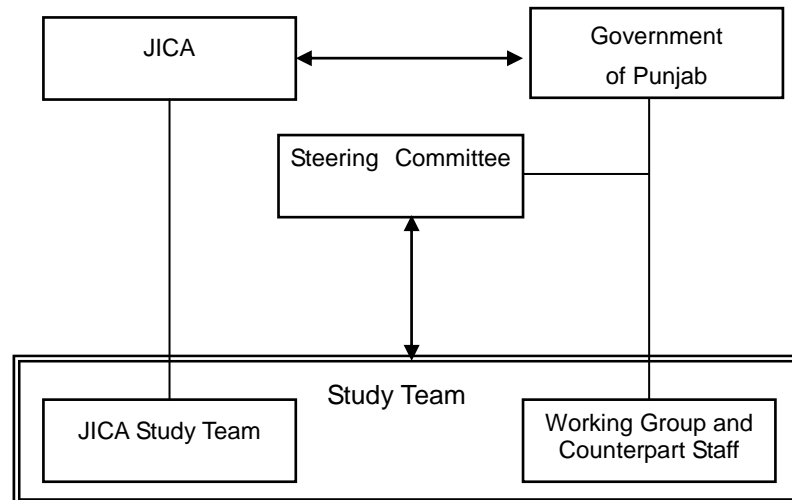
In addition to the above, urban transport database has been created in the form of DVD based on various transport /traffic surveys, demand needed and 2020 and 2030 travel demand forecasts.

1.6 Study Organization

1.6.1 Study Organization

The study organization is composed of JICA and JICA Study Team on the Japanese side and Steering Committee, Working Group, and Counterpart Staff on the Pakistani side, as shown in Figure 1.6.1.

Figure 1.6.1 Study Organization



1.6.2 Members of Study Organization

The members of the study organization are presented in Table 1.6.1 and Table 1.6.2 for the Pakistani and the Japanese side, respectively.

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CHAPTER 1 – INTRODUCTION

Table 1.6.1 Members of the Pakistani Side

Steering Committee Members

No.	Name	Position/ Status	Department/ Agency
1.	Mr. Ali Tahir,	Secretary/ (Chairman)	Planning and Development
2.	Mr. Muhammad Yousaf	Secretary	Transport
3.	Mr. Azam Suleman Khan	Secretary	Communication and Works
4.	Mr. Sajid Saleem Hotiana	Secretary	Environment Protection
5.	Dr. Muhammad Abid Bodla	Member (Infrastructure and Development)	Planning and Development Board
6.	Mr. Ahad Khan Cheema	DCO	City District Government
7.	Mr. Ahmad Mobeen	D.I.G Traffic	Traffic Police
8.	Mr. Abdul Jabbar Shaheen	Director General	Lahore Development Authority
9.	Mr. Ihsan-ul-Hq	Managing Director	Traffic Engineering and Transport Planning Agency
10.	Dr. Nasir Javaid	Project Director	The Urban Unit
11.	Khawaja Ahmad Hassan	Chairman	Lahore Transport Company

Working Group Members

No.	Name	Position/ Status	Department/ Agency
1.	Mr. Muhammad Yousaf	Secretary/ (Chairman)	Transport
2.	(Vacant)	Project Director	Transport Planning Unit
3.	Mr. Manzoor Ahmad Ch.	EDO (W/S)	City District Government
4.	Dr. Shagufta Shahjahan	Director General	Environment Protection
5.	Dr. Muhammad Shehzad	SP Traffic	Traffic Police
6.	Mr. Waseem Ahmad Khan	Chief Metropolitan	Lahore Development Authority
7.	Mr. Saif-ur-Rehman	Chief Engineer	Traffic Engineering and Transport Planning Agency
8.	Mr. Tayyab Farid	Coordinator LRMTS/ Optional Member	Transport Department
9.	Mr. Muhammad Imran	Asst. Chief, Infrastructure/ Optional Member	Planning and Development
10.	Mr. J.I. Kim	Chief Exec. Officer	Lahore Transport Company
11.	Mr. Ozair Shah	Transport Specialist	The Urban Unit
12.	Mr. Sohail Raza	Director	Lahore Ring Road Project

Table 1.6.2 Members of the Japanese Side

JICA

No.	Name	Position	Division/ Office
1	Mr. Hiroyuki HAYASHI	Director	Urban and Regional Development Div.
2	Mr. Kenji MAEKAWA	Director	Urban and Regional Development Div.
3	Mr. Yasuhisa TOMINAGA		Urban and Regional Development Div.
4	Mr. Masahiro Suzuki		Urban and Regional Development Div.
5	Mr. Nobuyuki KOBE		Urban and Regional Development Div.
6	Mr. Tomoharu OTAKE	Chief Representative	JICA Pakistan Office
7	Mr. Takatoshi NISHIKATA	Chief Representative	JICA Pakistan Office
8	Mr. Toshiya SATO	Senior Representative	JICA Pakistan Office
9	Mr. Nobuhiro KAWATANI	Representative	JICA Pakistan Office
10	Ms. Haruka SHINDO	Representative	JICA Pakistan Office
11	Ms. Naila ALMAS	Senior Program Officer	JICA Pakistan Office

JICA Study Team

No.	Name	Position/ Status	Assignment
1.	Mr. SHOYAMA Takashi	Team Leader	Comprehensive Transport Policy
2.	Mr. Mazhar IQBAL	Deputy Team Leader	Public Transport Planning
3.	Mr. KUMAZAWA Ken	Deputy Team Leader	Urban Planning, Land Use Planning
4.	Mr. SHIBA Yutaka	Member	Urban Planning, Land Use Planning
5.	Mr. David O'BRIEN	Member	Demand Forecast/ Bus and BRT Development
6.	Mr. OKAMURA Naoshi	Member	Traffic Survey and Analysis/ Demand Forecast
7.	Mr. Malik BECHAR	Member	Demand Forecast
8.	Mr. Johan GEORGET	Member	Transport Survey
9.	Mr. KOMORI Masaru	Member	Transport Survey
10.	Dr. KANAI Yoshikazu	Member	Supplemental Traffic Survey
11.	Mr. WAKUI Tetsuo	Member	Organization/ Capacity Development
12.	Mr. HORIE Tetsuo	Member	Capacity Development
13.	Mr. Joel CRUZ	Member	GIS

14.	Mr. TANAKA Masanobu	Member	Database Development
15.	Mr. TAKEDA Haruo	Member	Road Development Planning
16.	Mr. NISHIKATSU Yoshiaki	Member	Road Development Planning
17.	Mr. MATSUDA Tatsuyuki	Member	Railway Development Planning
18.	Mr. Frits OLYSLAGERS	Member	Bus and BRT Development
19.	Mr. TAKAGI Michimasa	Member	Traffic Management Planning
20.	Mr. SEKI Yosui	Member	Project Evaluation
21.	Mr. OKUZAWA Shinjiro	Member	Environmental / Social Considerations
22.	Ms. SAKAI Yuko	Member	Project Coordination

JICA Local Study Team

No.	Name	Position	Title
1.	Mr. Aqeel Younis Mughal	Member	Transport Planning
2.	Mr. Nisar Ahmad Shaikh	Member	Transport Planning
3.	Mr. Taimoor-ul-Haq Abbasi	Member	Transport Planning
4.	Mr. Muhammad Usman Akram	Member	Transport Planning
5.	Ms. Sara Anbreen	Member	GIS Specialist
6.	Ms. Uzma Shahzadi	Member	Project Administration
7.	Mr. Kamran Alam Khan	Member	Project Coordination

1.6.3 Meetings Held

During the course of the conduct of LUTMP, a series of meetings were held as shown in Table 1.6.3. In addition, numerous lectures were delivered for capacity development of Pakistani officials comprised mainly of Transport Planning Unit, Transport Department, GoPb, The Urban Unit, Lahore Transport Company, University of Engineering and Technology, Lahore School of Economics and JICA Local Staff, as detailed in Chapter 5, Volume 2.

Table 1.6.3 List of Meetings Held

Steering Committee

Description	Date	Venue	Participants
1 st Meeting	3 rd June, 2010	Planning and Development Department	22
2 nd Meeting	27 th November, 2010		19
3 rd Meeting	23 rd February, 2011		21
4 th Meeting	18 th April, 2011		23
5 th Meeting	14 th September, 2011		26
6 th Meeting	2 nd December, 2011		24
7 th Meeting	22 nd February, 2012		26
8 th Meeting	24 th February, 2012	Transport Department	18

Working Group

Description	Date	Venue	Participants
1 st Meeting	5 th August, 2010	Transport Department	18
2 nd Meeting	17 th September, 2010		17
3 rd Meeting	1 st July, 2011	Planning and Development Department	21

LUTMP Intl. Seminars

Description	Date	Venue	Participants
1 st Seminar	25 th February, 2011	Royal Palm Golf and Country Club, Lahore	152
2 nd Seminar	15 th September, 2011		158
3 rd Seminar	17 th November, 2011		45
4 th Seminar	1 st December, 2011		170

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**CURRENT TRANSPORT SITUATION,
PROBLEMS AND ISSUES**

FINAL REPORT

CHAPTER 2 – CURRENT TRANSPORT SITUATION, PROBLEMS AND ISSUES

2 CURRENT TRANSPORT SITUATION, PROBLEMS AND ISSUES

2.1 Review of Existing Information, Studies and Plans/ Projects

2.1.1 Historic Development of Lahore and Previous Studies

Lahore is a city which has its mentions in history books as far back as AD 630. Lahore City has been growing, and underwent many development eras, i.e. The Hindu Era, Mughal Period, Sikh Raj, the British Rule and then the creation of Pakistan in 1947. Since then, as the capital of Punjab Province, city has been growing in somewhat circular fashion around the walled city, and also unplanned organic growth of old population centres outside the walled city area. The major growth started around late 1960's when the population growth rate was very high. This high growth lead to the city's expansion in the south and south-west corridors of Ferozpur Road and Multan Road, again mostly unplanned suburbs, with the exception of rich areas Model Town, Gulberg and Shadman. In the east urbanisation has been limited due to proximity to the India, and was seriously affected after the 1965 war. Similarly, westward expansion has been restrained due to Ravi River.

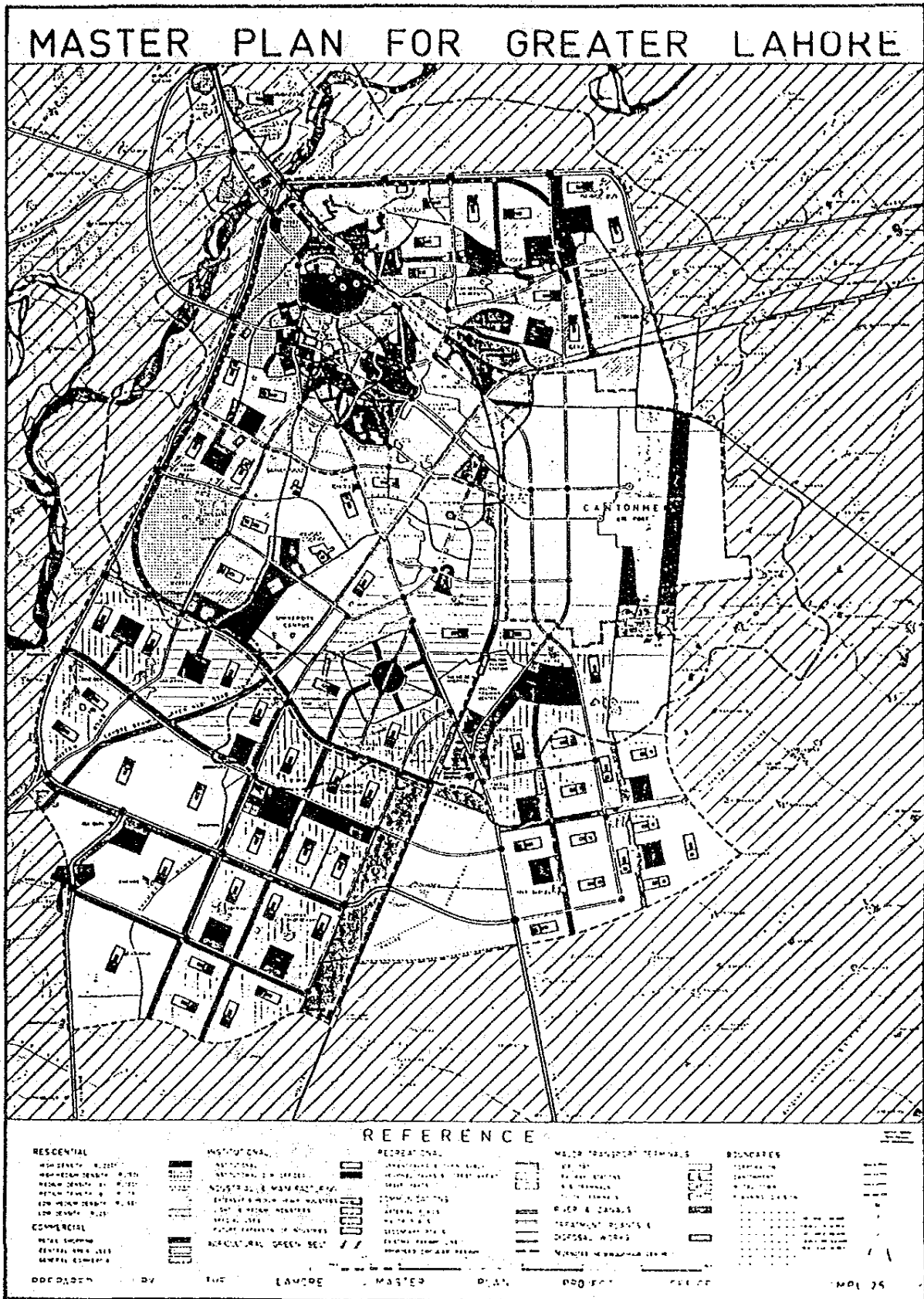
1) 1966 Greater Lahore Master Plan

Development planning of Lahore was first envisaged in the 1966 Master Plan for Greater Lahore. Similar to the prevailing town planning trends of that period, the Grater Lahore Master Plan conceived Lahore as a metropolitan area with several satellite towns around within a radius of 20~25 km. However, due to total lack of development control, no understanding of transport needs that exceed the growth in transport infrastructure, the city continued to grow linearly along radial routes, and the Greater Lahore Master Plan failed to achieve its objectives. The master plan output is depicted in Figure 2.1.1.

2) Lahore Urban Development and Traffic Study, 1980

This study was conducted by Halcrow Fox UK, and it was the first attempt to plan the city growth, and prepare an integrated development and transport infrastructure plan for the year 2000. The future growth was planned towards the south and southwest axis, with additional townships and population centres with adequate transport infrastructure. Again the plan was for the development of population centres and associated transport infrastructure. The transport infrastructure comprised mostly building of new secondary and tertiary roads. No attempt was made to address the overall transport demand, including the issue of public transport, which is crucial for the mobility of its poor residents, with such low vehicle ownership. The overall development plan key features are shown in Figure 2.1.2.

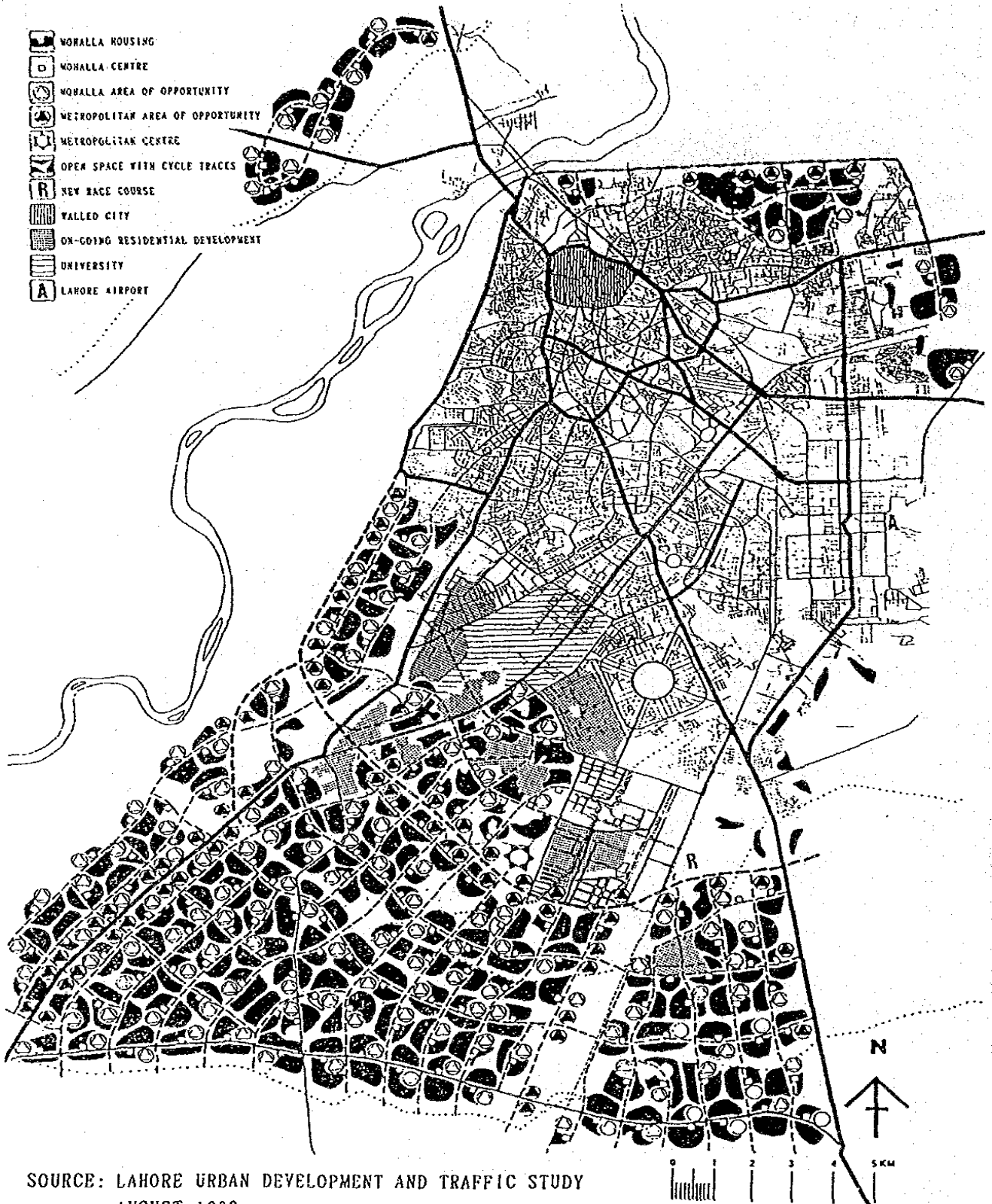
Figure 2.1.1 Master Plan for Greater Lahore



Source: Greater Lahore Master Plan, 1966

CHAPTER 2 – CURRENT TRANSPORT SITUATION, PROBLEMS AND ISSUES

Figure 2.1.2 Lahore Urban Development and Traffic Study



SOURCE: LAHORE URBAN DEVELOPMENT AND TRAFFIC STUDY
AUGUST, 1980.

3) 1991 Comprehensive Study on Transportation System in Lahore, JICA

This study was conducted in 1991 by JICA consultants with the assistance of Lahore Development Authority (LDA) and Traffic Engineering and Planning Agency (TEPA). The study objectives were:

- to formulate a transportation master plan for the Study Area for 2010, with intermediate action plans for year 2000, and
- to conduct a feasibility study of selected mass transit system and other selected transport infrastructure projects.

The study was first ever attempt to apply modern transport planning techniques for travel demand analyses, development and evaluation transport infrastructure projects to meet the travel demand of the City of Lahore (comprising of most of the contiguous urban area of Lahore District and adjoining parts of Sheikhpura District in the north and part of Kasur District in the south. The Study Area is shown below in Figure 2.1.3. The key features of the master plan were:

- most of the future population will be accommodated by intensification of the existing urban areas, and further urbanisation of the city in the south/ southwest quadrant;
- a series of road projects, comprising of new roads and major improvement of existing road intersections by construction of grade separated; and
- introduction of mass both road based and fix-track mass transit system;
- the implementation cost of the master plan was PKR 20 billion in 1991 prices

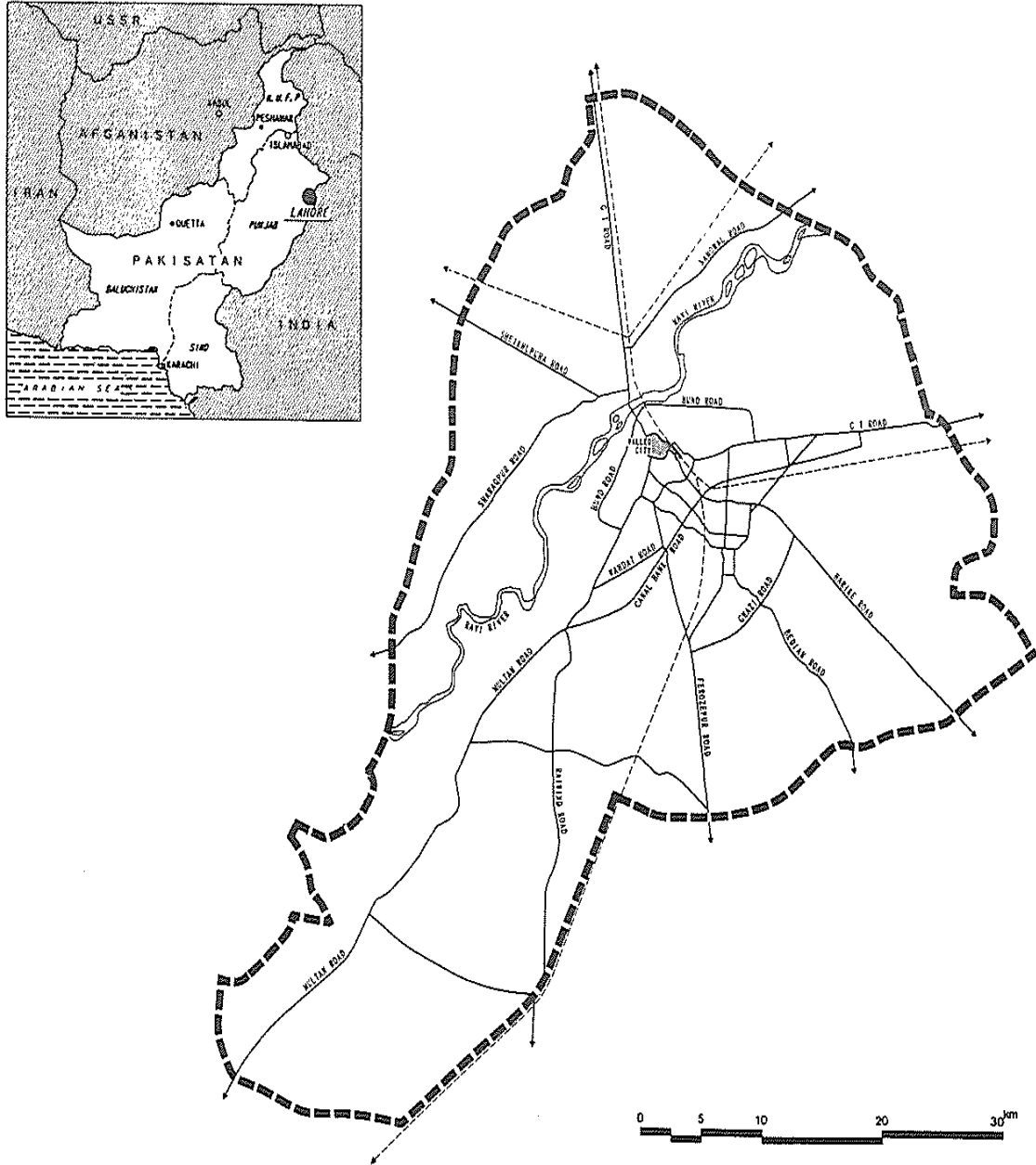
The master plan proposed a number of projects as shown in Figure 2.1.4. Its progress since then is:

- Improvement of existing roads – 70 km; halfway
- Construction of new roads – 200 km; Lahore Ring Road (LRR) and some feeder roads completed but no progress for circumferential roads in the south of the center of Lahore
- Improvement of 26 intersections; mostly done but needs further improvement
- New bridges over River Ravi; proposed two new bridges completed
- Introduction of bus priority lane 52 km; no progress
- Provisions of bus larger bus fleet; once tried but failed due to the lack of control
- Improvements of bus routes and schedules; being done continuously
- Revision of fares; adjustment to inflation only
- Improvement of existing railways – 40 km; none
- Ferozpur LRT system 12.5 km; Pre-FS conducted by WB in 1994 but suspended due to financial constraints
- Development of 2-multi-modal interchanges (Bus and LRT); none completed
- A new bus terminal in the south; proposed

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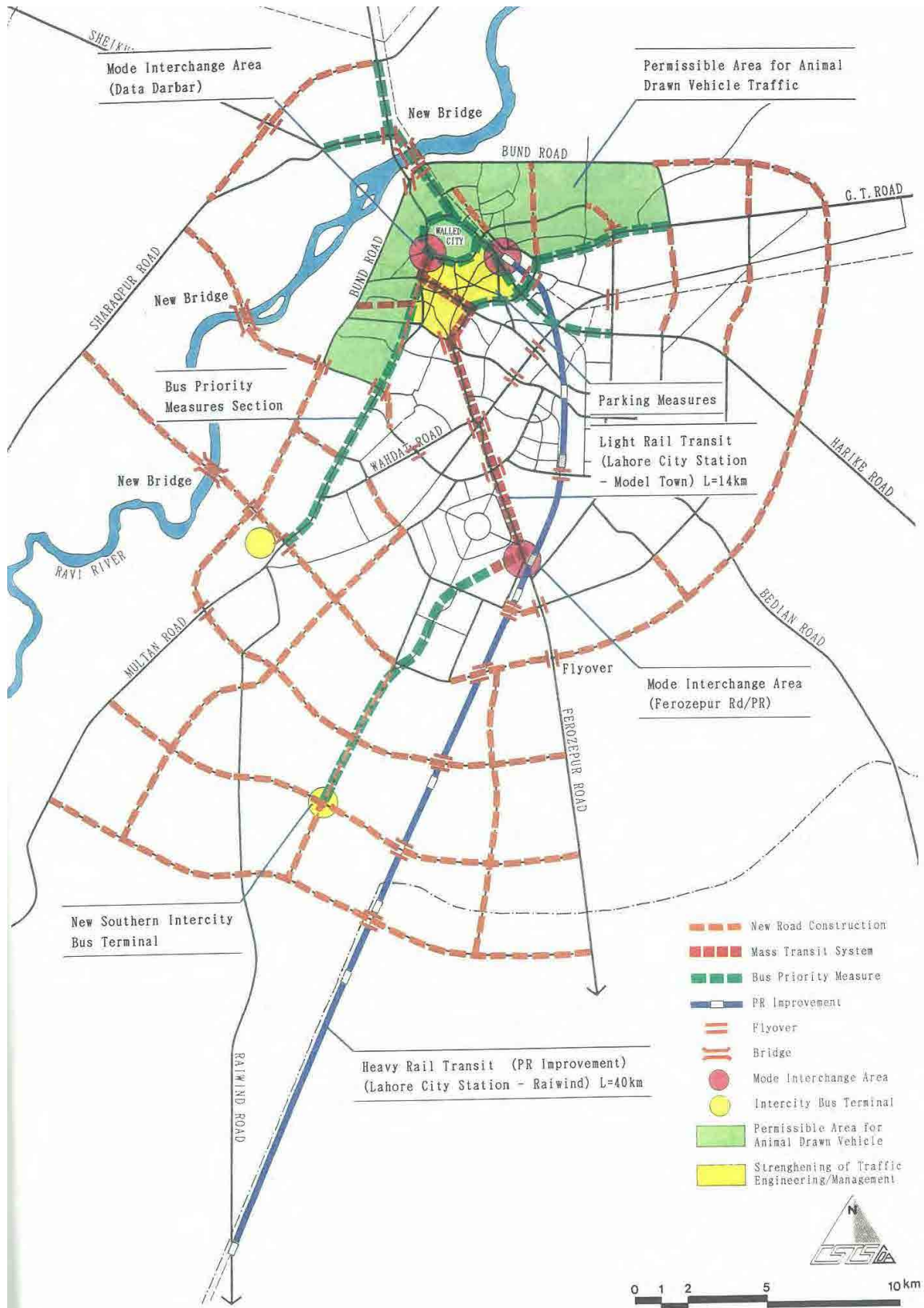
- Parking control; proposed
- Segregation of motorised and non-motorised traffic; limited control only

Figure 2.1.3 Comprehensive Study of Transportation System in Lahore – the Study Area



Source: Comprehensive Study on Transportation System in Lahore, JICA, 1991

Figure 2.1.4 Comprehensive Study of Transportation System in Lahore – Master Plan



Source: Comprehensive Study on Transportation System in Lahore, JICA, 1991

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4) Integrated Master Plan for Lahore-2021 by NESPAK

This study was conducted in 2001 by National Engineering Services Pakistan (NESPAK) consultants for LDA. The study addressed the urban planning issues of Lahore and prepared a 2020 master plan. The study is comprehensive in nature as far as urban planning is concerned. The data analysis is weak, as does not provide the impact of the urban development scenarios on travel demand and corresponding requirement for transport infrastructure. Therefore the master plan is of little use as an integrated master plan for the city without taking account of the accessibility/ mobility issues of the residents and future travel demand requirements.

2.1.2 Plans and Projects

1) Vision 2030

Pakistan's strategic priorities are summarized in "Vision 2030" prepared by Planning Commission, Government of Pakistan, August, 2007. The Vision 2030 statement approved by National Economic Council (NEC) envisages a "developed, industrialized, just and prosperous Pakistan through rapid and sustainable development in a resource constrained economy by deploying knowledge inputs".

The "Vision 2030" mentioned some important comments and targets, including those for Lahore City, for example:

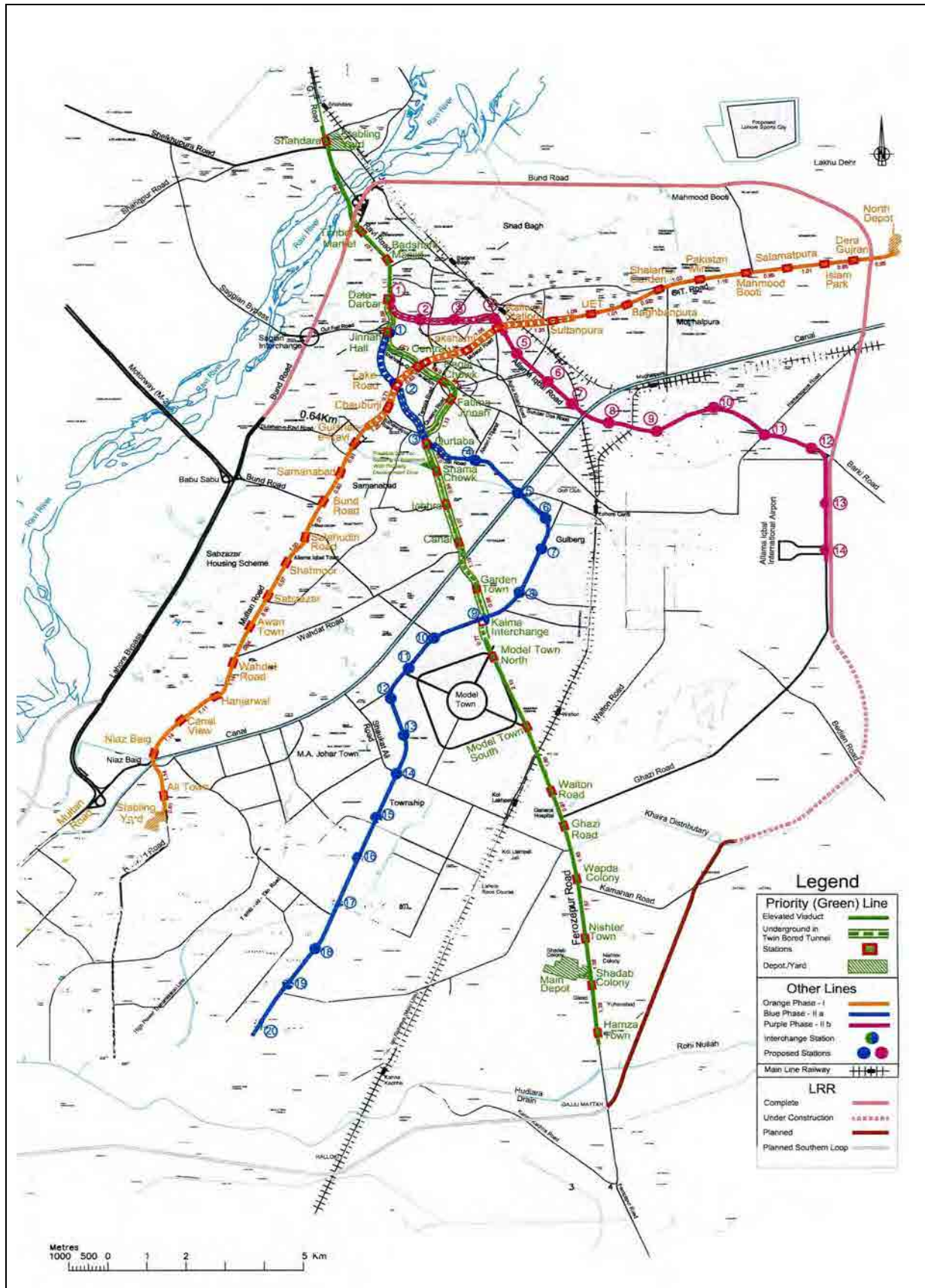
- "With present infrastructure, it will not be possible to expect our enterprises to become part *of*, and players *in*, the international supply chain, or to facilitate new investments in industry, agriculture and services." (p.67)
- "Reducing delays in our transport system is critical instrument for the cost of doing business, and hence increasing our competitiveness." (p.67)
- "Lahore, a sprawling metropolis of seven million, has fewer than 150 traffic lights, which are measures of insufficient traffic management. The result is severe traffic congestion." (p.96)
- "Lahore returns to being a city of intellectual activity and entertainment. Half a dozen foreign universities will have made it their first overseas campus; together with its older well known Pakistani universities, they will offer a variety of studies to people from across the world. The Mall will have a large number of theatres and restaurants, with the walled city and historical monuments becoming a haven for tourists and students. Its industrial estates, technology parks, and shopping centres will rival the best in the region. Its cultural and art festivals will attract a large numbers of domestic and international tourists." (p.99)

2) Lahore Rapid Mass Transit System (LRMTS)

Lahore Rapid Mass Transit System (LRMTS) is a project envisioned to provide mass transit facilities to Pakistan's second largest city Lahore. The project is expected to complete in 2025. In the first phase, two medium capacity rail based mass transit lines will be constructed. For the priority Green Line between Shahdara and Hamza Town (Ferozpur Road), a feasibility study was completed in 2006, and was immediately followed by its reference design, which was completed in 2008 by SYSTRA. The Green Line was likely to be completed by 2015 at a cost of USD 2.4 billion. The funding source for the construction has not been decided. The feasibility study of the second priority line (Orange Line) was completed in August 2007. No further programme has been made on the mass transit project, since June 2008.

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Figure 2.1.5 Lahore Rapid Mass Transit System (LRMTS)



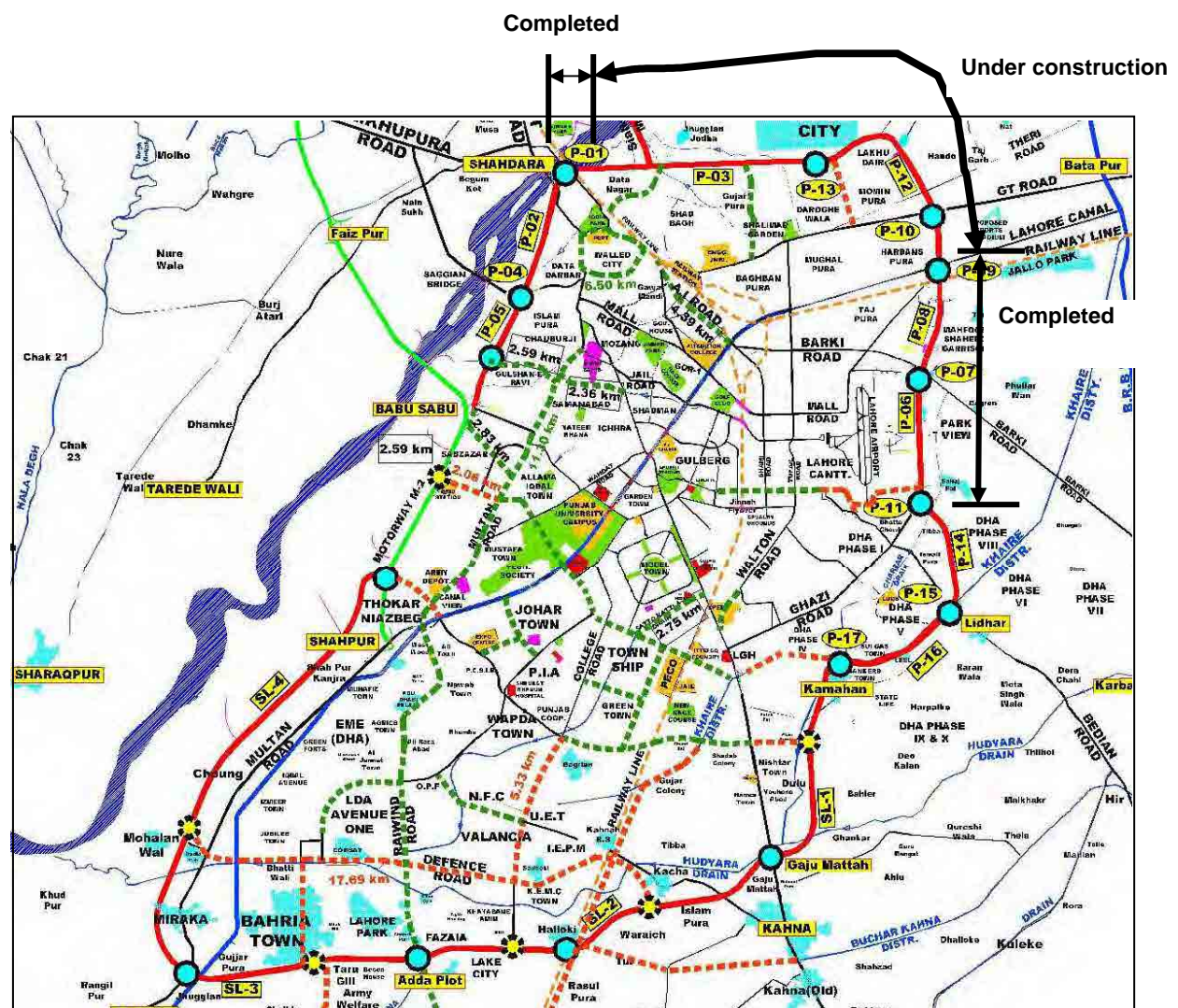
Source: LRMTS Study, 2007

3) Lahore Ring Road (LRR)

The Lahore Ring Road (LRR) Project was launched on December 22, 2004. The LRR Project is a large road project being developed by the GoPb, intended to ensure efficient and speedy movement of freight and passengers, to alleviate traffic flow problems, and to boost the city's potential for industrial development. The project includes the construction of:

- 6-lane divided highway with interchanges (access-controlled);
- RCC bridges with reinforced earth abutments and walls;
- Overhead pedestrian bridges, culverts, tunnels, underpasses, flyovers and related works; and
- Total projected cost of over PKR 20 billion.

Figure 2.1.6 Lahore Ring Road (as of May 2010) and Connecting Roads Plan



Source: NESPAK, 2008

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At present (May 2010), the first phase of the north-eastern part 18 km is under construction and the part of it from west to Airport is open to operation.

Figure 2.1.7 A Completed Section of Lahore Ring Road



Source: JICA Study Team

4) Underpasses and Flyovers in Lahore

Lahore has the highest number of underpasses and flyovers in Pakistan after Karachi. One of arterial roads, Canal Bank Road, has 10 underpasses in the Study Area.

Figure 2.1.8 One of the Underpasses along Canal Bank Road



Source: JICA Study Team

Shalimar Interchange

In 2009, one of the interchanges in the Canal Bank Road, called Shalimar Interchange, was completed. It has a flyover 1 km long, in north-south direction and crossing two underpasses in east-west direction.

Figure 2.1.9 Shalimar Interchange



Source: JICA Study Team

Features of the underpass of the Shalimar Interchange are as follows (from the Design report and Drawings):

- Wall Structure: Diaphragm piled-wall (Dia. 660 mm) with retaining walls (tile- surfaced),
- Overpass part: Pre-cast roof deck slab,
- Vertical clearance: H = 3.6 m Too low by AASHTO standard
- Carriageway: Dual-3
- Carriageway grade: Max. 3 %,
- Design speed: 70 km/h

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Features of the flyover part of the Shalimar Interchange are as follows (from the Design report and Drawings):

- Superstructure: Inverted Pre-stressed pre-cast concrete T-beam, span = 25 m, beam height: H=1,360 mm.
- Substructure: Single column piers with bored pile (Dia. 1,000 mm) foundations,
- Vertical clearance: 5.5 m (under the flyover)
- Carriageway: 3.3 m x 2 x two-way, total 4-lane,
- Carriageway grade: Max. 3.9 %
- Design speed: 70 km/h

5) Ferozpur Road Pilot Project

The GoPb decided to implement the project in 2006. However it has not been completed. The main components of the project are relatively minor civil works (intersections and service roads) and the installation of modern traffic signals, signs and road markings on the 11.8 km stretch of Ferozpur Road from Qartaba Chowk to Khaira distributary near Lahore General Hospital. It is treated as a pilot project to demonstrate the benefits of applying modern traffic management methods, with a view to replicating the same approach elsewhere in the city. In February 2010, the Lahore Division Commissioner directed that Ferozpur Road should be remodelled soon while imposing a ban on the entry of two-stroke rickshaws on the thoroughfare, besides removal of all kinds of encroachments and garbage containers. The project cost was estimated at PKR 600 million.

2.1.3 Data Gaps Identified

There is no single agency/ department of either GoPb or Lahore District or local authority that is responsible of maintaining transport and traffic data. There is no system in place to keep up-to-date data, be it socio-economic, vehicle ownership, driving licenses, or on traffic and transport in Lahore. There is a tendency that each agency collects its own data for its own purpose and most often for particular purpose or a study. It is sometimes the case that traffic and transport surveys are repeated on the same road within a year, but by different agencies and consultants.

The data or database received from various government departments, agencies and consultants is sometimes rudimentary. As a result LUTMP has to launch a comprehensive set of transport and traffic surveys to prepare an up-to-date and comprehensive database of travel demand and traffic situation in the Study Area. For example:

- The last census was in 1998, almost 12 years ago.
- There have been no household interview surveys since Comprehensive Study on Transportation System in Lahore conducted by JICA in 1991.

- The road inventory data was poorly collected and documented, without geographic reference. It only covered physical attributes of roads, and completely neglected to collect the adjacent land-use, and time conditions such as kerb side parking and encroachments.
- There was no data available on junction conditions.
- There was little latest and comprehensive traffic count data available from any agency. The traffic data received is mostly related to localised traffic impact studies, and lacks level of detail.

Therefore, the Study Phase1 is totally devoted to comprehensive transport and traffic surveys. The definition and scope of these surveys are detailed in the remaining sections of this report.

2.1.4 Possible Future Directions in Transport Infrastructure Development

Lahore is undergoing transport infrastructure improvement; albeit at much lower rate than one would expect for city of 10 million inhabitants and population growth rate of almost twice the national average. The developments in transport infrastructure during the last decade were also limited, but the neglect of the system has been much more pronounced over the last three to four years. Some of the key areas of transport infrastructure developments have been:

1) Lahore Ring Road (LRR)

The construction of LRR (Phase-I, the northern loop) has been on-going, albeit at slower pace. To some extent it could be attributed to the changes made to the alignment in the south-west section of Lahore. It is anticipated that the LRR remainder section from Lahore Airport to Ferozpur road would be completed by 2012.

The southern loop of the LRR was envisaged after the changes to alignment of the original LRR route, which passed through the city along Ferozpur Road. A pre-feasibility study of the southern loop was completed in 2009. This study defined the 49 km alignment and estimated the cost to be PKR 63 billion. The funding for the project is yet to be secured. Given the current austerity measures, it is unlikely that GoPb could provide funds for this project much before 2012/ 13 financial year. However, attempts are being made by the GoPb to secure private sector financing on 'Private, Public Partnership (PPP) basis, with little success.

2) Lahore Rapid Mass Transit System Projects

The work on the project was stopped in June 2008. Since then there has been no progress on any component of the project. ADB had initially expressed interest in funding the Green Line capital cost by about USD 1.0 billion. This funding was contingent upon GoPb putting the project on PPP basis for raising the part or all of the remainder (USD 1.4

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billion) of the capital cost and to secure private sector operator. As the GoPb showed no interest in funding the project through ADB loans, the proposed financing model collapsed. The GoPb alone cannot afford to fund the project capital cost. As a result the project remains suspended until some form of capital cost funding could be secured.

As alternative to building the LRMTS defined alignments, GoPb has been soliciting proposals of lesser capital costs, albeit of lesser capacity, and not necessarily '*value for money*'. These attempts are outlined next.

Monorail System for Lahore

A Malaysian group has recently submitted an unsolicited bid to build a monorail system along the Green Line alignment on BOT basis. The proposal is currently being examined by the GoPb in detail. Particularly its financial and technical aspects are under scrutiny, as some of the 'claims' regarding source of funding, its technical and financial feasibility lack level of detail required for the implementation for such large scale infrastructure project. As a result there has been no decision on adopting a 'Monorail' system for Lahore.

Bus Rapid Transit (BRT) System for Lahore

A Korean group has expressed interest in providing BRT system for Lahore along the Green and Orange lines corridors on BOT basis. The proposals are in early stages of development. GoPb has requested to group to submit detailed feasibility reports on its proposals. Feasibility report from the proponent has not been submitted yet as of November 2011.

3) Other Transport Projects

There are a number of transport improvement projects under various phases/ stages of consideration and implementation. The status of each one of these project is unclear. The list below outlines these projects:

- Widening of Canal Bank Road project – Project suspended by the Supreme Court of Pakistan on environmental grounds
- Gradual phasing out of 2-stroke rickshaws and replacement by '*cleaner*' 4-stroke engine rickshaws – project completion delayed, due to financial constraints.
- Setting up of Vehicle Inspection and Testing System – at proposal stage with Transport Department
- Development and implementation of an ITS (Intelligent Transport System) – A pilot project was studied, but never implemented. Implementation of a city-wide system under consideration with Transport Department (TD) with the support and technical help of Istanbul Municipality.

- Development of Parking Plazas – LDA recently built a parking plaza, and is trying to operate it as Park-n-Ride facility for the nearby shopping area. So far success has been limited as a parking facility. A repetition of the project in other areas of Lahore is being planned.
- Development and Setup of Transport Planning Unit (TPU) – Development and implementation of transport projects have been under the domain of TEPA. However, over the last decade or so TEPA has done little or no planning. Much of the work done by TEPA has been based on ad-hoc project development and its implementation, without any concern or priority for the overall transport needs of Lahore citizens. As a result, TD has setup TPU under the provincial government, which is now conducting Lahore Master Plan study, with the aid of JICA in TD. It is envisaged that TPU would gain the necessary technical skills from the JICA Study Team, through a comprehensive technology transfer programme, and would be capable of carrying out similar transport planning studies for the other major cities of the Punjab Province.

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2.2 Current Policy and Institutional Framework

2.2.1 Policy and Institutional Framework

1) Transport-related Organizations

Historically, many transport-related organizations and agencies have been established and abolished in the Punjab Province. In addition, decentralization policy has been promoted based the Punjab Local Government Ordinance 2001, aiming at the transfer of administrative powers and obligations from the Provincial Government to the City District Government. By this, transport-related agencies have been increased and jurisdictional demarcations became complicated and ambiguous.

Table 2.2.1 shows main organization and agency, in principle, responsible for each sector. Some of them focus on the physical infrastructure such as roads and pedestrian facilities, others on public transport services, others on the management of the public space available for the movement of persons and goods, and yet others have cross-cutting responsibilities.

Table 2.2.1 Main Transport-relating Organizations

Field	Organization/ Agency	Coverage			
		Nation	Province	City District	Town/ Union
Infrastructure	EDO(W&S)/ CDGL Office(W&S)				
	Lahore Development authority (LDA)				
	Department of Communication and Works (C&W)				
	P&D Department/ Urban Unit (UU)				
	Cantonment Boards and Defence Housing Authority (DHA)				
Public Transport	Transport Department (TD)				
	District Regional Transport Authority (DRTA)				
Public Space Management	EDO(MS)/ CDGL Office (Revenue)				
	EDO(MS)/ CDGL Office (Municipal Services)				
	Parks and Horticultural Authority)				
	Traffic Police				
Cross Cutting Responsibility	Traffic Engineering and Transport Planning Agency (TEPA)				
	Town Municipal Administrations (TMAs)				
	Punjab Planning and Development Department (P&D)				

Source: Institutional Development of a Traffic Management for Ferozepur Road Pilot Project, Dec. 2007

Many of these agencies report to the Nazim of the City District Government of Lahore (CDGL). Some are agencies of the GoPb, while others maintain direct links to both the city and provincial Governments. In addition, there are two Cantonment Boards, administrating large areas with a population of more than 830 thousands in 2010. They are under National Jurisdiction and have virtually no institutional links with local and provincial agencies.

There are four mega-cities in Punjab: Lahore, Rawalpindi, Multan and Gujranwala. These city districts have three tiers: the City District Government (CDG), the Town Municipal Administration (TMA), and the Union Administration (UA). Accordingly, the CDG of Lahore includes 9 TMAs and 150 UAs.

(i) Physical Infrastructure

The CDGL office of Works and Services (W&S), under the Executive District Officers (EDO) of W&S is conceived as the main agency responsible for the management of urban street system. Most of the senior staffs were transferred from the Communication and Works Department (C&W) of the GoPb and in many ways, remain in closer coordination with the provincial agency than with those specifically created for Lahore. However, it is expected that, over time, this office will be strengthened and to assume all functions related to public works in the city.

As other organizations responsible for physical infrastructure, there are C&W, LDA, Cantonment Boards, Defence Housing Authority (DHA), National Highway Authority (NHA), Urban Unit (UU) and Planning and Development Department (P&D). Their roles are described in this chapter.

(ii) Public Transport

The Transport Department (TD) is responsible for public transport policy and planning in the Province. It is also responsible for licensing of public transport service outside the major cities through the Provincial Transport Authority (PTA) and, by statutory exemption, licensing of high-occupancy bus services in Lahore and other large cities. District Regional Transport Authority (DRTA) continues to issue route permits for minibuses (“wagons”) instead of TEPA.

(iii) Public Space Management

Most attention focuses usually on road infrastructure and transport services, neglecting the issues regarding day-by-day management of public space such as parking, encroachments and traffic safety. At present, many of these aspects are addressed by CDGL, the Parks and Horticultural Authority (PHA), the traffic police and TEPA.

(iv) Cross-cutting Responsibilities

At the provincial level, the P&D has been actively involved in shaping road and transport investments in Lahore. Most road construction and rehabilitation are financed through the Provincial Annual Development Program and assigned for execution to variety of agencies. In addition, the P&D has spear-headed studies and policy initiatives, such as the studies for a Rapid Mass Transit System in Lahore, and Ferozepur Road Pilot Project implemented by the UU.

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When TEPA was created in 1987, TEPA was to perform all function and exercise all power of Authority with regard to traffic engineering and planning within the metropolitan area of Lahore. Practically, it was given 25 specific functions. As seen in the next section, however, it could not function as expected mainly due to insufficient financial and personnel capacity.

2) Allocation of Responsibilities

Table 2.2.2 was worked out in the Ferozpur Road Pilot Project conducted in 2007, showing allocation of transport-related responsibilities among organizations, both according to regulations and practice in reality. Comparing allocations by regulation and in practice, several gaps are observed. In the next steps, reliability of the table will be examined. As for functions with more than two agencies assigned, their appropriateness will be investigated as well.

Table 2.2.2 Function Allocation of Transport Administration

	Functions	Regulation	In Practice
Transport Planning and Finance	Comprehensive Transport Planning	TEPA	None
	Defining priorities and requesting budget	P&D + CDGL	P&D + CDGL
	Approving budget requests	P&D + CDGL	P&D + CDGL
	Funding infrastructure investment	GoP + CDGL ?	GoP + CDGL ?
	Funding Operation and Maintenance	-	-
Road Infrastructure (Primary and Secondary Road)	Planning	TEPA+LDA+CantB+ P&D+C&W+NHA	as per regulation
	Design	TEPA+LDA+CantB+ P&D+C&W+NHA	as per regulation
	Construction + remodeling roads	LDA+CantB+P&D+ C&W+NHA	as per regulation + TEPA
	Landscaping	PHA	PHA
	Maintenance of road surface	W&S	W&S
	Maintenance of drains	WASA + EDO(MS)	WASA + EDO(MS)
	Maintenance of pedestrian facilities	W&S	None
	National Route N-5	NHA	NHA
Road Infrastructure (Tertiary Roads)		TMA+LDA+ CantB in their areas	TMA+LDA+ CantB in their areas
Traffic Signals	Planning + Design	TEPA	TEPA + C&W
	Installation + Maintenance	TEPA	TEPA + C&W
	Operation	TEPA	TEPA + Police
	Signals in Cantonment Board Areas	CantB	CantB
Traffic Signs and Road Markings	Design	TEPA	PHA + TEPA + C&W+W&S
	Implementation	TEPA	PHA+TEPA+C&W+ W&S+Police
Public Transport	Mass Transit Planning	TEPA	TD
	Bus Route Planning and Regulation	TEPA	TD
	Award and Issuance of Bus Route Permits	PTA	DRTA
	Award and Issuance of Wagon Route permits	DRTA	DRTA
	Monitoring and Supervision of Route Permits	DRTA	None
	Issuance of permits for yellow cabs	PTA	PTA

	Functions	Regulation	In Practice
Public Transport	Issuance of permits for rickshaws and similar vehicles	DRTA	DRTA
	Design of Traffic Safety Strategy	TEPA	None
	Accident Recording (General)	Police	Police
	Accident Recording (Commercial Transport)	Police + DRTA	Police + DRTA
	Black Spot and other Accident Analysis	TEPA	None
	Physical Traffic Safety Improvement	TEPA	TEPA
	Traffic Safety Education and Campaigns	TEPA	None
	Enforcement of Traffic Rules	Police	Police
	Monitoring of Periodic Reports	TEPA	None
Public Space Management	Design Parking Policy and Regulations	TEPA	None
	Implement (enforce) parking regulations	EDO (Rev)	EDO (Rev)
	Parking Fines and Revenue Management	EDO (Rev)	EDO (Rev)
	Define Policy of Encroachment Control	-	None
	Reinstate Pavement Affected by Construction	-	None
	Implement (enforce) encroachment regulations	TEPA+TMA+EDO(M S)	as per regulation
	Encroachment Fines and Revenue Management	TEPA+TMA+EDO(M S)	as per regulation
Public Space Management	Conditions of Road Surface, Signs and Markings	TEPA	None
	Functioning of Traffic Signals	TEPA	TEPA
	Conditions of Pedestrian Facilities	TEPA	None
	Traffic Flow Conditions (volumes, speeds, orderliness)	TEPA	None
	Pedestrian Conditions	TEPA	None
	Public Transport Quality	TEPA	None
	Unwanted Use of Public Space, such as parking, encroachment, solid waste management	TEPA	None
	Consultation with Stakeholders and Neighborhood Groups	-	None
	Periodic Reports to Government Decision Makers	-	None

Source: Institutional Development of a Traffic Management for Ferozpur Road Pilot Project, MVA Asia Dec. 2007

3) Main Laws and Regulations

According to Institutional Development of a Traffic Management for Ferozpur Road Pilot Project, Dec. 2007, the transport sector in Pakistan is regulated through the federal and provincial enactments; they are:

- The Provincial Motor Vehicles Ordinance, 1965,
- The Provincial Motor Vehicle Rules, 1969 – regulates the motor vehicles throughout the four Provinces, i.e. Balochistan, K.P.K, Punjab and Sindh except the Tribal Areas,
- The Motor Vehicles Act, 1939 – extends its jurisdiction throughout Pakistan except Tribal Areas,
- The Fatal Accidents Act, 1855 – provides the methodology provisions for the payment of compensation to family for loss caused by the death of a person on account of an actionable claim.
- The National Highway Safety Ordinance, 2000 – extends to the whole of Pakistan and the Northern Areas for providing safe driving on the national highways and motorways and for matters connected therewith.

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(i) The Provincial Motor Vehicles Ordinance (MVO), 1965

The Provincial Motor Vehicles Ordinance, 1965 being a Provincial law relates to the whole of the Province of Baluchistan, K.P.K., Punjab and Sindh except the Tribal Areas. It consists of 9 Chapters, 122 Sections and 14 Schedules, as shown in Table 2.2.3.

Table 2.2.3 Composition of the Provincial Motor Vehicles Ordinance, 1965

Chapter No.	Description	Sections
I	Preliminary	1-2
II	Licensing of Drivers of Motor Vehicles	3-22
III	Registration of Motor Vehicles	23-43
IV	Control of Transport Vehicles	44-69
V	Road Transport Corporation	70-72
VI	Construction, Equipment and Maintenance of Motor Vehicles	73-74
VII	Control of Traffic	95-76
VIII	Offences, Penalties and Procedure	97-118
IX	Miscellaneous	119-122

Source: Institutional Development of a Traffic Management for Ferozpur Road Pilot Project, MVA Asia Dec. 2007

The said provincial law contains the provisions for the registration, movement, control and regulations of Motor Vehicles. The term “Motor Vehicle” as defined in the MVO, 1965 means “any mechanically propelled vehicle adapted for use upon road”. The MVO, 1965 includes a motor cab, contract carriage and stage carriage. The MVO, 1965 provides for the mandatory Registration of Motor Vehicles and Licensing of drivers of Motor Vehicles whereas the Transport Vehicles are required to obtain the Fitness Certificate prior to their registration and then to ply these vehicles in accordance with the terms & conditions of the Route Permits issued by the Provincial Transport Authorities or District Regional Transport Authorities.

The MVO, 1965 is administrated by the four departments of the Provincial Government in the manner listed Table 2.2.4.

The MVO, 1965 provides the mechanism for registration, licensing and regulation of Motor Vehicles in particular and for control of traffic but it does not cover all the aspects of the Road Traffic and the Public Space Management. The MVO 1965 has provisions for the construction, equipment and maintenance of Motor Vehicles but has not been updated for a long time and there is a frequent need for its amendment.

Table 2.2.4 Allocation of Responsibility by Provincial Motor Vehicles Ordinance, 1965

No.	Name of Department	Attached Department	Statutes	Functions
1	Transport Department	Provincial Transport Authority; District Regional Transport Authorities	MVO, 1965 and MVR, 1969 except control of traffic, checking and inspection of motor vehicles	Policy making, Planning and regularization of public service vehicles

No.	Name of Department	Attached Department	Statutes	Functions
2	Home Department	Inspector General of Police, Punjab; Deputy Inspector General of Police (Traffic), Punjab	Police Order, 2001 MVO, 1965 and MVR 1969	Licensing of Drivers of Motor Vehicles Enforcement of Traffic Laws and Chapter 7 of Motor Vehicles Ordinance, 1965
3	Excise and Taxation Department	Director General (E&T)	MVO, 1965 and MVR, 1969	Registration of Motor Vehicle
4	Environment Protection Department	Provincial Environment Protection Agency	MVO, 1965 and MVR, 1969 Environment Protection Act, 1997	Monitoring and control of traffic generated air pollution

Source: Institutional Development of a Traffic Management for Ferozepur Road Pilot Project, MVA Asia Dec. 2007

(ii) The Motor Vehicle Rules (MVR), 1969

The Motor Vehicle Rules, 1969 prescribed under the provisions of Motor Vehicle Ordinance, 1965 provides the mechanism causes for carrying out of the provinces of Motor Vehicle Ordinance, 1965. The MVR, 1969 consists of 8 Chapters, 268 Rules, 6 Schedules and 3 Appendices shown in Table 2.2.5.

Table 2.2.5 Composition of the Motor Vehicle Rules, 1969

Chapter No.	Description	Sections
I	Preliminary	1-4
II	Licensing of Drivers of Motor Vehicles	5-27
III	Registration of Motor Vehicles	28-53
IV	Control of Transport Vehicles	54-125
V	Road Transport Corporation	126-149B
VI	Construction, Equipment and Maintenance of Motor Vehicles	150-215
VII	Control of Traffic	216-239A
VIII	Offences, Penalties and Procedure	240--268

Source: Institutional Development of a Traffic Management for Ferozepur Road Pilot Project, MVA Asia Dec. 2007

The MVR, 1969 expand upon the parent law i.e. MVO, 1965 and are conforming pedigree. There is a definite need to establish a Motor Accidents Claims Tribunal' Rules providing specialized, focused and fast relief in Pakistan. The MVR are exhaustive, but they lack certain issues such as passport/ visa, international driving and technical requirements of vehicles, transport of animals, dangerous goods and perishable goods. It also lacks the provisions for new technological advancements in the automobile sector such as CNG 4 stroke Motor Cab Rickshaws and Compressed Natural Gas (CNG) Buses.

(iii) The Motor Vehicle Act, 1939

The West Pakistan Motor Vehicle Ordinance, 1965 has repealed the Motor Vehicle Act, 1939 in its application to the Province of West Pakistan, except Chapter VII and VIII and Section 125; these deal with insurance of motor vehicles against third party risks. The Act provides that no person shall use a motor car vehicle in any public place without having proper insurance cover for the third party risk.

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Table 2.2.6 Insurance by the Motor Vehicle Act, 1939

Chapter No.	Description	Sections
VII	Motor Vehicle Temporarily leaving or visiting Pakistan	92
VIII	Insurance of Motor Vehicles against third party risks	93-111
	Driving uninsured vehicle	125

Source: Institutional Development of a Traffic Management for Ferozepur Road Pilot Project, MVA Asia Dec. 2007

(iv) The Fatal Accidents Act, 1855

The Fatal Accidents Act, 1855 provides the provisions for the award of compensation to families for loss occasioned by the death of a person caused by actionable wrong by filing a Suit in the Court of District and Sessions Judge of the District. It consists of four Sections shown in Table 2.2.7.

Table 2.2.7 The Fatal Accidents Act, 1855

Section No.	Description
1	Suit for compensation to the family of person for loss occasioned to it by his death by actionable wrong
2	Not more than one suit to be brought. Claim for loss to estate may be added
3	Plaintiff shall deliver particulars, etc
4	Interpretation Clause

Source: Institutional Development of a Traffic Management for Ferozepur Road Pilot Project, MVA Asia Dec. 2007

(v) The National Highway Safety Ordinance, 2000

The National Highways Safety Ordinance, 2000 provides provisions for safe driving on the National Highways and for matters connected therewith or incidental thereto. It consists of 8 Chapters, 99 Sections and 11 Schedules as shown in Table 2.2.8. The Ordinance aims at safe driving on the National Highways and administration by the Federal Government.

Table 2.2.8 The National Highway Safety Ordinance, 2000

Chapter No.	Description	Sections
I	Short title, extent and commencement	1-2
II	Licensing	3-17
III	Registration of Road Vehicles	18-38
IV	Construction, Equipment and Maintenance of Motor Vehicles	39-40
V	Control of Traffic	41-64
VI	Offences, Penalties and Procedure	65-89
VII	Establishment of a Police for Motorways and National Highways	90-93
VIII	Miscellaneous	94-99

Source: Institutional Development of a Traffic Management for Ferozepur Road Pilot Project, MVA Asia Dec. 2007

4) Orientations of the Current Plans and Policies

Current urban transport policies are briefly summarized in the Punjab Urban Transport Policy 2007 prepared by the Urban Units. It listed the followings as basic transport policies which will be checked one by one from the viewpoints of their actualization in the next steps.

(i) An Integrated Urban Transport System

The GoPb shall notify an overarching legal and regulatory framework for the establishment and management of a unified, consolidated and an independent transportation institution.

(ii) Public Transport System

The GoPb shall encourage, facilitate and guide Local Governments to introduce competitive mass transit system and make it choice of the riders through long term strategic intervention to meet public transport demand such as:

- Introduce Multi-modal Transit System
- Private equitable road space for Public Transport
- Private incentives to the operators linked with service performance and passenger comfort
- Reforms for bus and para-transit operations, and
- Introduction of executive bus system for educational institutions

(iii) Urban Road Infrastructure

The expansion and up-grade of road infrastructure shall contribute substantially to transform the economy through significantly reducing journey times and cost of passengers and freight. The GoPb shall prepare an overall framework to continuous process of need identification and assessment for the expansion and up-grade of transport infrastructure. The Local Governments shall be encouraged to adopt planning process for urban transport expansion based on sound engineering, socio-economic and environmental consideration.

Adequate financing for road operation and maintenance is critical for sustainability of the existing road infrastructure. The Local Governments shall estimate systematic and secure financial arrangement for continuous operation and maintenance of the road infrastructure. The GoPb shall issue guidelines and manuals for the operation and maintenance of the transport infrastructure.

The GoPb shall promote traffic management instruments (traffic signaling system, traffic circulation design, parking management, bus priority, demand management, traffic signage etc.) for safe and efficient mobility of people and goods.

(iv) Land Use and Transport Planning Integration

The GoPb shall encourage the City Governments to develop area-wide computer based transport planning models in the framework of overall city land use planning. The Local Government shall be facilitated to prepare, approve and regularly update land use plans for all towns and cities. Land use plans shall provide a programmatic and efficient base to

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enable towns and cities to develop an integrated transport and traffic engineering plan and restructure the urban space.

(v) Public Private Partnership

The GoPb shall develop the necessary legal, regulatory and institutional framework for optimum use of PPP Model in activities such as:

- Construction, operation and maintenance of transport infrastructure;
- Construction, operation and maintenance of parking facilities;
- Vehicle testing and certification facilities;
- Construction and management of terminals;
- Investment on Large Buses and Rolling Stock for Mass Transit System and etc.

The Local Government shall be encouraged to adopt various options of Public Private Partnership (PPP) in design, construction, maintenance and operation of road infrastructure, public transport and services.

(vi) Urban Freight Transport

Unregulated axle weights, unplanned truck stations due to poor land use control and shop loading in the city centers resulting in deterioration of road infrastructure, environment and congestion which can be optimized through restraining freight movement in short term basis which can be addressed through zoning and land use control on long term basis.

The GoPb shall encourage Local Governments to develop freight transport planning guidelines, time limited movement strategies and regulatory framework for permissible weight limits.

(vii) Capacity Building

The GoPb shall develop capacity in the transport sector institutions by strengthening their professional and organizational capacity. In-house skill development shall be enhanced by providing scholarships for higher studies, continuous in service training programs and career development.

(viii) Road Safety

In line with the framework development by the National Road Safety Secretariat, Ministry of Communication of the Government shall formulate comprehensive road safety legislation

The Local Government will develop mandatory safety audit system as part of each transport infrastructure project to ensure road safety of the road users and frame regulations and rules under proposed road safety legislation such as:

- Rules for operation of vehicles on road
- Legislation for victim's compensation
- Permissible traffic speeds
- Responsibilities of pedestrians on roads
- Procedures to follow in the event of accidents

(ix) Public Awareness

The Local Government shall allocate a reasonable percentage of development budget to conduct community education programs to change the driving and road use behavior. The masses shall be educated through community awareness programs, educational institutions, print and the electronic media etc. These programs shall focus upon *inter alia*,

- Driver's training;
- Road safety;
- Women and children mobility;
- Pedestrian mobility; and
- Other transportation issues as required

(x) Environmental Protection

The GoPb shall invest in research, development, educational programs and utilization of clearer technologies in the context of indigenous knowledge to reduce vehicular tailpipe emissions and improve air quality of cities.

The Local Government shall be finalized to adopt clearer technologies to reduce externalities and concentrate on disseminating basic knowledge of transport impacts on environment and human health through media. The Local Government shall also make ensure that environmental impact assessment shall an essential component of the transport and land-use structure planning.

(xi) Standardization

The GoPb shall develop and encourage Local Government to adopt standardized uniform procedures, guideline and codes while planning, designing and implementing transport infrastructure and services projects.

(xii) Central Data Repository

Central Data Repository is essential for planning, monitoring and evaluation of infrastructure and service delivery.

(xiii) Monitoring and Evaluation

The Local Government shall adopt regulations for monitoring and evaluation of operation, maintenance and development of various transport projects. Environmental management and monitoring plan shall be prepared and adopted by the Local Government during

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construction operation stage of the project.

(xiv) Non-Motorized Transport

Non-motorized transport modes (NMT) *i.e.* walk and bicycle has predominant share in daily trips therefore NMT network planning must be integrated with detailed road section planning and intersection planning

2.2.2 Expenditure and Financing

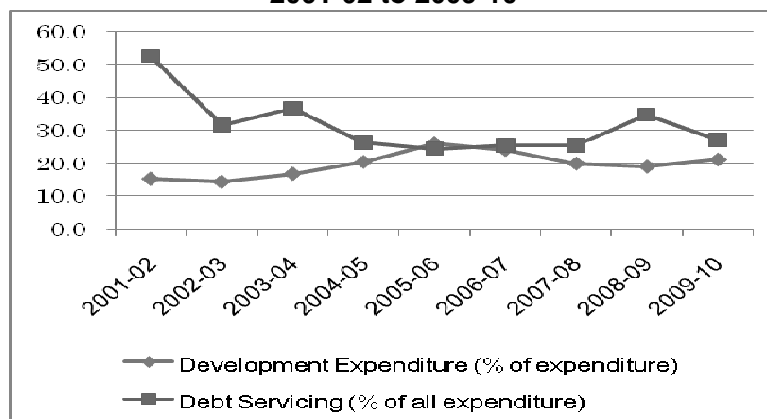
1) Federal Finance

In the Federal budget for 2009-10, a total expenditure of PKR 2,877 billion was estimated for the full year, comprising of PKR 2,261 billion of current expenditure and PKR 616.5 billion of development expenditure. Among the major expenditure heads, interest payments of PKR 647.1 billion were estimated. According to IMF in April 2010, Pakistan has considerable general government debt which is 58.1 % of the country’s GDP. In the last decade, however, the Government has improved its finance structure. It is attested by reduced debt servicing ratio in the federal budget, from 52.5 % in 2001-02 to 27.1 % in 2009-10. The second largest category was defence services, requiring PKR 343 billion.

In terms of structure of budgeted expenditure, current expenditure was estimated to account for 78.9 % of total spending, with development and net lending at 21.1 % of the total. The government has made continuous efforts to increase development expenditure in the last decade, *i.e.*, 15.3 % of the 2001-02 budget.

In the Federal budget for 2009-10, net transfer of province was estimated at PKR 697.9 billion, where Punjab Province may receive 51-52 % of the total in compliance with the 7th National Finance Commission (NFC) Award. From the Punjab Province’s viewpoint, provincial finance largely depends on federal transfers. In fact, provincial own revenues accounted for only 27 % in the Punjab Province budget for 2008-09.

Figure 2.2.1 Shares of Development Expenditure and Debt Servicing in Federal Finance, 2001-02 to 2009-10



Source: Pakistan Economic Survey 2009-10

2) Provincial Finance

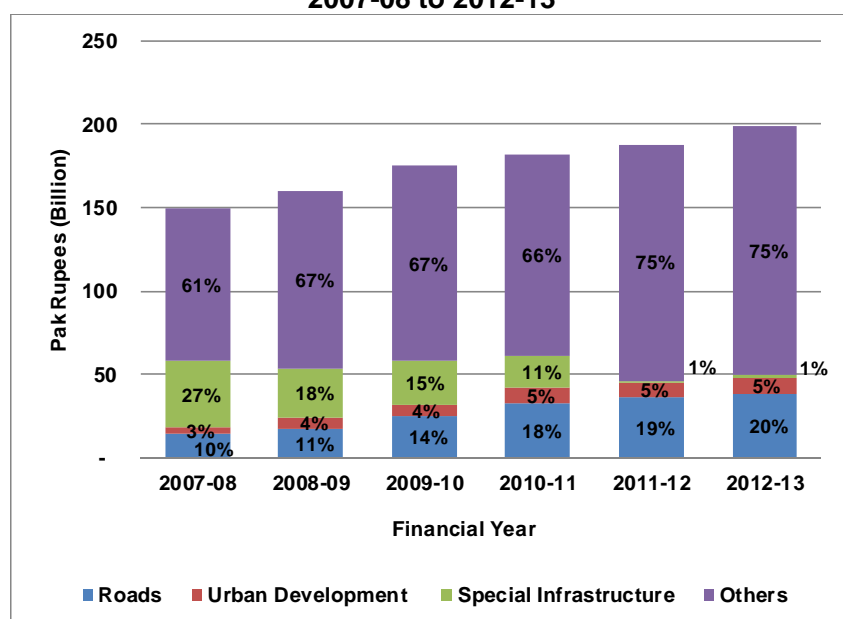
Similar to the federal finance, provincial finance of Punjab has expanded development expenditure, i.e., 24.6 % of the budget in 2005-06 to 38.5 % in 2009-10. As results, provincial development expenditure sharply increased from PKR 63 billion in 2005-06 to PKR 175 billion in 2009-10 or by 2.8 times. Even taking rupee depreciation against US dollar into account, provincial development expenditure substantially increased from USD 1,055 million equivalent to USD 2,101 million equivalent during the same period.

In the development expenditure categories, urban transport related public spending may be absorbed into “roads” especially for provincial roads or “urban development” for minor urban roads and terminal facilities or “special infrastructure”.

Special infrastructure comprises two major projects, i.e., Lahore Ring Road (LRR) and Lahore Rapid Mass Transit System (LRMTS). The projects under this sector cater for major urban transportation and mass transit needs in the provincial metropolis. These projects, owing to their potential impact on economic growth, are placed as a separate sector under present Medium Term Development Framework (MTDF) in Punjab.

In the 2010-11 Development Programme, PKR 19,121 million is budgeted for the Special Infrastructure Sector including approved 23 contracts or equivalently PKR 4 billion for LRR. No specific contract is recorded in order to disburse the rest budget of over PKR 15 billion for both LRR and LRMTS. In the MTDF 2010-13, subsequent budget allocation is planned for the Special Infrastructure Sector, i.e., each PKR 20 billion for the years 2011-12 and 2012-13, respectively.

Figure 2.2.2 Composition of Development Expenditure in Punjab Province, 2007-08 to 2012-13



Note: “Others” include education, health, irrigation, agricultural production, etc.

Source: MTDF 2007-2010, MTDF 2010-13, Punjab Statistical Book 2009

Unit: PKR Billion

CHAPTER 2 – CURRENT TRANSPORT SITUATION, PROBLEMS AND ISSUES

3) Analysis of Punjab Development Budget 2009-10

(i) Overview

According to the White Paper (Budget 2010-11) of GoPb, the overview of the Budget 2010-11 is summarized as follows:

- “Budget for financial year 2010-11 is being presented in the backdrop of difficult and challenging security situation; sluggish economic growth; persistent inflationary trends; ever increasing resource requirement for rehabilitation, improvement and up gradation of existing infrastructure; a substantial salary increase for public sector employees; a greater demand and emphasis on the development and implementation of social security net etc.” (p.1)
- “Notwithstanding the constraints highlighted above, provincial government will ensure the realization of its development vision through substantial allocations for Annual Development Program.” (p.1)

Table 2.2.9 Budget at a Glance (The GoPb, 1 Jul. 2010 - 30 Jun.2011)

CURRENT BUDGET (Year 2010-2011)	PKR (Million)
General Revenue Receipts	558,381.7
Revenue Expenditure	386,787.0
Net Revenue Expenditure	365,787.0
Pro-poor Subsidies	21,000.0
Net Revenue Account Deficit (-) / Surplus (+)	171,594.7
CURRENT CAPITAL BUDGET	
Current Capital Receipts	222,049.6
Current Capital Expenditure	222,378.1
Net Capital Account	-328.5
Net Public Account	-3,040.6
Net Deficit (-) / Surplus (+) in the Budget	168,225.6
Federal Grants	677.4
Foreign Project Assistance	12,597.0
Financing through privatization sale proceeds	12,000.0
Operational Shortfall	-
Total Resources for Development	193,500.0
Provincial Annual Development Programme	182,000.0
Other Development Expenditure	-
Daanish School	3,000.0
Punjab Millennium Development Goal Program (PMDGP)	6,500.0
TEVTA / TEVTC	2,000.0
Total provincial Development	193,500.0
PSDP Funded Schemes	-
Total Development	193,500.0

Source: Budget 2010-11 (White Paper), the GoPb

From the table above, the following amounts are notable and related to this Project:

- General Revenue Receipts: PKR 558 billion,
- Foreign Project Assistance: PKR 12 billion,
- Provincial Annual Development Programme: PKR 182 billion

(ii) Budget Items Related to Transport

The Budget for Annual Development Programme of Punjab of PKR 182 billion is tabulated in Table 2.2.10.

Four (4) Lahore transport related items are found in the table below:

- a) Roads (in Infrastructure Development): PKR 32 billion,
- b) Urban Development (in Infrastructure Development): PKR 9 billion,
- c) Transport (in Services Sectors): PKR 1 billion,
- d) Special Infrastructure (Special Programme/ Packages): PKR 19 billion

Table 2.2.10 Budget Allocation of Annual Development Programme Punjab, 2009-10

No.	Sector (Budget Year 2010-2011)	Allocation PKR (Million)	Percentage (%)
A.	Social Sectors (Education, Health etc.)	68,253.0	37.5
B.	Infrastructure Development	59,260	32.6
	1) Roads	32,885	18.1
	2) Irrigation	11,005	6.0
	3) Public Buildings	6,210	3.4
	4) Urban Development	9,160	5
C.	Production Sectors (Agriculture, Livestock etc.)	7,000	3.8
D.	Service Sectors	7,050	3.9
	1) Information Technology	1,960	1.1
	2) Commerce and Investment	140	0.1
	3) Labour and HR Development	85	0.0
	4) Transport	1,190	0.7
	5) Emergency Services	2,000	1.1
	6) Tourism	1,675	0.9
E.	Others (Planning and Development etc)	6,366	3.5
F.	Special Programme/ Packages	34,071	18.7
	1) District/TMA Development Programme	12,000	6.6
	2) Special Infrastructure (Lahore Ring Road and Lahore Rapid Mass Transit System)	19,121	10.5
	3) Special Packages	1,450	0.8
	4) New Initiatives/ Medical Colleges	1,500	0.8
Total Development Programme		182,000	100

Source: Annual Development Programme of the GoPb, 2009-10

In the following sections, each item is analyzed.

(iii) Budget Items for Roads

Budget for the roads takes the largest portion (18.1 %, PKR 32 billion) of the Development Programme as shown above in Table 2.2.10.

The provincial road sector has been focusing to consolidate and maintain the existing inter-district roads while catering for rehabilitation of the rural-access roads under an umbrella program. In addition to above, present development portfolio for the province entails major urban and inter-city road projects including the Lahore Ring Road (LRR) and Lahore Rapid Mass Transit System (LRMTS) projects (Both are included under Special Infrastructure section).

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The road projects for Year 2010-11 in Lahore are shown in Table 2.2.11. Location of these projects is shown in Figure 2.2.3.

Table 2.2.11 Roads Projects for Lahore (2010-11 Budget)

No.	Description	Length (km)	Budget (PKR million)
1	Construction of 4 lane, Lahore Wahgha Road	16.35	203
2	Dualization of Lahore Ferozepur Road	11.50	124
3	Thokar Flyover	0.95	100
4	Improvement of Canal Bank Road	10.96	200
5	Widening of Kamahan-Lidher Road	3.10	34
6	Widening from Jallo More to River Ravi	13.95	45
7	Construction of over Head Bridge in Raiwind	-	150
8	Rehabilitation of Defense Road	6.00	22
9	Construction of Road along both side of Butcher Kahna Distributory	8.50	50
10	Widening of road from Kahna Kacha Approach Road	14.10	10
11	Widening of road from Kahna Nau to Kahna Kacha	7.35	37
12	Feasibility study for construction of new Roads	-	5
13	Construction of Dual carriageway for Tarogil road	2.00	51
14	Rehabilitation of Allama Iqbal Road	4.00	5
15	Detailed engineering design and Feasibility of Circular Road	-	5
16	Detailed engineering design and construction supervision of Multan Road	-	115
17	Improvement of existing Multan Road	-	1,000
18	-ditto-	11.20	675
19	-ditto-, Proposed sewerage, drainage and Water supply	-	1,325
20	Dualization of Barki Gawandi Road	2.77	40
21	Study and design of Kalma Chowk	-	60
22	Establishment of Project Management Unit (PMU) for Kalma Chowk	-	93
23	Widening of Sui-e-Asil to Raiwind Road	19.00	300
24	Linking of Centre Point with Ferozepur Road	-	600
25	Improvement of Centre Point Intersection	-	1,000
26	Construction of Extension Building for IWMI	-	31
27	Rehabilitation of road from Jallo More to Khaira Bridge	0.90	1
28	Rehabilitation of road from Sundar Stop to Khaneki Jhuggian village	7.60	13
1-28	Total	140.23	6249

Source: Development Programme, 2010-11, the GoPb

(iv) Budget Items for Urban Development

Urban Development Sector covers developmental projects sponsored by WASA and Development Authorities of the Large Cities (Lahore, Faisalabad, Rawalpindi, Gujranwala and Multan) and district governments of the selected Intermediate Cities (with population ranging from 0.24 to 0.54 million) of Punjab.

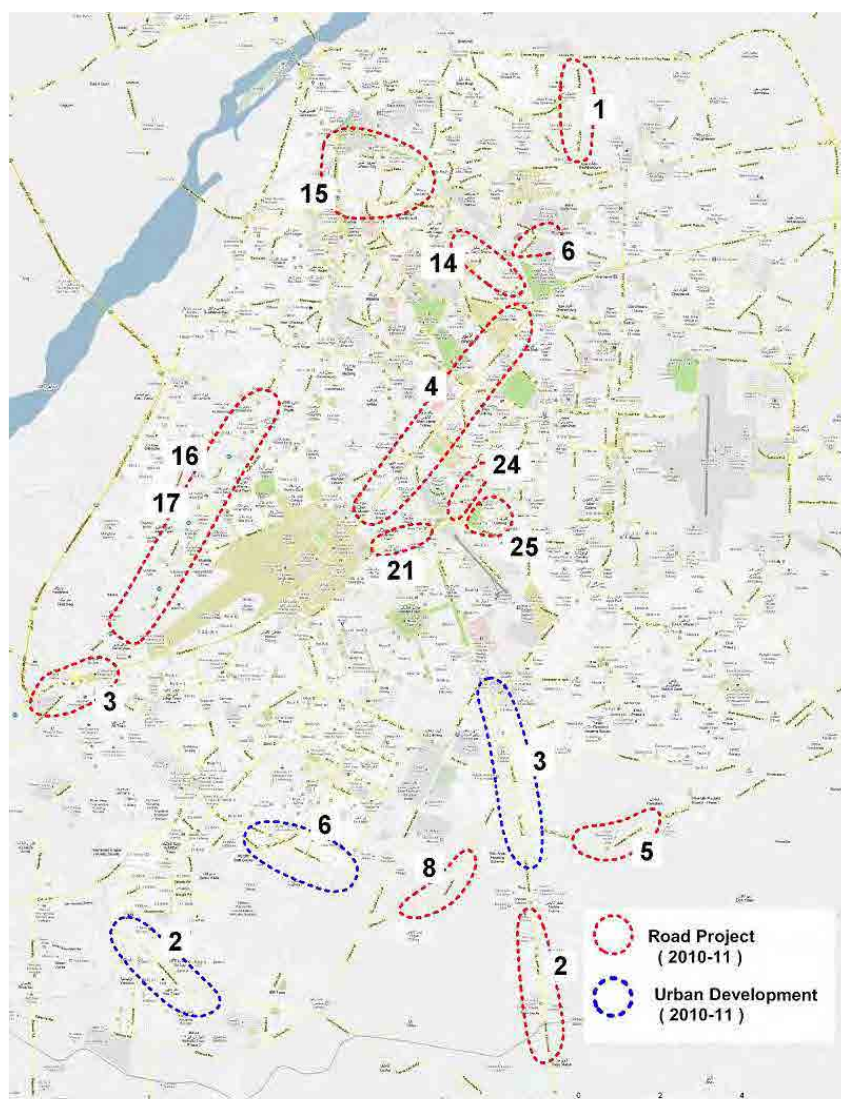
Budgets 2010-11 for urban development related to Lahore are presented in Table 2.2.12. Location of these projects is shown in Figure 2.2.3.

Table 2.2.12 Urban Development Budget 2010-11 for Lahore

No.	Description	Amount (PKR Million)
On-going schemes, Lahore Development Authority (LDA)		
1	Improvement of 45m wide road in M.A. Johar Town	33
2	Construction of Structural Road from Khayaban-e-Jinnah to Valencia Town	163
3	Integrated Traffic Management system, Ferozepure Road	10
4	Widening of M.M. Alam Road, L=2 km	10
5	Remodeling of Canal Bank Road	50
New Schemes, Lahore Development Authority (LDA)		
6	Construction of Southern Bypass Road from Ferozpur Road to College Road	10
7	Construction of Missing Link, Allama Iqbal Town	10

Source: Development Programme, 2010-11, the GoPb

Figure 2.2.3 Location of Road and Urban Development Projects, Budget 2010-11



Source: JICA Study Team

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(v) Budget Items for Transport in Service Sectors

Transport development aims at provision of efficient, economical, comfortable safe and green transport facility to the public in Punjab. The Development Programme 2010-11 holds three new strategies:

- Introduction of environment friendly transport (CNG Buses).
- Preparation of Transport Master Plan for Lahore with the assistance of JICA.
- Preparation of Transport Master Plans for all major cities of Punjab in coming years with in-house expertise of TD developed by JICA.

Table 2.2.13 Transport Budget (Punjab, 2010-11, in Services Sectors)

No.	Scheme Information	Major Components	Amount (PKR Million)
On-going schemes			
1	Capacity building of Transport Dept.	Purchase of equipment and capacity building of officers	1.5
2	Establishment of Transport Planning Unit in Transport Dept.	Recruitment of staff, procurement of equipment	51
3	Lahore Transport Master Plan (JICA assisted)	Hiring of consultants, procurement of equipment and vehicles	92
New Schemes			
4	Conversion of 2-stroke Rickshaws into 4-stroke CNG rickshaws	Subsidy to Rickshaw owners	43
5	Subsidy for induction of CNG/ Diesel buses in Urban areas	To enable private sector to induct buses in Urban transport system	1,000

Source: Development Programme, 2010-11, the GoPb

(vi) Budget Items for Special Infrastructure

As already mentioned in the previous section, the Special Infrastructure Sector is composed of Lahore Ring Road (LRR) and Lahore Rapid Mass Transit System (LRMTS).

The Development Programme gives the following targets to LRR:

- Completion of LRR (north loop); and
- Detailed engineering design for LRR (south loop).

On the other hand, there is no specific budget item for LRMTS.

Table 2.2.14 Lahore Ring Road Budget (2010-11)

No.	Scheme Information	No. of Schemes	Amount (PKR Million)
On-going schemes			
1	Lahore Ring Road	19	2,875
New Schemes			
2	Lahore Ring Road	4	1,125
Total		23	4,000

Source: Development Programme, 2010-11, the GoPb

2.2.3 Transport Related Organizations

As stated earlier in this report, there are a dozen of transport-related organizations in the Metropolitan Lahore and their inter-relationships are complicated and role demarcations are not very clear. Figure 2.2.4 shows such organizations by levels of nation, province, city district and municipality. In the following sections, the roles and organizations of transport-related agencies are briefly outlined. There is no special intention regarding the order of descriptions as this study has not covered yet all the responsible agencies.

1) Federal Government

Under the Ministry on Communication of the Federal Government, National Highway Authority (NHA) was established in 1991 to plan, construct and maintain national highways and specific provincial roads entrusted by the provincial Government. In the Study Area, NHA manages Lahore – Islamabad motorway and Nation Road No.5 (Multan Road and Ravi Road in Lahore).

National Highway and Motorway Police (NHMP) controls traffic on the national highways together with Punjab Highway Patrol. National Transport Research Center (NTRC) makes nation-wide transport plans and strategies as well as transport-related researches. NOTC conducted “Pakistan Transport Plan Study” in 2005-2006 with the technical cooperation by JICA.

2) Provincial Government

As of April 2010, there are 42 Departments and Boards in the GoPb and out of which the following four Departments are responsible to transportation administration and transportation infrastructure development:

- A) Planning and Development Department (P&D)
- B) Transport Department (TD)
- C) Communication and Works Department (C&W)
- D) Housing, Urban Development and Public Health Engineering Department (HUD & PHED)

The GoPb P&D is the principal planning organization at the Provincial level. It coordinates and monitors the programs prepared by the Provincial departments concerned with provincial development. The department also prepares an overall provincial Five Years Plan and the Annual Development Program. It acts as a catalyst between different departments in order to improve the pace and quality of economic development in the Province. The main objectives of the Planning and development department are:

- Assessment of the material and human resources of the province and formulation of long and short term plans.
- Recommendations concerning to prevailing economic conditions, economic policies or measures. Examination of such economic problems as maybe referred to for advice.
- Coordination of all economic activities in the Provincial Government.

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Urban Unit (UU) was set up under the P&D Department in 2006 with the purpose of urban development research, improvement of urban traffic, study of solid waste treatment policy and policy making for water supply and sanitation system.

The TD is responsible mainly in public transport administration established in 1987 based on the West Pakistan Vehicle Ordinance 1965. TD issues the license for mass-transit project and bus operation in Lahore, through its subordinate organization, i.e. the Provincial Transport Authority (PTA).

The C&W Department is responsible for establishment of road and bridge design standard, planning, designing, construction, improvement and maintenance of roads, bridges and causeways, management of toll road inclusive of leasing of roadside land, inspection of roads and materials and training of civil works. Under this department, there are Project Management Unit (PMU), Lahore Ring Road Office (LRR) and District Support and Monitoring Department (DSMD).

Lahore Development Authority (LDA) was established under Housing and Urban Physical Development Department (HUPDD) based on the LDA Act 1975 and in charge of management of the comprehensive development plan of Lahore, management of the building code and regulations and development of poverty areas. LDA established the Traffic Engineering and Planning Agency (TEPA) in 1987 based on LDA Act 1975, aiming at playing all the roles concerning traffic management and transport planning.

3) City District/ Town Municipality Level

The TD established a government-owned company named Lahore Transport Company (LTC) in July 2009, aiming at improvement of public transportation, currently with about 40 staffs. LTC is responsible to evaluate and review existing bus routes, propose new routes, monitor bus operation and plan other improvement measures of public transport, excluding a rail transit.

PTA has local offices named Regional Transport Authorities (RTA), one of which is Lahore District Road Transport Authority (LDRTA). LDRTA was established in 2001, based on Provincial Motor Vehicles Ordinance 1965. LDRTA was originally responsible for management of public transport and issuing all the public transport. However, since PTA became responsible for city bus licensing by Provincial Motor Vehicle Act 2005, LDRTA has issued licenses only to mini-buses. LDRTA has 28 staff, headed by the District Coordination Officer (DCO).

Lahore City District as well as other three mega-cities has three tiers: the City District Government (CDG), the Town Municipal Administration (TMA), and the Union Administration (UA).

When setting up the City District Government and TMA, two important principles have been kept in mind (according to www.lahore.gov.pk/city-government/overview):

- Where technical factors allow, the principle of subsidiarity has to be used in determining which planning and municipal services/ functions are assigned to the CDG and which ones to the TMAs; and
- The transition process should be smooth and no disruption in services should be felt by the people.

The City District Government consists of Zila Nazim and District Administration. The City District Government of Lahore (CDGL) is component to hold, acquire or transfer any property, to enter into contract and sue or be sued through the District Coordination Officer (DCO).

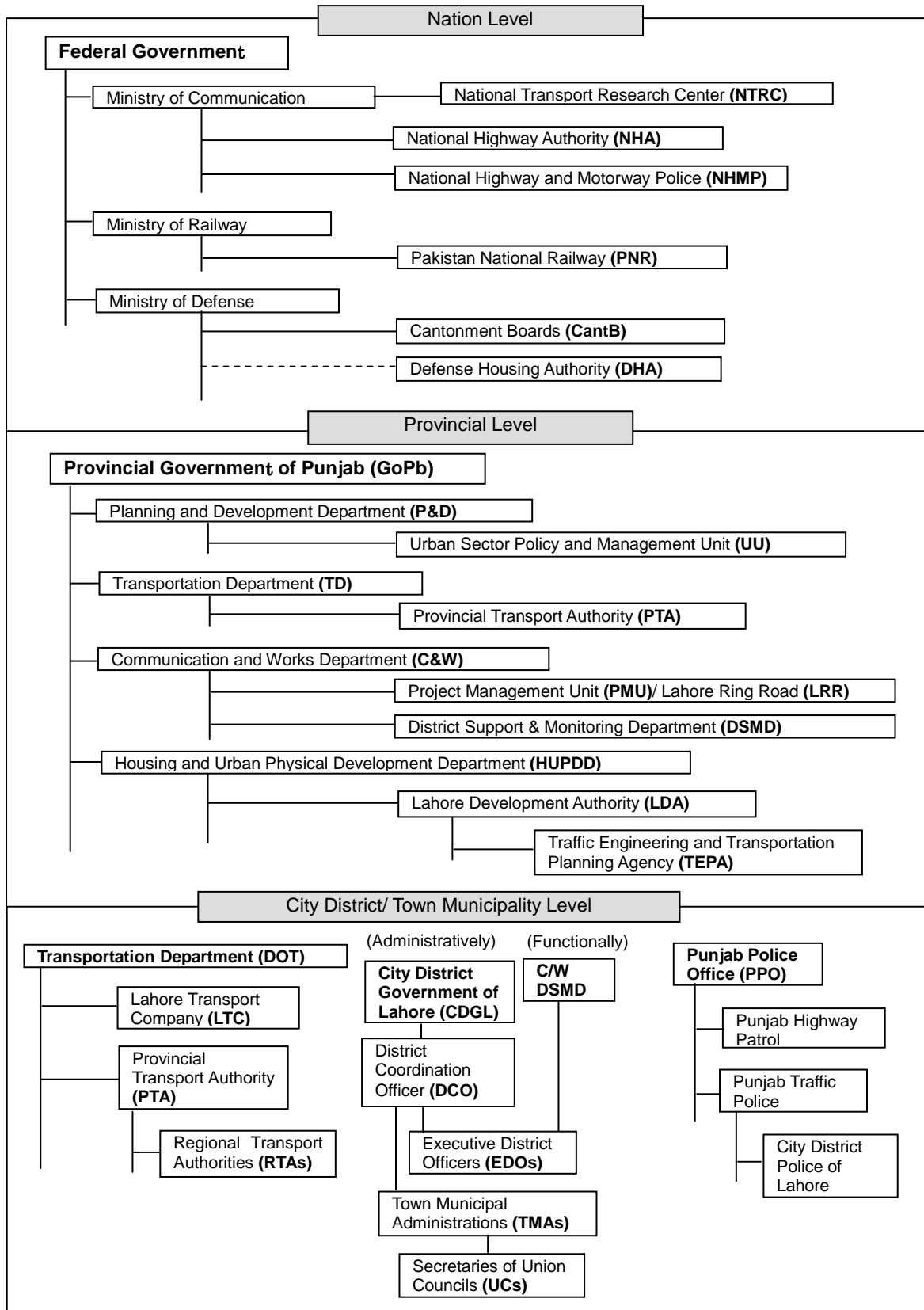
District Coordination Officer (DCO)

In every District, the Government appoints a DCO who is a civil servant of the Federation or the Province. He is the coordinating head of the District Administration, and his functions are to:

- ensure that the business of the District Coordination groups of officers is carried out in accordance with the law;
- coordinate the activities of the groups of officers for coherent planning and synergistic development;
- exercise general supervision over programs, projects and other activities;
- coordinate the flow of information required by the Zila Council;
- act as principal accounting officer for the CDG;
- call for information and reports from local governments in the district;
- assist Zila Nazim in accomplishing administrative and financial discipline and efficiency

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Figure 2.2.4 Transport-related Governmental Organizations



Source: Elaborated by JICA Study Team based on various information sources

- prepare a report on the implementation of development plan
- initiate the performance evaluation report of the Executive District Officers; and
- implement government policy and collect and disseminate information on behalf of the Provincial or District Government.

Executive District Officers (EDO)

The activities of any District are assigned to a number of groups and officers, each of which is headed by an EDO whose functions are:

- ensure that the business under his administrative control is carried out in accordance with the law and that the resources placed at his disposal are optimally utilized;
- supervise the activities and ensure efficient service delivery;
- supply information to the Monitoring Committee;
- take corrective actions based on the information received from the Monitoring Committee;
- enforce relevant laws and rules;
- prepare development plans and propose budgets;
- Implement approved plans and policies;
- authorize disbursement bonuses to employee;
- prepare proposals from programs, projects and other activities;
- propose relevant bye-laws on service delivery to the DCO; and
- act as Departmental Accounting Officer.

In Lahore, some agencies such as LDA, TEPA, Water and Sanitation Agency (WASA) and the LDRTA report to either the DCO or Zila Nazim. In addition, there are eleven EDOs responsible for the following subjects: Revenues, Health, Education, Agriculture, Community Development, Finance and Planning (F&P), Law, Information Technology, Literacy, Municipal Services (MS) and Works and Services (W&S).

In this chapter hereunder, outlines inclusive of roles and staffing will be shown as for the main organizations. Main information sources are:

- Institutional Development of Traffic Management Unit for Ferozepur Road Pilot Project, 2007, Urban Unit
- Assessment of Capacity and Capacity Building Institutions in the Development Policy Loan (DPL) Sectors, 2008, Urban Unit
- Home page of the GoPb.

In the next steps, the stated facts will be checked if they are still valid or correct and if there are any outdated descriptions, they are to be updated.

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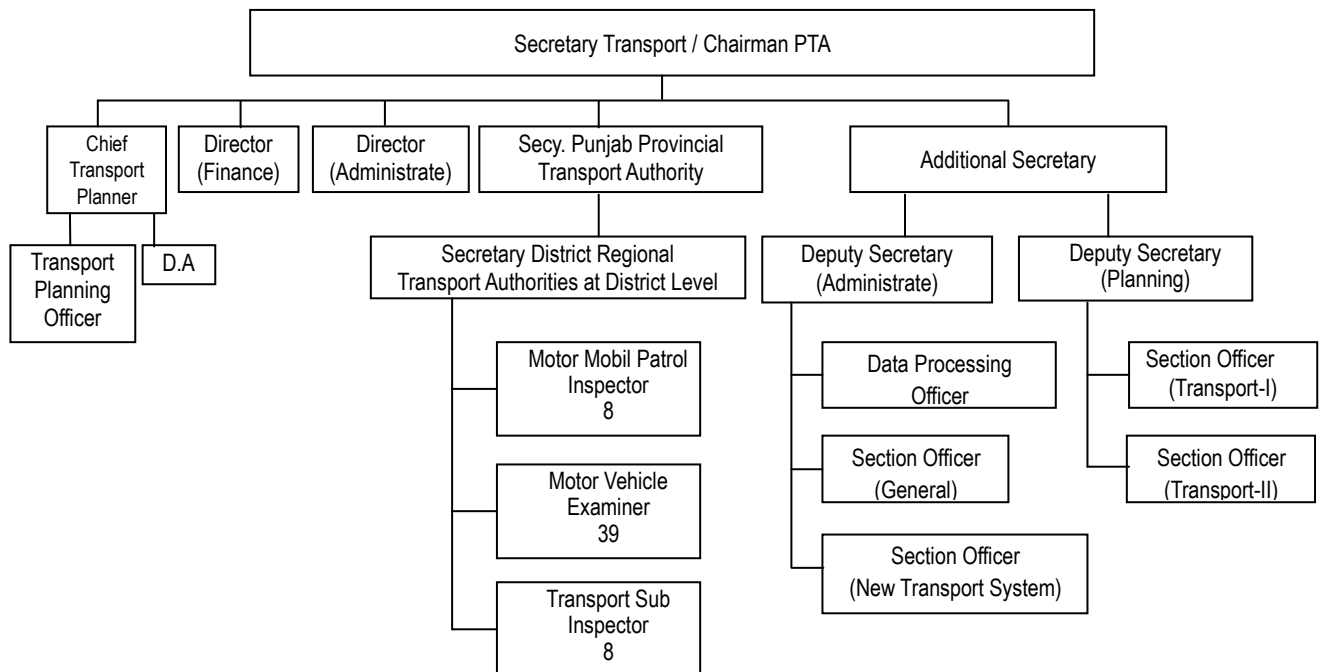
2.2.4 Transport Department (TD)

1) General

TD is headed by Secretary (BS-20) with two Deputy Secretaries (BS-18), four Under Secretaries/ Section Officers and one Data Processing Officer. It has one attached department i.e. Provincial Transport Authority and one Autonomous body, Punjab Road Transport Corporation (PRTC). The Department has District Regional Transport Authorities (DRTA) at District level. Main functions of the Transport Department are:

- Formulation of Transport Policy and planning.
- Administration of the Punjab Motor Vehicle ordinance, 1965 and the Rules framed there under except control of traffic and registration of vehicles.
- Administration of Provincial Transport Authority, DRTA and PRTC.
- Regulation of fares of public service vehicles.

Figure 2.2.5 Organizations of Transport Department (TD)



Source: Transport Department, 2010

2) Punjab Provincial Transport Authority

Secretary Transport is an ex-office Chairman of Punjab PTA under the Chairman a Secretary (BS-18) along with ancillary staff functions at provincial level.

Provincial Transport Authority consists of:

- Secretary TD Chairman ;
- Secretary, C&W Member ;
- Chief (Transport) P&D Member ;

- Deputy Inspector General (DIG) of Police (Traffic) Punjab, Lahore
Member ; and
- Secretary, Punjab PTA
Member/Secretary

3) District Regional Transport Authority (DRTA)

DRTA constituted under Section 46 of the Motor Vehicles Ordinance, 1965 in each District of the Punjab. The composition of the District Regional Transport Authority is as under:-

- i) DCO of the concerned District Chairman
- ii) District Police Officer of the concerned Member
- iii) EDO (Works and Services) of the Member concerned District.
- iv) Secretary of DRTA Member/ Secy

4) Functions

- To regulate transport within their respective jurisdiction by assessing the Traffic needs of passengers and goods transport.
- To grant issue and renew the route permits to the transport vehicles plying in the District (Region).
- To classify various routes within District (Region).
- To prepare time and fare tale of public service vehicles.
- To issue and renew licenses to the Body Building Workshops.
- Checking of traffic in their respective jurisdiction.
- To grant/renewal of licenses of A, B, C and D Class stands.
- To grant/renewal of licenses of Goods Forwarding Agencies.

5) Regional Transport Authorities

- To regulate transport within their respective jurisdiction by assigning the traffic needs of passengers and goods transport.
- To grant issue and renew the route permits to the transport vehicles plying in the divisions.
- To classify various routes within region.
- To prepare time and fare tables of public service vehicles.
- To issue and renew licences to the Body building workshops.
- Checking of traffic in their respective jurisdiction
- To grant licences for bus stands.

Note: The right of appeal against the order of the RTA lies with Chairman PTA.

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6) Motor Vehicles Examiners

- Examination of motor vehicles for the purpose of issuance of fitness certificates.
- Checking of vehicles on roads.
- Detection of un-road worthy vehicles.
- Suspension of fitness certificates.
- Investigation of fatal accidents and to give technical expert opinion
- Inspection of government vehicles for repair and issue their condemnation certificates.
- Prosecution of vehicles without fitness certificates and to force such vehicles for examination.
- Acts as essential member of Driving Test Board.

2.2.5 Traffic Engineering and Planning Agency (TEPA)

1) Roles

TEPA was created in 1987 under section 6, subsection (3) sub-clause (xii) of the Lahore Development Authority Act, 1975 as a subsidiary agency of LDA.

When it was created, TEPA was to perform all function and exercise all power of the Authority with regard to traffic engineering and planning within the metropolitan area in Lahore. TEPA was given 25 specific functions, among which the followings were main ones:

- Coordinate and prepare comprehensive transportation plan for the city (item b);
- Plan, design and implement traffic engineering and traffic management programs (item c);
- Define design standards, specifications and layout plans of roads (item d)
- Monitor and undertake regular traffic on roads (item i)
- Be responsible for the collection, analysis and publication of road accident data (item j)
- Identify the needs of the pedestrians and the facilities as they may be provided (Item k)
- Plan and design the public transport system for Lahore Metropolitan Area (Item l)
- Undertake the management, design and maintenance of traffic signals, road signs and road markings (Item m)
- Design and maintain a parking policy and impose parking fee (Item n)
- Require the concerned agency or authority to remove encroachments (Item u)
- Make recommendations to Government with regard of Traffic Police (Item w)

2) Organization, Staffing and Budget

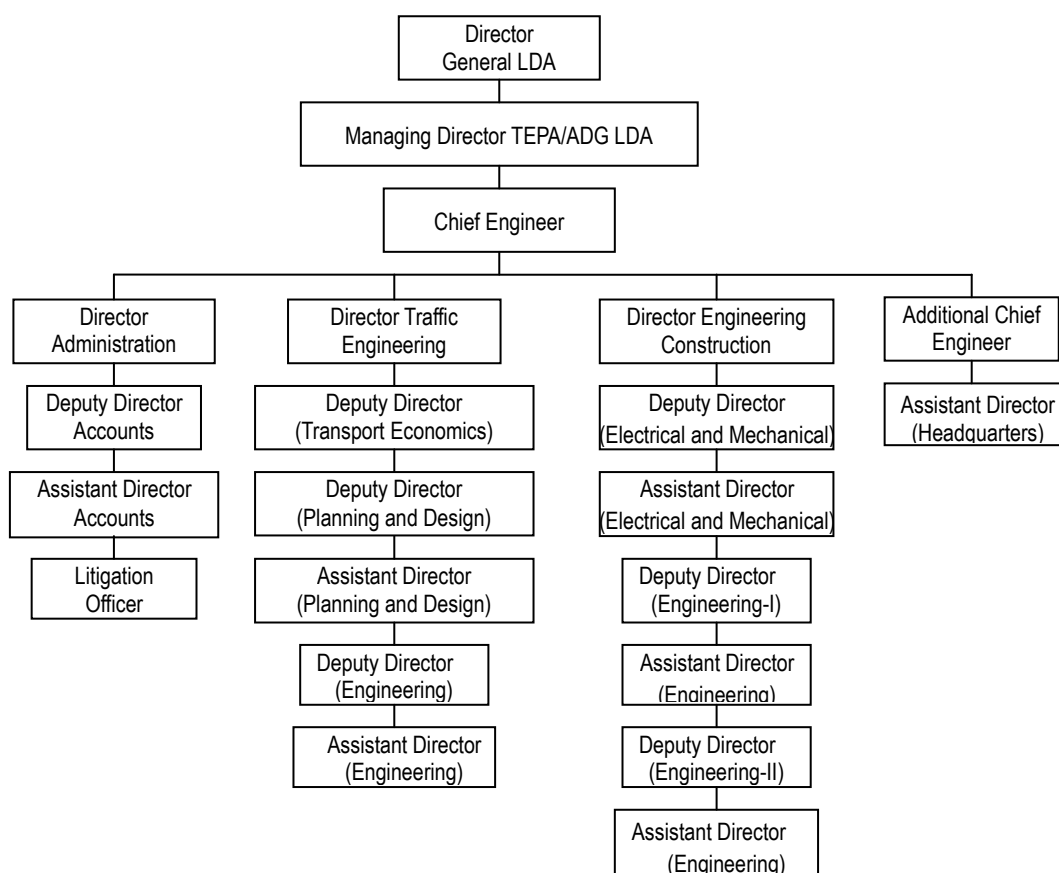
TEPA is headed by a Director General, a Managing Director and Chief Traffic Engineer who direct a staff of about 135 persons, working in four directorates: (i) Administration and

Finance, (ii) Traffic Engineering, (iii) Engineering Construction and (iv) Special Projects (Figure 2.2.6). Number of Staff of TEPA as of December 2007 is shown in Table 2.2.15.

The budget of TEPA is approved and consists of non-development expenditures (salaries, operating expenses, etc.) and development expenditures (project funded from the provincial Annual Development Program Annual Development Program (ADP) and deposit works of CDGL). The budget for development expenditures was raised from PKR 136 million in fiscal year 2005/ 2006 to PKR 315 million in 2006/ 2007 and PKR 2,146 million in 2007/ 2008 The ADP funds most (98%) of the FY 2007/ 2008 program, including the implementation of the Ferozpur Road project (PKR 593 million).

TEPA does not receive direct income from the transport sector, as original sources from roadside advertisement charges or parking fees are no longer available. Roadside advertisements have been taken over by the Parks and Horticultural Authority, and parking by CDGL and the TMAs. This leaves behind departmental charges and fines to meet the non-developmental expenses of the agency. The non-developmental expenses budgeted for FY 2007/ 2008 amount to PKR 99 million, including PKR 23 million for staffing and PKR 20 million for a new office building in Jubilee Town.

Figure 2.2.6 Organizational Chart of TEPA



Source: TEPA/ Institutional Development of Traffic Management Unit for Ferozpur Road Pilot Project,12-2007

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Table 2.2.15 TEPA Staff Numbers by Grade

Designation	BPS	Status	P/S	Number of Post			
				2005/6	2006/7	2007/8	2009/10
Managing Director	20	Regular	P	1	1	1	
Chief Traffic Engineer	20	Regular	P	1	1	1	
Addl. Chief Engineer	19	Regular	P	1	1	1	
Director Traffic Engineer	19	Regular	P	1	1	1	
Director Engg. Const.	19	Regular	P	1	1	1	
Director (P&D)	19	Regular	P	-	1	1	
Director Admin. & Fin.	19	Regular	S	1	1		
Director Admin.	19	Regular	S	-	-	1	
Director Finance	19	Regular	S	-	-	1	
Director Study	19	Regular	P	-	1	1	
Dy. Director Headquarter	18	Regular	S	1	1	1	
Dy. Director Engg.	18	Regular	P	2	2	2	
Dy. Director Electrical	18	Regular	P	1	1	1	
Dy. Director (P&D)	18	Regular	P	-	1	3	
Dy. Director Engg. Const.	18	Regular	P	2	2	2	
Dy. Director Account	18	Regular	S	1	1	1	
Magistrate	18	Regular	S	-	-	1	
Magistrate	17	Regular	S	1	1	-	
Transport Economist	18	Project	P	1	1	1	
A.D. to M.D.	17	Regular	S	-	1	1	
AD Admin.	17	Regular	S	-	-	1	
Litigation Officer/ Asst Dir.	17	Regular	S	-	1	1	
Asst. Director Engg.	17	Regular	P	6	6	7	
Asst. Director Account	17	Regular	S	1	1	1	
Asst. Director	17	Regular	S	-	-	2	
Assistant Architect	16	Regular	P	-	1	1	
Sub-Engineer	16	Regular	P	7	6	12	
Sr. Accountant	16	Regular	S	-	-	1	
Sub-Engineer	11	Regular	P	8	8	10	
Sub-Engineer	11	Project	P	1	1	1	
Circle Head Draft Man	16	Regular	P	-	1	2	
Sr. Accountant	16	Regular	S	-	-	1	
Stenographer	12	Regular	S	1	5	6	
Stenographer	12	Project	S	1	1	1	
Draft Man	11	Regular	P	-	1	1	
Junior Accountant	11	Regular	S	1	1	1	
D-E-O	11	Regular	S	-	-	1	
Assistant	11	Regular	S	3	3	3	
Supervisor	6	Project	P	5	5	5	
Junior Clerk	5	Regular	S	2	5	9	
Junior Clerk	5	Project	S	4	4	4	
Telephone Operator	5	Regular	S	-	1	1	
Reader/ Junior Clerk	5	Regular	S	-	1	1	
Electrician	5	Regular	S	1	1	1	
Driver	7	Regular	S	1	1	1	
Driver	5	Regular	S	2	6	9	
Driver	5	Project	S	6	6	6	
Naib Qasid	1	Regular	S	2	4	3	
Peon	1	Regular	S	-	2	5	
Peon	1	Project	S	4	4	4	

Designation	BPS	Status	P/S	Number of Post			
				2005/6	2006/7	2007/8	2009/10
Chowkidar	1	Regular	S	-	4	4	
Chowkidar	1	Project	S	2	2	2	
Dak Runner	1	Regular	S	-	1	1	
Sweeper	1	Regular	S	1	2	2	
Total Number of Posts				74	104	135	

Source: TEPA/ Institutional Development of Traffic Management Unit for Ferozpur Road Pilot Project,12-2007

2.2.6 Urban Unit (UU)

1) General

UU with the formal name of the Urban Sector Policy and Management Unit was established in March 2006 as a project management unit within the GoPb P&D Department. It is a professional team, staffed with highly qualified and experienced professionals in the field of urban management, including urban planning, urban transport, solid waste management, urban water and sanitation and municipal finance.

In the urban transport sector, its projects include the development of a Manual for Uniform Traffic Control Devices, an Urban Transport Study for the Province, and Ferozpur Road Pilot Projects.

2) Roles and responsibility

The UU shall be working under the overall guidance and supervision of the Chairman of Planning and Development Board. The Unit is proposed to be staffed by a core team of qualified and experienced professionals in various fields/sectors relating to urban planning and development, in particular those included in the Development Policy Loan (Urban planning, Urban transport, Solid Waste Management and municipal finance), the Private Sector Participation (PSP) initiative in municipal services (Water and sanitation, Costing and tariff) etc, development of an Integrated Traffic Management System and for the overall development of cities to turn these into engines of economic growth in-line with the vision 2020 of the GoPb.

The Unit shall act as a technical wing of the P&D in urban matters and shall have the following broad parameters of responsibility:

- Shall provide technical advice and support in matters relating to urban planning and development.
- Shall coordinate with the WB for DPL, International Finance Corporation (IFC) for PSP in WASA Lahore in matters related to project preparation, and execution.
- Shall assist the P&D in evaluation and appraisal of projects programs and schemes related to urban development, whether donor funded or ADP funded.
- Shall carry out extensive data collection, data analysis and research on all issues of urban development, especially in the five city District Governments in the Province.

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- Shall act as a resource bank for all the information, data, facts and figures relating to urban sectors in the province.
- Assist the P&D Department in preparation of project proposals and documentation for donor funded projects.
- Shall assist the GoPb in developing a sound and effective regulatory framework for PSP in municipal services.
- Shall act as a technical facilitation unit for the local governments, in matters relating to urban development, service delivery, infrastructure and municipal finance.
- Shall provide technical assistance and guidance to the Local Governments in all urban matters.
- Any other work assigned by the Chairman P&D on matters related to Urban Development.

3) Staffing

- Project Director (1)
- Cultural Heritage Specialist (1)
- Urban Planner (1)
- Junior Urban Planner (1)
- Urban Economist (1)
- Local Government Finance Specialist (1)
- Water and Sanitation Specialist (1)
- Solid Waste Management Specialist (1)
- Costing and Tariff Specialist (1)
- Urban Transport Specialist (1)
- Institutional Development Specialist (1)
- Communications Specialist (1)
- GIS Expert (1)
- Internees (10)
- Supporting Staff
 - a. Admin officer (1)
 - b. Accountant (1)
 - c. Internal Auditor (1)
 - d. Stenographer (1)
 - e. Receptionist (1)
 - f. Office assistants (3)
 - g. IT Manager (1)
 - h. IT Assistant (1)
 - i. Drivers (3)
 - j. Naib Qasids (3)
 - k. Chowkidar (2)
 - l. Sanitary Worker (1)

Ten floating positions of 'interns' at the UU have been proposed. The interns would be recruited from the market for a period of six months to a year in three categories.

1. Research Assistant (Fresh Graduates)
2. Research Associate(one to 2 years experience)
3. Research Analyst (2+years experience)

These interns would be working as assistants to the sector specialists/ Project Director and would be selected from amongst the brilliant graduates in the fields of Engineering, Town Planning, Economics, Business Administration, Information Technology and Sociology etc.

These interns would enhance the output of the consultants; provide 'skilled mind power' for data collection, data analysis, research and studies etc, one of the key assignments of the Urban Unit. It may be mentioned that provided the guidance, this kind of activities can be performed very well by these interns and saves a lot of time of the more expensive specialists for strategic work.

Last, but not the least, the Urban Unit would be disseminating knowledge skills and expertise available in the country for dealing with urban issues, and narrowing the gap between the academics and the implementers.

2.2.7 Housing, Urban Development and Public Health Engineering Department (HUD & PHED)

HUD&PHED was created during August, 1972 by replacing West Pakistan Housing and Settlement Agency with a single attached department of "Directorate General Housing and Physical Planning" at Lahore. Later on Improvement Trust at Faisalabad, Gujranwala, Multan, Rawalpindi, Sargodha and Murree with Social Welfare and Local Government Department were placed under the administrative control of Housing and Physical Planning (H&PP) Department during 1973.

Improvement Trusts ultimately were converted into Development Authorities except Murree and Sargodha. In 1978 Public Health Engineering Department (PHED) was placed under the administrative control of Housing and Physical Planning Department.

The Department was renamed as Housing Physical and Environmental Planning (HP & EP) in 1978 and Environmental Protection Agency (EPA) was created as its attached wing. In 1996, Environmental Protection Agency was detached from Housing Physical and Environmental Planning Department and was made independent provincial Department. Finally Housing Physical and Environmental Protection Department was given the name as Housing, Urban Development and Public Health Engineering Department (HUD&PHED) in 1997 to depict Urban Development Authorities and Public Health Engineering Department.

The Directorate General H&PP Punjab has been revamped as Punjab Housing and Town

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Planning Agency (PHATA) under the PHATA Ordinance, 2002. The said agency has been effectuated w-e-f 01.04.2004 with the objective of rejuvenating the housing sector in general and provision of shelter to shelter-less low income group in particular.

2.2.8 Communications and Works Department (C&W)

1) Establishment and Function

C&W Department was set up in May 1962, with attached departments, namely, Buildings, Highways and Architect departments beside the three organizations namely, Budget Directorate, Building Research Station and Road Research Laboratory. The Buildings and Highways Departments are further subdivided geographically into two zones. Each zone is headed by a Chief Engineer. The Architecture Department is headed by a Chief Architect.

The functions of C&W are defined as follows:

- To plan, design, construct, maintain, repair and improve all government buildings;
- Evaluation, fixation of rent, control, management, leases of government buildings;
- Preparation of architectural design/ drawings;
- Building, road research and material testing activities;
- Laying standards and specifications for various types of buildings, roads and bridges;
- Plan, design, construct, maintain, repair and improve roads, culverts, causeways and boat bridges
- Administration of roads, bridges and boat bridges, toll collection. Leases of land for access road for filling/ service stations and factories
- Execution of works on behalf of other agencies/ departments as deposit works

2) Budget

The C&W Department allocates funds under two heads i.e. development and non-development. All development activities in the Rehabilitation and Building (R&B) as well as Farm to Market Roads (FMR) sectors are carried out under the development budget. Payment of establishment and maintenance activities are done under the 25-communications budget grant. The construction of government buildings both offices as well as residential are carried out through budget allocations for the respective sector. Buildings maintenance activities are done under the head 24-civil works budget grant. The maintenance allocations are made according to yard stick which is based per 10 feet width per kilometer for roads and on the basis of unit area for government buildings.

2.2.9 Lahore Transport Company (LTC)

LTC was established in July 2009, as a non-profit public association under the Transport

Department, aiming at review and assessment of present bus routes, propose of new routes, effective monitoring of bus operation and planning of other public facilities other than rail transits.

1) Legal Framework

LTC was established under Section 42 of the Company Ordinance, 1984. Prior to establishment, the Section 2 of Ordinance XIX of 1965 was amended by inserting the following definitions.

- (1-A) “Area” means such as area or areas as are notified by the Government,
- (4-A) “Company” means the urban public transport company established under 43-A
- (43-A) “Urban Public Transport” means the urban public transport vehicles operating under the regime of company with valid route permits within the area.

In addition, the following Chapter V-A was inserted in the Ordinance XIX of 1965.

- 72-(A) Company, --- (1) Government may establish a not-for-profit Urban Public Transport Company limited by shares incorporated under the Section 42 of the Companies Ordinance, 1984 in such area as the Government may determine, for the provision of urban public transport and related services consistent with the provisions of this Ordinance and the Company so established shall have perpetual succession and a common seal and shall by that name sue and be sued.

2) Activities

According to a presentation material by the Company, its nature and responsibilities are defined as follows:

- LTC shall be a corporate sector limb of the Government with the objective to plan, provide, operate, enforce and regulate urban transport in the city of Lahore
- LTC shall enter into negotiations, understandings, agreements and contracts with public and private persons/ entities
- LTC shall plan, align, classify and re-classify the routes
- LTC shall prescribe the criteria for operation of urban public transport
- LTC shall undertake and maintain such works as required for infrastructure related to public transport, i.e. Bus Stops, Bus Bays Shelters, Terminals, Bus Lanes, Fleet management systems, Control room(s), etc.
- LTC shall solicit and channelize subsidies/ concessions of the Government if any for Urban Public Transport
- LTC shall survey, collect, classify, analyze, plan, circulate, distribute the data, information, statistics relating to Urban Public Transport
- LTC shall be competent to establish and maintain contacts and relations with companies, bodies, authorities, associations, societies and institutions throughout the world for achievement of its objectives.
- LTC shall employ or engage the required services of its professionals for the achievement of its objectives
- LTC shall be competent to obtain permits and other certifications in its name under

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- Hire-purchase agreements for the public transport operating in its area of operations
- LTC shall survey, assess, purchase, lease and acquire under the law the immovable properties required for the purpose of public transport.
(Omitted hereunder)

3) Associate and Members

LTC is a company, not a corporation because public corporation and authorities are more inflexible in their management style subject to government rules and regulations. LTC is on self-financing basis and therefore can have the option of working under a more flexible structure controlled by its own Board of Directors.

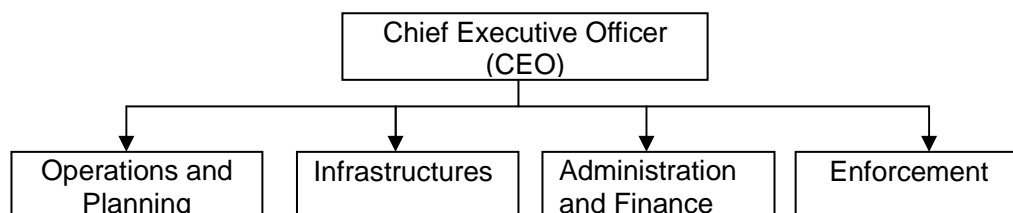
LTC was licensed as Association Not-for-Profit and registered as a Guarantee Limited Company having no share of capital. LTC is a Membership Organization which will derive income from membership fees, user fees and commercial revenue but does not distribute it amongst its directors but utilize the same for achievement of its objectives.

LTC has individual members and corporate members which are classified into four classes: Class A to D. Class A members are nine founders of LTC and constitute the Board of Directors, inclusive of Chairman, Chief Executive Officer, Secretary, Treasurer and other five members of Secretary of Transport Department, Deputy Inspector General Traffic Police of Lahore, District Coordination Officer/ Chairman DRTA of Lahore, Director General of LDA and Private Sector Nominee. Members of Class B to D are the persons fulfilling criteria of membership up to the satisfaction of the Board of Directors.

4) Organization

Figure 2.2.7 shows the organization of LTC. As of May 2010, LTC has about 40 employees out of which approximately 15 staffs are professionals of traffic surveys, data analysis, demand forecast and transport planning.

Figure 2.2.7 Organization of LTC



Source: Presentation Material of Seminar by LTC

2.3 Socio-Economic Characteristics

2.3.1 The Study Area Profile

1) Regional Setting

Lahore District lies between 31°-15' and 31°-43' north latitude and 74°-10' and 74°-39' east longitudes. The district is bounded by Sheikhupura District on the north and west mostly separated by Ravi River, on the east by the Indian district of Amritsar and in the south by Kasur District. The Study Area land elevation is depicted in Figure 2.3.1.

The summer season starts in April and continues till September. May, June and July are the hottest months. The winter season lasts from November to March. December, January and February are coldest months. Light rain fall happens during January and February. Towards the end of June, monsoon starts and continues for about two and half months. The maximum temperature touches around 50 degrees Celsius. Sometimes, minimum temperature falls below zero degrees Celsius.

The terrain conditions are flat and gently sloping towards south and south-west directions. There is no physical hindrance in the expansion of the metropolis except the Ravi River and the Indian Border.

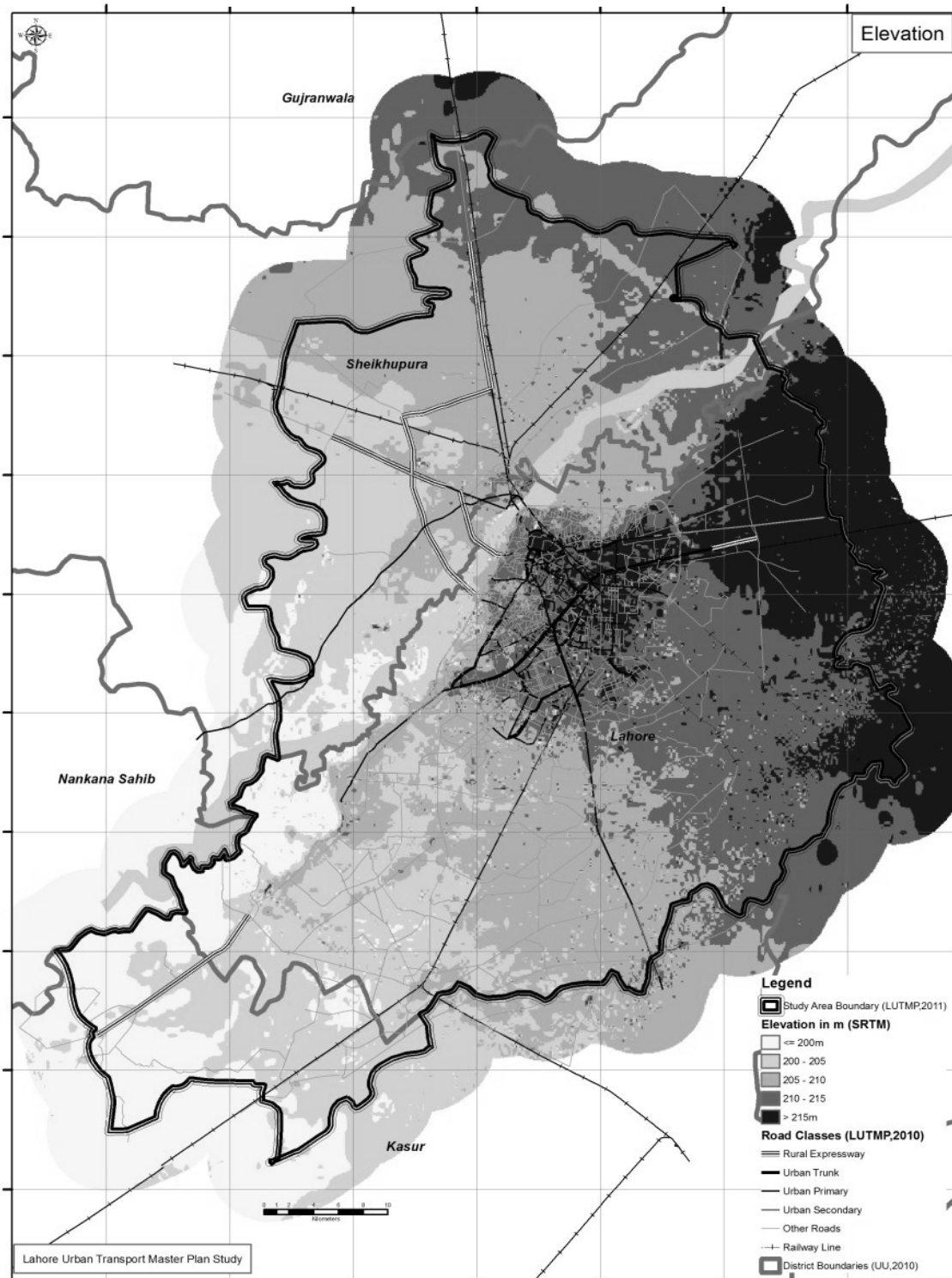
The Ravi River historically caused floods and consequently flood protection facilities were constructed, including Mahmood Booti Bund (initially constructed in 1952, 8.8 km long), Lahore Protection Bund (initially constructed in the early 1950s, 7.6 km long), Tie Bund (constructed in 1979-80) and others. The local topography shows that flat lands located at the north of the city center and across the river are very low and vulnerable against floods.

In recent years, the year 1988 flood seriously damaged Tie Bund of Lahore Protection Bund and Shahdara Distributary Flood Bund. The year 1997 flood caused damages to the Spur near Furrakhabad and Shahdara Flood Protection Bund.

The water right of Ravi River is given to India in accordance with the Indus Water Treaty. Beside natural conditions, India operates Thein Dam, at the upstream of Madhopur Barrage. It is therefore difficult for Pakistan to control river stream.

The Indian border lies at the eastern edge of district boundary. There are defense restricted areas notified by the Army authorities. There is Niaz Baig Ammunition Depot and its surrounding area with a radius of 11 km is regarded as prohibited area in development.

Figure 2.3.1 Land Elevation in the Study Area



Source: LUTMP GIS Database

2) Local Administration

The administrative structure has been changed after promulgation of Local Government Ordinance (2001). Districts, City Districts, Towns/ Tehsil and Union Council's Administrations have been created. Lahore was declared as City District and divided into

six towns. In 2005, six towns were split to create nine towns in CDGL. Now, Lahore City District comprises of following nine towns which are administrated by TMA. The Lahore cantonment is separately governed by cantonment board and provision of core facilities is the responsibility of Lahore Cantonment Board.

Today, Lahore District is spread over 1,772 km²: over 80 % of the total area is occupied by three towns of Iqbal Town, Nishtar Town and Wagha Town.

Local Government Ordinance 2001 changed local administration. Before 2001, in urban areas, local bodies which performed services¹ were metropolitan corporations, municipal corporations, municipal committees and town committees. In rural areas district and union councils were performed functions. After 2001, major local level services have been transferred to Local Governments. These include primary education, health, water supply and sanitation. Three tiers of Local Government have been developed in the form of district/city district, Town/ Tehsil and union administration.

Under the Punjab Development of Cities Act 1975, LDA was established in 1975 as a successor body of Lahore Improvement Trust (LIT) which was established in 1935 under Punjab Town Improvement Act 1922. The prime purpose of its establishment is to introduce a comprehensive system of Planning and Development in order to improve standard of living in Lahore. It is headed by a Director General (DG) and houses three sections: 1) Urban Development, 2) WASA, and 3) TEPA. LDA under its first wing i.e. the Urban Development is responsible for the planning, designing and development of various projects in accordance with the functions of the Development Authority. Area jurisdiction under LDA is over 2,000 km², consisting of Lahore District and parts of areas of Sheikhpura and Kasur Districts.

2.3.2 Urban Development Characteristics

1) Urban Structure

As a meaningful debate on urban structure formation, the history of Lahore started from the walled city as shown in Figure 2.3.2. During the Mughal Era, particularly 16th and 17th centuries, the city was walled and many gardens were constructed. To protect the city from floods, 4 miles long embankment, known as Band-e-Alamgiri was constructed.

During the British Rule period, the city was expanded by 3 times, equipped with modern urban infrastructure. Particularly for the second half of 19th century, urban development was significant. Some remarkable events were recorded including the Bari Doab Canal opened in 1859, Lahore Railway Station opened in 1861 and the first piped water supply started in 1882.

¹ It included provision and maintenance of roads, bridges, public buildings, water supply, hospitals and school buildings.

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As to urban structure in 1900, two built-up areas were separated between expanded city center and cantonment area. In the early 20th century, two built-up areas were further expanded and combined in a form of conurbation. The city sought for new large development lands southwards around Model Town.

Soon after the independence, Lahore experienced severe times, tackling with urban rehabilitation, redevelopment and new development. The situations were brought about from about 40 % of city's populace migrated to India and a proportionate number of refugees came to Lahore. LIT empowered under the Punjab Development of Damaged Areas Act 1952 undertook numerous urban renewal and new development projects such as Shah Almi, Gulberg, Samanabad, Upper Mall, etc.

During the period 1970s and 1980s, urban population exceeded 2 millions, forming Lahore into a metropolis. Ferozewala in Sheikhpura District was urbanized as part of the metropolis although major expansion trends remained to the south and southwest directions.

In the last two decades, urbanization has shown more dynamics and is complex. It is discussed in the next section.

Since the 1950s, urban development pace has been accelerated because of greater accumulation of population and economy. Today, Lahore experiences mass urbanization of over 1,000 hectares every year.

2) Current Urbanization Directions

Below Tehsil or Towns, there are Union Councils (UC). In Lahore District, there are 122 urban UCs and 28 rural UCs. In the Study Area, for the Household Interview Survey (HIS) zoning system, some UCs are subdivided (as they lie across natural or man-made barriers) and Cantonment is subdivided into 24 Zones, resulting in 228 Zones in the Study Area (Volume 2, Annex -1).

Figure 2.3.3 shows population density by zone and it implies urban directions in the Study Area. As we define urbanized zones over 100 inhabitants per hectare, such urban zones are concentrated in 7 towns, the northern edge of Nishtar Town and part of Ferozewala Tehsil in Sheikhpura District.

As we define the zones from 20 to 100 inhabitants per hectare are partially settled such as rural centers along inter-city roads and new housing areas adjacent to the urban zones, the latter zones are found to be in many directions from the massive urbanized areas of Lahore, i.e., to the north-west across the Ravi River, to the north beyond the Ring Road, to the east along GT Road, to the southeast beyond the airport towards Barki and Bedian Roads, DHA V, VI & VII, and Ghazi Road, to the south along Ferozepur Road and to the southwest along Multan Road.

Those urbanization trends are quite different from the Integrated Master Plan for Lahore 2021 which clearly directs urbanization towards south and southwest axis in inverted V shape as shown in Figure 2.3.4. The gap can be explained by the following reasons:

- (1) Mono-centric metropolitan structure: Holding a mono-centric structure in the metropolis, travel time to the existing city center is only a decisive factor in land development and valuation;
- (2) No mass transit available: The Comprehensive Study on Transportation System in Lahore (JICA, 1991) envisaged LRT on the Ferozepur corridor by 2010. However, no mass transit has been introduced. Frequent and punctual mass transit services allow people longer commuting distance. Without mass transit, actually in Lahore, people particularly who can't afford private transport means must be conscious about accessibility to their work places on severely congested roads;
- (3) Cantonment development by DHA: Beforehand, Lahore Cantonment was regarded as an exclusive area for military purpose and residents were limited to active military staff families and veterans. In addition, the area beyond the cantonment area to the east was supposedly restricted in urban development due to border management. However, DHA was established in 1999 as a converted body of former Lahore Cantonment Cooperative Housing Society (LCCHS), changed the situations. DHA has actively engaged in housing development for upper middle-class clientele, i.e., 7 phases or 4,400 ha under construction, Phase VIII (1,400 ha) under planned and Phase IX / X (2,400ha) under land acquisition (see Figure 2.3.5). Today, DHA is the largest housing supplier and the east and southeast suburbs in Lahore becomes most active development areas although they were not assumed in the previous metropolitan planning documents;
- (4) Insufficient housing schemes for low to middle income class: Many small to medium-size developers are undertaking residential development along south and southwest axis. But their target is upper middle-class, competing with the current DHA market while low to middle-class residential development schemes barely appear in the suburbs. Without such schemes and transit support, those people must cling to the edge of the city center regardless of congested housing units and unfavorable urban environments.

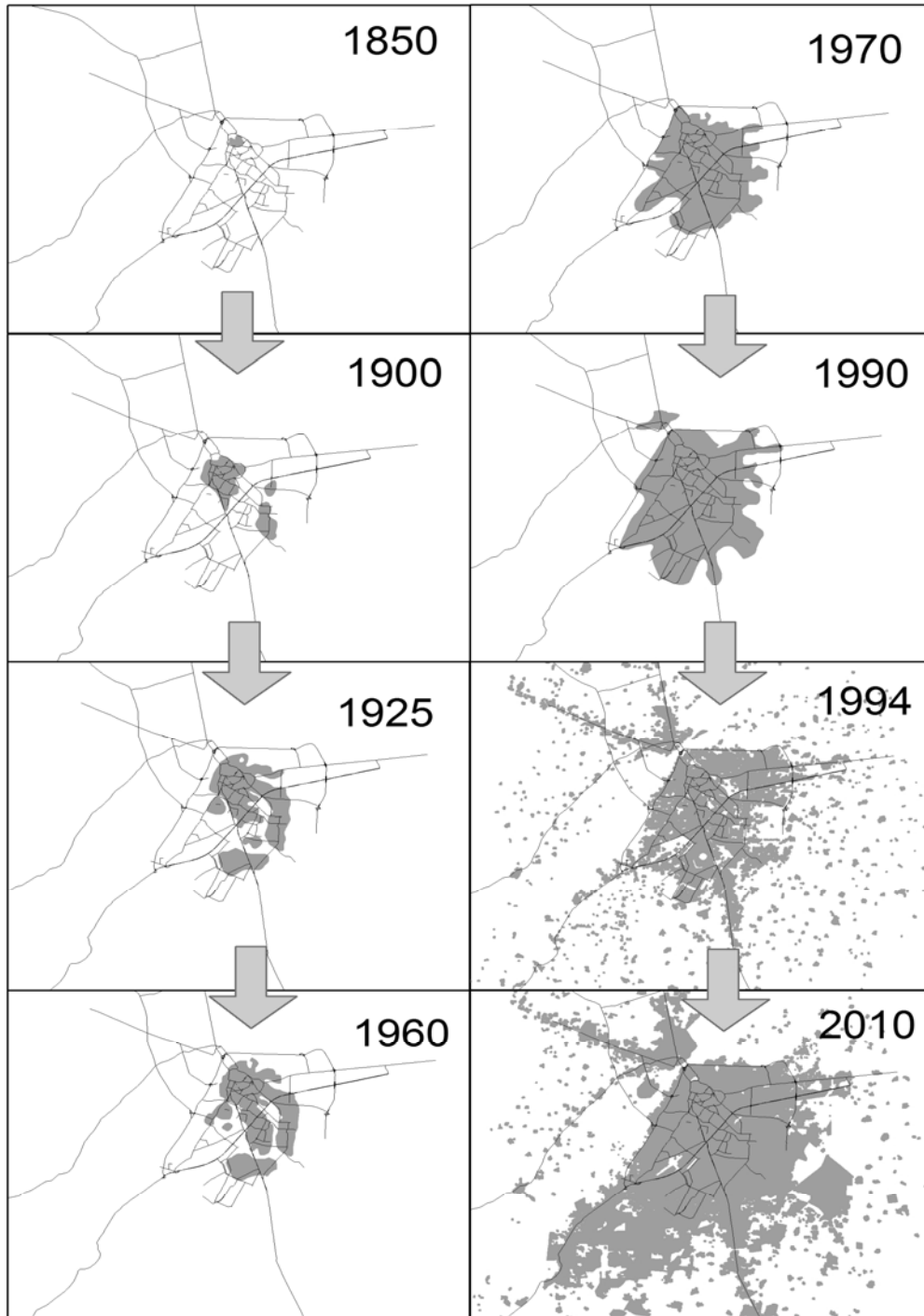
Table 2.3.1 Historical Development of Lahore

Period	Cumulative Developed Area (km ²)	Average Growth Area Per Year (ha)
Pre-British Period	23.8	
1850 – 1900	68.7	90
1901 – 1950	71.2	48
1951 – 1965	117.2	323
1966 – 1980	175.7	390
1981 – 1990	245.6	699
1991 - 2000	326.0	804
2001 - 2006	397.8	1,196

Source: Developing Comprehensive "City Boundary" for Lahore – Consultation Report, NESPAK, 2010

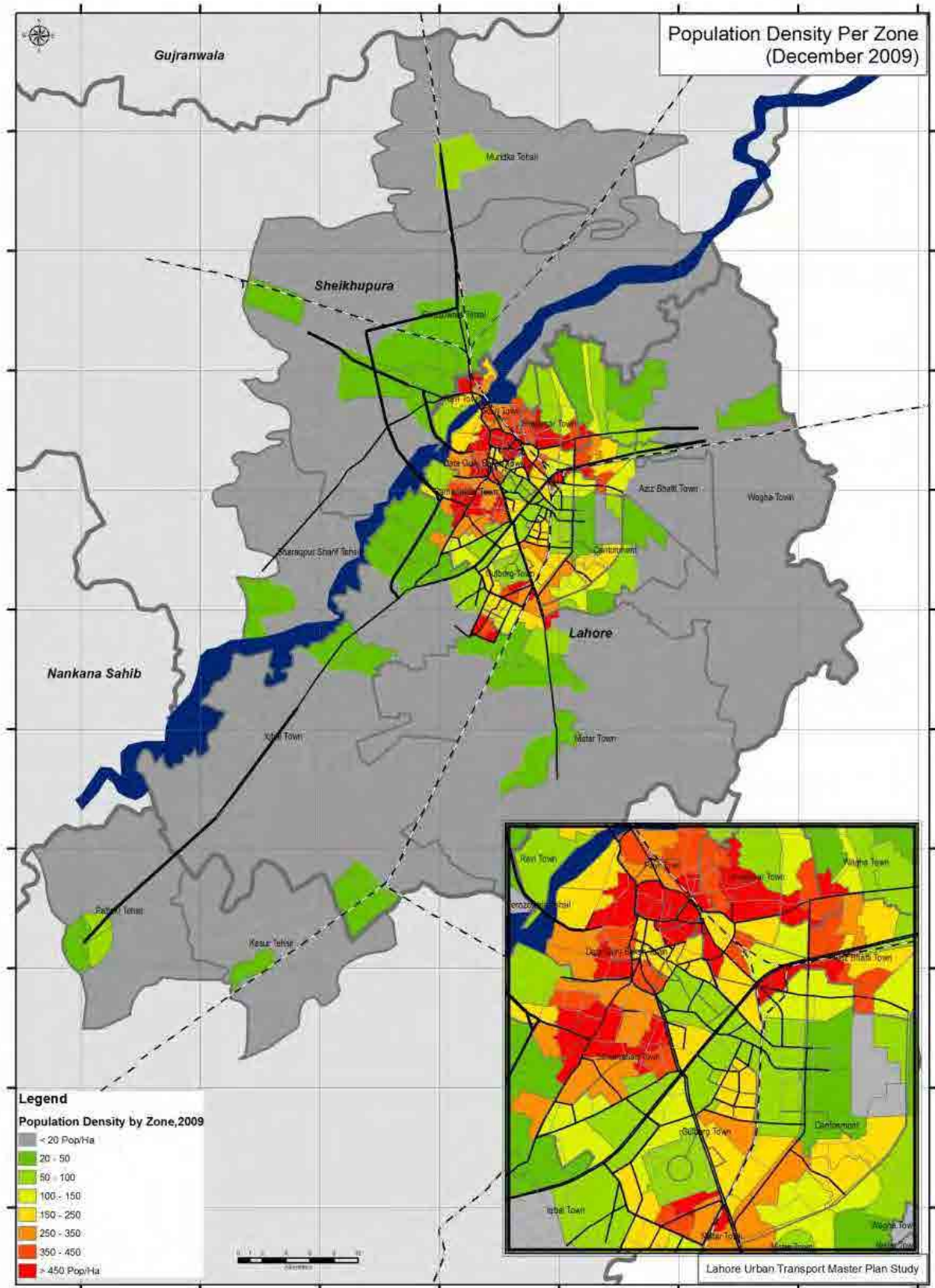
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Figure 2.3.2 History of Urban Structure Transformation



Source: Comprehensive Study on Transportation System in Lahore, JICA, 1991
Survey of Pakistan and LUTMP GIS Database

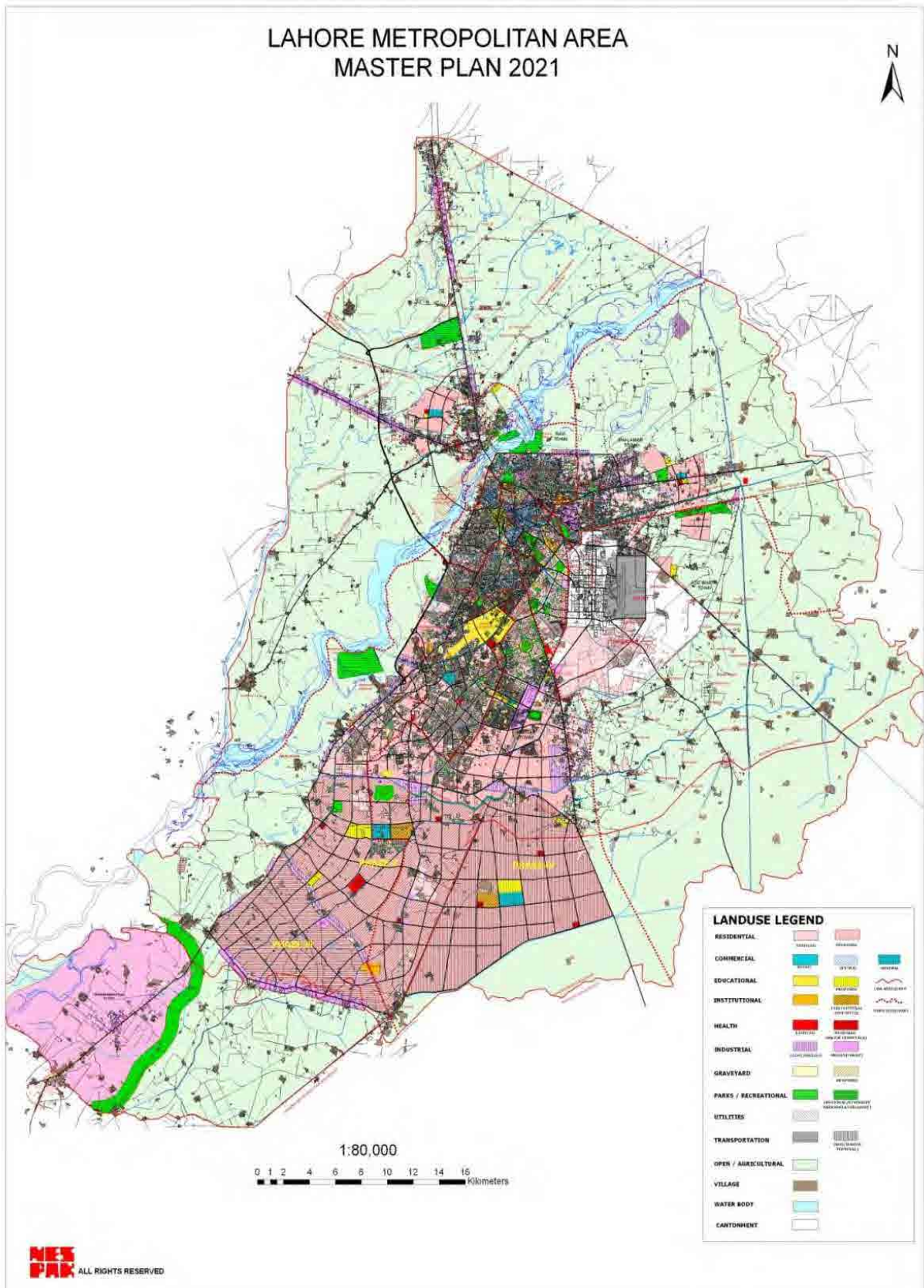
Figure 2.3.3 Population Density by LUTMP Zone (Dec 2010)



Source: JICA Study Team

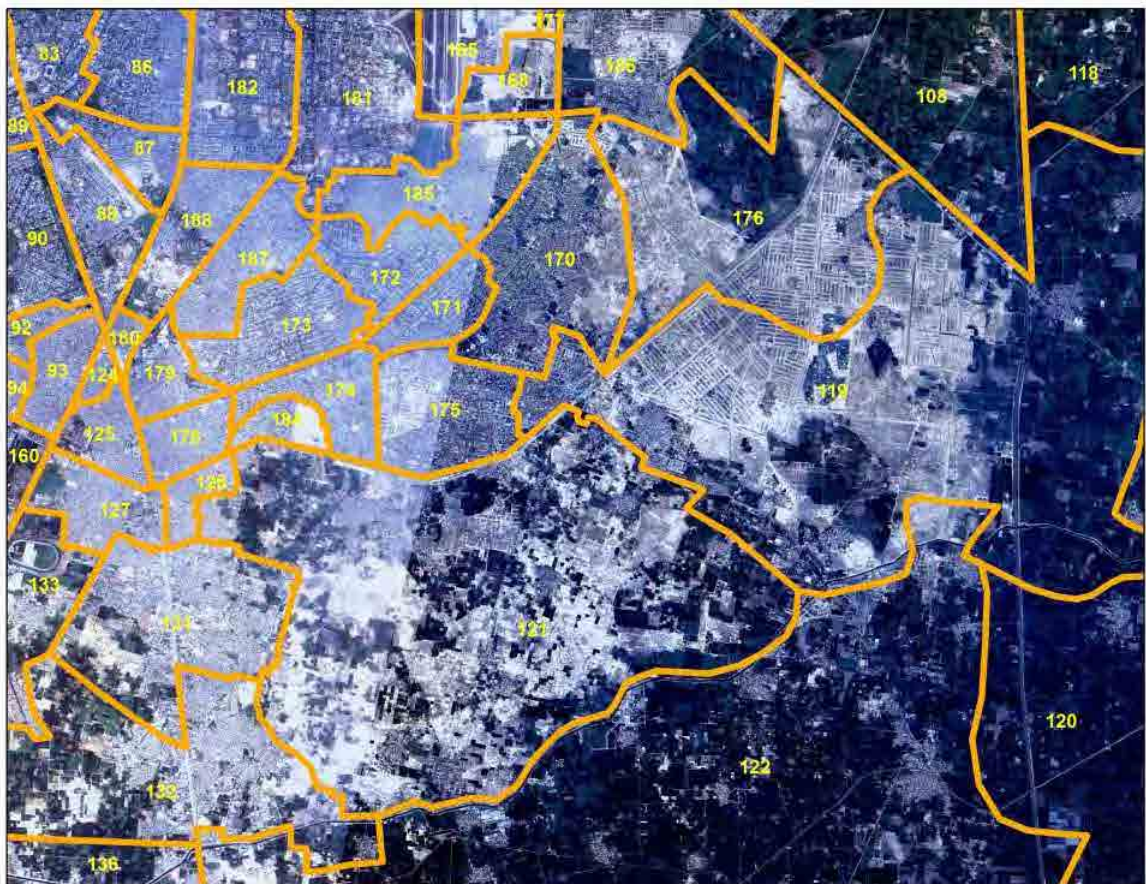
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Figure 2.3.4 Lahore Metropolitan Area Master Plan 2021



Source: Lahore Metropolitan Area Master Plan, NESPAK, 2021

Figure 2.3.5 Delineation and Satellite Image of DHA Phases



Source: DHA

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3) Housing Condition

Lahore city is facing severe shortage of housing. Although data are limited and not new, two milestone statistics of 1980 and 1998 showed the situation. Majority of these housing units comprised two to three rooms, with 3.0 inhabitants per room on the average. During the period, the number of inhabitants per unit increased from 6.7 to 7.1 inhabitants. It is an adverse phenomenon experienced in other countries where household size becomes small as a city grows with economic development. Such household congestion is attributed to high density urban areas in Lahore.

Table 2.3.2 Housing Supply and Conditions, 1980 and 1998

Data Item	1980	1998
No. of house stock	441,721	722,721
Persons per house	6.7	7.1
Persons per room	3.0	3.0
Rooms per house	2.2	2.4

Source: City Report, Lahore, 1998

According to Population Census 1998, about 68 % of total population of Lahore owned a house, 22 % rented a house and the rest stayed free.

4) Urban Services

(i) Water Supply and Waste Disposal

The Household survey of 2007-08 indicates that 85 % people were using potable (tap) water, and the rest 10 % people were dependent of their personal hand pumps. These figures are not different from that of 1998, where 10 % population was using hand pumps for drinking water.

WASA Lahore provides its sanitation services to very large number of people, i.e., 80 % of the city population on 66 % of the city area, according to WASA Report 2005-06.

(ii) Solid Waste Management

In Lahore it is estimated that 5,000 ton waste is generated within the day and in which 70 % waste is lifted but 30 % waste leaves un-lifted. The services are labor-intensive, i.e. 7,897 to serve the vast area of Lahore city and thus the division of worker per thousand people is 1.21.

Solid waste management needs considerable improvements. The Solid Waste Management department of Lahore faces weak management, the biggest reason of its inefficiency in fulfilling the demands of growing population. Landfill sites, workshops and proper machinery are apparently short. The problem becomes more crucial when the hospital and industrial waste is dumped with household waste and disposed without treatment.

5) Development Regulation

The Building Regulations 2005 was issued by the LDA which is responsible for a coordinated process of planning and development in Lahore Metropolitan Area. Relevant regulations with urban transport development are cited in the following:

(i) Right of Way (Article 17)

The right of way for arterial, major and secondary roads prescribed as such in the Master Plan, shall be as specified below:

- | | |
|--------------------|--------------------|
| a) Arterial Roads | 150 feet and above |
| b) Major Roads | 120 feet |
| c) Secondary Roads | 80 feet |

The minimum right of way for minor roads is less than 20 feet (6 m).

However, existing roads are accepted as established at site in existing built-up areas. It means that existing arterial, major and secondary roads designated by a statutory master plan must be widened on an individual project basis when necessary.

(ii) Parking of Vehicles (Article 66)

In the Central Area as well as in case of converted plots in other areas, every prospective builder shall be required to provide parking space within the premises at the rate of:

- a) Apartment buildings: one car space for every 1000 sft. of covered area subject to minimum one car space for every housing unit and one motor cycle/ scooter space for every housing unit.
- b) Office, commercial including large stores and retail shops and hospitals: One car space for every 1000 sft. of floor area and one motor cycle/ scooter for every 500 sft. of floor area.

Vehicle parking is regulated in other building types in a similar way except residential lots.

(iii) Areas Subject to Special Control (Section 96)

In addition to general requirements, the Building Regulation 2005 specifies some areas subject to special control.

For example, a minimum building line (30 ft.) is required in case of properties abutting the following 26 roads:

- (1) Main Boulevard, Gulberg, (2) Stadium Road, Gulberg-III, (3) M.M Alam Road, Gurberg-III, (4) Syed Hussain Shaheed Suhrwardi Road, (5) College Road, Gulberg, (6) Main Market Road, Gulberg-II, (7) Park Road, Gulberg, (8) Gurumangat Road, Gulberg, (9) Road from PACE to Chen One Junction, Gulberg, (10) Shabbir Ahmad Usmani Road, (11) Ferozepur Road, (12) Jail Road and Gulberg Road, (13) Multan Road, (14) Wahdat Road, (15) Raiwind Road, (16) Road behind Liberty Market to Stadium Road, (17) Tollinton Market Shadman, Shadman Road, (18) Link M.M Alam Road, (19) Link Road Main Boulevard Garden Town, (20) Link Road Main Market Gulberg-II, (21) Qazi M.Esa Road Link, (22) Road from Firdaus Market to 37 Block-J,

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Gulberg-III, (23) U.B.D. Canal, (24) Campus Bridge U.B.D. Canal to Y-Junction, New Garden Town, (25) Sher Shah Road, and (26) Main Boulevard, Shadbagh.

10 Roads are also designated for general commercial areas, including all types of retail and wholesale commercial activities, offices, restaurants, showrooms, etc. These are: (1) Multan Road, (2) Lytton Road, (3) Ferozepur Road, (4) Allama Iqbal Road, (5) Shahrah-e-Quaid-e-Azam, (6) Temple Road, (7) Ravi Road, (8) G.T. Road (Baghbanpura), (9) Sheikhpura Road from Octroi to the roundabout near Ravi Bridge, and (10) Shalimar Link Road.

Due to roadside development, heavy urban traffic and substantial public transport needs are expected on the above-mentioned roads.

(iv) Rules for Private Site Development Schemes

Punjab Private Site Development Schemes (Regulation) Rules 2005, attached to the Building Regulation 2005, guide privately-led housing schemes. Planning standards other than residential lots and roads are set as below:

- a. Open space/ parks – not less than 7 % of total scheme area;
- b. Graveyard – not less than 2 % of total scheme area;
- c. Commercial area – not more than 5 % of total scheme area;
- d. Maximum size of residential plots – 1,000 sq.yds.;
- e. Minimum road width – 30 feet; and
- f. Public buildings – 2 to 10%

2.3.3 General Socio-economic Condition

1) Demography

(i) Broad Analysis

Broad population analysis is given in the table below. 8.5 million People reside in Lahore District and 82 % of which are urban dwellers. The population growth rate of 2.5 % since 1998 Census is much faster than the national and provincial rate of 1.9 %.

The Study Area is expanded by 70% from Lahore District due to inclusion of parts of Kasur and Sheikhpura Districts. Rural populace is still dominant in these two inclusion areas and thus urban residents account for 66 % in the Study Area. The reason of inclusion of these two areas into the Study Area is simply to compare the result with the Comprehensive Study on Transportation System in Lahore conducted by JICA in 1991. The population growth rate of 2.3 % is slightly lower than Lahore District.

Table 2.3.3
Past Population Trends of Pakistan, the Punjab, Lahore Division and the Study Area

Area Description	Area (sq.-km)	Census Population ('000)					Annual Growth Rate (%)				
		1961 ¹	1972 ¹	1981 ¹	1998 ¹	2010 ¹	1951-61	1961-72	1972-81	1981-98	1998-10
Pakistan	796,096	42,880	65,309	84,254	132,352	168,258	2.43	3.90	2.87	2.69	2.02
The Punjab	205,345	25,464	37,607	47,292	73,621	93,682	2.17	3.61	2.58	2.64	2.03
Lahore Division	11,729	3,560	5,431	7,183	12,016	15,784	2.36	3.91	3.16	3.07	2.30
Lahore District	1,772	1,626	2,588	3,545	6,319	8,650	3.66	4.32	3.56	3.46	2.65
Kasur District	3,995	854 ²	1,186 ²	1,528 ²	2,376	3,016	1.16	3.03	2.86	2.63	2.01
Sheikhupura District	3,242	656 ³	1,028 ³	1,338 ³	2,276 ³	2,888	1.61	4.17	2.97	3.17	2.00
The Study Area	3,044	N/A	N/A	N/A	7,307	9,928	N/A	N/A	N/A	N/A	2.59

Note 1: Census Year; Note 2: Lahore divided in to Lahore District and Kasur District; Note 3: Sheikhupura divided in to Sheikhupura District and Nankana Sahib District in 2005.

Source: Punjab Development Statistics, 2010

(ii) Analysis at Tehsil/ Town Level

Tehsil is lower level of administration boundary under district administration in Pakistan. The Study Area is composed of whole of Lahore District: 2 Tehsils of Lahore and Cantonment areas; Part of Sheikhupura District: parts of Tehsils of Ferozewala, Muridke, and Sharaqpur; and Part of Kasur District: Tehsils of Kasur and Pattoki adjacent to Lahore District in the South-west and south respectively.

In Lahore District, Tehsil Lahore is comprised of 9 towns, whereas Lahore Cantonment Tehsil areas are treated as single town. In Lahore district six towns (including Cantonment) are totally urbanized. Except Cantonment, other 5 towns areas are densely populated with density reaching over 200 inhabitants per hectare.

It is noted that there are Data constraints at Tehsil level. After 1998 Census, all Towns in Lahore, except Cantonment has the same population growth rates in the District, as shown in Table 2.3.4 below.

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Table 2.3.4 Demographic Characteristics by Tehsil

District	Tehsil/ Lahore Tehsil Town	Area (km ²)	1998 Census Population	Current Population (Dec 2010)				Annual Growth Rate (%)
				Pop (000)	Urban Pop (000)	Density (persons/ha)	Urban Rate (%)	
Lahore	Aziz Bhatti Town	89	414	553	348	60	62.9	2.4
	Data Gunj Baksh Town	33	712	949	949	288	100.0	2.4
	Gulberg Town	32	571	761	761	238	100.0	2.4
	Iqbal Town	464	567	756	279	16	36.9	2.4
	Nishtar Town	520	734	978	526	19	53.8	2.4
	Ravi Town	62	1,163	1,550	1,550	250	100.0	2.4
	Samanabad Town	35	722	963	963	275	100.0	2.4
	Shalimar Town	15	389	519	519	346	100.0	2.4
	Wahgha Town	435	481	642	258	15	40.2	2.4
Cantonment	87	566	791	791	90	100.0	2.8	
Sheikh- upura	Ferozewala	576	428	547	149	10	27.2	2.1
	Muridke	224	420	538	180	24	33.5	2.1
	Sharaqpur	140	151	193	36	14	18.7	2.1
Kasur	Kasur	150	1,157	1,452	458	97	31.5	1.9
	Pattoki	162	634	797	144	49	18.1	1.9

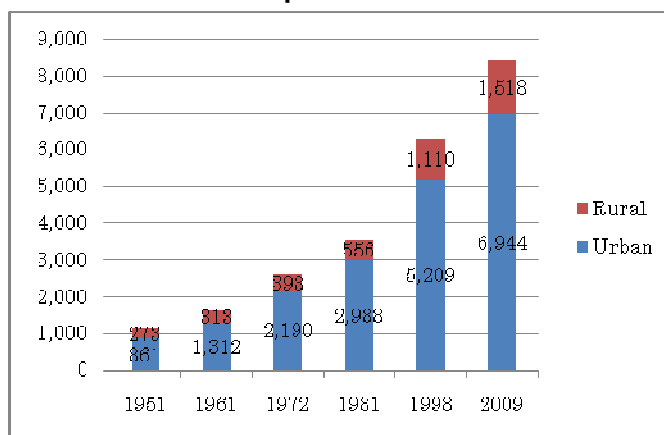
Source: Punjab Development Statistics, 2010

(iii) Historical Change

Population in Lahore District has been growing continuously, and increased by 7.5 times since the first census in 1951. The fastest growth pace was recorded between 1972 and 1981, i.e., 4.3 % per annum. Since then, the growth rate has been steadily declining. In recent years, a growth rate of 2.69% is estimated.

The share of urban population in Lahore District has always been in a narrow range between 75 % and 85 %. Inline with rapid population growth, urban areas have been expanding accordingly.

Figure 2.3.6 Historical Population Growth in Lahore District



Source: District Census Reports, Lahore
Punjab Development Statistics, 2010

(iv) Age Profile

Age profile in Lahore District is very much young like other Districts in Pakistan. The population below 14 years old account for nearly 40 %. Within possible labor force age group between 15 and 64, people less than 49 years are dominant.

The Lahore urban areas show a similar age profile where the possible labor force age group is slightly weighted due to the accumulation of higher education facilities and other reasons.

Table 2.3.5 Age Structure in Lahore District, 1998

Age Group	Total	Urban
Below 14	39.2 %	38.1 %
15 – 49	50.0 %	51.1 %
15 – 64	57.5 %	58.7 %
65 and Over	3.2 %	3.2 %
Age Dependency Rate*	73.6 %	70.4 %

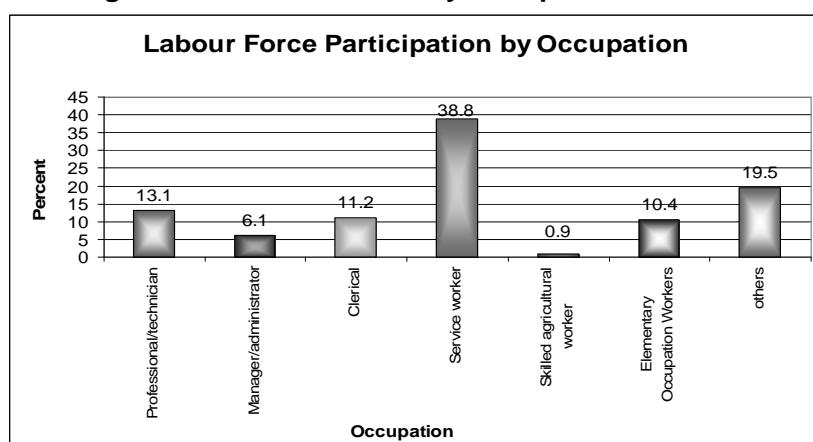
Note: * Age Group = (below 14 + 65 and over) / Age Group (15 – 64)

Source: District Census Report, Lahore

2) Labour Force

In Punjab Province, labour force (‘working’ plus ‘looking for work’) accounts for 31.8 % of the provincial population during the period 2006-07. In the urban areas, an unemployment rate of 7.5 % is rather high than that of 4.7 % in the rural areas. Recent provincial statistics do not show district-level labor force. When working population had a share of 29.4 % in the provincial population during the period 2003-04, its share was 21.8 % in Lahore District due to the mass of students and other reasons. According to the labor survey done by the Urban Unit during the period 2007-08, Lahore labor force is characterized as many service workers by occupation type and social services and trade and commercial activities by industry type as illustrated in Figure 2.3.7 and Figure 2.3.8.

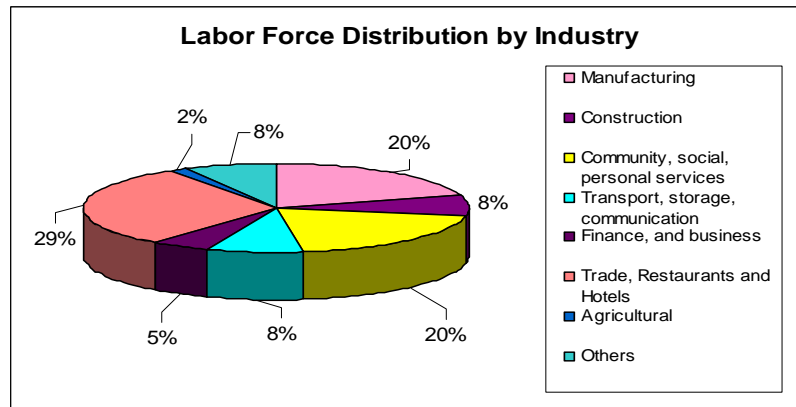
Figure 2.3.7 Labour Force by Occupation in Lahore



Source: Urban Unit, Lahore, 2007-08

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Figure 2.3.8 Labour Force by Industry in Lahore



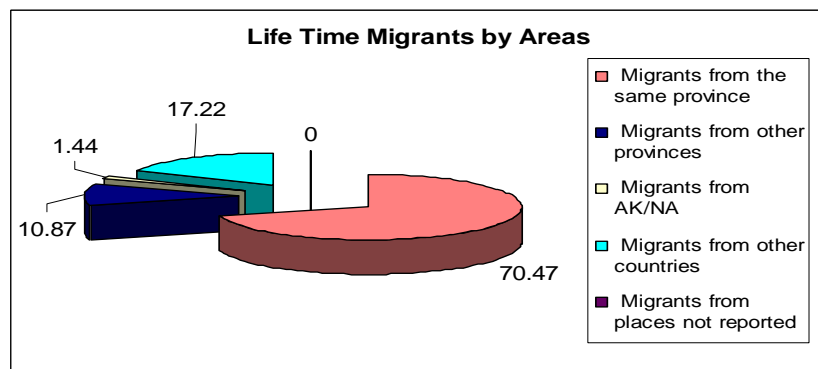
Source: Urban Unit, Lahore, 2007-08

Lahore District also shows considerable labour concentration on the manufacturing sector. In 2004, the district has 1,454 factories with 118,450 workers. The share of manufacturing workers in the province is 19.9 % which is much larger than that of population, 9.2 % in the province. Locally prevalent manufacturing types are metal, machinery, textile and food related.

3) Social Migration

According to 1998 Census, 897,129 migrants in urban Lahore were reported. It nearly constituted 17.4 % of total urban population. There are two types of migration inflow, i.e., intra-provincial migration and international migration. In the census figure, 70.5 % of intra-provincial migrants came from other districts while international migration accounted for 17.2 %. In Lahore, primary reasons of in-migration are better economic opportunities and larger high-quality educational facilities.

Figure 2.3.9 Migration Origins into Lahore



Source: 1998 Census

4) Education

Educational facilities are considered important social facilities and an indicator for human development. In Punjab Province as a whole, various enrolment rates by education stages during 2007-08 were estimated as follows:

- Primary stage education (5-9 years) – 42.2 %
- Middle stage education (10-12 years) – 29.6 %
- High stage education (13-14 years) – 20.6 %
- Intermediate stage education (15-16 years) – 11.9 %
- Degree stage education (17-18 years) – 5.4 %

The 1998 Census indicated that the literacy rate of urban dwellers in Lahore District was 69.1 % which was higher than that of provincial urban average, i.e., 64.5 %. It is thus supposed that enrolment rates of Lahore by education stages may be higher than the above-mentioned provincial averages accordingly.

Lahore is known as an educational hub in the country. High schools and higher educational facilities are concentrated in the city. The number of all types of students is estimated at approximately 883 thousand. 651 thousand of which goes to high schools or higher education facilities and they mostly need longer trips to the education places than primary and middle school students.

In Lahore, there are 24 universities. 11 universities are relatively new since they established after 1990. The largest university is University of the Punjab (30,000 students), followed by University of Engineering and Technology, Lahore (16,000 students) and the University of Lahore (11,500 students).

Table 2.3.6 Educational Facilities and Enrolment in Lahore, 2009

Education Level and Type		No. of Facilities	No. of Students
Government Schools	Primary, Mosque Schools	847	146,123
	Middle	192	86,694
	High	268	247,872
Colleges and Vocational, Intermediate Schools		231	282,656
Universities		24	Approx. 120,000
Total		1,562	Approx. 883,000

Source: Punjab Development Statistics, 2009

2.3.4 Population Distribution

The population of the Study Area in 2010 is estimated at about 9.9 million, of which 8.65 million (87 %) are resident in Lahore district, and 0.9 million (9 %) are resident in part of Sheikhpura District: partial Tehsils of Ferozewala, Muridke, and Sharaqpur. The remainder 0.37 million (4 %) are resident in Kasur District Tehsils of Kasur and Pattoki. Within Lahore District population is almost evenly distributed (around 900,000) between the seven Towns and Tehsils of Cantonment, with the exception of two peripheral towns Aziz Bhatti and Wagah where the population is just over 660,000 each. Key Study Area population statistics are summarised below in Table 2.3.7.

CHAPTER 2 – CURRENT TRANSPORT SITUATION, PROBLEMS AND ISSUES

Table 2.3.7 The Study Area 2010 Population by Town/ Tehsil

District	Town/ Tehsil	Area (km ²)	2010 Population ('000)	Urban Population ('000)	Density (Persons/ha)	% of Study Area
Lahore	Ravi Town	31	1,007	1,007	328	10.1
	Data Gunj Bakhsh Town	31	970	970	317	9.8
	Samanabad Town	38	984	984	262	9.9
	Shalamar Town	24	854	854	350	8.6
	Gulberg Town	44	778	778	178	7.8
	Aziz Bhatti Town	69	667	609	97	6.7
	Wagah Town	440	656	263	15	6.6
	Nishter Town	497	945	399	19	9.5
	Iqbal Town	520	960	424	18	9.7
Cantonment	98	831	831	85	8.4	
Sheikhupura	Ferozwala Tehsil	576	534	152	9	5.4
	Muridke Tehsil	224	266	143	12	2.7
	Sharaqpur Tehsil	140	101	36	7	1.0
Kasur	Kasur Tehsil	150	168	50	11	1.7
	Pattoki Tehsil	162	207	71	13	2.1
Lahore	Lahore District	1,792	8,652	7,119	48	87.1
Sheikhupura	Part of Sheikhupura	939	901	331	10	9.1
Kasur	Part of Kasur	312	375	121	12	3.8
LUTMP	The Study Area Total	3,044	9,928	7,571	33	100

Source: Punjab Development Statistics, 2010

The zonal population is depicted in Figure 2.3.10 indicating that zonal population mostly lies around 40-80,000, with the exception of few large suburban zones, where population exceeds 80,000 and further dis-aggregation was not possible.

The gross population density (total population / total zone area) is shown in Figure 2.1.11. This reflects that highest densities are in and around the walled city area. However, some zones in south model town, Township, Ghazi road and Shahdara areas also have densities similar to the inner city areas.

The net 2010 population density (total zonal population/ built up area of the zone) as shown in Figure 2.3.12 gives a more realistic picture of residential developments in the Study Area.