
APPENDIX-1 MEETINGS

1. Persons Interviewed

During the Phase 1 study period, which is Karachi Transport Master Plan-2030, JICA Study Team (JST) has been visited different organizations and Departments to collect data and also meet the officials. The list of these officials and their department/organization are given below

1.1 CDGK

- Administrator/ DCO, City District Government Karachi

1.1.1 KMTC

- Director General, Karachi Mass Transit Cell, CDGK
- Director, (Planning & Coordination) Karachi Mass Transit Cell, CDGK.
- Director (T), KMTC, CDGK

1.1.2 Master Plan

- Executive District Officer, Master Plan Group of Offices, CDGK
- District Officer, Master Plan Group of Offices, CDGK

1.1.3 Transport & Communication

- Executive District Officer, Transport Department , CDGK
- District Officer (Parking & Terminal Management), Transport & Communication Department (TCD), CDGK
- District Officer, Policy, Planning & Design, Transport & Communication Dept. CDGK

1.1.4 Education Department

- Executive District Officer, Education(School) , CDGK

1.1.5 Works & Service Department

- Executive District Officer, W&S , CDGK

1.2 DRTA

- Superintendant, District Regional Authority, CDGK

1.3 Town Administration

- Administrator, Keamari Town
- Administrator, Baldia Town
- Administrator, Bin Qasim Town
- Administrator, Gulberg Town
- Administrator, Gadap Town
- Administrator, Gulshan Town
- Administrator, Jamshed Town
- Administrator, Korangi Town
- Administrator, Landhi Town
- Administrator, Liaquatabad Town

- Administrator, Lyari Town
- Administrator, Malir Town
- Administrator, New Karachi Town
- Administrator, North Nazimabad Town
- Administrator, Orangi Town
- Administrator, Shah Faisal Town
- Administrator, Site Town
- Administrator, Saddar Town

1.4 Government of Sindh

1.4.1 Planning & Development

- Chief Secretary, P&D Dept, GOS
- Chief Economist, P&D Dept, GOS
- Special Secretary (Tech.), P&D Dept, GOS
- SS (D) , P&D Dept, GOS
- Chief Foreign Aid Planning & Development Dept
- Chief (T&C), P &DD, GOS.
- DS (Dev) FD
- DG (M&E) CG

1.4.2 Excise and Taxation Department

- Director GOS.

1.4.3 Transport Department

- Project Director, Transport Department, GOS

1.4.4 Directorate of Private School/Institutions Sindh, GOS

- Director, GOS.

1.4.5 Directorate Corporate Service, PPP Unit, GOS

- Director, GOS.

1.4.6 Sindh Board of Investment

- Advisor to Chief Minister, GOS
- CEO, SBOI.
- Director Project, SBOI.

1.4.7 Zulfikarabad/PDMA

- DG,GOS

1.4.8 Sindh Governor's Secretariat

- Deputy Secretary

1.4.9 Karachi Urban Transport Corporation (KUTC)

- Managing Director

1.4.10 Karachi Building Control Authority (KBCA)

- Controller of Buildings

1.4.11 SEPA

- DG, SPEA

1.4.12 Traffic Police

- Deputy Inspector General of Police Traffic
- SSP Traffic Zone 3, Karachi

1.5 Government of Pakistan**1.5.1 Population Census Organization**

- Deputy Census Commissioner (G)
- Assistant Census Commissioner (G)

1.5.2 Pakistan Railway

- Divisional Engineer, Pakistan Railway, Karachi

1.5.3 Security

- SP Foreigner Security Cell, CCP Karachi

1.5.4 Military Land and Cantonment Board

- Director Military land and operation, Karachi
- Defence housing authority, Karachi
- Chief Executive Officer, Karachi Cantonment Board
- Chief Executive Officer, Malir Cantonment Board
- Chief Executive Officer, Korangi Cantonment Board
- Chief Executive Officer, Clifton Cantonment Board
- Cantonment Engineer, Faisal Cantonment Board
- Chief Executive Officer, Manora Cantonment Board

1.5.5 Civil Aviation and Ports

- GM Planning and Design, CAA, Karachi
- GM, Civil Works & Estate Division, KPT
- Executive Engineer, KPT
- Director P & D, Port Qasim Authority

1.5.6 National Highway Authority (NHA)

- General Manager

1.5.7 Lyari Express Way

- Project Director

1.6 Others**1.6.1 Urban Planners**

- Urban Planning Expert
- Chairman, Department of Architecture and Planning, NED University

1.6.2 Applied Economic Research Centre (AERC)

- Senior Research Economist

1.6.3 Karachi Electric Supply Company.

- Director Corporate, KESC
- Director New Connections, KESC

1.6.4 DHA

- Additional Director, DHA
- Senior Project Director, DHA

1.6.5 DHA City Consultant

- Director, Osmani & Company
- GM, Osmani & Company
- Director, Osmani & Company

1.6.6 Sustainable Initiatives (Sehari)

- Executive Director

1.6.7 The Agha Khan University

- Director Construction

1.6.8 NED University of Engineering and Technology

- Chairman Department of Urban & Infrastructure

1.6.9 National Industrial Park

- Senior Manager Marketing

1.6.10 Pakistan Textile City

- General Manager Technical Operation

1.6.11 SUPARCO

- General Manager

1.6.12 Karachi Transporters Associations

- President, KTI
- General Secretary, KTI
- President, Large Bus Association

- Chairman, PTF
- Vice President, KTI
- Member
- Member

1.6.13 Sindh Industrial Trading Estate (SITE)

- Deputy Director Land

1.6.14 Association of Builders and Developers of Pakistan (ABAD)

- Chairman

1.6.15 Education City Consultant

- Team Leader, Halcrow
- Team Member, arcop

1.6.16 Rail Mass Transit Consultant

- Team Member

1.6.17 Environment Expert

- Expert

Except above, JICA Study Team was conducted their assignment in close coordination and assistance by following KMTC, CDGK, officials:

- Director General, Karachi Mass Transit Cell, CDGK
- Director, (Planning & Coordination) Karachi Mass Transit Cell, CDGK.
- Director (T), KMTC, CDGK
- Traffic Engineer, KMTC, CDGK
- Assistant Traffic Engineer, KMTC, CDGK
- Research Student Assistant, KMTC, CDGK
- Research Officer, KMTC, CDGK.

2. Major Meetings

2.1 Technical Committee

The table below shows the number of Technical Committee (TC) meetings held during the Transport Master Plan preparation period.

Meetings	Date	Venue
Kick-off Meeting	15th April,2010	P&D, GOS
1st Technical Committee	12th May,2010	CDGK
2nd Technical Committee	06th October,2010	CDGK
3rd Technical Committee	02nd February,2011	CDGK
4th Technical Committee	23rd July, 2012	CDGK

The kick-off meeting was held on April 15, 2010; during this meeting the JICA Study Team (JST) introduced the outline and schedule of the Study. The 1st Technical Committee was held on May 12, 2010 on Inception Report. In this meeting JST described the methodology will be adopted for traffic surveys and demand forecast. Participants from various organizations expressed the closed cooperation to the Study

In the 2nd Technical Committee which was held on 6th October, the JST introduced mainly review of policies and studies, present condition analysis, and methodology of Household Interview Survey (HIS). Participants from various organizations appreciated the progress to date made by JST and expressed their full cooperation for the completion of this Study on time.

The third Technical Committee meeting was held on 2nd February, 2011 in which participants of the committee reviewed the Progress Report-2 submitted by the JST. The participants expressed their full satisfaction on progress so far made by JST and no major comments and objections were recorded on Progress Report-2.

The JST submitted the Interim Report-1 on 30th June, 2011. The report was reviewed by KTMC and the comments were given to the JST. After the modification by the JST, the Interim Report-1 was distributed to the members of Technical Committee.

The contents of the Interim Report-1, which includes the results of the master plan, were presented to the members in the 4th Technical Committee held on 23rd July, 2011. The participants expressed various comments on the master plan which was very productive to finalize the master plan. The JST explained that the proposed BRT routes would be studied in the phase-2 stage (Feasibility Study).

2.2 Joint Steering Committee

The table below shows the number of the Joint Steering Committee meetings held during the preparation phase of Transport Master Plan -2030.

Meetings	Date	Venue
1st Joint Steering Committee	31st May,2010	P&D, GOS
2nd Joint Steering Committee	22nd October,2010	P&D, GOS
3rd Joint Steering Committee	8th February,2011	P&D, GOS
4th Joint Steering Committee	1st August, 2012	P&D, GOS

The first Joint Steering Committee (JSC) was originally scheduled on 26th April in the kick-off meeting, but it was changed to 20th May and finally was held on 31st May. There was no objection about the Inception Report in the Joint Steering Committee.

The JST submitted the 1st Progress Report during the month of October, 2010, the 2nd Joint steering committee meeting was held on 22nd October 2010 in which JST informed the participants the Overview of the Progress, Review of Policies & Plans, Present Conditions, UC Boundary Maps, Traffic Survey, Household Interview Survey, etc. They also elaborated the program for HIS surveys and ground conditions faced by JICA Team in Town and UC boundaries. The JST also acknowledged the support of GOS and KMTC for accomplishing the tasks. They also appreciated the cooperation extended by all concerned Depts. of GOS and CDGK besides town administration and head of cantonment boards. The participants of JSC expressed their hope that the study will go a long way in solving the transport & transit issues of Karachi and also thanked the JICA study team for their presence in Karachi to conduct this important study. It resulted in that they were finalizing different tasks of the study on time. They also assured the JICA study team, his full of cooperation and assistance at all levels.

The JST submitted 2nd Progress Report during the month of January 2011, the third JSC meeting was held on 8th February, 2011 followed by TC meeting held on 2nd February, 2011, on Progress Report-2. The JST explained the Overview of the Progress and progress to date made on Socio-economic Framework, Land Use Plan, Transport Policy, Public Transport Network, Household Interview Survey, Environmental Consideration, etc. The JST acknowledged the support of GOS and KMTC for smooth working on the assignment in hand. JST also reported that all stakeholders had extended full support and cooperation towards the study team. He further informed that about 60% work on Phase I, which included the preparation of Transport Master Plan under 2030 vision, had been completed by JST. After completion of Transport Master Plan, the same would be presented in a Seminar, to have input and support of all stakeholders and community as well. In the second phase, JICA team would prepare a detailed feasibility study on priority corridors.

The 4th JSC meeting was held on 1st August, 2011 for the Interim Report-1. The results of the master plan and the priority project for the feasibility study were explained by the JST. Regarding the master plan, the major discussion was the population projection after 2020. There was an opinion that the projection for 2030 was small comparing the high growth rates of population up to 2020. The JST explained that the growth rate by 2030 was rational considering the trends of world mega cities. The members agreed the proposed BRT routes would be the priority project for the feasibility study in the second phase.

2.3 Others Meetings

2.3.1 Administrators of Towns

A meeting was organized with all 18 Town Administrators on May 14, 2010 in which JST described the purpose and objective of the study besides the study parameters and methodology to the Administrators of Towns. The JST also requested the participants for their support to facilitate the JST with special reference to various types of surveys to be conducted at various locations/towns. The Administrators of all towns assured of their fullest cooperation and support to accomplish the task in hand. They requested for prior information about the visiting team in their respective towns for survey so that administrative arrangements could be made in advance for smooth survey work.

2.3.2 Meetings for Socio-economic Framework

The JICA Study Team held a meeting with CDGK and the following urban transport experts on 17th October 2010, in which important suggestions were given to JICA Study Team.

- Urban Planning Expert
- Chairman, Department of Architecture and Planning, NED University

CDGK also held a brain storming session to discuss socio-economic framework on 27th October 2010 in the Conference Room of Civic Centre. There were 23 participants including various departments of CDGK, JICA Study Team (6 members), local consultants (Exponents), NED University, Urban Resource Centre (URC), Shehri (NGO), and Applied Economics Research Centre (AERC). The JICA Study Team made a presentation on socio-economic estimation.

A further discussion for socio-economic framework was also separately held with AERC on 15th November 2010 at AERC Office in which the discussion was made on future population density, growth rate, GDP share of Karachi, and other related topics.

2.3.3 Meetings with Chief Economist, GOS for Socio-economic Framework

Two meetings were held with Chief Economist, GOS at his office on November 25, 2010 and February 21, 2011. During the above stated meetings the JST briefly explained the project progress and sought comments on Demographic and Economic indicators of Karachi and Pakistan besides budgetary trend of GOS and CDGK with respect to transport related development activities and projects. The JST also asked about the international funding from Donor Agencies, fluctuating trend observed during the year 2000-2004 and further funding program from those agencies.

The Chief Economist, (P&D), GOS, expressing his views said that:

- Pakistan GDP growth rate and Karachi Growth rate might be considered as same. He further added that about 99% agriculture activities are outside Karachi. More than 70% small and medium industries are located outside Karachi but more than 70 % service industries are operating in Karachi. Since agriculture and manufacturing contribute 25, 25 percent and service sector 50 %, therefore, it is safe to assume the growth rate of Karachi and growth rate of Pakistan are moving in the same direction and with the same pace.
- He suggested that the GDP growth rate of Pakistan might be projected on the basis of average growth rate of last 10 to 15 years.
- He, further, informed that due to 9/11 events, the international funding disturbed towards Pakistan but gradually, it was stabilized and then increased, thus the past trend shown some fluctuation. He added that for next 10 years Pakistan could foresee the same trend but for long term, it could not forecast reliably.
- He further advised that JICA team might consider average growth rate of last 10 years of international funding and project it, for next 10 years which might be realistic approach.
- He informed that “existing population of Karachi is estimated at more than 20 million but JICA team forecast based on past census growth rate seems to be appropriate and future projection based on international trends of similar city like Karachi may also be considered as realistic”.

2.3.4 Meetings for Development Plan

The JICA Study Team was also held a lot of meetings with different organizations to collect information on the future development plan in Karachi, as listed below:

Organization	Date	Subject
Defense Housing Authority (DHA)	23rd September 21st October	The development plan of DHA City (along Super Highway)
Aga Khan Foundation (AKF)	25th October	The development plan of Education City (along Super Highway)
Karachi Building Control Authority	2nd November	To collect Approval of Building Data
Textile City	4th November	Information on the status of Textile City
NED, Department of Urban Infrastructure Engineering	11th November	Urban transport policy in Pak-USAID Karachi Metropolitan ITS Project
Sindh Board of Investment Office (SBOI)	12th November	Investment plans in Karachi, such as Education City, Marble, Japan Economic Zone, DHA City, Wind Power Plants and so on
National Industrial Park (NIP)	12th November	Development of industrial parks in Karachi
Zulfikar Town	16th November	Plan of new towns along coastal belt of Thatta District
National Highway Authority (NHA)	1st December	The future project by NHA and the status of Lyari Expressway

2.3.5 Karachi Electric Supply Company (KESC)

A meeting with KESC officials was held on 3rd December, 2010 to confirm the stability of electric power supply for railway operations.

2.3.6 Meeting for Environmental Considerations

The followings meetings were held regarding environmental considerations. During the meeting JST had recorded the views of the officials of stated organizations on different environmental issues

- Sindh Environmental Protection Agency (SEPA), 2nd November, 2010
- Sr. Environmentalist, 5th November, 2010
- Pakistan Space & Upper Atmosphere Research Commission (SPARCO), 8th November, 2010

2.3.7 Transporters Associations

Two meetings were held with Transporters Associations (PTF and KTI) on 7th December, 2010 and 06 January 2011 at KMTC office to understand the problems faced by transporters and their views for its solution., During the meeting the JICA Study Team also informed the participants the objectives of the project and further informed that JICA Team is now carrying out traffic surveys and surveys at different Highways so that cooperation of Transporters Associations are required during these surveys. JST also asked the views of transporters associations on type of bus operators, any limit on operators to have at least 10 numbers of buses, how fares fix, financial and operational structures of operators, any banned on new mini buses, how many trip a bus is made in a day, fuel consumption ,etc.

The representatives of KTI & PTF, welcomed the JICA Team in Karachi and appreciated the efforts of the JICA team to-date has been made for the improvement of Transport system of Karachi City. He also responded one by one on different questions raised by the JICA Team. Their responses on different questions are given below:

- They informed that there are no companies operating mini or large buses, they are mostly individuals having fleet of maximum 2 to 3 buses or less. They disclosed that some owner hire driver, conductor, mechanic on daily wages basis and some owners themselves are drivers or conductor as well operate the vehicle themselves. Owners of Buses do not employ driver and conductor due to poor law and order situation as well high operating cost
- They also informed the participants that the revenue mostly collected by driver and he is responsible to submit the same revenue to owners. The Owner daily basis pays the fixed amount out of this collected revenue to driver, conductor, petrol pump, etc. The remaining balance of one day after deducting all stated expenses is the profit of owners which is very less as required by owners; therefore day by day the number of buses is reducing from the road. He also informed that out of 16000 buses in Karachi nowadays only 11000 buses are on road.
- They also stated that since 1986 no new permit was issued for mini buses. In 1993 some new coaches were came on road according to PM Transport scheme. Now all the minibuses on road are re-furbished and life of re-furbished bus is only 5 years. He also informed that the fare of buses set by Transport Dept. GOS.
- They also informed the participants that the cost of re-furbished mini bus is around Rs.1 Million. Regarding Metro bus service ,they disclosed that it is also twenty six seated bus, initially it is operated by some company but after some years of operation, the owner of company sold out these buses to individuals and now metro buses are operated by individuals
- They also submitted the operation cost of one mini bus and disclosed the consumption of fuel is about 8 km/liter for both mini and large bus. They also told there is huge demand to add new buses but due to less profit margin companies and individuals are not interested to join in this business.
- They assured JICA team that if LRT will introduce in Karachi, they will welcome and fully support this project. They further assured that they will also cooperate with the JICA team during its implementation.

In addition to above stated meetings, the JICA Study Team was also held meetings with officials of Education Department (School) CDGK, Education Department of GOS, and DHA Education Directorate to collect information about the number of students in different educational institutions, etc. The JST also conducted some separate meetings with renowned experts in the field of environment, mass transit and urban planning.

APPENDIX-2 CAPACITY BUILDINGS

1. Capacity Buildings Program

The JICA Study Team prepared a draft technology transfer plan and presented it to KMTC in May 17, 2010. The program was mutually agreed between the JICA Study Team and KMTC and commenced from October 2010.

1.1 Goal

The goal of the capacity building program is:

- To enhance the capacity of KMTC in the field of mass transit system and urban transport planning.

1.2 Objectives

The objectives to achieve the goal are:

- To know the basic concept of urban transport system of international standard
- To understand the contents of person trip survey
- To learn the process of traditional demand forecast
- To acquire the skill of JICA-STRADA
- To understand the output of the Study of Karachi Transportation Improvement Project

1.3 Activities

To achieve the objectives, the following activities were proposed for the Capacity Building Program.

- Workshop
- Seminar
- GIS Training Course
- On the Job Training
- Database Transfer

1.4 Schedule

In the master plan stage, four workshops have been held and the GIS Training Course has been completed. The purpose of the seminar is to introduce the result of KTIP to stakeholders. It is planned to hold a seminar after submission of Interim Report, and another seminar after the submission of the Draft Final Report. On the Job Training is an on-going activity, while the database transfer is scheduled to be done in the end of this project.

2. Workshop

2.1.1 Completed Workshop

A total of seven workshops have been proposed by JICA Study Team, and accepted by KMTC, CDGK. The JICA Study Team held the four times out of seven as shown in Table A2-2-1 and Figure A2-2-1. The participants were officers of the departments of CDGK and the Government of Sindh and professors from NED University, Sir Syed University of Engineering and Technology, etc.

Table A2-2-1 Outline of Workshops

Date	Venue	Title	Goals and Objectives
October 18, 2010	Avari Tower Hotel	Concept and Methodology of Person Trip Survey	<p>[Goals]</p> <ul style="list-style-type: none"> - To understand the necessity of the person trip survey in this study <p>[Objectives]</p> <ul style="list-style-type: none"> - To acquire fresh information about person trip survey in various countries - To understand the concept of a trip - To know the categories in the interview applied in this study - To understand the purpose and contents of the cordon and screen line survey - To know the methodology of the survey applied in this study
December 7, 2010	PC Hotel	Evaluation of Mass Transit Corridors in Karachi	<p>[Goals]</p> <ul style="list-style-type: none"> - To share the issues of the existing plan of Mass Transit Corridors in Karachi in view of engineering aspects between KMTC and the JICA Study Team <p>[Objectives]</p> <ul style="list-style-type: none"> - To understand the physical obstacles along the corridors for mass transit system - To understand the evaluation of the corridors by the JICA Study Team - To understand the advantages and disadvantages of each corridor
January 27, 2011	PC Hotel	Approach of Demand Forecast by JICA-STRADA	<p>[Goals]</p> <ul style="list-style-type: none"> - To understand the coverage area and the approach of demand forecast applied in this study <p>[Objectives]</p> <ul style="list-style-type: none"> - To understand the precondition and limitation of the demand forecast in this study - To understand concept of the demand forecast model in this study - To understand the outline of JICA STRADA
9 March, 2011	PC Hotel	Introduction of Mass Transit System in Japan	<p>[Goals]</p> <ul style="list-style-type: none"> - To get fresh information about the mass transit system in Japan, and share the same image of "mass transit system" between KMTC and the JICA Study Team <p>[Objectives]</p> <ul style="list-style-type: none"> - To know the characteristics and category of mass transit system in Japan - To understand transit capacity by transit system

Source: JICA Study Team

Figure A2-2-1 Picture of Workshops

1st Workshop



1st Workshop



2nd Workshop



2nd Workshop



3rd Workshop



3rd Workshop



4th Workshop



4th Workshop

Photo: JICA Study Team

2.1.2 Scheduled Workshop

The other three workshops will be held as shown in Table A2-2-2.

Table A2-2-2 Scheduled of Workshops

Title	Goals and Objectives
Evaluation of Transportation Project	[Goals] - To enable to explain the reason of priority in the master plan [Objectives] - To understand the alternatives in the environmental consideration - To understand the methodology of economic evaluation of transportation project - To know the initial evaluation of the master plan by the JICA Study Team
Engineering Aspect of the Priority Project	[Goals] - To understand the proposed system in the feasibility study, and to enable to explain why such system is selected [Objectives] - To know the proposed technology, system, construction method and other engineering aspects of the project in the F/S - To understand the reason of the selection
Database Management and Update	[Goals] - To enable to update the study by KMTC after the completion of the study [Objectives] - To know the contents of the database prepared by the JICA Study Team - To understand how to update the data

Source: JICA Study Team

3. GIS Training

As a part of the capacity building, the JICA Study Team held a GIS training for four CDGK officers on 25th October, 2010. In the 2-hours training course, participants learned the basic concept of Graphical Information System (GIS) and different samples of GIS analysis of the Karachi city transport planning as a case. These samples are on (1) Working with Satellite image, (2) Editing Corridors Map, (3) Analysis of Population distribution, and (4) Analysis of Hinterland of CNG gas station.

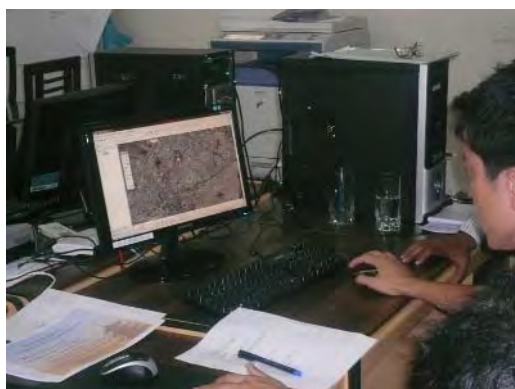


Photo: JICA Study Team



Following the GIS training above, an intensive training course was provided by the JICA Study Team to five CDGK officers from 30th May to 11th June 2011. They have attended total 24 hours GIS Training. This course was in collaborated with the local company "ER Solutions".

The course outline is as follows.

Table A2-3-1 Course outline of GIS Training

Title	Outline
1. Introduction to GIS	<ul style="list-style-type: none"> - What is GIS? - Task you perform with Arc GIS - Unique Projects to daily business
2. Exploring Arc Catalog	<ul style="list-style-type: none"> - Introducing Arc Catalog - Viewing data in Arc Catalog - Connecting to your data - Exploring data and adding it to a map - Managing a dataset
3. Introducing Arc Map	<ul style="list-style-type: none"> - Working with maps - Moving around the map - Adding existing features from a dataset - Create new features - Changing the way features are drawn
4. Exploring Database	<ul style="list-style-type: none"> - Working with an attribute tables - Adding data into an attribute tables - Importing tables from tables - Adding x-y data to a map - Converting x-y data (GPS survey data) into point features - Joining external tables to layers attribute table
5. Queries (SQL)	<ul style="list-style-type: none"> - Select by attribute - Select by location
6. Planning a GIS Project	<ul style="list-style-type: none"> - The steps in a project - Planning your project
7. Assembling the database	<ul style="list-style-type: none"> - Organizing the project database - Adding data to the project folder - Previewing data in Arc Catalog - Examining the data in Arc Map - Clearing up the Catalog tree
8. Preparing data for Analysis	<ul style="list-style-type: none"> - Setting up for analysis - Analysis techniques - Reviewing the analysis results
9. Presenting the Result	<ul style="list-style-type: none"> - Designing the map - Setting up the map page - Creating the map of analysis result - Adding the map elements - Saving the map and printing
10. Data Convert	<ul style="list-style-type: none"> - Working on Auto CAD MAP 3D - Import Data from Shape field - Annotation(Display data) on Map 3D - Add fields / fields value on Map 3D - Export DWG data into Shape file format

Source: Lecture material of ER Solutions

The participants can obtain an adequate knowledge of not only the basic operation of GIS but also creation and management of database with GIS.

Figure A2-3-1 Picture of GIS Training

Photo: JICA Study Team

4. On the Job-Training

4.1 Network Building in JICA STRADA

Network building is one of the important components in demand forecast. Road network and transit route network have been developed using GIS software and JICA-STRADA. The JICA Study Team assign a part of the network building task to CDGK staff and train them how to make network model in demand forecast. The output of the network has been used for the demand forecast in KTIP.

4.2 Railway Planning

During the study period, CDGK staff asked various question about railway planning such as route alignment, underground structure, and train operation. The members of the JICA Study Team responded to the questions and explain engineering aspects from their experiences.

APPENDIX-3 UC BOUNDARY MAP

1. Confirmation of UC Boundaries

1.1 Necessity of Administrative Boundary Map

Traffic zones are the basic units for transportation planning, representing origins and destinations in origin-destination (OD) matrices. In most cases, traffic zones conform to the existing administrative units because statistics of the basic socio-economic data such as population, which are very essential data for transportation planning, are usually available by administrative unit.

Union Council (UC) Administration was selected as the unit of traffic zone in KTIP.

A boundary map of UCs is an essential material for the Household Interview Survey, because sample households in each UC should be selected so that the total number of samples meets the necessary number of samples calculated by UC. In addition, the boundary map is necessary because the addresses or landmarks taken in the household interviews should be coded as traffic zones.

1.2 Available Maps for UC Boundaries

It appeared that UC boundary maps would be available in the beginning of the study, because administrative jurisdiction of UC is the very basic information of each Town, which is under the administration of CDGK.

There are three sources identified for the UC boundaries: 1) Person Trip Survey in 2005, 2) sector report of KSDP, and 3) Population Census Organization (PCO).

The first source was the person trip survey in 2005 by JICA, in which UCs were used for its traffic zone system. The JICA Study Team obtained a GIS data of the person trip survey in 2005 from the local consultant which conducted the survey, and started sub-zoning work using the data.

The second source was CDGK. Master Plan Group Office (MPGO) furnished the JICA Study Team with copies of Town maps in a sector report in KSDP-2020 on 21st May, 2010. Although this was the future land use map, the existing UC boundaries were illustrated. Since the map was a part of the official CDGK document, this appeared to be more accurate than the first map which was just prepared by a private company. The JICA Study Team received a GIS data of the UC boundary from MPGO on 10th June, 2010. The GIS data was modified because it did not fit the satellite images.

The last source was PCO. The JICA Study Team visited PCO to collect population data in 1998 Census and purchased 18 Town maps from PCO on 5th July, 2010. PCO has maps of Charges and Circles, which were the previous administrative units until 2001 when the present Town-UC system was applied. If the boundaries of UCs have not changes since then, the Town maps of PCO appears to be most reliable. However, roads and landmarks in the maps were very old and it was very difficult to identify the boundary on the satellite image.

There were many contradictions between the two official maps. The location, shape, and size of UCs in some Towns were quite different.

1.3 UC Boundary Confirmation Works

1.3.1 Town Maps of CDGK

To prepare proper boundary map, a meeting was held on 12th August, 2010 to discuss the issue of UC boundary, where 11 Town maps were provided by CDGK to the JICA Study Team as official maps. These maps were compared with maps of Population Census Organization (PCO), and four maps were found to be acceptable because there are few differences from PCO maps. There is unclear area in the map of Jamshed Town but it was confirmed by site visit. These town maps (North Nazimabad, New Karachi, Gulberg, Liaquatabad, and Jamshed) became available for the work plan of Household Interview Survey (HIS) in the end of August, and therefore the JICA Study Team could start the HIS on 5th September, 2010 from these five towns. On the other hand, the UC boundaries of Orangi, SITE and Keamari had not been clarified until the end of November.

1.3.2 Meetings with Town Administrators

Since the town maps of Keamari, Bin Qasim, and Gadap Towns were not furnished from CDGK, the JICA Study Team visited these Towns to confirm the UC boundary. Although these towns were busy in managing camps of flood refugees, the meetings with these towns were successful. In addition, the JICA Study Team had a meeting with Baldia, Gulshan-e-Iqbal, and Shah Faisal Town to confirm UC boundaries. The boundary of SITE Town and SITE Limited was identified in several meetings with SITE Town and SITE Limited.

Table A3-1-1 List of visits to Towns for UC boundary confirmation

Town	Date	Remark
01 Kimari	31 st August, 2010	Site visit to Bhutta Village with the town officers was conducted on 15 th September.
02 S.I.T.E Town	10 th , 11 th , 12 th , and 15 th September, 2010	It was found that SITE Limited is not under jurisdiction of CDGK.
03 Baldia Town	29 th September, 2010	UC map was prepared by the JICA Study Team and sent to Baldia Town for the confirmation.
04 Orangi Town	24 th November, 2010	Orangi UC map of CDGK found to be correct.
08 Gulshan-e-Iqbal Town	23 rd September, 2010	Site visit with the administrator was conducted to confirm the boundary with Malir cantonment on 24 th September.
09 Shah Faisal Town	30 th September, 2010	The boundary map of CDGK was corrected in the meeting using the image of Google Earth.
17 Bin Qasim Town	30 th August, 2010	A Town map was provided by Bin Qasim Town.
18 Gadap Town	1 st September, 2010	The boundaries of UCs in Gadap Town were drawn on the image of Google Earth.

Source: JICA Study Team

1.3.3 UC maps of Population Census Organization

Population Census Organization (PCO) has Town maps and Union Council maps produced by the organization itself. The UC maps are more detail than the Town maps. The boundaries could be drawn on the satellite images only if the roads in the maps were clearly identified.

However, in many cases, it was difficult to identify the roads in the maps on the satellite images because the scales and shapes of these maps were not correct.

PCO had maps of Circles and Charges, which are the previous administrative units. Since the corresponding Circles and Charges to each Union Council were declared in the notification (Karachi, the 21st May, 2001), the boundaries of Union Councils would be clear if the maps of Circles and Charges contain enough information to identify the roads and streets. Since these were schematic (not to scale) maps and information was old, it was also difficult to identify the boundaries using these maps. Nevertheless, UC maps of PCO were most useful materials to confirm UC boundaries.

1.3.4 Boundary in Cantonments

To collect information of the administrative boundary in each cantonment, the JICA Study Team visited each cantonment with officers of KMTC and local consultant.

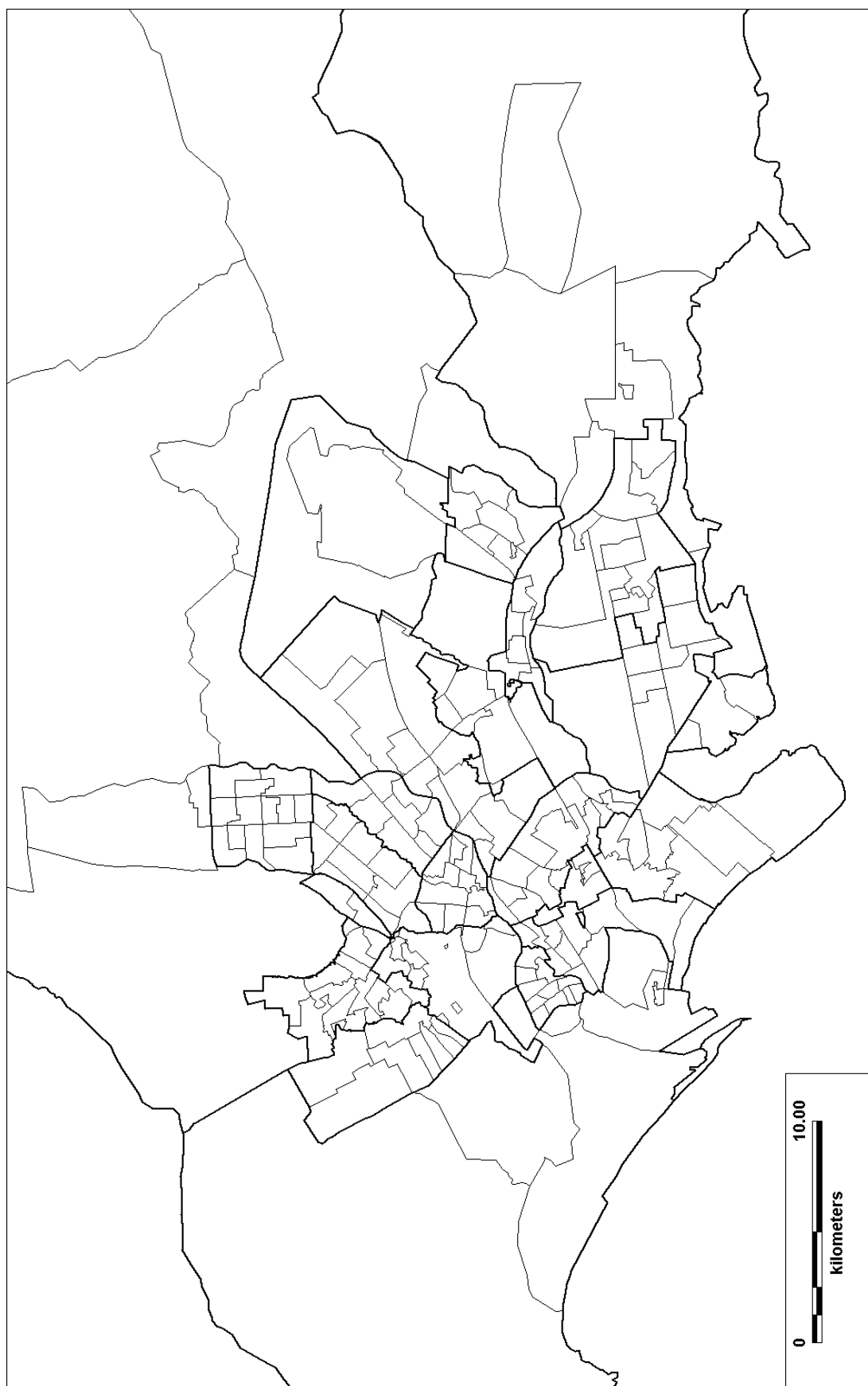
Table A3-1-2 List of visits to Cantonments for Administrative Boundaries

Cantonment	Visit	Data Collection	Boundary
Military Land and Operation	2 nd July, 2010	Request for data collection from each cantonment	-
Karachi Cantonment	21 st July, 2010	Plan of Karachi Cantonment	- There are 4 wards (proposed)
Malir Cantonment	22 nd July, 2010	Plan of Malir Cantonment Presentation Paper (2 pages) Memo (2 pages)	- There is only one ward - Military area and civil area
Clifton Cantonment	29 th July, 2010	Presentation Paper (2 pages) No. of units per street (16)	- Wards are not designated. - DHA Phasing is the base zone - Population= 182,489 (98 Census) - Population= 250,000 (present)
Korangi Cantonment	28 th July, 2010	Presentation Paper (2 pages) Memo (1 page) Guide Map of Battahi Colony Plan of Cantonment Board Korangi Creek	- Battahi Colony (20,000 pop*) - Industrial Area - PAF (15,000 pop*) * 1998 Census Present population is estimated as 70,000 in total.
Faisal Cantonment	9 th August, 2010	Map of Cantonment	- Sector I, II, III, IV - Restricted Area
Manora Cantonment	9 th August, 2010	Map of Cantonment	-

Source: JICA Study Team

1.3.5 Site Visit

The best way to confirm the boundary is to visit the place and ask the residents about the jurisdiction of the area, and the JICA Study Team visited some places where its jurisdiction was not clear. The visited sites are: Sector "A" Akhtar Colony, Qayyumabad, A triangle area near KPT Park, Karachi Zoological, Garden West Area, Lea Market, Old Haji Camp, City Railway Colony, Sultanabad, Bhutta Village, Millat Garden, a boundary between Gulshan-e-Iqbal and Malir cantonment, etc. In some cases, Union Council officers helped us to confirm the jurisdiction.



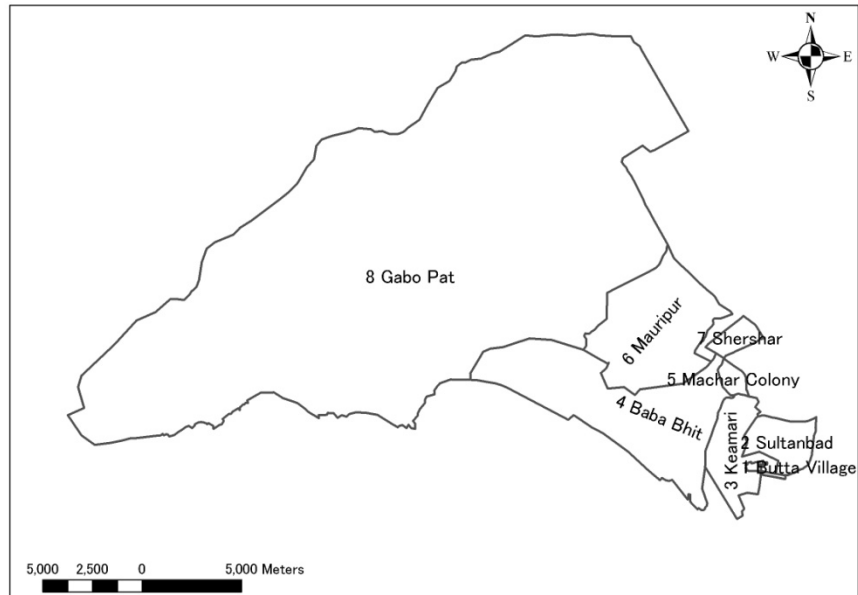
Source: JICA Study Team

Figure A3-1-1 UC Boundary Map

2. UC Boundary Maps

The following figures are the results of UC boundary maps for 18 Towns and 6 cantonments.

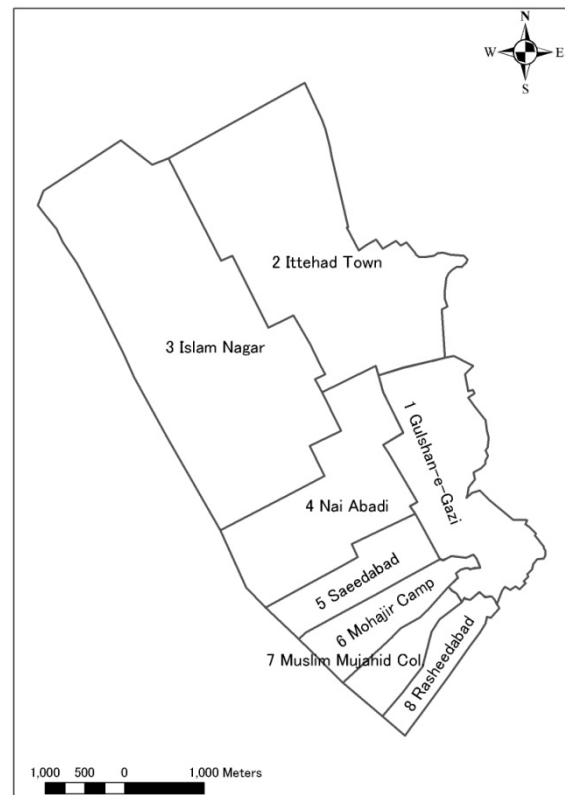
1. Keamari



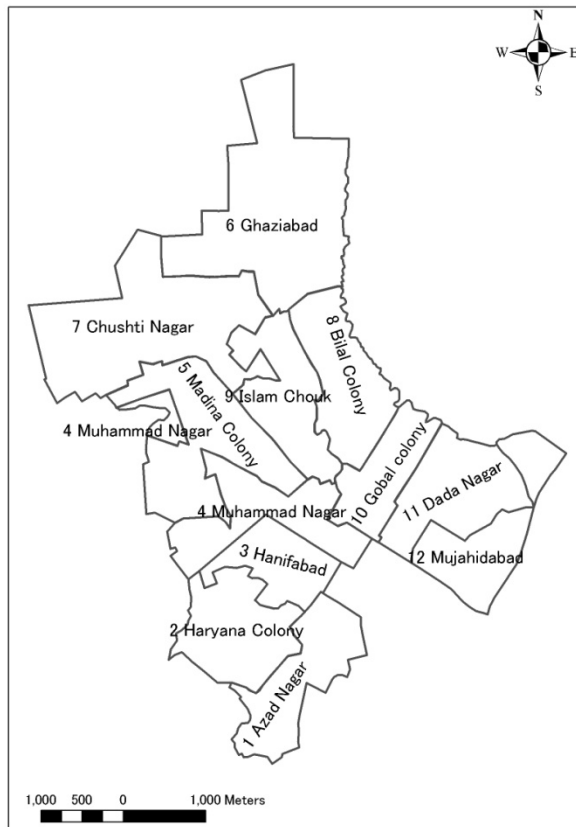
2. S.I.T.E



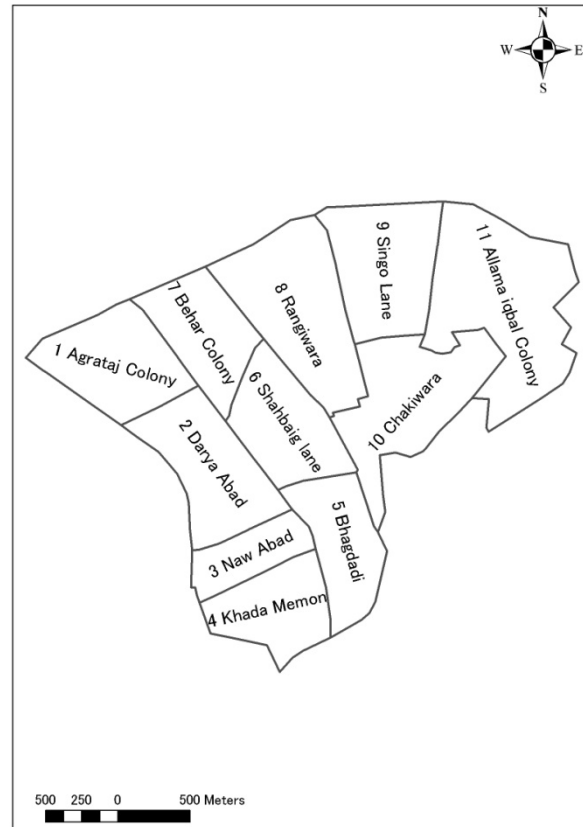
3. Baldia



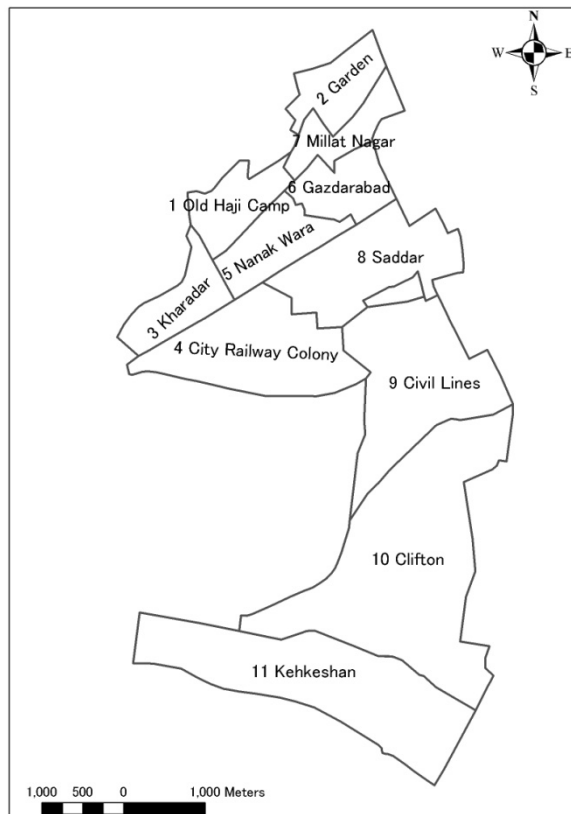
4. Orangi



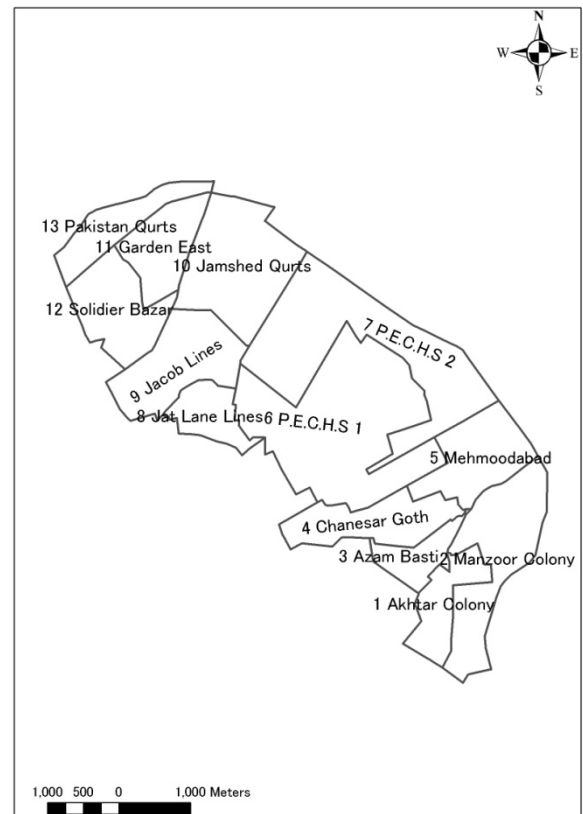
5. Lyari



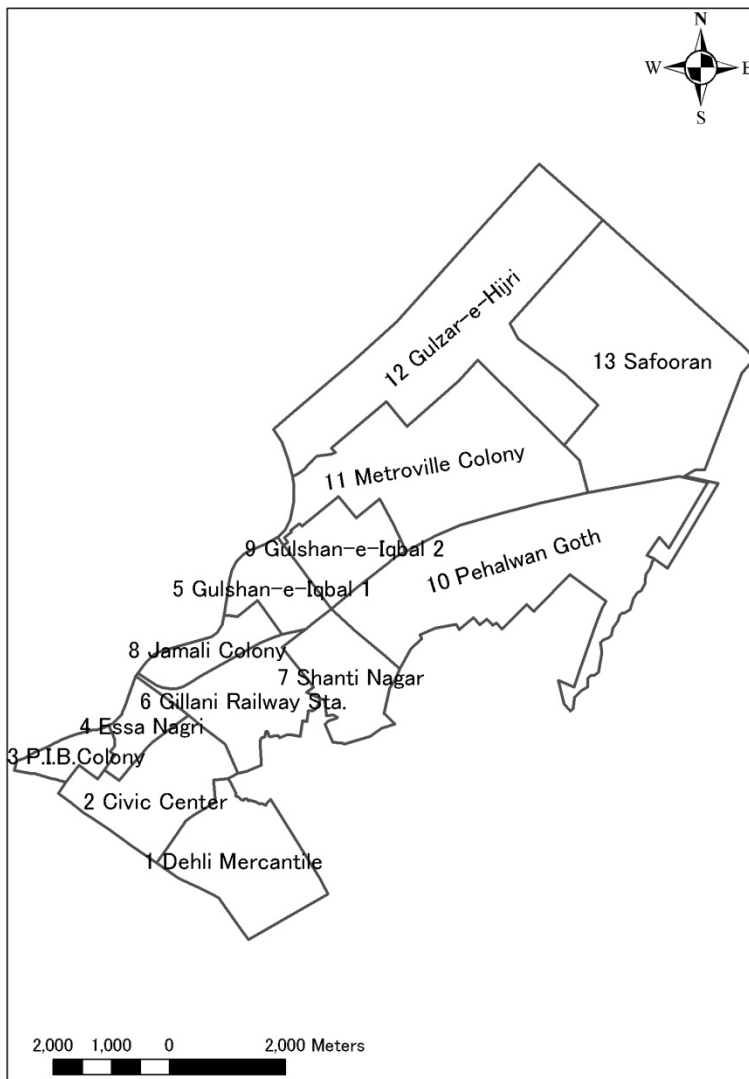
6. Saddar



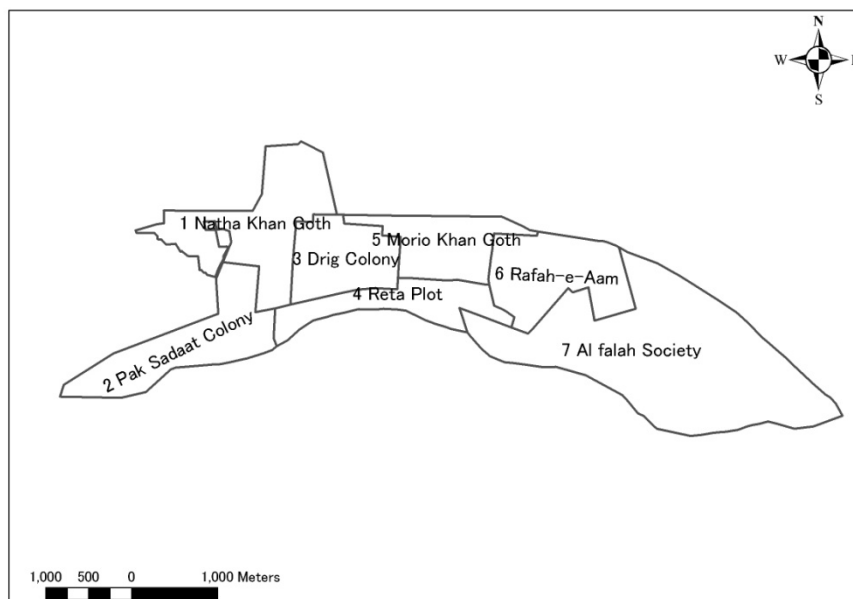
7. Jamshed



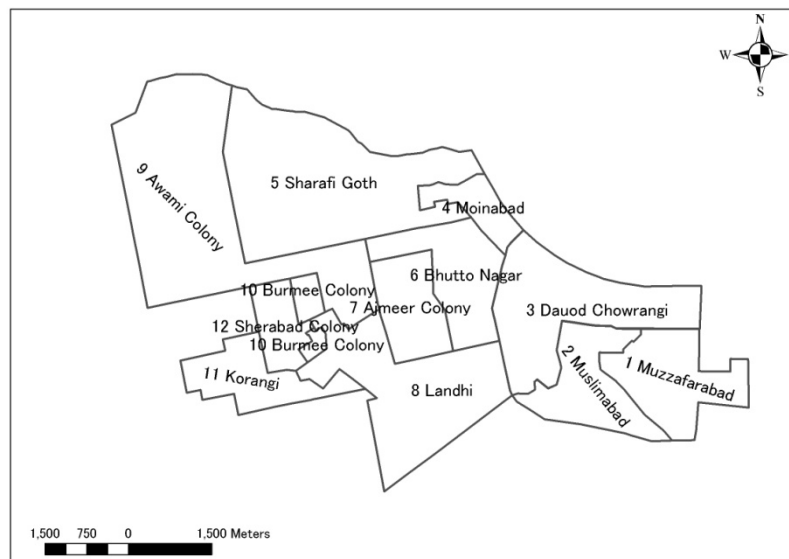
8. Gulshan-e-Iqbal



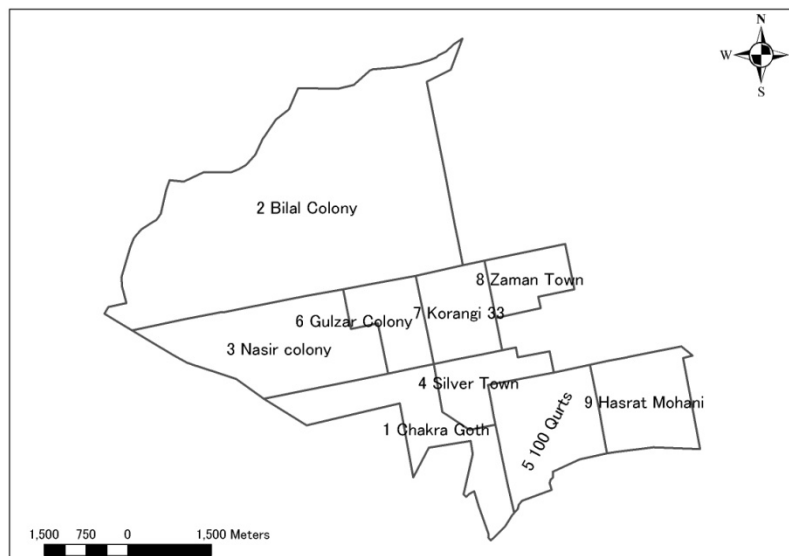
9. Shah Faisal



10. Landhi



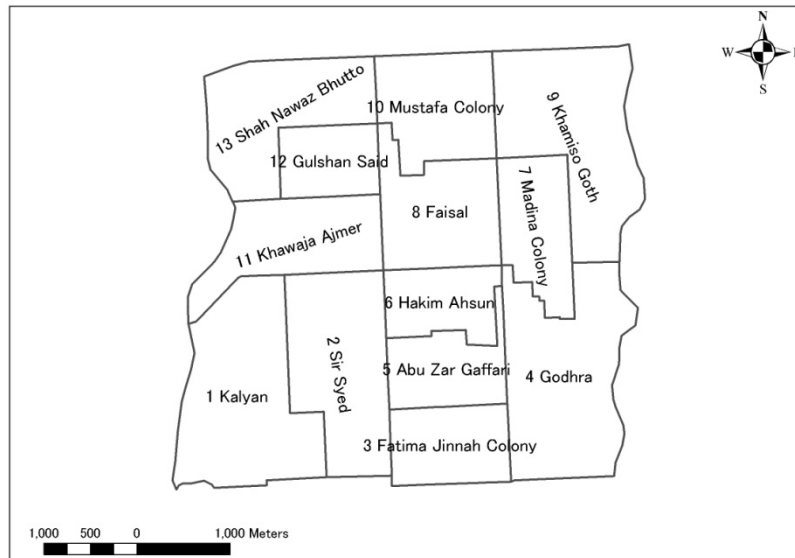
11. Korangi



12. North Nazimabad



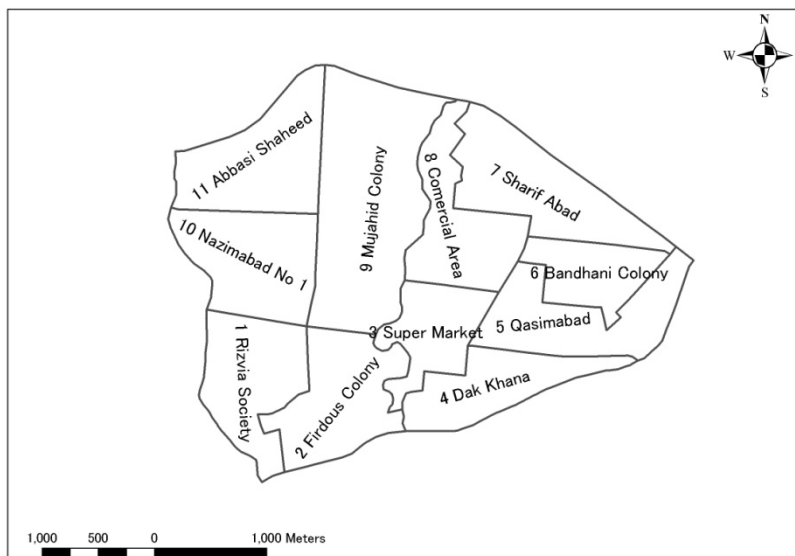
13. New Karachi



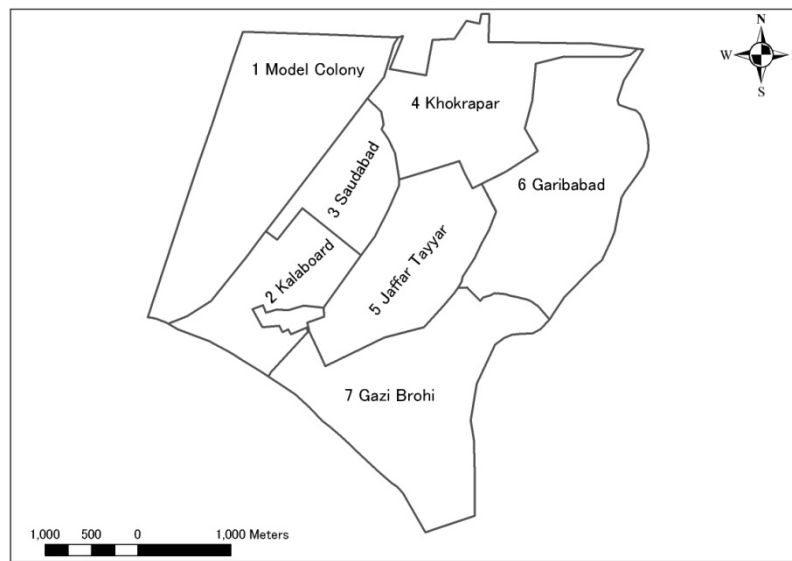
14. Gulberg



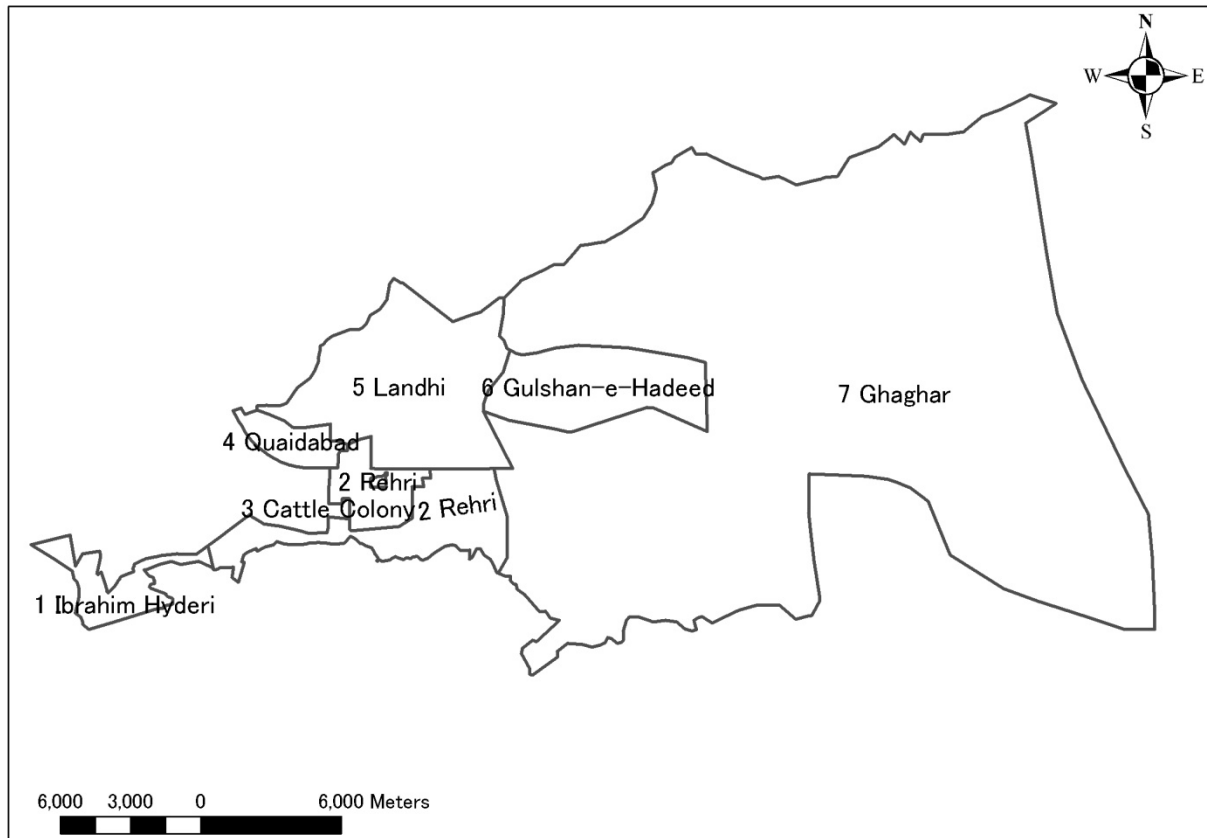
15. Liaquatabad



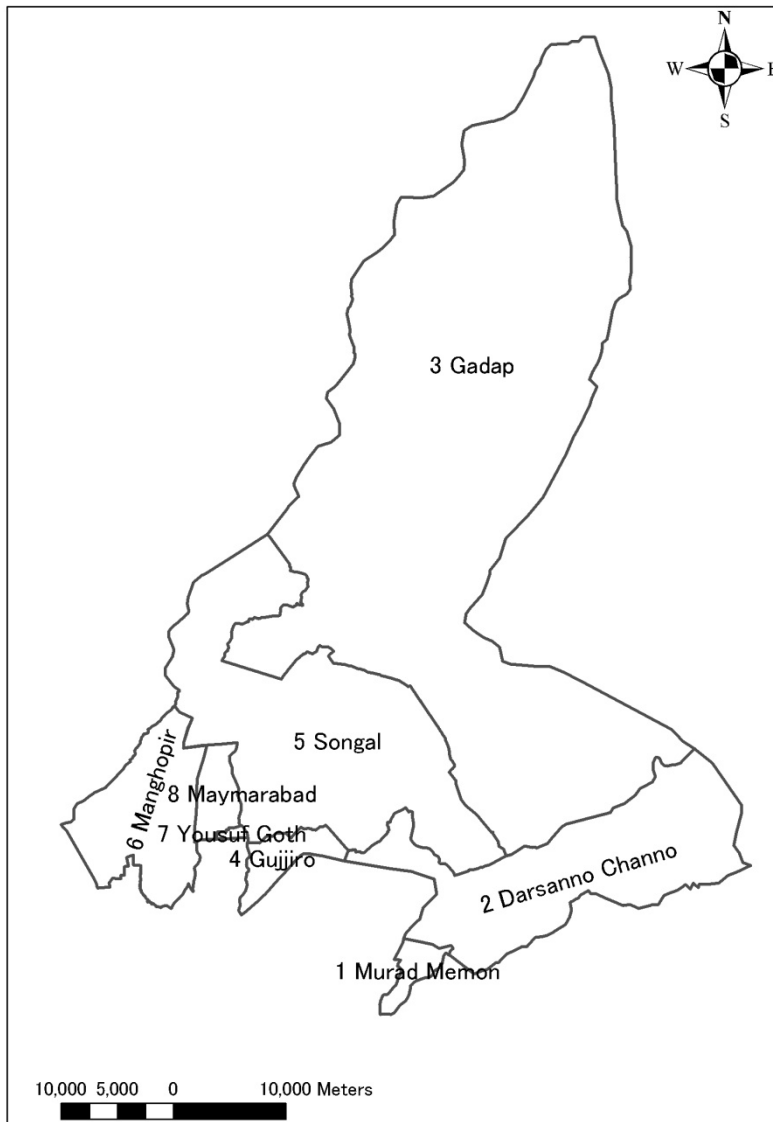
16. Malir



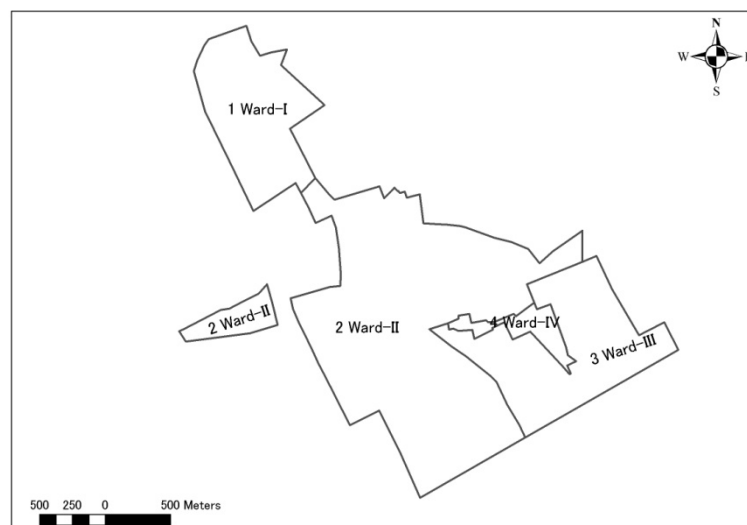
17. Bin Qasim



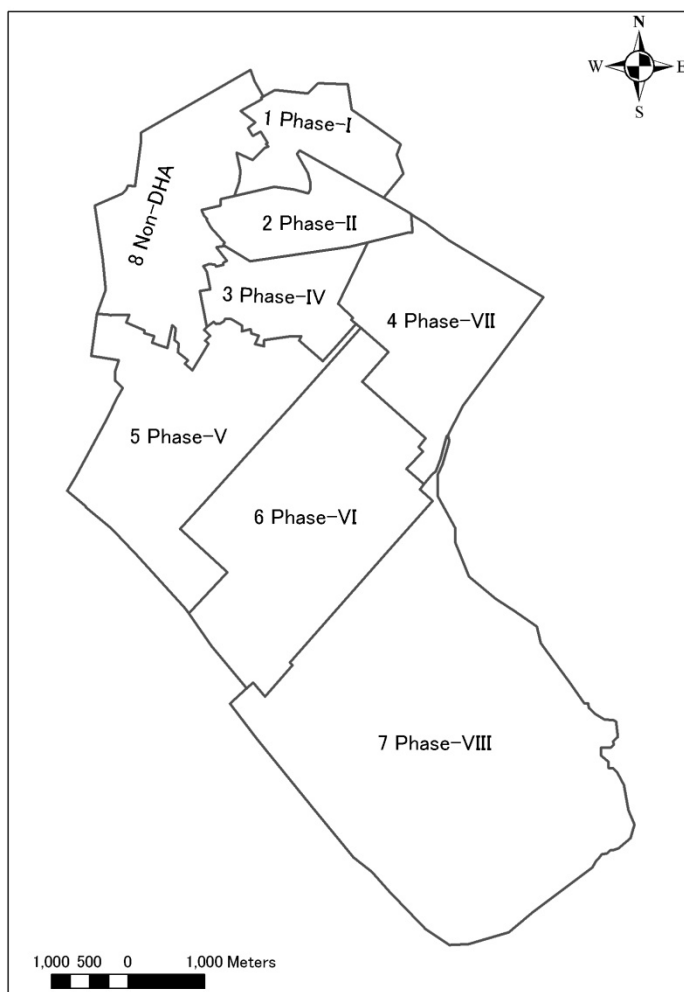
18. Gadap



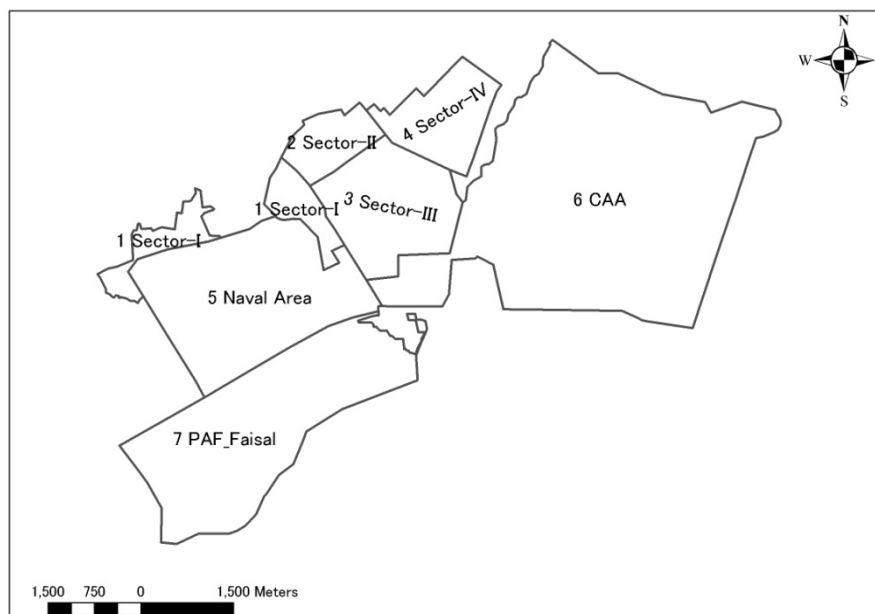
19. Karachi Cantonment



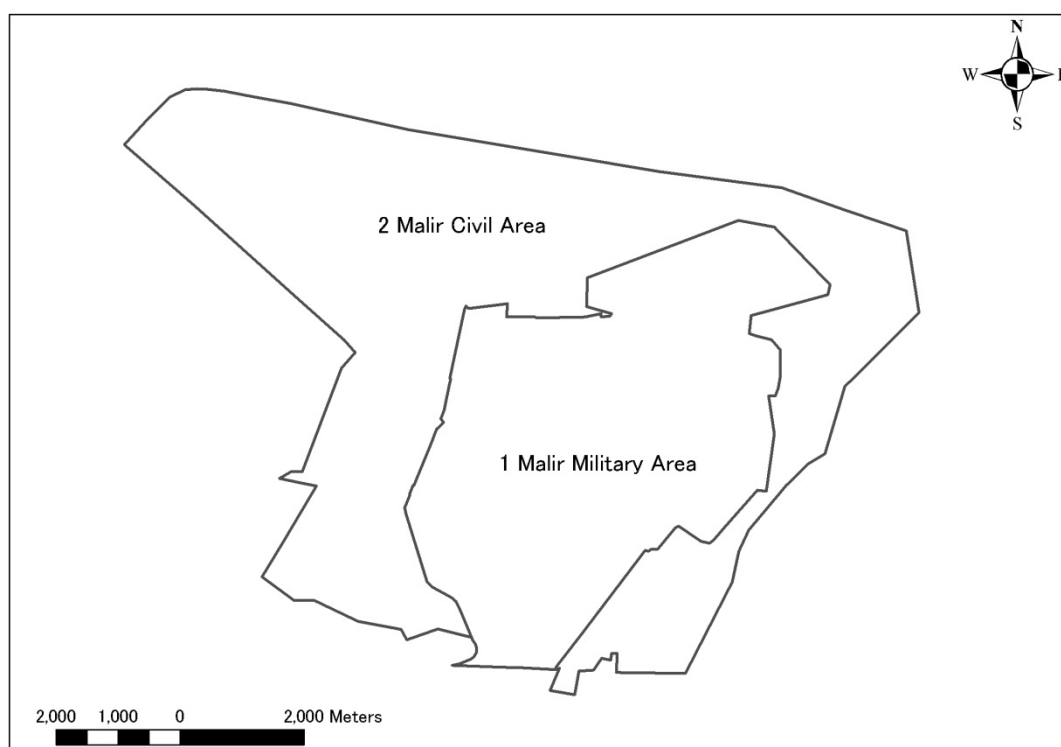
20. Clifton Cantonment



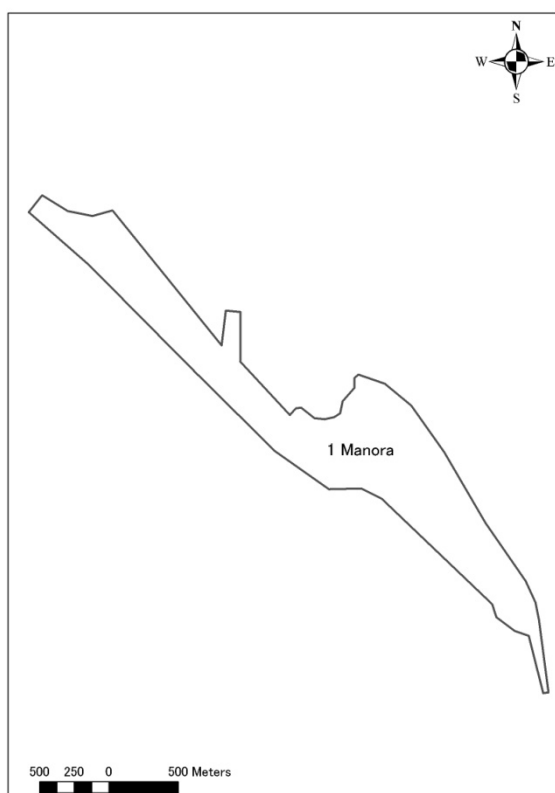
21. Faisal Cantonment



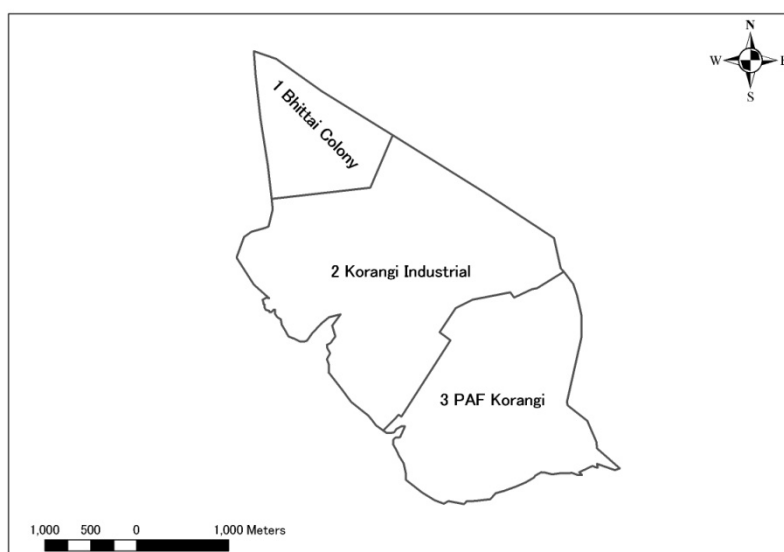
22. Malir Cantonment



23. Manora Cantonment



24. Korangi Cantonment



Source: JICA Study Team

APPENDIX – 4 TRAFFIC SURVEYS

1. Household Interview Survey

1.1.1 Traffic Zone System

In this study, origins and destinations are coded into 267 zones.

(1) Karachi and External Zones

In the HIS, samples were selected from the residents in Karachi. Although most trips by the residents in Karachi are generated inside Karachi, there are a large number of trips between Karachi and other area of Karachi. For those trips between inside and outside of Karachi, the following external zones were prepared in this Study.

- Province of Sindh (excluding Karachi)
- Province of Punjab
- Province of Balochistan
- Other provinces in Pakistan
- India
- Afghanistan
- Other countries

In the external zoning, the province of Sindh was subdivided into 23 Districts, in which Thatta was further subdivided into 9 tehsils. Thatta and Karachi adjoin each other. Since there are two highways (National Highway and Super Highway) between Karachi and other districts of Sindh, tehsil level information is needed.

The province of Punjab was subdivided into 1) Islamabad, 2) Lahore, and 3) Others, while the province of Balochistan was subdivided into 1) Quetta and 2) Others. Other provinces in Pakistan consisted of 1) FATA, 2) Khyber Pakhtunkwa, and 3) Azad Kashmir/Kashmir.

There was no subdivision for India, Afghanistan, and Other countries.

The total number of the external zones was 41 (excluding dummy zone of Karachi).

(2) Town and Cantonment

There are 18 Towns and 6 cantonments in Karachi. Population of a Town ranges from about 500,000 to 1,000,000, while those of cantonments are less. These 24 administrative units were considered as zones at the same level (Town Level). Although Manora Cantonment was too small as a Town Level, an independent zone was given to this cantonment instead of merging the cantonment to Keamari Town in order to maintain consistency with socio-economic analysis.

(3) UC, Ward, Sector and Phase

Union Council (UC) Administration was the basic unit of the traffic zone in this study. This is the minimum unit of official statistics of population. Population of a UC varies from 30,000 to 100,000. There are 178 UCs in Towns.

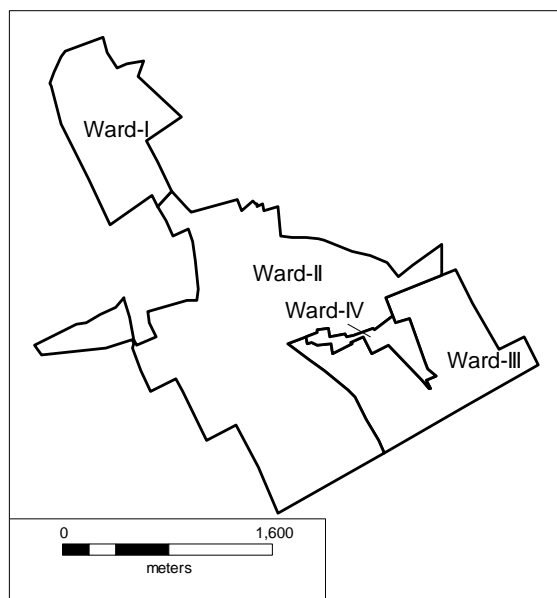
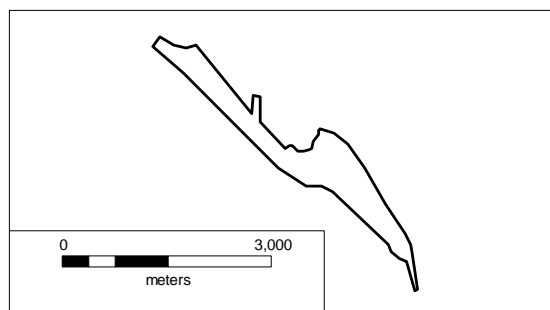
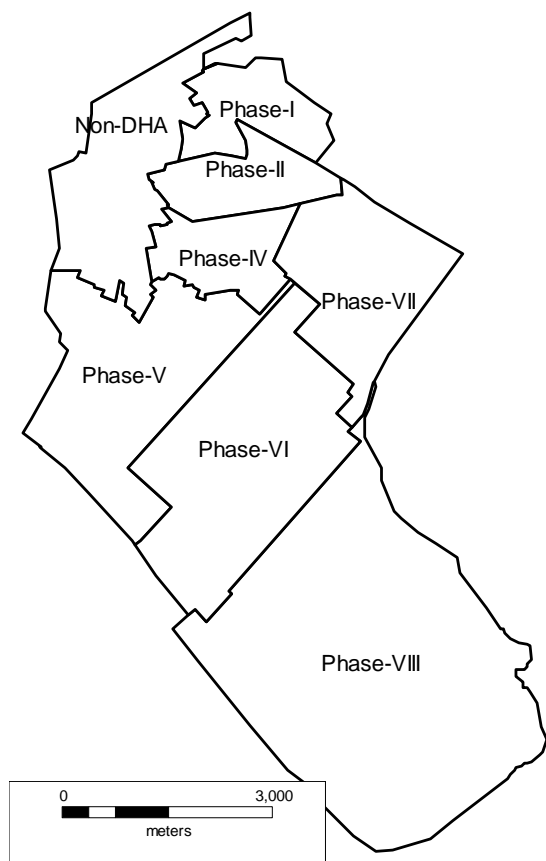
Union Council is the administrative unit of Towns, while cantonments, which are out of jurisdiction of CDGK, apply the different administrative system in each cantonment. For

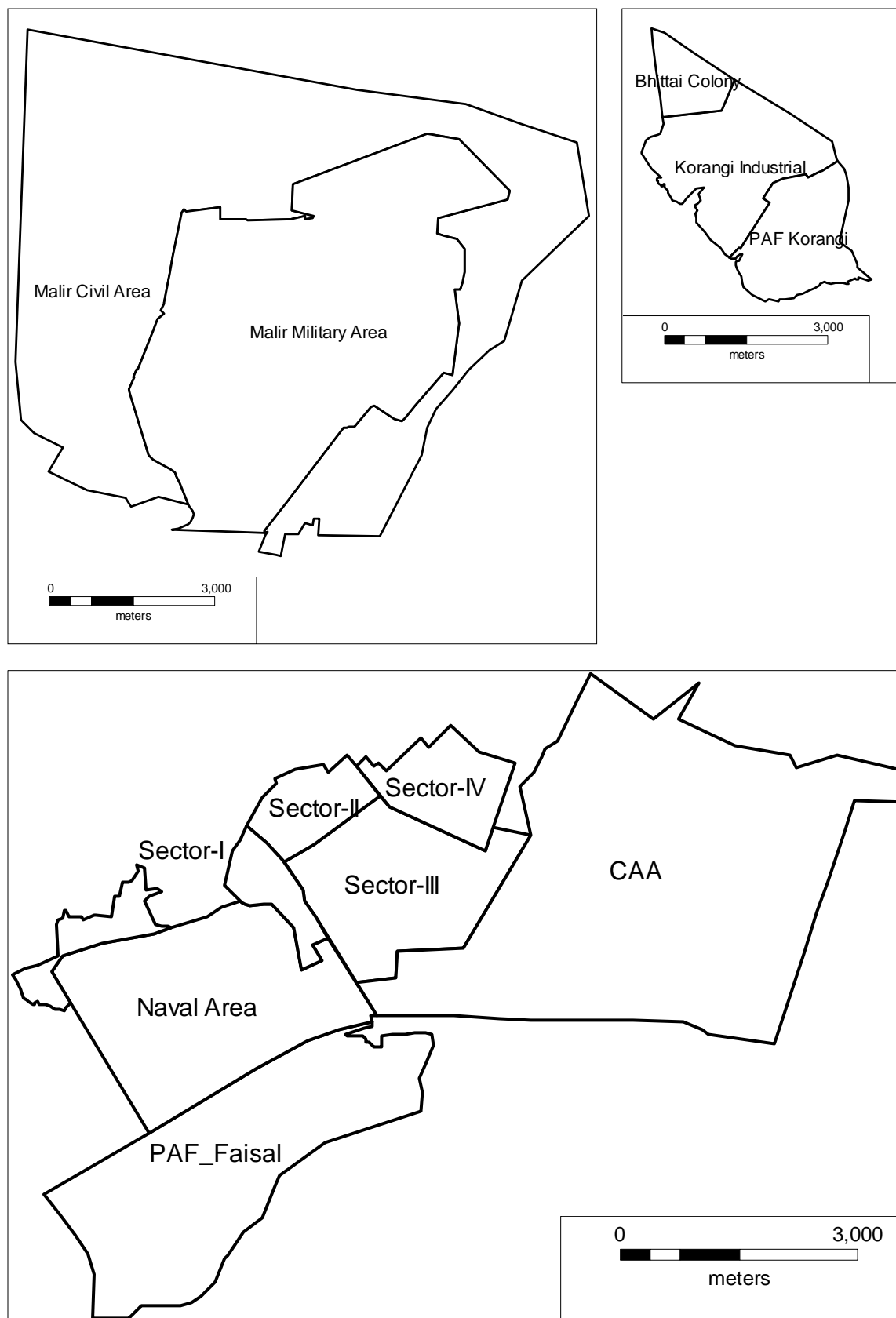
example, Clifton Cantonment consists of DHA Phases while Faisal Cantonment consists of Sectors and other areas. Karachi Cantonment has a plan to introduce Wards. From the administrative system, each cantonment was divided into several zones which corresponded to UCs as shown in Table A4-1-1.

Table A4-1-1 Subdivision System of Cantonments in Karachi City

No.	Name of Cantonment	Subdivision	No. of zones
1	Clifton	DHA Phases (seven in total) + Other area	8
2	Faisal	Sector I, II, III, IV, Airport Area, Naval Area, PAF Area	7
3	Malir	Military Area and Civil Area	2
4	Korangi	Residential Area, Industrial Area, and PAF Area	3
5	Karachi	Proposed four wards	4
6	Manora	-	1
Total			25

Source: Hearing from each cantonment





Source: Illustrated by the JICA Study Team based on cantonment maps provided by Karachi Cantonment Board, Clifton Cantonment Board, Manora Cantonment Board, Faisal Cantonment Board, Korangi Cantonment Board, and Malir Cantonment Board

Figure A4-1-1 Subdivision System of Cantonments in Karachi

(4) Survey Zone

UCs (Sub-UCs) were further subdivided into “Survey Zones”. The Survey Zones were not coded and recorded in the output of the HIS. It was prepared only for the survey purpose. To ensure the randomness of the location, the sample households were selected over an UC dispersedly. This was achieved by allocating the number of samples to be collected to a subdivided zone of each UC.

Table A4-1-2 Zone Code (1)

Town	UC	No.	Town	UC	No.	Town	UC	No.
01 Keamari Town	01 Bhutta Village	1	07 Jamsheed Town	01 Akhtar Colony	62	13 New Karachi Town	08 Shadman	123
	02 Sultanabad	2		02 Manzoor Colony	63		09 Buffer Zone 1	124
	03 Kiamari	3		03 Azam Basti	64		10 Buffer Zone 2	125
	04 Baba Bhit	4		04 Chanisar Goth	65		01 Kalyrai	126
	05 Machar Colony	5		05 Mehmooda Abad	66		02 Sir Syed	127
	06 Maripur	6		06 P.E.C.H.S 1	67		03 Fatima J. Colony	128
	07 Shershah	7		07 P.E.C.H.S 2	68		04 Godhra	129
	08 Gabo Pal	8		08 Jat Land Lines	69		05 Abuzar Ghaffari	130
02 Site Town	01 Pak Colony	9		09 Jacob Line	70		06 Hakim Ahsan	131
	02 Old Golimar	10		10 Jamshaid Qtrs	71		07 Madina Colony	132
	03 Jahanabad	11		11 Garden East	72		08 Faisal	133
	04 Metroville	12		12 Solder Bazar	73		09 Khamsio Goth	134
	05 Bawany Chawl	13		13 Pakistan Qtrs	74		10 Mustafa Colony	135
	06 Frontier Colony	14	08 Gulshan-e-Iqbal Town	01 Delhi Mercantile Society	75		11 Khwaja Ajner	136
	07 Banaras Colony	15		02 Civic Center	76		12 Gulshan Sind	137
	08 Qasba Colony	16		03 P.I.B Colony	77		13 Shah N. B. Colony	138
	09 Islamia Colony	17		04 Essa Nagri	78	14 Gulberg Town	01 Azizabad	139
	10 Site Limited	18		05 Gulshan-e-Iqbal 1	79		02 Karimabad	140
03 Baldia Town	01 Gulshan-e-Ghazi	19		06 Geelani Railway Station	80		03 Aisha Manzil	141
	02 Ittehad Town	20		07 Shanti Nagar	81		04 Ancholi	142
	03 Islam Nagar	21		08 Jamali Colony	82		05 Naseerabad	143
	04 Nai Abadi	22		09 Gulshan-e-Iqbal 2	83		06 Yaseenabad	144
	05 Saeed Abad	23		10 Pehlwan Goth	84		07 Water Pump	145
	06 Mahajir Camp	24		11 Metroville Colony	85		08 Shafiq Mill Colony	146
	07 Muslim Mujahid Colony	25		12 Gulzar-e-Hijri	86	15 Liaquatabad Town	01 Rizvia Society	147
	08 Rasheed Abad	26		13 Safooran Goth	87		02 Firdous Colony	148
04 Orangi Town	01 Azad Nagar	27	09 Shah Faisal Town	01 Natha Khan Goth	88		03 Super Market	149
	02 Haryana Colony	28		02 Pak Saadat Colony	89		04 Dak Khana	150
	03 Hanifa Abad	29		03 Drigh Colony	90		05 Qasimabad	151
	04 Mohammad Nagar	30		04 Reta Ploat	91		06 Bhandara Colony	152
	05 Madina Colony	31		05 Morio Khan Goth	92		07 Sharif Abad	153
	06 Ghazia Abad	32		06 Rafah-e-Aam	93		08 Commercial Area	154
	07 Chushti Nagar	33		07 Al-Falah Society	94		09 Mujahid Colony	155
	08 Bilal Colony	34	10 Landhi Town	01 Muzzafar Abad	95		10 Nazimabad No. 1	156
	09 Islam Chouk	35		02 Muslim Abad	96		11 Abbassi Shaheed	157
	10 Gabol Colony	36		03 Dauod Chowrangi	97	16 Malir Town	01 Model Colony	158
	11 Data Nagar	37		04 Moin Abad	98		02 Kala Board	159
	12 Mujahid Abad	38		05 Sharafi Goth	99		03 Saudabad	160
	13 Baloch Goth	39		06 Bhutto Nagar	100		04 Khokrapar	161
05 Lyari Town	01 Agrataj Colony	40		07 Ajmer Colony	101		05 Jaffar Tanyar	162
	02 Darya Abad	41		08 Landhi	102		06 Garibabad	163
	03 Naw Abad	42		09 Awami Colony	103		07 Gazi Brohi	164
	04 Khada Memon	43		10 Burmee Colony	104	17 Bin Qasim Town	01 Ibrahim Hyderi	165
	05 Baghdadi	44		11 Korangi	105		02 Rehri	166
	06 Shah Baig Lane	45		12 Sherabad Colony	106		03 Cattle Colony	167
	07 Behar Colony	46	11 Korangi Town	01 Bilal Colony	107		04 Quidabad	168
	08 Rangi Wara	47		02 Nasir Colony	108		05 Landhi	169
	09 Singo Lane	48		03 Chakra Goth	109		06 Gulshan-e-Hadeed	170
	10 Chaki Wara	49		04 Silver Town	110		07 Ghaghar	171
	11 Allama Iqbal Colony	50		05 100 Quatars	111	18 Gadap Town	01 Murad Memon	172
	01 Old Haji Camp	51		06 Gulzar colony	112		02 Dursanno Channo	173
06 Saddar Town	02 Garden	52		07 Korangi 33	113		03 Gujro	174
	03 Kharadar	53		08 Zouman Town	114		04 Gadap	175
	04 City Railway Colony	54		09 Hasrat Mohani	115		05 Songal	176
	05 Nanakwara	55	12 North Nazimabad Town	01 Paposh Nagar	116		06 Yusuf Goth	177
	06 Gandarabad	56		02 Pahar Gang	117		07 Maymarabad	178
	07 Millat Nagar	57		03 Khandu Goth	118		08 Manghopir	179
	08 Saddar	58		04 Hyderi	119			
	09 Civil Lines	59		05 Sakhi Hassan	120			
	10 Clifton	60		06 Farooq-e-Azam	121			
	11 Khehkesan	61		07 Nusrat B. Colony	122			

Source: JICA Study Team

Table A4-1-3 Zone Code (2)

Cantonment	Administrative Unit	No.	Province/ Area	District/ Area	No.
19 Karachi Cantonment	01 Ward-I	180	25 Sindh Province	01 Badin	205
	02 Ward-II	181		02 Dadu	206
	03 Ward-III	182		03 Ghotki	207
	04 Ward-IV	183		04 Hyderabad	208
20 Clifton Cantonment	01 DHA Phase-I	184		05 Jacobabad	209
	02 DHA Phase-II & III	185		06 Jamshoro	210
	03 Non DHA Area	186		07 Karachi	211
	04 DHA Phase-IV	187		08 Kashmore	212
	05 DHA Phase-V	188		09 Khairpur	213
	06 DHA Phase-VI	189		10 Larkana	214
	07 DHA Phase-VII	190		11 Matari	215
	08 DHA Phase-VIII	191		12 Mirpurkhas	216
21 Faisal Cantonment	01 Sector-I	192		13 Naushahro Firoze	217
	02 Sector-II	193		14 Nawabshah	218
	03 Sector-III	194		15 Qambar Shahdadkot	219
	04 Sector-IV	195		16 Sanghar	220
	05 Navy Area	196		17 Shikarpur	221
	06 PAF Faisal	197		18 Sukkur	222
	07 CAA Area	198		19 Tando Allahyar	223
22 Malir Cantonment	01 Military Area	199		20 Tando Muhammad Khan	224
	02 Civil Area	200		21 Tharparkar	225
23 Manora Cantonment	01 All	201		22 Thatta	226
24 Korangi Cantonment	01 Bhattai Colony	202		23 Umerkot	227
	02 Korangi Industrial Area	203	26 Balochistan Province	01 Quetta	228
	03 PAF Korangi	204		02 Others	229
			27 Punjab Province	01 Islamabad	230
				02 Lahore	231
				03 Others	232
			28 Other Province	01 FATA	233
				02 Khyber Pakhtunkwa	234
				03 Azad Kashmir/ Kasimir	235
			29 India	00 All	236
			30 Afghanistan	00 All	237
			31 Other countries	00 All	238

Source: JICA Study Team

1.1.2 Interview Form

An interview document consists of the following interview forms:

- Household Information
- Member Information
- Trip Information

The number of interview items should be limited to the extent where interviewees do not feel burden to answer the questions.

The following interview items were used in the HIS. The interview forms were prepared in Urdu language so that interviewers can ask interviewees to fill in the form.

Table A4-1-4 Interview Items

Survey Form	Interview Item	Purpose	
		Modeling	Survey
Household Information	1) Name of Interviewee,		✓
	2) Address,	✓	✓
	3) Contact number,		✓
	4) The number of household members,		✓
	5) The total monthly income	✓	
Member Information (for all household members above 5 years of age)	1) Age,	✓	✓
	2) Gender,	✓	✓
	3) Occupation,	✓	
	4) Sector/ Field,	✓	
	5) Employment,	✓	
	6) Education,	✓	
	7) Location of work place/ school	✓	
	8) Car License,	✓	
	9) Car ownership (including car type)	✓	
Trip Information (for all household members above 5 years of age)	1) Purpose for Trip	✓	
	2) Origin (address, type of origin, departure time)	✓	
	3) Destination (address, type of origin, arrival time)	✓	
	4) Transport mode	✓	
	5) Transfer (address or place)	✓	

Source: KTIP

The JICA Study Team and KMTC held several meetings about the HIS in July 2010 to finalize the interview forms in consultation with the survey company (Exponent Engineers) and AERC (Applied Economics Research Centre, University of Karachi).

In the course of the discussion, “Job” was separated into “Sector/ Field” and “Employment”. The item of “Employment” represents the status of a person such as 1) workers in the government sector, 2) workers in semi government sector, 3) workers in private sector, 4) retired, 5) unemployment, 6) housewife, and 7) others. The item of “Education” was also added to the interview forms.

The survey forms are shown in Figure A4-1-2, A4-1-3, and A4-1-4. Table A4-1-5 shows the categories and codes for the interview forms.

HOUSEHOLD INTERVIEW SURVEY

$$\boxed{}\boxed{} - \boxed{}\boxed{} - \boxed{}\boxed{} - \boxed{}\boxed{} - \text{Not Applicable}$$

فارم نمبر ۱: گھرانے کی معلومات

1۔ گھرانے کے سربراہ کا نام _____

					-							-	
--	--	--	--	--	---	--	--	--	--	--	--	---	--

کمپیوٹرائزڈ شناختی کارڈ نمبر (لازمی نہیں)

2۔ پتہ: (موجودہ مکمل پتہ تحریر کریں) پلاٹ نمبر: _____

_____ ایریا / علاقہ:

_____ محلہ:

_____ گھر کے قریب اہم مقام (Land Mark) لکھیں

3۔ ٹیلیفون نمبرز: (لازمی نہیں) _____

_____ فون نمبر:

_____ موبائل نمبر:

4۔ گھرانے میں کل افراد کی تعداد

نمبر شمار	تفصیل	کراچی میں	کراچی سے باہر	
			عارضی طور پر	مستقل طور پر
1	پانچ سال سے کم عمر افراد کی تعداد			
2	پانچ سال سے زائد عمر افراد کی تعداد			
3	مستقل نوکریا کر، ماسی، آیا، ڈرائیور وغیرہ کی تعداد		NA	NA

5۔ گھرانے میں گاڑیوں کی تعداد

نمبر شمار	گاڑی کی قسم	گاڑیوں کی تعداد
1	سائیکل	ذاتی ملکیت
2	جانور گاڑی (غیر مشین)	دفتر یا کسی اور ذریعہ (لیز، کرائے وغیرہ) سے ملی ہوئی
3	موزسائیکل / اسکوتر	
4	کار، جیپ وغیرہ	
5	ٹیکسی / ریشہ	
6	وین / سوزوکی کی کیری	
7	بس / مٹی بس / کوچ	
8	ٹرک / ڈیلر	
9	دیگر وضاحت کریں	

6۔ گھرانے کی ماہانہ آمدنی (بشمول ترسیلات، کرایہ، سرمایہ کاری اور پنشن سے حاصل شدہ آمدنی) (Table-A)

Figure A4-1-2 Survey Form (Household)

Sheet No. **KARACHI TRANSPORTATION IMPROVEMENT PROJECT****HOUSEHOLD INTERVIEW SURVEY**
 - - - -

فارم نمبر ۲: گھرانے کی معلومات
ہدایت: گھرانے کے 5 سال اور 5 سال سے زائد عمر کے ہر فرد کی معلومات لیں۔

1- نام _____							
1a گھرانے کے سربراہ سے رشتہ _____							
2- عمر (سال)	<input type="text"/>	3- جنس	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>1- مرد</td> <td>-1</td> </tr> <tr> <td>2- عورت</td> <td>-2</td> </tr> </table>	1- مرد	-1	2- عورت	-2
1- مرد	-1						
2- عورت	-2						
4- کیا آپ کے پاس مستقل (پکا) ڈرائیونگ لائسنس ہے؟	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>1- ہاں</td> <td>1</td> </tr> <tr> <td>2- نہیں</td> <td>2</td> </tr> </table>	1- ہاں	1	2- نہیں	2		
1- ہاں	1						
2- نہیں	2						
4A اگر سوال نمبر 4 میں جواب "ہاں" ہے تو ڈرائیونگ لائسنس کونسی کیلگری کا ہے؟ (کیلگری لکھنے کیلئے TABLE-B ملاحظہ کریں)							
5- کیا آپ کے ذاتی استعمال کیلئے آپ کے پاس گاڑی ہے؟	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>1- ہاں</td> <td>1</td> </tr> <tr> <td>2- نہیں</td> <td>2</td> </tr> </table>	1- ہاں	1	2- نہیں	2		
1- ہاں	1						
2- نہیں	2						
5A اگر سوال نمبر 5 کا جواب ہاں ہے تو پوچھیں کونسی گاڑی ہے؟							
1- سائیکل	6- وین/سوزو کی کی کیری	2- جانور گاڑی (غیر مشینی)	3- موٹر سائیکل/اسکوٹر				
4- کار، جیب وغیرہ	7- بس/منی بس/کوچ	5- ٹیکسی/رکشہ	8- دیگر (وضاحت کریں)				
9- ٹرک/ٹریلر	10- دیگر (وضاحت کریں)						
6- آپ کی تعلیم کتنی ہے؟ (کوڈ کیلئے TABLE-C ملاحظہ کریں)							
7- آپ کا پیشہ کیا ہے؟ (کوڈ کیلئے TABLE-D ملاحظہ کریں)	8- آپ کی ملازمت کس قسم کی ہے؟ (کوڈ کیلئے TABLE-E ملاحظہ کریں)						
9- ملازمت کی نوعیت کیا ہے؟	10- آپ کس شعبے (سکینر/فیلڈ) میں کام کرتے ہیں؟ (کوڈ کے لئے TABLE-F ملاحظہ کریں)						
11- کام کے مقام/اسکول/کالج/یونیورسٹی کا نام کیا ہے؟	11a- کام کے مقام یا اسکول یا کالج یا یونیورسٹی کا مکمل پتہ						
ناؤن کا نام _____ یونین کونسل کا نام _____ اس جگہ کے نزدیک کوئی اہم نشانی _____							
12- آپ اپنے کام، اسکول، کالج یا یونیورسٹی جانے کیلئے عموماً کتنے بجے گھر سے نکلتے ہیں؟							
13- آپ کی ماہانہ آمدنی (بشمول ترسیلات، کرایہ، سرمایہ کاری، پنشن وغیرہ) کتنی ہے؟ (Table-A)							

Source: JICA Study Team

Figure A4-1-3 Survey Form (Member)

Sheet No.

KARACHI TRANSPORTATION IMPROVEMENT PROJECT

HOUSEHOLD INTERVIEW SURVEY

 - - - -

فارم نمبر 3: گھرانے کے افراد کی آمدورفت (Trip) کی معلومات
ہدایت: گھرانے کے 5 سال اور 5 سال سے زائد عمر کے ہر فرد کی معلومات لیں۔

مندرجہ ذیل تاریخ کو کتنے ٹرپ لگائے گئے			گھر کی کیٹگری			آغاز		
			1 گھر			1 گھر		
			2 دفتر			2 کام کی جگہ / اسکول		
			3 دکان / شاپنگ سینٹر / مارکیٹ			3 دیگر		
			4 ٹیکسری / ویٹر ہاؤس			مقام آغاز 3 ہے تو درج ذیل معلومات لیں۔		
			5 اسکول / یونیورسٹی / تعلیمی درجہ			ایمیا / بلاک		
			6 ہسپتال / کلینک / ڈسپنسری			مکان		
			7 مذہبی مقامات			یونی / اہم		
			8 ریسٹورانٹ / دیگر تفریح مقام			نشانی		
			9 دیگر (وضاحت کریں)					
سال	مہینہ	دن						
دن میں لگائے گئے ٹرپ کی کل تعداد								

ترتیب	سفر بذریعہ	گازی خود چلائی (یاں) (نہیں)	دوران سفر مقام	اگر مقام آغاز 3 ہے تو درج ذیل معلومات لیں۔	ٹرپ
1	Table H			ایمیا / بلاک / فیئر	مقصد (کوڈ کیلئے Table-G پڑھیں)
2				نمبر	رواگی کا وقت
3				ناؤن	منزل پر پہنچنے کا وقت
4				یونین	مقام منزل
5				قریبی	1 گھر
6				نشانی	2 کام کی جگہ / اسکول
7					3 دیگر
8					اگر مقام کیٹگری 9 ہے تو وضاحت کریں
9					

Source: JICA Study Team

Figure A4-1-4 Survey Form (Trip)

FORM-1: HOUSEHOLD INFORMATION**Instruction:** Only to be completed by Head of Household

1. Name of Household Head:			
CNIC (Optional)		<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
2. Address (Please write complete present Address):			
Plot #: _____ Street: _____ Area: _____			
Muhallah: _____ Block: _____			
Landmark (near the house): _____			
3. Telephone Number (Optional):			
Landline No.:		Cell No.:	
<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>		<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
4. Total number of household (HH) members			
S. No.	Description	In Karachi	Out of Karachi
			Temporarily Permanently
1.	Under 5 years		
2.	5 years & Above		
3.	Helpers, maids, drivers, servants etc (permanently residing)		NA NA
5. Total number of vehicles in household (HH)			
S. No.	Vehicle Type	Number of Vehicles	
		Own	Given by office / others (lease, rent etc)
1.	Bicycle		
2.	Animal Drawn Vehicle		
3.	Motorcycle / Scooter		
4.	Car, Jeep etc		
5.	Taxi / Rickshaw		
6.	Van / Suzuki Carry		
7.	Bus / Minibus / Coach		
8.	Truck / Trailer		
9.	Any Others (Specify): _____		
7. Monthly household income (including foreign remittances, rent, investments, pension etc in Pak Rupees) – <i>Select from Table A</i>			

Source: Translation of Figure A4-1-2

Figure A4-1-5 Survey Form in English (household)

FORM-2: HOUSEHOLD MEMBER INFORMATION**Instruction:** To be completed for Every Household Member aged 5 & above.

1. Your Name:																				
1a. Relationship with Household Head:																				
2. Age		3. Gender	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">1.</td> <td style="width: 10%;">Male</td> </tr> <tr> <td>2.</td> <td>Female</td> </tr> </table>	1.	Male	2.	Female													
1.	Male																			
2.	Female																			
4. Do you have a permanent driving license																				
		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">1.</td> <td style="width: 10%;">Yes</td> </tr> <tr> <td>2.</td> <td>No</td> </tr> </table>	1.	Yes	2.	No														
1.	Yes																			
2.	No																			
4a. Category of driving license, if answer to Q4 is <u>Yes</u> ? – Select from Table B																				
5. Do you have a vehicle for your own use?																				
		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">1.</td> <td style="width: 10%;">Yes</td> </tr> <tr> <td>2.</td> <td>No</td> </tr> </table>	1.	Yes	2.	No														
1.	Yes																			
2.	No																			
5a. Type of Vehicle, if answer to Q5 is <u>Yes</u> ?																				
		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>1.</td><td>Bicycle</td></tr> <tr><td>2.</td><td>Animal Drawn Vehicle</td></tr> <tr><td>3.</td><td>Motorcycle / Scooter</td></tr> <tr><td>4.</td><td>Car, Jeep etc</td></tr> <tr><td>5.</td><td>Taxi / Rickshaw</td></tr> <tr><td>6.</td><td>Van / Suzuki Carry</td></tr> <tr><td>7.</td><td>Bus / minibus / coach</td></tr> <tr><td>8.</td><td>Truck / Trailer</td></tr> <tr><td>9.</td><td>Any Others (Specify): _____</td></tr> </table>	1.	Bicycle	2.	Animal Drawn Vehicle	3.	Motorcycle / Scooter	4.	Car, Jeep etc	5.	Taxi / Rickshaw	6.	Van / Suzuki Carry	7.	Bus / minibus / coach	8.	Truck / Trailer	9.	Any Others (Specify): _____
1.	Bicycle																			
2.	Animal Drawn Vehicle																			
3.	Motorcycle / Scooter																			
4.	Car, Jeep etc																			
5.	Taxi / Rickshaw																			
6.	Van / Suzuki Carry																			
7.	Bus / minibus / coach																			
8.	Truck / Trailer																			
9.	Any Others (Specify): _____																			
6. What is your education level? Select from Table C																				
7. What is your occupation? Select from Table D																				
8. What is your type of employment? Select from Table E																				
9. What is status of employment?																				
		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">1.</td> <td style="width: 10%;">Full Time</td> </tr> <tr> <td>2.</td> <td>Part Time</td> </tr> </table>	1.	Full Time	2.	Part Time														
1.	Full Time																			
2.	Part Time																			
10. Which sector/field you work for? Select from Table F																				
11. Name of your work place or school or college or university																				

FORM-2: HOUSEHOLD MEMBER INFORMATION (Contd.)**Instruction:** To be completed for Every Household Member aged 5 & above.

11a. Address of Work Place or School or College or University (Please write complete address): 		
Town Name	Union Council (UC)	Nearest Landmark, if any

12. What time do you usually leave for your Work Place or School or College or University? (hh:mm)	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>
--	---	---	---	---

13. What is your monthly income (including foreign remittances, rent, investments, pension etc in Pak Rupees) – Select from Table A	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>
---	---	---	---	---

Source: Translation of Figure A4-1-3

Figure A4-1-6 Survey Form in English (member)

Origin 1. Home 2. Work Place/School 3. Other If Origin is 3, take following information. Area _____ / Block _____ / Phase _____ House _____ Town _____ UC _____ Landmark _____ <div style="border: 1px dashed black; width: 100px; height: 20px; margin-bottom: 5px;"></div> <div style="border: 1px dashed black; width: 100px; height: 20px; margin-bottom: 5px;"></div> <div style="border: 1px dashed black; width: 100px; height: 20px;"></div>	Category of Place 1. Home 2. Office 3. Shop/Shopping Center/Market 4. Factory/Warehouse 5. School/University/Educational Institute 6. Hospital/Clinic/Dispensary 7. Religious Sites 8. Restaurant/Recreational Places 9. Other (Specify Others) <div style="border: 1px dashed black; width: 100px; height: 20px; margin-bottom: 5px;"></div> <div style="border: 1px dashed black; width: 100px; height: 20px; margin-bottom: 5px;"></div> <div style="border: 1px dashed black; width: 100px; height: 20px;"></div>	Trips made on following date <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 20%;">Year</th> <th style="width: 20%;">Month</th> <th style="width: 20%;">Day</th> </tr> <tr> <td style="text-align: center;"><input style="width: 20px; height: 20px;" type="text"/></td> <td style="text-align: center;"><input style="width: 20px; height: 20px;" type="text"/></td> <td style="text-align: center;"><input style="width: 20px; height: 20px;" type="text"/></td> </tr> </table> <div style="border: 1px dashed black; width: 100px; height: 20px; margin-bottom: 5px;"></div> <div style="border: 1px dashed black; width: 100px; height: 20px; margin-bottom: 5px;"></div> <div style="border: 1px dashed black; width: 100px; height: 20px;"></div>	Year	Month	Day	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>
Year	Month	Day						
<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>						

Trip Purpose (Refer Table-G for Code) Time of departure <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> Time of Arrival <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> Destination 1. Home 2. Work Place/School 3. Other If destination category is 9, then specify _____	If place of destination is 3, then take following information Area _____ / Block _____ / Phase _____ Number _____ Town _____ Union Council _____ Nearest Landmark _____ <div style="border: 1px dashed black; width: 100px; height: 20px; margin-bottom: 5px;"></div> <div style="border: 1px dashed black; width: 100px; height: 20px; margin-bottom: 5px;"></div> <div style="border: 1px dashed black; width: 100px; height: 20px;"></div>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 10%;">Seque nce</th> <th style="width: 10%;">Mode of Trip Table H</th> <th style="width: 10%;">Drive yourself (Yes 1) (No 2)</th> <th style="width: 10%;">Place of Change of Mode</th> </tr> <tr> <td style="text-align: center;">1st</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">2nd</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">3rd</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">4th</td> <td></td> <td></td> <td></td> </tr> </table>	Seque nce	Mode of Trip Table H	Drive yourself (Yes 1) (No 2)	Place of Change of Mode	1 st				2 nd				3 rd				4 th				<div style="border: 1px dashed black; width: 100px; height: 20px; margin-bottom: 5px;"></div> <div style="border: 1px dashed black; width: 100px; height: 20px; margin-bottom: 5px;"></div> <div style="border: 1px dashed black; width: 100px; height: 20px; margin-bottom: 5px;"></div> <div style="border: 1px dashed black; width: 100px; height: 20px;"></div>
Seque nce	Mode of Trip Table H	Drive yourself (Yes 1) (No 2)	Place of Change of Mode																				
1 st																							
2 nd																							
3 rd																							
4 th																							

Source: Translation of Figure A4-1-4

Figure A4-1-7 Survey Form in English (trip)

Table A4-1-5 Code Tables of Household Interview Survey**Table A Income Level Range**

Code	Item
0	No income
1	Upto 1,000
2	1,001 – 2,500
3	2,501 – 4,000
4	4,001 – 5,500
5	5,501 – 7,000
6	7,001 – 10,000
7	10,001 – 13,000
8	13,001 – 16,000
9	16,001 – 20,000
10	20,001 – 25,000
11	25,001 – 30,000
12	30,001 – 35,000
13	35,001 – 40,000
14	40,001 – 45,000
15	45,001 – 50,000
16	50,001 – 60,000
17	60,001 – 70,000
18	70,001 – 80,000
19	80,001 – 100,000
20	100,000 – 125,000
21	Above 125,000
99	No Response

Table B Driving License Category

Code	Item
1	Motorcycle / Scooter
2	Rickshaw
3	Taxi (cab)
4	Car
5	Delivery Van
6	LTV
7	HTV
8	Others: _____
99	No Response

Vehicle Ownership Category

Code	Item
1	Bicycle
2	Animal Drawn Vehicle
3	Motorcycle/ Scooters
4	Car, Jeep, etc
5	Taxi/ Rickshaw
6	Van/ Suzuki Carry
7	Bus/ Minibus/ Coach
8	Truck/ Trailer
9	Others

Table C Education Level

Code	Item
1	Uneducated
2	Primary Level / Madarsa
3	Matric Level
4	Intermediate Level
5	Graduation Level
6	Post Graduation Level
7	Any Other: _____
99	No Response

Table D Occupation

Code	Item
1	Unskilled worker
2	Skilled Worker
3	Non Executive Administrative Staff
4	Supervisor level (e.g. supervisor, head clerk etc.)
5	Shop keeper / Shop Owner / Small Businessman
6	Junior / Middle Level Officer / Executive
7	Doctor / Engineer / Lawyer
8	Armed Forces / Paramilitary / Police / Law Enforcing Agency
9	Middle Income Businessman
10	Senior Executive/ Manager
11	Upper Class Businessman
12	Land lord / Agriculturalist
13	Agricultural Worker (e.g. Related to farming, poultry, fish farming, cattle farming etc)
14	Teacher
15	Student
16	Driver / Servant / Maid / Helper / Baby Sitter
17	IT Professional / Technicians
18	Household Women
19	Others (Specify): _____
99	No response

Table E Employment

Code	Item
1	Government
2	Semi Govt. / Public-Private Partnership
3	Private
4	Retired
5	Unemployed
6	Housewife
7	Any Other: _____
99	No response

Table F Sector / Field

Code	Item
1	Engineering / Construction
2	Manufacturing
3	Utility Services
4	Retail / Wholesale
5	Transport
6	Telecommunication
7	Financial / Insurance
8	Real Estate
9	Service Industry
10	Home / Cottage Industry
11	Medical / Hospital Services
12	Not Applicable
13	Other (please specify)

Table G Trip Purpose

Code	Item
1	To Home
2	To Work
3	To School for Study
4	On Business / Duty / Work
5	Shopping
6	Eating / Entertainment
7	Religious
8	Social Activity
9	Visit Friend / Relative
10	Accompanied by Others
11	Leisure / Recreation
12	Medical / Treatment
13	Other: _____
99	No Response

Table H Mode of Travel

Code	Item
1	Walk
2	Bicycle
3	Animal Drawn Vehicle
4	Motorcycle / Scooter
5	Car, Jeep etc
6	Taxi / Rickshaw
7	Van / Suzuki Carry
8	Bus / minibus / coach
9	Truck / Trailer
10	Any Others (Specify): _____
99	No Response

Source: JICA Study Team

1.1.3 Training

The survey company recruited 10 supervisors including women. An intensive training course for the supervisors was held on 24th and 25th September, with participation of the JICA Study Team. After the supervisors' training, the survey company held a 3-days training course for more than 100 enumerators at NED for 28th–30th September. Officers in CDGK participated in the training session. A pilot survey was conducted on 2nd October. The survey company has continuously recruited new enumerators and they were trained during the field survey as “On-the-job-training”. To improve the survey performance, the second training course was held on 22nd and 23rd, November.



Photo: JICA Study Team



1.1.4 Schedule

The original survey schedule was 3 months from May 2010. However, the survey started on 5th October 2010 and finished on 10th February 2012.

The major purpose of the Household (HIS) Interview Survey in this Study is to produce Origin-Destination matrices of people's trips in a typical weekday of Karachi. Therefore, the HIS was conducted in the season when people's trips were usual. From this, the survey was re-scheduled to avoid the summer vacation in June-July, Ramadan (mid August – mid September), and Eid holidays and Haji season in November.

The JICA Study Team conducted the survey from 5th October to 10th November to avoid these periods when traffic becomes unusual. In this survey period, samples were collected from five Towns: Gulberg, Liaquatabad, North Nazimabad, New Karachi, and Jamshed Town.

The survey in December was scheduled from December 2, 2010 to January 2, 2011 in Saddar, Korangi, Landhi, and Shah Faisal. It was decided that the JICA Study Team would not conduct the survey from December 14 to December 18 to avoid unusual traffic during Ashura. Due to the delay of UC boundary confirmation, the survey in Keamari, Malir, Malir Cantonment, Gulshan-e-Iqbal, Clifton Cantonment, Faisal Cantonment, Karachi Cantonment, S.I.T.E, Bin Qasim, and Manora Cantonment was scheduled to be conducted in January. The survey in Baldia, Orangi, Lyari, Gadap, and Korangi Cantt was conducted in February.

The survey team had visited all UCs by 1st March, 2011 although the number of collected samples was 35,900, which was 10% less than the target sample size of 40,000. The backlog survey was conducted in March, April, and June in 2011. The field survey was completed on 13th June, 2011 except for Clifton Cantonment where the response from residents was

extremely poor. The data punching was finished in the end of June, 2011. The number of samples collected was 41,255.

Table A4-1-6 shows the HIS schedule.

Table A4-1-6 HIS Schedule

No.	Town /Cantonment	Period
1	Gulberg	5th – 8th October, 2010
2	Liaquatabad	8th – 15th October (incl. 2 off days)
3	North Nazimabad	15th – 20th October (incl. 2 off days)
4	New Karachi	21st – 28th October (incl. 2 off days)
5	Jamshed	28th October – 4th November
6	Saddar	2nd – 9th December (incl. 1 off day)
7	Korangi	10th – 12th December/ 30th – 31st December
8	Landhi	19th – 24th December (incl. 1 off day)/ 1st – 2nd January
9	Shah Faisal	25th – 29th December (incl. 1 off day)
10	Keamari	5th – 7th January, 2011
11	Manora Cantt	7th January
12	Malir	10th – 14th January
13	Malir Cantt	13th January
14	Gulshan-e-Iqbal	14th – 21st January (incl. 1 off day)
15	Clifton Cantt	22nd – 24th January (incl. 1 off day)
16	Faisal Cantt	25th – 26th January
17	Karachi Cantt	27th January
18	S.I.T.E	28th January– 2nd February
19	Baldia	3rd – 7th February
20	Lyari	7th – 12th February
21	Bin Qasim	14th – 17th February
22	Gadap	18th – 21st February (incl. 1 off day)
23	Orangi	22nd February – 1st March

Source: JICA Study Team

Due to the poor response from Clifton Cantonment, the survey method was reviewed. It was decided that the survey forms would be simplified and drop-off/ pick-up method would be applied for the survey in Clifton Cantonment. From 10th January to 18th January, 2012, the survey team distributed the simplified survey forms to 1,243 households. The survey form collection was closed on 10th February, 2012.

1.1.5 Survey Performance

(1) Survey Interruption by Law and Order Situation

The law and order situation had not been stable in the period of the survey. The survey was interrupted many times by the deterioration of law and order situation during the survey period. The cases are listed below:

Table A4-1-7 Days Lost during Survey Period

Date	Case	Days Lost
October 7	Bombings at Hazrat Abdullah Shah Ghazi	1.5
October 15 – 22	Large scale target killings	3.5
October 29	Police operation in Jamshed Town	0.5
November 5 – 8	Funeral of the former MQM leader	3.0
November 11	Bomb explosion at CID building	1.0
November 26	Police operation	0.5
December 3	Mafia fighting in Saddar Town	0.5
December 14, 15	High level security in Moharram	2.0
December 21	Threaten to survey team	0.5
December 23	Public rally to KESC in Korangi Town	0.5
December 31	Strike call all over Pakistan	1.0
January 3	Target killing	1.0
January 4	Murder of Punjab Governor	1.0
January 5	Mafia fighting in Keamari	0.5
January 8	Murder of a MQM worker	1.0
January 12	Target killing	1.0
January 14	Target killing	1.0
January 15	Murder of ex-Nazim in SITE Town	1.0
January 25	Bomb at Malir	0.5
February 7	Law and Order Situation in Lyari Town	0.5

Source: KTIP

The survey was suspended when these cases happened and the surveys on the next days were cancelled. Especially, the series of the target killings from October 15 to 20 had caused continuous suspensions and rescheduling of the survey. Assuming that the achievement of the interview on the day when the survey was interrupted by those incidents is equivalent to the half of the target, the total delay due to the incidents becomes 4.5 days from 5th October to 4th November. This is approximately 20% loss of the total samples, which is the reason of the backlog in North Nazimabad and Liaquatabad Town.

There was no interruption by law and order situation from 23rd November to 13th December. However, there were several minor accidents. Some surveyors were threatened and robbed their mobile. There was a threat from a political group to a survey team demanding to stop the survey in Kharadar UC of Saddar Town on 3rd December.

In January 2011, the law and situation in Karachi was very bad and the survey was interrupted many times. On the other hand, the situation was relatively stable in February 2011.

During the period of the backlog survey from March 2012 to June 2012, law and order situation did not affect the survey performance because the survey team became small and flexible schedule was possible. However, the increase number of kidnapping made the survey in high income area very difficult.

(2) Improvement of Survey Method

The survey method was improved in the beginning of the field survey.

1) Revisit

To obtain trip information of all age groups as much as possible, this survey will collect the trip information of all the members of five years old or over. If this principal is strictly applied, the enumerators would need to visit same sample households two or three times when some of the members are absent at the time of the first visit. This will happen if the survey is conducted in day time because heads of families are working outside their house in most cases. The necessity of the revisit to the same households requires flexibility of the survey schedule because the survey area will vary according to the necessity of the revisit, which cannot be predicted before the survey. On the other hand, it is required to inform the survey schedule to CDGK, Police, Foreign Security Cell, and relevant local authorities for the security reason, which makes such flexible survey difficult. From this background, it was decided that interviewers collect trip information of all household members at one visit to avoid revisit as much as possible.

2) Survey Time

The start time of the survey was 3:00 PM in the beginning of the survey. However, it was changed that the survey starts from 4:00 PM in order to capture the sample household where all the household members are present. The end time of the survey was also changed from 9:00 PM to 10:00 PM. The survey in night time brought about a concern over the security of the survey team.

3) Interviewee

The survey was planned to apply the direct interview to all household members of five years old or over in the beginning. However, it was found that the direct interview to women by male interviewers was difficult because most heads of households have a tendency to refuse such interview to their family. In principal, female interviewers took over the interview in such a case. However, since the number of female interviewers was limited due to the security concern in the night time survey, proxy answers by the heads of households were accepted as exceptional cases.

2. Other Traffic Surveys

The JICA Study Team has conducted traffic surveys other than HIS by subcontracting the works to a local consultant firm. Result of these surveys support present traffic state analysis in Karachi City, and finally contribute to traffic demand analysis.

Following table shows outline of the surveys.

Table A4-2-1 Outline of Other Traffic Surveys

Survey	Objectives	Method	Coverage
1. Cordon Line Survey-1 (Highway)	<ul style="list-style-type: none"> To collect trip information of passenger across highway boundary 	<ul style="list-style-type: none"> Passenger interview Vehicular traffic count Vehicular occupancy 	<ul style="list-style-type: none"> 6 locations, 20 % sampling 3 locations, 24 hours 3 locations, 24 hours
2. Cordon Line Survey-2 (Airport)	<ul style="list-style-type: none"> To collect trip information of passenger across boundary by airplane 	<ul style="list-style-type: none"> Passenger interview 	<ul style="list-style-type: none"> Domestic terminal; 200 samples, international terminal; 200 sample
3. Cordon Line Survey-3 (Railway)	<ul style="list-style-type: none"> To collect trip information of passenger across boundary by railway 	<ul style="list-style-type: none"> Passenger count Passenger interview 	<ul style="list-style-type: none"> 15 trains at one day 15 trains at one day
4. Screen Line Survey	<ul style="list-style-type: none"> To obtain traffic volume and capture passenger volume on screen line 	<ul style="list-style-type: none"> Vehicular traffic count Vehicular occupancy 	<ul style="list-style-type: none"> 15 locations, 24 hours 3 locations, 16 hours
5. Mid Block Traffic Survey	<ul style="list-style-type: none"> To obtain in-city traffic volume 	<ul style="list-style-type: none"> Vehicular traffic count 	<ul style="list-style-type: none"> 5 locations, 24 hours
6. Cargo Movement Survey	<ul style="list-style-type: none"> To collect information about freight movement 	<ul style="list-style-type: none"> Vehicular traffic count Passenger interview 	<ul style="list-style-type: none"> 3 terminals, 24 hours 3 terminals, 24 hours
7. Passenger Interview Survey	<ul style="list-style-type: none"> To collect information about passenger stated preference 	<ul style="list-style-type: none"> Passenger interview 	<ul style="list-style-type: none"> 5 locations, Minimum sample size: 2,000
8. Public Transport Survey	<ul style="list-style-type: none"> To obtain public transport frequency 	<ul style="list-style-type: none"> Bus frequency count 	<ul style="list-style-type: none"> 15 Locations, 18 hours
9. Travel Speed Survey	<ul style="list-style-type: none"> To obtain traffic speed 	<ul style="list-style-type: none"> Transit time record by running car 	<ul style="list-style-type: none"> 10 routes, 4 round trips on each.
10. Road Inventory Survey	<ul style="list-style-type: none"> To collect information about road attributes 	<ul style="list-style-type: none"> Capturing by digital video camera on running car 	<ul style="list-style-type: none"> Arterial roads

Source: JICA Study Team

Following chapters describe the details of each survey.

2.1.1 Cordon Line Survey 1 (Highway)

(1) General

The cordon line in this study was defined as the border of Karachi city area. This survey was conducted at the border of the study area (highway cordon) on the three (3) major highways, National highway, RCD highway, Super highway, in order to collect information about origin and destination of passengers who are non-residents of Karachi, which consist of 3 types of survey, interview, traffic count and occupancy.

(2) Survey Method

1) Interview

Surveyors interviewed to non-Karachi resident passengers with random sampling on passenger cars, public buses, and freight vehicles. As for passenger car and freight, toll plaza was mainly selected on account for safety and convenience reason. In other cases, interview location was

the roadside, where vehicles are flagged down with police assistance and guided to safety space.

Public bus interview is held at bus terminals along or near each highways. Surveyors take interview to waiting passengers at terminal or inside a stopping bus. This survey continues on the operation hours of the terminals.

Interview items are as below.

- Origin and destination,
- Trip purpose
- Number of passengers
- Commodity type (for freight)
- Tones loaded (for freight)
- Trip mode to reach bus terminal (for public transport)

2) Traffic Count

The number of vehicles is counted by following eleven (11) types by direction at the same day as the interview.

- | | | |
|---|---|------------------|
| - Passenger cars | | |
| - Taxies, Auto Rickshaws | | |
| - Motorcycles & Scooters | | |
| - Large Busses | } | Public Buses |
| - Mini Buses, Coaches, Contract Carriages | | |
| - Light Freight Vehicles | } | Freight Vehicles |
| - Single Unit Trucks, 2 Axle | | |
| - Single Unit Trucks, 3 Axle | | |
| - Trailers, 4 Axle | | |
| - Trailers, 5 Axle | | |
| - Trailers, 6 Axle | | |

3) Occupancy

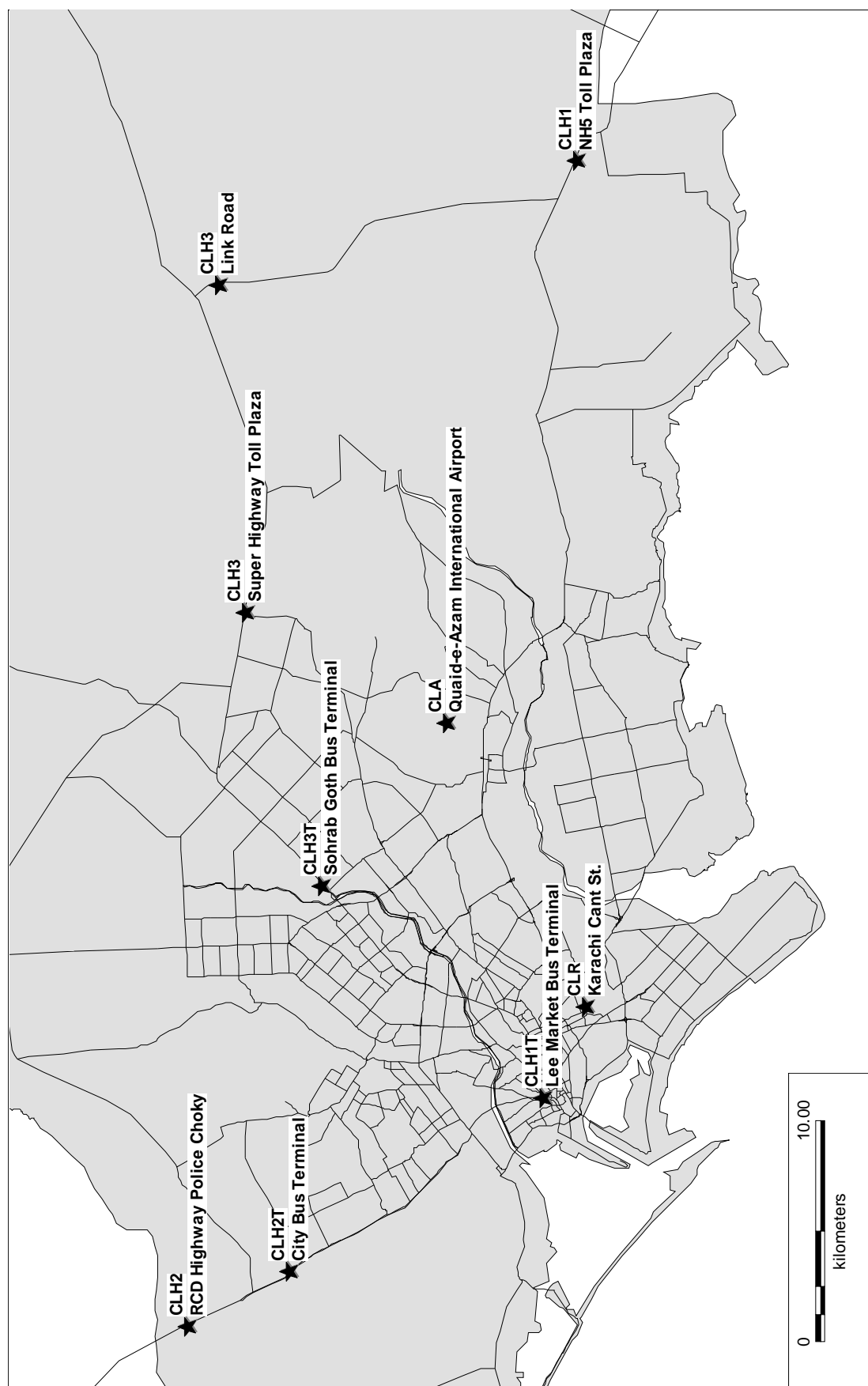
The number of passengers or congestion level in each vehicles by direction were observed and recorded with random sampling. Sampling vehicles were classified into five (5) types as below.

- Passenger cars
- Taxies, Auto Rickshaws
- Public Buses
- Freight Vehicles

(3) Coverage

Survey hours covered 24 hours or operation hours, starting from 8 am on weekday.

Following table and figure shows the survey location, date, and hours. It has Eight (7) locations including one (1) supplementary location and four (3) bus terminals for bus interview.



Source: JICA Study Team

Figure. A4-2-1 Location Map of Cordon Line Highway Survey

Table A4-2-2 Location Lists of Cordon Line Highway Survey

ID	Location	Survey Date (Year 2010)			
		Count	Interview	Bus Interview	Occupancy
CLH-1	a. National Highway Toll Plaza	18-May	18-May,	-	18-May
	b. Lee Market Bus Terminal	-	-	28-Dec	-
CLH-2	a. RCD Highway Police Choky	25-May	25-May,	-	25-May
	b. City Bus Terminal (Hub River Road)	-	-	17-Jan-2011	-
CLH-3	a. Super Highway Toll Plaza	7-Dec	7-Dec	-	7-Dec
	b. Link Road between National & Super Highway	7-Dec	7-Dec	-	7-Dec
	c. Sohrab Goth Bus Stand	-	-	7-Dec	-

Source: JICA Study Team

(4) Result

Following table shows the result of Count Survey.

Table A4-2-3 No. of Vehicles of Cordon Line Highway Survey

ID	Number of Vehicles, 24 hours, both directions											
	Passenger cars	Taxis	Motorcycles	Large Busses	Minibuses, Coaches	Light freight	Trucks [2 axle]	Trucks [3 axle]	Trailers [4 axle]	Trailers [5 axle]	Trailers [6 axle]	Total
CLH-1	3,710 (35.1)	143 (1.4)	1,011 (9.6)	255 (2.4)	432 (4.1)	1,890 (17.9)	1,861 (17.6)	1,052 (10.0)	57 (0.5)	44 (0.4)	103 (1.0)	10,558 (100.0)
CLH-2	4,425 (27.4)	622 (3.9)	2,274 (14.1)	463 (2.9)	2,270 (14.1)	991 (6.1)	2,005 (12.4)	2,228 (13.8)	423 (2.6)	177 (1.1)	265 (1.6)	16,143 (100.0)
CLH-3a	5,092 (22.0)	858 (3.7)	1,094 (4.7)	1,996 (8.6)	1,423 (6.2)	1,587 (6.9)	3,774 (16.3)	2,899 (12.5)	2,136 (9.2)	1,220 (5.3)	1,049 (4.5)	23,128 (100.0)
CLH-3b	807 (22.0)	21 (0.6)	181 (4.9)	58 (1.6)	10 (0.3)	56 (1.5)	666 (18.1)	480 (13.1)	662 (18.0)	368 (10.0)	364 (9.9)	3,673 (100.0)

Source: JICA Study Team

Following three tables shows the result interview survey on each modes.

Table A4-2-4 Trip Purpose of Car Passengers at Highway Cordon

		Car			
		CLH-1a	CLH-2a	CLH-3a	CLH-3b
Sample size		535	826	262	92
Vehicle Type (%)	Passenger Car	97.9	93.5	96.9	100.0
	Taxi	2.1	4.8	0.8	0.0
	Auto Rickshaw	0.0	0.0	0.8	0.0
	Motorcycle	0.0	1.7	1.5	0.0
Trip Purpose (%)	To Home	12.8	18.1	50.0	0.0
	To Work	26.9	23.9	14.9	71.1
	To School	0.5	5.8	0.0	0.0
	On business	15.2	14.0	9.6	28.9
	Shopping	7.5	2.9	0.0	0.0
	Leisure	4.3	0.8	1.8	0.0
	Religious	8.0	15.6	9.6	0.0
	Visit Someone	24.8	18.9	14.0	0.0

Source: JICA Study Team

Table A4-2-5 Commodities of Trucks at Highway Cordon

		Freight			
		CLH-1a	CLH-2a	CLH-3a	CLH-3b
Sample size		638	868	3132	192
Vehicle Type (%)	Single unit Trucks [2 Axle]:	30.7	17.5	28.6	8.3
	Single unit Trucks [3 Axle]:	20.2	13.1	23.6	20.8
	Trailers [4 Axle]:	1.5	61.8	18.5	37.5
	Trailers [5 Axle]:	0.7	0.2	10.3	10.4
	Trailers [6 Axle]:	0.0	0.0	9.9	16.7
	Tractor without Trailer	0.4	0.0	0.4	1.0
	Pickup (Light Freight Vehicle)	46.4	7.4	8.7	5.2
Load (%)	Empty	32.3	14.5	8.1	41.7
	Full	67.7	85.5	91.9	58.3
Commodity (%)	Animals	34.9	19.3	38.9	25.0
	Food Items	0.5	7.0	1.9	10.4
	Cement	6.4	4.8	2.2	5.2
	Steel	0.9	1.2	1.3	3.1
	Concrete	10.6	11.1	8.9	9.4
	Wood	15.1	16.1	12.9	0.0
	Chemical	2.8	2.7	1.5	0.0
	Electronic Items	0.9	0.7	2.4	0.0
	Agriculture	3.7	5.1	5.8	8.3
	Fertilizers	2.3	3.6	0.3	0.0
	Vehicles	4.1	13.0	8.1	37.5
	Gas Cylinder	10.1	13.3	11.2	0.0
	Plastic	0.0	0.5	0.0	0.0
	Tire	0.0	0.5	0.0	0.0
	Others	7.8	1.2	4.7	1.0

Source: JICA Study Team

Table A4-2-6 Trip Purpose of Bus Passengers at Highway Cordon (Bus Terminal)

		Bus		
		CLH-1b	CLH-2b	CLH-3c
Sample size		362	406	486
Mode of Arrival (%)	Car	3.3	25.1	12.6
	Taxi	2.2	47.3	19.7
	Auto Rickshaw	15.6	20.7	15.5
	Large Bus	19.4	1.5	28.0
	Minibus	46.1	3.9	11.3
	Coach	13.3	1.5	13.0
Trip Purpose (%)	To Home	3.3	3.9	5.8
	To Work	37.0	35.0	40.3
	To School	0.6	3.0	1.2
	On Business	12.7	23.2	15.2
	Shopping	15.5	0.5	2.5
	Entertainment	1.7	9.4	6.2
	Social Activities	6.1	0.0	2.5
	Visit Someone	17.7	16.7	23.0
	Others	5.5	8.4	3.3

Source: JICA Study Team

2.1.2 Cordon Line Survey 2 (Airport Cordon)

(1) General

This survey aims to collect trip information of flight passenger in Karachi city. It is conducted at departure terminal of Quaid-e-Azam International Airport with assumption of a trip symmetry, departure and arrival. For this survey, cooperation from Civil Aviation Authority (CAA) was essential because surveyors go into restricted area of airport, which is one of the highest-security places in the country. The basic information is origin and destination of passengers who are non-residents of Karachi city.

(2) Survey Method

Interview is conducted at the terminal of domestic and international, and the target is non-Karachi residents excluding transit passengers. Surveyors randomly took interviews from the passengers waiting at a terminal, with prepared questionnaires.

The interview items are as below;

- Origin and transport mode of last trip for reaching to airport
- Flight Destination
- Purpose of Karachi visit

(3) Survey Coverage

The required number of sample is 200 for each terminals, 400 in total.

Survey was separately conducted on 28th-29th Dec. 2010 at international terminal, and on 30th-31st Dec. 2011 at domestic terminal.

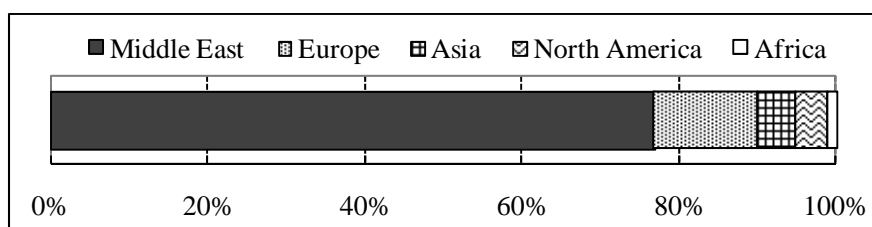
(4) Result

Following table shows the result of interview survey.

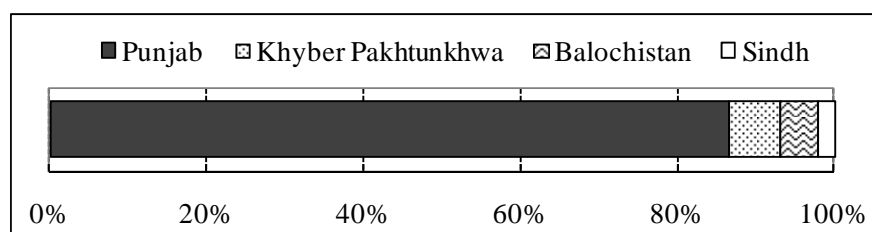
Table A4-2-7 Trip Purpose of Air Passengers

		Terminal	
		International	Domestic
Sample size		211	202
Mode of Arrival (%)	Walk	0.0	0.0
	Bicycle	0.0	0.5
	Animal Drawn Vehicle	0.0	0.0
	Motorcycle / Scooter	0.0	2.8
	Car, Jeep etc	57.8	49.8
	Taxi / Rickshaw	34.6	38.9
	Van / Suzuki Carry	1.4	2.4
	Bus / minibus / coach	5.7	0.9
	Truck / Trailer	0.0	0.0
	Others	0.5	0.5
Purpose of Karachi Visit (%)	To Home	24.2	10.9
	To Work	22.7	19.9
	To School	0.0	1.9
	On Business	4.3	20.9
	Shopping	0.9	1.9
	Entertainment	4.3	1.4
	Religious	1.9	1.9
	Social Activity	4.3	4.7
	Visit Friend / Relative	31.8	21.8
	Accompanied by Others	1.9	0.5
	Leisure / Recreation	1.4	2.8
	Medical / Treatment	1.4	4.7
	Others	0.9	2.4

Source: JICA Study Team



Source: JICA Study Team

Figure A4-2-2 Ratio of Destination Area of International Air Passengers

Source: JICA Study Team

Figure A4-2-3 Ratio of Destination Area of Domestic Air Passengers

2.1.3 Cordon Line Survey 3 (Railway Cordon)

(1) General

This survey aims to collect trip information of passengers who is crossing over cordon line (Karachi city border) by railway. It consists of two surveys, passenger count and OD interview for non-Karachi resident passengers over 5 years old. Both were conducted inside trains on the way from Landhi station to Hyderabad station under cooperation with Pakistan Railway (PR), with assumption of a trip symmetry, departure and arrival.

(2) Survey Method

1) Passenger Count

Surveyors counted the number of passengers inside a train in service, separately by bogie class among Economy, AC Lower, Business, and AC Sleeper.

2) Interview

Interview was held toward non-Karachi resident passengers aged over 5 years, based on the prepared questionnaires. Interview items are as below;

- Departure Station
- Origin and transport mode of last trip for reaching to departure station
- Final Destination of the trip
- Purpose of Karachi Visit

(3) Survey Coverage

Following table shows surveyed train name and the date.

Table A4-2-8 Schedule of Trains for Cordon Line Railway Survey

ID	Train Name	Dept. Time from Cantt Sta.	Survey Date (Year 2010)
CLR-1	Hazara Express	6:00	1-Nov
CLR-2	Shah Rukne Alam Express	6:30	1-Nov
CLR-3	Awam Express	7:30	1-Nov
CLR-4	Super Express	9:30	3-Nov
CLR-5	Pakistan Express	14:30	28-Oct
CLR-6	Allama Iqbal Express	14:50	2-Nov
CLR-7	Karakoram Express	16:00	2-Nov
CLR-8	Millat Express	16:30	2-Nov
CLR-9	Tezgam	17:00	3-Nov
CLR-10	Karachi Express	18:00	3-Nov
CLR-11	Bahauddin Zakria Express	18:20	4-Nov
CLR-12	Fareed Express	18:50	4-Nov
CLR-13	Khushhal Khan Khattak Express	20:05	28-Oct
CLR-14	Khyber Mail	22:00	4-Nov
CLR-15	Sukkur Express	22:15	28-Oct

Source: JICA Study Team

(4) Result

Following table shows the result of Count Survey.

Table A4-2-9 No. of Passengers in Trains

ID	Train Name	Economy	AC Lower	Business	AC Sleeper
CLR-1	Hazara Express	292	-	-	-
CLR-2	Shah Rukne Alam Express	45	-	-	-
CLR-3	Awam Express	328	59	-	-
CLR-4	Super Express	416	-	-	-
CLR-5	Pakistan Express	655	66	-	-
CLR-6	Allama Iqbal Express	783	-	-	-
CLR-7	Karakoram Express	564	44	-	-
CLR-8	Millat Express	647	-	15	-
CLR-9	Tezgam	554	112	-	-
CLR-10	Karachi Express	548	-	-	-
CLR-11	Bahauddin Zakria Express	760	-	-	-
CLR-12	Fareed Express	399	-	-	-
CLR-13	Khushhal Khan Khattak Express	302	-	-	-
CLR-14	Khyber Mail	237	-	36	-
CLR-15	Sukkur Express	460	43	-	-

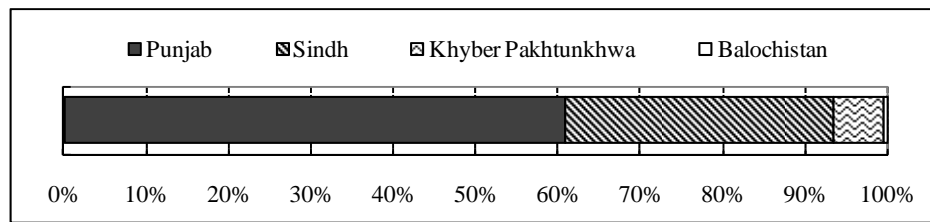
Source: JICA Study Team

Following table shows the result of interview survey.

Table A4-2-10 Trip Purpose of Railway Passengers

		Bogie Class			Total
		Business	AC Lower	Economy	
Sample Size		16	13	364	393
Boarding Station (%)	City Station	0.0	0.0	6.3	5.9
	Cantt Station	100.0	61.5	80.8	80.9
	Drig Road Station	0.0	0.0	0.5	0.5
	Malir Halt Station	0.0	23.1	3.0	3.6
	Landhi Station	0.0	15.4	9.3	9.2
Mode of Arrival (%)	Walk	12.5	0.0	5.5	5.6
	Bicycle	0.0	0.0	1.1	1.0
	Animal Drawn Vehicle	0.0	0.0	0.0	0.0
	Motorcycle / Scooter	0.0	0.0	1.9	1.8
	Car, Jeep etc	50.0	7.7	10.7	12.2
	Taxi / Rickshaw	18.8	46.2	42.3	41.5
	Van / Suzuki Carry	0.0	7.7	8.5	8.1
	Bus / Minibus / Coach	18.8	38.5	29.7	29.5
	Truck / Trailer	0.0	0.0	0.0	0.0
	Others	0.0	0.0	0.3	0.3
Purpose of Karachi Visit (%)	To Home	0.0	7.7	3.8	3.8
	To Work	12.5	23.1	26.4	25.7
	To School for Study	0.0	0.0	1.9	1.8
	On Business	31.3	15.4	18.4	18.8
	Shopping	0.0	7.7	3.6	3.6
	Eating / Entertainment	0.0	15.4	4.1	4.3
	Religious	0.0	0.0	1.9	1.8
	Social Activity	18.8	7.7	8.8	9.2
	Visit Friend / Relative	31.3	15.4	22.3	22.4
	Accompanied by Others	0.0	0.0	1.1	1.0
	Leisure / Recreation	0.0	0.0	2.7	2.5
	Medical / Treatment	6.3	7.7	4.7	4.8
	Others	0.0	0.0	0.3	0.3

Source: JICA Study Team



Source: JICA Study Team

FigureA4-2-4 Ratio of Destination Area of Railway Passengers

2.1.4 Screen Line Survey

(1) General

JICA Study team set Lyari River as screen line of the Karachi city in this survey, and conducted traffic count and occupancy survey at roads crossing over the screen line.

(2) Survey Method

1) Traffic Count

Video camera method is applied to most of this survey to record the flow of transportation. Due to necessity for capturing wide vision of the spot, it is set on the Lyari Expressway on flyover, under the cooperation with National Highway Authority.

Vehicle types are classified into twelve (12) as described below,

- Passenger cars [Including Jeeps & Station Wagons]
- Taxies [Yellow & Black Cabs, Yellow Cabs & Radio Cabs]
- Auto Rickshaws [Old Style & CNG 4-Stroke]
- Motorcycles & Scooters
- Contract Carriages
- Large Public Busses [Intercity, UTS, KPTS etc]
- School Busses including Suzuki
- Mini Busses
- Coaches
- Light Freight Vehicles [Pickups, Shehzoor, etc]
- Single Unit Trucks [2 & 3 Axle]
- Trailers

2) Occupancy

The number of passengers or congestion level in each vehicle were observed and recorded by roadside surveyors with random sampling. Sampling vehicles were classified into nine (9) types as below.

- Passenger cars
- Taxies
- Auto Rickshaws
- Motorcycles & Scooters
- Contract Carriages including School Buses
- Large Public Buses
- Minibuses
- Coaches

- Freight Vehicles

Three (3) locations were selected for this survey to represent the 15 locations; Gulbai, Teen Hatti and Sohrab Goth. The survey is conducted on the same day as the traffic count survey at the corresponding location.

(3) Survey Coverage

It took 24 hours for traffic count survey, and 16 hours for occupancy survey, starting from 6 am on weekdays. Following table and figure show the survey location and date.

Table A4-2-11 Location List and Schedule of Screen Line Survey

ID	Location	Date
SL-1*	G Allana Road / Gulbai	13 th Dec 2010
SL-2	Chakiwara Road	13 th Dec 2010
SL-3	New Kumbhar Wara Road / Mewashah Graveyard	14 th Dec 2010
SL-4	Dhobi Ghat	14 th Dec 2010
SL-5	Manghopir Road / Shamshan Ghat	20 th Dec 2010
SL-6	Las Bela	20 th Dec 2010
SL-7*	S M Toufee Road / Teen Hatti	21 st Dec 2010
SL-8	Altaf Hussain Bareilvi Road / Old Sabzi Mandi	21 st Dec 2010
SL-9	Sir Shah Suleman Road / Gharibabad	3 rd Jan 2011
SL-10	Yasinabad Bridge	3 rd Jan 2011
SL-11	Rashid Minhas Road / UBL Sports Complex	4 th Jan 2011
SL-12*	Sohrab Goth / Super Highway	4 th Jan 2011
SL-13	New Karachi Sector 12 / Saba Cinema	5 th Jan 2011
SL-14	New Karachi Sector 6 / Ibrahim Goth	5 th Jan 2011
SL-15	Northern Bypass btw Surjani Town Road & Hub Dam Road	5 th Jan 2011

* Occupancy Survey is conducted at SL-1, SL-7 and SL-12.

Source: JICA Study Team

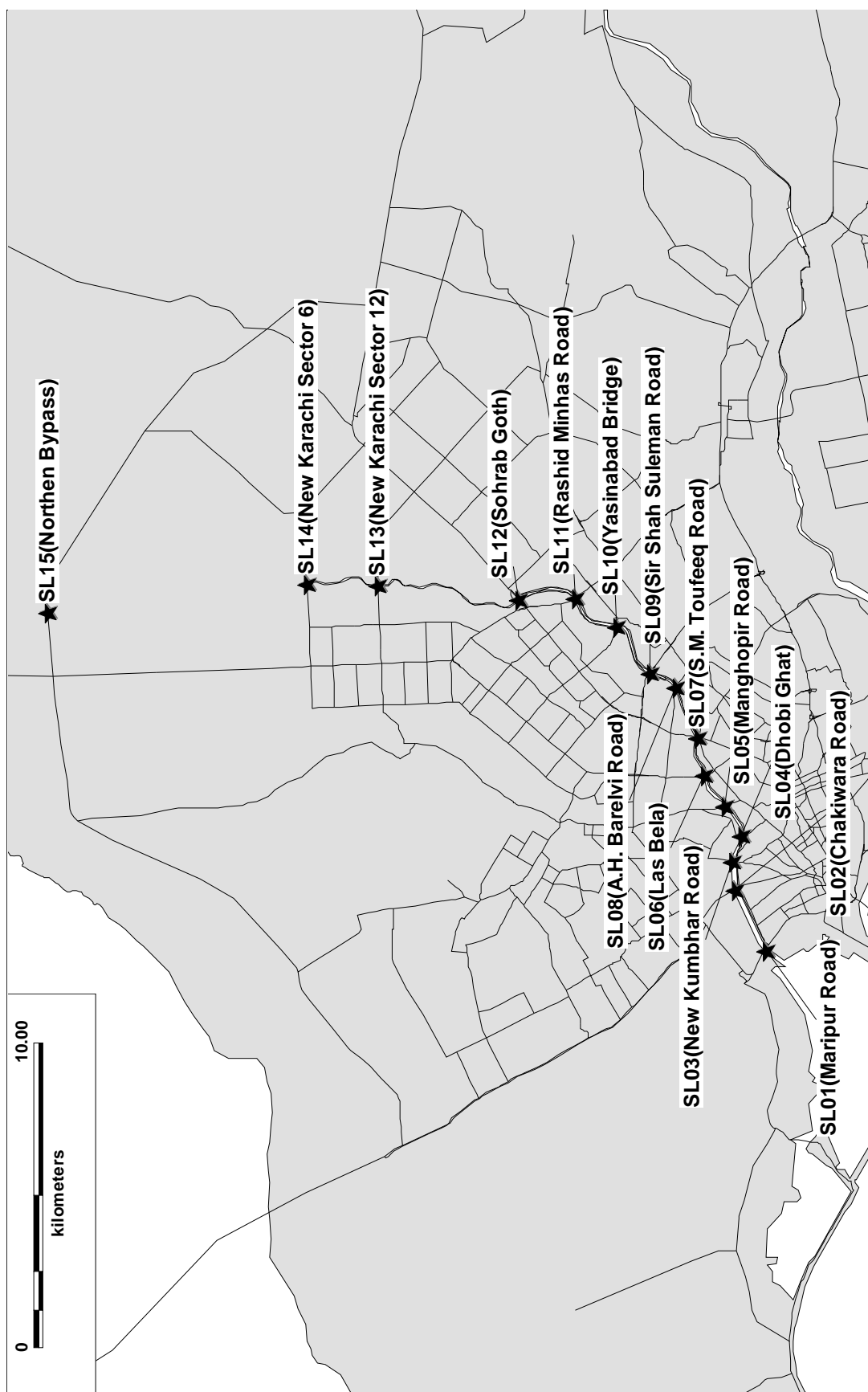
(4) Result

Following table shows the result of Count and Occupancy Survey with the next one explaining abbreviation of transportation modes.

Table A4-2-12 Abbreviation of transportation modes

Abbreviation	Description
PC	Passenger Cars [Including Jeeps & Station Wagons]
Tx	Taxies [Yellow & Black Cabs, Yellow Cabs & Radio Cabs]
AR	Auto Rickshaws [Old Style & CNG 4-Stroke]
Mc	Motorcycles & Scooters
CC	Contract Carriages including Suzuki
LPB	Large Public Busses [Intercity, UTS, KPTS etc]
SB	School Busses
MB	Mini Busses
Co	Coaches
LFV	Light Freight Vehicles [Pickups, Shehzoor, etc]
SUT	Single Unit Trucks [2 & 3 Axle]
Tr	Trailers
Fr	Freight Vehicle (Includes LFV, SUT, and Tr)

Source: JICA Study Team



Source: JICA Study Team

Figure A4-2-5 Location Map of Screen Line Survey

Table A4-2-13 Number of Vehicles of Screen Line Survey

ID	Number of Vehicles, 24 hours, both directions												
	PC	Tx	AR	Mc	CC	LPB	SB	MB	Co	LFV	SUT	Tr	Total
SL-1	14,826 (18.1)	4,003 (4.9)	2,200 (2.7)	33,413 (40.7)	3,659 (4.5)	71 (0.1)	25 (0.0)	4,278 (5.2)	2,192 (2.7)	5,954 (7.3)	8,093 (9.9)	3,327 (4.1)	82,041 (100.0)
SL-2	7,460 (17.2)	2,040 (4.7)	7,215 (16.6)	18,674 (43.0)	25 (0.1)	251 (0.6)	16 (0.0)	1,205 (2.8)	148 (0.3)	3,125 (7.2)	2,905 (6.7)	317 (0.7)	43,381 (100.0)
SL-3	1,342 (14.9)	189 (2.1)	1,792 (19.9)	4,344 (48.3)	47 (0.5)	0 (0.0)	6 (0.1)	0 (0.0)	0 (0.0)	522 (5.8)	709 (7.9)	46 (0.5)	8,997 (100.0)
SL-4	802 (7.2)	292 (2.6)	2,980 (26.8)	4,849 (43.6)	383 (3.4)	136 (1.2)	6 (0.1)	0 (0.0)	33 (0.3)	1,320 (11.9)	321 (2.9)	1 (0.0)	11,123 (100.0)
SL-5	14,717 (21.2)	3,299 (4.7)	7,944 (11.4)	36,001 (51.8)	261 (0.4)	1,293 (1.9)	25 (0.0)	2,253 (3.2)	161 (0.2)	2,545 (3.7)	1,018 (1.5)	5 (0.0)	69,522 (100.0)
SL-6	30,870 (23.5)	5,230 (4.0)	16,324 (12.4)	70,649 (53.8)	1,382 (1.1)	1,939 (1.5)	12 (0.0)	1,617 (1.2)	458 (0.3)	1,626 (1.2)	1,147 (0.9)	6 (0.0)	131,260 (100.0)
SL-7	34,903 (20.8)	4,780 (2.8)	19,813 (11.8)	93,188 (55.4)	963 (0.6)	3,201 (1.9)	16 (0.0)	4,465 (2.7)	467 (0.3)	5,076 (3.0)	1,223 (0.7)	13 (0.0)	168,108 (100.0)
SL-8	4,327 (15.2)	1,068 (3.8)	5,698 (20.0)	15,438 (54.3)	199 (0.7)	98 (0.3)	6 (0.0)	152 (0.5)	0 (0.0)	1,208 (4.2)	247 (0.9)	0 (0.0)	28,441 (100.0)
SL-9	72,219 (41.1)	4,999 (2.8)	9,365 (5.3)	75,346 (42.9)	959 (0.5)	633 (0.4)	19 (0.0)	4,795 (2.7)	767 (0.4)	3,957 (2.3)	2,690 (1.5)	59 (0.0)	175,808 (100.0)
SL-10	30,753 (38.6)	3,338 (4.2)	7,810 (9.8)	33,496 (42.0)	518 (0.7)	0 (0.0)	16 (0.0)	1,836 (2.3)	0 (0.0)	1,552 (1.9)	296 (0.4)	49 (0.1)	79,664 (100.0)
SL-11	51,359 (34.2)	7,191 (4.8)	7,384 (4.9)	65,371 (43.5)	1,974 (1.3)	624 (0.4)	61 (0.0)	5,803 (3.9)	571 (0.4)	5,471 (3.6)	4,436 (3.0)	38 (0.0)	150,283 (100.0)
SL-12	24,678 (25.2)	6,700 (6.8)	10,636 (10.9)	38,899 (39.7)	2,255 (2.3)	2,367 (2.4)	7 (0.0)	2,005 (2.0)	1,443 (1.5)	4,008 (4.1)	3,976 (4.1)	932 (1.0)	97,906 (100.0)
SL-13	2,453 (11.6)	1,071 (5.1)	1,780 (8.4)	11,722 (55.5)	177 (0.8)	383 (1.8)	19 (0.1)	1,010 (4.8)	0 (0.0)	1,548 (7.3)	797 (3.8)	166 (0.8)	21,126 (100.0)
SL-14	2,013 (17.4)	312 (2.7)	566 (4.9)	4,964 (43.0)	101 (0.9)	0 (0.0)	36 (0.3)	1,497 (13.0)	0 (0.0)	944 (8.2)	1,072 (9.3)	42 (0.4)	11,547 (100.0)
SL-15	724 (15.0)	106 (2.2)	0 (0.0)	452 (9.4)	0 (0.0)	1 (0.0)	0 (0.0)	33 (0.7)	0 (0.0)	243 (5.0)	1918 (39.7)	1351 (28.0)	4828 (100.0)

Note: Figures in parentheses indicate % share.

Source: JICA Study Team

Table A4-2-14 Passenger Occupancy on Screen Line

ID		Average Occupancy, 16 hours, both direction								
		PC	Tx	AR	Mc	CC	LPB	MB	Co	Fr
SL-1	Occupancy	2.25	2.33	2.40	1.26	2.74	44.24	32.91	37.49	2.19
	No. of Sample	9,364	2,588	1,518	27,069	2,112	144	2,229	2,482	10,767
SL-7	Occupancy	2.28	2.01	2.09	1.26	3.22	50.30	34.85	35.29	2.28
	No. of Sample	13,812	2,967	10,930	56,391	632	1,161	2,563	124	4,316
SL-12	Occupancy	2.39	2.44	2.40	1.24	3.16	54.74	31.80	34.52	2.54
	No. of Sample	11,376	2,593	3,464	25,842	1,189	736	1,271	236	5,835

Source: JICA Study Team

2.1.5 Mid Block Traffic Survey

(1) General

This Survey aims to obtain traffic volume data of each vehicle type on directional traffic flow at selected five (5) locations.

(2) Survey Method

Numbers of twelve (12) types of vehicle as same categorization as screen line count survey, are counted for twenty-four (24) hours, starting from 8 am, at 5 locations.

(3) Survey Coverage

Following table and figure show the survey location and date.

Table A4-2-15 Location and date of Mid Block Traffic Survey

ID	Location	Survey Date (Year 2010)			
		Weekday	Friday	Holiday	Ramadan
MB-1	Shahrah-e-Sher Shah Suri near Hyderi Market	12-May, 10-Nov *	14-May, 15-Oct *	9-May, 24-Oct *	24-Aug
MB-2	Estate Avenue Site near Textile Avenue	26-May	3 rd -Dec	16-May	24-Aug
MB-3	M. A. Jinnah Road near Numaish	26-May	28-May	23-May	26-Aug
MB-4	Shahrah-e-Faisal near Nursery	12-May	14-May	9-May	26-Aug
MB-5	Khayaban-e-Iqbal between Teen Talwar and Under Pass	19-May	28-May	16-May	1-Sep

* Surveys repeated for MB-1 and conducted only for the mode of Passenger car due to inconsistency

Source: JICA Study Team



Source: JICA Study Team

Figure A4-2-6 Location map of Mid Block Traffic Survey

(4) Result

Following table shows the result of Count Survey referring abbreviation with table A4-2-14 .

Table A4-2-16 Number of Vehicles of Mid-Block Survey

Location ID	Day	Number of Vehicles, 24 hours, both directions												
		PC	Tx	AR	Mc	CC	LPB	SB	MB	Co	LFV	SUT	Tr	Total
MB-1	Weekday	48,773 (27.0)	7,314 (4.0)	16,195 (9.0)	90,425 (50.1)	2,621 (1.5)	3,049 (1.7)	500 (0.3)	3,626 (2.0)	1,826 (1.0)	5,378 (3.0)	887 (0.5)	59 (0.0)	180,653 (100.0)
	Friday	47,696 (28.3)	5,902 (3.5)	15,493 (9.2)	86,137 (51.1)	1,627 (1.0)	1,945 (1.2)	490 (0.3)	2,521 (1.5)	794 (0.5)	5,012 (3.0)	863 (0.5)	69 (0.0)	168,549 (100.0)
	Holiday	42,875 (26.6)	7,854 (1.7)	13,817 (7.6)	88,194 (57.3)	1,209 (1.5)	1,376 (1.0)	339 (0.1)	2,218 (0.6)	752 (0.7)	2,729 (1.9)	678 (1.1)	57 (0.0)	162,098 (100.0)
MB-2	Weekday	18,288 (20.8)	2,761 (3.1)	5,189 (5.9)	40,316 (45.9)	1,490 (1.7)	1,324 (1.5)	107 (0.1)	2,072 (2.4)	627 (0.7)	5,835 (6.6)	7,587 (8.6)	2,212 (2.5)	87,808 (100.0)
	Friday	15,034 (20.8)	2,748 (3.8)	4,382 (6.1)	35,732 (49.4)	932 (1.3)	415 (0.6)	16 (0.0)	877 (1.2)	181 (0.3)	5,658 (7.8)	5,169 (7.2)	1,117 (1.5)	72,261 (100.0)
	Holiday	10,454 (23.8)	5,583 (2.5)	6,833 (3.4)	17,543 (48.5)	1,001 (2.4)	502 (0.8)	0 (0.1)	1,215 (2.6)	233 (0.2)	2,466 (5.5)	1,779 (8.2)	1,188 (2.0)	48,797 (100.0)
MB-3	Weekday	51,358 (29.7)	7,924 (4.6)	14,784 (8.5)	80,342 (46.4)	1,339 (0.8)	4,518 (2.6)	312 (0.2)	4,760 (2.8)	3,030 (1.8)	4,497 (2.6)	181 (0.1)	25 (0.0)	173,070 (100.0)
	Friday	47,186 (26.7)	7,619 (4.3)	16,470 (9.3)	88,980 (50.4)	1,199 (0.7)	3,808 (2.2)	374 (0.2)	3,825 (2.2)	2,443 (1.4)	3,965 (2.2)	477 (0.3)	131 (0.1)	176,477 (100.0)
	Holiday	37,143 (24.3)	5,645 (1.9)	12,488 (9.7)	58,337 (57.2)	1,240 (1.3)	2,551 (1.5)	16 (0.0)	2,578 (1.3)	1,848 (1.0)	2,229 (1.3)	431 (0.4)	28 (0.0)	124,534 (100.0)
MB-4	Weekday	86,176 (43.7)	7,731 (3.9)	9,305 (4.7)	78,408 (39.8)	3,230 (1.6)	571 (0.3)	414 (0.2)	2,881 (1.5)	2,229 (1.1)	4,400 (2.2)	1,805 (0.9)	68 (0.0)	197,218 (100.0)
	Friday	96,140 (49.1)	7,873 (4.0)	8,695 (4.4)	69,226 (35.4)	2,449 (1.3)	478 (0.2)	325 (0.2)	2,697 (1.4)	1,615 (0.8)	4,772 (2.4)	1,378 (0.7)	104 (0.1)	195,752 (100.0)
	Holiday	55,887 (48.4)	7,207 (3.1)	5,197 (2.7)	31,282 (41.1)	1,572 (1.7)	354 (0.2)	65 (0.1)	1,615 (0.7)	1,227 (0.6)	2,461 (0.9)	1,265 (0.5)	149 (0.0)	108,281 (100.0)
MB-5	Weekday	64,951 (62.0)	2,079 (2.0)	5,482 (5.2)	29,734 (28.4)	1,083 (1.0)	168 (0.2)	15 (0.0)	2 (0.0)	296 (0.3)	608 (0.6)	418 (0.4)	8 (0.0)	104,844 (100.0)
	Friday	65,498 (65.2)	2,035 (2.0)	5,740 (5.7)	23,896 (23.8)	1,718 (1.7)	28 (0.0)	37 (0.0)	1 (0.0)	4 (0.0)	1,058 (1.1)	494 (0.5)	1 (0.0)	100,510 (100.0)
	Holiday	42,766 (64.6)	2,389 (2.1)	4,237 (8.1)	13,010 (21.6)	1,163 (1.0)	8 (0.0)	10 (0.2)	0 (0.0)	9 (0.0)	573 (2.0)	399 (0.4)	4 (0.0)	64,568 (100.0)

Source: JICA Study Team

2.1.6 Cargo Movement Survey**(1) General**

This Survey aims to collect information about origin and destination of freight at three (3) major truck terminals, which consists of interview survey and traffic count survey.

(2) Survey Method

1) Interview

At the gates of truck terminals, surveyors interviewed to the drivers based on the questionnaire. Interview items are as below;

- Origin and Destination
- Commodity Type
- Tones Loaded

2) Traffic Count

Numbers of six (6) types of freight vehicles as below are counted separately.

- Light Freight Vehicles
- Single Unit Trucks, 2 Axle
- Single Unit Trucks, 3 Axle
- Trailers, 4 Axle
- Trailers, 5 Axle
- Trailers, 6 Axle

(3) Survey Coverage

It took 24 hours for this survey from 8 am on weekdays. Three (3) terminals of survey location are described and shown in following table and figure.

Table A4-2-17 Locations List and date of Cargo Movement Survey

ID	Location	No. of Gates	Date (Year 2010)
CM-1	New Sabzi Mandi	2	13-July
CM-2	New Truck Stand	6	21-July
CM-3	Karachi Port	8	19-July

Source: JICA Study Team



Source: JICA Study Team

Figure A4-2-7 Location Map of Cargo Movement Survey

(4) Result

Following table shows the result of Count Survey.

Table A4-2-18 Number of Vehicles of Cargo Movement Survey

ID	Light Freight Vehicles	Single unit trucks		Trailers			Total
		2 Axle	3 Axle	4 Axle	5 Axle	6 Axle	
CM-1	5,999	2,555	354	9	0	21	8,938
CM-2	4,308	3,554	1,458	822	74	68	10,284
CM-3	293	863	2,838	2,645	437	620	7,696

Source: JICA Study Team

Following table shows the result of interview survey.

Table A4-2-19 Commodities at Cargo Movement Survey

		CM Interview		
		CM-1	CM-2	CM-3
Sample size		1064	2134	2216
Load (%)	Full	46.3	33.2	37.9
	Half	11.7	11.9	3.8
	Empty	41.9	54.9	58.3
Commodity (%)	Food and Beverage	95.8	22.6	14.1
	Petroleum and fuels	0.0	2.8	13.4
	Cement and earth	0.0	2.1	8.8
	Steel and Iron	0.2	5.2	15.0
	Raw materials	0.0	11.1	5.1
	Manufactured Products	0.2	33.4	5.1
	Electrical Products	0.0	6.1	0.3
	Car and Auto Supplies	0.0	9.2	0.2
	Medical and Chemical Products	0.0	4.7	1.1
	Others or Unknown	3.9	2.8	36.8

Source: JICA Study Team

2.1.7 Passenger Interview Survey**(1) General**

This survey aims to collect information of passenger's stated preference for modal transportation choice by interview.

(2) Survey Method

Interview is conducted to a passenger traveling by any of the four (4) transport modes, Passenger car, Motorcycle, Taxi and Rickshaw, and Bus, with using one of several types of questionnaires.

Interview items are as below;

- Personal Attributes
- Trip mode information
- Stated Preference (SP) of LRT and BRT system
- Willingness-to-pay for LRT and BRT

Result of SP interview would be applied for logit modeling as mode choice in demand forecast. Thus, it is necessary to collect varied results on different conditions. Due to the reason, Questionnaires are prepared several types (eight (8) types for Car users, four (4) types for the other mode users on each).

(3) Survey Coverage

Survey hour was from 8 am to 8 pm and minimum sample number is 2,000. Following Table and Figure show the survey location and date

Table A4-2-20 Location list and date of Passenger Interview Survey

ID	Location			Date (Year 2010)
		Car & Motorcycle	Rickshaw & Bus	
PI-1	Shahrah-e-Sher Shah Suri near Hyderi Market	petrol pump	Bus Stop	31-May, 17-June*
PI-2	Estate Avenue Site near Textile Avenue	petrol pump	Bus Stop	1-June
PI-3	M. A. Jinnah Road near Numaish	market parking area	Bus Stop	2-June
PI-4	Shahrah-e-Faisal near Nursery	market parking area	Bus Stop	3-June
PI-5	Khayaban-e-Iqbal between Teen Talwar and Under Pass	petrol pump & roadside w/ police	Bus Stop	8-June

*Re-conduct part of survey due to error of interview

Source: JICA Study Team



Source: JICA Study Team

Figure A4-2-8 Location Map of Passenger Interview Survey

(4) Result

Following table shows the profile of interview survey.

Table A4-2-21 Profile of Interviewers of PIS

		Transportation Mode			
		Cars	Motorcycle	Buses	Rickshaw
No. of Sample		1080	973	555	614
Gender (%)	Male	92.8	99.9	96.8	85.7
	Female	7.2	0.1	3.2	14.3
Age (%)	Under 20	4.5	9.6	10.6	12.9
	21 – 30	41.9	48.4	42.7	51.6
	31 – 40	32.0	29.6	31.7	26.7
	41 – 60	20.0	11.8	14.1	8.3
	Over 61	1.6	0.6	0.9	0.5
Occupation (%)	Officials of Government	12.2	16.8	11.3	7.8
	Employee of private company	40.1	43.4	42.9	39.3
	Independent/ Self-employed	28.2	5.9	21.0	16.5
	Bus/ Rickshaw/ Taxi Driver	1.5	1.0	0.9	1.1
	Truck Driver	0.1	0.5	0.0	0.7
	Teacher	1.8	1.4	3.2	3.8
	Student (Elementary)	0.2	0.4	0.2	0.7
	Student (High school)	0.9	1.4	2.7	3.3
	Student (University/ College)	7.2	6.4	12.9	6.0
	Housewife	2.5	0.0	0.5	5.5
	Retire/ Pension	0.7	1.0	1.4	1.5
	Jobless	1.3	1.8	2.2	6.4
	Others	3.4	19.8	0.7	7.5
Car Ownership (%)	None	16.6	2.4	67.7	52.5
	Motorcycle	11.4	88.2	16.9	33.9
	Car / 4WD / Pickup	59.4	8.9	13.0	11.8
	Van / Hi-Ace	11.5	0.0	1.3	1.1
	Truck	0.7	0.0	0.2	0.2
	Others	0.4	0.5	0.9	0.5

Source: JICA Study Team

2.1.8 Public Transport Survey**(1) General**

This survey aims to collect information about public transport frequency. Fifteen (15) locations were selected to cover all the public bus routes, based on the study for CNG Bus project, conducted by KMTC in 2009.

(2) Survey Method

Number of each bus line are counted and recorded on the sheet by roadside observing.

(3) Survey Coverage

It took eighteen (18) hours from 6 am to 12 am on weekdays for this survey. Following table and figure show the survey location and date.

Table A4-2-22 Location and date of Public Transport Survey

ID	Location	Survey Date (Year 2010)
PT-1	Bolton Market	4-Nov
PT-2	KMC Bldg	4-Nov
PT-3	Taj Medical Complex	4-Nov
PT-4	Karachi Zoo (south)	4-Nov
PT-5	Karachi Zoo (north)	4-Nov
PT-6	Askari Park	8-Nov
PT-7	Korangi Rd near Sunset Boulevard	8-Nov
PT-8	Jauhar Mall	10-Nov
PT-9	PAF Museum	10-Nov
PT-10	Malir Halt	10-Nov
PT-11	Landhi near Industrial Area	10-Nov
PT-12	SITE Avenue	11-Nov
PT-13	Abdullah Girls College	11-Nov
PT-14	Sohrab Goth	11-Nov
PT-15	Al Asif Square	11-Nov

Source: JICA Study Team



Source: JICA Study Team

Figure A4-2-9 Location Map of Public Transport Survey**(4) Result**

Following table shows the result of Count Survey.

Table A4-2-23 No. of Buses in Service of PT Survey

ID	No. of Bus in service, 18 hours, both direction				
	Large Bus	Minibus	Coach	UTS, KPTS	Total
PT-1	394	2,719	2,420	148	5,681
PT-2	1,166	1,017	992	88	3,263
PT-3	2,415	3,134	1,784	0	7,333
PT-4	1,204	1,937	386	0	3,527
PT-5	417	205	392	0	1,014
PT-6	302	1,908	1,038	46	3,294
PT-7	644	1,653	1,000	0	3,297
PT-8	74	2,190	316	126	2,706
PT-9	0	2,432	1,007	413	3,852
PT-10	532	2,183	763	159	3,637
PT-11	0	1,876	441	0	2,317
PT-12	204	1,066	561	0	1,831
PT-13	0	1,674	121	0	1,795
PT-14	286	1,650	451	0	2,387
PT-15	0	1,759	507	179	2,445

Source: JICA Study Team

2.1.9 Travel Speed Survey**(1) General**

This survey aims to collect travel speed information on present traffic situation in the study area. It is conducted by passenger car (SEDAN) passing through ten (10) major routes, corridors, in peak hours.

(2) Survey Method

Travel time is recorded for every section of the survey routes by running two (2) cars.

(3) Survey Coverage

Ten (10) routes are selected, referring to Corridors on KSDP2020, as described in Table A4-2-23.

Table A4-2-24 Route List and Date of Travel Speed Survey

ID	Ends of Route	Corresponding Corridor in KSDP 2020	Date (Year 2010)
TS-1	M. W. Tower – Sohrab Goth	LRT-1	3-May
TS-2	Cantonment Station – Banaras Chowk	LRT-2	4-May
TS-3	FTC – Quaidabad (through Shahrah-e-Faisal)	LRT-4	5-May
TS-4	Colony Gate – Nagan Chowrangi	LRT-5	6-May
TS-5	M. W. Tower – RCD Highway Police Training School	LRT-6	10-May
TS-6	Cantonment Station – Surjani Town	BRT-1	12-May
TS-7	Numaish – Safoora Goth	BRT-2	11-May
TS-8	Board of Secondary Education – Banaras Chowk	BRT-3	13-May
TS-9	City Station – Hotel Mehran	BRT-1 Ext	17-May
TS-10	FTC – Quaidabad (through Korangi)	-	18-May

Source: JICA Study Team

(4) Result

Following table shows the result of travel speed survey.

Table A4-2-25 Summary of Travel Speed Survey Result

ID	Distance	Average speed (km/h) of both direction						
		(1) → (2)				(2) → (1)		
		Average	Morning	Evening		Average	Morning	Evening
TS-1	(1) M.W.Tower - (2) Sohrab Goth							
	14.9km	23.30	22.98	24.72	19.51	23.59	28.81	15.77
TS-2	(1) Banaras Chowk - (2) Cantt. Station							
	10.5km	15.66	16.66	20.15	11.43	14.66	16.80	11.44
TS-3	(1) Abbot Laboratory - (2) Cantt. Station							
	21.3km	31.81	30.30	31.35	28.18	33.17	38.06	25.85
TS-4	(1) Nagan Chowrangi - (2) Colony Gate							
	10.2km	40.14	39.30	38.52	40.00	40.93	49.40	34.15
TS-5	(1) RCD Highway - (2) M.W.Tower							
	11.0km	28.13	24.86	24.78	24.99	31.41	34.26	26.83
TS-6	(1) Surjani Town - (2) M.A.Jinnah Road							
	16.5km	33.62	33.05	31.91	34.77	34.20	37.58	29.11
TS-7	(1) Numaish - (2) Safoorah Goth							
	16.0km	35.80	34.30	34.28	34.31	37.31	42.81	31.81
TS-8	(1) Board Office Chowrangi - (2) Banaras Chowrangi							
	1.7km	15.81	16.59	16.59	-	15.02	15.02	-
TS-9	(1) Hotel Mehran - (2) City Station							
	2.7km	8.12	7.70	7.05	8.36	8.54	7.16	9.93
TS-10	(1) Quaidabad - (2) FTC							
	17.5km	35.14	33.05	32.11	33.99	37.22	40.68	33.77

Source: Travel Speed Survey in KTIP

2.1.10 Road Inventory Survey

(1) General

This survey aims to collect information about Attributes of urban roads in Karachi for developing road network model through traffic demand forecast.

(2) Survey Method

This survey collects following information of attributes, based on segments into which targeted roads are divided by cross sections and some other index.

- Existence of median strip
- Paved or unpaved
- One way or two way
- Direction (in case of one-way road)
- Enforced maximum speed (if the sign board is observed)
- Number of lanes for each direction
- Existence of lane marking
- Existence of frontage roads

- Existence of roadside parking (main road, not in frontage road)

Those data is captured by video camera set on running vehicle.

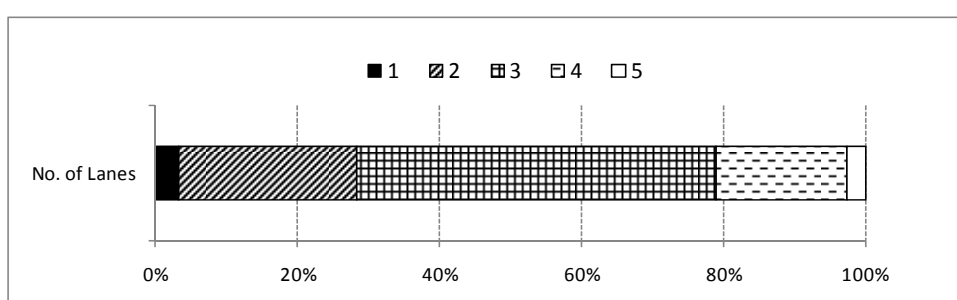
(3) Survey Coverage

The target is main part of arterial and major roads in Karachi city and over 1,000 segments organize the data of result in total

(4) Result

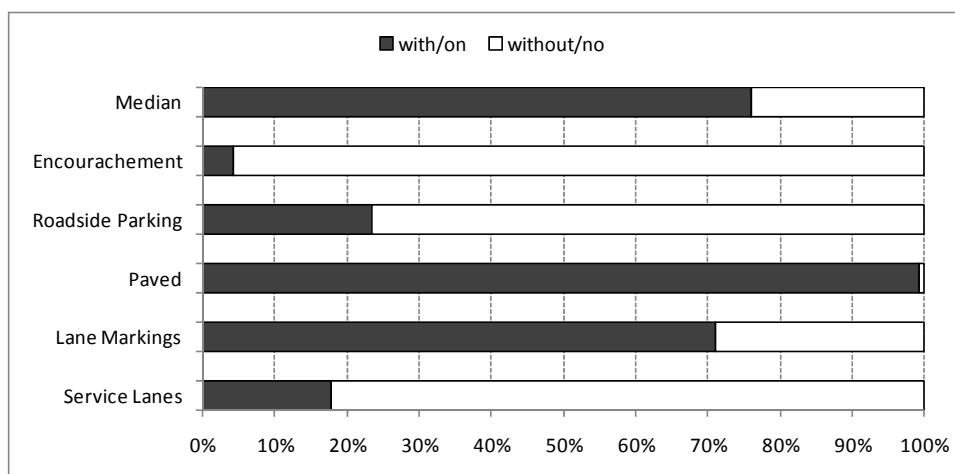
Following figure shows the summery of the result.

It is necessary to note that the points consist of segment-based counting, and describes not all in-city roads, but only targeted in this survey.



Source: JICA Study Team

Figure 4-2-10 Total Ratio of No. of Lanes per One Way of Road Inventory Survey



Source: JICA Study Team

Figure 4-2-11 Total Ratio of the Attributes of Road Inventory Survey